**Instructions for building E.B.Models Stroudley 2-4-0 Belgravia Class kit:**

**Historical Notes** *(These are a summary from 'Locomotives of the LB&SCR' vol. 1 by Bradley, with reference to LBSCR locos by F. Burtt, and 'Stroudley Locomotives' by Brian Haresnape. It is clear there are discrepancies, so I have followed a "common sense" path!)*

The first four of these locos were built in 1872, not long after Stroudley had assessed the state of the Company's stock after taking office, and were built, along with the C class from 1871, under the strictures of very limited funds. Nos. 201, 202, 204, & 205 appeared first, using some frame material Craven had ordered from Avonside Eng. Co., (appearing as version 1 above) named *Belgravia, Goodwood, Westminster* and *Kensington* respectively. They were noted for their lack of sparkle as regards performance, and, like the C class before them, were known as sluggish steamers. None originally appeared with loco brakes, these being fitted after 1878. All bar 201 *Belgravia* and 202 *Goodwood*, had varying versions of Craven tenders – these two sporting an outside frame tender each for most of their later life as from 1873. (Number 203 of the series was held by the famous high-performing Single 'Sussex' - of which more when that kit is released soon)

The second batch of two – Nos. 206/7 – named *Carisbrooke* and *Freshwater* was constructed in 1875/6, with similar boilers to the single *Grosvenor* – some 2" larger in diameter. They proved to be better performers, and were entrusted with Brighton – London Bridge morning expresses, and were the first to receive Westinghouse brakes. They were replaced on this 8.45 a.m. service by the Richmonds around a decade later, and the others on the Portsmouth expresses by the advent of Stroudley's singles.

All were eventually relegated to secondary traffic, where they gave satisfactory service until the turn of the 20th century. Known shed details below.

**Details:**

**First Batch**
Cylinders: 17" x 24"
Leading Wheels: 4' 3" – 204/5. 4' 0" – 201/2*
Coupled Wheels: 6' 6"
Wheelbase: 8' 4" + 8' 4" = 16' 8"
Boiler diam. 4' 3"
Firebox length: 6' $2^{1/4}$"
Boiler Pitch: 7' 0"
Grate Area: $18^{3/4}$sq'
Working Boiler Pressure: 140lb

**Second Batch:**
Cylinders: 17" x 24"
Leading Wheels: 4' 1"
Coupled Wheels: 6' 6"
Wheelbase: 8' 4" + 8' 4" = 16' 8"
Boiler diam. 4' 5"
Firebox length: 6' $2^{1/4}$"
Boiler Pitch: 7' 1"
Grate Area: 19sq'
Working Boiler Pressure: 140lb

***Note:** Whilst the details given by Bradley are that 204/5 had 4' 0" wheels, I have altered this above, as I believe this to be in error. The very simple reason is that pictures of the whole class show that only Kensington and Westminster had small splashers behind the front springs. This is scarcely likely to have been added for smaller diameter wheels!

**Sheds:**
**New:** Battersea – 201, 202
Brighton – 204, 205 – assumed 206/7 also, as no evidence is known to the contrary.
**1881:** 201, 202 moved to Brighton, then on to Hastings soon after, followed later by 204/5
**1890's:** all appear to be shedded at Brighton – operating secondary Passenger services.

| **Renumbered:** | | | **Withdrawn:** |
|---|---|---|---|
| 201 | 501 1/97 | - | 2/99 |
| 202 | 502 1/97 | 602 9/99 | 1/02 |
| 204 | 504 1/97 | - | 2/99 |
| 205 | 505 1/97 | 605 9/99 | 8/01 |
| 206 | 506 1/97 | 606 9/99 | 8/01 |
| 207 | 507 1/97 | 607 9/99 | 2/01 |

This kit is a result of further co-operation between members of the Brighton Circle and acknowledgement of help and encouragement is here made to those who provided details that helped in the research, as well as encouragement. My thanks, Gentlemen.

**Parts still needed to complete:** As usual, motor, gearbox, wheels, axles, paint, transfers and couplings are not included – as these are left to the wide variety of personal choice. However, for Brighton Circle members, excellent Loco Name transfers are supplied by Ian White, who is geared up to produce the names needed for this kit, as is Ian MacCormac for the number plates. Eric Gates also supplies Stroudley Passenger Livery lining transfers. I use Sharman wheels, though they are not in production at the time of writing. Alan Gibson does not produce wheels without crank-pin holes at this diameter, but they can be adapted.

