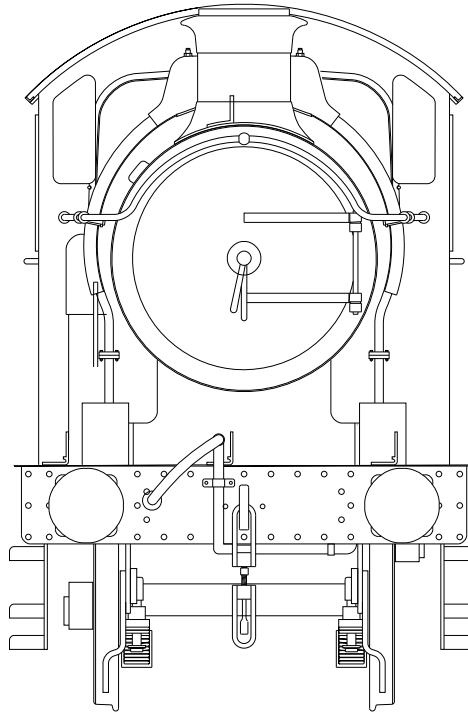


GWR 2251 LOCOMOTIVE



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

For a detailed history of this class Part Four of 'Locomotives of the Great Western Railway' published by the RCTS. is essential reading. From this kit any of the 2251 class (2200 - 2299) can be built from circa 1930 to the end of steam.

The following Swindon drawings were used in designing the kit:

87873	9/1929	Lot 261	Erecting plan
87875	6/1929	Lot 261	General arrangement
102601	1/1934	Lot 283	General arrangement
114627	3/1940	Lot 337	Arrangement of boiler mountings in cab

Lot	Numbers	Built	Reverse	Cab	Original Tender
261	2251-2270	1930	Lever	1	Dean/Churchward 3000G
283	2271-2280	1934	Screw	2	Dean/Churchward 3000G
298	2281-2286	1936	Screw	2	ROD 4000G - GC Design
	2287-2290	1936	Screw	2	Dean/Churchward 3000G
312	2291-9 , 2200	1938	Screw	2	Dean/Churchward 3000G
322	2201-2210	1939	Screw	2	Dean/Churchward 3000G
337	2211-2230	1940	Screw	3	Collett 3000G
347	2231-2250	1944-45	Screw	3	Collett 3000G
360	3200-3219	1946-48	Screw	2	Collett 3000G

CABS.

Lot 261 were built with lever reverse and the cab sides and roof overlapped the cab front and are designated Type 1 cab in these instructions. These cabs featured a single cab side handrail below the window. All were later rebuilt (in the mid 1930s) with screw reverse retaining the original cabs. Lot 283 onward were built with screw reverse with cabs that had sides and roof flush with the cab front and are designated Type 2. These cabs gained a second vertical hand rail in front of the window. Those built during the war years had windowless cab sides and are designated Type 3; they had a combined L shaped hand rail. Subsequently these cabs were fitted with windows although at least one (2239) was unaltered in September 1957.

TENDERS.

All the engines built before the War were paired with second-hand tenders. From Lot 337 new 3000 gallon tenders of Collett pattern were provided although not all the new engines received new tenders as only fifty tenders of this design were produced. After the war many of the older engines and indeed some of the newer ones received second-hand Churchward 3500 gallon tenders.

VARIATIONS POSSIBLE WITH THE KIT

Rear sandboxes. Fitted to Lot 360 causing the injectors to be mounted further to the rear; not included in the kit.

Whistle manifold cover. Fitted from Lot 283 onward.

Whistle shield. Fitted from Lot 298 onward but removed from many engines during works visits.

Smokebox lamp bracket. Moved to the smokebox door on a few members of the class (2204 and 2297 are the only examples we can find).

Cab side handrails. Three different configurations as described above. See Fig.13.

Balance weights. A bewildering variety - we have attempted to include all the different permutations.

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.

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.

COMPONENTS NOT SUPPLIED

Wheels

Driving wheel - 5' 2", 16 spoke, 3/16" diameter axle (3) Slater's Ref.7862GW

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

Crankpins. Steel crankpins are available from Finney7.

Inside motion. A separate kit is available from Finney7 to construct the working inside motion.

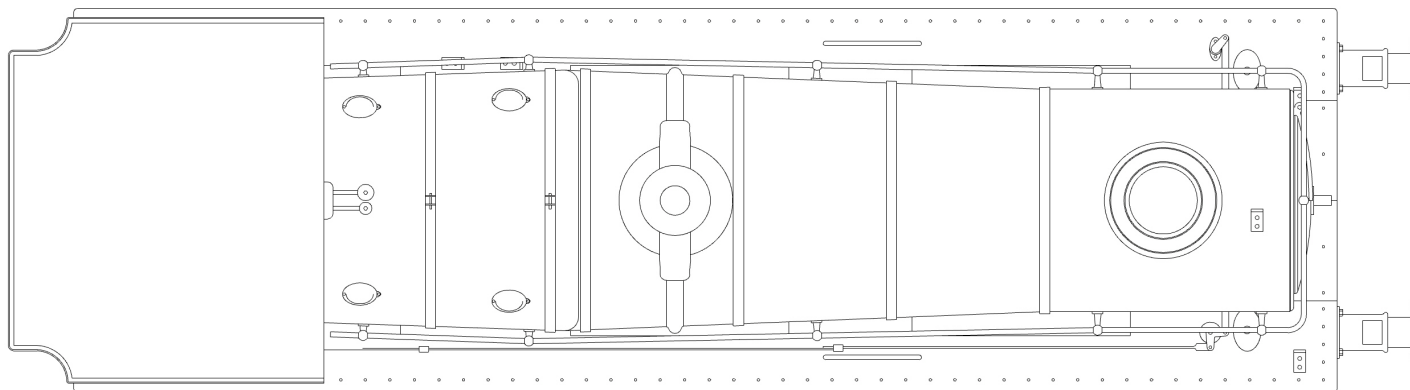
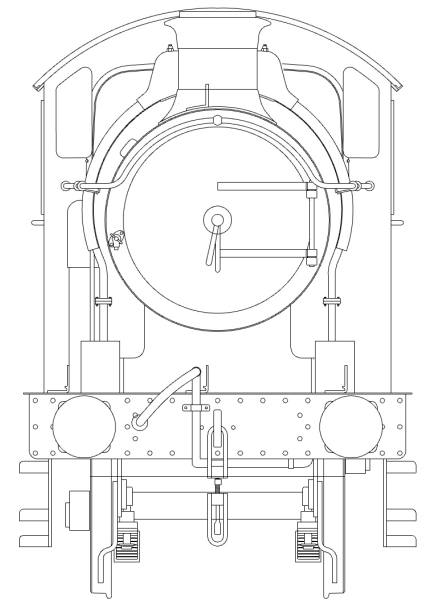
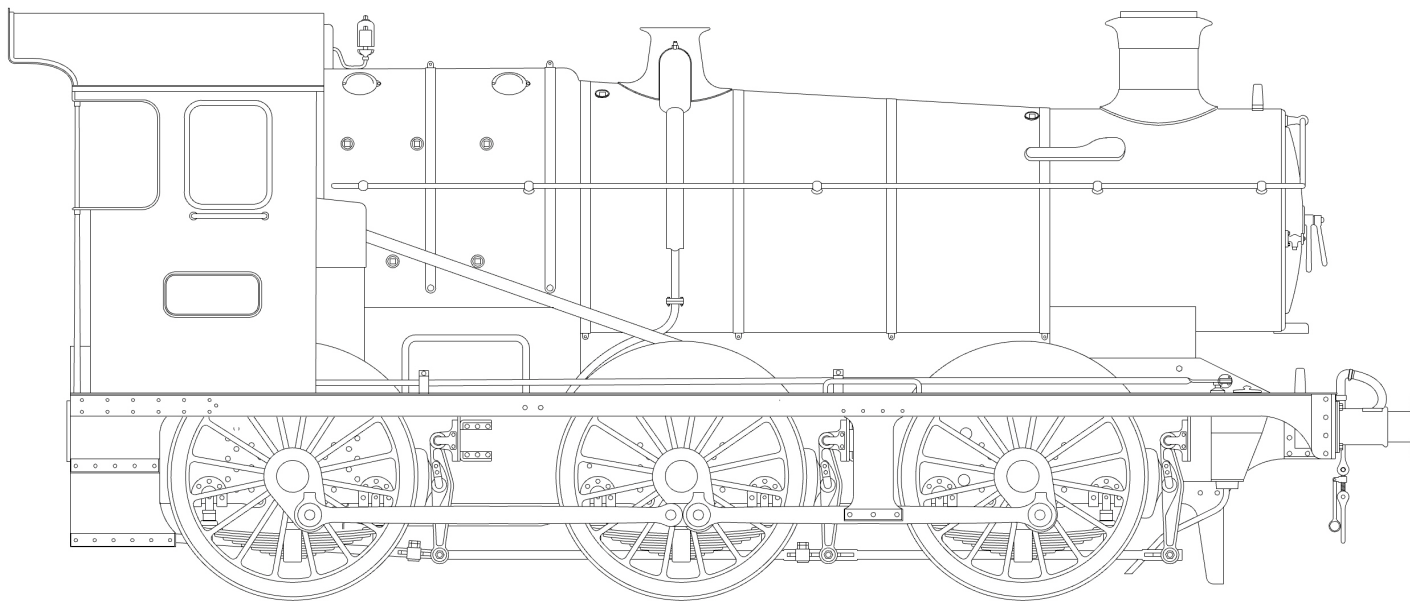


Fig 1. 2251 Class GA

COUPLING RODS AND FRAME PREP

COUPLING RODS.

The coupling rods are now made so that they can be used as a jig to align the leading coupled axle hornblocks accurately.. First drill out all the crankpin holes to a convenient size which is undersize for the crankpins. Remove all burrs caused by the drilling. Now drill the same drill into a suitable small block of wood and leave the drill in the wood with its shank projecting. This projecting shank is used as a mandrel to accurately align the two laminations of each rod. Tin well the front face of all the inner laminates and the back face of the outer laminates and place them over the mandrel. Using plenty of solder and flux, solder the two laminates together. You should now have a rod with the bosses on each laminate perfectly 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.

FRAME PREPARATION

To construct the kit as designed with a compensated chassis remove the axle holes by cutting up the half etch lines on the inside of the frames (F1 & F2). Follow the instructions in the hornblock pack. Open out the following holes in the frames:

- P only if plunger pick-ups are being used
- B for brake hanger pivots to 0.8mm
- R for reversing shaft to 1.6mm
- A for compensation beam pivot to 1/8"
- S to fit the sandbox castings

If you are fitting inside motion modify the cylinder spacer (F5) as shown in Fig.3 and tap the inside motion fixing hole 6 BA.

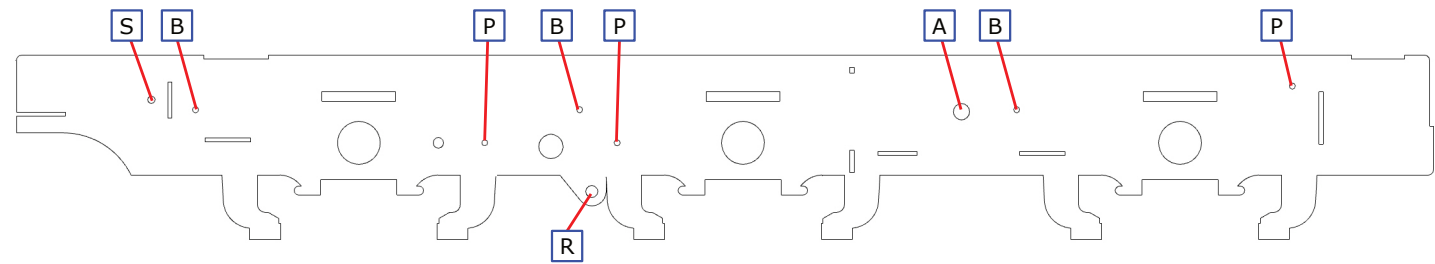


Fig 2. Frame Preparation

No.	Description	Sheet
M1	Coupling rod front inner lamination (2)	B2
M2	Coupling rod front outer lamination (2)	B2
M3	Coupling rod rear inner lamination (2)	B2
M4	Coupling rod rear outer lamination (2)	B2
F1	Left main frame	A1
F2	Right main frame	A1
F5	Cylinder spacer, 3 widths	A2

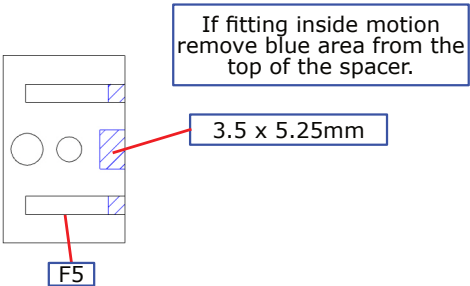


Fig 3. Cylinder Spacer Modification

FRAMES CONSTRUCTION

Fold up the rear spacer and the cylinder spacer (F3 & F5) making sure the 1/2 etched fold lines are on the **inside** and that each bend is a right angle. Check that all tabs on the spacers fit properly in the frame slots so that the rest of the spacer is hard up against the inside of the frames. Fold up the small tabs on the cylinder spacer and solder the 1.6mm steel wire front compensation beam in place.

