

Fig 1. A4 Streamlined Non-Corridor Tender With a High Front

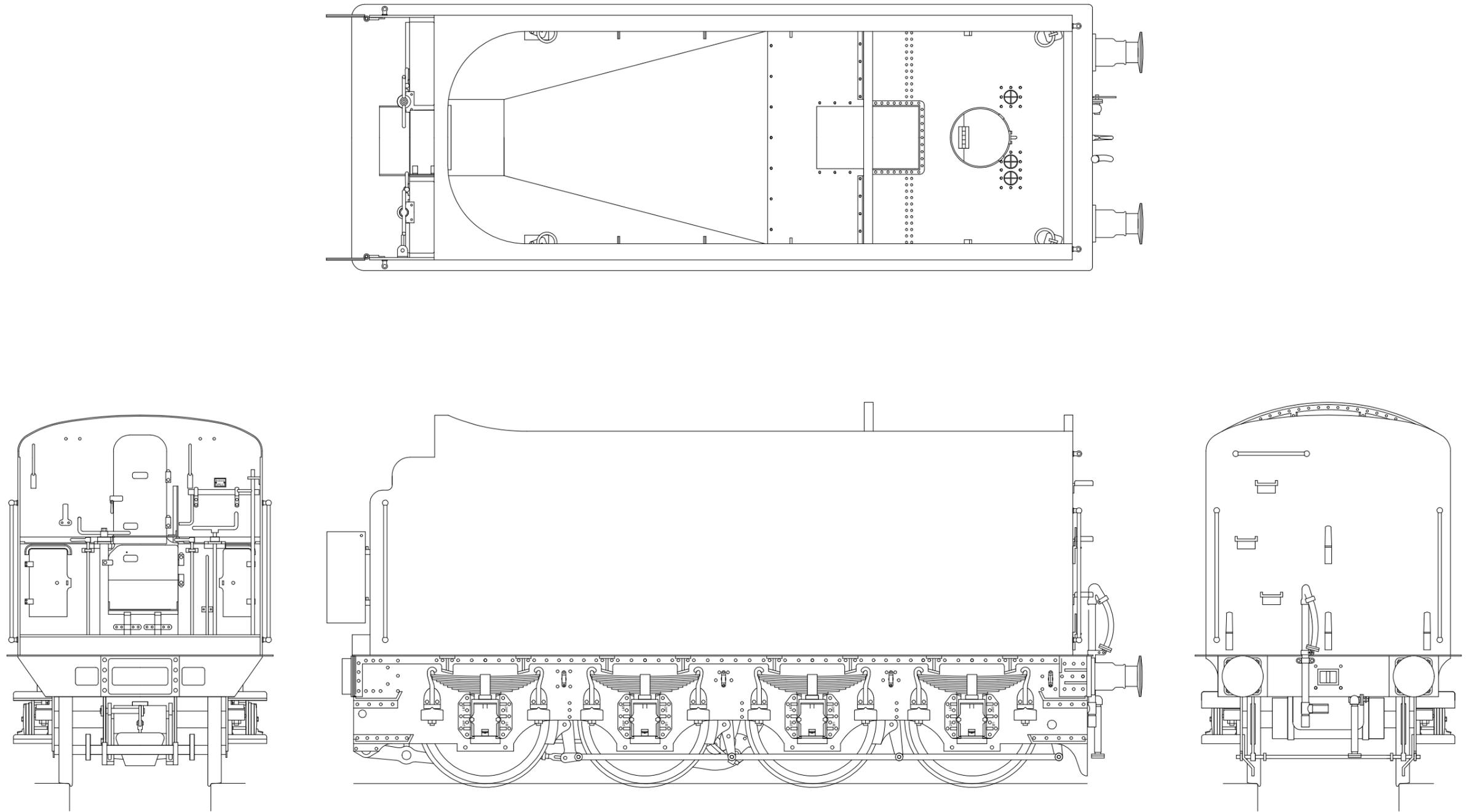


Fig 2. A3 Streamlined Non-Corridor Tender With a Low Front

## 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 (C1 & C2) and centre spacer (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 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 (C18). 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.

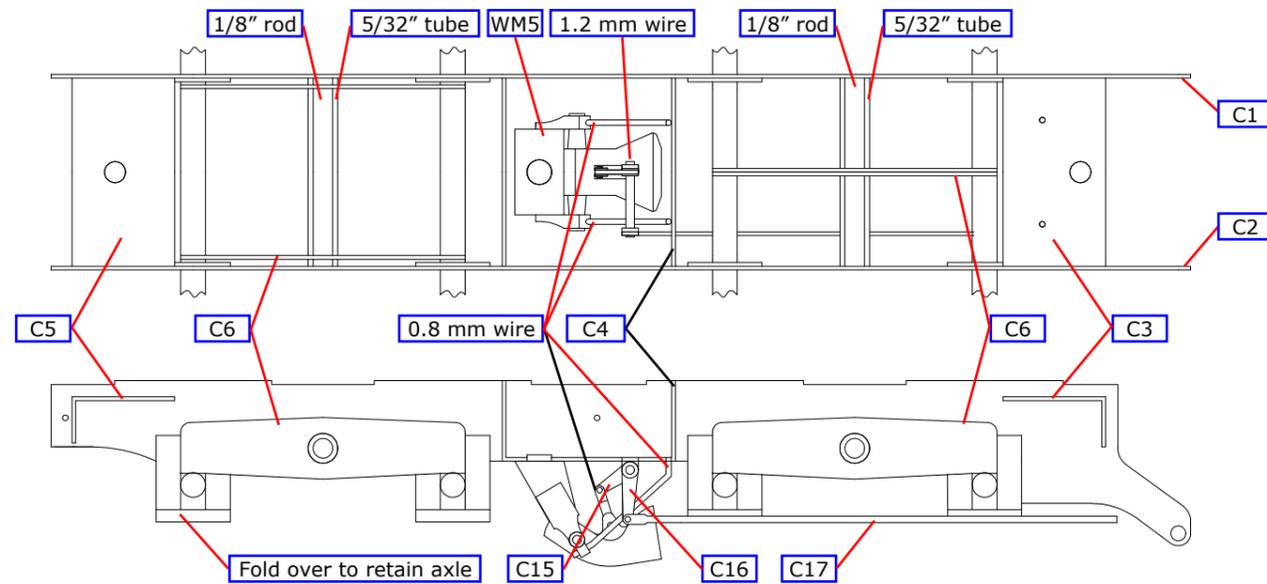


Fig 3. Chassis Construction

Fold down the brackets for the rear scoop cross shaft on the centre spacer and assemble the water scoop (WM5) as shown in Fig 3. 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.

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	3	C10	Brake pull rod (4)	2
C2	Chassis frame, right	3	C11	Brake cross-shaft	2
C3	Front chassis stretcher, 3 widths	1	C12	Front brake pull rod lamination (4)	2
C4	Centre chassis stretcher, 3 widths	1	C13	Left brake cylinder to cross-shaft lever (2)	2
C5	Rear chassis stretcher, 3 widths	1	C14	Right brake cylinder to cross-shaft lever (2)	2
C6	Compensation beam - (4)	1	C15	Water scoop to rear cross shaft lamination (2)	1
C7	Brake hanger & shoe lamination, 1st axle (4)	3	C16	Water scoop lever cross-shaft to pull rod	1
C8	Brake hanger & shoe lamination, 2nd axle (4)	3	C17	Water scoop pull rod	2
C9	Brake hanger & shoe lamination, 3rd & 4th axle (8)	3	C18	Washer, wheel side control	1

