88D Models – GWR Class 78 Rebuild of Rhymney Railway AP Class

This kit was designed to be assembled by modellers with varying skill levels. Were ever possible I've tried to provide an easy solution for the more difficult or tedious bits. The kit will produce a fine model but some of you will want to upgrade it by either substituting or even fabricating small extra details, a list of suggestions appears at the end.

A great deal of care has gone into designing this kit and I have "test" built one to ensure everything fits with the minimum of "fettling" by yourselves. Therefore when cleaning off the cusp left by etching - **remove only the cusps**, otherwise the parts will be undersize.

If you are an experienced modeller, then you won't need any help, however others might find these notes useful.

The main skill to master is soldering and the choice of soldering iron is endless, I have named some options under ***Suggested Tools*** below. Whichever make and model you choose you will need a selection of "bits". I get by with 3 - a small pointed one, a small chisel shaped one and lastly a large knife shaped one.

Soldering isn't a black art, you just need to know the rules and stick to them.

Make sure the surfaces to be soldered are clean. Use a glass fibre stick, scratch pen or very fine "wet & dry" paper to remove any oxidation, try to avoid tearing up the surface as it might show later. Preparation is very important on brass, even though it might look clean it still needs a clean, also the etching process can leave an invisible film.

Flux – avoid some of the varieties used by plumbers, they can be too powerful and more difficult to clean off, I use Duncan Models for almost everything. Keep a jar of clean water to hand and a small paint brush and when you have finished a section wash off the flux, it's far harder later. At the end of each model session thoroughly clean your model with a bit of washing up liquid and warm water. I often brush over with "ViaKal" and this both neutralises the acid flux and cleans your model.

Solder, I use 4 sorts. Rosen cored electrical solder for high temperature items i.e. fixing steps to the back plate. 190^0 for a more durable fixing, 145^0 everything else with exception of low melt for white metal items. I also have a separate iron for low melt solder as I find it can ruin the tips.

Use the solder sparingly; I can't stress enough the need to keep the model clean and tidy. If you inadvertently over apply the solder, drag the surplus out to an area where it can be removed with a craft knife and then buff up with a fibre glass pen. Always take the solder to the joint on the tip of the iron, don't feed it in.

It is important to keep the bit clean and in good condition as you work. Get a soldering iron stand containing a damp sponge as old oxidized solder is wiped off on this before picking up fresh solder for each joint. If you haven't made a joint for some time you may find that a hard black crust has formed on the bit. Remove this with a brass wire brush (suede brush) and then feed some multicore solder onto each side of the bit to restore a bright surface (referred to as wetting or tinning the bit). If you follow these rules you should achieve success. Practice on some scrap material to get your hand in first.

If you would like more details on soldering etc. go to Jim McGeown's - **Connoisseur Models site and follow the link "PDF print out sheets", he has taken a lot trouble to provide a wealth of information on how to build a kit.**

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 2-3 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)

3 x Slater's 7860Q – 5' 0" wheels

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

1 x Slater's 7157 plunger pickups

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

Transfers

Paint

Only cut parts from fret as needed and read each instruction fully before commencement.

Do not fit any printed parts until soldering is complete, they have a relatively high melting point but better safe than sorry.

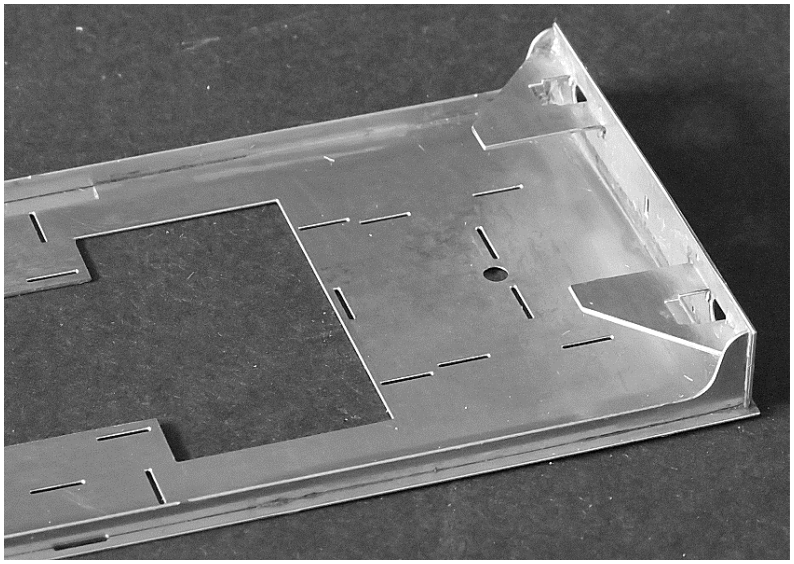
All pictures and more are available at http://www.88d.uk/pups/78_Class_Pictures.asp

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.

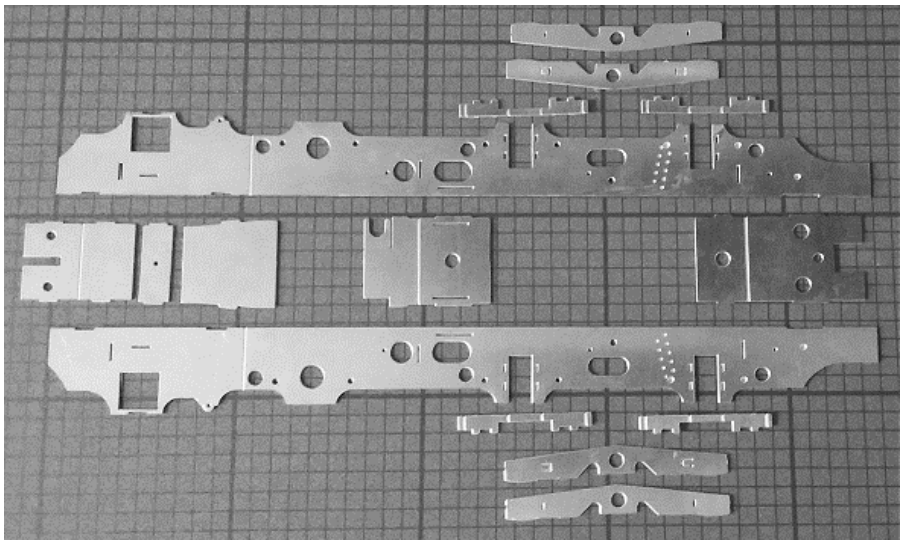
Note! *Not all of the items on the etch maybe required to complete this model.*

A number of holes are marked but <u>not drilled</u>, you will need to decide which to do before assembly.

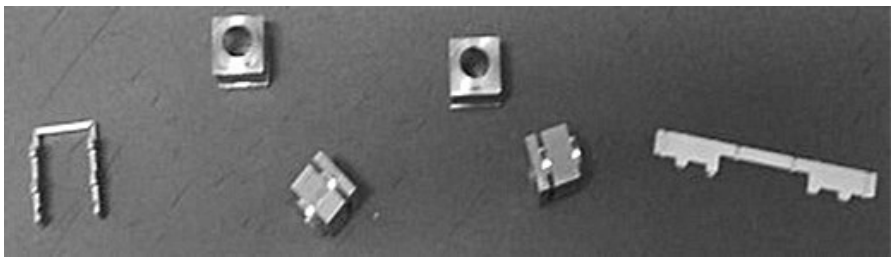
I suggest the following sequence of actions which should ensure a stress free build.

