

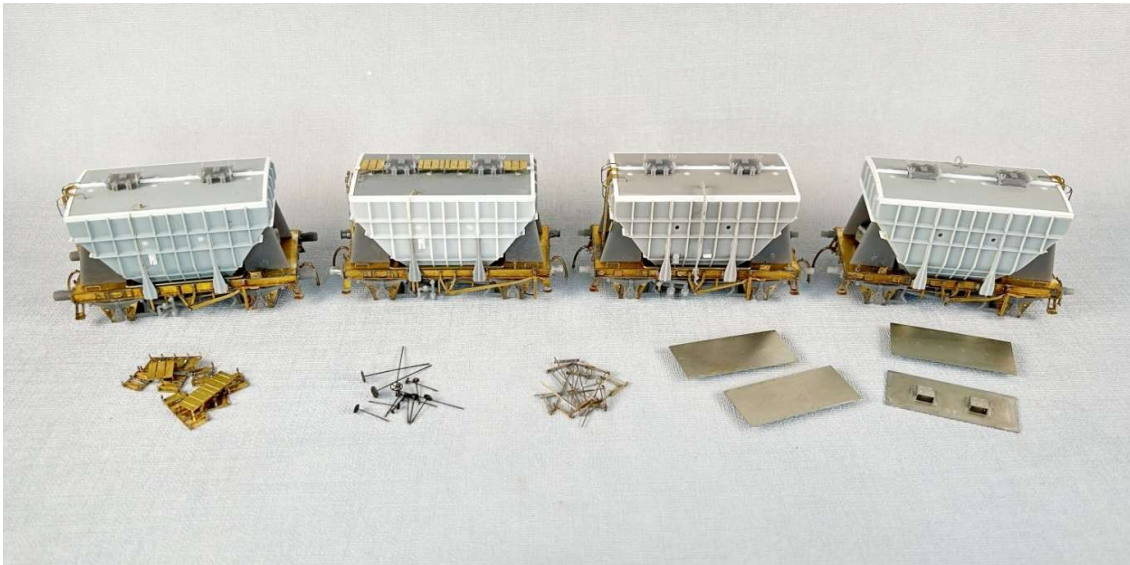
Rumney Models Presflo Underframe and Detailing Instructions

Notes

This set of instructions covers Rumney Models underframe and detailing kits for the 10'6" wheelbase BR, Tunnel Cement and APCM Presflos. There are several kits to cover variations. Details of these variations can be found in the Prototype Notes section below. Product codes for the kits covered by these instructions are as follows:

- PB.81A BR Presflo – Early brakegear
- PB.81B BR Presflo – Late brakegear
- PB.81C BR Ferry Presflo - Additional Parts (For use with PB.81B)
- PB.81A-Dap Airfix/Dapol body upgrade pack - BR Early brakegear
- PB.81B-Dap Airfix/Dapol body upgrade pack - BR Late brakegear

- PB.82 PO Presflo - Late Brakegear
- PB.82-Dap Airfix/Dapol body upgrade pack - PO Late brakegear
- PB.82HSB PO Presflo - Hopper side boards



The basic kits (PB.81A, PB.81B and PB.82) include etches for the underframe and detailing parts such as ladders, walkways and valve wheels. They also include one or two cast vacuum cylinders and 3D printed parts for the brakegear, springs & axleboxes, buffers and the discharge pipes. Please note these are EM/P4 only.

The additional parts for the BR Ferry fitted Presflo contains new solebars, tie down rings and continental label boards. They are to be used in conjunction with PB.81B.

The Airfix/Dapol body upgrade packs (PB.81A-Dap, PB.81B-Dap and PB.82-Dap) include 3D printed replacement ends and side stanchions, new manholes and a hopper bottom.

Replacement hopper side boards (PB.82HSB) as found on the APCM and Tunnel Cement Presflo when built are available.

Finally, solebars without slots for side stanchion brackets are available by request for those wishing to model for Shildon built wagons in their early days, before they were fitted with side stanchions.

The basic kits are designed to be used with either the original kit produced by Airfix or older production of the same kit marketed by Dapol which are moulded in light grey plastic. I would avoid new Dapol kits (moulded in dark grey plastic) because, for some inexplicable reason, they have a great big trench in the sides of the hopper.

The Basic kits can be used under the Bachmann body, though this will need a little modification as may the discharge pipes as the bottom of the hopper is wider and longer than the Airfix one.

Prototype Notes

The first production Presflo appeared in 1955 and building continued for the next 9 years. Over this time there were several variations. Broadly speaking, there were two types of brakegear each with different length brake levers, two types of ladders and two styles of steps. On top of this there were two styles of pressure gauge piping, and the arrangement of hopper bottom and discharge piping were different depending on whether the Presflo was BR or privately owned.

Early builds (lots 2769, 2863 & 3029) had a single vacuum cylinder and brakegear with simple push rod brakes acting on a crank on the brake lever shafts. They were fitted with long brake levers with the lever guard on the outside of the right hand axleguard. The first two lots weren't built with side stanchions, but they were added fairly quickly between about 1958 and 1963. They also had an early style ladder which was mounted at the top to a plate welded onto two of the stanchions and plate style steps attached to the underside of the solebar. Lot 3029 had a late style ladder which curved up at the top to be fixed on the top of the hopper along with steps fabricated from angle. Both these features were continued throughout the rest of the production.

Everything else had twin vacuum cylinders with changeover levers and had brakegear with compensated links around the brake lever shafts. They were fitted with short brake levers with the lever guard on the inside of the right hand axleguard.



Buffers were 1'6" self-contained (either BR or GWR style 2 rib) on the first two lots with Instanter couplings. The next few lots of BR built wagons had a right mixture with either 1'8½" self-contained buffers (either GWR style or BR), 1'8½" or 2' Oleo or 1'8½" or 2' Dowty. Wagons fitted with 1'8½" buffers had standard screw couplings while those with 2' buffers had UIC type screw couplings with two shackle type links from the drawbar hook rather than a U shaped bar link. This settled down in about 1960 with everything from that point onwards having 1'8½" Oleos and Instanter couplings.

The first three lots had oil axleboxes when built. These were replaced with roller bearings in the late 1950's/1960s. In the case of the first two lots this could well have been at the point when they got their side stanchions. The rest had roller bearing axleboxes from new and there were at least 5 types used. Wagons fitted with oil axleboxes had 8 leaf springs, those with roller bearings had 9.

The main discharge pipe from the bottom of the hopper seemed to be the same on all, but the arrangement of air pipes was different depending on whether the Presflo was BR or privately owned. The PO air pipes were bigger and fed into the hopper bottom in a different place. There was a pressure gauge on the pipe side of the hopper. On early BR builds this was a simple small pipe which ran up the side of a stanchion from the gauge into the top of the hopper. At some point, probably starting around 1960, this arrangement was changed. Now there was an additional larger pipe leading down from the top of the hopper and the pipe to the pressure gauge linked into that. The pressure gauge was also in a different position on BR and PO builds. Early builds were modified to the latter arrangement in the 1960s.

Those Presflos built by Butterley had a sharp change of angle between the vertical parts of the hopper and the bottom. The rest had a curved change of angle.

There were also other small detail differences. The Shildon and Met Cam builds had grab handles on top of the underframe in all four corners, everything else had them at the ladder end only. The Met Cam built wagons also had grab handles half way up the end stanchions on the ladder end. Instruction boards appeared in the mid 1960s on the pipe side, mounted to the top of the underframe between the side stanchions. Manholes were generally arranged so that the hinges were on the discharge pipe side except those built by Central to lot 3175 where they faced the other way. There's always got to be one...



The body of the Presflos had three sets of angled horizontal ribs or bracing which strengthened the platework. The prototype, as well as not having any side stanchions, didn't have any long reinforcing 'fins' on the end parts of this horizontal bracing. It is probable that the Shildon lots didn't either when new, but they appear on those that had gained their side stanchions and were included from new on subsequent lots. The arrangement of these 'fins' differed depending on when the Presflo was built. The Shildon wagons had long fins (though maybe not initially) on all three rows of bracing. Lot 3029 wagons seemed to have them only on the top row when built but some wagons gained them on all three later in life. After this, things seemed to settle down with long 'fins' on the top two rows only.

10 wagons were converted for ferry use to carry Fuller's Earth to the continent. They seem to have been drawn from lots 3176 and 3177 and had continental style buffers, 2' UIC couplings, tie down rings and continental style label boards. The traffic for which they were intended ceased in the early 1970s after which they went into general use, though they retained their ferry fittings.

Finally, I think, and with some trepidation we come to salt traffic. Paul Bartlett states that 20 of lot 3029 were built for ICI salt traffic. These had two silos within the same body. Due to the two silos, they had a different (twin) hopper bottom and two set so of discharge pipes. They were painted ICI blue. In the 1960s they were transferred to other traffics including Delafilla, which is a brand of powdered slate, and then fly-ash. Numbers include B888181/3/92. Given this it is possible that they were numbered in the range B888181-888200 or more randomly from within lot 3029. Don Rowland also states that 30 of lot 3156 (B888551-888580) were branded for bulk salt but gives no further details. If true, some at least were rebranded for cement traffic later in life. The three I have seen images of from this batch appear to be pretty standard. David Larkin states that prior to the lot 3029 wagons, 20 wagons from lots 2769 and 2863 were allocated to salt traffic. He says that this involves modifications to the roof but doesn't say what. The numbers he lists are B888003/17/22/5/38/51/84/94, B888111/8/21/8/9/48/50/5/60/2/3/4. Paul Bartlett has an image of B888003 later in its life and it is branded for Cement. There is nothing obviously different about it.

As always when modelling a wagon, try and find an image from the period you are modelling. Early photos are hard to find but they are out there and beware features that were not on the wagons when built. The main things to watch out for are oil axleboxes on the first three lots and the larger air pipe which was not initially fitted to early builds.

Prototype Details

BR Diagram 1/272

Early brakegear with single vacuum cylinder, long brake levers, early style ladder, plate steps, 1'6" self-contained buffers (mainly BR but occasionally GWR style 2 rib), Instanter couplings, oil axleboxes when new. These two lots didn't have side stanchions when built though they gained them between around 1958 and 1963.

- B888801-B888110 2769 Shildon 55
- B888111-B888180 2863 Shildon 56

Early brakegear with single vacuum cylinder, long brake levers, late style ladder, fabricated steps, 1'8½" self-contained buffers (GWR style 2 rib with backing plate), screw couplings, oil axleboxes when new. Fitted with plain T shaped side stanchions when built. These were later reinforced with wedge shaped plates as per the other Presflos. 20 from this lot were built for ICI salt traffic with twin silos, two hopper bottoms and two sets of pipes (see above).

- B888181-B888280 3029 Met Cam 57/8

All of the flowing wagons had late brakegear with twin vacuum cylinders and changeover levers, short brake levers, late style ladder, fabricated steps, roller bearing axleboxes. All had side stanchions with the characteristic wedge shaped plates attaching to brackets fixed to the solebar from new.

1'8½" self-contained (BR style), Oleo or Dowty buffers and screw couplings. Grab handles on all four corners of the underframe top.

- B888281-B888580 3156 Met Cam 58/9

1'8½" self-contained (BR style), Oleo or Dowty and screw couplings. 2' Oleo or Dowty buffers and UIC type screw couplings. Grab handles on top of underframe at ladder end only. 10 wagons from lots 3176 and 3177 had Ferry fittings with 2' continental style self-contained buffers and UIC type screw couplings. The Butterley built wagons had a sharp change of angle between the hopper side and bottom in contrast to the usual curve.

- B888581-B888880 3175 Central 58/9
- B888881-B888980 3176 Butterley 58/9
- B887800-B887999 3177 Gloucester 58/9

1'8½" Oleo buffers, Instanter couplings.

- B873024-B873197 3323 Gloucester 60
- B873200-B873369 3361 Gloucester 61
- B873420-B873569 3406 Gloucester 61/2
- B873570-B873719 3409 Central 61/3
- B873794-B873893 3497 Central 64

All BR built Presflo appeared in freight stock red with black underframes. Many were branded for specific traffic or companies, including Fuller's Earth, Rugby Cement, Tunnel cement and APCM with 'Blue Circle' roundel boards on the side of hoppers.

Wagons built with oil axleboxes were given roller bearings in the late 1950s or 1960s.

APCM

228 Wagons built in three batches. Butterley built one lot in 1960 and another in 1963. Met Cam also built a batch in 1963. Registration numbers 8601-8828.

Late brakegear with twin vacuum cylinders and changeover levers, short brake levers, late style ladder, fabricated steps, 1'8½" Oleo buffers, Instanter couplings, roller bearing axleboxes.

- PF01-PF106* Butterley 1960
- PF117*-PF162 Butterley 1963
- PF163-PF228 Met Cam 1963

* Somewhere between PF106 and PF117 the first batch ended and the second began though I don't know where at the time of writing.

The 1960 batch was initially painted yellow, the 1963 ones grey with black underframes. All had rectangular boards mounted on the side of the hoppers with Blue Circle Products branding.

Tunnel Cement

8 wagons built by Butterley in 1960. Registration numbers 8951-8958.

Details as per the APCM wagons.

Livery was freight stock red with black underframe.

Tops Codes

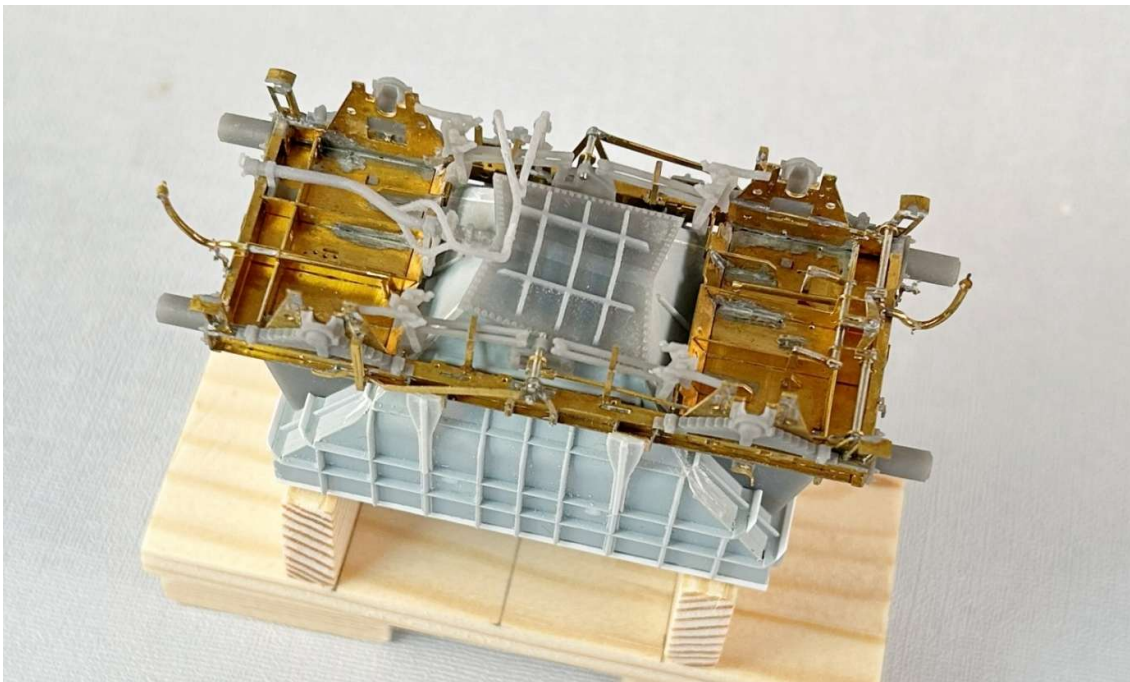
CP001A - 1'6" Buffers - Lots 2769, 2863

CP001B - 1'8½" Buffers - Lots 2769, 2863, 3029, 3156. 3175, 3176, 3177 (all part), Lots 3323, 3361, 3406, 3409, 3497

CP001C - 2' Buffers - Lots 3156. 3175, 3176, 3177 (all part)

References & Assistance

- Paul Bartlett's wonderful website of wagon photos.
- BR Diagram Books, courtesy of the Barrowmore Model Railway Group.
- Wagons of the Middle British Railways Period by David Larkin
- Wagons of the Late British Railways Period by David Larkin
- British Railways Wagons by Don Rowland
- Richard Oldfield, Paul Dawe and Noel Anderson



General 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. Parts are numbered on the fret, and I've tried to do this in build order.

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 I say 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 I 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.

3D Printed Parts

The 3D prints are resin prints from an SLA printer. This process uses a laser to cure photosensitive resin. They have been thoroughly cleaned and then cured to produce the parts you have. As they are cured by a certain wavelength of light there is the possibility that if left exposed to sunlight for a prolonged period of time the parts may go brittle. This is not unlike some plastics. To avoid this please consider the following:

- Do not leave unpainted resin parts exposed to direct sunlight for any length of time. Store in a dark place.
- Make sure all 3d printed parts are properly primed and painted.
- If the kit is not intended to be built for a while, consider priming the printed parts before storing.

If these points are followed, then the printed parts will be fine. However, if you leave them for several years on a south facing windowsill, then you might end up having problems with them...

Some parts have been left on the supports they were printed with to help prevent damage to them. They will need removing from the supports and cleaning up before use. When removing them from the supports and cleaning them up please note the following:

- Parts should be removed from the supports using a pair of flush cutters or a piercing saw with a fine blade (size 7/0 or 8/0 is recommended). Only use flush cutters, one side of the blade needs to be straight, so it makes a || shape. Cutters where each blade forms a V rather than being completely flat on one side should be avoided as they may cause damage. I tend to mostly use a piercing saw.
- If using cutters, the place to cut them is where the support meets the part. Often this is right against the printed part. This is the designed in weak point. Avoid the temptation to cut the supports away from the printed parts as this may damage them. If using a piercing saw, then the closer you cut to the part the less you will need to clean up. Be aware of the following point though:

- The material files/sands and cuts with a saw blade very easily, almost too easily. Go slowly and take care. When cleaning up, wet and dry paper is recommended, preferably with a little water to contain any dust. You can also use fine files.
- The material does not cut well with a knife blade, and it may fracture if you try. I can't imagine why anyone would want to try and slice the prints, but I thought I'd say it anyway. You can however use a sharp scalpel blade to pare away material if needed.
- Due to the process used to produce these parts they may need fettling to fit, i.e. parts may come out slightly oversize.
- Holes will almost certainly need opening out. Use a sharp drill or a cutting broach. Smaller holes such will almost certainly appear as an indentation rather than a hole.
- Dispose of the waste support material responsibly. At this time, it cannot be recycled.

Fixing the printed parts in place can be done using either cyanoacrylate (superglue) or epoxy. I have used both successfully. Epoxy will give you more time for adjustment. In both cases makes sure the printed parts and what they are being attached to are free from any grease.

The printed parts need no special cleaning before painting. A wash with a cream cleaner to remove any grease will be sufficient. Like plastics avoid using prolonged contact with cellulose thinners as this may damage them. IPA will be fine as this is what is used to clean them after printing.

Technical

The suspension is individual springs made from 0.008" steel guitar wire soldered to the etched spring/bearing carriers. The wire is nickel plated so should solder with your regular flux. If you have any issues the use Carr's Black label flux for steel. If the finished vehicle is weighted to 50g with the weight evenly distributed, then this will produce a spring deflection of 0.5mm. Don't be tempted to up the gauge of spring wire. Even moving up to 0.009" springs will have a significant effect on the spring deflection. Also, don't overweight the wagon or the springs will not have enough upwards movement before they hit the axleguards. Think of the 50g total as an ideal weight but also a maximum. I actually aim for 45g of sprung weight with my models (so not including wheels or spring carriers). There are notes on weighting the wagon in the part of the instructions that deals with assembling the body.

Tools

The following tools may be useful when constructing the wagon:

- A selection of drill bits including 0.3mm, 0.4mm, 0.5mm, 0.6mm, 0.8mm, 0.9mm, 1mm & 1.2mm
- A selection of tapered reamers in the range 0.3mm-1mm and 2mm
- A selection of fine files
- A 0-1mm pin vice
- A piercing saw with fine blade (size 7/0 or 8/0 recommended)

Materials list

You will need to source some parts to complete the kit.

Wire and Tube

You will need several sizes of wire are needed to build the underframe. Cambrian Models are good source for these as they obtained the stock of Eileen's Emporium when they ceased trading.

- 0.31mm - Brakegear, keeps, brake lever guards, grab handles, ladders, valve wheel shafts
- 0.4mm - Discharge pipes
- 0.5mm - Drawbar hook retention
- 0.6mm - Vacuum cylinder piston
- 0.8mm - Brake cross shafts
- 1mm - Construction 'pins'

You may find 0.7mm x 0.5mm thin walled microtube useful for retaining sprung metal heads, if using. This size is produced by Albion Alloys under their Precision Metals range, code MBT07. It is worth noting that you will need to fit sprung buffers before the outer printed clasp brakes as there is no room to get at the shanks afterwards. I painted those parts separately.

You will need thin wire for the pressure gauge pipe. I used 38SWG soft brass wire. Fuse wire could be a possibility. If you are doing an early BR style pressure gauge pipe you may also want some 0.5mm x 0.3mm tube, Albion Alloys MBT05. If you are upgrading an Airfix/Dapol body, there are various bits of plastic sheet and section that you will need. These are summarised at the end of the section dealing with the body detailing.

Buffers

The buffer types used on these wagons were listed in the Prototype Details section above. Oleo 1'8 1/2" 3D printed buffer housings are included with the basic kits and 2' Dowty with the additional ferry detailing. You will need metal heads and springs to complete. Wizard Models list 13" buffer heads with a 1.45mm shank though supply seems infrequent. An alternative to this is to use 13" heads with a 1mm shank and 1.4mm x 1mm stainless steel tube. The tube can be had from China via Ali Express and both MJT and Wizard Models list 13" buffer heads with 1mm shanks.

If the range ever rematerialises, Lanarkshire Models & Supplies would be a good place to look for self contained and rigid buffer castings. The GWR style 2 rib type can be made from the GWR 6 rib by careful removal of some whitmetal, which is what I did for one of mine.

Couplings

Drawbar hooks and Instantan links are included but plain links will be needed to complete them. Making your own links from 0.5mm nickel silver wire is not difficult and John Hayes shows you how to do it in his "4mm Coal Wagon" book published by Wild Swan. I use this method to produce mine. Brassmasters now supply blackened chain for those not wishing to make their own. For Screw couplings use those available from Rumney Models (B.96). Parts are included to model both the standard and UIC types.

Wheels

You will need 3'1 1/2" 3 hole disc wheels from your favourite manufacturer to your chosen 4mm gauge along with bearings. As always, check your prototype for which type wheels you need. If you are using pinpoint bearings a waisted type such as that marketed by Alan Gibson (their code 4M63W) would be ideal. If you are using Exactoscale products, then you can also use parallel axles and either 2mm or 1.5mm parallel bearings. If you are using the later, you will need some 2mm x 1.5mm tube to act as a sleeve over the bearings.

Parts List

Numbers - 0.25mm sheet except where noted.

Letters - 0.3mm fret except where noted.

1 - Bottom plate
 A - Top plate
 A1 - Riveted axlebox guide - early brakegear (on 0.25mm sheet)
 A2 - Riveted axlebox guide - late brakegear (on 0.25mm sheet)
 B - Top plate angle jig (part of fret)
 C - Inner springing bracket
 D1 - End reinforcement - early brakegear & ladder end on later brakegear
 D2 - End reinforcement and brake shaft brackets - vacuum cylinder end on later brakegear

2 - Solebars
 3a - Solebar overlays - early brakegear
 3b - Solebar overlays - late brakegear
 4 - Solebar detailing

5a - Underframe end plating - ladder end
 5b - Underframe end plating - vacuum cylinder end - early brakegear
 5c - Underframe end plating - vacuum cylinder end - later brakegear

6a - Side stanchion brackets - Dapol
 6b - Side stanchion brackets - Bachmann

7 - Brake lever vees
 7a - Brake lever vee washers
 8 - Brake lever vee brackets

9 - Brake lever guard brackets
 10a - Brake lever guard - early brakegear
 10b - Brake lever guard - later brakegear

11 - Vacuum cylinder shaft to brake lever shaft links and overlays

12 - Late brakegear compensating links and overlays

13a - Vacuum cylinder actuator - early brakegear
 13b - Vacuum cylinder actuator - late brakegear

14a - Plate steps
 14b - Fabricated steps

15a - Drawbar hook plates - early welded type - early builds with 1'6" buffers and Instanter couplings, middle builds with 1'8½" buffers and ordinary screw couplings
 15b - Drawbar hook plates - UIC type - middle builds with 2' buffers and UIC type screw couplings
 15c - Drawbar hook plates - late type - late builds with 1'8½" buffers and Instanter couplings

16 - Dummy vacuum pipe couplings
 17a - Standard lamp irons
 17b - Short lamp irons

18a - BR cement pipe bracket (on 0.3mm fret)
 18b - PO cement pipe bracket (on 0.3mm fret)
 18c - PO cement pipe bracket angle

E1- Middle vacuum cylinder bracket - plain

E2 - Middle vacuum cylinder bracket - reinforced
E3 - Middle vacuum cylinder bracket - reinforcing plate for early brakegear
E4 - Middle vacuum cylinder bracket - reinforcing plate for later brakegear
E5 - Middle vacuum cylinder bracket - washers
F - Outer vacuum cylinder brackets

19 - Vacuum release chord pedestal (two pairs to include spares)
20 - Changeover levers and overlays - late brakegear only

G - Spring carriers
H - Bearing washers
I - Parallel axle washers (on 0.25mm fret)

21 - Axle keeps

J1 - Drawbar hooks - Instanter and standard screw couplings
J2 - Drawbar Hooks - UIC type screw couplings

22a - BR Instanter links
22b - GWR Instanter Links

23a - Brakegear safety loops - early brakegear short
23b - Brakegear safety loops - early brakegear medium
23c - Brakegear safety loops - early brakegear long
23d - Brakegear safety loops - later brakegear

24a - Brake levers and Morton clutches - early brakegear
24b - Brake levers and Morton clutches - later brakegear

25a - Discharge valve wheels - 3 types
25b - Air Inlet pipe valve wheels - 2 sizes (smaller early, larger late)
25c - Roof pipe wheel

31 - Ladder assembly jig
32a - Ladder - early - Dapol
32b - Ladder - early - Bachmann
32c - Ladder - late
33 - Early ladder drilling jig (also on walkway jigs L1 and L2)
34 - Dapol manhole shaping jig

K - Right hand handrail drilling jig (for late type ladders only)
L1 - Walkway and ladder drilling jig - Dapol

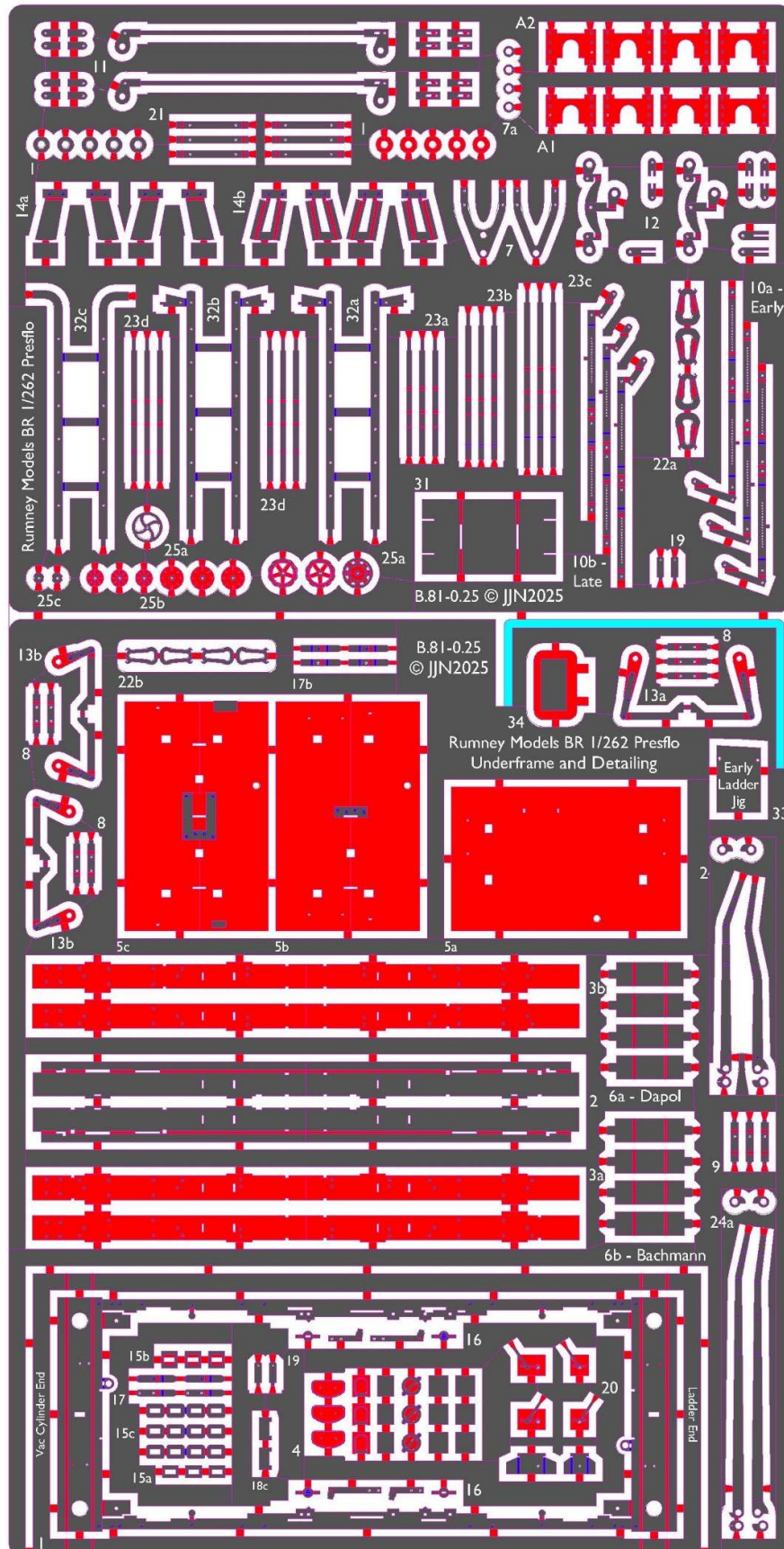
M1 - Outer walkways
M2 - Middle walkway
N - Walkway supports

