88D Model Kits

GWR 56xx

88D Models – GWR Class 56

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 may want to upgrade it by either substituting or even fabricating small extra details.

A great deal of care has gone into designing this kit and I have "test" built at least 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" as 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. trapped nuts. 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 cheap 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 or scoring mop, 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.

Soak and then carefully wash all 3D printed parts in 50^0C hot water to remove any wax left from printing and dry.

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

Wash off the flux residue after each operation and always clean thoroughly at the end of the session.

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** if practical.

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.

Always tack solder parts to ensure they are 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 S gearbox and motor or Slater's SG28

3 x Slater's 7855WP – 4' 7" wheels

1 x Slater's 7843 – 3' 7" bogie wheels

1 x Slater's 7157 plunger pickups

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

Transfers — Caerphilly style block GWR (available at — http://www.88d.uk/pups/Transfers.asp)

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/GWR_56xx_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.*

IMPORTANT

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

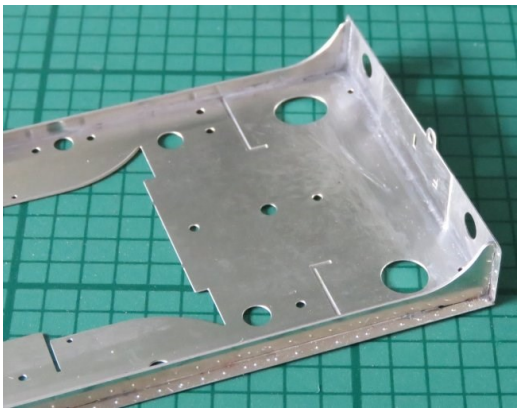
Before you start, Please Decide on the following: -

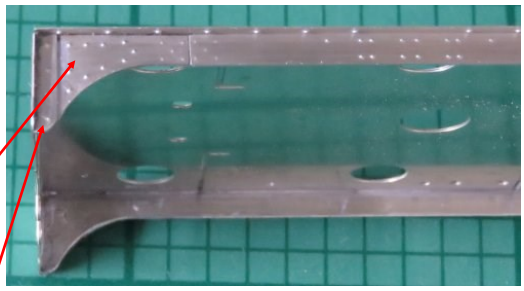
1) You can either Solder everything together as per normal or *Make it in sections and screw it together at the end, this will make painting much easier.*

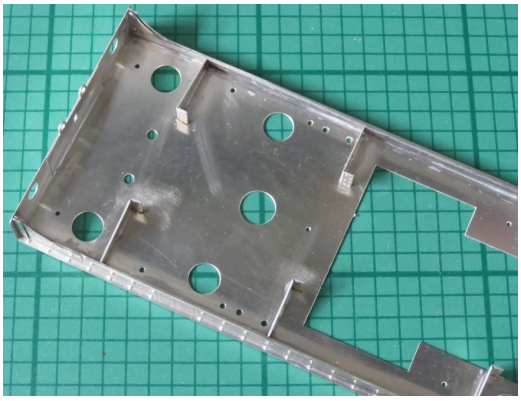
2) Type of suspension, simple beam compensation, sprung horn-blocks or your own favourite.

3) Whether to fit inside motion, a 3D printed set is provided and a 2 part etched motion plate for those wishing to fit a full working version.

Please note! The pictures are from 2 test builds and may differ very slightly from the final product







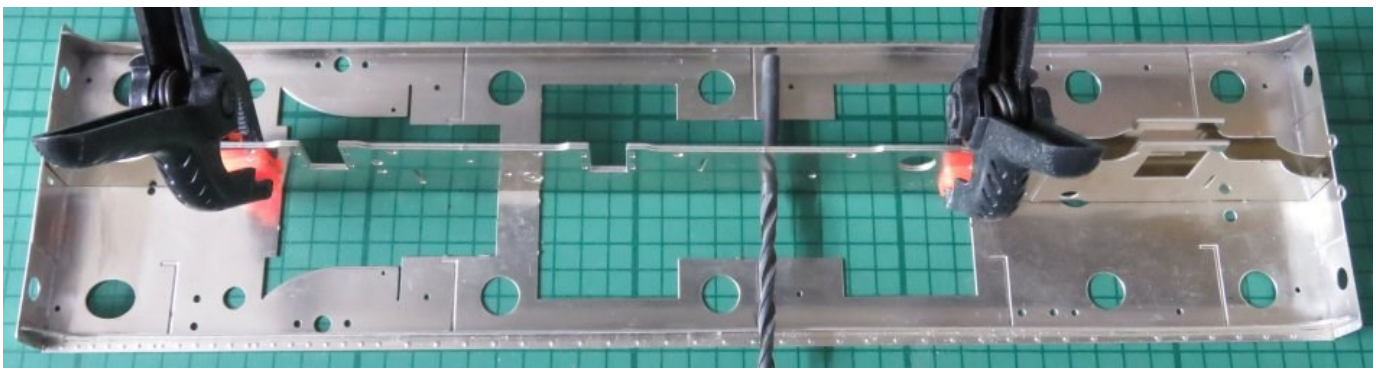
1) Remove (1) Running Plate and (2 & 3) Valances from sheet, Before detaching and parts within note that a small piece remains, these will be dealt with after instruction #33, detach the other parts and store safely. Clean off the cusp from the running plate and valances taking care not to bend or distort the valances. See picture on Page 18 for exploded view of component parts.
2) With running plate upside down i.e. with the rivet detail facing you, tack solder valances into grooves, there are tabs to help, also the R indicates rear and should be facing inside, ensure they remain at 90^0 to the running plate. When satisfied finish soldering and check again they at 90^0 to running plate.
3) The Buffer Beams have an inner and outer part. Remove and clean up (4 & 5) the inners, and solder on to ends of valances and running plate, with etched detail facing inwards. The buffer holes should be furthest from running plate and they sit on the running plate, refer to picture. You now have box into which the chassis will fit.
4) Locate (6 & 7) Valance Overlays, these are handed with the most rivet detail towards the rear, (6) goes onto (2) and (7) onto (3). Align the holes which are off centre on the width of the overlay to project up further to the running plate, fix in place.
5) Take parts (8 & 9) Valance Overlay Ends, fettle to fit, (8) at the front and (9) at the rear.
6) Lastly, there are 4 x (10) Corner Overlays and these fit at each end on both sides. See pictures.

Chassis Section

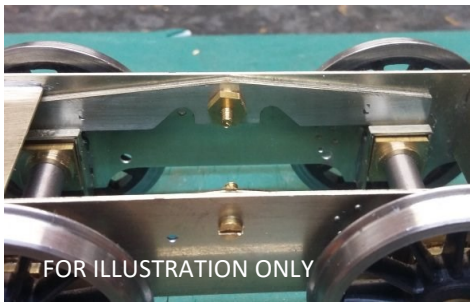
7) See picture on Page 18 for exploded view of component parts. Locate (14 - 20) from chassis etch and remove cusp left by etching process. Apply a joggle to (14 & 15), etch lines to the inside, bolt, clamp or tack solder together, with outside faces together. The gap between to rear ends should be 4mm. Now offer to the running plate assembly, if they are too long remove an equal amount off each end until they fit comfortably inside the “box” of the running plate/buffer beam. The above action is very important, both to be able to keep the chassis square and is easier done now than when the chassis is assembled. When satisfied put the running plate to one side for now and separate the frames.
8) Fold (18 & 20) at 90^0, (16) needs to be folded more than 90^0. Set parts (14 - 20) to one side

   If you are using slaters plunger pickups now is the time to enlarge the holes marked on the frames.

   Before moving on it is recommended that you transfer the pivot holes and plunger holes through the frame overlays (26 & 27).



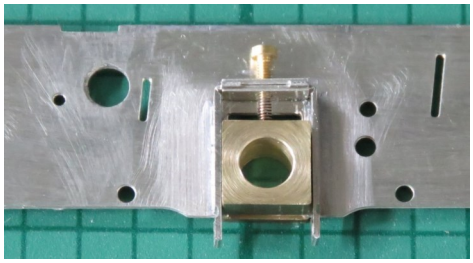
9) Depending on your chosen suspension method, follow the appropriate instructions.



Beam Compensation

See instruction #13 before proceeding

10) Remove (21) 4 off horn block guides fold into U shape and dry fit into slots in frames (14 & 15). Enlarge the 2 holes in the frames, half way between the horn-blocks to 1.75mm for 10BA clearance. Solder 2 pairs of beams (23) together and clean up, DO NOT open up the centre hole unless absolutely necessary for the pivot bearings to fit.