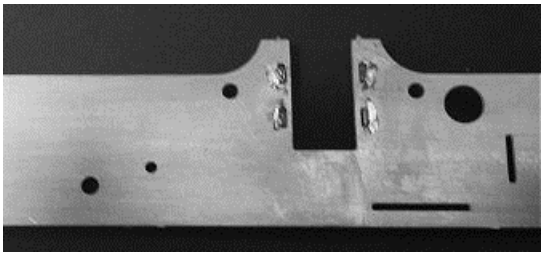


1) Remove (1) footplate and (2) valances from sheet, detach any parts within the footplate and store safely. Clean off the cusp from the footplate and valances taking care not to bend or distort the valances.
2) With footplate upside down, tack solder valances into grooves, equal distance from each end, ensure they remain at 90^0 to the footplate. When satisfied finish soldering and check again they at 90^0 to footplate.
3) Remove and clean up (3) buffer beams and punch out half etched rivet holes.
4) Solder buffer beams on to ends of valances and footplate, groove by buffer holes furthest from footplate; make sure they overhang each side of buffer beams equally. You now have box into which the chassis will fit.
5) Remove parts (12) 4 off buffer beam stiffen plates, start by removing the cusp 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 25.5mm 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 0.5mm clearance either side. Repeat at rear and measure, the distance should be 22.5mm, check chassis fits.



6) Locate (4) & (5) from chassis etch and remove cusp left by etching process, bolt together and offer to the footplate assembly, if they are too long remove an equal amount off each end until they fit comfortably inside the “box” of the footplate. The above action is ***<u>very important</u>***, both to be able to keep the chassis square and is easier done now than when the chassis is assembled. When satisfied put the footplate to one side for now.
7) Punch out the 2 rows of rivets on each frame and if the front axle is to be under-sprung – drill marked holes either sides of front horn block cut-out. This happened mid to late 40’s.

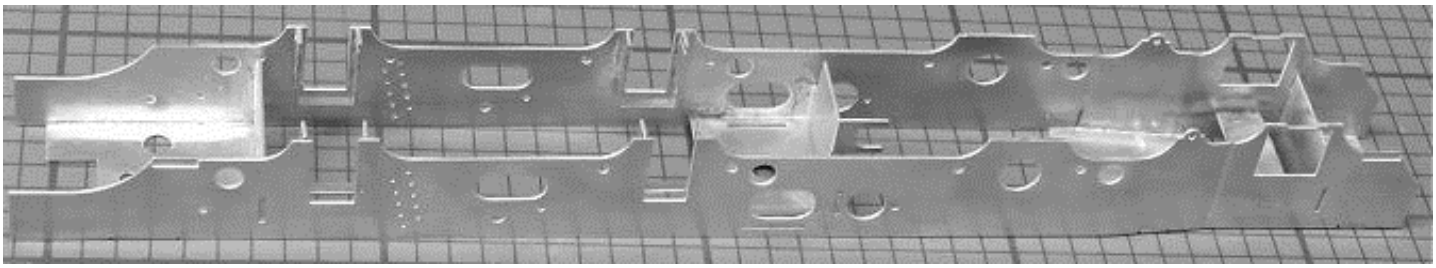




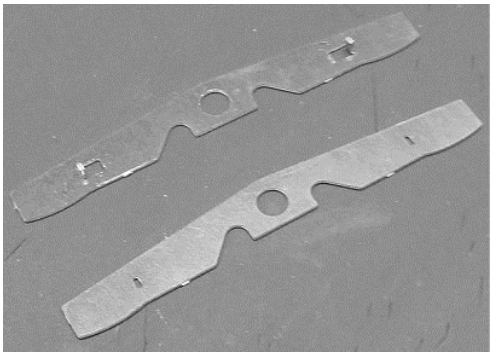
8) Remove (6) 4 off horn block guides fold into U shape and dry fit into slots in frames. Ensure the horn block is a tight sliding fit, adjust until satisfied. With horn guide on the underside apply flux and solder to each tab, don’t overdo it as the solder will run through and build up on the inside 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.
9) Joggle the frames at the rear end, lines on the inside of bends, final adjustment later.

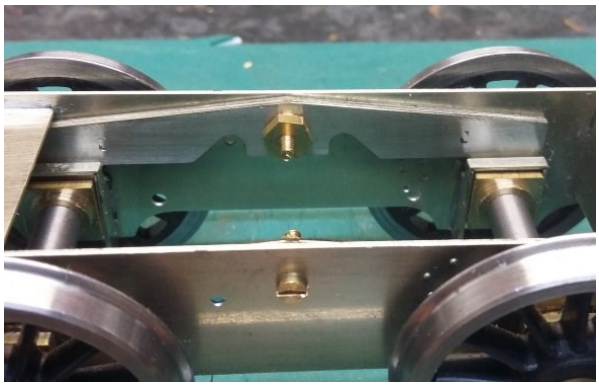
10) Remove (7) (8) (9) (10) & (11) frame spacers, clean up cusp. Bend with the half etched lines on the inside. ***Note! All bends will have the half etched line on the inside unless otherwise stated.*** The kit is deigned to be fitted with an ABC motor/gearbox and a mounting bracket is incorporated as part of the centre spacer. Spacer (7) is at front and spacer (10) at the rear of the chassis. (11) Provides the springing for the radial axle, tap the hole 12BA, a nut can be soldered to the underside if desired.

11) Dry fit all the seven parts to ensure they all slot, 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 solder all joints fully. Check again before proceeding. See below.



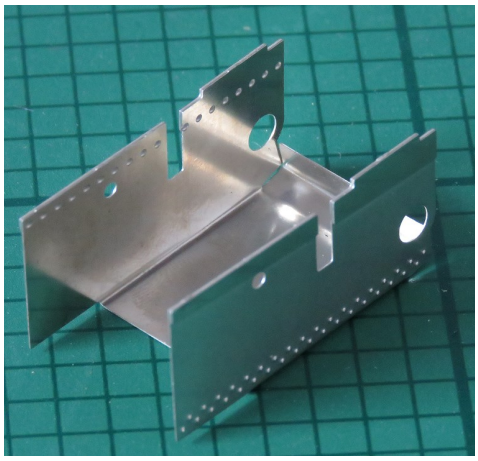
12) Locate the compensation beam parts (13) & (14) 2 pairs, bend up tabs on (13) and "tin", place (14) over tabs solder together, file off tabs and deburr all around outside. Note! There should be a slight bulge on each end of the beams where they rest on the hornblocks.

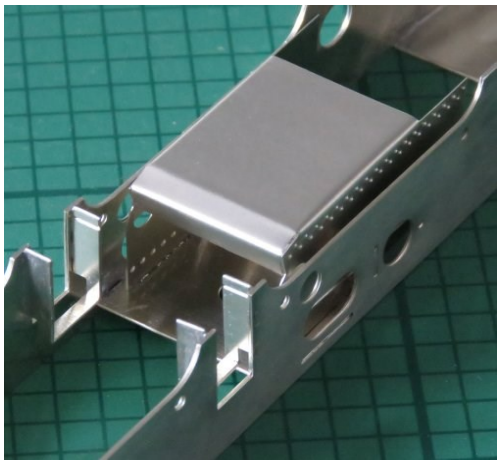


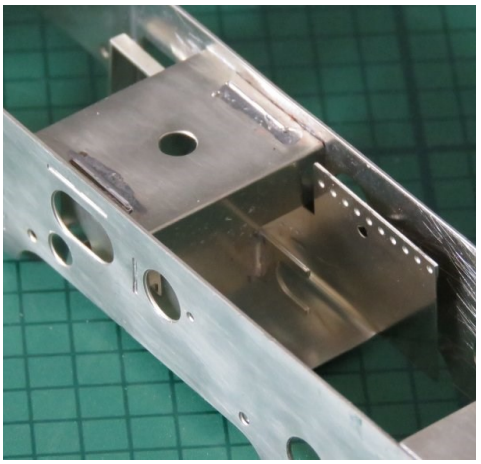


13) Using the 2 pivot bearings and 2 - 10BA x ¼ bolts secure the 2 beams to the chassis. *(The beams fit in the slot above each hornblocks)*. Check that the beams move up and down easily. **DON'T** open out hole in chassis as this will affect ride height and the degree of compensation.

