

# 88D Model Kits

## Taff Vale 04



## 88D Models – Taff Vale 04 Class

Please note that due to the accuracy of some of the 3D plastic parts, they need to be handled with care when assembling the model. The parts will stand temperatures up to 60°C, but best left off where ever possible until the soldering is done.

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.

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° for a more durable fixing, 145° 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, using your iron 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 to 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 due 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 alternative)

3 x Slater’s 7854HR – 4’ 6” wheels

1 x Slater’s 7837 – 3’ 1” bogie wheels

1 x Slater’s 7157 plunger pickups

Number Plates (available at — [http://www.88d.uk/pups/Number\\_Plates.asp](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/TV\\_04\\_Pictures.asp](http://www.88d.uk/pups/TV_04_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 may be required to complete this model.**

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

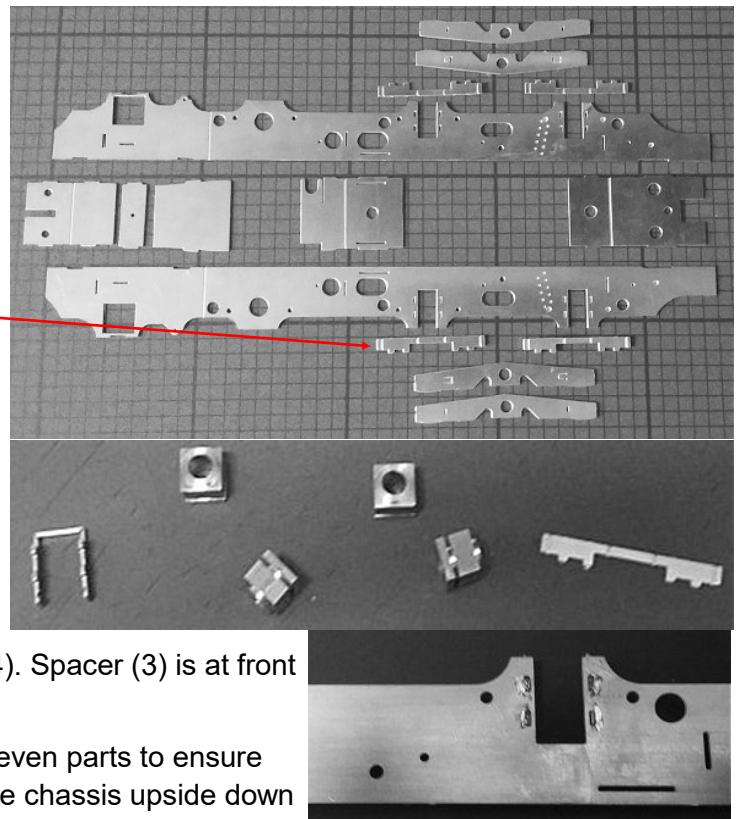
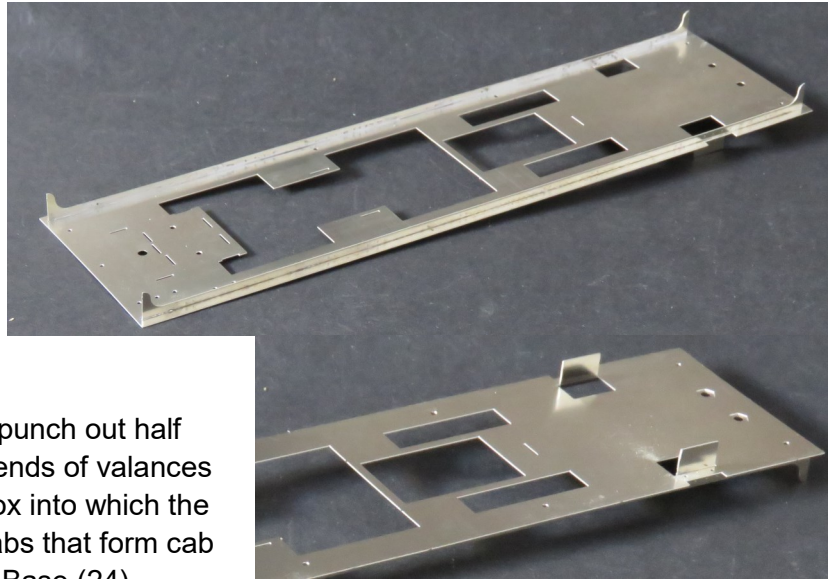
Some of the pictures are from previous kits, but will be almost identical to this model—marked “Illustration only”.

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

1) Solder everything together as per normal.

