

E.B.Models: Billinton 6 wheel 33' 6" Tricompo Diag. 72

Historical Notes:

These are very limited, as these carriages are none to well documented in sources that I have researched. This vehicle was part of the extensive series of 6 wheel carriage designs that were produced by Robert Billinton, in the 1890s.

Full 1st, 2nd, and 3rd class carriages were produced in large numbers, some Brake/3rds, a few Brake/2nds and even lavatory composites, along with centre-ducket matching brake vans (the subjects of a whole range formerly produced by Branchlines). Also there was the unique design of double-ended brake van (still produced by D&S Models).

This carriage is often partly seen in many of the LBSCR photos of locos at stations, or near carriage sidings - the best being the photo of Terrier "Preston" wearing its duplicate no. 663 at East Southsea. Behind it is just such a tricompo, coupled to a full third for comparison, though it is much more obscured by the engine. Sometimes these vehicles are wrongly labelled as full 2nd class carriages. Also I have a couple of photos of a C class goods and a D2 mixed passenger 0-4-2 with them, and one picture of E1 'Calvados' leaving Eastbourne with one as the second carriage. This was taken in the Umber & white era.

The clues for spotting them are - the shape on the rain strip on the roof - to determine whether one is viewing part of a bogie or a 6-wheel coach - and the very narrow panel at each end of the vehicle sides - denoting 3rd class compartments at each end. The presence of the other more sizeable panels next to those compartments is the clinching evidence. This indicates more sumptuous provision, i.e. 1st & 2nd class - rather like the Stroudley 4 wheel 1st / 2nd 4 wheel compo. (Roxey Mouldings model - still produced.)

All three classes of accommodation were provided for as follows:- 3rd!1st!2nd!1st!3rd The panels on the sides give the clues as to what lay behind them, when the class names on the doors are not visible. The outer two panels of the four are slightly narrower than the centre two, indicating a different class of compartment.

There were, apparently, some 67 of these carriages built - which makes them fairly prolific, despite there being so few instances of them being well documented photographically.

Livery: These vehicles would have been turned out originally in varnished mahogany livery, lined round the panel edges with gold. Door waist panels displayed the class in words, not numbers, of gold shaded red. After the Livery changes of c1904/5, umber was used, with some stock being graced with white panels - predominantly on main line use. Check photos for frequency of this. I have not yet seen any so rendered - but that does not mean they weren't! Bear in mind, though, that the construction of mainline bogie carriages, which so quickly replaced most of these vehicles, was going on in the 1890's also, and the 6 wheeled stock was very soon relegated to secondary / local / branch work. (The Brighton Line's first bogie carriage in 1889 was a 6 compartment full 1st class carriage, designed by Stroudley. A 4mm scale etched kit is produced by Ian MacCormac, also of the Brighton Circle)

Train formations: These, I am afraid, are totally unknown to me, and so I have not made any pretence at knowledge - except to say that photos show them often in two's, or mixed in singly with other full-class carriages. One is shown in Brighton (erroneously captioned "a 6 wheel full 2nd") with 0-6-2 E3 "Itchingfield" blowing off steam by platform 3 - proving at least that they entered the mainline stations! My own guess as to why they were built is probably to increase the overall capacity of a train without unduly upsetting the mix of provision for each class. Often the Brighton put out some real mixes of carriage types - both Stroudley and Billinton types, giving the impression of quite a ramshackle outfit - as a scan through the many Middleton Press books will reveal! (A train headed by D1 "Maresfield" at Eastbourne being a notable example). My guess is that all the variety of carriages were made up very much as needed, before the days of set trains - which seems to be in Marsh's era.

Numbering & build dates: (Courtesy of the Brighton Circle correction list for the Oakwood Press Book, by Peter Newbury, on Carriage stock of the LB&SCR)

238-43 built 1891

244-9/252/3 built 1892

256-9/273-6 built 1893

278-284 built 1894

285-296 /442-53 built 1895

Total 67 (by1896)

454-61/8/9 built 1896

470/1 built 1897

277 built in 1893 or 1894 broken up after the Mayfield smash Sept 1897

Instructions:

Please read through instructions and identify part numbers and processes before commencing construction. No responsibility can be entertained for parts damaged during construction, or by not following the instructions correctly – especially whitemetal castings. Supplies of replacements of the latter can be arranged, cost pro rata.