14) Remove (15) (ash pan) and punch out the 2 rows of rivets, clean up and fold into a flat bottom "U" shape with the rivet detail on the outside. Then make the double 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.



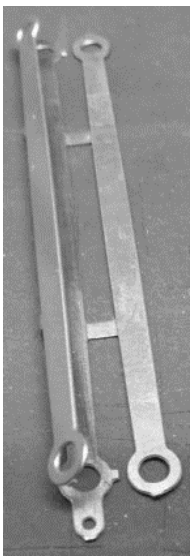


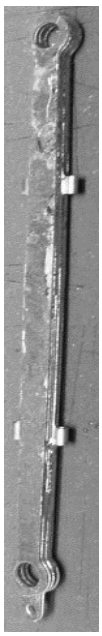


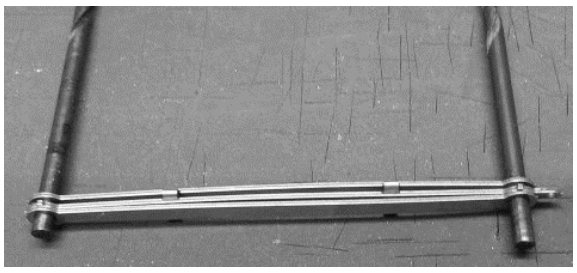
15) Take each slater's wheel and lay face upwards on a piece of 600 grade, wet and dry and with a circular motion remove and slight pips of plastic left from moulding operation. With an emery stick or similar, **kiss** each of the 4 facets on each end of the axle and then try fitting a wheel to each 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.

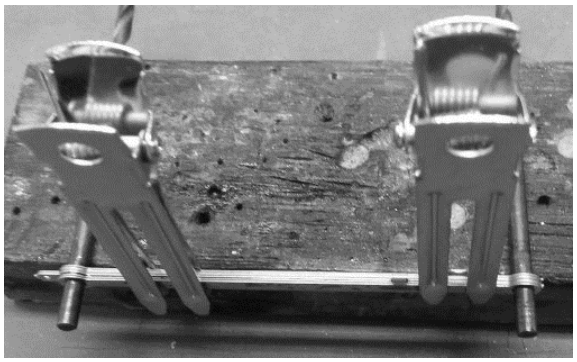
16) Using the bearings (*and washers to reduce side play if needed*) fit wheels and axles to the chassis – *Do Not fit the motor/gearbox at the moment*. When all 3 wheel sets have been fitted, push along the bench or piece of spare track, the chassis should roll freely. If not determine which axle is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

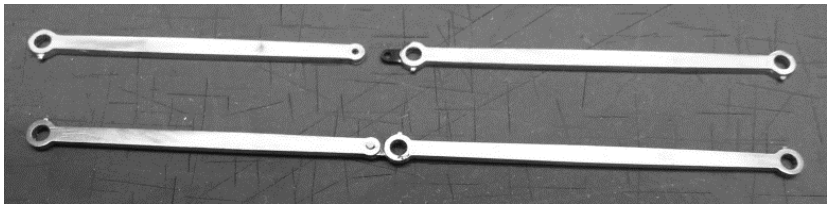
17) **Before removing parts (16)** coupling rods read this note fully. The three parts of the rods can be cut out as one piece and then using the tabs to keep in line, folded before soldering (*half etch of tabs on the outside of fold*), **do not** remove the cusp at this time. Use "black" 2.5mm drill(s)) 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.





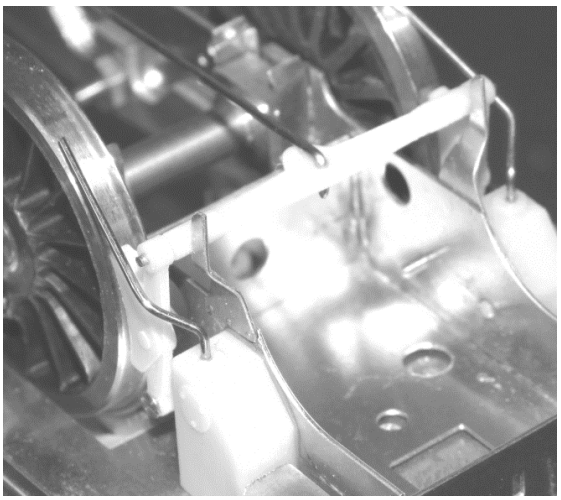






18) Fit bearings to crankpins and try coupling rods, it may be necessary to ever so slightly open holes in coupling rods, if so do it sparingly, sloppy rods = poor running. Don't worry about excess length of bearings at this stage remove excess later, fit washers, retaining nuts and roll along the bench.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

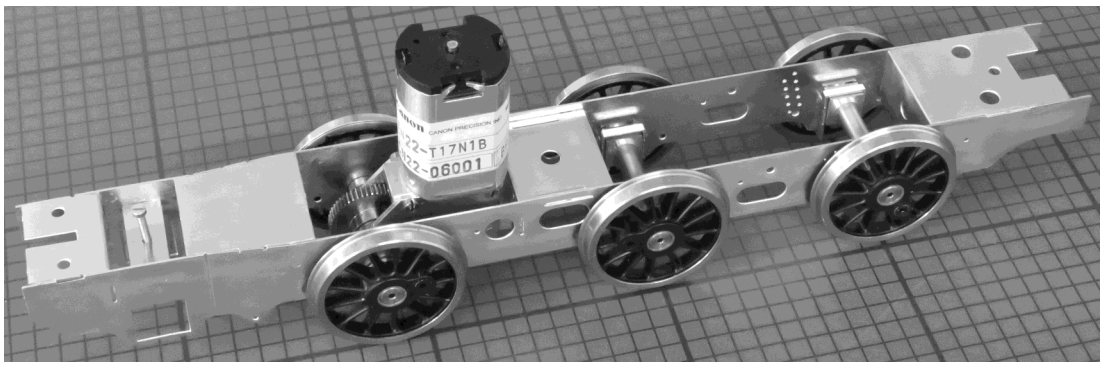
19) Remove (17) life guards (guard irons), the larger ones go to the rear, bend to shape to align with the wheels, note the bends go in opposite direction for each pair. Study picture right. Having bent to shape solder into the half etched locations on chassis

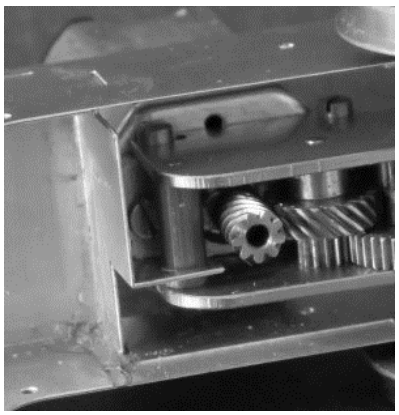


20) Remove the coupling rods and rear set of wheels and fit motor and re-fit wheels and coupling rods.

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.

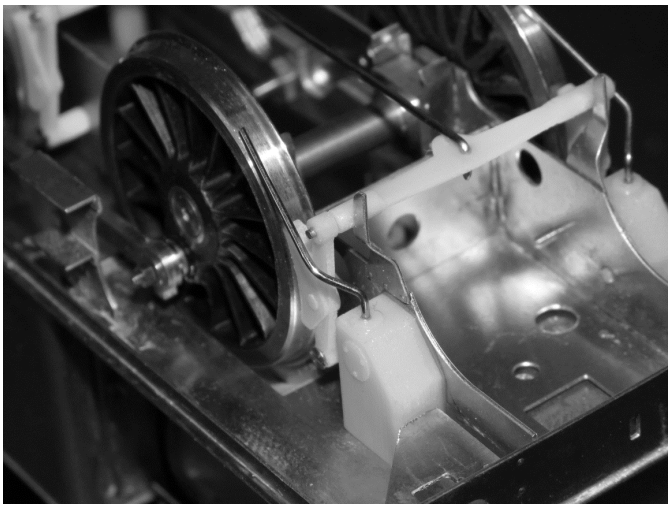




21) There are 2 ways of attaching the Brake Hangers (PP1). a) Solder a piece of 1mm wire (45mm) across chassis through the holes and glue on brake hangers. b) Drill 1.05mm and tap holes for 12BA screws to screw on brake hangers. In either case now is the time to drill and tap or solder in wires.