**General Advice:**
If you have not built an etched brass kit before, or feel in need of assistance, the best all-round reference work is the Wild Swan book:- 'Etched Kit Building' by Iain Rice. This book deals with a similarly double-framed (GWR) loco, so it is very appropriate.

**I strongly advise reading through these rather lengthy preparatory notes, in conjunction with the diagrams, to get construction straight in your thinking first.**

You can choose whether to begin with the chassis or the bodywork. I tend to begin with the latter to get the shape and feel of the model. It also lets you see what motor space is available, as construction proceeds, but start on the chassis as soon as the footplate, smokebox and cab structures have been positioned.
I assume you will use solder construction at all stages; the exception is the attachment of whitemetal castings, where I would advise the use of adhesives. If you are adept at low-melt soldering, you *can* do so – *but proceed with great caution, as no liability can be accepted for damage to castings caused by soldering. However, purchase of replacements can be arranged*.

***Please Note: There is a supplementary fret enclosed – as there was considerable difficulty in getting the Nickel Silver chassis sides and details properly etched on the same 14thou fret. Some of the finer parts may have come out poorly on the 14thou fret – especially springs, brake rodding and the like. You will find that the substitute parts are stronger, and better formed, though thinner, to enable better production. Simply recognise the parts from their numbers on the original chassis fret, and substitute the better version from the Supplementary Fret.***

***Also, as a result, some spare parts will be left over! Fear not. They were left on the main fret in the artwork to save yet another costly phototool.***

***Careful removal of parts from all frets, and gentle cleaning up of tabs and any 'etch-cusp edges' with a needle file is recommended for all etched parts. Castings should also be lightly cleaned up as necessary, to remove any mould 'joint' or sprue residue.***

Some arrangement for bending parts is necessary. Curves can simply be bent over a parallel drill shank or rod of suitable diameter, held in a vice - suitably lined to protect the part. Allow for spring-back in the metal. Often pliers will suffice on sharp curves, and small items, pressed against a hard surface. Beware, though, of using round nosed pliers, as they are usually tapered. Sometimes even just fingers will do! Straight right-angle bends are best made using a vice, with the ½-etch bend line 1mm above the jaws, and **facing you**. Carefully check that the bend line is parallel to the top of the vice jaws / bending bars, and, using a steel rule / piece of flat hardwood behind to support, bend the metal **towards** you in one go. This will ensure a clean bend, and maintain the flatness of the part. Usually a slight tweak more than 90° is needed to get a true resulting right angle.

***All bends are made with the ½-etched line on the inside of the bend, unless otherwise stated. Where ½-etched dots are provided, these should be pressed through from the back with a blunt scriber, to form bolt / rivet detail on the other side.***

***Some of the holes are deliberately etched slightly undersized, or even only half-etched.*** *There are 2 reasons for this: -*
*1) to cater for individual preferences where fittings are concerned (which do vary) – especially in the wheel department.*
*2) In some cases, especially using nickel silver, which is .15mm thicker, the action of etching removes more metal, and, in order to try and preserve the delicate proportions of some thin parts, especially ones where there is a hole in a round end, I have taken the cautious route. Drilling out gently and gradually* ***while the part is still on the fret*** *is safer. Taper broaches are even gentler than drills. That way you get more delicately shaped parts, which so enhance a scale model, rather than an overscaled apology or a blitzed remnant!*
Please also note that there are areas that I have been deliberately cautious about – and I have offered suggested procedures. This is due to the absence of either precise information or convincing proof as to the exact nature of the detail under consideration. In these cases, I suggest a way forward, rather than categorically state one. As you read through the instructions, it should be obvious where this occurs. I make no apology for even omitting some areas completely - as insufficient information was available to produce a part. Just occasionally one gets information too late to include!

**Important introductory Notes:**

- This kit is designed to use a Mashima 1420 series motor (often confusingly called 1620 series) – use the longest possible in the space available- with a Branchlines Multi-box gearbox. This can be built to 'fold back' under the motor and render the whole unit very compact. There is plenty of 'visual shielding' for this mechanism with the 6' 6" driving wheels and large splashers – they can cover "a multitude of sins"! For those who will use it, the chassis is arranged for simple compensation on the front two axles, with the rear one fixed in top hat bearings. This means the driving wheels and drive unit will need to be "floating". *(Full compensation could possibly be used - see chassis construction notes – but it is doubtful whether there is adequate space to achieve this)*