Contents include:-

- Set of brass etchings – with part numbers on fret.
- Set of whitemetal castings (or not, depending on customer's choice)
- Instructions, with construction diagrams.
- Not included:*** Wheels, couplings, transfers & paint, glazing material, seats etc. Sources:- wheels - Gibson / Maygib Coach Mansell; transfers - Eric Gates - email address = ericgates@aol.com; Paint - Phoenix Precision Paints varnished mahogany / Marsh Umber (+ white - depending on era being modelled)

Avoid handling etchings without Boots latex or garage forecourt gloves – as the inevitable sweat from your hands will begin to tarnish the brass.

Construction:

Preparation:

- Tools; scribe, strong knife / jewellers' snips (despite advice to the contrary, I have always used these quite satisfactorily - except where very small parts are concerned), set fine needle files, soldering iron, fibreglass burnishing tool, bending aids. Adhesives: 5-minute epoxy & slightly viscous Superglue. A truly square wooden block glued/screwed to a flat piece of wood - a vital item for any kit-building - hereafter referred to as a "90° jig"

Underframe:

1. Carefully identify all ½ etched dot marks on complete etch, and use a scribe to make a depression that will show on the other side to represent bolt heads.
There are small vertical ½ etch lines on the inside of the solebars - these indicate the later position of the spring 'J' hangers. There are also small alignment marks on the ends and the underside of the roof, to aid good alignment when the roof is fitted.
2. Separate **underframe (3)** and clean off all 'nibs'/tags used to hold to main fret. Continue to proceed this way hereafter, with each new part detached.
3. Check you have impressed all the ½ **etch dot marks** - and can see the bolt detail on the outside of the solebar. Using a set of folding bars, carefully bend the sides through 90° with the ½ etch line on the **inside** of the bend. (This will be the rule, unless otherwise stated) *Take care during this operation that you don't flatten the bolt detail just formed.*
4. Bend down **centre cosmetic** and **end fixed 'W' irons**, and run a fillet of solder along the bend line to stiffen the fold.
5. Now fold down the two **buffer beams**, soldering in the bend line, and fold round the ends of the buffer beams, strengthening with solder filling.
6. Detach the **rocking 'W' iron fitting (6)** and pass a 0.45 drill through the holes in the backs of the brake blocks. Bend the 'W' iron sides through 90°, and then bend up the shallow 'apex'-shaped front and rear strengtheners. These have holes in them to take the pivot rod. Strengthen-solder along these lines, taking care that the holes are not filled up with solder.

Solder the brake rod in place after fitting wheels. *These are very delicate parts, and can easily get damaged by handling during further construction.*

7. Detach the **centre axle support yoke (7)**, and bend down the two rocking frame pivot plates, and the end wire-retainer plate - identified by the fact that it is a single plate at one end, whereas there are two on the rocking axle end.
8. Locate the rocking 'W' iron in situ, between the two tabs, and thread some of the **.45mm brass wire**

provided through the first tab, rocking 'W' iron, second tab, the centre axle yoke and the end tab. Solder the central yoke to the wire when satisfied the wheels and axle align with the 'W' irons, looking from the side-view. One small tack of solder will allow adjustment here.

The centre support yoke should 'float' while the wire keeps it in longitudinal position. There will be some upward and sideways spring to it. Solder need only be applied to the end of the wire that passes through the single tab on the underframe, though you may prefer to fix both ends. If any adjustment is needed, then soldering at one end only will simplify matters.

If you prefer the central yoke to be more 'guided' in its lateral motion, then apply the 2 strips of brass (**3b**) to limit this. This will have the added effect of limiting any tendency to fore and aft movement. Ensure there is ample clearance for the wire to move freely above the top of these pieces.

Small pieces of wire soldered 'across the posts' of the yoke will retain the centre axle in place. There should be a good deal of up-and-down movement. This can be left loose, or further spring pressure applied with a separate wire bearing down on the top of the axle. Experimenting with the underframe on curves and points will soon determine track-holding capabilities, and determine the best course of action. Further refinements of this part could be to add thick washers on the insides of the yoke - to act as 'bearings'.

9. **Footboards (3b)**: After embossing the bolt-head detail from the inside, these are attached along the lower edges of the solebar by bending the 'legs' through 90°. Ensure the lower edge is flush with the lower edge of the solebar, and fitting neatly around the ends of the buffer beams. Use minimum solder!
10. Bend down **gas tank fixing cradles** on the underframe, and apply the usual solder fillet in the fold. Whitmetal tank castings will be attached here later.
11. Align **brakes** on front and rear axles with wheel treads (there were none on the centre axle), and, if you have not already done so, solder operating rods of 0.45 wire between the brake blocks.