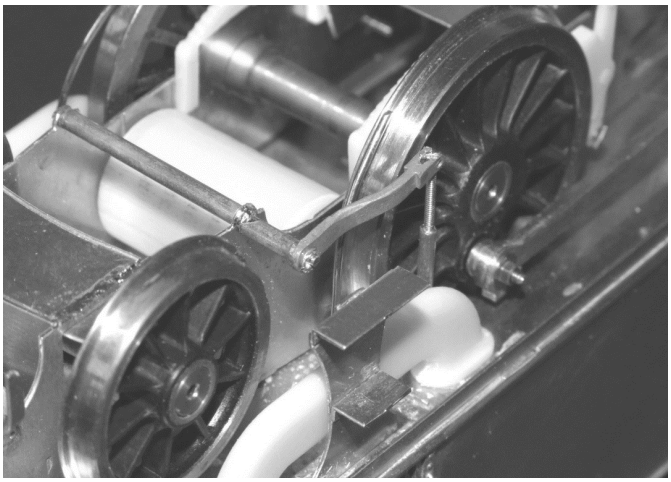
If you intend to screw on the brake hangers, carefully drill top holes with a 1.4mm drill bit to provide clearance for 12BA bolts. **Temporarily** fit front and rear brake hangers, if not screwing, hold hangers in place with small pieces of blue tack.

22) Now identify the (PP2) front Sand Boxes to use. The rear sand boxes are mounted in the cab, so ignore at present. The front sand boxes are mounted on the chassis; use the pips on the back to locate in holes in chassis.
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.



23) A piece of 2mm rod, (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.

Next take the 14BA bolt, cut off the head and then slide the end into the 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.



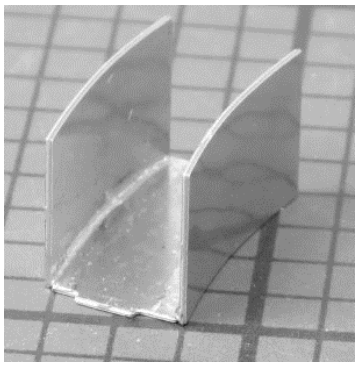
24) Fit Vacuum tank (PP3) between frames as per photo on right.

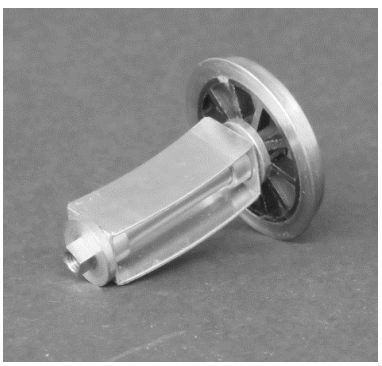
25) Take brake stretcher bars (PP4) and either glue in a short length of 1mm wire or drill 1.05mm and tap 12BA each end of stretcher. Fit stretchers between brake hangers. Using lengths of 0.7mm wire bend to length 3 pieces to form pull-rods and glue in place on stretchers. If you have screwed on your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

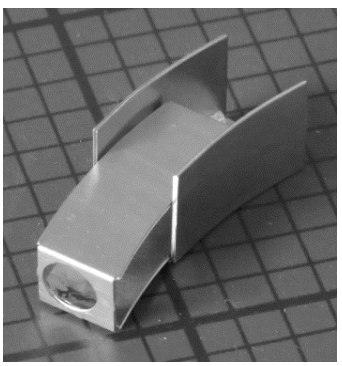
26) Pickups – If you are not fitting plunger pickups, the easiest option, then you will need to glue some pieces of copper clad strip onto the chassis for later use to enable you to secure the wire you use for “wiper” pickups.

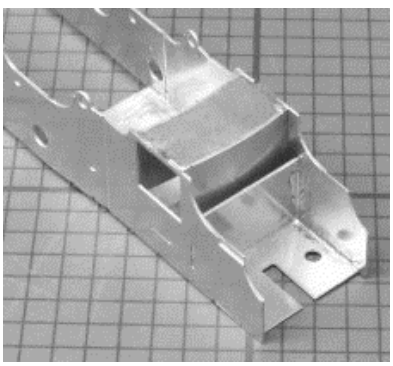
27) Taking the 4 or 6 under-slung springs (PP5) glue into place, there are pips on the springs and holes in chassis for location.

28) Bend (18) & (19) to match curve on (20), solder (18) & (19) to sides of (20) to form a “U” shape. Now fit this assembly to the chassis to form Radial axle guide. Bend (21) to form a box & solder, test in guide and fettle until it moves smoothly, place in guide and bend up tabs. Lastly fit screw in (11) and place a spring over screw to press on to (21) – it’s a bit fiddly! Place a top hat bearing in each end of box and fit wheels and axle.









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.

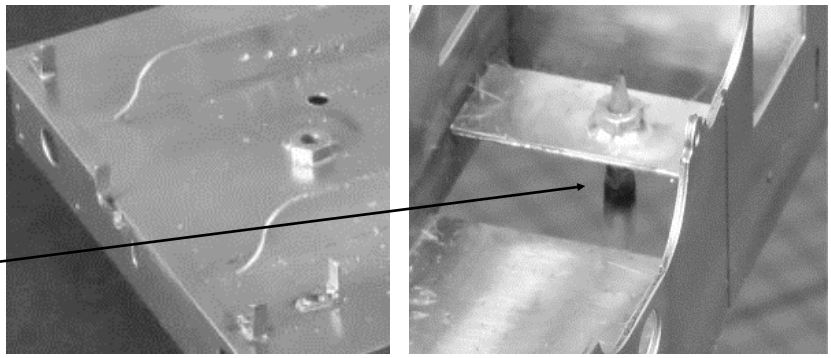
30) There are a large number of wheel balance weights, choose the combination to suit your chosen loco. Cut out parts (22*)* balance weights and clean up, glue to wheels in correct position relative to the crankpin. Either mask wheel tread using maskol or similar and paint the whole of the wheel front or just paint the balance weights

31) 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

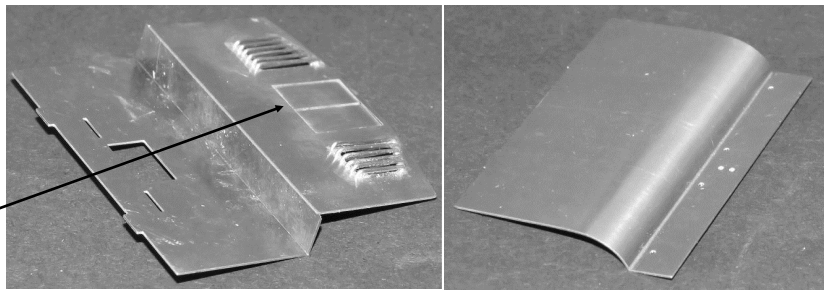
Superstructure

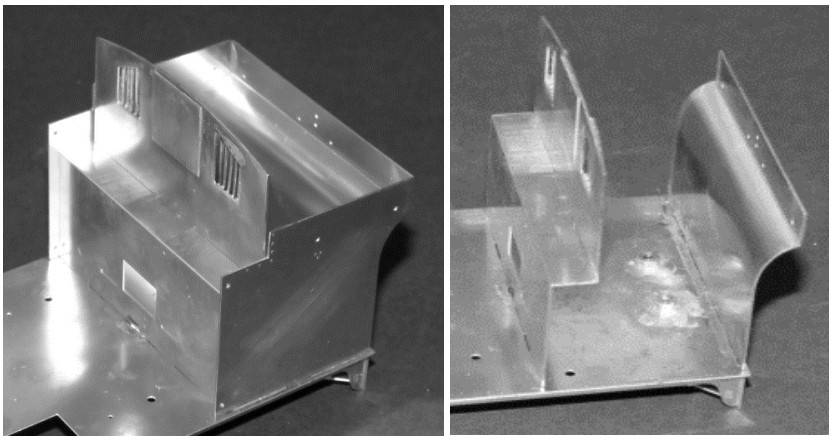
32) **IMPORTANT** - There are hexagonal half etched locations at each end of the footplate, solder an 8BA nut into each.