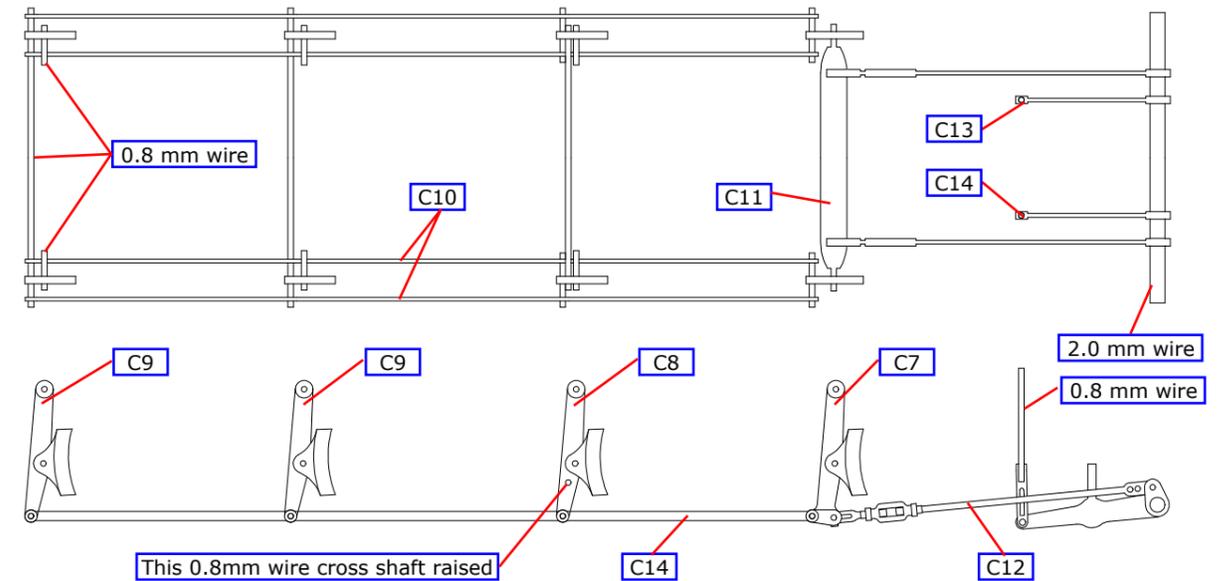


Fig 4. Brake Construction



## 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 or if 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 steps (F10 & F11) and solder in position; note that the steps are handed. Solder the coupling plate beneath bufferbeam (F12) in the slots below the rear bufferbeam. Attach the vacuum cylinder (WM4) with the vacuum tank straps (F13).

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 (F15) from a 6BA screw and a wheel side control washer (C18). 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 (F15) 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	No.	Description	Sheet
F1	Frames, bufferbeam & dragbeam assembly	2	F10	Upper steps (4)	1 & 3
F2	Frame & footplate brackets overlay (2)	3	F11	Lower steps (4)	1 & 2
F3	Frame & footplate bracket webs (16)	2	F12	Coupling plate beneath bufferbeam	1
F4	Dragbeam overlay	1	F13	Vacuum tank strap (2)	1
F5	Drawbar pocket overlay laminations (4)	1	F14	Brake hanger pin retainer (8)	3
F6	Bufferbeam overlay	1	F15	Drawbar	1
F7	Bufferbeam & frame bracket (2)	2	F16	Coupling hook lamination (2)	2
F8	Bufferbeam & frame web (4)	2	F17	Screw coupling	1
F9	Bufferbeam overlay (2)	2			

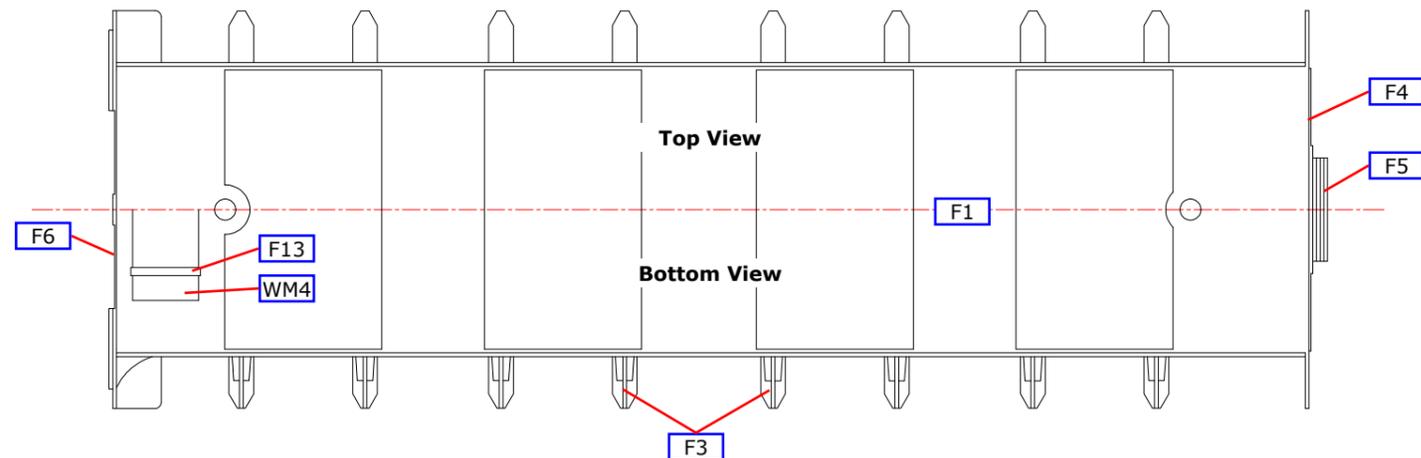
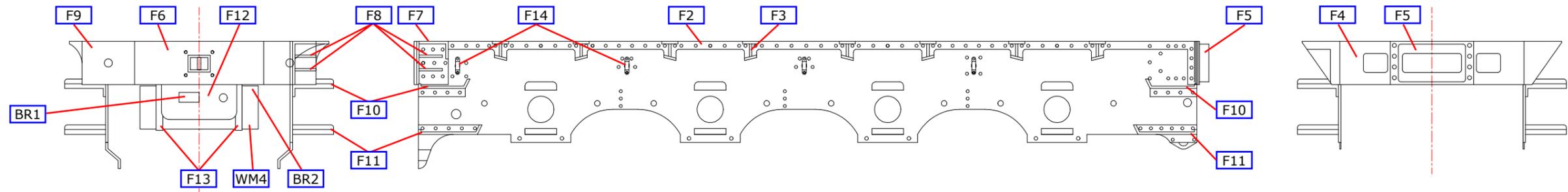
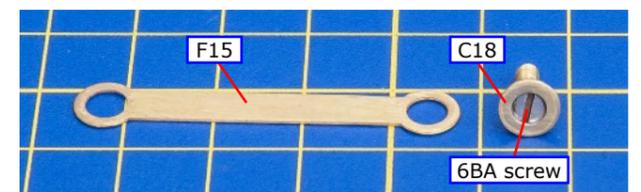


Fig 5. Frame Construction



## CONSTRUCTING THE BODY

Drill the appropriate upper front handrail holes 1.2 mm diameter as shown in Fig 6. The centres can be determined by one of these ways:

- Measuring from the lower hole - the dimensions are in millimetres.
- Using Fig 6 as a template.
- Using the cab side from the loco kit as a template.

Form the curve at the top of the sides (T2 & T3) over a 1/4" diameter rod. Check that the curve in the side fits over the following parts: the tank back (T7), the coping plate strengthening ribs (T19, T20, T21, & T22) and the upper front plate inner overlay (P6). Solder the cab door hinges (T4) and coping plate strengthening rib 1 (T19) in place on the tank sides as shown in Fig 7; the raised rib surface of the coping plate faces forward. Form the spare lamp brackets (P12) into the stepped shape and attach one to the inside of the RH tender side; the other will fit to the front end upper bulkhead later. Attach the vertical handrails at the front using 0.8 mm wire.

Emboss the rivets on the division plate front and rear laminations (T26 & T27), the tank top overlay (T15), the coal hopper (T17).

Assemble the tank back by soldering together the tank back (T7) with the tank back inner overlay (T8) and the tank back ribs (T9) as shown in Fig 7 & 8. Fold up the rear steps (T11) and solder in place on the outside of the tank back. Fold up the lamp bracket upper and lower sections (T12 & T13) and solder in place on the tank back as shown in Fig 7. Fit the rear handrails from 0.8 mm brass wire.

Solder the tank top (T14) and the tank top overlay (T15) ensuring accurate alignment. Fit the lifting ring eyes (T23) to the tank top. Make the lifting rings from 0.5 mm wire around a rod or drill 4 mm in diameter.

