

Fig 1. GNR/LNER Eight Wheels Coal Rail Tender Original Condition

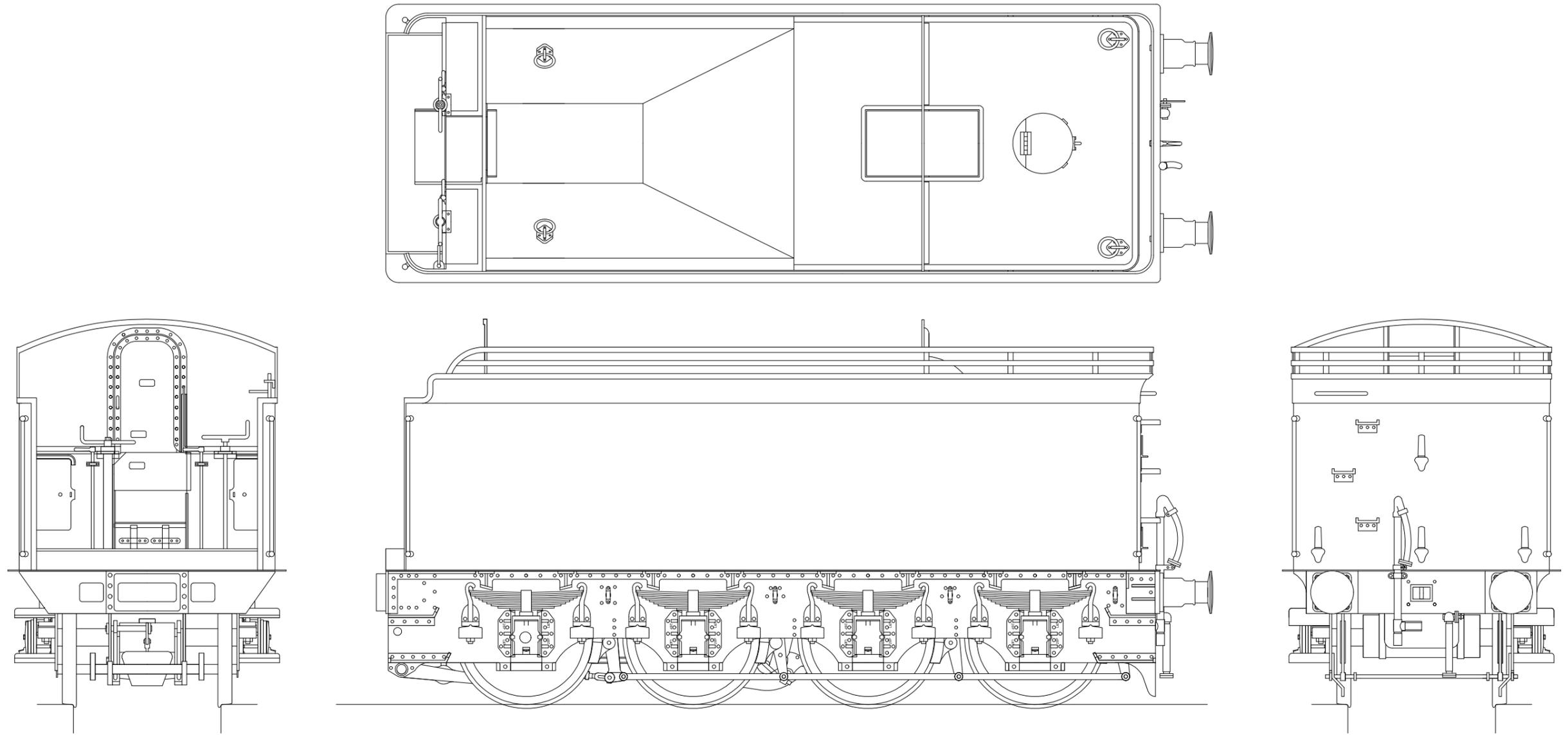


Fig 2. GNR/LNER Eight Wheels Coal Rail Tender BR Condition

CONSTRUCTING THE CHASSIS

Note that many of the components are handed left and right and care must be taken to ensure the correct component is used. We have not always identified left/right components separately but with care and common sense no problems should arise.

Start by opening up the holes in the chassis frames and centre spacer (C1, C2 & C4) as follows:

- 1/8" to fit the compensation beam pivots
- 0.8 mm to fit the wire for the brake hanger pivots & scoop stays
- 2.0 mm to fit the front brake cross shaft
- 1.2 mm in the brackets to fit the rear scoop cross shaft

Fold over the axle slot reinforcing plates, on the chassis frames, through 180° with the half etched line on the outside of the fold. Widen the slots so that the axles are a sliding fit.

Fold up the widest chassis spacers, front, centre and rear (C3, C4 & C5) with the fold lines on the inside and solder in place in the chassis slots checking that the chassis is straight and square.

Construct the front compensation beam by soldering the two laminations (C6) together. Cut a piece of 5/32" brass tubing to fit between the sides of the chassis frames and solder the beam in place in the centre of the tube. Fit the beam using a piece of 1/8" brass wire as the pivot. Similarly fit the rear beams to two pieces of tubing so that they pivot independently. They are soldered to the tubing near one end so that they will clear the axle slot reinforcing plates.

Check that the beams are the correct way up, fit the wheel sets and test that the chassis works correctly. Wheel side control is limited by using the washers (S18 on the supplementary sheet). Clearance between the wheels and the outside frames is limited, especially in Scaleseven, so it is probably wise to assemble the outside frames now so that clearances can be checked.

The 0.8mm wire brake hanger pivots are designed as stubs that protrude from the inner chassis, for extra strength the wire can be passed across the frames as one piece. If this method is adopted then the wire will impact on the tops of the compensation beams, as such their tops will need to be trimmed to clear the brake hanger wire. Test fit both items and check for clearance before finally fitting either in place.