- If you intend to model in 00, please note that this kit is designed with all three 4mm gauges in mind, but primarily P4. Before commencing building, go to construction paragraph **no.20** and read the sections where you see the ***.** These are to highlight where '00' gauge allowances have been made as far as possible, and where some extra work will be needed. Some of it refers indirectly to EM as well, though not specifically mentioned. I treat EM like P4, and therefore assume only the odd shaving of some parts / spaces with a few file strokes!*(the obvious exception being the chassis)*

- It is most important at the outset to understand the way the kit is designed to go together. It was a considerable challenge to design it in such a way that it could be built relatively easily. If you have built the E.B.M. C or C1 Stroudley goods, this kit is, by nature, rather more complex – but the others are a good lead in to this one.

- The problems revolve around the double framing, and the raised curved areas on the platform / footplate. These attractive, flowing curves necessitate that certain phases of construction be completed quite meticulously - as subsequent work relies heavily on these.

- As a result, the outside frames are attached to spacers first and then the combined splashers and cab sides added on the inside. The reason for this was to enable three relatively long and flexible pieces of brass to be joined as easily as possible. There is no half-etch valence guide underneath the footplate / platform – as there was with the C class – as this would have further weakened the already very narrow platform sheet. Instead, the means of locating the platform in the correct place is a pair of upstanding tabs at the front end of the outer frame *(not the overlay).* This enables the platform to align with the outer frames from the front, when mounted in the frame construction jig. This will necessitate a little more cleaning up than usual. A certain amount of skill with the iron is needed to keep the ensuing soldering operations on both frames even, and the whole assembly parallel. Clamping the frame sides to a straight piece of metal *(such as square*

*brass tube, or a steel rule)* as an extra precaution might further help avoid kinked frames *(though it might also act somewhat as a heat sink during soldering.)*

- The **first operation**, then, is to mount the outside frames in the **fold-up jig** provided *(which comes with add-on pieces to accommodate the 3 differing gauges - P4, EM & 00 - for building the chassis later)*. The platform is now shaped over ramin dowel as a former *(possibly ¼" or 6mm – experiment on a piece of fret waste in preparation)*, and then is continuously soldered along the top outline of the outside frames – preferably on the inside. Once this is done, an overlay is added on the outside of the outer frame, on which is the half-etched ridge that appears on the prototype *(presumably part of the original means of attachment?)* This makes the outer frame a tad thicker than preferred, but will add to its strength. There are holes etched in the frames to assist good soldering from behind. The cab front and roof will be added later, making it all more rigid still. Splasher tops and ends are then bent over and soldered into "3D" form.

- The smokebox / wingplate arrangement is constructed next, with a built-up arrangement to form a sub-frame – on to which the smokebox wrapper is soldered – and then mounted on the platform. **It is possible to construct the complete boiler assembly before attaching to the platform / footplate – to ease painting and attachment of boiler bands later. However, it would probably need to be done on some parallel square material, as there are tabs protruding downwards to locate in the platform.** Also, doing it this way, there is a potential risk of the boiler and smokebox being twisted, rather than being aligned perfectly, and this could lead to problems when aligning the firebox with the curvaceous driving splashers.

- Finally, the boiler is rolled and front and rear formers soldered inside, located with short 0.9mm wire dowels and joined between smokebox and cab. *(The ingenious might be able to use a small nut and bolt to allow a little rotational adjustment!)* The firebox area is not a fully rolled cylinder, as only the upper half is curved - with the sides left vertical. When these solder to the inner edges of the splashers, a small projecting lower edge is left around the insides. This is to ensure any discrepancy between the fitting of the parts is allowed for, after the rigours of boiler rolling. Experience has shown that a visually perfectly rolled boiler may not actually align 100% along such edges, however carefully one prepares the artwork! Hopefully this will allow some latitude for those to whom boiler-rolling is a fearful science they would prefer to avoid!

**Construction:** ***There are exploded diagrams provided to cover construction***

**A) Chassis:** (Nickel Silver fret)
**Part numbers in (brackets) after name.**

1. Detach both **chassis sides (1** & **2)**. Note the four **chassis spacers (3,4,5,6).** Leave as a unit for the moment, as these are in the correct order on the fret. Please note that OO and P4 both have 4 chassis spacers, but EM shares the motion plate/spacer with P4, with ½-etched lines for trimming back for EM. Punch the ½-etched dots out to form the bolt/rivet heads for the guard irons.