Solder the division plate front and rear laminations (T26 & T27) back to back to form the division plate. Add the division plate ribs (T28) as shown. Solder the division plate into the slots in the tank top ensuring that it is at right angles to the tank top.

Fit the water filler catch (T16) to the water filler casting (WM7), form a short length of 0.7 mm wire into an inverted L and fit through the water filler catch into the casting to form the catch. Add the filler assembly to the tank top. The front half of the scoop dome (WM6) will need to have a recess cut into the mating face so that the top edges meet perfectly with the division plate. Failure to do this will result in the sloping coal plate not fitting correctly. See Fig 9 For details of the modification.

Open up the holes for the vent pipes in the coal hopper (T17), then fold the coal hopper up, making the top bends first before soldering the hopper edges together. Fit the lifting rings (T23, T24 & T25) to the coal space hopper. Add the vent pipe flanges (T18) and open the holes up to 1.6 mm.

Solder 6 BA nuts, for body fixing, over the holes front and rear in the footplate (T1). The flat part of the footplate is the bottom.

Assemble the tender body in the following order, with most of the soldering being done from inside. First fix one side and the back into the slots in the footplate. Solder the tank top in place in the half etched slots in the tank side and rear. Now attach the second side before soldering the hopper in place.

Emboss the rivets onto the sloping coal plate (T30) and solder in place; the recess for the scoop dome may need a gentle trim to enable the top of the sloping plate to fit into the horizontal slots on the division plate. Add the coping plate strengthening ribs (T19, T20, T21, T22) as shown below. The raised rib sides face forward.

Add the coping plate strengthening ribs (T20, T21 & T22) in place as shown in Fig 7. Add the rear plate (T10) and division plate (T29) angles as shown in fig 7 & 8.

No.	Description	Sheet	No.	Description	Sheet
P12	Spare lamp bracket (2)	3	T16	Water filler catch	2
T1	Footplate	1	T17	Coal hopper	1
T2	Tank side - left	3	T18	Vent pipe flange (2)	1
T3	Tank side - right	3	T19	Coping plate strengthening rib 1 (2)	1
T4	Cab door hinge (4)	1	T20	Coping plate strengthening rib 2&3 (4)	2
T5	Cab door-(2)	1	T21	Coping plate strengthening rib 4 (2)	1
T6	Water gauge bracket	3	T22	Coping plate strengthening rib 5 (2)	1
T7	Tank back	3	T23	Lifting ring eye - (4)	1
T8	Tank back inner overlay	3	T24	Front lifting ring base plate (2)	1
T9	Tank back ribs (2)	2	T25	Front lifting ring bracket (2)	1
T10	Tank back angle	2	T26	Division plate front lamination	3
T11	Rear step (3)	2	T27	Division plate rear lamination	3
T12	Lamp bracket lower section (4)	1	T28	Division plate ribs (2)	2
T13	Lamp bracket upper section (4)	1	T29	Division plate angle	2
T14	Tank top	3	T30	Sloping coal plate	3
T15	Tank top overlay	3			

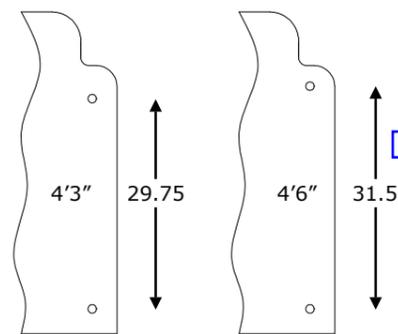


Fig 6. Handrail Holes

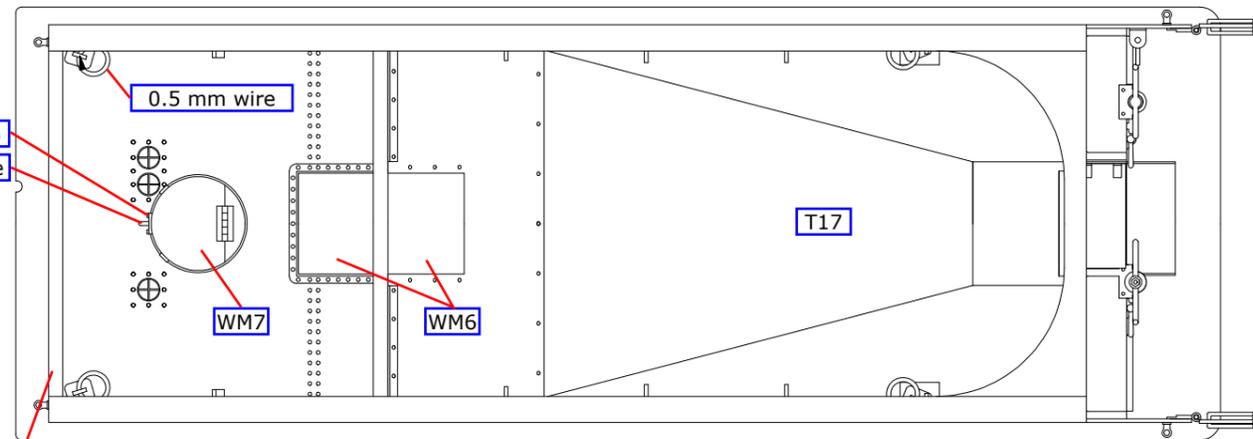


Fig 7. Tank Construction

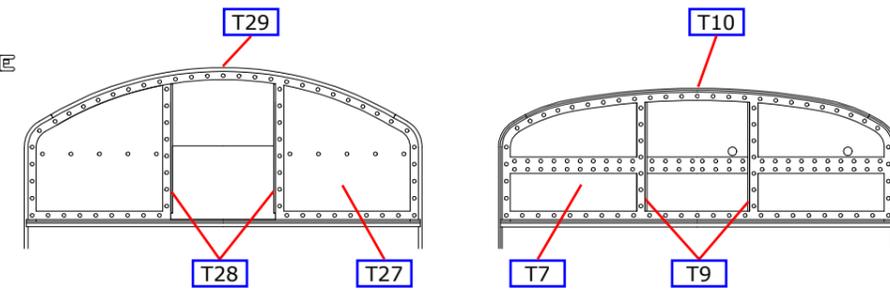


Fig 8. Rear Plate and Division Plate

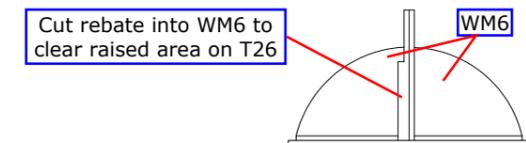
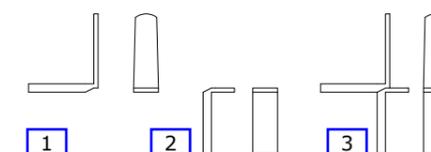
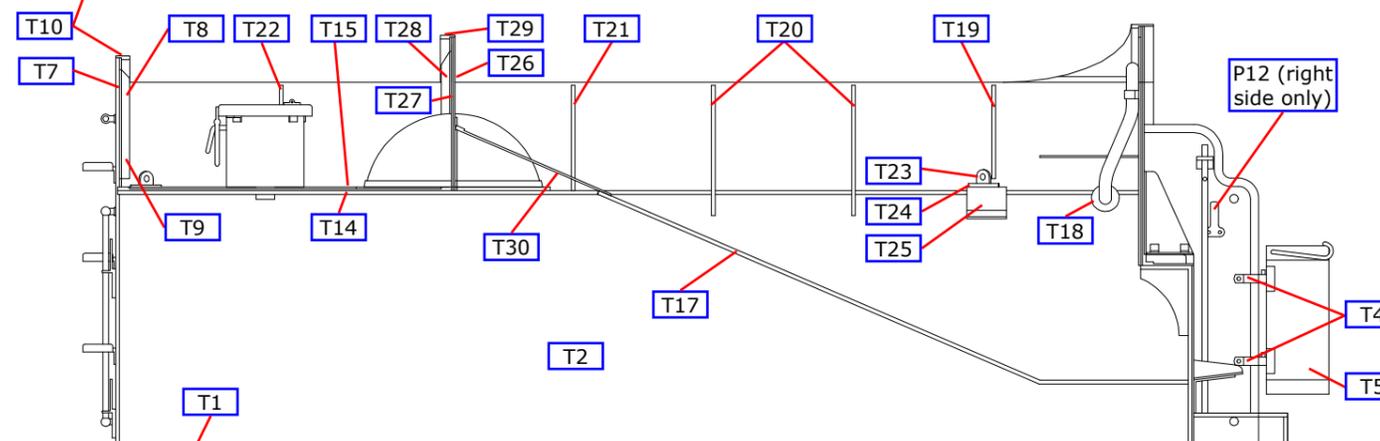
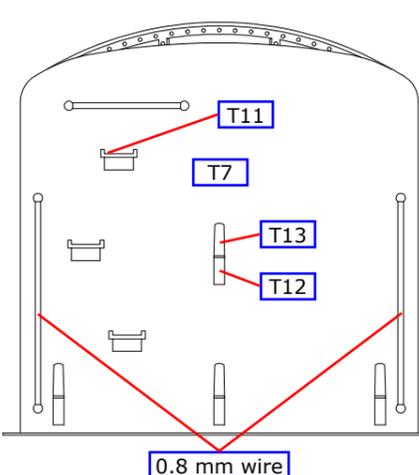


