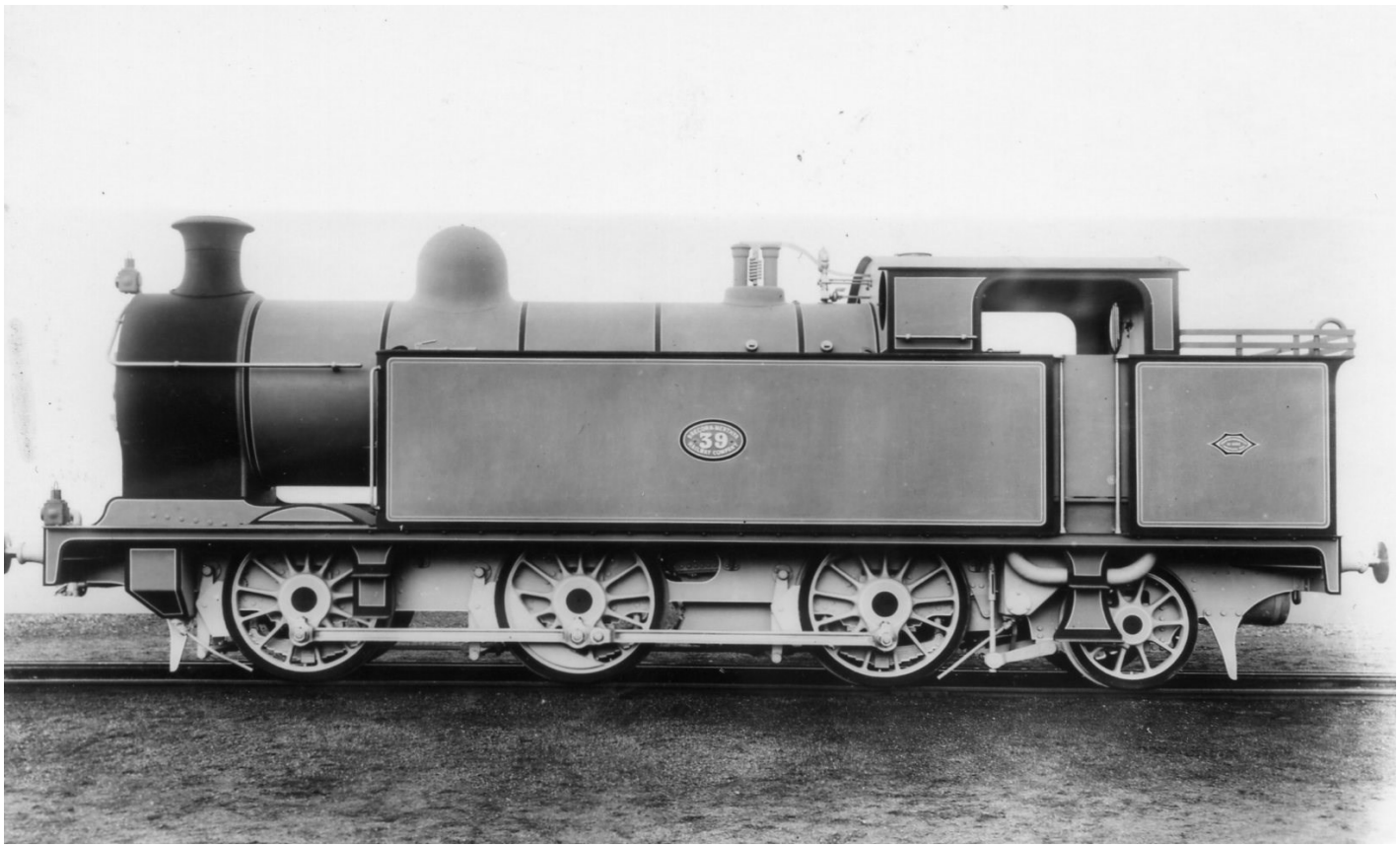
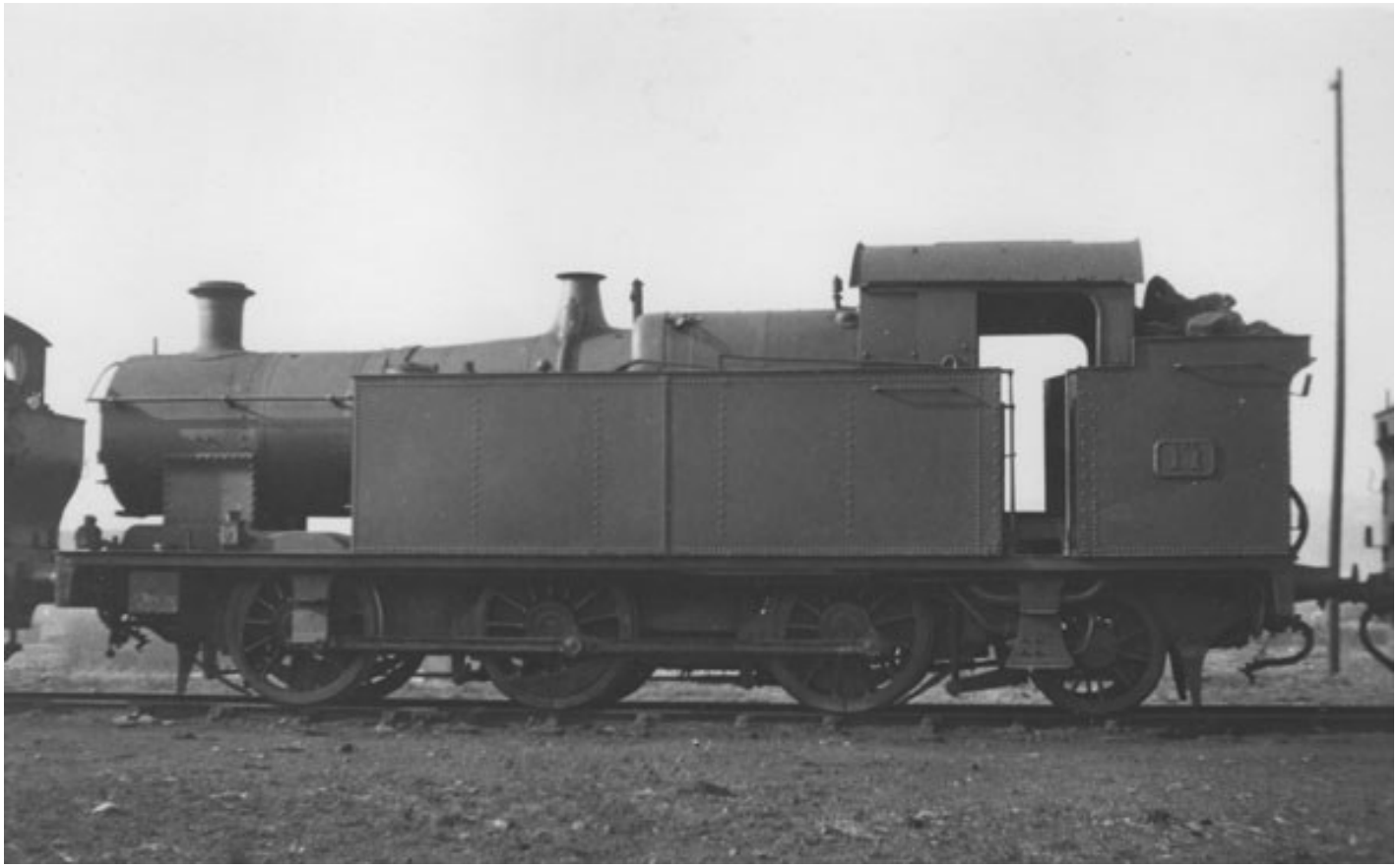
88D Model Kits

Brecon & Merthyr

36 Class





88D Models – Brecon & Merthyr 36 Class

Kit guidelines

As this is a "multi-media" kit I recommend you read the instructions carefully before you begin and I list some pointers, sorry if I'm teaching you such eggs.

