



## Air braked stock

### The Prototype

Designed in France by CFMF in 1980, three batches of wagons to Design codes PC017a, PC 017b and PC 017c were built on behalf of Storage Transport Systems (STS). All had a 16' wheelbase, a length of 27'1", a gross laden weight of 50.75 tonnes, and a maximum speed of 60mph. The design featured top loading through twin hatches, with a single outlet for gravity or air pressure discharge. The wagons are fitted with hand wheel and air brakes, and Gloucester Pedestal suspension.

Some 79 were built in three batches: 12 by CFMF in 1980/1, subsequently sold to Blue Circle Cement; 52 by CFMF in 1982-3, for the spot hire fleet; and a further 15 by Fauvel-Girel in 1985, for hire to Rugby Cement. The wagons are numbered:

1980	BCC10838-10849	referred to as batch 1
1980/1	STS 10600-10651	referred to as batch 2
1982/3	STS 74030-74044	referred to as batch 3

There has been no prefix change during the lifetime of these vehicles.

The three batches were very similar with minor variations to the roof walkways and brake gear. The earlier batch was disc-braked with a rounded ladder arrangement; the later batches had two steps in the ladders and were clasp braked. Ferry tie down hooks were present on the first two batches but not the last.

The BCC owned wagons were used on Blue Circle flows including to and from Eastgate, Hope, Northfleet, Oxwellmains, Swanscomb and Aberdeen. This essentially remains so today. All were/are painted in the Blue Circle plain grey livery.

The second batch were hired out to several companies and were seen in STS grey livery in many parts of the UK. There is photographic evidence of them as far apart as Aberdeen, Barry, Hoo Junction, Severn Tunnel, and Westbury. They were in store by the 1990s.

The third batch worked initially between Halling and Southampton on hire to Rugby Cement. All were in the standard Rugby Cement livery of the period. After this traffic ceased these wagons were stored.

In the late 1990s all wagons from batches 2 and 3 were refurbished by Marcroft Engineering, returned to traffic by Caib and now work cement flows from Ketton to St Pancras. As far as 51L are aware all 67 are in traffic.

### Blue Circle, Rugby / Castle Cement 51 tonne pressure discharge powder wagon (PCA)



#### From 1980 onwards For OO, EM, P4 and S4

#### Required to complete:

- 12mm plain disc or disc brake wheels, waisted bearings
- Instanter couplings
- Paint and transfers for the livery of your choice

Over the years there have been a few minor changes to these wagons including removal of the gravity discharge apparatus, certainly by the time Castle Cement leased wagons from Caib but in all probability many years before. Secondly in the case of the STS/Caib fleet there have been some minor changes to the discharge pipe work including replacement of couplings and valves and addition of actuation controls.

## Acknowledgements

51L would like to thank Michael Fraser for his assistance in planning this model, and John Coulter for his assistance with photography.

## References

Modern Private Owner Wagons, David Ratcliffe, pp28, 30, 32.  
Private Owner Wagon Fleet, Gardner pp14, 15, 39, 40, 56  
Railways in Profile No 10: British Railway Private Owner Wagons Vol 2, G Gamble, p25  
Private Owner Wagons, Vol 1, Marshall pp39, 40, 74  
Working Wagons, Volume 4, 1985-1992, D Larkin, p58  
Modern Railways in Profile Series No 2: British Railway Air Braked Stock, Tom Smith, pp50-52

## Website information sources.

Wagons on the web

<http://wagons.wordpress.com/british-wagons-by-tops-code/p-coded/>

Paul Harrison's site

<http://paul3715.tripod.com/miscwag2.htm>

Huw Millington's site

<http://www.x-podworld.com/wagons/>

Paul Bartlett's site

<http://gallery6801.fotopic.net>

## Assembly

These wagons are of the 'fabricated' type i.e. welded construction. Butt and fillet welds are not always apparent, being raised, undercut or flush with the surrounding steel work.

Please read these instructions before starting to build your model. Examine all the parts and familiarise yourself with their assembly. Remove any moulding flash and ensure all parts fit correctly. We recommend wet fine 1200 grit emery (silicon carbide) paper for cleaning up castings or fine needle files. For assembly use low melt solder (70 degree), an epoxy resin such as Araldite or superglue.