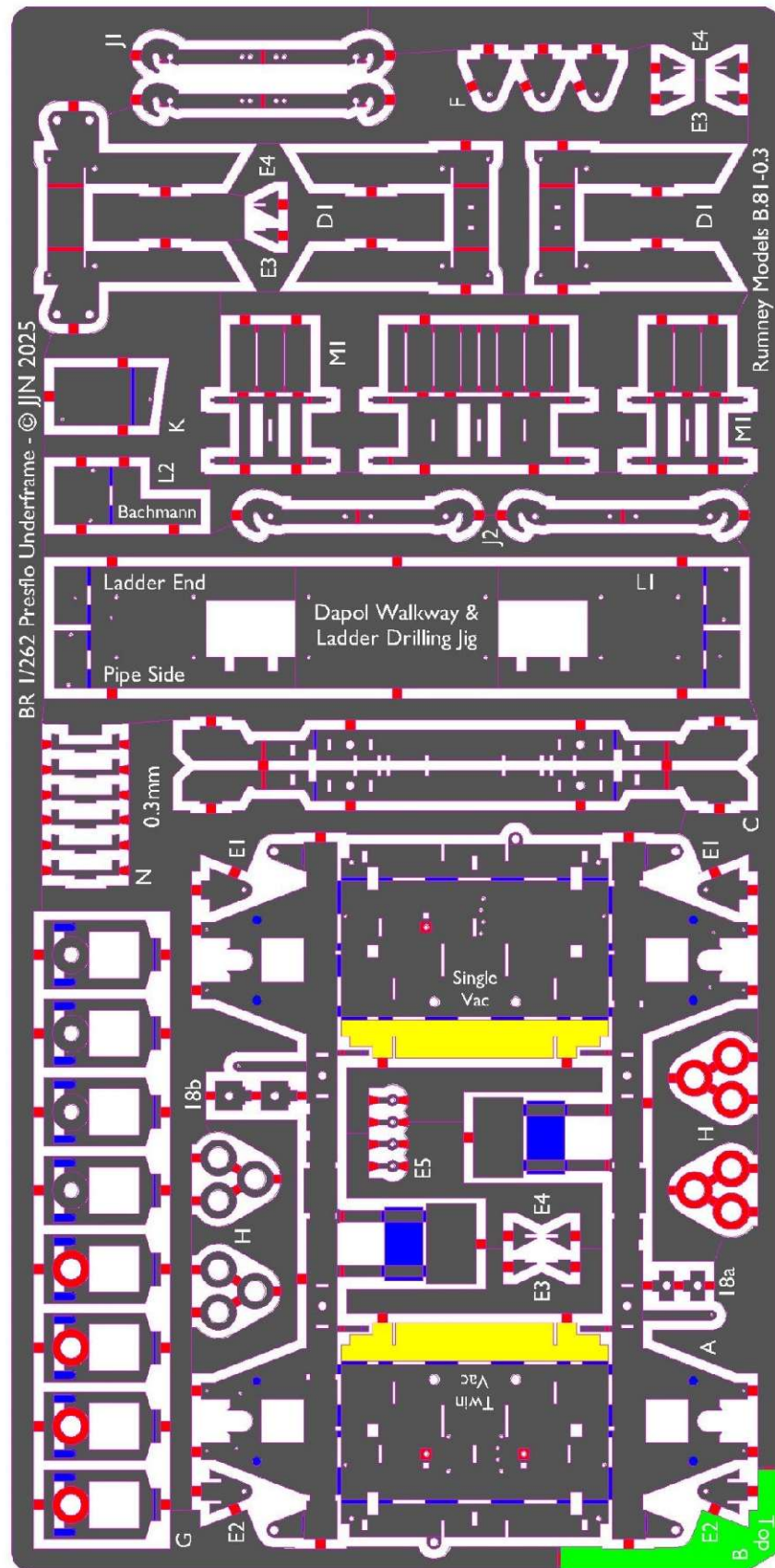
BR Ferry Presflo Parts

2 - Solebar for pipe side
3c - Solebar overlays - late underframe - Ferry Presflo
26 - Tie down rings
27 - Continental label clips

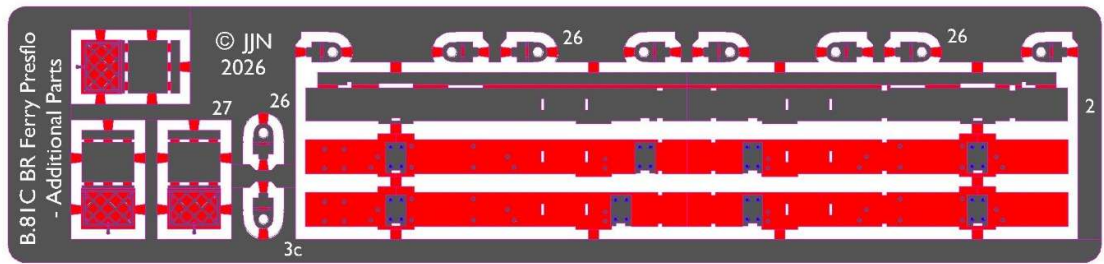
Parts Diagrams

B.81-0.25mm Fret

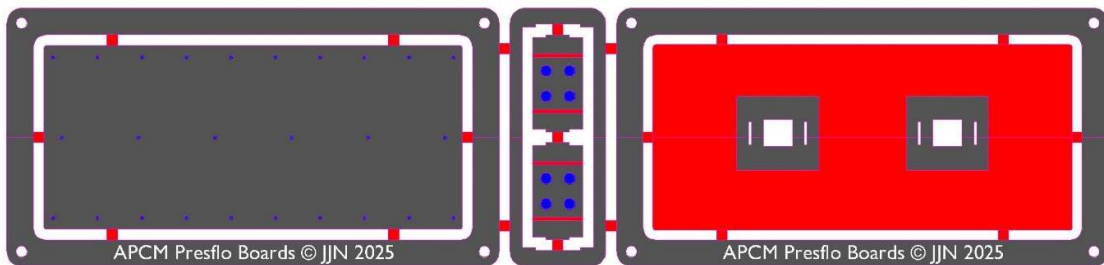




PB.81C Fret



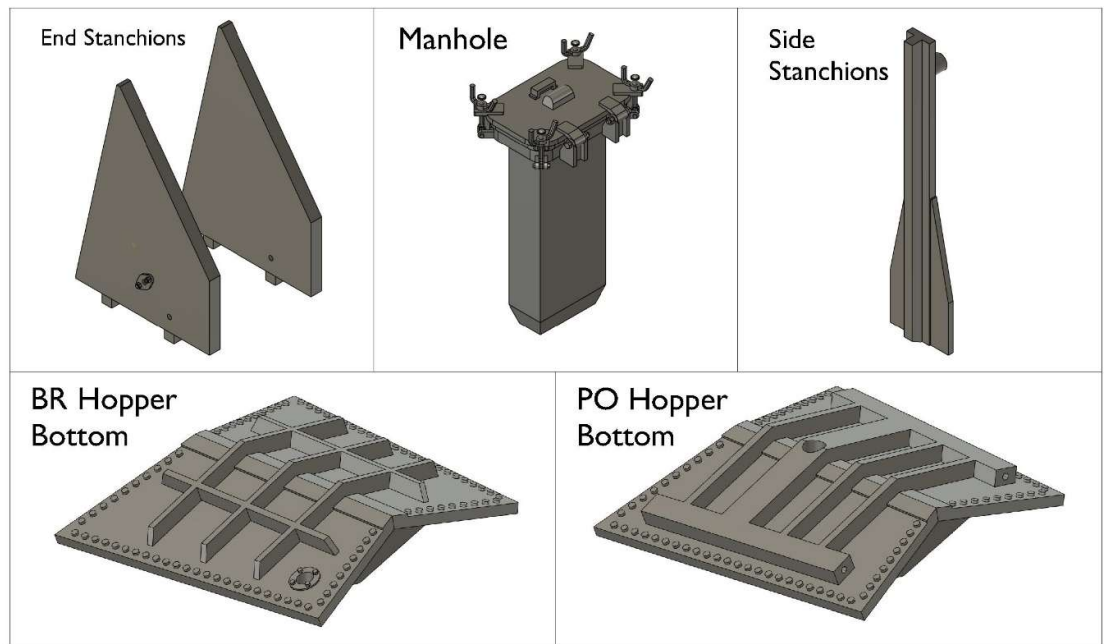
PB.82HSB Fret



3D Parts Illustrations

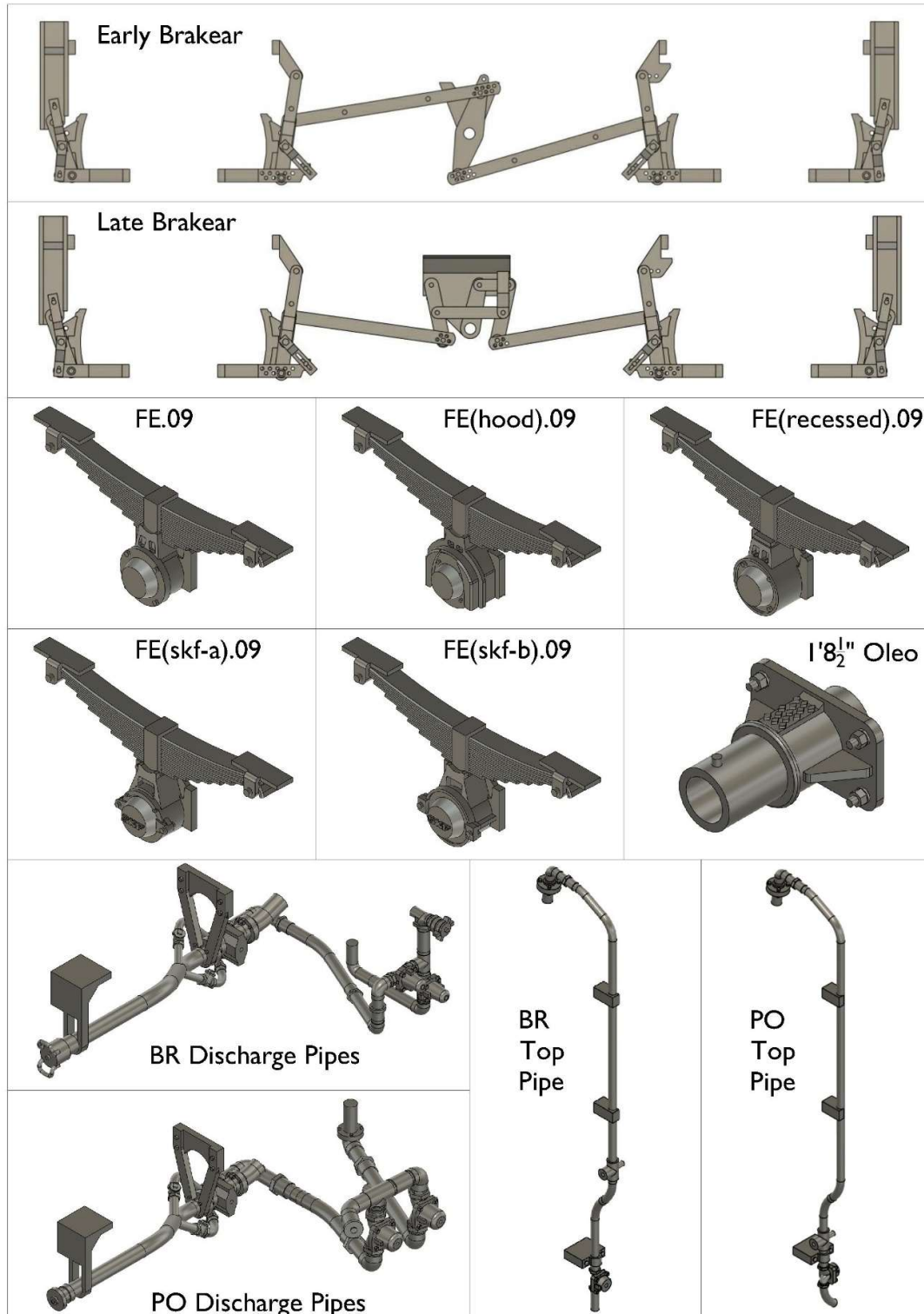
Dapol Upgrade Parts

Ends stanchions are different depending on whether the wagon has one or two vacuum cylinders.
Hopper bottoms are different for BR and private owner wagons.



Basic Kits

Brakegear is different between early batches with one vacuum cylinder and later batches with two. There are 5 sorts of roller bearing as illustrated below. Kit PB.81A includes either FE.09 or FE(hood).09 types. Kits PB.81B and PB.82 include FE(skf-b).09s. The other types are available on request when ordering, as are oil boxes for early builds. Discharge pipes differ depending on whether the wagon is BR or privately owned.



Underframe Construction

Main Structure

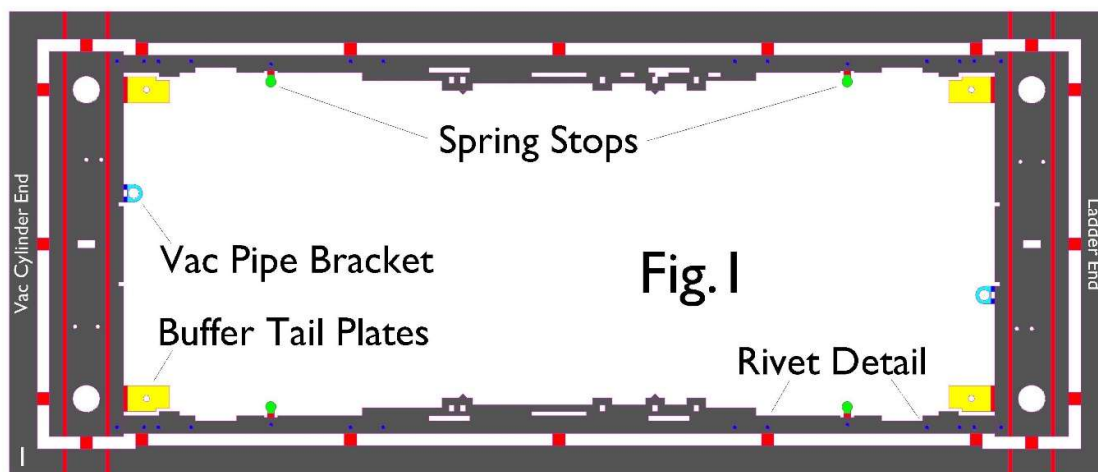
This first section is **very important**. Take your time to read and understand it or you may find that things don't fit.

As has already been outlined, there were two basic versions of the Presflo. Early wagons had a single vacuum cylinder and later ones two. The basic underframe consists of a bottom plate (1) with the headstocks as part of it and a top plate (A) with the axleguards and vees on. Both options are catered for **but** which configuration you get depends on which way round these two parts are put together.

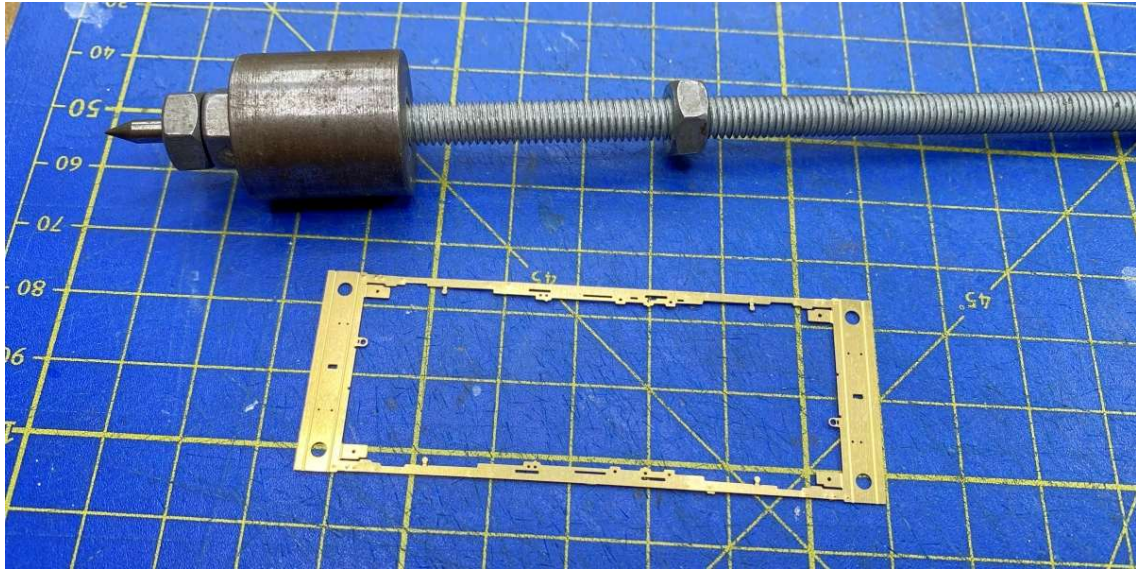
Note that the bottom plate (1) is surrounded by a rectangular fret. At one end there is '**Vac Cylinder End**' etched in the fret and at the other '**Ladder End**'. On the top plate (A) you will find that one end has '**Twin Vac**' etched in it and the other '**Single Vac**'. If you mate the two together so that top plate end marked **Single Vac** is at the **Vac Cylinder End** of the bottom plate you will get an underframe for an early Presflo with a single vacuum cylinder. If you do the opposite and mate them so that the top plate end marked **Twin Vac** is at the **Vac Cylinder End** on the bottom plate you will get a later underframe with two vacuum cylinders.

This should make sense, but it is important to get it right. You may find it impossible to undo an error at a later point in construction.

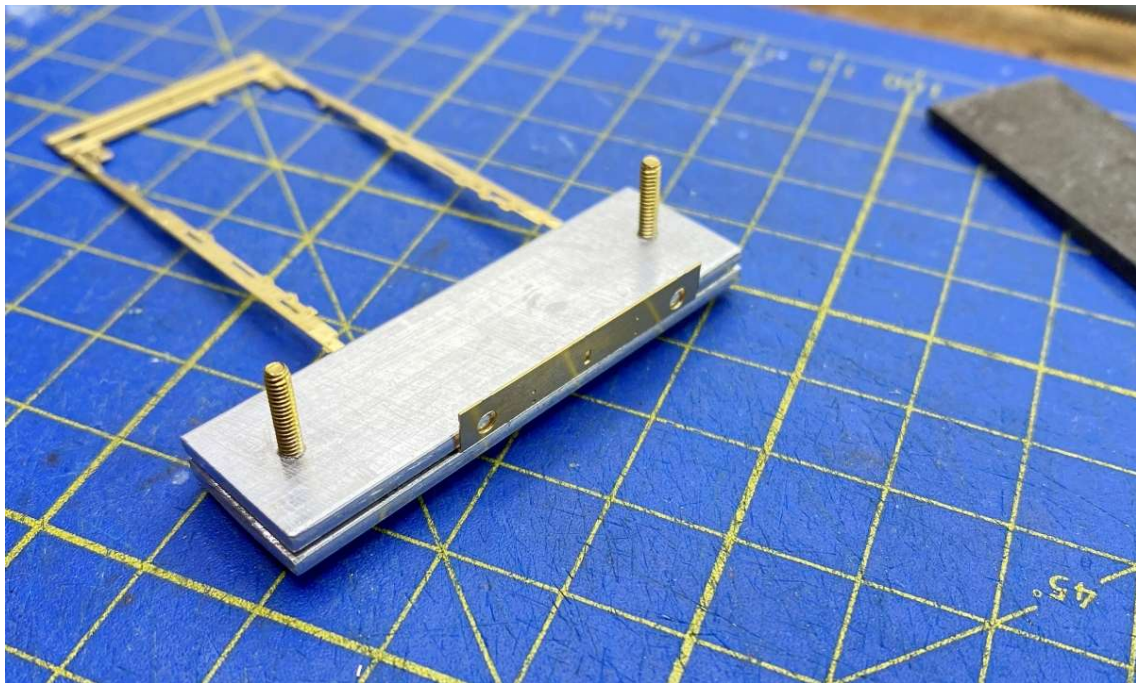
Remove the detailing parts from the middle of the bottom plate (1) and put in a safe place. Check the fit of the buffers in the holes. It is easiest to adjust with a tapered reamer at this point. Run a 0.5mm drill through the holes in the Buffer Tail Plates. See Fig.1 below. There are four small holes in the headstocks, one of which is half etched. Make sure the 3 that are etched through can accept 0.31mm wire. There were two styles of lamp irons fitted to Presflos. A standard type was fitted up to and including lot 3175 (Central 1959). If you are modelling a BR Presflo built up to this point, drill out the half etched hole in each headstock and make sure it can accept 0.31mm wire. If you are modelling a Presflo from lot 3176 (Butterley 1959) onwards, leave the half etched hole alone. Press out the half etched rivets along each side.



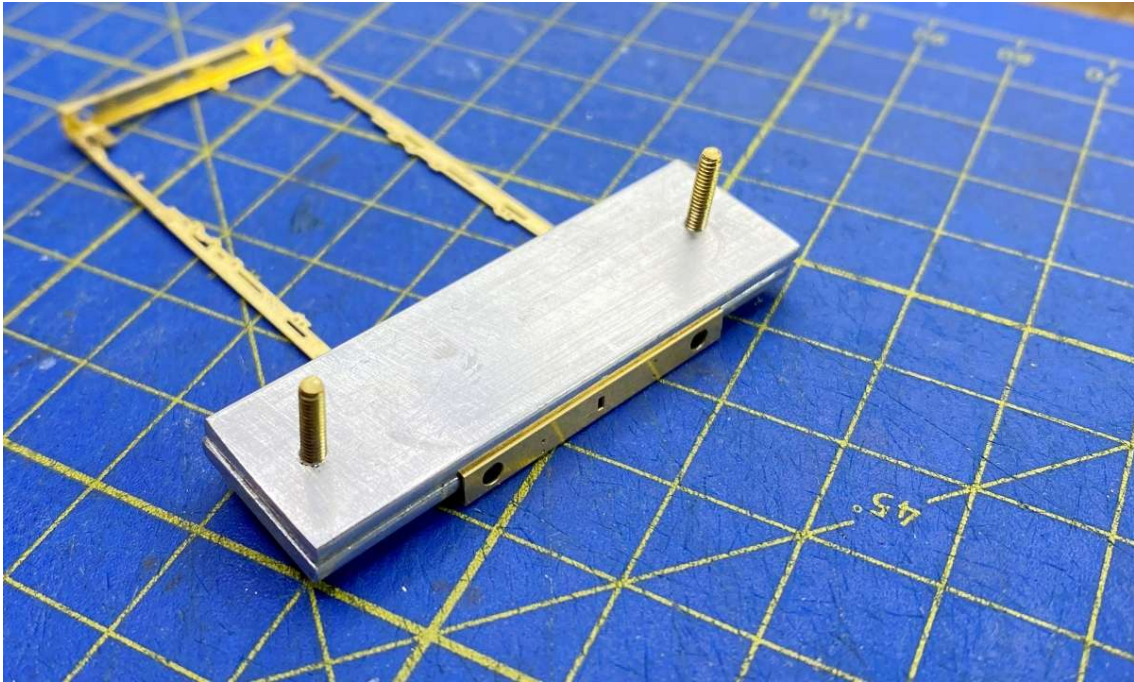
The rectangular fret surrounding the bottom plate was supposed to help with folding up the ends but didn't really work. Mark which end is for the vacuum cylinder, then remove the bottom plate from the fret.



The headstocks will need folding into a C shape. This is a bit tricky due to the lack of any frame or base on the bottom plate. You need to clamp the part inside the inner fold line at each end and then fold up the end of the headstock. I made a clamp from two lengths of 15mm x 2mm aluminium strip to help do these kinds of jobs though steel would probably be better and they could do with squarer edges. I should take a big file to the sides of mine. They were drilled 1.6mm at each end, then one side tapped M2 and the other opened to out 2mm. A pair of M2 screws pull things tight. I used a big(ish) file to make the fold. Make sure it is at 90 degrees.

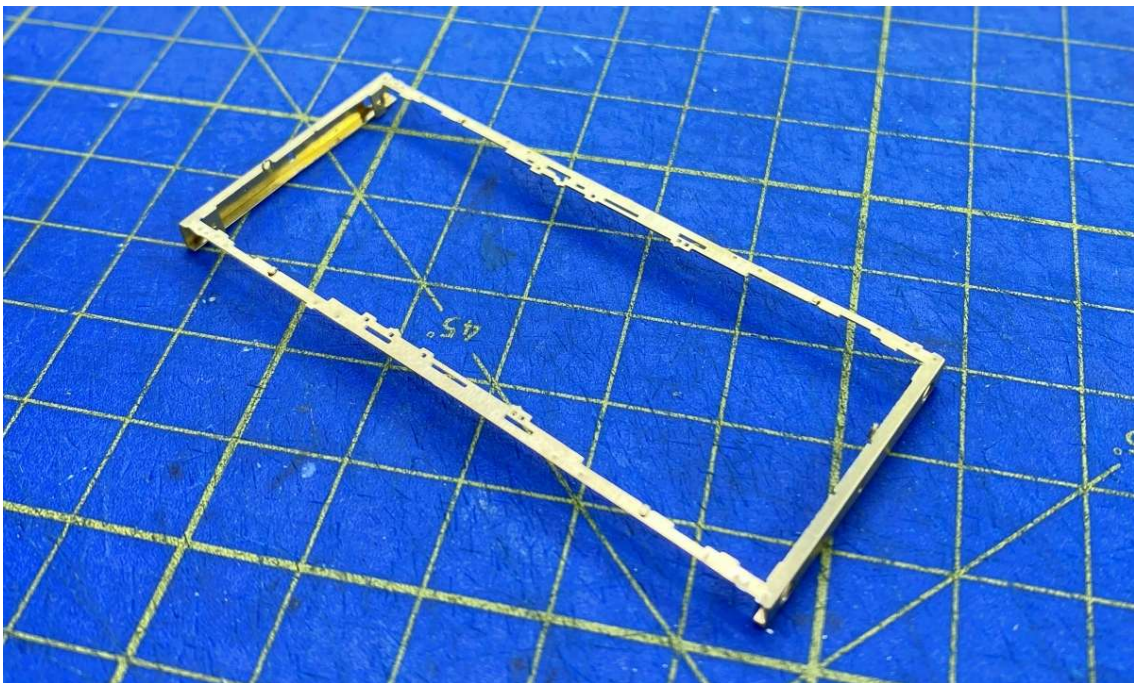


With the end folded into an L, clamp the outer edge and make the second fold to form a C shape for the Headstock.

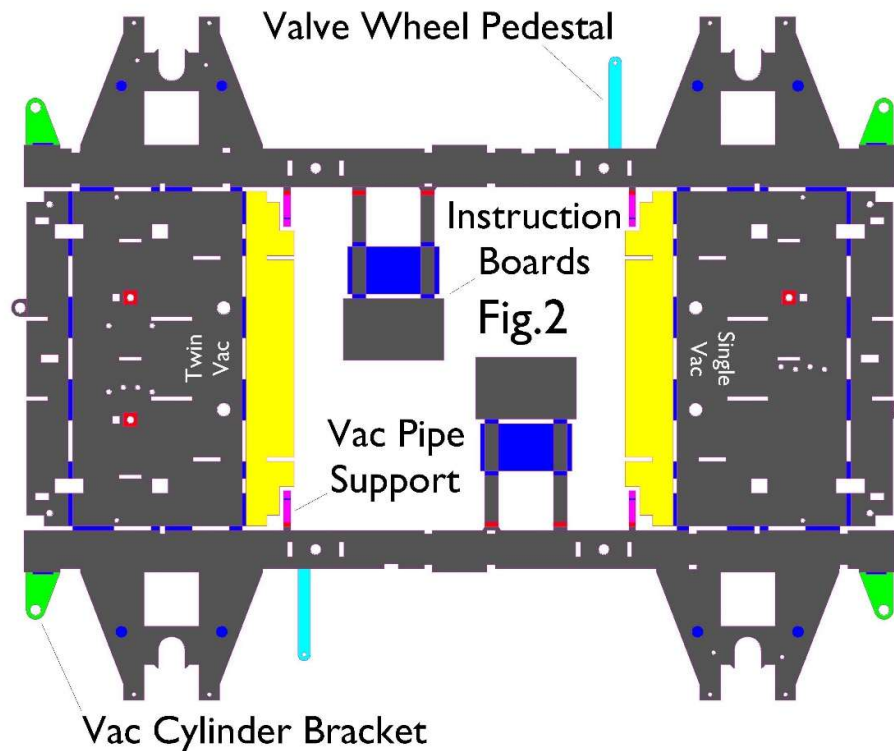


With both headstocks created fold up the four small springs stops. These are shaded green in Fig.1 above. The fold should be through 180 degrees with the fold lines on the outside. Solder the spring stops to the underside of the solebars.

Fold up the four buffer tail plates and solder to the other side of the headstock channel. You may need to give them a squeeze with a pair of pliers where the fold line is to get them to sit hard against the headstock.



