Rumney Models 7’3” 14T 10’w/b 1930s Class A Tank Wagon Kit

Introduction

This set of instructions covers Rumney Models kit PC.112. This is designed to build into an accurate model of a 7’3” 14T Class A riveted tank wagon with a 10’ wheelbase. The kit is very much a mixed media affair. The underframe, tank and details are etched in two materials and on three different thicknesses and a comprehensive selection of 3D printed parts are included. These comprise of saddles, tank ends, one piece end stanchions/crossbeams, springs/axleboxes, buffer housings and tank fittings. There are two options for the kit covering tanks with either saddle or cradle mountings:

PC.112A - Saddle Mountings
PC.112B - Cradle Mountings

In addition to this the etches allow for small Air Ministry walkways as fitted to some ESSO tanks or the 4 support type fitted by SMBP from the late fifties. Both Esso and SMBP style ladders are also included.

The kit has been designed for EM and P4. It may be possible to build it in OO, but it would require some carving of the underframe for the wheels to fit and the brakegear would not line up with the wheels.

General Notes

This is very much a composite kit with both etched and 3D printed parts. The kits have been designed so that as much of the etched component construction can be done before fitting the printed parts. It is possible to solder small parts close to printed ones, but you need to be very quick, or you may risk damaging them.

Read through the instructions first and familiarise yourself with the components. Drawings and photographs taken during the construction of the test etches are included to attempt to make my waffle clearer. Note that not every single photo may be of your particular kit and some will be of the Air Ministry version but will suitably illustrate the item in question. Parts are numbered on the fret, and I've tried to do this in build order.

Prototype Notes

In 1927 the RCH updated the specs for smaller oil tank wagons. Whilst the tank itself remained the same length, the short bulbous tower on which the manhole sat was removed with the manhole sitting directly on the tank. The underframe was shortened to the now standard 17'6" over headstocks from the 18' it had been previously. This meant that the end stanchions, instead of being straight, had to be cranked outwards to meet the crossbeam. The wheelbase was also shortened and initially had a rather backwards 9' wheelbase in place of the 10'6" or 9' 6" wheelbases that were common before the changes. Whilst tank diameter varied depending on the type of product to be carried and its density, 7'3" became standard for most class A products and wagons could appear with either saddle or cradle mounting. After a few years the wheelbase was changed to a more progressive 10' and is the subject of this kit. It was this this variant that morphed into the Air Ministry wagons.

The 10' wheelbase variant of these tank wagons were built throughout the 1930s for various companies including; Anglo American Oil company (ESSO), National Benzole, Redline Motor Spirit Company, Shell-Mex and BP, Power Petroleum, Carless, Apel and Lenoard and Cleveland Petroleum Products. They could be seen in use into the late 1960s.

Liveries

The standard 1930s livery for Class A tank wagons was a light stone coloured tank with a horizontal 6" red band along the middle, light stone saddles or cradles and end stanchions and red crossbeams at the ends. The underframe was black but solebars and headstocks could be light stone as well.

In the 1939, at the behest of some oil companies, the RCH decided that class tanks could be painted 'silverette', an aluminium based paint, with red crossbeams and the red tank band extending only 1'6" along each side of the tank. The war then intervened and wagons were painted matt dark grey and the red band moved from the tank and crossbeams to the solebars.

Following the war the wagons began to be painted 'silverette' with red solebars and black underframes. Dove grey for tank wagons came into use in the 1960s though there may not have been many (if any at all) painted in this livery.

As built the 7'3" 14T Class A tank wagons didn't have ladders or walkways. Both ESSO and SMBP added walkways in the 1950s. Esso used two small walkways on top of the tank to the same design as those used on the Air Ministry wagons. SMBP fitted their own longer, 4 support type on either side of the tank fittings.

The bulk of the above information comes courtesy of the revised edition of R. Tourret's excellent book "Petroleum Railtank Wagons of Britain". For anyone with an interest in tank wagons it is worth getting a copy and contains much further information, including initial numbering and build details.

References and Further Reading

Petroleum Railtank Wagons of Britain - R Tourret - Tourret Publishing
The 4mm Wagon Part 2 - Geoff Kent - Wild Swan books
Oil on the Rails - Alan Coppin - HMRS
Railways in Profile Series No. 4 - G. Gamble - Cheona Publications
Railways in Profile Series No. 14 - R. Tourret - Cheona Publications
Non-Pool Freight Stock 1948-1968 Volumes 1 & 2 - David Larkin - Kestrel Railway Books

3D Printed Parts

This kit includes high quality 3D printed parts. They are produced using the latest stereolithography technology 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 sun light 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 have end up having problems with them…

The printed parts are pushing the boundaries of what is currently possible with the printing technology. Whilst they have been road tested and tweaked for strength where necessary some still feature very thin walls and should therefore be handled with care. Parts have been left on the supports they were printed with to help prevent damage to them before use. They will need removing from the supports and cleaning up. 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 6/0 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 \/ 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 the parts. 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 that well with a knife blade. Whilst not so brittle that it will crack as soon as look at it, it may fracture if you try and cut it with a blade. 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 as those in the steam manifold 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 glue. I have used both successfully. In both cases makes sure the printed parts and what they are being attached to are free from any grease. I have found that in both cases the glues can provide a good bond with the brass parts, so much so that the parts can break rather than the joint if you try to remove them. I put this down to the surface of the parts being not entirely smooth so there is something for the glue to key to.

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.

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.

Tools

The following tools may be useful when constructing the wagon:

- A selection of drill bits including 0.3mm, 0.4mm, 0.5mm, 0.8mm & 1mm
- A selection of tapered reamers in the range 0.3mm-1mm and 2mm
- A smooth jawed vice
- A selection of needle files including a small square one
- A piercing saw with fine blade (size 6/0 recommended) or a pair of flush cutters
- Wet and dry paper (800 or 1200 grade)

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 over weight 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. There are notes on weighting the wagon in the part of the instructions that deals with assembling the body.

Materials list

In addition to the etches and 3D prints, the following are included with the kit:

0.008" Spring wire
0.6mm x 0.4mm Microtube (Albion Alloys MAT06) for tank strap bracket detailing

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, tie bars, brake lever guards, hopper handles, ladders, steps
0.4mm - Longitudinal crossbeam stays
0.45mm - Angled crossbeam stays
0.5mm - Drawbar hook shaft
0.8mm - Brake cross shaft
1mm - Construction 'pins'

You may find 0.7mm x 0.5mm thin walled microtube useful for retaining both the drawbar hook shaft and, if you're using them, sprung metal buffer heads. This size is produced by Albion Alloys under their Precision Metals range, code MAT07

Buffers

Buffers on these wagons were 18” RCH 4 rib with a 13” head. 3D printed buffer housings are included but you will need metal heads and springs to complete. Both MJT and Wizard Models list 13” buffer heads with 1mm shanks.

If you wish to use rigid buffer castings the those produced by Lanarkshire Models & Supplies are recommended (their code LMS B003).

Couplings

The prototype was fitted with 3 links couplings. Drawbar hooks are included but plain links will be needed complete. Making your own links is not difficult and John Hayes shows you how to do it in his “4mm Coal Wagon” book published by Wild Swan. Brassmasters now supply links for those not wishing to make their own.

Wheels

You will need 3’1½” split spoke wheels from your favourite manufacturer to your chosen 4mm gauge along with bearings. Some may have been fitted with 3 hole disc later in life. 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.

Transfers

There are a number of suitable transfers available for these wagons.

Cambridge Custom Transfers

BL15 SMBP Class A (1950s style)
BL19 Esso Class A
BL24 SMBP Class A (1960s style)
BL86 Petroleum Board WW2 Livery

BL168 Regent Class A - Intended for anchor mounts so numbers may need tweaking
BL170 Benzene Class A - Intended for anchor mounts so numbers may need tweaking

Fox Transfers

Various livery elements including ESSO, SMBP and Regent Logos/lettering and black/white fast traffic stars.

Modelmaster

They list transfers for SMBP, ESSO and Regent. May be suitable but no images and I haven’t ordered any so can’t comment on what they are like.

Powsides Transfers

0443 Benzene Class A
0444 Regent Class A

Powsides are also worth investigating for pre-war liveries but you'll have to be patient as their website is very slow and its speed defeated my attempts to search it whilst writing these instructions.

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

Etched Parts List

Parts with numbers are on the larger 0.010" thick brass sheets.
Parts numbered A-H are on the smaller 0.12" brass fret.
Walkway covers are on the small 0.004" stainless steel fret.

Underframe

1 - Bottom Plate
2 - Longitudinal & diagonal spacers
3 - Crossbar spacers
4 - Headstock stay & buffer trimmer spacers

Underframe Knees
5A - Diagonal and headstock stay knee
5B - Diagonal/longitudinal and crossbar knee
5C - Headstock and headstock stay knee
5D - Headstock and diagonal knee
5E - Diagonal and buffer trimmer knee
5F - Longitudinal and crossbeam knee

A - Top plate

B1 - Tank strap brackets

6 - Solebars
7 - Solebar overlays (outside crossbeam stays)
7A - Solebar overlays (inside crossbeam stays)
8 - Solebar detailing fret
8A - Builders plates (for types see parts diagrams)

9 - Gusset plate
10 – Solebar and headstock knee
11 - Drawbar plate

12 - Additional vees (outside crossbeam stays)
12A - Additional vees (inside crossbeam stays)
13 - Outside crossbeam stays

16 - Brake lever guards
17 - Brake lever guard brackets
18 - Brake lever guard stays

C - Spring Carriers
D - Spring carrier washers
19 - Axle keeps

E - Coupling hooks

20 - Push rod safety loops

21 - Solebar and crossbeam knee

22 - Brake levers

Tank

23 - Inner tank wrapper
Note: You should use the separate replacement inner tank wrapper not the one on the fret with part 24.
24 - Outer tank wrapper

25 - Tank drilling jig

26a - Tank formers - Outer
26b - Tank formers - Middle
27 - Tank former spacers

F1 - Walkway frame (Air Ministry walkways)
F2 - Walkway frame (SMBP support walkways)

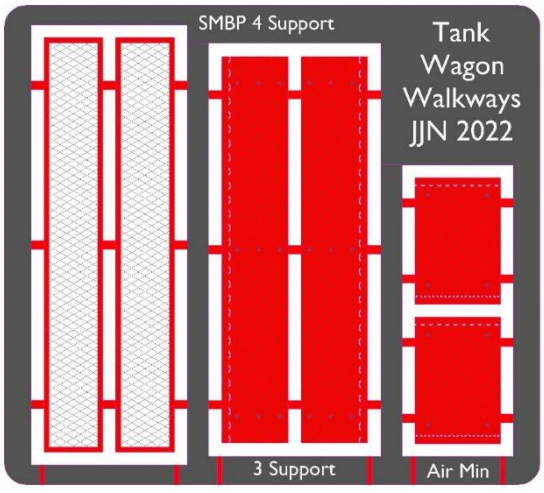
G1 - 7’3” Air Ministry walkway supports - Inner and outer tank wrappers
G2 - 7’3” SMBP supports - Inner and outer wrappers

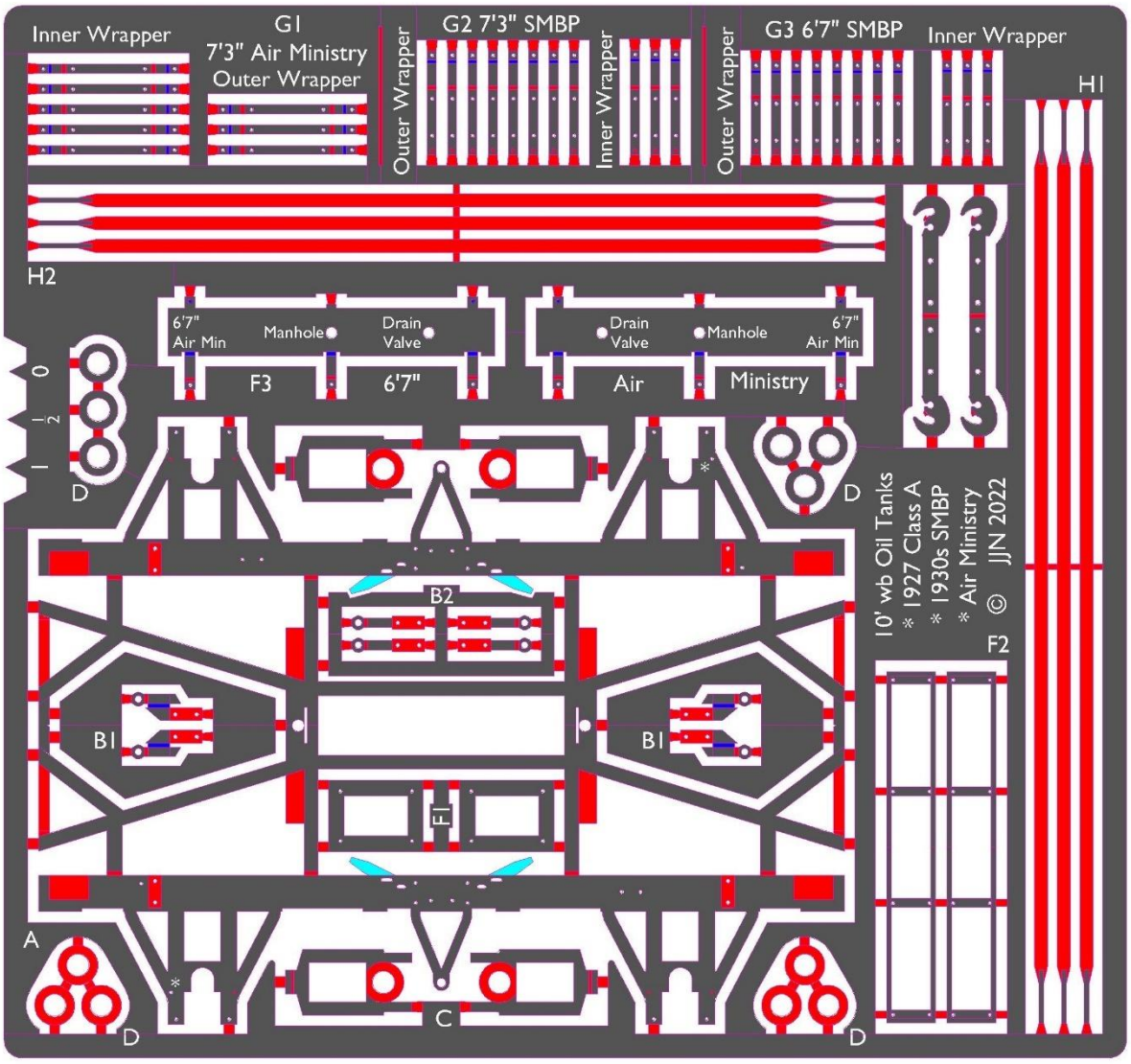
29 - Warning flash plates

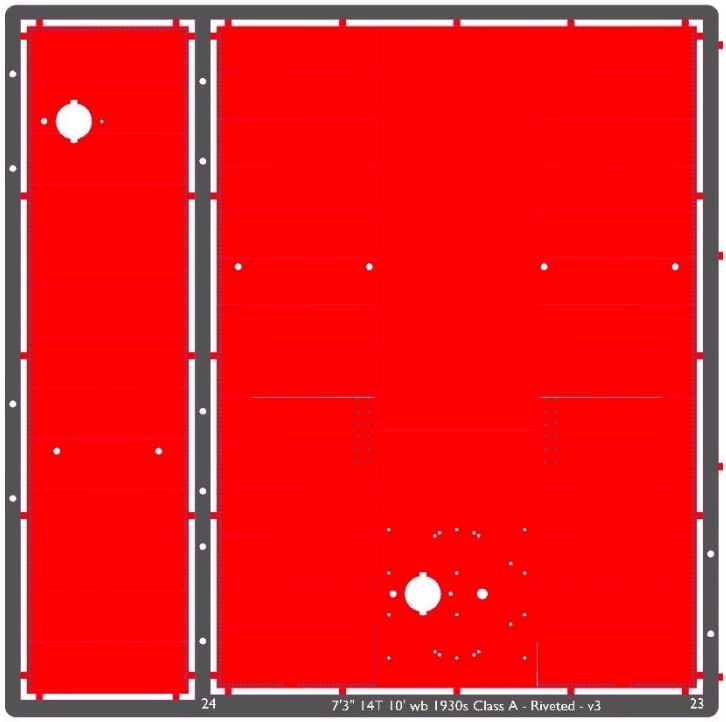
H1 - 7’3” Tank straps

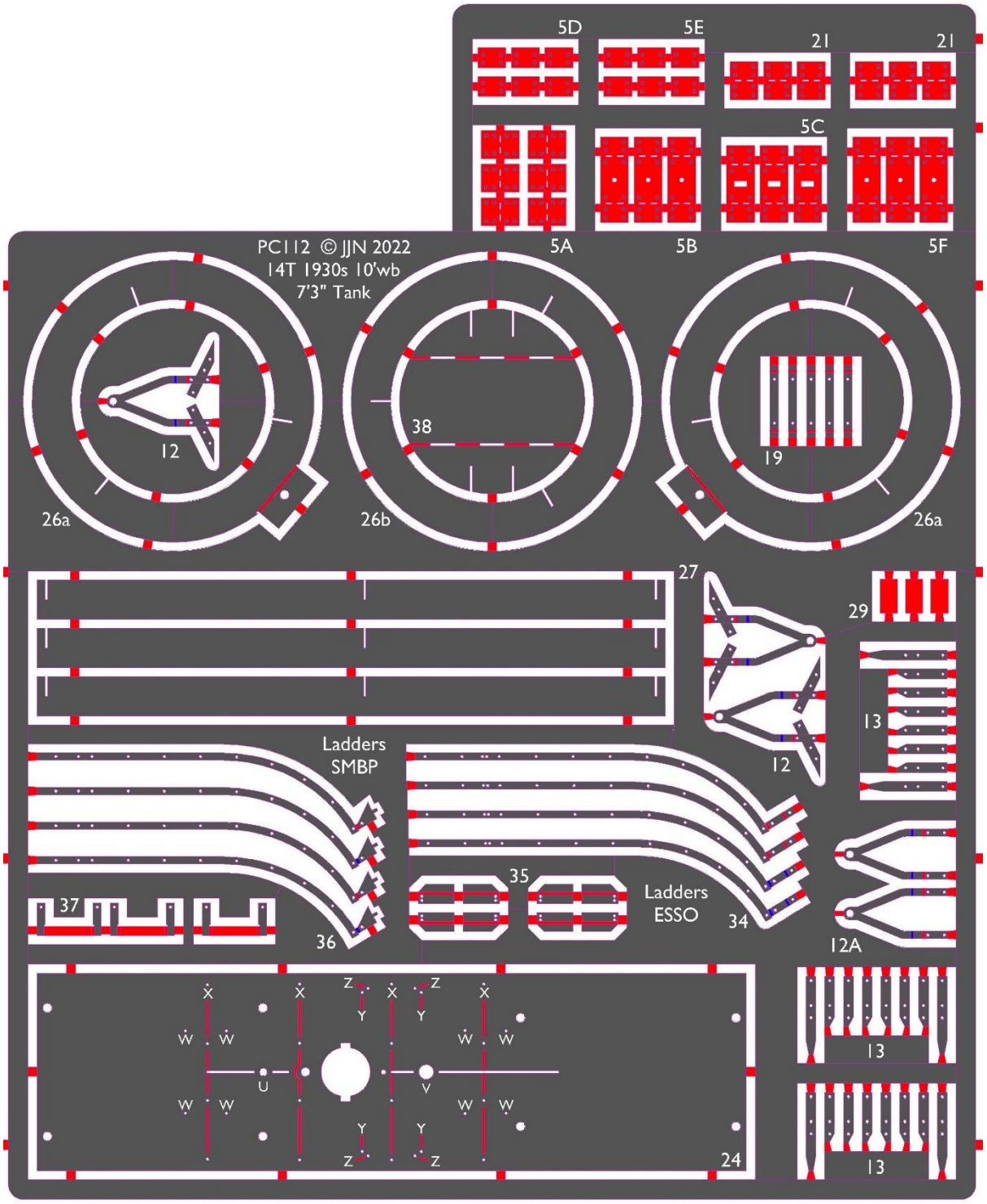
34 - Rails for Esso type ladders
35 - Stays for Esso type ladders
36 - Rails for SMBP type ladders
37 - Stays for SMBP type ladders
38 - Ladder jig

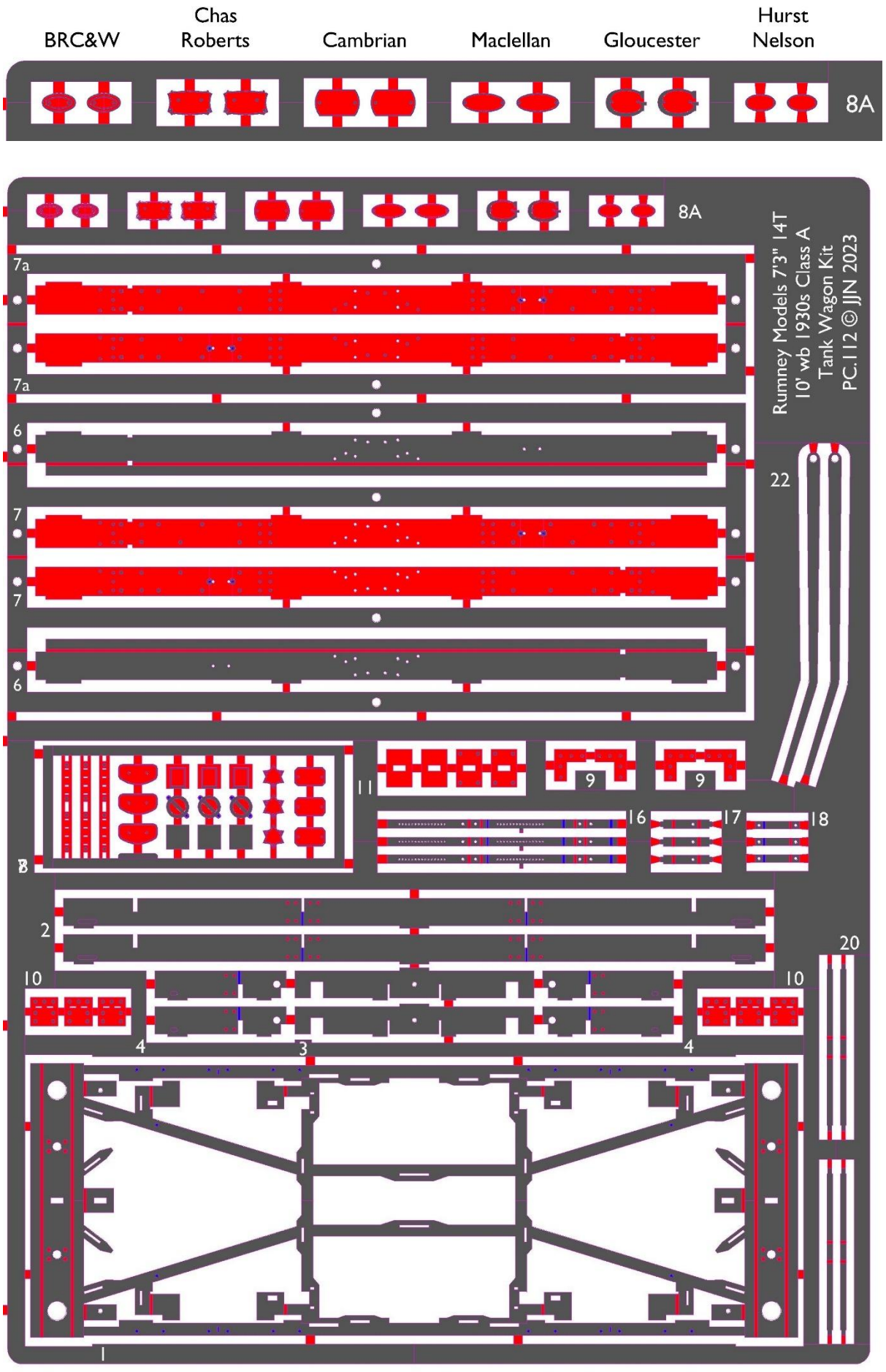
Etched Parts Diagrams




Inner Wrapper
G1
7'3" Air Ministry
Outer Wrapper
Outer Wrapper
G2 7'3" SMBP
Inner Wrapper
Outer Wrapper
G3 6'7" SMBP
Inner Wrapper
H1
H2
6'7"
Air Min
Manhole
Drain
Valve
F3
6'7"
Drain
Valve
Manhole
6'7"
Air Min
Air
Ministry
0
1/2
1
D
D
B2
B1
B1
F1
A
D
C
D
10' wb Oil Tanks
* 1927 Class A
* 1930s SMBP
* Air Ministry
© JJN 2022
F2


24
7'3" 14T 10' wb 1930s Class A - Riveted - v3
23


5D
5E
21
21
5C
5A
5B
5F
PC112 © JJN 2022
14T 1930s 10'wb
7'3" Tank
12
38
19
26a
26b
26a
27
29
13
12
Ladders
SMBP
35
Ladders
ESSO
37
36
34
12A
13
13
24


BRC&W
Chas Roberts
Cambrian
Maclellan
Gloucester
Hurst Nelson
8A
Rumney Models 7'3" 14T
10' wb 1930s Class A
Tank Wagon Kit
PC.112 © JJN 2023
7a
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9
11
16
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18
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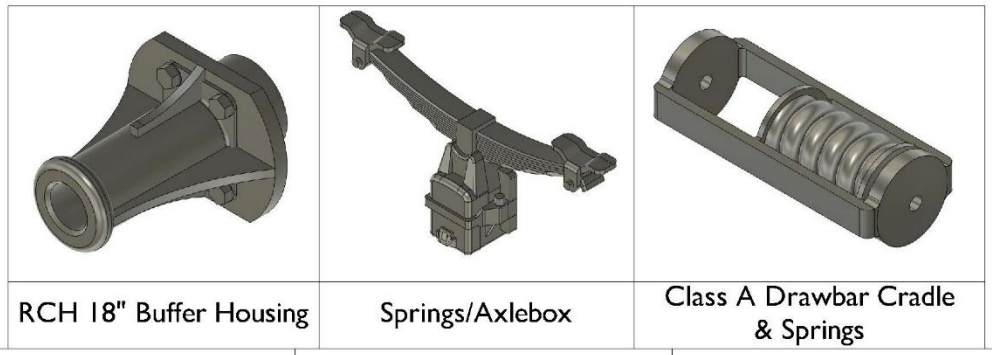
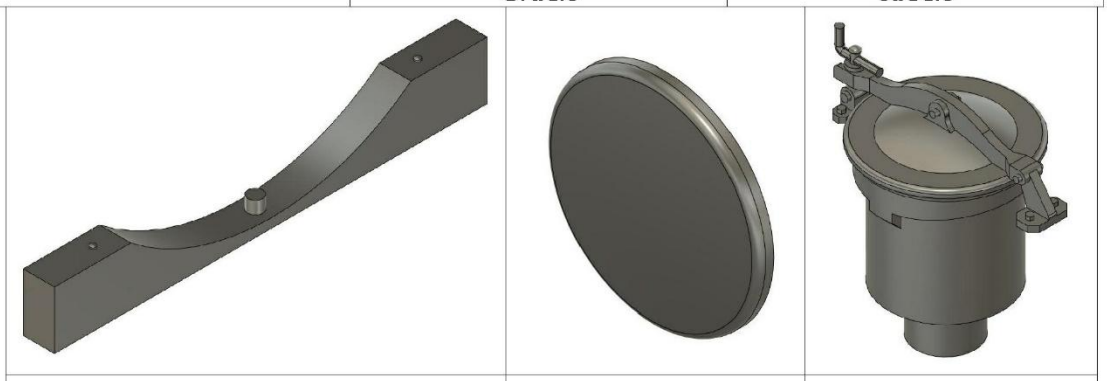
2
20
10
4
3
1