Now assemble the frames and spacers, including the firebox spacer (F4). Start by tack soldering the rear spacer to both sides. Check that everything is square and that the spacers are hard against the frames. Put an axle (a long piece of 3/16" rod would be better) 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.

Solder the buffer beam spacer (F10) in place in the notches under the frames at the front.

No.	Description	Sheet
F1	Left main frame	A1
F2	Right main frame	A1
F3	Rear spacer, 3 widths	A2
F4	Firebox front spacer, 3 widths	A2
F5	Cylinder spacer, 3 widths	A2
F6	Buffer beam spacer	C3
F7	Compensation beams (2)	A2
F8	Ash pan side (2)	C3
F9	Left frame overlay	C1
F10	Right frame overlay	C2

Cut a piece of 1/8" brass rod so that it fits through the holes A and is flush with the outside face of the chassis frames. Solder the rod in place and then cut through at each end 2.6mm from the frames. Cut two short pieces, 2.4 mm long, of 5/32" brass tube and solder the compensation beams (F7) to them centrally.

Temporarily fit all the wheels and axles and confirm that the compensation works properly and check that the chassis is sitting level.

Retain the rear beams in place by soldering the ash pan sides (F8) to the frames as shown in Fig 4. Solder a piece of 1.2mm wire rearwards through the hole in the bottom of the firebox spacer to form the motor support beam.

Frame Overlays. (See Fig 5, page 7)

Emboss all the rivets in the frame overlays (F9 & F10). Fold the rear step braces and shorten their length - O Finescale first half etched line - Scaleseven the second line. Fold up the injector mounting at the front of the support,

Solder the brake hanger pivot brackets (F11) into the slots in the overlays as shown in Fig.5. Use temporary lengths of 0.8mm wire through the brake hanger pivots to accurately locate the overlays which only need tack soldering around their edges.

If you are fitting working inside motion then build it next following the separate instructions.

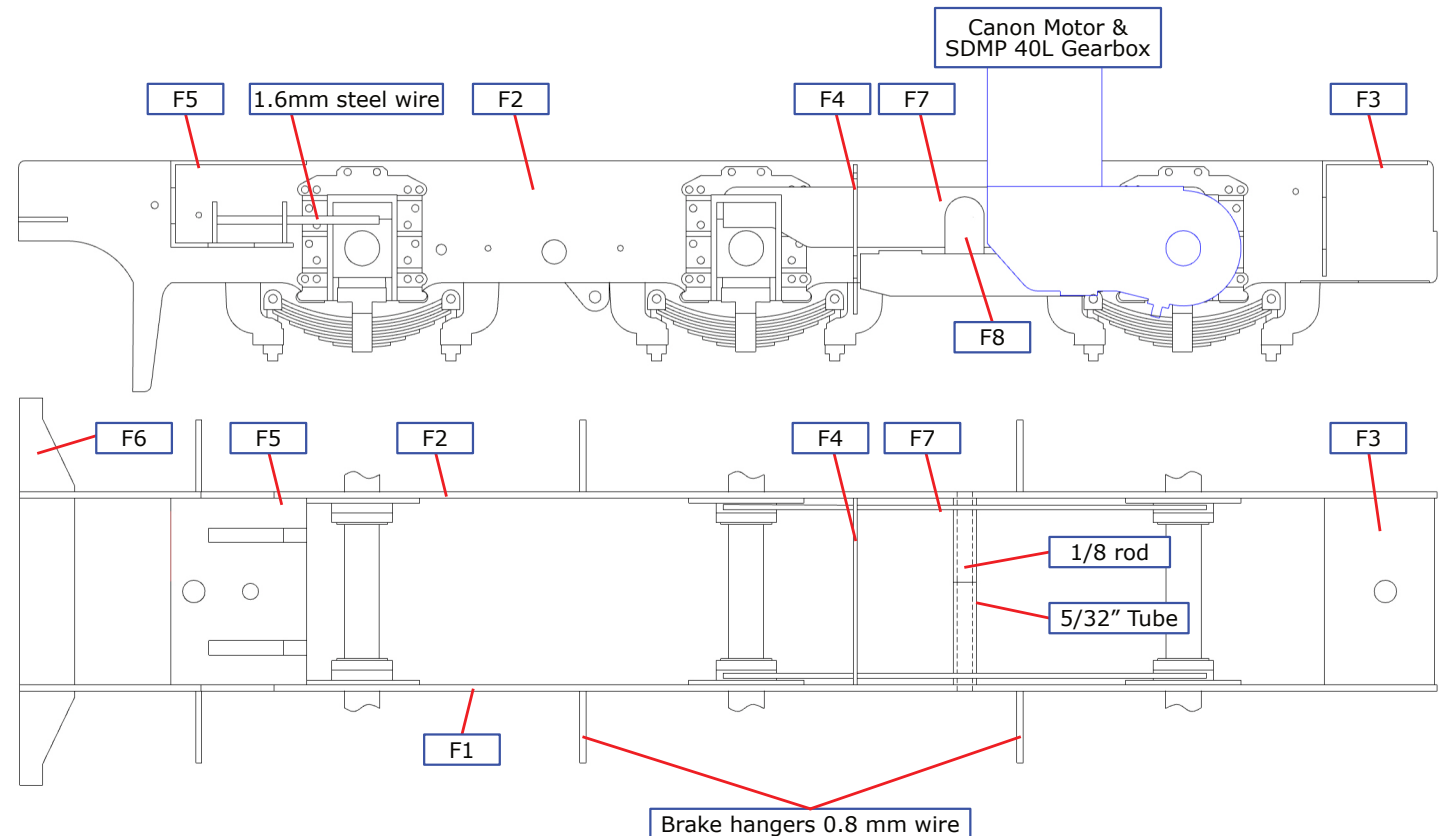


Fig 4 Frame Construction

FINISHING THE CHASSIS

Wheels. Attach the balance weights to the wheels using photographs as a guide to the appropriate weight and its position. Assemble the wheel sets, bearings and rods selecting 3/16" axle washers of appropriate thickness (F13 or F14) to control sideplay. A thorough check of all clearances at this stage is important.

Springs. Laminate a main spring outer lamination (F16) either side of a centre spring inner lamination (F15). The axle boxes are now retained by the springs when the springs are soldered to the inside of the spring hangers on the frames.

Sandboxes. Fit the sandboxes, left (WM1) and right (WM2) to the frames. Make the sand pipes from 0.8mm wire.

Injectors. The injectors (BR1) are mounted on a plate that folds out from the step brace and sit at right angles to the frames, see Fig. 5. Use copper wire for the plumbing. Drill suitable holes in the injectors for the wire and solder the wires in place. The drain pipe at the bottom is probably best soldered to the injector and then bent to shape once the injector is mounted on the mounting,

Drawbar. Make the drawbar (F24) by soldering a washer around the top of a 6BA screw head as shown below. The drawbar fits under this washer when the screw is screwed into the chassis.

ATC Gear. Fit the ATC shoe plunger switch (WM3) to the ATC shoe (BR2) and then fit the assembly to the buffer beam spacer.

No.	Description	Sheet
F11	Brake hanger pivot bracket (6)	35 C1
F12	Balance weight (18)	27 C2
F13	Sideplay washers	22 A2
F14	Sideplay washers	37 C1
F15	Spring centre lamination (6)	8 A2
F16	Spring outer lamination (12)	9 A2
F24	Draw bar, 3 different lengths (3)	36 C1

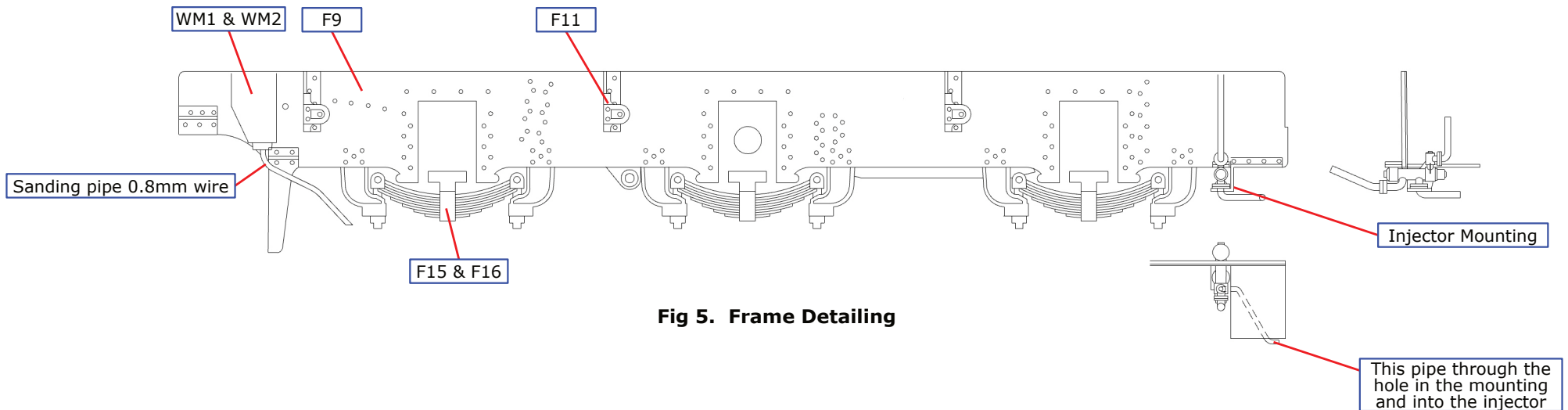


Fig 5. Frame Detailing

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BRAKES

Assemble the brake hangers (F17 & F18) first embossing the rivets in the front. Emboss the bolts in the brake cross shafts and rods etch (F19), the front brake cross shaft overlay (F20), the middle brake cross shaft overlay(F21) and the rear brake cross shaft overlay (F22). Solder the cross shaft overlays to the top of the brake cross shafts on F19, then carefully twist the pull rods between the cross shafts vertical. Fix this assembly and the brake hangers in place using 0.8mm wire for the hanger pivots.

Complete the brake gear by fitting the brake shaft to cylinder lever (F23) to the cross shaft of 1.6mm wire as shown in Fig. 6. Add the brake piston rod from 1.4mm wire.