Fig 9. Scoop Dome Modification



1. Fold up and fix to tank rear with spigot through hole in tank rear.
2. Fold up lower piece.
3. Fix in place on tank rear.

Fig 10. Lamp Iron Construction

## CONSTRUCTING THE ORIGINAL HIGH FRONT

The front plate is made in two separate assemblies (upper and lower) before soldering the two assemblies together. First open up the various holes to fit the castings. Emboss all rivets and fold out the brackets for the water valve handles, the shovelling plate and the shovelling plate sides.

**Lower Front Plate.** On the lower front plate inner lamination (P1) emboss all rivets and fold out the brackets for the water valve handles, the shovelling plate and the shovelling plate sides. Fold down the two top shelves into the tank area and then fold down the arched webs so that they are either side of the shovel plate opening. On the lower front plate outer lamination (P2) solder the locker hinges (P3) to both of the doors noting that the rivets are towards the outside. The locker rain strips left and right (P4 & P5) are easier to fit straight and to then gently form the turn downs using the raised etch on the lower front as a guide; solder into place and bend.

**Upper Front Plate.** On the upper front plate inner lamination (P6) add the ribs between side and front plate (P9) by soldering from the rear and ensuring that they are at 90° to the lamination. Add the coal door angle strip (P10) again soldering from the rear. On the upper front plate outer lamination (P7) fold up the shelf tops, the angled bracket on the left hand shelf and the small ledge on the right shelf. Add the A4 smoke box doors handle brackets (P8). Add the spare lamp iron (P12) as shown below. Bend some 0.7 mm wire to form the fire iron brackets and solder in place as shown below. Fit the vertically hinged flap (P11).

Assemble the upper plates by placing together and soldering around the edge. Repeat for the lower plates. Now, join the upper and lower plates together at the shelf, ensure all is square and solder together.

The complete front plate can be fitted to the tender body by placing it in the slots in the footplate and then fitting in ensuring that the internal webs are not damaged. Solder under the footplate and to the sides at the top.

Fit the raised footplate support (P16) into the recess. Add the the raised footplate (P15).

Form the two vent pipes from 1.6 m copper wire and fit into the holes in the coal space sides. Retain the vent pipes with the vent pipe brackets (P13).

Add the front fairing (P14).

Cut a 42 mm length of 0.8 mm wire to make the water gauge, Fold the gauge bracket (T6) and attach to the wire 2 mm from the top. Place the wire into the hole in the floor and solder the bracket to the tank side ensuring that the wire is vertical.

Cut two 27 mm lengths of 0.7 mm wire and attach the water valve handles (BR6) to the ends. Insert the wire into the brackets and then into the floor and adjust the height so that the handles just clear the shelf; solder in place. Form a length of 0.7 mm

wire into an inverted L, trim and fit into the floor to form the water scoop gauge rod set between the left water valve rod and the water scoop column.

Fit the handbrake column casting (BR4). Fit the water scoop column casting (BR5) through the bracket and into the floor and solder in place.

If required, fit the A4 smoke box door crank casting (BR7) to the brackets on the upper front plate.

Form the hinges on the cab doors (T5) around a 0.6 mm drill shank. The raised areas are to the inside of the tender and the hinges are best formed by rolling the tabs outboard. Fit the doors to the tender with the small hole for the door clips at the top and retain by carefully folding over the tips of the over long pins on the hinges. The door clip can be formed of 0.5 mm wire and fitted to the doors.

No.	Description	Sheet	No.	Description	Sheet
P1	Lower front plate inner lamination	3	P10	Coal door angle strip	3
P2	Lower front plate outer lamination	3	P11	Vertically hinged flap	1
P3	Locker hinges (4)	3	P12	Spare lamp bracket (2)	3
P4	Locker rainstrip left	1	P13	Vent pipe bracket (2)	1
P5	Locker rainstrip right	1	P14	Front fairing	2
P6	Upper front plate inner lamination	3	P15	Raised footplate	1
P7	Upper front plate outer lamination	3	P16	Raised footplate support	3
P8	A4 smoke box doors handle bracket (2)	1	T5	Cab door-(2)	1
P9	Rib between side and front plate (2)	2	T6	Water gauge bracket	3