3D Parts Illustrations

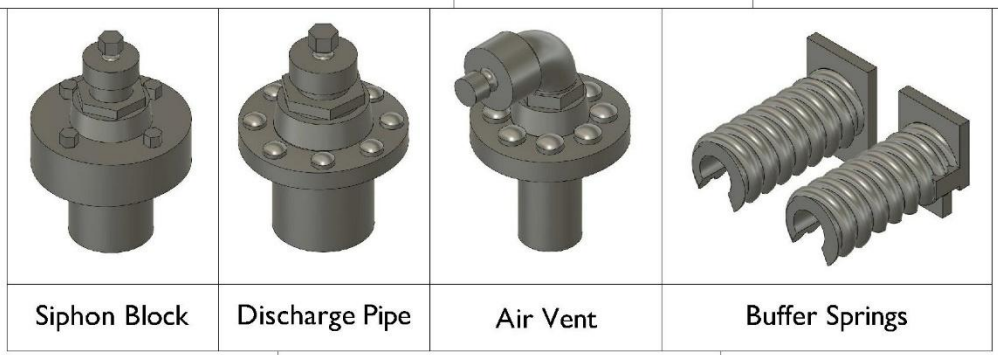


RCH 18" Buffer Housing | Springs/Axlebox | Class A Drawbar Cradle & Springs

Brakegear | End Stanchion & Crossbeam Cradle | End Stanchion & Crossbeam Saddle



Saddle | Standard Tank End | Manhole



Siphon Block | Discharge Pipe | Air Vent | Buffer Springs

Cradle

Construction

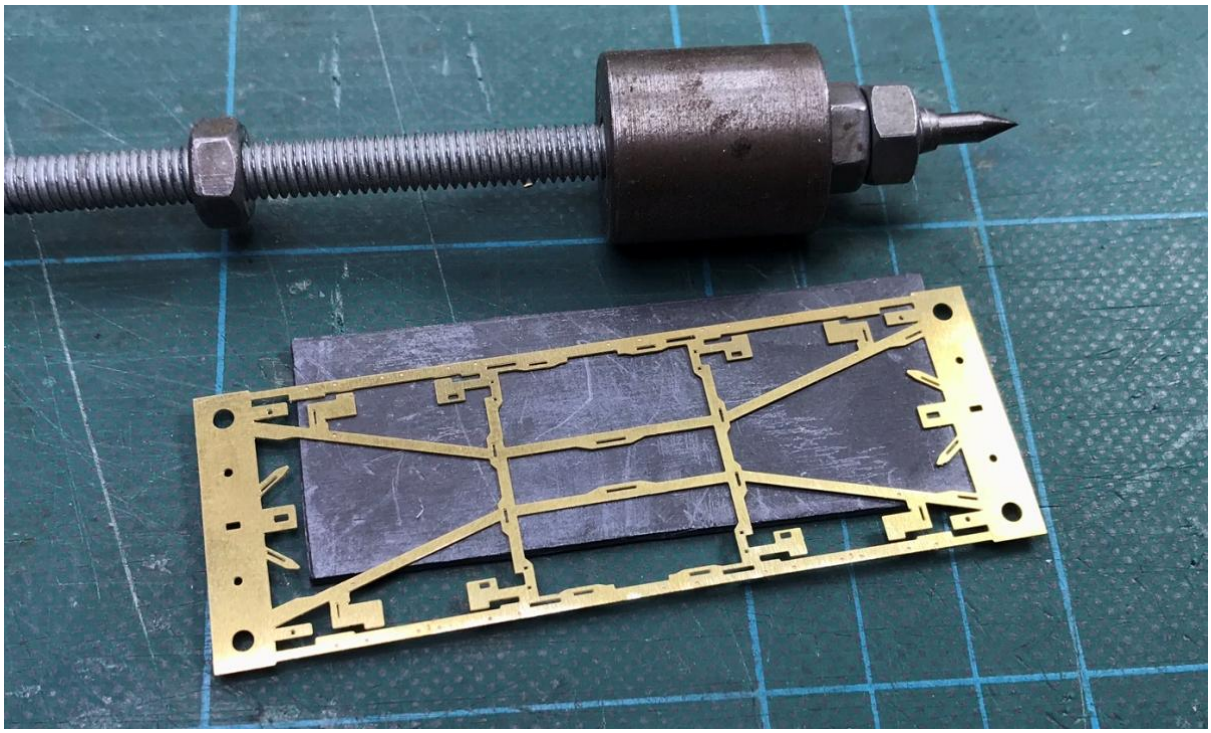
This kit is very much a mixed media affair, but I have tried to arrange construction so that as much of the soldering work is done before fitting any 3D printed items. There are a few items that need to go on during the process rather than at the end so keep in mind that they are there and away from the hot end of a soldering iron. It is possible to solder close to the prints but you will need to be quick and use a hot iron.

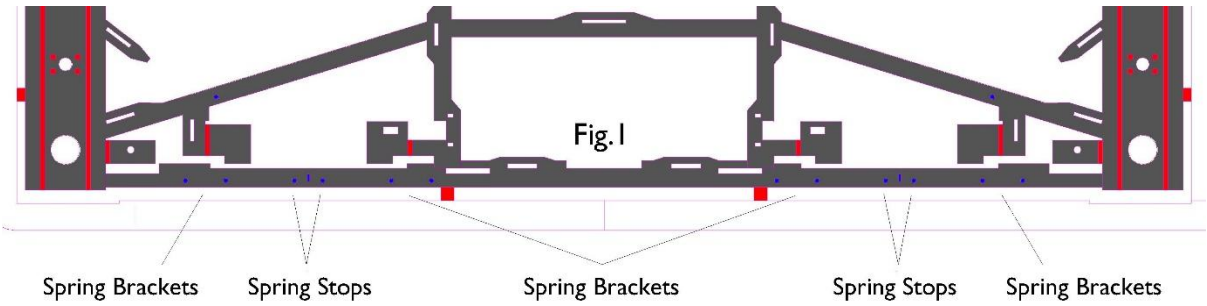
I have incorporated a lot of detail into the kit to try and get as close to the prototype as possible. Specifically, this means press out rivets in the underframe and representation of the 'knees' that joined the underframe members together. I have drawn the line at places where they are invisible from normal viewing angles. This of course adds to the time taken to build the wagon but not all of this needs to be done if you don't want to. It's up to you. Previous kits for tank wagon underframes have got on fine in the world without such detail.

Main Underframe

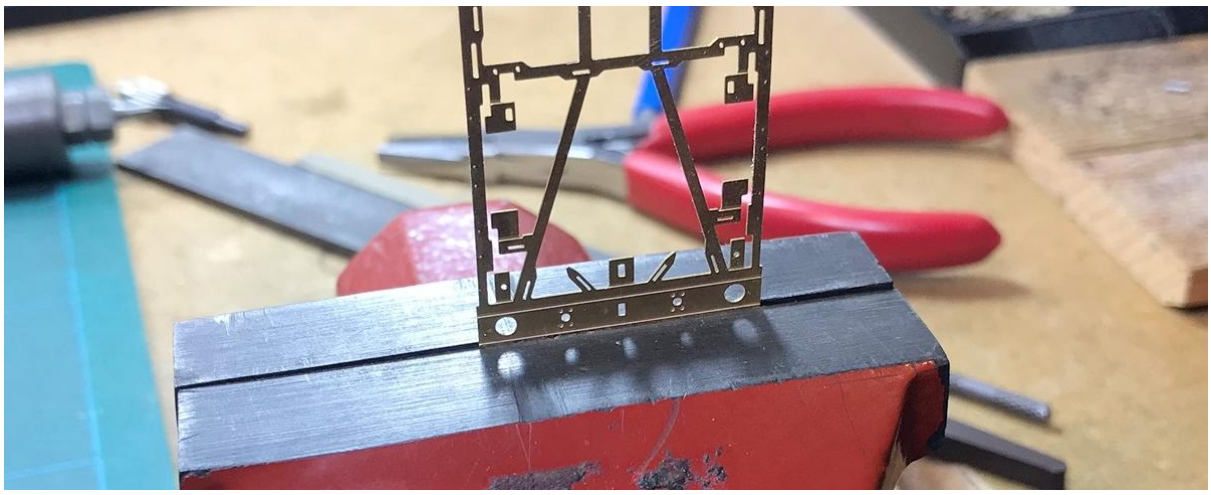
Firstly, check the fit of the buffers in their holes in the headstocks. It may sound a bit odd starting with something that will go on much later in the build process, but it will be much easier to open out the holes now rather than later. Use a tapered reamer if they are tight. If using the 3D printed buffer housings make sure all remnants of the supports are removed before altering the etches.

Start with the bottom plate (1). Remove from the fret and clean up connecting tags. There are numerous half etched rivets along the underside of the solebar which can be pushed out if wanted. There are for the spring brackets, the spring stops and class B discharge pipe safety loops. See Fig.1 below.



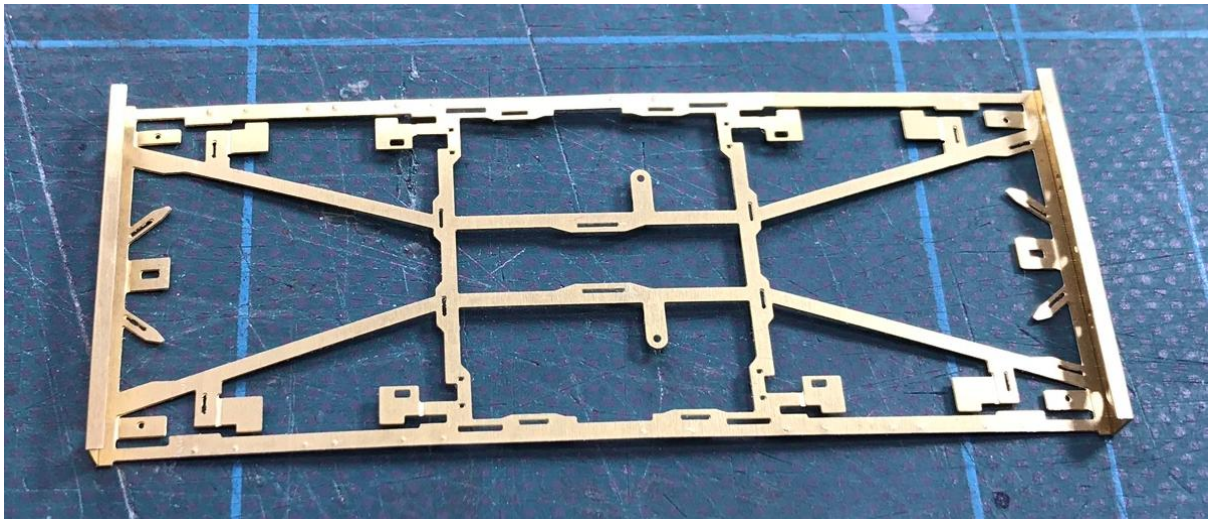


The headstocks need to be folded up. This is best done with the bottom plate clamped to something or held in a vice to avoid distortion. There are two sets of fold lines as the headstocks need to be folded into a channel. Start with the outermost parts of the chassis and fold the bottom plate fold through 90°. A pair of pliers can be used to tweak the parts. Take care to fold them to as close to 90° as possible.

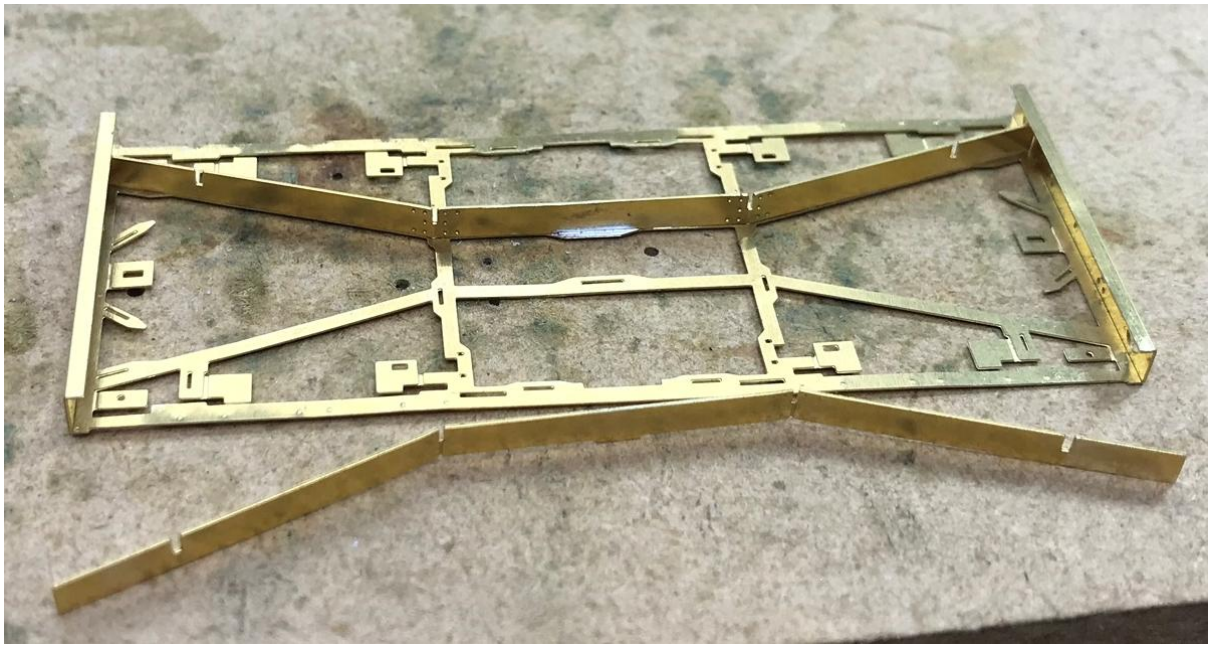


Next fold the headstock through 90° to form a channel. I do this with a couple of files, one to form the bend with and the other held down to prevent the underframe from bending. See image below.

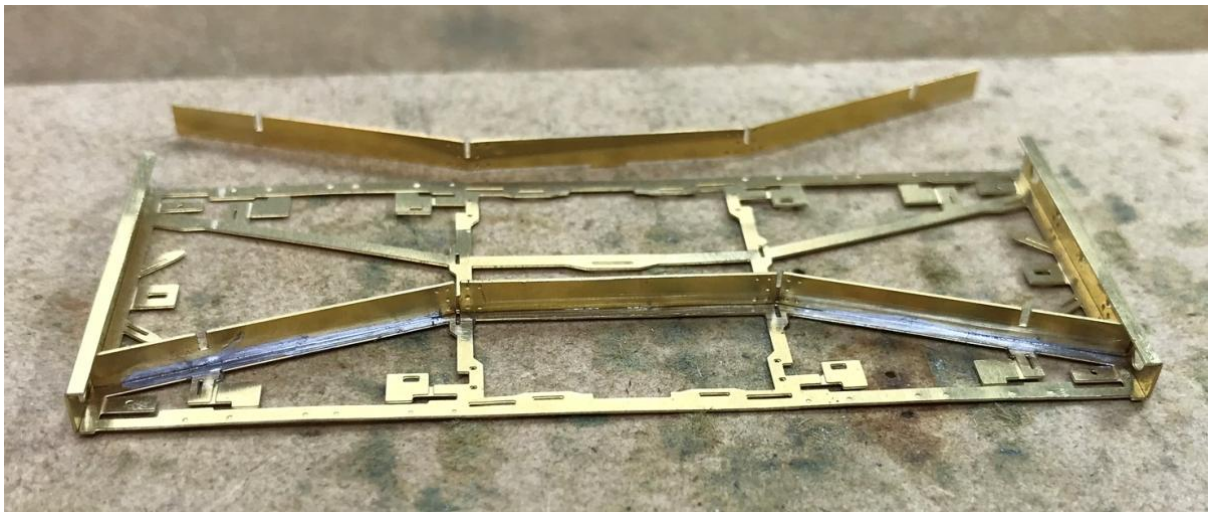
Repeat for the other end.



Next remove the longitudinal & diagonal spacers (2) and press out the half etched rivets. Fold to match the angle of the underframe with the fold lines on the inside. There are tabs in the middle and at the ends to locate these to the bottom plate. You will need to wiggle them in to get them in the outer slots and inside the headstock.

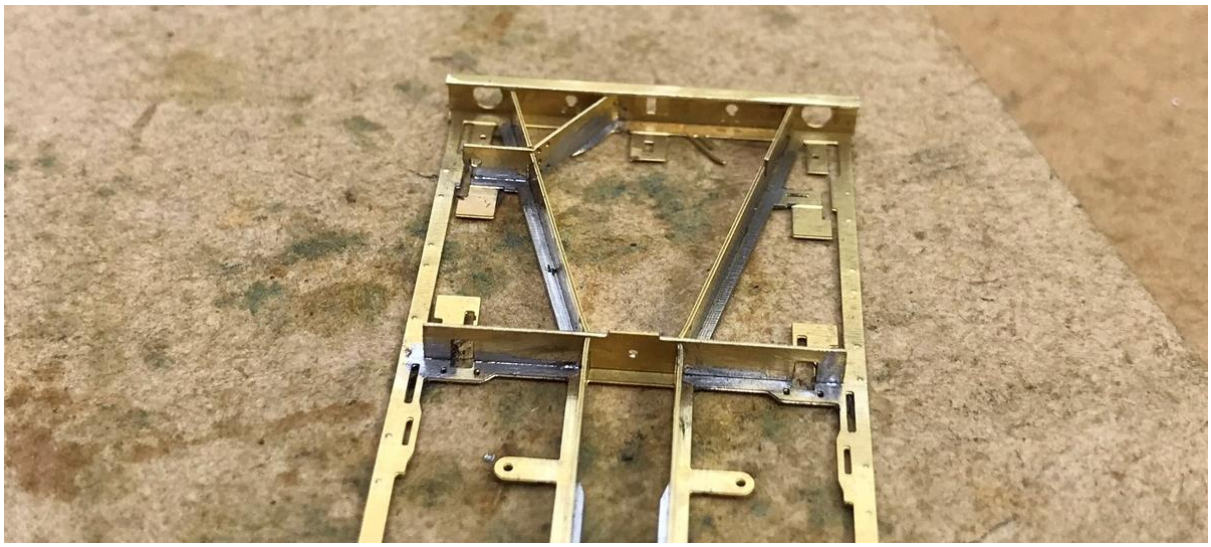


When you're happy with the fit, solder the spacers to the bottom plate.



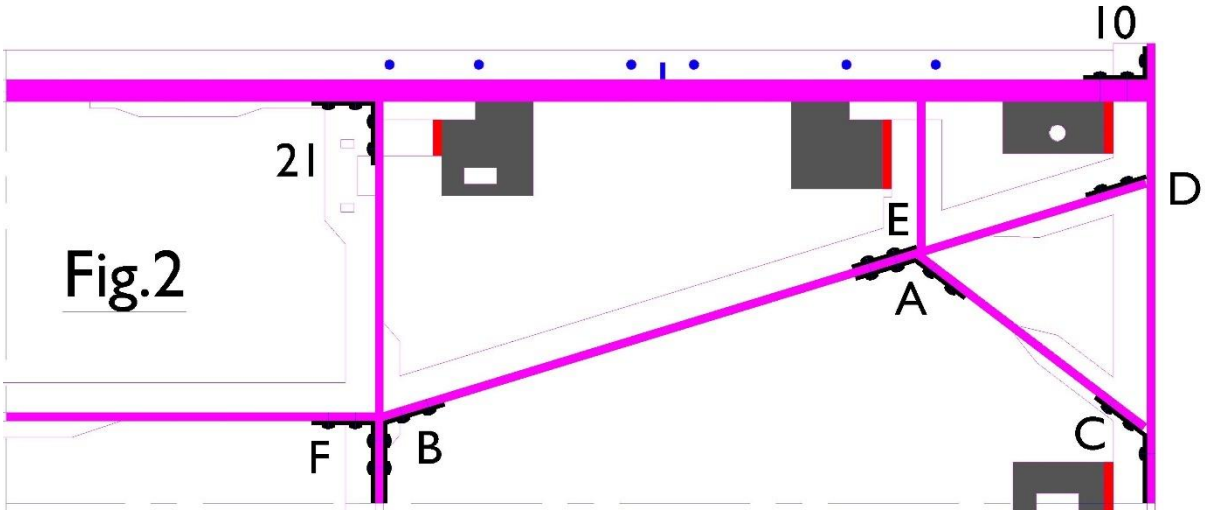
Remove the crossbar spacers (3) and fit to the bottom plate using the slots and tabs provided to locate them. Once happy with the fit solder in place.

Next repeat the procedure for the four headstock stay & buffer trimmer spacers (4). Like the longitudinal spacers they will need the half etched rivets pressing out and folding to match the underframe. You may also need to wiggle them into the headstock.



Knees

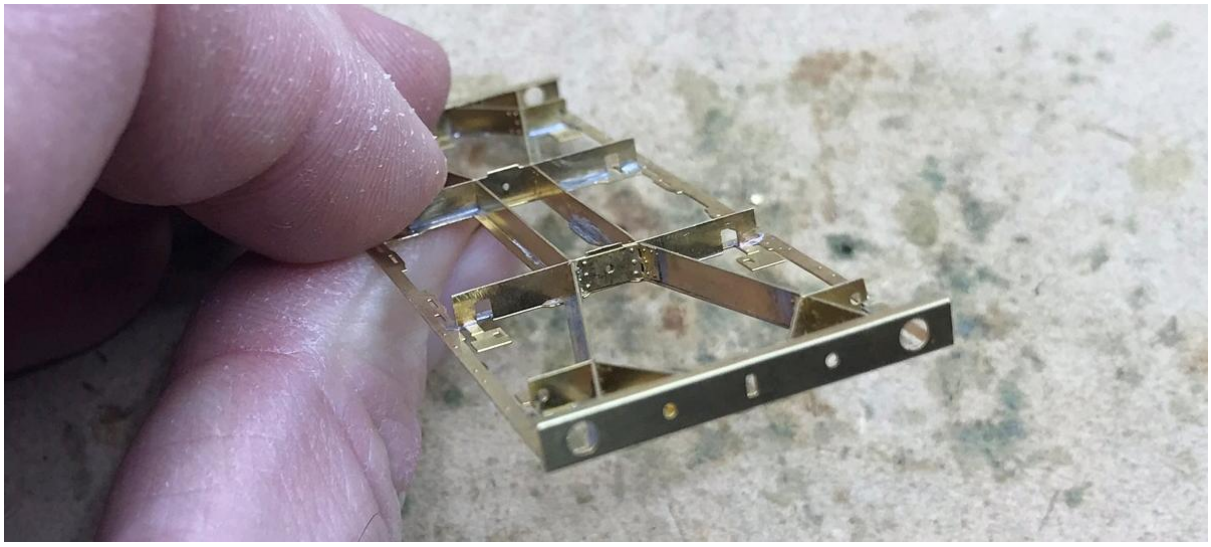
As mentioned before I have incorporated all the visible plates or 'knees' that joined the underframe members together on the prototype. It is best to fit them now. They are labelled 5A to 5F. The positions of them can be seen in Fig.2 below. Some will need bending to match the underframe profile. Small slots are etched into the knees to help locate these bends. Knees 10 and 21 are fitted later in the build.



The knees were revised from the test etches to batter match the prototype so don't worry if they don't quite look the same as in the photos below.

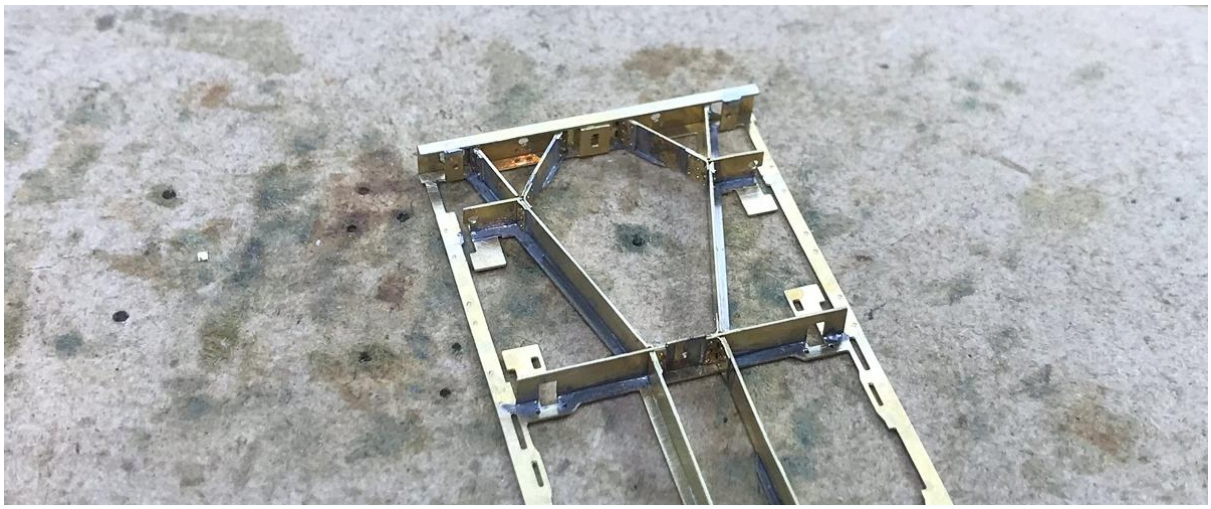
The diagonal and headstock stay knee (5A) goes at the joint between the long diagonal spacer and the headstock stay. See image above.

The diagonal and crossbar knee goes between the long diagonal spacer and up against the crossbar spacer. See image below.



The headstock and headstock stay knee (5C) fits between the headstock stays and up against the back of the headstock. The rectangular cut out should fit over the hole in the headstock for the drawbar hook. See image below.

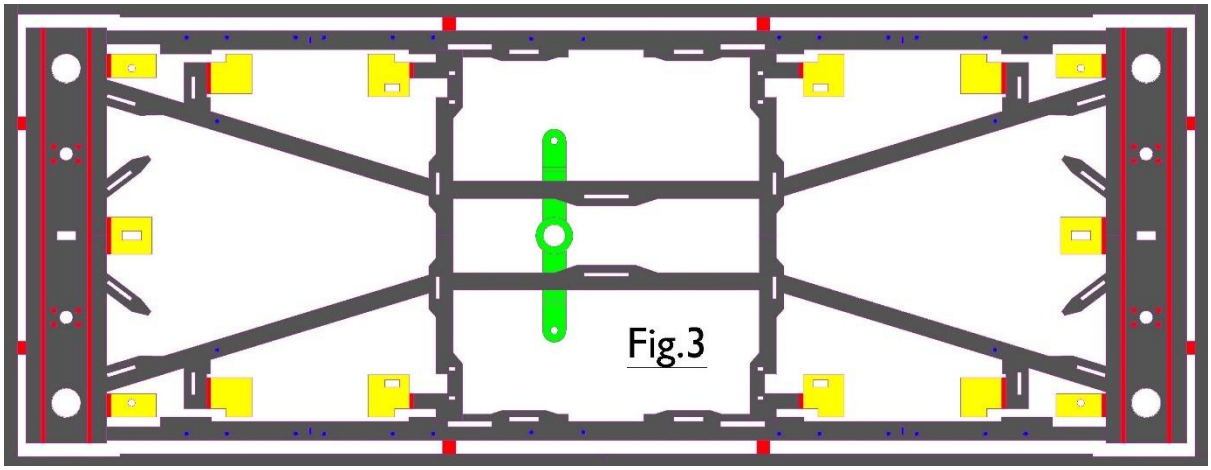
I have only included part of the headstock and diagonal knee (5D). This fits on the outside of the long diagonal and up against the headstock. See image below.