To prevent the solder from going up the thread, coat the end of a cocktail stick in light oil and screw on the nut. Pass the stick through the hole after fluxing the recess and apply solder – this is where I use Rosen cored electrical solder for the added strength. See picture right. ***NOTE!*** *Now is a good time to check the chassis fits.*



33) Locate (23) Left & (24) Right bunker sides and (25) bunker back, de-cusp and clean up. Drill the 2 pairs of holes for rear grab rails. Take the bunker back bend to match profile of the sides. Locate (26) cab back, clean up, locate (27) coal doors and solder into the recess in centre of cab back. Take (28) cab back overlay and fix in position, align with window holes, don't worry if there is a little overhang, this can be removed after fitting the rest of the cab. Next take a piece 0.7mm wire form the window protection bars. Using a piece of card to keep the bars at the same depth, solder in place. Form the 2 bends with half etched lines on inside.

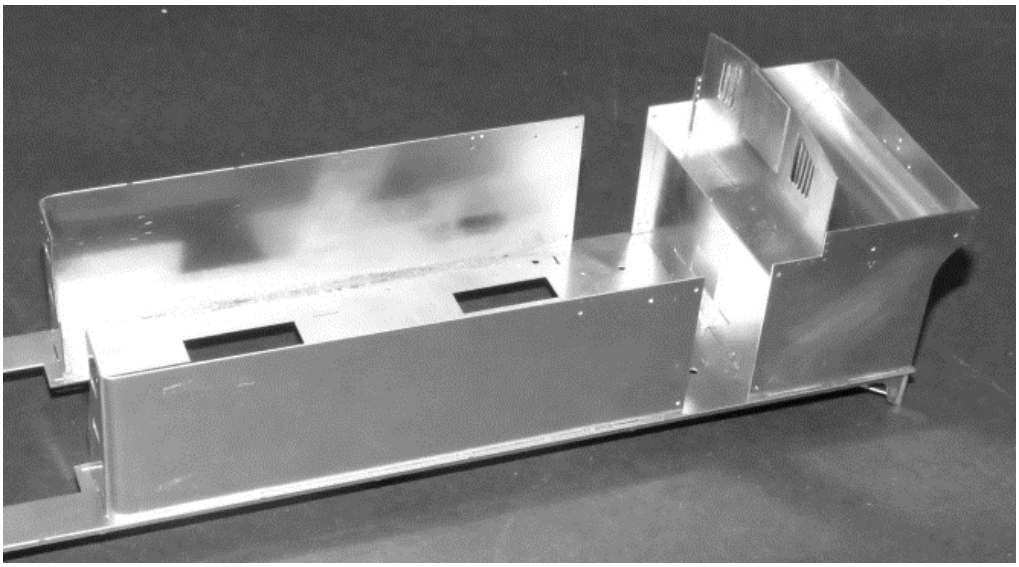




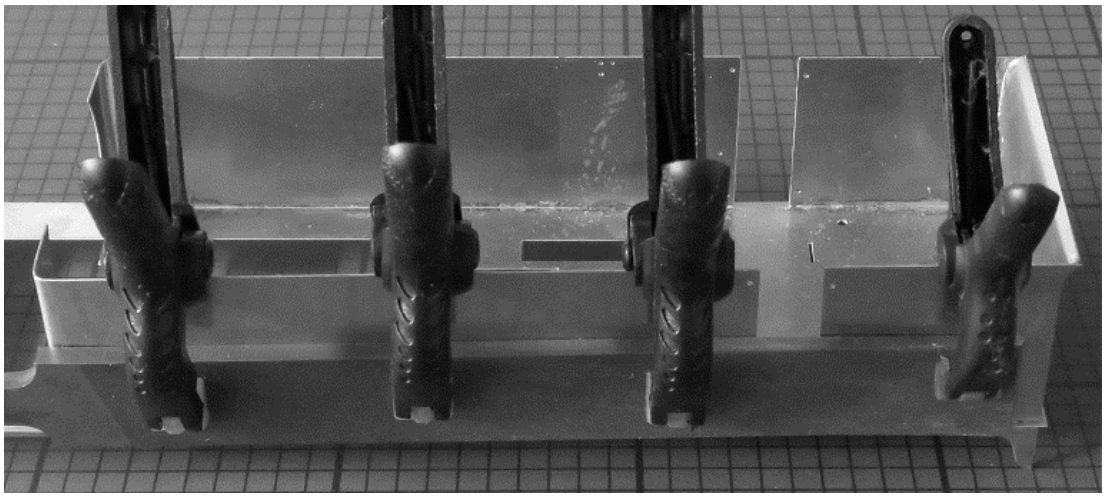
34) Tack the bunker back centrally onto the footplate, repeat with cab back, use a square to ensure they are upright.

35) Drill out the appropriate handrail holes for your chosen loco, now punch out rivet detail. Then tack one of the bunker sides in place, allowing a tiny overhang of the back. This can be filed off later leaving an invisible join. Repeat with the other side, we will solder fully later.

36) Locate (29) Left & (30) Right outer tank sides, clean up, *do not remove location tabs* and punch out rivets. The holes at front end are best left until the sides have been bent. Measure from cab end 109mm and mark a line on the inside, mark a second line at 114mm, these lines denote the start and finish of the curve (3mm radius). Using a 3mm bar (drill shank) form the 90^0 bend on both tank sides, offer to footplate and adjust to get a good fit, finally check the cab opening is 9.5mm. *NOTE! Because of the etching process the tabs might be a little long and protrude below the footplate and show on finished model, check and remove excess before fixing*. Now is a good time to drill the holes for the tank front handrails, pre-formed centre marks indicate where to drill.



37) With the footplate supported on a block of wood or similar to prevent bending, fit into location slots and when satisfied tack into position. Next clamp a file to the tank side and bunker side to ensure they are in alignment, when happy solder tank sides bunker sides and back full, but *not* cab back.

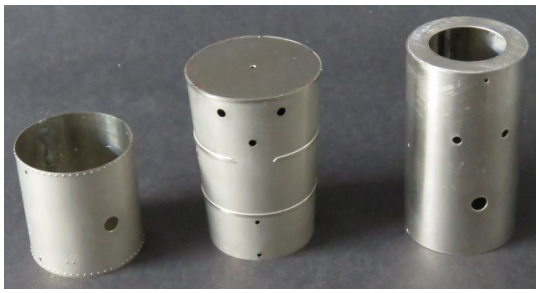


38) Remove (31) Left & (32) Right inner tank sides clean up, and fold. With the footplate supported on a block of wood or similar to prevent bending, fit to location slots and if needed clean out slots, when satisfied tack into position. Because the printed parts lack weight, now is the perfect time to add some ballast in the tanks, Lead sheet is perfect and I list elsewhere how to obtain some. Complete step 39 below to ensure that everything fits and then solder tanks & bunker.

NOTE—the following pictures are for illustration only, please read instructions carefully to identify differences.

