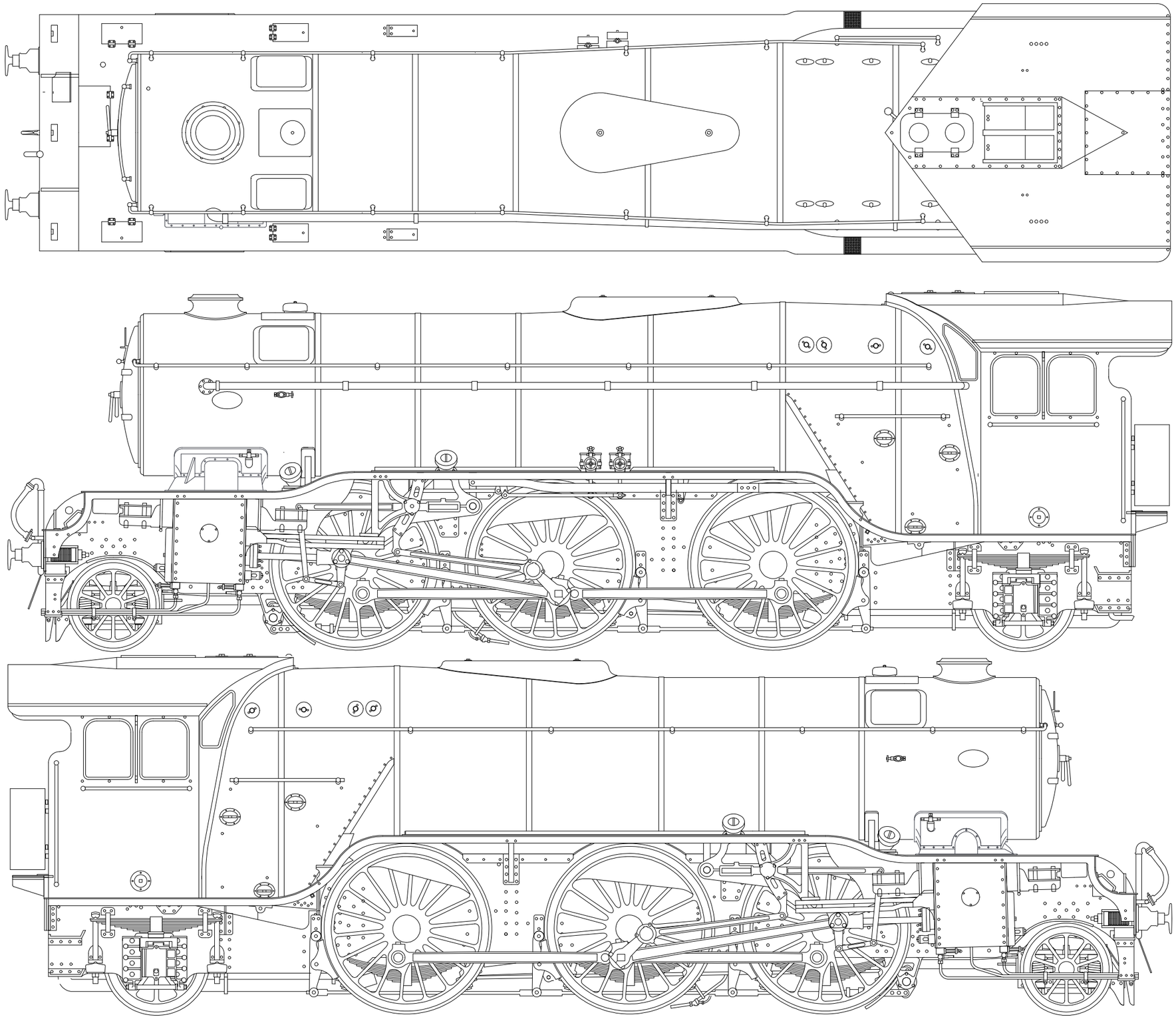
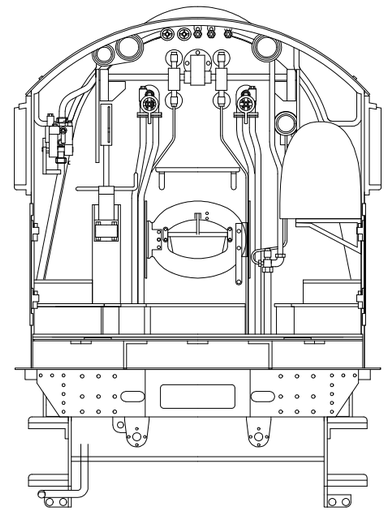




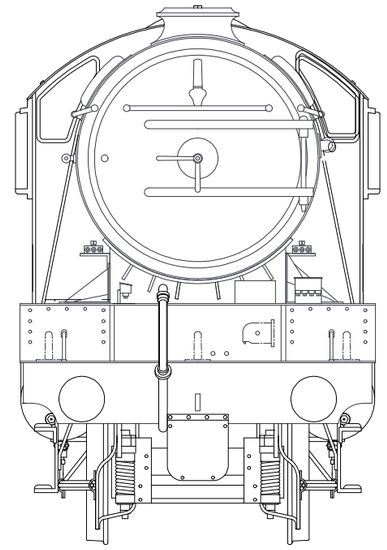


Fig 1. V2 GA - Monoblock Cylinders

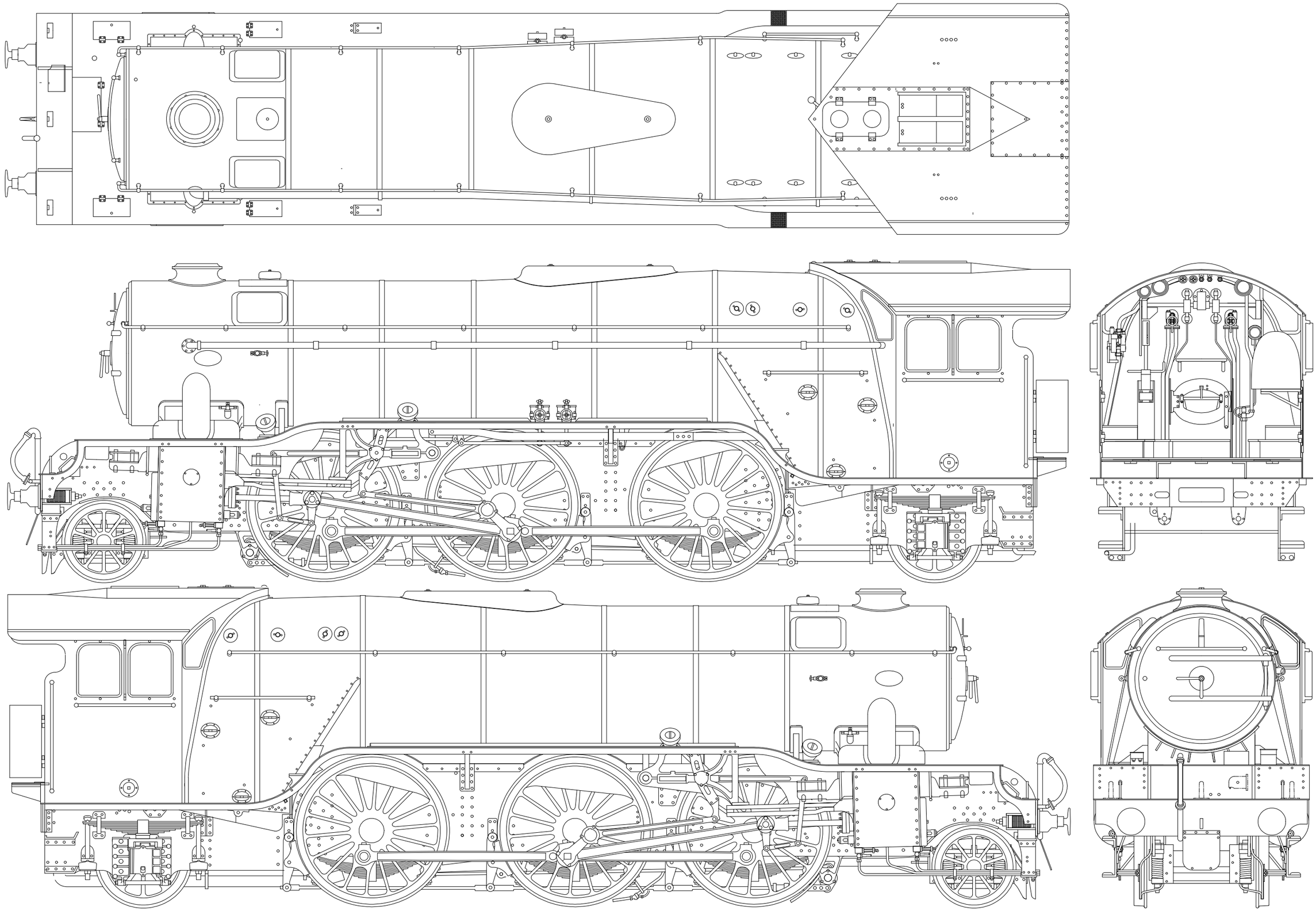


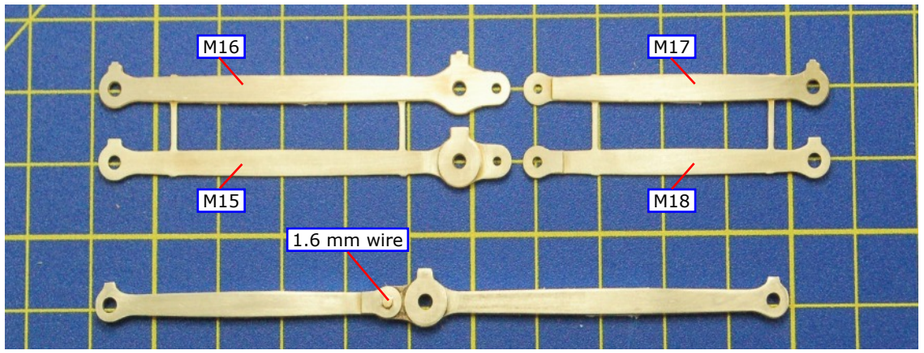
Fig 2. V2 GA - Separate Cylinders

COUPLING RODS & FRAME ASSEMBLY

COUPLING RODS.

The coupling rods are now made so that they can be used as a jig to align the remaining hornblocks accurately. First drill out all the crankpin holes to a convenient size which is well undersize for the crankpins. Drill out the fork joint holes 1.6 mm so that the 1.6 mm nickel silver wire is a tight fit. Remove all burrs caused by the drilling. Now drill a hole, with the drill used for the crankpin holes, in a 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 laminations of each rod.

Place the 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. Carefully file the edges 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.



No.	Description	Sheet
M15	Coupling rod front, inner lamination (2)	1
M16	Coupling rod front, outer lamination (2)	1
M17	Coupling rod rear, inner lamination (2)	1
M18	Coupling rod rear, outer lamination (2)	1

FRAMES.

Having decided which chassis to construct you can now start construction by preparing the frames , left and right (F1 & F2). If you are fitting the later spring pony truck then using the etched lines as a guide, reshape the front frame cut outs as shown in Fig 2. Then emboss the frame rivets.

To construct the kit as designed with a compensated chassis remove the axle holes by cutting up the half etch lines. Follow the instructions in the hornblock pack.

Drill out the holes marked C (1/16") for the compensation beams pivot. Drill the holes marked B (0.8 mm) for the brake pivots. Drill the holes marked P as required for plunger pick ups.

Fold up the brackets for mounting part BR4, as shown in

Remove the rear firebox stretcher (F4), the middle horizontal stretcher (F5), The middle reach rod stretcher (F6), the front compensation beam mounting stretcher (F7) & the front cylinder mounting stretcher (F8) to suit your chosen gauge. Open out the holes for the front compensation beam in F7 to 1/16" and tap 6BA the pony truck pivot and the motion bracket fixing. Modify F4 by removing the 1.5 mm x 2.5 mm area shown on the drawing (Fig 13, page 7) to clear the springs. Alter the shape of F8 by filing the corner square as shown in red; tap the cylinder fixing holes 6BA. Fold up F4,F7 & F8 making sure the etched fold line is on the inside and that each bend is at a right angle.