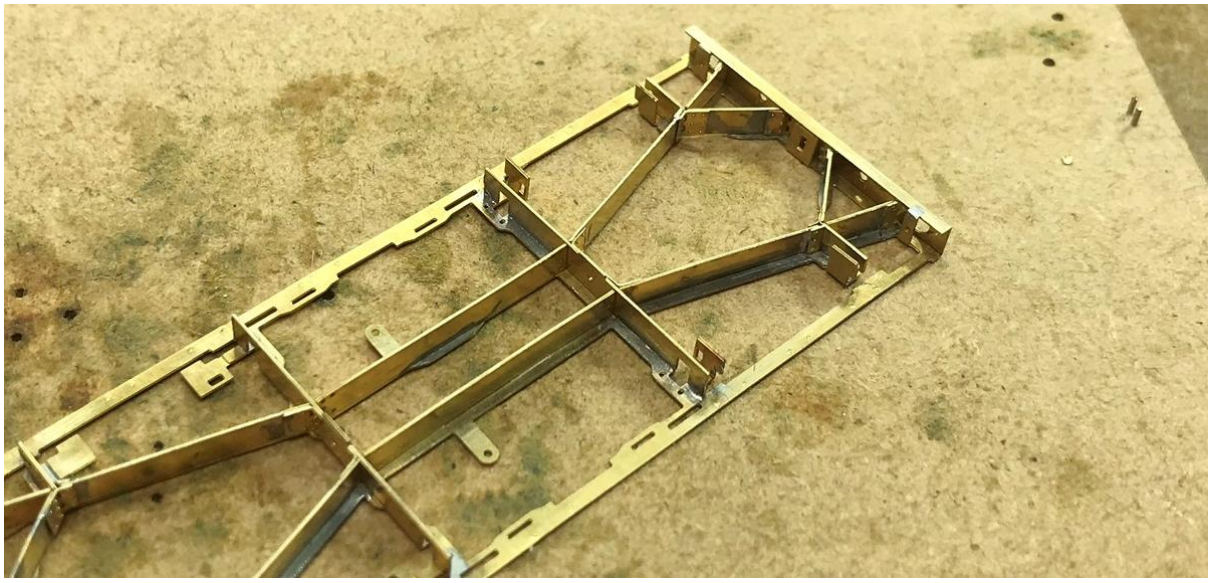


The diagonal and buffer trimmer knee (5E) fits on the outside of the long diagonal and up against the inner face of the buffer trimmer. See image above.

Finally fit the longitudinal and crossbeam knee. This goes on the opposite side of the crossbar to 5B and folds to fit between the inner faces of the longitudinal spacer.

With the knees in place fold up the tabs for the buffer head tails, drawbar hook and spring bearers. These are shaded yellow in Fig.3 below. Ignore the green part, it only applies to the Air Ministry tanks. Solder the tops of the tabs that are along the headstock to the headstock. If you need to, give them a little squeeze with a pair of pliers at the fold so they sit up against the top of the headstock.



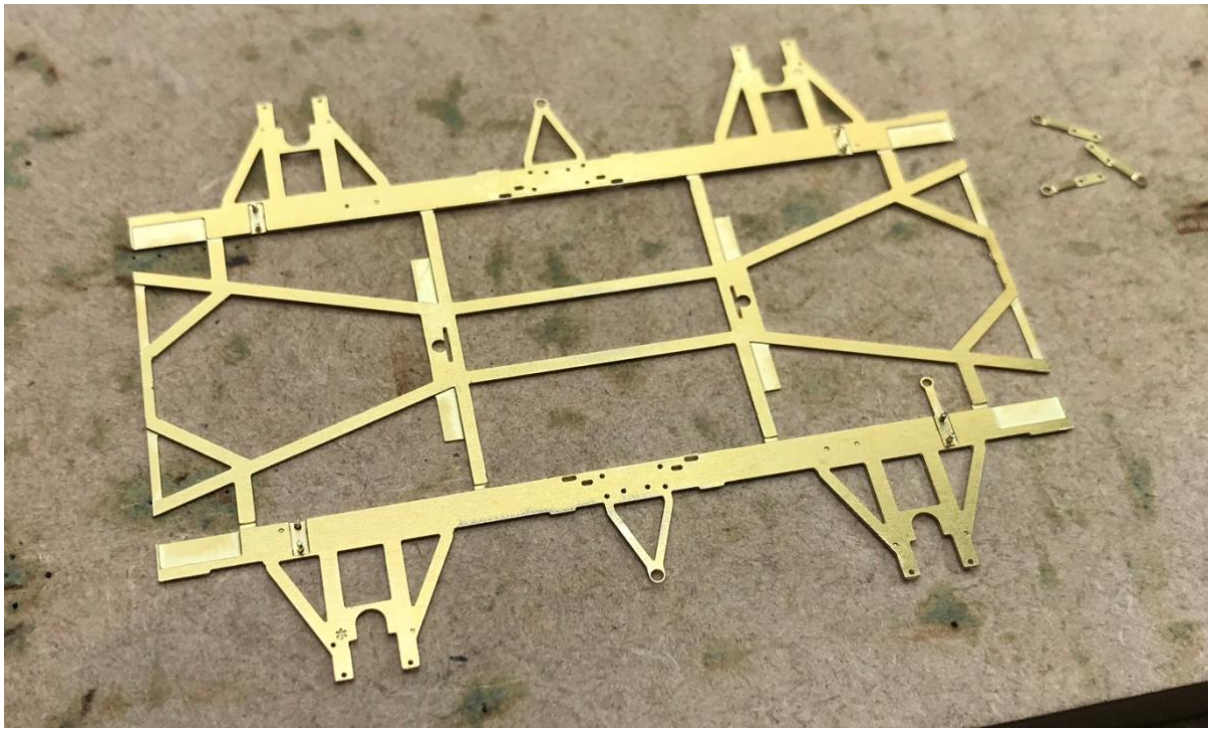


Top Plate and Tank Strap Brackets

Locate the top plate (A) on the smaller 0.012” fret. Make sure that the holes in the bottom of the axleguards along with the holes in the full thickness part of the solebar back can accept 0.31mm wire. Find the two holes marked with a * and make sure they can accept 0.31mm wire. Finally, make sure that the holes in the half etched areas on the solebar back are a good fit for 0.4mm wire. Remove from the fret and then remove from the middle of the top plate the small frets containing the tank strap brackets (B1 & B2) along with the Air Ministry walkway frame. Clean up the top plate.

The 0.012” fret has been designed to suit several different types of tank wagons that share the same basic underframe, and the top plate comes with a representation of internal solebar tank stay brackets. These are shaded cyan on the parts diagram on page 9. If you want to model the crossbar stay brackets on the inside of the solebars leave these bits on. If you want to model them as fitted to the outside of the solebar then remove the cyan shaded parts with a piercing saw. Both arrangements could be found on these wagons.

Use the holes in the half etched areas on the solebar backs to drill eight 0.4mm holes into a piece of scrap wood or mdf. Short lengths of 0.4mm wire can be used to pin the top plate to the wood. See image below. These will be used to locate the tank strap brackets.



Next fit the tank strap brackets (B). You will need to check that the smaller holes in the half etched areas of the brackets are a good fit on 0.4mm wire and the larger hole can accept the 0.6mm x 0.4mm microtube that was included with the kit. Remove from the fret and fold into an L but leave the part with the larger hole in flat for the time being. Locate the brackets onto the wire holding the top plate to your jig. The brackets should be arranged so that the bracket appears to form a continuation of the solebar. If the bracket steps away from the top plate, it's the wrong way around. See image below. The bracket will need orientating the correct way. The hole for the tank strap bracket should face towards the centre of the wagon. See Fig.4 below.

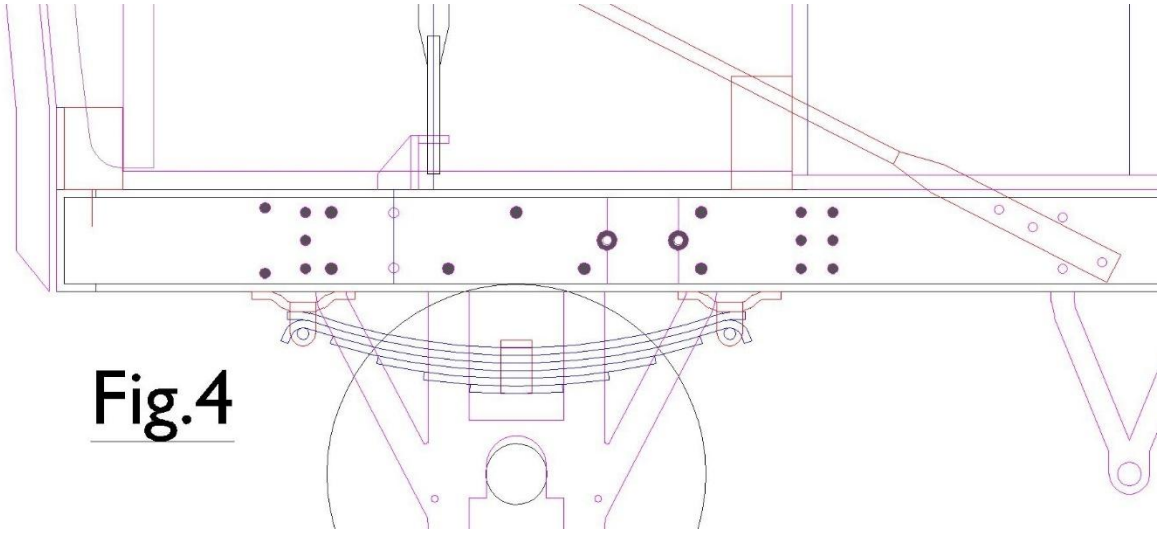
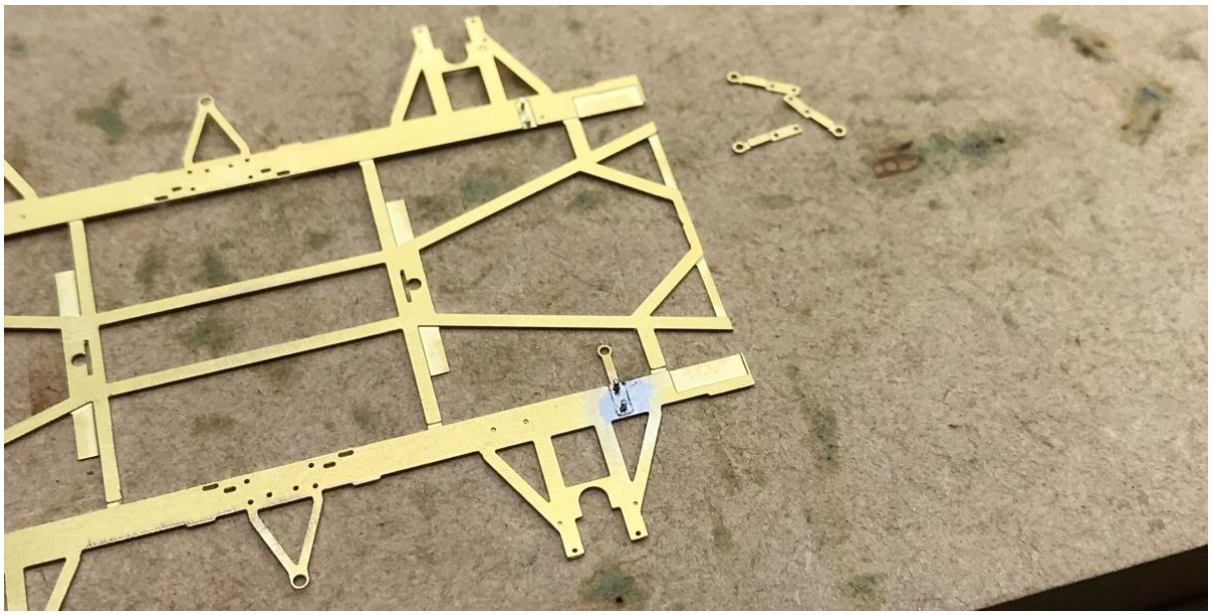


Fig.4

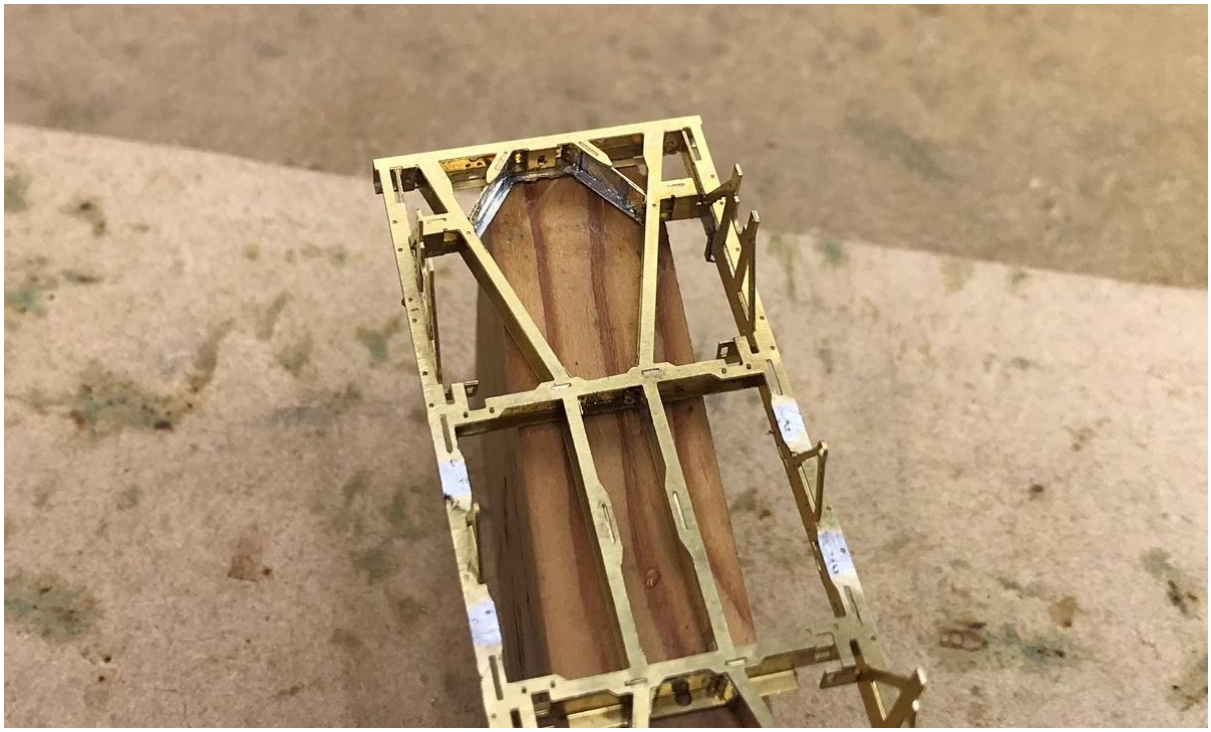
Solder the bracket and wire locating pins in place.

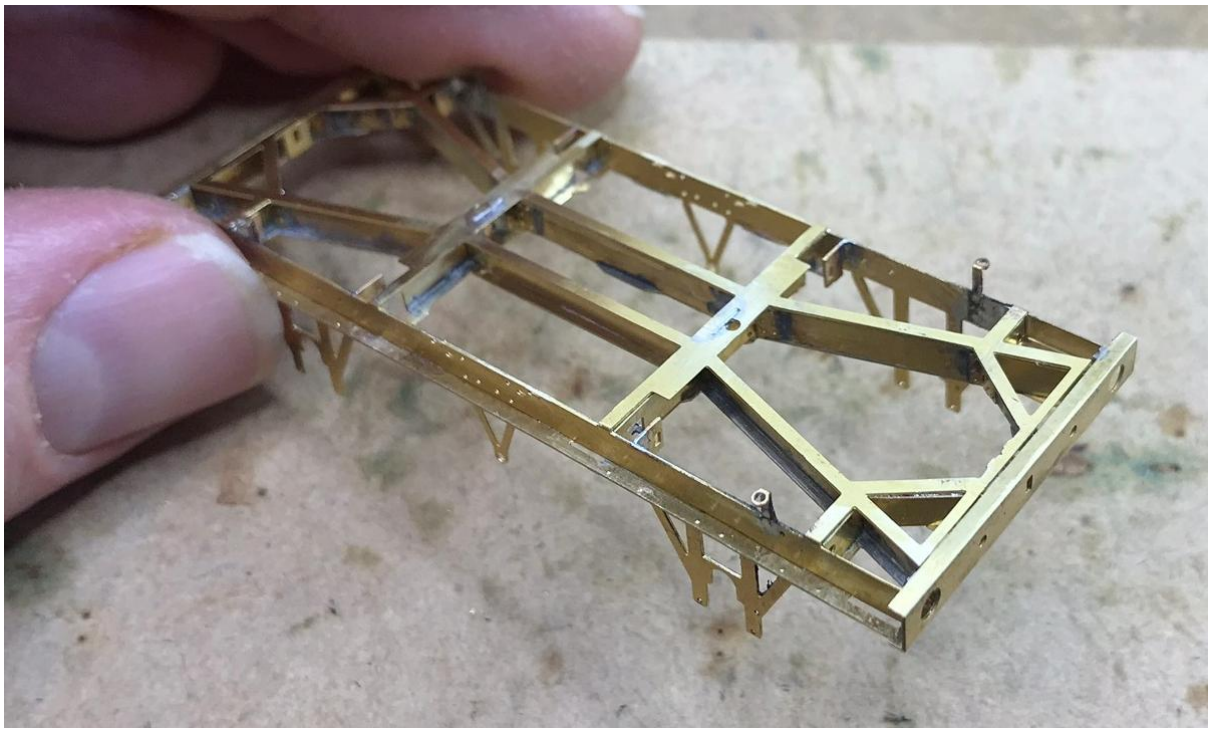


When all the brackets are soldered in place file the visible bits of wire to represent bolt heads on the visible side. Carefully remove the top plate from the jig and cut/file the bracket locating wire flush with the surface of the top plate on the side where the wire went into the wood. Fold up the sides making sure that the sides are at 90° to the top.

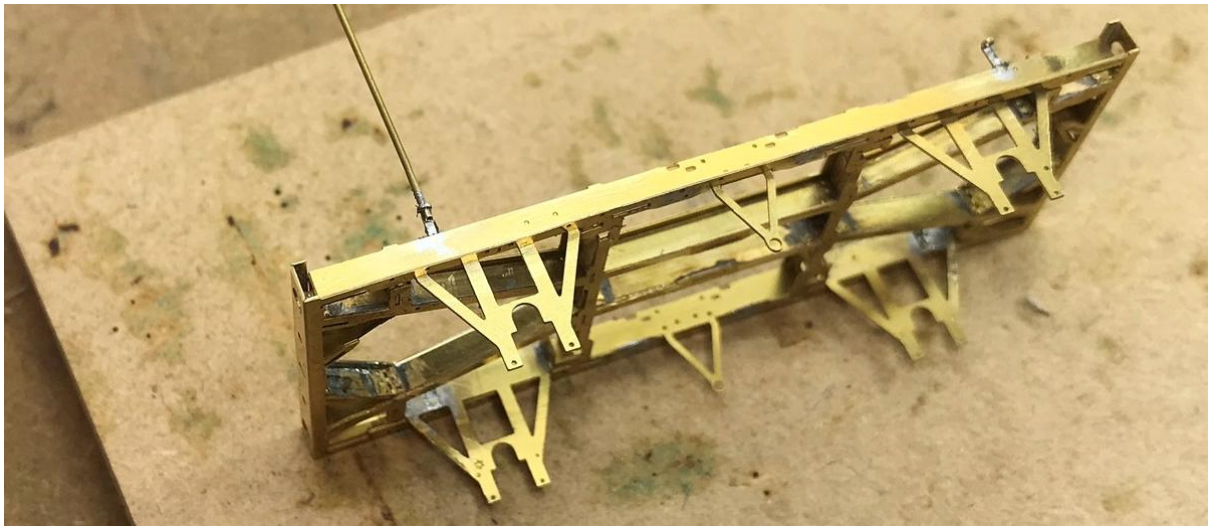
Locate the top plate into the underframe. There are tabs on the top plate that locate into the bottom of the solebar and tabs on the crossbar spacers that locate into the top plate. When you are happy with the fit solder the top plate to the underframe at the points where the tabs locate into their slots. Also solder the top plate to the headstock stays at the ends. See images below.

Make the final fold in the tank strap brackets so that the larger holes for the tank straps are parallel to the top of the underframe. Take care with the tank strap brackets once the top plate has been fitted. A small block of wood is helpful to rest the underframe on.





You will now need to add small piece of the 0.6mm x 0.4mm microtube to the tank strap brackets to represent the nuts that held the tank straps in place. The easiest way to do this is to insert the whole length of tube into the hole in the bracket from the top so that it protrudes about 1mm. Solder the tube in place, making sure that the fold line in the bracket is reinforced at the same time.



Use a sharp piercing saw to cut the tube flush with the top of the bracket. Repeat for the other brackets. Once they are all in place run a 0.4mm drill or tapered reamer through the tube to clear out the hole.

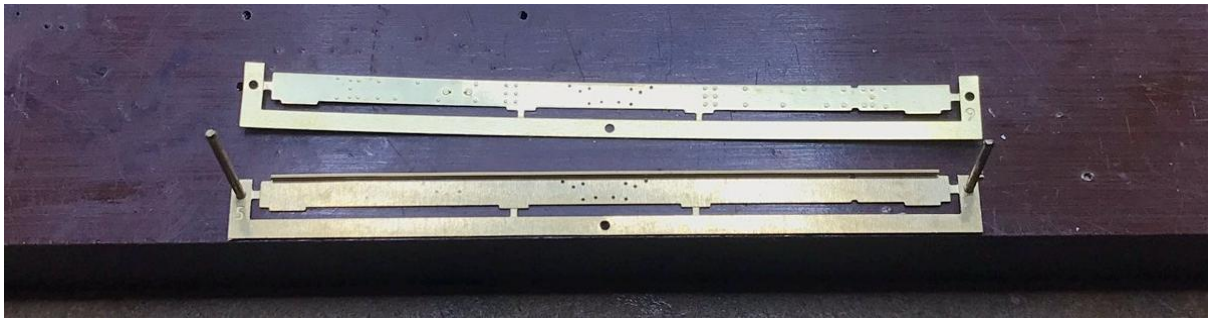
Solebars

The solebars are designed to be assembled and the detail added whilst still attached to their surrounding frets using wire pins to align things. Do not remove them from the surrounding frets until they are ready to be fitted to the wagon.

Make sure the holes in the frets surrounding the solebars (6) and solebar overlays of your choice (7A for external crossbeam stays or 7B for internal crossbeam stays) are a good fit for 1mm wire. Separate the two solebars and two solebar overlays of your choice from the block in which they are on the sheet. There are small half etched lines on the surrounding frets to enable you to do this. Use one of the solebars to drill three 1mm holes into a spare piece of wood or mdf. This will be the jig on which the solebars will be constructed.

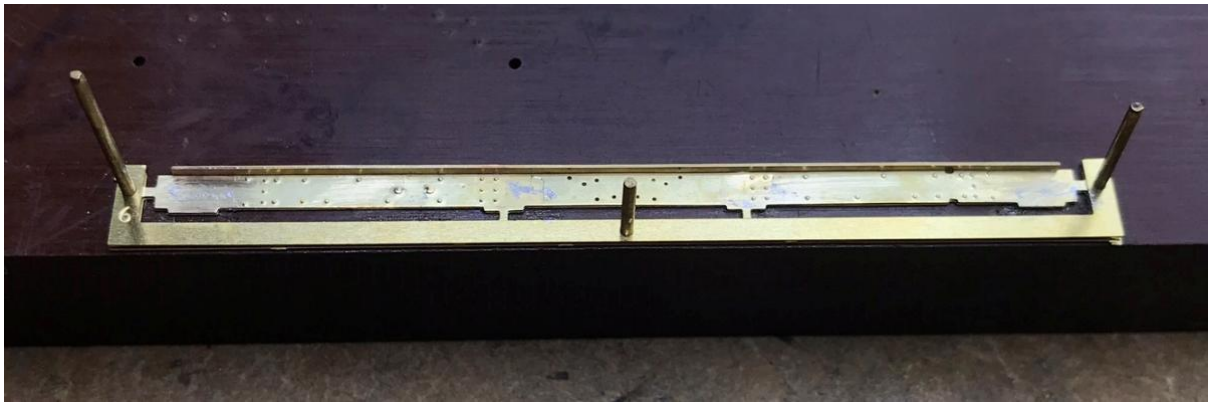
Clamp the long thin part of the solebars in a vice and fold up taking care to make sure the fold is at 90°.

Pin the solebar to the jig using 1mm wire ‘pins’. I find it helpful to chamfer the ends of these pins to make fitting easier. See image below.



Add a small amount of solder to the solebar at the pints where the locating tabs are. See image below.

Place the solebar overlay onto the jig and sweat the two parts together.



Remove the solebar detailing fret (8) from the sheet. This small fret contains numerous detailing items. You will not need all of them. Fig.5 below gives details of what’s on there.

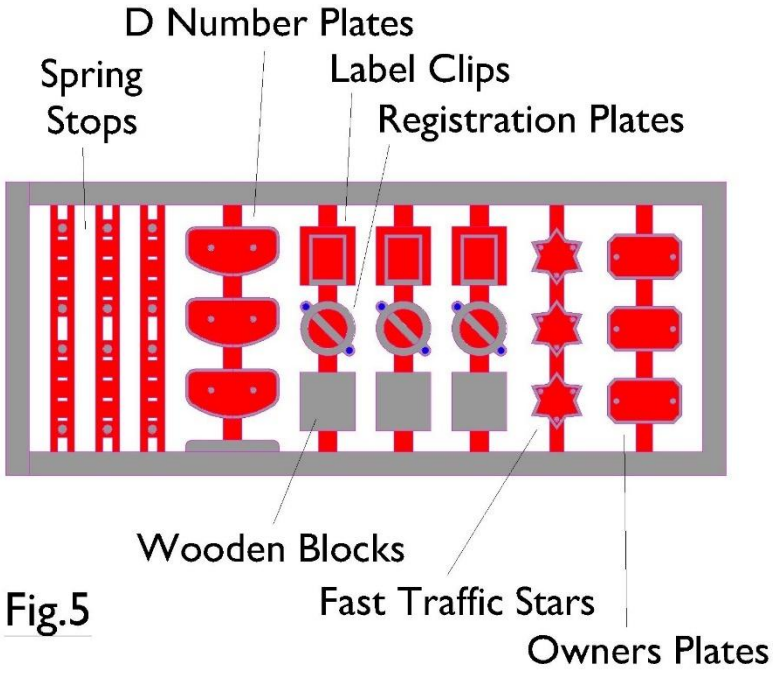


Fig.5

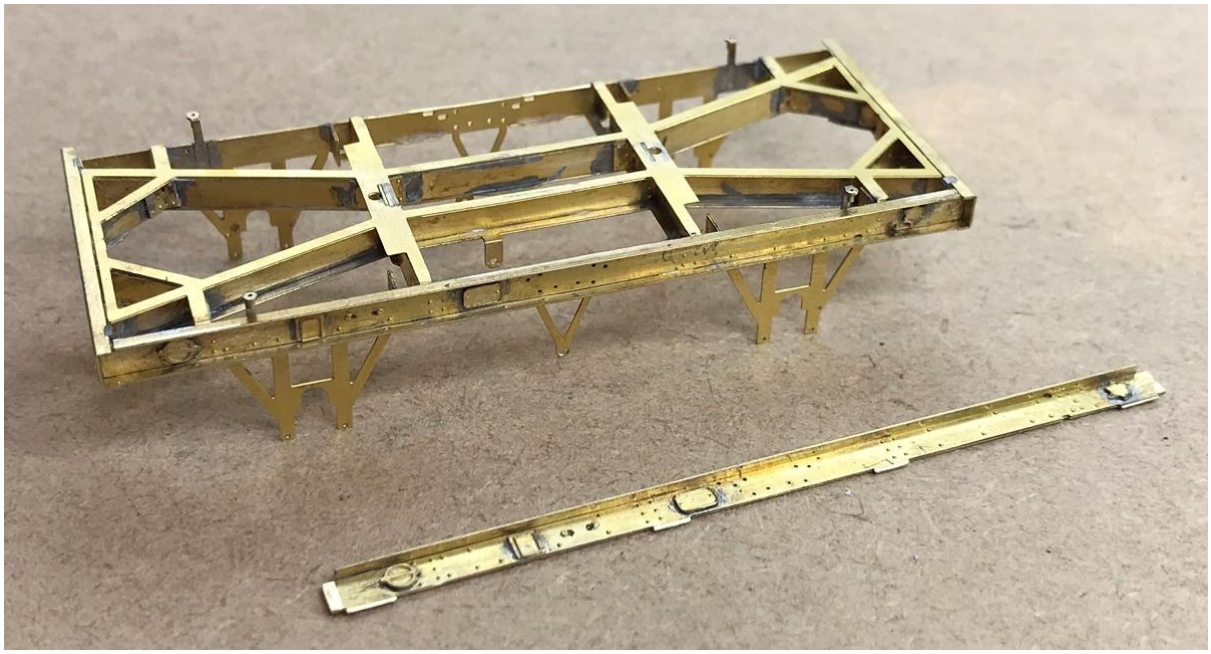
The image below shows the typical arrangement of the plates that got fitted to the solebars of these wagons. As always though, check your prototype for the exact arrangement.

