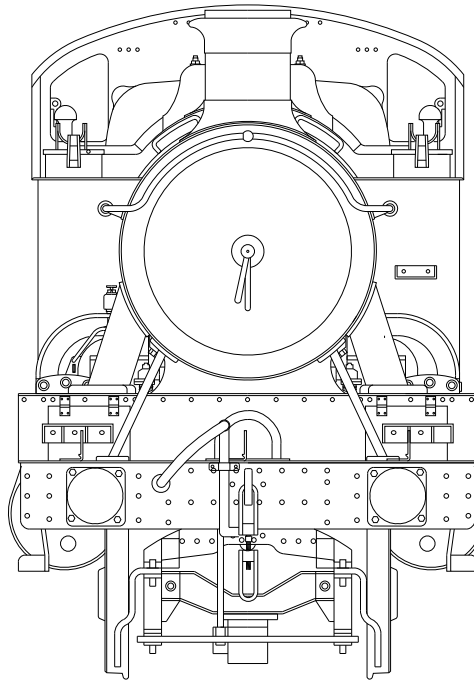


GWR 51XX CLASS LOCOMOTIVE



CAUTION.

This product contains etched parts with very sharp edges and castings that may contain lead. Neither the Manufacturer, Distributor or Retailer can accept any liability for illness, injury or consequential damage caused when handling or building this product.

Read any instructions before assembly. Do not eat or drink whilst handling. Wash hands after use.

BRIEF HISTORICAL DETAILS

The engines which form the basis of this kit were an up-to-date version of the Churchward engines introduced in 1903. They are divided into two classes the 5101 class (5101-5110, 5150-99, 4100-79) introduced in 1929, for general use, with 200 lb. pressure boilers followed by the 6100 class (6100-69), specifically to work accelerated London suburban services, with 225 lb. pressure boilers.

For a detailed history of this numerous class Part Nine of 'The Locomotives of the Great Western Railway' published by the RCTS is essential reading.

Other valuable sources of information and photographs are:

A Pictorial Record of Great Western Engines Vol. Two, J.H.Russell, OPC

Churchward Locomotives, Brian Haresnape & Alec Swain, Ian Allan

Locomotives Illustrated No. 33, Ian Allan

Great Western Railway Journal No.5 (Winter 1993), Wild Swan, this includes some of the drawings listed below.

The following Swindon Drawings were used to design the kit:

98682	2/1934	Lot 284	Frame plan
87341	2/1934	Lot 257,259	Cross sections
102535	2/1934	Lot 284	Erecting Plan
100729	4/1933		Arrangement of Boiler Mountings
59048	9/1938		Arrangement of Motion

The engines were built under 12 Lots as follows:

Lot	Numbers	Built	Lot	Numbers	Built
257	5101-10	11/29-12/29	292	4100-19	8/35-11/36
	5150-59	2/30-3/30	313	4120-29	12/37-5/38
259	5160-89	10/30-4/31	323	4130-39	10/39-12/39
269	6100-29	4/31-11/31	335	4140-49	8/46-10/46
278	6130-59	9/32-4/33	361	4150-59	6/47-9/47
284	5190-99	10/34-11/34	369	4160-79	9/48-12/49
291	6160-69	10/35-11/35			

VARIATIONS POSSIBLE WITH THE KIT

Water Fillers. Numbers 5101-10, 5150-89, 6100-6109 were fitted with a screw down lid whereas the remaining engines were fitted with a lever type.

Cab shutters. Numbers 5190-99, 6110-69 & 4100-79 were fitted with shutters from new. The earlier engines received shutters from 1933.

ATC equipment. Fitted when new to 5160-99, 6130-69 & 4100-79 and applied to the earlier engines between 1930 and 1933. The earlier engines had the ATC conduit pipe clipped midway up the valence on the left hand side whilst the later engines had the pipe clipped under the lower edge of the valence. The earlier engines were fitted with the standard ATC shoe bolted to the front buffer beam and clearly visible in photographs. Later engines, including all the 61XX series, had a less visible shoe mounted beneath the pony truck.

Journal lubricators mounted on the tank top. The majority of the 51XX & 61XX series were so fitted when built. The 41XX series did not have these lubricators and some of the earlier engines subsequently had them removed.

Step on tank front. Numbers 5101-10, 5150-89, 6100-6109 were fitted with a step of traditional appearance. The later engines had a step of the same design as fitted to the rear of the bunker.

Upper front lamp bracket. Moved to the smokebox door on a few engines.

Spare lamp brackets. On early engines these were mounted towards the footplate edge along side the splasher whilst later they were placed further forward and in front of the splasher.

Whistle shields. Fitted to 4160-79 when new and later to a few of the earlier engines.

Handrails on tank strap. Two extra handrails were added on the strap over the boiler from circa 1945.

Bunker steps. The welding of three steps to the left side of the bunker began in 1952. This necessitated shortening the handrail on the bunker side whilst at the same time two extra handrails were added one to the rear of the cab cut-out and one on the cab roof.

VARIATIONS NOT NOT POSSIBLE WITH THE KIT

Safety valve bonnets. Numbers 5101-5110 & 5150-59 were fitted with tall safety valve bonnets. The safety valve bonnet supplied is of the short type fitted to the remaining engines.

Bunkers. Numbers 5101-5110 came out with a recessed fender above the flat bunker top, whilst from No. 5150 the upper half of the bunker extension was recessed to match the fender. The kit only caters for the recessed bunker and fender. Several of the earlier engines were subsequently retro fitted with the recessed bunker and fender.

Trip gear. The 61XX series worked over the electrified lines in the London area and all were fitted with trip gear for automatic brake application in case of over-running an adverse signal. The ATC apparatus on these engines is arranged to clip up automatically on entering an electrified section.

CHASSIS OVERVIEW

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

Before construction can commence you have to decide which particular chassis you are going to construct. The options are:

Gauge.

For Finescale, where little sideplay is required, the widest spacers can be used but they will need careful filing to make their width 26.0 mm. If you require your engine to negotiate sharp curves then the middle width spacers should be used.

The widest frame spacers supplied are suitable for Scaleseven and care will be needed to allow sufficient sideplay, especially in the leading axle to enable the model to negotiate moderate curves.

Suspension.

Rigid. The kit is supplied with top hat bearings to build a rigid chassis. Open out the main axle holes to accept top hat bushes and solder them in place. If the leading axle is 5/32" diameter then reduce the bearing diameter accordingly by fitting a sleeve from short lengths of the 3/16" tubing provided.

Sprung. If you are going to fit sprung horn blocks, you should open out the frame slots by cutting up the half etched lines and follow the manufacturers instructions.

Compensated. The simplest and most reliable suspension system is beam compensation and the necessary compensation beams are provided in the kit. Not provided are the hornblocks and bearings which are available as an extra item which includes instructions for aligning the hornblocks accurately.

Pickups. No pickup material is provided. The options are:

Scrapers. Attached to the middle frame spacer using printed circuit board.

Plunger. Open out holes P and fit according to the manufacturers instructions. It may not be possible to use plunger pickups if you wish to fit the inside motion because they may foul each other.

Split axle/frame. We leave this to you! Some useful information can be found at <http://www.euram-online.co.uk/tips/splitaxle/splitaxle.htm>.

COMPONENTS NOT SUPPLIED

Wheels.

Driving wheels 5' 8" dia. 18 spokes, 3/16" axle, early version	Slater Ref. 7868GW
Driving wheels 5' 8" dia. 18 spokes, 3/16" axle, later Collet wheel	Slater Ref. 7868GW51
Pony truck wheels 3' 2" dia. 10 spokes, 5/32" axle	Slater Ref. 7837MF
Rear truck wheels 3' 8" dia. 10 spokes, 5/32" axle	Slater Ref. 7843MF
Available from Slaters' (Plastikard) Ltd'	

Motor/Gearbox. A Canon motor with a SDMP 40L/15 gearbox (available from Finney7) or an alternative such as an ABC VML2 gearbox.

Crankpins. Heavy duty crankpins are available from Finney7.

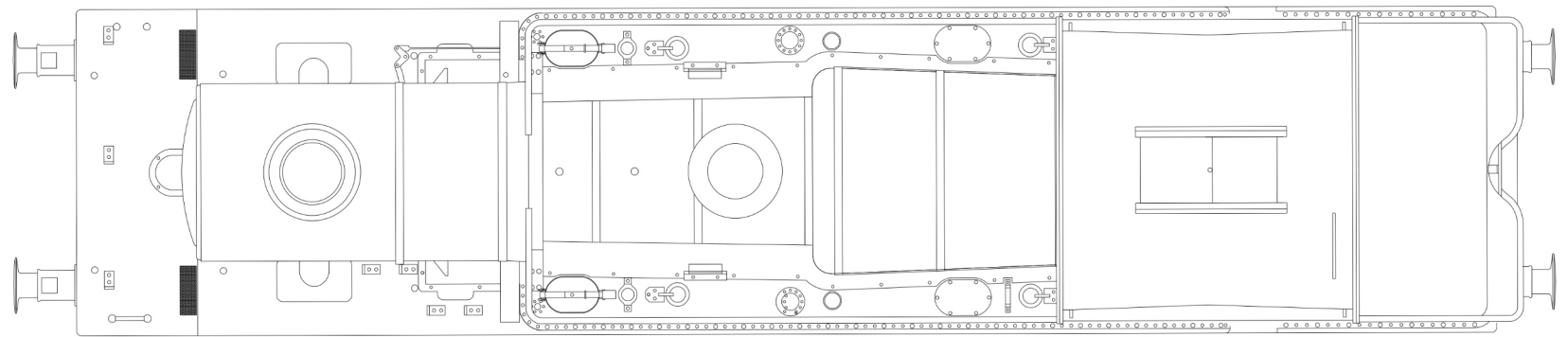
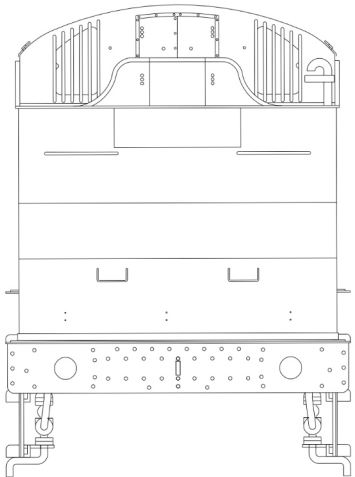
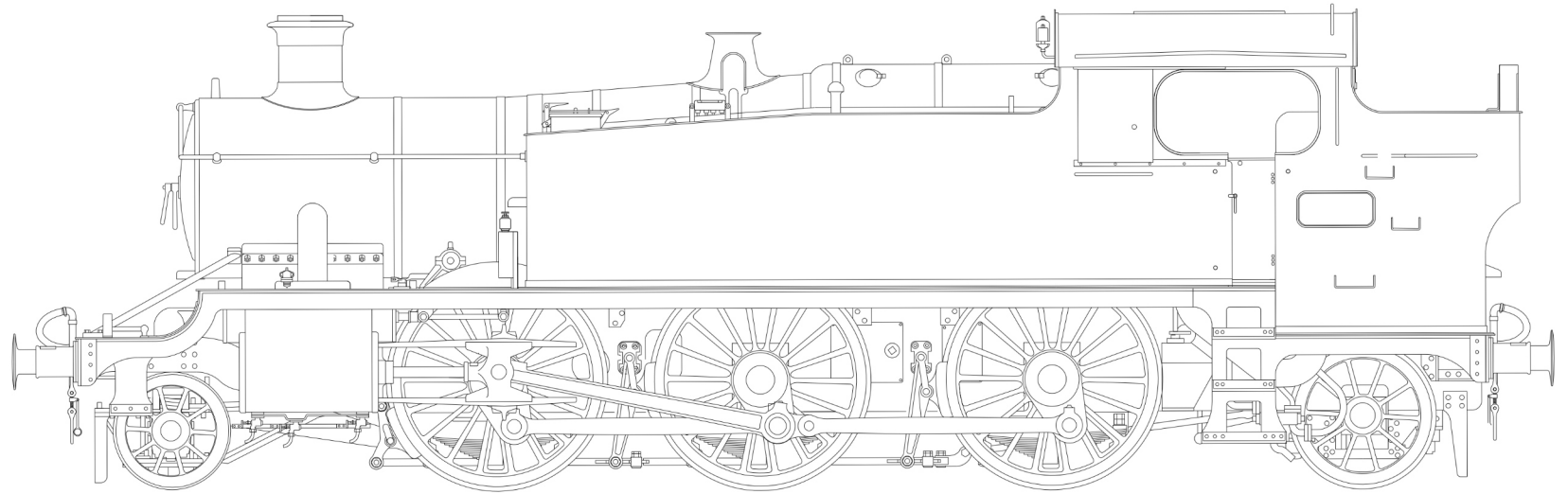
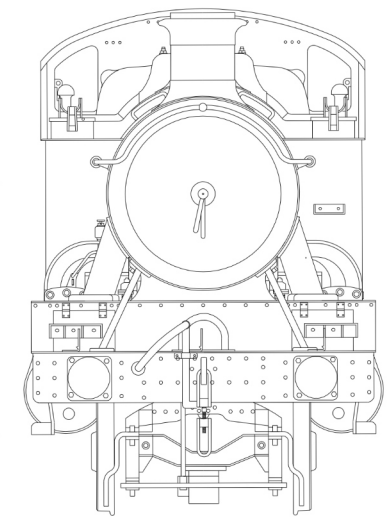


Fig 1. General Arrangement

COUPLING RODS AND RADIAL TRUCK

The coupling rods are made now so that they can be used as a jig to align the remaining hornblocks accurately. First drill out all coupling and connecting rods (Fig 2).

The coupling rods are now made so that they can be used as a jig to align the remaining hornblocks accurately. Remove the following from the fret - the coupling rod front (M1), the coupling rod front fork joint (M2),the coupling rod rear inner lamination (M3) and rear rod outer lamination (M4). First drill out all the crankpin holes to a convenient size which is well undersize for the crankpins and the fork joint holes 1.6mm so that the 1.6mm nickel silver wire is a tight fit. Remove all burrs caused by the drilling.

Now drill a hole in a small block of wood with the drill used for the crankpin holes; leave the drill in the wood with its shank projecting. This shank is used as a mandrel to accurately align the laminations of each rod. Place the inner and outer laminates over the mandrel and using plenty of solder and flux solder the two laminates together. You will now have rods with the crankpin and fork joint holes aligned. The rods have been deliberately etched too large so that the thin etched edges can be carefully filed so that the laminated effect is lost and the rods appear to be made from one piece of metal.

The crankpin holes now need carefully opening out until they just fit, with no free play, the ends of the hornblock alignment jigs. The fork joints are now pinned using the 1.6mm nickel silver wire. Retain the pins, which should be a tight fit, by lightly soldering on the inner face of the rods. The correctly assembled rods should now have a completely flush inner face.