No.	Description	Sheet
F17	Brake hanger front lamination (6)	33 C1 & C3
F18	Brake hanger rear lamination (6)	34 C1 & C3
F19	Brake cross shaft & pull rods	28 C1
F20	Front brake cross shaft overlay	29 C1
F21	Middle brake cross shaft overlay	30 C1
F22	Rear brake cross shaft overlay	31 C1
F23	Brake shaft to cylinder lever (2)	32 C1
F24	Draw bar,3 different lengths (3)	36 C1

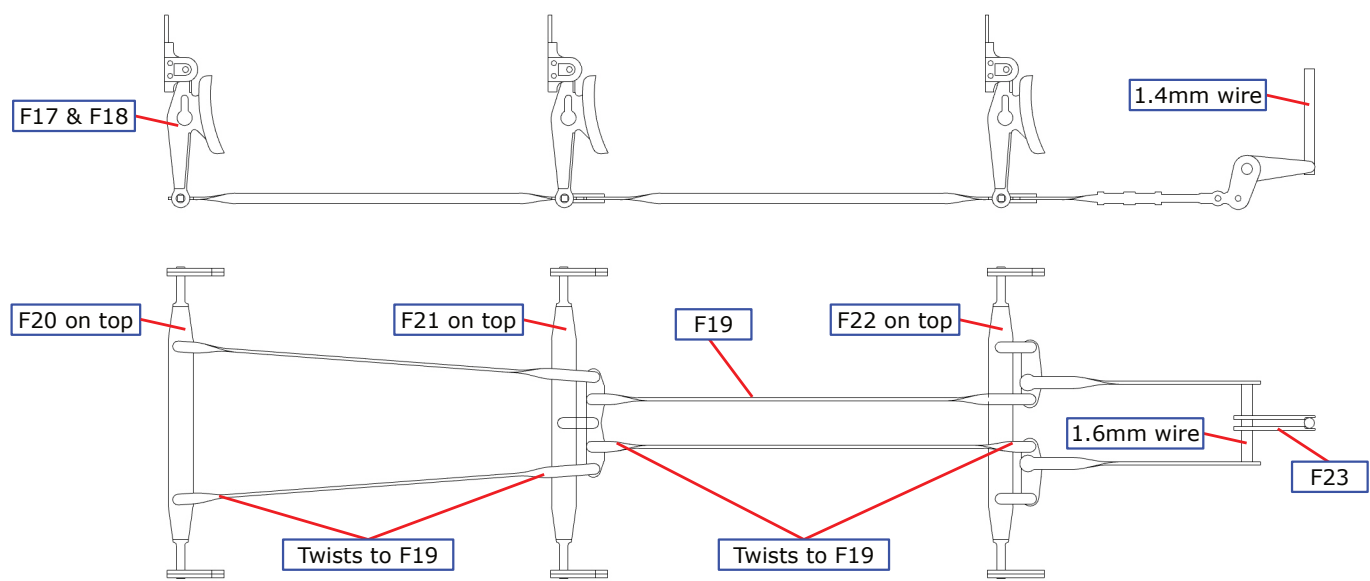


Fig 6. Brake Construction

FOOTPLATE CONSTRUCTION 1

Prepare the footplate (U1) by embossing the rivets on the rear steps and saddle sides. Open out the slots in the sides for the pipe clips with a 1.6mm drill. Fold the edges at right angles and fold up the saddle sides and lamp brackets. Form the inwards joggle in the rear step and strengthen the bends with solder at the rear.

Prepare the footplate overlay (U2) by embossing the rivets under the lamp brackets, around the edges of the splashers and under the small sand rod brackets. Drill 0.8mm through the holes for the cab rear handrails and fold up the splasher fronts and cab floor support.

Place the overlay in place and temporarily join to the footplate with a screw through the body fixing holes at the rear. Now solder together all round. Solder the 6BA rear body fixing nut in place.

Emboss the rivets for each pipe clip on the valence overlays (U3) and fold down the pipe clips before soldering the overlays in place. Emboss the rivets on the buffer beam (U4) and the buffer beam steam pipe bracket overlay (U5) and then attach the overlay to the buffer beam. Solder the buffer beam and drag beam (U6) in place and add the valence to buffer beam brackets (U7).

By referring to photographs bend the valence mounted vacuum and steam pipes to shape using 1.2mm wire and attach them by bending the clips through the small slots and soldering from inside.

No.	Description	Sheet
U1	Footplate 40	C1
U2	Footplate overlay 41	C2
U3	Valence overlay (2) 42	C2
U4	Buffer beam 4	C2
U5	Buffer beam steam pipe bracket overlay 44	C2
U6	Drag beam 11	A2
U7	Valence to buffer beam bracket (2) 46	C3

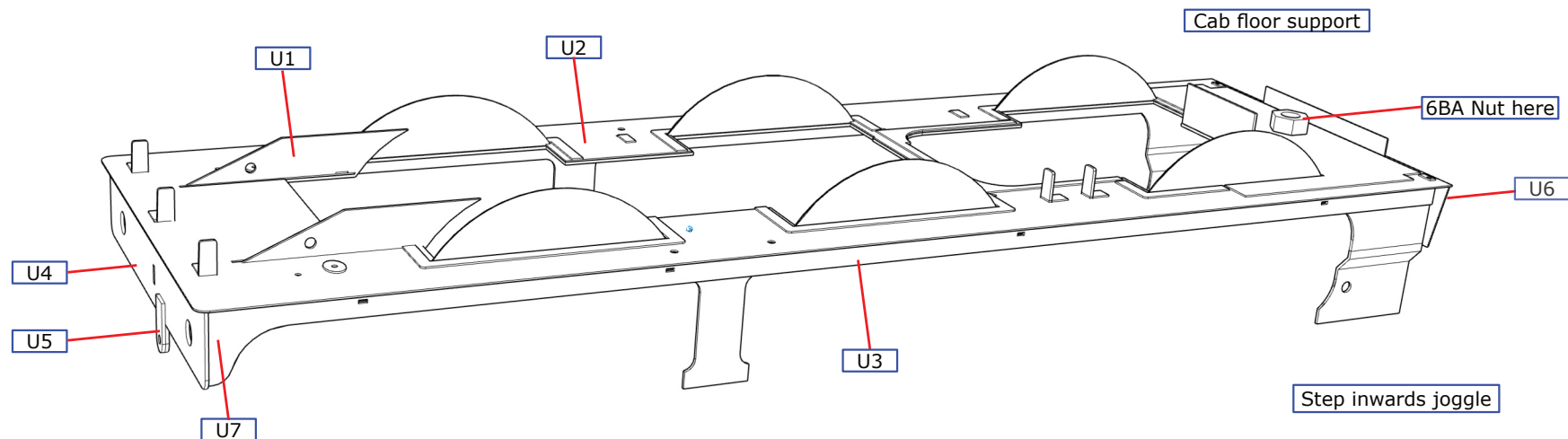


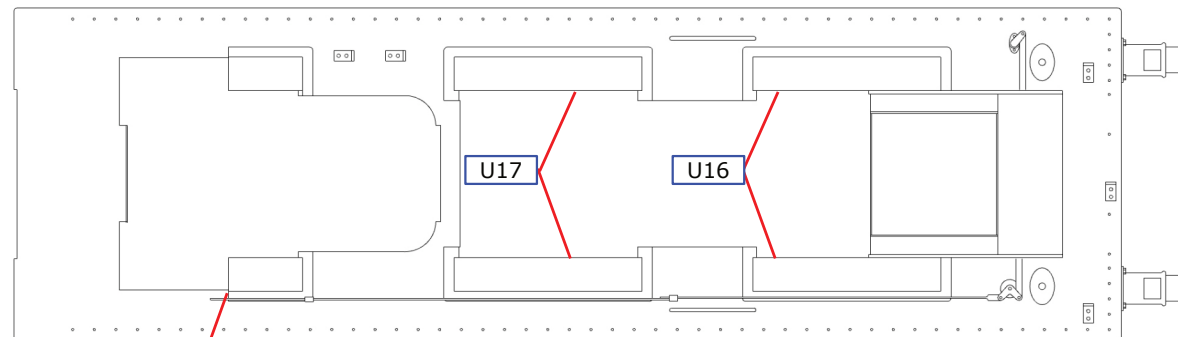
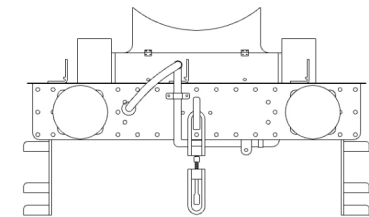
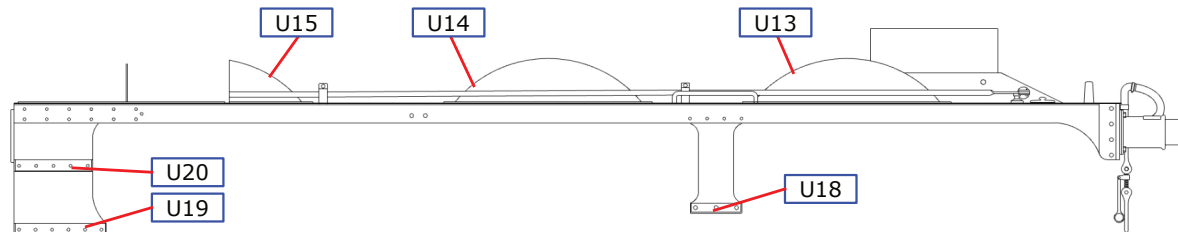
Fig 7. Footplate Assembly

FOOTPLATE CONSTRUCTION 2

Fold up the smokebox saddle (U8). Modify the smokebox saddle front (U9) as shown in Fig. 7 so that it slides into the slots in the saddle; solder in place. If you have fitted inside motion modify the smokebox saddle rear (U10) as shown in Fig. 7. Solder to the rear of the saddle. Now solder the complete saddle in place on the footplate. Solder the 6BA front body fixing nut in place. Emboss the rivets on the cylinder cover plate (U12) and use two short lengths of 0.8mm wire to make the two handles. Solder the plate in place.

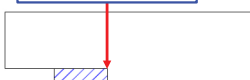
Modify the front splasher tops (U13) as shown in Fig 7. Curve the splasher tops, front middle and rear (U13, U14 & U15) to shape by rolling underneath a suitable rod or dowel on a soft surface, a piece of rubber sheet or carpet. Solder in place. Emboss the lubricator bracket rivets on the splasher backs, front and middle (U16 & U17)) and solder them in place so that the back surface is in line with the inner faces of the main frames. The lubricator brackets on the middle splasher backs are nearest the front. Attach the axle journal lubricators (BR3) to the back of the splasher backs over the half etched mountings.

No.	Description	Sheet
U8	Smokebox saddle 73	C1
U9	Smokebox saddle front 74	C3
U10	Smokebox saddle rear 75	C3
U11	Smokebox saddle side plate (2) 76	C3
U12	Cylinder cover plate 77	C3
U13	Front splasher top (2) 59	C1
U14	Middle splasher top (2) 60	C1
U15	Rear splasher top (2) 61	C1
U16	Front splasher back (2) 62	C1
U17	Middle splasher back (2) 63	C1



Cab front slots in here

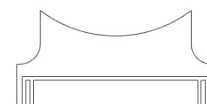
Saddle rear face



Modification to front splasher top (U13)



Modification to saddle front (U9)



Modification to saddle rear (U10)

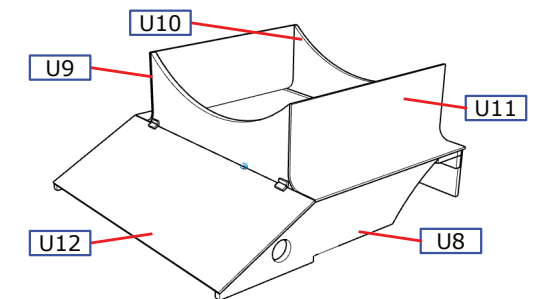


Fig 8. Footplate Construction

FOOTPLATE CONSTRUCTION 3

Emboss the rivets on the front step (U18) and fold up the tread. Solder the tread to the step back on the footplate. Emboss the rivets on the rear step lower and upper tread (U19 & U20), fold up and solder in place on the rear step back on the footplate

Buffer Beams. Construct and fit the Collett buffers as shown below (WM4). Fit the the vacuum pipe (BR5) and the dummy (BR6) to the buffer beam. Fit the steam heating valve (BR7) and then fit the valve handle (U21). Fit the steam heating pipe connector (BR8) to one of the copper springs and then fit the spring to the valve.