From left to right we have, Registration plate, label clip, owners' plate and fast traffic star.

Included in the kit are also a selection of builder's plates. These were quite common on tank wagons built in the 1930s. The parts diagrams will tell you which shape belongs to which builder. Now is the best time to fit them

Once the plates have been soldered in place use a piercing saw to remove the completed solebar from the surrounding fret and clean up the tags. Repeat for the other solebar.

Fit the solebar to the underframe using the slots and tabs provided. I find the easiest way to do this is to fit it at an angle and then push it into the headstocks. When happy with the fit solder to the solebar back. See image below.

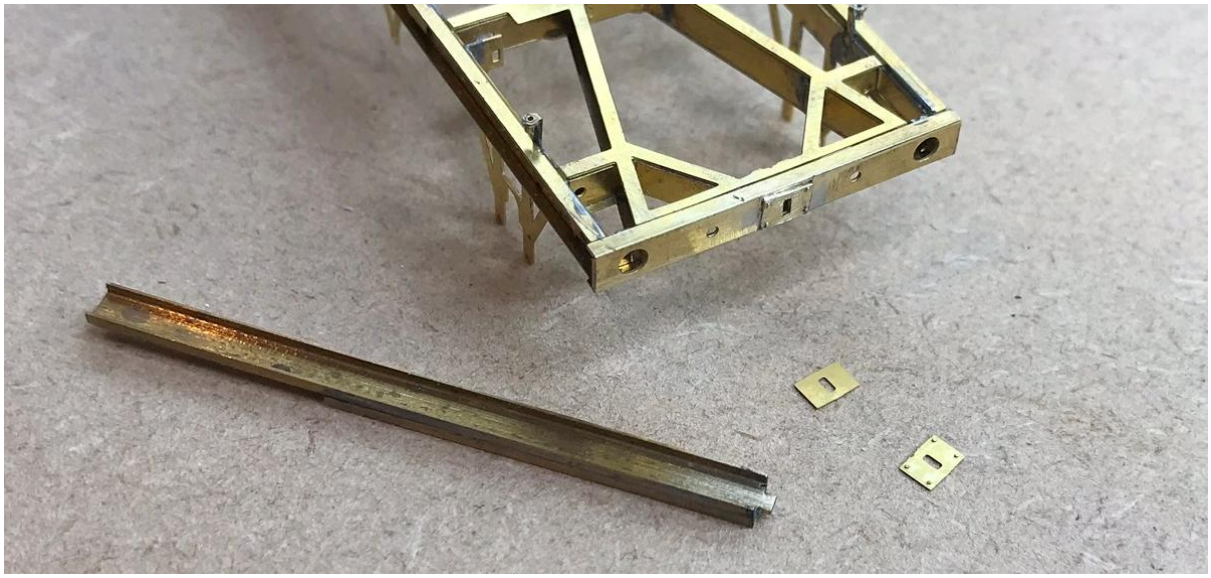


More Underframe Detail

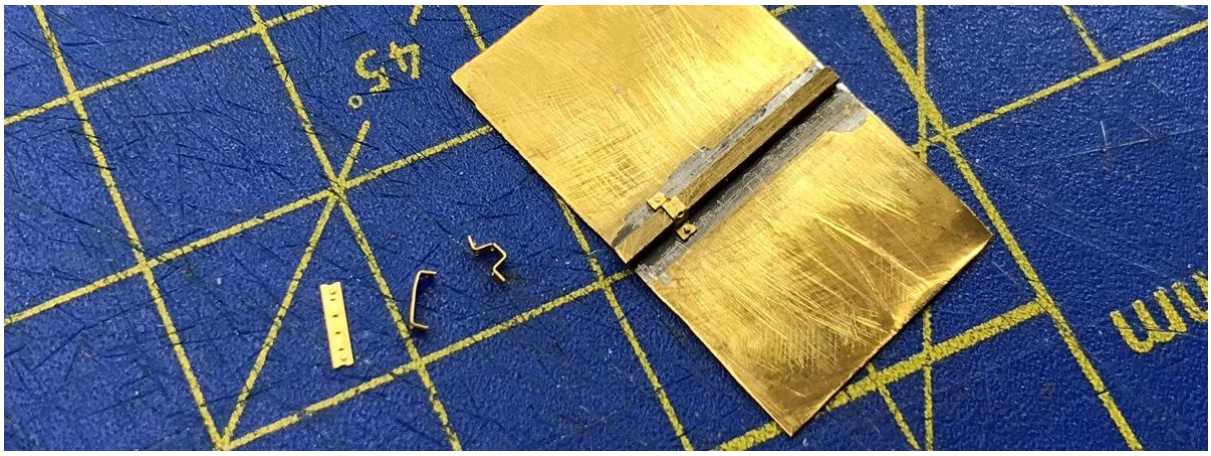
Fit the four gusset plates (9) to the underside of the join between headstock and solebar. See image below. I've made these L shaped on the production etches to allow better access to the buffer head tails.

Remove, fold up and fit the four solebar and headstock knees (10) to the solebar face where is joins the headstocks. See image below and Fig.2.

Fit the drawbar plates (11). They come in two layers, one with four bolt heads etched on and the other plain. Use both layers with the rivets to the outside. I've made up several implements to help fitting these including a cocktail stick filed to shape and a couple of pieces of brass C section soldered together and filed to shape. It's useful to have something to hold the plates on whilst fitting.

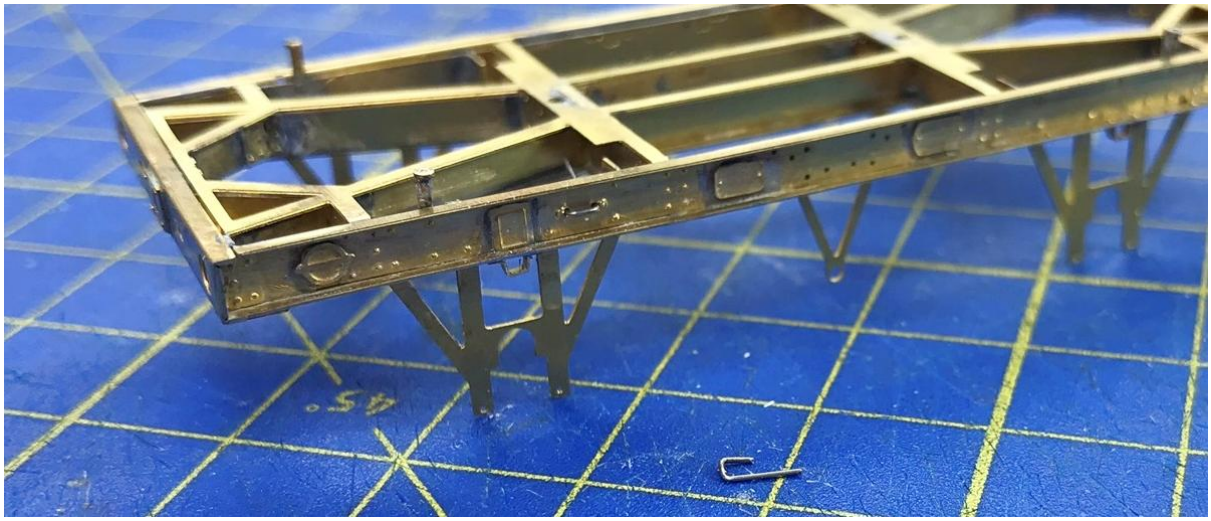


Next fold up and add the spring stops that came on the solebar detailing fret. I find a forming jig useful here. Mine is a piece of 1mm square brass bar soldered to a piece of scrap brass sheet. 0.8mm square brass might be even better. You can roughly form them to shape as in the image below and then use the bar to press them into something a bit more precise.



Fit the spring stop to the underside of the solebar. There is a half etched rectangle to mark the centre point. I find some paste flux and a pin held in a pin vice invaluable for holding them whilst soldering them in position.

Check that the holes in the solebars for the horsehooks can accept 0.31mm wire. Fold up a piece of 0.31mm wire and insert into the holes. Solder from behind. I find it easier with these to make one of the tails a bit longer than the other so you're only trying to get one piece of wire in one hole at a time.



Secondary Vees

The additional vees that sit on the outside of the solebar need to be made up now. There are two types depending on whether your crossbeam stays are fitted to the inside or outside of the solebar.

If you are fitting bracket to the **outside of the solebar** use one of the additional vees (outside crossbeam stays) (12) to drill eight 0.31mm holes into a piece of scrap wood or mdf to form an assembly jig. Do this so that the vee is close to the edge of the jig. See image below. Use four short lengths of 0.31mm wire to pin the vee to the jig. Do this in the holes that form part of the vee rather than the brackets. See image below. Once soldered in place cut/file to resemble bolt heads.

Fold the vee up and reinforce the fold lines with solder.

Next make sure the holes in the crossbeam stay brackets (13) can accept 0.31mm wire and remove from the fret. There are three sets in the kit to give you some spares. You should only need two sets. The stay brackets come in two lengths, the longer one goes on the outside. Use lengths of 0.31mm wire to layer up three of the shorter stay brackets on each side of the vee. Note the orientation of the shorter ones in the image below.

Fit the longer stay bracket on top.

Solder everything together and cut/file the wire to represent bolts.

If you are fitting the crossbeam stays to the inside of the solebar then use Additional vees (inside crossbeam stays) (12A) instead. The assembly methodology is the same as for those above but obviously there isn't the complication of the bracket and spacers.

Carefully remove the vee from the jig and fit to a solebar. You may need to open out the holes in the middle of the solebar a little to get it to fit.

Once in place solder from behind and tidy the wire up to resemble bolt heads.

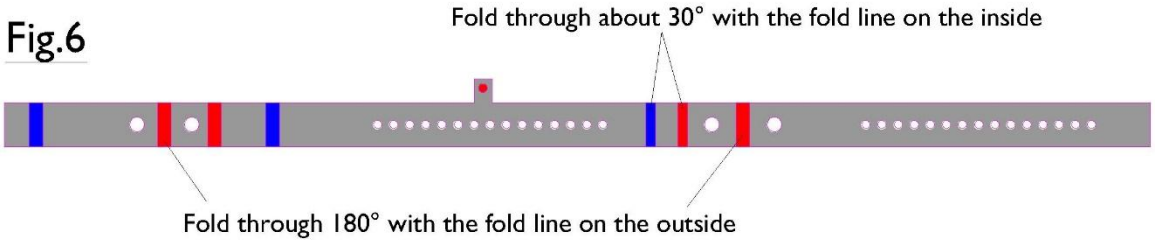
Brake Lever Guards

The brake lever guards come in three parts, the guard (16), the bracket (17) that attaches the guard to the solebar and the stay (18) that attaches the guard to the axleguard. There are three sets on the sheet, you will only need two.

Make sure that the larger holes in the guard and all the holes in the bracket and stay can accept 0.31mm wire before removing them from the fret. Fold the bracket in a C shape.

The guard is a bit more complicated. There are a couple of folds through 180° with the fold line on the outside and a couple through about 30° with the fold line on the inside. Fig.6 below gives the location of these folds. Everything else is through 90° with the fold line on the inside. I generally start with the 30° folds and then leave the 180° ones until last.

Fig.6



Leave the stay flat for the moment.

Use a piece of 0.31mm wire through the top hole in the guard to pin the bracket and guard together. The hole in the bracket is not central. The bracket should be arranged so the hole is towards the top. The bracket will then roughly line up with the top of the guard. See image below. When happy solder together and trim the wire to represent a bolt.

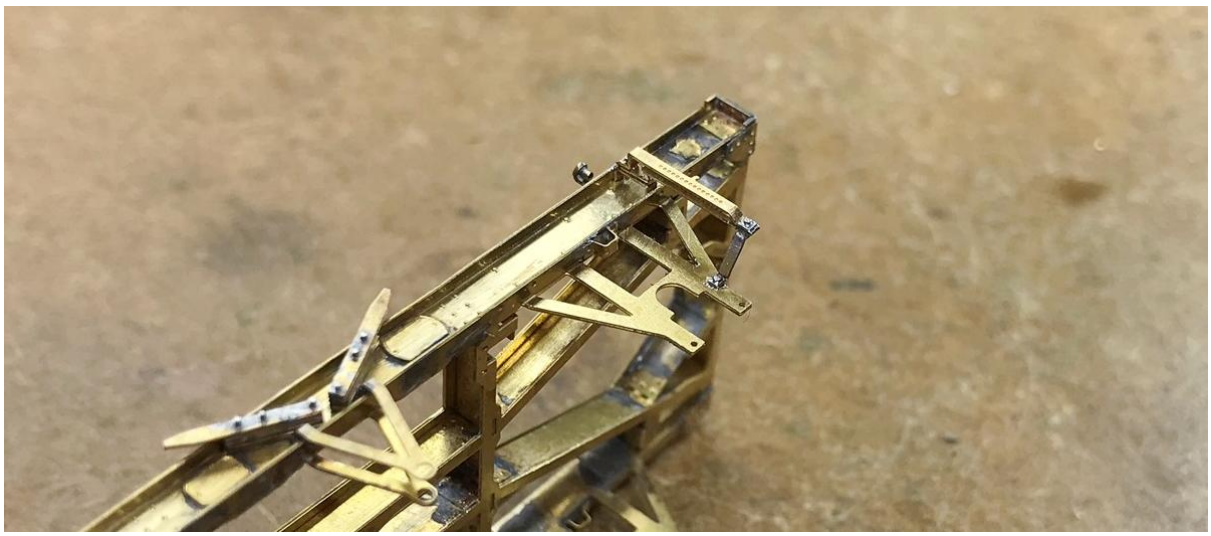
Use the stay to drill a pair of holes near the edge of a piece of scrap wood or mdf. See image below. Use a couple of lengths of 0.31mm wire to pin the stay to the piece of wood. It should be arranged as in the picture below, with the visible fold line on the stay to the right. This is important.

Place the lever guard over the wire on the left hand side. This should be done so the bracket is facing downwards. See image below. Get the guard as perpendicular to the stay as possible and solder the guard to the stay and wire and solder the other wire to the stay as well.

Trim the visible wires to represent bolts and carefully remove from the jig. Repeat for the other lever guard.

Fold the stay so the middle is at about a 45° angle to the ends.

Fit onto the underframe. The bracket locates into slots in the solebar and the stay locates into the holes marked with a * on the inside of the axleguard. Tweak the angle of the stay if necessary so that the guard is vertical when the wagon is placed on its axleguards. Solder the stay to the axleguard and the bracket to the top of the solebar. Trim the wire flush on the back of the axleguard and trim to resemble a bolt on the back of the joint between guard and stay. Repeat for the other side.



Spring Carriers and Axle Keeps

The spring carriers and axle keeps have been designed so that everything can be fitted after painting. This is my preferred method of arranging things. You can of course fit them permanently in place at this stage if you wish. Note that the keeps are fitted to the axleguards using wire to locate them and it is this wire protruding from the back of the axleguard that stops the spring carriers from dropping far enough that the spring wire becomes disengaged from its slots.

Assemble the spring carriers (C). The bearing sits in the round, half etched recess and the springing wire is soldered to the carrier using the half etched slot as a guide.

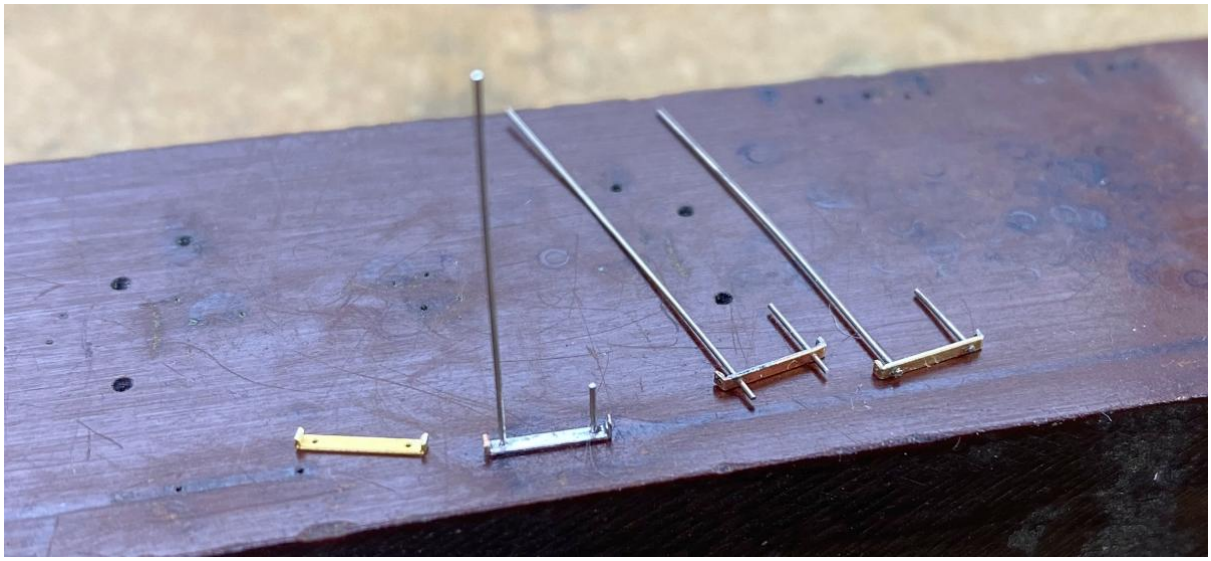
Remove from the fret and clean up. If you are using pinpoint bearings solder the bearing to the carrier so that it sits in the round, half etched recess. I find the easiest way of doing this is to drill a 2mm hole into a piece of scrap wood or mdf. The spring carrier can then be placed so that the bearing locates through the hole in the carrier and into the wood.

You should make sure that there is as little sideways movement as possible in the axle, but it shouldn't be so tight that it doesn't rotate properly. Bearing washers (D) are included to pack out the spring carriers and reduce the distance from the axle end to the tip of the bearing cone. Check the spring carriers with an axle on the underframe and add an appropriate number of washers to achieve this. There are full thickness and half etched washers on the sheet. I fit the washers over the bearing so that they are between the spring carrier and the axleguard as this reduces the bearing surface of the spring carrier on the back of the axleguard and so will reduce possible friction in the setup. Use a waisted type of bearing, the ones produced by Alan Gibson are recommended. See image above.

Locate the spring wire in the half etched slot and soldered in place. The spring wire is nickel plated steel so it should be possible to solder it with regular flux rather than something like Carr's black label flux for steel. The spring carrier sits slightly off centre between the fulcrum points so the spring wire will need to be longer one side than the other and they will need to be arranged in mirrored pairs. The spring wire should extend 6.5mm on one side and 8mm on the other. The safest way to get there is to make them overly long and trim them back checking on the model. I chemically blacken the spring carriers before final fitting.

Due to the removable nature of the axle keeps you can easily use Exactoscale parallel axles and bearings. If doing so, then you will need to pack the bearings out on the back of the spring carriers before soldering them in place due to the length of the axles. Use the bearing washers (D) provided. I have built my chassis with Exactoscale parallel axles, and when doing so used one half etched washer and one full width washer to pack the bearing out. This leaves the outer edge of the bearing about 0.25mm beyond the axleguard and provides 1mm of bearing surface for the axle. Assemble the spring carriers as per the instructions for pinpoint bearings above putting the washers on the opposite side of the spring carrier to the flange on the bearing.

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 (19) 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.

If you want to assemble everything permanently in place at this point then fit the springs carriers ad 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 remembering that it is this wire that will stop the spring carrier dropping so far that the spring wire can become disengaged.

Drawbar hooks

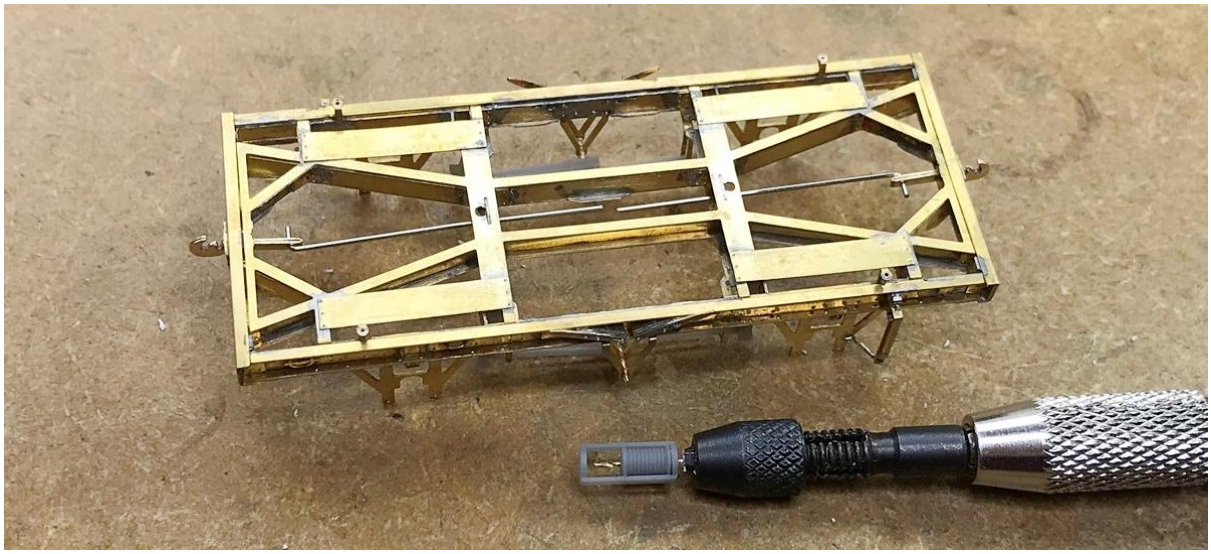
We have now got to the point where we can start thinking about adding some of the 3D printed parts. Remember to properly clean the remnants of the printing supports from them before fitting.

Locate the drawbar hooks (E) on the 0.012" fret. These should be folded double with the fold line on the outside and soldered together. Use a file to dress the edges around the hook and get it to look a bit more like a casting. Make sure the hole at the opposite end to the hook can accept 0.5mm wire and fit to the underframe.

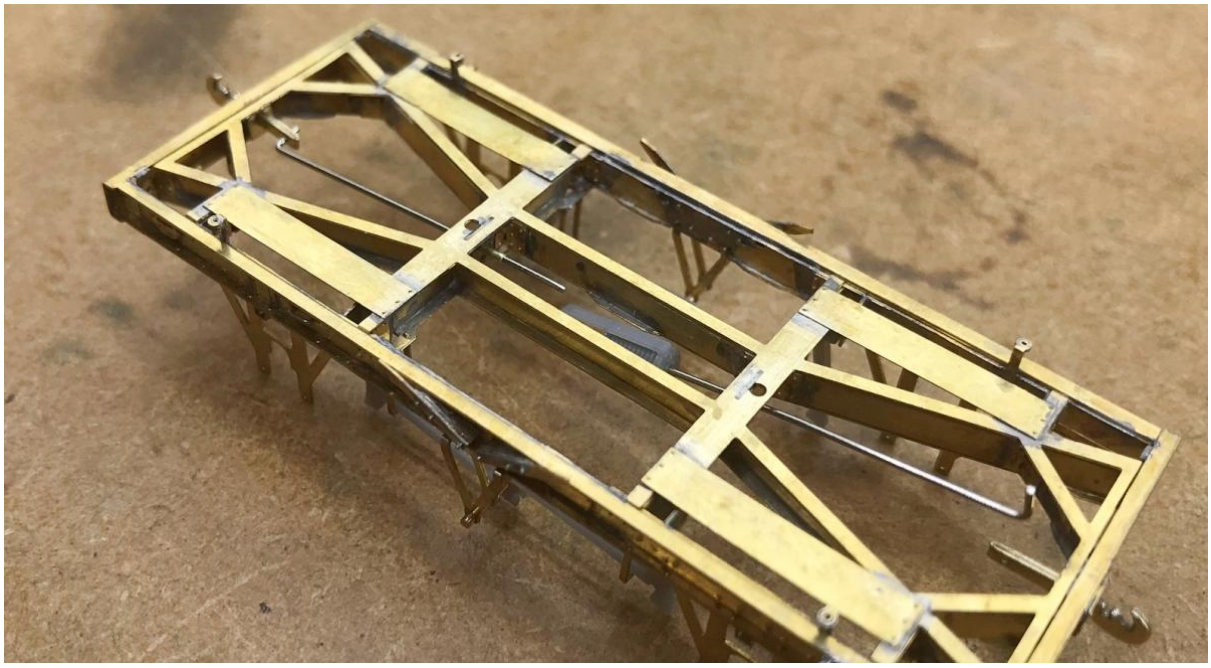
On the prototype the drawbar spring fitted into a cradle and attached to each hook via rods. Use 0.5mm to form two asymmetric Ls where the short end attaches to the hole in the drawbar hook. See image below. You will need to leave a small gap between them. For class A tanks this gap should be just off the wagon centre so that when the drawbar spring cradle is fitted it is central in the wagon and the wire just projects into the gap in the cradle at each end. On class B tanks the gap should be where the discharge pipe comes out of the tank as this actually passes through the drawbar spring cradle. Trim the wire if necessary. Hopefully the following images will make this clear.

Use a sharp 0.5mm drill to drill holes through each end of the drawbar spring cradle. There should be dimples at each end to give you a start. Note on the class B cradle the holes shouldn't pass through the two bars that go across the middle of the cradle.

Both rubber and coil springs were used on these wagons and I have done both types so yours may look different to the images below.



You will need to do something to stop the drawbar hooks from coming out. I like to be able to remove the hooks and couplings from my wagons when painting, so I soldered two short lengths of 0.7mm x 0.5mm tube to the rods so that they are hard up against the inside of the crossbars when the hooks are fitted. These will take the pull on the couplings. One of these is visible in the image below. The rod can then be prised out of the hook if you want to remove them. Alternatively, you could solder the hooks to the plate at the back of the headstock.



When you are happy with the arrangement use a little superglue to fix the drawbar spring cradle to the rods. The cradle should be orientated as per the image below.

You will need to add three links to complete the couplings. Brassmasters do some links that can be used but it's not hard to do your own. John Hayes did a nice write up on making your own from 0.5mm wire in his book 'The 4mm Coal Wagon' published by Wild Swan.

