Brassmasters Scale Models

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Detailing Kit for Bachmann MR/LMS 4F 0-6-0 Locomotive and Fowler Tender

Instructions

Additional components available separately:

- Replacement loco splashers for EM/P4
- Etched coal rails

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1 Introduction

1.1 The Easichas frames for Bachmann 4F locomotive, based on the original concept devised by John Brighton, have been specifically designed to allow easy conversion to EM or P4 gauge, which results in a fully sprung locomotive and tender. Furthermore, the basic conversion can be completed without the need to solder any of the main components together. To complement these detail can be added and this detail is available separately as follows:

1.2 Further components are provided to add to the detail of the conversion. These are, working from the front:

- leading sandbox components
- replacement loco buffer beams
- piston tail rod covers
- jig to correct tender brake hangers
- replacement tender pull rods
- replacement early tender front
- loco and tender cab doors
- replacement tender buffer beams
- replacement tender guard irons

2 General Notes

2.1 There is one etch for detailing the loco and Fowler tender. Numbers shown in square brackets [ ] in the instructions refer to the etch (FD refers to the detailing kit for the Fowler tender) and part numbers, e.g., [FD2] is part 2 on the etch. The part number appears on the separate etch diagrams. Certain parts, e.g. bolts, wire, springs, are not numbered.

2.2 Some of the parts are small and easily damaged, so do please take care. Parts should be removed from the sheets as and when needed by use of a small scalpel etc., and the tabs and etch cusp removed with a small fine-cut file.

2.3 All folds and bends are made with the half-etched line on the inside unless otherwise stated.

2.4 On some parts it is necessary to emboss rivet / bolt heads from the reverse sides by use of a punch.

2.5 There are half etched test rivet holes on the back of the etch edging strip. Use these to get used to forming uniform rivets.

3 Dismantling the locomotive

3.1 Tools Required

- A selection of cross head and normal miniature screwdrivers
- Small pliers
- Small plastic bags and labels to identify parts & screws when dismantling
- Small files
- Soldering iron (for electrical connections)
- A steel rule
- Plastic solvent, superglue and epoxy resin (24 hour & 5 minute)

3.2 Remove the electrical plug from the tender and separate loco and tender.

3.3 Unscrew the front and rear screws (below the cab floor hidden by wires), pull the chassis vertically to remove the chassis from the body.

4 Dismantling the tender

4.1 Unscrew the two screws behind the front drag beam and the one screw offset behind the buffer beam. Pull the underframe downwards to release it from the tender body.

4.2 Spring the tender side frames apart to release the brake pull rod assembly. Spring the tender side frames apart to release the wheels. Remove the rear tension lock coupling (put a screwdriver below it and twist) to reveal the screw holding the coupling pocket.

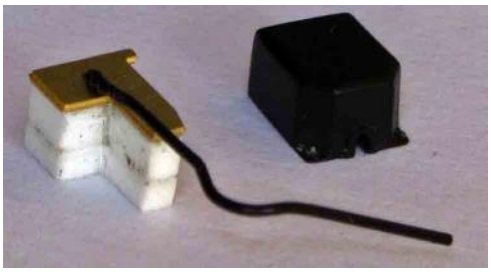
4.3 If you are not using the tension lock couplings, cut off the plastic pillar at the rear of the Bachmann tender frames.

Loco components

5 Sandboxes

The Bachmann sandboxes are the correct shape but the leading ones were quite wide extending beyond the face of the wheels and the coupling rods. On the prototype there was a 'trap' just below the sandbox. This can be represented by a joint in the wire (refer to photos and drawings), or you can re-use the pre-formed and blackened Bachmann ones.

5.1 Remove the leading sandboxes by twisting with pliers, then remove the sandpipes that go across the top of the chassis.

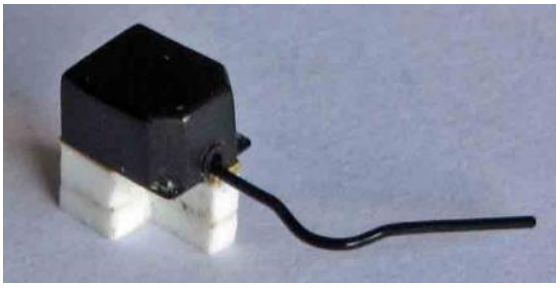


5.2 Join a piece of 4 mm x 2 mm plastic strip to a piece of 4 mm x 1 mm and a piece of 4 mm x 0.25 mm, all 7 mm long, using solvent, to form a spacer block.