No.	Description	Sheet
M1	Front coupling rod (2)	A2
M2	Front coupling rod fork joint (2)	A1
M3	Rear coupling rod inner lamination (2)	A2
M4	Rear coupling rod outer lamination (2)	A2
T1a	Radial truck bottom, S7	A1
T1b	Radial truck bottom, Finescale	A2
T1c	Radial truck bottom, Coarse	A2
T2a	Radial truck top and sides, S7	A1
T2b	Radial truck top and sides, Finescale	A1
T2c	Radial truck top and sides, Coarse	A2

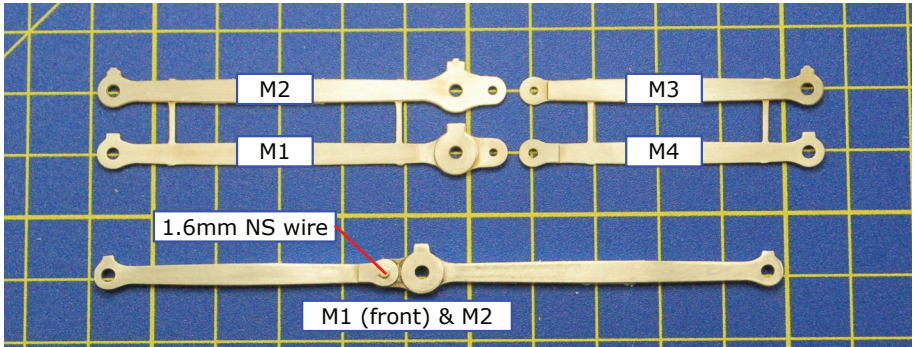


Fig 2. Coupling Rods

Radial Truck. Remove the radial truck bottom (T1a, b or c) that is to the appropriate gauge from the fret. Fold up the front spring wire bracket on the truck bottom. Likewise select the appropriate radial truck top/sides (T2a, b or c). Fold up the sides and attach the bottom and check for free, but not sloppy, movement in the horn guides. Solder the small top hat bearings in place and fit the radial truck wheels using the washers (T3) to eliminate any side play. Bend up the spring wire to give some downward pressure.

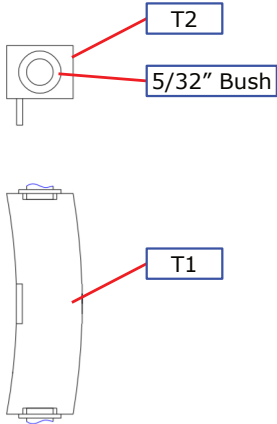


Fig 3. Radial Truck

Finney7

PONY TRUCK

The pony truck is provided with two widths. The wide comprises the frame (T4), the upper frame (T5) and the ATC shoe mounting beam (T6). The corresponding narrow parts are (T7, T8 & T9). Identify and remove the correct one for your gauge. Open up the axle holes in the pony truck frame, to accept the 5/32" bore top hat bearings. If you are not fitting the pony truck mounted ATC shoe then remove the frame mounting webs for the ATC mounting beams (Fig. 3). If you are fitting the pony truck mounted ATC shoe then open out the holes in these webs and those in the mounting beams (T10) to fit 0.8mm wire.

The folding of the frames is quite complex as some of the folds are 90° with the fold line on the inside and others 180° with the fold line on the outside. First fold the lower frame sections and the guard irons over through 180°. The remaining folds can now be made as shown in the diagram. Check that all the bends are square and solder all the pieces together. If appropriate, solder the ATC shoe mounting beams in place locating them with 0.8mm wire. Form the guard irons to shape and solder the diagonal stays (T13) in place. Solder the truck spring overlays (T10) in place with the 5/32" bore top hat bearings. Drill out all the small holes to accept short pieces of 0.8 mm wire to represent the frame bolts.

Bend the upper frame to shape folding the rear stays over through 180° and solder the two parts of the frame together. Solder two lengths of 0.8mm wire as stretcher bars through the holes in the lower frame. Fit the wheels and form the rear of the frame and the struts so that when fitted to the chassis over the pivot the frame is level.

Curve the strengthening ribs upper (T11) and lower (T12) to shape and solder in place in the slots in the upper and lower frames. If appropriate, attach the ATC shoe, pony truck mounting plunger (WM1). Fit the pony truck spring wire so that it locates in the hole in the rear of the upper frame.

No.	Description	Sheet
T3	Pony truck & rear truck axle washer	B2
T4	Pony truck frame, standard width	A1
T5	Upper pony truck frame, standard width	A2
T6	Pony truck ATC shoe mounting beam, standard width (52)	A2
T7	Pony truck frame, narrow width	A2
T8	Upper pony truck frame, narrow width	A1
T9	Pony truck ATC shoe mounting beam, narrow (2)	A2
T10	Pony truck spring overlay (2)	A2
T11	Pony truck upper frame strengthening rib	B3
T12	Pony truck lower frame strengthening rib	B2
T13	Pony truck diagonal stay (2)	B2

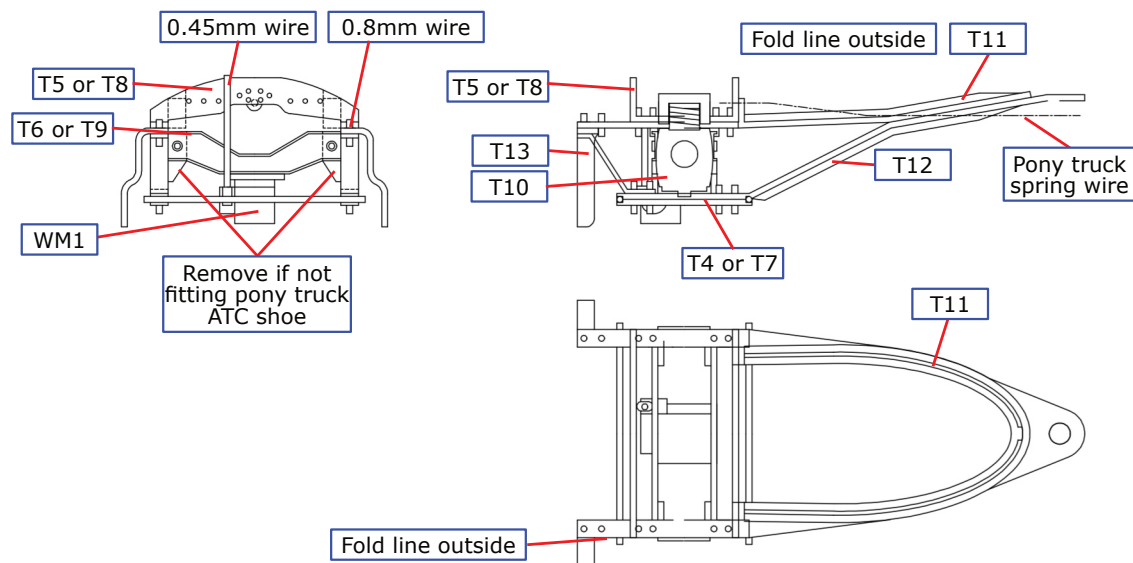


Fig 4. Pony Truck

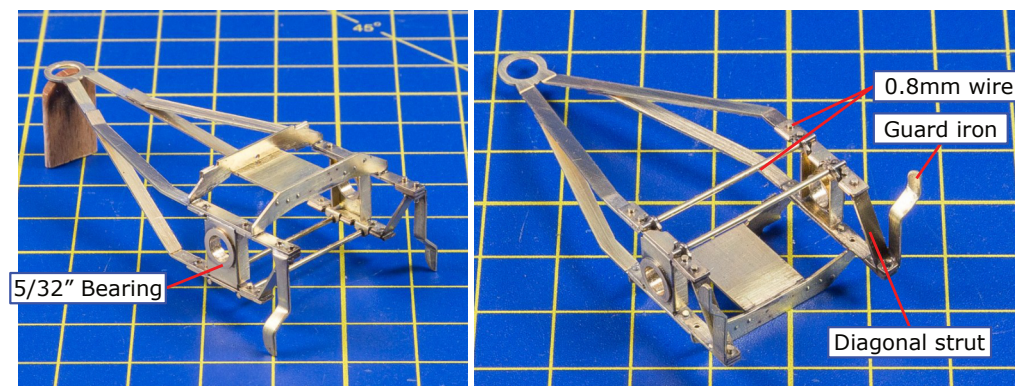


Fig 5. Pony Truck Details

FRAME CONSTRUCTION 1

Frames. To construct the kit as designed with a compensated chassis, first open out the slots in the frames (F1 & F2) by cutting up the half etched lines. Solder one of the rear hornblocks (F8) to the inside of the frames aligning them with the half etched line and with the bottom of the frames. Now open out the following holes in the frames:

B for brake hanger pivots - 0.8mm

S for brake cross shaft - 1.6mm

C for compensation beam pivot - 1/8"

Form the frame joggle to narrow the frames at the rear. Make the first bend inwards through 30° along the front half etched line and strengthen the bend with a fillet of solder. Then make the second bend outwards in the same way. Fold in the radial truck hornguides on the two frames. Bend the valve rock shaft brackets along the 1/2 etched fold lines at right angles and strengthen with a fillet of solder.

No.	Description	Sheet
F1	Left frame	A1
F2	Right frame	A1
F3	Rear frame spacer	A2
F4	Under cab frame spacer	A2
F5	Centre frame spacer	A2
F6	Pony truck pivot frame spacer	A1
F7	Front frame spacer	A2

Frame Spacers and Assembling the Chassis. Remove the frame spacers from the fret - the rear (F3), the under cab, (F4), the centre (F5) the pony truck pivot (F6) and the front (F7) selecting the appropriate width for your chosen gauge. Open out the holes for the front compensation beam in the centre spacer to 1.6mm and the holes for the rear truck and pony truck spring wires in the under cab and pony truck pivot to 0.8mm. If you are fitting plunger pickups drill two holes in the under cab to allow the pickup wires to pass through to the motor.

Fold up the spacers making sure the 1/2 etched fold lines are on the inside and that each bend is a right angle. Emboss all the frame rivets. Fold up the small tabs on the pony truck pivot spacer and solder the 6BA pony truck pivot screw in place between the tabs. Check that the spring wire fits through the holes in the tabs and through the screw slot.

Check that all tabs on the spacers fit properly in their corresponding chassis slots so that the rest of the spacer is hard up against the inside of the frames. Bend the frames inwards slightly along the fold lines at the back of the cylinder opening using the front spacer as a guide.

Now assemble the frames and spacers. Start by tack soldering the under cab spacer to both sides. Check that everything is square and that the spacers are hard against the frames. Put an axle (or better a longer piece of 3/16" rod) through the rear bearings and place the chassis on a piece of graph paper to check that the axle is square to the frames. If all is well solder the remaining spacers to the frames checking constantly that the chassis is square and the frames are straight.

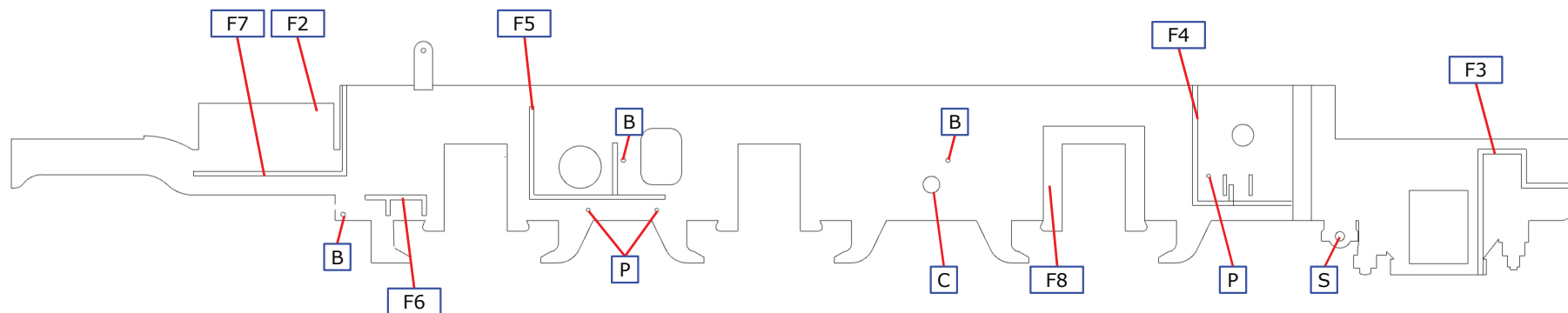


Fig 6. Frame Preparation and Spacers

FRAME CONSTRUCTION 2

Hornblocks and Bearings. Prepare the remaining rear bearings and hornblock (F8). Place a bearing into the rear hornblock that is already soldered to the frame. Slide the second rear hornblock and bearing for the rear axle over a long piece of 3/16" rod with a spring between the bearings. Carefully compress the spring and clip the hornblock between the frames. Make sure the hornblock is square to the chassis and that its bottom edge aligns with the lower edge of the frames and that the long rod is at right angles to the frame before soldering the second hornblock in place.

Fit the remaining centre and front hornblocks (F8 & F9) using a stepped hornblock alignment jig and spring in the same manner as for the rear hornblock. Slide the coupling rods onto the jig to give the correct spacing to the axle centres. Make sure the hornblock is square to the chassis and that its bottom edge aligns with the lower edge of the frames. Solder each into place.

Compensation Beams. Solder the front beam of 1.6 mm steel wire together with a sleeve of 3/32" brass tubing into place through the holes in The centre frame spacer. For the compensation beams (F10), cut a piece of 1/8" brass rod so that it fits through the holes C and is flush with the outside face of the chassis frames. Cut two equal pieces 5/32" tube which together fit between the frames and solder the compensation beams to them close to one end.

Temporarily fit all the wheels and axles and confirm that the compensation works properly and check that the chassis is sitting level. The top of the frames should be 36.6 mm above rail level.

Valve Gear. The valve gear extension rod (F18) fits on a stub of 0.8mm wire on the bracket towards the front of the main frames as shown in Fig 1; it will need to be shortened to clear the spacer. Solder into place.

No.	Description	Sheet
F8	Centre & rear coupled axle hornblock (4)	A1
F9	Leading coupled axle hornblock (2)	A1
F10.	Compensation beam (2)	A1
F18	Valve gear extension rod (2)	A1

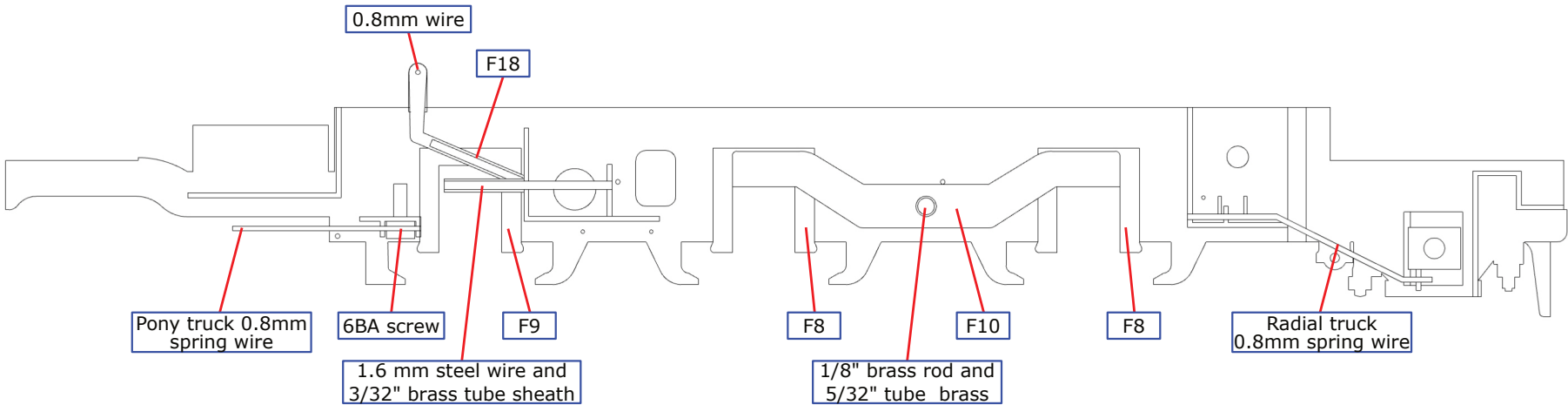


Fig 7. Hornblocks and Compensation

FRAME CONSTRUCTION 3

Frame Overlays. Emboss the rivets on the frame overlays - main left (F11), main right (F12), rear left (F13) and rear right (F14). Fold down the bracket at the top towards the rear of the left main overlay. The corresponding bracket on the right main overlay is not needed and should be removed.