Don't cut parts from the etched sheets until you need them. Small items get lost or are difficult to identify.

Remove cusp from each part before assembly.

All etched fold lines are on the inside unless otherwise stated.

Some half etched holes are to be punched out as rivets, whereas other are to provide a centre hole to allow you to drill later, example: the outer tank sides need to be bent very close to the location of a handrail, if these were holes, the metal could crease at this point whilst bending.

Due the process of etching, the holes will most likely be a fraction under size. These will need to be carefully opened out and this is best done using tapered broaches or if you can afford it tapered reamers. Do it a little at a time, you can take more off but you can't put it back!

The plastic printed parts have a reasonably high melting point but is best to finally fix in place **after all the soldering is complete**.

Care is required when handling the printed parts. The can be very thin and small parts will not stand up to rough handling or being dropped onto a hard floor – I've been there! However once fitted to the model it won't be a problem.

Take the shine off the surface of plastic parts which are to be glued to give the adhesive a good grip.

Always tack solder parts to ensure they correctly fitted and then solder permanently.

I will point out in the instructions if an assembly step is **critical** to get right.

Damaged Parts and Shortages.

If you damage an etching during construction it may not be possible to replace individual pieces, but at a minimum cost replacement frets (one of the sheets as originally supplied) can be supplied, unless in stock 4-6 weeks turn around.

The printed parts may be easier to replace, some parts may be stock and therefore can be supplied. If they are to be ordered then to excessive carriage costs from the printers I would need add it to another order. This will inevitably lead to a delay in providing the part, as with an etched sheet, I will do it as cheaply as possible.

Castings aren't normally a problem as again they are normally in stock.

Items required to finish Kit

ABC Mini gearbox and motor (or alternative) such as Slater's SG29

3 x Slater's 7854HR – 5' 0" wheels

1 x Slater's 7842 – 3' 6" bogie wheels

1 x Slater's 7157 plunger pickups (optional)

Number Plates (available at — http://www.88d.uk/pups/Number_Plates.asp)

Transfers

Paint

All pictures and more are available at http://www.88d.uk/pups/BM_36_Pictures.asp

The prototype differed from one loco to another and I would suggest you have a picture of your chosen loco before you start, some pictures are available at http://www.gwr813.org/gallerysw9.html.

Note! *Not all of the items on the etch will be required to complete this model.*

Some holes maybe marked but <u>not drilled</u>, you will need to decide which to do before assembly.

Please Decide. There are 2 ways to build this kit.

1) Solder everything together as per normal.

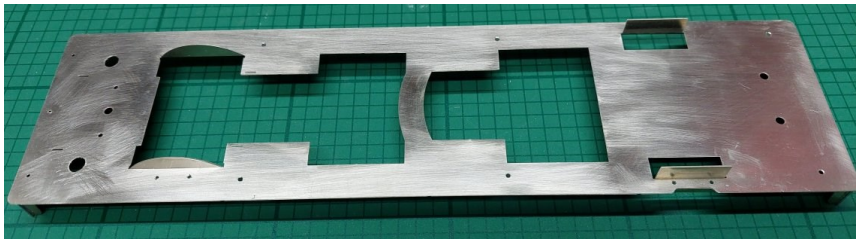
2) Make it in sections and screw it together at the end, this will make painting much easier.

3) The Sheets contain all the parts for both BM & GWR versions, tanks etc.

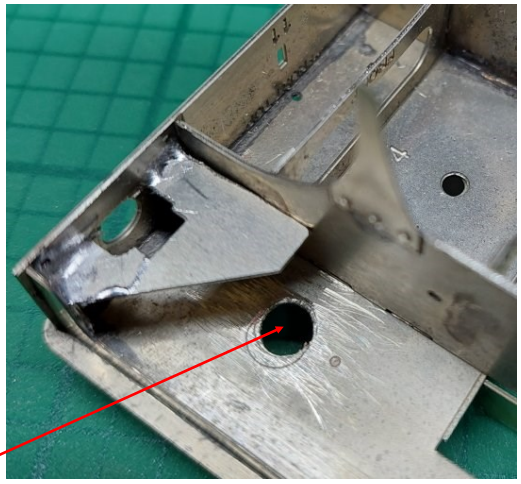
<u>Assembly</u>

1) Remove (16) footplate, there are 2 sets of circles which need to be opened out, the outer pair are for S7, this is best done whilst you have a flat sheet. See step 6.

2) Next remove (22 & 23) valances from sheet, detach any parts within the footplate and store safely. Do not remove the 2 upstands where the footplate narrows or the crescent pieces which form the splasher sides. Clean off the cusp from the footplate and valances taking care not to bend or distort the valances.



3) With footplate upside down, tack solder valances into grooves, equal distance from each end, ensure they remain at 90^0 to the footplate. When satisfied finish soldering and check again they at 90^0 to footplate.



4) Remove and clean up (11) buffer beams and punch out half etched rivets.

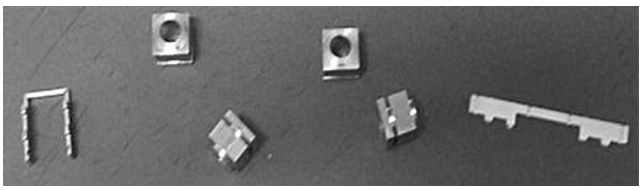
5) Solder buffer beams on to ends of valances and footplate, the groove by buffer holes is furthest from footplate, they do extend beyond valances. You now have box into which the chassis will fit.

6) *If you are doing a version with the Large sand boxes, drill now.*

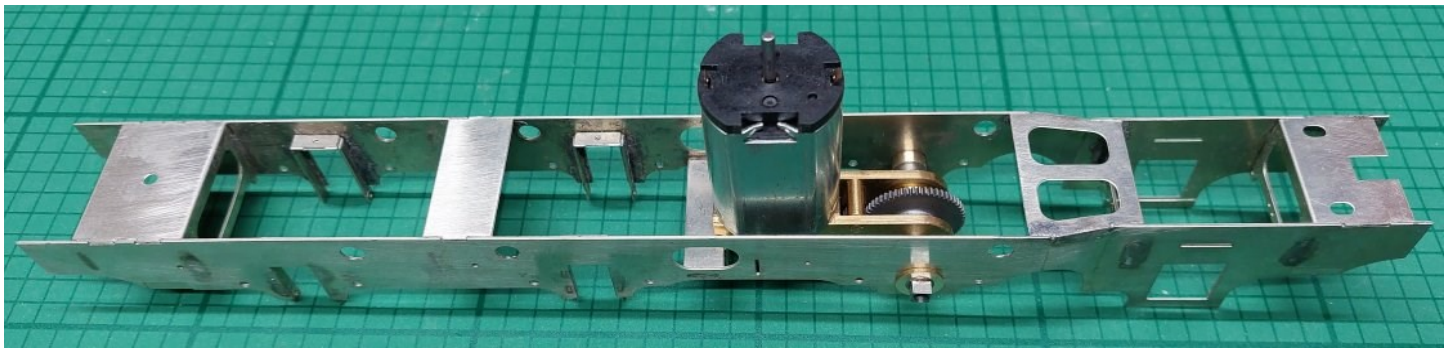
7) Remove parts (15) 4 off buffer beam stiffener plates and bend the tabs at 90^0. Lay a pair into front corners of the footplate and measure the distance between them, they should be a minimum of 26.6mm apart, if not, remove material from the long facing sides <u>equally</u>. When satisfied solder into the corners using half etched groove as guide. Offer chassis to footplate to check it fits between stiffeners, there should be about 0.3mm clearance either side. Repeat at rear and check chassis fits. *Scale 7 adjust as necessary.*

8) If you are going to use Slater's plunger pickups then now is the time to open up the half etched holes in the frames.