Check that all tabs on the stretchers fit properly in their corresponding chassis slots so that the stretcher is hard up against the inside of the frames.

Now assemble the frames and stretchers. Start by tack soldering F7 to both sides. Check that everything is square and that the stretchers 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 stretchers to the frames checking constantly that the chassis is square and the frames are straight and checking that the rear of F4 will be vertical. Stretcher F6 is not soldered in place until the angled plate and splashers have been attached.

FITTING THE COMPENSATION BEAMS.

Thread a piece of 1/16" wire together with a piece of 3/32" tube through the holes in the front compensation beam mounting (F7) as shown in the drawing. Solder the wire to the mounting.

For the rear beams cut a piece of 1/16" 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 of 3/32" tube which together fit between the frames and solder the compensation beams (F14) to them close to one end. Temporarily fit the beams and rod.

Temporarily fit all the wheels and axles and confirm that the compensation works properly and check that the chassis is sitting level. The height of the top of the frames above the rails, over the rear compensation beam should be 41.0 mm and over the front compensation beam 45.3 mm. Retain the beam pivot by carefully soldering one end to the frame.

No.	Description	Sheet	No.	Description	Sheet
F1.	Frame left	2	F7.	Front compensation beam mounting stretcher	2 & 3
F2.	Frame right	2	F8.	Front cylinder mounting stretcher	3
F4.	Rear firebox stretcher	3	F11.	Pony truck wheel splasher (2)	6
F5.	Middle horizontal stretcher	3	F12.	Brake hanger pivot overlay (4)	6
F6.	Middle reach rod bracket stretcher	4 & 6	F14.	Compensation beam (2)	3

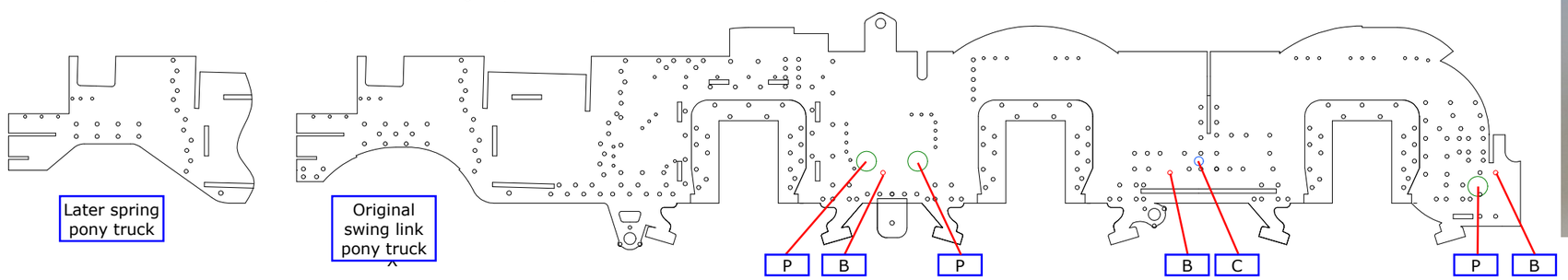


Fig 11. Frame Preparation

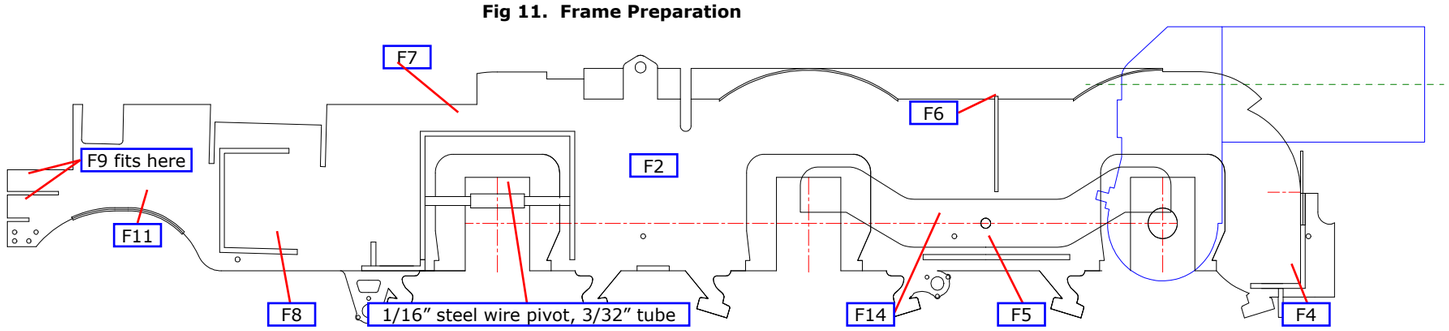
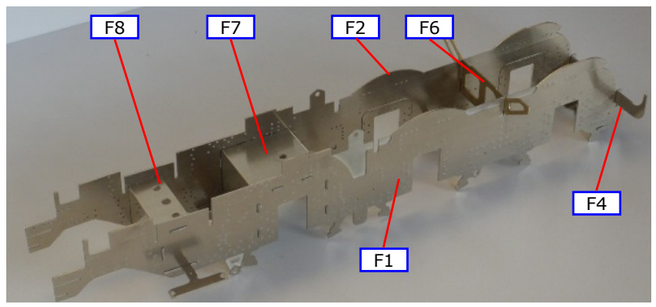
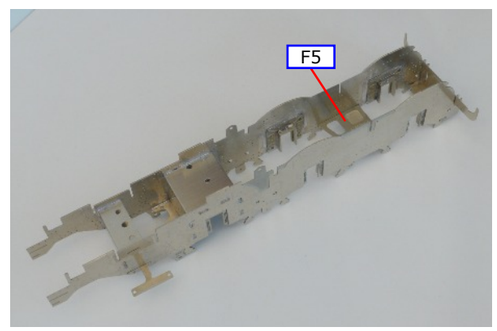


Fig 12. Frame Construction





DETAILING THE CHASSIS

For the original pony truck attach the pony truck wheel splashers (F11), locating them in the frame cut outs. If appropriate, add the guard irons (F3) as shown.

Solder lengths of 0.8 mm wire into the brake pivot holes. Add the brake hanger pivot overlays (F12) over the wires and solder in place.

Emboss the rivets in the reach rod bracket frame overlay/angled plate (F16) and the motion bracket frame overlay/angled plate (F17). Now fold these components to the correct angle using the angled plate setting jig (F42) as a guide. Pass the middle reach rod bracket stretcher (F6), with the short side on the left, through the slots in the reach rod bracket frame overlay/angled plate (F16) and locate all three components on the frames. Check that all is correctly located before soldering in place. Similarly solder the motion bracket frame overlay/angled plate (F17) in place. Check the angle of F16 & F17 again using the jig.

Chamfer the curved edges of the splasher tops, rear and centre (F18 & F19), and curve to shape over a suitable rod. Now solder them in place over the top of the frames and against the angle plate. Now trim the excess material from the outer edges of the angled plate and round off the rear corner as shown in Fig 13. Solder the reach rod bracket rib (F15) to the lower edges of the middle reach rod bracket stay (F6) and trim to length.

No.	Description	Sheet			
F3.	Guard iron (2)	6	F17.	Motion bracket frame overlay/angled plate (2)	6
F11.	Pony truck wheel splasher (2)	6	F18.	Splasher top, rear (2)	6
F12.	Brake hanger pivot overlay (4)	6	F19.	Splasher top, centre (2)	6
F15.	Reach rod bracket rib (2)	4	F42.	Angled plate setting jig	3
F16.	Reach rod bracket frame overlay/angled plate (2)	5			

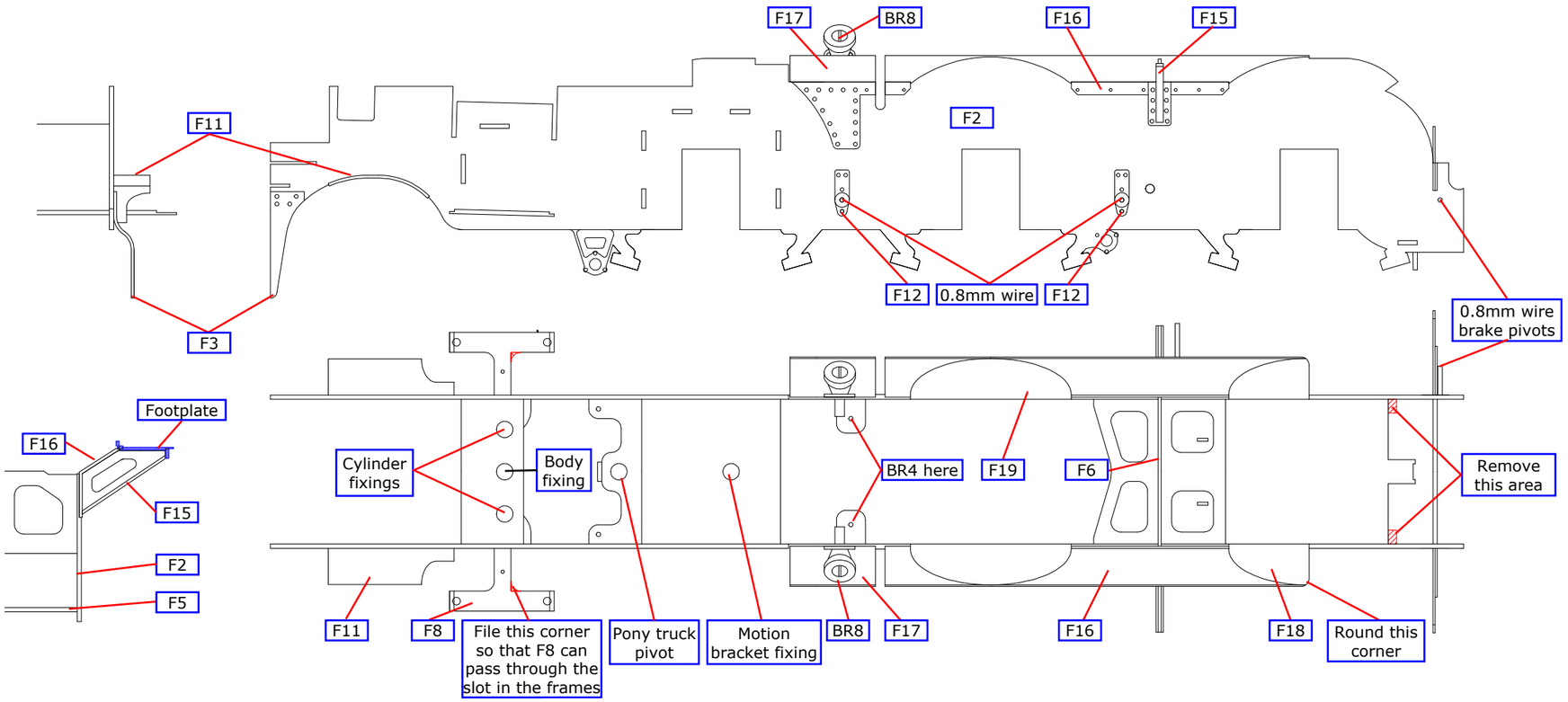


Fig 13. Frame Detailing

REAR FRAMES.

REAR FRAMES

Fold in the radial truck hornguides on the rear frames inner (F25). Now make all the bends on part F25 - all 90° and with fold lines inside - then solder in place on the rear of the rear firebox bracket stay (F4) ensuring that the rear frame is level. Emboss the rivets on the rear outer frames (F26) and form to fit. Many V2's appear to have a more angular fold in the rear outer frames, so check photographs. Form the folds carefully with flat nose pliers ensuring fold line is vertical and re-profile the inner frames to match.

Fit the rear frame drag beam bracket overlay (F28) and the rear frame footplate bracket overlay (F29).