Solder lengths of 0.8 mm wire for the brake hanger pivots. These locate the overlays which are now tack soldered around the edges.

Radial Truck. Fit the radial truck wheels using the washers (T3) to eliminate any side play. Bend up the spring wire to give some downward pressure on the radial truck.

Springs. The springs are made from two outer laminations (F17) around a middle lamination (F16). The leading axle spring is built around the leading axle spring and pony truck beam (F15). Solder up and then clean up in the same manner as the coupling rods. Solder the springs into place as shown in Fig 8. The axles are now retained by the springs.

Sandboxes and sand pipes. Fit 1mm brass wire to the pony truck pivot to represent the front sand pipes. The rear sand box sits against a bracket which is present in three widths to suit gauge. (F19a, b or c). Fold into a U shape and try the fit by placing the tabs into the two slots in the frames behind the trailing wheels. Solder in to place. Remove the rear sand rod (F22) from the etch. It goes through the holes in the main frames and is retained by soldering a length of 0.45mm wire on either side to represent the operating rod. Fit the rear sandbox left & right (WM2 & WM3) as shown in Fig 8. Fit the sand pipes from 1mm wire.

No.	Description	Sheet
F11	Left main frame overlay	B3
F12	Right main frame overlay	B3
F13	Left rear frame overlay	B2
F14	Right rear frame overlay	B2
F15	Leading axle spring and pony truck beam	A1
F16	Spring, middle lamination (4)	A2
F17	Spring, outer lamination (12)	A1
F19a	Sandbox bracket, S7 (2)	B1
F19b	Sandbox bracket, Finescale (2)	B1
F19c	Sandbox bracket, Coarse scale (2)	B2
F22	Rear sanding rod	B2

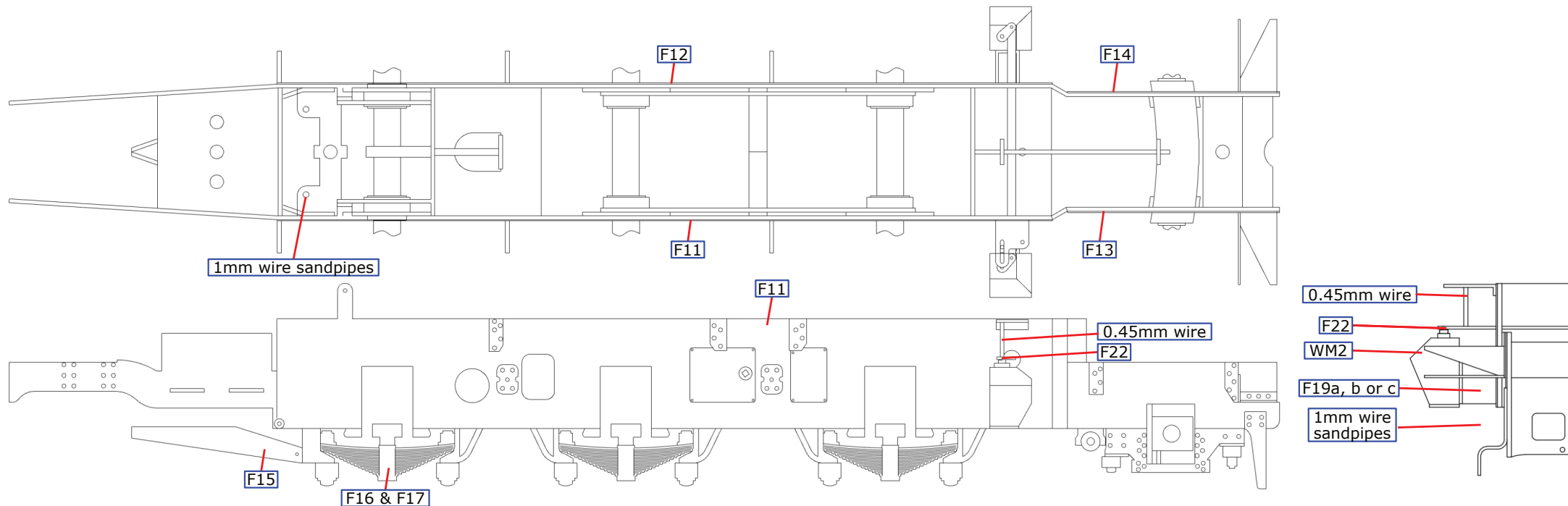
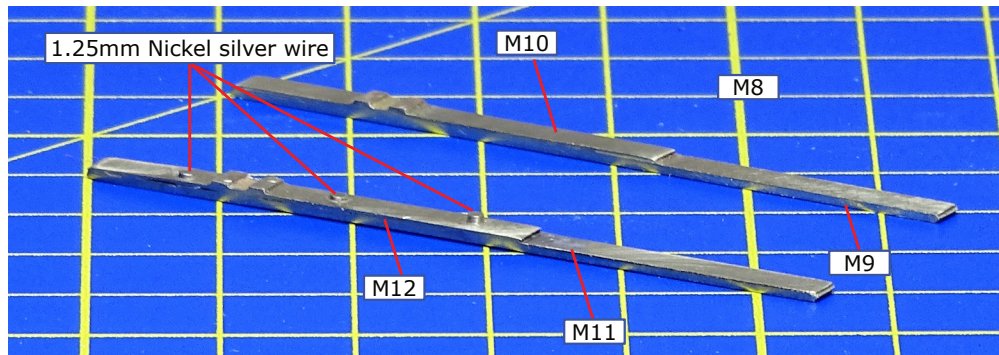


Fig 8. Frame Detailing

CYLINDER ASSEMBLY

The following photos are of a Hall cylinder set. The 51XX is similar with only two cylinder drain valves per cylinder.

Slidebars. Emboss the rivets in the lower slide bar lamination (M7) and solder to the lower slidebar (M8) aligning the sides and rear end. Carefully file the edges smooth and taper the outer surfaces at the rear. Repeat for the upper slide bar (M9 & M10). Open up the oil cup holes in the upper slidebars and solder in short lengths of 1.25mm nickel silver wire.

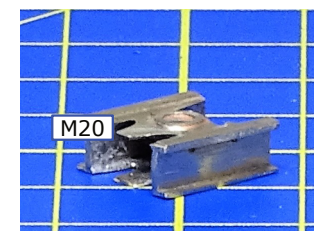
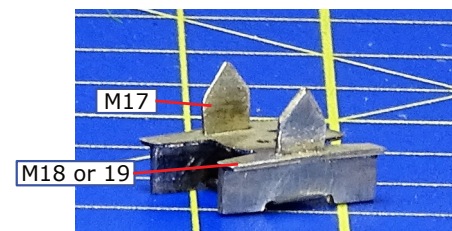
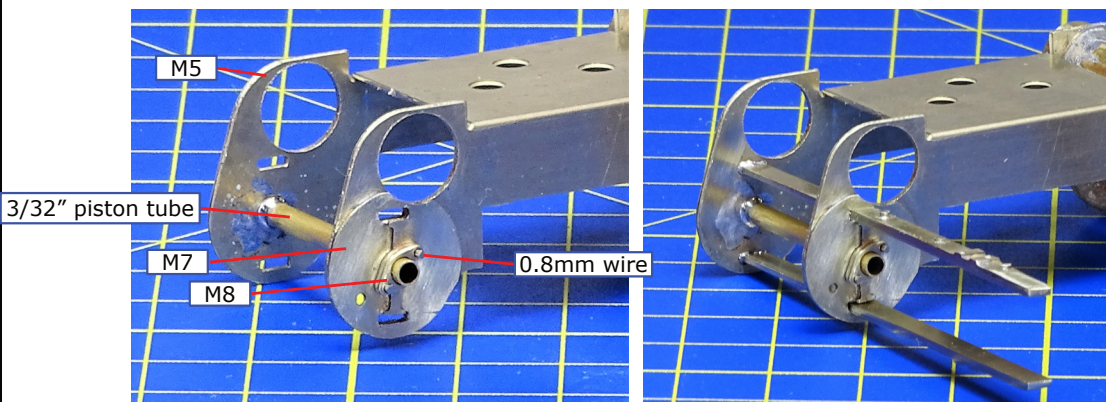


Cylinders. Open out the piston tube and valve chest holes in the cylinder former (M5) until the tubing fits snugly. Reduce the width of the inside cylinder faces to the etched lines provided so that the cylinders are a good fit into the slots in the frames. The holes for the 11/32" valve chest are etched too small and will need to be opened out carefully. Fold up the cylinders making sure they are square.

Fit the 3/32" piston tube flush at the front with 2.5mm projecting at the rear. Place the rear cylinder cover (M7) over the projecting tube and align. The slots for the slidebars will need opening out and we suggest the careful use of a scalpel (the Swann Morton brass handled type). When all the slide bars fit, remove the slidebars and place the cylinder cover rear overlay (M7) and piston rod gland (M8) over the projecting tube passing short lengths of 0.8mm wire through to represent the fixing studs. Solder the assembly in place. Now solder the slide bars in place.

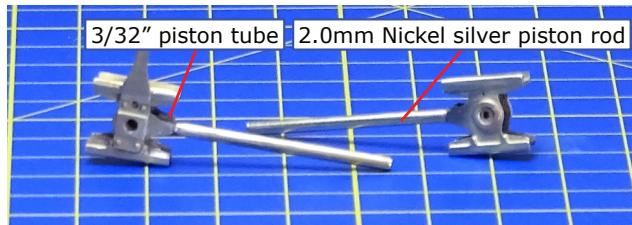
No.	Description	Sheet
M5	Cylinders	A1
M6	Cylinder rear cover (2)	A1
M7	Cylinder cover rear overlay (2)	A1
M8	Piston rod gland (2)	A2
M9	Lower slide bar (2)	A1
M10	Lower slide bar lamination (2)	A2
M11	Upper slide bar (2)	A1
M12	Upper slide bar lamination (2)	A2
M17	Crosshead slipper (2)	A1
M18	Crosshead back, left	A2
M19	Crosshead back, right	A2
M20	Crosshead front (2)	A2

Crossheads. Fold the crosshead slippers (M17) through 90° on the half etched lines. The holes in the crosshead back, left and right (M18 & M19) need to be enlarged with a scalpel to allow the spikes on the slipper through the crosshead back. Ensure that the back sits flat and true on slipper and solder together. Note that the crosshead back with the extension for the vacuum pump drive is on the right side of the engine with the extension at the rear. Drill a 1.25mm hole in the crosshead front (M20) and the hole in the crosshead back. Mount a 1.25mm drill vertically in a block of wood to act as a mandrel and thread the front over the slipper/back assembly. Ensure all is square and carefully solder together. Remove the two prongs at the rear and finish smooth.



CYLINDER ASSEMBLY

Crossheads. Cut a 3.5mm piece of the 3/32" piston tube and solder to a piece of the 2.0 mm nickel silver piston rod. Bend in slightly the small projections at the front of the crosshead so that the tubing is a tight fit between them. Place the piston rod in the piston and slide the crosshead in place with the tubing between the projections; not too far or it will foul the small end of the connecting rod. Now solder the crosshead to the piston rod and the result should be a perfectly aligned and free moving assembly.



No.	Description	Sheet
M13	Cylinder front cover (2)	A1
M14	Valve spindle lamination (4)	A2
M15	Front valve chest cover (2)	A1
M16	Rear valve chest cover (2)	A1
M21	Motion bracket lamination (4)	A2
M22	Cylinder wrapper (2)	B3
M23	Drain cock linkage (2)	B2
M24	Drain cock lever (6)	B2
M25	Slide bar splasher - (2)	B3
M26	Connecting rod inner lamination (2)	A2
M27	Connecting rod outer lamination (2)	A2
M28	Connecting rod boss lamination (4)	A2

Assembly. Clean off the cylinder front flush. Attach the cylinder front covers (M19) with the hole for the relief valve vertically below the centre of the cover. There is no hole etched for the front cylinder relief valves in the cylinder etch. Drill out the relief valve holes, back and front and solder the castings (BR1) in place.

Solder the slide bar bracket laminations (M20) together back to back. Fit them to the slide bars checking the crossheads for free movement and that when the cylinders are mounted on the frames they slide into the slot in the front extension to the frame overlay.

Valve Chest. Solder the valve chest covers, front and rear (M21 & M22) to the 11/32" valve chest tube and attach in place with equal amounts of tube protruding back and front.

Wrapper and Drain Cocks. Form the cylinder wrapper or the cylinder wrapper with snifting valve (M23 or M24) to shape and solder in place making sure the drain cock holes are on the bottom centre line. For the steam chest mounted snifting valves, first solder the snifting valve mounting plate (M25) in place behind the slot in the wrapper.

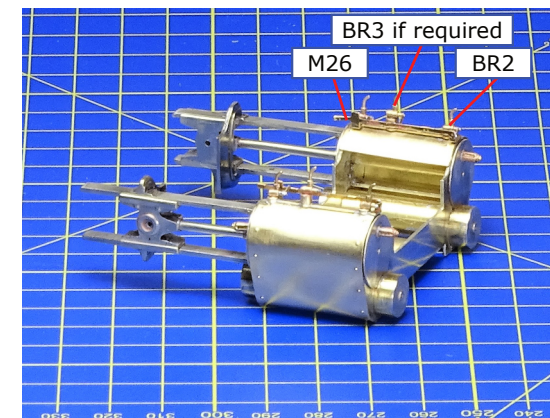
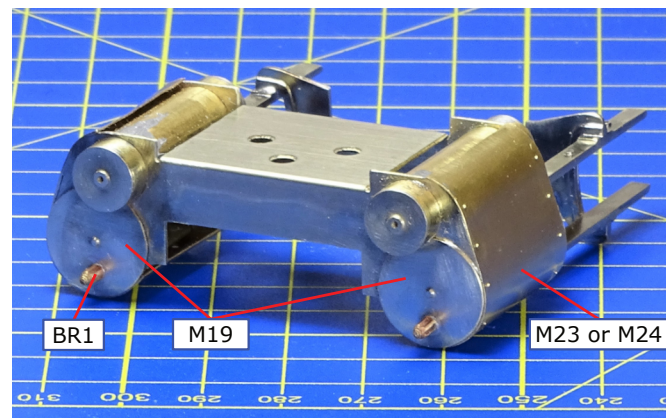
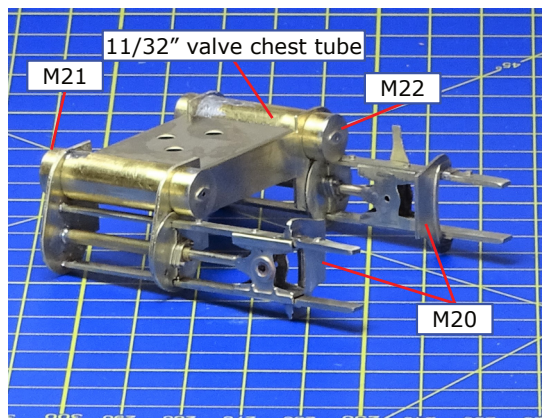
Emboss the rivets on the drain cock linkage (M26) and fold it along the half etched lines. Attach

the drain cock castings (BR2 and BR3) together with the drain cock linkages to the cylinders. File off the piece of the drain cock spigot in front of each lever.