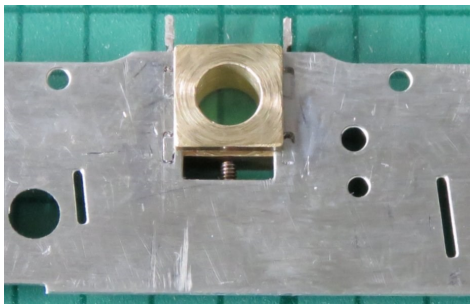


Sprung Suspension

11) Remove (22) 4 off horn block guides fold into U shape, double over extra tab and solder in place, tap 12BA and dry fit into slots in frames.

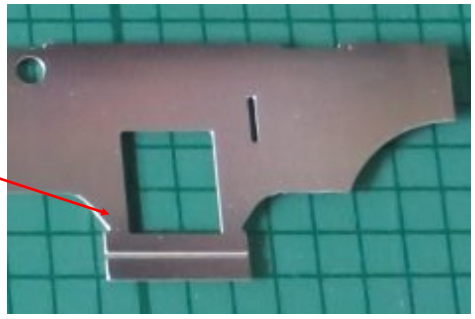
Common to both methods

12) There are 4 bearing retaining plates (RP) on sheet 69, if you bend the tags on the bottom of the guides outwards and tap the holes 12BA these will retain the bearings, but you will need to find a way of holding the springs so they can be removed.



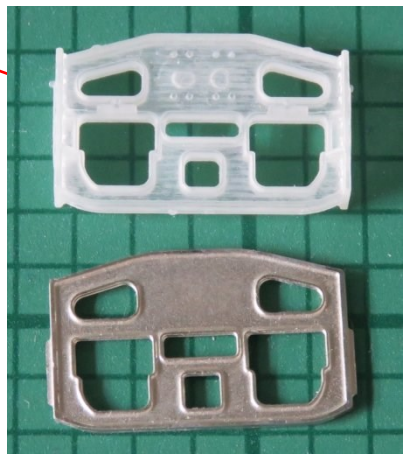
13) Ensure the horn block is a tight sliding fit, adjust until satisfied. With horn guide on the underside apply flux and solder to each tab, don't overdo it as the solder will run through and build up on the inside and foul horn block. Check that each horn block slides freely but is not sloppy, the slots in the bearings will be a little lose as they have to accommodate the overlays, then file off protruding tabs. Note small tab on end of each leg can be folded inwards to retain bearings and masked later for painting.

14) Double over the piece at the bottom of the radial axle box opening, this should be on the outside. Then make sure Joggles in the frames haven't flattened.



15) If you are using the etched motion plate (24), then solder back to back and dry fit to frames, as this will need to fitted before the second frame is fitted. This also applies to the 3D printed one (PP1) which is part of the dummy motion. Note! See instruction #15.

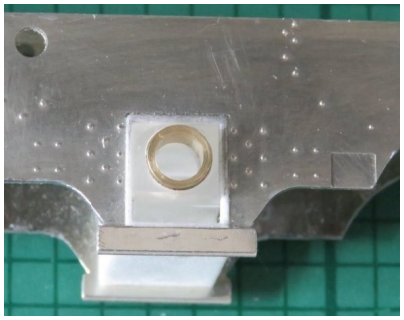
16) Locate (PP2) Radial axle box and fit into the square hole in the chassis frames. Make sure it is the right way up and the right way round. There is a pocket at the top to retain the spring. Slide the special bearings into the Radial Axle Carrier (PP3), then test that the unit slide smoothly in the box, do not fit spring at this time. Put (PP3) aside.



Towards front of chassis

17) Dry fit the frame spacers (16 - 20) to the frames, this is best done upside down. The kit is deigned to be fitted with an ABC motor/gearbox or Slaters SG28 and a mounting bracket (18) or (18S) respectively and are incorporated as part of the centre spacer. Spacer (16) is at front and spacer (20) at the rear of the chassis. Dry fit all the five parts to ensure they slot together, when satisfied with the with the chassis upside down on a flat surface, tack solder together. Offer to the running plate and check it still fits.

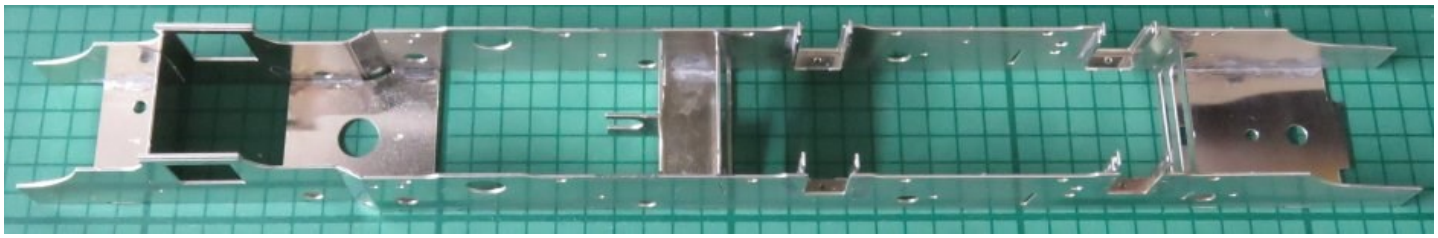
all fit,



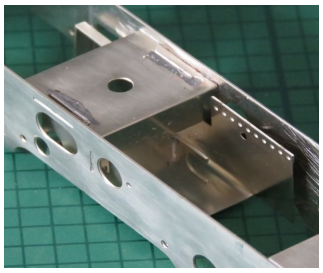
18) If you intend to fit Beam compensation you will need to make some alterations to the motion plate (24) or (PP1). These are only guidelines:- The beams need to pass through the area where the motion plates fit. You will need to remove an equal amount from each side to allow the beams to pass between plate and frame.

19) Return to the flat surface and check that it is still flat and square and then solder all joints fully, DO NOT solder (18) or (18S) in place yet. Check again before proceeding. See below.

20) Now ease the Motion Plate (24) or (PP1) into place and if satisfied fix (18) or (18S) in place. Place the chassis up the right way it should still sit square on a flat surface.

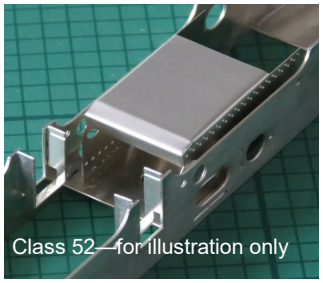


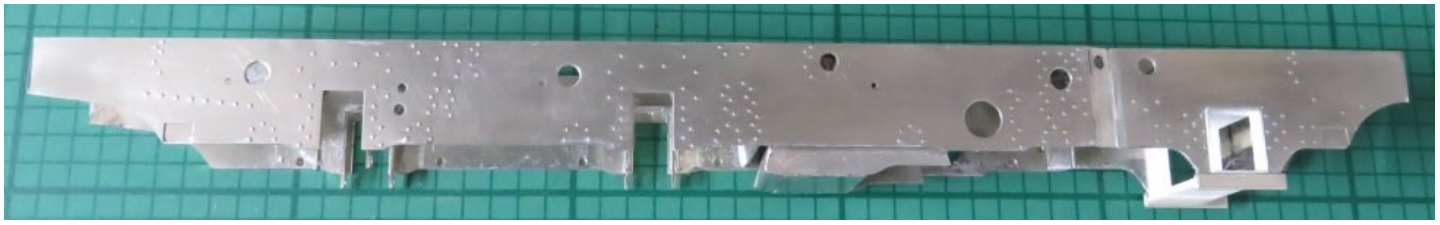
21) Remove (25) (ash pan) and punch out the 2 rows of rivets, clean up and fold into a flat bottom "U" shape with the rivet detail on the outside. Then make the 3 folds to form the front as per picture. Then make the last 2 folds at top of sides and offer up to the half etched locations on the chassis and adjust to get a good fit. Tack in place, see picture, check that your chosen motor/gears option doesn't foul.



22) Check that the sides of the frames are free of protrusions, then starting with main frame overlays (26 & 27) bend the rear ends to fit the shape of the frames, these may be slightly long, fettle if required and either glue or solder in place. Repeat for (28 & 29) the rear overlays, again these are likely to be a tad over size and need a shade off. Check fit to Running Plate.

23) If all is well locate (11 & 12) Valance Brackets. Punch out rivets and bend at 90^0. With the chassis in the running plate start from the front to tack solder the brackets into the half etched pockets. If need be, trim from the outer end until you have a clearance fit between bracket and chassis. Do in pairs this will ensure the chassis stays central.



