

DS74 BR[S] B0-B0 ELECTRIC LOCOMOTIVE

IT IS STRONGLY SUGGESTED THAT YOU READ THROUGH COMPLETELY BEFORE TOUCHING ANY PARTS

PARTS LIST

Item	Qty	Mat.	Remarks
Trucks and Bogie	1	NS	Etch Sheet
Cab front	1	NS	Etch Sheet
Cab Window Frames	1	NS	Etch Sheet
Footplate	1	NS	Etch Sheet
Frame	1	NS	Etch Sheet
Cabsides	1	NS	Etch Sheet
Cab trim	1	NS	Etch Sheet
Cab Windows	1	NS	Etch Sheet
Whistle	1	LW	
Headlamp	2	LW	On cab front
Deadman's handle	1	LW	Bulleid-Raworth pattern
Handbrake handle	1	LW	Bulleid-Raworth pattern
Buffers [Dumb]	4	LW	
Shoebeam	4	WM	Note: they are handed on each sprue
Headstock	2	LW	
Axlebox	8	WM	
Footplate box	1	Resin	optional
Control desk	1	Resin	
Resistance Box	1	Resin	
Paired Air Tanks	1	Resin	
Equipment Housing	1	LW	
Cab footsteps	1	LW	
Footplate fusebox	1	LW	
Handrail pillars	12	LW	0.7mm hole pre-cast
Piano front casting	2	LW	
Exhaust port	1	LW	
3mm x 1mm angle		Brass	2 x 137mm lengths
10BA nut, bolt & washer	3CH	Brass	Bogie and truck pivots
Frame top hat bearings	8	Brass	Slaters 7920 pattern for 3/16in. axles
2mm wide NS strip		NS	2 x 61mm
0.5mm wire		NS	Footplate Handrail
0.7mm Copper wire		Cu	For roof rainstrips 110mm
0.9mm wire	3in	NS/Brass	Pony truck support wire
0.5mm wire		NS/Brass	Cab door and cab front handles
Copperclad sleeper	1		For pick-up purposes
Phosphor-Bronze strip	1	PB	45mm - For pick-up purposes
3-Link coupling	1pr		Tower Models pattern
Headstock Lamp	2	WM	
Glazing		Styrene	0.25mm thick

Note: Wheels and Motor/Gearbox are not included.

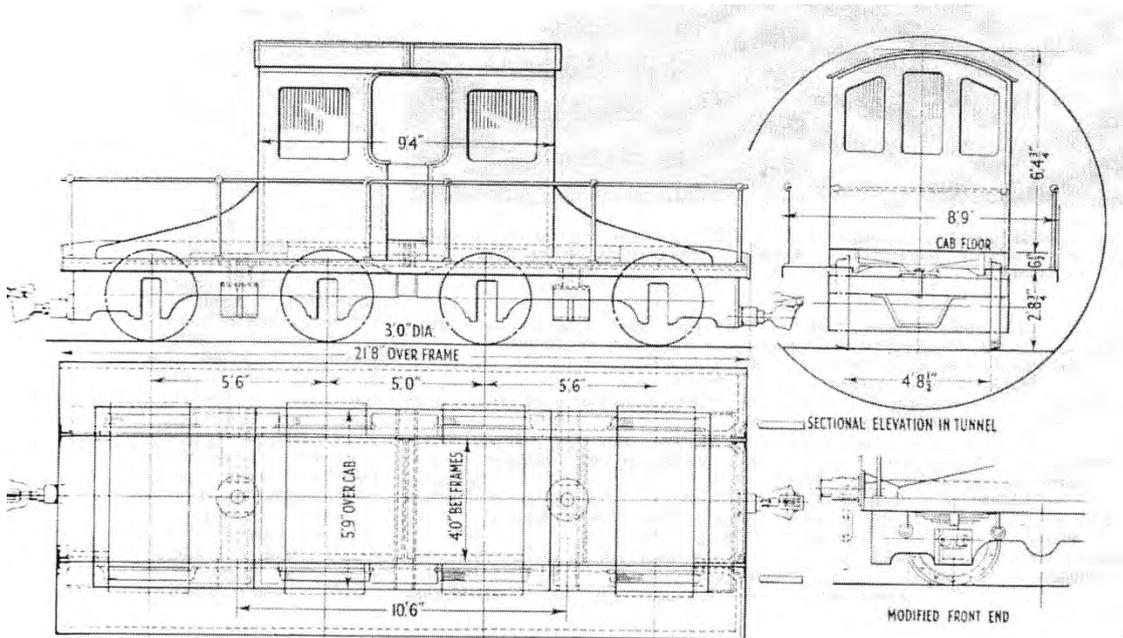
I suggest 4 axles of Slaters 7836ST or equivalent - <https://slatersplastikard.com>

Given possible future likelihood of finding supply difficulties with Mashima 1833 motors, I successfully used a 1525 motor [Reference: TVM-MAM-1525-5-12.5-12.5] supplied by Taff Vale Models [029-2002-6122 taffvalemotors@gmail.com].

The gearbox used in the photographed test-build was a Roxey Mouldings 26:1 designed for use with a Mashima 1833. The mounting screw hole positions in this gearbox are however, wholly compatible with the TVM motor. Roxey Mouldings contact no: 01932-245439 or www.roxeymouldings.co.uk.

HISTORY

Loco as built:



Loco as operating around 1948-50:



DS74, previously known by the SR as 74s, was the first electric loco to be built by a UK mainline railway company.

Designed by Dugald Drummond, it was built at Nine Elms Works in 1899 to the tube railway loading gauge as it was intended to work on the newly built Waterloo & City Railway. Hence it was designed

with a height from railhead to top of cab of no more than 9ft 8inches.

As it happened, it spent its early years hauling coal to the LSWR power station at Waterloo and by 1913-15 had been transferred to the Durnsford Road power station at Wimbledon where it spent the rest of its life hauling coal trucks. When that power station closed, it was withdrawn and subsequently scrapped [around 1965 according to JC Gillham].

Although identified as DS74, at no stage in its BR days did the loco actually carry any external crests, numbers or ownership markings. We know from contemporary writings that its bodywork was painted green but it is not now known which of the various SR/BR shades of green that might have been. However, all the photographs we have seen suggest that it was always heavily coal-dust weathered!