2. At this point you need to decide whether you are going to build a **rigid chassis** or a **flexichas** one.
   **-** If **rigid**, then simply ream/open out the axle holes to the outside diameter (OD) of the top-hat bearings. **Note:** I have assumed 1/8" diameter driving axles, but this may not necessarily be the case for the leading axle. Check the axle diameter supplied with 4' 1" or 4' 3" plain wheels by your wheel manufacturer.
   **-** If **flexichas**, then you will need to fret out the rectangles around the front two axle holes. Full compensation is not really possible, as there is so little 'meat' above the rear axle hole. This is why I have specified centre and front axle compensation, and rigid rear axle.

3. Remove the **frame jig** from the body fret, and bend the ends up. Apply plenty of solder on the inside of the bend – as this will help keep it as rigid as possible. *(You could even solder on some fret-waste brass strips at 45° to add some triangulation, if so wished, to further increase rigidity.)*
   To fit the two 'extensions', open out the pinholes to 2mm and temporarily use the 2mm nuts & bolts provided to hold body and chassis together, with appropriate gauge label uppermost. *(Originally they*

*were intended to be soldered, but whilst writing these instructions it has become clear they need to be more versatile.)* **P4 modellers do not need these extensions.**

4. **Make up your motor/gearbox drive unit now**, and check for clearances with the various spacer locations. Some positions may need to be varied, depending on what type you use. ***It would also be useful to have the bodywork available for this.*** *This is why I build the bodywork first.*

5. Place **chassis sides** in the pair of slots nearest the centre. These are slightly wider to accommodate the 0.45mm nickel silver chassis thickness. People with 3 hands can do this without the jig!

6. Still noting their respective positions, fold up the **chassis spacers** with ½-etched line across, and then solder ***diagonally*** only the front and rear ones in slot + tab locations between the frames, to avoid heat & cooling distortion. Then, slightly springing the chassis apart, locate the middle 2 spacers and solder in the same way. Note the one with the slot is for flexichas beam to pass through, between the leading and driving axle.
   *Please note that there may be need for some work on the rear spacer, as this has had to be turned round to allow for the drag beam bracket to be accessible. The lack of space made for some problems here.*

7. Add Brake hanger wires from brass wire. Brakes and Rods will be added later.

8. **Reversing lever bearing arm (7):** this is a more involved process than with other kits, as a good deal of the mechanism is visible. Solder the short **bearing support hanger** on the inside of the frame (chassis) side where there is a small ½-etched recess behind the rear axle hole **on one side only.**

9. **Hornguides (8)** are attached next to the two slots just fretted out. Ensure axleboxes slide freely up & down, with no slop front-to-back. I only give general instructions here, as builders often use their own variations – so be guided by the respective makers' instructions. (You might try the new High Level Hornguides)

10. **Weighshaft balance lever.** Solder up from the 3 parts numbered **(9)**, ensuring holes are clear. It hangs on the weighshaft, with the weight rearwards. Thread this loose on to the shaft to start with, and then solder up when centred through the slot in the motion plate, after the shaft is soldered between the brackets (see below).

11. **Weighshaft bearing brackets (10 & 10a)** are removed from fret and ½-etched dots inside the chassis frame punched to represent bolt heads outside. Solder bearing brackets in place, and cut a piece of brass .9mm wire to thread through to represent the Weighshaft. Looking forward, it should protrude about 1mm on the left-hand side, and be flush on the r.h.s. As mentioned above, the balance lever can now be permanently soldered in place. ***Have a good look at a clear photo, or the Burtt drawing reproduced herein, to understand the whole arrangement. Note carefully which side of other items it goes.***

12. **Weighshaft bearing cap (11)** is now detached (2 are provided on the brass sheet) and carefully soldered on the flush side. If so wished, the other one can be fitted under reversing rod - though it would need to be drilled!

13. **Weighshaft operating lever (12):** solder together the two halves of the lever, and set in place with the relief bosses to the outside. Clean up the **reversing rod (12a)** and connect it from the lever just constructed, to the similar one mounted on the hanger below the rear left hand inside of the chassis. You may find that a certain amount of tweaking is needed in order to ensure that not shorts occur with the wheels, when fitted, as there is very little room here. ***Again, consult the illustrations.***

14. **Guard irons (13):** these can be fitted now. The ½-etched dots behind were already punched out earlier, so solder the irons in place, aligned with these. The bosses sit to the rear.