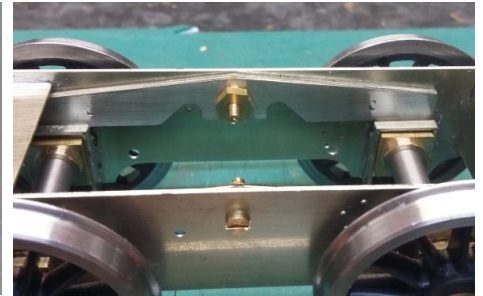
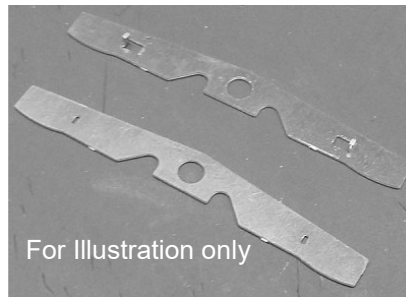
2) *Make it in sections and screw it together at the end, this will make painting much easier*

1. Remove Footplate (13) and Valances (14) 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° to the footplate. When satisfied finish soldering and check again they are at 90° to footplate.
3. Remove and clean up Buffer Beams (10) and punch out half etched rivet holes. Solder buffer beams on to ends of valances and centrally to the footplate, you now have box into which the chassis will fit. Picture on right shows foldup tabs that form cab steps backs, which also help locate Tank/Cab Base (24).
4. Locate Frames (1) & (2) from chassis etch and remove cusp left by etching process, bolt together (use 10BA compensation beam holes, alternatively tack solder together) and offer to the footplate assembly, if they are too long remove an equal amount off each end until they are tight fit inside the “box” of the footplate. When the frame are joggled this allow a enough space to slide the chassis into the underside of the footplate. 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 footplate to one side for now.
5. Remove 4 off Horn Block Guides (7), 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.
6. Joggle the frames at the rear end, lines on the inside of bends, final adjustment later.
7. Remove Frame Spacers (3 - 6), 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 (4). Spacer (3) is at front and spacer (6) at the rear of the chassis.
8. Having located (P56) Radial Axle Box, dry fit all the seven parts to ensure they all slot together, 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. DON'T melt the axle box and then check again before proceeding. See below.





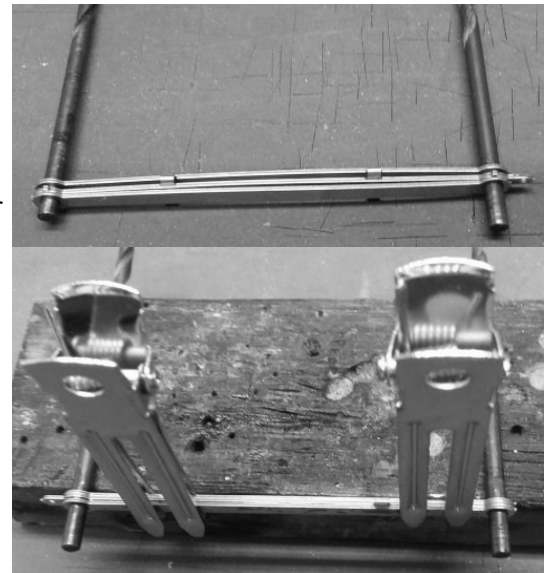
9. Locate the Compensation Beams (8), file off tabs and deburr all around outside. Note! There should be a slight bulge on each end of the beams where they rest on the horn blocks. The off centre hole is to clear the brake hanger screw / wire off the second axle, **(these are now just one piece per side)**.



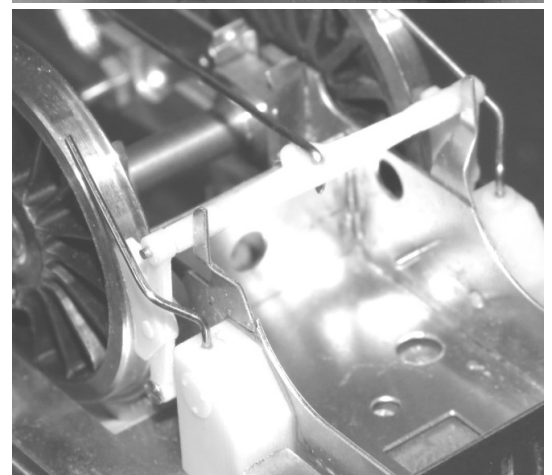
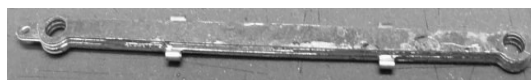
10. Using the 2 pivot bearings and 2 - 10BA x ¼ bolts secure the 2 beams to the chassis. (The beams fit in the slot above each horn blocks). Check that the beams move up and down easily. DON'T open out hole in chassis as this will affect ride height and the degree of compensation.