As built, it had symmetrical curved bonnet covers and could be driven from either end. At some point in its early life, the loco was rebuilt with its resistor box re-sited onto a redesigned sloping bonnet and a single driving position installed at that end. Additionally it was given uprated electric motors [4x85hp] and some other cosmetic changes e.g., to the front cab windows.

Note that this kit is designed only to build the loco as operating in BR days rather than as originally built.

References:

Model Railway Constructor article by PF Winding, March 1959

The Waterloo & City Railway, John C Gillham, Oakwood Press 2001

INSTRUCTIONS

Firstly, I think it makes sense to read the entire set of instructions all the way through before touching any parts of the kit. This is one of the reasons why our newer kits have their instructions freely available on request from www.electrifyingtrains.co.uk

Having read the instructions:

This kit contains nickel-silver etches and wire, Lost wax brass castings, white metal castings and resin parts. Regarding the castings specifically:

Wash all resin parts with a "Cif" type mildly abrasive kitchen cleaner. **Do not** use "Fairy Liquid" type cleaners as their lanolin will leach into the resin and forever prevent paint and glue from adhering.

Using a very fine [800/1200] grade wet & dry paper, scalpel and/or needle file, remove any moulding pips and/or casting flash present. The pips tend to occur on those surfaces that will form the edges/surfaces to be glued together.

As a result of the white metal casting process, there may well be a small thin ridge of white metal flash occurring around the circumference that is also readily removable with a coarser grade of wet & dry.

Personally, I also run a fine grade of wet & dry over any pieces of wire as clean metal sticks and solders better than tarnished metal.

I used 5minute Devcon epoxy for all of the loco's resin and white metal parts. Deluxe Thin Rocket Cyano is good for the cab headlamps. Use this sparingly as any excess falling on the glazing material will cause it to "bloom". The styrene glazing was fitted in place using Deluxe "Glue 'N Glaze" as this dries clear and works just as well on painted surfaces. Small resin parts may best be secured using the technique of drilling, pinning and gluing using small scrap pieces of 0.5-0.7 wire. Carry out dry run assemblies and identify which are the mating surfaces for each resin and lost wax part. Lightly abrade these using a piece of wet & dry.

Soldering was done using an Antex 50W iron, Carr's 188 solder and Carrs green flux.

Important Note Regarding Bogie Clearances In This Model

The prototype loco was a B0-B0 with 5ft6in WB bogies BUILT TO WHAT WOULD BECOME THE LONDON UNDERGROUND TUBE LOADING GAUGE and a mere 5ft clearance between the rear axle centre of one bogie and the rear axle of the next. Designing the bogies to scale would leave a 4mm or less clearance between the two bogies frames which would inevitably cause problems when travelling around curved track of greater than prototypical curvature. Accordingly, this kit has been designed to maintain correct axle spacing but also employing an optical illusion to give the impression that two bogies are being used.

What has been done is to redesign the mechanism by using a swivelling pony truck to represent the leading axles of each of the two bogies and to have the two rear axles of the two bogies [one of which will naturally need to be motored] mounted in a 5ft WB 4-wheel inner motor chassis with some wheel/axle sideplay but minimal pivoting.

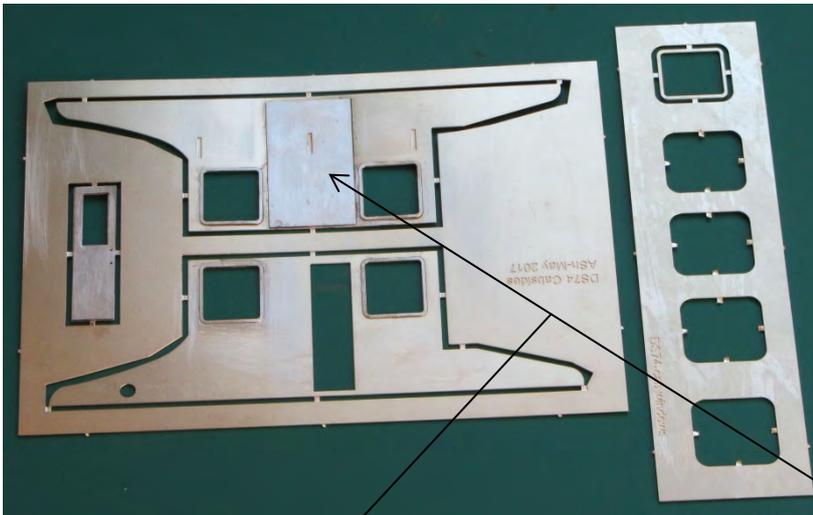
The cosmetic bogie frames have axleboxes in their correct positions but these frames only have three sides rather than the expected four.

Additionally, because of the tight clearances of the prototype, it is possible that as wheels swivel they will touch the superstructure. There are a number of ways around this but it will depend on what you choose as your final method of current collection. If you use the method employed in these instructions, then the surfaces that the wheel faces are likely to come into contact with should be insulated with a material such as "Copydex" or thin insulating tape.

Build Sequence

This loco kit divides into two basic modules viz., superstructure and footplate. The footplate further breaks down into three self-contained modules – pony trucks, motor bogie and the footplate itself. These may be assembled in any order.

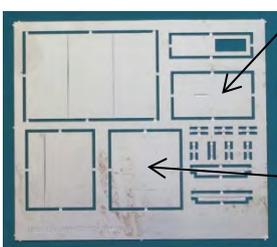
Superstructure



Remove four square window frames from the etch and solder into the half etched rebates on the superstructure sides. Note that there are various spare bits of etch scattered on the frets.

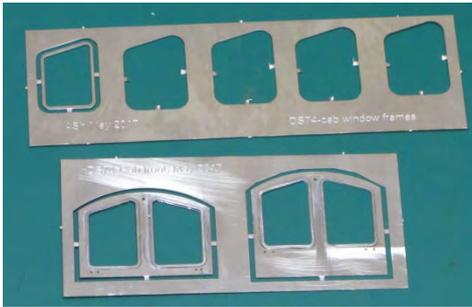
Push out the few superstructure half etched rivets – I used a GW press but any method will do.

From the cab trim etch, remove the large cab side reinforcing sheet and solder in place as shown.