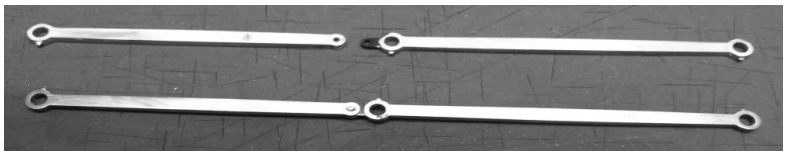


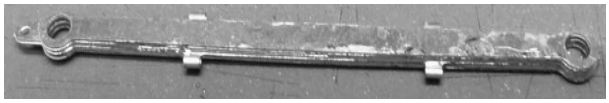
24) Locate (30) life guards (guard irons) and punch out bolt heads and bend to shape, fit into the square pockets on the chassis, the straight edge should face outwards and be vertical.

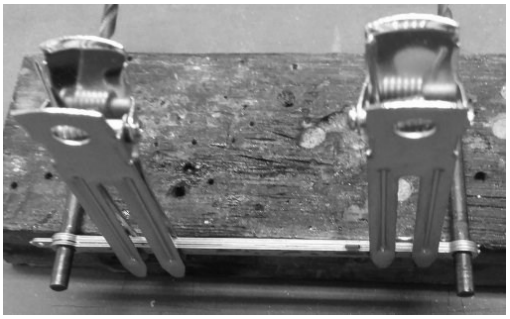
25) Take each slater's wheel and lay face upwards on a piece of 600 grade, wet and dry and with a circular motion remove and slight pips of plastic left from moulding operation. With an emery stick or similar, kiss each of the 4 facets on each end of the axle and then try fitting a wheel to each end.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

26) Using the bearings fit wheels and axles to the chassis (if using beams see instruction #25) – 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.

27) Locate parts (31) Coupling Rods, there are 6 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.







28) If using beam compensation, use 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 horn block). 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.

29) 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 type ones 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.

30) 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.

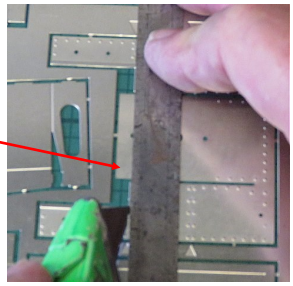
31) Remove the coupling rode and wheels and the identify (PP4) Balance Weights. There are 2 types, choose whichever suites the particular loco you are modelling. The pictures here show the position of the larger ones on the wheels (front & rear are same), the centre ones are not central. The ends weights have a step and you may need to very slightly open the grooves into which the spokes fit on all weights. Ensure the weights fit tight to the inside of the metal tyres. Refit the rods and check that nothing is snagging and that the chassis runs freely. Note! The pictures are with the chassis upside down. Tap 12BA, the six holes in the frames for the brake hangers and brackets (PP5) . If you need to move the rods out a fraction, you can use the crankpin washers, as the crankpin nuts supplied have there own.

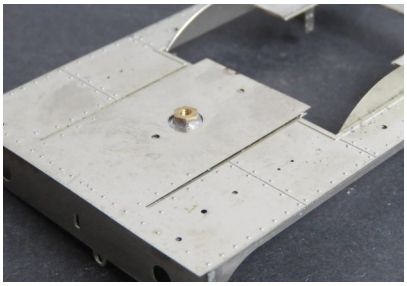
32) Take the piece of shim brass and with chassis upside down place in (PP2). Now slide (PP3) into (PP2) compressing the shim brass as it goes. Fit axle and wheels into radial axle and test for free running and smooth side to side movement.

To avoid unnecessary handling of the brake gear & main springs we will move onto the "body".

Superstructure

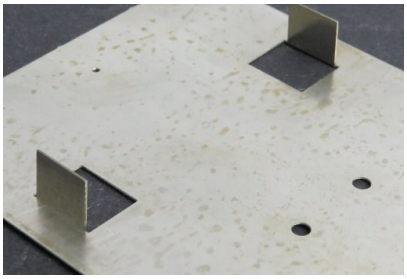
33) Note! The Running Plate is made up of several pieces. Locate parts (32 - 34), but before cutting out (32), scribe between the arrows but not under where the smokebox saddle will sit, to form grooves to represent joins between the plates. Remove any parts that are inside (33 & 34) and put to one side.





34) Take (1) the running plate and offer (32) to this, it should protrude at the front and slightly at the sides, place 2 short length of 1mm wire through the lamp bracket holes to help locate. When satisfied clamp together, turn over and using the large holes tack in place.

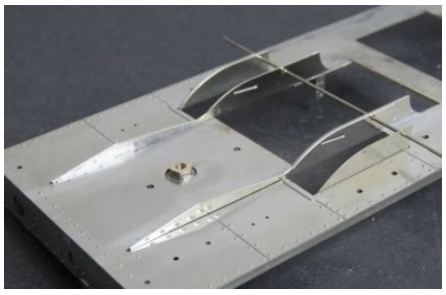
CHOOSE between fixed #35 or *sectional method #36.*



35) Fold up the 2 square tabs in (34) Rear Running Plate and then place (33) Tank Base, with the rivet detail upper most place on top. Align the holes with 1mm wire, clamp and then turnover and tack together make sure not to solder 1mm wire and keep flat. Take (33 & 34) the tank base and position on (1), using 1mm wire align. Again there is a overhang at the rear and sides, just. When you are sure there no conflicts solder (32) & (33 & 34) permanently in place on (1).

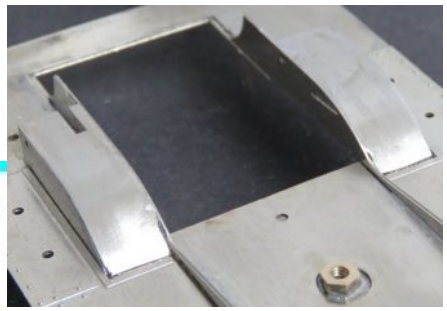
36. *If making sections tap the 7 small holes 12BA in (33) or solder 12BA over holes and then tap. Open up the corresponding holes in the running plate to 1.4mm. When you are sure there no conflicts solder (32) permanently in place.*

37. Locate (4 & 5) Buffer Beam Outers. Offer (4) to front inner beam and align buffer holes, if satisfied fix in place. Repeat with (36) at the rear.

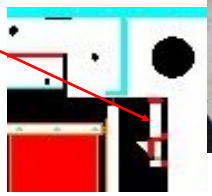


38. Bend up the splasher sides and then locate (37 & 38) the frame extensions. Take care not to distort. These fit in the 2 grooves on the running plate with the half etched portion facing out. Thread a piece of 1mm wire through the splasher sides and holes in the extensions to locate them, then tack in place making sure they are vertical.

39. Locate (45 & 46) Splasher Tops, take (45) and with the slit inner most bend the other end to follow the profile of the splasher sides, repeat for (46). It is well worth spending a little time fettling these until you get a nice fit, the tops should end flush with the rear of the sides. Take either (108) and fold to form a channel or the 3D printed one (PP7) , then slip into the slots in the frame extensions don't fix in place. Note! The longer one is for S7.

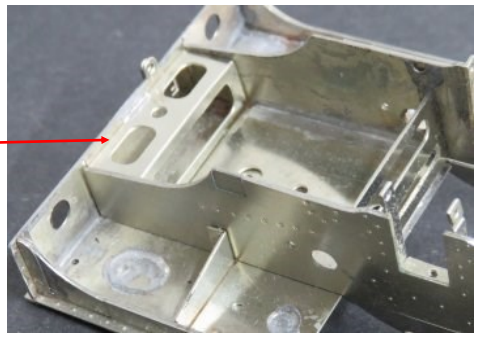


40. You can do either of the following, a) carefully cut the 2 tabs on the little piece inside the running plate, this is intended to fold up and provide a support for the sanding rod (123) which we will come to later. b) take the 2 parts (124), solder back to back leaving a groove at the top and fix to the running plate, in line with the slot in splasher, ready to accept (123).



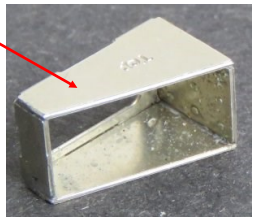
41. Solder 3 x 8BA nuts into the etched pockets on (1) & (33), I find the easiest way to do this is to thread a nut onto a pointed wooden cocktail stick, hang the plate over the bench edge so that the stick hangs down, flux plate and solder the nut, check it is central, if not adjust.

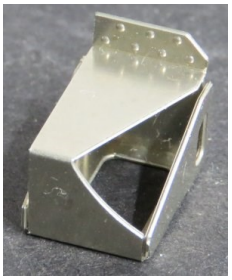
42. Bolt the Running Plate (& Tank Base) to the Chassis with 8BA bolts checking that it sits centrally. Locate (39) Front Centre Stiffening Box, fold at 60^0 and place between the frames with the 3 holes upper most and the slot sitting over the chassis spacer. Check that it is not too tight on the spacer, then tack to the back of the buffer beam.



