

TYPE A TENDER

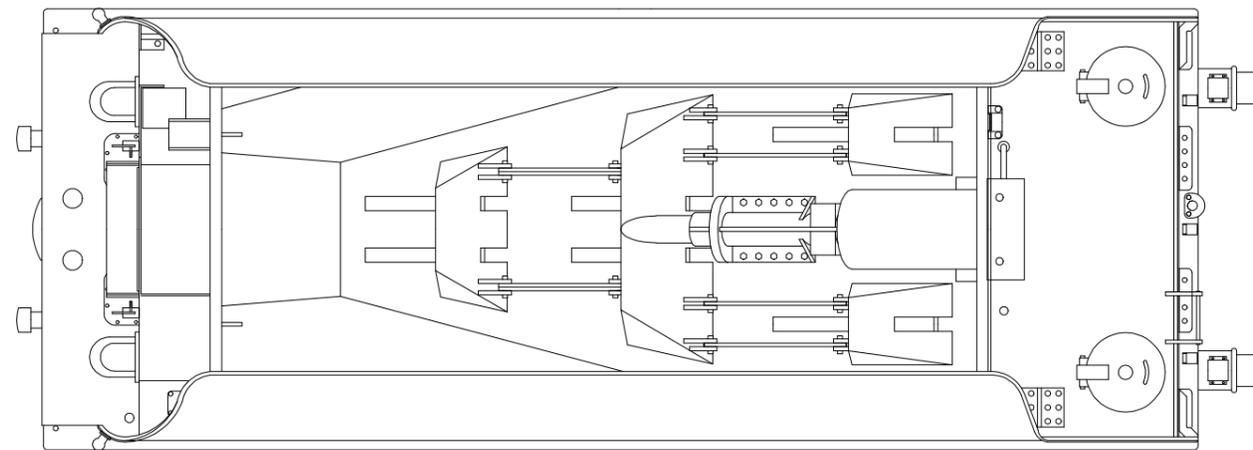
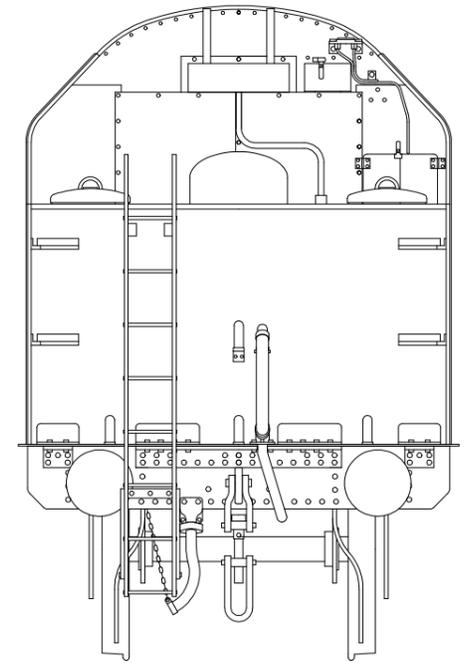
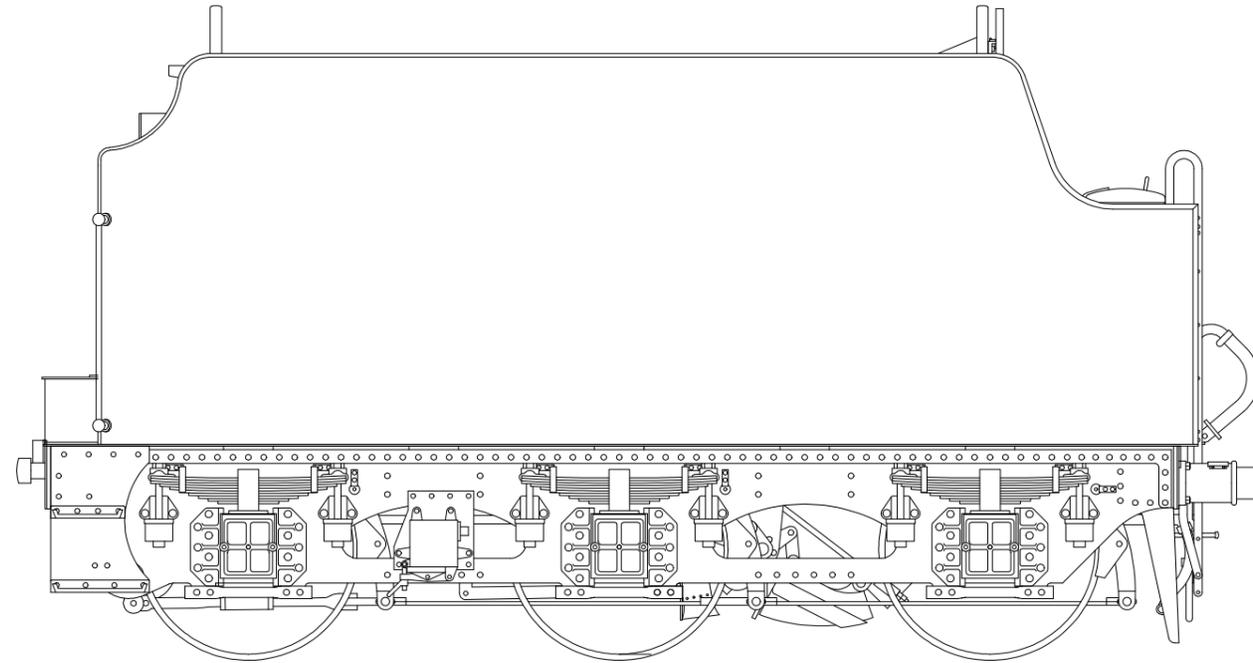
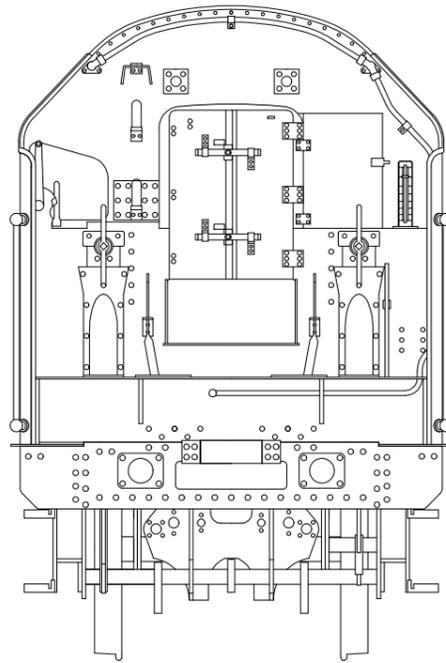


Fig 1. GA of Original Streamlined Tender Modified When the Locomotive Was De-streamlined