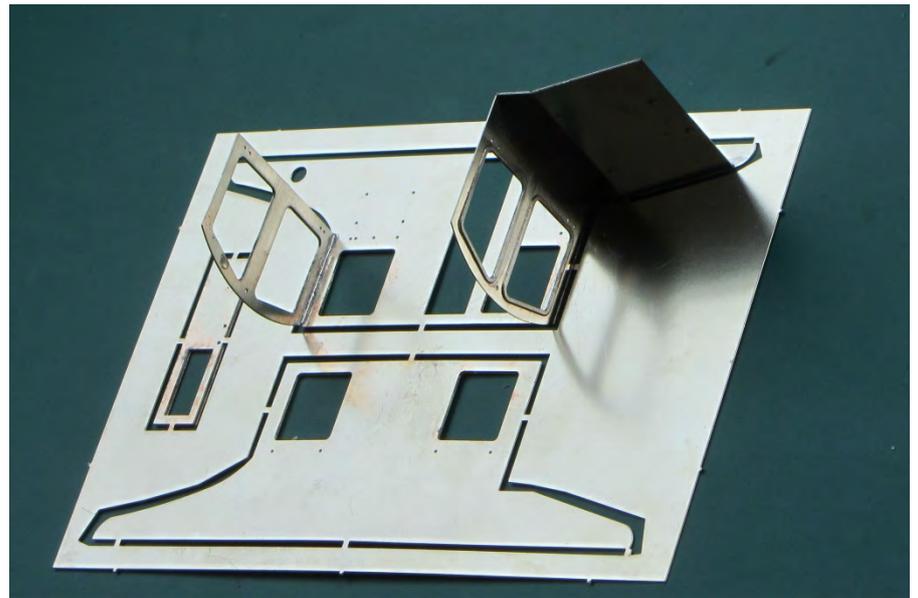


Also from the cab trim sheet, remove three of the short riveted strip and solder them in place in the three recesses on the cab side sheet.

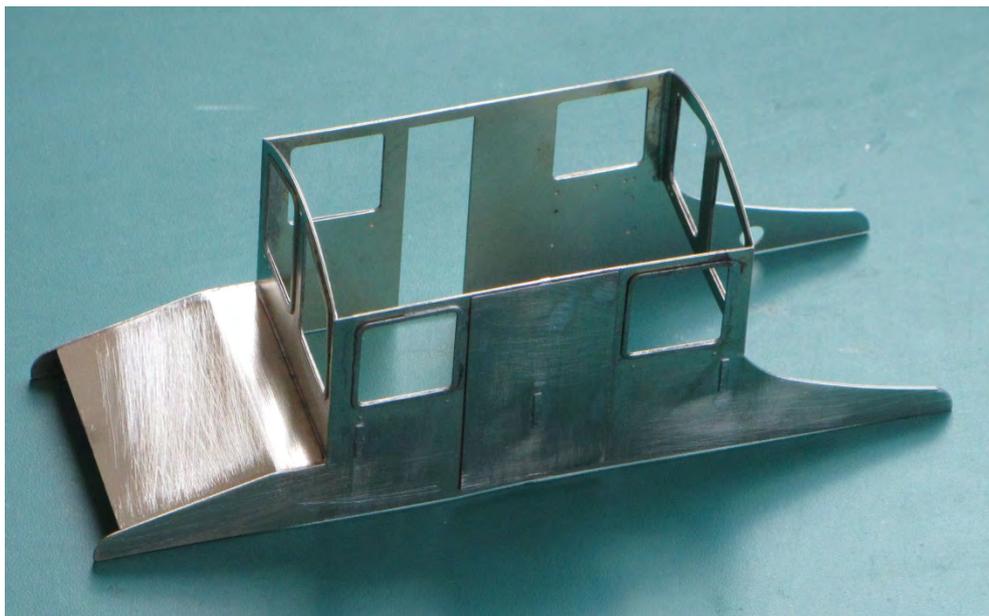
Also on the Cab Trim sheet, push out the half etched rivets on the roof etch.



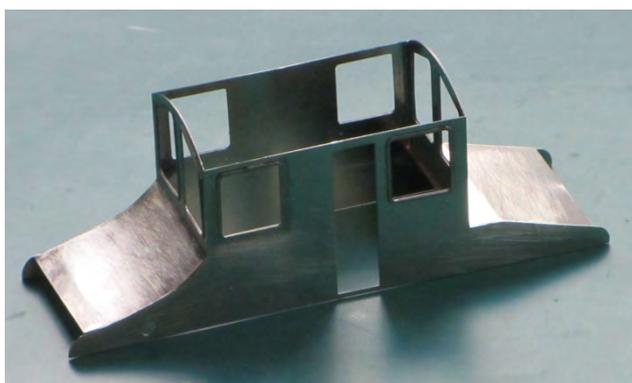
Solder four of the front/rear window frames into the half etched recesses on the cab end plates.



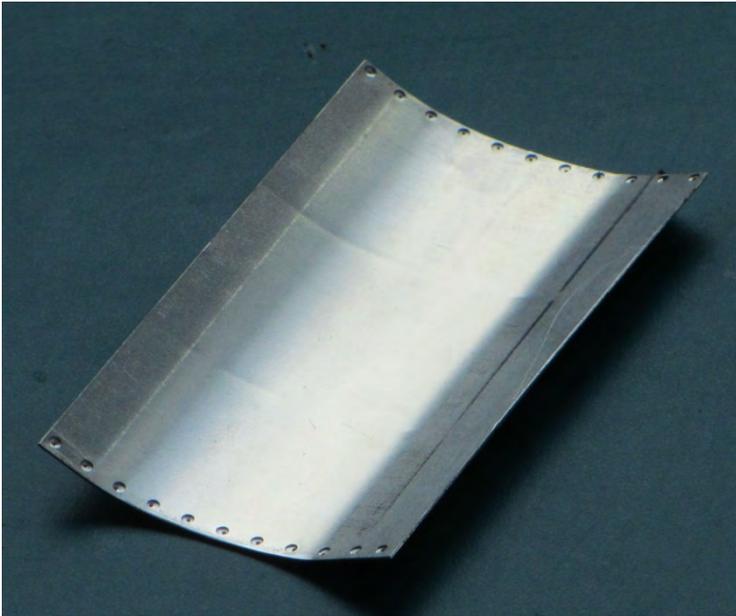
Put a roughly 15deg fold at the half-etched line on the front panel [found on the cab trim etch]. Solder the cab front sheet in place-note that it goes on the **inside** edge of the cab side sheet i.e., the cab front and rear sheets sit between the sides not the other way around. Solder the [shorter] rear panel in place similarly and then solder the now angled front panel in place as shown – It is aligned with the etched shape on the side sheet and like the cab front and rear, will eventually sit between the side sheets.