Next attention turns to preparing the top plate (A). It has been designed to cater for both arrangements of brakegear but that means that some parts will need to be removed from the top plate depending on whether you are doing a Presflo with a single brake cylinder or two. Refer to Fig.2 below for this next bit.



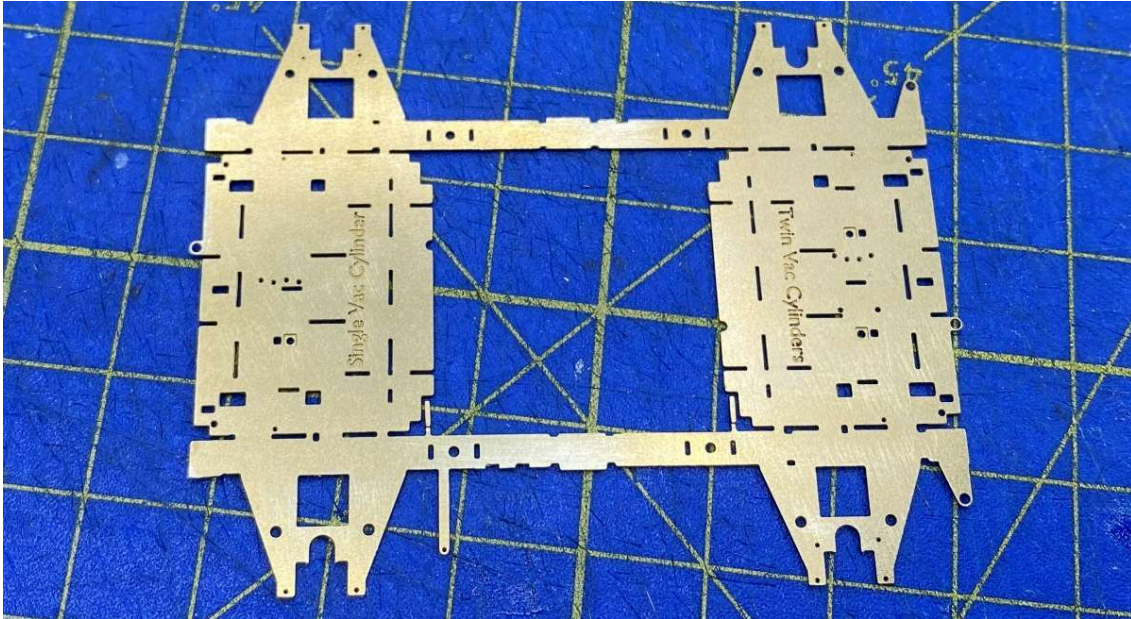
Presflo had a brake shaft at the vacuum cylinder end only. You will need to remove the brake shaft brackets at the other end. The brakes shaft brackets are shaded green in Fig.1. There are half etched lines to show you where to cut. Follow these instructions for each brakegear arrangement:

- If you are modelling a Presflo with a **single brake cylinder**, **remove** the brake shaft brackets from the end marked **Twin Vac Cylinders**.
- If you are modelling a Presflo with **two brake cylinders**, **remove** the brake shaft brackets from the end marked **Single Vac Cylinder**.

There are other parts that are duplicated depending on the brakegear arrangement. There is a pedestal for a valve wheel and supports for the vac pipe but these were only on the pipe side. Arrange the fret so that the half etched writing is visible and the end for the vacuum cylinder arrangement you want to the right. See next image. This is arranged for twin vacuum cylinders. Remove the pedestal and vac pipe supports from the side furthest away from you.

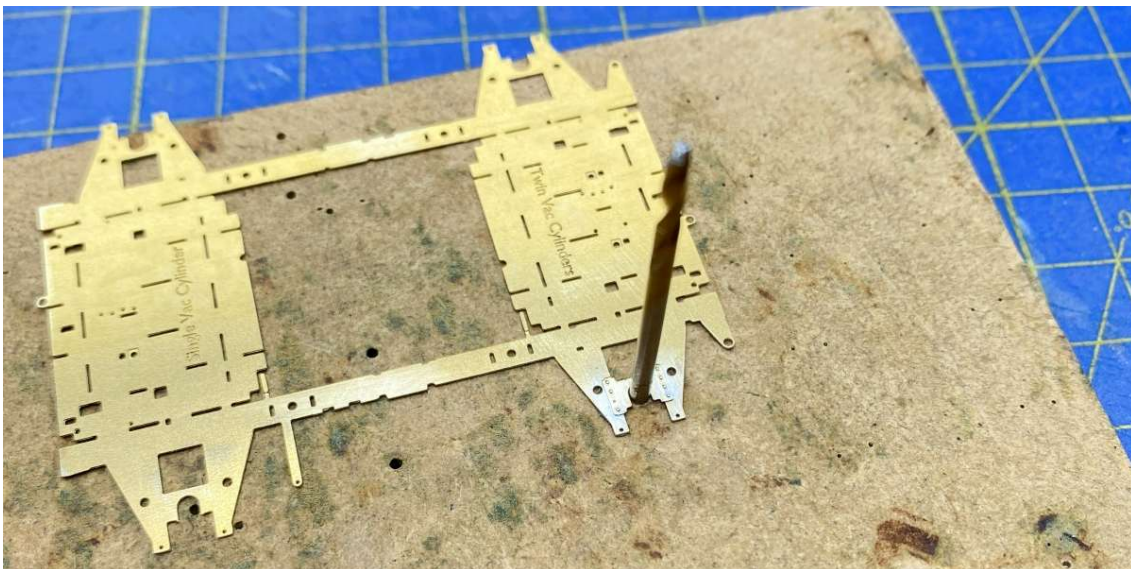
Instruction boards were fitted at some point in the mid-late 1960s to the pipe side only. These have been attached to the top plate. See Fig.2. If you're modelling prior to the second half of the sixties, both can be removed. If you want them, they will need to be folded up later. You can try and leave them in place, but they do get in the way a bit and the position did vary. At the very least remove the one from the non-pipe side, i.e. the side on which you removed the pedestal and pipe supports. You may want to remove both at this point and refit later. The fold lines are small and can easily be broken during assembly anyway.

The small holes etched in the axleguards need to be able to accept 0.31mm wire. You will also need to drill out the large half etched horse hook holes in the axleguards. Use a 0.8mm drill. The arrangement of the holes did vary. Generally, those built prior to lot 3176 (Butterley 1959) had two holes in each axleguard. From lot 3176 onwards (including the PO builds) there were generally holes on the outer side only. There did seem to be exceptions to this as lots 3409 (Central 1961), 3409 (Central 1961) and the Met Cam batch for APCM seemed to have two holes per axleguard. There were also replacements over time. The best thing is to try and find a photo of one from the lot and time period you are modelling.

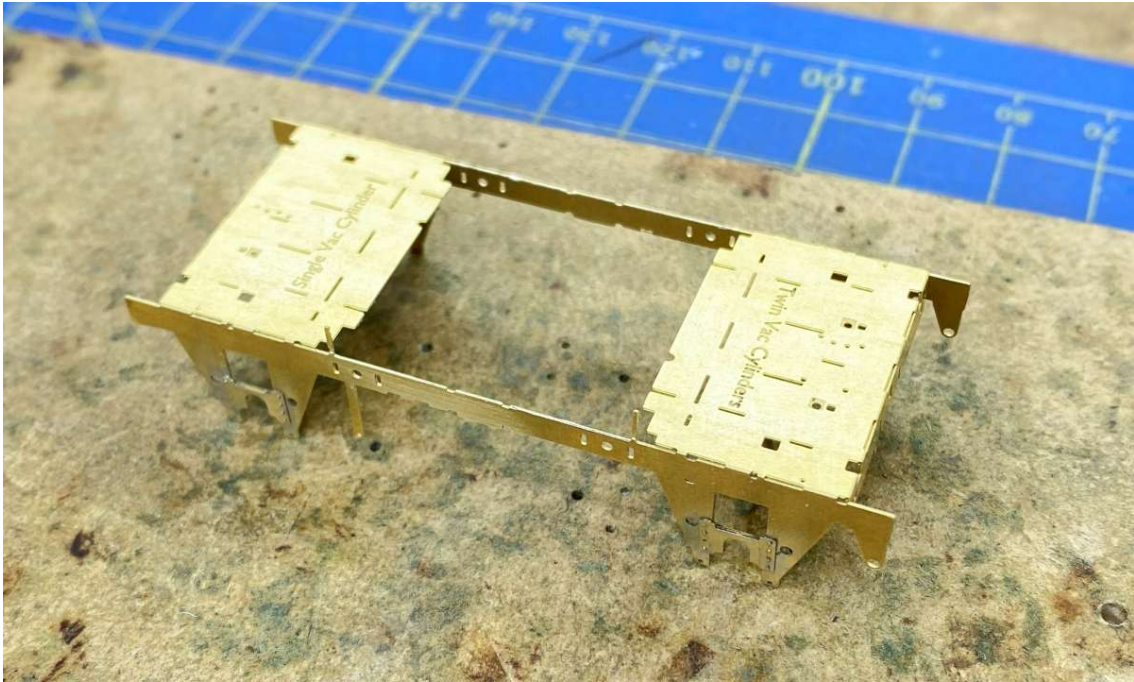


The riveted axlebox guides need to be fitted at this point. There are two types, one set of early brakegear with a single vacuum cylinder (A1) and one set for late brakegear with two vacuum cylinders (A2). These are all on the 0.25mm sheet.

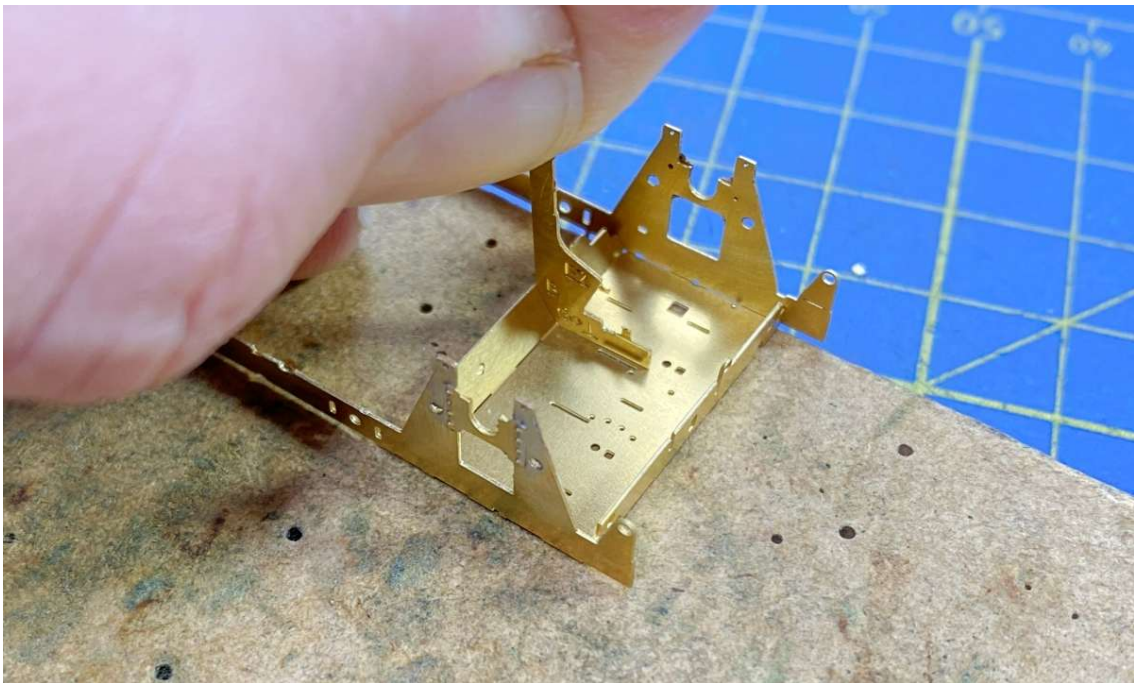
Drill a 2mm hole into a piece of wood or mdf. Insert a 2mm drill bit or a length of 2mm rod into the hole. This will help with fitting the guides. Note that half of each set of guides has a hole in. These are for the lever guard stays and should be fitted to the right hand axleguard when the top plate is laid so that the half etched vacuum cylinder writing is visible. See next image.



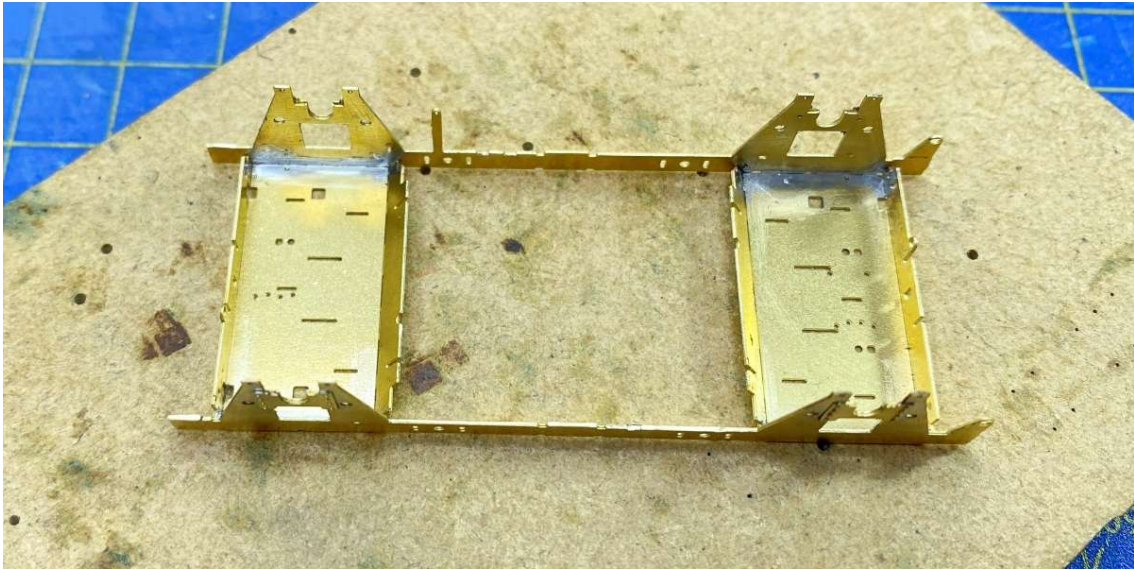
Fold the top plate up. Start with the side making sure they are at 90 degrees to the spacers at the top and there is no twist through it. Fold down the outer part of the top spacers to 90 degrees.



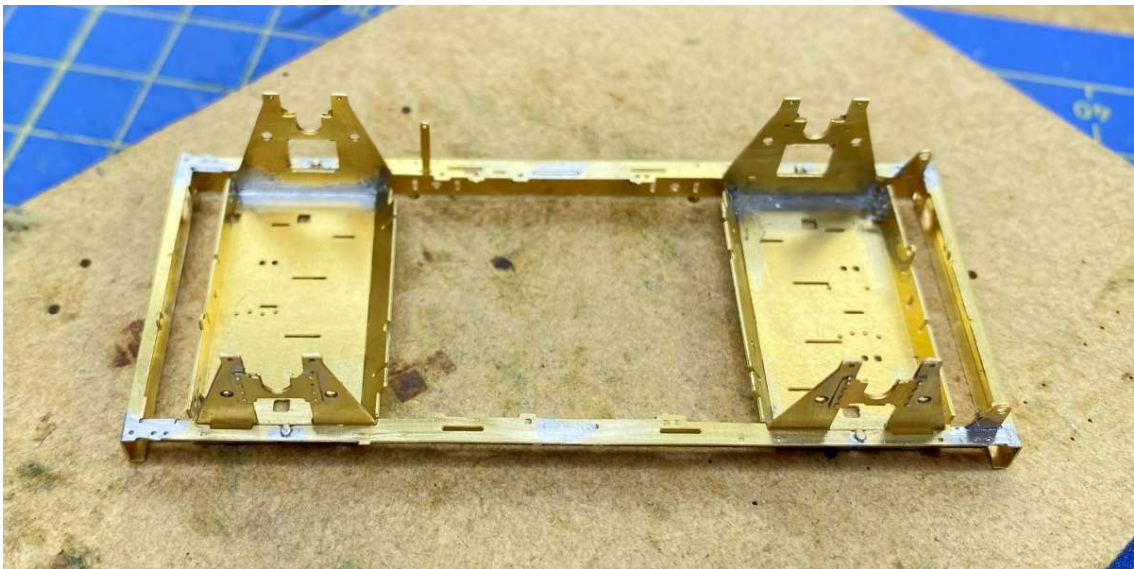
The inner parts of the top spacers need folding but to an angle. There is top plate angle jig (B) to help you get the right angle on the 0.3mm fret. It is part of the fret itself and is the area shaded green in the B.81-0.3mm Fret Parts Diagram on page 13. The side marked top on the jig goes against the spacer between the sides. Adjust until you match the angle on the jig. Take care of the vacuum pipe supports until the time comes to fold them up.



When you are happy reinforce the fold lines around each axleguard with solder.



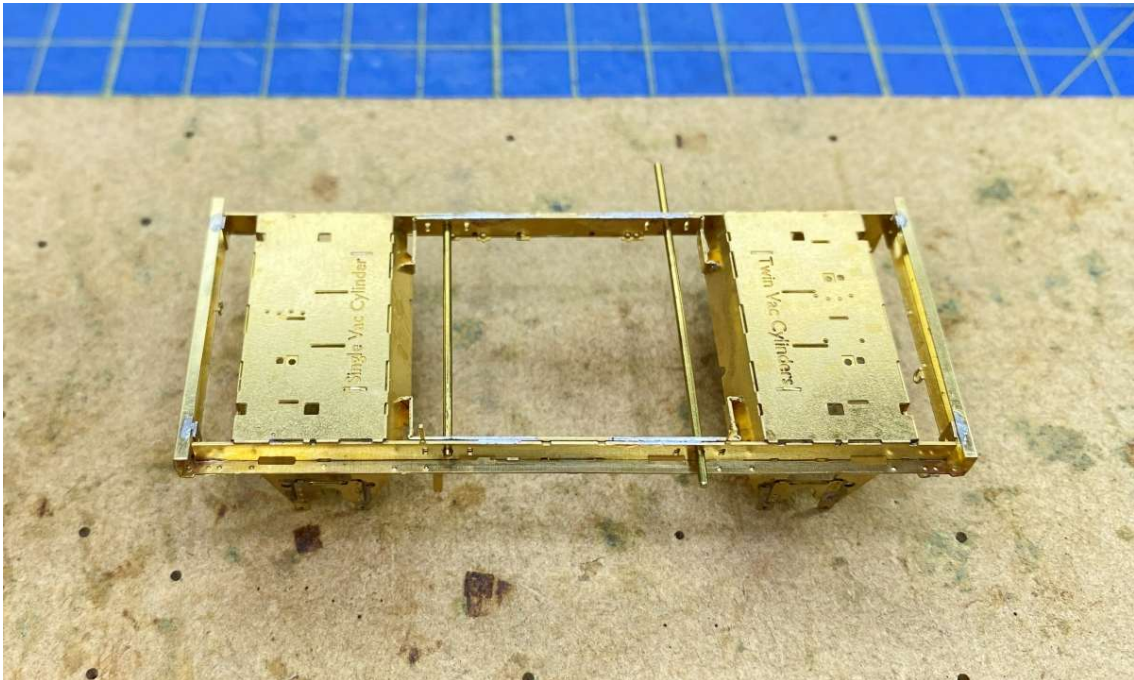
Fit the top and bottom plates together so that the vacuum cylinder ends match. The pedestal for the valve wheel fits through a small slot in the bottom plate. There are tabs in the middle of the top plate that fit into slots on the bottom plate. When you are happy with the fit, solder at these points and at the corners.



Next fit the inner springing bracket (C). This needs to be folded into an elongated top hat shape. It fits behind top plate between the axleguards and there are tabs on the bracket that go into slots in the spacers on the top plate at each end. See next image.



You can use 0.8mm wire through the holes in the brackets and the top plate to make sure everything is aligned. Solder the bracket to the top plate.



There are end reinforcement bracket to be fitted under the spacers on the top plate. There are two types. The end reinforcement - early brakegear & ladder end on later brakegear (D1) fits at both ends on wagons with early brakegear and at the ladder end on later brakegear.

The end reinforcement and brake shaft brackets - vacuum cylinder end on later brakegear (D2) is fitted to the vacuum cylinder end on twin vacuum cylinder wagons only. It has brackets attached for the vacuum cylinder shaft.

On the D1 type make sure the small holes can accept 0.5mm wire. Fold into a U shape and fit through the slots in the vertical part of the top plate spacers. If you are modelling a late brakegear Presflo, make sure that the small holes in D2 can accept 0.5mm wire and the larger ones 0.8mm wire. Fold up and fit at the vacuum cylinder end.



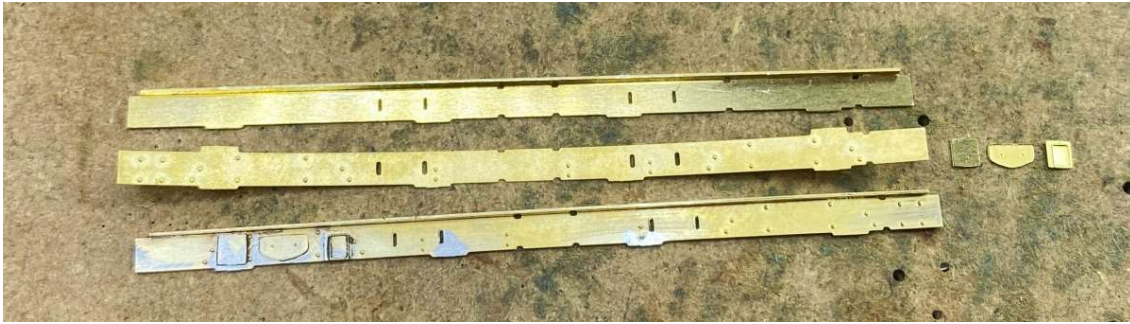
Solebars

The solebars come in two parts, solebars (2) and solebar overlays (3). There are two sets of overlays depending on whether you are doing early brakegear (3a) or late brakegear (3b). If you are modelling a ferry fitted Presflo you should use the solebar overlays included on the PB.81C fret and also the solebar from that fret for the pipe side only. For the other side you can use one of the solebars on the main fret. Shildon Presflos early in their life didn't have side stanchions and so there were no brackets on the solebars. A set of plain solebars, without the bracket slots, suitable for these are available on request.

Remove the solebars (2) from the fret and press out the half etched rivets along the narrower of the two parts. Using a smooth jawed vice, fold the solebars so they form a right-angled L.

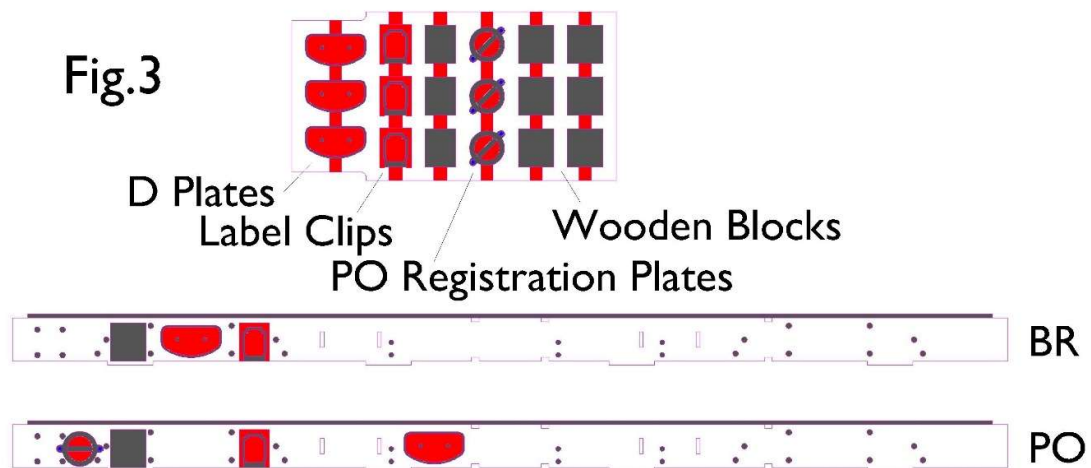


Remove the solebar overlays of your choice from the fret. Locate into the solebar using the tabs and slots provided. Note that there is a correct way around for the overlay. The edge with two tabs goes into the solebar. This should be obvious. Solder in place.



Now is the easiest time to fit the solebar detail (4) to the solebars. This is contained in the set of parts that was removed from the middle of the bottom plate.

This comes on its own little fret and contains D number plates, RCH registration plates for the PO builds, label clips and small rectangles which were blocks of wood on the real thing. The position and use of these detailing parts varied depending on type and some parts were lost over time so check a photo of your prototype, but Fig.3 below will give you a starting point.



Note that for the label clips there are full thickness backing plates which can be used under the detail if required. On the real things the blocks of wood to which the clips were attached were quite a bit thicker than a scaled up half etch. You could also use two layers for the wooden blocks.

Fit the solebars to the underframe, noting that there are rivets at one end for the vacuum cylinder brackets. Make sure they go on the correct side. Solder in place when you are happy with the fit.

The tabs that located the solebar overlay to the solebar were made deliberately overlong and will need filing flush on the top of the underframe.

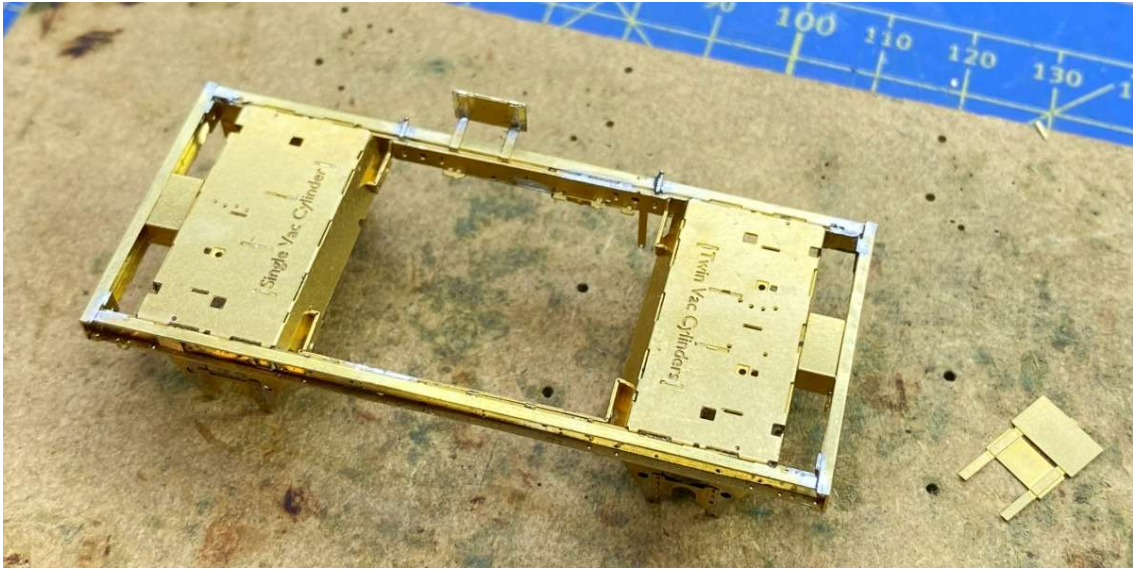


Underframe Detailing

Fold up the vacuum pipe supports, soldering them to the top of the underframe and reinforcing the fold lines on the ends.



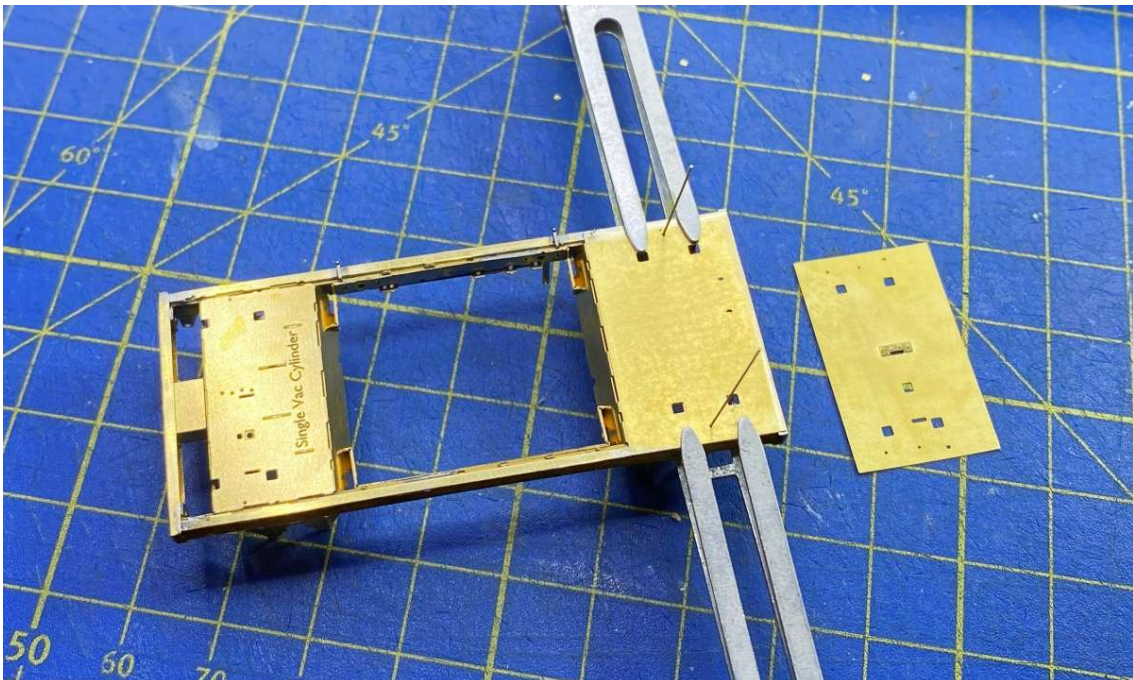
If you have left the instruction board on, fold it up and solder to the top of the solebars. Reinforce the fold lines with solder. All the fold lines are through 90 degrees apart from those immediately next to the plate which are through 180 degrees with the fold line on the outside.