Fold down the brackets for the rear scoop cross shaft on the centre spacer and assemble the water scoop (WM5) as shown in Fig 2. Add the bracing struts from 0.8 mm brass wire. Do not fit C16 & C17 at this time. Refit the wheel sets and retain as shown.

Assemble the brake hangers (C7, C8 & C9) and attach the hangers to the pivot wires. Check the clearance between the brake shoes and the wheels making any necessary adjustments. Complete the brake gear as shown in Fig 4. The brake pull rods (C10) are handed, the spacing of the front two axles being shortest. If in doubt match the pull rods to brake hanger pins. For a BR tender with left hand drive the brake cylinder to cross shaft levers (C13 & C14) should be swapped over to match the change in position of the hand brake. Once fitted, add short lengths of 0.8 mm wire up to the underside of the footplate.

Lastly finish the water scoop by attaching the water scoop to rear cross shaft lamination (C15), the water scoop lever cross-shaft to pull rod (C16) and the water scoop pull rod (C17), soldering the front end of the water scoop pull rod to the wire from C13.

No.	Description	Sheet	No.	Description	Sheet
C1	Chassis frame, Left	2	C10	Brake pull rod (4)	2
C2	Chassis frame, right	2	C11	Brake cross-shaft	2
C3	Front chassis stretcher, 3 widths	2	C12	Front brake pull rod lamination (4)	2
C4	Centre chassis stretcher, 3 widths	2	C13	Left brake cylinder to cross-shaft lever (2)	2
C5	Rear chassis stretcher, 3 widths	2	C14	Right brake cylinder to cross-shaft lever (2)	2
C6	Compensation beam (4)	2	C15	Water scoop to rear cross shaft lamination (2)	2
C7	Brake hanger & shoe lamination, 1st axle (4)	2	C16	Water scoop lever cross-shaft to pull rod	1
C8	Brake hanger & shoe lamination, 2nd axle (4)	2	C17	Water scoop pull rod	2
C9	Brake hanger & shoe lamination, 3rd & 4th axle (8)	2	S18	Washer, wheel side control	2