Open out the holes in the two safety bar brackets below the Cartazzi axleboxes on the rear frame outer to 1.25 mm and then fold out. Use 1.25 mm NS wire to represent the rods. (A modification is to use 1.25 mm tube with 0.8 mm wire passing through with 16BA nuts on the ends - not supplied). Check the fit of the axle boxes (WM1 & 2). Some trimming of the mounting hole in the frame might be required. Fit the spring (NS1) in place ensuring that the hangars are vertical. Fit the spring retaining brackets (F32).

The large ejector pipe made from 1/8" brass rod will trap the radial truck, so it is possible to be made removable by the builder to allow the truck to be removed for maintenance purposes

Fold up the rear stay body fixing (F27) and locate between the rear frames. Check all is fitting correctly before soldering the rear frames in place.

Fold the rear steps. Upper and lower (F30 & F31) and solder in place in the reliefs set into the rear outer frames.

Bend the firebox below footplate wrapper (F36) to shape and solder around the firebox below footplate former (F35) to make the lower firebox. Add the washout plugs at the corners from 0.64 mm square wire and the blowdown tap (BR7), before soldering in place on top of the rear inner frames. Add the rocking grate operating rod (F37) onto two 0.8 mm wire pins as shown in the drawing.

No.	Description	Sheet			
F25.	Rear frames inner	2	F31.	Rear steps, lower (2)	6
F26.	Rear frame outer (2)	5	F32.	Rear spring retaining bracket (4)	5
F27.	Rear stay body fixing	2	F35.	Fire box below footplate former	5
F28.	Rear frame drag beam bracket overlay (2)	5	F36.	Fire box below footplate wrapper	5
F29.	Rear frame footplate bracket overlay (4)	5	F37.	Rocking grate operating rod (2)	1
F30.	Rear steps, upper (2)	6			

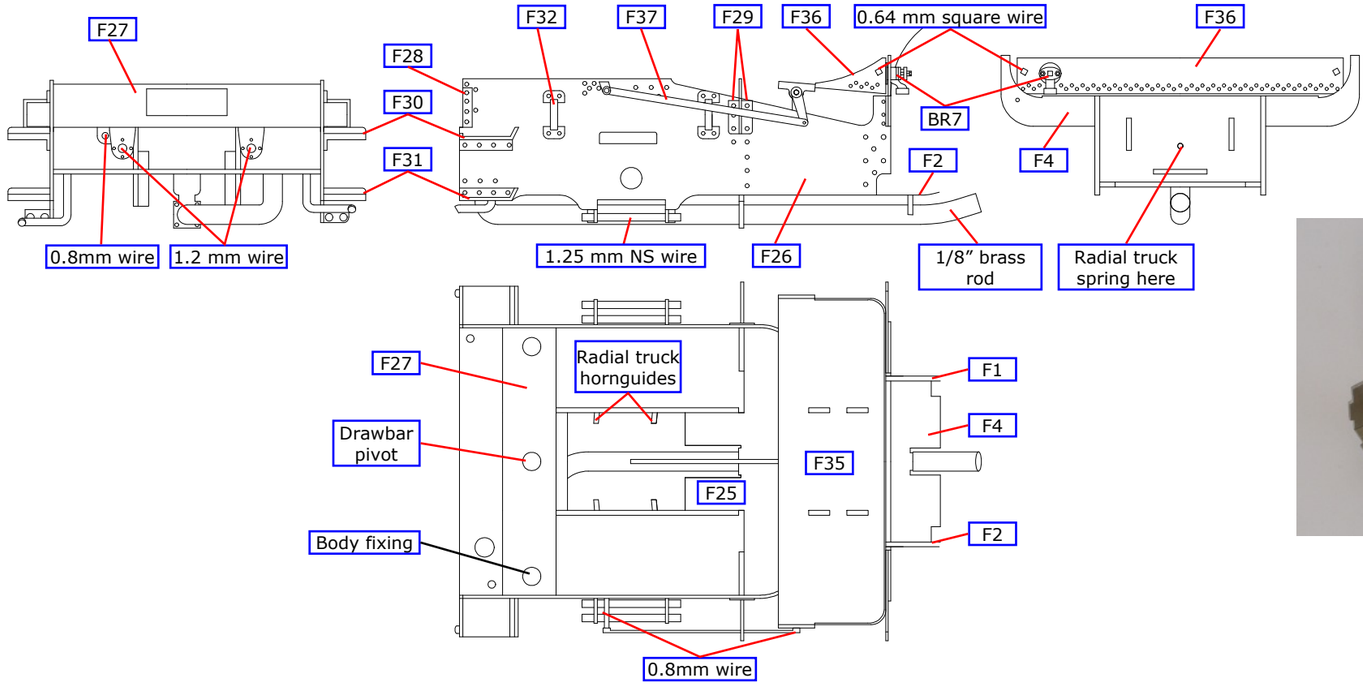
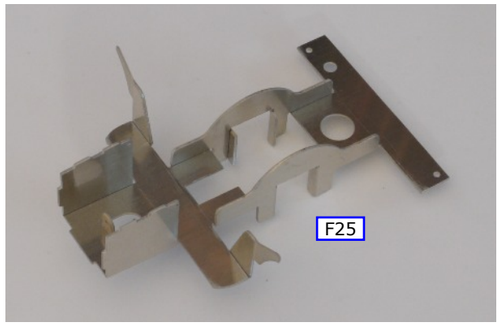
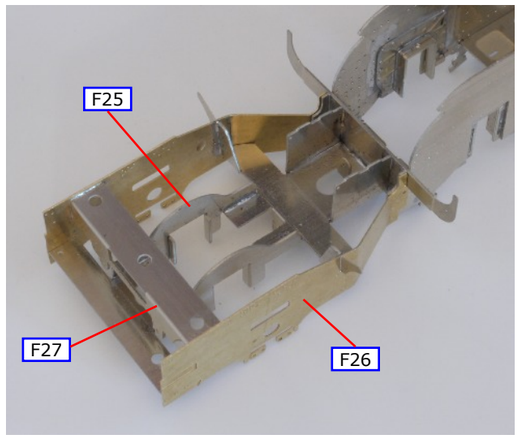
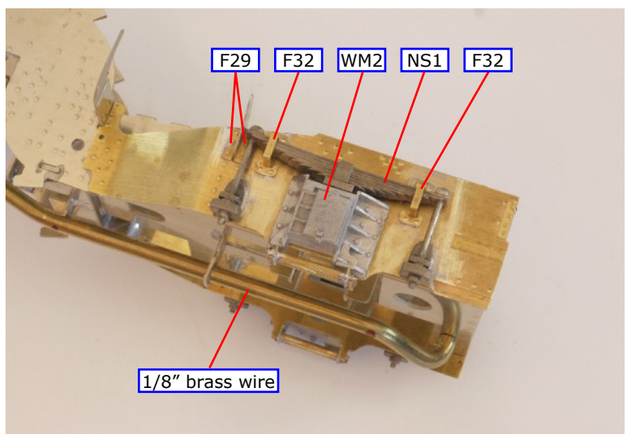


Fig 14. Rear Frame Construction







RADIAL & PONY TRUCKS.

PONY TRUCK

For the pony truck use the widest components for Scaleseven or the middle width components for Finescale standards.

No.	Description	Sheet			
P1.	Radius arm	5	**Swing link side control**		
P2.	Radius arm flange (2)	5	P6.	Side frames/rear stay, 3 widths	3
P3.	Guard iron (2)	4	P7.	Front stay	4, 5 & 6
P4.	Washer, axle	5	P8.	Axlebox dust shield (2)	6
P5.	Washer,pivot screw (3)	5	P9.	Front stretcher	1
			Spring side control		
			P10.	Side frames/rear stay, 3 widths	3
			P11.	Front stay	6

Original Pony Truck (Swing Link Side Control)

Emboss all the frame rivets as shown. Solder guard irons (P3) in place on the outside of the frames. Fold up the side frames/rear stay (P6) and solder the front stay (P7) in place as shown below. Form the dust shields (P8) to shape and solder in place. Add the front stretcher (P9). Solder the radius arm (P1) and radius arm flange (P2) together to make the radius arm. Solder the radius arm in place. Attach the pony truck axlebox/springs (WM3) and ream through the axle holes 5/32" (4 mm).

Using appropriate washers (P4) fit the wheels so that there is a minimum of side play. Form the guard irons to shape. Bend up the spring wire (0.7 mm phosphor bronze) to give some downward pressure and solder in place through the holes in P6. The pony truck is retained with a 6 BA screw and a washer (P5).

Replacement Pony Truck (Spring Side Control)

Emboss all the frame rivets as shown. Solder guard irons (P3) in place on the outside of the frames. Fold up the side frames/rear stay (P10) and solder the front stay (P11) in place as shown below. Solder the radius arm (P1) and radius arm flange (P2) together to make the radius arm. Solder the radius arm in place. Attach the pony truck axlebox/springs (WM3) and ream through the axle holes 5/32" (4 mm).

Using appropriate washers (P4) fit the wheels so that there is a minimum of side play. Form the guard irons to shape. Bend up the spring wire (0.7 mm phosphor bronze) to give some downward pressure and solder in place through the holes in P10. The pony truck is retained with a 6 BA screw and a washer (P5).

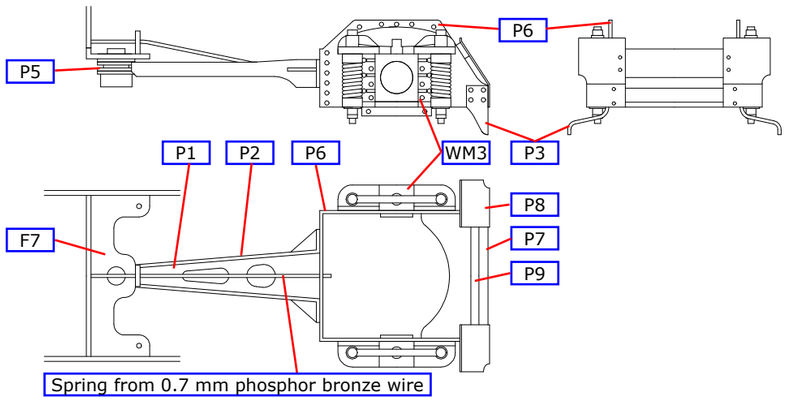


Fig 15. Swing Link Side Control Pony Truck

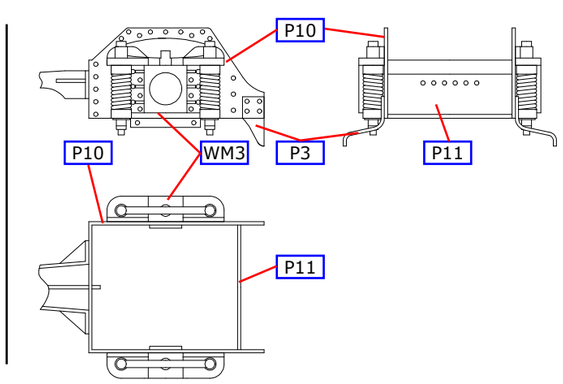


Fig 16. Spring Side Control Pony Truck

RADIAL TRUCK

For the radial truck use the widest components for Scaleseven or the middle width components for Finescale standards. Fold up the spring wire bracket and sideplay stops on the radial truck top plate (F33). Fold up the radial truck bottom and ends (F34) and attach the top plate (F33) and check for free, but not sloppy, movement in the hornguides. Solder the 5/32" top hat bearings in place and fit the radial truck wheels using the washers (F40) to eliminate any side play. Bend up the spring wire to give some downward pressure and solder in place through the bracket on the rear frame inner (F25) and the hole in the rear firebox bracket stay. The radial truck is retained with lengths of 0.64 mm square wire soldered across the bottom of each horn guide.

The draw bar (F38) is illustrated in Fig 17 but is built in at the end of the build, Use drawbar pivot screw washers (F41) to pack the drawbar to the correct height for the tender.