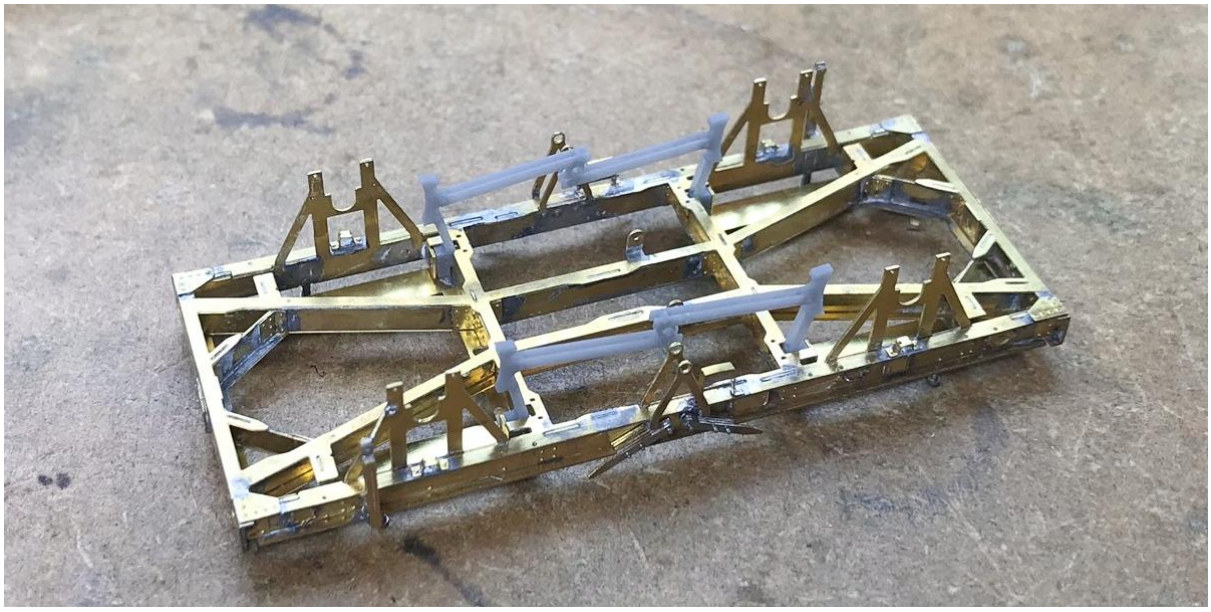
Brakegear

The brakegear is probably the most delicate of the printed parts and I have deliberately left them on the supports to protect them from damage. The time when they are most likely to get damaged is when getting them safely off the supports, once removed they will be robust enough to handle whilst fitting. Some care is needed getting them off but it's not impossible. I've only lost a couple of these printed brakegear sets and that was because I'd put the supports in the wrong places.

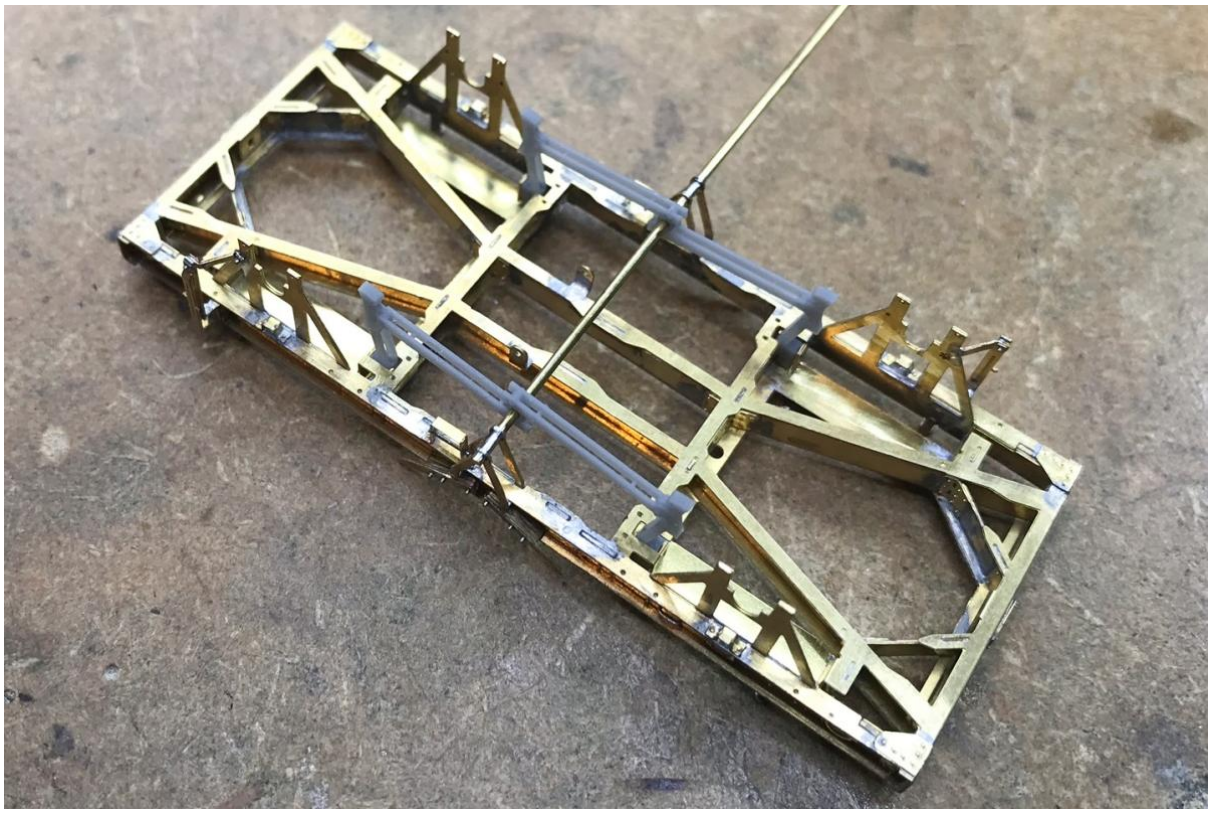
Fistly open out the hole in the middle for the brake shaft so that it can accept 0.8mm wire. I use a tapered reamer for this rather than a drill. The material cuts very easily so this shouldn't take a lot of effort.

Next use a sharp, fine (size 6/0 is recommended) piercing saw to cut the supports off at the point where they meet the part. This is the built in weak point of the supports. The temptation is to cut away from the part so as not to damage it but that can have nasty consequences. Start at one end and work your way around to the other. There should be ample room to do this. If necessary clean up the printed part with a fine file or wet and dry paper, something like 1200 grade will be good. Pay close attention to the small tabs on the bases of the brake shoe hangers as these will fit into slots in the underframe.

Fit the brakegear by sliding it into the slots in the underframe. You will need to gently bend the bases inwards so the locating tabs slide in. The bases can then be gently pushed outwards so the locating tabs fit into the slots. Pay attention to orientation of the brakegear when doing this. If you look at the two bases of the brakegear you will note that on one side, there is an I visible. The brakegear should be fitted to the underframe so that the I is visible when viewing the brakegear from the inside. See image below. This will save you from worrying about which way around the independent brakegear goes.



Next fit the brake shaft. This should be made from 0.8mm wire. I fit one length of wire and then cut out the middle on independent brakegear. Pass the wire through the holes in the vees and brakegear leaving 0.5mm protruding from the outside vee on one side. See image below. Quickly solder the wire to the vees on each side with a hot iron and using as little solder as possible.



The brake shaft can then be cut on the other side, leaving 0.5mm protruding beyond the outside vee and the centre section carefully cut out. Use a sharp blade to do this but take care not to cut the prints whilst doing it.

With the brakegear in place fold the push rod safety loops (20) into a C shape and fit to the underframe. There are small slots into which they locate. Quickly solder in place.

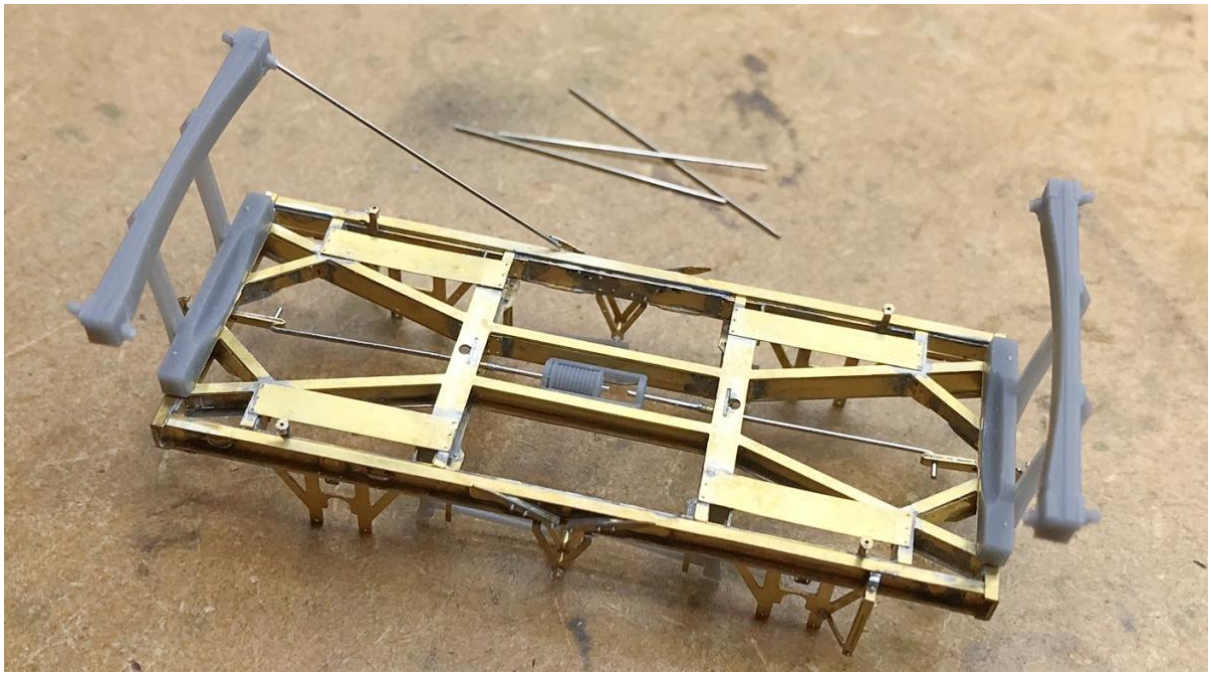
Add the solebar and crossbeam knees (21). Their position is noted in Fig.2 on page 17. You can solder them to the inside of the solebar or glue them in place if you're worried about the brakegear.

End stanchions

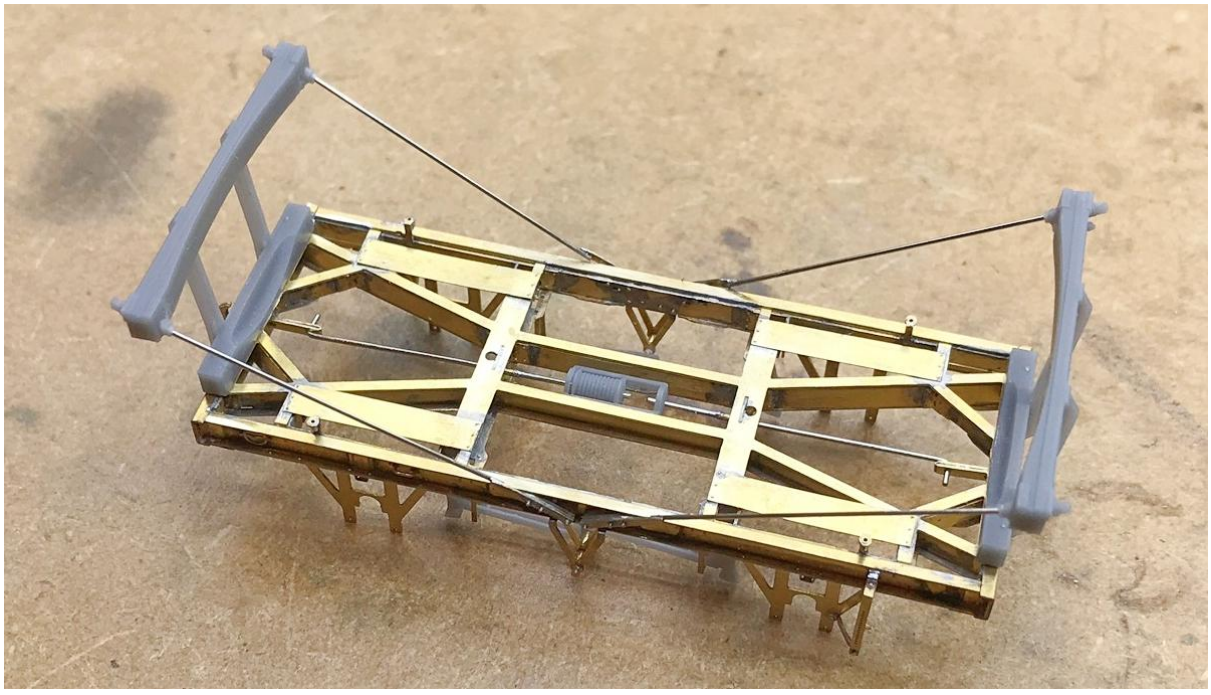
The end stanchions/crossbeams and associated stays will need preparing. You may want to leave the actual fixing in place of the end stanchions until you have made up the tank as you don't want to end up with a situation where they are being bent outwards when the tank is in place. I will cover their fitting now though.

I have removed the end stanchions/crossbeams from their supports, but they will need cleaning up. Note that there is a small locating peg on the back of the bottom of the end stanchions. You may need to fettle the prints to get them to fit on the headstocks, including the locating pegs.

You will need to drill out the backs of the cross beams for the stays. The angled stays locate into the outer ends of the cross beams. See images below. They should be made from 0.45mm wire but I drilled the holes out 0.5mm as it will be difficult to get the angle of the drill perfect. Use a sharp drill. You only need to go in 1-2mm. To the inside of where the angled stays locate, there will be a location mark for the horizontal stays. These should be drilled out 0.4mm. Again 1-2mm depth will be fine. Try and get this hole as perpendicular to the crossbeam as possible.



The angled stays will need to be soldered to the brackets on the vees. File a flat on the wire at one end of 2-3mm long. This will mean the wire sits better against the bracket and more like the prototype. Trim the other end so that it fits easily into the hole drilled into the crossbeam. Hold the wire in position and solder in place.



The horizontal stays should be made from 0.4mm wire. I would paint the wire for the horizontal stays separately and leave the actual fitting of them until after transfers have been applied. They will get in the way otherwise and they may start collecting gloss varnish behind them when you apply it for the transfers. Make the wires overly long and trim when fitting.

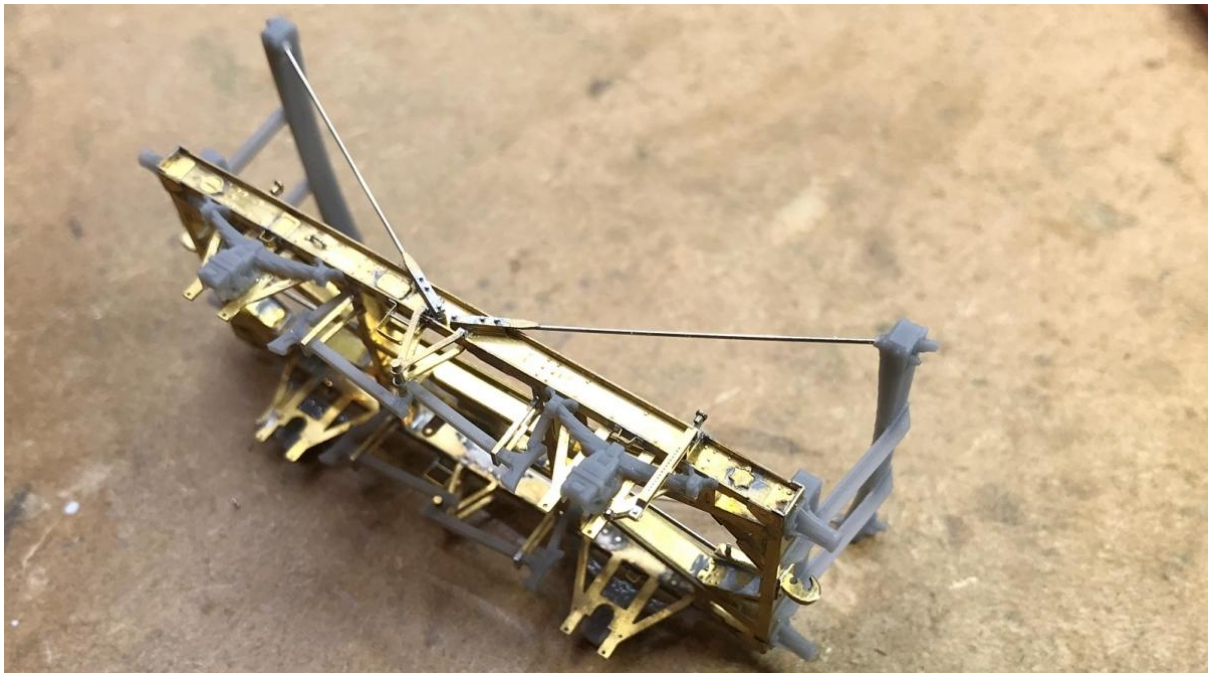
Buffers and Springs/Axleboxes.

If you didn't do it at the start, clean up the buffer housings. They will need a 1mm drill running through them for metal buffer heads and springs. Make sure they sit nice and flat against the headstock. Glue in place. I've used both 5 minute epoxy and superglue for this job. Superglue works fine, especially with the spigot locating into the headstock, but you'll need to get it right first time.

Sprung buffer heads will need a sleeve on the tail to secure them. I'd recommend a 2-3mm long piece of 0.7mm x 0.5mm microtube. If you use anything bigger the cosmetic buffer springs won't fit. I generally fit them after painting.

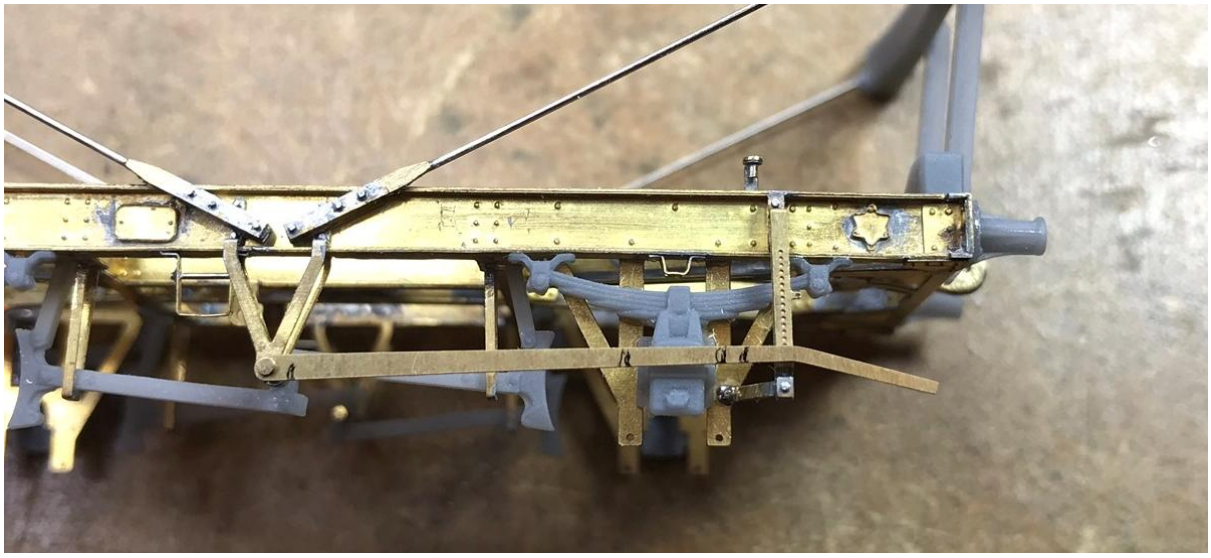
The springs and axleboxes will need fitting as well. Again, clean them up using a fine file or wet and dry paper (1200 grade recommended).

If you didn't permanently fit the spring carriers/wheels in place, then you will need some help with locating them. I created a jig to aid fitting consisting of a length of 2mm tube and a couple of spare axle washers. Cut the tube to about 26mm and then solder on a couple of 2mm inside diameter washers so that the washers sit behind the axleguards with an equal amount of tube sticking out at each end. You can then use this to help locate the slot on the back of the axleboxes in place. Again, I've used both 5 minute epoxy and superglue for this job but superglue requires getting it right first time. You shouldn't need to adjust the slot in the back of the axleboxes but if you find it's a bit tight when you fit the spring carriers and axles the material can be pared away with a sharp scalpel blade.

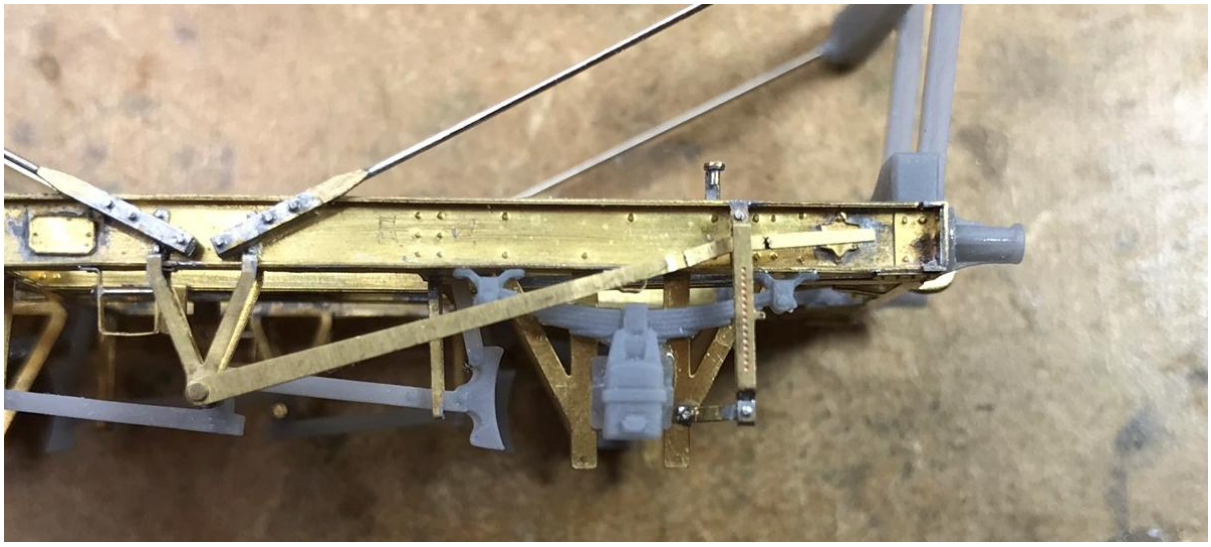


Brake Levers

Next bend up and fit the brake levers (22). Remove from the fret and place them on the brake shaft. Starting at the brake shaft end mark the brake lever about 1.5mm from the hole centre. Then mark it about 1mm either side of the axlebox and make another mark about 2mm beyond the outer line you've just put on. See image below. These will give you the points at which to bend the brake lever.



Once bent up, the flat face of the brake lever above the axlebox should be parallel to and about 3mm from the front face of the axleguard when in its resting position as in the image below.



Mark about 1mm beyond the brake lever guard and crank the brake lever for the handle.

When happy solder the brake lever to the brake shaft.

Tank

Finally, attention can turn to the tank. This is formed from two wrappers fitted around a frame. You will need to roll the tank but it's half etched on 0.010" material so this shouldn't be particularly difficult.

There are two types of wrapper in the kit, an 'inner' (23) and an 'outer' (24). The inner wrapper goes the full length of the tank on the inside and the smaller outer wrapper goes in the middle on the outside of the tank. There was an issue when I did the tooling for the kit with the original inner wrapped on the fret with part 24. So, I have done a replacement wrapper which comes on its own. You should use this one.

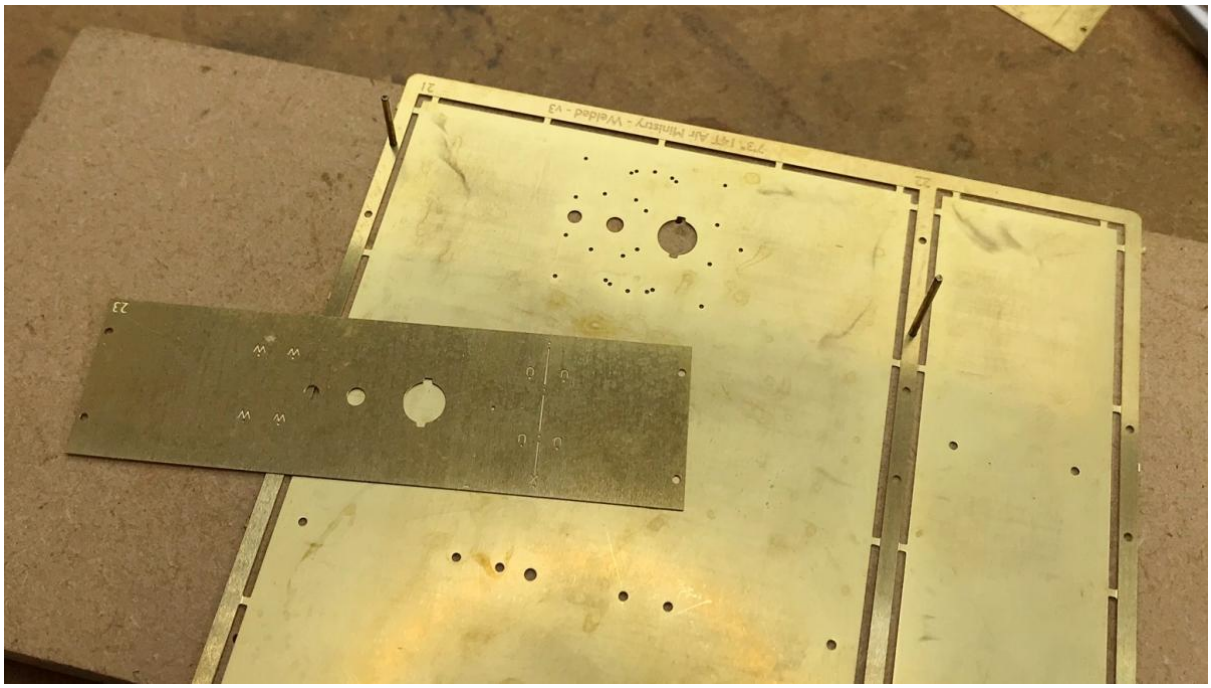
Before doing any construction work with them and definitely before removing them from the fret, some holes will need to be made for some of the fittings and, if you are fitting walkways and/or ladders. The position of some of the fittings varied on these wagons. Some were fitted with two discharge pipes and others a single siphon block as well as an air vent. The jig includes the typical position for the air vent and siphon block.