9) Remove Frames (1 & 2) and joggle the frames at the rear end, lines on the inside of bends, final adjustment later.

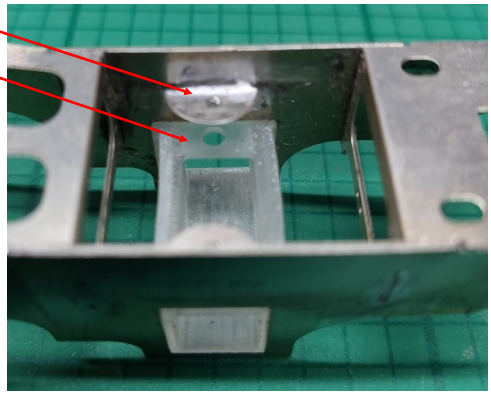


10) Take the 4 off (3) horn block guides, double over centre tab then fold into U shape and dry fit into slots in frames. Ensure the horn block is a tight sliding fit, adjust until satisfied. With horn guide on the underside apply flux and solder to each tab, don't overdo it as the solder will run through and build up on the inside and foul horn block. Check that each horn block slides freely but is not sloppy, file off protruding tabs. Note small tab on end of each leg can be folded to retain bearings later. Lastly tap the top holes 12BA, a screw will both retain the spring as well as limit vertical movement.



11) Remove (4-8) frame spacers, clean up cusp. Bend with the half etched lines on the inside. The kit is deigned to be fitted with an ABC motor/gearbox or Slater's SG29 and a mounting bracket is incorporated as part of the centre spacer (6) for each. Spacer (4) is at front and spacer (8) at the rear of the chassis. There are 2 semi-circular parts (9) which fit into the slots above the square hole to provide the springing for the radial axle, tap the holes 10BA.

12) Fit Radial Axle box (PP17) into the square holes with the 2 holes upper most.



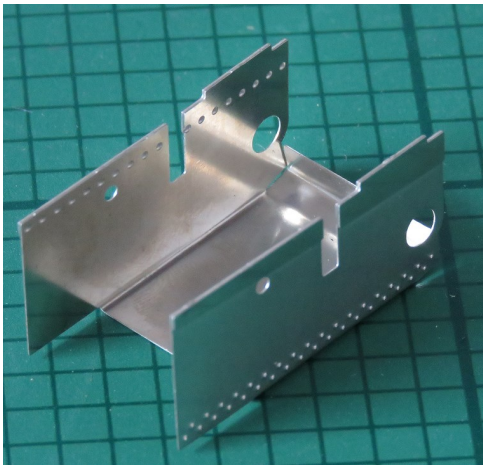
13) Dry fit all the seven parts to ensure they all fit the slots, when satisfied with the fit, lay the chassis upside down on a flat surface and tack solder together. Check that it is still flat and square and then complete soldering. Check again before proceeding.

14) Taking the 6 springs (PP09) glue into place, there are pips on the springs and holes in chassis for location. Refer to picture at the end.

15) Discard the Ashpan (49) on sheet 112 and use the one from the supplementary etch sheet 114. Fold over double the 2 long half etched pieces and solder, then fold into a flat bottom "U" shape with the rivet detail on the outside. Next make the fold on the base as per picture, offer up to the half etched locations on the chassis and adjust to get a good fit. Solder in place, see picture, ensure it is pushed up to the top of the location or it will foul the rear brake stretcher later.

Image to follow

16) Take each slater's wheel and lay face upwards on a piece of 600 grade, wet and dry and with a circular motion remove and slight pips of plastic left from moulding operation. With an emery stick or similar, kiss each of the 4 facets on each end of the axle and then try fitting a wheel to each end. Sometimes you might find the slightest burr in hole in the wheel, if so kiss with a fine square needle file. At all costs avoid a sloppy fit. Now fit the crankpins as per instructions that came with the wheels.

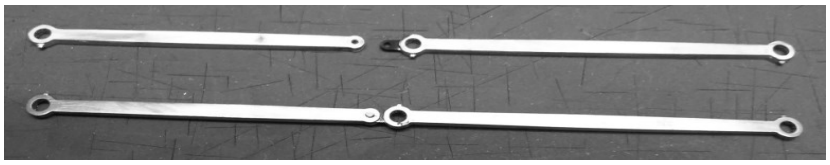


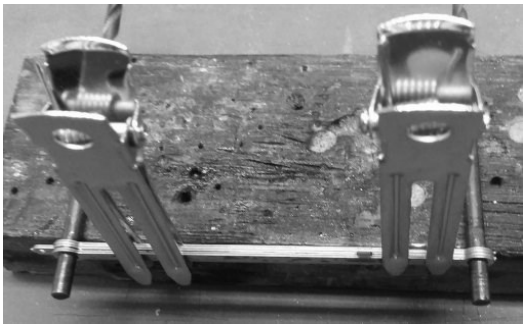
17) Carefully fit the Plastic balance weights (PP16) to wheels, fettle if required.

18) Using the bearings (use washers on sheet 112, to reduce side play if needed) fit wheels and axles to the chassis – Do Not fit the motor/gearbox at the moment. When all 3 wheel sets have been fitted, push along the bench or piece of spare track, the chassis should roll freely. If not determine which axle is the problem and correct it.

Image to follow

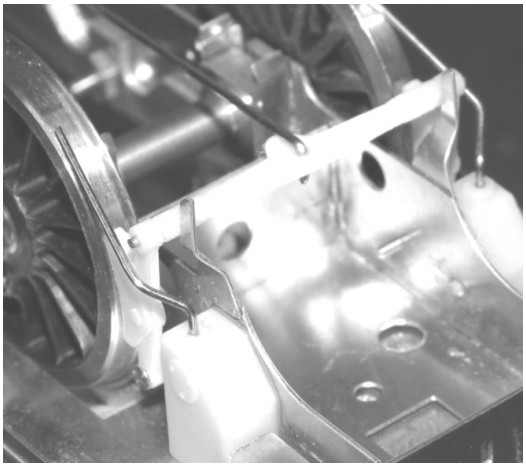
Balance weights





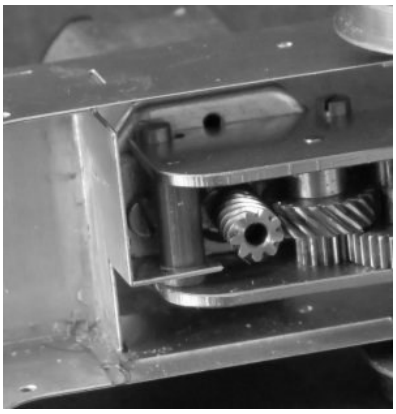
19) Locate parts (12), there are 4 parts to each side. Use “black” 2.5mm drill(s) shank to align the holes before soldering. After soldering the parts together file off surplus solder, cusp etc. until you have a nice solid looking rod. Before joining the two halves of the rods, either coat the “tongue” with a permanent marker pen or smear with super glue and allow time to dry thoroughly. Both methods should prevent the solder from penetrating the joint, use a piece of 1mm nickel silver wire to form the pin and solder on the back only, trim off excess and clean up.