TYPE B TENDERS

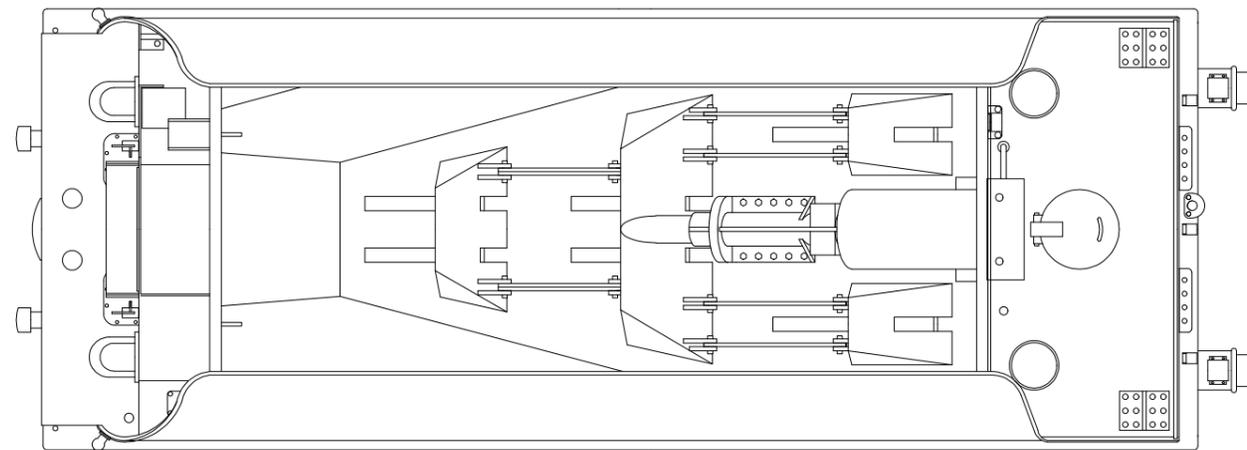
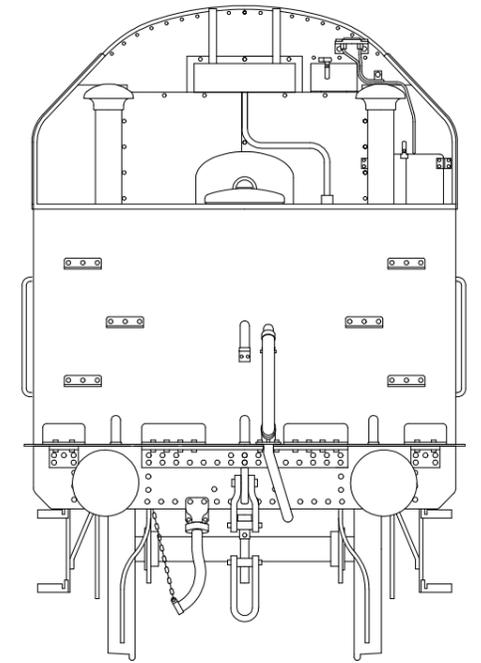
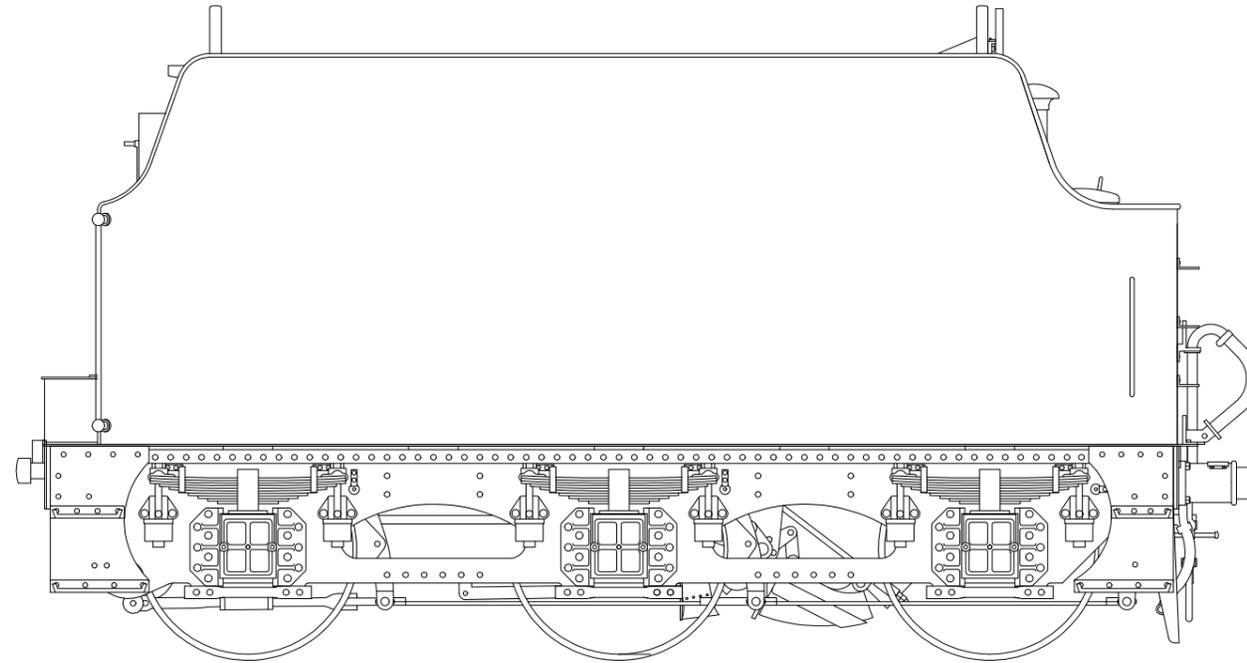
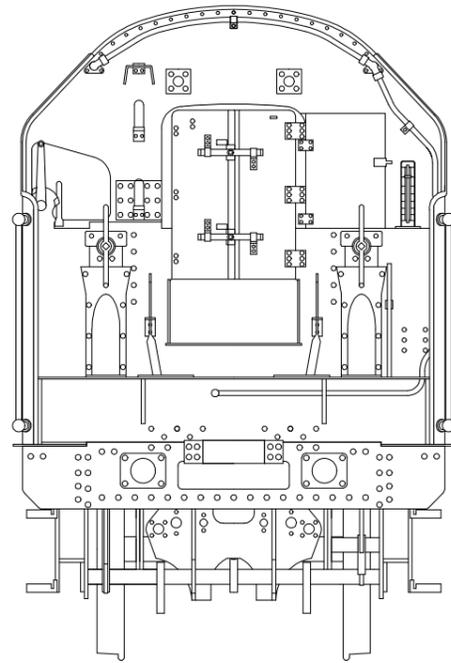


Fig 2. GA of Tenders Built for Un-streamlined Locomotives (Nos. 6230-6234)

BRAKES

BRAKES

Solder the brake hanger pivots from 0.8 mm wire in place. Refit the wheel sets and retain the moving axle by folding over and soldering the straps as shown. Open up the holes in the brake hanger laminations (C13), upper 0.8 mm and lower 1.2 mm, then solder together using a pair of suitable sized drill bits as a mandrel. Attach the hangers to the pivot wires. Check the clearance between the brake shoes and the wheels making any necessary adjustments.

Solder together Brake operating rods (C14), brake operating rods overlay, front (C15), brake operating rods overlay, centre (C16) & brake operating rods overlay, rear (C17). File the ends of the cross shafts to a circular section and solder the completed assembly between the brake hangers.

Solder together the 2 pairs of front brake pull rod laminations (C18 & C19), and the brake cylinder to cross shaft lever laminations (C20), see Fig 3. Cut a section of 2 mm brass rod 41 mm long and fit the front pull rod laminations and the brake cylinder to cross shaft lever lamination to the rod and through the front casting longitudinal section. Make sure that the adjuster detail on the front pull rods is to the outside and that the end of the front pull rod engages with the slots in the brake operating rods. Solder all joints. Solder the brake column to cross shaft lever laminations (C21) to the right hand side of the brake cross shaft rod

MAKING THE WHEELS REMOVABLE:

As designed, it is not possible to remove the wheels once the lower transverse stay mounting saddle (C9) is soldered in place. It is possible to make the wheels removable to aid maintenance and painting as was done with the build for the instructions, and this was done as follows.

The outer wheels are made removable by cutting the outer returns off the lower transverse stay mounting saddle where marked on the etch. The cuts will need to be filed back a little further so that the flanges on the front and rear axles clear the cut back saddle.

The centre axle requires more work. The centre axle slot reinforcing plate should be cut through and 12BA nuts attached to each side of the slot on the inside so that a 12BA bolt can be screwed through longitudinally to retain the axle.

The brake gear needs to be made removable, and this is achieved by soldering small bore tube instead of 0.8mm wire to the chassis to fit the hangers. The tube is tapped 14BA and 14BA bolts are used to attach the hangers to the chassis. The rest of the brake gear is made as normal, except that the ends of the front brake pull rods are not soldered to parts C14 and C15.

Finally in this section, the economiser (C24) must be screwed into the lower transverse stay, front (C10). A 'U' shaped bracket should be fabricated to fit between, and be soldered to the arms of the economiser. The bracket should be drilled at the centre to clear a 14BA bolt, and the stretcher tapped accordingly. The drop arm on C25 can have a slot filed in it so the rod across the economiser engages in it.

No.	Description	Sheet
C13	Brake hanger/shoe lamination (12)	1, 3
C14	Brake operating rods	3
C15	Brake operating rods overlay, front	3
C16	Brake operating rods overlay, centre	3
C17	Brake operating rods overlay, rear	3
C18	Front brake pull rod, inner lamination (2)	2
C19	Front brake pull rod, outer lamination (2)	2
C20	Brake cylinder to cross-shaft lever lamination (2)	3
C21	Brake column to cross-shaft lever lamination (2)	2

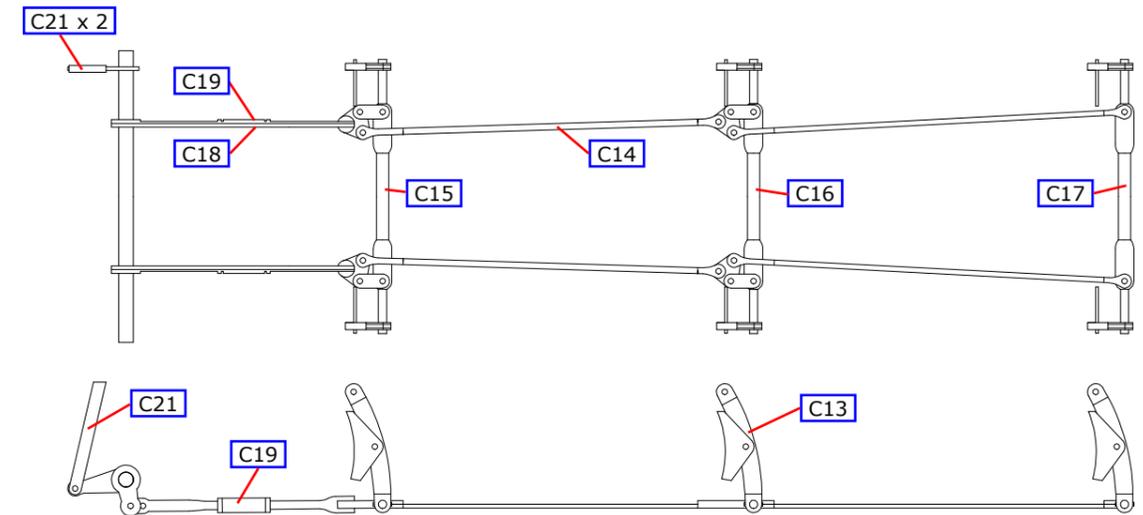
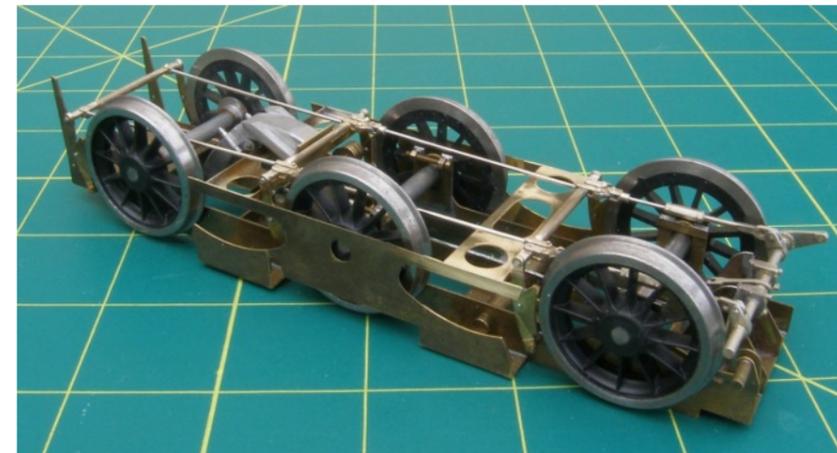


Fig 5. Brakes



FRAMES

FRAMES & BUFFER BEAMS.