These wagons were fitted with neither when new and many never got either, but some gained them in the 1950s. If you are fitting either walkways or ladders there is a tank drilling jig (25) included to help you do this. On the test etches I did two jigs, one for the inner and one for the outer wrappers. As it can all be done with the one jig, I have included only one. On the drilling jig there are holes etched for the manhole and other fittings which will correspond with the larger holes etched in the wrappers. There are also a series of smaller holes which are labelled and can be used as drilling points for the walkways and ladders if required. Have a think about which of these you will need before getting the drill out. They are summarised as follows:

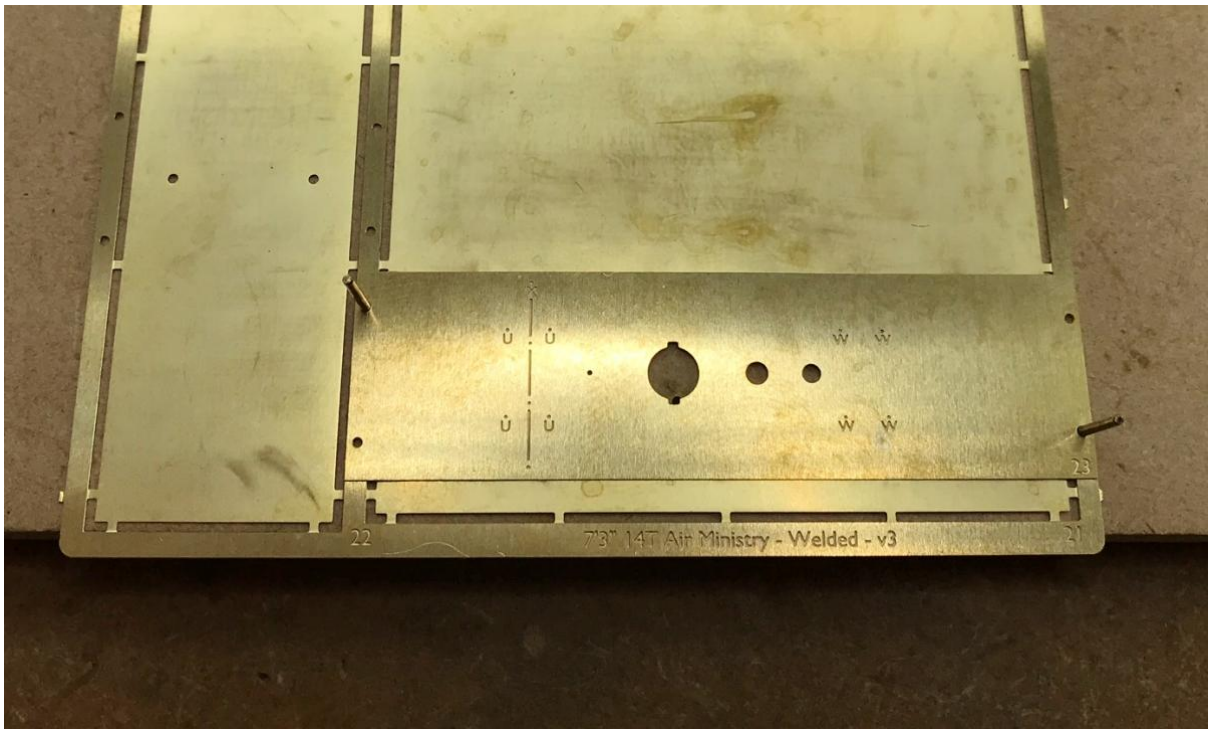
U - 2" Vent - Ø0.8mm
V - 2" Siphon/Discharge block - Ø1.5mm
W - 2 support walkways (Air Ministry type) - Ø0.3mm
X- 4 Support walkways (SMBP) - Ø0.3mm
Y - Esso type ladders - Ø0.3mm
Z - SMBP type ladders - Ø0.3mm

All holes should be drilled using a sharp drill.

Note, that on the sheet containing the wrappers there are several holes etched either side of the top of the tank where the holes for the manhole and various fittings are. These should be used to drill 1mm holes into a spare piece of wood or mdf. Short 1mm wire 'pins' can be inserted into the holes to align the wrapper and the drilling jig. See image below.



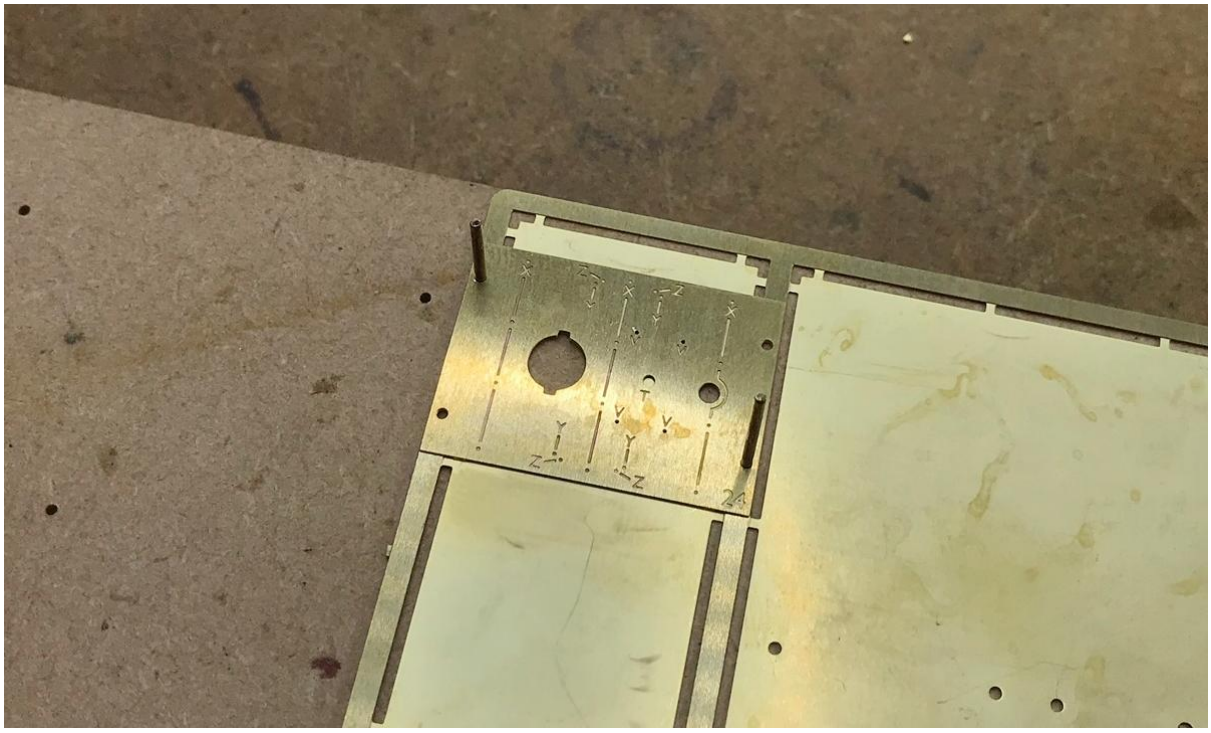
Use the 1mm wire ‘pins’ to fix the inner tank wrapper to the jig you’ve just created. Then fit the tank drilling jig over the top so that the large hole for the manhole coincides and the letters are visible.



Drill out the required holes using the jig. Note that all the possible holes that would sit under the outer wrapper have been etched already.

In a similar manner use the jig to drill out holes for walkways/ladders on the outer wrapper.

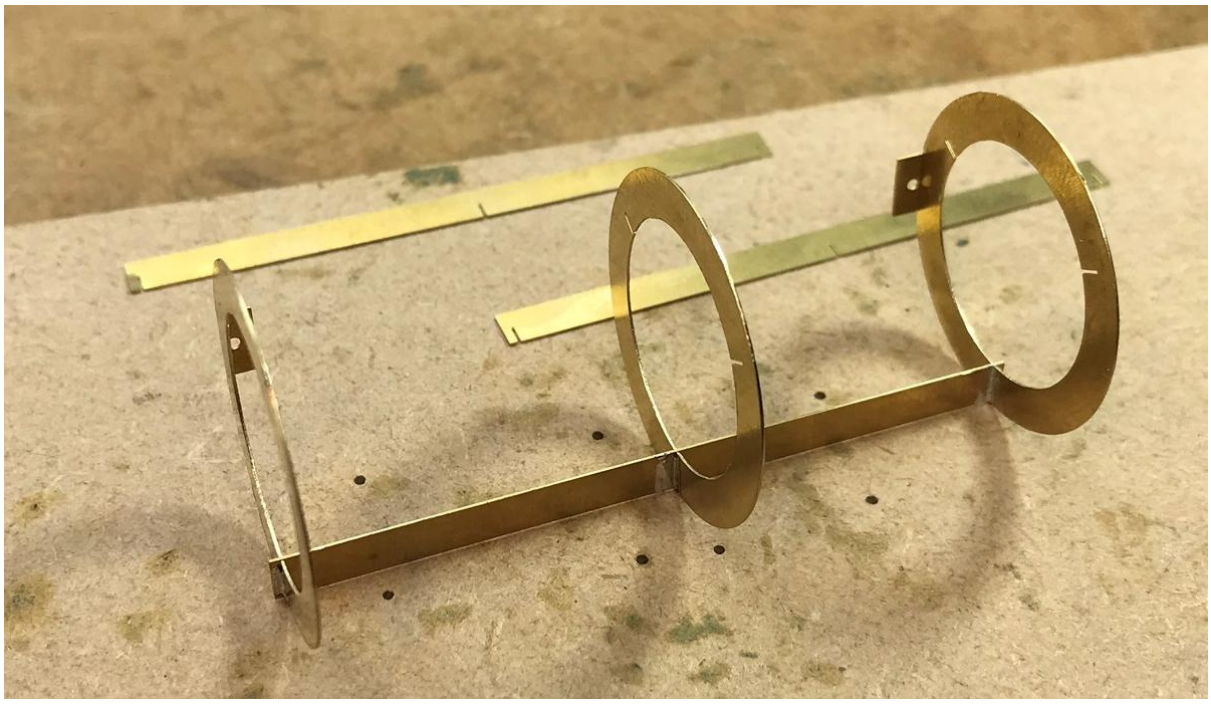
Make sure the drilling jig is fitted in place so that the large hole for the manhole coincides with that in the wrapper and the lettering is visible.



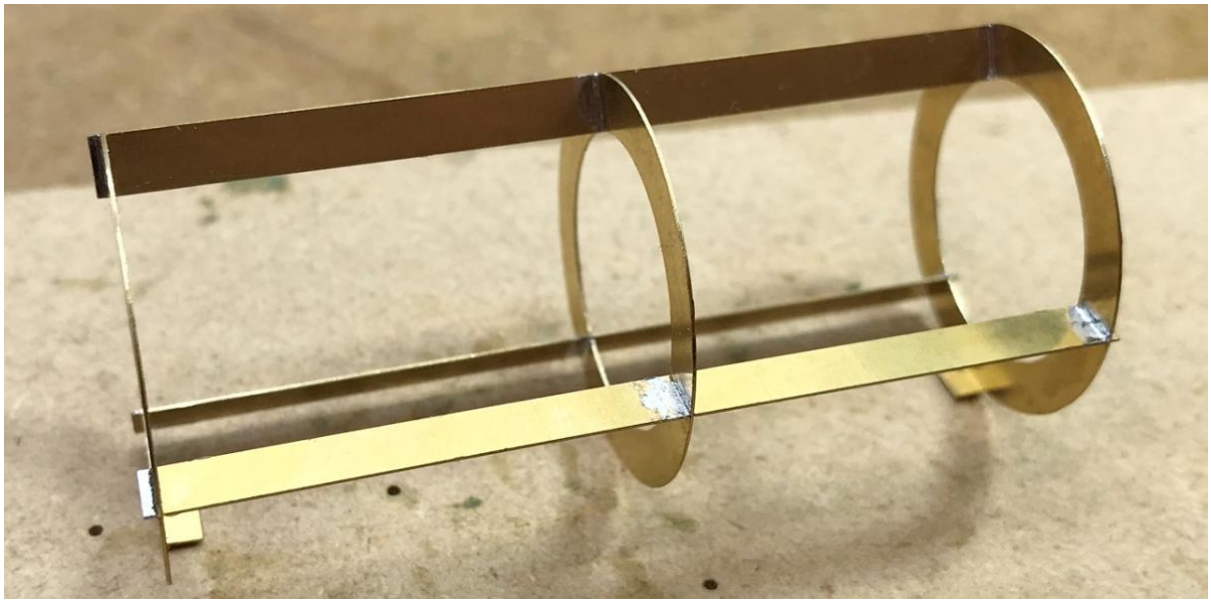
Drill out the required holes using the jig.

Once all the holes have been drilled, the wrappers can be removed from the sheet and the connecting tags cleaned up.

Next make up the frame. This consists of three tank formers, two for the outer ends (26a) and one for the middle (26b) and three spacers (27). On the two outer formers there are tabs with holes in that need to be folded through 90°. Fit the formers to one of the spacers so that the tabs on the outer formers face inwards and are opposite each other. Make sure the spacers are fully home in the slots. Solder the formers to the spacer.

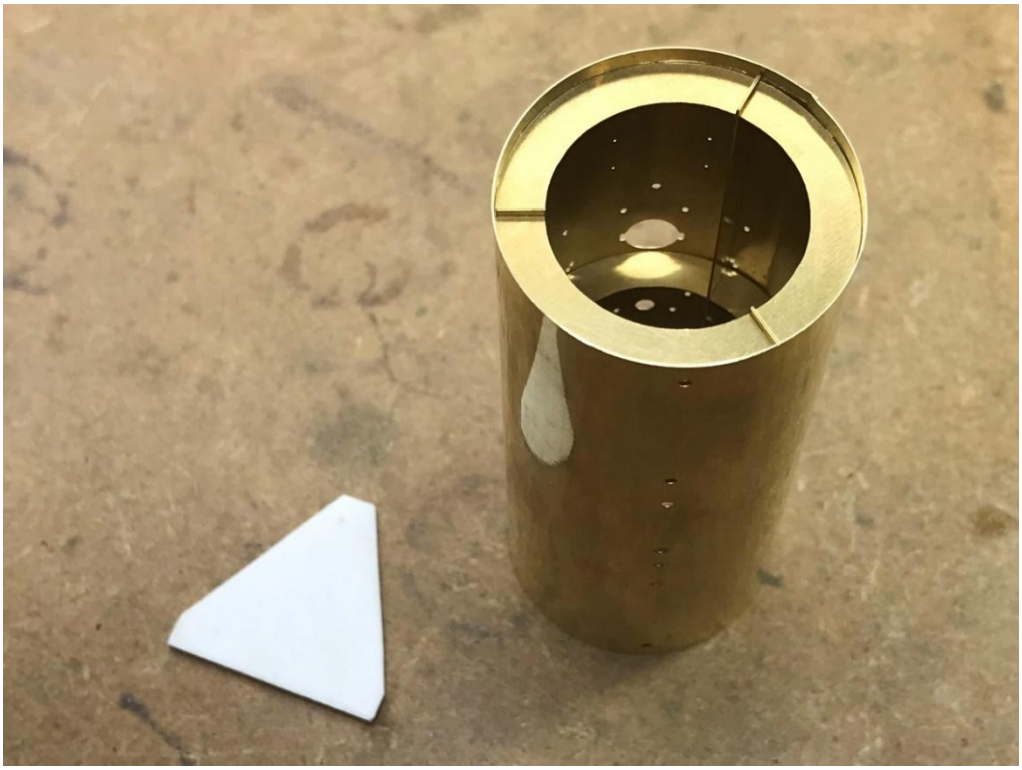


Add the other two spacers and solder together. I find at this point it's worth just touching each joint as it's tricky to get everything square in one go. Heating each join will relieve any pressure at that point and help everything to sit properly together.

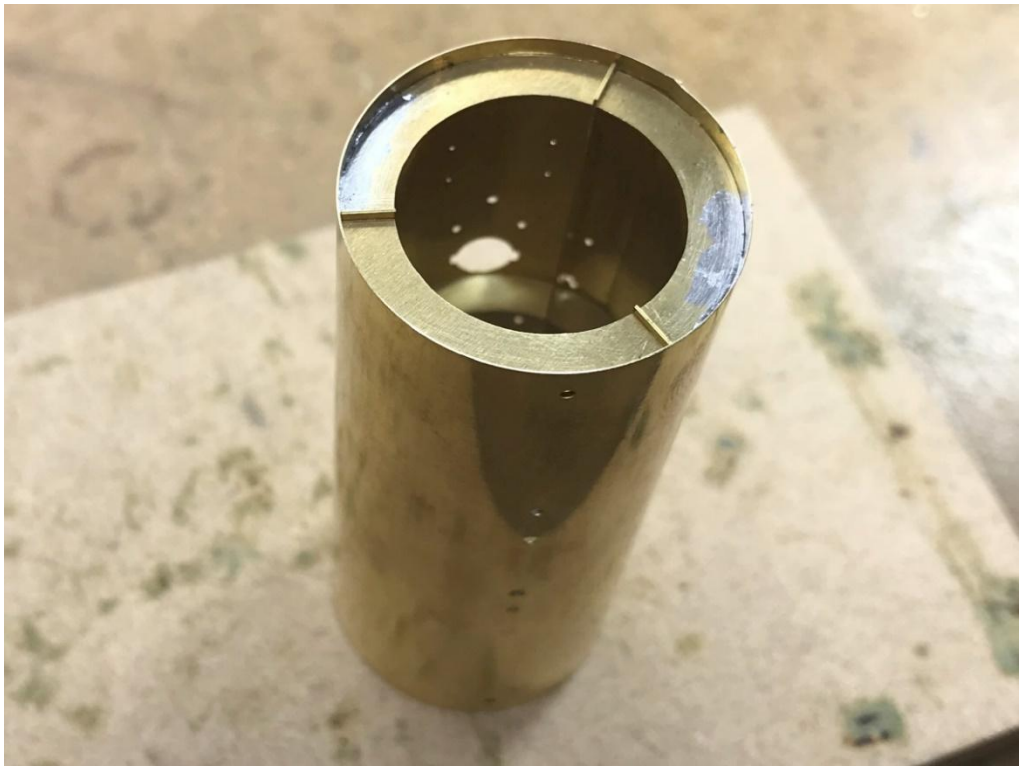


Next roll the inner tank wrapper. Make sure with the welded tank that the side that's been etched goes on the outside. Obviously with a riveted tank the rivets will go on the outside. I use a ½" brass bar to roll these resting the wrapper on my inner thigh. Go easy and try to get the wrapper to be as good a fit as possible on the wrapper. You may find the edges a little tricky as they have a tendency to straighten after rolling. If you're having problems, then a solution is to stick the wrapper to the bar using masking tape and then roll it. It works, honest. There should be a lap joint between the ends and the part nearest the top of the tank goes on top. You should fit the wrapper so that the two small holes at the bottom roughly coincide with the holes in the tabs on the outer formers. The middle former is there so that you can apply a little pressure to hold the wrapper in the right place. When fitting the inner wrapper make sure the middle former misses the holes for the fittings.

I generally only solder the inner wrapper a little in the middle and then to the formers at the end. You will need to set the ends of the wrapper away from the spacers on the former. You will need 1mm thick material to do this. I cut a triangular piece of plasticard to do this, but a circle would probably be better.



Rest the tank former on top of whatever you're using to set the wrapper and then solder the inner wrapper the former at the opposite end. You only need a little solder in a couple of places. Solder the wrapper to the former at the other end.



Roll the outer wrapper of choice and fit over the inner wrapper so that the lapped join is on the opposite side, again with the part nearest the top of the tank on top. The outer wrapper should be a nice tight fit over the inner one. Once you're happy with the fit, solder along the edge. I don't worry about soldering the inner and outer wrappers together. The fittings or walkways will hold everything in place.

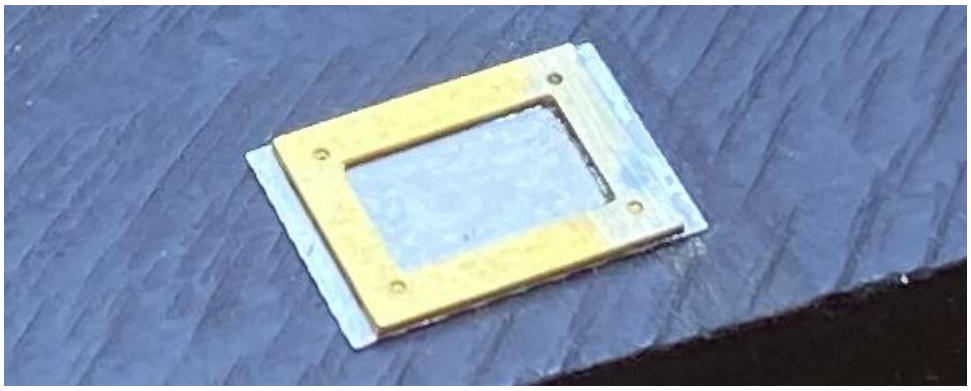
Walkways

Some 7'3" 1930s tank wagons gained walkways in the 1950s. Those in service with ESSO were fitted with two small walkways that sat on top of the tank. These were the same as those fitted to the Air Ministry wagons. In the late fifties, SMBP began fitting larger walkways with 4 supports to their wagons. Both types are included and are similar in that they consist of a frame and separate etched supports. These supports are designed to be located into holes drilled in the tank using 0.31mm wire. There is also a detail layer etched in stainless steel to go on top of the frame.

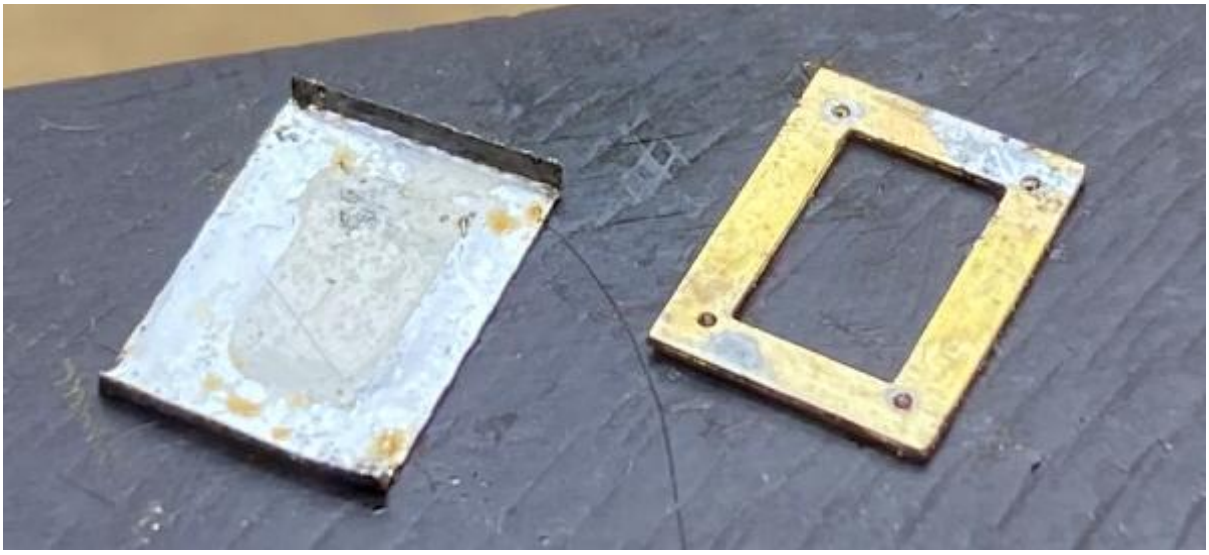
ESSO/Air Ministry type

I must confess at this point that the stainless steel Air Ministry walkway detail didn't quite come out as hoped. On the real thing the sides are folded down over the supports and I had hoped to make it easier for this feature to achieved by etching tiny fold marks on the back of the full thickness diamond pattern. It worked on the very first test etch but hasn't since. I'm not entirely sure why as it works fine on the 3 support walkways but it's way below my etchers tolerances so not much can be done about it. There are two choices, either trim the diamond plate once fitted or use the frame to score the back of and help fold up the detail layer. The latter will require soldering the stainless steel to the brass frame. This is fine if using something like Carr's brown label flux but be warned that this stuff is quite nasty, and health and safety advice should be adhered to.

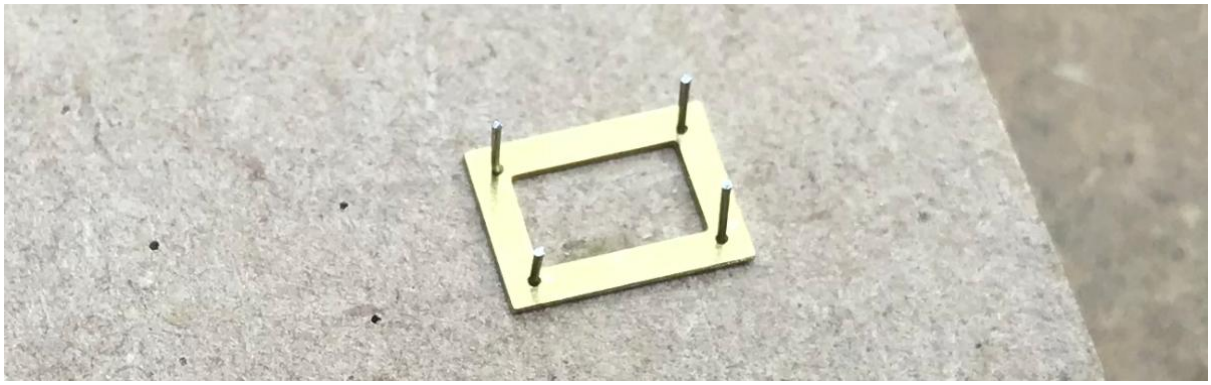
Assuming you don't want to just trim them, remove one of the Air Ministry walkway frames (F1) from the 0.012" fret and clean up the connecting tags. Remove the Air Min walkway detail from the stainless steel fret and solder the walkway frame to the back of it trying to get it as central as possible. You only need to solder it at the ends. Using a scalpel blade lightly score the detail layer at the point where the edge of the frame is.



You can now hold the frame and bend the ends of the detail layer, so they are at right angles to the middle. Unsolder the frame and repeat for the other detail layer.



To construct the walkway, use one of the Air Ministry walkway frames (F1) to drill four holes in a scrap piece of wood or mdf. Use 0.31mm wire to pin the frame to this construction jig.



Next remove two of the 7’3” Air Ministry walkway supports (G1) of your choice from the fret. Note there are inner and outer tank wrapper supports. Inner refers to the supports that sit directly on the inner (full length) tank wrapper and outer to the supports that sit directly on the outer wrapper in the middle of the tank.

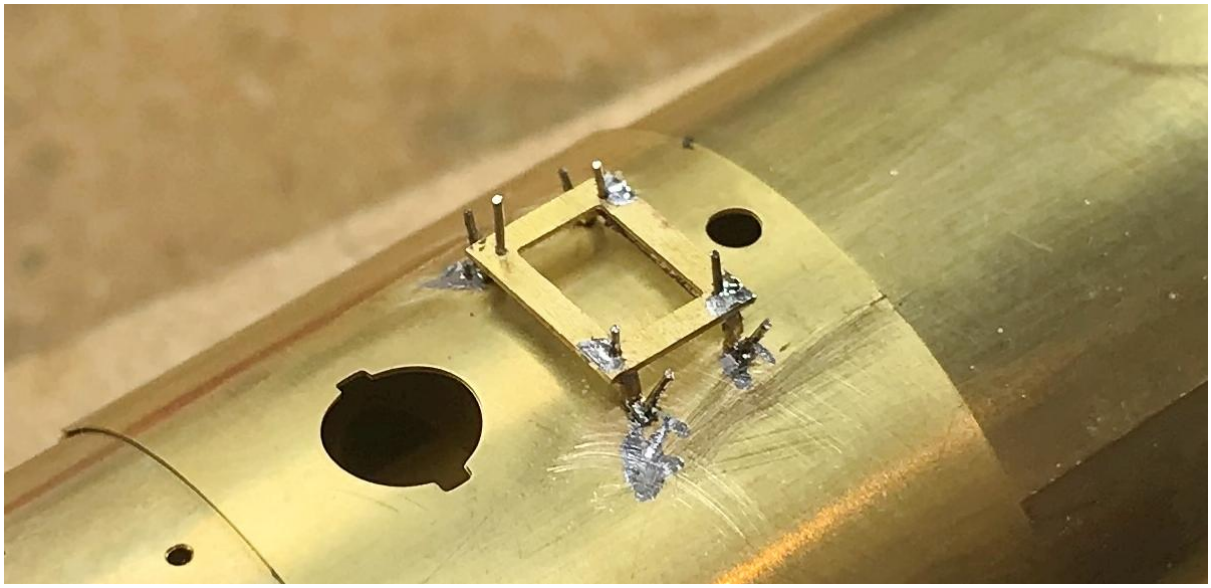
You will need one frame with inner supports and one with outer supports. Be aware that the supports are different lengths and keep track of which is which or, perhaps better still, only construct and fit one walkway at time.