No.	Description	Sheet
F33.	Radial truck top plate, 3 widths	3
F34.	Radial truck bottom & ends, 3 widths	3
F38.	Draw bar, 2 lengths	2
F40.	Washer, radial truck axle	4
F41	Washer drawbar pivot screw	4

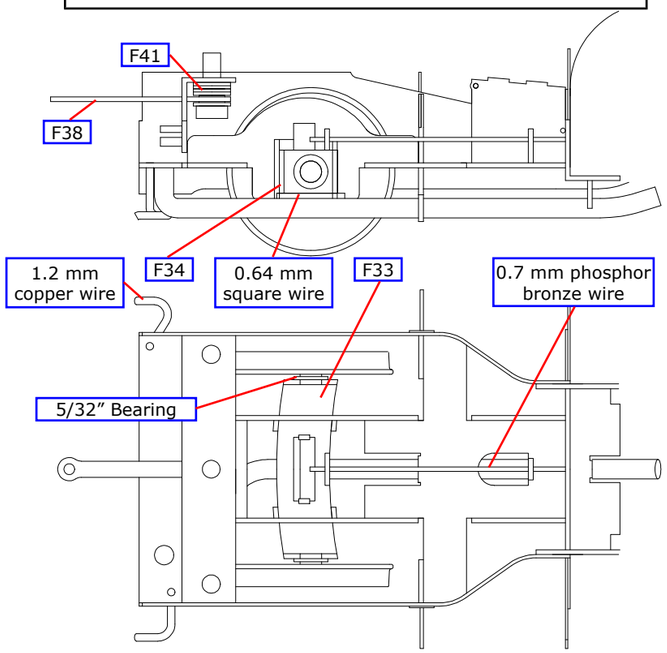


Fig 17. Radial Truck

VALVE GEAR NOMENCLATURE

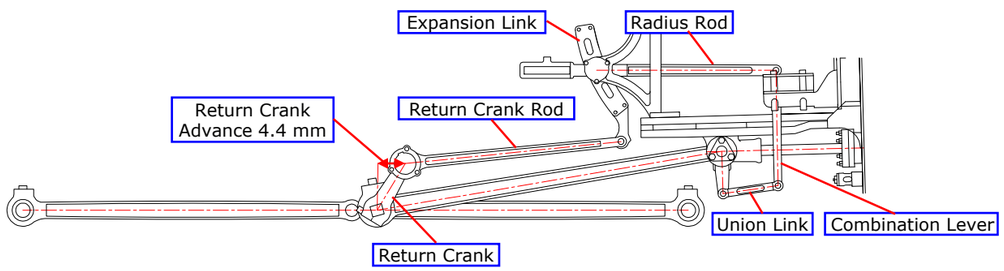


Fig 18. Walshaerts Valve Gear

CYLINDER ASSEMBLY

No.	Description	Sheet	No.	Description	Sheet
M1.	Cylinders	3	M11.	Motion bracket	3
M2.	Cylinder wrapper with cover plate (2)	6	M12.	Motion bracket inner web (2)	1
M3.	Cylinder wrapper without cover plate (2)	6	M13.	Motion bracket transverse web (2)	1
M8.	Slide bar lamination (12)	1	M14.	Expansion link washer (4)	1
M9	Slide bar rear spacer	1	M28.	Reversing crank lamination, left (2)	1
M10.	Slide bar front flange plate (4)	1	M29.	Reversing crank lamination, right (2)	1

CYLINDERS

Check all the holes in the cylinders (M1) against the appropriate components and open up the holes if necessary. Reduce the width of the inside cylinder faces to the etched lines provided if required, so that the cylinders are a good fit in the slots in the frames. Fold up the cylinders making sure they are square and fold out the 2 to 1 arm bracket.

Solder the valve crosshead guides, front (BR1) or old front type (BR3) and rear (BR2) in place aligning them with a piece of 1.4 mm NS wire passed through the valve rod holes. File away the back of the rear guides as shown below.

Insert the slidebars in the cylinders and tack solder in place. After checking all is square and parallel they are permanently attached to the cylinders. Attach the piston rod glands (NS3) and check that the crosshead (NS2) slides properly. Retain the cross head by folding and fitting M9 in the gap between the bars, trim to make a neat joint.

Attach the front covers (NS4) and fit the relief valves (BR6). Add the slide bar front flange plate (M10) as shown below.

Finally fit the appropriate cylinder wrapper either with or without the cover plate (M2 or M3).

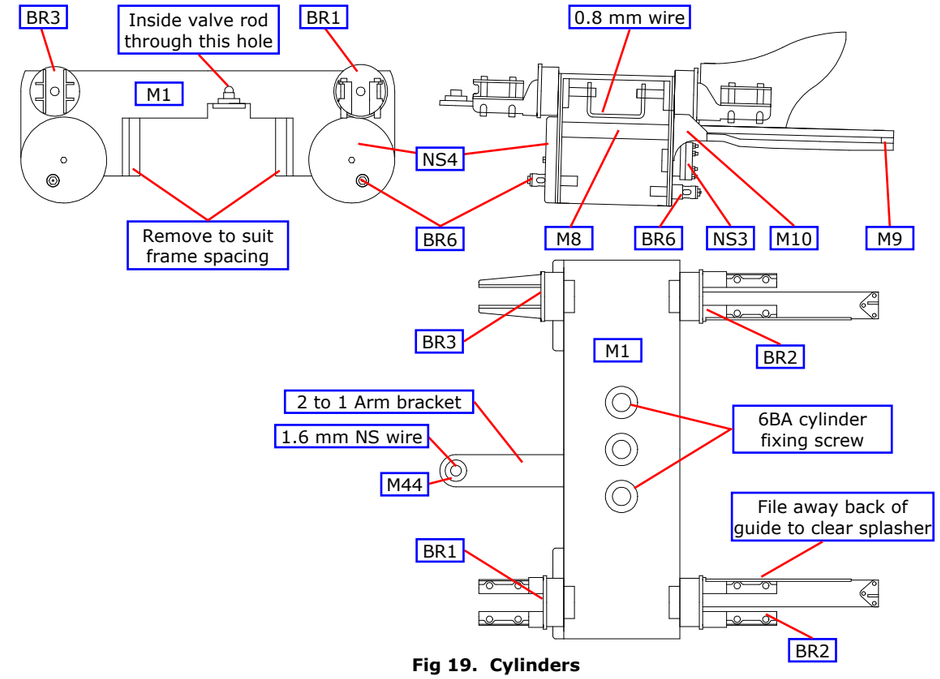
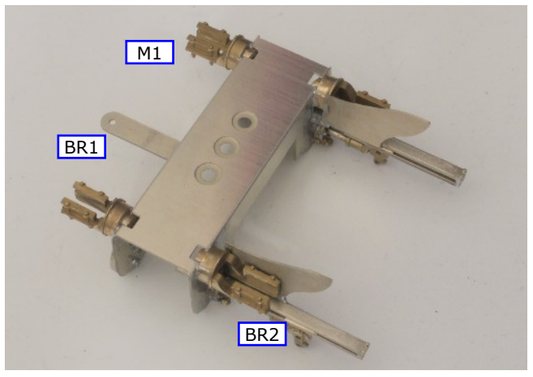
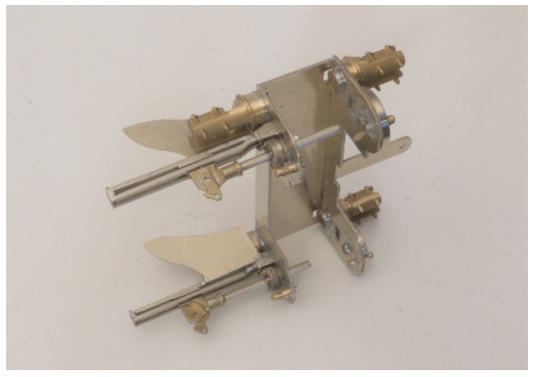


Fig 19. Cylinders





MOTION BRACKET

Modify the motion bracket (M11) to suit your frame spacing as shown in Fig 20 and fold it up, with all fold lines on the inside. Curve the lower ends of the motion bracket over a suitable rod to fit the motion bracket transverse web (M13). Solder an expansion link washer (M14) to the inside of the motion bracket (M11) and add a short length of 1.8 mm wire for the expansion link pivot. Solder the transverse web in place in the groove in the motion bracket. Attach an expansion link washer to the outside face of the motion bracket inner webs (M12) and add a short length of 1.8 mm wire for the expansion link pivot. Fit the webs in the grooves in parts M11 & M13, ensuring that the holes for the radius link pivot align horizontally and vertically.

Attach the cylinders and motion bracket to the chassis with 6 BA screws. Check all alignments before soldering the motion bracket to the slide bars.

Laminate the two left reversing crank laminations (M28) and the two right reversing crank laminations (M29) so that there is a gap between the arms to fit around the radius rod. Pass a length of 1.8 mm wire through the motion bracket and attach the reversing cranks as shown, ensure that the arms are parallel and centred on the gap in the motion bracket. Do not add the radius rod 1.25 mm pins yet.

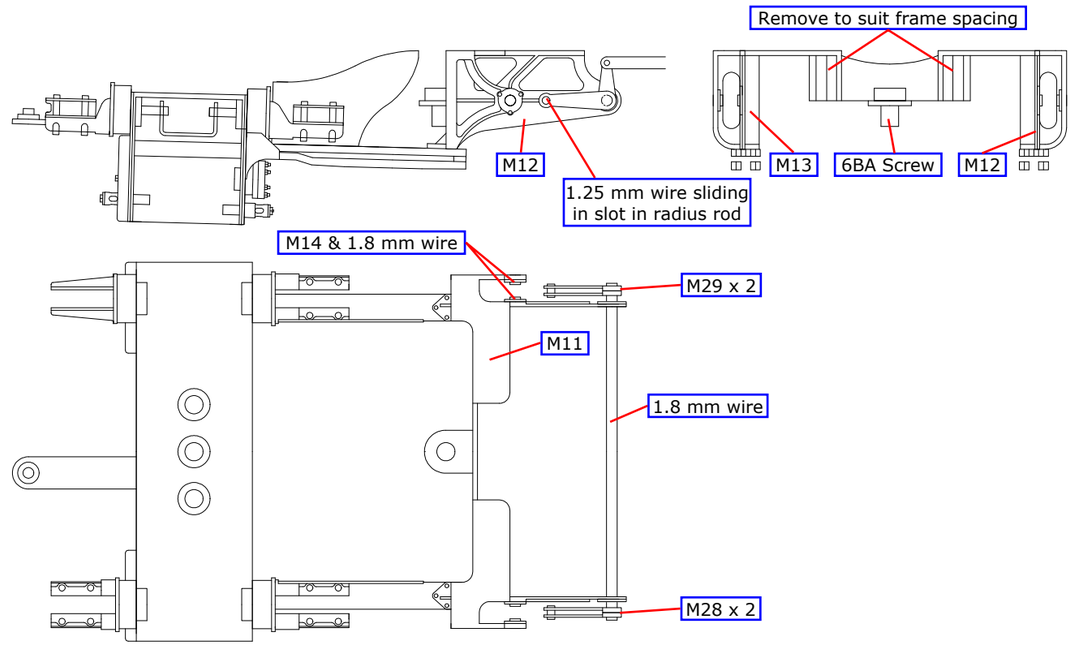


Fig 20. Motion Bracket

SLIDEBARS

Construct the slidebars (M8) as shown in Fig 21. Use plenty of solder whilst applying pressure to keep the laminations together. Clean off the front and rear faces, and remove the rear section. The crosshead slot will need cleaning out so that the crosshead is a good fit. This can be done with a thin file. If you don't have one use a piece of emery paper over a scrap piece of brass etch. The appearance of the slidebars is much improved by carefully filing the top smooth.

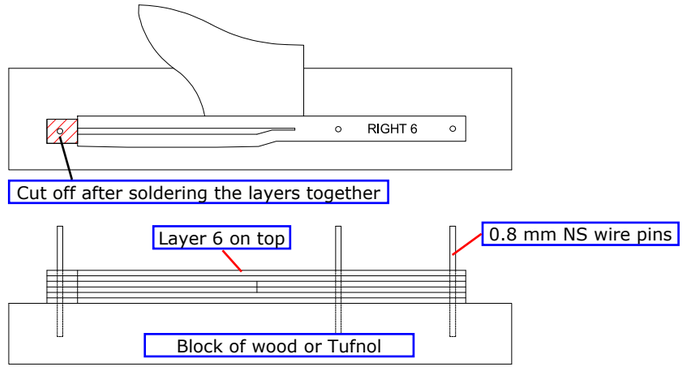


Fig 21. Slidebar Assembly

MOTION PARTS

VALVE GEAR JOINT ASSEMBLY

All the valve gear joints, with the exception of the eccentric arms/eccentric rods, are made with wire pins soldered on the inside (back). This clearly runs the risk of soldering the joint solid. To minimise this ensure the pin is a tight fit in the hole, use oil or a proprietary solder mask and use plenty of flux and a small amount of solder quickly.