15. **Main Axleboxes: (33)** are fabricated from components on the brass fret, and **Wheels** can now be fitted, and **coupling rods (14)** which are two-piece, assembled and fitted. Ensure that any vertical movement is smooth. There are nickel-silver outside cranks, which are made up from 3 parts to ensure scale thickness for these hefty items. Take plenty of time to ensure good soldering and smooth cleaning up afterwards – they are very visible! You may prefer to use Sharman (if you can get them!) or Gibson ones. Crankpins are made up from suitable rod, or a CSK bolt and nut, using a standard coupling rod tubular washer. Both Sharman (!) and Gibson supply these.

16. **Brakes (15) and rodding (16)** can now be fitted on to the hanger wires positioned earlier. The **brake operating arms (17)** are made up and attached to either end of a piece of wire spanning the holes at the lower rear of the chassis sides. Take care that nothing fouls, or causes short-circuiting. As stated elsewhere, there is not a great deal of room under here.

## B) Locomotive superstructure: *There are exploded diagrams provided to cover construction*

1. Remove **platform / footplate (1)** from the fret, and also the two **outside frames (3&4)** – ***not the ½ etch overlays***.
   Use the **assembly jig (2)** – ***without any add-on parts now (P4 modellers - ignore them completely)***.
   The ½-etched lines denote where the platform excess needs to be trimmed back for **P4**
   Mount the **outside frames** on it – in the outer 0.3mm slots – ***similar for all gauges***. If necessary, you can lightly tack either end with a minimum of solder, to avoid any chance of slipping during this tricky bit of construction. Do not remove the ½-etched frame overlay from the fret yet. ***See diagram.***

2. Remove the **front frame spacer (5)** and clean off the tabs. This is provided to help to avoid slight misalignments, which can easily add up and cause problems later. Solder spacer between the frames in the recesses provided on the top edge.

3. Remove the **other two spacers (6&7)** - the narrower of the two is the centre one - and solder in place in the slots. *(This may need to be narrowed, moved or even discarded later on – depending on the space required by the drive unit you choose. A suggestion was given above)*

   ***Note: if things start to go wrong with these two quite complex areas, it is always possible to use a small pencil butane torch*** *(of the kind sold by Maplins)* ***either to undo the thick assembly and start again, or to ease 'lumps' down flush, with heat played generously on the offending area. Strategically-placed clamps are vital to preserve alignment.***

4. Bend up the curves on the **platform / footplate**, constantly checking carefully, using the outer frames, now held in the jig, as a gauge. There should be no daylight or gaps at any point between the parts. ***Start soldering from the front end first*** – at the point where the upstanding tabs on the frame tops insert in the platform slots from beneath. This is important, as however carefully the maths is applied in design, the thickness of the metal means that there is the possibility that there might be a slight excess of overhang at the rear end - which may need reducing after the drag beam has been fitted. Leave approx. 0.5mm overhang.

5. Prepare **cab sides (8)** and **spacers (9)**. Solder spacers to cab/splashers *(spacers are identical, but **cab sides are 'handed'**)*, ensuring that the similar shapes at the bottom edge and axle clearance cutouts are exactly aligned. **½-etched platform contour lines must be on the outside**.
   ***Ensure they lie flat together without any space between -*** *see note above**.***
   Holes have been provided for wires to act as locating dowels, to assist with alignment.

6. The combined **cab/splashers and spacers** are now soldered to the inside of the outer frames - taking great care to ensure continued accurate alignment. This where the ½-etched line helps. The ***platform*** will align directly with this, and cover it up – ***not the frame top edge***. Ideally, there should be a .3mm space between the top edge of the frame and the ½-etched line.

***Please note:*** *The 'tails' should meet to from a 'dip' between the two splashers themselves, where they ioin the footplate. Some work may be needed here to achieve this – even using car body filler – as the confined space may mean that the heat used in soldering one area may merely undo another!*

7. Remove **cab front (10)** from fret, and clean up. Ensure that ½-etched ends of splasher-top "tails" will be underneath when they are bent up to the profile of the rear coupled-wheel splasher. When fully assured of best possible alignment, solder from cab front top corner downwards. *Tip: using small diameter rods / wooden dowels as bending formers makes the task easier. Allow for a degree of 'spring-back' - i.e. the metal uncurls a certain amount. The clue is to allow for that with smaller diameters than might appear necessary. Again, practise! The curved downward sweeps are best softened with the use of a fine-flame gas pencil torch (often obtainable for around £5-£10 on markets or at Maplins)*

8. **Splasher tops and fronts** are now bent over/round and soldered up.