Emboss all the rivets on the outside frames (C27 & C28) including the rivets to locate the brake hanger pin retainer (C41). Open up the holes that fit the axlebox and spring castings (WM4 & WM5). Fold over the horn guide ties with the fold line on the outside. For a Type 'B' tender with rear steps, remove the half etched section to clear the rear buffers as shown. For a Type 'A' tender snap off the rear steps.

Solder the front brake shaft bearing overlays (C35) to the frames. Emboss the rivets on the brake hanger pin retainers and solder in place before folding over the top section of each frame through 90°. Do not fold over the step plates yet. Emboss the rivets in the frame angle rivet strips (C29) and solder in place. The soldering is most easily done from the back through the slots in the frame that are along the upper edge. Solder the front step stays (C34) in place and if appropriate the rear step stays (C45) which locates over one of the rivets. Fold down the step plates and solder to the step stays. If appropriate solder the water sieve mounting plate (C30) and the filter boxes, left and right (BR4 & BR5) in place as shown in the drawing.

Fold up the front and rear buffer beams (C36 & C38). Emboss the rivets on the front and rear buffer beam overlays (C37 & C39) and fold over the angles along the top edge of the rear overlay and then solder both in place. Solder together the frames and stretchers. For a Type 'A' tender add the rear buffer beam to frame angle (C40) as shown

Assemble the buffers using the 1/2" 10BA screws. Now disassemble the buffers and solder the housings in place. On a type 'B' tender the buffers can be mounted in their correct position at the outer ends of the oval slots with the screw head moving in the frame slot previously made which is hidden by the rear steps. On a type 'A' tender without rear steps this is not possible and the only solution is to move the buffers inwards to obtain the necessary clearance for the screw head behind the frames. The displacement can be minimised by filing a flat on the housing where it fits next to the frames and by reducing the diameter of the 10BA bolt head.

Fold up the appropriate steps, lower, upper front and upper rear step (C32, C33 & C44) and solder in position. If required, drill a 0.6 mm hole in the front flange that is above the axlebox of two of the springs (WM5), to locate the centre axlebox lubricator (BR3). The centre of the hole corresponds to the small nut that is cast in the flange. Attach the remaining castings, the axleboxes and springs (WM4 & WM5), the front buffers (BR10), the front buffer beam rubbing plate (BR11) and the steam heating pipe (BR7). 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 part C9. Twist and bend the spring safety retaining bracket (C31) and solder in place through the slots in the frames and over the spring castings as shown below. Note that the front buffers (BR10) will need to be modeled fully retracted to enable the engine and tender to negotiate 6ft radius curves.

No.	Description	Sheet	No.	Description	Sheet
C27	Outside frame, left	3	C36	Front bufferbeam	2
C28	Outside frame, right	3	C37	Front bufferbeam overlay	2
C29	Frame angle rivet strip (2)	3	C38	Rear bufferbeam	2
C30	Water sieve mounting plate (2)	2	C39	Rear bufferbeam overlay	2
C31	Spring safety retaining bracket (12)	3	C40	Rear bufferbeam to frame angle	3
C32	Lower step (4)	2	C41	Brake hanger pin retainer (6)	1
C33	Upper front step (2)	3	C44	Upper rear step, Type B(2)	3
C34	Front step stay (2)	3	C45	Rear step stay, Type B (2)	2
C35	Front brake shaft bearing overlay (2)	2			

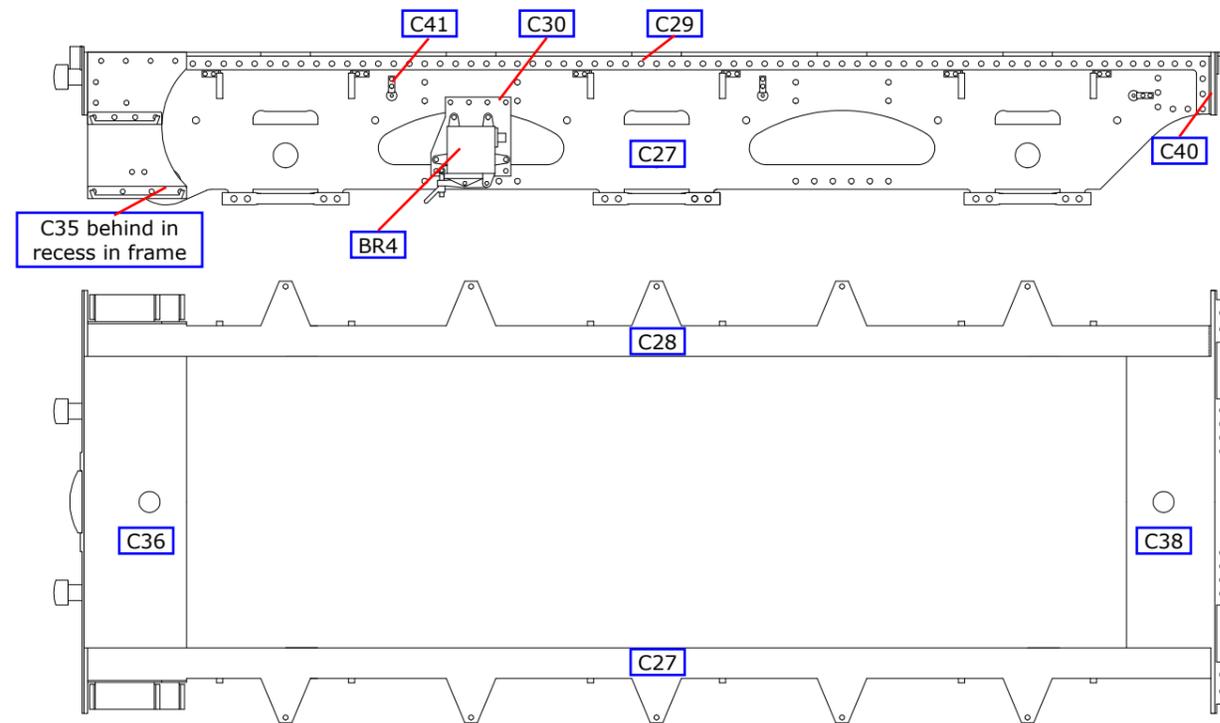
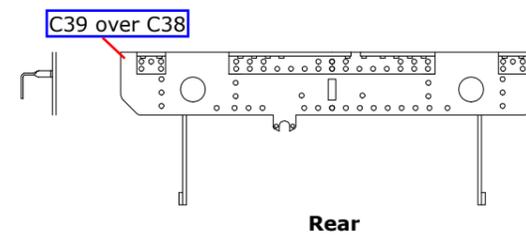
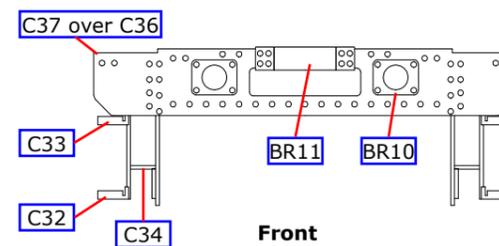


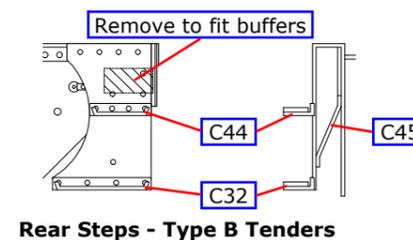
Fig 6. Frames



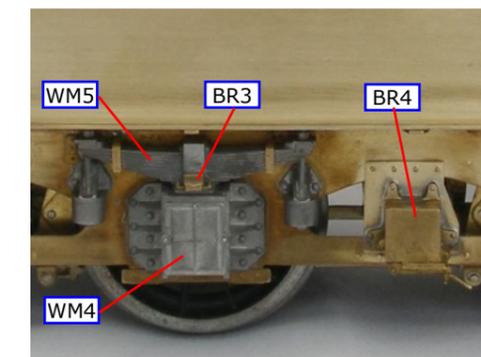
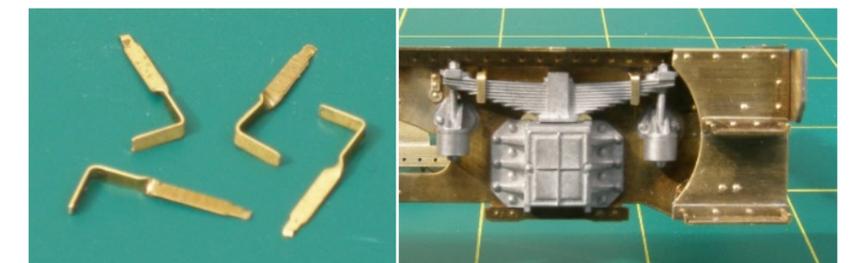
Rear



Front



Rear Steps - Type B Tenders



CONSTRUCTING THE BODY 1

The 'body' consists of several separate assemblies: footplate - front plate - rear division plate / tank top - sides - tank rear - ladder - coal hopper - coal pusher.