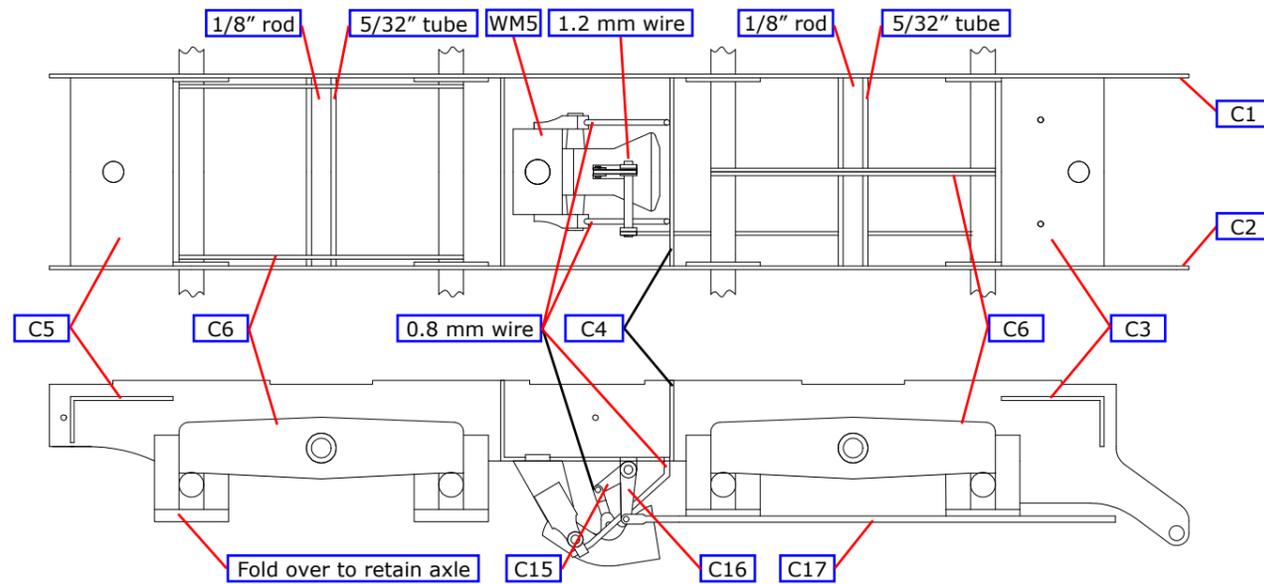


Fig 3. Chassis Construction

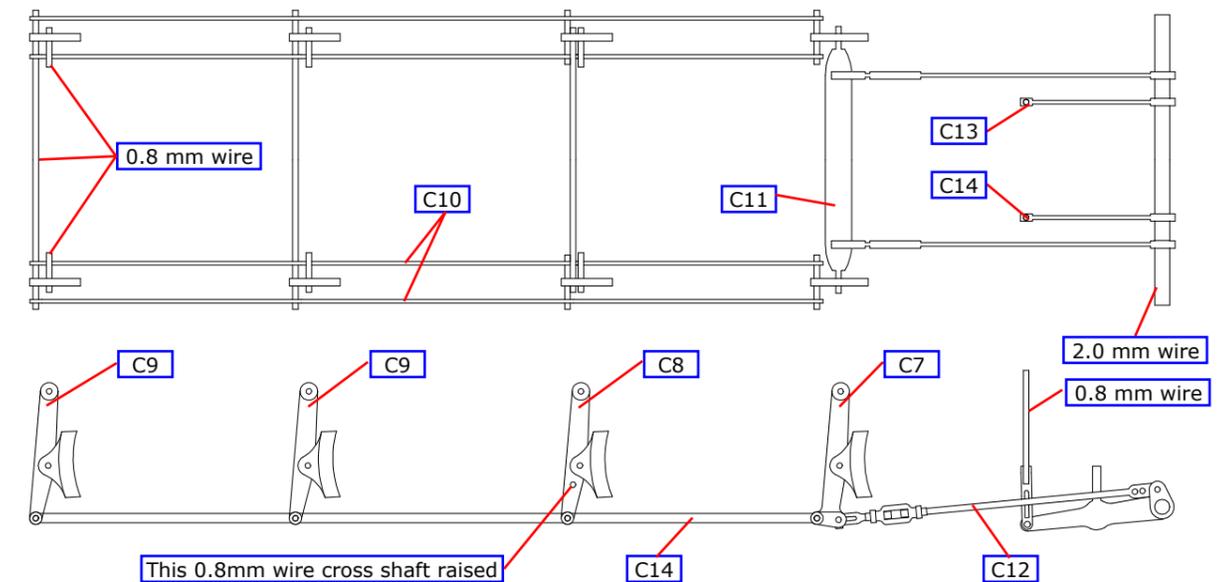
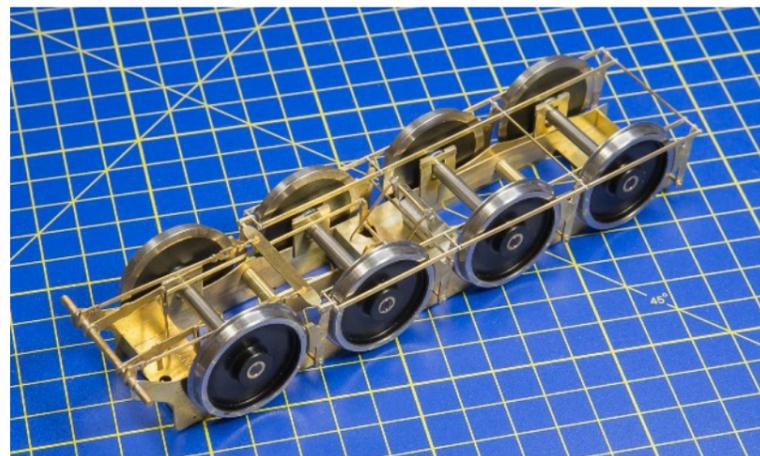


Fig 4. Brake Construction



CONSTRUCTING THE FRAMES / BUFFERBEAM / DRAGBEAM ASSEMBLY

First emboss all the rivets on the frames, bufferbeam & dragbeam assembly (F1) and the frame & footplate brackets overlay (F2) and solder in place the brake hanger pin retainer (F14) as shown below. The embossing process on the overlay does tend to distort the metal making the component grow longer. This can be minimised by doing the embossing carefully and before the component is removed from the main fret.

Fold up and solder together frames, bufferbeam & dragbeam assembly, with all fold lines on the inside. Fold out the upper part of the footplate support brackets. Fold out the lower brackets on (F2) and then attach (F2) to the frames.

Retaining the upper and lower cusps, trial fit the bracket webs (F3), remove the cusp as required to get a good fit and then solder into place.

Build up the drag beam by soldering the dragbeam overlay (F4) to the dragbeam. Add the four drawbar pocket overlay laminations (F5) to the dragbeam as shown below.

The buffer beam is built by first soldering the bufferbeam overlay (F6) onto the bufferbeam. Now add the bufferbeam and frame bracket (F7). Add bufferbeam and frame webs (F8) into the slots and solder in place. Add the buffer overlays (F9) to the front face of the bufferbeam overlay, aligning the holes accurately. Solder together the two coupling hook laminations (F16) and attach to the rear bufferbeam. Assemble the buffers and solder in place. Clearance for the buffer shank is very tight, it is designed to move in the slot in F1. You will probably have to move the buffers inwards by elongating the locating holes. The retaining nuts will also need filing smaller to provide sufficient clearance.

Fold up the appropriate steps (F10 & F11) and solder in position; note that the steps are handed. Solder the coupling plate beneath bufferbeam (F14) in the slots below the rear bufferbeam. Attach the vacuum cylinder (WM4) with the vacuum tank straps (F15).

Attach the axlebox and spring castings, the axleboxes (WM1), the springs (WM2), the spring hanger brackets (WM3). The locating spigots on the axlebox and spring hanger bracket castings will need to be cut off flush with the inside of the frames to clear the

wheels. Before fitting the vacuum stand pipe (BR1) temporarily place the footplate (T1) into position so that the stand pipe aligns with the recess in the footplate. Finally attach the the steam heating pipe (BR2) and the steam heating pipe connector (BR3); the stand pipe and recess are to the left side of the tender looking forward.

Construct the drawbar from a 6BA screw and drawbar washer (F20). Solder the washer on the slotted side of the screw head, take care to keep the screwdriver slot free of solder. Ease out the hole in the drawbar (F19) so that it is a snug fit over the head of the screw. Pass the draw bar through the drag beam slots and use the screw with washer to retain.