Now attach the sanding rods as shown in Fig. 7. The right hand, long, rod (U23) needs a twist through 90° as shown below. Fold the support brackets to appear like the brackets in the drawing. Make the pivots from 0.45mm wire. Insert the tail of the support bracket through the slots in the footplate and the horizontal part of the rod through the hole in the saddle, then place the crank onto the wire pivot. Solder onto the pivot and from below the footplate. Repeat for the simpler left hand rod (U24). Fit the sandbox lids (BR5).

Add the handrails above the front steps from 0.45mm wire.

No.	Description	Sheet
U18	Front steps (2) 50	C3
U19	Lower rear step (2) 48	C3
U20	Upper rear step (2) 49	C3
U21	Steam pipe valve handle 45	C2
U22	Buffer step plate (2) 47	C2
U23	Right hand long sanding rod 52	C2
U24	Left hand short sanding rod 53	C2

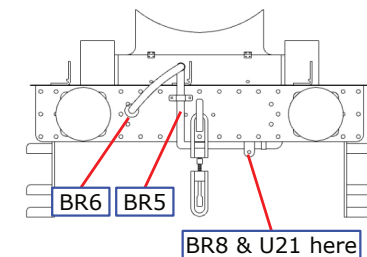
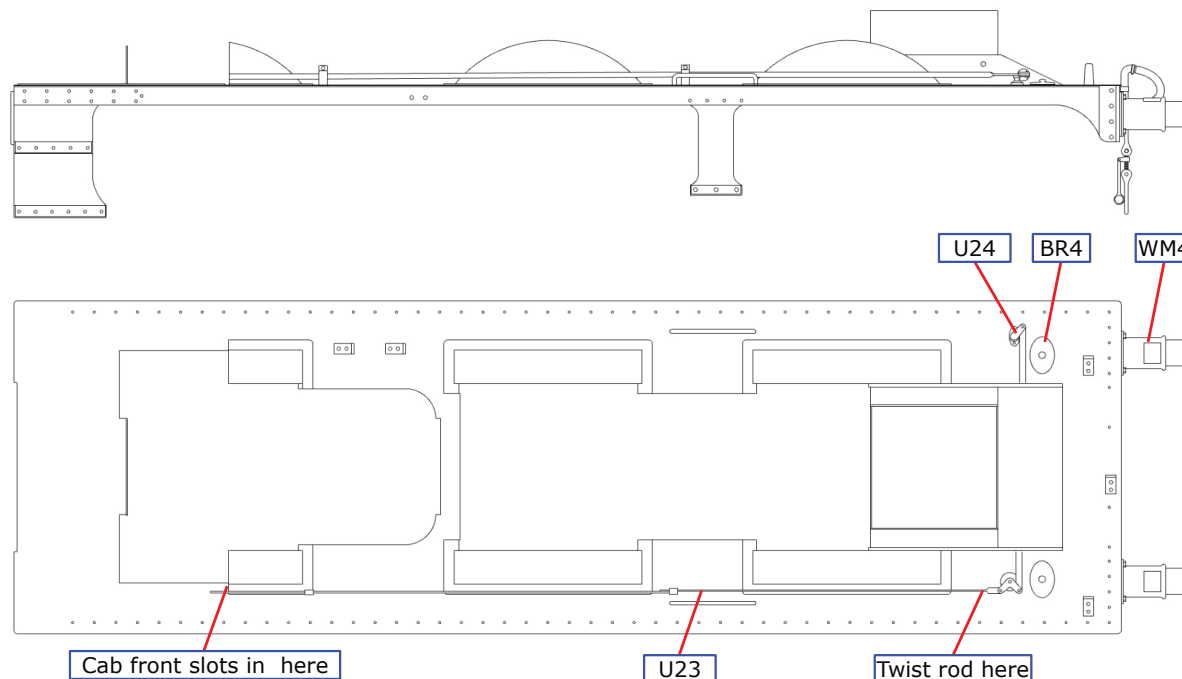


Fig 9. Footplate Construction

FORMING THE BELPAIRE FIREBOX 1

The photographs show the construction of a 47XX firebox. The construction of the Bulldog firebox follows the same procedures.

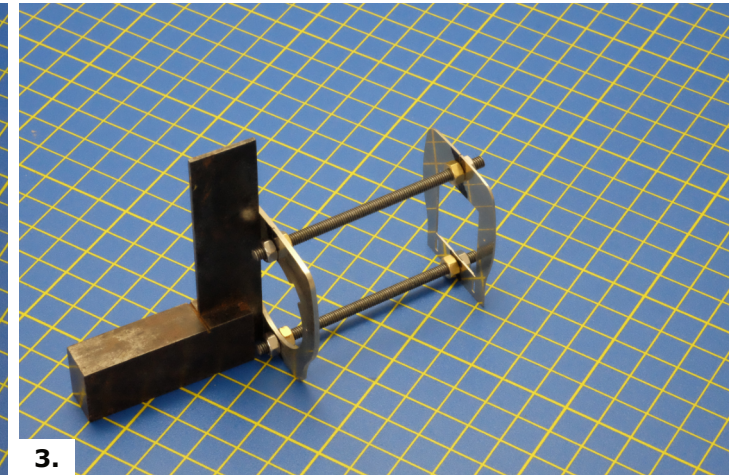
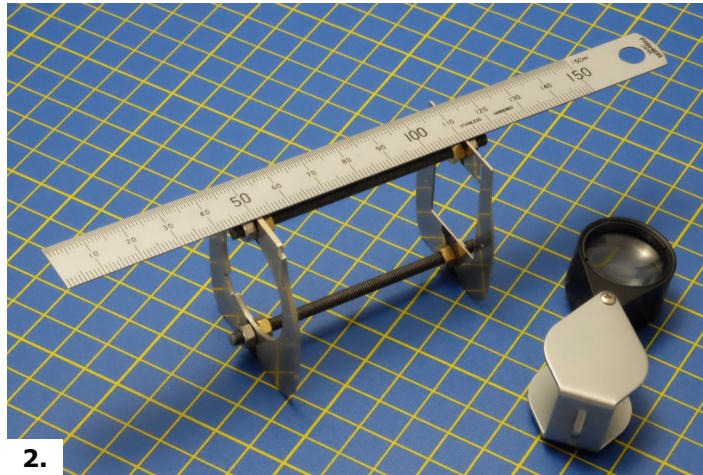
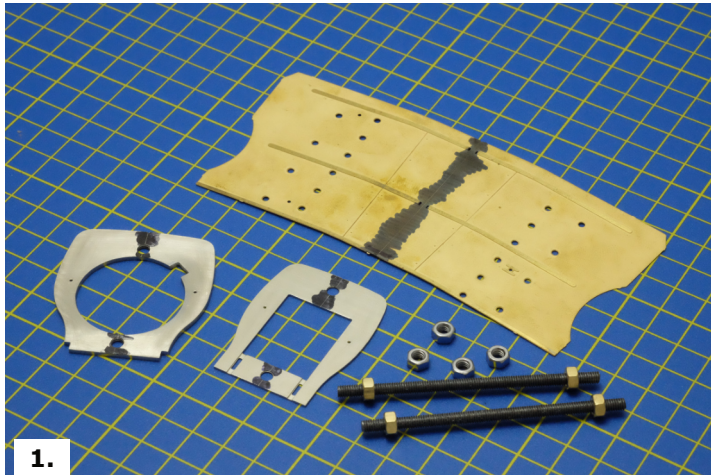
Photo 1. Solder together the two laminations of the firebox front (SB2). Clean the cusp off all parts, including the firebox rear former (SB1). Reduce the width of the lower faces of the firebox rear former so that it will fit between the frames in the locating groove in the footplate. Using the small dimples provided mark the centre lines on the outside and the inside of each part. Solder two 4mm lengths of 0.8mm wire into the holes on the cab front.

To assemble the firebox two 100 mm pieces of 4BA studding will be required with four brass nuts and four stainless steel nuts. Thread the brass nuts on to the studs.

Photo 2. Set the two spacers on to the studs, retain them with the stainless steel nuts. Ensure the length of the assembly over the formers is 46.4mm. Always measure the distance from the bottom of the firebox; even using a steel rule and eyeglass you can get pretty close to this sort of dimension with care. Take your time, measure and check it a few times. It's easier to use a vernier or similar gauge to get a precise measurement and to check that the spacers are parallel.

Photo 3. Check that the spacers are square, both front and rear; do this on a decent flat surface. When correctly spaced apart the front will fit in the half etched recess in the footplate and the rear, pinned to the cab front, will fit with the tabs on the lower edge of the cab front in the footplate slots.

No.	Description	Sheet
SB1	B4 firebox rear former	1
SB2	B4 firebox front formers (2)	1
SB3	B4 firebox wrapper	4
SB4	Firebox band joining brackets	6
SB5	Firebox washout plugs, left	6
SB6	Firebox washout plugs, right	6



FORMING THE BELPAIRE FIREBOX 2

Photo 4. Tighten the stainless steel nuts up tightly and then solder the brass nuts to the spacers. A good blobby tack will be fine:

Note: From this stage the spacers form a pretty strong assembly. Any attempt to twist the assembly results in one stud tightening as the other slackens. Just make sure the nuts are tightened up and you've checked the assembly is square again before moving on to the next stage.

Photo 5. Emboss the rivets for the ends of the cladding fixing bands on the firebox wrapper (SB3).

Align the centre line marks, the top can be formed to a gentle radius. This is a simple rolling job, using a length of dowel and finger pressure. An old round file has a taper that is useful on GWR fireboxes which don't have a constant radius. Ensure that the centre lines are maintained while forming the second shoulder.

On waisted fireboxes, such as this one, start forming the concave sections; this might be easier to do off the spacers. The final job is to pull in the waisted section, by putting a gentle curve on the sides of the firebox; again this is dowelling and finger pressure. As can be seen, it's not a perfect match to the spacers, but gentle finger pressure is enough to get the wrapper to meet the spacers without distortion.

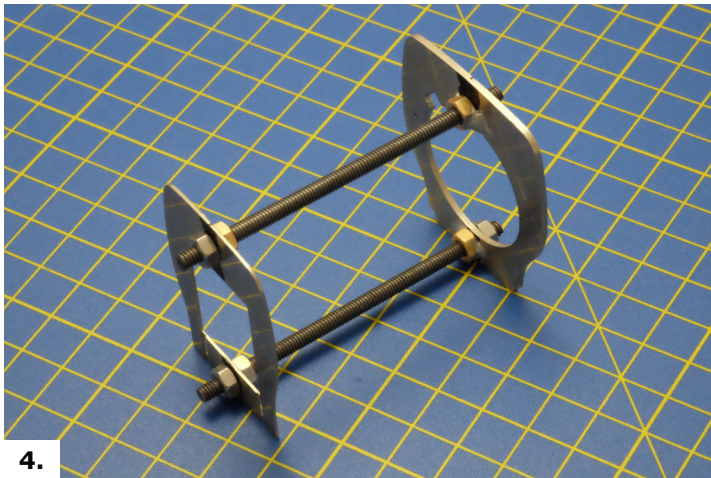
Photo 6. Tack the outside of the firebox at the centre and corners, both front and rear. Again, take care and check that the centres retain the alignment that we've worked so hard to achieve. Now work down the spacers alternating tacks left/right and front/rear to even out any expansion of the wrapper. Finally run the seams round at both ends.

With the wrapper now firmly attached to the spacers, the stainless steel nuts can be undone and the studs spun out.

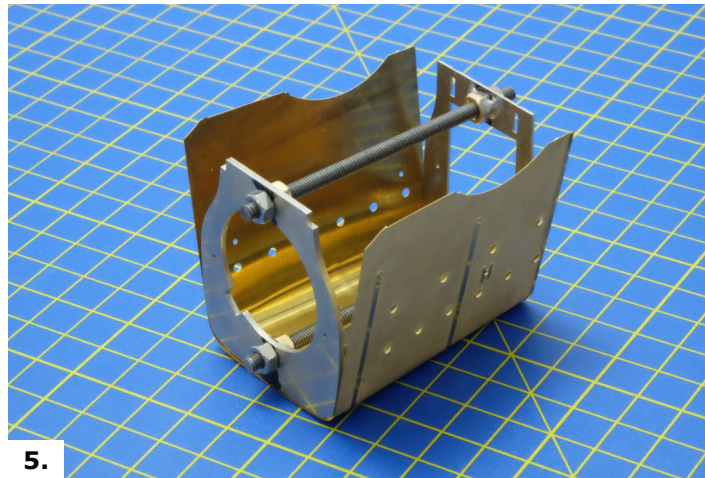
Run an extra fillet of solder into the internal front shoulders of the firebox to support the area which will be filed back. The brass nuts can be heated and removed. Remove the rear scrap section of the spacer.