FOOTPLATE.

Emboss all the rivets across the rear of the footplate (T1). Fold up the rear lamp brackets and reinforce with a fillet of solder. Solder 6 BA nuts, for body fixing, over the holes front and rear. For a Type 'A' tender cut two small slots in the rear edge of the footplate to accommodate the ladder.

FRONT PLATE.

Emboss all rivets on the front division plate (T14) and the front division plate rear overlay (T15) and open up the appropriate holes to fit the coal watering pipe unions, left and right (BR12 & BR13) and the water gauge (BR14). Now form the horizontal bend in the front division. To do this scribe the fold line with a sharp point on the front face; make the line quite deep. The line runs from the slots in the projections on each side. When the fold is made, file off the marking projections. Solder the two lamp brackets (T5 & T6) in place as shown below. The lower one to the reinforcing plate. Form the locker side & top (T22) and the lamp rain hood (T23) to shape and solder them in place. Now clean off the rear face flush.

Solder the front lifting bracket (T16) in place in the slots in the front division plate rear overlay (T15) and clean off the rear face flush. Carefully align the front division plate and the rear overlay back to back and solder them together around the edges only. Form the curved corners in the coal space door opening sides and roof (T19) around a 2.5 mm rod so that it fits inside the central opening before soldering it in place.

Emboss all rivets in the raised footplate (T29). On the front plate (T18) scribe two vertical fold lines for the triangular shovelling plate sides and emboss the rivets. The lines run from the short slots at the top and the bottom; fold out these triangles. Open up the hole for the coal pusher operating lever (BR15). Emboss the rivets in the coal space doors (T20) and the locking bars (T21) and solder in place, locating the locking bars over the embossed rivets on the doors. Bend the raised footplate middle support (T31) to shape and solder in place through the slots in the front plate. Solder the raised footplate in place over the footplate middle support. Emboss the rivets on the brake/scoop column overlays (T24) and solder in place on the front plate and then drill through the holes to accept the brake/scoop column handle (BR9). Solder a piece of 0.45 mm wire in place as shown below to represent the scoop in/out indicator. Solder the water feed valve handle bracket (T28) in place. Form the 90° twist in the water feed valve

handle (T27) and then thread through the handle bracket and the raised footplate before soldering underneath the footplate. Solder the brake/scoop column handle (BR9) in place and then clean off the rear completely flush.

Now solder the division plate to the front plate. Accurate alignment here is essential. Form and fit the coal watering supply pipe from 0.7 mm wire together with the coal watering pipe unions, left and right (BR12 & BR13) as shown. You may find it easier to break the coal watering supply pipe where it goes through the raised footplate. Solder the water gauge (BR14) and coal pusher operating lever (BR15) in place. Add the scoop/brake column cover (WM12).

No.	Description	Sheet
T1	Footplate	3
T5	Lamp bracket lower section (3)	3
T6	Lamp bracket upper section (3)	1
T14	Front division plate	2
T15	Front division plate rear overlay	2
T16	Front lifting bracket (2)	3
T18	Front plate	2
T19	Coal space door opening sides and roof	2
T20	Coal space doors	2
T21	Coal space doors locking bar (2)	2
T22	Locker side & top	2
T23	Lamp rain hood	2
T24	Brake/scoop column overlay	2
T25	Coal space hopper	3
T26	Fire iron tunnel, front section	1
T27	Water feed valve handle (2)	3
T28	Water feed valve handle bracket (2)	3
T29	Raised footplate	2
T31	Raised footplate middle support	1

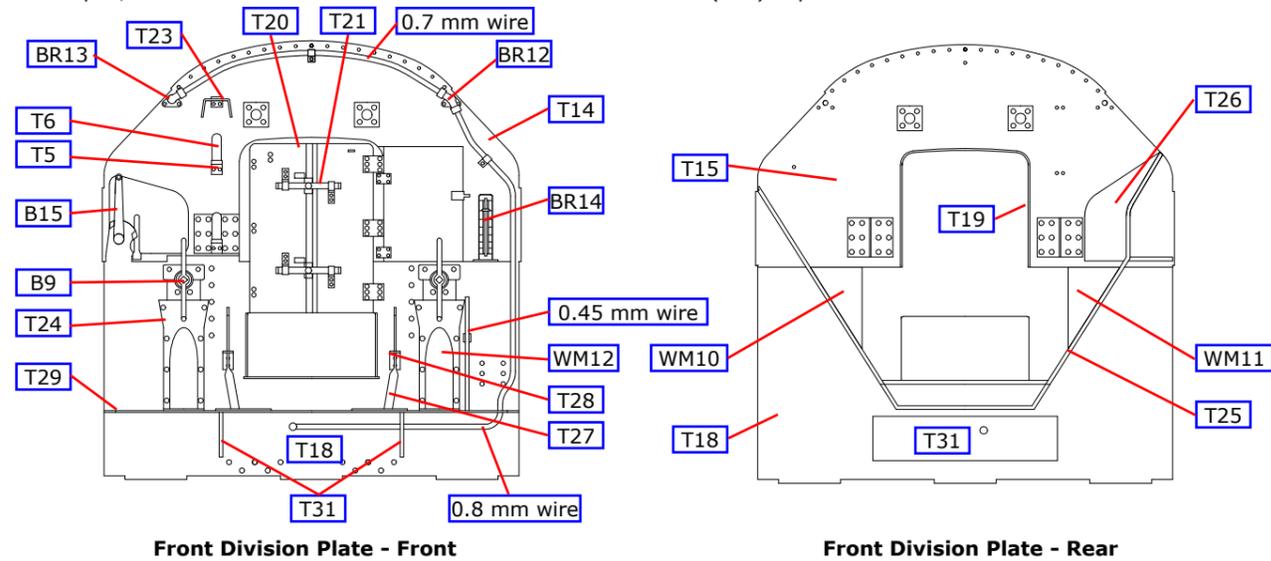
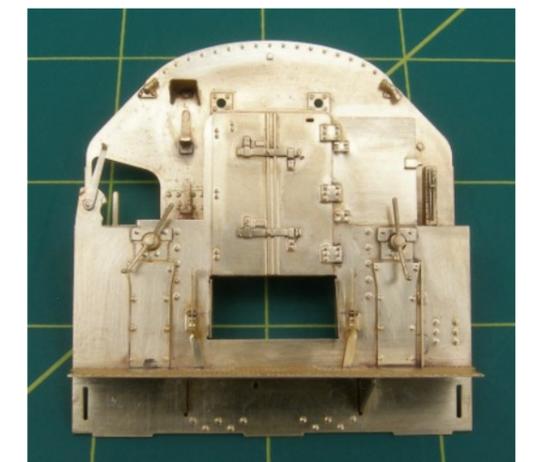
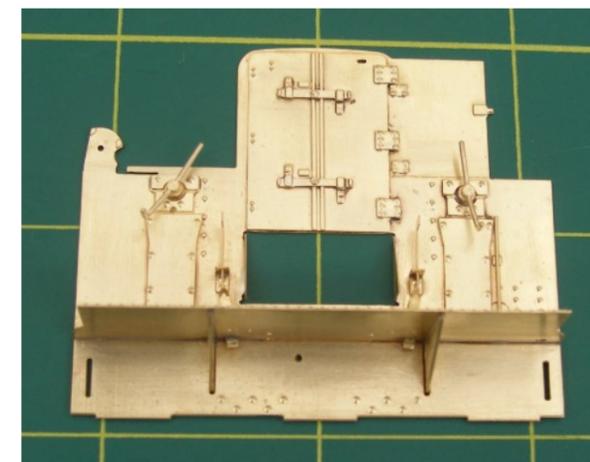
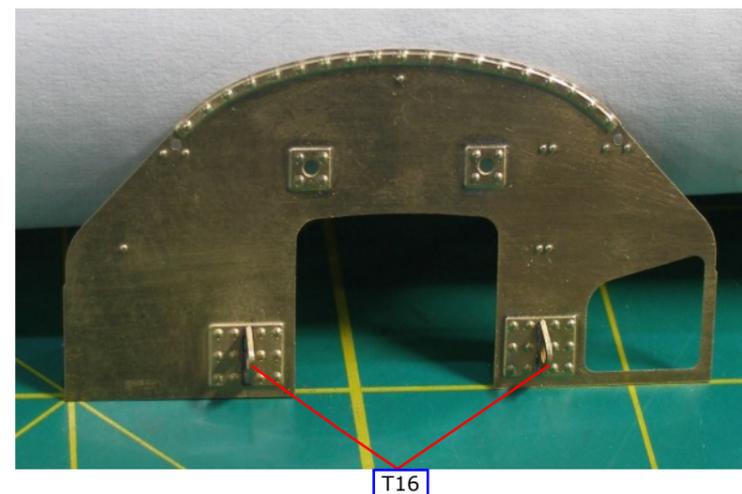
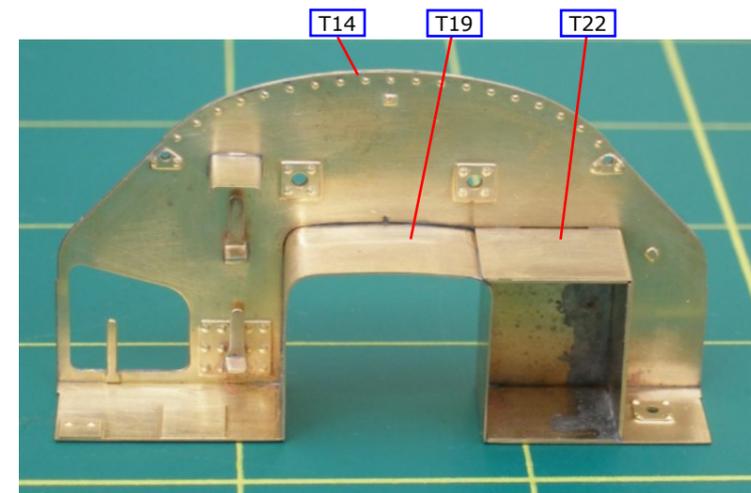
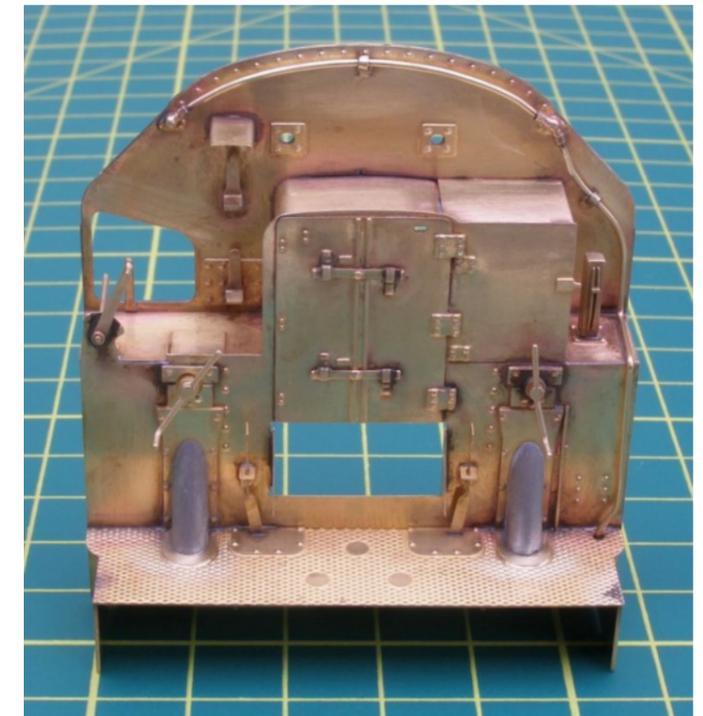
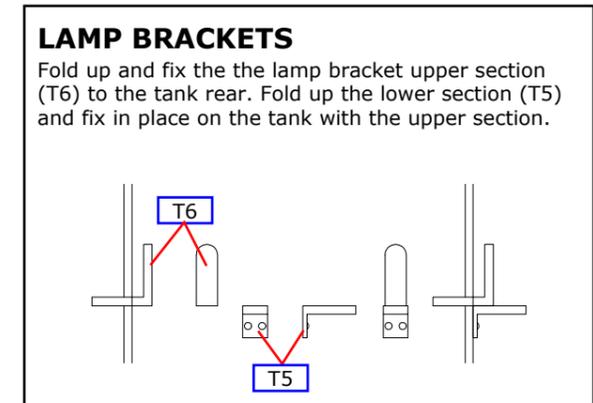