Valve Spindles. Emboss the rivets in the valve spindle laminations (M27)) and solder them together. If you are not constructing working valve gear fix them in place in the valve chest.

Connecting Rods. Solder together the connecting rod laminations (M28 & M29) and add the rod boss laminations (M30) to the big end back and front. The rods have been deliberately etched too large so that the thin etched edges can be carefully filed so that the 'laminated' effect is lost and the rods appear to be made from one piece of metal. Drill the big end to fit the crankpins and the small end 1.25 mm. Fit the connecting rod to the crosshead using 1.25mm wire for the pin. Carefully solder the pin from the rear and file flush.

The cylinders will be held in place when the body is attached but they can be fixed by fixing two 6BA bolts through the outside holes into tapped holes in the front spacer.



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BRAKES

Wheels and Balance weights. The balance weights supplied in the kit are incorrect and an etch of accurate weights is included in the kit. Attach the balance weights to the wheels using photographs as a guide to position. Assemble the wheel sets, bearings and rods selecting 3/16" axle washers of appropriate thickness to control side-play. A thorough check of all clearances at this stage is important especially between the leading crankpin/crosshead.

Springs. See Fig 7. The springs are made from two outer laminations (F17) around a middle lamination (F16). The leading axle spring is built around the leading axle spring and pony truck beam (F15) Solder up and then clean up in the same manner as the coupling rods. Solder the spring into place as shown in Fig 7. The axles are now retained by the springs.

Brakes. The brake hangers are made from two laminations. First select the leading axle brake hanger inner and outer (B1 & B2). First emboss the rivet on the outer lamination and then solder the inner and outer together and clean up. Detail the front of the hangers with the overlay (B3). Now select the centre and trailing axle brake hanger inner and outer (B4 & B5). First emboss the rivet on the outer lamination then solder the inner and outer together and clean up. Detail the front of the hangers with the overlay (B6). Attach the hangers to the pivot wires.

Emboss the bolts onto the brake pull rod and cross shafts (B7) and brake cross shaft overlays, leading, centre and trailing (B8, B9 & B10). Solder the cross shaft overlays to the top of B7, then carefully twist the pull rods between the cross shafts vertical. Fix this assembly to the brake hangers. Cut a piece of brass 1.6mm wire to length to be the brake cross shaft. Laminate the rear brake pull rod laminations (B11) together and clean up. Fit the brake shaft vacuum cylinder lever (B12), the hand brake lever (B13) and the rear pull rods onto the rear cross shaft as shown in Fig 6.

No.	Description	Sheet
F23	Washer for coupled wheels axle	A1
F24	Washer for coupled wheel axle	B2
B1	Leading axle brake hanger inner laminate (2)	B1
B2	Leading axle brake hanger outer laminate (2)	B1
B3	Leading axle brake hanger overlay (2)	B3
B4	Centre and trailing axle inner laminate (4)	B1
B5	Centre and trailing axle outer laminate (4)	B2
B6	Centre and trailing axle brake hanger overlay (4)	B3
B7	Brake pull rods and cross shafts	B1
B8	Leading brake cross shaft overlay	B1
B9	Centre brake cross shaft overlay	B1
B10	Trailing brake cross shaft overlay	B2
B11	Rear brake pull rod lamination (4)	B3
B12	Brake shaft vacuum cylinder lever (2)	A1
B13	Brake shaft handbrake lever (2)	A1

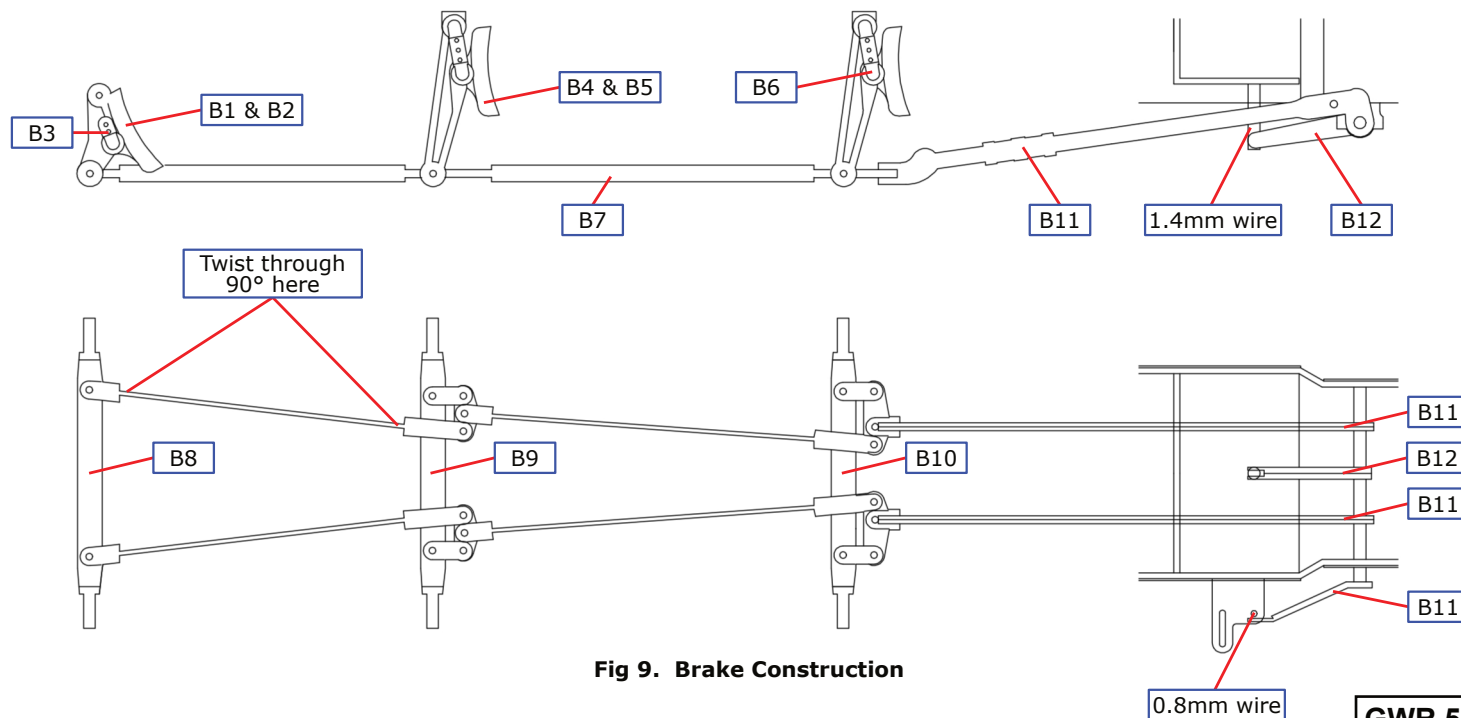


Fig 9. Brake Construction

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FOOTPLATE 1

Open up the buffer holes (4.7mm) in the footplate (U1) and the buffer beams front and rear (U2 & U3) to fit the buffer housings. Fold up the footplate, first folding the front valances followed by the rear valances and step. Now fold the step and lower platform behind the cab. Continue at the rear and fold down the rear valances and buffer beam. Next, at the front fold, over the front buffer beam followed by the front step. Finally fold the front sandbox sides, the rocking shaft brackets and the lamp brackets. Solder some scrap pieces of brass to the inside of the valance alongside the valance joggle to strengthen the footplate.

Emboss the rivets in the front footplate overlay (U4) then curve to shape to match the valances and solder in place. Prepare the main footplate overlay (U5) by embossing the rivets on the tank angle strips, around the splashers and on the bases of the front sandbox pivots. Fold over the cab floor support, fold up the splashers and temporarily join the overlay to the footplate with a screw through the body fixing holes at the front. Check the alignment of the tank former slots before soldering together all round. Solder a 6BA nut over the front fixing hole. Add the rear footplate overlay (U6) again, the overlay can be held down by putting a screw through the body fixing holes and ensure that tank former slots line up. Drill the pump rod hole, 0.8mm, in the end of the vacuum pump (BR4), solder in place in the slots under the footplate. Fix a piece of 0.8mm wire to the crosshead bracket. Trim the pump rod as short as possible so that the body can be removed by a slight movement forward.

Solder short lengths of 1.25mm wire into the holes in the footplate at the front to represent the oil cups. Emboss the rivets on the buffer beam front and rear (U2 & U3) and solder in place.

Solder the left main valance overlay (U7). The right main valance comes in three varieties - an overlay for no ATC (U8), an overlay with brackets to mount the ATC conduit in the centre of the valance (U9) and finally a valance to mount the ATC conduit below the lower edge of the valance (U10). Solder the chosen overlay in place. Now solder the rear valance overlay left and right (U12) in place. Add the front valance brackets (U13) and then the rear brackets (U14). These parts are handed to ensure that the curvature on the bracket matches the curvature of the valance.

No.	Description	Sheet
U1	Footplate	B1
U2	Buffer beam - front	B1
U3	Buffer beam - rear	B1
U4	Front footplate overlay	B1
U5	Main footplate overlay	B1
U6	Rear footplate overlay	B2
U7	Left main valance overlay	B1
U8	Right main valance overlay, no ATC brackets	B1
U9	Right main valance overlay, centred ATC bracket	B2
U10	Right main valance overlay, lower edge ATC brackets	B2
U11	ATC conduit fixing brackets	B1
U12	Rear valance overlay (2)	B3
U13	Valance to buffer beam bracket, front (2)	B3
U14	Rear valance to buffer beam bracket (2)	B3

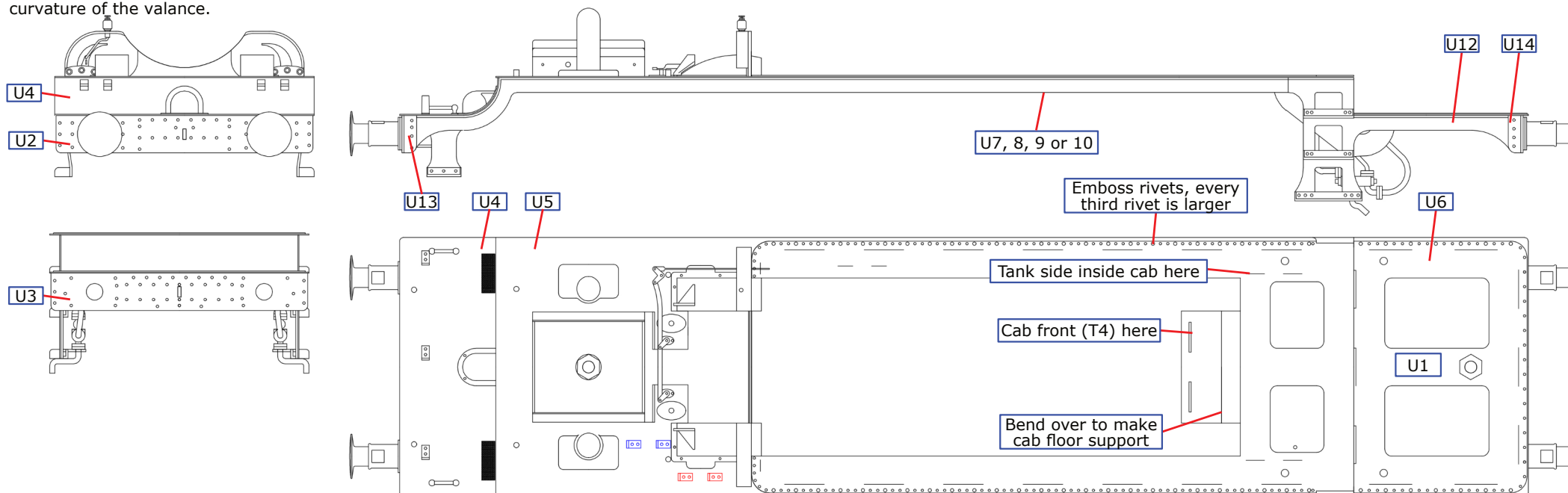


Fig 10. Footplate Construction

FOOTPLATE 2

Steps. The step treads are next. The rear steps have two upper treads (U15) and a lower tread (U16). The front step only has a lower tread (U17). Fold up and solder into place on the step backs.

Curve the splasher tops (U18) to shape by rolling underneath a suitable rod or dowel on a resilient surface (a piece of hard rubber sheet). Cut a small slot in the splasher tops to clear the rocking shaft brackets before soldering in place.

Solder the smokebox saddle front and back (U19) into the slots in the footplate. Curve the smokebox saddle sides (U20) to fit and solder in place.

Emboss the rivets on the motion bracket & boiler support (U21) and solder together with the support overlay (U22) at the front. Form motion bracket & support top angle (U23) to shape and solder to the motion bracket and then add the bolt overlays (U24). Check the fit of the motion bracket in the footplate slots - it must sit down tight on the footplate to ensure correct boiler fit later. When satisfied solder in place.

If you are fitting the ATC equipment from the ATC conduit, which runs along the right side valence, from 0.45mm wire. For the valance with the conduit on the centre line (U9) cut the strips (U11) into six pieces and use them to attach the conduit through the pairs of small slots in the valence. For the valance with the conduit on the lower edge (U10) attach the conduit in the small slots in the brackets along the lower edge of the valence.

No.	Description	Sheet
U15	Rear step upper tread (4)	B3
U16	Rear step lower tread (2)	B3
U17	Front step (2)	B3
U18	Splasher top - (2)	B2
U19	Smokebox saddle front and back - (2)	B1
U20	Smokebox saddle sides (2)	B3
U21	Motion bracket & boiler support	B1
U22	Motion bracket & boiler support overlay	B2
U23	Motion bracket & boiler support top angle (2)	B1
U24	Motion bracket & boiler support bolt overlay	A2
U25	Front sanding rod	B3
U26	Rocking shaft bracket web (2)	B3
U27	Steam pipe valve handle (2)	B1

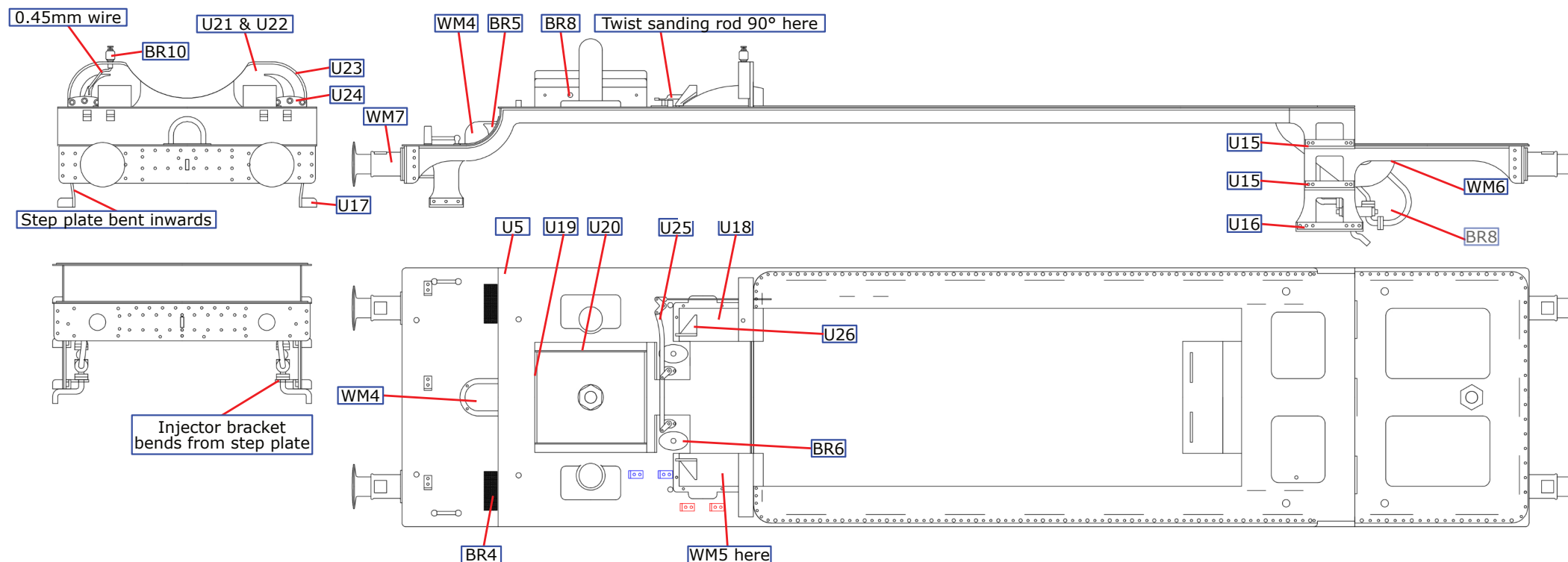


Fig 11. Footplate Construction

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FOOTPLATE 3

Attach the front sanding rod (U25) to the footplate using 0.45mm wire for pins. Fold up and solder the rocking shaft bracket web (U26) as shown in Fig 10.