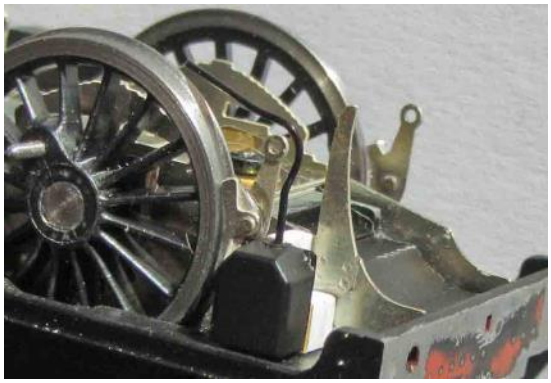
5.3 Attach the sandbox backing plate [**FD9**] to the face of the spacer block using cyanoacrylate glue or epoxy resin. Cut and file the spacer block to shape (see diagram at the end of this document).

5.4 Drill through the hole in the backing plate into the plastic block a short way using a 0.5mm drill.

5.5 Using the wire from the leading sandboxes removed earlier, cut and bend up new sandpipes roughly to shape and secure through the hole in backing plate.



5.6 File the sides of the leading two Bachmann sandboxes so that the back edge is the same width as the front edge. Thin the boxes by rubbing the back in a circular manner on emery paper until the box is about 3.3 mm thick (if you have rubbed off the fixing lugs at the bottom you have gone too far!).



5.7 Attach the sandboxes to the backing plates using cyanoacrylate glue or epoxy resin and then attach the sandbox assemblies to the frames again using cyanoacrylate glue or epoxy resin.

6 Replacement buffer beams

6.1 A number of replacement buffer beams have been provided to cover the life of the locos, some of which can be fitted with piston rod tail covers [**FD1**, **FD2**, **FD3**, **FD4**]

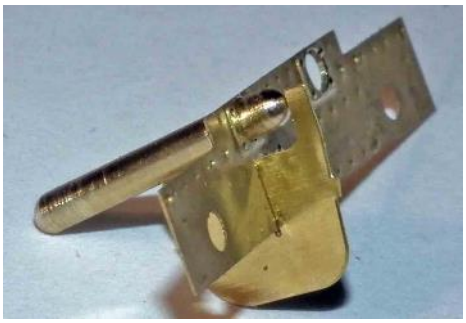
6.2 Remove the Bachmann buffers by gripping carefully with a pair of pliers and wriggling them until they come loose.

6.3 Remove the detail from the cast Bachmann buffer beam by either filing it completely flush (including the lip of the overhanging footplate at the top), or retain the lip but remove all detail below here. This latter option looks better but the holes for the buffers will need 'drifting' by about 0.5mm.

6.4 Taking the appropriate buffer beam overlay, press through any rivets required.

6.5 Piston Tail Rod covers were fitted to all locomotives except the 1937-9 build batch from new. They were mainly removed from 1933 to 1938 although at least one loco still had them in 1963! If fitting piston tail rod covers, drill through and open out the half etched holes in the rear of the chosen buffer beam so that they are a tight fit on a piece of 2mm rod.

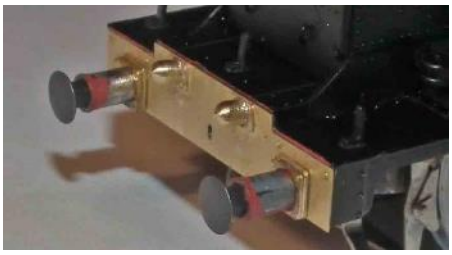
6.6 Place the piece of 2 mm rod in a mini drill and suitably round both ends. Position the rod in one of the holes in the buffer beam using the jig [**FD7**] which slides on from below and helps set the angle and length of projection – see photos. Solder in place from the rear. Cut off the rod flush with the back of the buffer beam and repeat the process for the second piston tail rod cover with the cut off piece of 2mm rod .