The Bill Bedford W-irons should be assembled following the enclosed instructions. Modellers may wish to choose a rigid chassis, in which case use a larger diameter spring wire. A rigid chassis are not recommended for either P4 or EM. The use of waisted bearings is considered essential.

### The Chassis

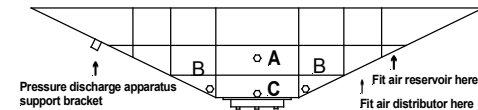
Initially tack solder the components, and when all chassis parts are in place and square solder properly. Care should be taken to ensure solder or superglue is restricted to the joint area. Note that the projection on the solebar is part of the wagon – it is not a casting feed! Attach one solebar to a buffer beam. Ensure both components are square and adjust as required. Note the top of the solebar casting leans inwards to form the tank saddle. **It is therefore important to ensure that the solebar and buffer beam are square to each other.** Repeat for the second buffer beam and solebar and bring together.

Attach a floor plate to one end of the chassis. This will fit into the slot in the solebars and should be placed so that the rib is on the lower surface next to the tank and the raised areas adjacent to the buffer beam. The floor plate should fit on top of the ledge on the buffer beam. It may be necessary to gently file the solebar slot. When satisfied solder the chassis properly. Repeat for the other end. Attach the buffers.

1<sup>st</sup> and 2<sup>nd</sup> batches only: bore holes for the etched ferry hooks, if required. Drill 0.5mm holes at each corner in the buffer beam upper surface in line with the solebar. When fitted the hook should be just beyond the buffer beam. Two spare hooks are supplied.

### Hopper

Bore holes in the side for the pipe work castings. These are pip marked and we suggest 1mm diameter for those indicated A and B and 1.75 mm diameter for those marked C. Do not attempt to fit the pipework yet!



If gravity discharge apparatus is required bore a 0.7mm diameter hole through the support bracket using the pip mark as a guide. (If you do not process a long enough drill bit, lengthen it by attaching a piece of stiff wire via a plastic tube - a sort of flexible coupling!) Attach a length of 0.7mm wire from the bracket and bend one end flat to attach to the hatch on the underside of the hopper. The rivet detail on the hopper underside should be removed.

If gravity discharge apparatus is not required file off the support bracket, but do not file off the hatch rivet detail.

### Tank

It is desirable initially to wash the resin tank in solvent to remove any mould release agent. We suggest the use of enamel or cellulose paint thinners for this purpose. Washing up liquid is **not** satisfactory.

Attach the whitemetal ends to the resin tank using an epoxy resin such as Araldite. Line up with the chassis and lightly file the ends to suit. Attach the tank to the chassis using Araldite or super glue. When dry it will be necessary to slightly fill the white metal solebar adjacent to the tank at one end on each side. Prepare to attach the hopper to the tank underside. Use the supplied 0.030" plasticard under the tank to achieve the correct height, cutting it to fit between the solebars and floor plates, and attaching it with epoxy resin. Fit the hopper, ensuring it is placed centrally. Bore 1mm diameter holes for the tank air inlet valves. These are just inboard of the RH sloping weld line, 0.75mm above the tank/solebar weld. The holes should be drilled perpendicular to the tank surface, and not horizontally. Fix the valves in place.

Cut the 0.020" plasticard into 4 25mm wide pieces, to provide support for the W-irons. Two pieces should fit on the floor plates between the rib and the raised areas, and two

are slightly longer so they will overlap the rib by around 2-3mm. Fix in place with epoxy resin, which will act as filler between plasticard and floor plate.

### W-irons

Prepare the Bill Bedford Pedestal W-irons as per enclosed sheet. If building a Blue Circle wagon, disc brake wheels should be used. Place the W-irons on the floor plates using the bolt heads cast on the solebar as a location guide. Check the rail to sole bar height; this should be 12 mm from rail head to the underside of the solebar. It is very unlikely that any packing is required. We suggest that the W-irons are glued in place after detailing the hopper.