Fit the following castings into place - the front drop plate steps (BR5), the pony truck spring cover (WM4), the valve rocker shaft housings (WM5), the front sandbox lids (BR6), the pony truck lubricator (BR7), the snifting valves (BR8), the tank balance pipes (WM6), the injectors (BR9), the vacuum pump lubricator (BR10).

Buffer Beams. Fit the front vacuum pipe (BR11) and dummy (BR12) to the front buffer beam. Fit the rear vacuum pipe (BR13) in place. The steam heating pipes (BR14) fit in the brackets under the buffer beams. Steam heating pipe valve handles (U27) fit on the lower spigot of the casting. The pipes can be fitted later along with the steam heating pipe connectors (BR15). Fit the buffer housings (WM7). Fit the ATC shoe (BR16) if you are using the buffer beam mounting. You will need to add the ATC shoe plunger (BR45).

No.	Description	Sheet
U25	Front sanding rod	B3
U26	Rocking shaft bracket web (2)	B3
U27	Steam pipe valve handle (2)	B1

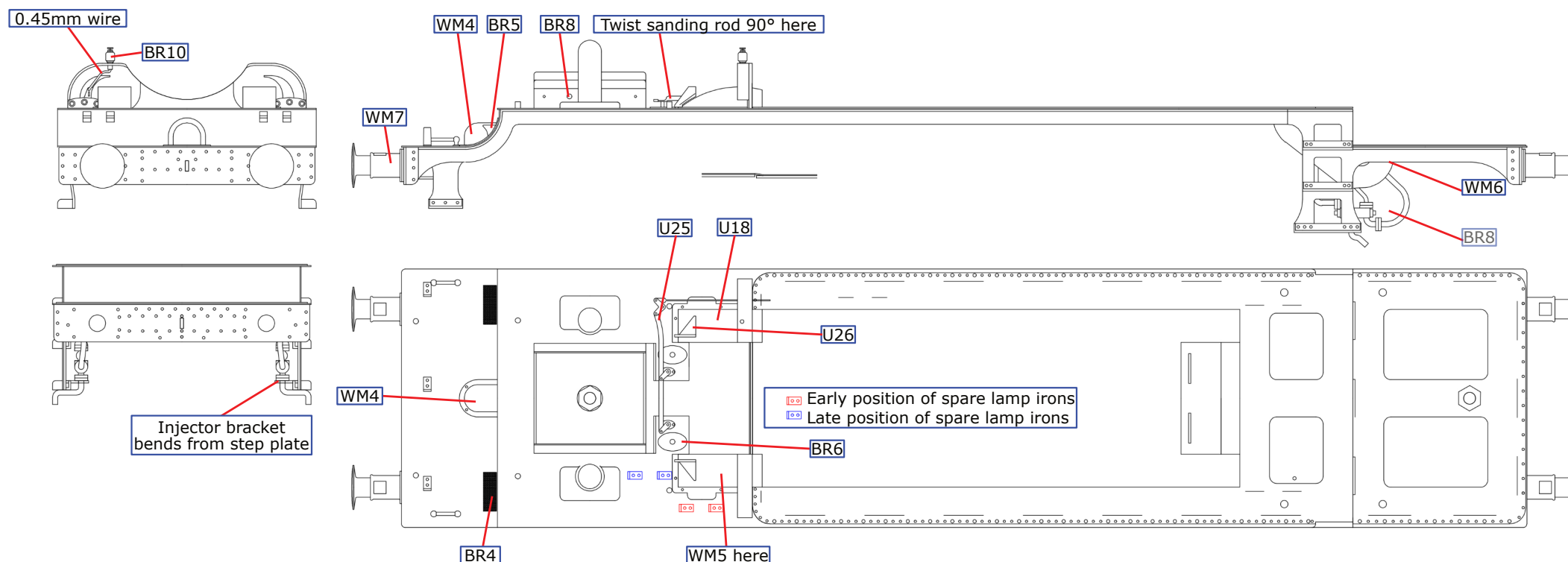


Fig 12. Footplate Construction

FIREBOX, BOILER & SMOKEBOX

Fold up the firebox former (SB1) and solder the firebox front overlay (SB2) to the front ensuring the dowel holes align. Using the notches in the top of the formers and the firebox wrapper (SB3) as a guide centre the wrapper and mark in pencil the position of the top bends. Form the bends over a suitable rod held in a vice. When happy with the forming, solder the wrapper to the formers ensuring a large fillet of solder around the front join. Round the front corners of the firebox with a file.

Fold the firebox band joining brackets (SB4) into a 'U' shape so that they fit through the slots in the firebox top and solder in place from inside. Complete with a short piece of 0.45mm wire to represent the tightening bolt. Attach the mudhole doors (BR21) in place on the firebox.

Emboss the rivets either side of the top feed pipe on the boiler wrapper (SB5). The washout plugs can be drilled out and the etched boiler washout plugs (SB6) used if you prefer. Form the coned boiler by rolling and check for fit around the front and rear formers (SB7 & SB8) before soldering together. The etched notch at the top of the rear former must align accurately with the notch in the wrapper. Solder two short pieces of 0.8mm wire into the holes in the rear former to act as dowels to locate the boiler and firebox.

Take the smokebox wrapper (SB9) and open out the front strut holes to 1.2mm and emboss the rivets around the plates behind the valve rocking shaft. Roll the wrapper and check the fit on the front and rear formers (SB10 & SB11). Solder the wrapper ends together using the joining strip (SB12); the two band joining brackets go through the two slots in the bottom section of the wrapper. Solder in the two formers flush with the back and front with the notch in the bottom of the front spacer aligned with the wrapper join. Represent the bolts in the joining brackets using 0.45mm wire. The upper hole in the front former is for the handrail knob and the other hole is for the steam lance cock. Emboss the four rivets on the smokebox front overlay (SB13), and attach to the front of the smokebox aligning the handrail and lance cock holes. Bend up the smokebox step (SB14) and solder in place under the smokebox front.

No.	Description	Sheet
SB1	Firebox former	A1
SB2	Firebox front overlay	A1
SB3	Firebox wrapper	B3
SB4	Firebox bands joining bracket	B3
SB5	Boiler coned wrapper	B3
SB6	Boiler washout plug (4)	B3
SB7	Boiler front former (2)	A1
SB8	Boiler rear former	A2
SB9	Smokebox & parallel boiler wrapper	B3
SB10	Smokebox front former	A1
SB11	Smokebox rear former	A1
SB12	Smokebox/parallel boiler section joining stripB2	
SB13	Smokebox front overlay	A1
SB14	Smokebox step	B1
SB15	Footplate front strut plate (2)	A1
SB16	Smokebox front strut plate (2)	A1

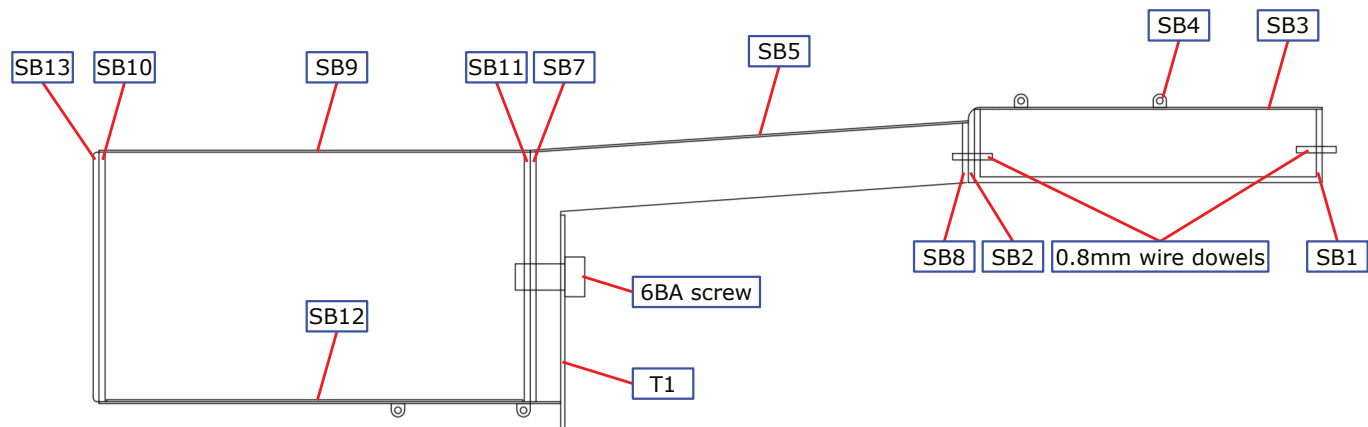


Fig 14. Smokebox, Boiler and Firebox Construction

CONSTRUCTING THE TANKS 1

Tank Former & Cab Front. The holes for the horizontal cab handrails, which move when shutters are fitted, need to be drilled. Using the tank former (T1) as a template (align the handrail knob holes in front of the cab door), drill the appropriate holes 0.45mm for the horizontal handrail on the tank, cab & bunker overlay (T2). Store the overlay for later use. Fold up the tank former and solder in place in the footplate slots.

Solder the front window frames (T3) in place on the cab front (T4) before soldering in place in the slots in the footplate and tank former. Ensure the edges of the cab sides are flush with the tank former sides.

Now check the fit of the boiler, smokebox and firebox with the cab front and smokebox saddle. Tack solder the smokebox to the saddle and once again check. If all is well complete soldering of smokebox to saddle and firebox to cab front.

Fit the front struts from 1.2mm wire together with the front strut plates for the footplate and smokebox (SB15 & SB16), see Fig 13.

Tank Top Overlays. If appropriate, fold up the lubricator brackets from the tank former. Emboss the rivets on the tank top overlays (T5) and curve the inner edges to fit over the boiler and firebox before soldering in place.

Cab Interior. Working inside the cab, solder the cab tank insides (T6) to the tank former and footplate. Emboss the rivets on cab tank top (T7) and solder into place. Add the brake column brackets (T8) to the inside of the left hand tank.

Fold the outer tabs of the cab floor (T9) at the door openings under to thicken the cab floor. Drill out the brake column hole in the cab floor (T9) so that the column will pass through. Form the splashers tops on the cab floor and fill the splashers sides with scrap brass. Fix the cab floor in place. Add the following castings - the brake column (BR18), the ATC battery box (WM7), the lever reverse base (WM8) & and the lever reverse handle (BR19).

No.	Description	Sheet
T1	Tank former	B3
T2	Tank, cab & bunker overlay (2)	B2
T3	Cab front window frame (2)	B1
T4	Cab front	B3
T5	Tank top overlay (2)	B1
T6	Cab tank inside (2)	B1 & 3
T7	Cab tank top (2)	B1
T8	Brake column bracket (2)	B2
T9	Cab floor	B1

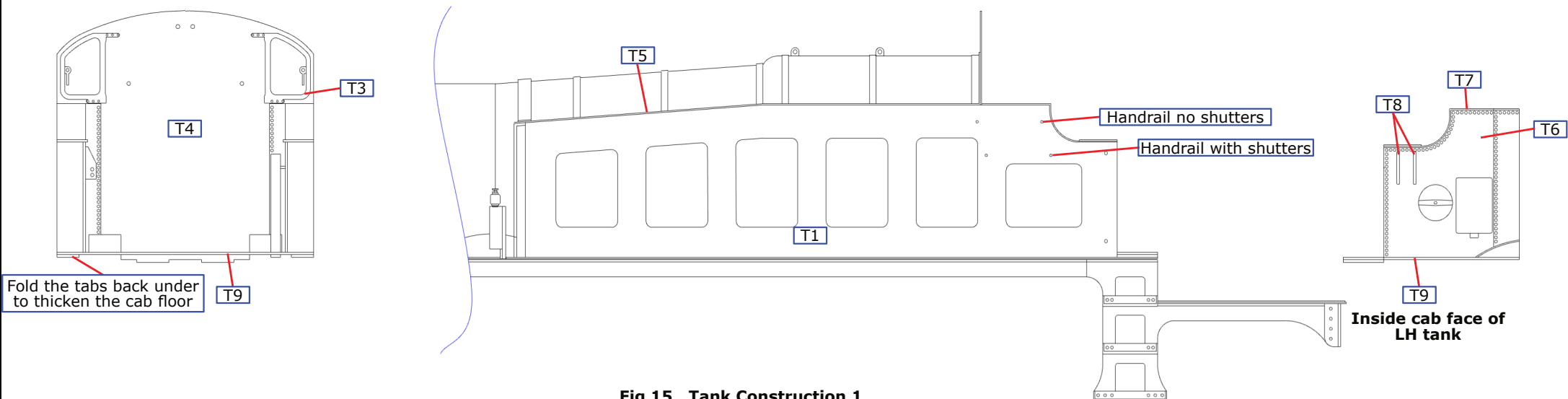


Fig 15. Tank Construction 1

CONSTRUCTING THE TANKS 2

Bunker Former. Using the bunker former (T10) as a template (align the handrail knob holes behind the cab door) drill the appropriate 0.45mm holes for the bunker and cab rear handrails in the tank, cab & bunker overlay (T2). Fig 11 should help select the correct holes.

Emboss the rivets on the bunker former (T10) before folding to shape. Fit the coal door (T12). Attach the water feed valve brackets (T11), the operating rods from 0.8mm wire and the water feed valve handles (BR20). Assemble the cab seats (T13 & T14) which are designed to be working. Now remove the seats from the brackets, solder the brackets to the front of the bunker and then replace the seats.

Solder the bunker former, together with the rear former (T15), in place in the footplate slots.