6.7 If refitting the Bachmann buffers, after pushing through the rivets, attach the buffer base [**FD5**] and if appropriate, the buffer packing plates (most locos were fitted with them and they were slightly larger than the buffer bases) [**FD6**], to the buffer beam by solder or using cyanoacrylate glue or epoxy resin (if using replacement buffers attach only the packing pieces as appropriate). Note – the packing pieces are not square and the shorter side should be towards the bottom i.e. there should not be anything overhanging the bottom of the buffer beam.

6.8 Attach the buffer beam to the loco using cyanoacrylate glue or epoxy resin.

6.9 Replace the Bachmann buffers or fit replacement buffers, undoubtedly you will have damaged the Bachmann red paint so it is probably best to remove this from all the buffer body before re-fitting.



7 Replacement splashers

7.1 The splashers fitted to the Bachmann body are overscale to accommodate 00 wheel flanges. If modelling in P4 a set of reduced size splashers is available as a separate etch from Brassmasters.

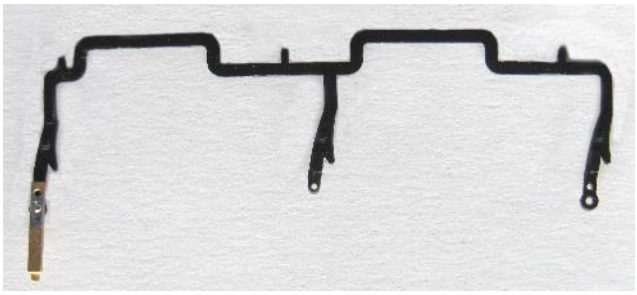
Tender components

8 Shorten brake hangers

8.1 The plastic brake hangers and blocks on the Fowler tender are perfectly acceptable separate plastic units in line with the wheels except that the brake hangers are slightly too long and hang too far below the tender frames. However, they can be shortened and the pull rods refitted.

8.2 Remove the plastic brake hangers from the Bachmann frames by placing a sharper screwdriver between the flat section of the brake hanger moulding and the tender floor and levering gently.

8.3 Take the brake hanger drilling jig [FD10] open out the hole nearer the centre to 0.7 mm and solder a short piece of 0.7mm wire through the hole.



8.4 Position the jig with the wire in the in the hole in the bottom of one of the Bachmann brake hangers, ensure that the section with the upper hole is central on the hanger and drill a 0.5 mm hole through the outer hole into the brake hanger. Cut off the bottom of the brake hanger below the new hole and round the end (see photo – left, jig in position, right, hole drilled and middle, finished shortened brake hanger).

8.5 Repeat for all the other brake hangers.

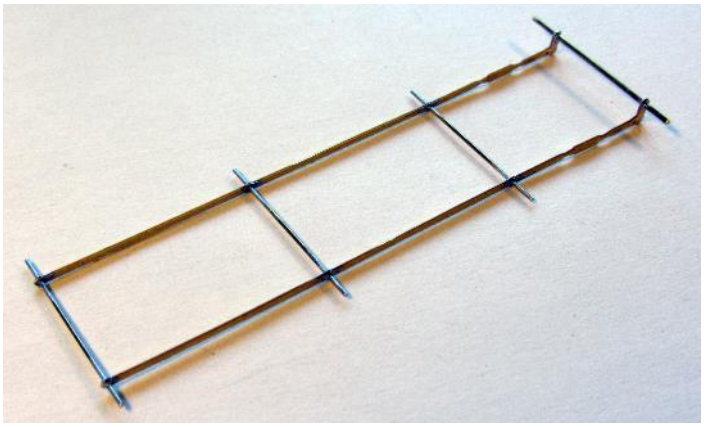
8.6 Refit the plastic brake hanger assembly to the plastic underframe using cyanoacrylate glue or epoxy resin.

8.7 Refit the plastic pull rods, having first bent the front section downwards slightly and the lever back slightly to ensure the bake shaft fits into the holes in the plastic frames. However, a more accurate set of pull rods are provided in the kit (see 11.2)

9 **Replacement pull rods**

9.1 The plastic pull rods are not quite the correct shape at the front end so can be replaced if required. They can also be positioned further apart than the plastic ones.

9.2 Cut three lengths of 0.7 mm wire and thread through the bottom of the brake hanger one side, through the brake pull rods [**FD11**] and through the other side brake hanger. Retain in position with a small piece of Blu-Tac or similar over the outside of each brake hanger.