Place the supports on the wire, locating the frame on the jig so that the fold lines next to the holes in the middle are visible. See image below. Solder in place and then file the wire flush with the supports.

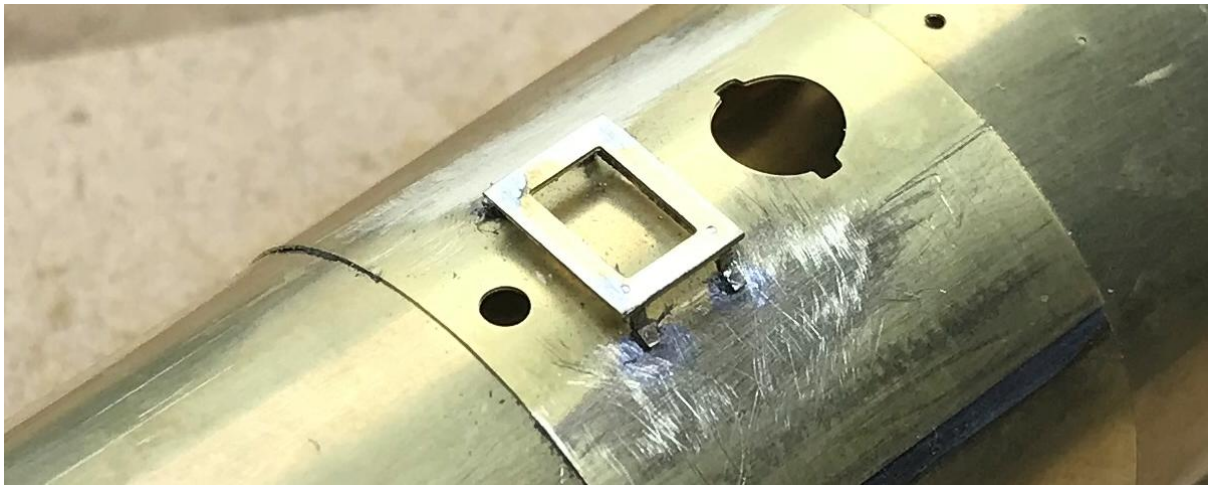
Drill 0.3mm holes into the jig through the outer holes in the supports. Insert short lengths of 0.31mm wire and solder in place. See image below.

Carefully remove the walkway from the jig and fold up the supports. The inner pair of folds should be through 90° and the outer ones on the opposite side should be though about 45° with the fold line on the inside.

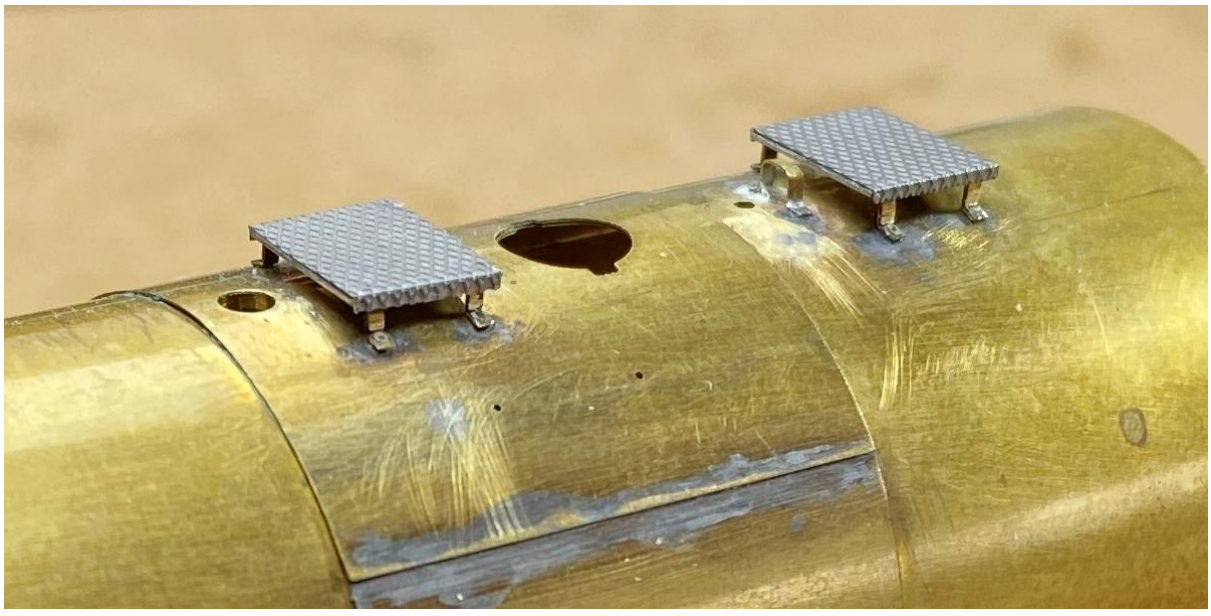
Fit to the tank in the appropriate place and tweak the supports if necessary. Solder the supports to the tank.



Clean up the wire so that it is flush with the walkway frame. As far as I know the supports were welded to the tank so cut/file the wire flush at the joins as well.



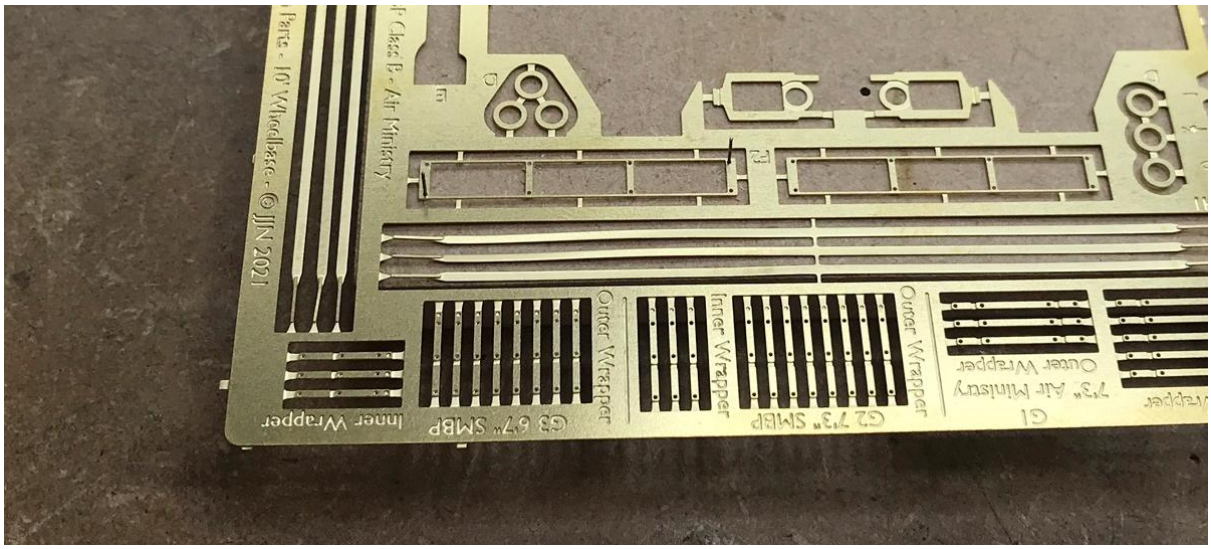
Finally, the detail can be fitted over the top of the frame. Solder or glue in place.



As has been mentioned previously, in the late fifties SMBP set about equipping their tank wagon fleet with a larger style of walkways set on either side of the tank fittings. They had a really good go at it and most of their older wagon wagons, including these 1930s ones, got them quite quickly. They featured a mesh on top rather than diamond plate which makes them a bit spindly as you can see through them to the frame underneath.

You will need to create a jig so you can assemble the SMBP walkway frames (F2) and 7'3" SMBP walkway supports (G2). Note that there are 6'7" SMBP supports on the fret for smaller tanks. You need the 7' 3" ones when the time comes.

Whilst still attached to the fret use one of the SMBP walkway frames to drill eight 0.3mm holes into a piece of scrap wood or mdf. Carefully remove frames from the sheet and clean up. The frame is a bit delicate so it might help holding the crossbars on the frame with a pair of pliers whilst removing the tags.



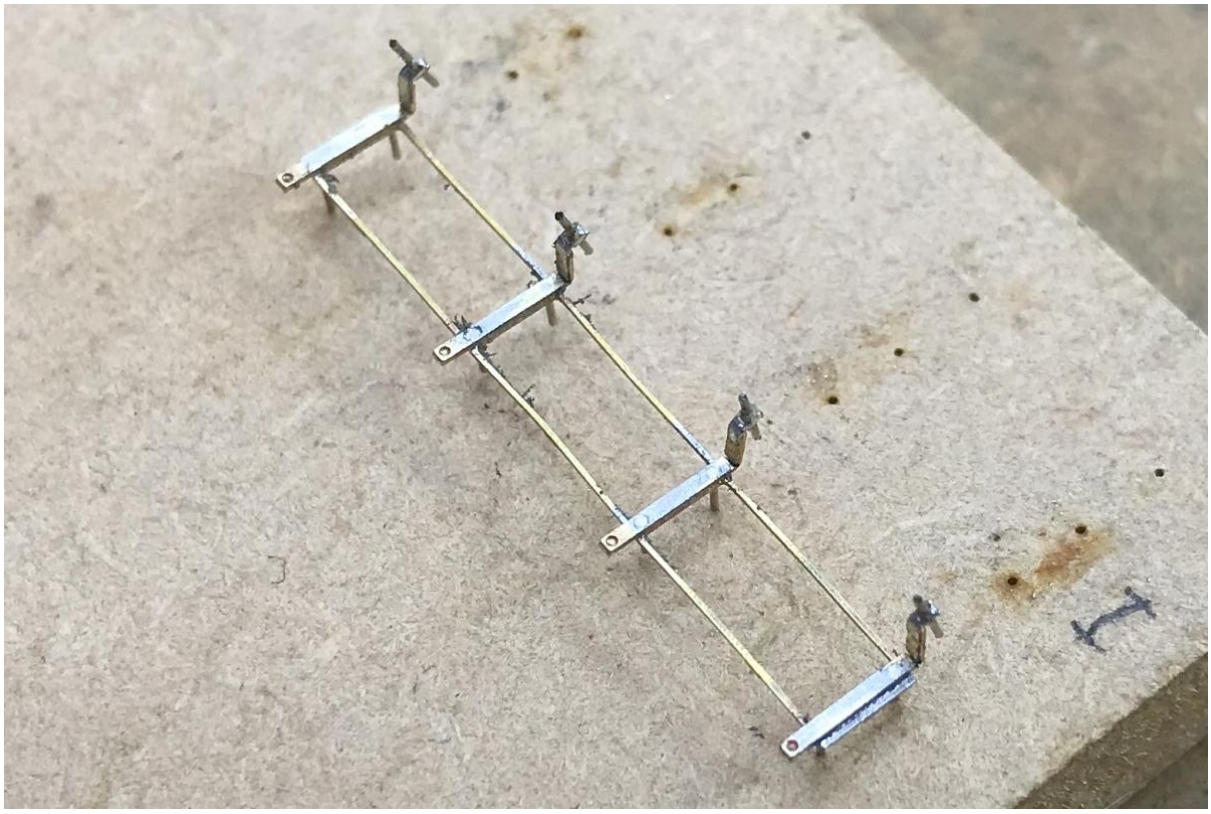
Use 0.31mm wire to pin the frame to this construction jig.

The walkway crosses beyond the outer (middle) wrapper at one end so you will need slightly longer supports at this end. The supports are labelled inner and outer. Inner refers to the supports that sit directly on the inner (full length) tank wrapper and outer to the supports that sit directly on the outer wrapper in the middle of the tank. You will need one inner and three outers for each frame. Take care to note which end the inner support is. I labelled the jig to make sure. See image below.

Place the supports on the wire locating the frame on the jig so that the fold lines next to the holes in the middle are visible. See image below but note that the second from left is the wrong way around! Solder in place and then file the wire flush with the supports.

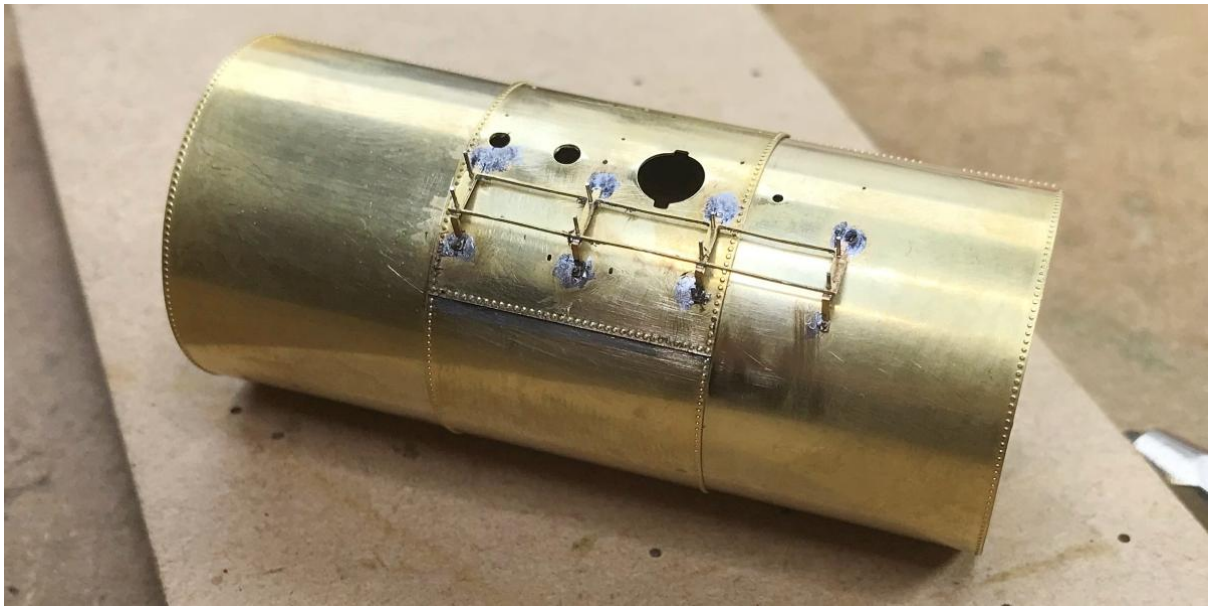
Drill 0.3mm holes into the jig through the outer holes in the supports. Insert short lengths of 0.31mm wire and solder in place. See image below.

Carefully remove the walkway from the jig and fold up the supports. The fold next to the frame should be through 90° and the outer one should be though about 45°. See image below.



Fit to the tank in place using the holes that have been drilled and making sure that the inner support goes on the inner (full length) wrapper.

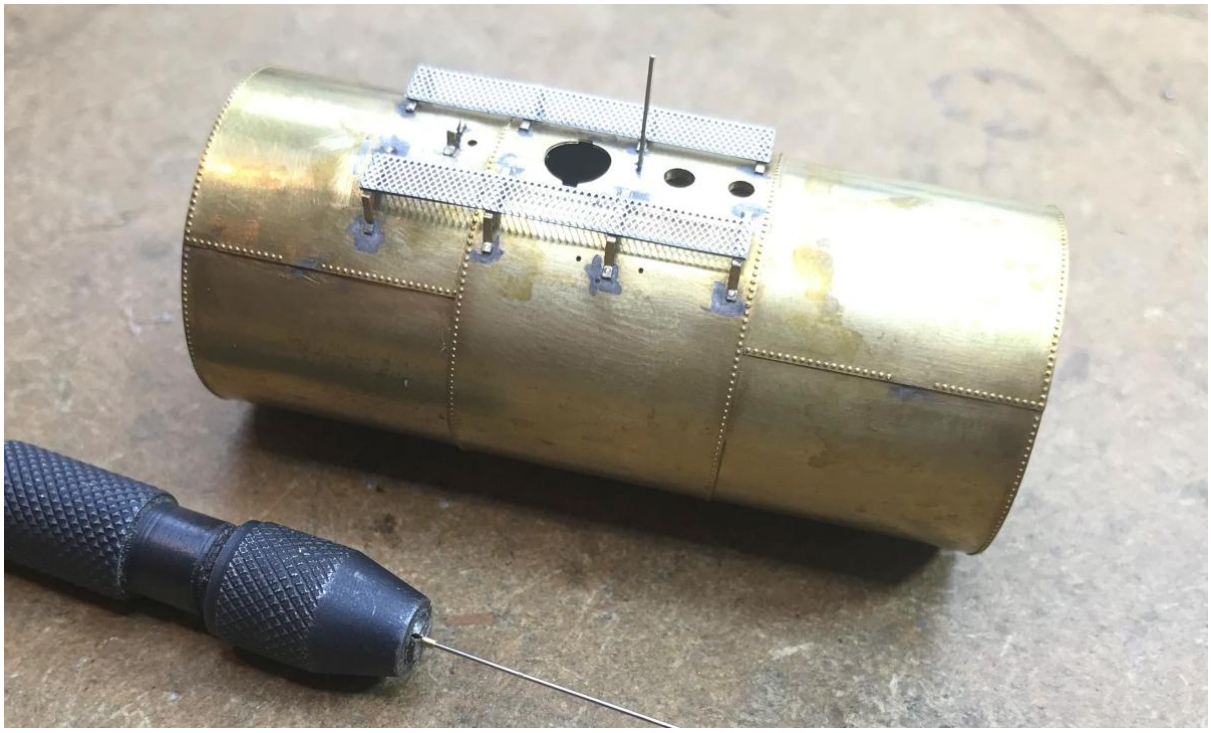
Tweak the supports if necessary and then solder to the tank, both where they are pinned and at the top.



Clean up the wire so that it is flush with the walkway frame. As far as I know the supports were welded to the tank so cut/file the wire flush at the joins as well.

Repeat for the other side noting that it should be a mirror image of the first one. This means you will need to drill new holes in the jig for the wire on the ends of the supports.

When both frames have been fitted and tidied up, the detail can be fitted over the top of the frame. Solder or glue in place. See images in the next section.



Saddles/Cradles

Next clean up the two saddles or the cradle. They will need some attention with a file so that they fit properly.

The saddles are deigned to fit to the completed tank and there is a spigot in the arc of each saddle to help alignment. These spigots fit into holes that are etched in the bottom of the tank either side of the outer (middle) wrapper. When you're happy with the fit glue in place with epoxy and check against the underframe as you go.

The cradle is designed to fit to the top of the underframe and there are spigots on the underside to help locate it. Temporarily fit the tanks ends to the tank (see section after ballast) and check the fit on the cradle before gluing the cradle to the underframe.

Ballast

I build my wagons so that they weight about 45g without the wheels and spring carriers. The only place to put any ballast on this wagon is in the tank. I used code 3 lead sheet cut so that was only slightly longer than the outer tank formers and of a width so that it brought the components of the wagon up to 45g. Don't worry too much about the 3D printed fittings or tank ends when weighing things as they won't contribute much.

Roll the lead sheet so that it matches the radius of the holes in the tank formers, insert int the tank and solder to the end formers making sure it sits at the bottom of the tank.

Tank Ends

Now is a good time to fit the 3D printed tank ends. You may need to fettle them slightly to get them to fit on the ends of the tank. I glued my tank ends in place using epoxy.

With the tank done and ends in place, the end stanchions can be fitted to the underframe and the associated stays added as well if you haven't already. This was covered earlier (from page 37) before we got onto making the tank.

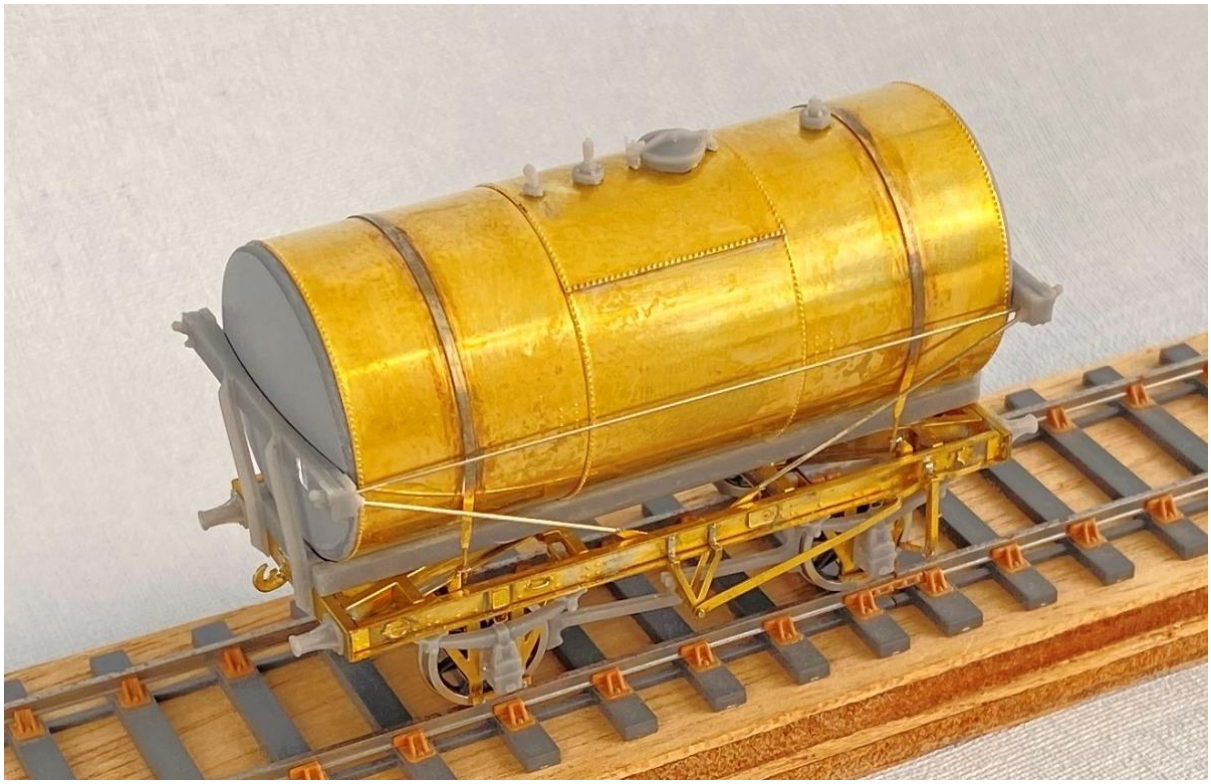
Important!!! Do not glue the tank to the underframe at this point until you have read the section that following:

To Glue or Not to Glue

We haven't really covered how this wagon is going to be painted. I have tried painting complete tank wagons with tanks a different colour to the underframes and it is a complete nightmare. You basically have to paint the tank the right colour and hand paint the underframe with all the accessibility problems that come with this type of wagon. I would strongly recommend, at least as far as class A tanks go, that you keep the tank separate and paint if before gluing in place. You can add everything to it, including the tank straps but take care when handling it. It's bit of a fiddle fitting the tank in place and getting the tank straps in the brackets but that is nothing when compared to trying to paint the underframe with the tank in place.

Tank Straps

The last bit of soldering work on the tank is to fit the 7'3" tank straps (H1). Curve them to shape and apply a good amount of solder to the backs before sweating them on. The straps basically went all the way around the tank and then vertically down into the tank strap brackets. There is full thickness detail at the end which go into the tank strap brackets. You need to make sure these fit into the strap backets before soldering the straps in place. The back of the strap is the side where everything lies in the same plane.



Fittings

With the all the soldering work done on the tank, the 3D printed fittings can be cleaned up and attached. Refer to the 3D Parts Illustrations on page 12 to identify the parts. Some will require a little fettling to get a good fit. I used 5 minute epoxy to glue these parts in place. Superglue is also an option, but you'll need to be spot on with the orientation of the parts. I also found I needed to use a little Milliput to tidy up some of the bases of the fittings. Fig.8 below gives the typical layout of the fittings on a 1930s class A tank. In some cases the discharge pipe was replaced by a siphon block, on others there were both.