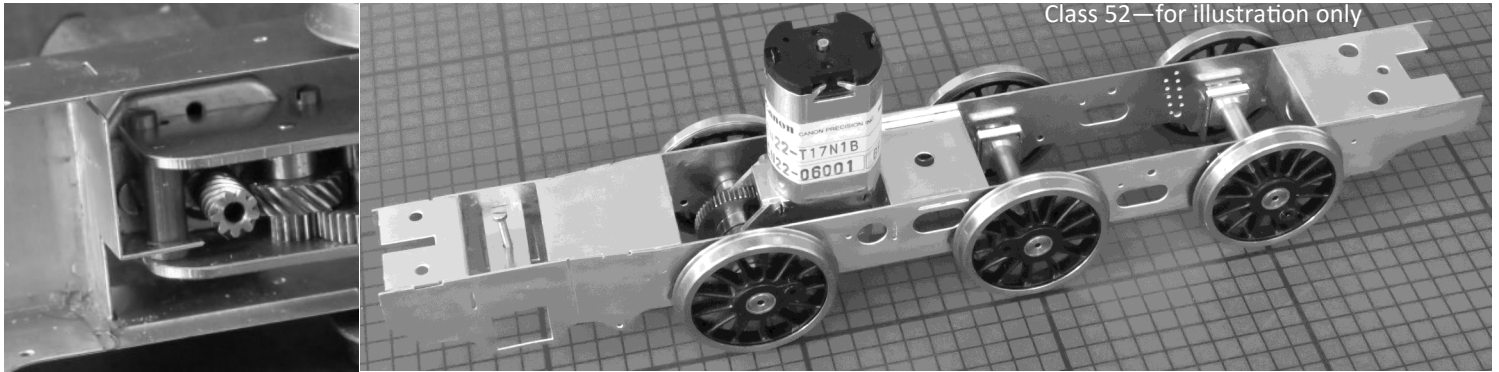
11. Taking the 6 Springs (P11) glue into place, there are pips on the springs and holes in chassis for location.
12. Take each slater's wheel and lay face upwards on a piece of 600 grade, wet and dry and with a circular motion remove and slight pips of plastic left from moulding operation. With an emery 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. 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.
13. Locate parts (15) Connecting 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. WARNING — super glue gives off carcinogenic fumes when heated**. 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.



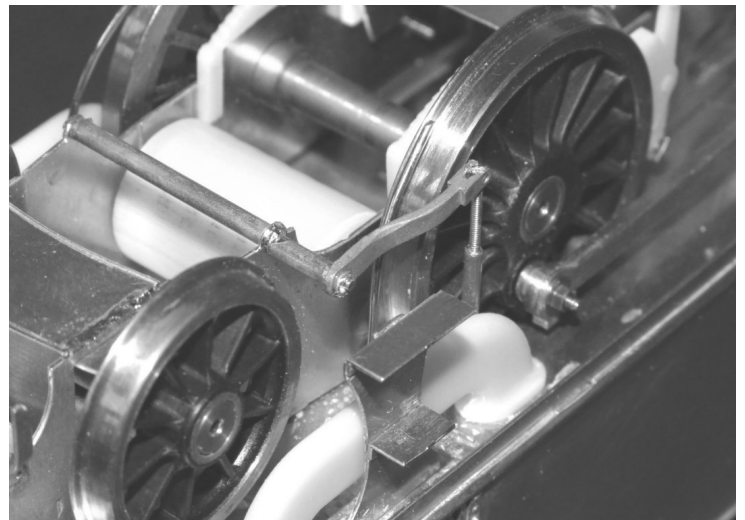
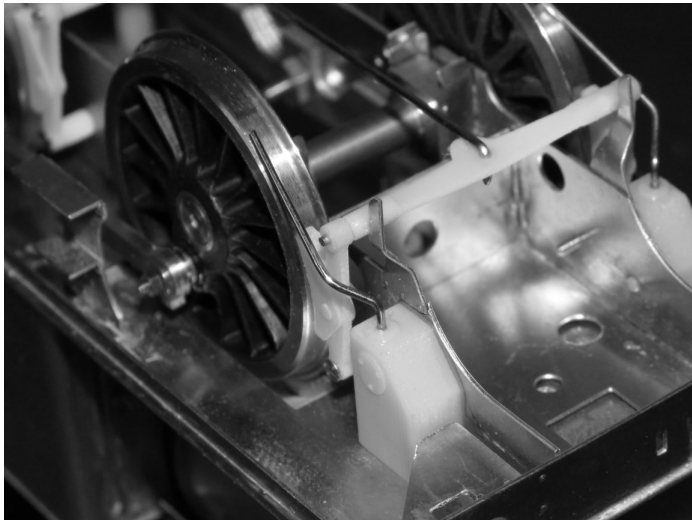
14. Fit bearings to crankpins and try coupling rods, it may be necessary to ever so slightly open holes in coupling rods, if so do it sparingly, sloppy rods = poor running. Don't worry about excess length of bearings at this stage remove excess later, fit washers, retaining nuts (prototypical nuts are 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.



15. Remove (9) Life Guards (guard irons) and punch out rivets, bend to shape to align with the wheels, note the bends go in opposite direction for each pair. Having bent to shape solder into the half etched locations on chassis.
16. 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 S as should be fitted.



17. Now identify the (P47) rear Sand Boxes to use. The front sand boxes are combined with front splashers, so ignore at present. The rear sand boxes are mounted on the chassis; use the pip on the back to locate in holes in chassis.
18. 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.
19. There are 2 ways to fit (P46) 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.