Remove both sides from their etches and carefully align - and solder the two sides together via the folded front panel sheet and both ends.



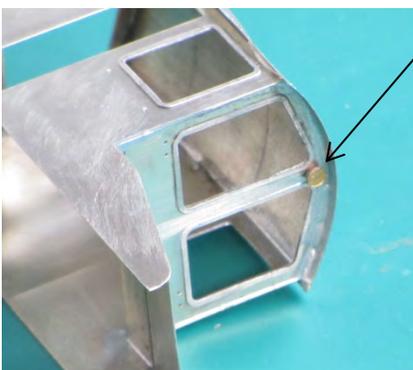
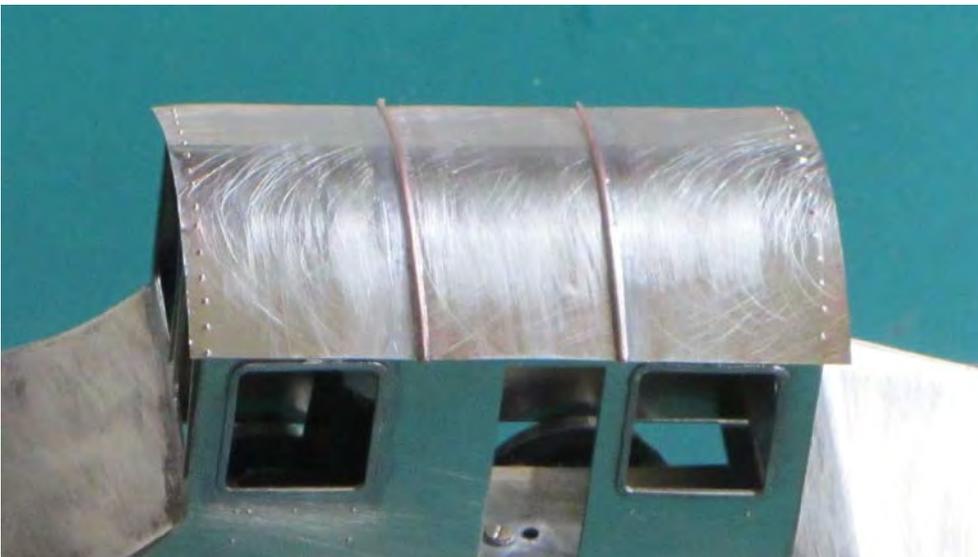
Using finger pressure only, carefully roll the rear bonnet side to match the shape of the rear part of the side sheets. I found it useful to anneal this piece of etch first. When satisfied with the shape, solder in place between the rear side sheets as shown.



Roll the cab roof till the profile matches the front and rear cab walls. Solder in place or clip [if a removable roof is preferred] in place with a couple of short pieces front and rear of scrap etch.

grooves [as rainstrips] and trim when done

Once roof is soldered on, solder two pieces of copper wire into the etched

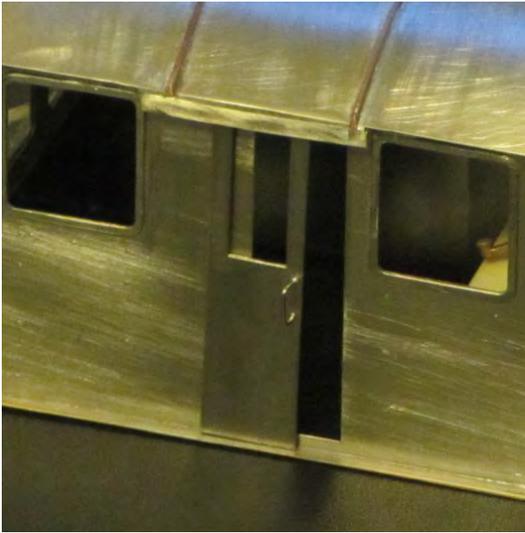


Glue or solder one of the LW brass headlamps into the hole between the two windows at each end.



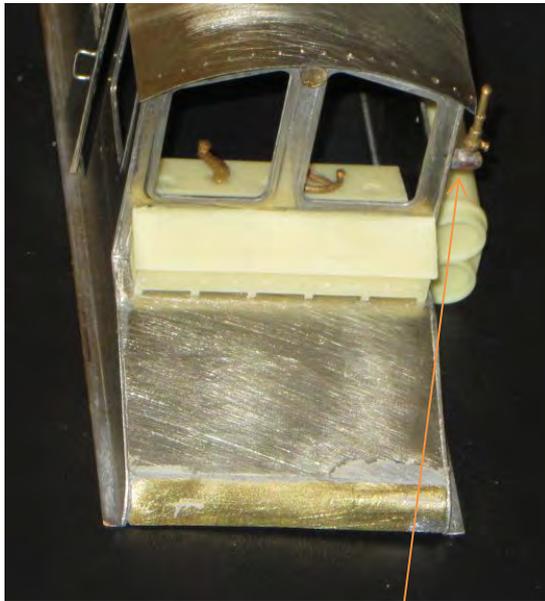
Fold up one of the cab door support pelmets as shown – All etched foldlines to the inside.

Solder the pelmet in position as shown in the photo below. Solder together the two door laminations and use a loop of wire soldered in place to make a door handle.