Fig 7. Tender Front



CONSTRUCTING THE BODY 2 - TYPE A REAR

REAR DIVISION PLATE & TANK TOP.

Emboss all rivets on the rear division plate & tank top (T7), the rear division plate rear overlay (T8) & the rear division plate front overlay (T9). Drill out the holes in the tank top using the tank top template. Bend rear division plate & tank top through 90° and solder both the overlays parts in place.

Solder the coal pusher door catch (T12) and the coal pusher lubricator (BR8) in place and add the lubricator pipes from 0.3 mm wire as shown below.

Cut a piece of 1/16" tube to a length of 5.1 mm and solder in place in the rear division plate & tank top flush with the underside. Solder the rear lifting bracket (T10) to the rear lifting bracket base (T11) and then in place as shown in Fig 1 or 2.

Drill out the marked holes in the coal pusher steam pipe cover (WM18) to take 1 mm and 0.8 mm wire. Cut lengths of 1 mm wire to represent the coal pusher exhaust pipes and fix in place. Form the coal pusher steam supply pipe from 0.8 mm wire as shown in below and fix in place, through the 1/16" tube, together with the coal pusher steam pipe cover. Fix the water scoop dome (WM6) in place.

SIDES.

Emboss the beading rivets around the edge of the appropriate side sheets, Type A (T34 & T35). Carefully form the curve in the side sheets over a 5/16" (8 mm) diameter rod. Practise on the unwanted side sheets. Check the fit of the sides against the front and rear plates. Similarly carefully form the curve in the front edge of the side sheets around the same rod.

Now solder the external beading to the sides. Start by straightening the beading by stretching it slightly. Clamp one end in the vice and pull the other end with a pair of pliers.

Cut two lengths of beading just long enough for the vertical beading down the rear edge of the sides. Cut the remaining beading into two equal lengths. File a 45° mitre on one end of one of the short lengths of vertical beading before soldering in place as shown in the GA. File a matching mitre in one end of the remaining pieces of beading and solder in place. Now proceed to solder the beading in place working towards the front. The best method for the sharp bends at the back and front are to gently ease the beading to match the edge shape with a small pair of pliers, soldering each bend before proceeding to the next.

Solder the side sheet angle, two front and two rear two (T2 & T3) in place in the half etched slots in the sides. The front side sheet angles (T2), with the small notch to accommodate the coal watering pipe, are placed in the front two slots. Fit the front, and for Type 'B' tenders the rear, handrails using 0.8 mm wire.

No.	Description	Sheet	No.	Description	Sheet
T2	Side sheet angle, front two (4)	2	T10	Rear lifting bracket (2)	3
T3	Side sheet angle, rear two (4)	2	T11	Rear lifting bracket base (2)	3
T5	Lamp bracket, lower section (3)	3	T12	Coal pusher door catch	3
T6	Lamp bracket, upper section (3)	1	T34	Right side sheet, Type A	1
T7	Rear division plate & tank top	3	T35	Left side sheet, Type A	1
T8	Rear division plate rear overlay	2	T36	Back outer overlay, Type A	3
T9	Rear division plate front overlay	2	T38	Rear ladder	2
			T39	Rear ladder lower support bracket	2

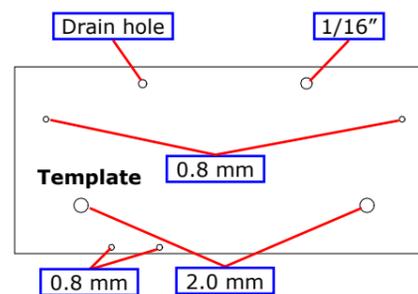
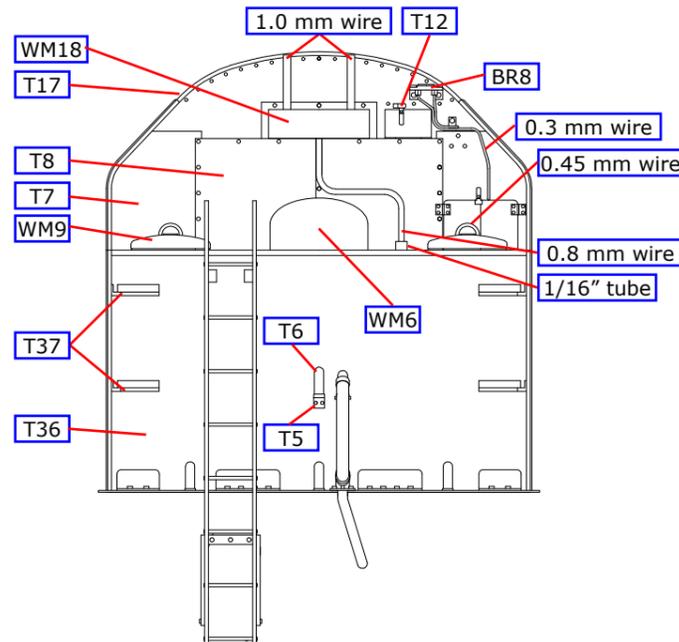
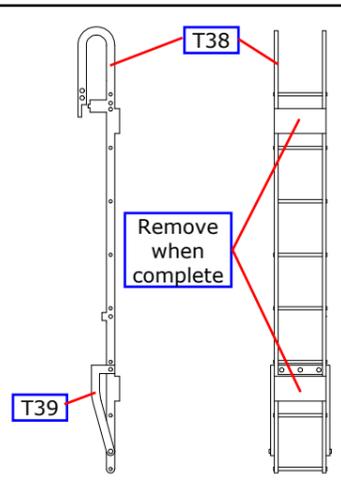


Fig 8. Type A Tender Front



Ladder (Type 'A' only).