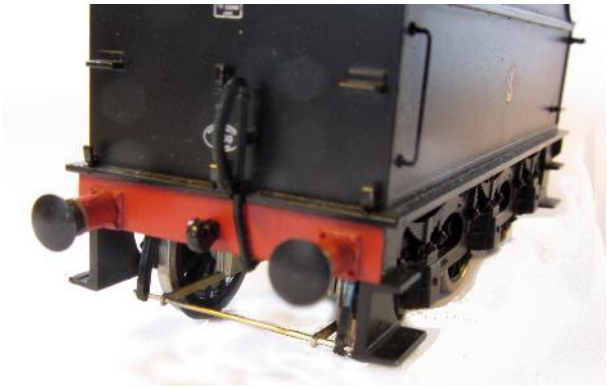


9.3 Position the pull rods as far out along the wire as possible but without touching the backs of the wheels. Measure the distance between the pull rods.

9.4 Remove the wire and brake pull rods from the plastic hangers and assemble on the bench with the wire positioned centrally between the two pull rods and at the distance measured apart.

9.5 Put a piece of 0.7 mm wire 25 mm long through the front end of the two brake pull rods. Again solder centrally between the pull rods.

9.6 Refit to the brake hangers and check all is ok. Make sure that the brake hangers are as far apart as possible then trim the cross wires.

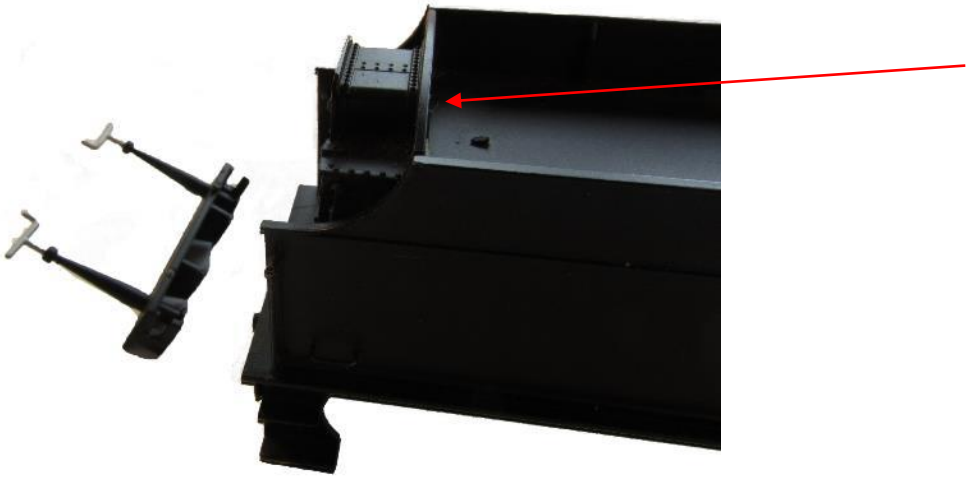


10 Replacement tender front

10.1 The Fowler tender supplied by Bachmann is a later version with coal doors. A lot of locos were fitted with the original Fowler type with a coal hole and long tool box. A conversion for this type tender is supplied in the kit.

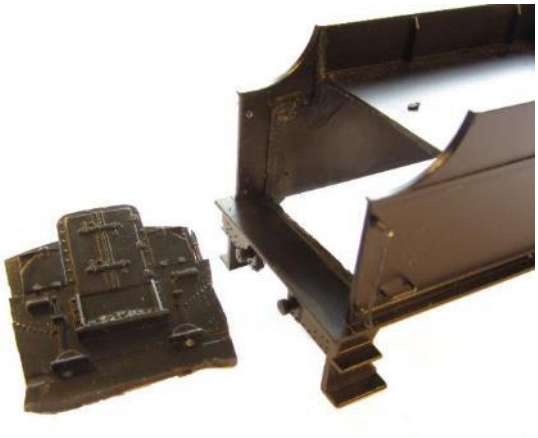
10.2 Having removed the Bachmann tender underframe from the Bachmann tender body, carefully remove the front platform, complete with brake pillar and water scoop pillar. This is done by carefully levering away from the tender front. Put to one side for future use.

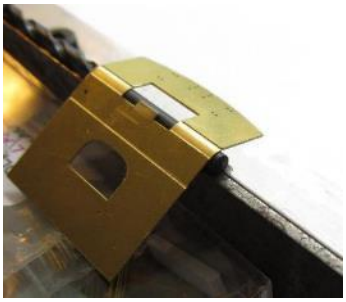
10.3 Grip the water gauge, to the right of the tender front, very carefully and pull out. Put to one side for future use.