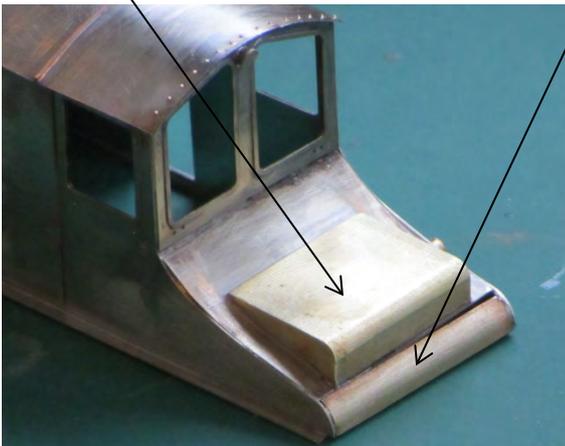
stage of construction [once the resin been attached].

Take the 137mm lengths of brass angle and solder to the superstructure sides so that the longer part of the "L" shape lies at 90degrees to the body side with the short side inside the body.



This pic shows the flange effect created once the angle is soldered in place. This photo was taken at a slightly later parts had

The remaining brass elements may now to the superstructure. These are the cover :

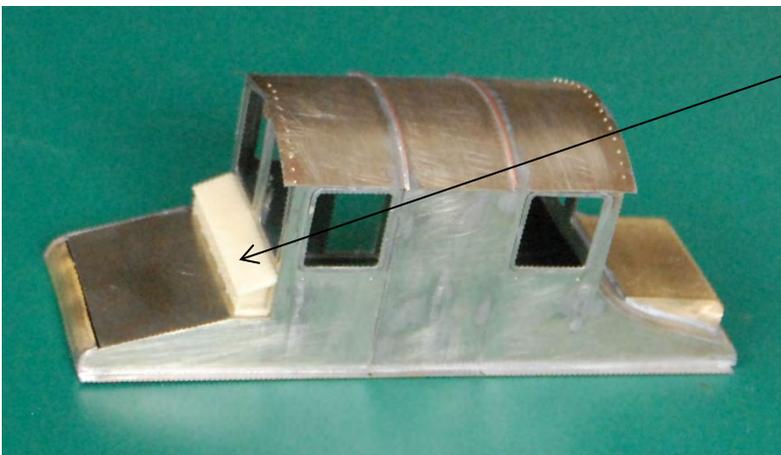


and the two "pianofronts" which are soldered front and rear between the sides.

The last brass casting to go on the superstructure is the whistle which is fitted onto a piece of scrap etch folded into an "L" shape and soldered to the cab side as in the picture above.

You may prefer to leave this more fragile casting till the very end of the construction of the loco.

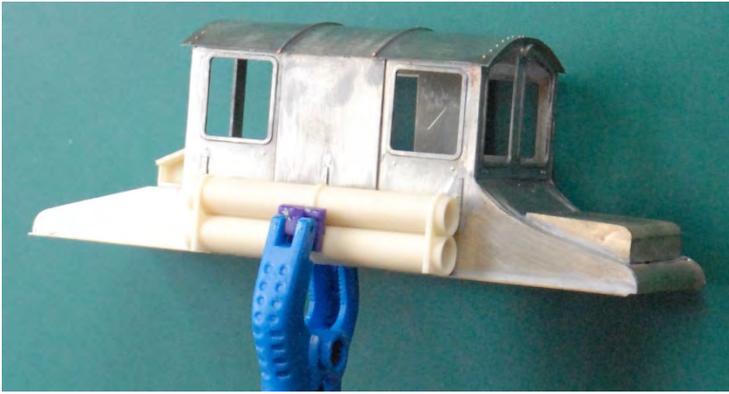
be soldered equipment



Glue in place the resistance box [grids] on the flat area at the driving end of the loco.

Glue in place the paired air tanks on the superstructure side opposite the one with the door. They should sit on the flange created by the soldered length of angle.

[as per picture on next page]



Take the resin dashboard casting and glue in place a circular handbrake casting and a "Deadman's Handle" as shown below:

Once painted, this can be glued in place into the cab after the cab has been primed and painted/glazed. The dashboard goes at the driving end which is the one with the resistance/grid boxes.



It is inserted as shown on the left.



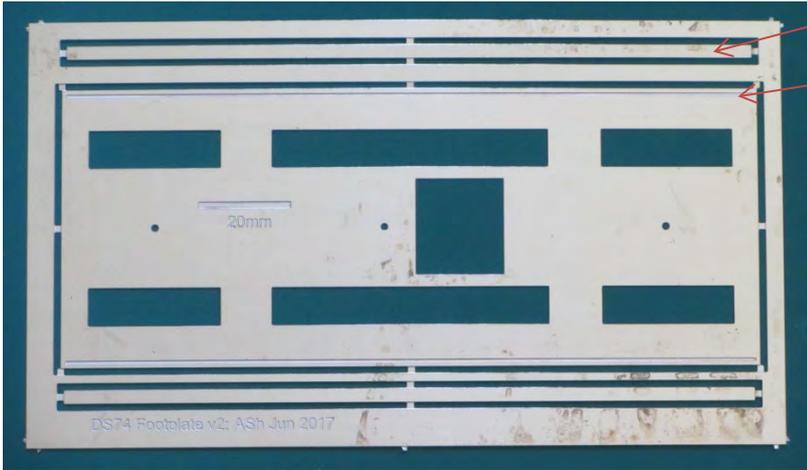
All that remains on the superstructure is to glue/solder the exhaust port into the hole in the body side aft of the cab door.

Below the two windows at this end are two small holes. These should have a small loop of wire glued or soldered in place

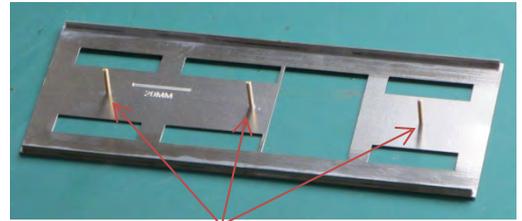
That completes the superstructure assembly.



Footplate Assembly



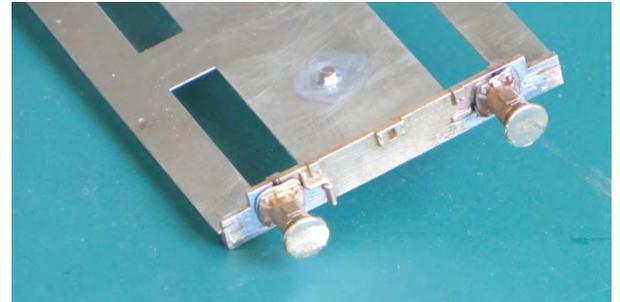
Solder the two valance strips into the half etched channels.