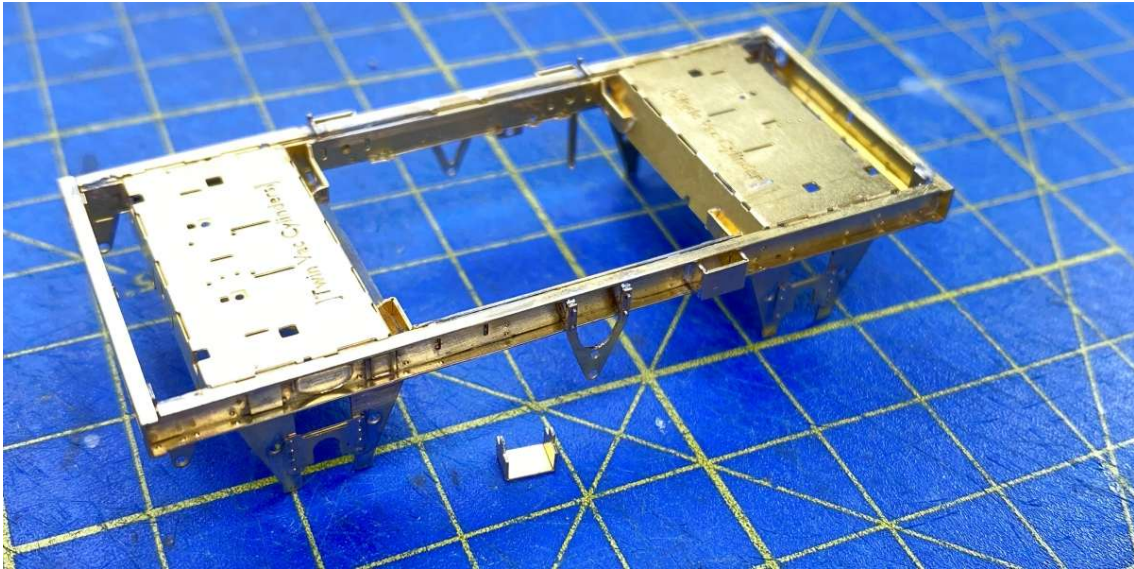
There are three types of underframe end plating:

- Ladder end (5a) - Ladder end on all wagons
- Vacuum cylinder end - Early brakegear (5b)
- Vacuum cylinder end - Late brakegear (5c)

Press out the half etched rivets on the underside of the vacuum cylinder end plating of your choice and then fit to your underframe along with the ladder end plating. Some aluminium soldering clips are handy here. They should be fitted so the slots in the end plating match those on the top plate spacers. You can use 0.31mm wire through the holes for the handrails on the ladder end and the vacuum cylinder end on early brakegear. Solder along the edges.



The side stanchion brackets need to be fitted unless you are modelling a Shildon Presflo early in their days. There are two sorts depending on whether you are building an Airfix/Dapol body (6a) or using the Bachmann one (6b). The brackets should be folded into a C shape and can then be inserted into the slots in the solebar. Make sure they are fully home and solder in place.



Next make up and fit the brake lever vees. Each of these consist of three parts, the vee (7) and then two brackets (8). Make sure the smaller holes can accept 0.31mm wire and the large holes in the vees can accept 0.8mm wire. Use one of the vees to drill four holes into a piece of wood or mdf towards the edge and pin the vee to it using four short lengths of 0.31mm wire as in the next image.



Fit two of the brackets onto the wire protruding from the vees so that the fold lines on the brackets are visible. See next image.

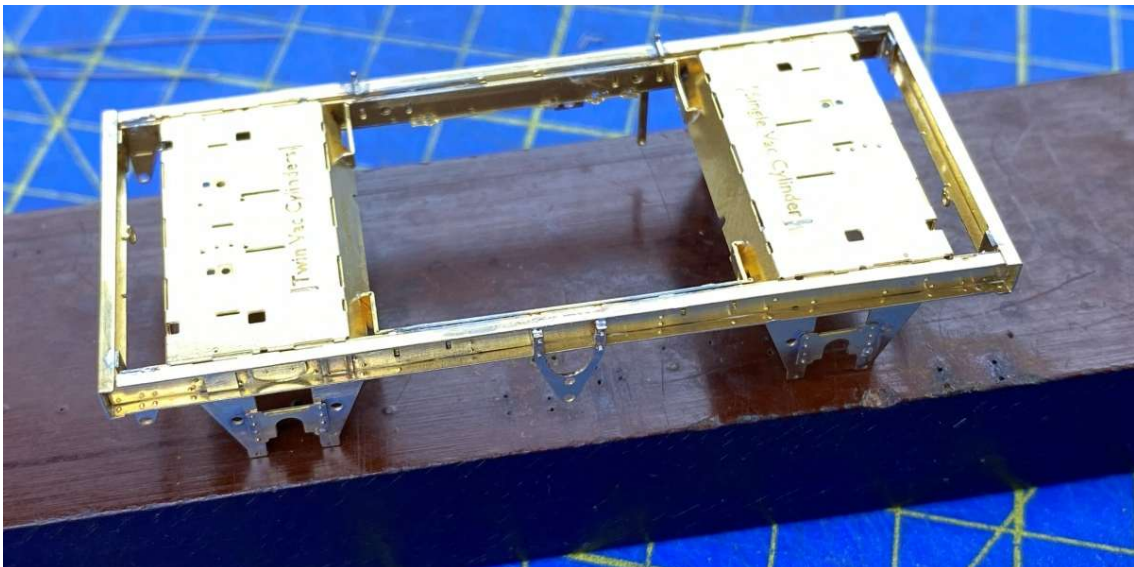


Carefully solder the brackets to the vees making sure to avoid getting solder in the fold lines and then trim the wire to resemble bolt heads.

Fold up the ends of the brackets and reinforce the folds with solder.



Note the correct orientation of the vees. The vee for the Morton cam (the one with two holes in) needs to go on the opposite side to the pipework. I.e. the side without the pedestal for the valve wheel. See next image. Fit to the underframe using the slots in the solebar and, making sure the brackets are fully home, solder in place. I found soldering at the top was sufficient.



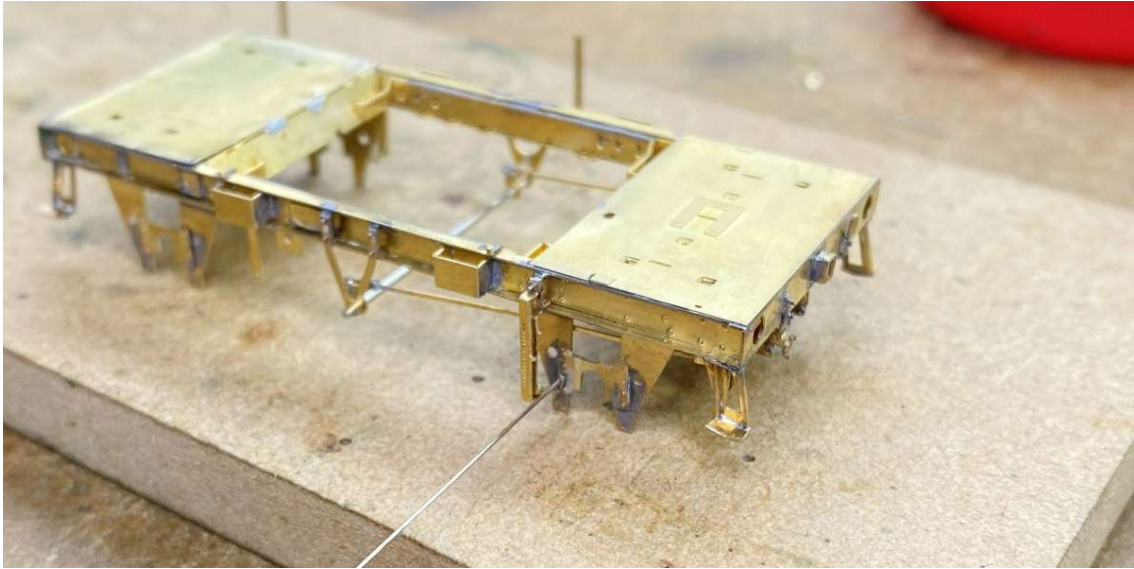
If we're being really pedantic, there were bosses on the outside of the vees behind the brake levers. I have included brake lever vee washers (7a) to replicate this, but they will be a right pain, and I left them off my four.

Next make up the brake lever guards. These consist of brackets that fit into the solebar and a combined lever guard and stay. There are two types of guard, one for early brakegear (10a) and the other for late brakegear (10b). They make up the same way, but the stays are in different directions as the guards on early brakegear wagons were to the right of the axleguard but those on later brakegear wagons were to the left.

Make sure that the holes in the brackets can accept 0.31mm wire and also the larger holes in the appropriate set of guards. You can leave the rows of smaller holes on the guard alone. Fold the bracket into a C shape. Fold up the guard starting at the stay end. All the fold lines are through 90 degrees except for two. These are the fold lines between the stay and the guard and those between the pairs of holes. These fold lines should be made through 180 degrees with the fold lines on the outside. Pass a piece of 0.31mm wire through the three layers at the bottom of the guard and tack solder in place. Use another piece of 0.31mm wire to pin the bracket to the guard at the top. Note how the bracket is orientated in the images below with the hole towards the top. Solder the bracket and guard together with just a little of the wire protruding from the back of the bracket. Trim this wire to represent a bolt.



Fit the lever guard to the wagon. The brackets will fit into slots in the solebar, and the stay can be pinned to the axleguard using 0.31mm wire. Tweak the stay if necessary and solder everything in place. The wire at the bottom of the lever guard to represent a bolt. Trim the wire through the axleguard to represent a bolt at the front and file it flush on the back.



Brakegear Links

Make up the two vacuum cylinder shaft to brake lever shaft links and overlays (11). Make sure the small holes in the link and the bracket can accept 0.31mm wire and the larger ones on the link 0.8mm wire. Fold up the overlays and fit to the link using 0.31mm wire. The overlays should be folded so that they will wrap around link. Essentially fold the two halves of the overlays through 180 degrees with the fold line on the outside but do so about a piece of brass form the same fret the parts are on. They can be pinned in place using 0.31mm wire. Note that one set of overlays has a slot in. This should be fitted at the end of the link with a slot. If the overlays are too small and fiddly, leave them off.



Late Brakegear

If you are modelling a late brakegear wagon, then you will need to make up the late brakegear compensating links and overlays (12). If you are modelling an early brakegear wagon you are saved this fiddle! You can probably get away without the overlays if you want. This is how to make it with the overlays. There are lots of spares and you will only need one of the main part.

Make sure the larger holes in the links can accept 0.8mm wire. Make sure the middle of the three small holes in the compensating links can accept 0.4mm wire and the other two 0.31mm wire. Note that there are two types of overlay. They both have slots in but one is longer than the other. Make sure the hole in the longer one can accept 0.4mm wire and the holes in the shorter ones can accept 0.31mm wire.

Drill a 0.4mm hole into a piece of wood or mdf. Pin the links using a piece of 0.4mm wire so that the fold lines are facing towards the wood or mdf. Fit one of the longer overlays over the wire and up against the links. See next image. Solder lightly in place.



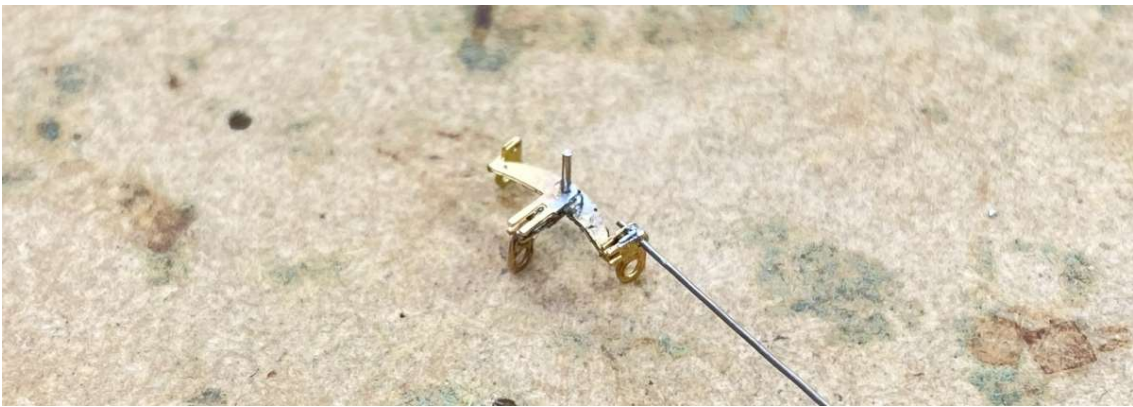
Remove the part trim the wire and turn it over. Fold out the middle crank and refit to the jig. Fit another of the longer overlays to the wire so that the crank goes in the slot. Solder in place. See image below.



Trim the wire to represent a bolt and then fold up the cranks at the ends of the compensating links.



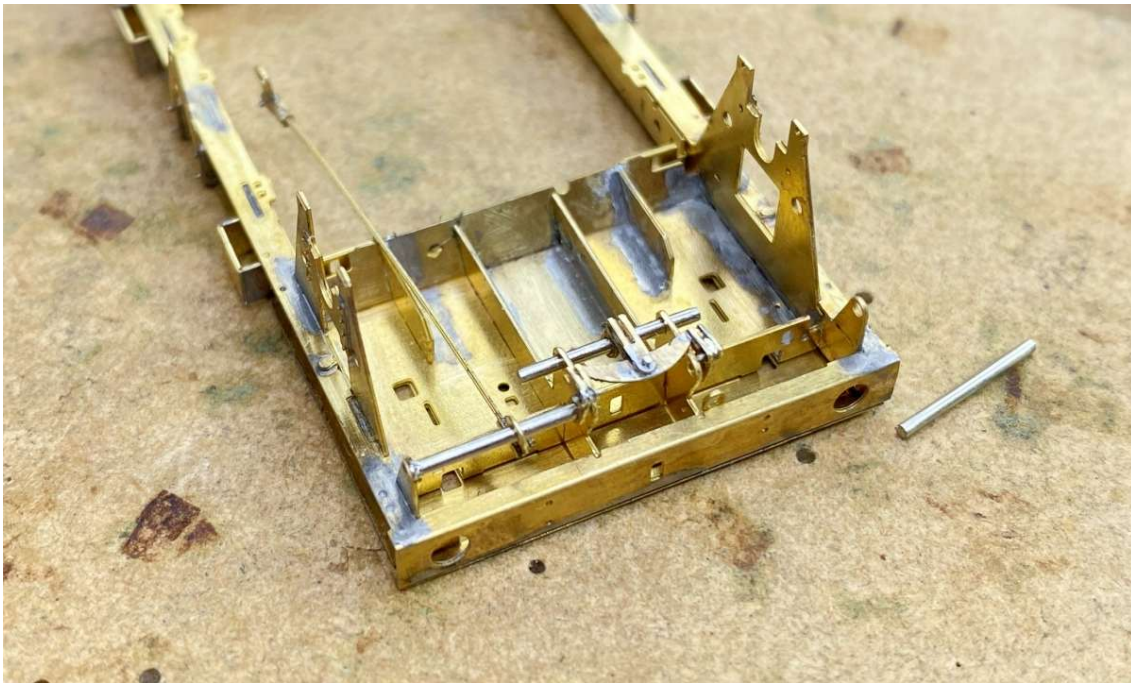
Super fiddly bit alert. On each of the outer cranks fit a pair of the shorter overlays so that the compensating links fit in the slot on the inside of the cranks using a piece of 0.31mm wire. See next image. Solder in place, trim the wire to represent a bolt and repeat for the other side.



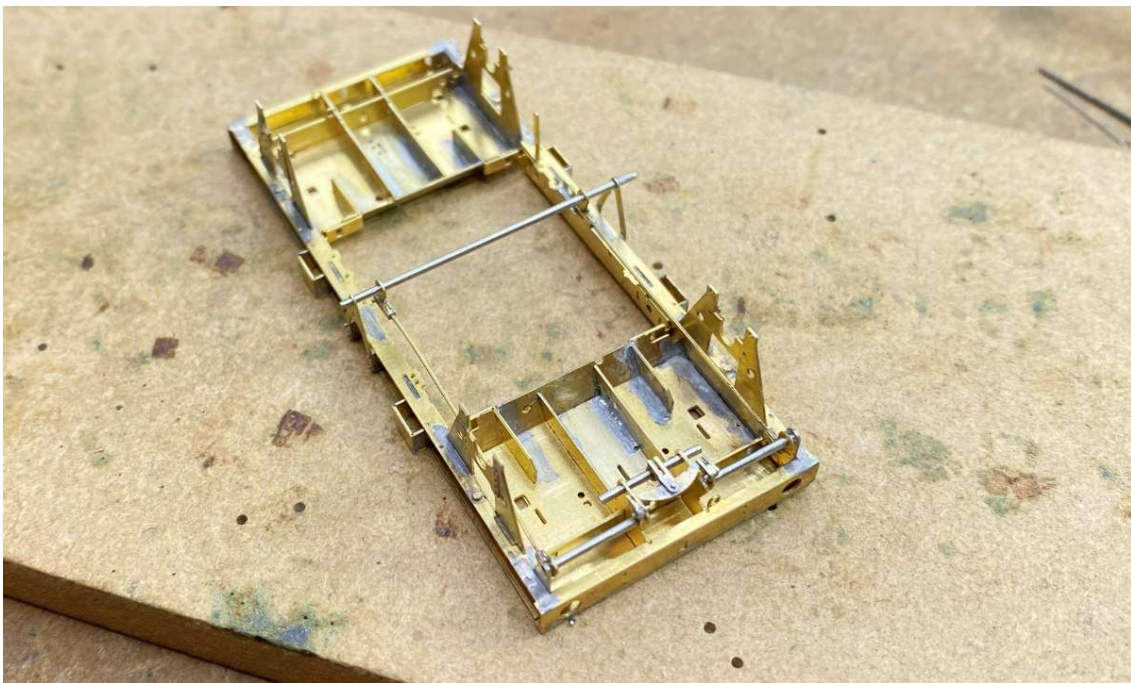
Fit the completed compensating links to the vacuum cylinder end using a length of 0.8mm wire. The wire needs to be cut to 10mm long. The links should be fitted so all the cranks face towards the underframe and the outer cranks are on the outside of the shaft brackets. See next image. Don't solder the wire in place yet.



Cut two more lengths of 0.8mm wire to 10mm long. Fit through the brake shaft brackets on either side along with the two brakegear links. The brakegear links should fitted so the bar is between the shaft and the underframe and the end with the slot is at the middle of the wagon. Solder the wire in place so that it is flush with the outside of the vees immediately behind the solebar. If it protrudes, the steps won't fit properly. Don't solder the brakegear links in place yet. Repeat for the other side.



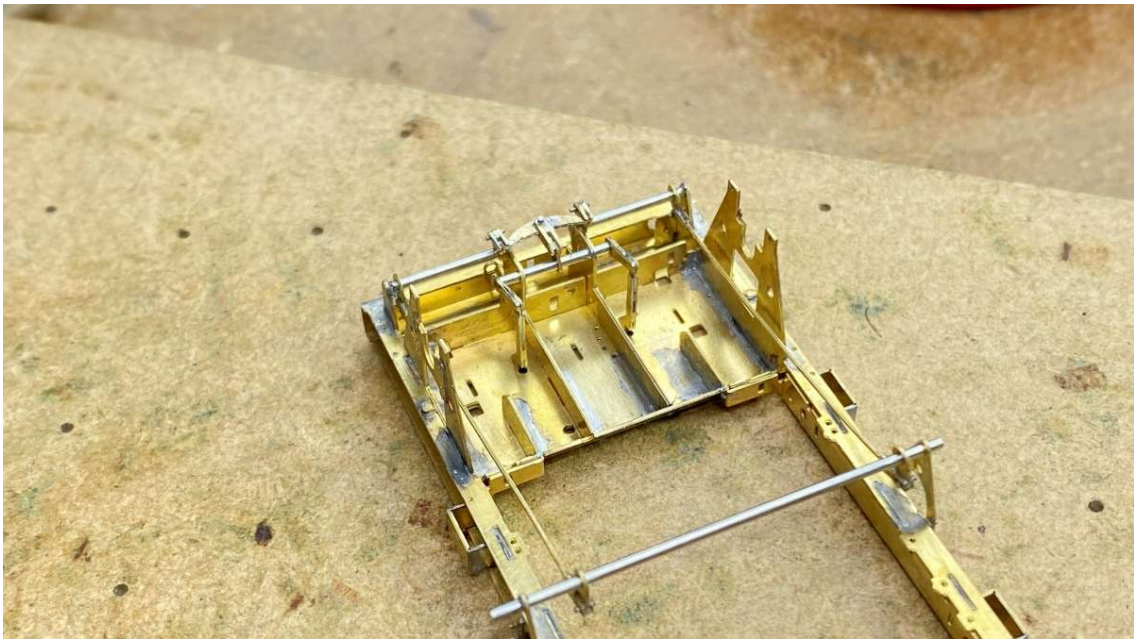
Fit a temporary piece of 0.8mm wire through the brake lever vees, picking up the brakegear links. You can make this wire over long as it will need redoing later, but it will stop the brakegear links getting in the way and potentially damaged if they are left free. Lightly tack solder the wire to one of the vees only.



Make up two vacuum cylinder actuators - late brakegear (13b). Press out the half etched rivets and then fold double about the centre. This means the fold is through 180 degrees with the fold line on the outside. Make sure that the holes are accurately aligned and solder together. Make sure the holes can accept 0.8mm wire.



On the underside of the top plate at the twin vacuum cylinder end there are two holes, each in a half etched rectangle. These holes are for the vacuum cylinder pistons. Next to them are small slots which take the ends of the actuators where the fold was. Fit the actuators into these holes with the other end fitting onto the wire. Solder everything in place making sure the actuators are vertical. See next image.



Early Brakegear

Make up the vacuum cylinder actuators - early brakegear (13a). Press out the half etched rivets and then fold double about the centre. This means the fold is through 180 degrees with the fold line on the outside. Make sure that the holes are accurately aligned and solder together. Make sure the holes can accept 0.8mm wire.



Cut a length of 0.8mm wire so that it fits between the two brakes shaft brackets behind the solebars. Be aware the wire will need to be flush on the outside of both brackets in order to fit the steps.

On the underside of the top plate at the vacuum cylinder end there is a hole in a half etched rectangle. This hole is for the vacuum cylinder piston. Next to it is a small slot which takes the ends of the actuator where the fold was. Fit the brakegear links, the wire and the actuator so that the actuator is on the wire and fits into this slot. The brakegear links should be fitted so the bar is between the shaft and the underframe and the end with the slot is at the middle of the wagon. Solder the wire and the actuator in place, making sure the actuators are vertical but leave the brakegear links free for now. See next image.

Fit a temporary piece of 0.8mm wire through the brake lever vees, picking up the brakegear links. You can make this wire over long as it will need redoing later, but it will stop the brakegear links getting in the way and potentially damaged if they are left free. Lightly tack solder the wire to one of the vees only.



Steps

There were two types of steps fitted to Presflos. There was a simple type with a plate back and a step welded to it and a fabricated type made from angle. The plate type was fitted to the Shildon builds and everything else seemed to have the fabricated type from new. Over time replacements could be found, meaning wagons could get the other type sometimes just at one end or in one corner. Occasionally they could be found fitted the wrong way around. As always, check an image of your prototype. They were found in each corner fitted under the solebar and, when fitted correctly, angled outwards from the wagon. This means each type comes in two mirrored pairs.

Plate Type

Press out the half etched rivets on the plate steps (14a). The step itself is on a gentle curve. I clamped the part when it was flat with a pair of round pliers and made the curve before folding up and soldering to the backing plate. See image of the fabricated type below. Fold the end with the rivets through 180 degrees and reinforce the fold with solder.

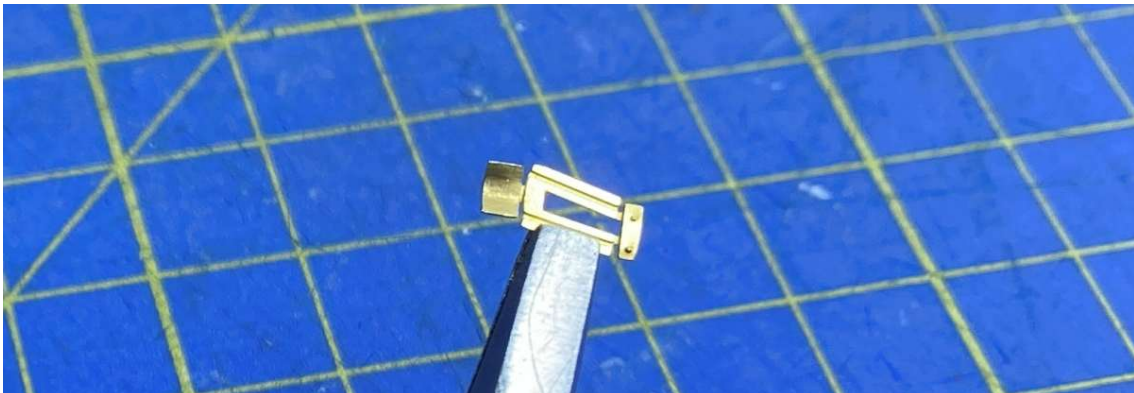
Fit the steps in the four corners to the underside of the solebar so that they are angled outwards and the part with the push out rivets in is level with the face of the headstock. See the images for the fabricated type below.

Fabricated Type

Press out the half etched rivets on the fabricated steps (14b).



The step itself is on a gentle curve. I clamped the part when it was flat with a pair of round pliers and made the curve.



Folding out the sides of the angle between step and fixing plate is tricky. Clamped the middle part with a pair of needle nose pliers and used a file to make the bends holding the part as close to the fold line as possible.



With both sides folded up, the step and plate with the rivets in can be folded up and the step soldered together. If necessary, adjust the curve on the step.



Fit the steps in the four corners to the underside of the solebar so that they are angled outwards and the part with the push out rivets in is level with the face of the headstock. See the next image.



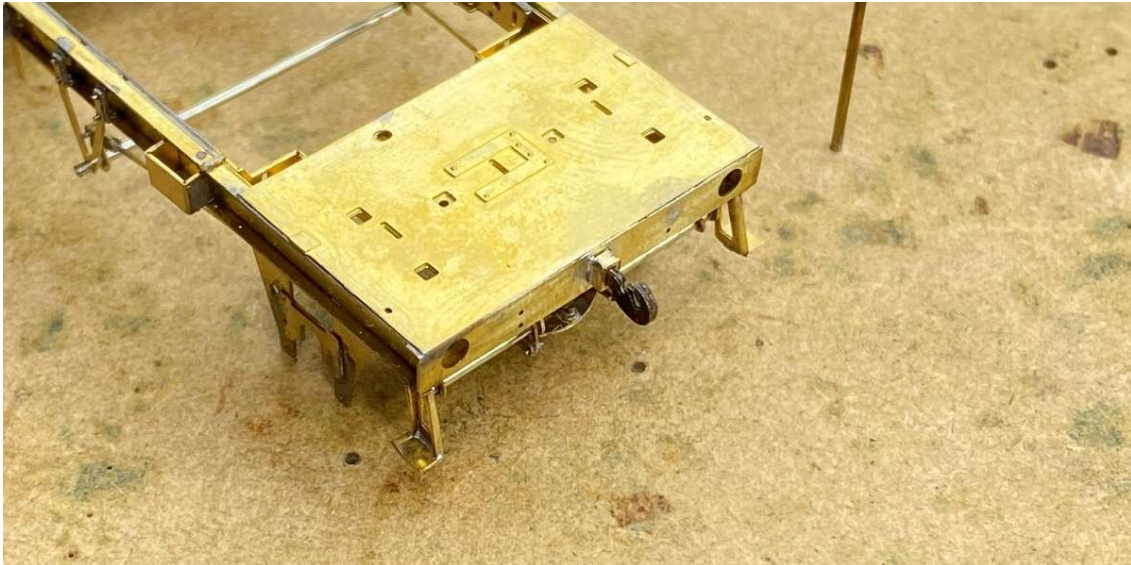
Further Detailing

Drawbar hook plates need to be fitted to the headstocks. There are three types:

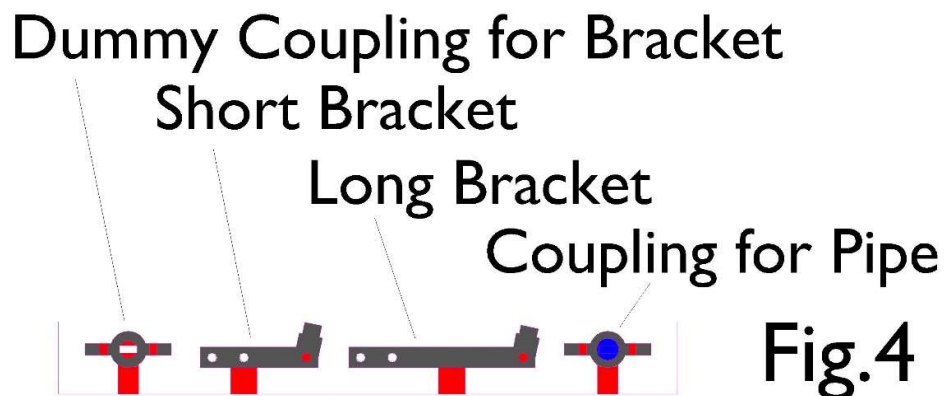
- 15a - Drawbar hook plates - early welded type - early builds with 1'6" buffers and Instanter couplings, middle builds with 1'8½" buffers and ordinary screw couplings
- 15b - Drawbar hook plates - UIC type - middle builds with 2' buffers and UIC type screw couplings
- 15c - Drawbar hook plates - late type - late builds with 1'8½" buffers and Instanter couplings

All these parts can be found on the small fret that was removed from the middle of the bottom plate at the start of the build. For both the early welded type (15a) and the UIC type (15b) you will need one per end. The late type (15c) comes as four layers that need to be concertinaed together, soldered and then tidied up.