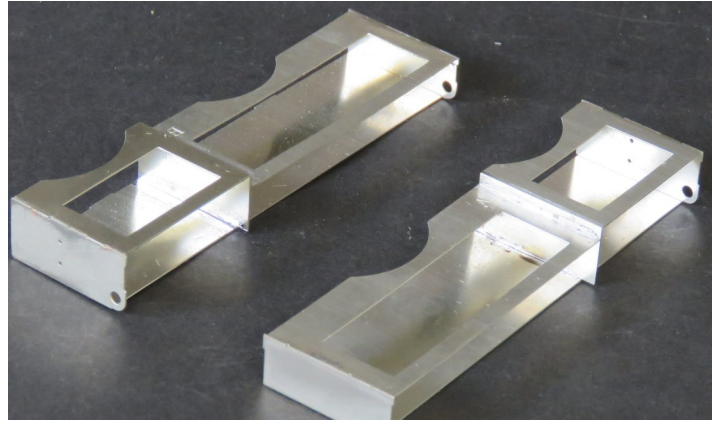


20. Take brake stretcher bars (P01) and either glue in a short length of 1mm wire or drill 1.05mm and tap 12BA each end of stretcher. Fit stretchers between brake hangers. Using lengths of 0.7mm wire bend to length 3 pieces to form pull-rods and glue in place on stretchers. If you have screwed on your brake hangers, you can remove them as one assembly when you decide to paint.
21. Trap the Rear Brake Shaft (CP09) between the Brake Shaft Brackets (CP11) and fix to the side frames just before the curved cut-out and at the start of the parallel chassis section.
22. Place a top hat bearing in each end of the radial axle box and fit wheels and axle. Having tested the fit with the footplate you can remove brake hangers, wheels, bearings and motor/gearbox. The chassis is now ready to paint.
23. Cut out parts (12) 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
24. 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

25. Identify the Tank sub-frames parts (16-23). Fold (16) to form 3 sides of a box, fold (17) into an L shape. Tack (17) to (16), then fit (18) to this assembly, make sure the box is square sits nicely. Tack (19) to this to form an open top to the box. Check again then solder up completely. Finally check there is no twist in this assembly, if need be rectify. Now repeat with parts (20-23). Offer both tanks to (24) Tank, Cab & Bunker base, the fronts should over hang and the backs fit into the slots.

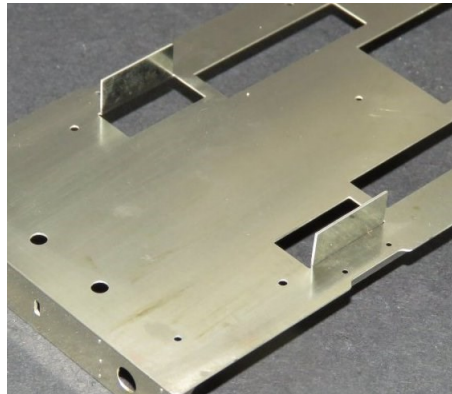


26. I find it easier to bend the tank overlays (25 & 26) and fit to tank sub frames before attaching the tanks to the base. The bend starts 26.5mm from the bottom and is 5mm diameter. Having bent the overlays lay one face down and position the subframe over it. Line up the base of the overlay with tabs and central to the overlay, remember the overlay must cover the tabs other wise there will be a gap between tank base and sides.

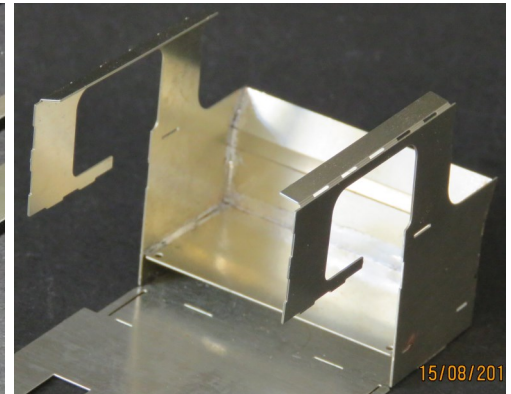
27. Locate and fit (27 & 28) tank end overlays.

28. Finally, fit (29) handrail brackets into the pockets. Fettle any overhang, knock back spikey rivet detail and tidy to final finish, clean up. Having done both assemblies, set aside for later.

29. *If you are making sections, tap the 6 holes in base (24) for 12BA.*  
Solder 8BA nuts into the half etched pockets.



30. You now need to decide which style of bunker you going to fit Taff Vale or GWR. Use either parts (30-33) for TV or (34-37) for GWR. Clean up your chosen 4 parts.



31. Take (24) and fold up rear piece, then tack either of the cab/bunker side (30 or 33) to base (24). With the folded up piece @ 90° line up rear of bunker side on the outside of this with the tiniest of overlap.