9. **Smokebox**: remove the **front wingplate (11)**, **smokebox front (12)** and **rear plates (13)**, and two fold-up **tabbed spacers (14 & 15)**. Bend these latter two parts through 90°, and solder to front plate. Now add rear plate. Ensure the front and rear plates are aligned correctly, or smokebox will end up skewed.

10. Now, before attaching **wingplate**, pre-shape the **smokebox wrapper (16)** and solder it progressively around - carefully ensuring it starts accurately aligned. ***Beware of lingering too long with the soldering iron, as it might cause the other parts to detach. Differing melting-point solders will help here. I'd use ordinary multicore for the inner construction***. There may be a slight overlap at the edges to clean up. Pre-bending, or, better still, annealing (softening) will greatly ease this operation. Pushing the inverted assembly down on to a suitable piece of wood helps to ensure a clean accurate joint.

11. **Wingplate:** offer up assembled smokebox to wingplate - they should be aligned temporarily with a stub of 0.9mm wire, which need not be attached permanently, but can be removed after soldering parts together. (The front wingplate hole must be clear for fitting the smokebox door casting later.) It is vital that they are flush at the bottom edge, but ***note that the tabs are different sizes***. Keep them free of any surplus solder.

12. **Boiler (17)**: Clean up boiler sheet, and anneal carefully. I am convinced that this is the best preparation to avoid kinks and metal that resists being bent. It can be done very simply, held with pliers, over a gas cooker ring. Ensure the whole sheet gets heated evenly, even if you have to stop occasionally to allow it to heat up. A dull red glow is safest. Beware the edges getting too hot.
A cylindrical former that is slightly undersize will be most useful.

    The rear firebox portion is only curved at the top, and the sides left vertical for now. A piece of ½" (12mm) dowel is about right. Solder the underneath seam (½-etched overlaps), after tacking the **boiler front former (18)** in position. This ensures that the boiler will be the correct diameter, but also enables it to be properly aligned with the smokebox.

    Part **(17a)** is the top part of the **motion bracket** – the lower half of which is a chassis spacer, for the purposes of this kit. This is fitted at any convenient time once the decision has been made whether to permanently fix the boiler or not. The notches indicate the position. 00 modellers will need to ensure it matches their chassis, along with the platform inner width. ***See diagram.***

13. **Firebox:** once the boiler part of the sheet has been rolled, take the **firebox rear former (18a)** and work the end of the sheet round to match the former. When they are matched, stand on end so the former is flat, and the boiler 90° to the surface, and start soldering from the top. (There are small 1/2 etched alignment marks) Then, as with the smokebox, turn on one side and press down onto a wooden board, so that no gap is left. Run the line of solder right down to the bottom edge. Repeat for the other side.

14. **Boiler / smokebox joint band (19)** This thin band *(the widest of those provided proved best)* butts up to the edge of the rear of the smokebox, and is not so much a boiler band as part of the smokebox wrapper edge. Usually I make it as part of the smokebox wrapper itself, but, in this case, it has to be treated as part of the boiler. Align with boiler front edge, with no gap; start and finish soldering underneath for neatness. ***Again, take care not to linger!***

15. **Assembly:** now offer up the smokebox, boiler and cab, using wire stub dowels, and check everything is correctly lined up. ***Now is the time to rectify any mistakes.*** Nuts and bolts might possibly be able to replace wire dowels. See earlier for suggested separate assemblies.

    Leave the dowels in position (they can be left permanently in the firebox end, and at the smokebox end also - so long as the boiler can be 'sprung' into place) and solder up. You will have to solder the smokebox / boiler joint from the outside - so use plenty of flux and proceed slowly to allow adequate heat to ensure solder flows well ahead of the iron. *(Insufficient heat and/or too little flux are the usual causes of soldering difficulties)* the firebox end should be soldered from the inside.

16. **Buffer beam / drag beam: (20, 21)** Remove both parts, clean up and attach drag beam first to the tabs on the end of the outer frames. Fold up front buffer beam, to represent a solid timber baulk. Fill in with plenty of solder at outside ends to make it appear solid. (Filler could be used later) Remove **drag beam pin plate (22)**, fold pin brackets 90°, and solder in behind drag beam.