To fit them you can use the drawbar hooks (see page 54) or cocktail stick shaped to a rectangle at the end. I've also made fitting jigs from bits of angle. The danger of anything brass is that you solder then in place as well. If you are permanently fixing the coupling hooks to the headstock then it's a good idea to use the drawbar hooks.



Dummy vacuum pipe brackets (16) are included. These are also on the small fret that came out of the middle of the bottom plate. There are four parts, see Fig.4 below.



It would seem that wagons built up to and including lot 3029 (Met Cam '57) had long brackets and everything else, including the PO builds, had short.

Make sure the small holes in the bracket of your choice can accept 0.31mm wire. Use one of the brackets to drill a pair of holes in a piece of wood or mdf. Remove the brackets, push out the half etched rivet and pin to this jig using two short lengths of 0.31mm wire. Solder in place and trim to resemble bolt heads.



Twist the tail of the bracket through 90 degrees just above the angled part so that it faces towards the side of the bracket where the wire was trimmed. Whilst still attached to the fret, fold down the two small tails on the dummy coupling for bracket. Drill a pair of into a piece of wood so these two tails can be inserted into them. Hold the bracket and fit the tab on the angled part into the slot in the dummy coupling and solder together.

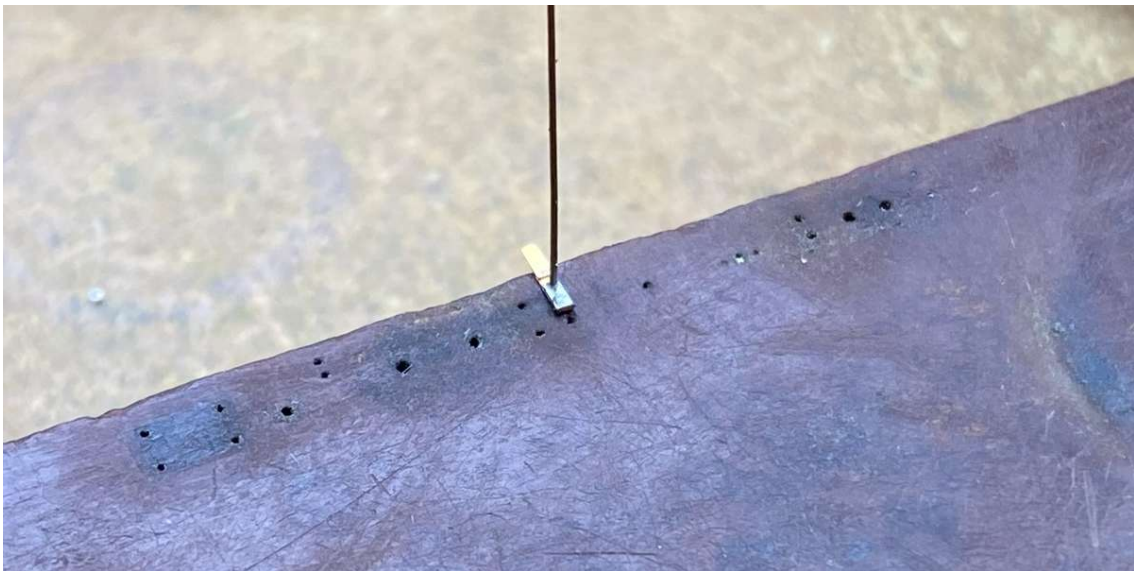


Remove from the fret, tidy up and fit to the headstock, inserting the top of the bracket into the pair of holes on the right hand side. Solder in place and repeat for the other end.

There are two types of lamp iron. There's a standard type (17a) with two fixing holes and a short version (17b) which only has one hole but has a bend which fits under the headstock. Note that the standard type 17a is labelled 17 on the fret.

It is not entirely clear if there was a pattern as to which type was fitted but it seems that the Shildon builds had the standard type and everything else had the short. However, it not as simple as this as the standard type appeared on later builds but potentially as replacements.

Make sure the small holes in your chosen lamp irons can accept 0.31mm wire. Use one of the lamp irons to drill a pair of or a single 0.3mm hole into a piece of wood or mdf near an edge. Pin the lamp iron to the jig with a length of 0.31mm wire. For the standard type, the lamp iron should be arranged so the fold line closest to the holes is visible. On the short lamp iron there are two fold lines on one side and one on the other. The short lamp iron should be fitted to the jig so the side with the single fold line is visible. Solder the wire(s) in place.



Trim the wire(s) to represent bolt(s). Fold the lamp iron at the fold line closest to the wire.



Reinforce the fold line with a little solder and then make the second bend at the fold line next to the first one.



Remove from the jig. For the short type make the fold at the other end and then fit to the headstock using the holes provided and soldered in place.



There are brackets that need to be added for the cement pipes. These brackets are different depending on whether you are fitting BR or PO pipes and they are in slightly different positions. Turn the underframe upside down and examine the pipe side, this is the side where the valve wheel pedestal is. You will find five small slots all in a row. These are for safety loops. You will then find two slots in line with the pedestal. The slot closest to the pedestal is for the PO pipe bracket and that furthest away is for the BR bracket. See Fig.5 below.

Fig.5

Safety Loop Slots

BR Bracket

PO Bracket

Valve Wheel Pedestal



If you are fitting BR pipes there is a BR cement pipe bracket (18a) which is on the 0.3mm fret. Fit into the slot shaded green in Fig.5 which is the one furthest from the pedestal and solder in place. See next image.



If you are fitting PO pipes there is a PO cement pipe bracket (18b) which is on the 0.3mm fret. Fit into the slot shaded cyan in Fig.5 which is the one closest to the pedestal. There is a PO cement pipe bracket angle (18c) which should be fitted to the underside of the solebar so that the slot in the angle fits into the bracket. Solder in place.

Grab Handles

Grab Handles need to be made up from 0.31mm wire and fitted in place. The Shildon and Met Cam builds had grab handles in all four corners. The rest had grab handles at the ladder end only. Holes have been provided in the underframe end plating. The only lot you can't do from the parts as supplied are lot 3156 wagons (Met Cam '57) which had late brakegear and handles in all four corners. This was the only lot like this. If you want to do one of this lot you will need to drill some holes at the vacuum cylinder end.

The handles will need to be 4.3mm long over the wire. I used a pair of tapered pliers to bend mine up. I found you quickly got a feel for where on the taper you should put the wire to get the second bend and end up with the right length. I left one end long and inserted this into the inner hole. It is easier to solder at this end. I made a spacer up from three layers of the 0.25mm fret. Something T shaped would be better than the L I used. See next image.



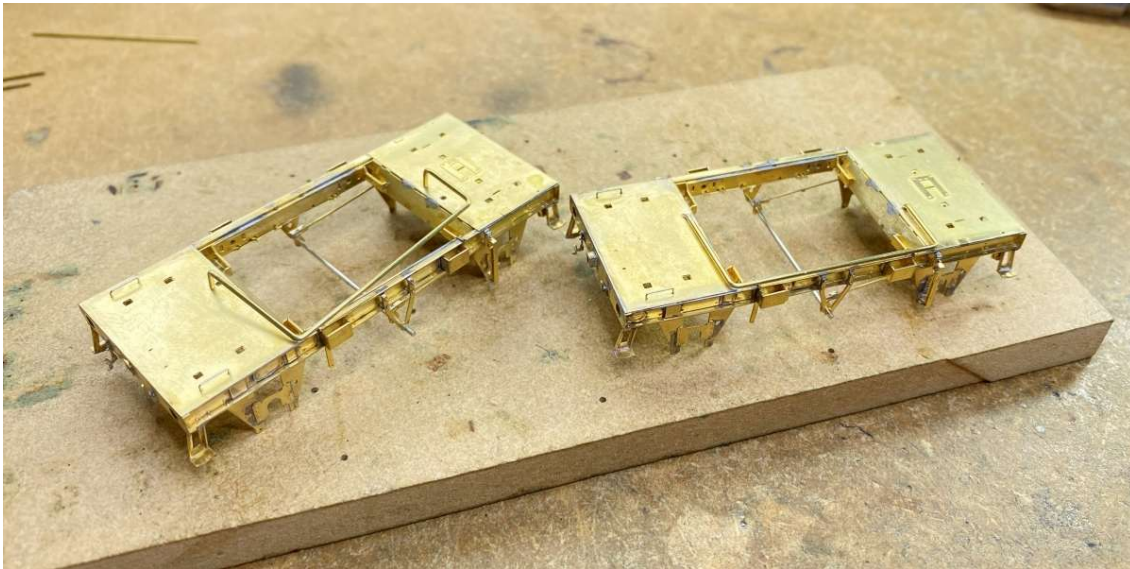
Solder the inner end of the handle to the underframe from the underside and trim the wire.



Vacuum Pipe and Cylinders

On the prototype the vacuum pipe appears through the plating at one end, skirts around the hopper side and dives down through the plating at the other end. This leads to a fairly complicated shape for the part of the pipe that runs above the underframe. Fortunately, there is a jig to help.

The vacuum pipe should be made from 0.8mm wire. On the 0.25mm fret you will find a jig to help you bend the wire to the correct shape. It isn't numbered but it is part of the outer fret and is shaded cyan on the B.81-0.25mm fret parts diagram on page 12. The wire needs to be bent into a U shape and then the ends folded away from you as you hold the fret with the writing visible. Try and get it as close to the shape as possible and the ends as close to the stops on the jig. I found that using a pair of round pliers was useful. If something was a bit long or short you could hold the bend in the pliers and undo it at one end and do it a bit more at the other. The ends should protrude ~3.7mm below the bottom of the main pipe. Once you are happy the pipe can be soldered to the supports that are on top of the underframe.



With the pipe in place, you will need to fit the vacuum cylinders and their associated brackets.

Clean up the vacuum cylinder castings and drill a 0.6mm hole in the flatter end for the piston. You may find a bit of misalignment in some of the castings. Arrange it on the model so that it is towards the hopper. Insert a length of 0.6mm wire so that it protrudes from the cylinder bay about 2.5mm.

The vacuum cylinder bracket in the middle of the wagon was a bit fiendish on both versions with reinforcing triangles at right angles to the main bracket, either on one side or both. The option has been provided to make a plain version without these if you don't like the look of the tiny parts.

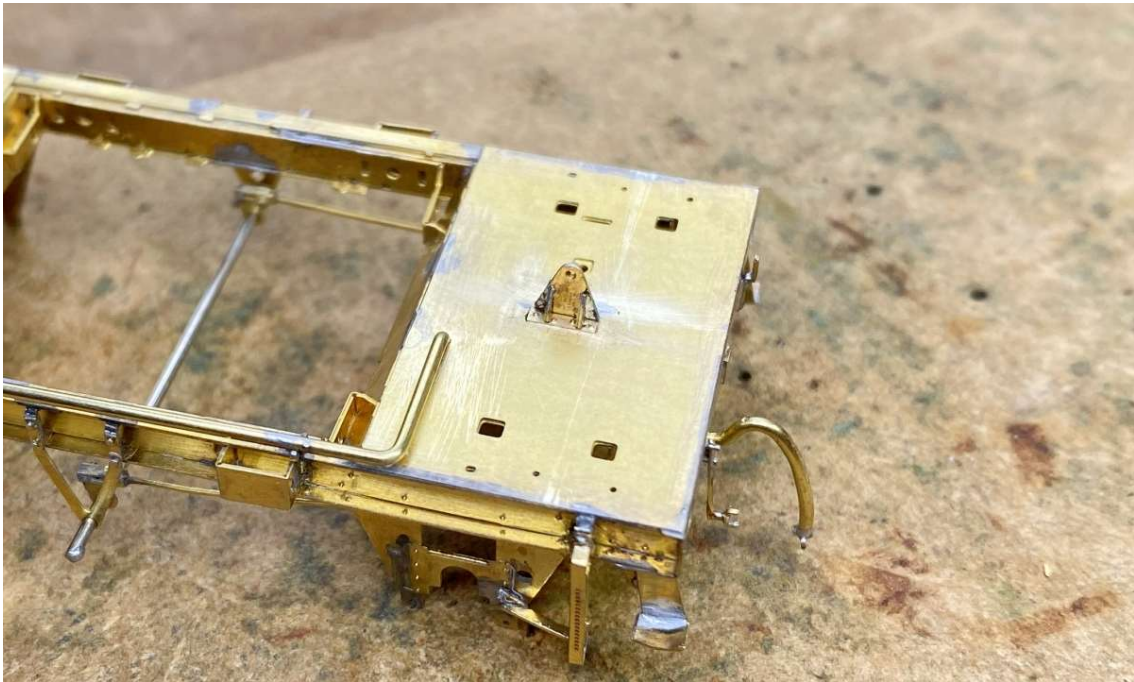
Middle Vacuum Cylinder Bracket

Choose whether you are using the plain (E1) or reinforced (E2) middle vacuum cylinder bracket. In either case you will need to solder washers (E5) to either one side for a single vacuum cylinder or both for twin vacuum cylinders. Use a 0.5mm drill bit through the parts to align them. See next image.



If you are using the plain bracket or are making an early brakegear wagon fit the bracket to the top of the underframe at the vacuum cylinder end using the slot provided in the middle of the wagon. In the case of an early brakegear wagon the side of the bracket with the washer should go towards the vacuum cylinder which will be on the right of the wagon when looking at the vacuum cylinder end.

If you are making an early brakegear wagon and are fitting the reinforced bracket add the reinforcing plates for early brakegear (E3). You will need two of them. They fit into the slots in the bracket and should go on the opposite side to the vacuum cylinder. Solder in place.



If you are making a late brakegear wagon with two vacuum cylinders and are using the reinforced bracket you will need to make up the bracket before fitting. You will need two reinforcing plates for later brakegear (E4). Fit them to the bracket using the slots and tack solder together.



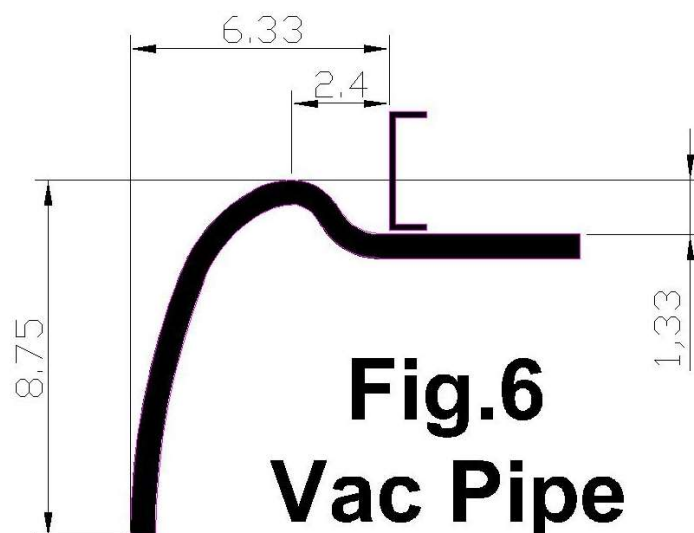
Fit the bracket to the top of the underframe at the vacuum cylinder end using the slot provided in the middle of the wagon and solder in place.

You will next need to fit the vacuum cylinder(s) along with the outer vacuum cylinder bracket(s) (F).

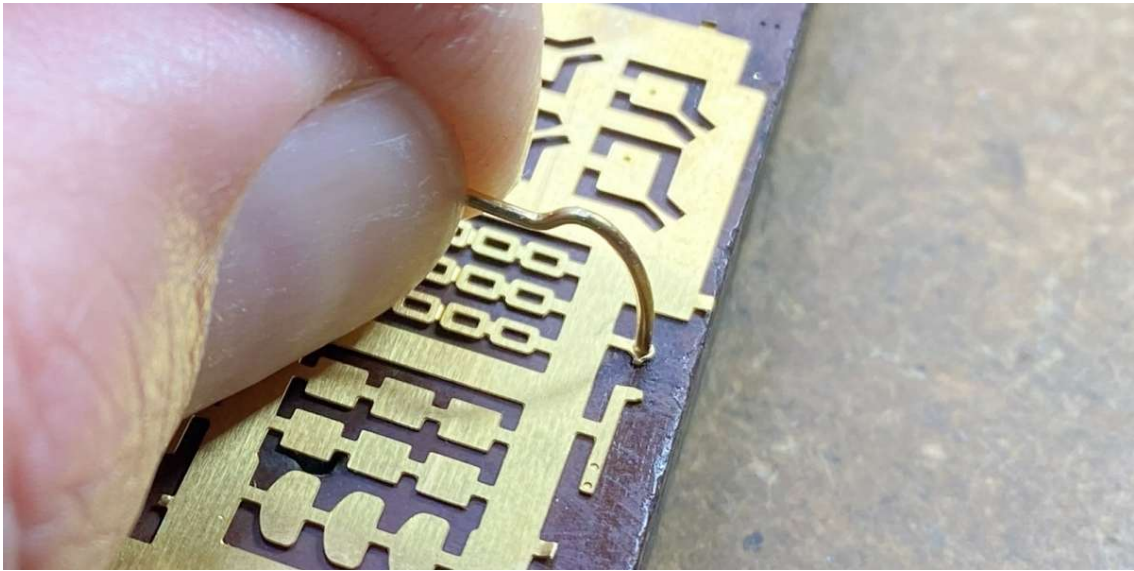
Fit the cylinder(s) first with the piston(s) going through the hole(s) in the underframe, then trap them in place with the outer bracket(s). Solder the outer bracket(s) to the underframe. I found no need to glue or solder the cylinders in place, they aren't going anywhere. If you are using two cylinders you may need to shorten the locating spigots that go in the middle bracket a little.



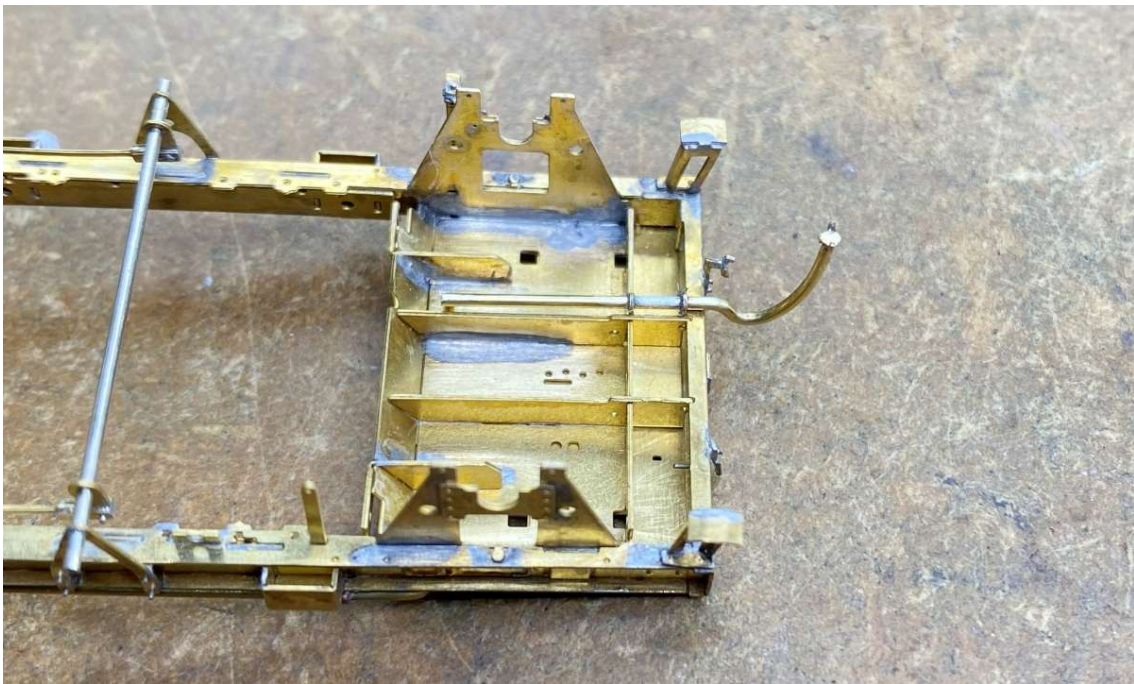
Make up the swan neck vacuum pipe from 0.8mm wire. Use the Fig.6 below as an aid. You will need 12mm of wire from the point of the first bend just beyond the headstock to the end of the pipe. Leave the other end long for the moment.



If you wish you can fit the coupling for pipe that was part of the dummy vacuum pipe coupling (16). Fold down the tails whilst attached to the fret and insert the holes drilled to do the dummy coupling for the bracket. Fit the end of the wire into the half etched hole in the coupling and solder in place with the tails at right angles to the plane of the wire.



Fold down the small pipe brackets on the headstocks and insert the vacuum pipe. Mark and cut the pipe where it meets the ends of the pipe attached to the top of the underframe. Solder the pipe in place.



Vacuum Release Chord Pedestal

There were vacuum release chord pedestals (19) mounted on both sides of the wagon at the vacuum cylinder end. These held the vacuum release chord which passed through the end stanchions. They were mounted differently depending on whether the wagons had early or late brakegear. On early wagons the pedestals were mounted towards the hopper with the vacuum release chord passing behind the vacuum cylinder. On later wagons it moved towards the end with the chord passing in front of the cylinders.

You will find two pairs of pedestals on the 0.25mm fret, one of which is on the small fret that came out the middle of the bottom plate. You only need to two but best to include spares. On the underframe end plating at the vacuum cylinder end you will find two small rectangular slots. Fit the pedestals into these slots and solder in place. They will be a bit vulnerable so take care once they are fitted. I didn't worry about trying to fit the chord as it's tiny on the real thing but if you want to after the body is the best time as it will pass through the end stanchions.

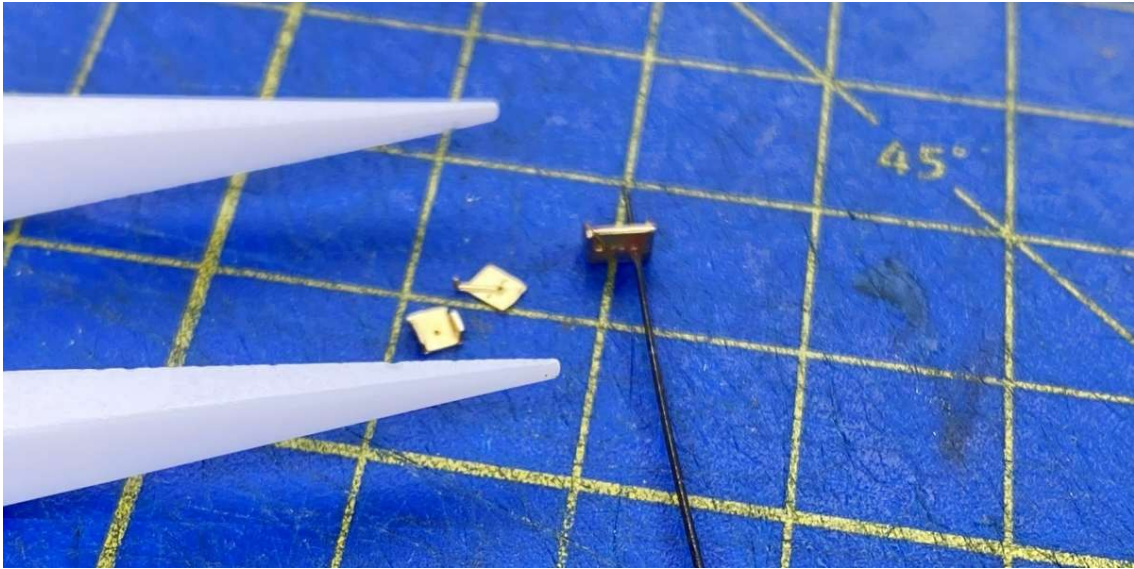


Changeover Levers (Late Brakegear Only)

If you are modelling a late brakegear Presflo you will need to add the changeover levers. These come in two parts, a fold up full thickness backing and a half etched detail layer. They also come in two sizes. The larger one has a mechanism for reversing the action of the handle. The detail layer come in two pairs with the handles in opposite directions so you can accurately represent whether the wagon is full or empty. The following image shows the orientation on the real thing.



Remove the full thickness backing and fold up. Remove the detail overlay and bend the tip of the handles over so they face out from the face with the detail. Place the overlay over the backing and align using the hole. Solder together. Make sure the hole can accept 0.31mm wire.



Fit the changeover levers to the top of the underframe. There are full thickness rectangles on the end plating overlay to locate them. It should be obvious which side the small and the large go. Note, the large one sticks out a bit from the underframe.

I fitted a piece of wire for the rod that links the two boxes, but not until the body and end stanchions were fitted as the rod passes through the end stanchions.



Other Detailing Parts

If you removed them earlier and want to fit them the instruction boards, fold up and solder to the top of the solebars. Reinforce the fold lines with solder. The fold lines for the fixing bars are through 90 degrees, those immediately next to the front plain rectangular plate are through 180 degrees with the fold line on the outside.

If you are making a ferry fitted Presflo and haven't already done so, fit the tie down rings (26) on the PB.81C fret. These need to be angled downwards slightly when they get to the solebar edge. There is a half etch line on the part to mark this point.

The ferry Presflo detailing includes continental style label board which will need folding up and fitting to the top of the solebar, directly above the middle of the left hand axleguard. Fold the front detail layer over 180 degrees relative to the large plain rectangle so the fold lines are on the outside and solder the two parts together. Fold up the small rectangle which will give you a plate to solder to the top of the solebar. Clean up and fit to the underframe.

Suspension

You can build the underframe with either pinpoint or Exactoscale Parallel axles and bearings. There are two types included for this purpose. There is a set with a half etched area around a 2mm diameter hole which are for pinpoint bearings. The other set that are full thickness around a 1.5mm diameter hole and are for parallel bearings. The spring carriers have a bar across the bottom which will represent the link between the clasp brakes.

If using pinpoint axles Alan Gibson waited bearings are recommended as they are quite deep. This will give you the opportunity to space the spring carriers away from the back of the axleguard. This will be useful to avoid the brakegear links.

If you are using Exactoscale parallel axles and bearings, I would recommend following what I do and use 1.5mm OD bearings with a sleeve of 2mm x 1.5mm tube over the outside and a washer to step it away from the back of the axleguard. You could use the 2mm OD bearings, but they aren't very deep meaning the spring carrier is going to have to sit flush up against the back of the axleguard. I will explain in a minute why this might be an issue.

Spring Carriers and Pinpoint Bearings

Drill a 2mm hole into a piece of wood or mdf. Remove the four spring carriers (G) with the half etched circle around the hole. Insert a waisted pinpoint bearing through the side of the spring carrier with the half etched circle and into the hole, pinning the part to the jig. Solder the bearing in place. Remove from the jig, turn over and solder a length of spring wire into the slot at the opposite end of the spring carrier to the bearing. The wire will need to be about 18mm long. I generally solder the wire in place and then trim each end to the required length. This will be about 8.5-9mm from the edge of the spring carrier where the wire is soldered.



Note that the spring wire in the above picture is on the opposite side to that which it should be on the Presflos.

Test fit an axle to the wagon with a pair of spring carriers and work out how much sideplay there is in the axle. There should be as little as possible. Use the bearing washers (H) to take up the slop. These should be fitted over the pinpoint bearing and soldered to the spring carrier. See above image.

If you found you needed to add at least a full thickness washer to each side then you can solder the brakegear links to the back of the axleguard. This is the best place for them. If not, you will need to arrange the brakegear links, so they pass between the spring carrier and the wheel. This will take a bit of care as shorting on the wheels may be an issue.

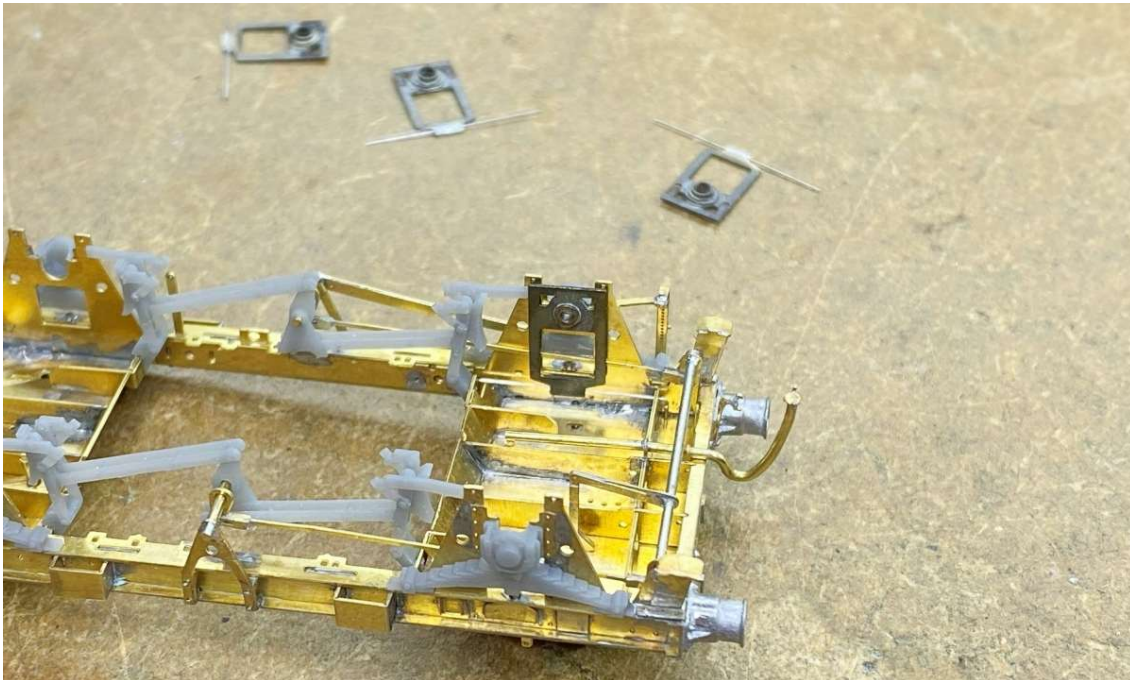
Before final fitting of the wheels, blacken the spring carriers.