Cab Back. There are two alternative cab rear overlays, the first has etched window bars and the second allows wire bars to be built (T17 & T18). Emboss the rivets on both the inner overlay (T16) and the chosen outer overlay. If you are using the wire bars back, form the window bars from 0.45mm wire using the bending jig (T19) as an aid. Space the bars off the cab rear with a piece of card (approximately 0.9mm thick) and solder in place. Solder the two cab rear laminations together before fixing in the slot in the bunker top. Solder the cab rear shelf (T20) in place. Bend the bunker vent pipe from 1.4mm brass wire as shown in Fig 9. Solder in place using the etched brackets (T21).

No.	Description	Sheet
T10	Bunker former	B3
T11	Water feed valve bracket (2)	B3
T12	Coal door	B1
T13	Cab seat bracket (2)	B3
T14	Cab seat	B3
T15	Bunker rear former	B2
T16	Cab rear inner overlay	B1
T17	Cab rear outer overlay, etched bars	B1
T18	Cab rear outer overlay, wire bars	B3
T19	Cab window bars bending jig	B3
T20	Cab rear shelf	B1
T21	Bunker vent pipe brackets	B1

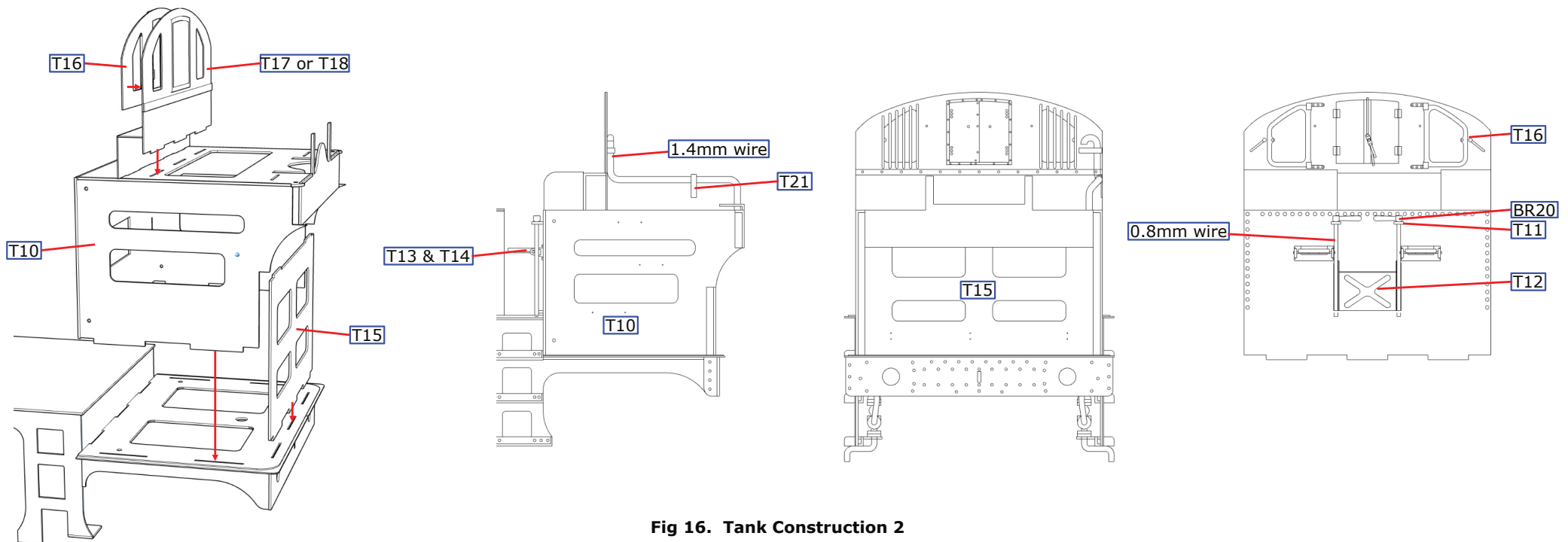


Fig 16. Tank Construction 2

CONSTRUCTING THE TANK 3

See Fig 17, next page.

Tank, Cab & Bunker Overlay. If you are fitting the cab shutters remove the rivets around the top of the cab opening on tank/cab side overlay(T2) so that the cab side shutter rivet strip (T23) will fit flush to the cab side. Now form the bend between the cab sides and the cab roof edges. To do this, first scribe, with a sharp point, the fold lines (make them quite deep) on the inside. The lines run from the slots in the projections either side. File off the marking projections when satisfied and make the folds to match the cab back and front. Attach the cut-out beading (T24) to the cab sides fitting the etched groove over the edge of the cab side, then trim to length and at the same time remove the upper of the pieces in the cab door opening.

Now, if appropriate, fit the cab shutters and rivet strip (T22 & T23). The shutters are set out from the cab sides by the rivet strip at the top and at the bottom by folding under the piece projecting at the front of the shutter.

Form the bends for the bunker and tank front by bending over a rod or drill shank (bunker 1/8" (3.2mm), tank front 4mm). The position of the bends are indicated by very small slots in the edges of the overlays. Remove the lower of the pieces in the cab door opening before soldering the overlays in place. Soldering the overlay in place can be done almost entirely from inside through the holes in the formers.

Add the handrail below the shutters from 0.45mm wire.

Cab Roof. Fold up the back and front of the cab roof building jig (T25) which gives a solid base upon which to build the removable cab roof. This is retained by clipping under the rain strips above the cab openings on either side. Roll the cab roof (T26) to shape and solder in place on the jig with equal overhang back and front - the cut-out for the ventilator is at the rear. Add front and rear angle (T27) to the front and rear edges and the ventilator (T28). Now using a Carborundum disc in a mini-drill cut through the unwanted part of the former and snap off the redundant parts along the half etched lines. The edges of the formers will now need cleaning up. Add the rain strips (T29) as shown in below. If fitting bunker steps, add the handrail to the roof from 0.45mm wire.

Bunker. Curve the bunker lower panel (T30) and solder in place making a generous fillet at the side seams before filing the corner to match the curve of the top and bottom. Curve the bunker upper rear panel (T31) to shape and solder in place in the groove in the base of the lamp bracket recess. Fit the tank top beading (T32) and the bunker top beading (T33), checking the clearance with the cab roof. The correct relationship between the beading and the roof angles, on the back and front, is shown below.

Bend the bunker fender (T38) to match the bunker rear panel and solder in place. Add the bunker fender centre bracket (T39) & bunker fender side bracket (T40) as shown in Fig 10. Add the tank lower rivet strip (T34) and the bunker lower rivet strip (T35).

Fit the left toolbox (WM9) and right toolbox (WM10) on to the bunker shelf. Fit the ATC Bell (WM20) to the cab right hand inside.

Until we complete a test build we are unsure as to when is the correct moment to add the cab doors (T37).

Emboss the two sets of four rivets in the tank connecting strap (T36); the four dimples in the centre portion mark the position of holes to be drilled for handrails when fitted. Fold up the strap and fit as shown in Fig 10.

No.	Description	Sheet
T22	Cab side shutter rivet strip (2)	B1
T23	Cab side shutter (2)	B1
T24	Cab side cutout beading (2)	B1
T25	Cab roof building jig	B1
T26	Cab roof	B3
T27	Cab roof front & rear edge angle (2)	B1
T28	Cab roof ventilator	B1
T29	Cab roof rain strip (2)	B2
T30	Bunker lower panel	B2
T31	Bunker upper panel	B1
T32	Tank top beading	B1
T33	Bunker top beading	B3
T34	Tank lower rivet strip (2)	B2
T35	Bunker lower rivet strip (2)	B1
T36	Tank connecting strap	B1
T37	Cab door (2)	B2
T38	Bunker fender	B2
T39	Bunker fender centre bracket	B2
T40	Bunker fender side bracket (2)	B2

CONSTRUCTING THE TANK 4

Section showing the tank connecting strap fixing

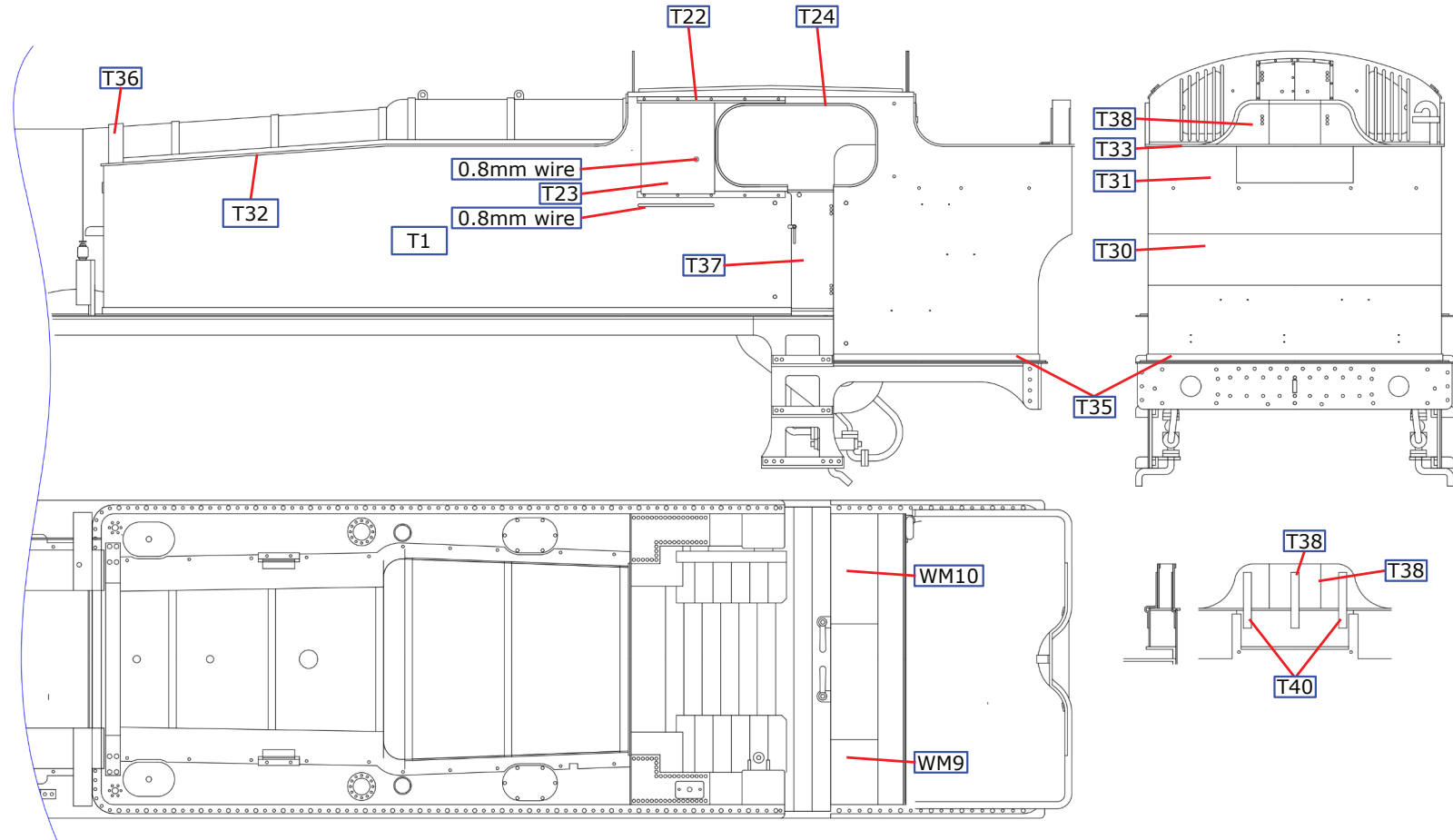
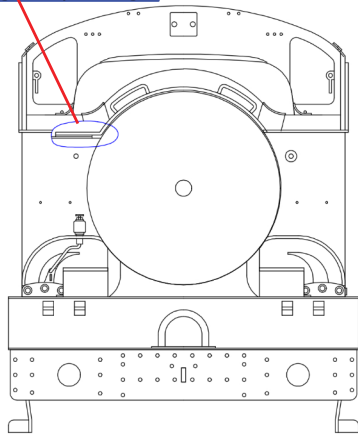


Fig 17. Tank Construction 3

CAB INTERIOR AND BACKHEAD

The backhead is placed here, out of sequence, due to space.

To soften the castings to drill holes for the copper wires, heat the castings to red on an asbestos board. Drill holes to match the wires shown in Fig 9. Solder the wires to the castings with a high melting point solder. Build the backhead (WM11) as shown in Fig 9.

No.	Description	Sheet
C1	Regulator lever extension	A2
C2	Backhead shelf	B1
C3	Cab pressure gauges (3)	B3
C4	Gauge glass lever	B3
C5	Steam fountain/blower handles (4)	B3
C6	Ejector/brake handle	B3

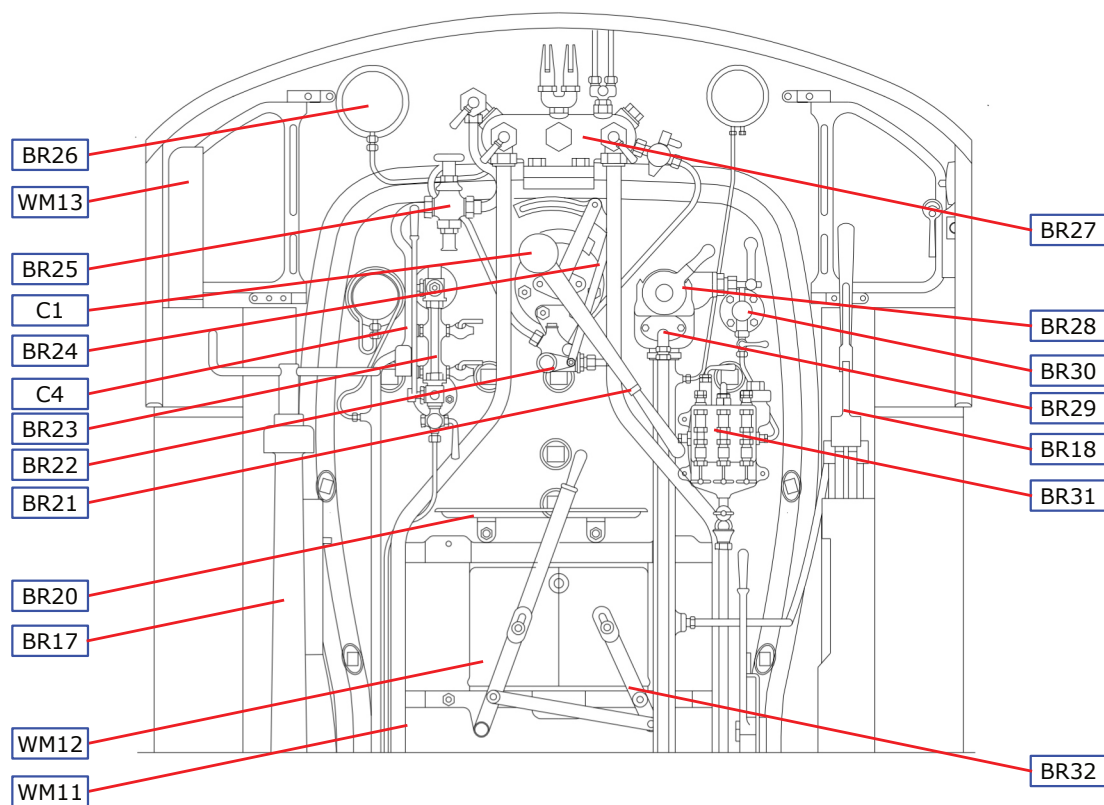
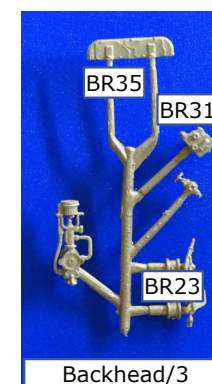
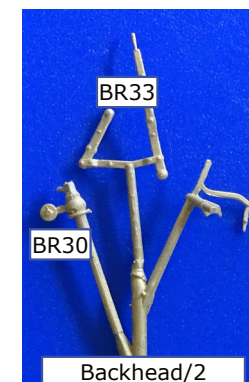
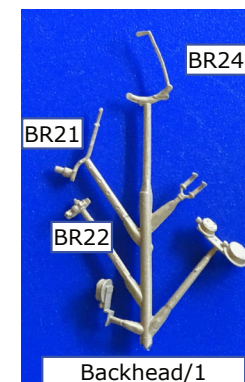


Fig 18. Footplate Construction



FINAL DETAILING

See Fig 19, next page.