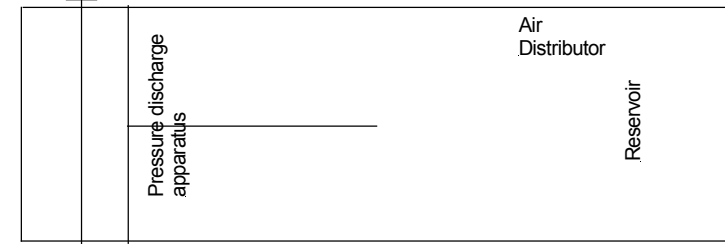
### Underframe detail

Attach the hand brake cross shaft, 8mm from the wagon end. This should be at the end with the gravity discharge apparatus, if fitted. The shaft slopes across the wagon so the hand wheels are at different heights, which is achieved by soldering the small rectangular block to one solebar, and the flat face of the shaft to the other solebar. When viewed from the shaft end of the wagon, the right hand wheel should be lower. Attach the hand brake wheels to the shaft ends. The shaft ends will need trimming to length using sidecutters leaving a small visible section in the wheel centre. If the gravity discharge apparatus is fitted it should be finished now. A 0.7mm brass wire shaft should be fitted across the wagon to the outside of the solebars, attached to short L shaped brackets made from scrap brass.

Now fit the hopper pipework. There are two sections of pipework, a T attached to two valves with protruding pipes (upper) and a section with a valve and coupling with a branch ending in a valve (lower). Fit the upper set of pipework so that the centre pipe enters the hopper at A near to solebar height and the section from each valve enters the hopper at B adjacent to the hopper side (see diagram on page 2). Next prepare the lower pipe work: open the pip mark in the end of the branch valve to 0.75 mm then fit the lower pipe section at C. The valve on the branch should be parallel with the track bed, pointing to the right, and may need bending upwards slightly. Lastly a U-shaped piece of 0.75mm diameter wire (electrical earth or fuse wire is ideal) should be placed between the end of the lower pipe valve and the upper main pipe. It should pass over the RH upper branch pipe, and join the main pipe just behind the branches.

Attach the air reservoir in place. This is situated at the opposite end to the hand brake wheels on the end slope of the hopper in the second panel adjacent to the outward rib. Orient the wagon so the higher brake wheel is facing you – the reservoir is attached centrally across the width of the panel, with the piped end also facing you. Fit the air distributor next to the solebar resting on the hopper bottom. The distributor is on the side of the wagon with the lower brake wheel, with the lever facing outwards.

Brake cross shaft



Underframe viewed from underside

The W-irons should now be firmly glued in place. If the wagon is gently pushed along a flat surface it should run in a straight line. If not, one or both of the W-irons are out of line and should be adjusted. Note that the Gloucester floating suspension units are handed, with the larger spring being adjacent to the end of the wagon. Attach the suspension units to the solebars, ensuring that hole in the casting rear is enlarged sufficiently to allow free vertical movement of the bearing. Finally, fit the 'over weight' indicator. This is the white metal rod found in the same packet as the suspension units. The flat end should be attached to the interior of the solebar with the round end just above and about 0.5mm from the suspension unit bottom plate. A short piece of plate is usually bolted onto the unit, with the other end being under but not in contact with the indicator. There is only one over weight indicator per wagon; it is generally positioned to the right of the suspension unit closest to the piped end of the air reservoir.

### Brake gear

If building wagons from batch 2 or 3 you need to attach the clasp brake shoes either side of each axle. The white metal castings fit behind the Bedford W-irons. It is suggested these are prepared for fitting but attached after painting. It will be necessary to remove the central section of the hand brake cross shaft and perhaps replace it with wire to avoid interfering with the brake castings. The shoes may be gently bent so they are in line with the wheel tread. You may wish to add the brake yokes; bore out the pip-marked holes in the end of each shoe and insert 0.7mm wire cut to length.