Spring Carriers and Parallel Bearings

If you want to use Exactoscale parallel axles I would recommend using the 1.5mm x 1mm bearings that are available and sleeving them with 1.5mm x 2mm tube. If find the 2mm x 1mm bearing too shallow. Use the spring carriers (G) that are full thickness around the hole. Solder the 1.5mm OD bearing to the spring carrier so the flange is on the opposite side to the half etched areas. Solder a full thickness bearing washer to the other side along with some 2mm x 1.5mm tube. The tube can be cut so that it protrudes about 1mm from the spring carrier. In practise this doesn't take long. Parallel axle washers (I on 0.25mm fret) are included to take out any sideplay left in the wheels.

Solder the brakegear links to the back of the axleguard. This means they will pass in front of the spring carriers which is the best place for them.

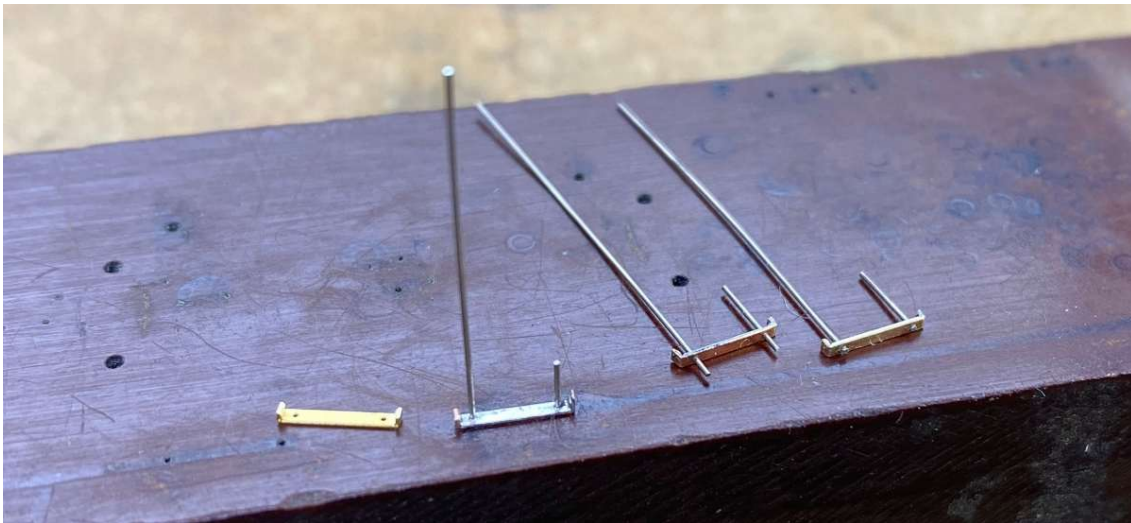
Before final fitting of the wheels, blacken the spring carriers.



Axle keeps (21) will need making up. You can fit them to the underframe now, but you will trap the wheels in. My preference is to make them removable and fit the wheels and the keeps after painting. This keeps primer and paint from interfering with the suspension and makes the business of painting the wheels a bit easier.

If you want to assemble everything permanently in place at this point, then fit the springs carriers and wheels in place then use lengths of 0.31mm wire strung between the holes in opposite axleguards to locate the keeps in place after you've folded them up. Solder in place and cut/file the wire on the front so that it resembles bolt heads. Trim the wire between the backs of the axleguards noting that it is this wire that will stop the spring carrier dropping so far that the spring wire can become disengaged.

The following method is how I make up the keeps so that I can paint them separately and fit them at the end. Whilst still attached to the sheet, use one of the axle keeps (21) to drill a pair of holes into a piece of scrap wood or mdf. Remove from the sheet and fold up the ends. Use two lengths of 0.31mm wire to pint the keep to the wood. One of the lengths can be quite short but leave the other longer, say 20-30mm, as this will give you something to hold or something to stick into a piece of wood when painting them. See image below.



Remove the keep from the wood and cut/file the wire on the front so that it resembles bolt heads. I don't worry about the wire on the back at this stage and simply trim it when everything goes together.

Couplings

There are two types of drawbar hooks provided. There is one pair for Instanter and standard screw couplings (J1) and another for UIC type screw couplings (J2). Both types are designed to be folded double about the middle (fold through 180 degrees with the fold line on the outside) and be soldered together as two layers. Clamp in something suitable and shape the head around the edge to better represent a casting.

Instanter links are included, both BR (22a) and GWR (22b). The GWR type could generally be found on the Shildon builds and BR on the later builds once BR had gotten over its screw coupling obsession. There are instances of those two groups getting the other type, particularly later in life.

As with the drawbar hooks, they are designed to be folded double, be soldered together and then tidied up.

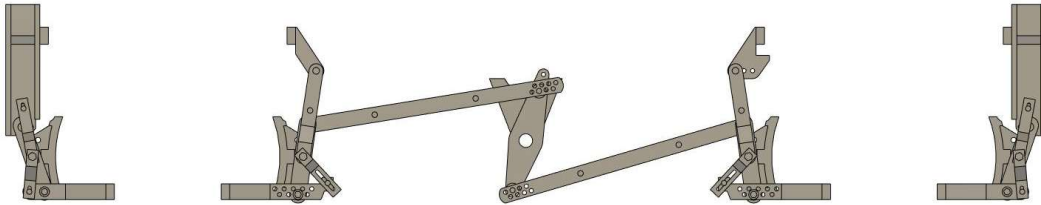
For links I use 0.5mm wire wrapped around a piece of bar 3.5mm x 1mm and then split along one of the long edges with a piercing saw. John Hayes shows you how in his book, *The 4mm Coal Wagon* (Wild Swan). Brassmasters sell blackened chain.

For those wishing to use screw couplings, Rumney Models produces suitable (B.96) and these include parts to do standard and UIC types.

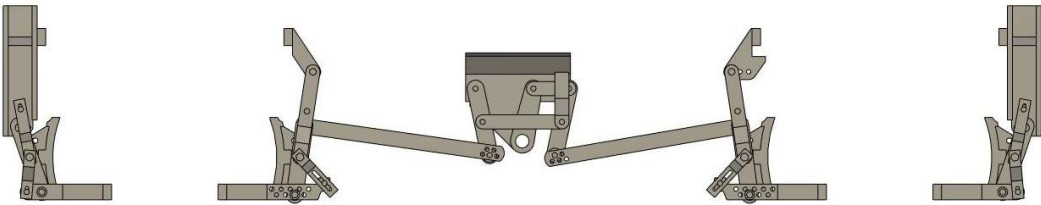
Brakegear

The central section of the brakegear can now be fitted. Make sure that the hole for the brake lever shaft can accept 0.8mm wire. I use a tapered reamer to do this as it is kinder than drills. The brakegear is supplied on the supports to protect it. The best way to remove it is using a piercing saw with a fine blade (7/0 or 8/0). Cut close to the part as this is the built in weak point. Note that the resin cuts very easily so go carefully. The following images show what you should end up with. Note that one set is a mirror of the other.

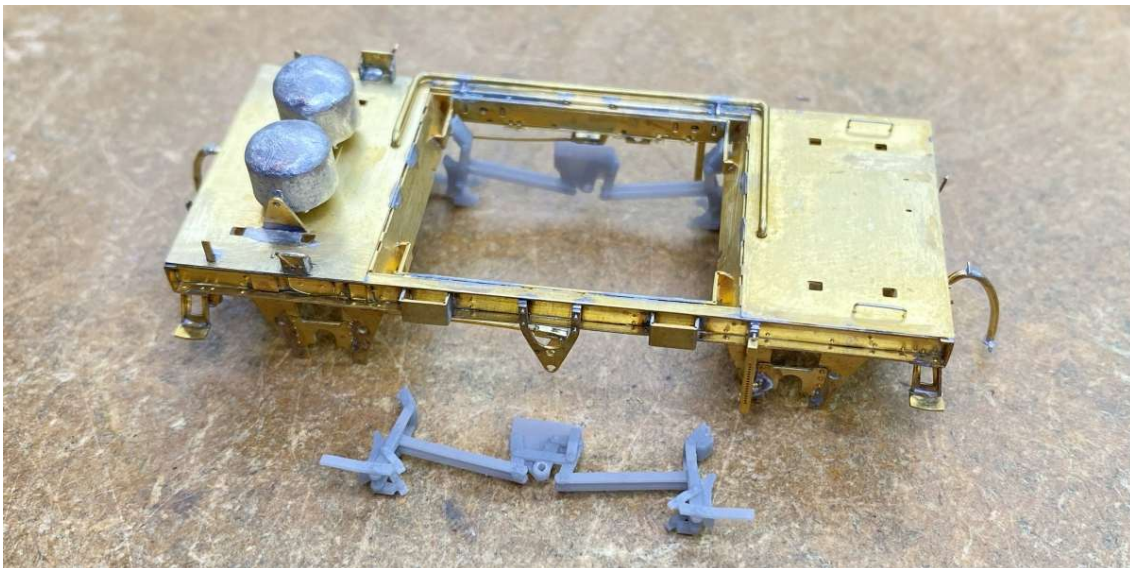
Early Brakegear



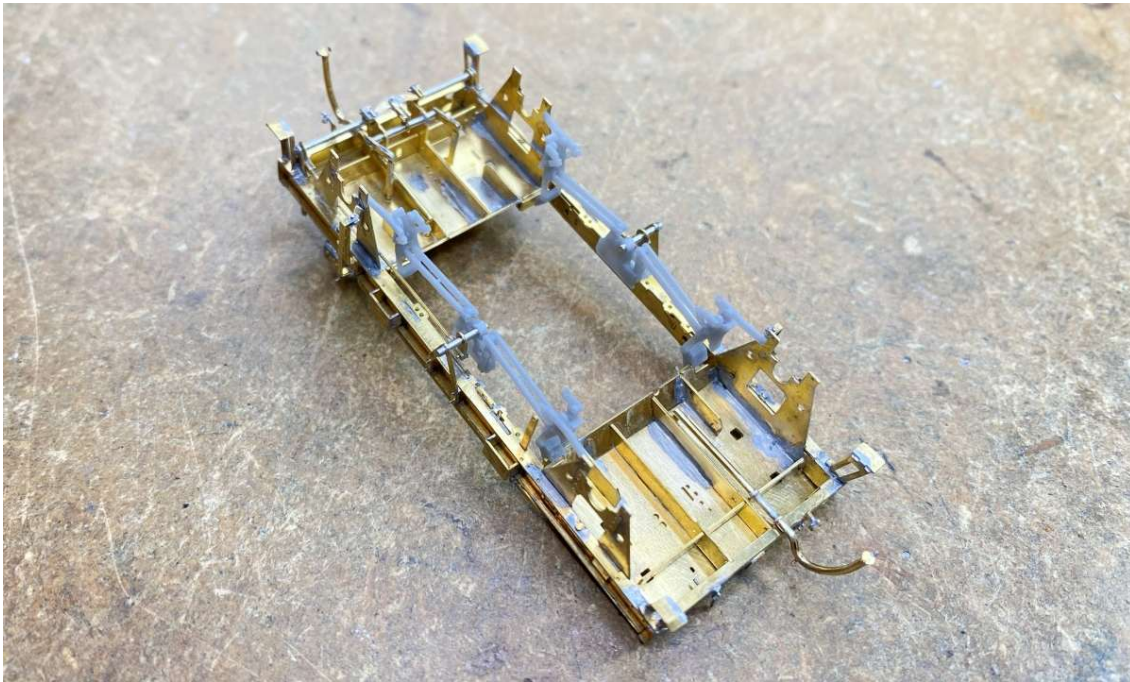
Late Brakegear



There are vertical slots on the inner springing bracket (C) into which tabs on the brakegear are located. You will note that on the hangers, one of the brackets at the top is more substantial. The more substantial bracket goes at the ladder end on both sides. I used a little superglue to attach the clasp brake rods to the backs of the axleguards. The tabs and the brake lever shafts will do a good job of keeping everything in place.



With the brakegear in place it is a good point to fit the brake lever shafts from 0.8mm wire. These should protrude about 1mm from the outer face of the vee and finish close behind the brakegear on both sides. Solder to the vees. I think I fitted a long piece of wire, soldered it in place and then cut it with a piercing saw in the middle. You could fit shorted pieces on each side though.



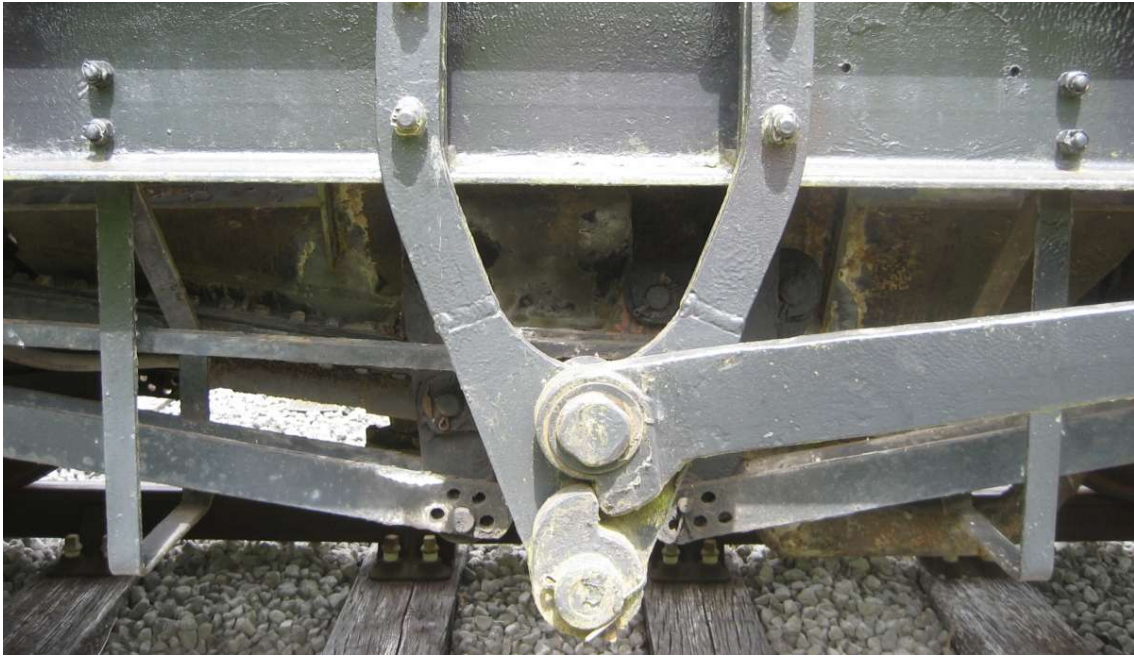
The outer brakegear parts are common to both types of brakegear. I would fit them at the end as they may be a bit vulnerable. If you are springing your buffers, I would definitely fit them after you've fitted the heads. As there is little chance of getting at the buffer head tails once they are in place. I painted mine separately by drilling a 0.5mm hole in the base and then pinning them to a piece of wood using 0.5mm wire.

Safety Loops

The brakegear safety loops are tricky. The real things are attached to the backs of the solebar and loop around the brakegear. I have provided slots and tabs to help you fit them, but you will need to take care. There are four types depending on which type of brakegear you are doing and what position they go in.

- 23a - Brakegear safety loops - early brakegear short
- 23b - Brakegear safety loops - early brakegear medium
- 23c - Brakegear safety loops - early brakegear long
- 23d - Brakegear safety loops - later brakegear

With all the safety loops note that there is a tab at one end which is narrower than the main part of the loop. This is designed to fit into the safety loop slots on the underside of the solebars. There are then three fold lines next to each other on the same side. The two closest to the tab should be folded through 90 degrees. The third fold line will need to be bent so that the other end of the safety loop returns to the main vertical part. This third bend will need to be done after the safety loop is fitted. On the longer early brakegear safety loops there is also another fold. The following image should give you a good idea of the kind of shape you are aiming for.



I'll deal with the late brakegear loops first as they are the same in size and position. This next bit will deal with the methodology so, if you are building a Presflo with early brakegear, keep reading.

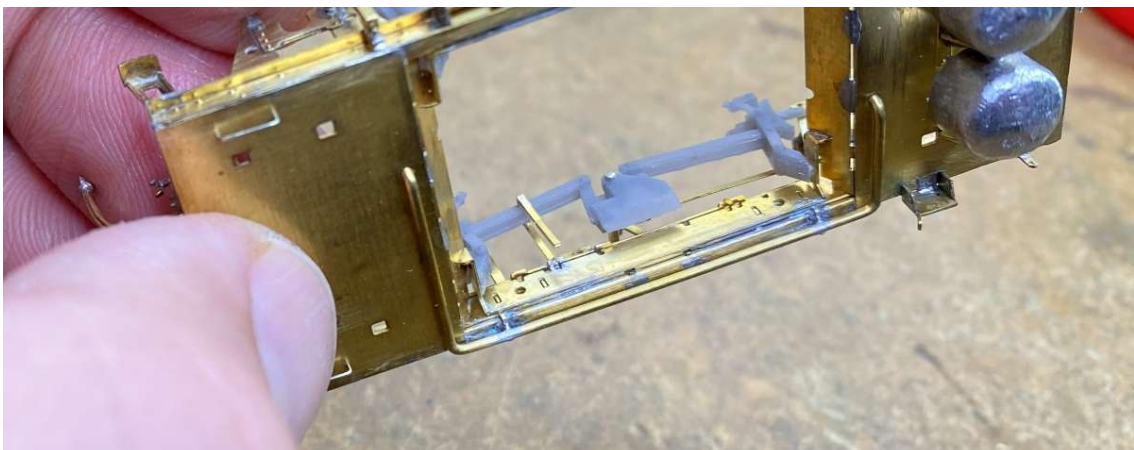
Remove four late brakegear safety loops (23d) from the fret. Find the end with the tab and fold up at the two fold lines nearest to it so you end up with a long U shape. There are a series of small slots on the underside of the solebar. Two on each side have a small triangle etched next to them These are the slots for the late brakegear. See Fig. 7.

Fig.7

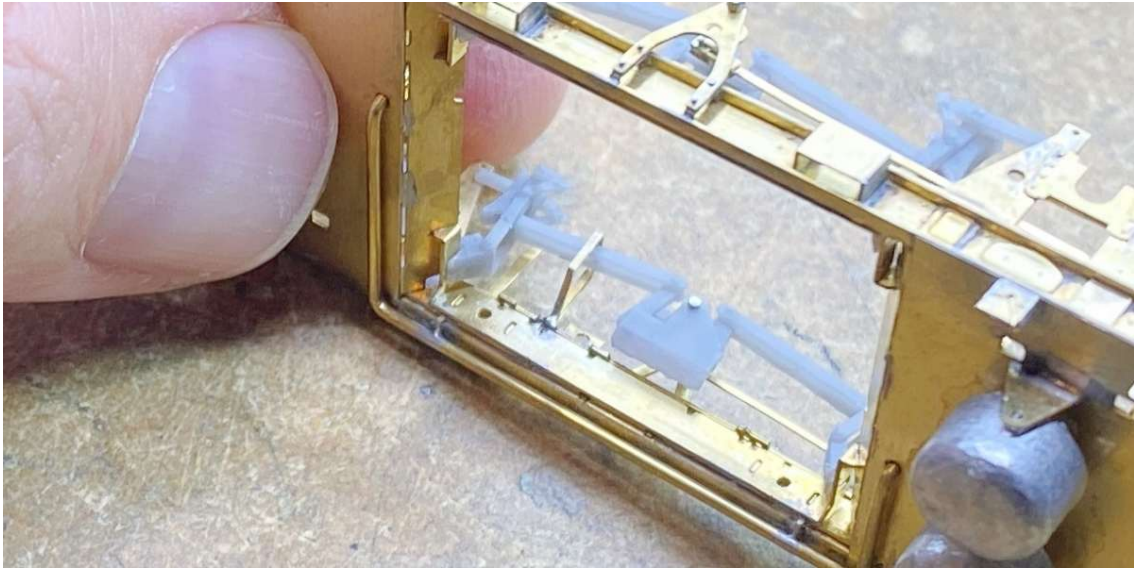
Early Safety Loop Slots
Late Safety Loop Slots



Insert the tab on the safety loop into the slot so the U goes around the brakegear. Make sure it is in as far as it goes and solder in place. If it is a tight fit, file the tab on both sides.



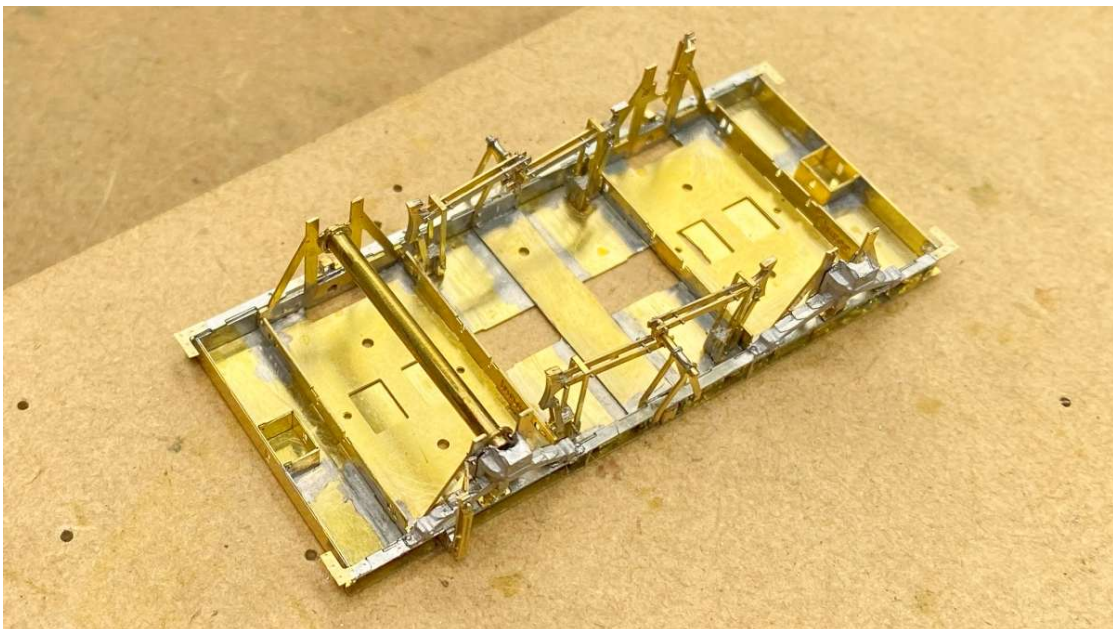
Bend the inside of the safety loop so that it rejoins the main vertical part. On the late brakegear safety loops this will be where it joins the underframe. Solder in place. Repeat for the other three.



For the early brakegear safety loops, you have three types (23a-c) all of them different lengths. These will fit into the slots without the etched triangles next to them. See Fig.7 above. The arrangement of the loops should be fairly clear from the shape of the brakegear. The longest goes in the middle of the three slots. The height of the brakegear will then dictate where the other two go. The shorter safety loops (23a) follow the same pattern as the late brakegear loops we just covered. The medium (23b) and long (23c) have an extra fold as the loop rejoins the main vertical lower down. Make them the same way as the late brakegear safety lops but keep this in mind.

Other 3D Prints

Now is as good a time as any to fit the springs and axleboxes. I made up a jig using a piece of 2mm tube and some bearing washers soldered to it to stop it moving in the slots. It protrudes about 1mm either side of the axleguards which is enough to locate the axleboxes. See image below



Tidy up the prints and glue in place. I usually glue in the centre, just above the slot and also on the spring seats that fit on the underside of the solebar.

Fit your buffers. If using the 3D printed Oleos, make sure base sits properly against the headstock. There is a tendency for a fillet to form between the base and spigot which might stop it from sitting flush. A good square edge file will take care of it. Also check the fit of your heads in the holes. Open out with a tapered reamer if tight. Wizard sell 13" heads for Oleos with a 1.45mm shank but it can vary in size and usually up instead of down. Now I use 1.4mm x 1mm stainless steel tube as a sleeve over a standard 13" buffer head. This is available from Ali Express. It is big enough to give the right effect and, being stainless steel, won't rust.

Brake Levers

The final item on the underframe agenda are the brake levers. There are two sets, one for early brakegear (24a) and one for late brakegear (24b). Both sets include brake levers for both sides and Morton clutches.

For your chosen set make sure that the holes can accept 0.8mm wire before removing from the fret.

The levers and cams can then be removed from the fret but note that the connecting tab between the non-Morton lever and backing cam should be left intact. Once removed from the fret, the connecting tab between the cam and the non-Morton brake lever can be folded through 180° with the fold line on the outside.

Solder a short length of 0.8mm wire through the hole in the Morton cam brake lever. This will locate into the top hole on the vee with a pair of holes in. I use a hole drilled into a piece of scrap wood to aid doing this. I also make the Morton Cam double thickness and solder a cam to the back of the brake lever. Once the Morton lever is made up trim the wire so it is just proud of the front of the lever and file so the end is flat. Leave about 1mm of wire protruding from the back.

If you want to, double up the Morton Cam and make sure it can still fit on a piece of 0.8mm wire.

The brake levers then need bending to shape. There are small half etched slots in the back of the levers to aid with the position of these bends.

Early Brakegear

The levers need bending to clear the axleboxes. The area directly in front of the axleboxes should be parallel to the axleguard and just over 3mm from the face when at rest in the guard. The lever needs cranking for the handle. See Fig.8 below.



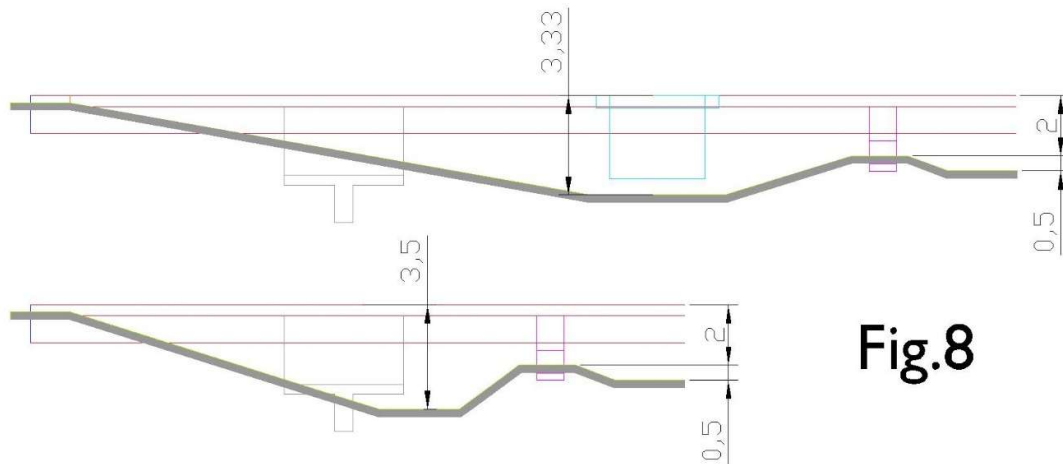


Fig.8

Late brakegear

There is no axlebox to clear with the short levers, but the lever needs bending so that the widest part is approximately 3.5mm from the face of the axleguard. You will also need to crank the lever for the handle. See Fig.8 above.



Pipe Valve Wheels

The discharge pipes themselves are best left until last, but I have put the valve wheels next in the numbering so they may as well be covered at this point. They often seem to be painted yellow and feel a bit vulnerable. Given this and that the pipes will go on last, I think it is best to make them up with lengths of 0.31mm wire, blacken them, paint the wheels and then fit after painting of the wagon.

The wheels are grouped together on the 0.25mm fret and have the following numbering:

- 25a - Discharge valve wheels
- 25b - Air Inlet pipe valve wheels
- 25c - Roof pipe wheel

There are three types of discharge valve wheel. I'm not sure I can detect a definitive pattern but those built at Swindon and Met Cam seem to have been fitted with the plain type with curvy spokes. Most of the rest seem to have been fitted with 5 straight spoke type, though not always, and the third more solid type is included. It looks like there was some swapping around later in life.

There are two sizes of air inlet pipe valve wheels. The smaller type is for BR builds and the larger for PO.

Finally, there are very small wheels for the valve on the pipe from the roof (if fitted).