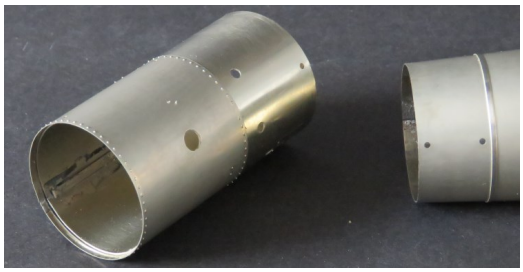
39) The boiler and smokebox comprises of parts (56 to 62). Start by rolling (56 to 59), then using elastic bands or clamps, dry fit parts (56 to 58) over (59). When all the overlay tubes fit snugly over (59) solder the seams of (56 to 59), BUT NOT TO EACH OTHER.

Part (61) goes in the chimney end of (59) opposite to the picture (County Class), solder firmly in place and then gently round off the sharp corner. When you slide (57) on it will be slightly back from this.



Part (61) goes in the end of (59).

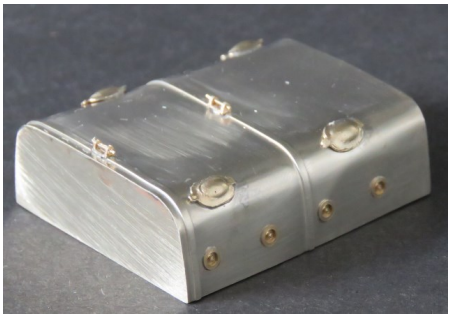
Slide (57) onto (59) and align using the chimney and handrail knob holes (use a piece wire or handrail knob to hold in place). Next slide (58) onto (59) as it will go, there is a hole on top to align it, put a piece of 1mm wire in and when completed fill hole.



Place the whole unit on a flat surface with chimney etc. holes at the top and press down so that all the components touch the bench. Visually check there isn't a "dog leg" when viewed from the end.

When totally satisfied tack together, check again and adjust if necessary then solder up completely. The following pictures will hopefully illustrate the process.

40) Form the fire box crown (64) to match the ends (65) & (66), then solder together ensuring the finished unit sits flat.

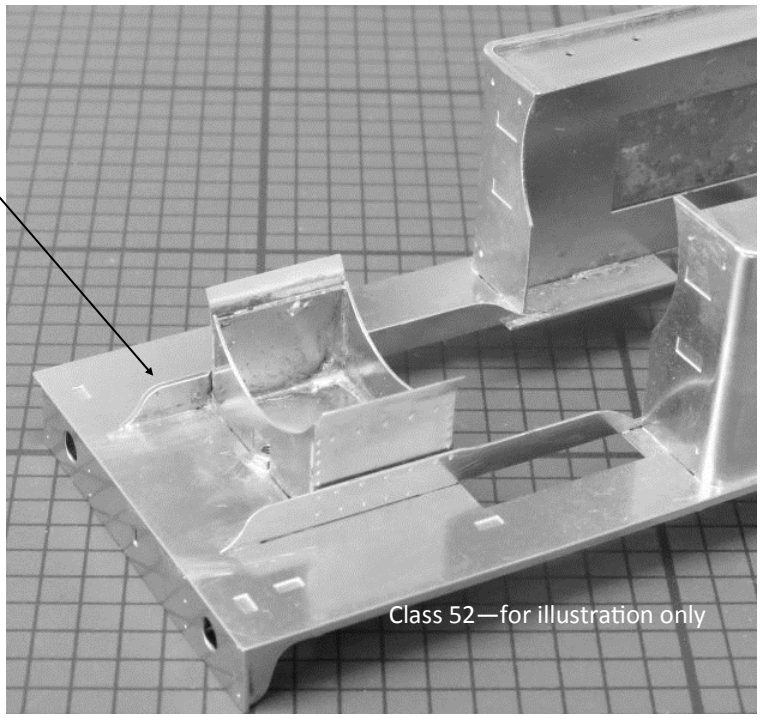


41) Fit washout plugs, mudhole covers, cladding clamps. Leave Chimney, top feed and safety valve bonnet for now.

42) Glue (PP6) to front of firebox crown and smooth carefully to match profile of firebox crown.

43) If your chosen loco had a front step under the smoke box take (63) and fold to shape, then solder in place.

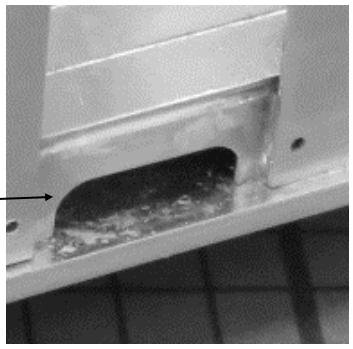
44) Remove (45) frame extensions; **carefully** clean up, there is a rebate at the front end to accept "piano" cover, form rivet detail. Locate parts (46 to 49) smokebox saddle clean up and offer to the slots in the front of the footplate. Using an elastic band to hold in place solder together, check the box formed is square and central. Then trapping (50) the saddle overlays, clamp (45) alongside the smokebox saddle. When satisfied with the position of these solder to the footplate, *check that everything is still flat and square.* Flare saddle overlays.



45) Remove (33) tank top from etch and bend down centre support at right angles, fill the other half etched lines with solder to keep flat. Loosely attach rear of boiler to tank top and offer to sides and saddle, you may need to wiggle it between the tank returns at the front. If happy tack solder in place and check that footplate is flat and not twisted, if not correct it, when satisfied solder in place fully and check again.

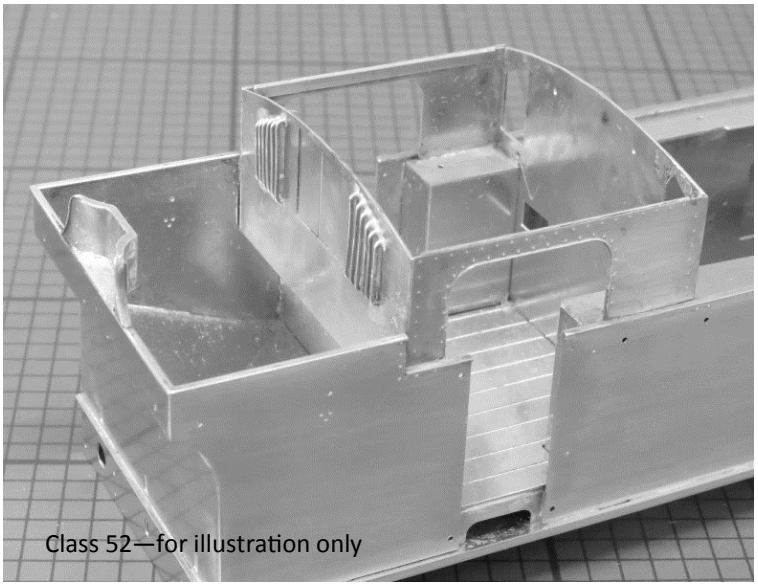
46) There is a small rivet strip on the etch (76), this goes on the underside of the boiler just behind the saddle.

47) Remove (34) the cab floor supports, fold at 90^0 on long fold and fold ends double and solder. Place in doorway on footplate, they should be the same length as the gap between tank rear and cab back, fettle to suit.



48) Remove (35) & (36) cab front & floor, take cab front and check it fits between tanks. Take cab floor and fit tabs into slots in back and rest on (34), next put base slot of cab front into slot in footplate and push back onto slots on floor. When satisfied tack to footplate.

49) Remove (37) & (38) cab sides. Check that each side fits with cab front and back, now bend top of cab side over to form a double thickness. With the sides in place use an elastic band to hold them roughly in place. The sides fit into rebate at the front and alongside the cab back, check cab is square or it will affect fit of roof. If satisfied solder in place. Now fix the (39) cab side and (40) front overlays, either by glue or soldering, they are slightly oversize so a little fettling is required to ensure tidy corners.