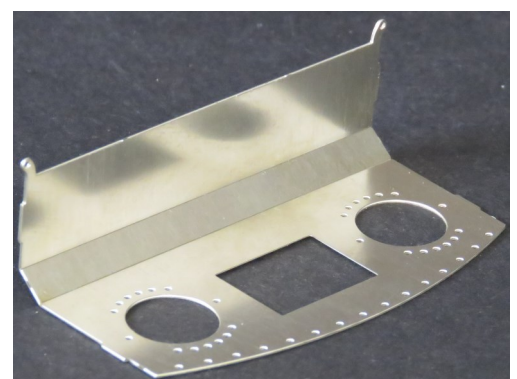
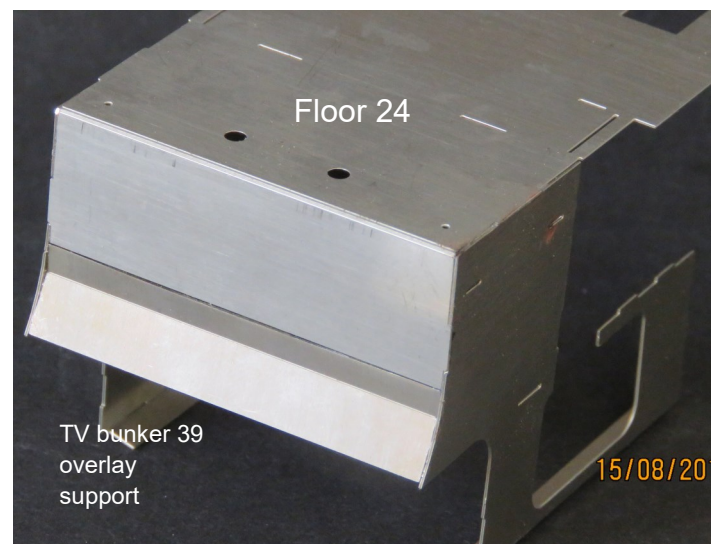
32. Locate (38) bunker floor and if needed open up the holes to suit the copper wire supplied. Next fit the other side (30 or 33) whilst trapping the floor (38) and (39 TV) or (40 & 41 GWR) in place and if everything is sitting flat and square finish soldering. Lastly, fit Bunker front (42) and check everything is flat and square.

33. Finally clean up Bunker Rear (32) and bend over sides. Set to one side.

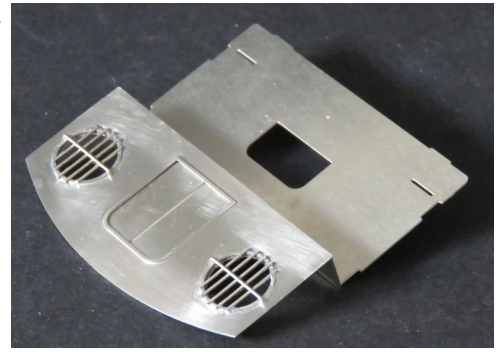
34. Locate your chosen Cab Rear (43 or 44). Next form the folds to produce cab shelf, *do not fit bunker cab assembly yet.*

35. Locate the correct Cab Rear Doors (49 or 50) and solder into recess in Cab Rear (43 or 44) to provide a flush fit. Some of you may choose to adapt the doors to be open.

36. There are various ways to carryout the next step which is "window guards", my preferred method is bend the "U" shaped wires for each required, then taking either Cab Rear Overlay (46 or 48), fix to the cab rear ensuring the holes line up.



37. Again I find it easier push all the wires through and with whole assembly laying on the bench with tails pointing up, solder in place from the inside, **solder the cross wires last**. **Tip if you flux the outside of the holes, then when you solder on the inside a little will flow through and for a meniscus which not only looks good it helps to hold wires in place when you clean up the outside. If unsure drill a couple of holes in scrap metal try it first.** You should end up with something similar to the picture opposite (this is a different kit). Trim off excess tails, and file until flush with the cab back. **Do not trim overlay at this time.** Then tack in place between cab sides, we will solder solid when the rest of the cab is in place.



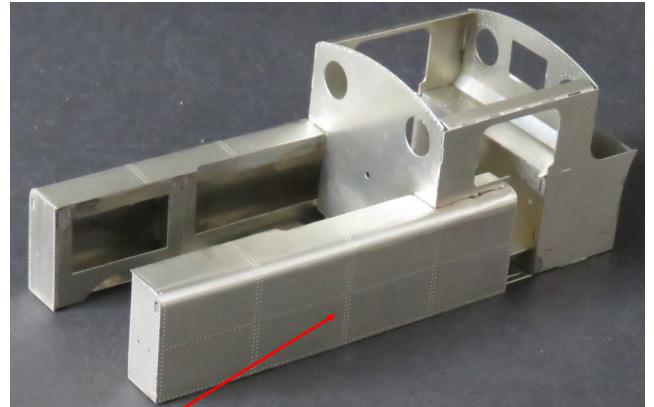
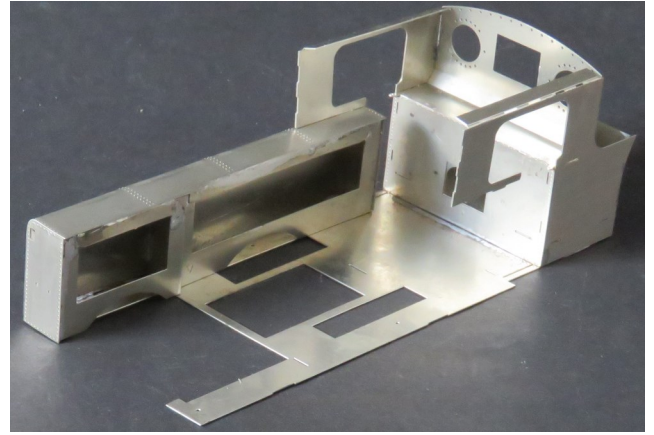
38. Taking Cab Front (45) try the fit with the rest of the cab. Assuming all is well locate the Cab Front Overlay (48) and solder in place.