20) Fit bearings to crankpins and try coupling rods, it may be necessary to ever so slightly open holes in coupling rods, if so do it sparingly, sloppy rods = poor running. Don’t worry about excess length of bearings at this stage remove excess later, fit washers, retaining nuts (prototypical are supplied in the kit for final fitting) and roll along the bench. If there is any binding, identify where and ease the offending hole in rod and retry, repeat until chassis rolls freely.



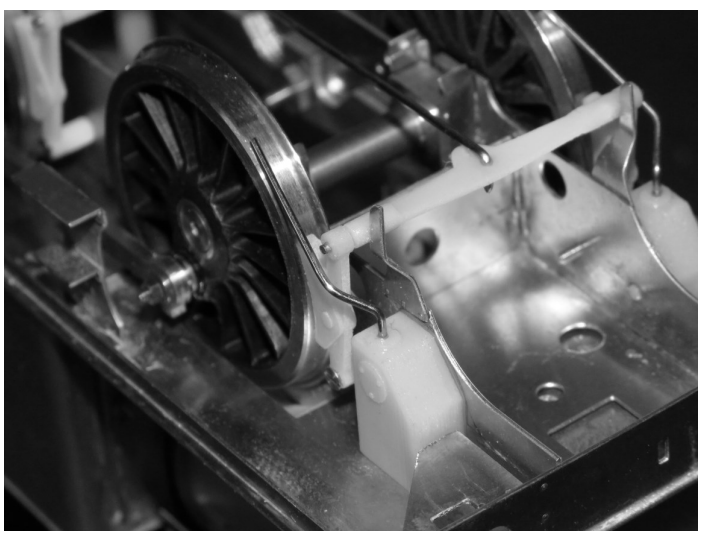
21) Remove (10) life guards (guard irons), bend to shape to align with the wheels, note the bends go in opposite direction for each pair. Study picture right. Having bent to shape solder into the half etched locations on chassis.

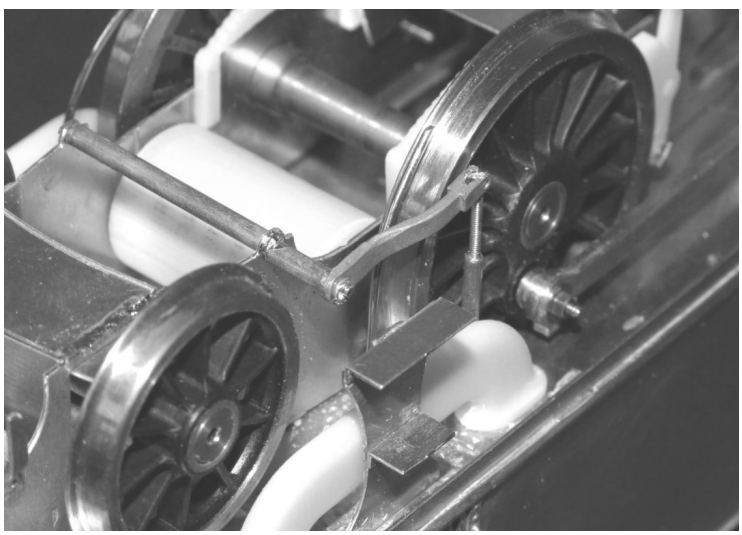
22) Remove the coupling rods and rear set of wheels and fit motor and re-fit wheels and coupling rods. If you have pair “flying leads”, you could now try out the chassis on a piece of track. Note! Photo shows a ABC Mini motor / gearbox, not a ABC Mini S as should be fitted.



23) Now identify the (PP19) rear Sand Boxes to use. The Front Sand Boxes can be mounted above or below the footplate, so ignore at present. The rear sand boxes are mounted on the chassis; use the pip on the back to locate in holes in chassis.

23) There are 2 ways to fit (PP3) the brake hangers, (a) solder a piece of 1mm wire through the holes in the chassis or (b) tap the holes 12BA and carefully drill the upper brake hanger hole 1.2mm diameter. Now fit brake hangers to chassis.





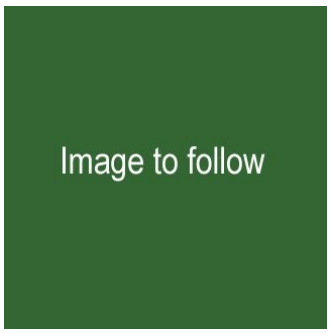
24) Take brake stretcher bars (PP4) and either glue in a short length of 1mm wire or drill 1.05mm and tap 12BA each end of stretcher. Fit stretchers between brake hangers. Using lengths of 0.7mm wire bend to length 3 pieces to form pull-rods and glue in place on stretchers. If you have screwed on your brake hangers, you can remove them as one assembly when you decide to paint.

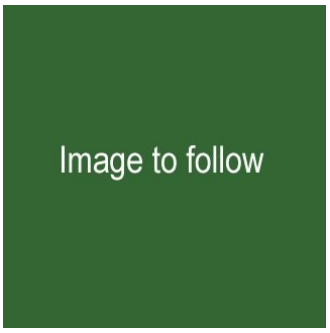
25) A piece of 2mm rod/tube, (trim to 42mm long) is provided to form the brake cross shaft. Thread this through brake rod brake holes on rear of chassis. Solder right end (looking from the rear and top) with 1mm poking through to outside of chassis. Locate and clean brake arm and slide on end of rod.

26) Next take the 14BA bolt, cut off the head and then slide the end into the smaller brass tube and solder. Either crush the tip of bolt or file a small flat on it and slide into fork on the brake arm, then with the arm slightly below centre, trim top of tube level with top of chassis.

27) Taking 2 pieces of 1mm wire form sand pipes which fit into the holes on the bottom of each box, run a 1.1 or 1.2mm drill down the holes to ensure the wire will fit and the super glue can penetrate. The rear two are easy, requiring just one bend, the front are more complicated. They need to come out and wrap around the front brake hanger see pictures.

28) Bend the 2 smaller parts left on sheet 114 at 90^0. Place over the each end of the Radial Axle Carrier and fit a bearing in place to align and the glue. These act as rubbing plates for the spring.





29) Having tested the fit with the footplate you can remove brake hangers, wheels, bearings and motor/ gearbox. The chassis is now ready to paint.

30) After painting re-assemble and ensure everything moves freely. Fit your wiper pickups or plunger type and wire up to the motor and test your chassis runs smoothly.