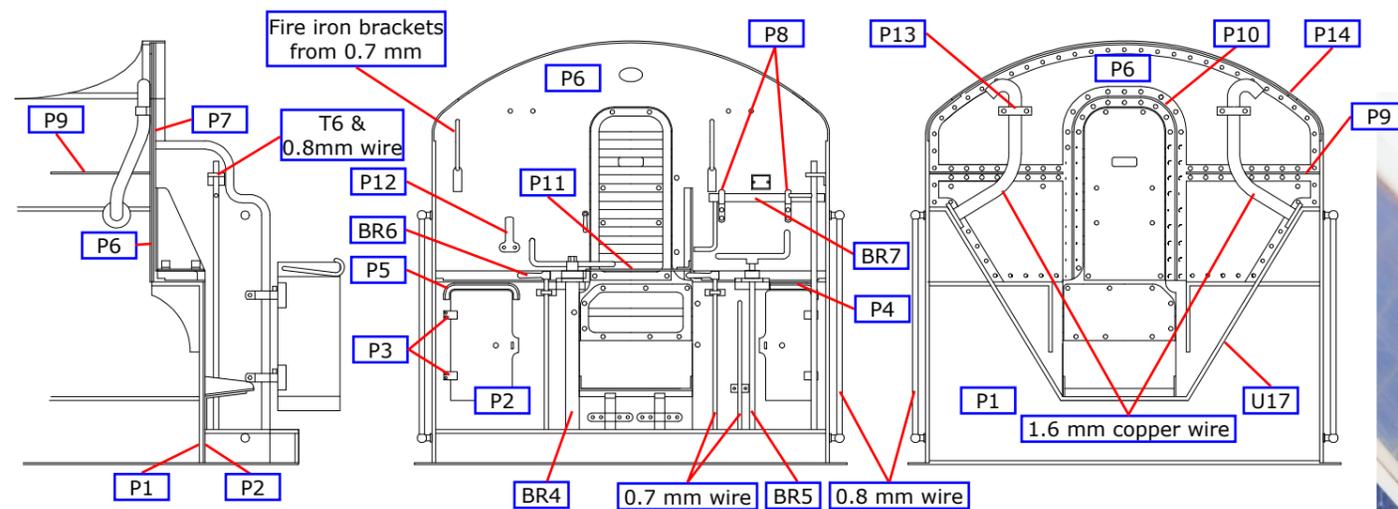
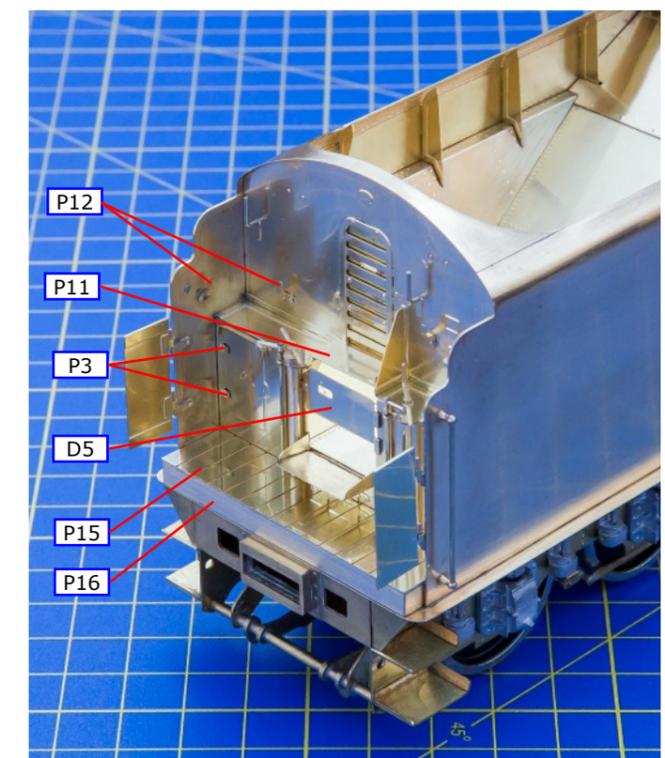
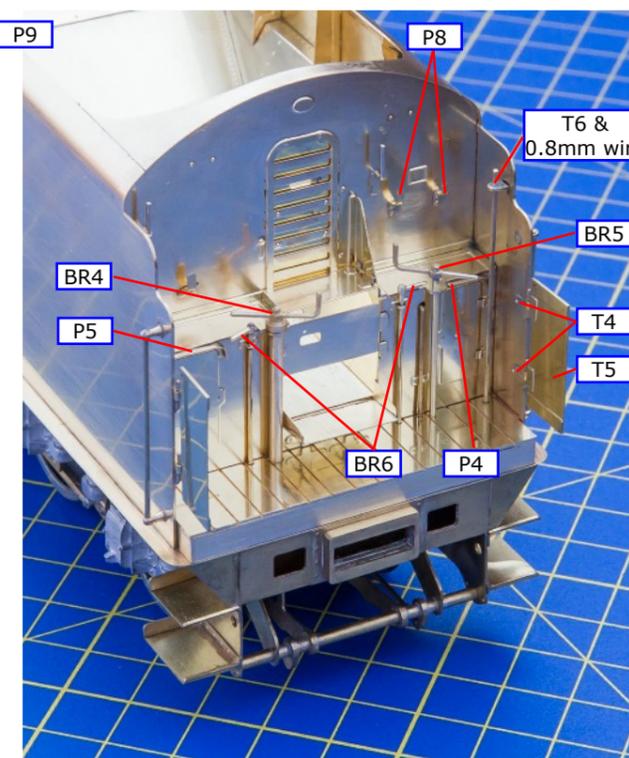
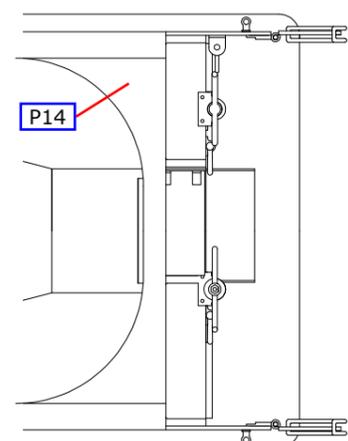


Fig 11. High Front Construction



## CONSTRUCTING THE LATER LOW FRONT

The front plate is made in two separate assemblies (upper and lower) before soldering the two assemblies together. First open up the various holes to fit the castings.

**Lower Front Plate.** If modelling a low front A3 tender on the lower front plate inner lamination (P1) remove the rear of the slatted shovelling plate door. Emboss all rivets and fold out the brackets for the water valve handles, the shovelling plate and the shovelling plate sides. Fold down the two top shelves into the tank area and then fold down the arched webs so that they are either side of the shovel plate opening.

If modelling a low front A3 tender on the lower front plate outer lamination (P2) remove the front of the slatted shovelling plate door. Solder the locker hinges (P3) to the doors noting that the rivets are towards the outside. The locker rain strips left and right (P4 & P5) are easier to fit straight and to then gently form the turn downs using the raised etch on the lower front as a guide; solder into place and bend.

**Upper Front Plate.** On the upper front plate inner lamination (D2) add the ribs (P9) between side and front plate by soldering from the rear and ensuring that they are at 90° to the lamination. Add the coal door angle strip (P10) again soldering from the rear. On the upper front plate outer lamination (D3) fold up the shelf tops, the angled bracket on the left hand shelf and the small ledge on the right shelf. Solder the coal door (D4) in place. Solder the shovelling plate door (D5) in place where the slatted door was. Add the spare lamp iron (P12) as shown below. Bend some 0.7 mm wire to form the fire iron brackets and solder in place as shown below. Fit the vertically hinged flap (P11).

Assemble the upper plates by placing together and soldering around the edge. Repeat for the lower plates. Now, join the upper and lower plates together at the shelf, ensure all is square and solder together.

The complete front plate can be fitted to the tender body by placing it in the slots in the footplate and then fitting in ensuring that the internal webs are not damaged. Solder under the footplate and to the sides at the top.

Fit the raised footplate support (P16) into the recess. Add the the raised footplate (P15).

Form the two vent pipes from 1.6 m copper wire and fit into the holes in the coal space sides. Retain the vent pipes with the vent pipe brackets (P13).

Add the front fairing (D1).

Cut a 42 mm length of 0.8 mm wire to make the water gauge, Fold the gauge bracket (T6) and attach to the wire 2 mm from the top. Place the wire into the hole in the floor and solder the bracket to the tank side ensuring that the wire is vertical.

Cut two 27 mm lengths of 0.7 mm wire and attach the water valve handles (BR6) to the ends. Insert the wire into the brackets and then into the floor and adjust the height so that the handles just clear the shelf; solder in place. Form a length of 0.7 mm wire into an inverted L, trim and fit into the floor to form the water scoop gauge rod set between the left water valve rod and the water scoop column.

Fit the handbrake column casting (BR4). Fit the water scoop column casting (BR5) through the bracket and into the floor and solder in place.

Form the hinges on the cab doors (T5) around a 0.6 mm drill shank. The raised areas are to the inside of the tender and the hinges are best formed by rolling the tabs outboard. Fit the doors to the tender with the small hole for the door clips at the top and retain by carefully folding over the tips of the over long pins on the hinges. The door clip can be formed of 0.5 mm wire and fitted to the doors.

No.	Description	Sheet
D1	Front fairing	1 P9 Rib between side and front plate (2) 2
D2	Upper front plate inner overlay	3 P10 Coal door angle strip 3
D3	Upper front plate outer overlay	3 P11 Vertically hinged flap 1
D4	Coal door	3 P12 Spare lamp bracket (2) 3
D5	Shovelling plate door	3 P13 Vent pipe bracket (2) 1
P1	Lower front plate inner lamination	3 P14 Front fairing 2
P2	Lower front plate outer lamination	3 P15 Raised footplate 1
P3	Locker hinges (4)	3 P16 Raised footplate support 3
P4	Locker rainstrip left	1 T5 Cab door-(2) 1
P5	Locker rainstrip right	1 T6 Water gauge bracket 3