43. Repeat as above for (40) the Rear Centre Stiffening Box. Remove the chassis and solder both permanently. Then check the chassis still fits.

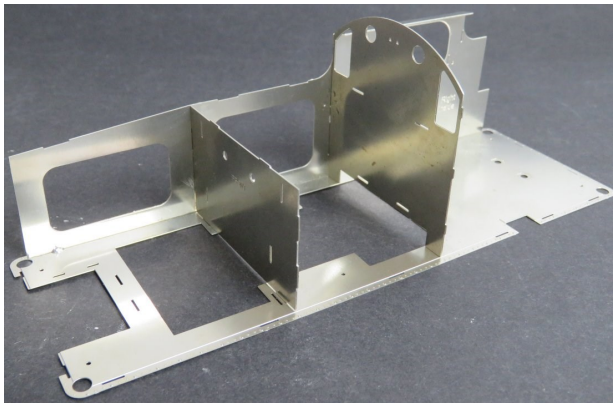
44. Identify parts (41 & 42) Front Buffer Strengthening Boxes. Punch out the rivets, the carefully fold each into a box, then try (41) in the space behind the left buffer. It should not "grip" the chassis, if it does squeeze it in a vice. Then solder up the box and tack the box to the running plate/ buffer beam. It is important that make sure it is the right way up so as not to foul the buffer base shank. Repeat for (42), then remove the chassis and solder fully.





45. Identify parts (43 & 44) Rear Buffer Strengthening Boxes. Next repeat the steps in instruction #44 above.

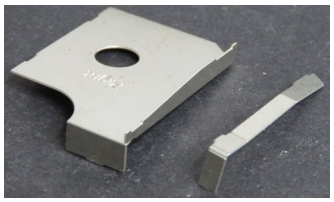
46. Locate parts (47 & 48) Cab/Tank Sides, (49) Centre Plate & (50) Cab Front. Take (47 & 48) carefully fold the piece above the cab door way by about 60^0 making sure not to distort the narrow piece of cab side above the doorway. Carefully cut the tabs and then fold the tank rear (in doorway) at 90^0.

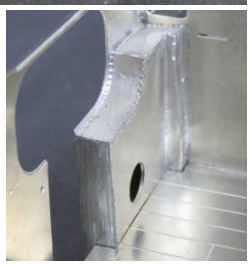
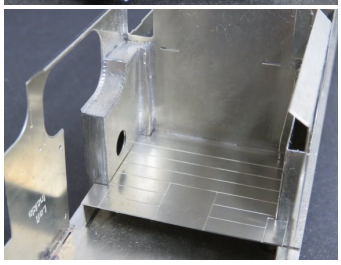


47. Offer (47) to (33/34) the tabs will align with the holes/slots, the tank rears sit in a slot on (33). Repeat for (48), then take (49) and fit between (47 & 48), make sure it is the right way around and not upside down. Then take (50) the Cab front and do the same. Starting with one side apply a couple of tacks to hold in place, but before tacking the bunker side ensure the cab doorway is parallel (8.75mm). Next tack (49) to the same side followed by (50) the cab front, then lastly tack the other side in place, make sure that the sides are in same position relative to each other else there will be problems fitting the tank tops later.

48) After checking that everything is square, all these parts can be soldered together with the exception of the bunker sides, leave as tacked for the moment.

49) Locate parts (52 - 55), taking (52) Cab Tank and form both bends. Take (53) and form bends to follow the profile of (52) see picture, when satisfied solder in place. Repeat for (54 & 55) then offer into position in the cab, if necessary fettle to get a good fit, solder in place and smooth any tabs back to give a flush surface.



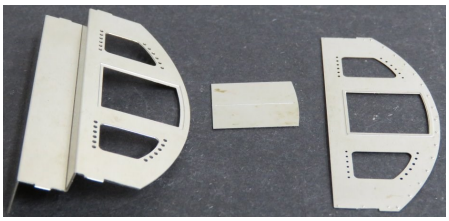



50) Locate (56 - 59) Cab Tank Overlays, fit (56) to the left tank and after bending to shape fit (57) to form the top and making any adjustments solder in place. Repeat for (58 & 59).

51) Place (51) the Footplate into position, this should rest on the upstanding tags and fit into the slots in cab front. Check that it is not too long by placing a strip of scrap etch across under the floor and against the bunker sides, you need it to be about 0.3mm too short to allow for bunker front overlay. To make life easier tack to the cab front from the underside, in the centre between the tabs.

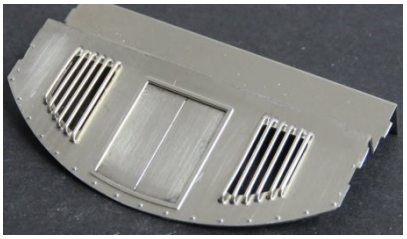
52) Locate (PP6) Cab Tank Manhole Covers, glue in place in tank sides. Whilst here it would be worth trying the Back-head and fitting the Reversing Lever and Handbrake Handle castings in place. Its much easier too check now than when cab back is in place. Some of you may want to add extra detail which will be more difficult, so now is the time.

53) Locate Parts (60– 62). Take (60) Cab Back and form the 3 bends at right angles and trial fit between the cab sides then stiffen the folds with a bead of solder. Next lay (61) Bunker Doors into the hole in (60), half etch to half etch and solder in place. Then place (62) on top of this and after aligning guard rail holes, solder in place.

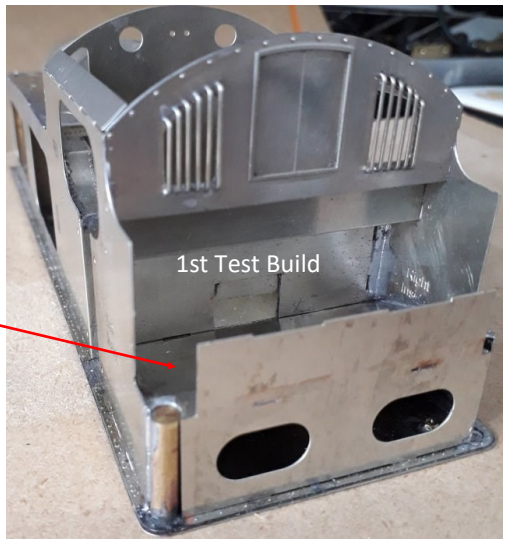
54) Now using the bending jig supplied on Sheet 69, bend the window guards from 0.7mm wire. I lay a thin sheet of card or scalpel blade underneath the wires to keep them off the back and at a consistent height. Snip off the surplus pocking through and clean up thoroughly, easier now than later.


55) Locate (63 - 65) Bunker Front and overlay. Align the overlay over the bunker front and solder together making sure not to fill the 4 slits for door hinges. It will be wider than the bunker front do not trim. Next align the (65) Coal Shute Door and solder in place.

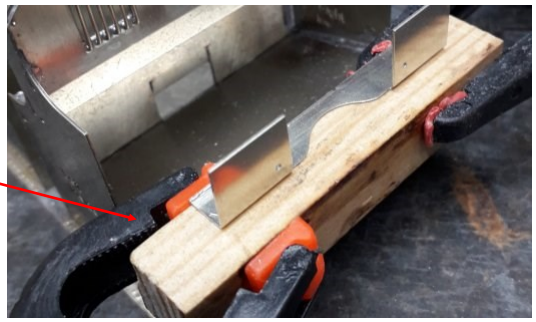
56) After cleaning, place this unit between bunker sides and flush with the front of bunker sides, when content, solder in place, Take the cab back assembly and snap into place, check all is square and the solder to cab sides and bunker front.

57) Bend (66) Bunker Floor to about 15^0 and then place into slots in bunker front. Next place (67) Bunker Back into slots in base and tuck tabs on floor into corresponding holes in bunker back. See Picture. If everything lines up, square and base is flat solder bunker sides, floor and back fully. Thoroughly clean this unit making sure to get any flux residue from area under bunker floor.



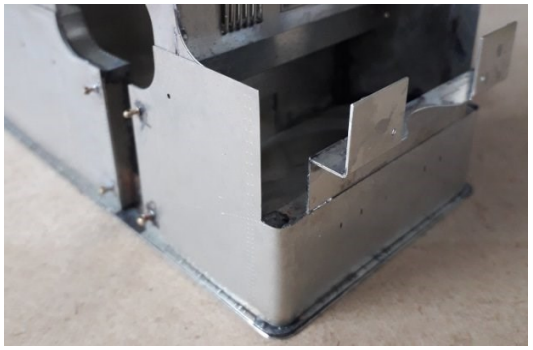
58) Take the shorter 2 tubes and solder into pocket in the bunker floor and the base, this is designed to help form and stop the overlay from creasing, we will come to this later.