The base, front and rear are now rubbed down on a sanding board to keep them flat, this will remove the cusps from the wrapper and leave the firebox ready for the final shaping and fitting to the rest of the loco. Round the front edges of the firebox with a file referring to photographs for the correct shape.

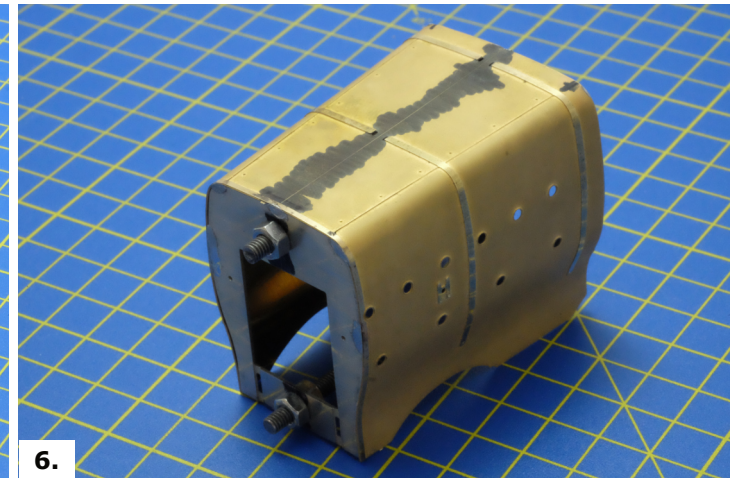
Fold the firebox band joining clips (SB4) into a 'U' shape, fit through the slots in the firebox top and solder in place from inside. Complete with a short piece of 0.45mm wire to represent the tightening bolt. Fix the mudhole doors (WM23) in place on the firebox.



4.



5.



6.

Finney7

CAB

If appropriate emboss the rivets in the type 1 cab front (C1) and then solder the cab window frames (C3) in place. Attach the cab front (C1 or C2) to the firebox using short lengths of 0.8mm wire to ensure accurate alignment.

Now solder the firebox/cab front assembly in place carefully checking the alignment. Tack solder the smokebox to the saddle and once again check all is true. If all is well, complete soldering the smokebox to the saddle and the boiler to the firebox. Fit the saddle side plates (U11). The correct radius curvature is obtained by forming over a 4.0mm diameter drill

Attach the cab cutout beading (C4), to the cabsides (C5, C6 or C7) fitting the etched groove over the edge of the cab side. Solder the cab side riveted angle strip (C8) in place and form and fit the cab side handrails from 0.45mm wire referring to Fig.13. Assemble the cab seats (C9) which are designed to be working. Now remove the seat from the bracket and solder the bracket to the inside of the cab side. Attach the ATC bell mounting (C10) inside the right side window.

Solder the cabsides in position and attach the rear handrails. The sides are correctly aligned when the rear handrails are vertical and they are flush with the cab front (Type 2 & 3) or slightly overlap the cab front (Type 1).

Bend the cab floor support (C11) to shape and fit on the cab base between the sides. Solder the cab roof rear frame (C13) between the rear edges of the cabsides and the cab roof centre frame (C14) between the riveted angel strips ensuring the cab roof line will be horizontal. Curve the cab roof (C15 or C16) and solder the cab rood edge angle (C17) in place before attaching the roof.

Slightly curve the fall plate (C18) and hinge to the floor as shown in Fig.13. before soldering the floor in place.

No.	Description	Sheet
C1	Type 1 Cab front	C2
C2	Type 2 Cab front	C2
C3	Cab window frame	C1
C4	Cab cut out beading (2)	C1
C5	Type 1 cab side (2)	C3
C6	Type 2 cab side (2)	C3
C7	Type 3 cab side (2)	C3
C8	Cab side riveted angle strip (2)	C1
C9	Cab seat (2)	C1
C10	ATC bell mounting	C2
C11	Cab floor support	C3
C12	Cab floor	C3
C13	Cab roof rear frame	C1
C14	Cab roof centre frame	C1
C15	Type 1 Cab roof	C1
C16	Type 2 cab roof	C1
C17	Cab roof edge angle	C1

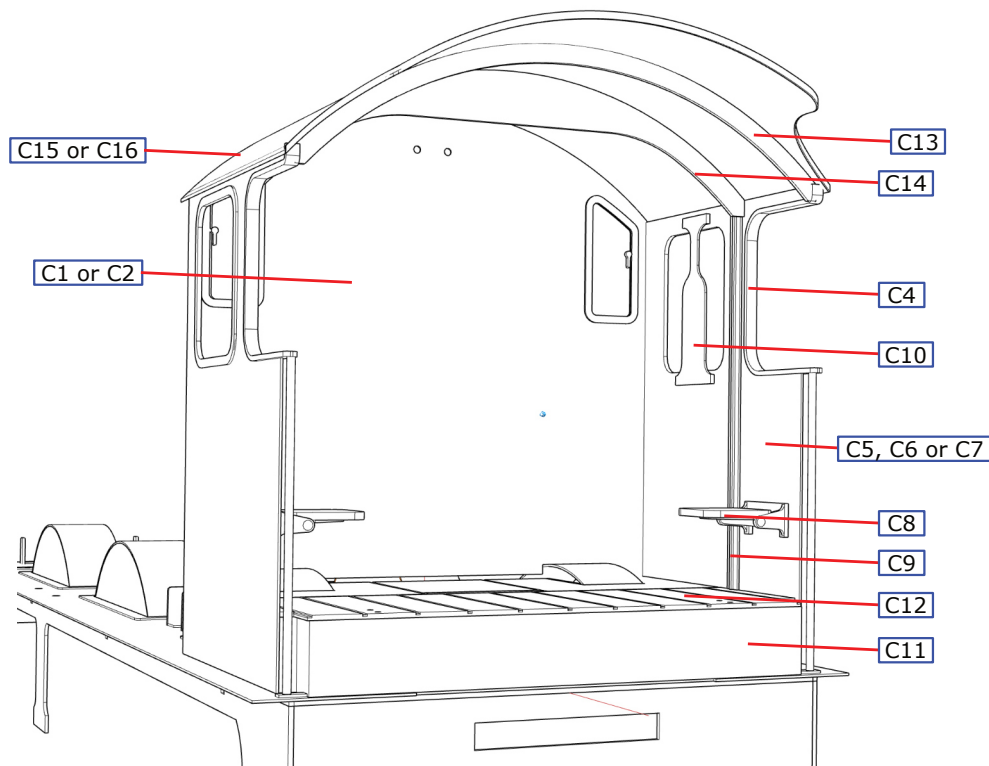


Fig 11. Cab Construction

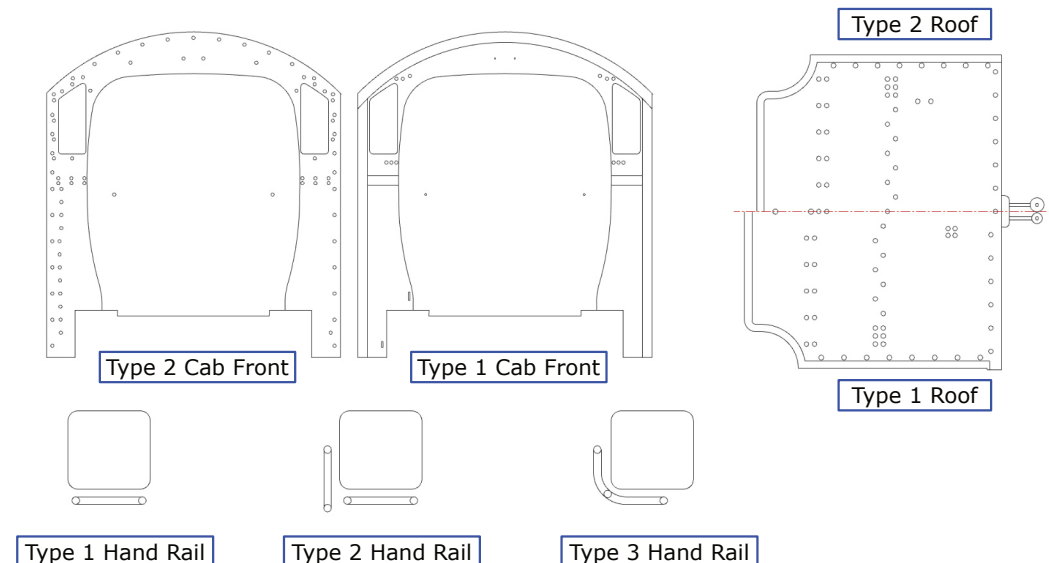


Fig 10. Cab Types

BOILER AND SMOKEBOX

Boiler. If you wish to fit the separate washout plugs (SB7) then drill out the half etched ones on the boiler wrapper (SB8). Emboss the small rivets on the top feed pipe band, form the boiler by rolling and check for fit around the formers (SB9 & SB10). Bend the boiler band joining brackets on the boiler jointing strip (SB11) and fit through the small slots from inside the boiler. If the fit is good and the formers fit then solder the wrapper ends together with the jointing strip. The cutouts in the formers are to clear the jointing strip and the etched notch at the top of the rear former must align accurately with the notch in the wrapper. Fit the formers so that they are **almost** flush with the ends and solder in place. 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. Check the boiler and firebox fit. Represent the bolts in the joining brackets using 0.45mm wire.

Smokebox. Roll the smokebox wrapper (SB12) and check-fit it on the smokebox front and rear formers (SB13 & SB14). Solder the wrapper ends together using the smokebox jointing strip (SB15). Solder in the formers flush with the back and front with the notch in the bottom of the front spacer aligned with the wrapper join. The upper hole in the front former is for the handrail knob and the other hole is for the steam lance cock (BR15). Emboss the four rivets on the smokebox front lamination (SB16), and attach to the front of the smokebox aligning the handrail knob holes. Bend up the smokebox step (SB17) after first embossing the rivets and solder in place under the smokebox front.

No.	Description	Sheet
SB7	Boiler washout plugs (4) 69	C1
SB8	Boiler wrapper 68	C3
SB9	Boiler rear former 17	A1
SB10	Boiler front former 18	A1
SB11	Boiler jointing strip 70	C3
SB12	Smokebox wrapper 71	C3
SB13	Smokebox front former 20	A2
SB14	Smokebox rear former 19	A2
SB15	Smokebox jointing strip 72	C3
SB16	Smokebox front lamination	A2
SB17	Smokebox step 51	C3

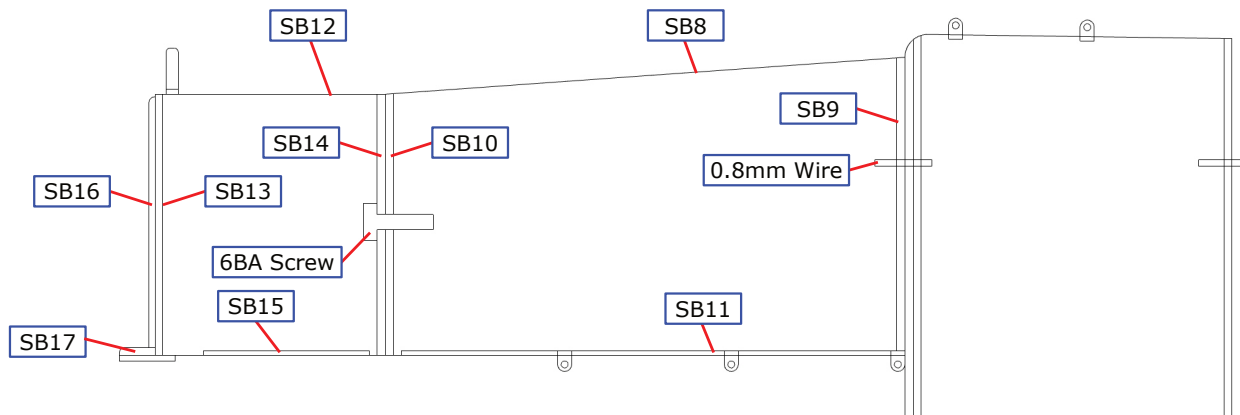


Fig 12. Smokebox and Boiler Construction

SMOKEBOX AND BOILER DETAILING

Assembly. Tap 6BA the hole in the boiler front former and open out the hole in the smokebox rear former to clear so that the smokebox and boiler can be screwed together. Now check fit of the boiler and smokebox to the firebox and saddle. Remember the bottom of the boiler is horizontal and so parallel to the footplate. When happy with the alignment solder the smoke box to the boiler permanently.