No.	Description	Sheet
C18	Drawbar washer	2
F1	Frames, bufferbeam & dragbeam assembly	1
F2	Frame & footplate brackets overlay (2)	1
F3	Frame & footplate bracket webs (16)	1
F4	Dragbeam overlay	2
F5	Drawbar pocket overlay laminations (4)	2
F6	Bufferbeam overlay	1
F7	Bufferbeam & frame bracket (2)	2
F8	Bufferbeam & frame web (4)	1
F9	Buffer overlay (2)	1
F10	Upper steps, Doncaster pattern (4)	1
F11	Lower steps, Doncaster pattern (4)	1
F12	Upper steps, North British pattern (4)	1
F13	Lower steps, North British pattern (4)	1
F14	Coupling plate beneath bufferbeam	1
F15	Vacuum tank strap (2)	1
F16	Brake hanger pin retainer (8)	3
F17	Drawbar	2
F18	Coupling hook lamination (2)	3
F19	Screw coupling	3

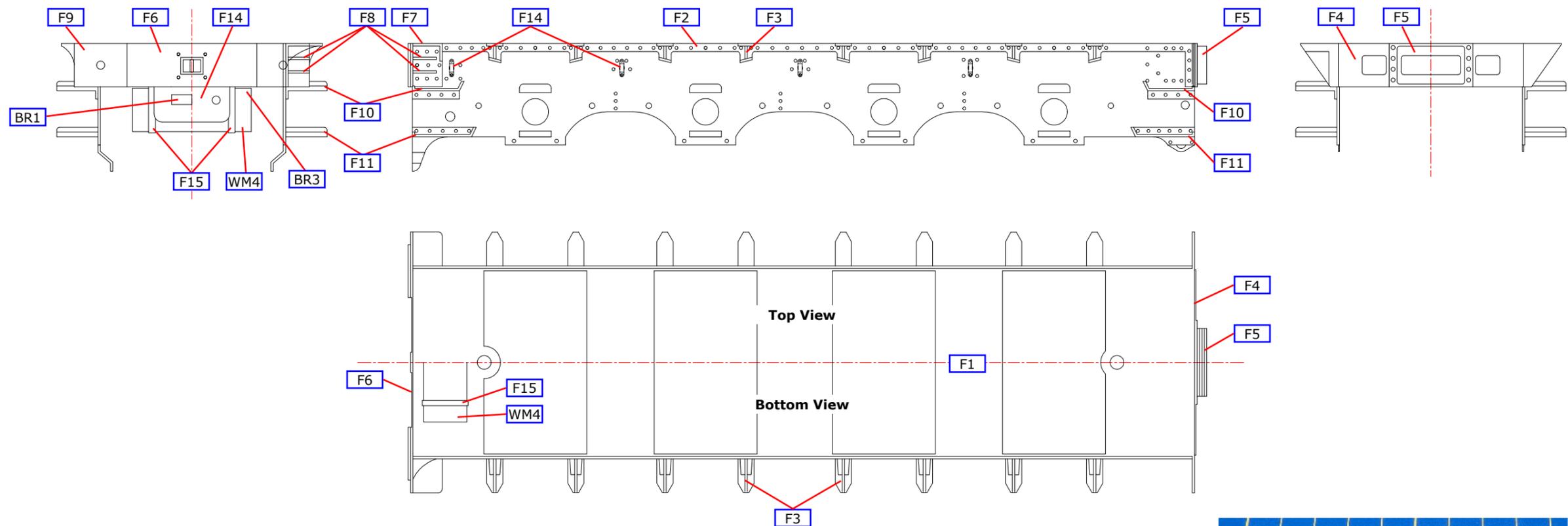
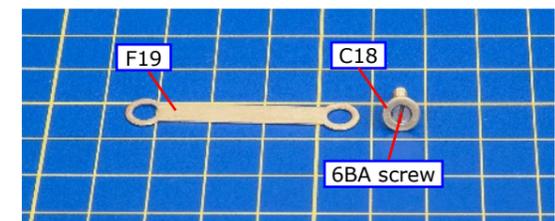
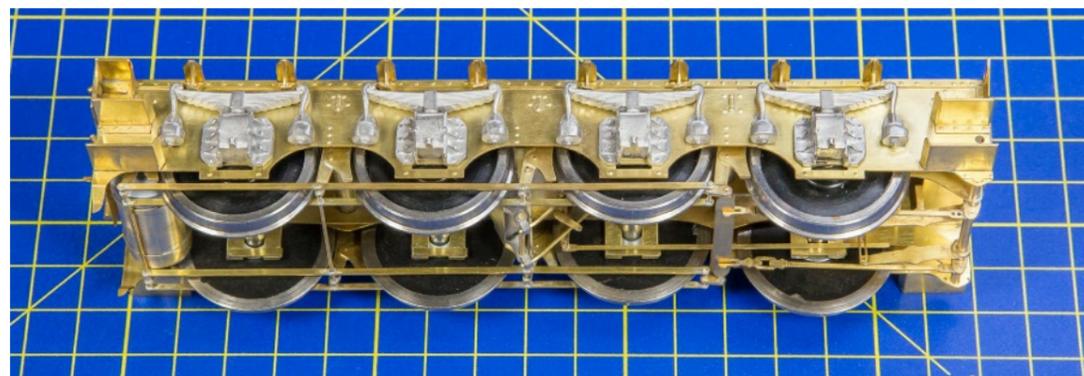


Fig 5. Frame Construction



CONSTRUCTING THE ORIGINAL BODY

Solder 6 BA nuts, for body fixing, over the holes front and rear in the footplate (T1). Drill out the holes, in the tank sides and back (T2), for the rear steps and fifth lamp bracket if appropriate. Form the curved corners in the tanks sides and back over a 7 mm diameter rod for the rear corners and 9 mm diameter rod for the front corners. Solder the tank sides/back in place in the slots in the footplate.

If appropriate, solder the coal rail filler plates (T4 & T5) between the coal rails (T3). The appearance of the coal rails can be improved by rounding the top edge of the upper rail.

Fold the coal plate beneath the coal rails at the rear through approximately 30°. A sharp bend here is essential. To achieve this first make a fold line by scoring with a sharp blade immediately below the lower coal rail. Then grip the coal rails in the vice or bending bars before making the fold. Now form the curve in the rear coal plate over a suitable bar. Form the curved rear corners in the coal rails around a 7 mm diameter rod.