59) Locate (68) either the early straight back bunker or (69) or later version with familiar “lamp hole”. Clean and fold to 90^0 and then attach to the top of (67), again at 90^0 . To help keep it in position clamp a small piece of square wood to support it whilst soldering. See picture.



60) If doing the later bunker take (70) and bend to shape to fit the space in (69). This is a little bit fiddly, but worth spending the extra few minutes getting it right. Be careful not to distort (69) in the process.

61) Carefully remove (71) Bunker Overlay and very carefully remove any residue of the tabs. Place on to one side of bunker and using a 1.2mm drill shank locate the overlay onto the side through the lower handrail knob hole, then with overlay sitting parallel to the running plate, carefully “drag” the overlay around the corner. Remove and carefully tighten the bend around a rod or drill shank of 4mm diameter. Position as before and form the second corner, remove tighten bend and offer to the bunker again, handrail holes should line up on both sides.



62) Locate (72) Early or (73) late, Bunker Rear Overlay. Laying the overlay face down measure and mark a line 10.5mm from the top, then scribe the line several times until you see a faint impression on the other side. Now roll the lower portion over a suitable rod to form the curve. Most of you won’t have that to hand so a piece of $^3/_4$ (18mm) dowel will do. Next fold the upper and lower section along scribed line to approximately 60^0, offer to the bunker. Tweak until you have a good fit. Note! Overlay extends sideways beyond the frame, don’t trim. Fix in place.

63) Again if doing the later bunker locate (74) Lamp Hole Overlay, as before bend to shape and fettle to fit, once satisfied fix in place.

64) Take (PP8) Bunker Corners and trial fit, you may have to make some slight adjustments, go sparingly. They should sit 0.2mm below the top of the sides and back and just proud of the sides and back, if using Epoxy to secure then they may need to a little more proud to allow for glue. When you have a nice snug fit, fix in place. Set aside and allow to cure fully.

65) The above picture is from the original test build but it illustrates the relationship of the parts.

66) If you need to do any filling or rubbing down, it is easier now.

67) Locate the bunker rear steps (125) and bend to shape, fix into the slots on the bunker rear.

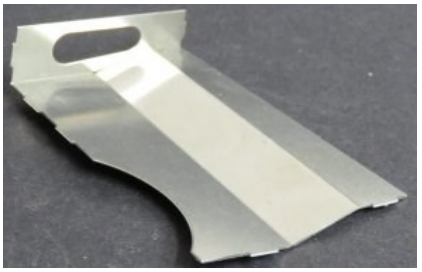
68) Take 3 lamp brackets and fix into the holes provided.

69) Now depending on your bunker type using the jig bend and fit 1 or 2 handrails on the back. Bend the 2 side handrails and also fit.

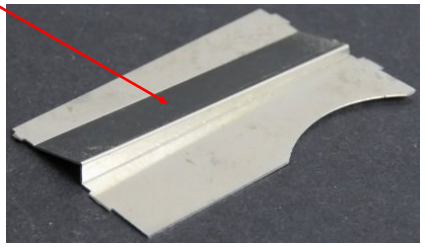
70) Then bend and fit the cab side handrails.

71) Lastly solder in the handrail knobs for the cab and fix wire in place.

72) Back to the front, locate (75) Inner tank Left. Fold the lower side bend (nearest wheel cut-out), then the upper bend, lastly fold the front around to meet the side and tack together. Now over to the main unit, adjust if necessary. The things to check are, main tank sides are at 90^0 to the base, that front of the inner tank is vertical, and the front sits in slot.



73) Repeat step #72 for parts (76 & 77), this is a little more difficult due to forming a tapered overhang. Part (77 frame front) is supplied separately to make it easier to form the bends in part (76).



Boiler Assembly

74) Locate parts (78 - 83) Boiler Parts. Roll (78 - 81) then using Boiler Clamps or some other means form 4 tubes. Parts (79) & (80) fit onto (78) and (81) onto (79) and should be a very tight fit.

75) So before soldering the seams of the parts check in the following order.



76) First try (80 tapered section) onto (78 main former) and note the fit, next (79 straight section) onto (78), this should give an indication if any of these 3 need adjusting. Now repeat for (81 smokebox wrapper) onto (79) and again adjust if need be.

77) When satisfied that all these parts are a snug fit solder the seams, I prefer to place a length of scrape etch shorter than the tube on the inside and solder that in to strengthen the joint.

78) With (79) on (78) , the small hole on (78) visible and the large holes lined up, solder 2 brass washout plugs into the holes of (79), its neater if you solder them from inside.

79) Take (82) and align the etched line with seam the of (80), then solder together. Solder (83) into the end of (78). Now solder 2 short 8BA bolts through the holes from inside the boiler.

80) Assemble parts (78 - 80) as in right hand picture above, there is a 1.2mm hole in the top of (78) and a similar hole in the top of (80), align these holes and pop a 1.2 drill shank in.

81) With the holes at the top press down onto a flat surface, check the drills are in place and carefully stand on end with moving the parts relative to each other. At this point I would slide a square up to the seams side to check, then tack the 3 together. Lay flat and check again, rectify if there is a problem.

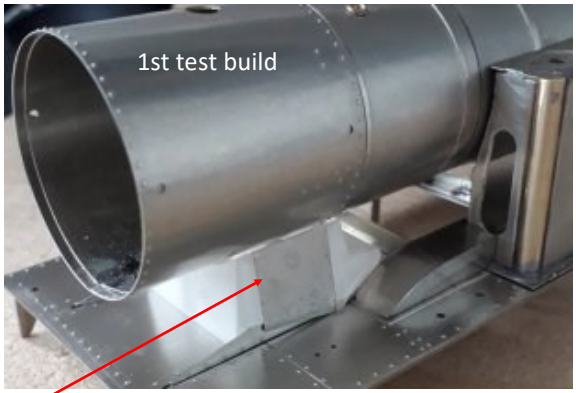
82) Now slide (81) on to this assembly and align the large chimney hole, it can only go on one way around. Place a drill shank in the hole and lie flat as before, push down and then carefully solder in place.

83) You can if you wish fit a second disk into the (81), but it must be back 5mm from the end.

84) Take part (84) Boiler support and tack centrally into the slots in base (33) between tanks.

85) *If you have built a separate Tank/Cab/Bunker assembly bolt it to the running plate.* Get (PP9) the Smokebox Saddle and carefully remove the 3 parts inside and put the sanding lids aside safely. Carefully tap the 2 small holes in the saddle to 12BA. Take the front cylinder cover and fit to the front of the saddle, if it won't slide in gently ream out the holes, it won't need much. Next place this on the running plate between the frame extensions and check the fit, there should be no need for adjustment, unless you need to lower the smoke box to get it level, in which case file off a little of the top.

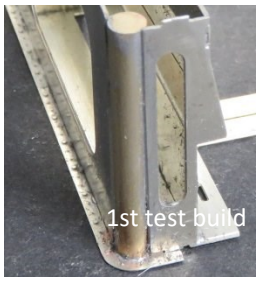
86) Get (107) Retaining plate and solder a 8BA nut into the pocket provided. Remove the saddle and boiler assembly and place (107) inside smokebox over the hole and use a short 8BA bolt to attach to the saddle, back off the bolt until you are just able to slide the saddle. Return the assembly to the main structure, and bolt the saddle to the running plate, use 2 pieces of masking tape to hold the saddle in place on the boiler. Carefully remove boiler and saddle and tighten the 8BA screw whilst aligning the retaining plate across the inside the smokebox as you do so. Tack the plate in place, dis-assemble and then solder the plate permanently as this will be inaccessible later.



87) Locate the 2 off Saddle inspection plate (105 & 106), take each and put a slight bend on the bottom approximately 1.5 mm from the edge. See picture. (106) goes on right hand side and (105) the left, when satisfied with the fit, remove the saddle and glue on the sheets. Allow to dry, then put back in place.

89) Whilst it is easy to handle the boiler identify the Safety Valves Top Feed casting and Bonnet. Now fettle both until the top feed sits nicely on the boiler section and do the same to the bonnet, before putting the bonnet to one side. Cut a groove for the feed pipes with a cutting disc in both sides of the top feed, this will make it easier to fit the pipes under later. Now solder the Top-feed casting and from the inside. Make sure it is the right way around. Then try the bonnet, adjust until all is sitting nicely.

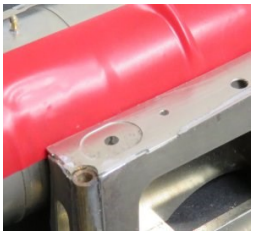
90) *If you have a sectional build there is no need to re-fit the saddle at this time*. Now take the boiler and bolt in place using 2 8BA nuts, do not solder at this time.



91) Now is a good time to fit lead ballast in the tanks before you seal them.