50) Locate (41) the bunker floor and put a slight bend on the fold line, fit into bunker with tongue thru hole in cab back.

51) Remove (42) & (43) tank top beading clean side with groove whilst still attached to etch. Carefully clean off the cusp on the inside of each by gripping in a vice whilst working. The outer can be done later when fitted to tanks. Fit beading to tank top and solder in place, when complete trim of surplus at each end. Now very carefully remove outer cusps, file in a direction that pushes the beading on to, rather off the model.

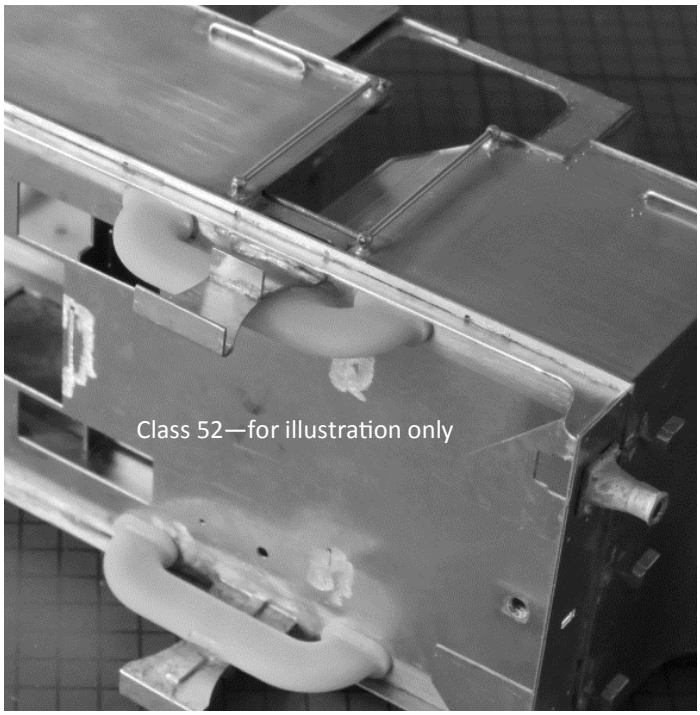
52) The bunker beading (44) incorporates the lamp shield base, if your chosen loco did not have the lamp shield at that date and you will need to remove the lamp shield base. Fit beading to bunker and lamp shield onto beading as shown if so desired.

53) Remove (51) (x2) tank front steps clean, form rivets, bend and solder to tank front into half etched pockets, flange uppermost.

54) Take a piece of 0.7mm wire and form tank front handrails and solder into place.

55) Taking (52 to 54) steps & back plates. Form rivets in steps and back plates, then form folds in all parts. Some locos acquired fabricated cab steps (55). I personally like to solder steps to back plates with Rosen cored solder and then fix assemblies to footplate with 190^0 solder, this I find gives a strong bond whilst not having the steps fall off during the process. When you have made up your 4 sets of steps, solder the front pair to the underside footplate in the half etched pockets provided. The rear pair will need to be bent slightly to roll around the balance pipes (PP7).

No 79 had fabricated rear steps (55) similar to a 56xx and these can be found on Sheet 8. Again they appear to have needed to bent to sit around the balance pipes.

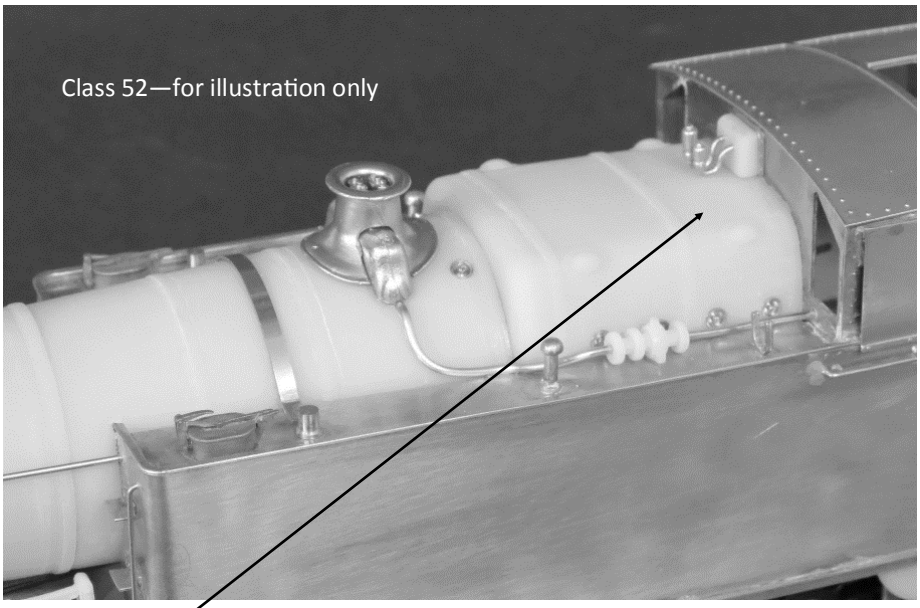


56) Solder or glue tank fillers into tank top, repeat for tank lid stops and tank vents.

57) Remove the casting sprue from the top feed fettle until it sits nicely on the boiler. Place the bonnet over the top feed and slide it forward until it touches the boiler band, mark the position with a pencil, remove bonnet and fix top feed.

58) There is a hole in the top of the smokebox wrapper to indicate the position of the chimney, once happy with the position glue down the chimney.

59) Locate (67) the tank strap, clean up and punch out rivets, roll until it fit the boiler as per picture, bend the last 4-5mm at each to fit on tanks, solder in place.

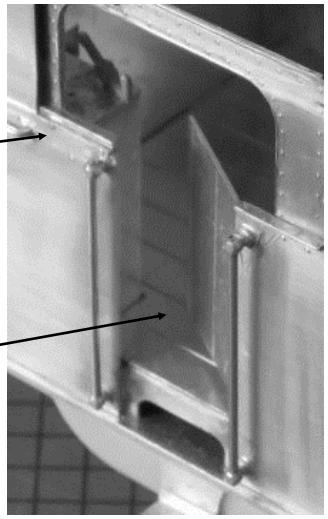


60) Take part (79) and place (PP8) whistle shield box over the front, mark and drill the 2 holes. Fix (79) & (PP8) in place and if need be drill through cab front. Bend the whistle as per picture fix in holes in cab front.

61) Fit Hand brake handle in the hole in left tank top inside the cab.

62) Assemble and fit the screw reverser in cab on to the flap on right tank.

63) Remove (73) the cab doors and decide if you are going to have them open or shut (easiest) and after cleaning up and fettling to fit, solder or glue into place. Note they have little legs to keep them proud of the floor.



64) Remove (69) cab roof and (70) roof brace and clean up. Carefully roll the roof to match the profile of the cab front (back) avoiding any creases and then punch out rivets. With roof upside down solder the brace into position making sure it equal distance from each. Offer to cab, the brace goes on the inside, if necessary adjust until it fits and that the overhang is equal front and back and the same at the sides. Ventilator hole is towards the back.

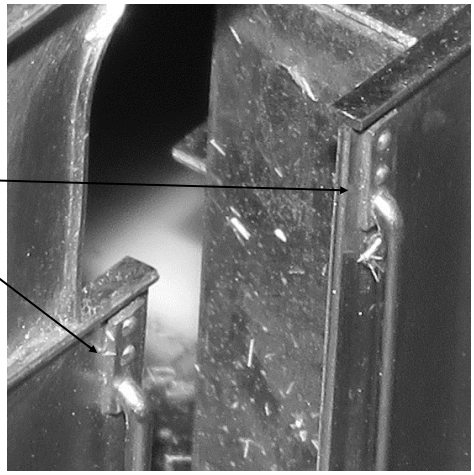
Take 2 pieces of 1 x 1 brass angle and carefully bend to same shape as the roof, when happy solder to each end of the roof with “upstand” outer most. Next take 2 more pieces and form the very shallow Vs for the rain strips, note they stop 1.5mm from the other angle pieces.