Emboss all the rivets in the rear ladder (T38) and the rear ladder lower support bracket (T39). Fold up the ladder sides and add the rungs from 0.45 mm wire. Fold up the support bracket and locate on the ladder with 0.45 mm wire. Solder the rungs, the ladder and lower support bracket together. Remove the unwanted sections, as shown, by cutting down the centre of each section with a carborundum disc in a mini-drill then snapping off along the fold lines. Trim all the wire pieces to length and clean off the front face flush.



CONSTRUCTING THE BODY 2 - TYPE B REAR

REAR DIVISION PLATE & TANK TOP.

Emboss all rivets on the rear division plate & tank top (T7), the rear division plate rear overlay (T8) & the rear division plate front overlay (T9). Drill out the holes in the tank top using the tank top template. Bend rear division plate & tank top through 90° and solder both the overlays parts in place.

Solder the coal pusher door catch (T12) and the coal pusher lubricator (BR8) in place and add the lubricator pipes from 0.3 mm wire as shown below.

Cut a piece of 1/16" tube to a length of 5.1 mm and solder in place in the rear division plate & tank top flush with the underside. Solder the rear lifting bracket (T10) to the rear lifting bracket base (T11) and then in place as shown in Fig. 2..

Drill out the marked holes in the coal pusher steam pipe cover (WM18) to take 1 mm and 0.8 mm wire. Cut lengths of 1 mm wire to represent the coal pusher exhaust pipes and fix in place. Form the coal pusher steam supply pipe from 0.8 mm wire as shown in below and fix in place, through the 1/16" tube, together with the coal pusher steam pipe cover. Fix the water scoop dome (WM6) in place. Fit the water filler (WM9) in place and add a handle from 0.45 mm wire.

SIDES.

Emboss the beading rivets around the edge of the appropriate side sheets (T40 & T41). Carefully form the curve in the side sheets over a 5/16" (8 mm) diameter rod. Practise on the unwanted side sheets. Check the fit of the sides against the front and rear plates. Similarly carefully form the curve in the front edge of the side sheets around the same rod.

Now solder the external beading to the sides. Start by straightening the beading by stretching it slightly. Clamp one end in the vice and pull the other end with a pair of pliers.

Cut the beading into two equal lengths. The easiest place to start soldering the beading in this case is along the top edge and then to work forwards and backwards independently. Leave the beading at the rear slightly long at this stage.

Solder the side sheet angles, two front and two rear (T2 & T3) in place in the half etched slots in the sides. The front side sheet angles (T2), with the small notch to accommodate the coal watering pipe, are placed in the front two slots. Fit the front and rear handrails using 0.8 mm wire.

No.	Description	Sheet
T2	Side sheet angle, front (4)	2
T3	Side sheet angle, rear (4)	2
T5	Lamp bracket, lower section (3)	3
T6	Lamp bracket, upper section (3)	1
T7	Rear division plate & tank top	3
T8	Rear division plate rear overlay	2
T9	Rear division plate front overlay	2
T10	Rear lifting bracket (2)	3
T11	Rear lifting bracket base (2)	3
T12	Coal pusher door catch	3
T40	Left side sheet, Type B	1
T41	Right side sheet, Type B	1
T42	Back outer overlay, Type B	3
T43	Back step, Type B	3

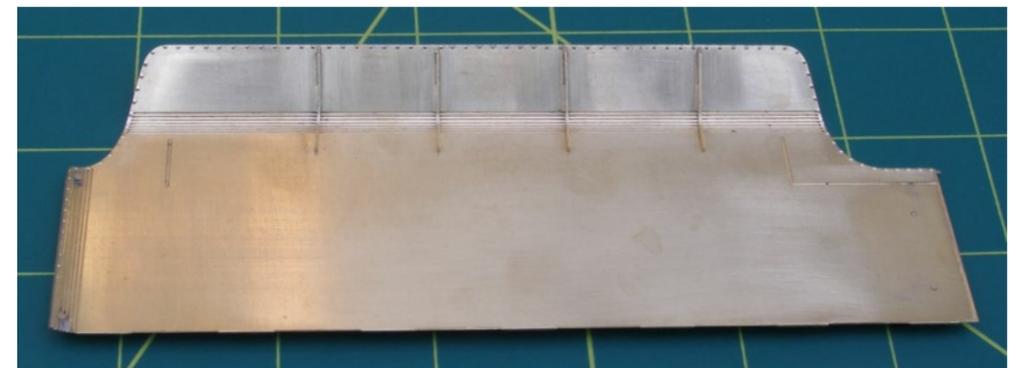
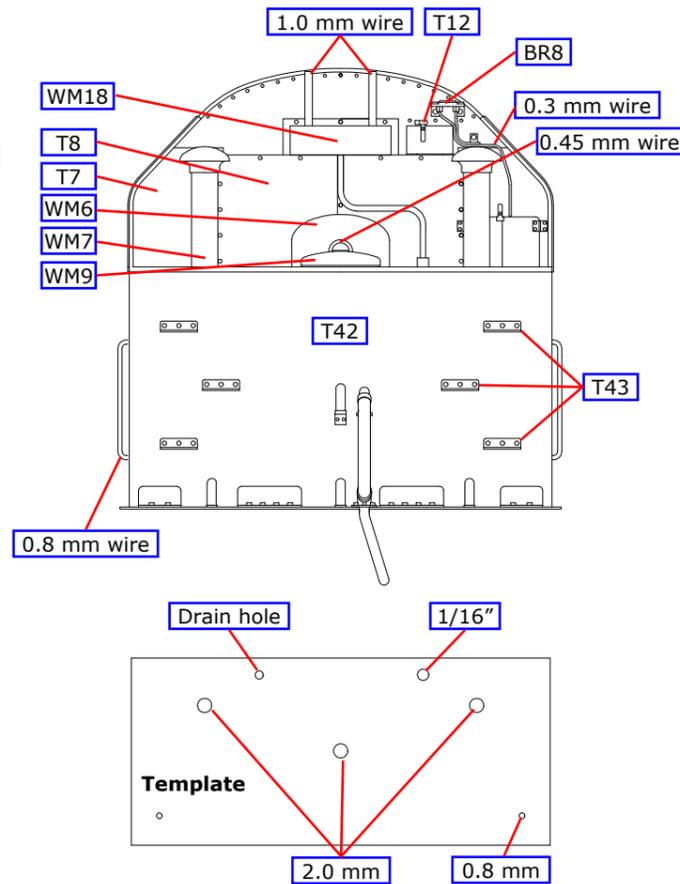
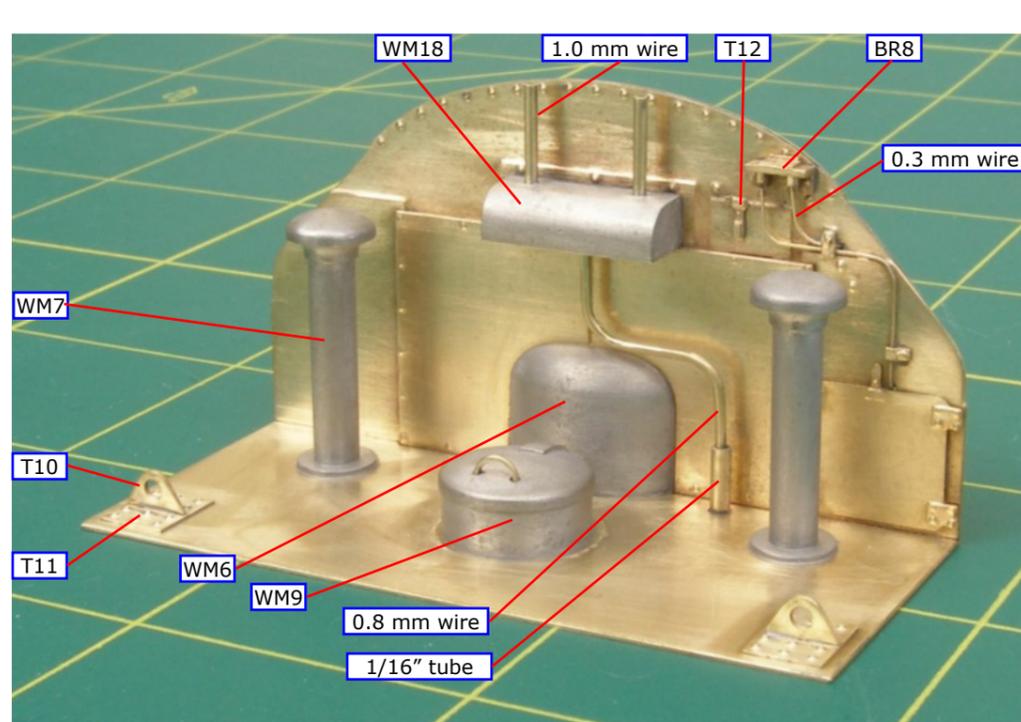


Fig 9. Type B Tender Front

CONSTRUCTING THE BODY 3

TANK REAR.