92) Now fit the long 4mm Tubes as per the bunker corners. Place the rod in the hole in the base, visually hold vertical and tack to the tank side, check with a square that it is upright. Adjust until satisfied and then solder fully to both tank side and front.

93) Locate (85) Tank Tops, clean and check fit on the tanks, tabs should locate into cab front, cross member, tank frames. Make sure the boiler is sitting centrally, if not adjust the support (84), repeat until it is central. If satisfied that everything fits and the whole structure is sitting flat and is still square solder the tops in place.



94) Place a piece tape along the side of the boiler for protection whilst you file smooth the joints between the tank top, side and front. (Note picture from 1st test build, now modified, top will cover the tube).

95) Carefully remove (86 & 87) Tank and Cab Overlays from the sheet and remove only any tab residue. Place a drill shank into the lower handrail hole as before and holding in place carefully bend the overlay around the tube. Remove tighten then bend and adjust until a good fit is achieved. The fit around the boiler might need fettling. If satisfied fix in place.

96) Repeat step #95 above for the other side.

97) Locate (88 & 89) Cab Side Overlays. Fix to the cab sides, they should butt up to and align with the existing the side & bunker overlays.

98) Locate (90) x 2, Cab Surround Beading. Begin by forming a bend, nominally 6mm radius, starting 9mm from one end, place this on top of the tank, push the beading into the next corner and so on until you are back at the start. Now tack end to the tank top, push the beading into first corner using something like a wooden dowel tack again. Repeat all the way around, then solder fully, trim off the surplus at each end, repeat for the other side.

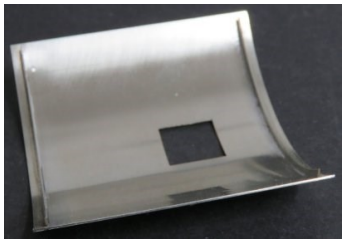
99) Now do similar for the Bunker Beading (91 or 92) but start at the back and then roll up the cab back, trim the surplus at the roof.

100) Identify the bunker tank breather pipe and solder in place on the right hand cab back.

101) Taking (93 & 94) Tank Top Beading repeat as #85 above only this time start on a front corner. These are deliberately too long so will need trimming to fit next to the boiler and after fixing at the roof end.

102) Locate (95 & 96) Cab Front Overlays, choose which ever matches your chosen prototype. Adjust if needed to fit and solder in place whichever one you have chosen.

103) Roll (97) Cab Roof to match the profile of the cab front or back, the grooves are on the inside and go across the cab. Now punch out the 2 rows of rivets across the centre.

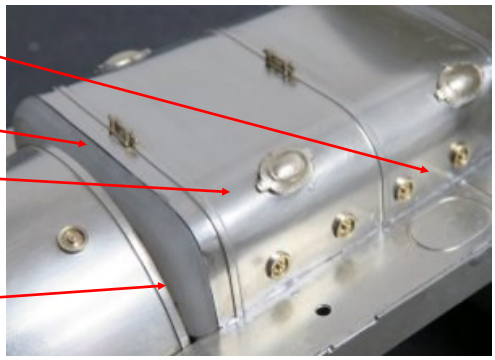


104) Take (98) Roof Braces and check they fit in between the cab sides, if need be file equal amounts of both ends until they do (width over ends 0.5mm less that inside cab dimension). When satisfied solder centrally into the grooves and check it fits the cab.

105) Next take each of the curved brass angle strips and solder to the roof, uprights outer most and flush with end of the roof. Then using 2 pieces of straight brass angle 51mm long form the gutters.

106) Take (99) Roof Shutter, punch rivets, curve it slightly to fit roof profile and fit to roof with door forward, hole to the rear.

107) Cut out parts (100 - 102) Fire Box Crown and formers, clean the cusp off (101 & 102). Bend (100) to the profile of (101 & 102), then with (101) lying flat put (100) around it, standing vertically. Placing something behind (100) push the former hard up against (100) and tack it in the centre. After checking it is central and hasn't moved start working away from the centre in each direction, making sure to keep pushing the former against the crown, then repeat for the other end. Check that it sits level on the bench, if not twist until it does. If the ends or sides for some reason are not all equal file off surplus. Stand on end on a sheet of wet and dry laid on the bench and with a circular motion clean up the ends, this should keep them flat. The ends must be vertical.



108) Take 8 washout plugs, place into the holes and solder from the inside.

109) Fit 2 cladding clamp castings into holes on the top.

110) Identify 4 mudhole covers, using a round file thin these from the rear and fit where the 4 small holes indicate centre points.

111) Next identify (PP10) Throat Plate and offer this and the firebox crown into the gap between the cab front and the boiler. If need be, reduce the thickness of (PP10). When satisfied with the fit, fix both in place.

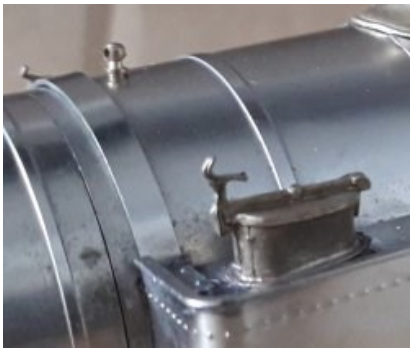
112) Locate (103) The Fire Iron Rack, there are 2 in case of error. Fold double, solder together, clean up and solder in place on left tank.

113) Get (104) 2 off Manhole Covers and after cleaning fit on the tank tops in front of the cab, half etched mark indicate where.

114) Take 2 Tank Vent castings and solder into holes in tank tops.

115) Locate (109) Smokebox Step, fold up and solder to the underside of the smokebox.

116) Take (110) Tank Stay and drill out the 4 holes for grab rails then form a gentle curve to match the profile of the front of the tapered boiler section. Lastly fold up the ends so that they sit flat on the tank tops. When satisfied with the fit solder in place at the front end of the tanks.



117) Bend up 2 grab rails and solder in the holes in (110).

118) Fit 2nd handrail knob to top of boiler and fit 0.7 wire.

119) Lifting Rings, cast bases are supplied if you want to fit them. 2 go 30mm back from the front of the tanks and the other 2 go just inside the cab front. You will need to form the rings from some 0.5 wire 5.5mm diameter.

120) Identify the Water Filler/Manhole castings and fix into the pockets on top of the tanks.

121) Now take a piece of copper wire and bend to shape and place into the groove under top-feed and down the hole in the tank top, then fix in place and repeat for the other side. If you are not having a polished bonnet then this can fixed in place.

122) Identify the Bump Stops (PP11) and glue in the holes on the tank tops.

123) Locate (111) Tank Base Rivet Strips, square the end and starting from the cab doorway "drag" around the bunker front corner, it will be to long. Mark and trim and then fix in place at the base of the tank. Repeat on the other tank base.

124) Do the same around the base of the bunker using (112).

125) Fit the lamp holder brackets into the holes on the footplate by soldering from underneath.

126) There is a twisted one which should be soldered to the front buffer beam, with the base central and in line with coupling hook. See cover picture.

127) Take 4 handrail knobs and fix into the holes on the running plate in front of the splashers to form front step grab rails, then using a piece of 0.7mm wire to keep them aligned, solder from underneath.

128) Take the 2 x (113) Front Step Back and punch rivet detail. Start by folding out the little triangular piece at 90^0 then fold in half. You will now see you need to bend forwards and the backwards. See picture. When you have a nice fit solder together.

129) Locate parts (114 & 115) Front Steps, punch rivet detail, then make the 3 folds, ensure they are “tight”. Then solder (114) into the upper pocket and (115) into the lower, make sure they are at 90^0 to the top edge and parallel to each other. Then fix the front steps to running plate behind the valance and central to the handrail.

130) Now take (116) Cab Step backs, start by punching out the rivets. Then double back on itself and solder together flat. The steps protrude backwards through the step backs, so take (117), make the centre fold first and the 2 end ones. Fit to the back plate with step sitting in the centre hole. Repeat for (118) but with the extra bend, this sits level with the bottom of the back plate. See pictures page 17. Fix Cab steps centred on cab doorway and vertical.

131) Identify the Front Sand Boxes (PP12) and after removing any carrier wires glue into the 2 holes in the under side of the running plate.

132) Identify the cast Injectors and drill out holes for pipes. Fix into the holes in the bottom cab steps, then form copper wire to represent the pipework. See pictures page 17.