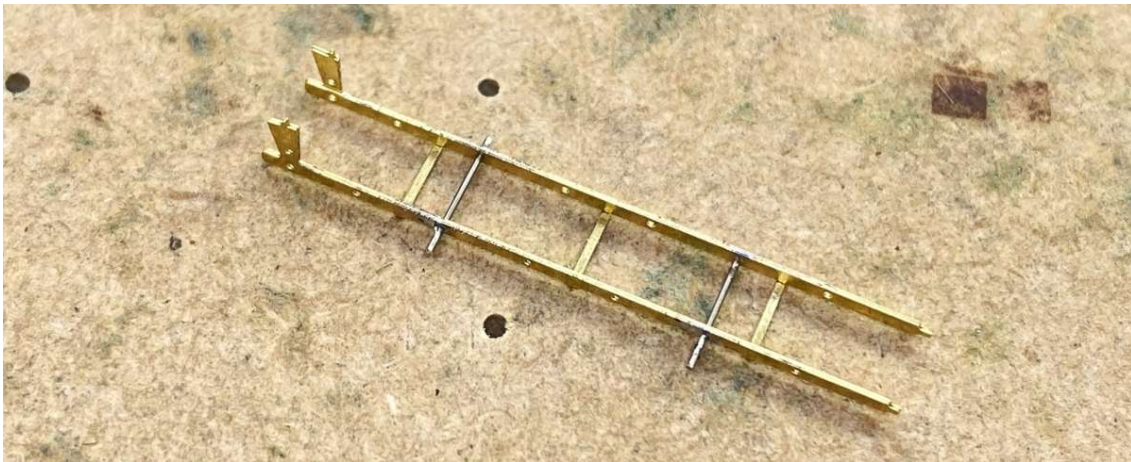
In all cases make sure that the hole in the middle is a good fit on 0.31mm wire. I found it easier to solder them to lengths of 0.31mm wire whilst still attached to the fret. Drill a 0.3mm hole into a piece of wood and then pin the wheel to this jig using a length of 0.31mm wire. Make sure you have the back of the wheel facing towards you. Solder the wheel and wire together then remove from the fret and clean up. Trim the wire on the front of the wheel so it protrudes just a little. Leave the back long so you can pin it to a piece of wood if you want to paint them.

Blacken and paint as required. Most seemed to be painted yellow, but PO ones could have been black when new.

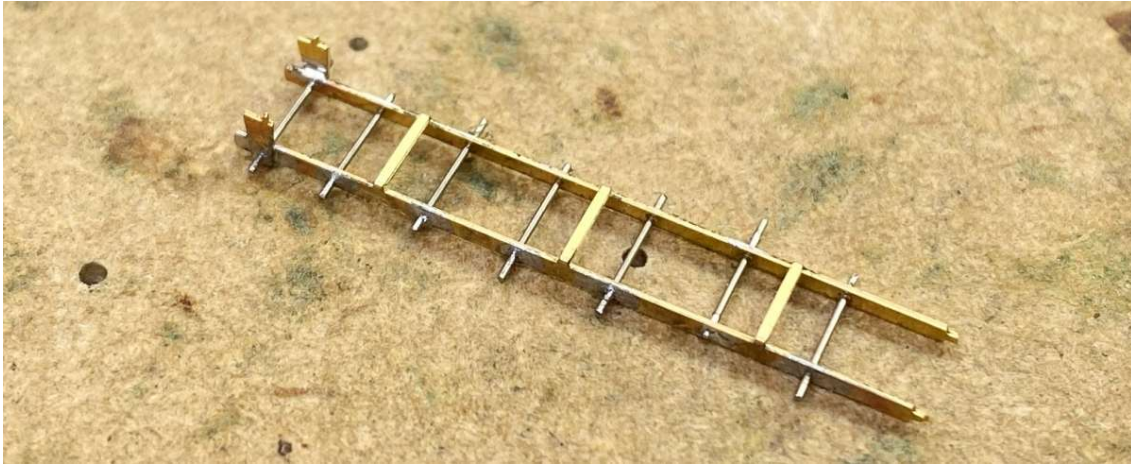
Ladders

There are three types of ladder included. There are early types as fitted to Shildon builds for the Airfix/Dapol kit (32a) and Bachmann (32b) models. There is also a late ladder for everything else (32c). The ladders come as pairs of rails connected by three bars. The rungs need to be added from 0.31mm wire and then the connecting bar can be removed. An assembly jig (31) is included which is designed to hold the rails parallel, but I found with the connecting bars it wasn't really needed.

Make sure the holes in your chosen ladder can accept 0.31mm wire and remove from the fret. Fold the two rails so they are perpendicular to the connecting bars. Make sure that everything sits flat and there's no twist through it. Insert short lengths of 0.31mm wire through the holes, except where the brackets are on the early ladders and solder in place.



Fold the bracket over on the tops of the early ladder. These should end up on the outside of the rails, and the fold should be made through 180 degrees with the line on the outside. Insert a length of 0.31mm wire through the rails and brackets and solder in place. This wire will need trimming both inside and out to represent bolt heads.



With all the rungs in place, use a piercing saw to cut through the connecting bars. Wiggle them back and forth to break the bars at the fold lines and then clean up.



The late ladder is ready to be fitted. The early ladder can be fitted as it is with the tabs on the brackets locating into holes in the body drilled using the early ladder drilling jig (33). This jig fits between the middle and right hand vertical end rib and the holes can be drilled 0.4mm. However, this isn't quite as per the prototype. On the Shildon builds the ladder was attached to the end of the hopper by means of a bar which was welded to the middle and right hand vertical end stanchion. I fitted this bar on my Dapol body using a piece of 0.25mm plasticard cut into a 2mm wide strip. The brackets on the ladder can be cut flush with the back of the rails. See the Airfix/Dapol Detailing Instructions on page 72. Some investigation will be necessary for the Bachmann version.



The Dapol manhole shaping jig (34) is redundant. I was originally going to just do a new top for the Airfix/Dapol manholes, but I decided it was better to replace them all.

Walkways

Walkways have been provided for upgrading the Airfix/Dapol kit. It may be possible to replace the Bachmann ones, but I've not investigated. Even when I was intending to use the Bachmann bodies on my two APCM models I hadn't intended to replace the walkways on them.

There are two types of walkways, a shorter outer one (M1) and a longer middle one (M2). As is suggested by the description the longer one goes between the manholes and the outer walkway towards the ends. The outer legs that they sit on are included with the walkways but there were intermediate ones on both, with the longer version having more. Walkway supports (N) are provided for these. The outer legs have small tabs attached to them which are designed to locate into 0.4mm holes drilled in the hopper roof. A walkway and ladder drilling jig (L1) is provided to drill these accurately on the Airfix/Dapol model. See the Airfix/Dapol Detailing Instructions on page 67. This should be done before you detail or fit the roof and before you remove the bottom of the manholes to fit the replacements. If you are attempting to fit the walkways to the Bachmann model, you are probably going to need to modify the jig.



For the walkways there are six parts to each. There is a detail layer which has the planking on, four outer legs and a frame that joins them all together. Remove the outer and middle walkways from the fret. Fold the frame and the planking layers so they fit against each other. The fold will need to be made through 180 degrees with the fold line on the outside. Fold out the four legs and solder everything together, reinforcing the fold lines of the legs while you are at it. See above image.

Remove the walkways supports and fit them to the walkways using the slots provided. You will need one for the outer walkways and three for the middle. Solder in place.



Once fitted clean up around the edges. If you are making a representation of the rib that ran along the apex of the hopper roof, see Airfix/Dapol detailing section on page 71, you will need to file a slot in the middle of the supports so the walkway can sit properly on the roof.



I fitted my walkways during the priming process. I was a little concerned that I wasn't going to be able to prime the underside sufficiently with the walkways fitted to the top of the hopper. I therefore stuck the walkways to a piece of wood using blu tack and primed the underside. Once the body had been primed the walkways were stuck on using a little superglue and the tops primed properly.

That's about it for the underframe and the etched detailing parts. There are the discharge pipes to cover but they will be done at the end. Next, we will look at giving the underframe a body. The section of the Bachmann model is quite short, the Airfix/Dapol section is quite long but will cover the detailing work that was undertaken as well as the parts in the Airfix/Dapol body upgrade packs.

Bachmann Body

The main challenge with using the Bachmann body is getting it off the underframe. Each end stanchion is located into the underframe by two rectangular spigots, and the end stanchions are glued in place. If you can manage, keep the spigots as these will locate the hopper onto the new etched underframe. The end stanchions are glued to the hopper body but there are no 'pins' locating them. It is a simple matter to reglue them if the joint fails, especially if you have the spigots to locate the stanchions.

To fit the Bachmann body to the new underframe you will need to file back the ribs at the base of the hopper. This part of the Bachmann model is a bit wide, hence the issue. Once they have been filed back you shouldn't have any issues fitting the body in the underframe opening. Make sure the body goes the right way around with the pressure gauge and the roof pipe on the pipe side. You will need to re-fit the side stanchions. Ballast is an issue. The middle section of the roof is a separate piece but I'm not sure how it comes off.



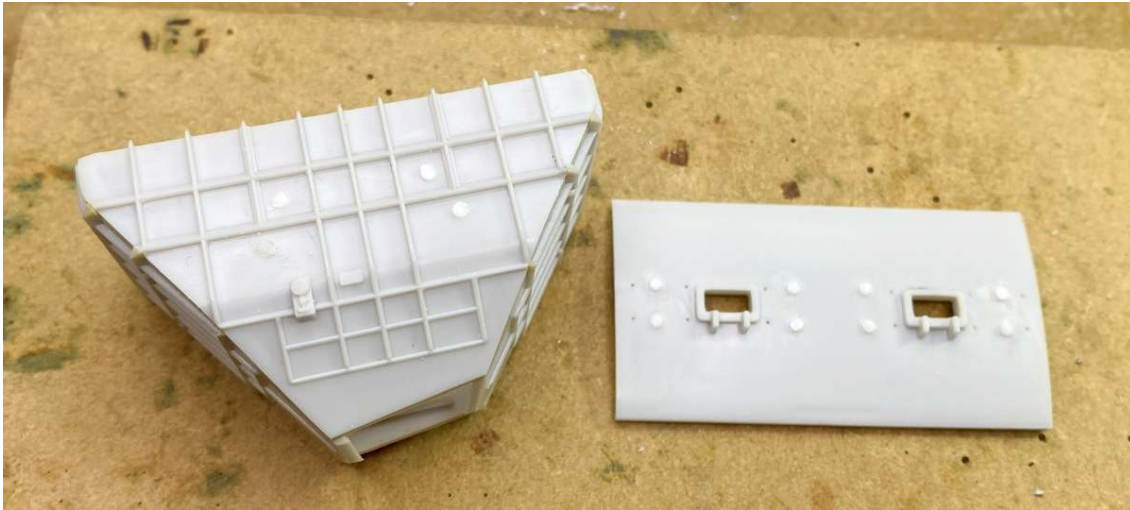
Airfix/Dapol Detailing

Most of the next section is optional. It outlines how I tried to upgrade the Airfix/Dapol body to bring it in line with its shiny new underframe. It does however cover work needed to model some of the variations that could be found in the prototype and use of the 3D printed upgrade parts. There was an amount of plastic section and sheet used during this process. These are noted as we go along and there is a summary at the end.

I don't know where Airfix got their information from, but the kit they produced seems to be a bit of a mix of types. It was obviously intended to be one of the first batch of APCM Presflos. The arrangement of the pressure gauge, which was different to that on BR wagons, and the representation of the discharge pipe would suggest this. The sides, however, have a rounded change of angle which was not a feature of that first batch of APCM Presflos built by Butterley which had a sharp change of angle. It turns out it is pretty good for a Met Cam built APCM Presflo but curiously they hadn't been built when the kit was released! This means that, as well as making it look a bit better, there are elements that need to be changed if you want to do a BR built Presflo with it.



Firstly, a little prep work. The kit comes with holes in the sides to locate spigots for the side stanchions and trader's boards and also holes in the roof for the plastic walkways. The holes you don't want need to be filled in. That will mean the roof and, if you're modelling a BR or Tunnel Cement wagon, the holes in the tops of the sides. Further, if you're modelling one of the Shildon built Presflos soon after they were built, you'll have to fill the holes for the stanchion locating holes as well. I used Evergreen 1/16" plastic rod (Item No. 222) with a tapered reamer to open out the holes. Do this slowly and keep checking so the rod is a nice tight fit. Cut the ends nice and square and try to get them as flush as possible without having a recess. The roof is easy enough to get smooth, but the sides are tricky due to the ribs sticking out and the softness of the plastic. I used a sharp chisel blade to take most of it off, but it is easy to dig into the plastic body. I resorted to strips of emery paper wrapped over a length of brass strip that could fit in the space to finish them. It took a while, and a couple of attempts, but a smooth surface can be had with no sign of the holes that were there.



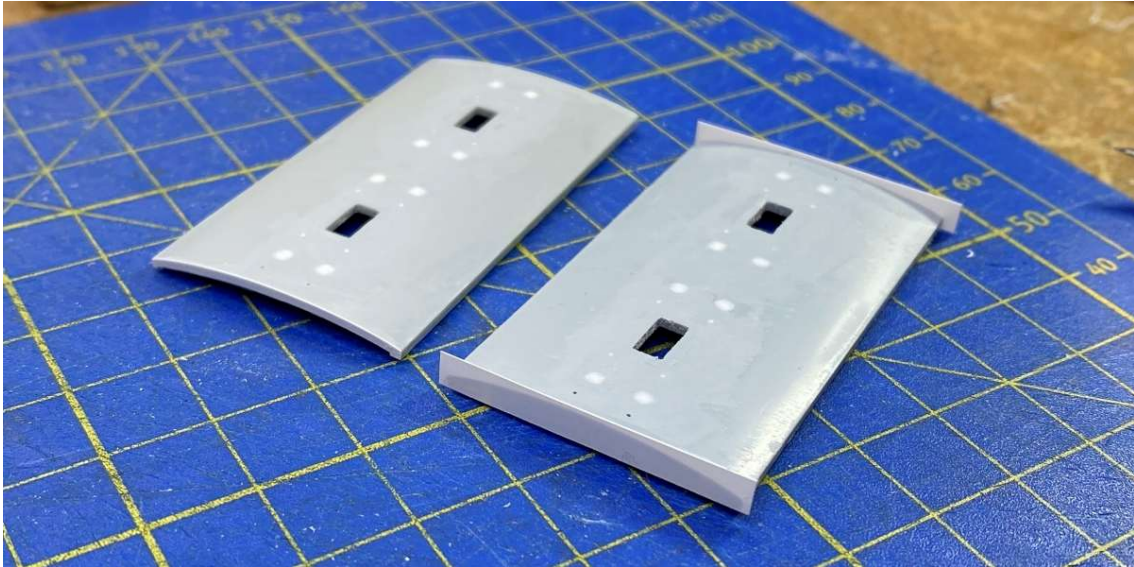
With the holes in the roof filled, the drilling jig in the kit was used to drill new 0.4mm holes for the replacement walkways and then the bottom of the manholes removed and filled smooth. It's important to do it in this order as the plastic manholes are used to locate the jig.



As mentioned above, the pressure gauge and its mounting are in the wrong place for the BR version. If you need to, carefully carve it off. I made a replacement using a piece of 0.005" plasticard cut to 4mm x 2.33mm for the backing plate. Once this had been welded in place and gone hard a 1.5mm hole was drilled for at the gauge centre. This was carefully opened out so that a short length of 1/16" plastic rod could be fitted for the gauge itself. A small 0.3mm hole was drilled at an angle just below the gauge to allow for a wire for the pipe.

If you're modelling an APCM wagon, there was a small metal plate fitted just to the right of the centreline about level with the gauge glass on the angled part of the hopper. The face of this is vertical and works out at approximately 1.33mm x 2.5mm but is set against the angled part of the hopper so some shaping is going to be required. I started with a piece of 0.75mm x 1.5mm strip cut to 2.5mm long. I then thinned the 1.5mm wide part a little to get a bit closer to 1.33mm and shaped it to sit against the angled part of the hopper, so the front face was just about vertical.

There is no representation of the angles that joined the sides and end to the roof. The Bachmann model has it and looks much better for it. This can be added to the roof section, but you will need to carefully file back the stanchions on the sides and ends to get the slightly bigger roof to fit. I found it easiest to modify the roof at this point but leave the sides and ends until the body is assembled. The tops of the stanchions are quite vulnerable, and this work is best left as late as possible. Using 0.005" plasticard, I cut a strip 3.5mm wide and glue to the ends of the roof. Once it has hardened, it can be carved to shape with the top flush to the roof profile. Cut strips of 0.005" plasticard to ~1.3mm wide and use these for the sides of the roof and the top part of the angles. Do the sides first and make them the full length of the roof. The ends can then be fitted between the sides.



With the prep done attention can turn to assembling the body.

Whenever I assemble a plastic kit, I always start by tacking it together with plastic cement. I have a small bottle of Revel Contacta Professional on my workbench for this purpose. If used sparingly, it is a simple matter to get the thing apart again if you've ended up with bits slightly misaligned or if something isn't quite square. Only when I'm completely happy do I reach for the Butanone and lock it together permanently. This approach proved useful on a couple of occasions whilst building my Presflo bodies, not least when assembling the basic sides and ends. If I had reached for the plastic weld from the start a couple of the bodies would have been scrap as there is no way I would have got them apart without damaging the parts.

The shape of the hopper doesn't help, four parts and 8 planes doesn't make life easy for the tool maker, but I found that if you assembled the vertical parts of the hopper so that they are as square as possible then there are slight gaps in bottom angled part. I found this out by trying to assemble them so there were no gaps and the result wasn't very true. Not a problem to fill the gaps with pieces of plasticard and filler but it was very handy to be able to rectify things when they weren't right.

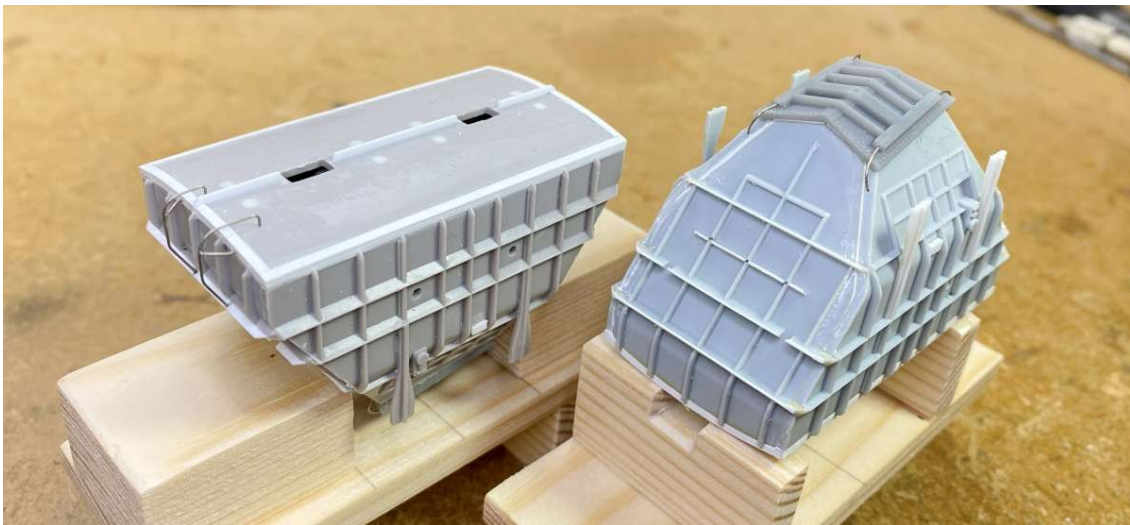


With the four sides of the body done, thought needs to be turned to how you weight it. The obvious place for it to go is in the hopper. The kit includes a floor that was fitted and then plastic strip used to create a recess into which a piece of lead sheet can be fitted. I do get a bit paranoid about bits of ballast coming loose and rattling around inside a closed space so I take care to try and trap it in place somehow. I also prime the lead before fitting. I have had instances of lead glued in place oxidizing and expanding. The lead was glued with epoxy which shouldn't cause any issues, but I think the problem was fumes from a glued wooden box and shelf brackets inside the box which were done with PVA. Anyway, I now take no chances. My motto is, do a job so you don't have to do it again, even if it takes longer. It would be helpful if I could tell you how much lead I added and I thought I had made a note, but I can't find it. I aim for 45g for everything but the wheels and spring carriers.



With the ballast fitted, the roof can now go on. Carefully take back the stanchion tops on the sides and ends with a fine file. Go slowly and keep checking the fit until the roof fits in place. Once happy, glue in place. Any gaps can be filled in. I used white milliput.

Next attention turned to the ends. The Presflo had horizontal angled metal ribs fitted around the hopper to strengthen the platework. These were all the same length on the sides and ends on the prototype and, I think, on the two Shildon lots when built. They also lacked side stanchions. This arrangement was found to be insufficient, so side stanchions were fitted and additional 'fin' pieces were added on the ends to strengthen the ribs, but they weren't all the same length. On the Shildon built Presflos they gained long fins on all three rows of horizontal ribs. The lot 3029 wagons built by Met Cam seemed to have them only on the top row when built but some wagons gained them on all three later in life. After this, things seemed to settle down with long 'fins' on the top two rows only and shorter ones on the bottom. As it comes the Airfix/Dapol kit resembles the prototype with no 'fins' at all on the end ribs, probably to make the tooling easier. I added them to mine using lengths of 0.25mm strip, either 1mm wide for the long 'fins' (Evergreen No. 102) or 0.5mm wide for the short 'fins' (Evergreen No. 100). As with the body I tacked them in place with cement and then welded them in place when I was happy with their positioning. The ends were trimmed either straight or angled depending on the prototype using a sharp scalpel blade once things had hardened. It's worth putting in this effort with the ends as the ribs are really a bit undersized and the 'fins' give everything a bit more presence.



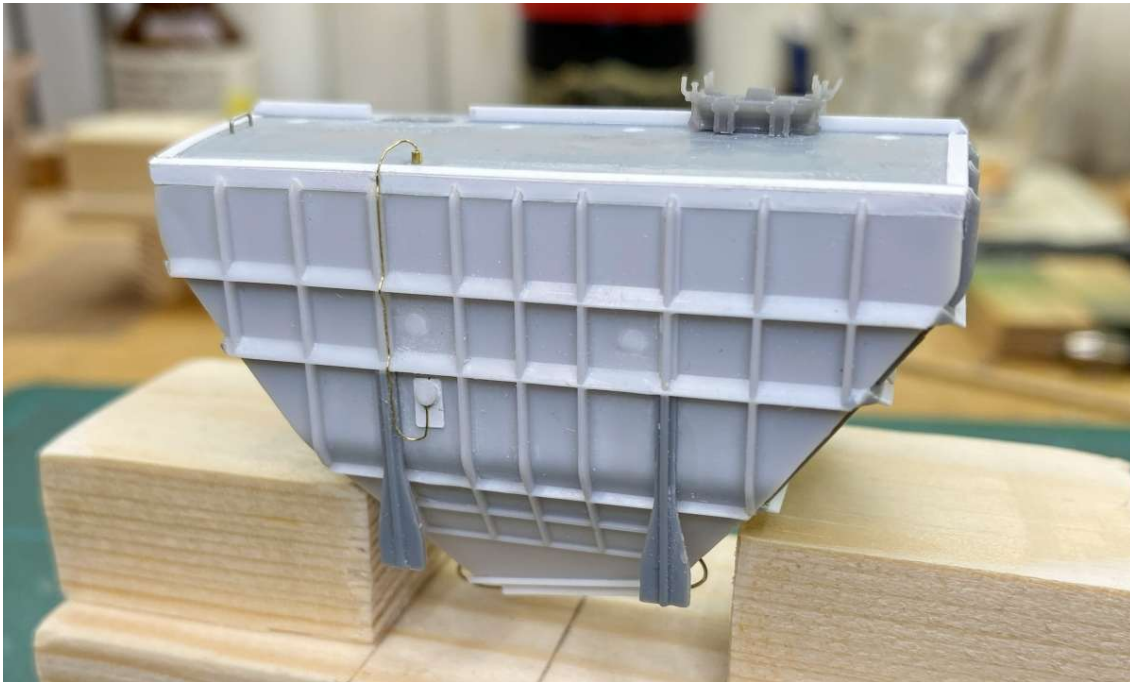
There also seems to be a horizontal rib missing from the ends. Bachmann also missed this as did Ellis Clark with their recent 7mm model. This was added using short lengths of 0.75mm x 0.25mm strip (Evergreen No. 101). On the Airfix end there are four horizontal ribs on the end, three full width and a shorter one at the bottom. The missing rib goes a bit above halfway between the two lower full width ribs. Be aware that it only extends between the end stanchions and not beyond. See the upside down Presflo in the above photo.

A test fit was made with the body, underframe and end stanchions and the ribs/fins on the ends tweaked with a scalpel if the end stanchions didn't quite fit.

I used the Dapol side stanchions on my four, cutting them off the underframe and filing any excess from the bracket off. They were glued in place and then checked on the underframe, tweaking the backs of the stanchions if necessary to ensure a vertical fit. The 3D printed version used in the kits hadn't been done when I built the bodies, but I would use that now to save time. If I was really picky the early builds with a single vacuum cylinder had a different pattern of wedged shaped strengthener on the side stanchions once they were fitted. The Shildon builds didn't have any side stanchions when built and so the vertical ribs would need adding in the gap if you were modelling one of these soon after building. The lot 3029 wagons built by Met Cam had plain T-shaped side stanchions initially with strengtheners added later.

On the roof there is a strengthening rib that runs along the apex of the curve. On the prototype this extends from the middle vertical end rib. I added this using 1mm x 0.5mm strip (Evergreen No. 122) leaving gaps for the manholes. I shaped the outer ends to match the angle at the top of the middle vertical end rib and trimmed around the manholes with a scalpel when I fitted the 3D prints.

There were two arrangements of pipe for the pressure gauge. On early BR builds this was a simple affair with the pipe looping around from the bottom of the gauge to run along the inside of the stanchion immediately to the left. At the top this looped over and entered the roof of the hopper. I used, I think, 38 SWG soft brass wire for the pipe and a short length of 0.5mm x 0.3mm tube (Albion Alloys MBT05) inserted into the hopper on the roof into which the wire was fed.

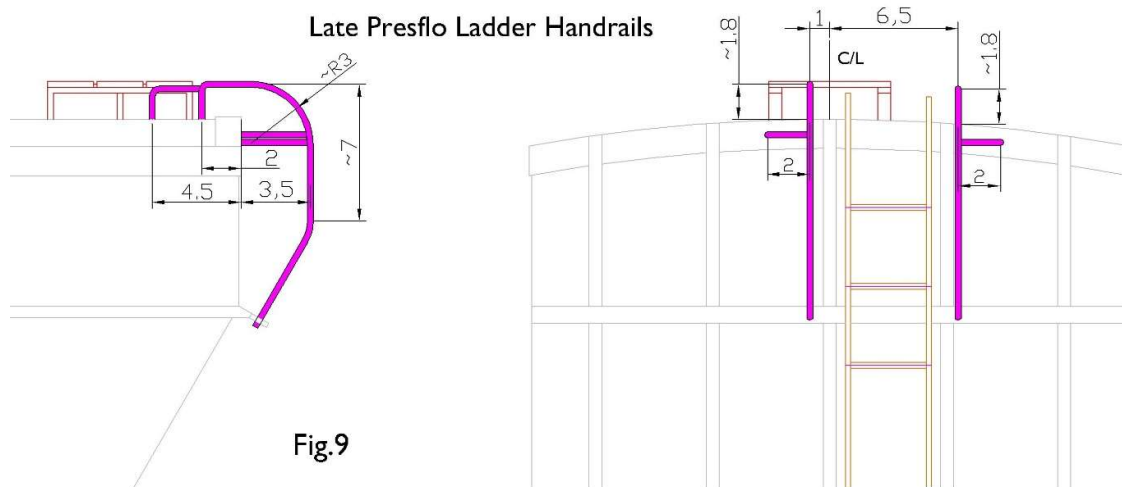


The later arrangement, which all the early ones seemed to be converted to in the 1960s, featured a more substantial pipe coming out of the top of the hopper and running down the centreline of the wagon. There was a join in this pipe just above the top of the solebar into which the small pipe from the pressure gauge fed. For the main pipe I used a print included in the kit with 38SWG soft brass wire being feeding into it from the gauge.

The two Shildon lots had a different ladder arrangement to everything else. This early type of ladder was a fairly simple affair and was fixed to a plate at the end of the hopper which went between two of the vertical ribs. I made the plate from 0.25mm thick plasticard cut into a 2mm wide strip and glued to the ribs. There was a short handrail (~3.5mm long) on the top of the hopper just in from the end. I added this from 0.3mm wire inserted into holes drilled into the roof with the inner end roughly lining up with the outer rail of the ladder.