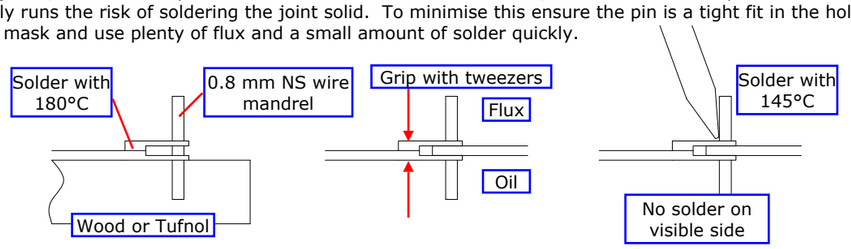


Fig 22. Valve Gear Joint Assembly

CONNECTING ROD & CROSSHEAD

Solder together the connecting rod inner and outer laminations (M19 & M20) and add the rod boss laminations (M21) to the big end inside and outside. Drill the big end to fit the crankpins and the small end 1.6 mm.

Solder the crosshead arm (M39) to a piece of 1.6 mm wire as a pin. Fit the connecting rod to the crosshead (NS2), ensuring the crosshead arm is vertical, carefully solder the pin from the rear and file flush.

Fit the connecting rods with a suitable washer (M50) between the coupling rods and connecting rods and check the clearance of the connecting rod and the leading axle crankpin nut. You will possibly have to reduce the thickness of the nut. The connecting rod passes between the two lower slide bars and it will be necessary to widen the gap between them to give clearance for the connecting rod to pass through.

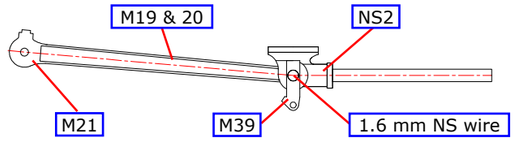


Fig 23. Connecting Rods & Crossheads

VALVE GEAR

Expansion Link & Radius Rod. Drill out the holes in the expansion link laminations, outer and inner (M26 & M27) to take the 0.45 mm wire pins; these align the laminations and represent the bolt heads. Solder the inner laminations together with 4 lengths of 0.45 mm NS wire. Check that the slot in the inner laminations is a sliding fit with the 1.25 mm wire.

Throughout the following,do not allow the expansion link and radius rod to be soldered together. Place the radius rod (M33) and radius rod front lamination (M34) either side of the expansion link (M27) and align with a piece of 1.25 mm wire. Solder the radius rod lamination to the radius rod. Solder the 1.25 mm wire pin to the rod and clean off flush. The radius rod should now move smoothly in the link. Add the fork joint (M35) to the front of the radius rod.

Open out the holes in the expansion link outer lamination (M26) so that they are a good fit on the 1.8 mm wire pivot wires on the motion bracket. Solder the outer laminations in place (Note - they are not symmetrical) and cut off the 0.45 mm wire to represent the bolt heads.

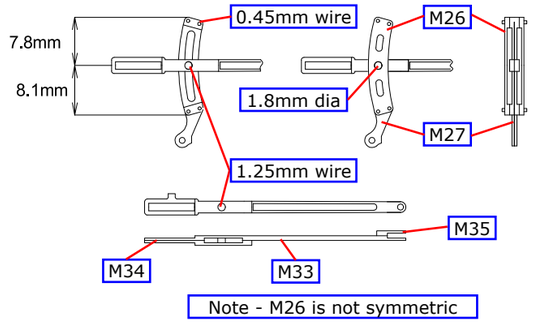


Fig 24. Expansion Link & Radius Rod.

No.	Description	Sheet	No.	Description	Sheet
M19.	Connecting rod, inner lamination (2)	1	M35.	Radius rod, fork joint (2)	1
M20.	Connecting rod, outer lamination (2)	1	M36.	Combination lever (2)	1
M21.	Connecting rod boss lamination (4)	1	M37.	Union link, inner lamination (2)	1
M22.	Return crank (2)	1	M38.	Union link, outer lamination (2)	1
M23.	Return crank rod (2)	1	M39.	Crosshead arm (2)	1
M24.	Return crank rod fork joint (2)	1	M40.	Valve spindle rear lamination (4)	1
M25.	Return crank rod bearing overlay (2)	6	M41.	Valve spindle front lamination (6)	1
M26.	Expansion link outer lamination (4)	1	M42.	2 to 1 arm	2
M27.	Expansion link inner lamination (4)	1	M43.	2 to 1 arm lamination (2)	1
M33.	Radius rod (2)	1	M44.	2 to 1 arm packing washer	1
M34.	Radius rod, front lamination (2)	1	M45.	Equal arm	1
			M50.	Crankpin washer (4)	6

Combination Lever and Valve Rods. Form the joggle in the combination levers (M36) with the fold lines inside; reinforce the bends with solder. Assemble the valve spindles with the front lamination (M41), the rear (M40) and 1.4 mm NS wire. Assemble the union link (M37 & M38). Pin together the combination lever, union link and valve rod with 0.8 mm NS wire. Thread the radius rods through the hole in the motion bracket and pin to the combination levers. Carefully fit the expansion links and pass the tail end of the radius rod between the two arms of the reversing lever cranks and pin with 1.25 mm wire.

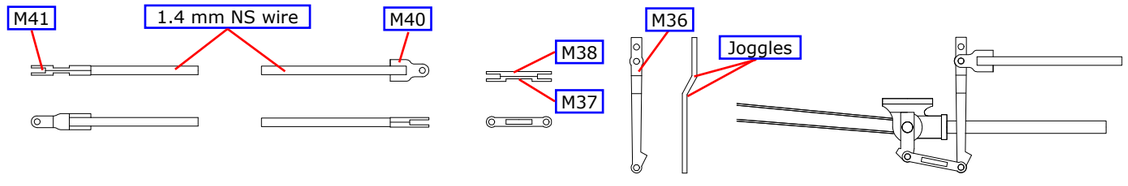


Fig 25. Valve spindles, Union Link & Combination Lever.

Return Crank and Return Crank Rod. Add the fork joint (M24) to the return crank rod (M23). Reduce the diameter and thickness of the rivet head so that it will fit in the recess in the back of the return crank rod bearing overlay (M25). Tap the crankpin hole in the return crank (M22) for the crankpin. Rivet the return crank rod to the return crank and add M25. Fit the arms on the crankpin and tighten so that the offset of the end of the arm is 4.4 mm (see Fig 18). Now pin the return crank rod and eccentric link. Check that the motion works smoothly. By rotating the cross shaft you should now be able to reverse the motion.

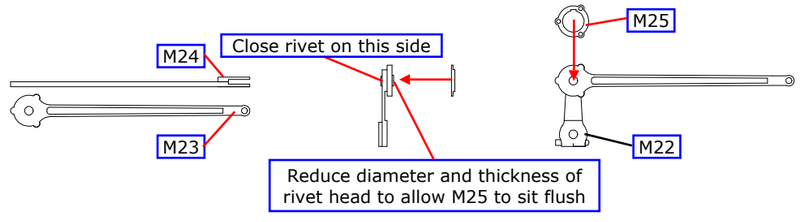


Fig 26. Eccentric and Eccentric Rod.

2 to 1 Lever Assembly. Assemble the 2 to 1 arm (M42 & M43) and the front valve spindle as shown in Fig 27. Pin the left and middle valve rods, 2 to 1 arm and equal arm (M45) together using 1.25 mm NS wire. Solder a 1.6 mm wire pin in place in the bracket attached to the cylinders. Make the pin just long enough so that the 2 to 1 arm can be sprung in place over the washer (M44). Adjust the valve rods to length so that they do not interfere with the rear valve rods and check for free movement. Fit the right side valve rod and pin to the 2 to 1 arm. Now link the valve rods together with U of 0.8mm wire, as shown in Fig 19, checking that you have equal backward and forward movement on the conjugated valve gear arms.

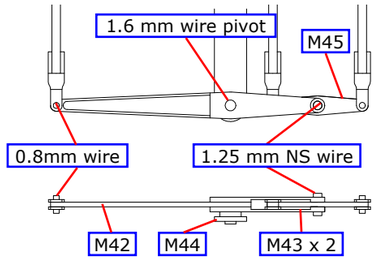


Fig 27. 2 to 1 Lever

FINISHING THE CHASSIS

Front Steps. The drawing shows the cylinder drain pipes attached to the steps after removal of the front guard irons. Drill the holes in the buffer beam stay (F9) 2.6 mm to fit the buffer spring gaiter (BR28). Fold up the buffer beam stay, inserting the buffer spring gaiter at the same time. Attach the front step upper (F10) and solder the complete assembly to the frames.

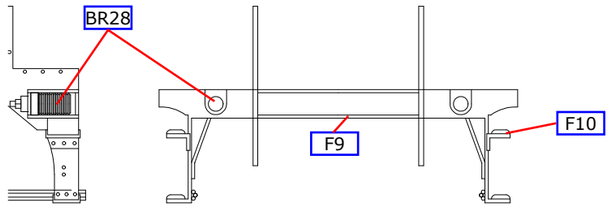


Fig 28. Front Steps

Cylinder Drain Cocks. Attach the drain cock castings (BR5) to the front cylinder mounting stretcher (F8). Emboss the rivet on the drain cock linkage (M4) and fold over the end bracket at the front as shown below, before soldering in place together with a length of 0.8 mm wire to represent the operating rod. Add the drain cock linkage rear cock bracket (M5). Make the drainpipes from the 0.6 mm copper wire provided, adding the brackets to the guard irons and around the pipes (M6 & M7) as shown below. For the original pony truck the joggle in the pipes to clear the wheels is immediately behind the guard iron.

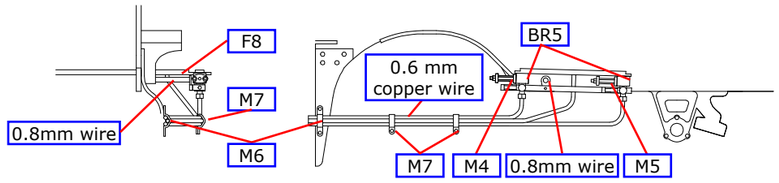


Fig 29. Cylinder Drain Cocks

Brakes. Assemble the brake hangers (B5 & B6) first embossing the rivet on each lamination. Attach the hangers to the 0.8 mm pivot wires. Emboss the bolts in the brake pull rods/cross shafts (B1) and the cross shaft overlays (B2, B3 & B4) and solder the overlays to the top of brake pull rods/cross shafts. Fix this assembly to the brake hangers. Complete the brake gear by fitting the front and rear cross shafts from 2 mm brass wire and the pull rods and front laminations (B7 & B8) as shown below.

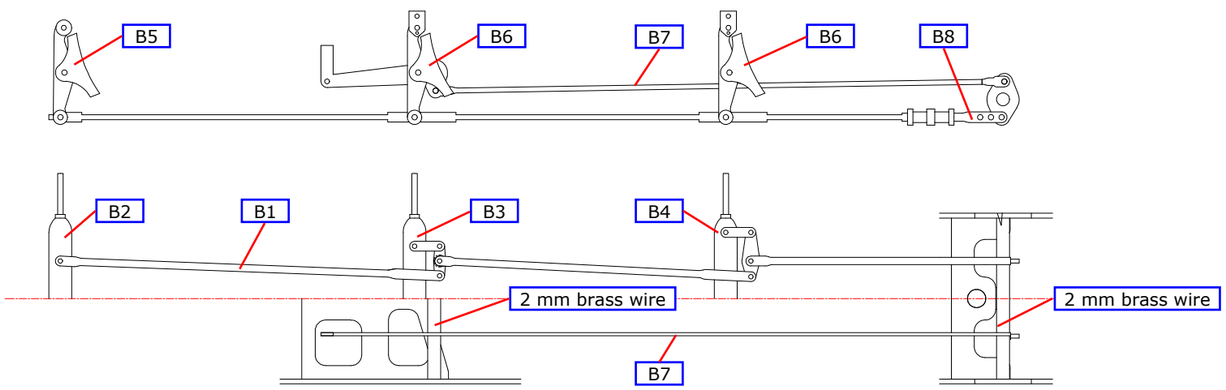


Fig 30. Brakes

Springs. The axles are now retained by the springs, formed from a triple lamination of F20,F21 & F22. The front springs may need modifying to clear part F7.