Now solder the coal rails in place. Accurate positioning is achieved by aligning the coal rail brackets on the tank side and back with those on the coal rail. Ensure the top of the brackets aligns with the top of the coal rails.

Carefully shape the etched fingers on the rear corners below the coal rails before filing the gaps between the fingers with solder and then filling to shape; 145° solder works best after first tinning the area with ordinary solder. This should be left until all other soldering is complete to avoid the possibility of a meltdown.

Attach the front edge beading (T6) to the outer front edge of the sides. Appearance is improved if the edges are rounded off. Attach the vertical handrails at the rear using 0.8 mm nickel silver wire. Solder together the tank top (T7) and the tank top overlay (T9) ensuring accurate alignment by inserting the division plate (T9) in the transverse slot. The overlay overlaps the tank top at the front to form a recess into which the coal hopper (T10) fits. Solder the tank top in place on the half etched recess around the tender sides. Solder the division plate in place. Fit the lifting ring base plates (T11) and the lifting ring eyes (T12) to the coal hopper and tank top. Form the rings around a 4 mm rod from 0.5 mm wire.

Now assemble the front plate as shown in Fig 6. The design uses two layers for most of the plates. Bear in mind the following:

Open up the various holes to fit the castings first.

For the fire iron cut-out in the front coal plate first solder the overlay (T19) in place before cutting the plate to shape.

Fit the locker rainstrips (T41) as appropriate before soldering the laminations together.

Emboss all rivets and fold out the brackets for the water valve levers and the shovelling plate sides before soldering the laminations together.

When you have assembled the front plate fit it in place in the slots in the footplate. Soldering need only be done under the footplate and to the coal plates. Fit the raised footplate support (T37) locating it in the slots in the footplate before fitting the appropriate raised footplate (T13).

The remaining parts can now be fitted as shown in the diagrams.

No.	Description	Sheet	No.	Description	Sheet
T1	Footplate	3	T16	Original front plate overlay	3
T2	Tank side and back		T17	Original brake handle cut-out	1
T3	Coal rails		T18	Original brake handle cut-out curved plate	1
T4	Coal rail filler plate (4)	2	T19	Original fire iron cut-out beading	3
T5	Coal rail filler plate, BR (4)	3	T20	Original left fire iron bracket	2
T6	Front edge beading (2)	1	T21	Original right fire iron bracket	
T7	Tank top	3	T22	Original spare lamp iron bracket	3
T8	Tank top overlay	3	T23	Original step	3
T9	Division plate	2	T37	Raised footplate support	3
T10	Coal hopper	1	T38	Lamp bracket lower section (5)	3
T11	Lifting ring base plate (4)	3	T39	Lamp bracket upper section (5)	3
T12	Lifting ring eye (4)	3	T40	Locker hinges (40)	3
T13	Original raised footplate	3	T41	Locker rainstrip (2)	3
T14	Original water scoop lever	1	T42	Water filler catch	3
T15	Original front plate	3			

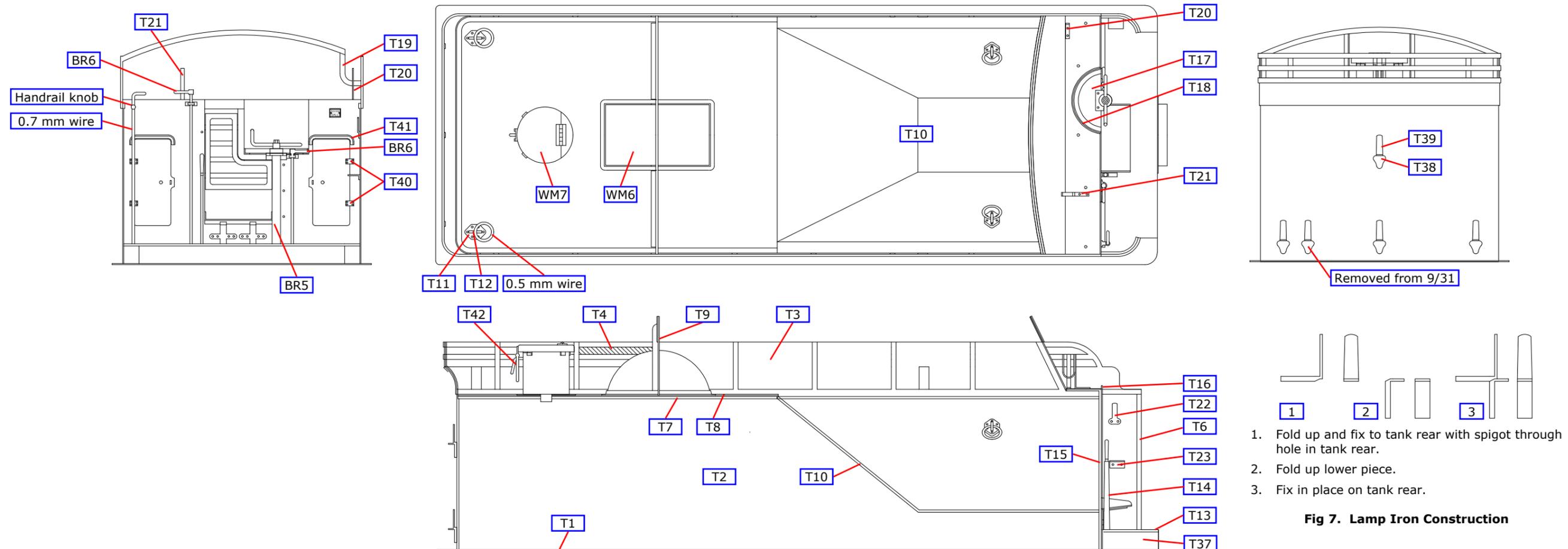


Fig 6. Original Tank Construction

Fig 7. Lamp Iron Construction

CONSTRUCTING THE BR MODIFIED BODY

Solder 6 BA nuts, for body fixing, over the holes front and rear in the footplate (T1). Drill out the holes, in the tank sides and back (T2), for the rear steps and fifth lamp bracket if appropriate. Form the curved corners in the tanks sides and back over a 7 mm diameter rod for the rear corners and 9 mm diameter rod for the front corners. Solder the tank sides/back in place in the slots in the footplate.