10.4 Drill two holes about 1.5 mm immediately behind the front coal partition and close to the outside of the coal space (see photo)

10.5 Using a fairly coarse piercing saw blade, put the blade through one of the holes and mount in the piercing saw frame but with the blade facing into the frame. Cut through the front of the tender front down to the bottom but not into the platform (see photo). Remove the blade and repeat in the other hole and the opposite side of the front. Finally with the blade in the frame in the normal orientation cut across the coal space immediately behind the partition, and then just above the front platform to release the tender front. Clean up the cuts in the tender body.





10.6 Take the new tender front [FD12] and identify the large half etched section where the large radius curve will be formed. This section needs to be bent around a 2.8 mm drill (available from Eileen's Emporium, Hobby Holidays etc.). We did it by sitting the drill on top of two thin pieces of plate held together. These could be held in the vice although ours was part of a plate used for soldering (see photo to get the idea). The tender front is placed over the drill with the half etched section uppermost (i.e. with the half etch on the outside of the bend). Line up the centre of the half etched section with the drill and carefully bend the top and bottom over the drill. Check that the front is bending correctly when the bend gets to about 45 degrees. If all is ok continue to bend 90 degrees. If it is not quite correct, it is possible to ease the bend into the right position before continuing to bend.

10.7 Once you are happy with the curve, make the right angle bend on the lower part of the front.

10.8 Bend up the tool box locating tab.

10.9 Check the fit of the front in the Bachmann body. You will probably find that where the old front was cut away the sides are thicker than the part in front. This thick part need to be cut and filed back until the front sits back so that the distance from the front edge of the tender sides to the new front is 5.66 mm and the new front is vertical.

10.10 Push through the rivets in the toolbox [FD13] and the tool box top [FD14]. Fold up the tool box [FD13] into a U shape making sure the bends are 90 degrees.

10.11 Solder the tool box top [FD14] to the tool box [FD13] with the half etched section over the tool box front.

10.12 Solder the two tool box ends [FD15] onto each end of the toolbox.

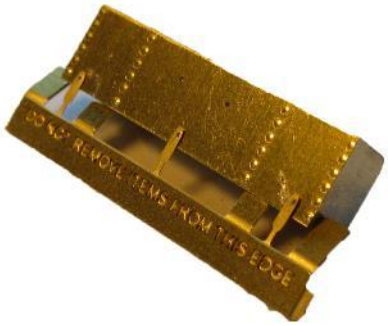
10.13 The toolbox and toolbox top have been deliberately left slightly over long, so now file them back flush with the toolbox ends. Similarly, the toolbox ends are slightly over long so the back edge now needs filing back to match the toolbox top and to allow the toolbox to sit back against the tender front.

10.14 Now the fun begins. It is time to solder on the hinges and the hasps and staples. We have managed to make this easier for you in the production etch than in the first test etch by attaching the components on strips with guides.

10.15 First remove the section of etch with the six hinges on [FD16]. Bend the two outer ends down by about 30 degrees (fold line on the outside). Check the tool box fits between the two. Then bend down the two spacers slightly (fold line on the outside). It should now be possible to position the hinges on the tool box front with the toolbox between the two ends and the spacers resting on the bottom of the toolbox. Having tinned the six hinges first carefully solder all six in place.

10.16 Cut the tabs to the six hinges and clean up the cut edges.

10.17 Remove the section of the etch with the three hasps and staples on [FD17]. Bend the two outer ends down by about 30 degrees (fold line on the outside). Check the tool box fits between the two. Then bend down the two spacers slightly (fold line on the outside). It should now be possible to position the hasps and staples on the tool box top with the toolbox between the two ends and the spacers resting on the front of the toolbox. Having tinned the three hasps and staples first carefully solder all three in place.



10.18 Cut the tabs to the three hasp and staples and clean up the cut edges.

10.19 Bend the overhanging part of each hasp and staple down over the front of the tool box, ensuring it lies flat with the front (see photo).