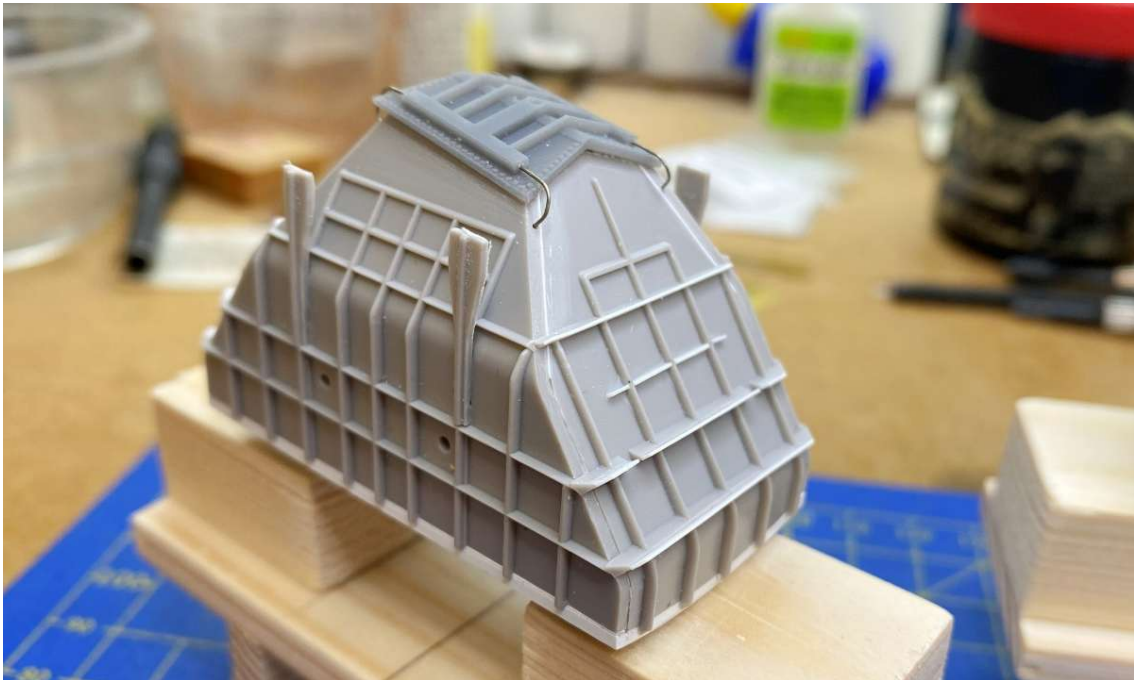
Later ladders and handrails were more involved. The ladder curved over at the top to be welded to the roof of the hopper. Either side were handrails which were fixed to the top of the hopper and, aside from the curved changes in direction, followed the shape of the hopper before angling in and fixing to the top strengthening 'fin' on the upper horizontal end rib. The handrail along the wagon centreline was shorter at the top than the other as the walkways would have got in the way it being the same length as the other. Off both handrails there were stays that fixed to the curved angle that joined the end and roof. The ladder on the models came from the kit and the handrails were made from 0.3mm wire inserted into holes drilled in the body. I made a rough sketch to help with forming them and soldered the stays to the handrails in situ. See Fig.9 below.





The rest of the detailing used parts from the upgrade kits.

The Airfix/Dapol kit comes with no bottom for the hopper. It transpires that this is different for the BR builds and those built for APCM and Tunnel Cement. The correct version was fitted to hopper for each type. The private owner version has pipes that come out of bars that ran along each side of the hopper bottom and then disappeared into the hopper. These were made from 0.3mm wire and inserted into holes drilled in the hopper and hopper bottom. See next image.



3D printed end stanchions were one of the first things created beyond the etches. The Airfix/Dapol kit has a very thick floor to which the end stanchions are attached. This would have need a fair bit of work to sort out and then there's the question of the detailing at the vacuum cylinder end, with brackets for the cylinders and holes for the vacuum release cord and the rod from the changeover levers. Given this was all different between the wagons with early brakegear and one vacuum cylinder and those with late brakegear and two cylinders, it was easier to make new printed end stanchions with correct detail for each type. The Bachmann model has two lugs on the bottom of each end stanchion which locate into the underframe. This feature was useful and so was copied for the new ones.

Manholes were added into the slots in the top of the hopper. The strengthening rib that runs along the top of the roof was trimmed at this point so that they finished neatly against the manholes. The manholes are arranged so the hinges are on the same side as the discharge pipes except on BR built wagons to lot 3175 where they faced the other way. There's always one...



Materials Summary

Plastic Sheet

- 0.125mm (0.005") - Evergreen No. 9009
- 0.25mm (0.010") - Evergreen No. 9010 or other

Plastic Sections

- 1.6mm (1/16") Rod - Evergreen No.222
- 0.25mm x 0.5mm (0.010" x 0.020") Strip - Evergreen No.100
- 0.25mm x 0.75mm (0.010" x 0.030") Strip - Evergreen No.101
- 0.25mm x 0.1mm (0.010" x 0.040") Strip - Evergreen No.102

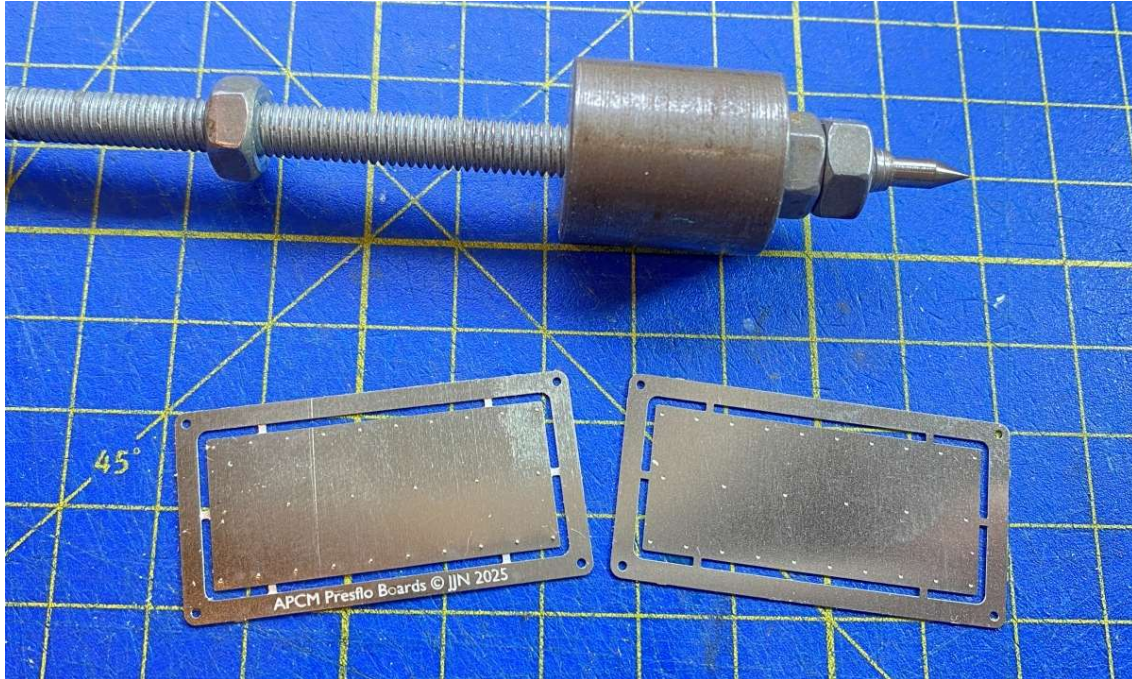
Metal Wire and Tube

- 0.31mm wire - Handrails
- 38SWG soft brass wire or similar - Pressure gauge pipe
- 0.5mm x 0.3mm tube - BR Pressure gauge pipe - Albion Alloys MBT05

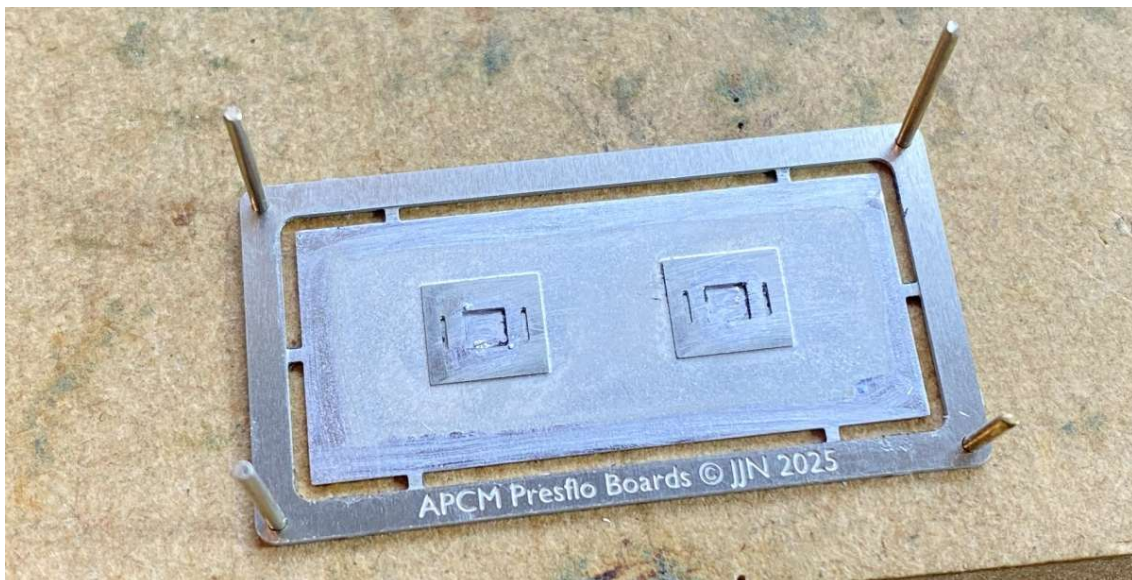
Hopper Side Boards

Kit PB.82-HSB provides replacement etched rectangular 'traders' boards for APCM and Tunnel Cement Presflos. They are thinner than the plastic mouldings and rivet detail included.

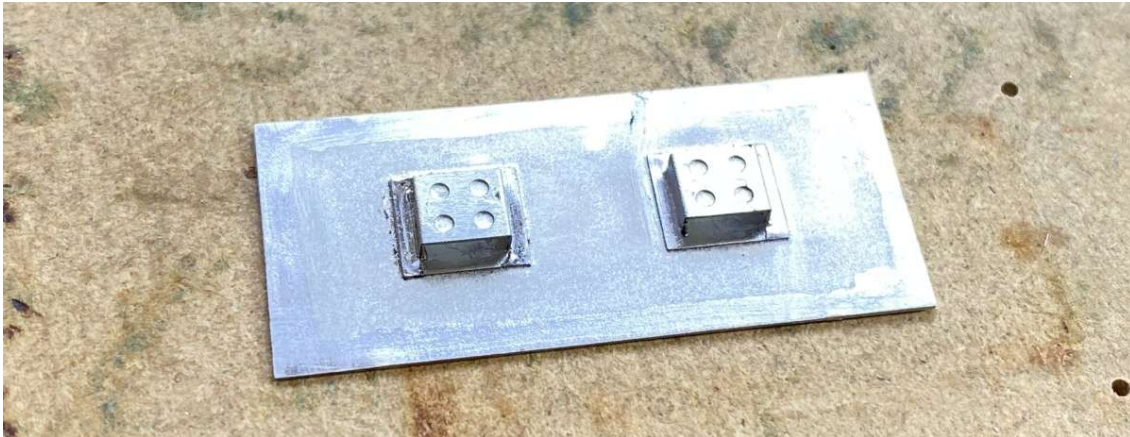
The boards consist of two layers. The front layer has half etched rivets in which will need to be pushed out. The rear layer is mostly half etched but has locating points for the brackets which will attach it to the hopper. These two layers should be soldered together whilst still attached to the surrounding frets.



Use the holes in one of the frets surrounding a board to drill four 1mm holes in a piece of wood or mdf. Pin the outer layer to the jig using four lengths of 1mm wire so that the pushed out rivets are facing the wood or mdf. Place the back layer onto the jig so the full thickness location points for the brackets are visible. Solder together around the edges and at the slots in the middle of the two bracket location points.



Fold the bracket into a C shape and fit to the boards using the tabs and slots provided. Solder in place then remove the boards from the frets and clean up. The boards can be glued in place. I did this after I'd painted them, the wagon and fitted the transfers.



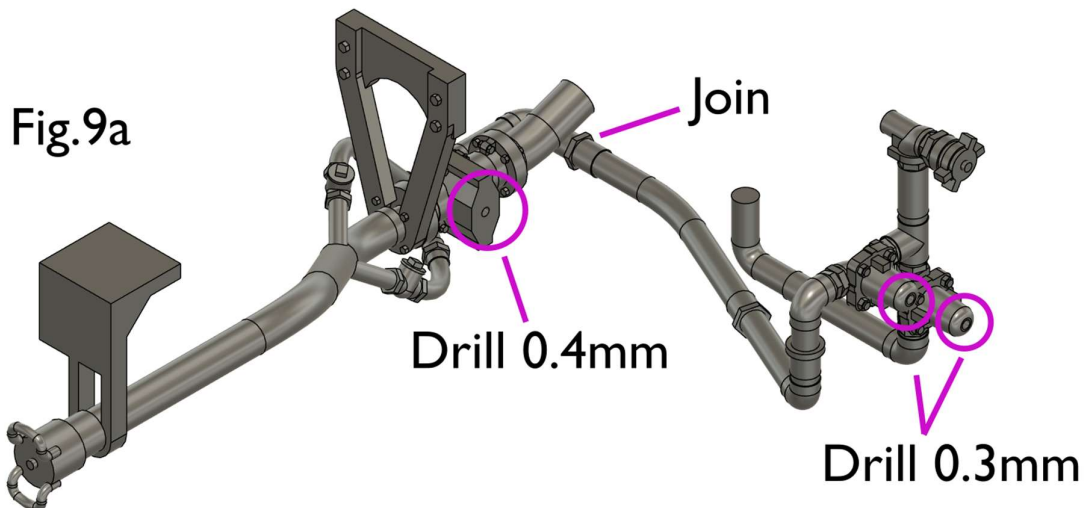
Discharge Pipes

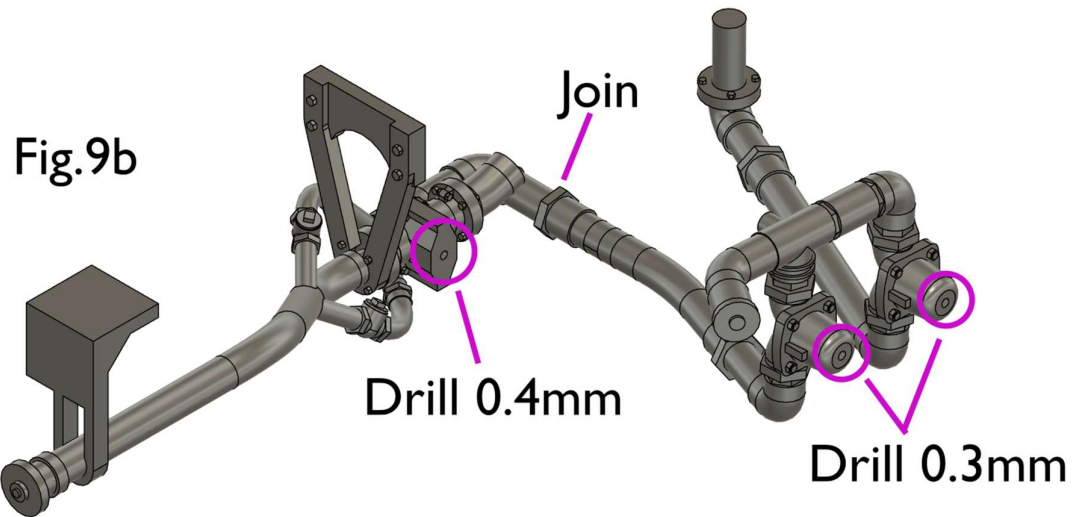
Well done if you've got this far. Only the pipes, painting and lettering to go!

You will need to remove the pipes from the supports. Use a piercing saw with a fine (7/0 or 8/0) blade. Cut as close to the part as possible as this is the built in weak point. Take care around the back of the air inlet pipes which will sit under the solebar as there are location spigots which will fit into the holes in the etched pipe brackets. Clean up with a small file. You will need to make sure the hole in the hopper bottom can accept the pipe that feeds into it. On the BR version this will need to be 0.9mm diameter and the PO version 1.2mm diameter.

The discharge pipes come in two parts which will need pinning together. Drill 0.4mm in the two parts of the pipe for a short length of 0.4mm wire to join them.

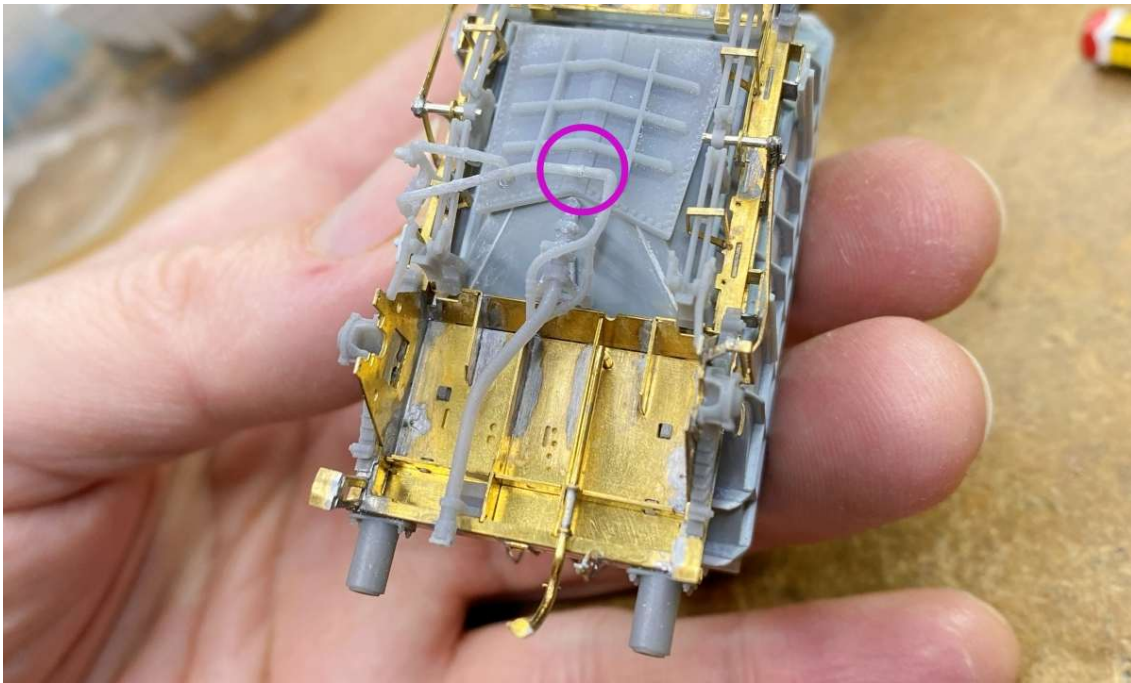
You will need to drill holes in the valve blocks for the 0.31mm wire attached to the etched valve wheels. The holes on the air inlet valves which go directly under the solebar can be drilled 0.3mm. The holes through the discharge pipe block which will sit in the middle of the wagon can be drilled 0.4mm. It's a bit awkward to get to and open out later if necessary and given the wire from the wheel passes through the pedestal it doesn't matter if it's slightly oversize. There will be small indentations where you need to drill. The parts were drawn with holes in, but they fill in at these sizes. Fig. 9a shows where the holes and the join are for the BR pipes and Fig.9b for the PO pipes.



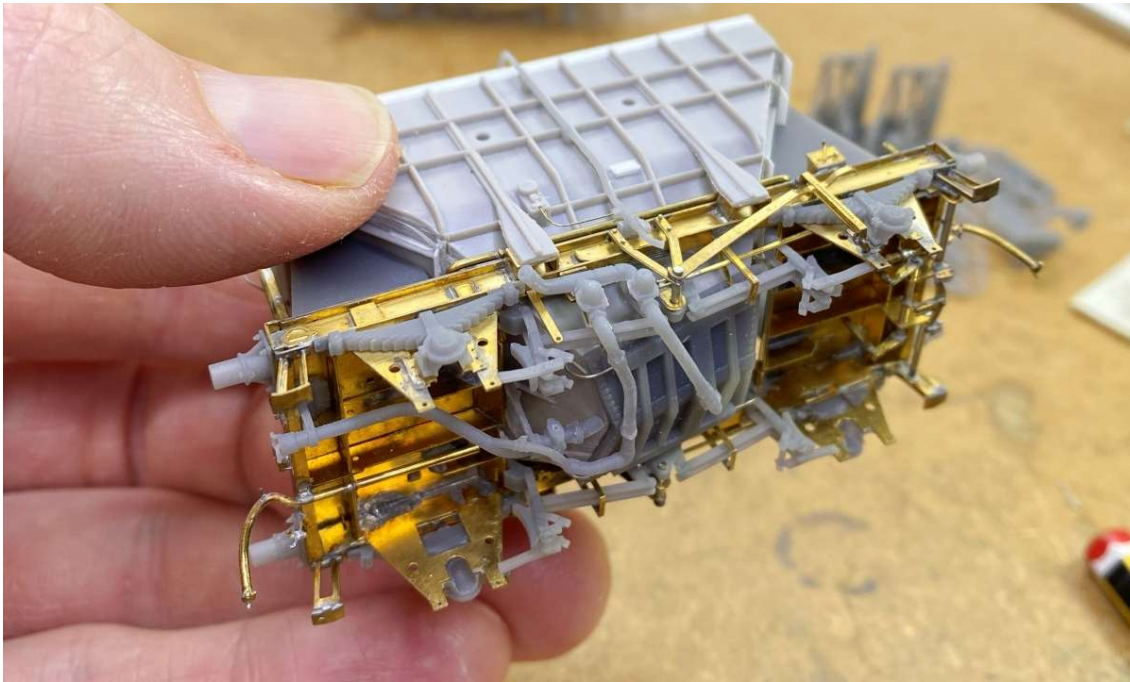


Join the pipes together with a short length of 0.4mm wire. Locate the air inlet pipes into the bracket on the underside of the solebar. The L shaped bracket under the discharge pipe fits flat against the underframe immediately behind the headstock on the opposite side to the vacuum pipe. I glued my pipes in with epoxy which gave me a chance to tweak them.

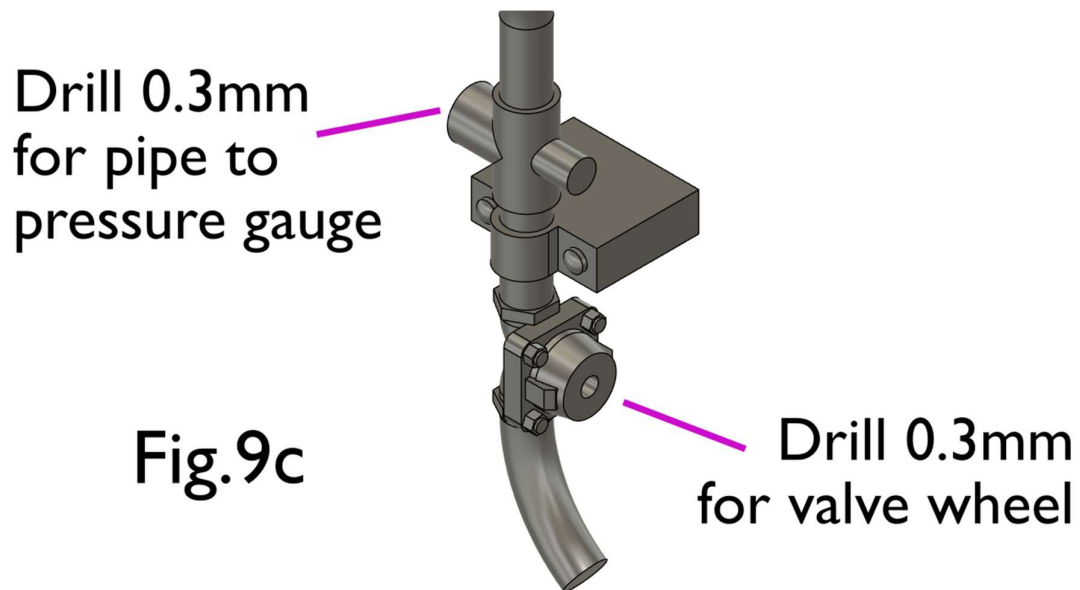
BR pipes. The circle shows the position of the join between the two sections.



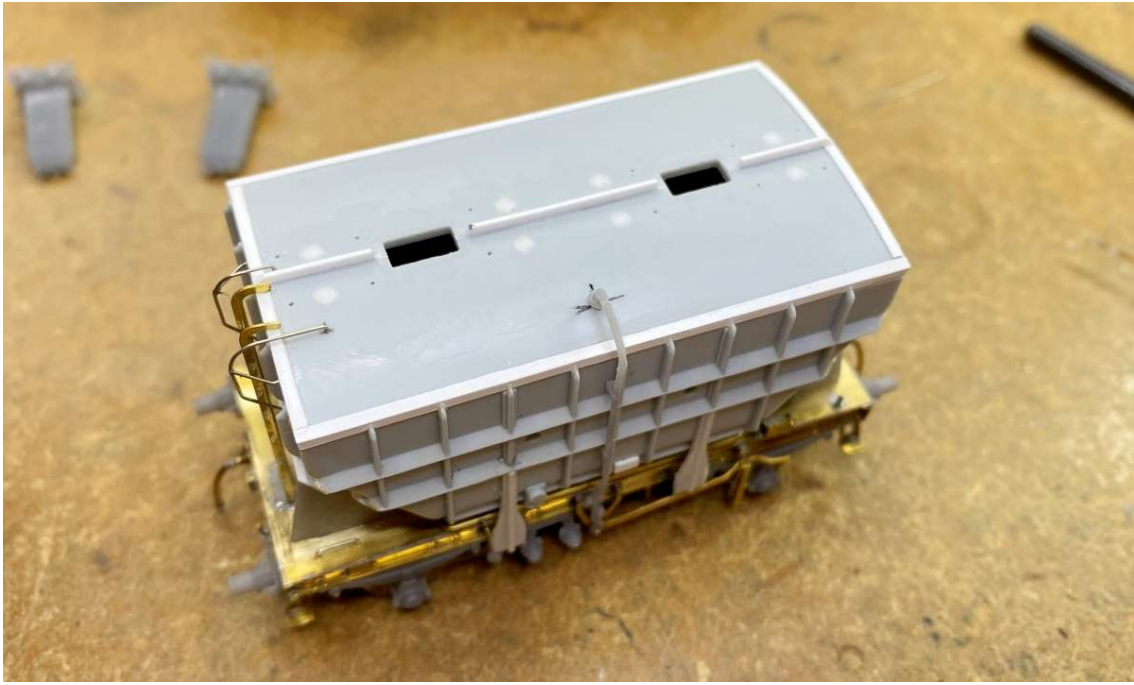
PO pipes. Note the discharge pipe valve block behind the pedestal.



The final pipe to fit, if required, is the one that comes down from the roof to the solebar. Remember that early BR builds didn't have this pipe when built. There are flat backs to the small brackets that fit against the hopper and solebar. When fitted they should be glued at these points. You will need to drill 0.3mm holes for the valve wheel and pressure gauge wires. Fig. 9c shows the position of these.



You will need to drill a 0.8mm hole in the roof to take the pipe. I did this by holding the part against the hopper, so the pipe just touches the roof. I then marked the position and drilled the hole. I glued the pipe in place using epoxy, at the roof and the three small brackets.



Add the pipe to the pressure gauge from 38 SWG soft brass wire or similar. Fit it into the hole drilled in the roof pipe and a hole drilled at the base of the pressure gauge.



That's about it for construction work except maybe for the rod for the changeover levers. Add this between the lever boxes from 0.31mm wire.

At this point I started the painting process with a view to adding the wheels, spring carriers, keeps, buffer heads, outer brake blocks, valve wheels and hopper side boards (on my APCM Presflos) after painting was complete. If you haven't fitted any of these items and want to then do so now.

Liveries and Painting

BR Presflos bodies were painted freight stock red, as you would expect for fitted wagons. Tunnel Cement Presflos were also painted this colour. The 1960 lot for APCM were painted yellow, those built in 1963 were a light grey. Underframes were black but where it ended varied. The tops of the underframe could be either body colour or black. Body colour seems most common though. If the top of the underframe was black, then the vac pipe, changeover lever boxes and pedestals for the vacuum release chord could also be black. Side stanchions were mostly body colour but occasionally the bottom part was painted black, finishing level with the top of the underframe. When built the APCM Presflos had side stanchions that were the same colour as the body, either yellow or grey. Later in life the yellow ones were repainted grey, and all seemed to have gained yellow side stanchions. They also lost their trader's boards though not the fixing brackets on the sides of the hopper.

Given the mixed media nature of these models, you will want to use an acrylic primer with your favourite paint over the top. I use Halfords grey primer in a tin through my airbrush as my primer though this recently seems to have been discontinued. I have taken to using Vallejo Model Air paints for greys and black and Vallejo Model Colour paints for freight stock red. I generally use three or four different shades, mixing them as required and varying the colours across my fleet. Prototype colours varied a lot so why don't ours? A uniform colour across everything just looks wrong to my eyes.

On my two BR models I used a mix of Model Colour Beige Brown (70.875), Red Leather (70.818) and Cavalry Brown (70.982). The paint is quite thick, and I thin it down 1:1:1 with Airbrush Thinners and Flow Improver.

For my APCM grey Presflos, I used a mix of Model Air Light Grey (71.050) and Light Gull Grey (71.121). It looks a bit light to my eyes but given I don't really want to add more paint to it so it will have to do. By the time it's weathered it should look alright.

I am part way through painting mine as I write. Three will have body coloured tops to the underframe and these were roughly masked off to spray everything under the solebars black. The solebars and headstock will be painted by hand. One of the BR ones however, at least according to the official photo I am working to, has a black top to the underframe along with black vacuum pipe, etc. I will probably try and mask off the body as best I can, but it looks a tricky job.

Transfers are available for BR Presflos from Cambridge Custom Transfers (sheet BL27). The Dapol kit comes with PO transfers though you will need to do something about the numbers.

For weathering I use a mixture of Windsor & Newton artists oil paint and Pan Pastels. These are in line with the methods used by Mike Confalone who is a scenic and weathering genius as far as I'm concerned. Use your favourite internet search engine to look up Weathering with Mike Confalone. There's a wagon weathering dvd download on the Model Railroad Hobbyist Store that's well worth a look at.

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