If appropriate emboss the rivets in the type 1 cab front (C1) and then solder the cab window frames (C3) in place. Attach the cab front (C1 or C2) to the firebox using short lengths of 0.8mm wire to ensure accurate alignment.

Now solder the firebox/cab front assembly in place carefully checking the alignment. Tack solder the smokebox to the saddle and once again check all is true. If all is well, complete soldering the smokebox to the saddle and the boiler to the firebox. Fit the saddle side plates (U11). The correct radius curvature is obtained by forming over a 4.0mm diameter drill

No.	Description	Sheet
SB18	Smokebox lamp bracket, smokebox top	C1
SB19	Smoke box lamp bracket, smokebox door	C1
U11	Smokebox saddle side plate (2)	C3
U25	Lever reverse reversing rod	C3
U26	Lever reverse reversing rod support bracket	C1
U27	Screw reverse reversing rod	C3
U28	Screw reverse reversing rod support bracket	C1
U29	Reversing rod support bracket base	C1

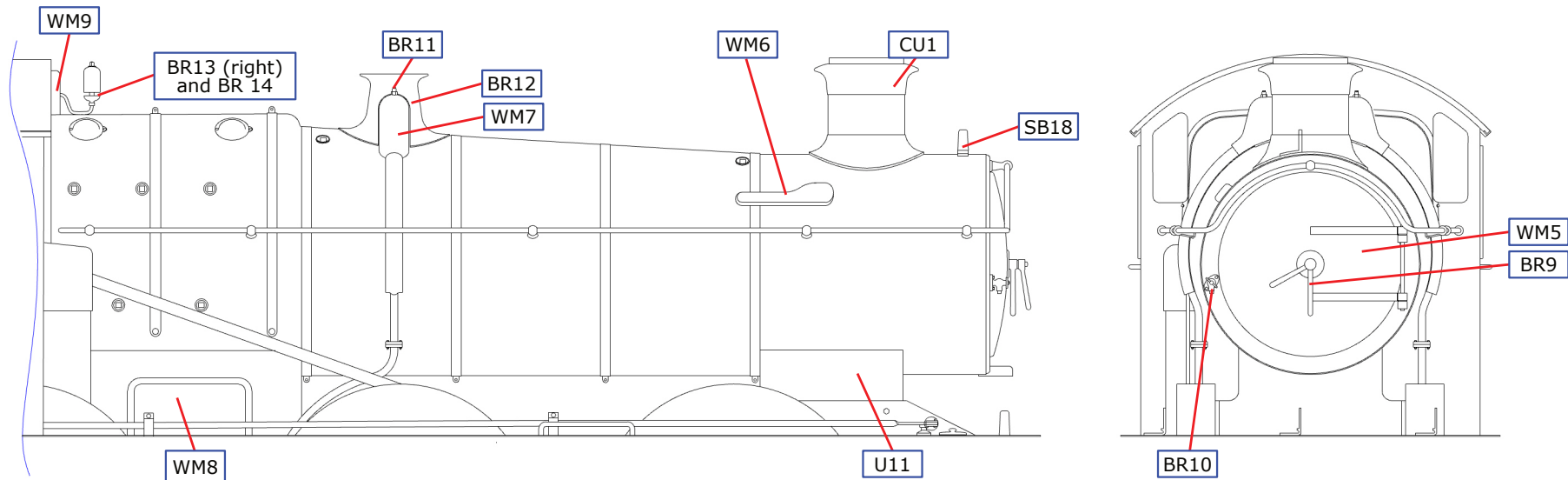


Fig 13. Smokebox and Boiler Detailing

Finney7

REVERSER

Lever Reverse. Modify the end of the screw reversing rod (U27) to form the top of the reversing arm as shown in Fig 11; solder in place. Place the reversing rod (U25) in place one end in the slot in the cab and with one end pinned to the reversing arm. Solder in place. Fold up the reversing rod bracket (U26) and solder the supporting rod in place 33mm from the cab front.

Screw Reverse. Attach the screw reverse cover (WM9) to the front of the cab. Emboss the rivets in the reversing rod support bracket (U29) and fold up. Fold the reversing rod bracket (U28) and solder to the base. Solder this assembly to the middle splasher as shown in Fig 12. Fold the screw reversing rod as shown in Fig 12 and solder in place.

Fit the smokebox door (WM5), the steam lance cock (BR10) and the smokebox door handles (BR9). Fit the chimney (CU1) and then solder the smokebox lamp bracket in place, either smokebox top or smokebox door (SB18 or SB19). Fit the smokebox pipe cover (WM6). Fit the safety valve base (WM7) and form the top feed pipes from 1.4mm wire, thread on two pipe unions and solder in place. Attach the safety valves (BR11) and then place the polished safety valve casing (BR12) over the base and valve. Attach the firebox side covers (WM8) to the firebox. Fit the steam fountain cover (WM9) to the front of the cab and finally fit the whistles, large (BR13) on the right and small (BR14) on the left.

Solder four small knobs in the holes in the firebox and six medium knobs in the boiler/smokebox holes. Form the handrail to shape from 0.8mm wire, thread on the front medium knob, and fix the handrail in place.

No.	Description	Sheet
U25	Lever reverse reversing rod	C3
U26	Lever reverse reversing rod support bracket	C1
U27	Screw reverse reversing rod	C3
U28	Screw reverse reversing rod support bracket	C1
U29	Reversing rod support bracket base	C1

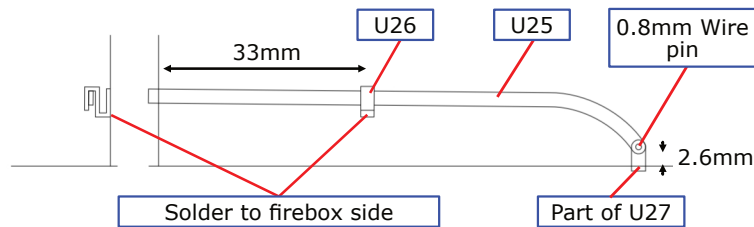


Fig 14. Lever Reverse

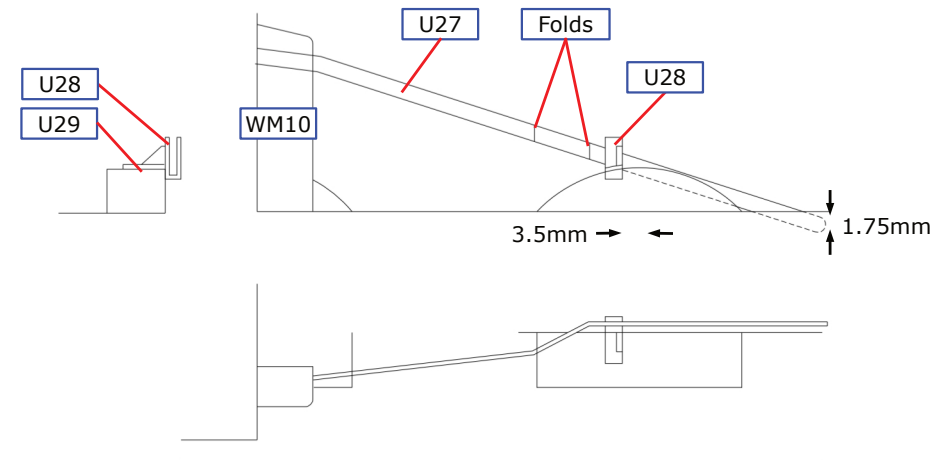


Fig 15. Screw Reverse

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BACKHEAD

Using the drawing (Fig. 14) of the cab interior the backhead can be assembled and the cab interior detailed. Use copper wire of a suitable size for the pipes. The drawing shows a screw reverse engine in 1940 condition.

Differences for an engine in earlier condition could be:

Lever reverse positioned in line with the reverse rod

The ATC bell mounted in a lower position

No regulator lever balance weight extension.

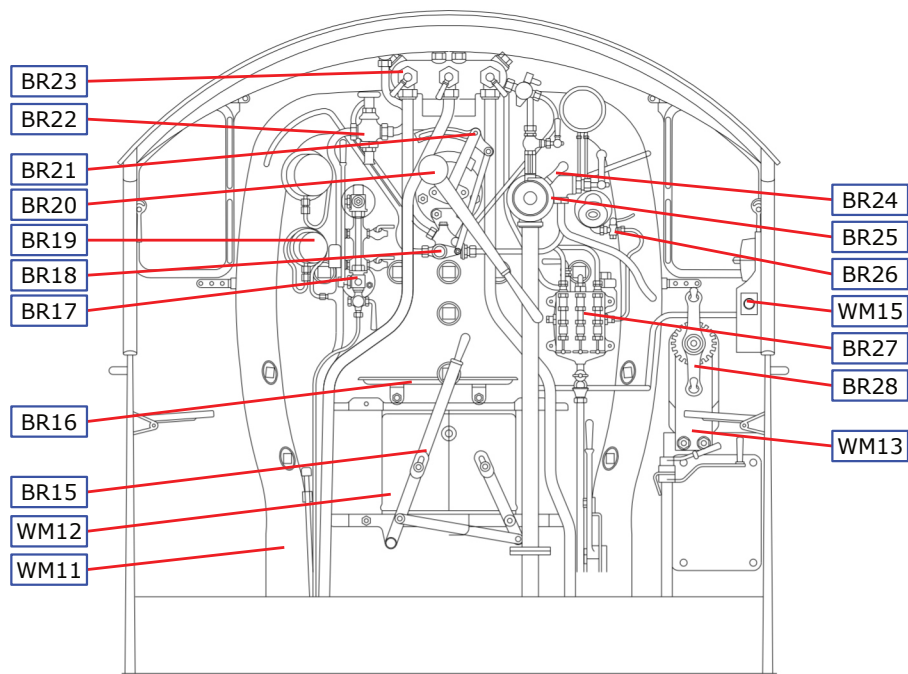
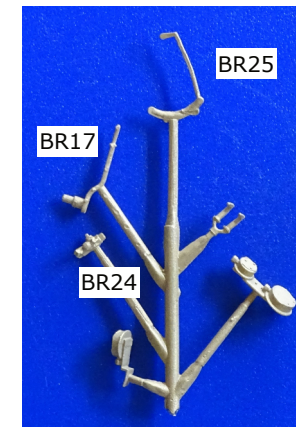