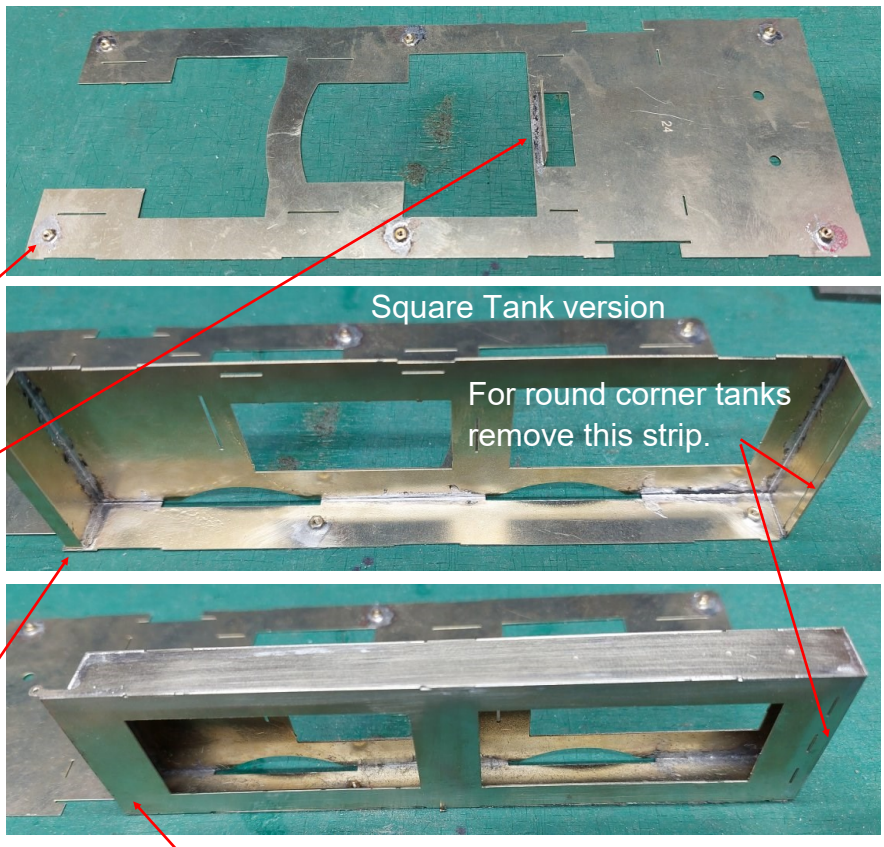
Superstructure

31) Bend up the 2 large tabs on running plate (16), these help with location of tank/bunker base and support the cab floor.

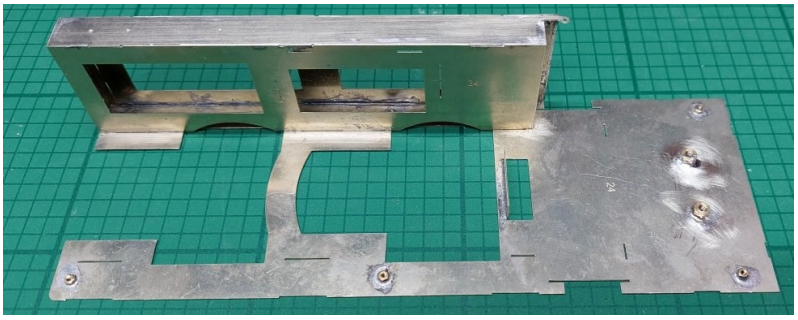
32) Remove any parts located inside (24) Tank Base. De-cusp and locate over running plate, use holes and step back to align before soldering. *If you are making sections, solder 6 off 12BA nuts over holes, then run 12BA tap thru holes in base.*

33) Bend up Footplate (cab floor) support.

34) Take the Inner Tank sub-frame (33), de-cusp and *decide if your model will have square or round cornered tanks.* If round corners remove the 2.5 mm piece to the right of the number. tabs should extend beyond the for later location. Now fit into the slots on the tank base and tack in place, with the front exactly over the base. The Tank Overlays extend down to cover the joint where frame meets base. Note the rear return is stepped in from the edge to accommodate the outside frame.



Note we are doing one side first because the Cab Front and possibly Firebox Crown Support fit in slots between the tanks.



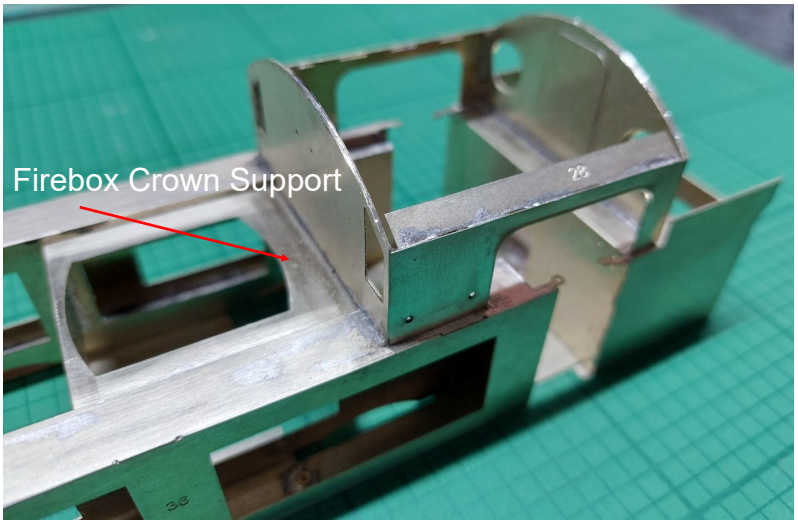
35) Remove parts from (35) Tank Frame Outer. Fit in slots in tank base and align with inner frame, tack. Before going any further locate the tank top (31). Offer to the frame assembly and make any adjustments, including ensuring frame sides are perpendicular.

36) If all is well, solder frame sides checking as you go. If you intend to add any lead in the tanks, now is the time.

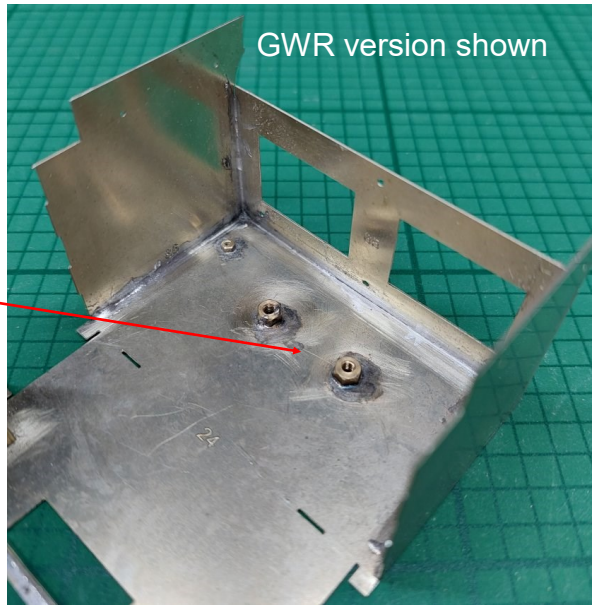
37) Fit the tank top (31) taking care not to damage the handrail bracket.

38) Locate either Cab Front (61) or *(63) for high dome cab* and de-cusp.

39) Repeat steps 34 to 37, but trap your chosen Cab Front in the appropriate slots. *Also fit Firebox Crown Support (21) if using (63) or (27) if using B&M round Boiler.* If all is square etc. solder Cab Front (& Crown if using) in place.