Bodywork.

12. Remove and clean up the two **sides (1&2)**, the two **ends (5&5a)**, **roof (4)** and ten **droplights**. It would be advisable to attach the opening droplights before the sides are soldered up into a 3-dimensional unit - restricting access somewhat.

Note that the narrower end of the droplight is the top. These can be positioned up, down or any desired position in between. Always remember that if you wish to model them right down, the weather conditions modelled must also be Summer time, and there will need to be a degree of inside detail added! Fine if you are only modelling one carriage, but several set trains?

*If you wish, you can also now attach door vents (10), door handles (13), hinges (11), & grab handles (14) can also be attached now (see section 17.)

13. Using a piece of ½" ramin dowel and fingers, or a piece of tube bolted loosely at each end to a length of square-section aluminium, gently bend the lower half of the **sides** to form the tumble-home. Whichever method used, always trap the bottom end, and ease up the windowed upper-half with a flat article such as a 6" rule. Check against the ends to ensure the correct amount of curvature. It was not very great.

Next, using your bending bars very carefully bend the **bottom strengthening edge** at 90° to the flat *upper side - not the lower curved part*. Make sure this is correctly done, or problems will ensue when fitting to the underframe. Finally, bend the **top strengthening edge** so that it matches the angle at the top of the ends.

14. Now fold up the lower 'fixing edges' on the **ends** through 90°. Offer up to the sides, one at a time, and bend the **secondary tabs** up, and curved to match the curve on the inside of the tumble-home. Solder using your 90° jig. Solder one side to one end, and then repeat with the other two parts. Finally, and preferably with two 90° jigs, solder the last two corners - thus giving a box-like structure, with no roof, or base.
15. Check that all **sides** are flush with the **ends**, and have no over lap, and then offer up the **body** to the **underframe**, and check for alignment with the securing holes. Using the 10BA nuts provided, solder one over each of the end tail holes - taking care not to fill the threads with solder. Not do a trial assembly with

the bolts provided. The slots should ensure a degree of adjustment.

16. If you have not already done so, solder **grab handles (14)** and **door handles (13)** in position by the doors. You will also need 5 more grab handles - one at each corner, and one on the roof above where the end steps are attached. Drill holes of 0.4mm to receive them.
On the other hand you may prefer, as I do, to use brass lace-making pins that have been hammered flat on both sides of the head, and filed up to produce a more solid-looking door handle. This can then be soldered with the long pin shaft handy to hold with your third hand, during soldering! It can then be cut off (the pin shaft, that is!) afterwards, using proper side-cutters.
17. Attach the **end steps (12)**, by threading through the slots and bending up the end tabs. **Always** solder these from inside. Carefully, and with minimum solder, attach the **lamp irons** to each end - having ensured that the bolt-detail was first pressed through from ½ etch dots on the back.
18. **Partitions: (8) detach** and clean up the compartment partitions. These should fit in place along the length of the body, though there may need to be some gentle filing to ensure a really good fit. Actual positions need to be determined by information regarding compartment sizes. Here are some (I am not sure whether they are the correct ones) :-

1st class compartments - 7' 4" long; 2nd class compartments - 6' 3"; 3rd class compartments - 5' 9"; (It appears these sizes may have varied somewhat over the range of carriages. Reference to Peter Newbury's book may help here. A First can be 7'4" or 6'3" and a third 7'4", 6'3", 6'2" or 5'9").

Scale these to size 4mm to the foot: This should give the guidance needed, but you are rather on your own at this point! Ratio supplies plastic seats that can be used, cut to length. I believe photos and maps of the LBSCR system were on the partitions, as well as mirrors. I have no details of positioning.

19. **Door ventilator hoods (10)**. These can be soldered in position now, if you haven't already done so (@ section 13), with the roof not yet fixed. The holes are to aid sweating them in position, though I have used Superglue in the past. The square-cornered ones are for the smoking compartments. Otherwise, the curved corners on the others go uppermost. Refer to photos here.
20. **Door hinges (11)**: these are simply applied through the small rectangular hole on the lower left hand edge of each door. Bend to an 'L' shape, poke the shorter end through, and solder the back in place.
21. **Roof (4)**: Mark a centre line on the underside of the roof etch – between the 2 small ½ etch marks, and space out marks for the gas lamp tops. This is best done by marking the halfway point of the centre line, and then stepping off the distances from each respective compartment (all different) with dividers – you could use the door handle holes. I strongly suggest doing this in easy stages beginning with 1mm. For final drill size, measure the spigots on the lamp top castings, and drill with a piece of wood supporting the roof.