Smokebox. Fit the steam lance cock (BR34) to the front of the smokebox. Fit the Smokebox door (WM14) and then fit the smokebox door handles (BR33). If required, fit the smokebox lamp bracket in place (T48) or solder the smokebox lamp bracket to the smokebox. Fit the smokebox saddle bolt strip (WM15) to each side of the saddle. Fit the outside steam pipe (WM16) and the outside steam pipe bases (WM17). Fit the chimney (CU1) to the smokebox. Fit the smokebox pipe cover (WM18) to the right hand side of the smokebox. Solder four medium handrail knobs in the smokebox holes then form the handrail to shape, thread on the front medium knob, and fix the handrail in place.

Boiler. Fit the top feed & safety valve base (WM19) followed by the safety valve springs (BR35). If the safety valve casing (BR36) is to be painted, fit it now, otherwise wait until painting is complete. Form the top feed pipes from 1.4mm wire and solder in place in the 'slot' in the boiler overlay. Fit the mudhole doors (WM20) as shown. Fold up the whistle shield (T52). Thread the whistles, large and small (BR37 & BR38) through the whistle bracket (T51) and whistle shield and into the cab front. Solder into place.

Tanks. Add the steps on the front of the tank either the original step (T41) or the later type (T42). As required, fit either the screw type water filler (BR39) or the later lever type water filler (BR40). Next fit the water filler bumper bracket (T47) and the water filler bumper (BR41). The lifting ring brackets (T45) need to be riveted. The lifting rings are made by wrapping 0.45mm fuse wire around a 2.8mm drill shank. Thread a ring through the lifting ring eyelet (T45) and assemble with a bracket as shown below. Repeat for all four lifting ring brackets. Fold up the fire iron bracket (T46) and solder in place. Fit the tank vents (BR42). If required, add the axle journal lubricators (BR43) to the tanks just in front of the top feed pipe

Bunker. The steps on the right hand side of the bunker were fitted by BR. Add the four bunker steps (T42) and the bunker lower step (T43) as required. Fold up the bunker top lamp bracket (T49) and solder in place. Emboss the rivets in the bunker lamp irons (T50) and fold to shape. Solder the lamp irons in place on the bunker with the rivets of the lamp iron over the rivets on the bunker. Add the handrails from 0.45mm wire.

No.	Description	Sheet
T41	Tank front step, original type (2)	B3
T42	Tank front, later type and bunker step (6)	B2
T43	Bunker lower step, long	B2
T44	Lifting ring eyelet (4)	B1
T45	Lifting ring bracket (4)	B2
T46	Fire iron bracket	B2
T47	Water filler bumper bracket (2)	B1
T48	Smokebox lamp bracket	
T49	Lamp bracket for smokebox, bunker top & spare	B3
T50	Bunker lamp bracket (3)	B3
T51	Whistle bracket	B2
T52	Whistle shield	B3

Finney7

FINAL DETAILING

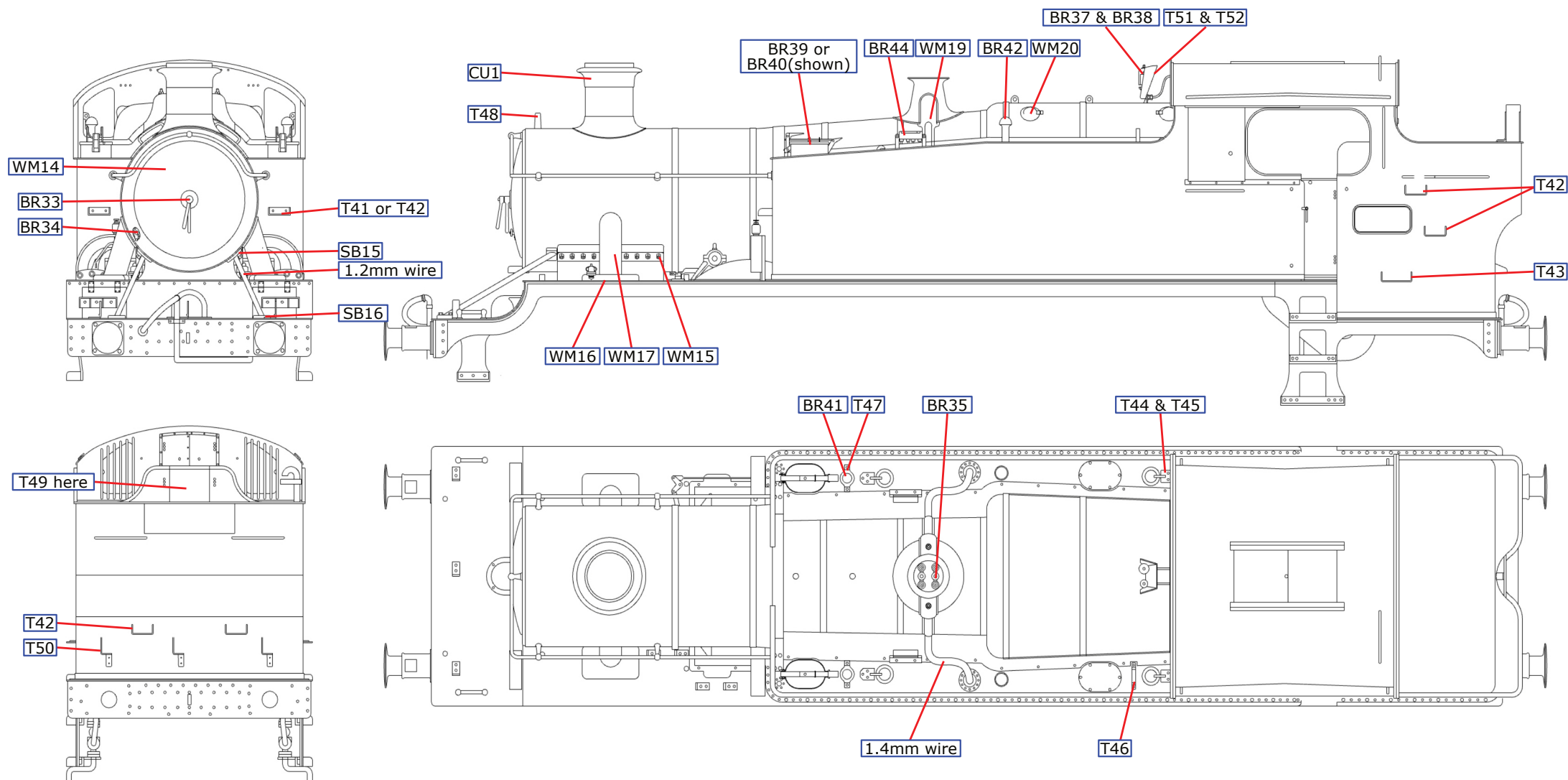
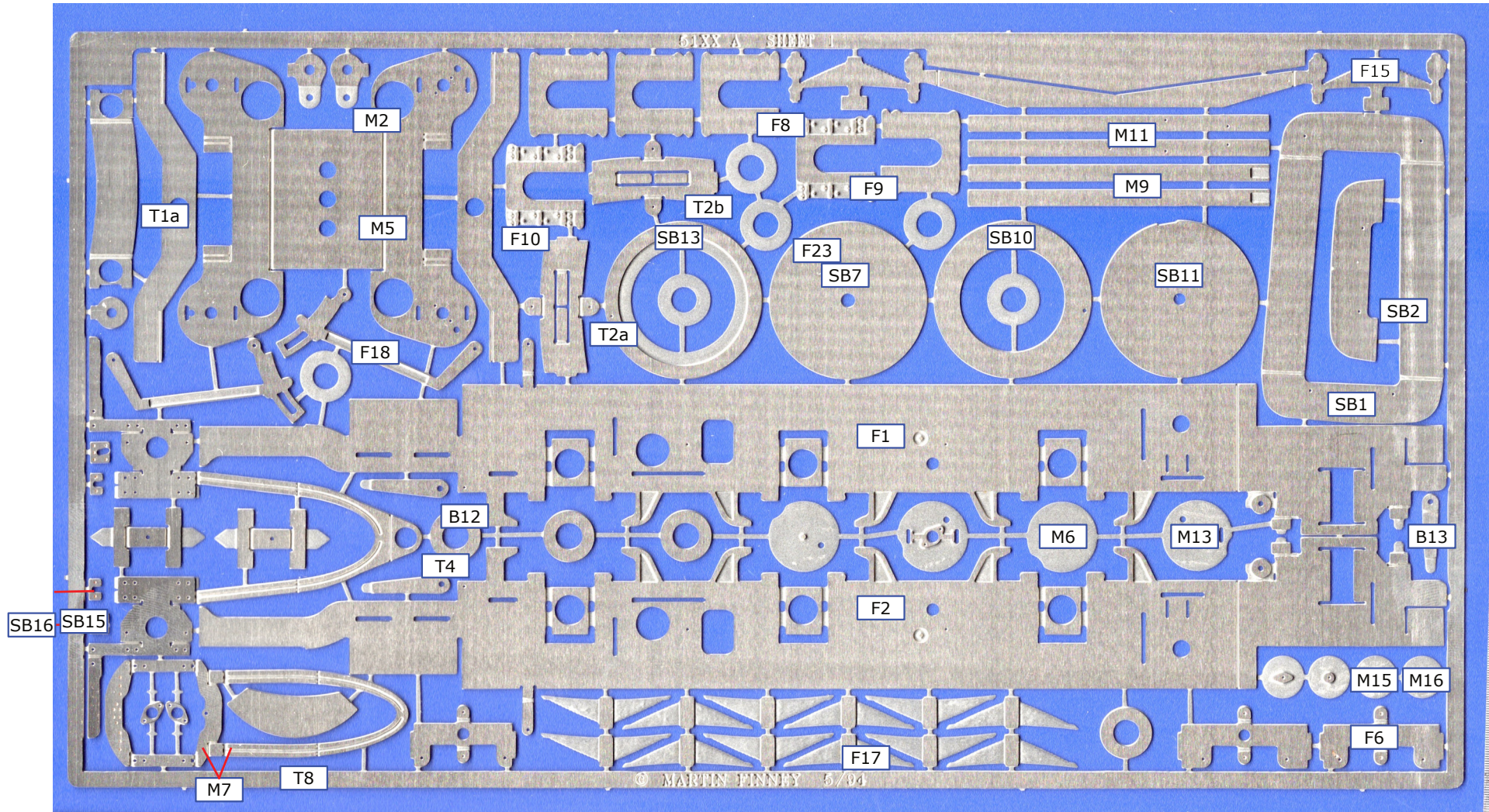
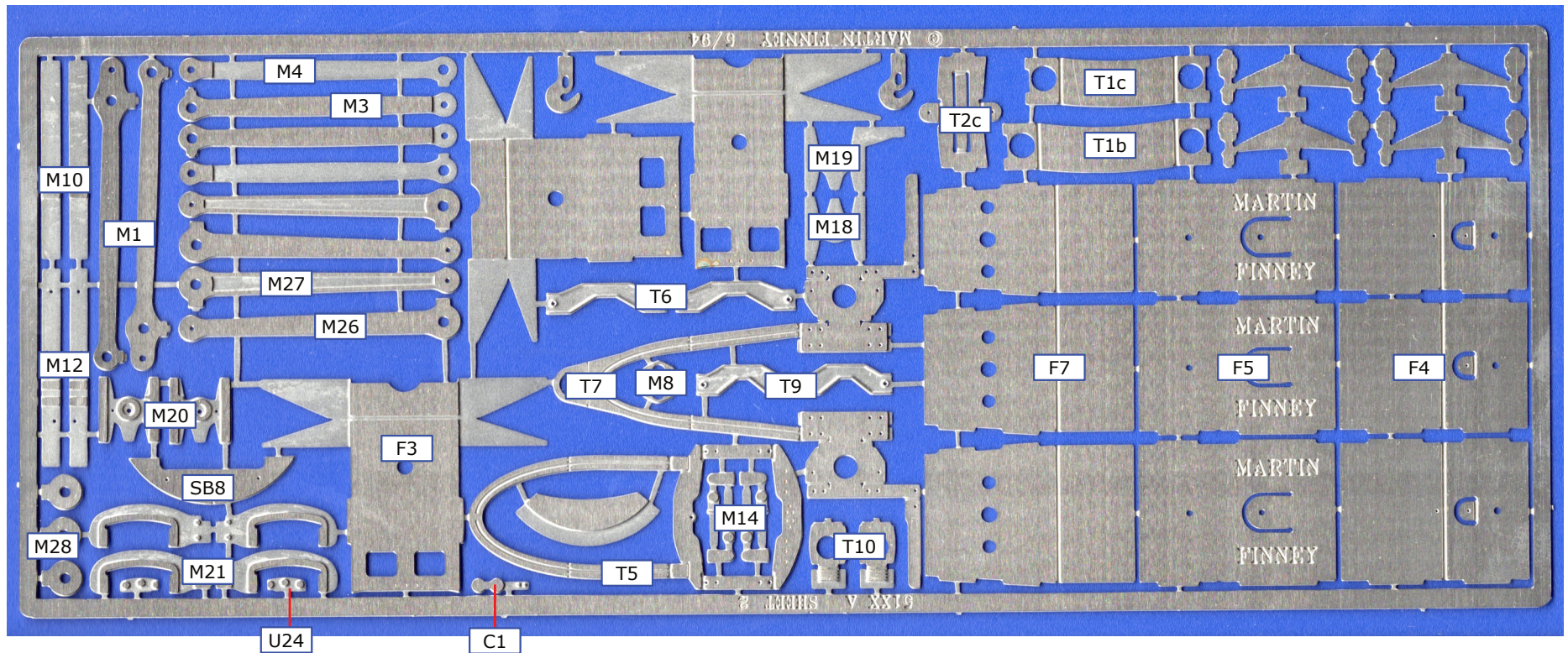