If appropriate, solder the coal rail filler plates (T4 & T5) between the coal rails (T3). The appearance of the coal rails can be improved by rounding the top edge of the upper rail.

Fold the coal plate beneath the coal rails at the rear through approximately 30°. A sharp bend here is essential. To achieve this first make a fold line by scoring with a sharp blade immediately below the lower coal rail. Then grip the coal rails in the vice or bending bars before making the fold. Now form the curve in the rear coal plate over a suitable bar. Form the curved rear corners in the coal rails around a 7 mm diameter rod.

Now solder the coal rails in place. Accurate positioning is achieved by aligning the coal rail brackets on the tank side and back with those on the coal rail. Ensure the top of the brackets aligns with the top of the coal rails.

Carefully shape the etched fingers on the rear corners below the coal rails before filling the gaps between the fingers with solder and then filling to shape; 145° solder works best after first tinning the area with ordinary solder. This should be left until all other soldering is complete to avoid the possibility of a meltdown.

Attach the front edge beading (T6) to the front outside edge of the sides. Appearance is improved if the edges are rounded off. Attach the vertical handrails at the rear using 0.8 mm nickel silver wire. Solder together the tank top (T7) and the tank top overlay (T9) ensuring accurate alignment by inserting the division plate (T9) in the transverse slot. The overlay overlaps the tank top at the front to form a recess into which the coal hopper (T10) fits. Solder the tank top in place on the half etched recess around the tender sides. Solder the division plate in place.

For the BR modified front end remove the sections indicated by the half etched lines on the coal space hopper (T10) so that it will fit the front plate. Bend up the coal space hopper, making the long top bends first. Fit the lifting ring base plates (T11) and the lifting ring eyes (T12) to the coal hopper and tank top. Form the rings around a 4 mm rod from 0.5 mm wire. Solder the coal hopper in place with the upper edges on the half etched recess around the tender sides.

Now assemble the appropriate front plate as shown in Fig 8. The BR front plate is made in two parts (upper and lower) before soldering the two parts together. The design uses two layers for most of the plates. Bear in mind the following:

Open up the various holes to fit the castings first.

Fit the locker rainstrips (T41), BR coal door angle (T32) add the BR locker rainstrip (T33) as appropriate before soldering the laminations together.

Emboss all rivets and fold out the brackets for the water valve levers and the shovelling plate sides before soldering the laminations together.

When you have assembled the front plate fit it in place in the slots in the footplate. Soldering need only be done under the footplate and to the coal plates. Fit the raised footplate support (T37) locating it in the slots in the footplate before fitting the BR raised footplate (T24).

The remaining parts can now be fitted as shown in the diagrams.

No.	Description	Sheet	No.	Description	Sheet
T1	Footplate	3	T28	BR Front plate upper	1
T2	Tank side and back		T29	BR Front plate upper	2
T3	Coal rails		T30	BR Vertically hinged flap	1
T4	Coal rail filler plate (4)	2	T31	BR Horizontally hinged flap	1
T5	Coal rail filler plate, BR (4)	3	T32	BR Coal door angle	3
T6	Front edge beading (2)	1	T33	BR Locker rainstrip	3
T7	Tank top	3	T34	BR Water gauge bracket	3
T8	Tank top overlay	3	T35	BR Division plate angle	3
T9	Division plate	2	T36	BR tank rear footsteps (4)	1
T10	Coal hopper	1	T37	Raised footplate support	3
T11	Lifting ring base plate (4)	3	T38	Lamp bracket lower section (5)	3
T12	Lifting ring eye (4)	3	T39	Lamp bracket upper section (5)	3
T24	BR Raised footplate	3	T40	Locker hinges (4)	3
T25	BR top internal beading (2)	1	T41	Locker rainstrip (2)	3
T26	BR Front plate lower	3	T42	Water filler catch	3
T27	BR Front plate lower overlay	3			