The next assembly is best carried out as one operation.



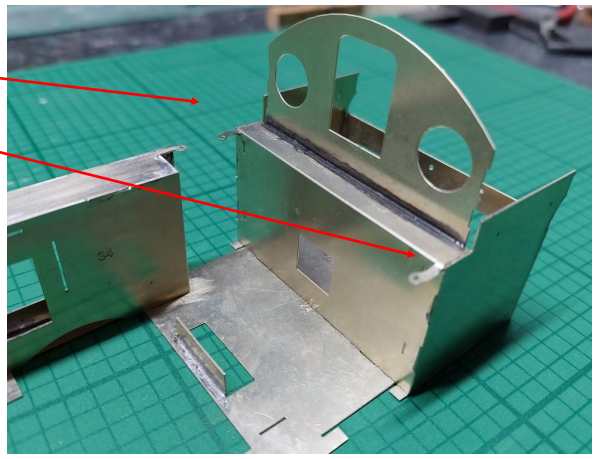
40) Choose your Bunker Frame Sides (85 & 100) for B&M, *(86 & 87) for GWR*. Now locate the Cab Back (62) or *(64)* to match your cab front. Lastly get (65) Bunker Back, *if doing GWR version (88) Bunker Rear Top crossbar*.

41) If you haven't already done so, solder 2 off 8BA nuts to tank/bunker base.

42) Clean up the Bunker rear & side frames and tack to base as shown.

43) Next solder appropriate Bunker Door (18) in place on Cab back. Now form the two 90^0 bends.

44) Now offer to the sides and base, check the base is sitting flat and the sides and back vertical, tack in place check again, then solder all 4 pieces to the base. You should have something similar to this.



45) Locate (47) handrail brackets. Solder into the pockets of the cab back, centre of hole to bunker front = 3.8mm. These could be fitted before fitting back in place.

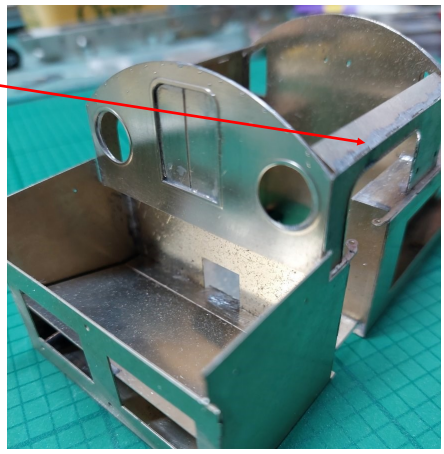
46) With the tank/bunker assembly sitting flat on the running plate, drop the Cab Floor (30) into position. Fettle if required, then fix to bunker front & inner tanks.

47) De-cusp (44) Bunker Floor and bend to 15^0, then slide tab thru hole in bunker front and rest against bunker back. *See picture on next page*.

48) Now punch rivets down each side and then fit the Coal Shute door (26).

49) Next fit the Cab Doors (48), the tabs fit into the slots in bunker front.

50) Locate (28 & 29), then carefully bend over the stiffening strip, this is best done by gripping the side in a vice to distortion over the doorway.



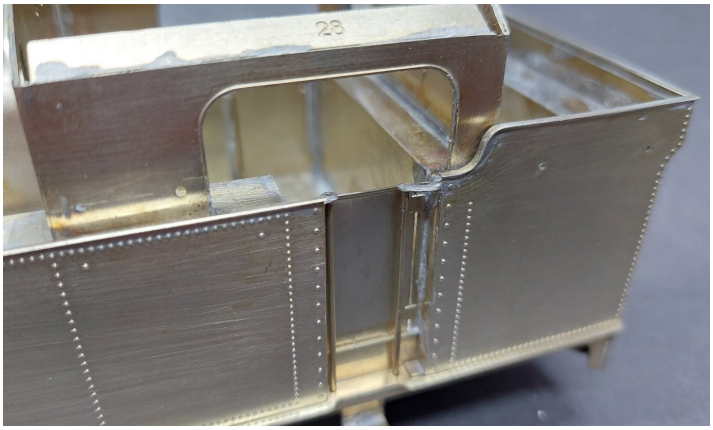
51) Now fit in place on each side between cab front and back, then smooth flat the corners so as not to prevent overlays sitting flat.

52) Locate Cab Front Overlays (70) for B&M and *(66) for GWR*. Carefully align and fix in place.

53) Next fit Cab Back Overlays (69) for B&M and *(67) for GWR*.

54) Lastly fit Cab Side Overlays (45 & 46). Tidy up completed Cab.

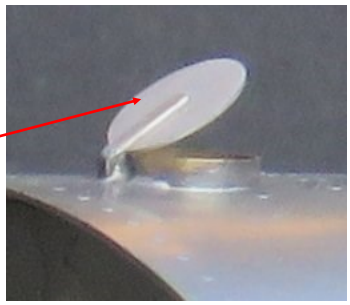
55) Now fit the cab side handrails. *Alternatively, on GWR version you can use pieces of brass channel to fit Cab Shutters (90).*

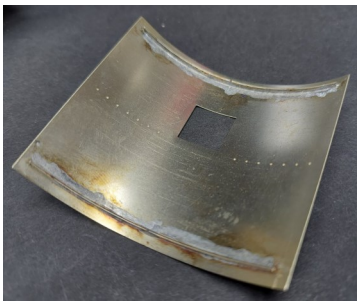


56) Roll Cab Roof (75) for B&M, then punch all the rivets. Next fit the Braces (14) into the grooves, there is a mark on the brace centre, which aligns to the adjacent centre rivet. *Use (76) for GWR, punch the rivets and fit in grooves & (13) for braces*.

57) *Punch the rivets and fit (37) Roof Vent for GWR version*.

58) To complete the B&M roof take the piece of $^{1}/_{4}$" tube , solder in place on the roof and file down to 1.5mm height. Take part the parts that were contained in part (34) and form "lid", you can fix it shut or part open, the hinge goes at the front. Alternatively there are some etched rings which will perform the same function as the tube Set the roof to one side for later.





59) Locate and fettle to fit, then fix Bunker Side Overlays (96 & 99) for B&M or (97 &98) for GWR.

60) Take B&M Back Overlay (103) and curve the top to match the profile of the side and fix in place. *The GWR version is composed of 2 parts (102 & 104), part (104) should be curved to match the side profile and (104) goes onto the crossbar. As above fettle to get a good fit*.

61) Next get Bunker Beading (68) and fit to top bunker sides and back, the 2 sides legs will need to be trimmed after fixing.

62) B&M Coal Rails bend to shape, the rear tags will need to be bent in to follow the contour of the bunker back. Dry fit first and when your satisfied fix in place soldering tags to inside of bunker and fitting inside where they meet the cab.

63) Lastly take a short length of copper wire and bend to a "umbrella" shape and fit it hole in bunker floor.