No.	Description	Sheet	No.	Description	Sheet
B1.	Brake pull rods/cross shafts	4	F21.	Spring outer lamination (6)	1 & 3
B2.	Front brake cross shaft overlay	4	F22.	Spring inner lamination (6)	1 & 3
B3.	Middle brake cross shaft overlay	4	F23.	Balance weight leading & trailing wheels (4)	4
B4.	Rear brake cross shaft overlay	4	F24.	Balance weight centre wheels (2)	4
B5.	Brake hanger/shoe lamination, rear (4)	6	F38.	Draw bar, 2 lengths	2
B6.	Brake hanger/shoe lamination, middle/front (8)	6	F39.	Washer, coupled wheel axle	3 & 4
B7.	Brake cylinder pull rod (2)	4	F41.	Washer, drawbar pivot screw	4
B8.	Brake cylinder pull rod front lamination (2)	4	M4.	Drain cock linkage (2)	6
F9.	Buffer beam stay	6	M5.	Drain cock linkage, rear cock bracket (2)	6
F10.	Front step upper (2)	6	M6.	Drain pipe bracket, guard iron (2)	6
F20.	Spring centre lamination (6)	1 & 3	M7.	Drain pipe bracket around pipes (4)	6

COMPLETING THE CHASSIS.

Attach the balance weights to the wheels as shown in Fig 31. Assemble the wheel sets, bearings and motor/gearbox selecting 3/16" axle washers of appropriate thickness to control side play. Side play on the leading axle should be kept to an absolute minimum to avoid clearance problems with the leading axle crank pin and the slide bars. The cranks on the right hand side should lead the left by 120°. Now connect the motor to your pick-ups and test run.

Complete the chassis detailing by fitting front sand pipes from 0.8 mm wire and steam sanding pipes (BR4) as shown in the GA.

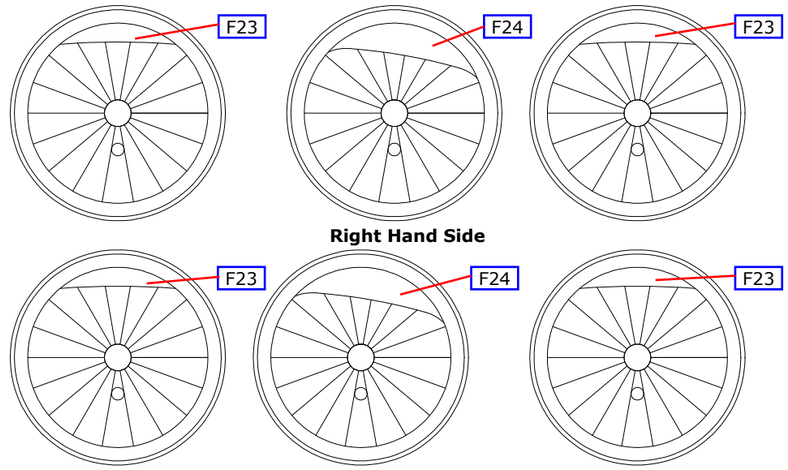


Fig 31. Balance Weights

FIREBOX, BOILER AND SMOKEBOX

The boiler/firebox/cab assemblies are doweled together, using 1.25 mm wire, for accurate location. An alternative to the use of wire are 10BA screws which are not provided.

Firebox. Fold up the cab floor support (C1) and use this as a jig to accurately make the bend in the firebox rear former (U28). Pin together, using 0.8 mm wire pins, the firebox front former (U29), the firebox front former lower extension (U30) and the firebox front former packing piece (U31). Fold this assembly along the fold lines and locate together with the firebox rear former (U28) and the firebox former spacer (U32) to make the firebox cage. Before soldering together check that the 26.5 mm dimension (see below) is correct and adjust as necessary. Accuracy is very important at this stage if the firebox is to fit.

Clean out the slot for the sanding and reversing rods in the firebox front and round the sloping front edge. The edge of the rear former must now be chamfered as shown below. Again, check that the dimensions are correct.

Press out the rivets on the firebox mudhole doors, upper and lower (U34 & U35) and then solder in place on the firebox wrapper (U33) before forming the wrapper to shape. Centre the wrapper on the formers by using the V at the rear (accuracy here is essential) before tack soldering the wrapper in place. Note that the lower edges at the rear will overhang the former at this stage; this will be filed flush with the face of the former so the firebox will fit against the cab front. When completely happy with the location of the wrapper, solder it in place.

Fix the mudhole door clamps (U36 or BR13) in place and attach the upper washout covers (U37) with 0.64 mm square wire. Solder handrail knobs in place and add the lower handrail from 0.8mm wire.

Coned Section of the Boiler. Form the coned boiler wrapper (U40) by rolling and check for fit around the formers, rear and front (U38 & U39). Bend the boiler band joining brackets on the coned boiler joining strip (U41) 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 joining strip. Solder the formers in place so that they are almost flush with the ends with the wrapper aligned accurately with the cut out in the rear former. Check the boiler/firebox fit. Represent the bolts in the joining brackets using 0.45 mm wire and solder the handrail knobs in place.

Smokebox/Parallel Section of the Boiler. Roll the smokebox/parallel boiler wrapper (U45) and check the fit on the formers, rear and front (U42 & U43). Solder the wrapper ends together using the smokebox/parallel boiler joining strip (U46) and solder in the formers flush with the back and front with the line on U43 aligned with the wrapper join. Round off the front edge of the smokebox front overlay (U44) and then attach it to the front of the smokebox aligning the handrail holes. Add the remaining handrail knobs.

Tap 6BA the hole in the coned boiler front former (U39), so that the smokebox and boiler can be screwed together. Now check the fit of the boiler/smokebox to the firebox and saddle.

Form the ejector exhaust pipe from 1.8 mm wire and attach using the ejector exhaust pipe bracket (U50) through the slots in the boiler together with the ejector exhaust pipe elbow (BR20). Leave the wire over length as it passes through the cab front to the rear. Add the boiler handrail from 0.8mm wire. (See Fig. 1 or 2)

No.	Description	Sheet	No.	Description	Sheet
C1.	Cab floor support	4	U38.	Coned boiler rear former	3
U28.	Firebox rear former	3	U39.	Coned boiler front former	2
U29.	Firebox front former	3	U40.	Coned boiler wrapper	5
U30.	Firebox front former lower extension (2)	3	U41.	Coned boiler joining strip	6
U31.	Firebox front former packing piece (2)	3	U42.	Parallel boiler rear former	2
U32.	Firebox former spacer	2	U43.	Smokebox front former	3
U33.	Firebox wrapper	4	U44.	Smokebox front overlay	2
U34.	Firebox mudhole doors, upper (2)	1	U45.	Smokebox/parallel boiler wrapper	4
U35.	Firebox mudhole door, lower (2)	1	U46.	Smoke box/parallel boiler joining strip	5
U36.	Firebox mudhole door clamp (6)	4	U50	Ejector exhaust pipe bracket	6
U37.	Firebox washout door cover (9)	4			

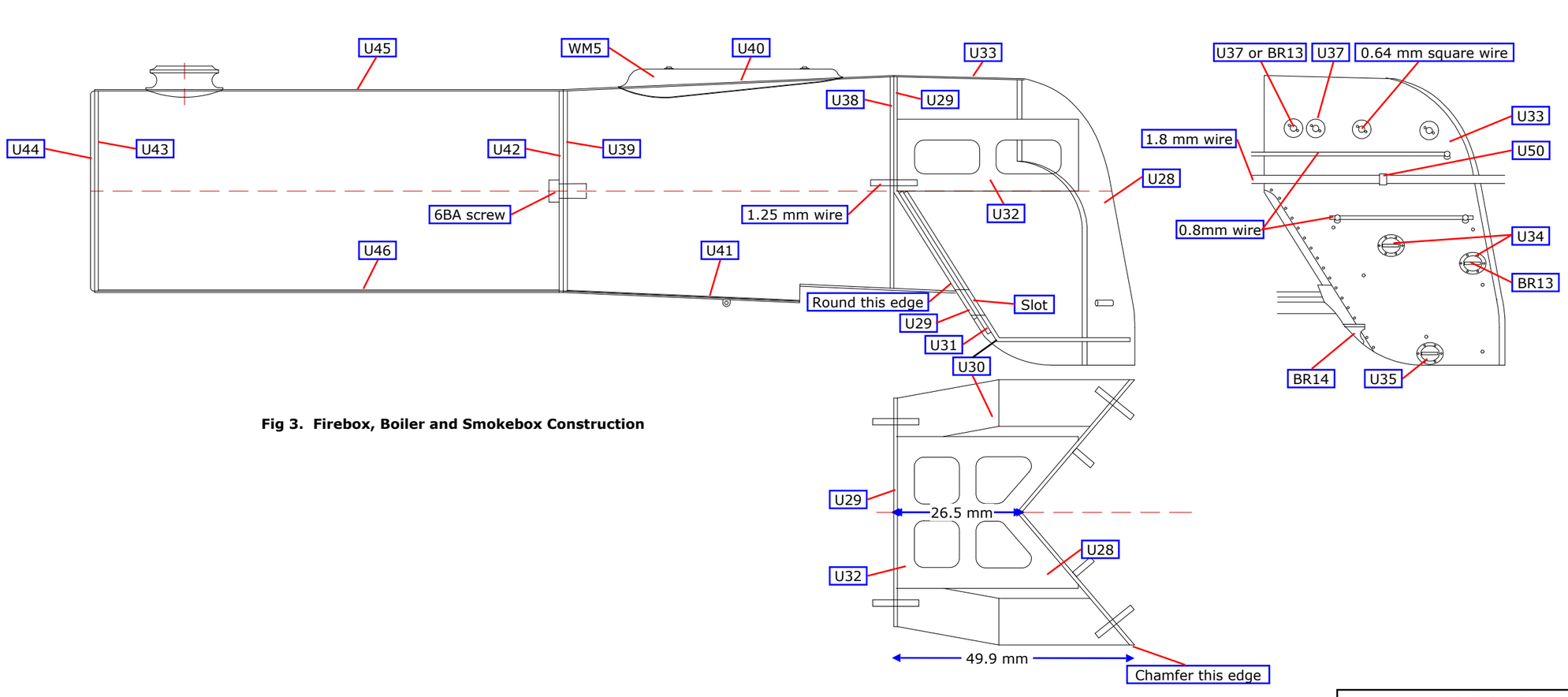


Fig 3. Firebox, Boiler and Smokebox Construction

FOOTPLATE FOR LATER SEPARATE CYLINDERS 1

Emboss the rivets on the valences and drag beam (U1). Fold up the assembly - note there are two fold lines below the drag beam and the fold should be made on the lower one. Curve the valence behind the drag beam as shown below. Emboss the rivets on the front drop plate (U7) and add the front end cover plate (U9). Fold up the front drop plate and solder in place behind the bufferbeam and between the valences so that it is flush with the upper edges. Decide on the correct position of the lubricators (BR16 & BR17) and drill out the appropriate locating holes in the footplate.