Solder three 10BA bolts into the footplate as shown – try to avoid getting solder on the threads on this side of the footplate!



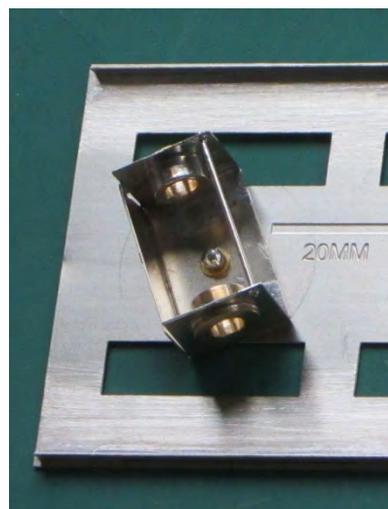
Solder the two buffer beams to each end



of the footplate:

Solder two buffers to the buffer beams – The centre of the buffer heads are 39.5mm apart with the top of each buffer's baseplate being 0.5mm below the top of the buffer beam.

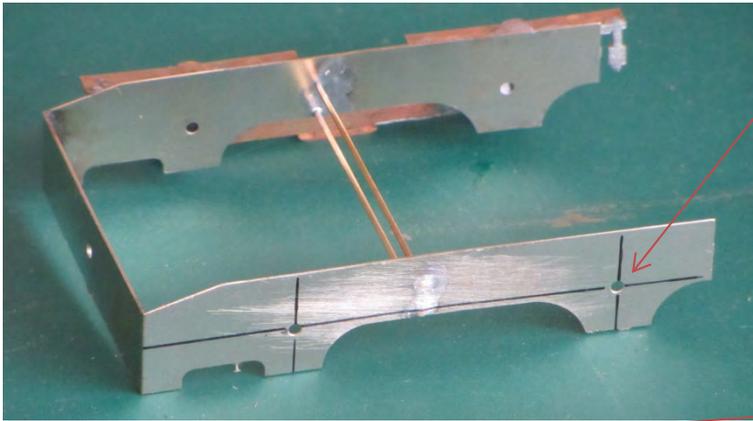
Set aside the footplate and fold up the two pony truck etches after having soldered in place the top hat bushes and a short piece of 0.9 mm wire to act as a support brace.



Remove the axle and locate the pony trucks over the two end 10BA bolts. Add washer and nut and tighten sufficiently to allow the truck to rotate. Carefully fix the nut in position with a spot of paint or solder and trim excess bolt that might interfere with fitting the axle.

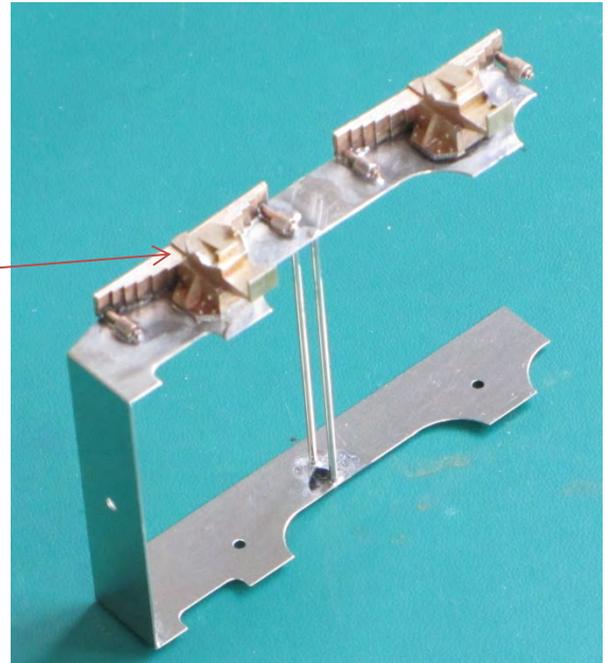
Fit the axles and the wheels to both trucks.

Using a square, fold up the sides of the external cosmetic frame and solder the joint lines. You may wish to insert a couple of pieces of 0.9mm wire through the holes to give some temporary support [but they will be cut and discarded soon anyway].



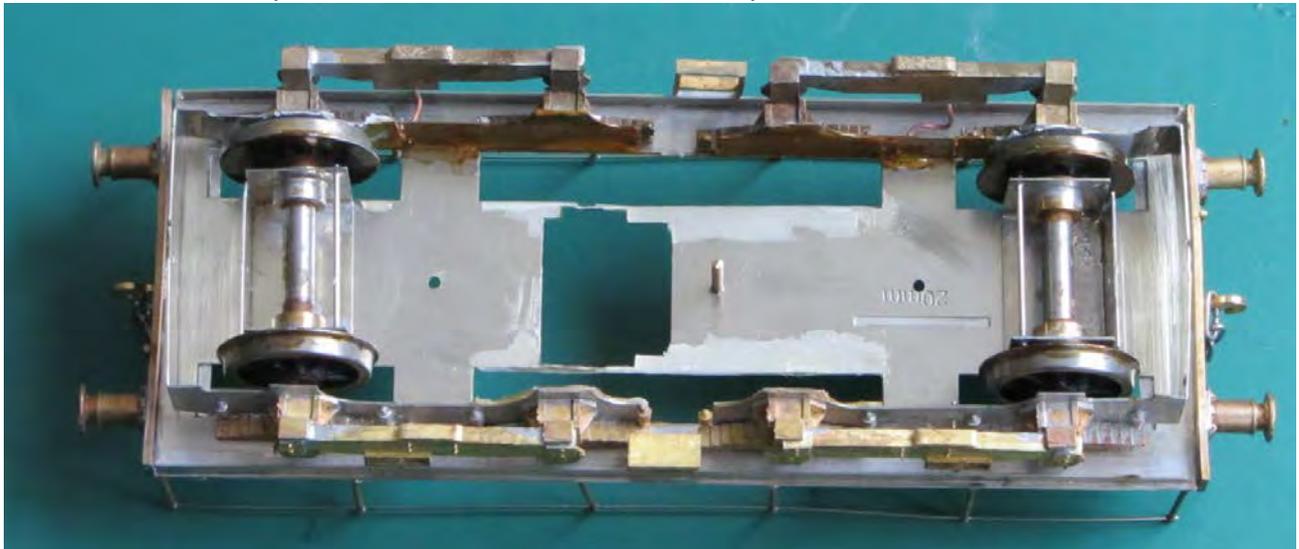
I found it useful to draw a couple of thin lines to help align the eventual position of the cosmetic axleboxes.