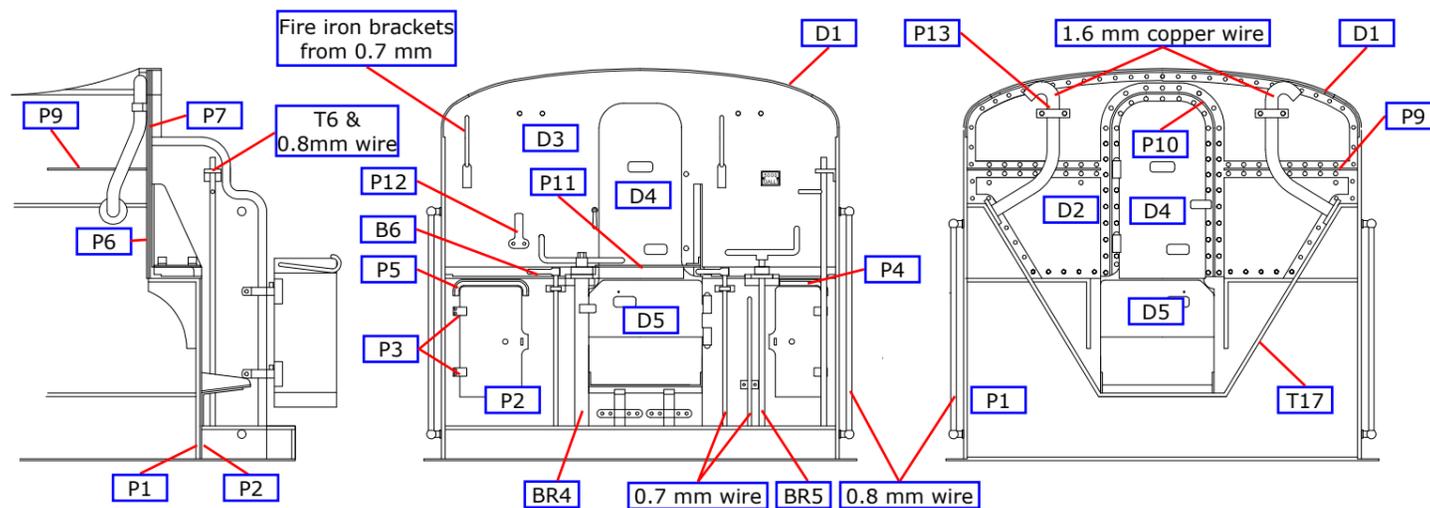
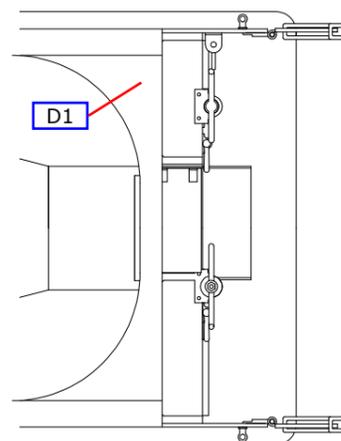
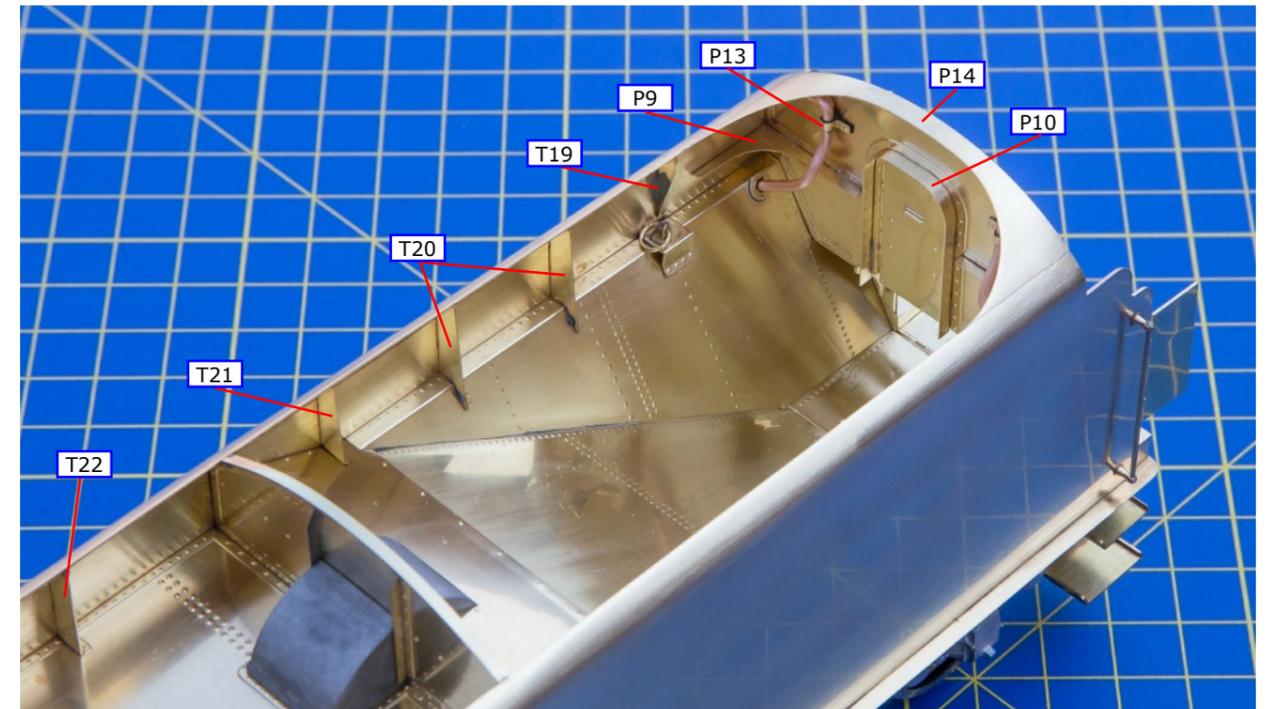
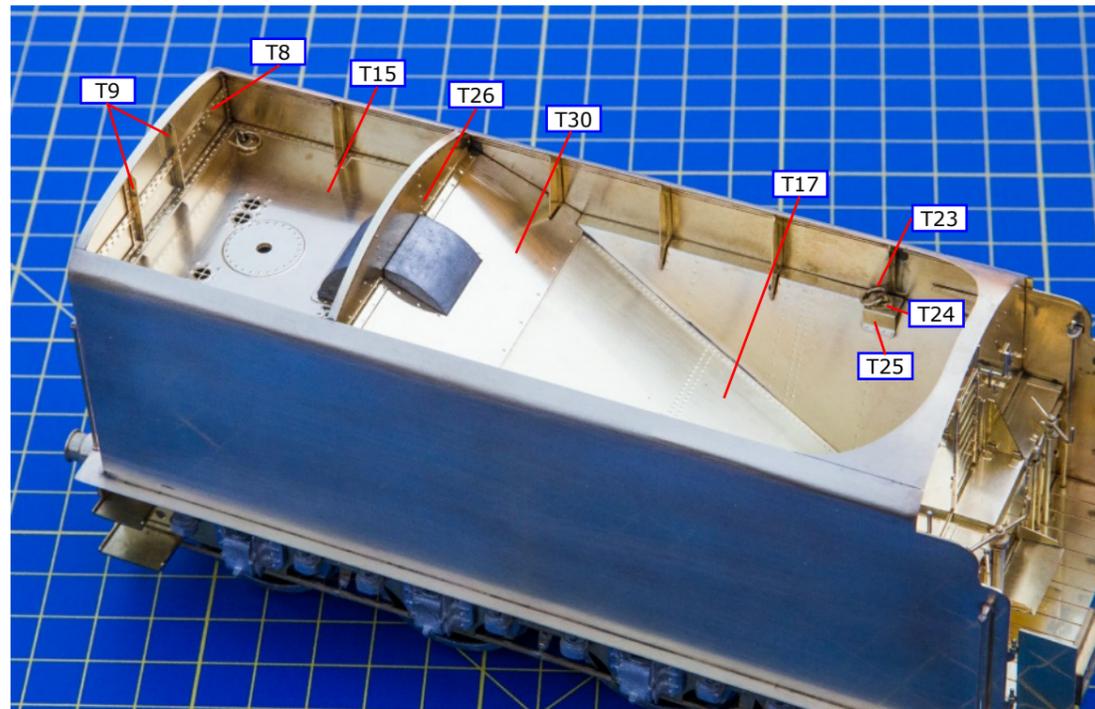
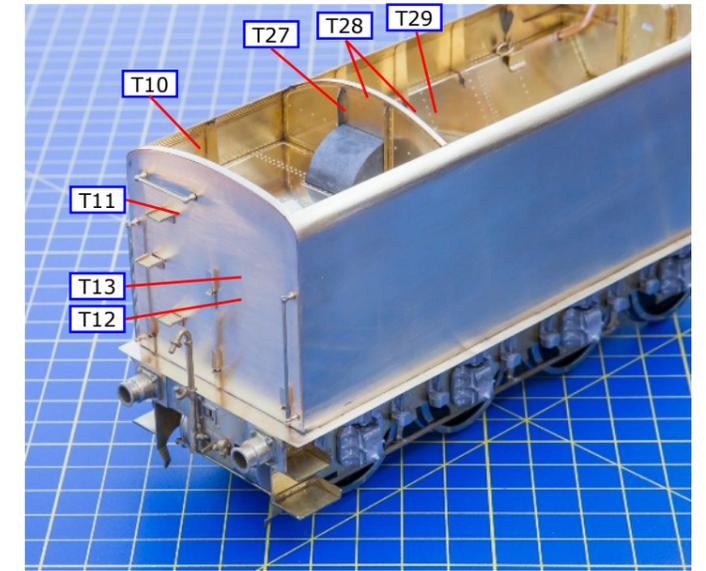
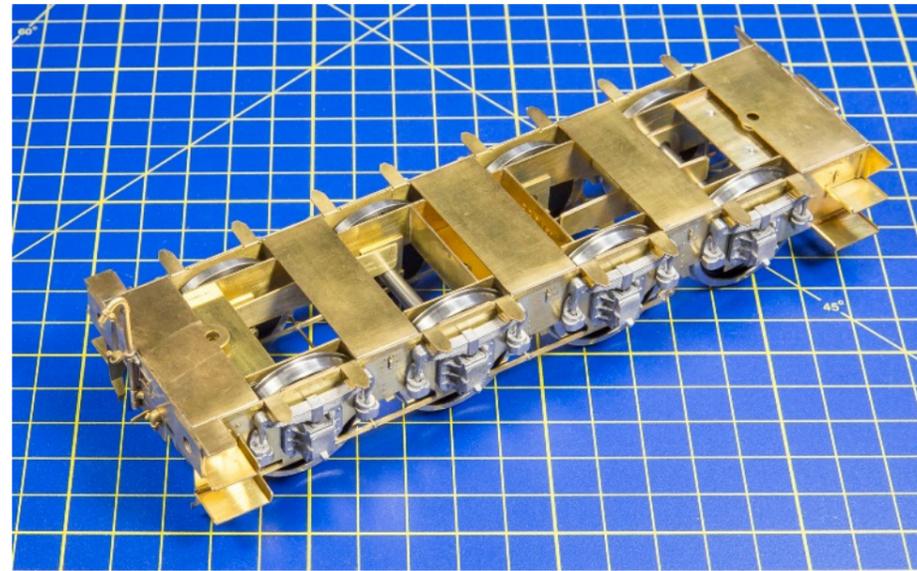