Carefully form the bends in the footplate (U3) by bending over a rod of suitable size. Now solder the footplate in place with the valences in the half etched recess along each side and the front drop plate in the recess under the front edge. Solder in place the footplate access door hinges, large and small (U4 & U5). Add the drag beam overlay (U2) to the rear drag beam and a 6BA nut over the middle hole at the rear and another 6BA nut over the hole at the front. This now gives a sturdy platform upon which to construct the upper works. The excess metal is not broken away until the boiler is fixed to the footplate. Add the footplate handrails from 0.45 mm wire.

Curve the outer edges of the front drop plate footplate overlay (U8) and locate in place over the lamp irons, see below. Locate the front frame extensions (U6) and then solder up all the joints at the front end. Add the footplate inner angle using the horizontal section right (U12), the vertical section right (U13), the horizontal section left rear (U14), the horizontal section left front (U15), the vertical section left rear (U16) and vertical section left front (U17) as shown below.

Add the anti-carboniser (BR9) to the smokebox saddle. Fit the smokebox saddle casting (WM9) to the footplate aligning it with the etched guide lines. Laminate together the boiler support laminations (U10) and then fix into the boiler support flange (U11); attach to the footplate. Laminate together the sandbox filler packing pieces (U24) and solder in place on the footplate with the front sandbox fillers (BR8). Attach the rear fillers. Solder the later smokebox saddle horizontal overlay (U23) to the footplate next to the saddle. Fit the lubricators, large and small (BR16 & 17).

Smokebox. Attach the smokebox door knob (NS5), the smokebox later lamp iron (U49) and the smokebox door handles (NS6) to the smokebox door (WM4) and then attach in place on the smokebox. Add the anti-vacuum valve plate (U47) to the top of the smokebox and then solder in place the anti-vacuum valve (BR11). Add the two smokebox superheater covers (WM8). Add the anti-carboniser valve (BR10) to the right hand side of the smokebox. Finally add the chosen works plate (U51) to the smokebox. The outside steam pipes (WM12) are best left off until the boiler is fitted.

Assemble the buffer Housing (BR27), Buffer head, buffer sleeve, spring & nut as shown below.

The outside steam pipes (WM12 &13) are best left off until the boiler is fitted.

If required, attach the bufferbeam AWS protection plate (U25) when the footplate can sit on the chassis.

No.	Description	Sheet			
U1	Valance/bufferbeam/drag beam assembly	6	U13.	Footplate inner angle vertical section, right	5
U2	Dragbeam overlay	6	U14.	Footplate inner angle horizontal section, left rear	5
U3.	Footplate	6	U15.	Footplate inner angle horizontal section, left front	5
U4.	Footplate access door hinge, large (6)	4	U16.	Footplate inner angle vertical section, left rear	6
U5.	Footplate access door hinge, small (4)	4	U17.	Footplate inner angle vertical section, left front	6
U6	Front frame extension (2)	1	U23.	Later smokebox saddle horizontal overlay (2)	6
U7	Front drop plate	5	U24.	Sandbox filler packing piece (4)	1 & 4
U8	Front drop plate footplate overlay	5	U25.	Bufferbeam AWS protection plate	6
U9	Front end cover plate	4	U49.	Smokebox later lamp iron	4
U10.	Boiler support lamination (2)	1	U50.	Ejector exhaust pipe bracket (5)	6
U11.	Boiler support flange	4	U51.	Works plate, four different locomotives	4
U12.	Footplate inner angle horizontal section, right	5			

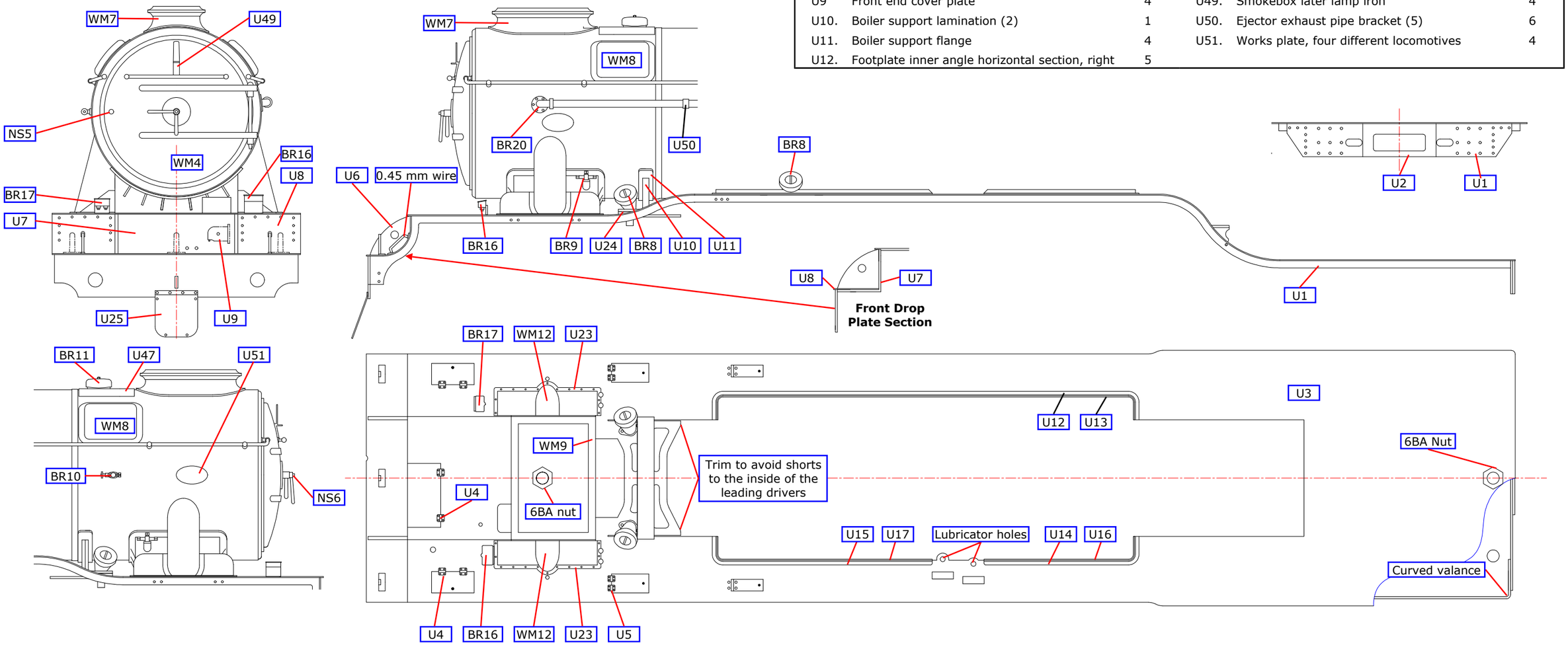


Fig 5. Footplate and Smokebox Construction

FOOTPLATE FOR ORIGINAL MONOBLOCK CYLINDERS 1

Emboss the rivets on the valences and drag beam (U1). Fold up the assembly - note there are two fold lines below the drag beam and the fold should be made on the lower one. Curve the valence behind the drag beam as shown below. Emboss the rivets on the front drop plate (U7) and fold up the lamp irons. Add the front end cover plate (U9). Fold up the front drop plate and solder in place behind the bufferbeam and between the valences so that it is flush with the upper edges. Drill out the appropriate locating holes in the footplate for the lubricators (BR16 & BR17).

Carefully form the bends in the footplate (U3) by bending over a rod of suitable size. Now solder the footplate in place with the valences in the half etched recess along each side and the front drop plate in the recess under the front edge. Solder in place the footplate access door hinges, large and small (U4 & U5). Add the drag beam overlay (U2) to the rear drag beam and a 6BA nut over the middle hole at the rear and another 6BA nut over the hole at the front. This now gives a sturdy platform upon which to construct the upper works. The excess metal is not broken away until the boiler is fixed to the footplate.

Curve the outer edges of the front drop plate footplate overlay (U8) and locate in place over the lamp irons, see below. Locate the front frame extensions (U6) and then solder up all the joints at the front end. Add the footplate inner angle using the horizontal section right (U12), the vertical section right (U13), the horizontal section left rear (U14), the horizontal section left front (U15), the vertical section left rear (U16) and vertical section left front (U17) as shown below.

Fit the smokebox saddle casting (WM9) to the footplate aligning it with the etched guide lines. Laminate together the boiler support laminations (U10) and then fix into the boiler support flange (U11); attach to the footplate. Laminate together the sandbox filler packing pieces (U24) and solder in place on the footplate with the front sandbox fillers (BR8). Attach the rear fillers. Fit the lubricators, large and small (BR16 & 17).

Solder the original smokebox saddle horizontal overlays, left and right (U18 & U19) to the footplate next to the saddle. Fix in place the original smokebox saddle vertical overlays, left and right (U20 & U21) and the original steam pipe casing, left and right (WM10 & WM11). Some locomotives had strengthening web (U22) fitted to the saddle. Add the anti-carboniser (BR9) to the smokebox saddle.

Smokebox. Attach the smokebox door knob (NS5), the smokebox early lamp iron (U48) and the smokebox door handles (NS6) to the smokebox door (WM4) and then attach in place on the smokebox. Add the anti-vacuum valve plate (U47) to the top of the smokebox and then solder in place the anti-vacuum valve (BR11). Add the two smokebox superheater covers (WM8). Add the anti-carboniser valve (BR10) to the right hand side of the smokebox. Finally add the chosen works plate (U51) to the smokebox.

Assemble the buffer Housing (BR27), Buffer head, buffer sleeve, spring & nut as shown below.

The outside steam pipes (WM10 &13) are best left off until the boiler is fitted.

If required, attach the bufferbeam AWS protection plate (U25) when the footplate can sit on the chassis.

No.	Description	Sheet	No.	Description	Sheet
U1	Valance/bufferbeam/drag beam assembly	6	U15.	Footplate inner angle horizontal section, left front	5
U2	Dragbeam overlay	6	U16.	Footplate inner angle vertical section, left rear	6
U3.	Footplate	6	U17.	Footplate inner angle vertical section, left front	6
U4.	Footplate access door hinge, large (6)	4	U18.	Original smokebox saddle horizontal overlay, left	6
U5.	Footplate access door hinge, small (4)	4	U19.	Original smokebox saddle horizontal overlay, right	6
U6	Front frame extension (2)	1	U20.	Original smokebox saddle vertical overlay, left	6
U7	Front drop plate	5	U21.	Original smokebox saddle vertical overlay, right	6
U8	Front drop plate footplate overlay	5	U22.	Original smokebox saddle strengthening web	5
U9	Front end cover plate	4	U24.	Sandbox filler packing piece (4)	1 & 4
U10.	Boiler support lamination (2)	1	U25.	Bufferbeam AWS protection plate	6
U11.	Boiler support flange	4	U47.	Anti-vacuum valve plate	6
U12.	Footplate inner angle horizontal section, right	5	U48.	Smokebox early lamp iron	4
U13.	Footplate inner angle vertical section, right	5	U51.	Works plate, four different locomotives	4
U14.	Footplate inner angle horizontal section, left rear	5			