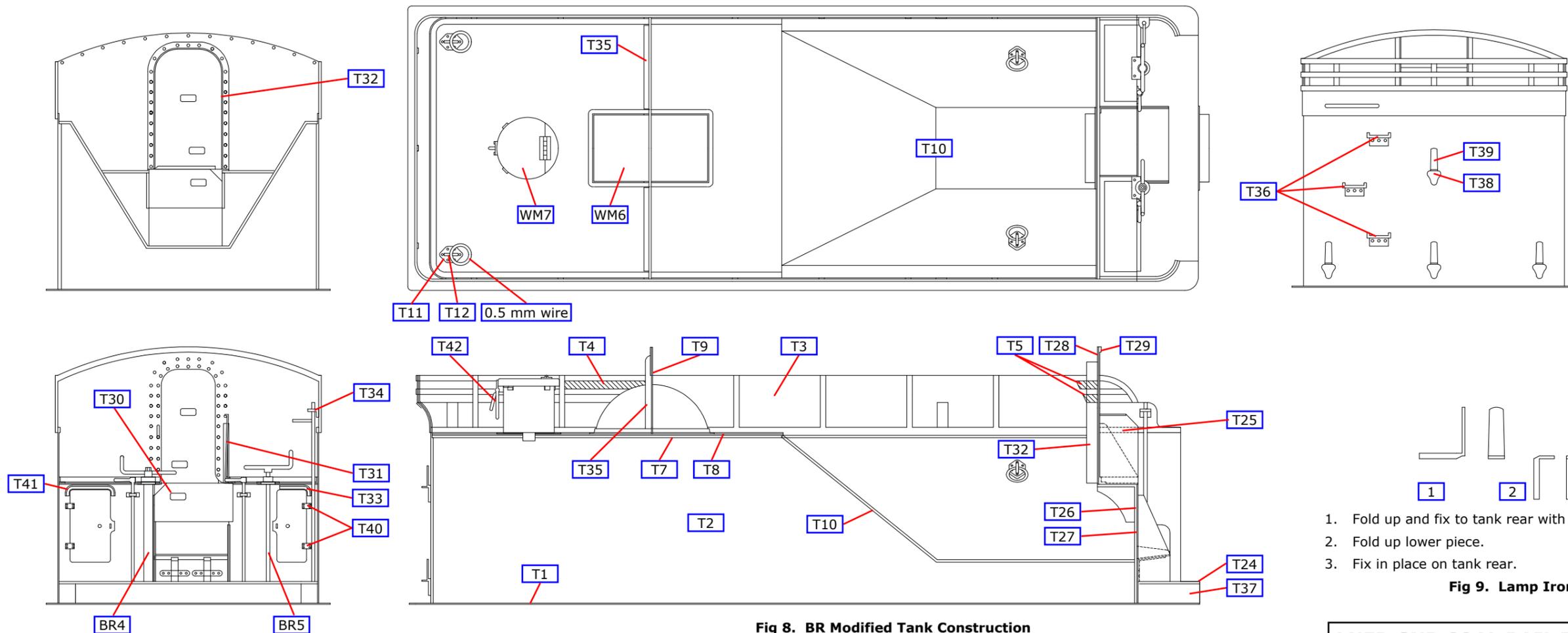
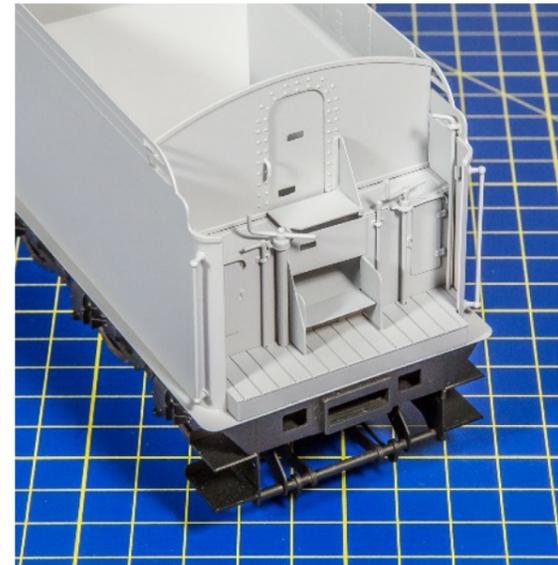
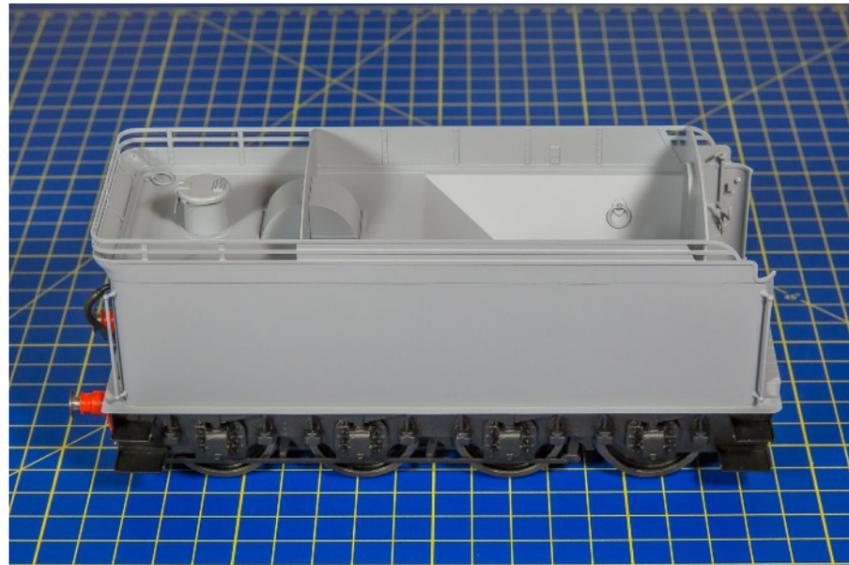
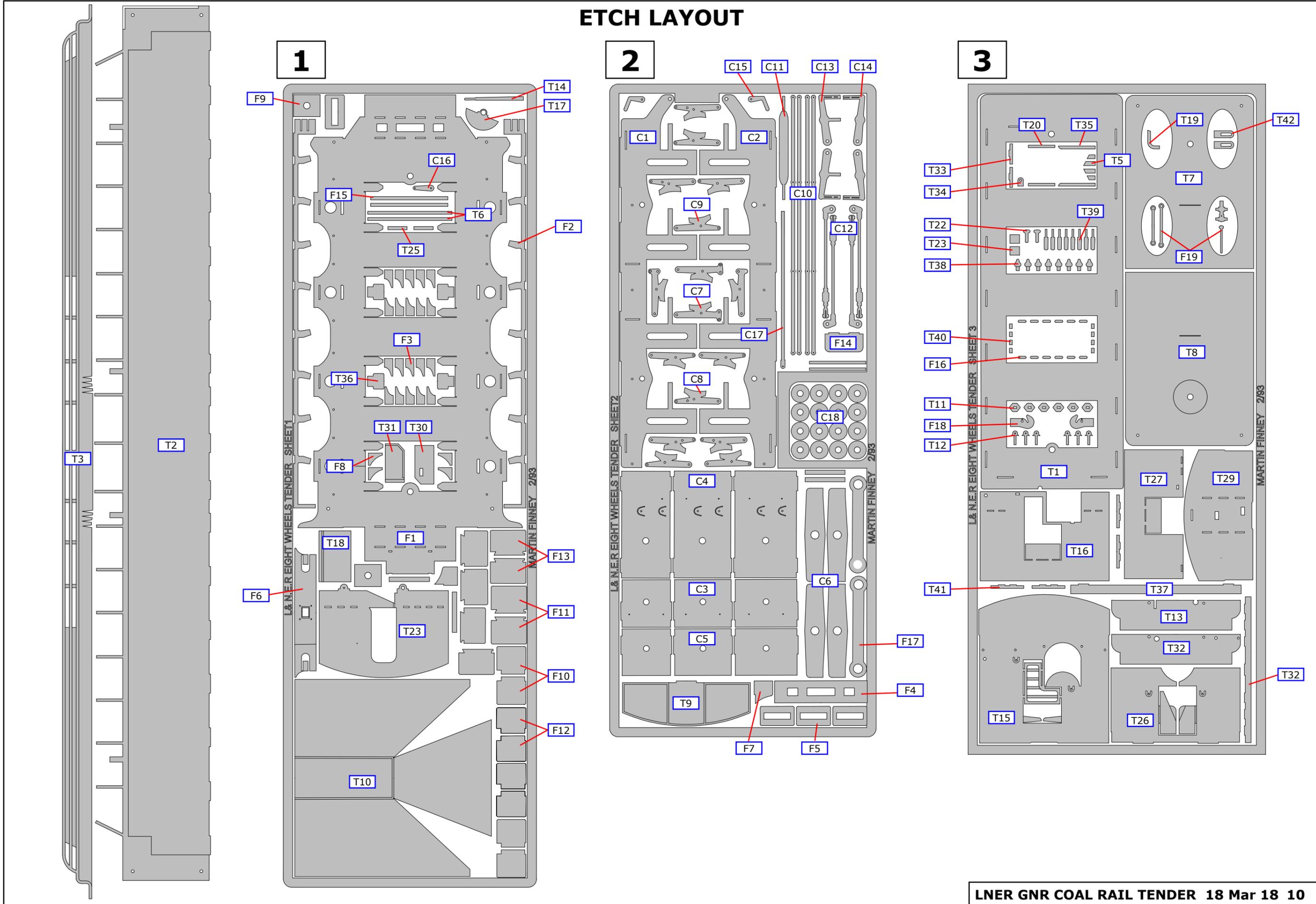