10.20 Using 0.33 mm wire bend up the handrail on the top of the toolbox and solder in place

10.21 Fold up the coal plate [FD18] by placing a ruler between the two nibs and bending to 90 degrees.

10.22 File off the nibs so that the coal plate fits through the coal hole and solder in place from the rear.

10.23 Make a right angled bend in 2 pieces of 0.33 mm wire and thread through the two holes in the lower half of the tender front from the back, ensuring they are perpendicular. Solder the valve bodies [FD19] over the wire to the front of the tender front, ensuring that they are correctly orientated (see photo).

10.24 Bend the ends of the 2 handles [FD20] as seen in the photos and solder to the wire. The handles should be just under 2 mm from the tender front (see photo).

10.25 Push through the rivets in the top half of the new front for the fire iron bracket and, if being fitted, the rivets for the coal rails.

10.26 If like me, you have managed to lose the water gauge, a replacement can be made from 0.8 mm brass wire. If you still have the plastic one, leave attachment to 11.3.30. Take a piece at least 7mm long, round off one end and mount in a pin chuck with 2.5 mm protruding. File a flat on one side of the protruding wire and then solder the wire into the hole in the replacement front with 5.5 mm showing and the flat towards the front.

10.27 Attach the toolbox assembly to the tender front by soldering from the rear of the new front through the hole.

10.28 Take a piece of 0.33 mm wire. Flatten and shape the end to represent the fire iron bracket. Bend over the bottom so that the bracket protrudes above the coal partition by just over 3 mm. Position in the hole and solder to the inside of the partition. Repeat for the second bracket.

10.29 Attach the new front to the Bachmann tender body using cyanoacrylate glue or epoxy resin.

10.30 Attach the plastic water gauge removed earlier to the hole in the horizontal surface of the new front to the right of the toolbox using cyanoacrylate glue or epoxy resin.

10.31 Cut a piece of 4 mm x 1 mm and a piece of 4mm x 0.25 mm plastic strip to fit between the tender sides at the bottom of the new front.

10.32 Attach the plastic strips to the front of the new front using cyanoacrylate glue or epoxy resin, and then attach the front footplate, removed earlier, to the plastic strip, again using cyanoacrylate glue or epoxy resin.

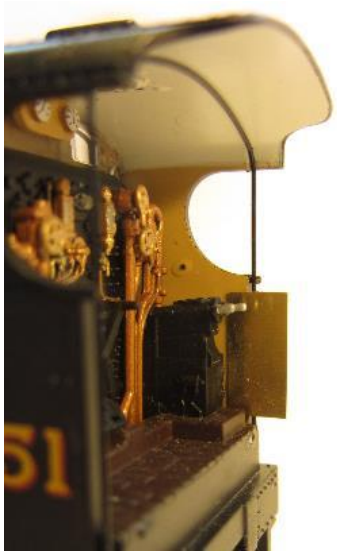
11 Tender coal rails

11.1 Some of the Fowler tenders were fitted with coal rails. A separate etch is available from Brassmasters if this is required.

12 Loco and tender cab doors

12.1 Attach the loco cab doors [FD21 and FD22] to the inside of the cab sides, using cyanoacrylate glue or epoxy resin, so that the join between the half etched section and the full etched section aligns with the rear of the cab side and the bottom of the etch is level with the cab floor.

Photo of left hand side door



12.2 There are two lengths of tender cab doors provided. The scale size doors [FD23 and FD24] can be used when your layout curves are very large. However, for most layouts the wide cab doors [FD25 and FD26] are better.

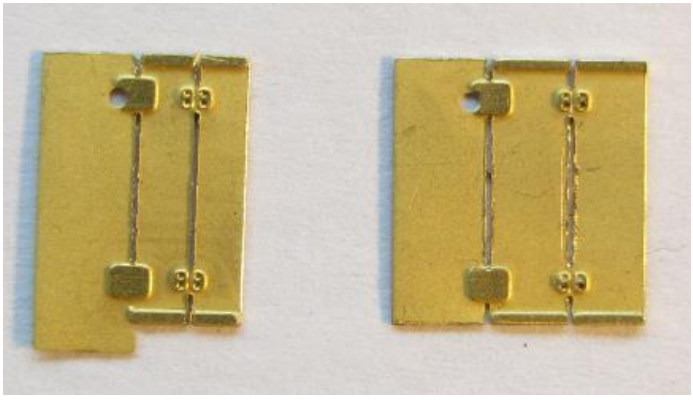
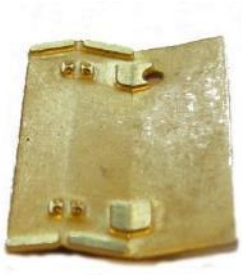