You must **anneal** (heat to almost dull red heat to soften) and gently curve the **roof** over a shallow former that is a tighter curve than the roof arc. Be careful that the line of holes will tend to crease if not very careful. If preferred, drill after bending, or even after final solder fixing. It is better to have a slightly tighter curve than a broader one – so a former that is smaller in diameter than the roof curve is preferable. Rub well down into the former, to avoid kinking around the half-etched marks.

The roof should sit in contact with the tops of the sides, without significant gaps. There are very small alignment marks on the roof ends - born out of past frustration at trying to get the first solder-tack in the correct place! Another small mark should be on the top centre of the raised panelling on each end. This can be continued up by scribe to the top of the thinner section of the end, above it. This should line up with the mark on the roof. Both these marks can be easily filled and rendered invisible before final painting. Take care to ensure that the slight overlap is equal at each end - approx. 0.5mm. Flow solder all along the joints using a hot enough iron and plenty of flux. 145° solder is best here.

22. Solder the **rainstrips (4a)** in place along the ½-etched guidelines on the rooftop. A spare is provided.
23. **Cast gas lamp tops**: these castings are best glued in position, ensuring that they are well cleaned up, and fit accurately into the drilled holes. Use fine fuse wire to attach gas pipe from below non-step end buffer beam, up via switch, and along the roof - with a small 'spur' running to the first 4 lamp tops, and the end of the long pipe bending through 90° to the final and furthest one. **See diagram**.

24. **The cast axleboxes** are Billinton pattern, and should fit over the standard pinpoint bearings that come with Gibson / Maygib Mansell wheels. Some easing / drilling may be required here - both in the 'W' irons and castings.

Springs glue in position on the 'W' iron faces - preferably with 5-min epoxy, though Superglue is also an option. The thicker version of that glue is to be preferred.

'J' hangers locate where the small ½ etched mark appears on the inside of the solebar. It is best to do a dry location of these three parts. ***Please note that the longer springs - 8' - go on the centre axle, and the shorter - 7' - on the outer axles.***

25. **Gas cylinders** attach to the bent-down cradles underneath the underframe. Some form of retainer can be fashioned from spare fret waste - or a length of spare rainstrip. ***See diagram***

26. **Westinghouse brake pipes:** These are supplied in the form of Chris Cox's multi-design casting, and need to be cut to size. Discard the incorrect pattern, and attach the other to the buffer beam/end.

27. **Screw couplings (15,16,17&19):** these are fabricated using the various parts dotted around the fret - and should be some of the only bits left by now, unless something has gone badly wrong. ***See diagram***

28. **Coupling hook plate: (18):** these solder around the coupling hook slots in the buffer beams. Ensure the raised bolt detail has been pressed out before attaching. Clean soldering is repaid here - or consider glue again if you find application of a very small amount of solder difficult.

29. **Gas supply switch (20):** Carefully detach, and fold the square over through 180° so it folds back on top of the main part. Solder carefully in place. This attaches on the opposite end to the steps, with the square block on the raised panel edge.

30. **Final touch:** For those who have seen one in photos, but never found one in any kit, glue a small round disc no more than a pin-head in diameter (another lace pin head might do), to represent the gas gauge - found usually around the middle of the solebar. See a clear photo!

31. **Choice of couplings** is left to you. Bill Bedford produces a useful all-in-one coupling with brake pipes that can be well used between sets of permanently coupled carriages.

32. **Completion:** Finish all over with either a Carr's Acid dip, or a lightly abrasive cleaner such as Jif/Cif you are confident all the grit in the liquid can be removed. Another useful cleaning liquid is Viacal – used for removing limescale from taps in hard water areas. If you use any form of chemical cleaner, ensure it is thoroughly washed off and/or neutralised in Washing soda – or it will go on working after you have painted the model, with disastrous results!

Avoid handling after final cleaning, but before painting, without Boots latex or garage forecourt diesel gloves – as the inevitable sweat from your hands will begin to tarnish the brass.

It is advisable to use a very thin coat of Phoenix Precision etch primer (as brass does not hold paint well), followed by a thin undercoat of car spray grey cellulose undercoat, and airbrush Phoenix Precision varnished mahogany. Underframe metalwork was black. Eric Gates's LBSCR carriage transfers complete the job.

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