Fig 16. Backhead



Backhead/1



Backhead/2

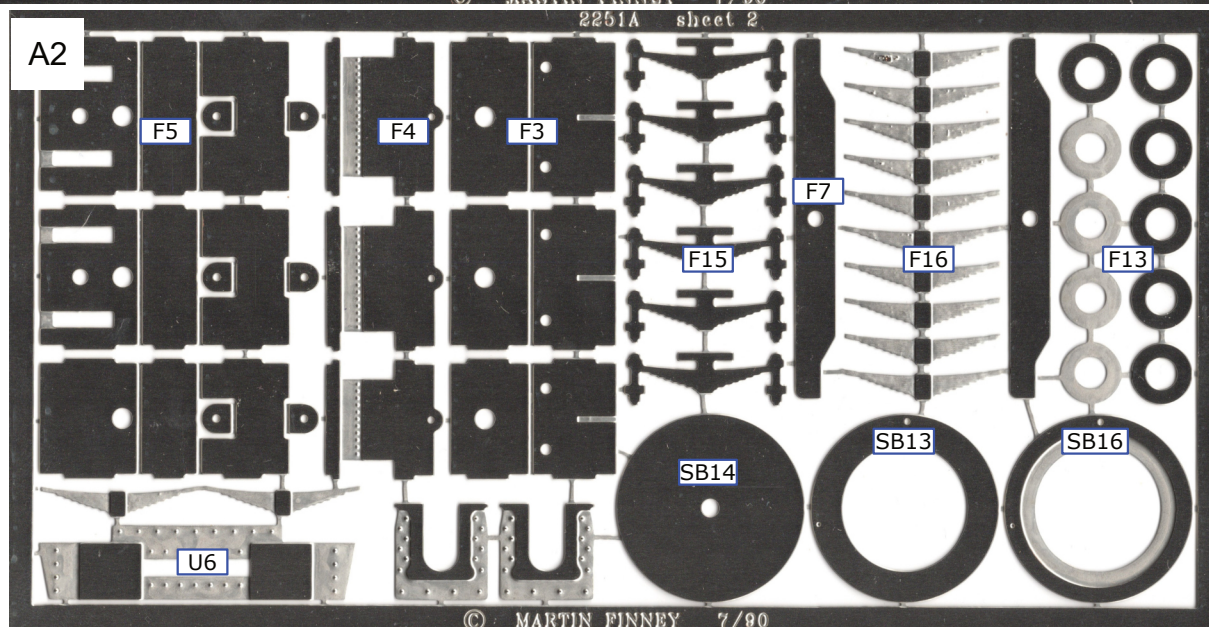
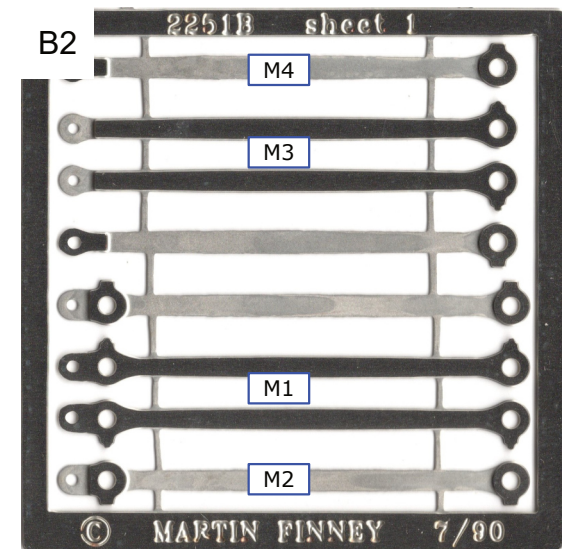
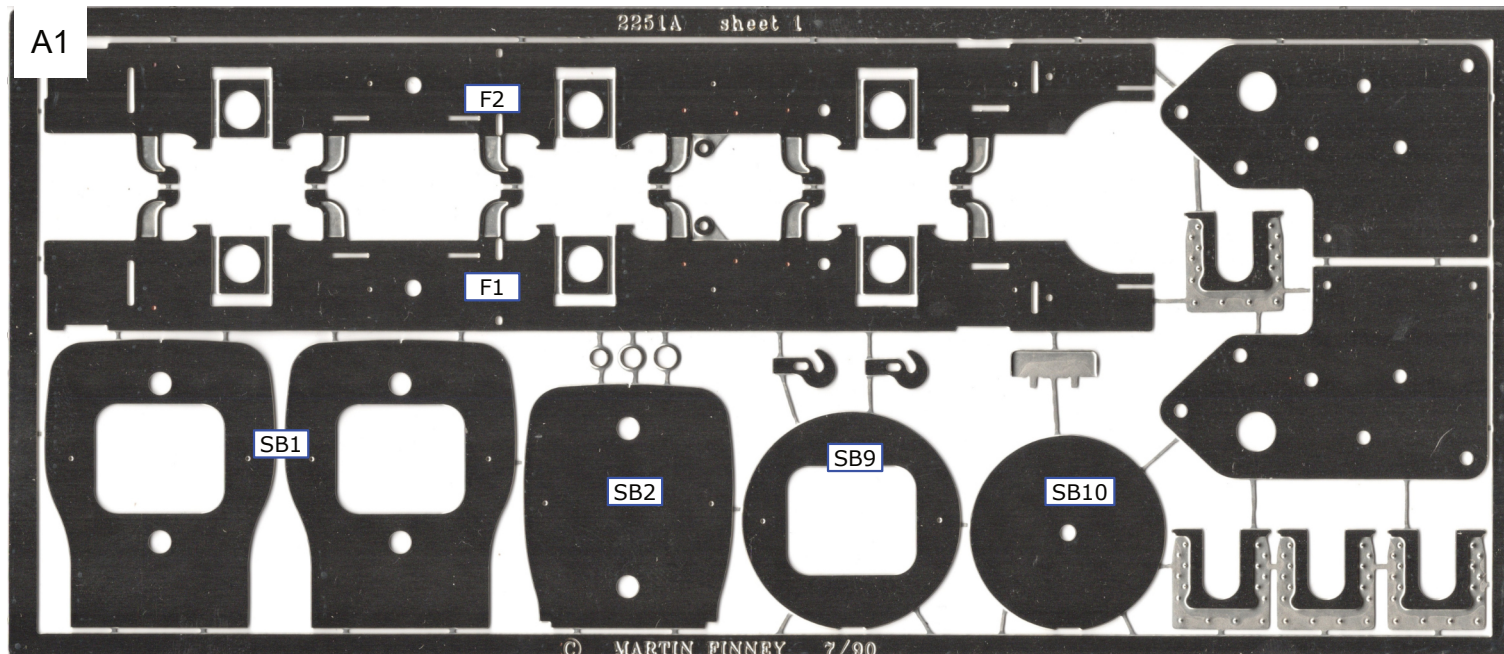


Backhead/3



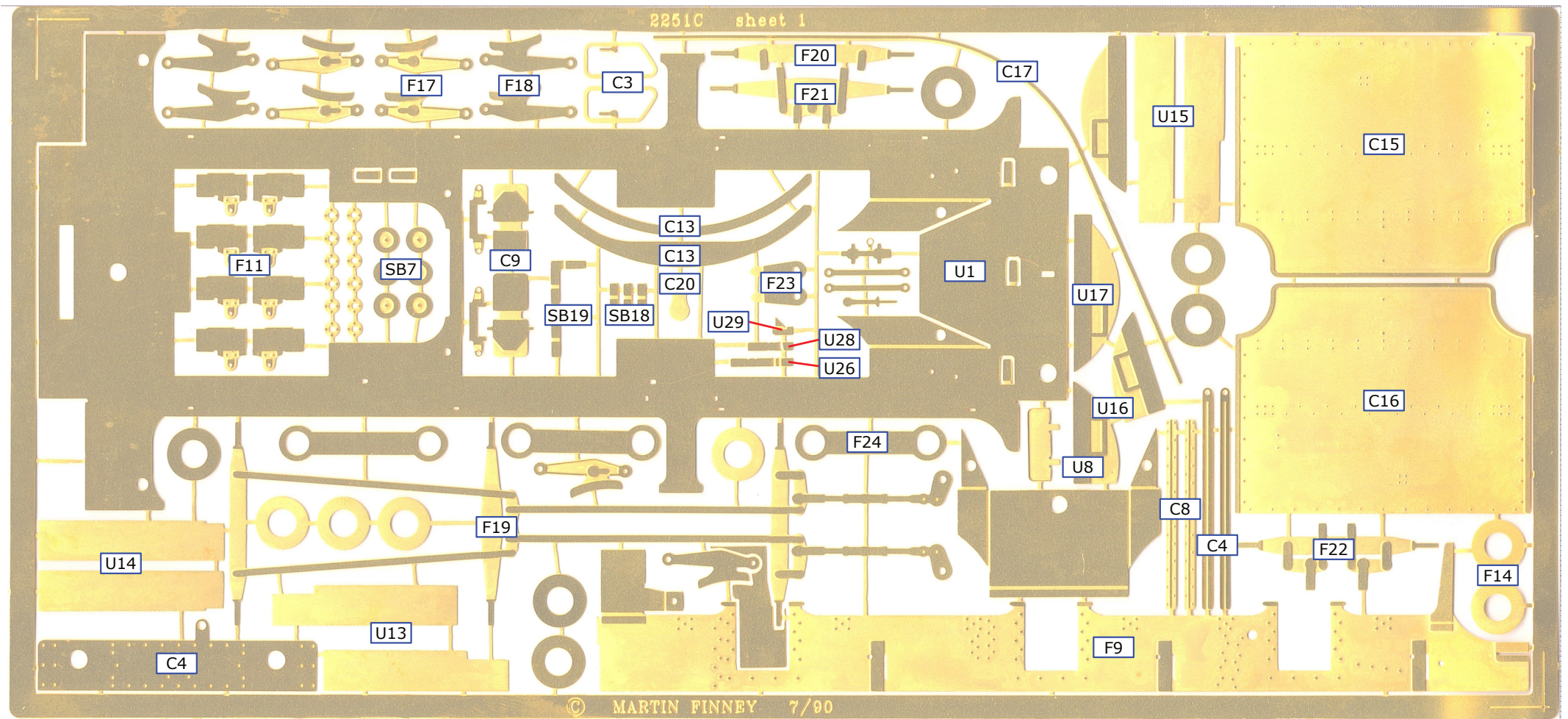
Backhead/4

NICKEL SILVER ETCH 1



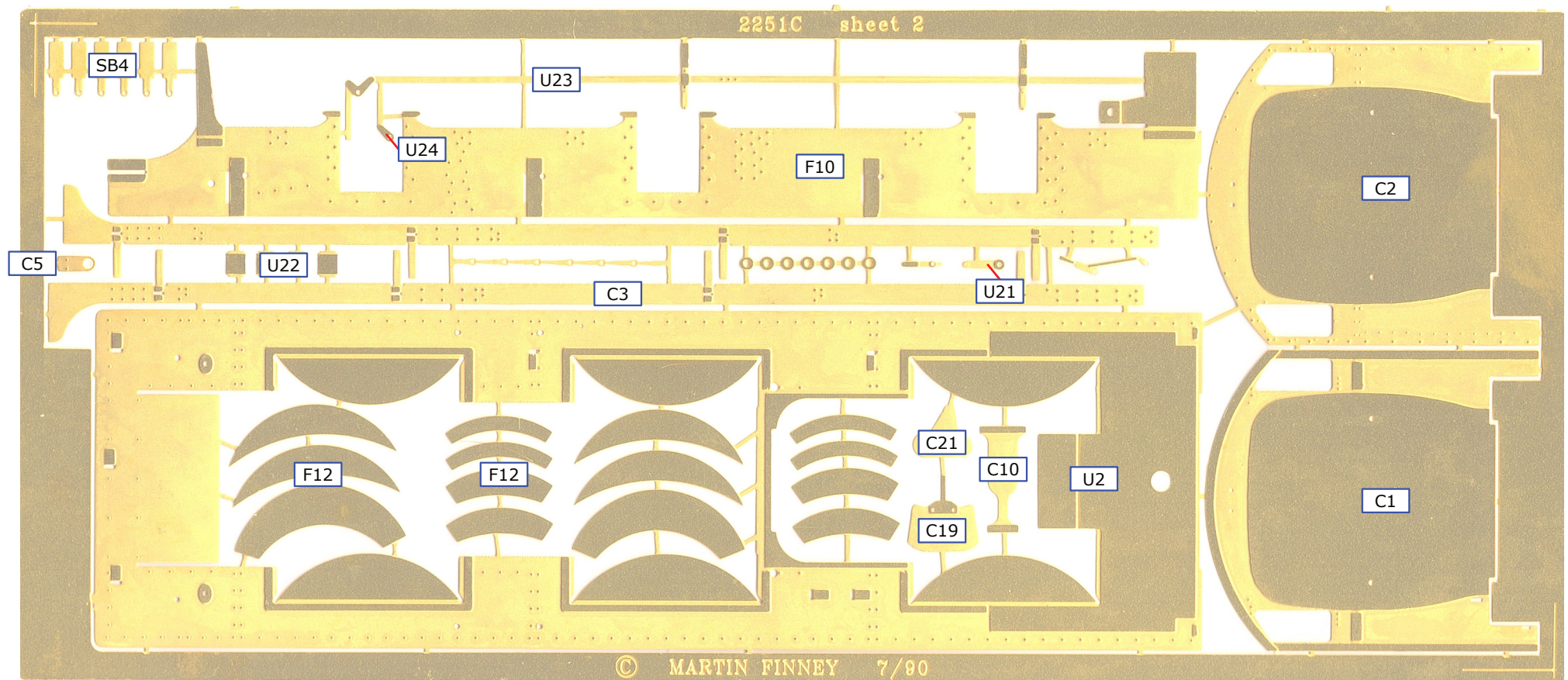
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ETCH C1