See Photo 1. Solder the back inner plate (T4) and the back outer overlay (T36 or T42) together. The etched beading along the top edge can be improved by rounding the top edge. Add the lamp bracket and for a Type 'B' tender the six steps (T43).

COAL HOPPER.

See Photo 2. For a type 'A' with four vents in the coal space cut out the three half etched areas to accommodate the rear vents. Make the curved bend in the fire iron tunnel over a 1/8" rod to match the profile shown in Fig. 7. Fold up the coal hopper (T25) with all folds on the inside of the bends. Solder the lower edges at the front together. Form the fire iron tunnel front section (T26) to shape making the curved bend over a 1/8" rod before soldering in place. Check the slots for the tank vent, inside coal space castings (WM8) for clearance and open up if needed.

COAL PUSHER.

See Photo 3. Solder the coal pusher lower linkage (T33) together in pairs. Drill out all the pin holes in the pusher castings to fit 0.8 mm wire pins. Assemble the coal pusher using the coal pusher rear pushers (WM14), coal pusher middle pusher (WM15), coal pusher front pusher (WM16) and coal pusher upper and lower linkages (T32 & T33) and pins of 0.8 mm wire.

FINAL ASSEMBLY

See Photos 4 to 7. The tender body, with most of the soldering done from inside, can now be assembled in the following order. It is very important to constantly check the fit of assemblies and to follow this order.

Solder the rear division plate/tank top into the half etched slots in the right side sheet.

Solder the coal hopper to the front plate and attach the scoop/brake gear covers, left and right (WM10 & WM11), see Fig 7.

Fix this assembly to the right side sheet and rear division plate.

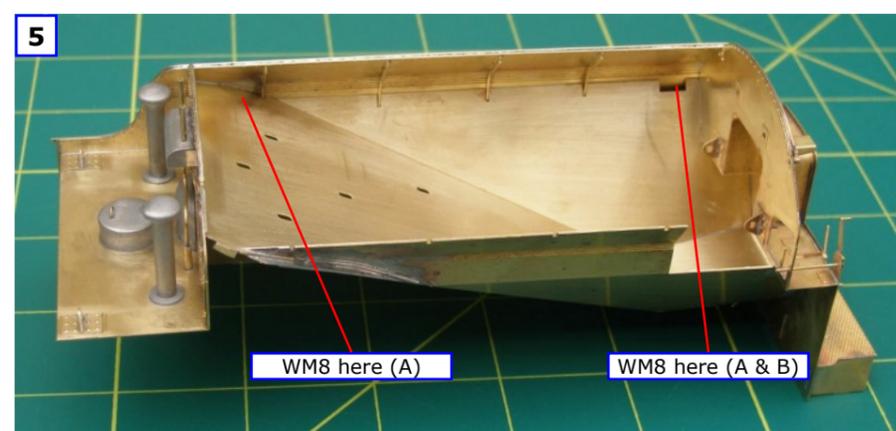
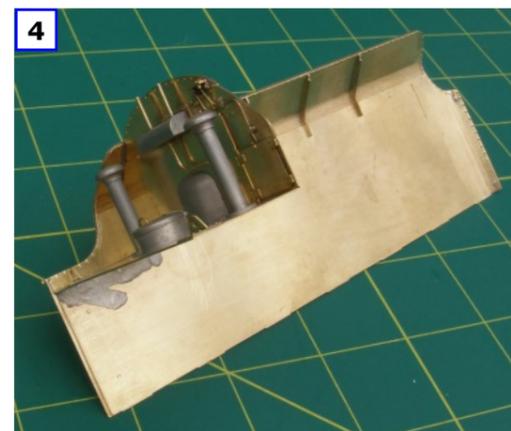
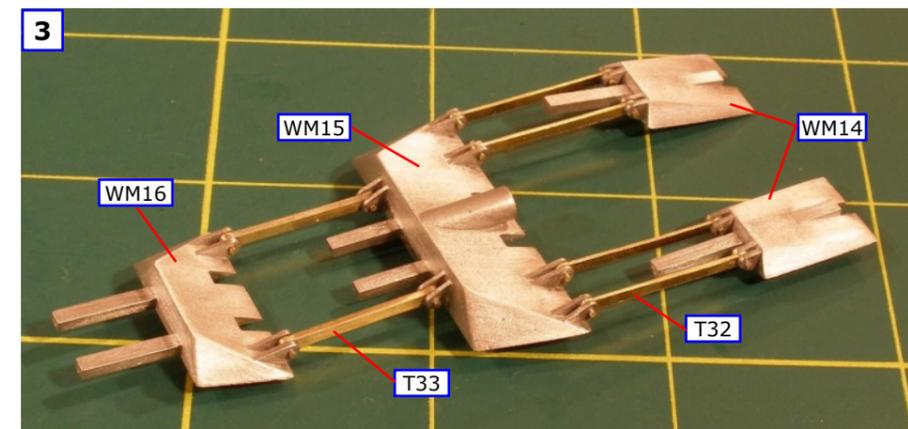
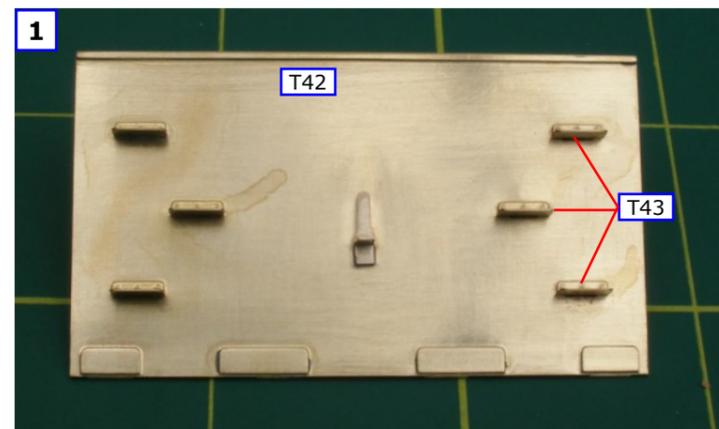
Attach the left side sheet followed by the tender back.

Solder the raised footplate support side (T30) in place in the outer slots in the front plate. Lastly locate the footplate over the tabs on the sides, back and front.

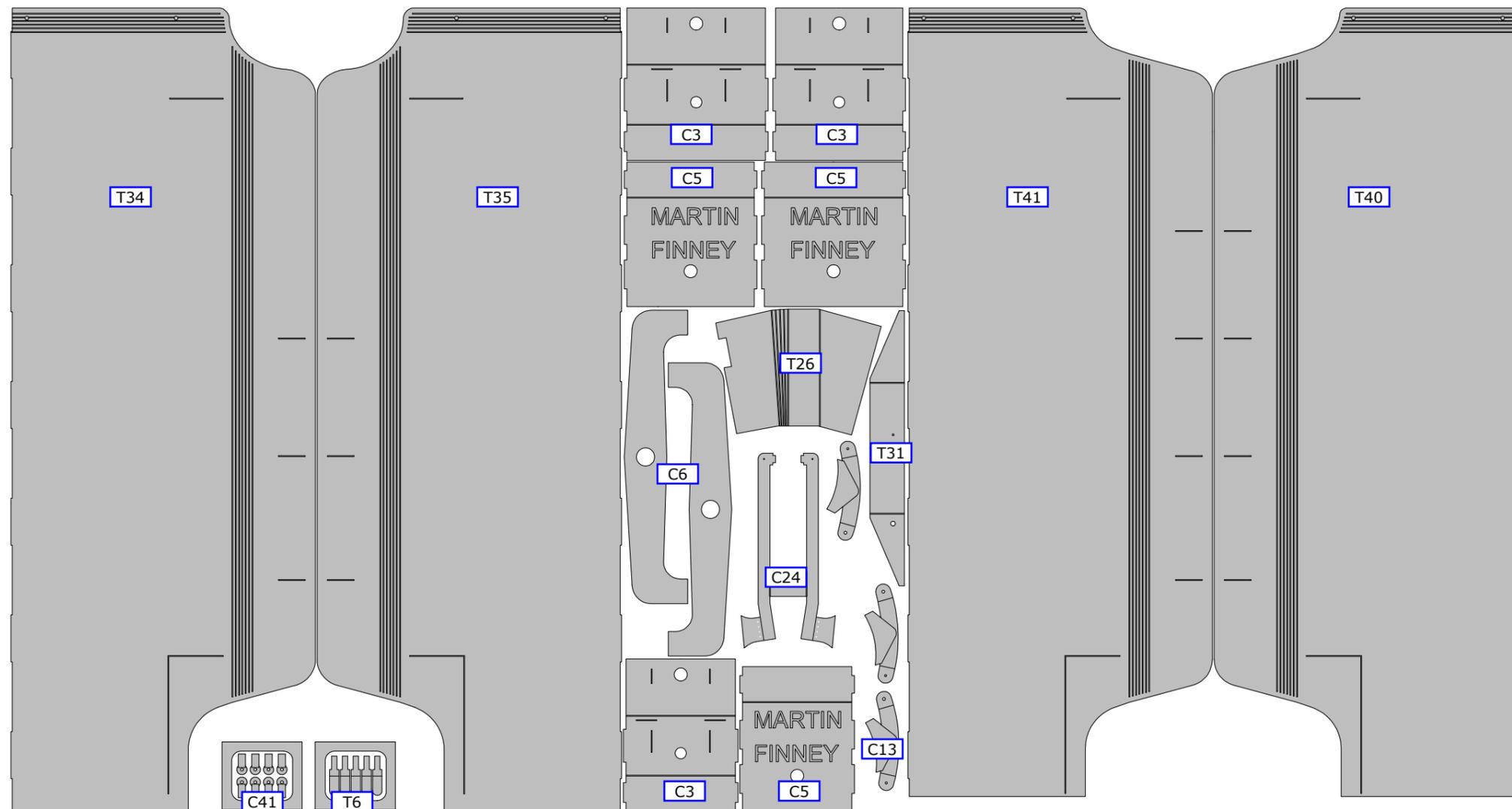
For a Type 'A' tender bend up the side to back corner gusset plate (T37) and solder in place together with the ladder assembly. Fit the vacuum pipe (BR6), the tank vent inside the coal space (WM8), the water filler (WM9) and the coal watering pipes and for a Type 'B' tender the tank vents, tall (WM7).