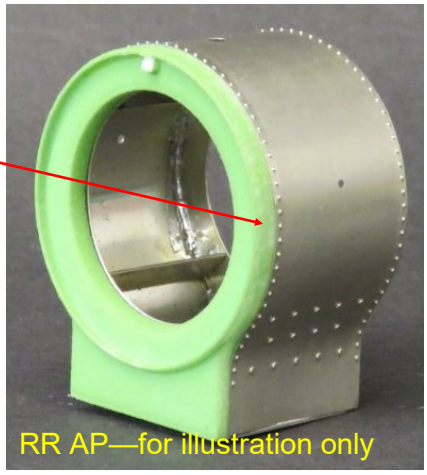
To make things clearer the next steps are for the B&M boiler, for the GWR boiler version go to step 69.

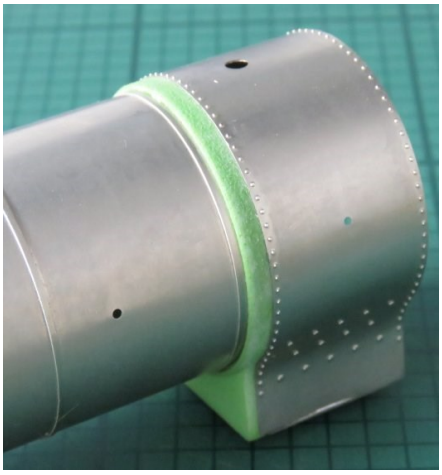
64) Start with Smoke Box. Locate parts (77x4, 78, 79) smokebox assembly and clean up (78). Solder 2 off 12 BA nuts over holes. Fold into a "U" shape, then fit the 4 parts (77) in to the slots. Adjust until square and the solder together.

65) Take item (81) Smoke Box wrapper and carefully form around the structure you have just made. Establish that you have the wrap the correct way, the extra hole is on the right hand side. Overlap the wrapper at the front by 0.5 mm, this will then cover the front overlay (79). *Alternatively, fix (79) in place first and then carefully file off any surplus overhang of the wrapper.*

66) Offer (PPx) Smokebox Rear into the deep overhang at the rear, if wrapper protrudes to far trim back.

67) Locate (82) Boiler, then roll. Test the fit in smokebox rear and fettle if required. When satisfied solder the seam, then fit (80) at either end.





68) Bolt tank/bunker base to running plate if not already done so. Bolt the boiler to cab front and slide smokebox onto it, turn over and check that the 2 holes align with those in the base, if so glue boiler into smokebox rear, with smokebox centred, solder to the running plate. Bolt in place.

Taper boiler assembly

69) Start by rolling (53) Tapered Boiler Section then tack the seam.

70) Roll (51) Straight Boiler Section, now check that the small end of (53) is the same as (51), if necessary fettle and then solder seam.

71) Solder 1 off (80) into the large end of (53).

72) Roll (52) then check that it fits into both (51) & (53), if not adjust before soldering the seam.

73) Roll (51) parallel barrel, this should be a tight sliding fit over (52), if not adjust before soldering.

74) Slide (52) into (51) and align the washout plug holes, (52) should protrude by about 2.5 mm. Next place 2 plugs into holes and hold in place with masking tape, then slide on (53) on to (52) and align the seams of (51) & (53). With the top feed hole at the top press the whole assembly down onto a flat surface, this will insure the bottom is flat. Now carefully solder together.

75) Finally Roll (50) Smokebox Wrapper check it is a tight sliding fit over (51). I find it is easier to clamp in place aligning the chimney holes and then solder in place. Use (54) Former to ensure the smokebox is round.

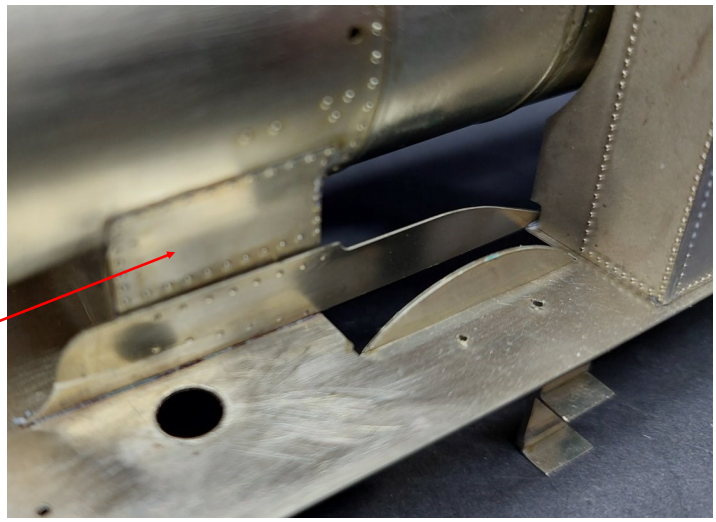
The pictures below are from the CR 155, but the method of construction is the same.

76) Solder a 8BA nut into the pocket of (19) and set aside.

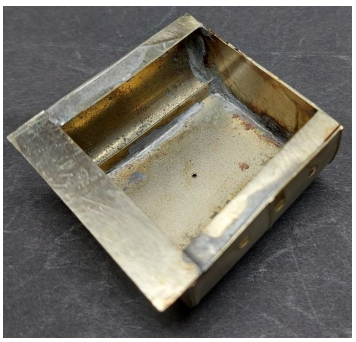
77) De-cusp (55) & 2 off (20), Saddle parts. Solder 2 off 12 BA nuts over holes. Fold (55) to form a “U” shape and then solder part (20) on either side form a box. Adjust until square and the solder together.

78) Now bolt or solder, using the holes for alignment, to the running plate (16).

79) Locate 2 off (43) Saddle Overlays and form a slight bend at the top, then solder to the saddle.



80) Get (2 off 42 & 84) + (56 & 57) + (101), these will form the Firebox Crown, it is tapered. Start by tacking the front (56) to the 2 off (84) at the bottom corners, then add (57), next tack the top braces (42) in the slots at the top. Now check that all is square, flat and even, solder fully.



81) Taking (101) lay upside down, use a steel rule to scribe a faint line thru the centre holes to mark the centre at each end. Next if you look carefully 4 very small holes, these are a guild to the centre of the bends, form the bends. Place the support cage into (101) and tack in place, then when satisfied solder fully. Make sure not to distort it.

82) Identify (PPx) Fire Box Throat Plate and glue to the front of the Crown, when set carefully shape to match crown.

83) Fix 8 washout plugs in the holes, 2 cladding clamps to the top and 4 mudhole covers over the 4 tiny holes.

84) Fix the Firebox Crown assembly in place and then slide the smokebox/boiler into position. Push a long 8BA bolt up thru the Running Plate and Smokebox and put (19) inside and loosely tighten the bolt. This will hold the front whilst you set the rear of the tapered boiler top to match the Crown, then in tack in place underneath.

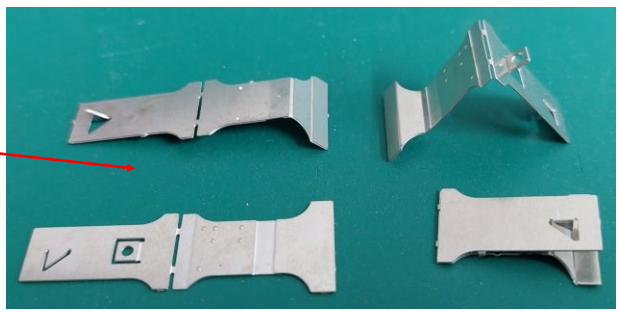
85) Next tighten the 8BA bolt without distorting (9) and then solder (9) in place.

This ends the tapered boiler specific steps.