39. Fit the Bunker Front Overlay (49) before moving on to next step, ensure the slots align and fettle if required.

40. Locate Bunker Door (51) and fit into place, **make sure that it's base is in line with the top of the slots for the Cab floor.**

41. Taking the Tank assemblies you made earlier tack to base (24), larger picture shows this with one tank for clarity (forgive the excess solder, I don't waste time being to clean with a test build).

42. Taking Cab Front (45) try the fit with the rest of the cab. Cab Floor (52) and check the fit, start by sliding the floor into the bunker and lowering until parallel with the base. Next take the cab front and slide onto the floor tabs and into slot in the base. If necessary fettle until you get a good fit. When satisfied that whole assembly is flat and square, solder all tacked joints checking as you go. You should now have something that closely resembles the picture adjacent. (Ideally with cab rear doors, guard wires and front and rear overlays)



43. Take the Cab Doors (53) and clean, **do not remove the large tabs**. These tabs fit into the recess between cab back and sides and can be soldered from within the bunker. They are handed and the thicker un-etched part is at the top.

44. If you are building the TV bunker take the Bunker Rear Overlay (54) and form the top curve to match the profile of the sides, **note sides may be a tad too long, this can be removed later. Remove before soldering so as not to solder to the footplate.** Alternatively do the same using (55) for the GWR style bunker. Make sure you align the hand rail and lamp bracket holes.

48) Locate correct Cab Side Overlays (31 and 33) for TV and (35 and 37) GWR. They should be a tad longer than the cab. If so you may need to remove any surplus front and rear overlay. When satisfied with the fit fix your chosen overlays in place.

49) Locate Cab Roof (56) and roll to shape **grooves on the inside**, use cab front and rear as a guide, it is often better to slightly over bend as the metal has a tendency to unroll. Then bend edges to form gutters.

50) Take the Roof Braces (57) and solder into the grooves on inside of roof centrally, Check fit and tweak if required.

51) Locate part (58), this is in 2 parts, fix the small part in the groove to form a "T" section, then solder centrally to **outside** of the roof. **Note there wasn't a roof shutter, holes in the top of cab front and rear provided ventilation.**

52) A white metal firebox rear is supplied and this can be painted and fitted at anytime.

53) Take the handbrake lever casting and fit to the inside of the left tank inside the cab, you may need to play about a little with this until looks right when viewed from outside.



54) Locate Bunker Beading (59), for pre-grouping you will need to remove the "protrusion" used as a base for top lamp shield on other versions. Form to shape and trim to length as required.

55) Locate Cab Shutters (60), simply attached inside the cab side sheets, either open or closed or wherever suites you.

56) You can now add cab and bunker handrails, rear lamp brackets. *Note this was the test build and isn't 100% complete and roof not seated properly.*

57) Identify the Tank top Fillers (P53) and position approximately 18mm back from front of tanks.

58) Lastly, fit the Front Tank Steps (Px) in the holes provided.

59) **Now to the Boiler and Smoke Box.** Locate parts (61 to 66) smokebox assembly. Clean up (61) and either tap for 10 BA screws or solder 12 BA nuts over holes. *Tip if you wet the end of a cocktail stick with a smear of oil and screw the nut onto this, you can then hold the nut in place and the oil will hold back the solder.* Now fold into a "L" shape, then tack the 4 parts (65) in to the slots, then tack on (63). Adjust until square and the solder together fully, offer to the footplate. You should have a structure similar to this.

60) Take the Smokebox Overlay (66) and carefully form around the structure you have just made. Lay the smokebox subframe face down and flat, make sure that you have the wrap the correct way, the chimney hole is nearest the cab and with extra hole on the left hand side when looking down. *If you want to have a smooth smokebox, knock*