Solder the axle boxes in position:
 [The dimple in the back is centred over the hole in the frame.]



Solder or glue the shoebeams in place – note that they are handed in terms of the relative positions of the fuseboxes on top.

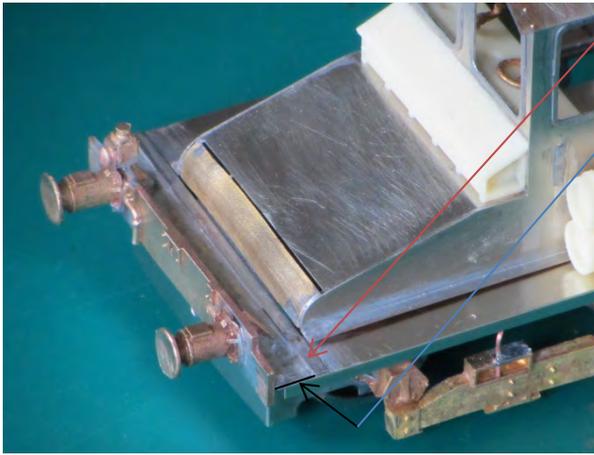
With the pony truck wheels and axles in place, remove the frame supporting wires [if used] and solder the frames in position on the underside of the footplate as shown:



Align the wheel centres with the axleboxes with the axles at 90degrees to the long axis of the footplate. Note that this pic was taken at a slightly later stage – I found that I had to enlarge the motor hole in the footplate to allow the motor leads to pass through comfortably.

At this stage the three link couplings may be added – solder the shank through the hole in centre of the buffer beam and trim any excess that passes through.

Draw a line at each end of the footplate, 5½mm from the back of the buffer beam and parallel to it. Solder a 2mm strip across the footplate here:



2mm strip

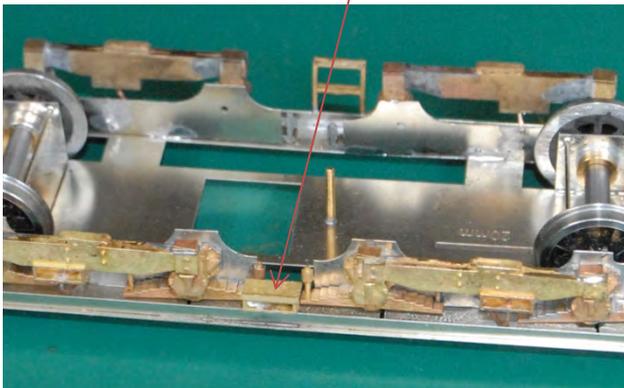
5½ mm

Solder or epoxy glue a headlamp casting in position on each buffer beam as shown.

Test fit the superstructure – It should fit neatly between the two 2mm strips.

Solder 6 handrail stanchions on each side of the footplate between the half-etched dimple and the edge – NOT over the dimple.

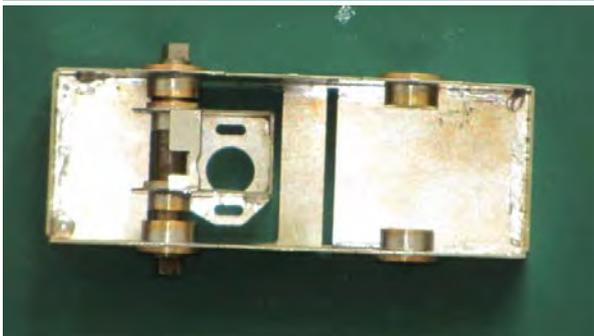
Pass 0.5mm wire through the holes in the top of stanchions and secure with solder. With the superstructure temporarily in place mark off the position of the cab doorway on the footplate and solder the footsteps in place opposite the doorway. On the opposite side solder the fusebox midway between the two inner axleboxes and inside the valance:



Motor Bogie

Fold up and solder fold lines in the bogie etch. Solder in the four top hat bearings.

Assemble as per manufacturer's instructions your chosen gearbox.



The Roxey box is shown with a 3/16 in parallel reamer through the bearings.

In the picture to the left, the box is shown in-situ with no motor but with a Slater's axle through the

bearings.

Place one axle and one wheel in each bearing and trace the wheel circumference on each side of the bogie. Also on each side, glue a small piece of copper clad between the arcs as shown