86) Carefully clean (60) frame extensions, don’t remove half etching at the front end (very sharp end). Dry fit along side the smokebox in the slots of the footplate, make sure they are the same distance back from front of footplate. Tack back end and extreme tip of front end to stop them moving, when satisfied you can solder the boiler and frame extensions to the footplate. Remove the boiler and solder frame extension, check boiler still fits.

87) If you haven’t done so, bend up the splasher outer sides on the running plate. Do Not remove half etched recess.

88) Get (38) Splasher Tops and curve to match splasher side profile. There are rebates on the running plate for the ends to sit in, they may need shortening. As this can be tricky to get right I have provided an extra pair. Once satisfied solder in place.



89) Locate 2 off (39) Rear Steps Backplate, to strengthen, fold double and then fold the tab at the top forward.

90) Next fold the 8 of (25) Steps at 900, then solder into the pockets of (39).

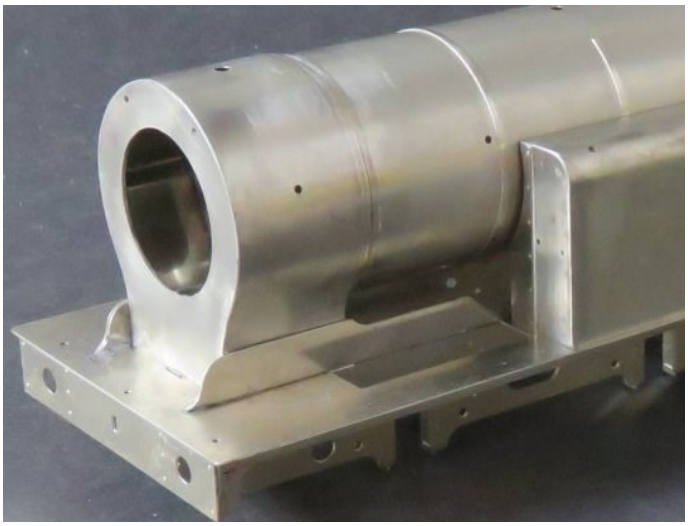
86) Take (PP7) Balance Pipes and glue in place in the holes in the footplate, behind the rear steps.

65) Fit (PP5) Smokebox Door into the front of the smokebox and fit handle (dart) in the centre.

66) Fit handrail knobs to smokebox and along boiler and bend 0.7mm wire to form the handrail.

67) Fit (PP6) Combined sandbox and splasher to footplate with rear edge up against tank front. Bend 1mm wire form sand pipes as per picture and solder into holes in the footplate.

68) Fit buffer bases to the buffer beams, put heads etc. safely to one side for fitting after painting.

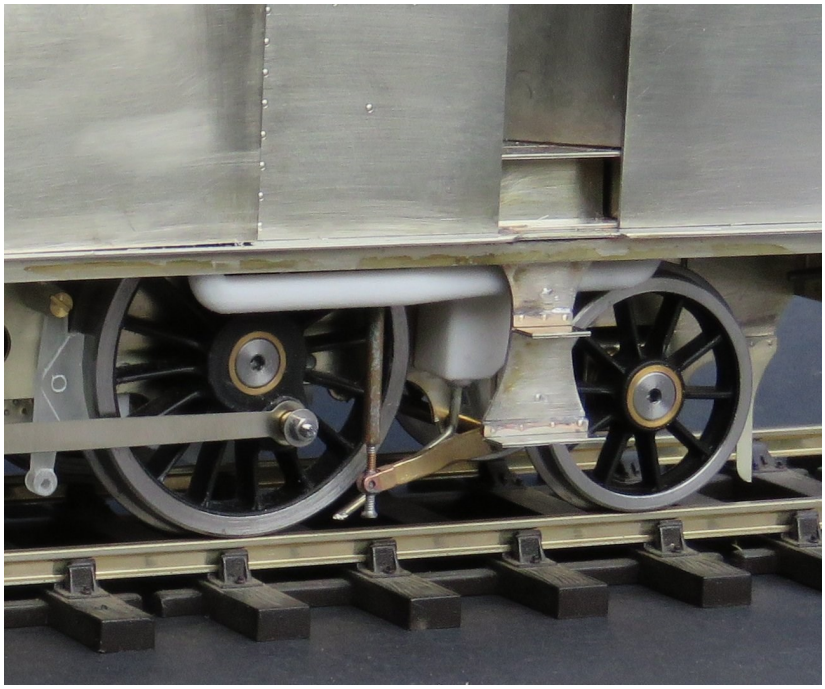


69) There is a choice of Lamp Brackets, later style castings which solder into the holes in the footplate and bunker or etched early style (61). The front ones simply require bending at 90^0 and soldering over the holes in the footplate. For the rear take a “T” shaped piece, punch out rivets and fold at 90^0, then solder in place on the bunker with the protruding piece at the top, then use low melt solder or glue to fix the straight piece into the slot.

70) Clean up (62) Step back plates and punch out rivets, fold tops at 90^0. Clean up (63) Steps, punch out rivets, fold at 90^0.

71) Solder (64) to the back of (62), this helps stiffen where the centre is half etched, there are 2 short and 2 long for respective back plates. Then solder one small step to each back plate, followed by a medium one on each front back plate and large on each rear back plate.

72) Clean up each step assembly and fit in the pockets on underside of the footplate, make the holes are not filled with solder as these are used by handrails.



77) From 0.7mm wire form 2 handrails and fit in holes in footplate above from steps.

78) Repeat for handrails on tank fronts.

79) Identify (PP8) “Piano” cover and fix in place between frame extensions.

80) Fix brake pipe castings to the footplate at each end.

81) Bend whistles to shape and fix in holes in front of cab.

82) Clean up Safety Valves casting and fit to boiler. A good way to get it sit neatly is to wrap a piece of wet & dry around the boiler, then work the casting around the so it take on the shape of the boiler.

83) Glue on Dome (PP9) and Chimney (PP10) after using the above technic to sit nicely. To be sure there are central use the technic described in step 61 earlier.

84) Identify (PP11) Tank Fillers and (59) Foot Trap Sheets, dry fit (59) and offer (PP11) in position where the cut out is. It may be necessary to trim the sheets and notch around boiler bands until a happy balance is achieved. When satisfied fix both in place.

85) On the right hand side, a pipe ran from the smokebox into the cab. I have provided (PP12) a 90^0 flanged fitting to be glue to the side of the smokebox. There is also a piece of 2mm brass rod which should be bent with a joggle at the front end, which goes into the (PP12) and through a hole in the cab front, this hole will need to be enlarged to take the pipe. I suggest the following sequence, a) enlarge hole until rod fits b) joggle rod and with (PP12) pushed on, adjust until it sits parallel to the boiler c) put rod through hole in cab and line up (PP12) on smokebox until the rod lies horizontal to the tank top d) fix at each end and (PP12) to rod, trim surplus in the cab. Don’t fix rod to cab or (PP12), leave a little long at cab end to hold whilst painting, fit and trim later.

86) Identify (PP13) Handbrake Column and fix in place on left side of cab above the pull rod on the chassis.

87) Dry fit Boiler Back head, it will need a little metal removed at each side at the bottom to fit between splashers. When happy paint and detail ready to be fitted after painting inside cab.

88) Paint Body and Chassis, reassemble, fit decals and number plates.

89) Fit coupling hooks and buffer heads.