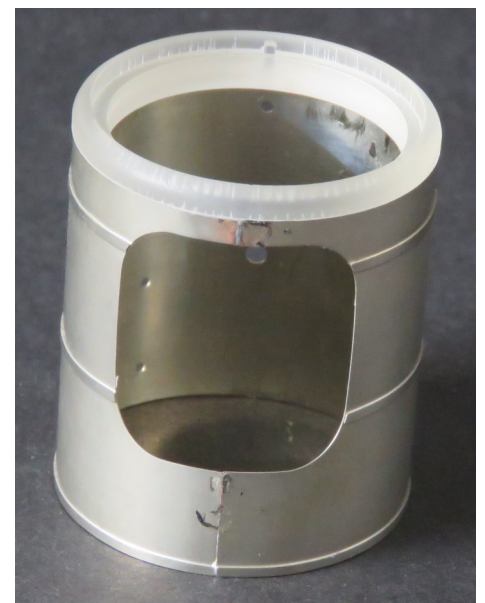
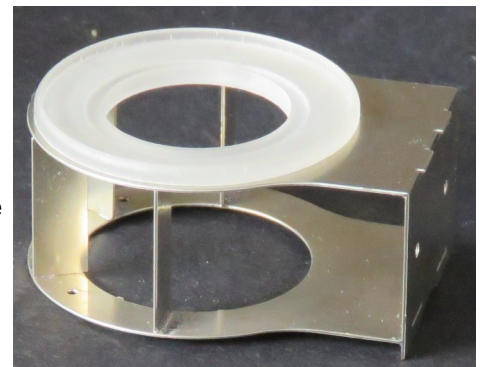
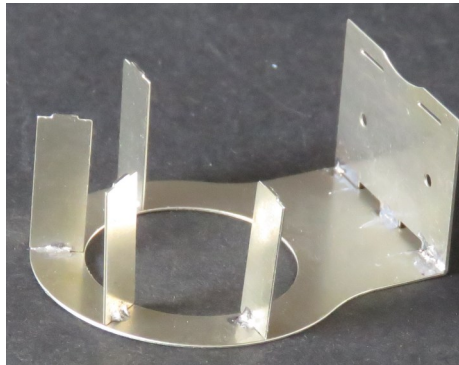
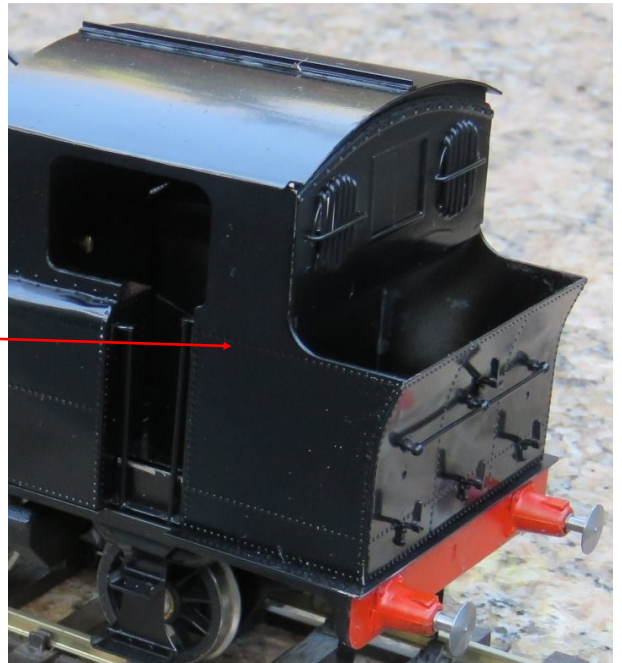
*back the rivets with a fine file and turn inside out, as the chimney doesn't locate in the hole, this won't be a problem.* Using clamps squeeze the wrapper into curves and pull tight around top of smokebox. The wrapper should be the correct length to fit around the whole structure, if too long, trim end each end equally. When sure that it fits and wrapper sits flat tack solder, repeat checks and then solder fully. If the wrapper protrudes to the front or rear of this assembly file back until flush. You can now fit either (61 or 62) to the front, this is best done with a resistance soldering iron, low melt solder or glue, clean up the whole assembly.

61) Check the fit of the smaller Boiler Ring, if necessary carefully enlarge the hole until it fits. *Do not fix in place yet, especially if you are going for a GWR livery, this way with the boiler and smokebox separate it is a doddle to paint.*

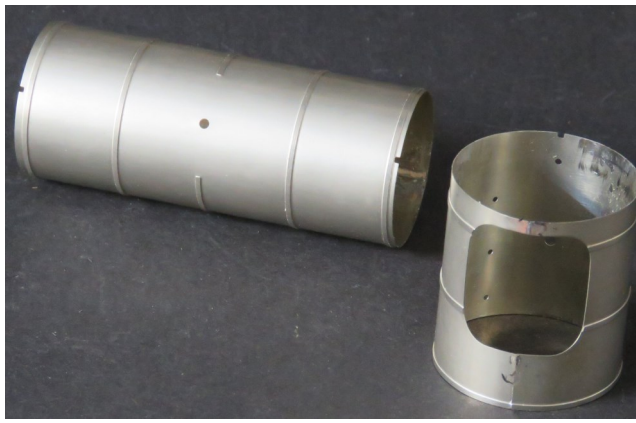
62) Next clean up parts (68 & 69), roll both and set aside. Roll Boiler (68) and hold in shape with elastic bands.