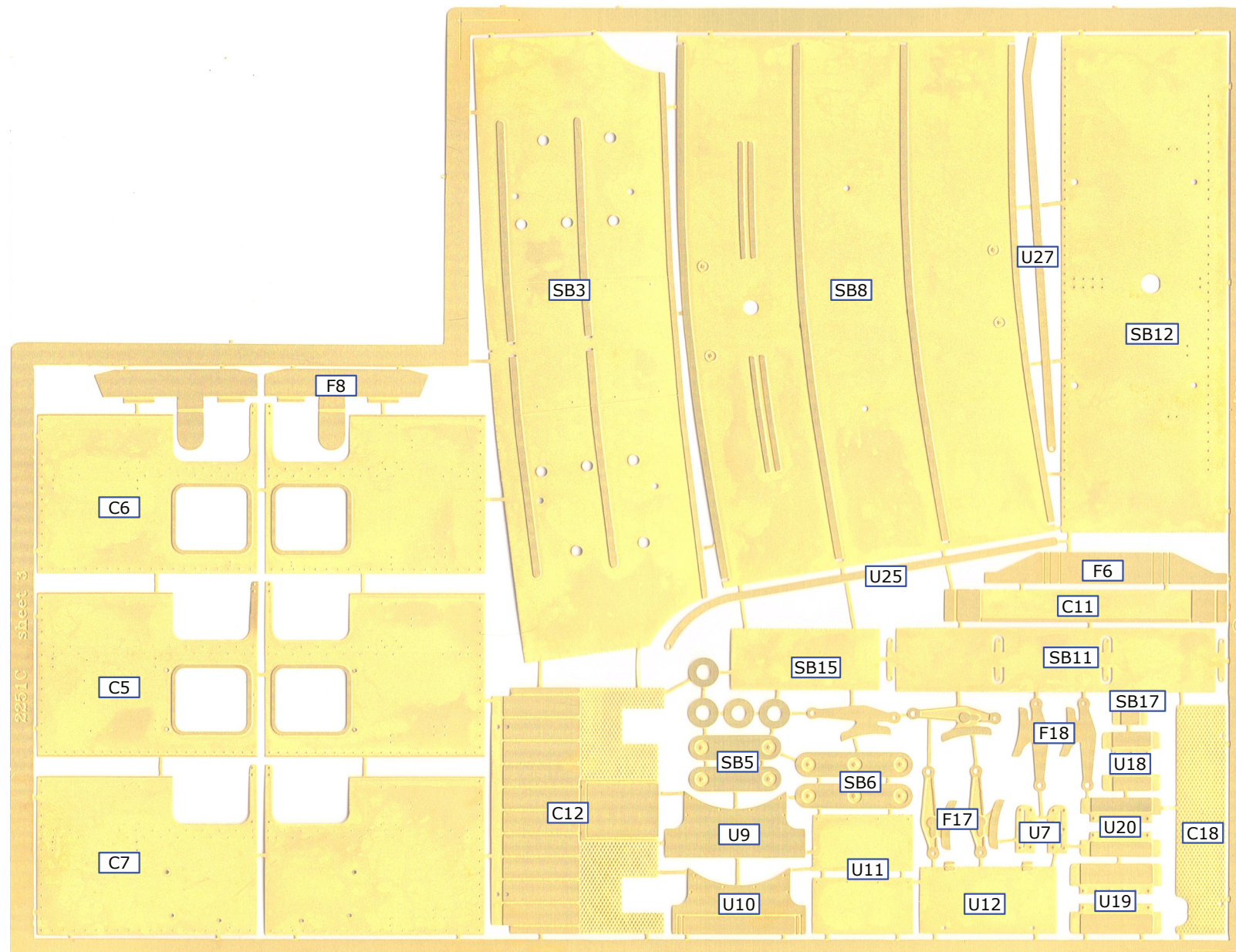
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ETCH C2



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ETCH C3



BRASS CASTINGS

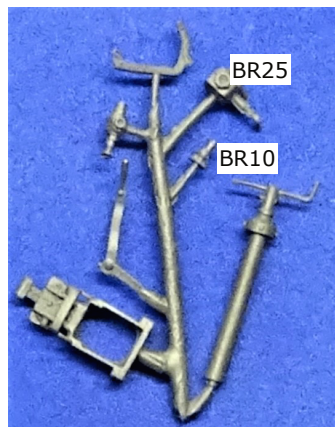
CU1 Parallel chimney	Atbara/2	BR10 Steam lance cock	51XX/2	BR21 Regulator and jockey valve linkage	Backhead/1
BR1 Injector (2)	2251/1	BR11 Safety valves (2)	Details/1	BR22 Steam heating valve	Backhead/2
BR2 ATC shoe	Details/1	BR12 Safety valve casing	47XX/2	BR23 Steam fountain	Backhead/4
BR3 Axle journal lubricator (4)	Lube/1	BR13 Large whistle	Atbara/1	BR24 Combined ejector/brake handle	Backhead/2
BR4 Sandbox lid (2)	Details/1	BR14 Small whistle	Atbara/1	BR25 Combined ejector/brake	51XX/2
BR5 Vacuum pipe	2251/1	BR15 Firebox door handle	Backhead/2	BR26 Blower valve	Backhead/2
BR6 Vacuum pipe dummy	2251/1	BR16 Backhead shelf	Backhead/3	BR27 Sight feed lubricator	Backhead/3
BR7 Steam heating pipe valve (2)	2251/1	BR17 Water gauge	Backhead/3	BR28 Screw reverse handle	2251/1
BR8 Steam heating pipe connector (2)	2251/1	BR18 Jockey valve	Backhead/1	BR29 Lever reverse handle	2251/1
BR9 Smokebox door handles	2251/1	BR19 Cab pressure gauges (3)	Backhead/1	BR30 Firebox flap	Backhead/4
		BR20 Regulator handle	Backhead/1	BR31 Whistle Valves	Backhead/1



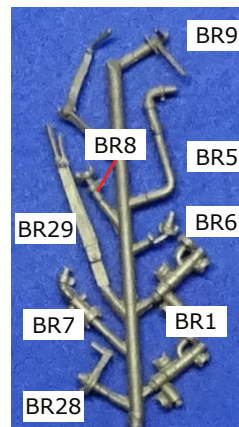
Atbara/2



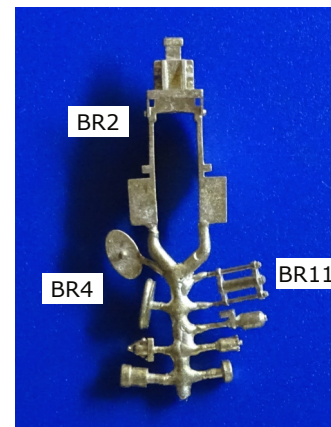
47XX/2



51XX/2



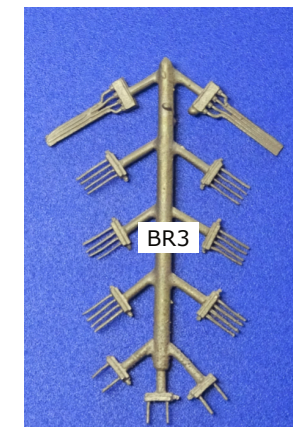
2251/1



Details/1



Atbara/1



Lube/1

WHITEMETAL CASTINGS

- WM1 1 Left sandbox
- WM2 1 Right sandbox
- WM3 1 ATC shoe plunger switch
- WM4 2 Collett parallel buffer stock
- WM5 1 Smokebox door
- WM6 1 Smokebox pipe cover
- WM7 1 Safety valve base with top feed
- WM8 2 Firebox side covers (2)
- WM9 2 Steam fountain cover
- WM10 1 Screw reverse cover
- WM11 1 Backhead
- WM12 1 Screw reverse
- WM13 1 Lever reverse base
- WM14 1 ATC bell
- WM15 4 Mud hole covers



WM1



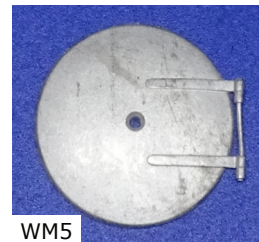
WM2



WM3



WM4



WM5



WM6



WM7



WM8



WM9



WM10



WM11



WM12



WM13



WM14



WM15

OTHER COMPONENTS

- 3/16" bore bearing (6)
- 6BA x 5/16" Brass screws (3)
- 6BA nuts (2)
- Short handrail knobs (4)
- Medium handrail knob knobs (7)
- Buffer head, screw & spring - (2)
- Vacuum pipe and steam pipe hose (2)
- 4mm studding (75mm x 2), 4 brass & 4 stainless nuts

- 1/8" brass wire for compensation beam pivot
 - 5/32" OD brass tube for compensation beams
 - 1.6mm Steel wire for front compensation beam
 - 1.6mm Nickel silver wire for coupling rod fork joints
 - 0.45mm Brass wire for fallplate hinges and handrails
 - 0.8mm Brass wire for brake hanger pivots and handrails
 - 1.2mm Brass wire for vacuum and steam pipes
 - 1.4mm Brass wire for top feed pipes and brake cylinder
 - 1.6mm Brass wire for brake shaft
 - 0.8mm & 1.5mm Copper wire for backhead pipes
- Note. Screws may be supplied over-length and may require cutting to length.

2251 PACKING LIST

ETCHES

1	2251 Frame	2251B7(PT 81332)
1	2251 Body	2251A7(PT 81333)

SPRUES

1	MF7/51XX/2
1	MF7/47XX/2
1	MF7/2251/1
1	F7/GW/Atbara/2
1	F7/GW/Details/1
1	F7/GW/Details/2
1	F7/GW/Backhead/1
1	F7/GW/Backhead/2
1	F7/GW/Backhead/3
1	F7/GW/Backhead/4
1	F7/GW/Lube/1

WHITEMETAL

1	ATC shoe plunger switch
1	ATC bell
1	Left sandbox
1	Right sandbox
2	Collet parallel buffer stock
1	Smokebox door
1	Smokebox pipe cover
1	Safety valve base with top feed
2	Firebox side covers (2)
1	Steam fountain cover
1	Screw reverse cover

1	Backhead (94XX)
1	Screw reverse
1	Lever reverse base
4	Mud hole doors

OTHER COMPONENTS

6	3/16" bore bearing
3	6BA x 5/16" Brass screws
2	6BA nuts
4	Short handrail knobs
7	Medium handrail knob knobs
2	Buffer head, screw & spring
2	Vacuum pipe and steam pipe hose
2x 75mm 4mm studding, 4 brass & 4 stainless nuts	

WIRE

35mm	1/8" brass wire
35mm	5/32" OD brass tube
25mm	1.6mm Steel wire
25mm	1.6mm Nickel silver wire
300mm	0.45mm Brass wire
2x 458mm	0.8mm Brass wire
150mm	1.2mm Brass wire
300mm	1.2mm Brass wire
200mm	1.4mm Brass wire
25mm	1.6mm Brass wire
220mm	0.8mm Copper wire
50mm	1.5mm Copper wire

INSTRUCTIONS