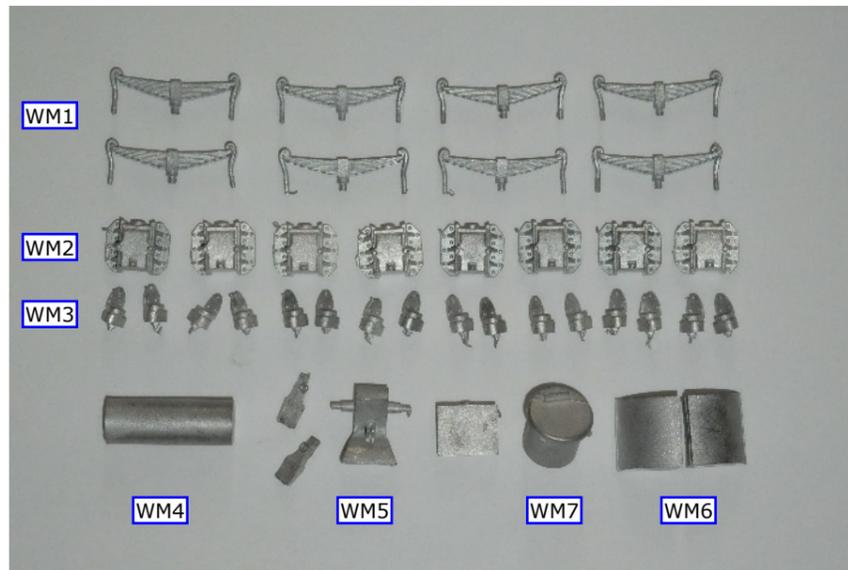
Fig 8. BR Modified Tank Construction

Fig 9. Lamp Iron Construction



ETCH LAYOUT





WHITEMETAL CASTINGS

- WM1 Axlebox (8)
- WM2 Spring (8)
- WM3 Spring hanger bracket (16)
- WM4 Vacuum tank (3)
- WM5 Water scoop 4 parts
- WM6 Scoop dome (2)
- WM7 Water filler



BRASS CASTINGS

- BR1 Vacuum pipe
- BR2 Steam heating pipe
- BR3 Steam heating pipe connector
- BR4 Brake column
- BR5 Scoop column
- BR6 Water valve handle (2)

OTHER COMPONENTS

- 6 BA screw (2)
- 6 BA nut (2)
- 1/8" brass wire for compensation beam pivots
- 5/32" diameter brass tube for compensation beams
- Handrail knob (10)
- Brass wire - 0.5 mm
- Brass wire - 0.7 mm
- Brass wire - 0.8 mm
- Brass wire - 1.6 mm
- Brass wire - 2 mm
- Buffer, nut & spring (2)
- Rubber tubing for vacuum, steam and flexible pipes between loco and tender