Photo showing the inside of the two left hand side doors, the unmodified scale door on the left and the modified wide doors on the right

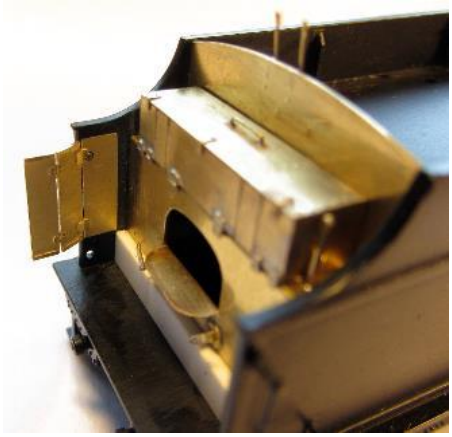
12.3 Take the appropriate cab doors and remove the bottom half etched part not required on this tender (see photo) (I used tin snips). Press through the rivets using a very fine point.

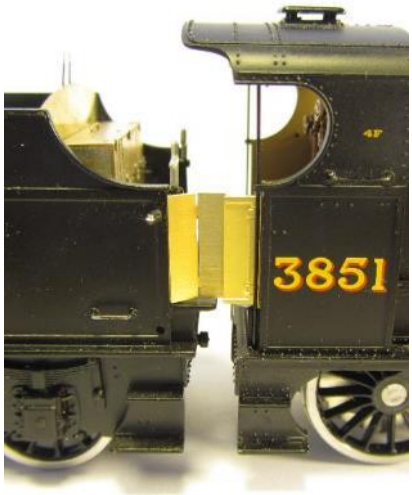


12.4 Bend the cab doors to the shape required along the fold lines with the fold line outside.

12.5 Attach the tender cab doors to the inside of the tender sides using cyanoacrylate glue or epoxy resin, placing the hole over the tail of the top handrail knob.

12.6 The bends in the doors may need further adjustment when the tender is attached to the loco.





13 Tender buffer beams

13.1 The ends of the Bachmann buffer beams are the wrong shape and are smooth representing the flush riveted version. Two replacement buffer beams are supplied with the correct curved ends representing the flush riveted version [FD27] and the fully riveted version [FD28].

13.2 Gently pull the buffers from the rear of the Bachmann tender frames. File the buffer beam flat.

13.3 Because the plastic footplate is over thick it will be necessary to reduce the thickness slightly at the top of the buffer beam for the new buffer beam to sit flat.

13.4 If refitting the Bachmann buffers, after pushing through the rivets, attach the buffer bases [FD5] and if appropriate, the buffer packing plates [FD6], to the buffer beam by solder or using cyanoacrylate glue or epoxy resin (if using replacement buffers attach only the packing pieces as appropriate). Note – the packing pieces are not square and the shorter side should be towards the bottom i.e. there should not be anything overhanging the buffer beam.

13.5 Attach the buffer beam to the loco using cyanoacrylate glue or epoxy resin.

13.6 Shape the ends of the plastic buffer beams to match the etched buffer beam.

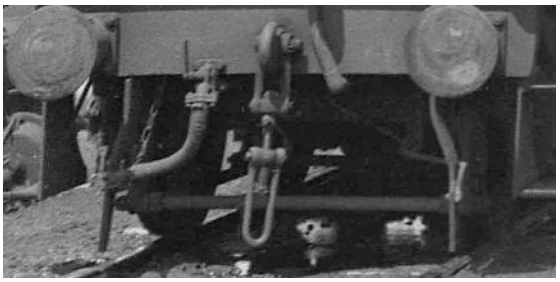
13.7 Replace the Bachmann buffers or fit replacement buffers.

(Picture show riveted buffer beam with Bachmann buffers. The left hand buffer has just the buffer base, and the right hand one has both buffer base and packing piece.)