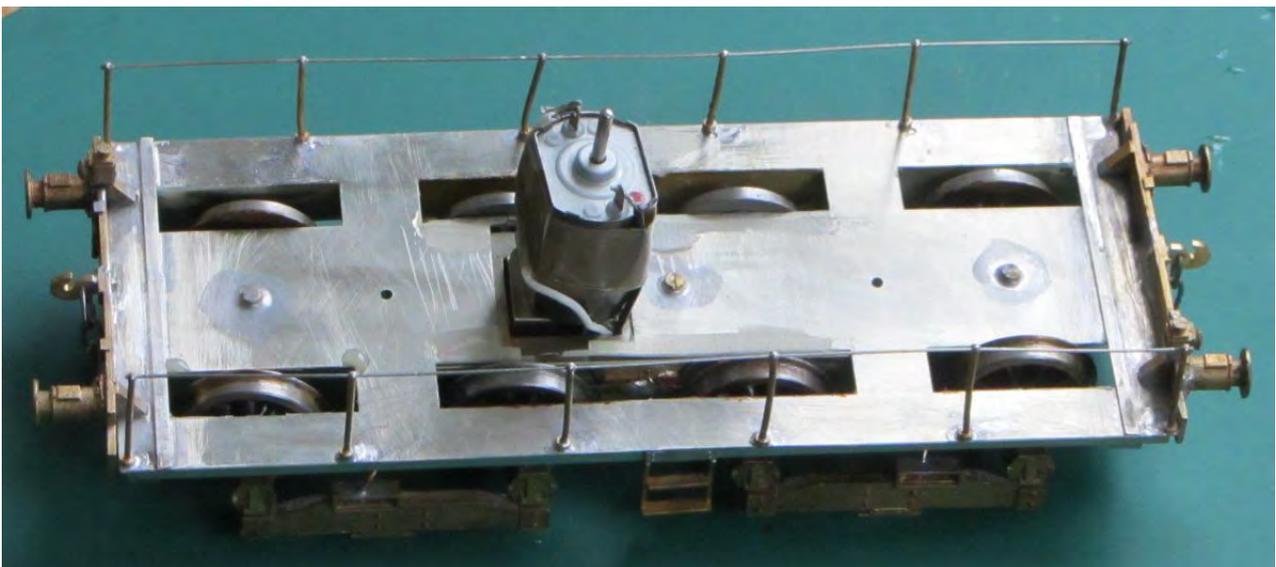
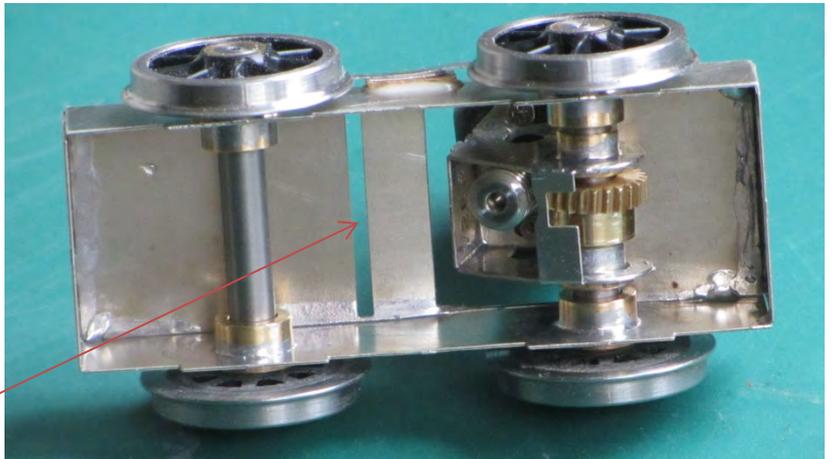




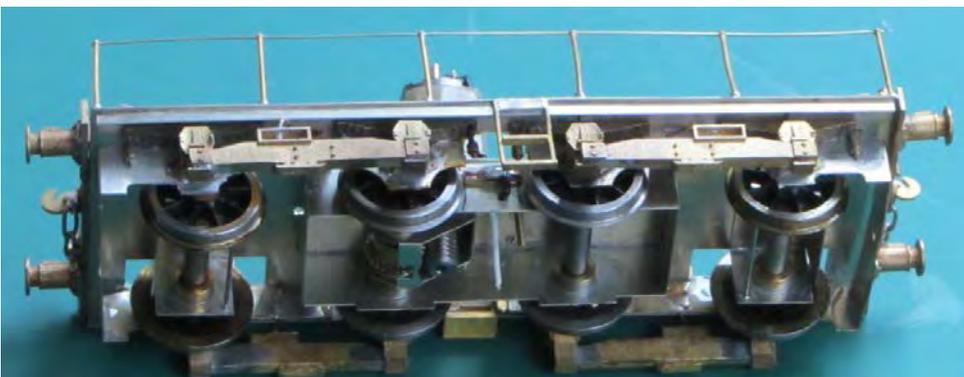
Solder a 22 mm piece of P-B strip to each copper clad piece so that it extends beyond the wheel circumference arcs.

Gearbox, motor and wheels in place with the P-B strips acting as contacts. Solder wire from the PB strip on each side to the respective motor contacts.

Note that the supplied etch for the motor chassis does not have this slit as this chassis should not have any side to side or rotational movement. There is simply a 10BA clearance hole. Locate the motor chassis under the footplate and check for fit.

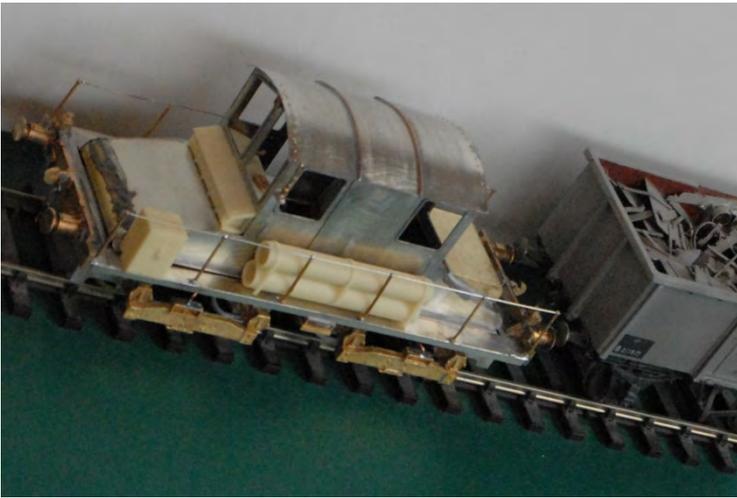


As noted, I found I needed to enlarge the hole in the footplate to allow the motor leads to pass through.



Motor and gearbox in position – note the alignment with the wheels and axlebox centres. I drilled a couple of holes through the side of the chassis [below the copper clad] to allow the motor leads to pass into the chassis

and then up through the square hole to the motor contacts.



This pic shows DS74 complete [less glazing and paint] with the optional box in position on the forward footplate. Note the tiny size of this tube gauge loco in relation to the standard BR 16-Ton mineral wagon.

IMPORTANT NOTICE

You will find that maintaining electrical insulation on this loco requires unusual techniques. I used an old technique of soaking cigarette papers in epoxy glue and placing them around the area where the wheels might make contact

with the metal work. Additionally, I dissolved flakes of Shellac in Methylated Spirit to produce a concentrated solution and applied that to wheel faces and areas of the superstructure and footplate where wheel contact might occur. On trying it out, the techniques do work!

I hope you have enjoyed building this particular kit of a unique prototype – Indeed it was the first electric loco in this country to be built by a mainline railway.

If you have any comments, please pass them on to Phil Radley via the website www.radleymodels.co.uk or by phone to 01425-479377

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