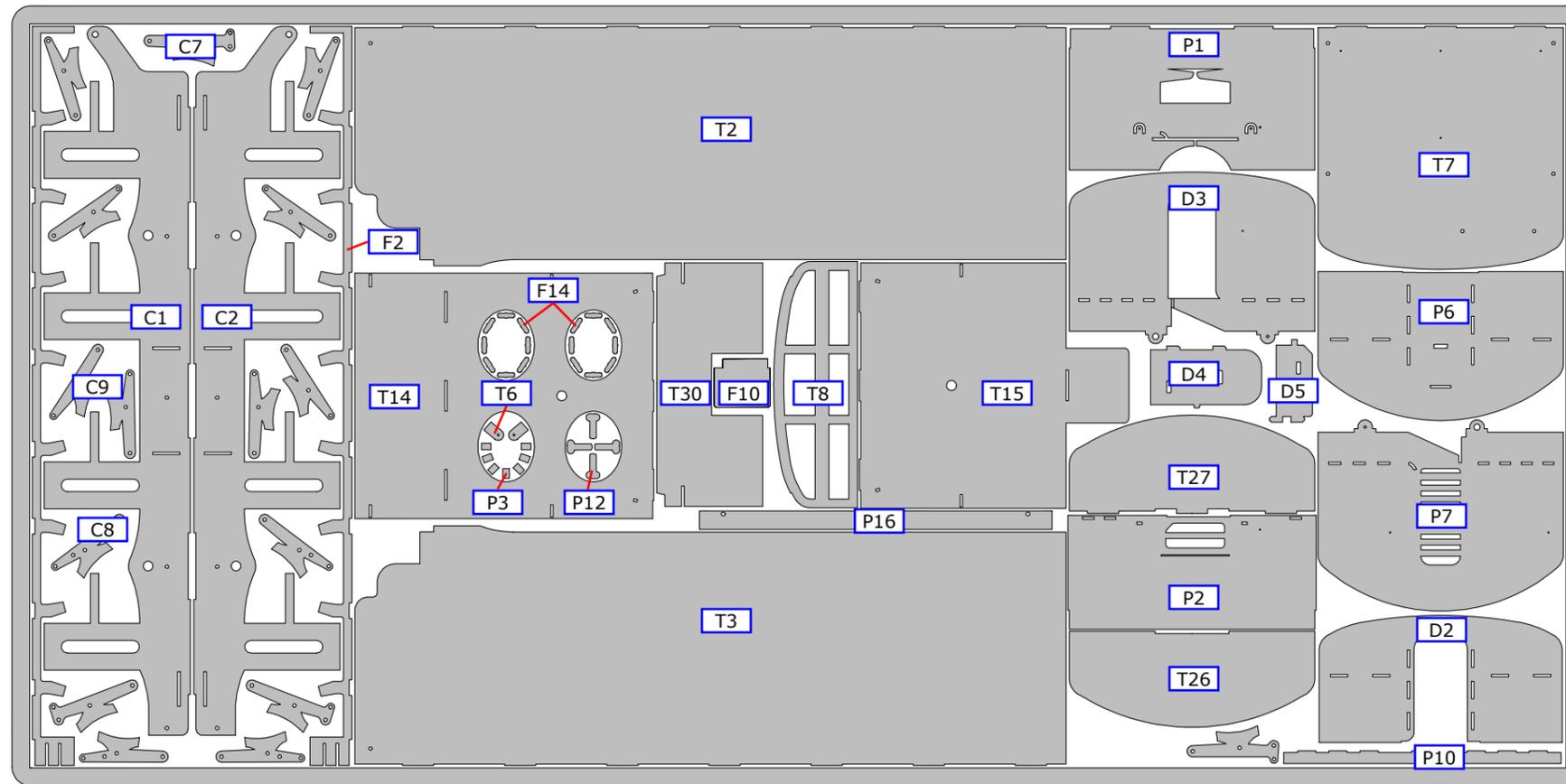
Fig 12. Low Front Construction



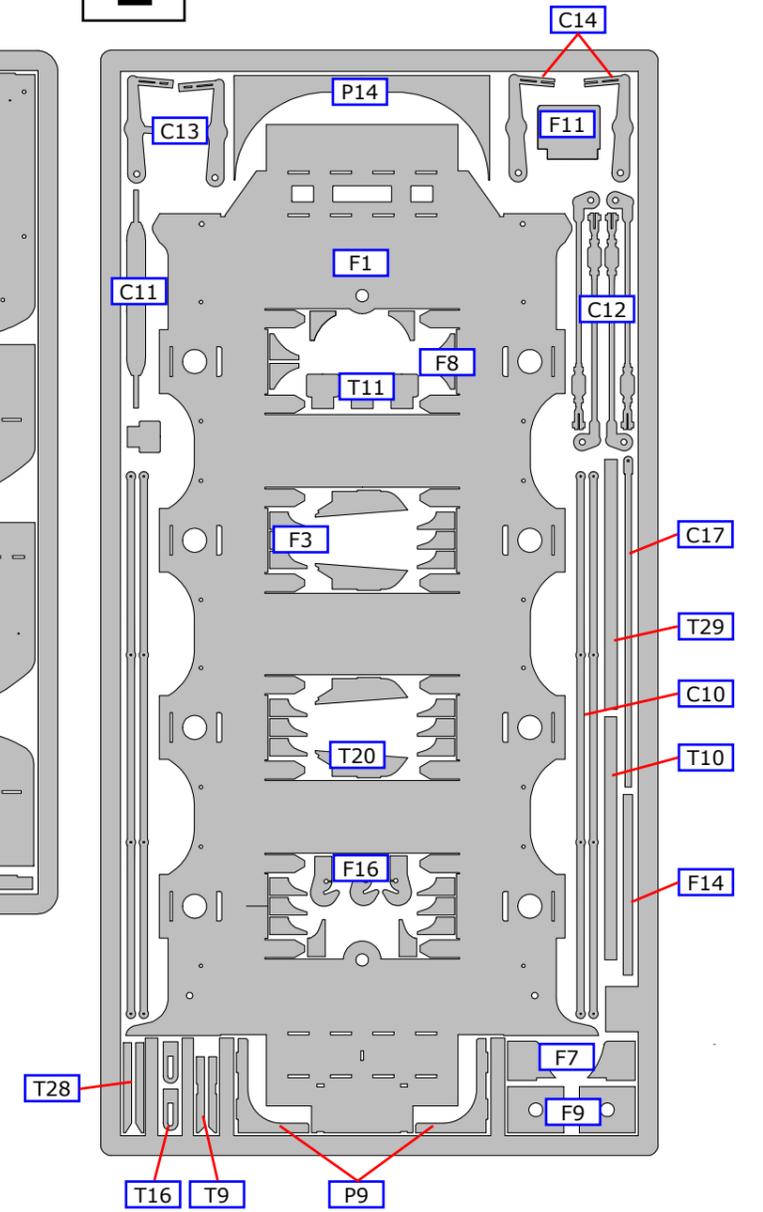


## ETCH LAYOUT

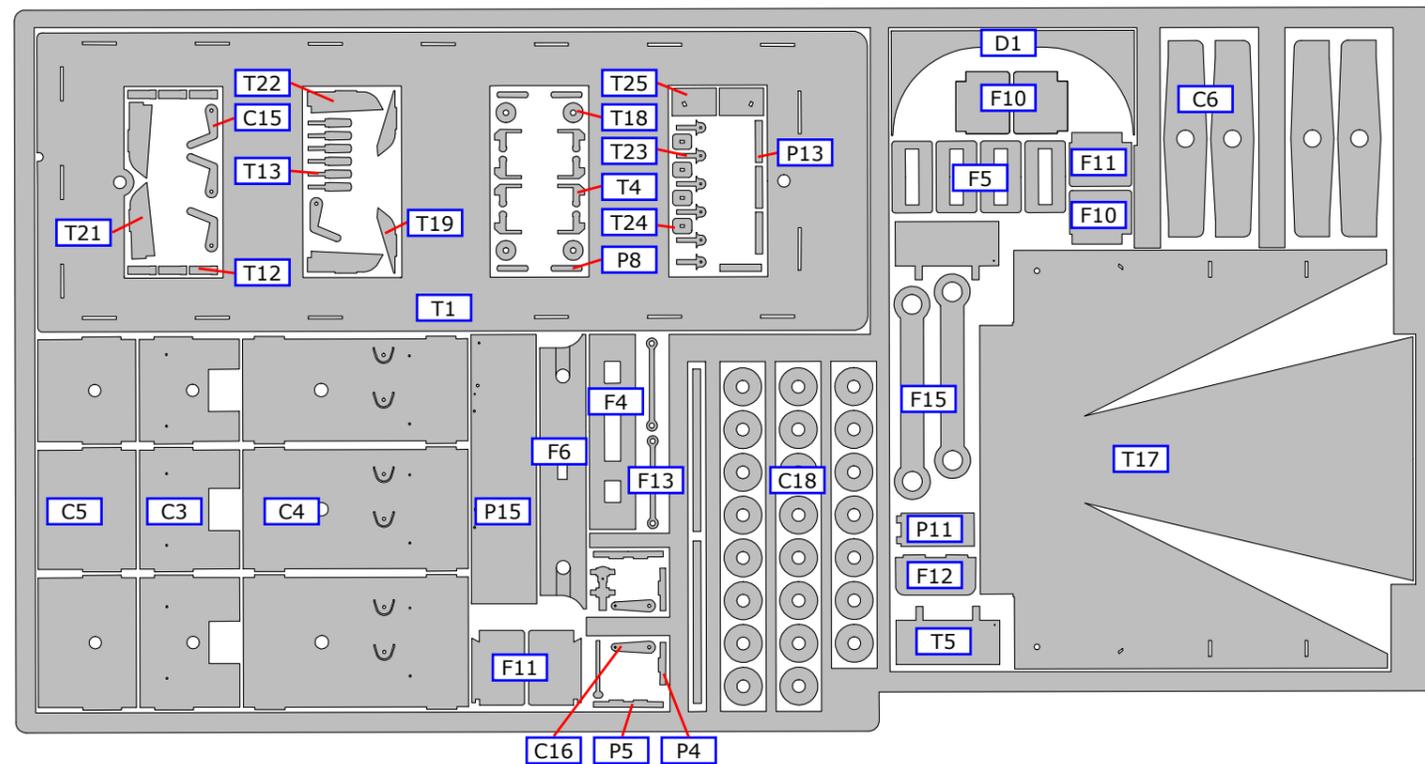
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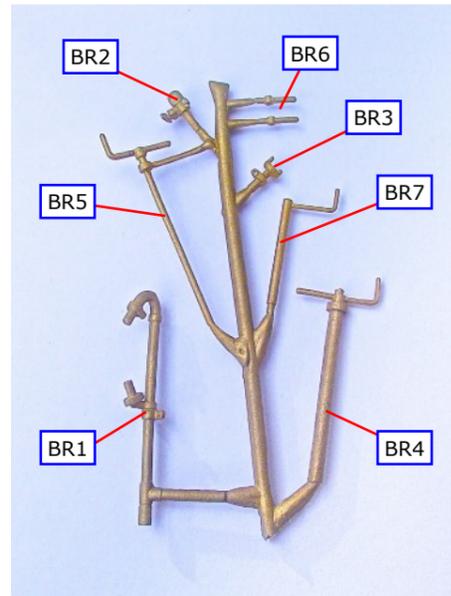


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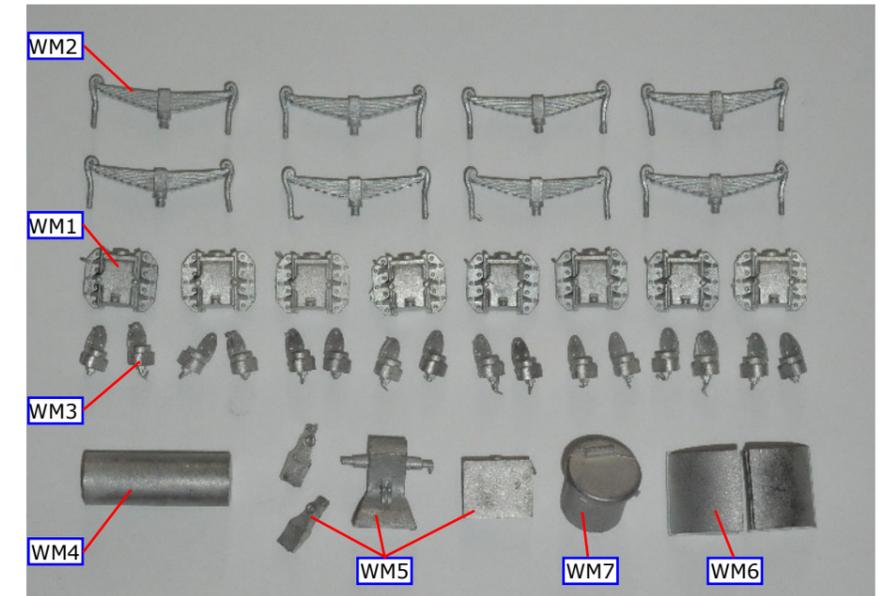
## BRASS CASTINGS

- BR1 Vacuum pipe
- BR2 Steam heating pipe
- BR3 Steam heating pipe connector
- BR4 Brake column
- BR5 Scoop column
- BR6 Water valve handle (2)
- BR7 A4 smokebox doors crank



## 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



## 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 - 1.6mm
- Brass wire - 2 mm
- Buffer, nut & spring (2)
- Rubber tubing for vacuum, steam and flexible pipes between loco and tender