Lastly fit the coal pusher assembly and the coal pusher steam cylinder (WM13) & the coal pusher curved cover plate (WM17); this fits above the coal pusher cylinder on the right hand side, see the GAs in Figs. 1 & 2.

No.	Description	Sheet			
T4	Back inner plate	3	T33	Coal pusher lower linkage (4)	2
T17	Beading for top of front and rear division plate (2)	2	T36	Back outer overlay, Type A	3
T25	Coal hopper	3	T37	Side to back corner gusset plate, Type A (4)	3
T26	Fire iron tunnel front section	1	T42	Back outer overlay, Type B	3
T30	Raised footplate support side (2)	3	T43	Back Step, Type B (6)	3
T32	Coal pusher upper linkage (4)	2			



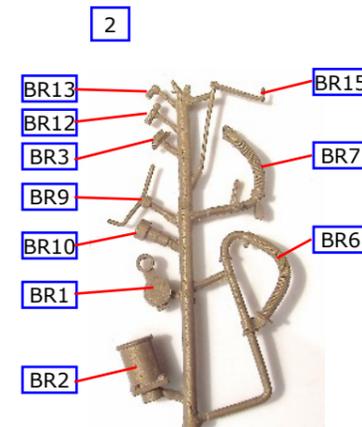
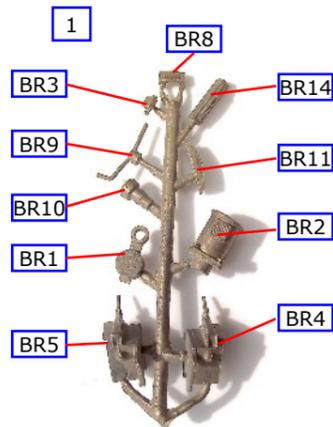
ETCH SHEET 1 & BRASS CASTINGS



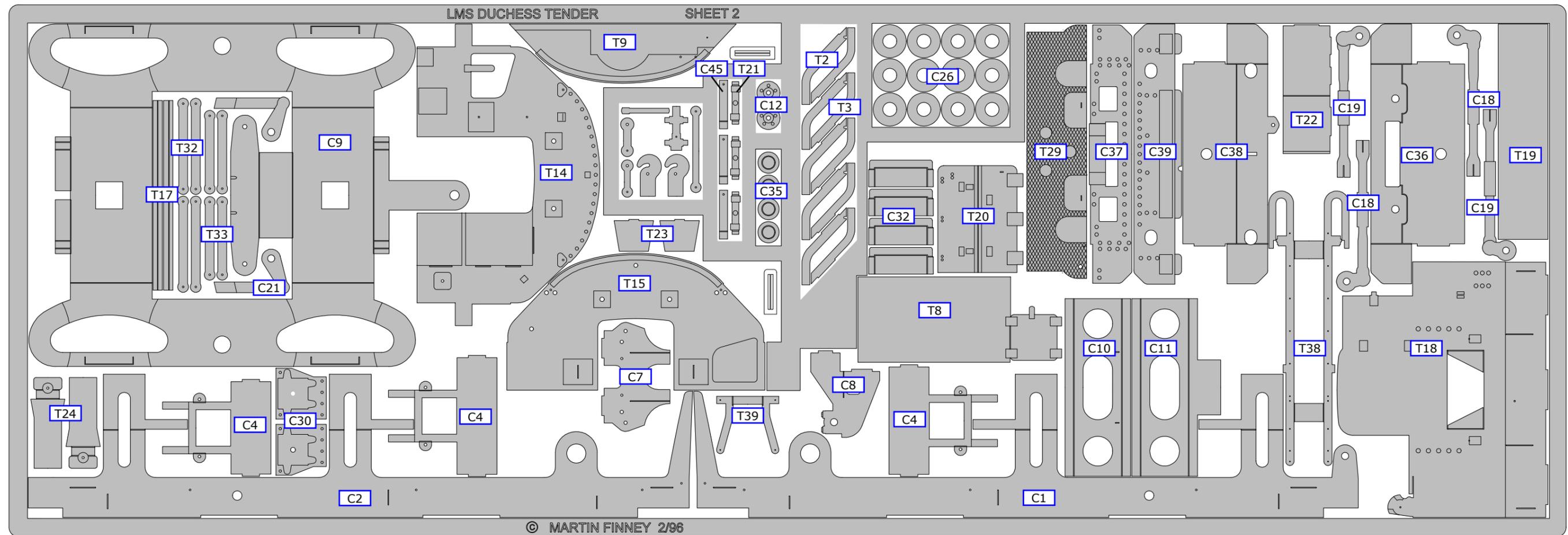
CASTINGS - BRASS

- BR1 Water scoop shaft balance weight (2)
- BR2 Rear buffer housing (2)
- BR3 Centre axlebox lubricator (2)
- BR4 Filter box, left
- BR5 Filter box, right
- BR6 Vacuum pipe
- BR7 Steam heating pipe
- BR8 Coal pusher lubricator
- BR9 Brake/scoop column handle (2)
- BR10 Front buffer (2)
- BR11 Front bufferbeam rubbing plate
- BR12 Coal watering pipe union, left
- BR13 Coil watering pipe union, right
- BR14 Water gauge
- BR15 Coal pusher operating lever
- BR16 Scoop crank and leadscrew

- 1, 2
- 1, 2
- 1, 2
- 1
- 1
- 2
- 2
- 1
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- 1, 2
- 1
- 2
- 2
- 1
- 2
- 3

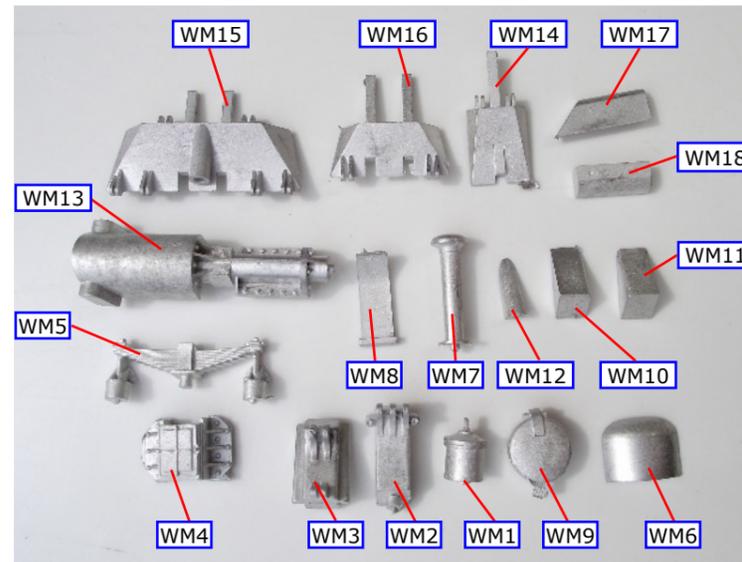


ETCH SHEET 2 & WHITE METAL CASTINGS



CASTINGS - WHITEMETAL

- WM1 Brake cylinder
- WM2 Water scoop, upper section
- WM3 Water scoop, lower section
- WM4 Axlebox (6)
- WM5 Spring (6)
- WM6 Water scoop dome
- WM7 Tank vent, tall (2)
- WM8 Tank vent, inside coal space (4)
- WM9 Water filler (2)
- WM10 Scoop/brake gears cover, left
- WM11 Scoop/brake gears cover, right
- WM12 Scoop/brake column cover (2)
- WM13 Coal pusher steam cylinder
- WM14 Coal pusher rear pusher (2)
- WM15 Coal pusher middle pusher
- WM16 Coal pusher front pusher
- WM17 Coal pusher curved cover plate
- WM18 Coal pusher steam pipe cover



ETCH SHEET 3