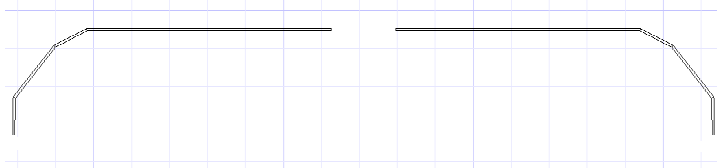
### Roof walkways and ladders

This is probably the trickiest part of the assembly process. Do take care to ensure you know how the parts go together. Remove the two walkways from the frets. The two sections of walkway now need to be soldered to one of the slotted central sections. The inner ends of the walkways are butted up against the half-etched blocks on the central section, so the slot remains clear. Note that the half-etched sides of all three components face upwards, so that the ladder supports are at the right-hand ends. To ensure the walkways are square we suggest they are lined up alongside a line or on a piece of graph paper. Bend the end hand bars upwards and the ladder supports downwards. Fix the walkway to the tank, resting it on the moulded blocks and ensuring it is centrally located.

Remove the two ladders from the fret. Bend the locating lugs (just above the next to end rung) back 90°. If building a Blue Circle wagon, form each ladder into a gentle curve, perhaps using a round file. It will be necessary to add two extra rungs using the supplied

0.5mm brass wire. These can be soldered in place before attaching the ladder to the walkway. Otherwise form the ladders to the curves shown below, then attach the steps section. This should be outside and under the rung-less section of the ladder, so that it starts at just above the top ladder rung and finishes next to the walkway (it effectively "cuts the corner" in the diagram below). Note that the rounded corners of the steps need to be adjacent to the tank. We suggest a section of card is placed between the ladder and steps section to keep them a fixed distance apart. When satisfied very gently twist the steps so they are horizontal when the longest section of the ladder is held vertically. Now fit the ladder assemblies in place. They will need to be attached with super glue to the solebar and can be soldered to the ladder support bars on the walkway. Do not use epoxy resin. When complete the walkways are delicate and require careful handling.

Bore out holes in manhole covers (pip-marked) and fit rectangular handles fabricated from the 0.3mm brass wire. Attach the manhole covers in place using the pip marks on the tank top for guidance; the "tail" on the cover fits in the slot on the walkway.



Sketch showing ladder shape for batches 2 and 3.

## Finishing

Clean and degrease your model prior to painting. Use either an etching primer, such as Precision Paints PS1 or Halfords primer for resin car bodies. Bear in mind that resin castings are prone to static electricity which will attract dust. Build up the paint thickness slowly, using many thin coats. After painting clean the model using a tissue soaked in white spirit. This is especially important if you are using dry lettering rather than waterslide decals.

## Livery

These PCA wagons have been used by a number of operators over the years and modellers are referred to the references where books and suitable websites for published photographs are detailed. 51L particularly recommends these websites as they contain numerous images which are invaluable modeller's aids.

### Livery summary:

**Blue circle cement:** light grey, legends in black, TOPS box white on black

**Rugby Cement:** light grey, legends in black, TOPS box black lettering

**Rugby Cement:** white/grey Rugby legend, TOPS box in black

**Caib:** White, TOPS code white lettering on black box

(wagon STS10633 only)

**STS:** white livery

**Castle Cement:** white, Castle cement legend, various types

Numbers etc. may be found on 51L's transfer sheets TRANBCCB (10838-49, black), TRANSBCCW (10838-49, white) and TRANSTS (10600-31).

## Interested in air-braked wagons?

Contact Diesel and Electric Modellers United

[www.demu.co.uk](http://www.demu.co.uk)

This is the first of what is expected to be a range of air-braked wagons. If you have any ideas or would like to assist the development team with contributions contact:

[andrew@modelsignals.com](mailto:andrew@modelsignals.com)

## Wizard Models

Wizard Models stocks a wide range of components, paints, transfers and other necessities for the modeller in OO, EM and P4. Contact us at:

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DN18 5XY

Tel/Fax: 01652 635885

Email: [andrew@modelsignals.com](mailto:andrew@modelsignals.com)

Alternatively view our online shop at: [www.wizardmodels.co.uk](http://www.wizardmodels.co.uk)

The site is fully searchable with many products illustrated. Lists in PDF format may be downloaded. Please contact us for any further assistance.

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