17. **Cab Roof (23):** clean up and fold roof rain edging, using pliers or folding bars, and run a fillet of solder round the inside of the fold. *Do not remove rear spacer bar yet.* Bend roof top into a shallow curve, and bend front piece to a shallow obtuse angle. Solder main roof top in place up against edge upstand, and then trim front piece into place. Fill with plenty of solder ***inside***, and shape the outer front edge to form a gentle curve – not an angle. A good photo of any Stroudley roof will show what shape to aim for. *Do not worry if you file through the brass and get down to solder!!* You can use car body putty to smooth off and fill any holes!

18. **Cab handrail:** this needs to be fitted in conjunction with vertical handrails. Drill out a .7mm hole approx. 1mm behind the rear cabside edge and cut a length of .7mm wire. Thread the beading over the wire and, whilst it still hangs loose, solder handrail wire to the underside of cab rainstrip (see photo) and beneath footplate where wire threads through hole. Snip off surplus. A small washer or small BA nut could be used at the top to represent what I think is a nut in reality.

19. **Cab Beading (24)**: now bend the beadings as close as possible to cab cutout edges first - and then solder from the handrail loops inwards and up towards the roof. Work quickly, with plenty of flux and heat, stopping promptly at the top to avoid de-soldering the roof.

20. **Boiler backhead:** this needs to be loose test-fitted with the cab splashers before it is Araldited in position, ahead of the cab splashers (see **20** below). Some filing may be needed to enable this to happen satisfactorily.

21. ***Cab splashers (25 & 26)**: these have been designed as something of a compromise (though the profile is correct) - to provide for the large variation between P4 and 00 dimensions. Fold up and solder inside the cab, ensuring that they match up with the boiler backhead. There may need to be some work done on them in order to fit. The main problem area is the relationship between these splashers and the chassis - as the chassis sides needed to be as high as possible for strength round the rear axle - so they come very close to invading the footplate. (****** *Every effort has been made to accommodate 00 modelling. However, problems do arise, and if you model to that gauge, you may need to make even more compromise by increasing splasher width. Remove the tops and rears provided, and fabricate deeper replacements from fret waste to keep the chassis sides out of sight behind them. If that is the case, you will also need to trim the footplate itself, and the width of the boiler backhead casting. This may be good to do before construction begins in earnest.)*

22. **Coupling drawbar (27)** ***on nickel silver sheet*****:** there are several of varying lengths provided - so that builders can choose the distance between the loco and tender - mainly to allow for differing curve radii. A small length of 2mm wire / rod will suffice as a link pin. It is helpful to have the permanently fitted pin under the loco footplate, and the loose pin through the base of the tender coal space - there not being enough space to enable a pin to be fitted from underneath.

23. Make up the etched **cab reverser quadrant (28)** parts with **lever** (or use the cast one, or a mixture of parts), to fit in the cab – tightly against the left-hand coupled wheel splasher. These are doubled to make sure that the finished item is strong enough. The lower part of this item on the chassis is already described above in the chassis section.

24. **Cab roof upstand (29)** The rather odd-looking curved strips on the fret are vertical roof strakes, which presumably stiffened it. 3 options are included, as the final curvature of the roof may vary slightly from model to model. Choose the best fit, and solder edge down to the rear etch-raised strip, to represent what looks like a piece of upside-down T angle iron. See photos. It will require some filing to reduce to scale height along its curved length. Now cut the rear bracing-strip off below roof when this part is completed, and clean back.

25. Remove **cab spectacle rims (30)** and clean up very carefully. Solder using a wooden or aluminium tapered stick to locate concentrically with the aperture. A piece of circular plastic as used in coach glazing will fit the bill, but it may exclude the possibility of soldering an inside rim. Alternatively, there are liquid plastic preparations on the market, as used by the aeromodelling fraternity. For the '*concours d'élégance*' model, you add these after the model is painted!

26. **Leading axle springs (31):** these are also on the nickel silver fret, as 3 parts fold-ups. They should be preceded by first attaching:-
**Leading splasher castings** - **these occur only on locos with 4' 3" wheels *Kensington*, *Westminster*,** and are fitted after you have removed any necessary material from the ½-etched rectangular area under the platform/footplate near the smokebox base. Glue in position covering the void (if created) where the leading wheel flanges need space. *(Alternatively, leave the brass in place and test whether necessary when the chassis is wheeled up, and remove excess material with a dental burr in a rotary tool)*
Once the splashers are in place, bend up the 3-part spring etchings, and solder lightly. Gently file off the ½-etched tab that held them together, and, if desired, put a short length of wire through the holes at each top end. In reality, solder will probably have filled them up!