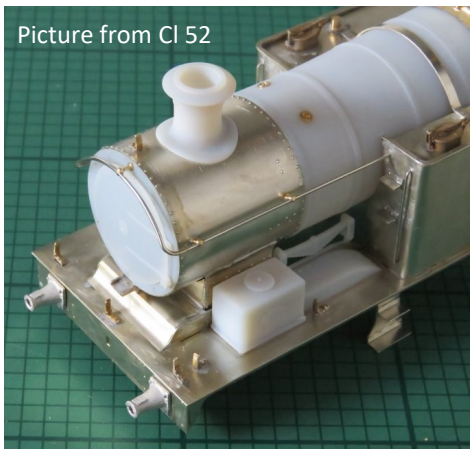
133) Fit the Rear Sand Boxes (PP13) , I prefer to leave the “pipes” at this time as they just seem to hook into everything.

134) Take the Balance Pipes (PP14) and again glue into the holes in the running plate behind the rear steps.

135) The Cab Doors (119) fit into the slots in the front of the bunker.

136) Prepare the buffers as per the instructions in the packet. Now fit buffer bases to the buffer beams with foot rest uppermost, put heads etc. safely to one side for fitting after painting.

137) The brake and steam pipe will vary depending on your chosen protype. Some engines had the heating pipes removed as the only ever used for freight duties. Originally both pipes ran under the engine, between the frames. Later this was moved outside along the running plate valance. Castings are provided for fixing to each end of the running plate, either in the loops under the buffer beam or to the centre strengthening box. NO outside pipework is supplied with the kit.



138) If you intend to fit AWS, then identify the casting and solder in the hole in the front stiffening box.

139) Take (PP15) Smokebox Door (be careful not to break the hinge pin) and carefully offer it to the front of the smokebox, you may need to fettle to fit. There is a small hole on the left just below centre that will need to be opened up take the steam lance casting, then fit handle (dart) in the centre. Making sure the handrail hole is at the top, glue in place.

140) Form the smokebox handrail from 0.7mm wire and using the 1 medium & 4 short handrail knobs fix in place, again the top hole in the door might be tight, don’t force it.

141) Shape and fit a lamp bracket to the top of the smokebox.

142) Check that the Chimney (PP16) sits nicely and is central.

143) Identify the “banjo” (PP17) and fix to the right hand side of the smokebox.

144) Foot Trap Sheets, (narrow copper strips), these rest on the top of the tanks and curve up the side of the boiler. It will be necessary to fashion these to suite, i.e. notch around boiler bands etc. until a happy balance is achieved. When satisfied fix both in place.

147. If you haven't already done so, fit reverser on the right side on the cab and hand brake column on the left.

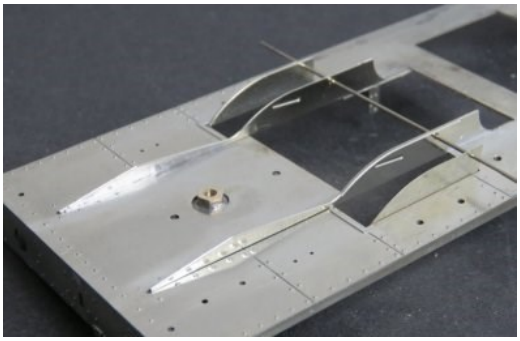
148. Take the 2 sanding levers and fit to either side of the bunker coal door.

149. If you chose AWS earlier locate the bell casting and fit to the right hand side of the cab.

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

151. If you are fitting Cab Shutters (126) then cut 4 pieces of 1mm channel 27mm long. With the cab roof held in place by an elastic band place one piece up into the overhang. Slide backwards until you can just see the row of vertical cab corner rivets. Making sure it is parallel to the running plate tack in place. With shutter sandwiched in the upper channel, take 2nd piece and slide on the bottom. Again this should be parallel to the running plate stop just short of the cab doorway. If the shutter is too tall trim, when satisfied tack in place, remove shutter, solder fully.

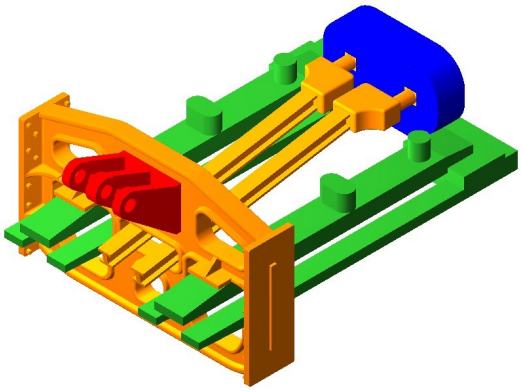
152. Locate the sandbox lids you removed from the saddle. Now take (122) pull rods and put 90^0 twist in them where the half etched hole is, they must be handed. Offer to the slot in the sand box lever arm and if need be carefully rub a piece of wet and dry through the slot until rod fits. Fix lids and arms in place on the running plate above the front sand boxes, there are location marks to assist. Thread a piece of 0.9 wire through the holes in the splashers trapping a lever in the slot of the right hand one. Slide a lever arm on to each end. The pull rod should now go between this arm and that above the sand box, make sure it's the right way up. Finally take (123) and connect to the lever projecting from the right hand splasher and lay on into (124). If satisfied fix everything in place and trim back any protruding wires.



153. Identify the Oil Box castings and attached short lengths of fine wire into the holes (may need to be deepened). Then fold and shape (120) to sit on the splashers. Next solder the oil boxes to the brackets and then shape and thread the wires down behind the splasher, trim and make sure they won't short out against the wheels. Repeat the above process for the 2 (121) that sit on top of the tanks.

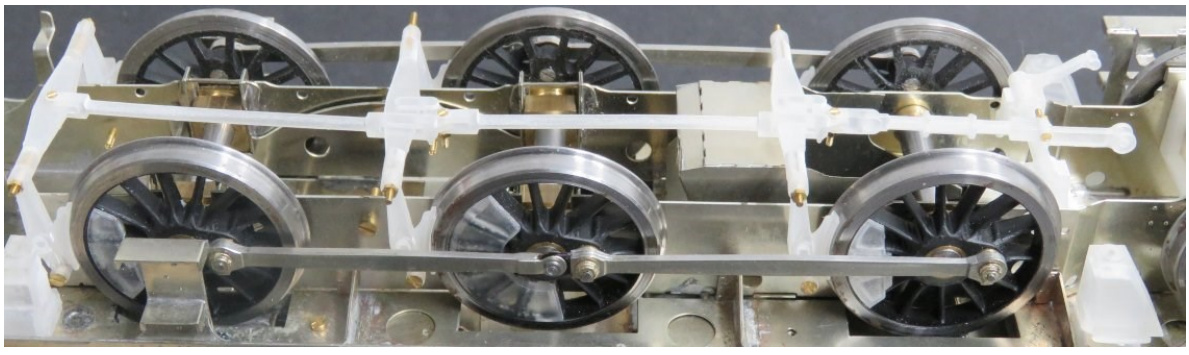
Back to the chassis

154. If you are fitting the Dummy Inside Motion now is a good time to do this. Remove the running plate/body assembly from the chassis. The slide bars (green) locate onto the valve cover (blue) and sit in motion plate (orange). Then valve cover and slide bars locate in to a pocket in frame spacer (16). The lifting link bracket (red) locates onto the motion plate and the lifting links (black, not shown) hang down from this. The valve rods (yellow) slide into the valve cover, they are handed and sit in centre hole of the motion plate.



155. There are 2 ways to fit (PP18) 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.

156. Take brake stretcher bars (PP19) and either glue in a short length of 1mm wire or drill 1.05mm and tap 12BA each end of stretcher then cut the heads of some 12BA bolts and glue the cut end into the end of the stretcher. Fit stretchers between brake hangers. Make sure the pull rod is off to the right hand side of engine. Using 2 of the brass pins the 3 stretchers together. *If you have screwed on your brake hangers, you can remove them as one assembly when you decide to paint.*



157. Take the brake cylinder (PP20), brackets (PP21) and push rod (PP22). Place a bracket on each side of the cylinder and slide to the top of the frame up under the frame spacer. Make sure it is about 3 - 4 mm away from the radial axle box, use a tiny spot of cyno glue to hold in place but not to fix the cylinder solid.

158. Identify the brake cross shaft brackets (PP23), brake shaft (PP24) and brake lever (PP25) . Place a brackets on each end of the shaft, make sure you get it right way around. Now slide this in between the frames, there are location holes into which the brackets fit. Again glue the brackets but not the shaft, then slide the brake lever onto the end of the shaft, it has a "D" shaped fit to ensure the correct position.

159. Take the remaining brake pull rod part and connect the 3rd stretcher the lug on the brake shaft using 2 brass pins. Finally slide the cylinder push rod into the cylinder and connect central brake lever arm using a brass pin. Take the handbrake link and fix between the running plate and the brake lever yoke.

160. Taking the 6 springs (PP26) glue into place, there are pips on the springs and holes in chassis for location. Note it may be necessary to remove a corner of the rear most spring mounting to avoid fouling the brake shaft brackets.