14 Guard irons

14.1 The replacement guard irons can only be used if the tension lock couplings are not being used.

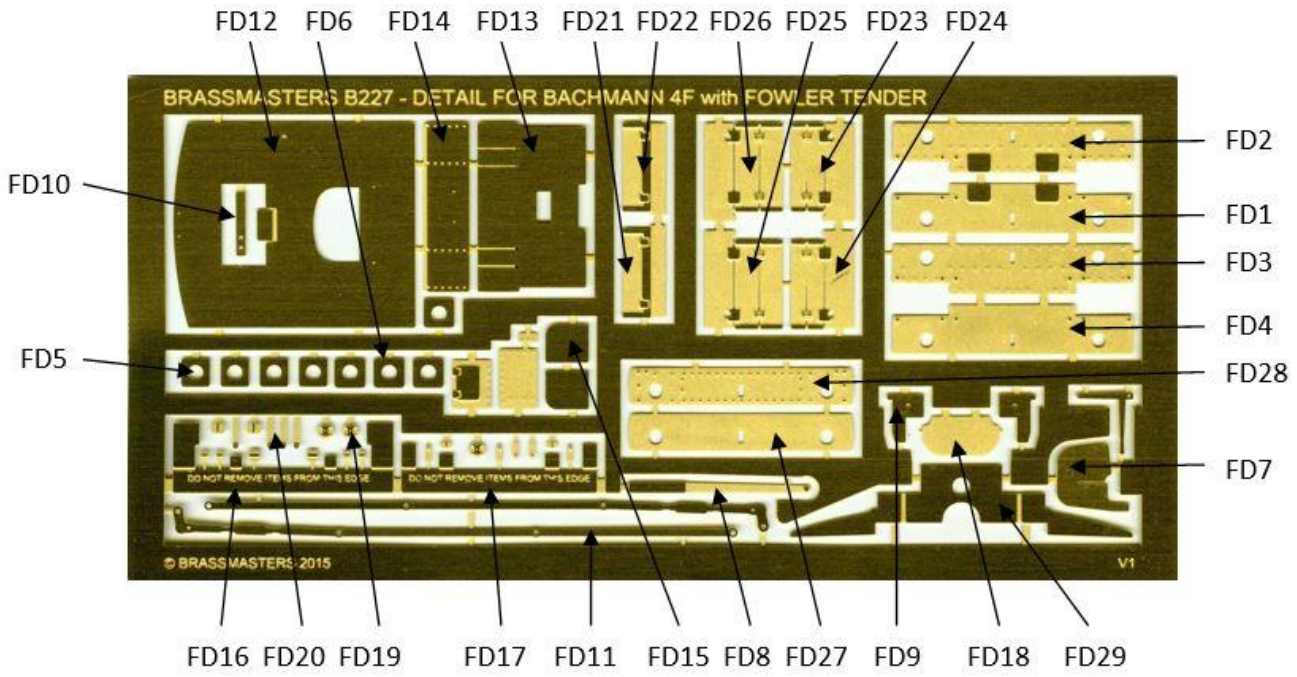
14.2 Fold up the replacement guard irons [**FD29**] by firstly bending up the two guard irons and then bend the straight sections to a lazy ‘S’ shape (see prototype photo of a Fowler tender with steam heating pipe).



14.3 Cut out the rear edge of the tender underframe to allow the new guards to fit up to the buffer beam.

14.4 Secure in place using cyanoacrylate glue or epoxy resin.

Etched Components



FD1	front buffer beam flush riveted with covers	FD16	hinges etch
FD2	front buffer beam fully riveted with covers	FD17	hasps and staples etch
FD3	front buffer beam fully riveted without covers	FD18	coal plate
FD4	front buffer beam welded without covers	FD19	valve body (2)
FD5	buffer bases (4)	FD20	valve handle (2)
FD6	buffer packing plates (4)	FD21	loco cab doors left
FD7	tail rod jig	FD22	loco cab doors right
FD8	reach rod	FD23	tender cab doors scale left
FD9	sandbox base (2)	FD24	tender cab doors scale right
FD10	brake hanger drilling jig	FD25	tender cab doors wide left
FD11	brake pull rods	FD26	tender cab doors wide right
FD12	tender front	FD27	buffer beam flush riveted
FD13	toolbox	FD28	buffer beam fully riveted
FD14	toolbox top	FD29	00 guard irons
FD15	toolbox ends (2)		

Other Components

2.0 mm brass wire	0.5 mm brass wire	plastic strip 4 mm x 2 mm
0.7 mm brass wire	0.31 mm brass wire	plastic strip 4 mm x 1 mm

Sandbox Diagram