***(You will find the remnants of an earlier, and much more complex fabricated design on the fret, as well as other apparently unused parts, and wonder why there are there - ignore them! Or find another use for them!)***

27. **Coupled wheel springs (32)**. As with the leading springs, these are 3 parts, but separate. Assemble carefully, and attach from beneath the frame, lining up with the axleboxes above them. ***See diagram.***

28. A quantity of **lamp irons** is provided in amongst the roof parts - some plain and some 'tee'. Tee ones are on the front edge of the platform - just above the buffer beam. Consult photos for exact locations. ½-etched line enables bend for soldering portion.

29. **Wheel balance weights (35)** are fitted to the driving wheels when convenient. Use photos to guide you. They start and finish on the spokes, The smaller ones go on the trailing wheels, and the larger on the driving wheels.

30. **Fallplate: (37)** this should fit in a hinging fashion between loco and tender – though you may choose to simply solder it in place at the back of the loco footplate.

**CASTINGS:**

**Boiler backhead:** this should be obvious! It is best glued to the rear of the cab spectacle plate, after a trial fit and any trimming done. This is much easier than trying to lo-melt solder it. Fit the regulator handle on the spigot on the backhead with Araldite.
**Sandbox caps** - locate in the holes on top of the front splashers.
**Chimney:** Simply run an appropriate drill through, or gently rat-tail file, ensuring the correct hole diameter. Looks will also benefit by drilling out the chimney some distance down.
**Dome** - again, obvious. Merely ensure the hole provided is correct size. In the early days, these locos had Adams valves until replaced in 1876. Parts are supplied for either version.
**Salter valves:** You have a a choice here: The levers of these appear on the loco body frets as well as the castings, as a fold up. It has been retooled for this kit. Brass pillars by Markits are provided. Parts **36**, on the brass sheet, are the **Salter valve levers** and there are several spares as useful fret-fillers – as there are couplings, and hooks.
**Westinghouse pump:** This is best left until after painting, though it might be best to prepare the fuse-wire pipes and location arrangements (not provided for) at this stage - simplifying matters later.
**Westinghouse brake pipes:** These attach under the front and rear buffer beams of loco and tender.
**Boiler clacks:** These are the standard 'right angle' ones that attach just behind the smokebox at "9 o'clock" and "3 o'clock". Drill the ½-etched hole for attachment. Phoenix Precision paints do good brass & copper paint for the body & pipes, respectively.
**Whistle:** locates just ahead of cab front. For the really adventurous, there should be a cross-drilled wire running through the cab front – representing the whistle-operating rod.
**Cylinder Cover:** this locates at the centre of the wingplate below the smokebox door, on the footplate.
**Boiler Handrail knobs**: They locate in the ½-etched holes along the boiler at approx. "10 o'clock" and "2 o'clock", as follows:-
6 longer ones on the handrails, and the 2 shorter ones on the front smokebox curved handrail. Gibson straight brass wire is provided for this purpose. Being brass, they solder in place, inside the boiler where possible, for a clean joint, unless you wish to attach them after painting.
If you look at pictures and drawings, you will notice a very thin link from the front of boiler handrails to the fittings on the smokebox. That is because the handrails were hollow, and there are operating rods that passed *through* the handrails. I can only suggest that you either ignore this size difference, or spin a piece of wire in the lathe / drill and thin down with a Swiss file or abrasive cloth. Some loco pictures show this changed and the rail leading right up to the fitting, other show it removed - though I have not seen any members of this class so treated.
**Smokebox door handles:** Brass turnings by Markits are provided (even finer than Gibson's!) These fit in the centre of the cast **smokebox door**. This locates in the centre hole in the etched smokebox wingplate (which may require opening out). The spindle will benefit from being mounted in a drill and the 'backplate' disc being considerably reduced in diameter, and the handles slightly reduced in length. Refer to a photo.

**Painting:** These locos were adorned in the Stroudley Passenger livery all their lives. Phoenix Precision Paints cater for all the Brighton stock paintshop requirements, and, as mentioned at the outset, lining transfers are available from Eric Gates, and names from Ian White.
Number plates and works date plates are best obtained from Ian MacCormac, now that Bill Bedford no longer does them. I suggest a small hole (1mm) drilled exactly at the centre point of the oval plate. When the brass plates come, you can solder a small stub of 1mm rod as a location assistance for fitting. After painting, these can be glued in position; a slight countersinking of the hole may assist the plate in lying flat. In both cases, the rear of the part is hidden - number plate on cab and works plate on driving splasher.