161. Bend 0.9mm wire to shape to form the sandbox pipes and the glue in place.

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

163. Prepare the Back head as per the instructions in packet, then paint it, after painting the body this can be fitted inside cab.

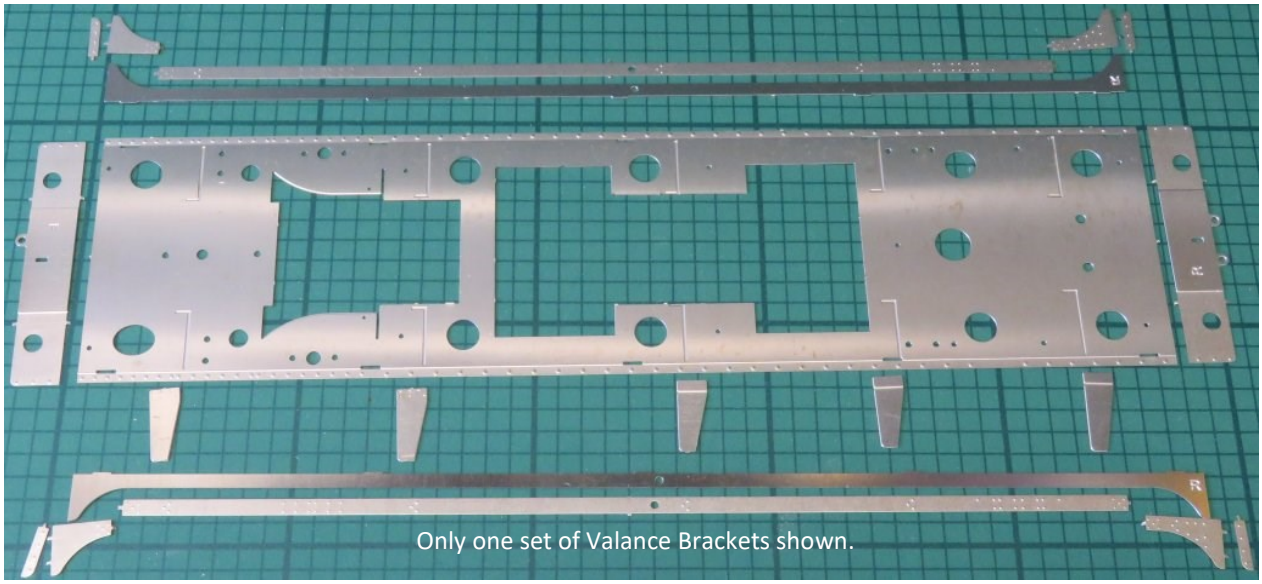
164. Paint Body and Chassis, reassemble, fit decals and number plates.

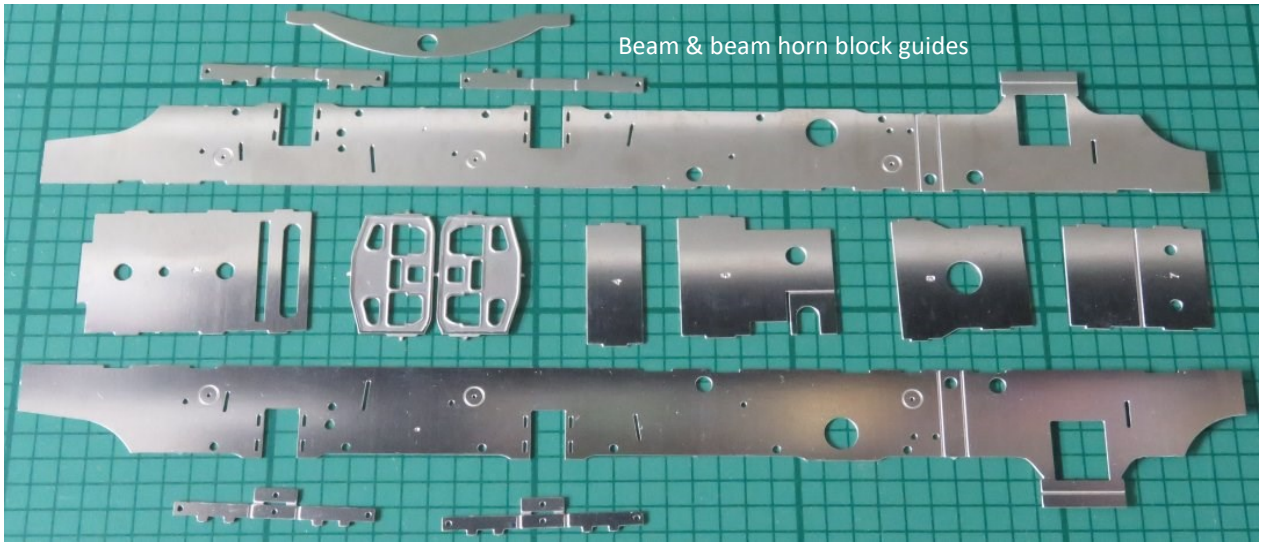
165. A piece brass shim is supplied and is already curved, bend down the ends the opposite way.

166. A set of cast nickel silver coupling rod nuts are supplied, tap to 12BA and use these for the final assembly.

167. 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.

168. Fit coupling hooks and buffer heads.



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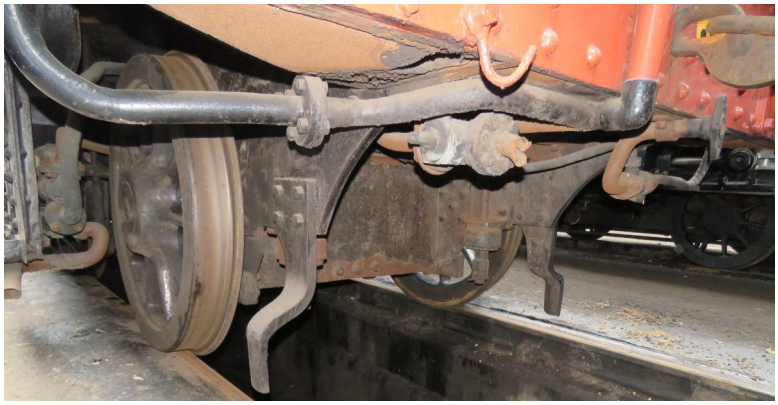


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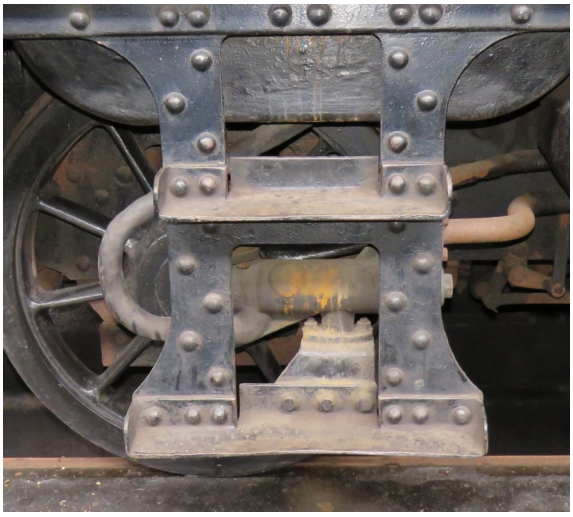

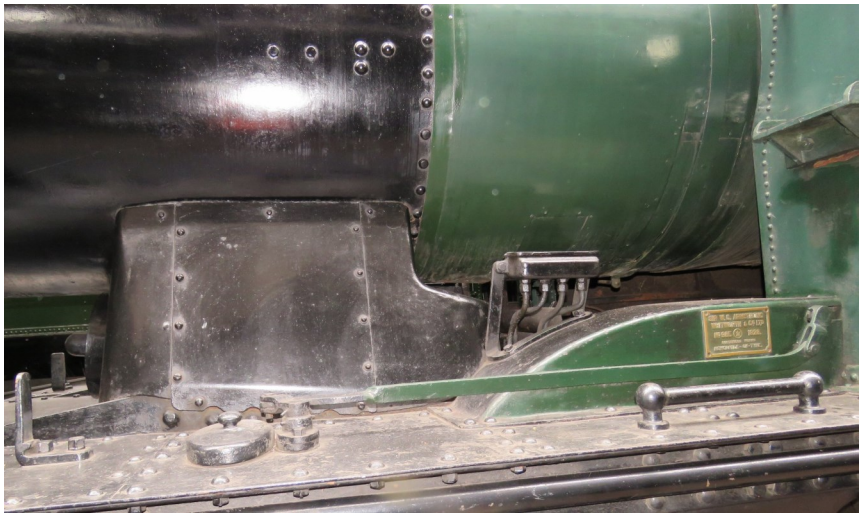


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