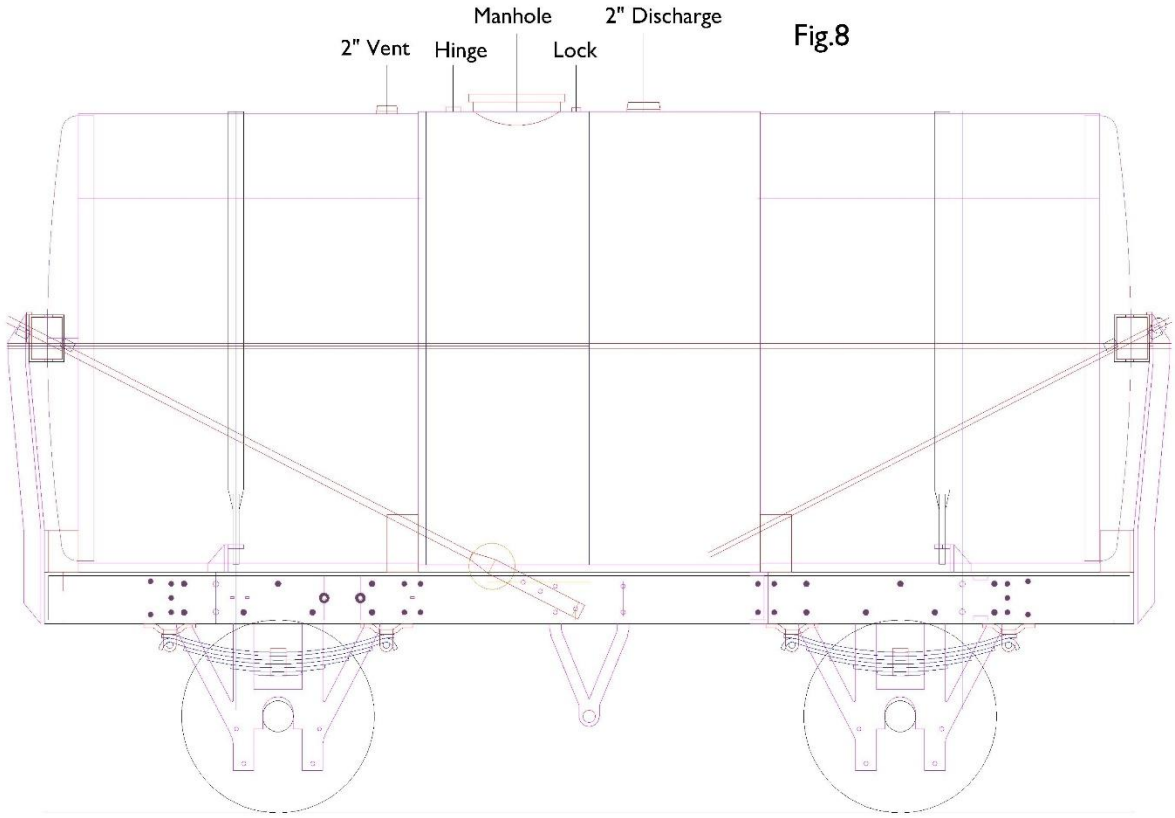


Fig.8

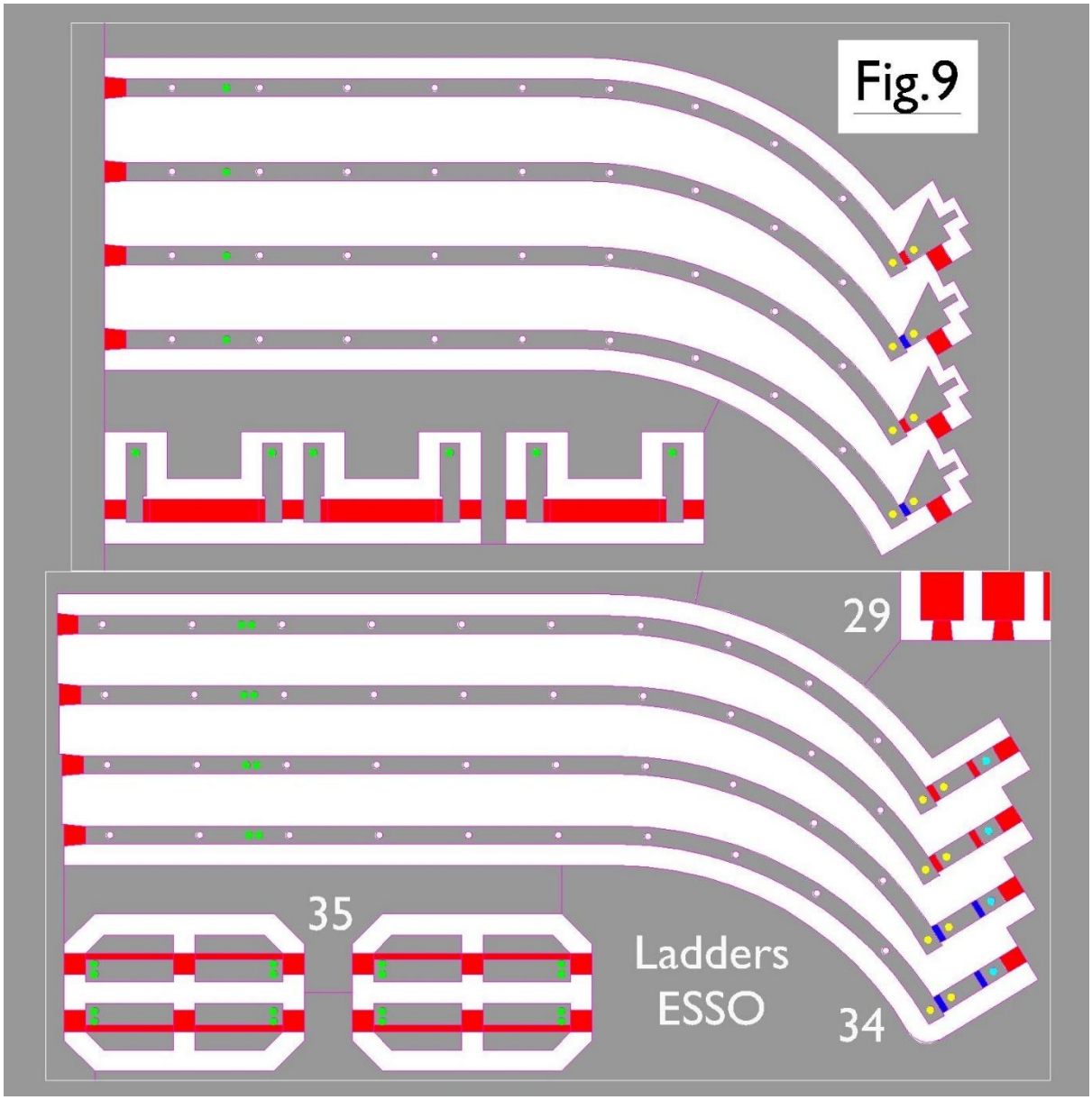
Start with the manhole, this is the fitting that will need the most work. Be careful with this part as the tiny locking handle is delicate. I have beefed them up as much as I wish to without them looking clunky and out of place with everything else. There is a lot of 'base' to the manhole and also a small spigot at the very bottom all of which is entirely deliberate. The flange around the bottom of the visible part of the manhole will need dressing with a small square file to get a good fit. The spigot at the bottom is there so that you can hold the manhole in a pin vice whilst doing this. Once you are happy glue in place noting which end the hinge for the lid and the lock are. See Fig.8 above.

Fit the discharge pipe/siphon block and air vent. The air vent has a bend at the top and this should face towards the side of the wagon.

Ladders

The 7'3" 1930s wagons weren't fitted with ladders when first built. Over time, some of the oil companies that came into possession of them added ladders. There were broadly two types, those fitted by SMBP in the late fifties when they also fitted their style of walkway and a slightly different type fitted by ESSO. I'm not entirely sure when ESSO started fitting ladders to their wagons, I would guess in the late fifties also. As always a (correctly) dated photograph is of help. As far as I know the 7'3" 1930s wagons owned by other oil companies didn't get ladders but note that some of the smaller oil companies were taken over so National Benzole and Power Petroleum became part of BP in the late fifties and their tank wagons treated like any other in the SMBP fleet.

The ladders consist of etched rails to which rungs from 0.31mm wire and solebar brackets need to be added. Both types are made up the same way. Refer to Fig.9 below for which holes are for what part. The holes shaded yellow are holes for wire 'bolts' for the tank brackets, green are for the stays and cyan are for wire to pin the feet of the brackets on the ESSO ladders to the tank. All the other holes are for rungs.

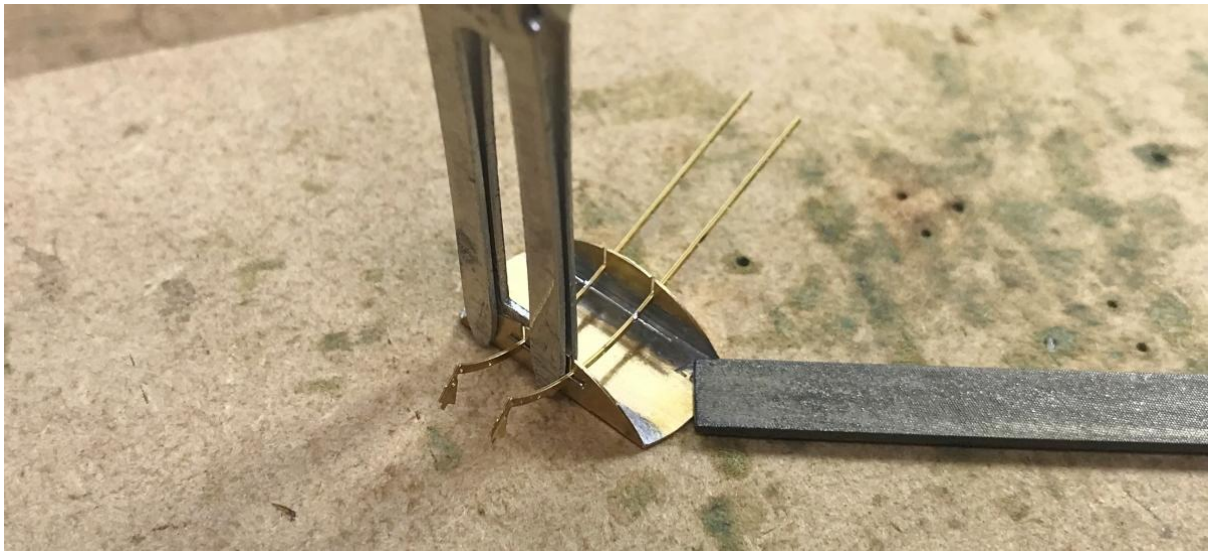


Remove the ladder jig (38) from the sheet and fold up into a C. Reinforce the fold lines with solder.

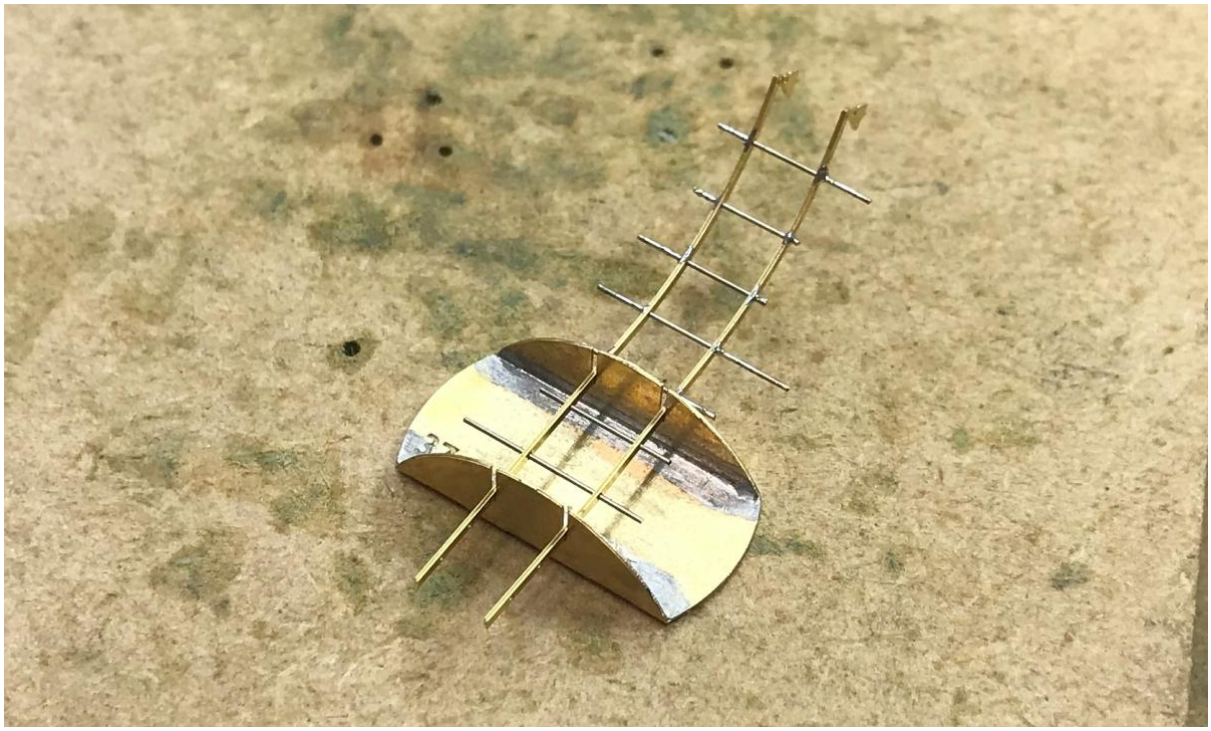
Before removing the rails of your choice (ESSO (34) or SMBP (35)) make sure all the holes can accept 0.31mm wire. I find running a 0.3mm drill bit held in an electric mini-drill through them fine for doing this.

Place the rails in the ladder jig making sure that the fold line at the top of the ladder for the brackets face towards each other so to be on the inside of the ladder. In both cases the brackets that attach the ladder to the tank will be folded through 180° and end up on the outside of the rails.

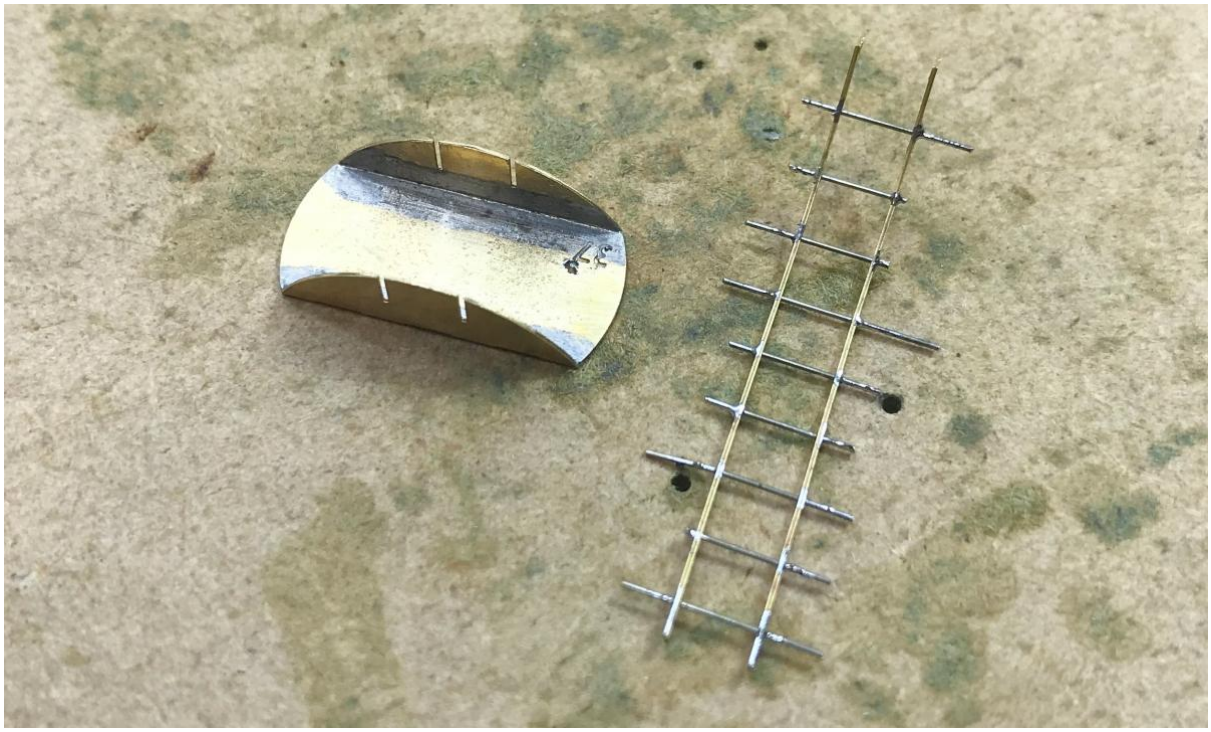
Insert a length of 0.31mm wire through corresponding holes in both rails somewhere towards the top of the ladder. Clamp this wire to one side of the jig using an aluminium soldering clamp or similar. Pass another length of wire through a corresponding pair of holes so that the wire is between the two sides of the jig. See image below. When happy that the wires are perpendicular to the rails (if the clamped wire is hard up against the ladder jig they should be) and the rails are sitting fully in the slots in the jig, solder the free wire to each rail.



Move the ladder in the jig filling up the holes with rungs. Make sure that when you add the wire you are soldering it between the sides of the ladder jig. I find it helpful to fit 2-3 rungs making sure a spare (and unsoldered) piece of wire is clamped against the side of the ladder jig. Don't pass wire through the holes green, yellow or cyan holes in Fig.9.



When all the rungs are done remove from the jig and trim the excess wire on the outside of the rails back and the file flush.



Fold the tank strap brackets at the ends through 180° with the fold line on the outside so the brackets sit on the outside of the ladder. See image below. You should find that there are holes in the bracket part and rails that now coincide. These are the holes shaded yellow in Fig.9. Note that the ESSO ladders have an extra fold line at the outer ends of the brackets. These will be folded down to form feet that sit on the tank.

Pass a length of wire through all four yellow holes and solder in place, soldering the tank bracket to the rails at the same time. See image below. Once fitted remove the middle section and trim the wire at each side to represent bolts.

Next, the stays need to be added (ESSO (35) or SMBP (37)). Make sure the green holes in the stays illustrated in Fig.9 can accept 0.31mm wire before removing from the fret.

The SMBP stays are done as one piece which needs to be folded into a C shape. The full thickness parts will sit on the outside of the ladder. See image below.

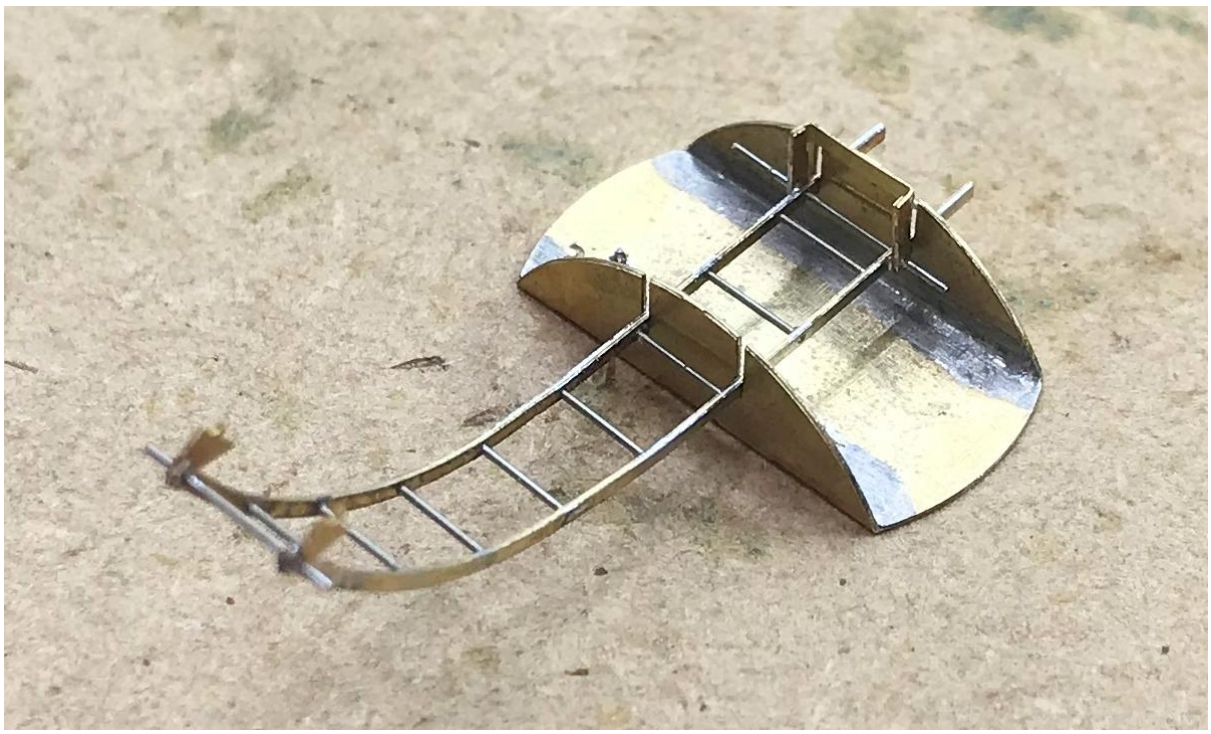
The ESSO ones need to be folded into a L shape. They fit on the outside of the ladder, so the flat or perpendicular part is towards the bottom. The stays will sit on top of the solebar.

In both cases the stays face towards the inside of the curve of the ladder.

Use one (SMBP) or two (ESSO) length(s) of wire to fit the stays to the ladder rails.

In the case of the SMBP ladder the jig can be used to make sure the stay is perpendicular to the rails.

The ESSO ladder stays have two holes so should automatically sit perpendicular to the rails.



Solder the stays and wire in place and then trim/file the wire to represent bolts.

The feet at the end of the brackets at the top of the ESSO ladders need to be folded up and lengths of 0.3mm wire soldered into the holes shaded cyan in Fig.9. These will locate the ladder on the top of the tank. I would try and leave one a bit long, so you have something to hold it with when painting. File the wire flush on the outside so that it isn't visible when the ladder is in place.

I would arrange to paint the ladders separately from the rest of the wagon and only fit in place on final assembly. It's possible they'll get in the way when doing transfers and even if not, you don't want to be resting the weight of the wagon on the ladders when applying them.

Cosmetic Buffer Springs

The buffer springs on the prototype were quite visible in the corners of the open underframe. I have included cosmetic ones. They have a spigot on them which fits into a hole in the buffer trimmer. If you are fitting sprung buffers, then these will need to be added after them. I add them after painting the wagon and at final assembly. They can easily be painted black or by hand.

They are open at the bottom and hollow to clear the buffer tails and retaining tube and there is a cut out to clean the wheel springs. They are as a result handed so make sure they go on the correct side.

As has been mentioned previously I think it is best to arrange for the tank to be painted separately to the underframe, at least on class A tanks. There are holes at the ends on the tank on the underside into which you can insert the ends of a loop of wire to hold the tank upside down when painting. I've used 15 thou plain steel guitar wire for this sort of job. If you form the wire into a loop and then put right angled bends in the end, inserting these into the tank, it will stay in place.

With the mixed media nature of the kit, you won't be able to use an etched primer as the prints won't like it. I would recommend using Halfords grey primer in a tin (not the rattle cans) to prime the model using an airbrush. This goes on with cellulose thinners and I usually mix the primer 1:3 with thinners. This primer doesn't affect the prints (it's acrylic and the cellulose thinners evaporate before they do any damage) and gives a lovely thin coat. The really good thing about this primer is that you can put any paint over the top of it, including cellulose which is great when it comes to silver paint…

If you are constructing a class A tank then you may need to paint the tank silver. I would recommend the Alclad II range of paints for this and in particular their High Speed Silver (ALC-125). This is cellulose based so you'll need a decent primer to provide a barrier to the prints. The Halfords grey primer in a tin will do this. Alclad also do a range of primers for their paints and they also do micromesh polishing cloths. Make sure you put the Alclad paint on before any others and give it plenty of time to dry.

Generally post war everything above the solebar on a class A wagon was silver including the end stanchions/crossbeams and stays.

The solebars on a 'silverette' class A wagon will need to be red. I've used Vallejo carmine red (70.980) for this before which I think is a good match. I mix the model colour paints 1:1:1 with Vallejo Flow Improver (71.362) and Airbrush Thinners (71.261). I've tried putting the red on first, masking and then painting the underframe black and I've also tried putting the red over a black underframe. I would definitely recommend putting the red on first. It took so many coats to cover the black that the finish was very thick and I stripped the model and start again. I've found Vallejo paint can give a very good finish but don't try to put too much on in one go or it will dry in the nozzle of the airbrush. I use a maximum of 12 drops of paint in one go and clean it out immediately with airbrush cleaner.

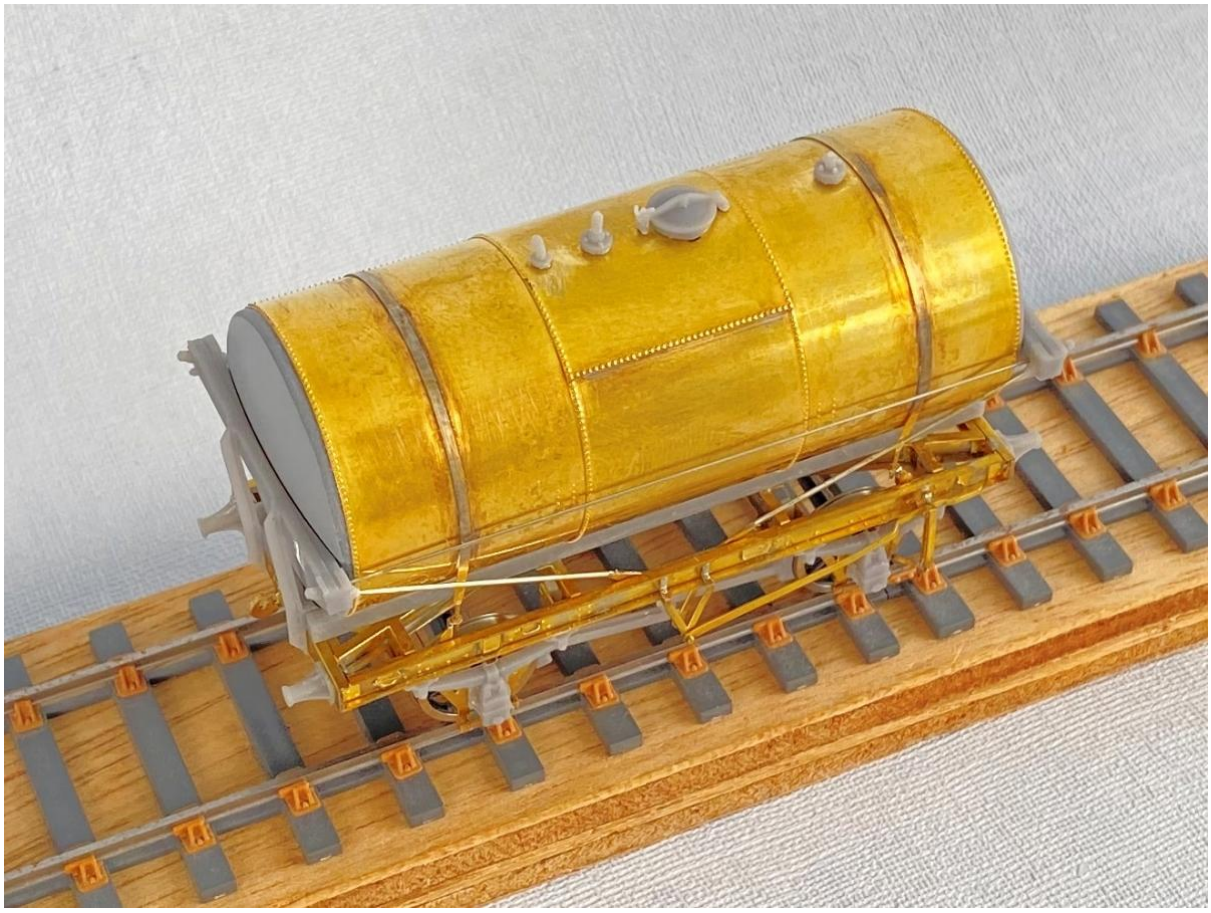
The rest of the underframe on class A wagons was black. This may require a bit of hand painting unless you're really good with an airbrush.

Waterslide transfers will need a really glossy surface to go on properly. This can be knocked back with matt afterwards. I've used Vallejo polyurethane varnishes successfully in the past for this. I generally apply the gloss (26.650) for transfers using a good quality flat soft brush with the varnish mixed 3:2 with Airbrush Thinners (71.261). I airbrush the matt (26.651) finishing coat mixing it 1:1 with Airbrush Thinners (71.261).

When assembling the model for the final time, fit the spring carriers/wheels and spring buffers first. Fit and paint the cosmetic buffer springs. Fit and glue the tank in place. I just glue the tank on at the bottom of the saddles with a little glue to hold the crossbeams on the tanks ends. Make sure that the tank straps go into the brackets on the back of the solebar. The straps also go behind the angled crossbeam stays.

Oil tanks were reasonable well cared for but will need a bit of weathering to knock back a very clean model. There are lots of different ways to do weathering. I would like to put in a big plug for a gentleman called Mike Confalone who does some of the most realistic weathering I have ever seen. He has a large proto-freelance HO layout called the Allagash set in Maine in the mid 1980s and uses artists oil paint and a product called Pan Pastels for weathering. I have tried his techniques and have been really happy with the results when using them. Pan Pastels are finely ground artists pastels and have a bit more to them than powders, not being a completely dry medium. They are applied using a good quality flat soft brush. Raw Umber (780.5) is a good general grime colour and Raw Umber Tint (780.8) is also useful for highlights. Burnt Sienna Shade (740.3) is good for representing rusting though I would not expect too much of that on an oil tank.

If you are interested, then do an internet search for Mike Confalone Weathering. He has done a couple of weathering DVD downloads for Trainmasters TV including one on weathering freight cars. They are all of big American bogie wagons but the techniques are still applicable to our British steam era wagon.



Justin Newitt - June 2024

Suppliers List

Cambrian Models (brass wire)
https://www.cambrianmodelrail.co.uk/

Lanarkshire Models and Supplies (cast buffers)
www.lanarkshiremodels.com

MJT (buffer heads)
www.dartcastings.co.uk

Wizard Models (buffer heads)
www.wizardmodels.ltd

Brassmasters (coupling links)
www.brassmasters.co.uk

Alan Gibson Workshop (wheels and bearings)
www.alangibsonworkshop.com

Scalefour Society and EM Gauge Society Stores (Exactoscale wheels and bearings)
www.scalefour.org
www.emgs.org

Cambridge Custom Transfers (transfers)
www.cctrans.org.uk

Fox Transfers (transfers)
www.fox-transfers.co.uk

Modelmaster (transfers)
https://modelmaster.uk/

Powsides Transfers (transfers)
www.powsides.co.uk