Fig 19. Final Detailing

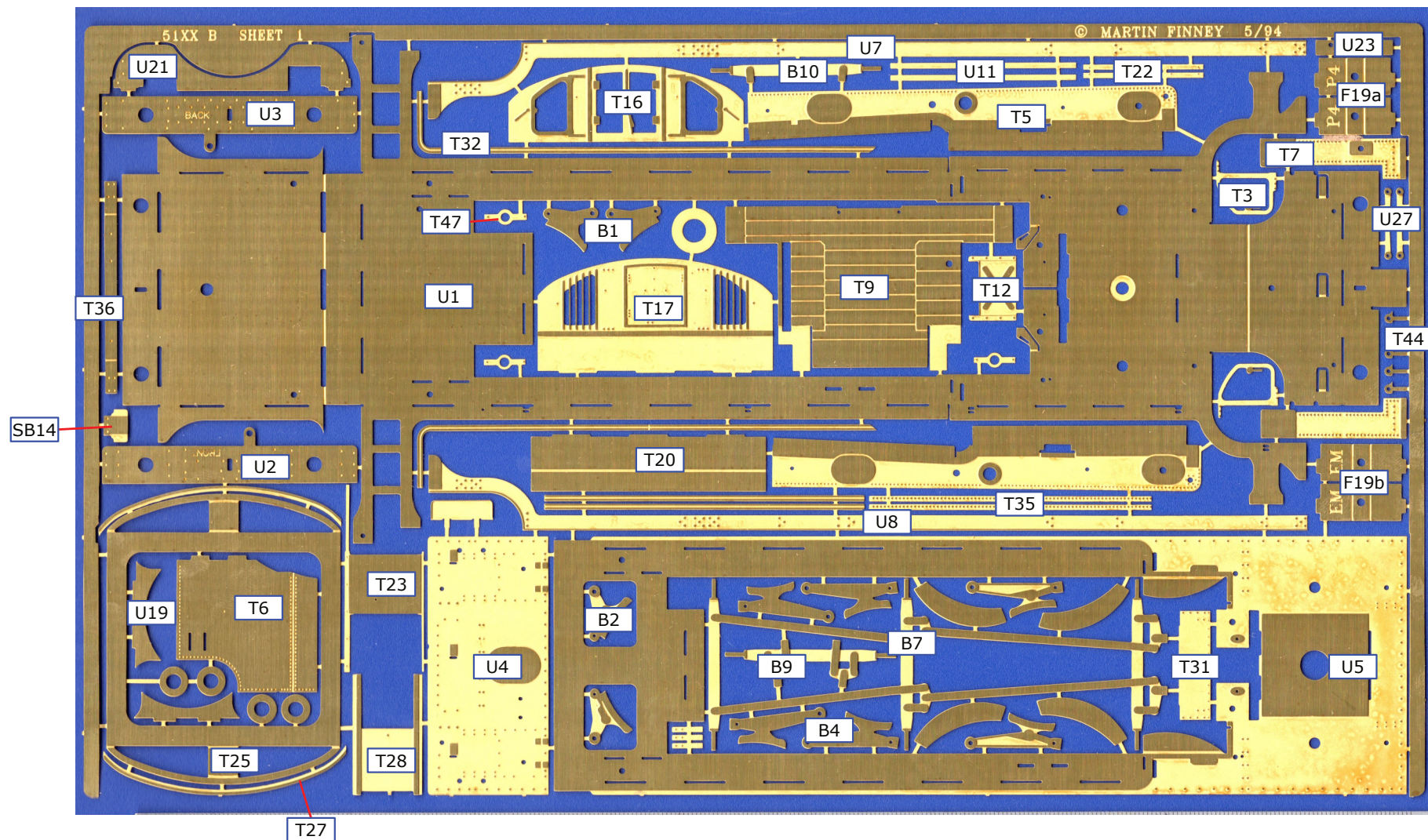
NICKEL SILVER ETCHES - A1



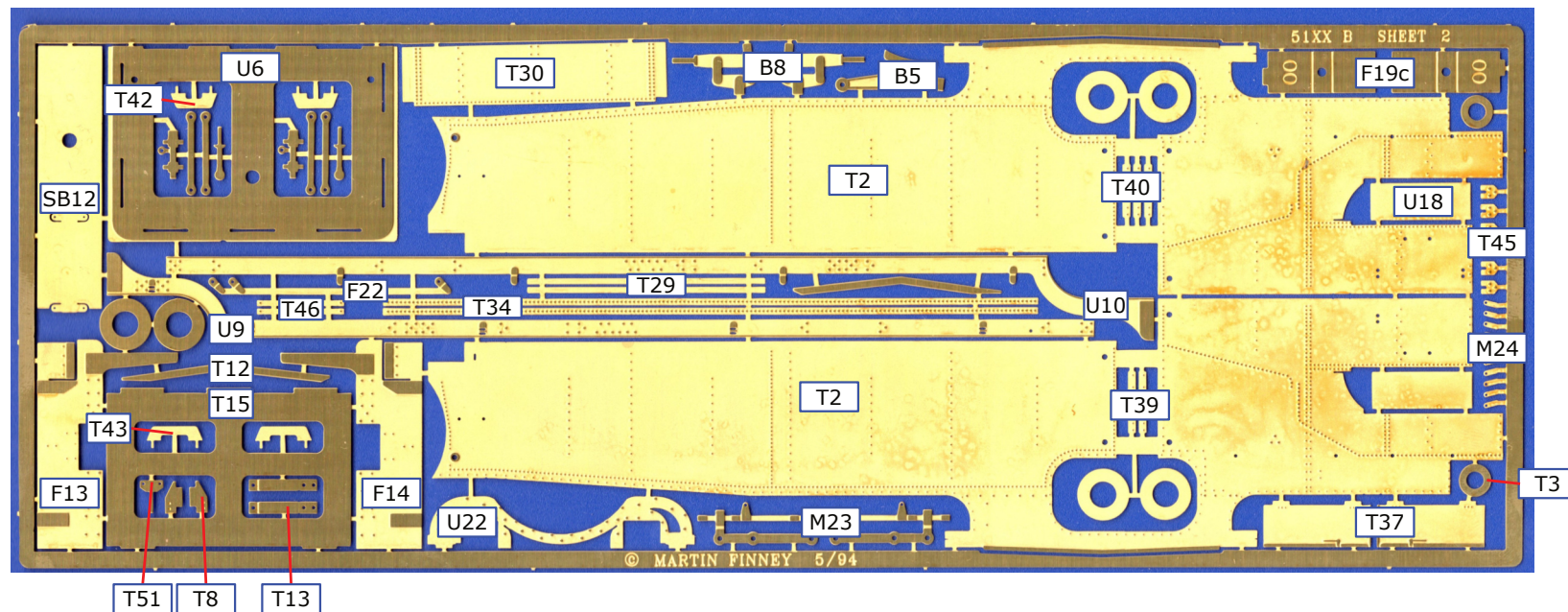
NICKEL SILVER ETCHES - A2



BRASS ETCHES - B1



BRASS ETCHES - B2

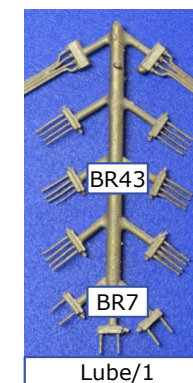
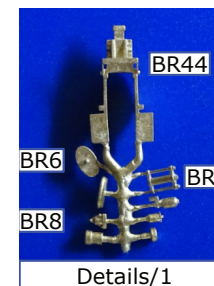
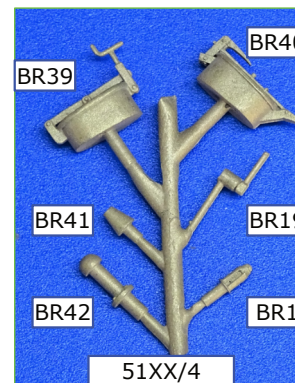
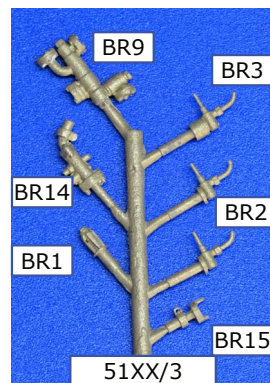
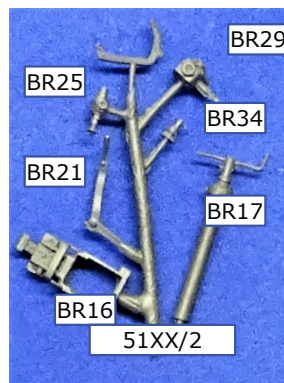
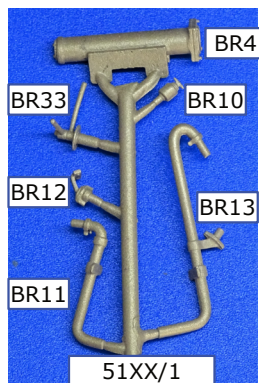


BRASS ETCHES - B3



51XX BRASS CASTINGS

CU1	Chimney	51XX/5	BR16	ATC shoe, bufferbeam mounted	51XX/2	BR31	Sight feed lubricator	Backhead/3
BR1	Cylinder relief valve (4)	51XX/3,4	BR17	Brake column	51XX/2	BR32	Firebox door handle	Backhead/2
BR2	Cylinder drain cock, short (4)	51XX/3	BR18	Lever reverse handle, short	Loose	BR33	Smokebox door handles	51XX/1
BR3	Cylinder drain cock, long (2)	51XX/3	BR19	Water feed valve handle	51XX/4	BR34	Steam lance cock	51XX/2
BR4	Vacuum pump	51XX/1	BR20	Backhead shelf	Backhead/3	BR35	Safety valve springs	Details/1
BR6	Front sandbox lid	Details/1	BR21	Regulator handle	Backhead/1	BR36	Safety valve casing	47XX/2
BR7	Pony truck lubricator	Lube/1	BR22	Jockey valve	Backhead/1	BR37	Whistle, large	Loose
BR8	Snifting valve	Details/1	BR23	Water gauge	Backhead/3	BR38	Whistle, small	Loose
BR9	Injectors (2)	51XX/3	BR24	Regulator and jockey valve linkage	Backhead/1	BR39	Water filler, screw type	51XX/4
BR10	Vacuum pump lubricator	51XX/1	BR25	Steam heating valve	Backhead/3	BR40	Water filler, lever type	51XX/4
BR11	Vacuum pipe, front	51XX/1	BR26	Cab pressure gauges (3)	Loose	BR41	Water filler bumper	51XX/4
BR12	Vacuum pipe dummy	51XX/1	BR27	Steam fountain	Backhead/4	BR42	Tank vent	51XX/4
BR13	Vacuum pipe, rear	51XX/1	BR28	Combined ejector/brake handle	Loose	BR43	Axle journal lubricator	Lube/1
BR14	Steam heating pipe	51XX/3	BR29	Combined ejector/brake	51XX/2	BR44	ATC Shoe, frame mounted	Detail/1
BR15	Steam heating pipe connector	51XX/3	BR30	Blower valve	Backhead/2			



**DUE TO SUPPLY ISSUES, SOME PARTS
MIGHT BE SUPPLIED AS WHITE METAL**

51XX WHITE METAL CASTINGS

WM1	1	ATC shoe, pony truck mounted
WM2	1	Rear sandbox, left
WM3	1	Rear sandbox, right
WM4	1	Pony truck spring cover
WM5	2	Valve rocker shaft housing
WM6	2	Tank balance pipe
WM7	4	Collett parallel buffers
WM8	1	Lever reverse base, tall
WM9	1	Toolbox, short
WM10	1	Toolbox, long
WM11	1	Backhead, early cladding
WM12	1	Backhead, later cladding
WM13	1	Tank water level gauge
WM14	1	Smokebox door
WM15	2	Smokebox saddle bolt strip
WM16	2	Outside steam pipe
WM17	2	Outside steam pipe base
WM18	1	Smokebox pipe cover
WM19	1	Safety valve base
WM20	4	Mud hole doors
WM21	2	Front drop plate step
WM22	1	ATC shoe plunger switch
WM24	1	ATC bell
WM25	1	ATC battery box



OTHER COMPONENTS

3/16" bearing (6)
 5/32" bearing (4)
 6BA x 1" Brass screw (1)
 6BA x 5/16" Brass screw (3)
 6BA nut (3)
 10BA x 1/2" screw (4)
 Short handrail knob (14)
 Medium handrail knob (5)
 Buffer head, screw and spring (4)
 Vacuum & steam pipe hose - (4)
 Balance weight fret (1)

1/8" Brass wire for compensation beam pivots
 5/32" Brass tube outside diameter for compensation beams
 1.25mm Nickel silver wire for oil cups & crosshead pins
 1.6mm Nickel silver wire for coupling rod fork joints & piston rods
 0.8mm Steel wire for pony truck & radial truck side control
 1.6mm Steel wire for front compensation beam

3/32" Brass tube outside diameter for piston tube
 11/32" Brass tube outside diameter for valve chests
 0.45mm Brass wire for handrails & ATC conduit
 0.8mm Brass wire for handrails, brake hanger pivots & pony truck
 1.0mm Brass wire for sandpipes
 1.2mm Brass wire for front struts
 1.4mm Brass wire for top feed pipes & bunker tank vent
 1.6mm Brass wire for brake shaft
 1.0mm & 1.5mm Copper wire for backhead pipes

Note. Screws may be supplied over-length and may require cutting to length.

51XX PACKING LIST

ETCHES

1	Frames	51XXA7	PT 81335
1	Body	51XXB7	PT 81334
	Balance Weights		

SPRUES

1	MF7/47XX/2
1	MF7/51XX/1
1	MF7/51XX/2
2	MF7/51XX/3
2	MF7/51XX/4
1	MF7/51XX/5
1	F7/GW/Details/1
1	F7/GW/Lube/1
1	F7/GW/Backhead/1
1	F7/GW/Backhead/2
1	F7/GW/Backhead/3
1	F7/GW/Backhead/4

Loose – Short lever reverse handle, Cab pressure gauges (3), Combined ejector/brake handle, Whistle, large, Whistle, small (Curved pipe)

WHITEMETAL

A1	1	ATC shoe
A2	1	ATC bell
A3	1	ATC shoe, pony truck mounted
A4	1	ATC battery box
A6	4	Collett parallel buffers
A9	1	Lever reverse base, tall
A11	1	Smokebox pipe cover
A13	1	Safety valve base
A14	4	Mud hole doors
A16	1	Smokebox door
C22	2	Smokebox saddle bolt strip
C30	2	Outside steam pipe base
D2	2	Valve rocker shaft housing
D3	2	Outside steam pipe
D4	1	Pony truck spring cover
D5	1	Rear sandbox, left
D6	1	Rear sandbox, right
D7	2	Tank balance pipe
D8	1	Tank water level gauge

D9	1	Toolbox, long
D10	1	Toolbox, short
	2	Backhead, early and late

OTHER COMPONENTS

6	3/16" bearing
4	5/32" bearing
1	6BA x 1" Brass screw
3	6BA x 5/16" Brass screw
3	6BA nut
4	10BA x 1/2" screw
14	Short handrail knob
5	Medium handrail knob
4	Buffer head, screw and spring
4	Vacuum & steam pipe hose
1	Balance weight fret

WIRE

35mm	1/8" brass wire
35mm	5/32" OD brass tube
25mm	1.6mm Steel wire
60mm	1.25mm Nickel silver wire
100mm	1.6mm Nickel silver wire
130mm	0.8mm Steel wire
85mm	3/32" Brass tube
2x 31.5mm	11/32" OD Brass tube
300mm	0.45mm Brass wire
150mm	0.45mm Brass wire
2x300mm	0.8mm Brass wire
100mm	1.0mm Brass wire
80mm	1.2mm Brass wire
120mm	1.4mm Brass wire
35mm	1.6mm Brass wire
220mm	0.8mm Copper wire
50mm	1.5mm Copper wire

INSTRUCTIONS