66) Remove (71) roof vent clean up and roll to same profile as the roof and fix on to roof. DO NOT FIX ROOF.

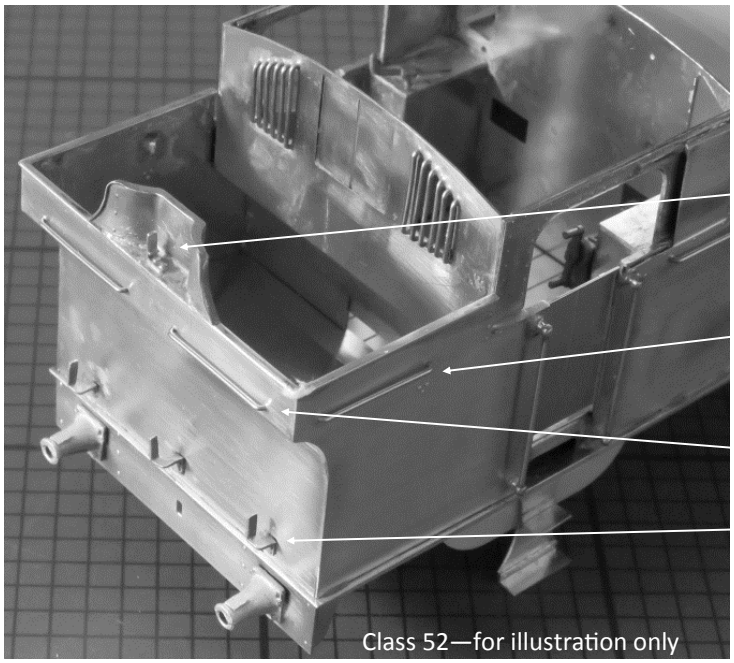
67) Fix (72) the coal door in place on bunker front in cab.

68) Remove (78) cab shutters x2) and set aside. Next cut 4 pieces of 1 x 1 mm channel 21mm long and fix to side of cab at the top and on the tank beading, 4mm back front the front. Repeat for other side and check that roof still sits snugly onto cab, then put cab roof out of harm's way.

Take the shutters (78) and offer in to the channels, file to size if necessary.



69) Locate (74) handrail bases punch rivets and tidy up. Next take 0.7mm wire and form handrails (excuse the fibreglass). Place one on each end of the handrails you have just formed and then fix to tank side, repeat for other side.



70) Similarly clean up and fix bunker lamp brackets into pockets on bunker rear.

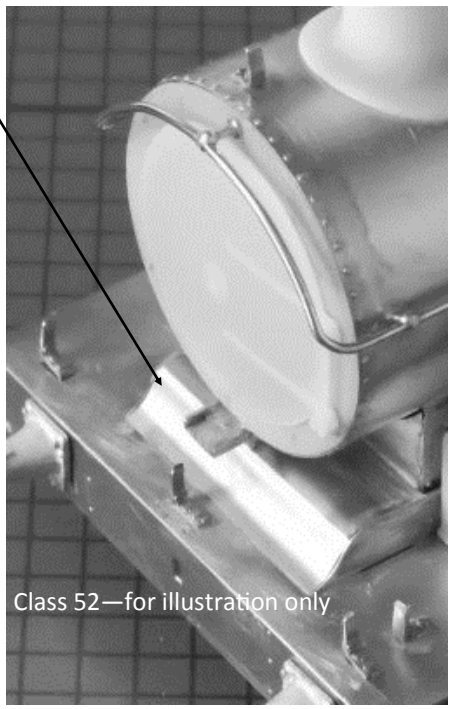
71) From 0.7mm wire form 2 bunker side handrails and fix in place.

72) From 0.7mm wire form 2 bunker rear handrails and fix in place.

73) Locate lamp brackets clean up and fix into the pockets on front & side of footplate.

74) Remove parts (75) sand box fillers, 2 bits for each and fix to the footplate directly above front sandboxes.

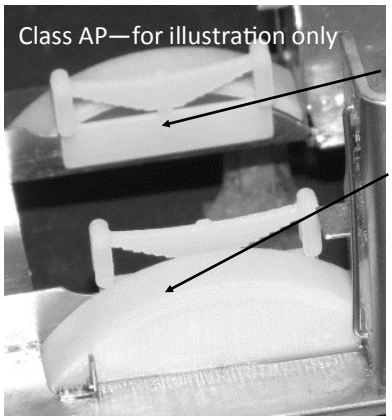
75) Locate (76) "piano" valve chest cover, bend to shape to fit between the front frame extensions.



76) Take part (PP9) smokebox door clean up and drill a hole in the centre to accept the door handle. Now fit into smokebox front and make sure the hinge pin is vertical. Glue into place when you are sure it is right. Now glue door handle in place, inner arm must be vertical and hanging down.

77) Locate the smokebox lamp bracket clean up and attach to the top of smokebox.

78) Take a length of 0.7mm wire and form the front hand rail, there are 4 short handrail knobs and 1 medium, these go on the boiler sides. Note the handrail goes into the tank fronts. When satisfied with the shape glue knobs and handrail in place.



79) Glue front over-springs (PP10) to inside of frame extensions, they are meant to be deeper than frames.

80) Clean up front wheel splasher (PP11) and glue in place against frames and footplate.

81) Having detailed and painted boiler back head, fix in place in the cab.

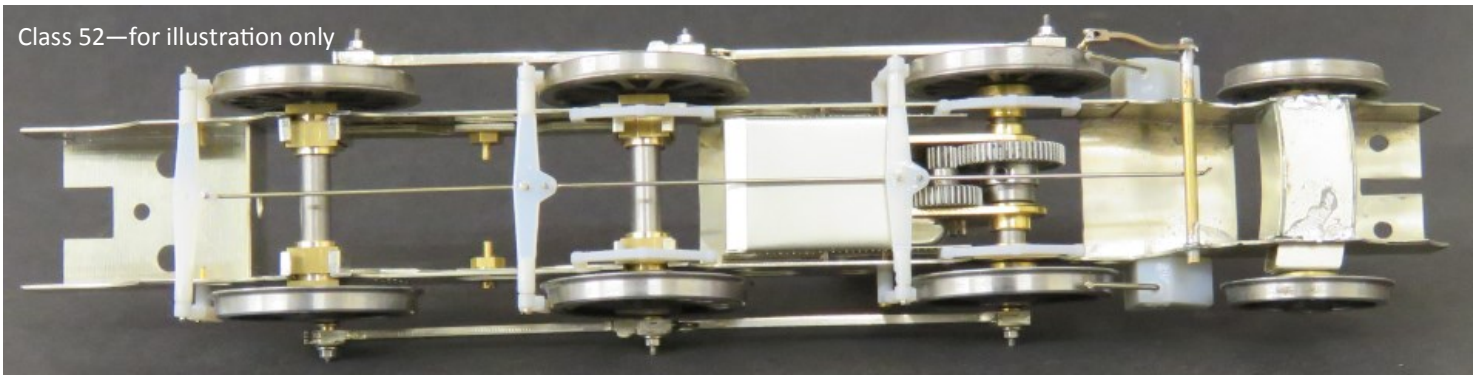
82) Glue Cab Sandboxes (PP12) into corner formed by tank side and end. There are 2 holes in the footplate into which you glue the sand pipes.

83) Taking a length of copper wire form the top feed pipes. The injector (PP13) is fitted between the 2 pieces as shown and the end is feed through the hole in cab front. Refer to pictures.

83) Fix buffers and coupling hooks in holes in buffer beams.

Paint the body, decal and number.

After re-assembling the chassis, bend over the tabs to hold the hornblocks in place.


Class 52—for illustration only