63) Offer to both plastic rings, in the picture adjacent the smokebox end is on the right should fit into (P53) pictured on previous page, study all pictures carefully. Do not force the metal boiler into the plastic, if it is too big take off the elastic bands and evenly file off a small amount from the jointing edges, repeat until it is a snug fit. When satisfied solder joint and clean up and check again.

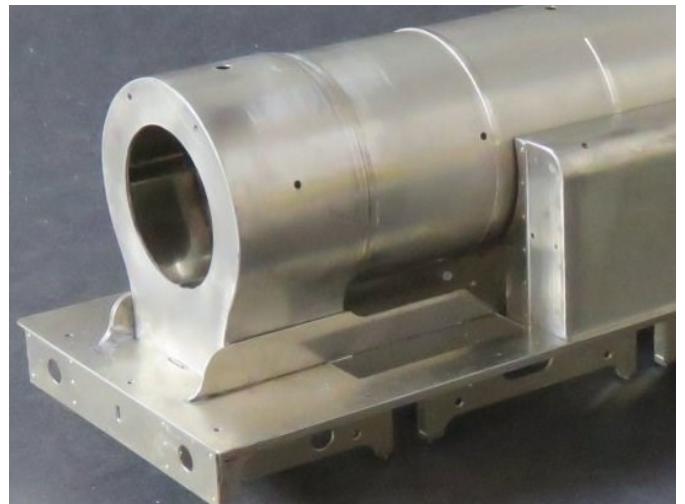
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- 66) Repeat the above process Firebox (69), this has to be a tight fit around (P53). The firebox joining ring will be slightly proud of the firebox etch, so you will need to rub back slightly after joining the whole assembly together. *Easier now than when fitted into the rest of the body.*
- 67) Fettle and fit one of the plain disk (69) into end of the fire box so this can be bolted to the cab front. Its up to you if you fit any of the rings, I've not found it necessary.
- 68) Take 6 brass washout plugs and solder in the holes on the firebox.
- 69) *If you have built a separate Cab/Bunker assembly bolt it to the footplate.* Next push the boiler into the smokebox and using a 12BA nut & bolt locate on the front of the cab and line up smokebox at front of chassis, hold in place with an elastic band (or bolt it). You can now rotate the boiler until the hole for the dome is at the top and solder to smokebox. *One way of doing this is to place a set square on each side of and up against the footplate, then rest a 6" steel rule on top of the boiler and clamp to both, you can then rotate the boiler until it is top dead centre.* Those following the sectional route may like to consider making an alignment mark on both and leaving them to be bolted to footplate after painting.
- 70) Clean up Safety Valves casting and fit to boiler. A good way to get it sit neatly is to wrap a piece of wet & dry around the boiler, then work the casting around the so it take on the shape of the boiler.
- 71) Glue on Dome (P52) and Chimney (P51) after using the above technic to sit nicely. To be sure there are central use the technic described in step 60 earlier. Set aside for now.
- 72) Some locos had a pipe that ran from the right hand side of the smokebox into the cab. If your chosen loco has this then you will need to form this, I suggest a piece of copper wire from a piece of electrical cable, alternatively blank off the hole.
- 73) Carefully clean Frame Extensions (11) and punch out rivets. Dry fit along side the smokebox in the slots of the footplate, make sure they are the same distance back from front of footplate. Tack back end and extreme tip of front end to stop them moving, when satisfied remove the boiler and solder frame extension, check boiler still fits.
- 74) Fit (P38) Smokebox Door into the front of the smokebox and fit door handle (dart) in the centre, remember the inner arm always hangs vertically.
- 75) Fit handrail knobs to smokebox and along boiler and bend 0.7mm wire to form the handrail.
- 76) Fit (P48) Combined Sandbox and Splasher to footplate with rear edge up against tank front. Bend 1mm wire form sand pipes as per picture and solder into holes in the footplate.
- 77) Identify (P50) "Piano" cover and fix in place between frame extensions.
- 78) Fit Buffer Bases to the buffer beams.





- 79) The Lamp Brackets, solder into the holes in the footplate and bunker.
- 80) Take (P49) Balance Pipes and glue in place in the holes in the footplate, they are handed so check before gluing.
- 81) Clean up Step Back Plates (70) and punch out rivets, fold tops at  $90^{\circ}$ , then bend to form joggle as per picture on the right.
- 82) Clean up Steps (71 and 72), punch out rivets, fold at  $90^{\circ}$ , including ends, fettle until they look right.
- 83) Solder (73) to the back of (70), this helps stiffen (70) where the centre is half etched, don't bother trying to bend (73) to match profile of (70), it won't notice when painted. Then solder one small step to each back plate, followed by a large one to each back plate.
- 84) Clean up each step assembly and fit in the pockets on underside of the footplate, make sure the holes are not filled with solder as these are used by handrails.
- 85) From 0.7mm wire form 2 handrails and fit in holes in footplate above front steps.
- 86) Repeat for handrails on tank fronts and cab doorway.
- 87) Paint Body and Chassis, reassemble, fit decals, number plates, coupling hooks and buffer heads.