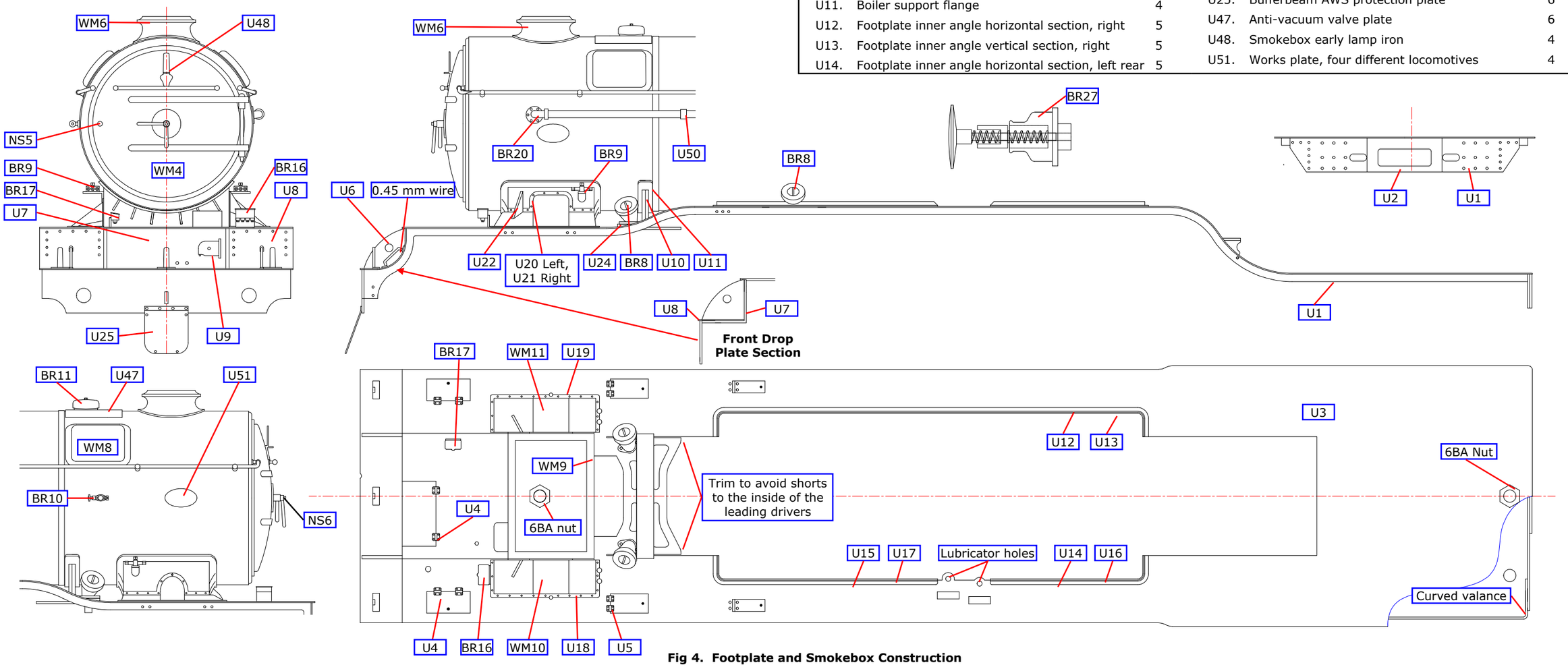


Fig 4. Footplate and Smokebox Construction

MECHANICAL LUBRICATOR AND RODDING

MECHANICAL LUBRICATORS

Solder the mechanical lubricators (BR18) in position as shown in Fig 6. Add the mechanical lubricator hand wheel (M49) to the front of each lubricator. Thread the lubricator arms, inner and outer (M46 & M47) through the footplate holes and locate on the lubricator spindles, but do not solder in place yet. Fold over the crank on the lubricator linkage (M48), with the fold line on the outside before soldering in place in the etched recesses under the footplate. Link the lubricator arms and linkage together M46,M47 & M48 with a piece of 0.8 mm wire. Add the reach rod/sanding rod (M30), the reach rod joint overlay (M31) and the sanding rod crank (M32) as shown.

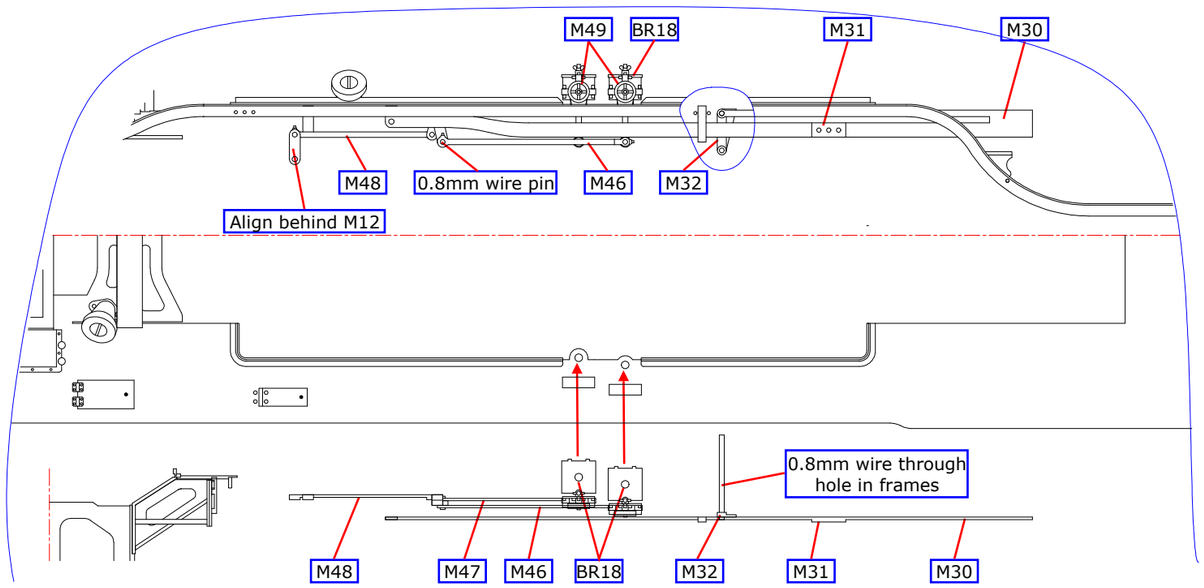
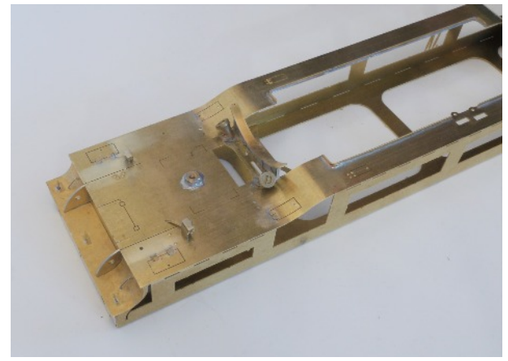
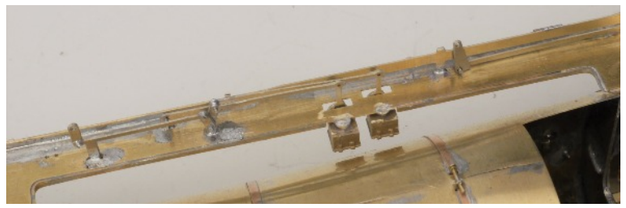


Fig 6. Mechanical Lubricator

No.	Description	Sheet
M30.	Reach rod/sanding rod	3
M31.	Reach rod joint overlay	1
M32.	Sanding rod crank	1
M46.	Mechanical lubricator arm outer	1
M47.	Mechanical lubricator arm inner	1
M48.	Mechanical lubricator linkage	1
M49.	Mechanical lubricator handwheel (2)	1





CAB

Solder the cab floor (C2) to the cab floor support (C1). Solder 6BA nuts in place over the holes in the support. Add the washout plugs from 0.64 mm square wire. On the cab front and sides (C5) press out the rivets around the washout hole.

Solder the spectacle window frames (C6) in place on the inside of the cab front.

Solder the cab window inner layer (C10) in place on the inside of the cab side using the small holes for the cinder guards (C14) for alignment. Next solder the middle layer (C11) over the window inner layer and then break off the rear piece along the half etched line. The outer window layer (C12) which retains the sliding window (C13) cannot be fixed until painting and glazing are complete. We suggest you also the cinder guards at this stage.

Solder the cab side rear inner beading (C7) inside the rear edge of the cab sides.

Form the bend between the cab sides and the cab front by first using a sharp point to scribe the fold lines on the inside; these need to be quite deep to get a sharp fold. The lines run from the slots in the projections at the top and bottom of the etch. These marking projections can be removed after the fold has been formed. Form up the cab to match the shape of the cab floor.

Now solder the cab floor into place, use the lower rear handrail knob holes for alignment. Form the firebox inside the cab (C8) to shape and solder into place using slots in cab front. The safety valves (BR12) can then be soldered in place in the holes at the top.

Check that the cab raised floor castings (WM15 & 18) will fit into the recesses on the floor. Ensure the recesses in the floor are clean; some trimming may be required to achieve a good fit. The floors must clear the lower door hinge on the cab side and the back of the washout recess. Do not fix in place yet. With the castings in place mark a light line at the raised floor level on the inner cab side. This line marks where the cab seat distance pieces should have their lower edge. These can be bent up and used to form triangulation supports for the cab seat if desired, once the cab seat supports (C26) are in place.

Solder the cab handrails in place using 0.8mm nickel silver wire.

Select the appropriate fall plate, hinged or fixed (C3 or C4) and fit in place as shown in the diagrams. The tabs on the hinged fall plate are folded down and fit in the slots in the cab floor. If desired a strip of scratch etch can be soldered between the two tabs under the floor to prevent the fall plate dropping out when the loco is inverted.

Anneal the hinges on the cab doors (C9), by heating in a flame to red heat and allowing to cool. The hinges are bent around an 0.8mm length of wire. The hinge pins have been made overlong so that they can be bent over to prevent the doors dropping off.

Fit the whistle (BR19).

No.	Description	Sheet	No.	Description	Sheet
C1.	Cab floor support	4	C8.	Firebox inside the cab	4
C2.	Cab floor	5	C9.	Cab door (2)	5
C3.	Fall plate - hinged	6	C10.	Cab window inner layer (2)	6
C4.	Fall plate - fixed	5	C11.	Cab window middle layer (2)	6
C5.	Cab front and sides	4	C12.	Cab window outer layer (2)	6
C6.	Cab spectacle window frame (2)	6	C13.	Cab sliding window (2)	4
C7.	Cab side rear inner beading (2)	4	C14.	Cab side cinder guard (2)	6

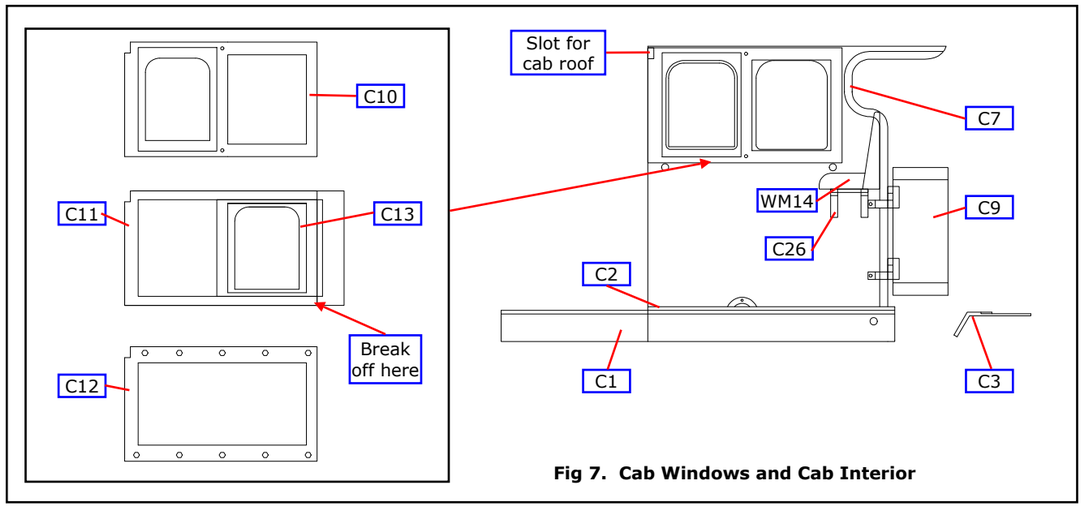
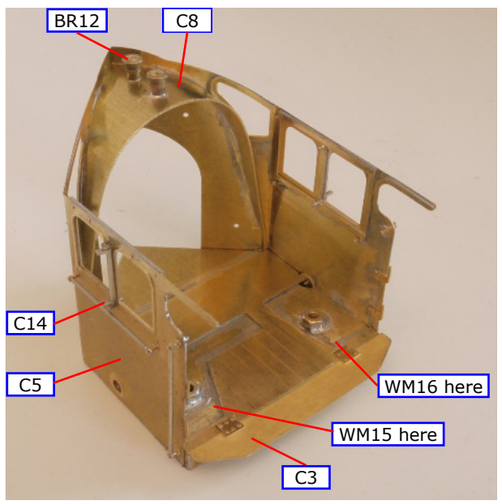
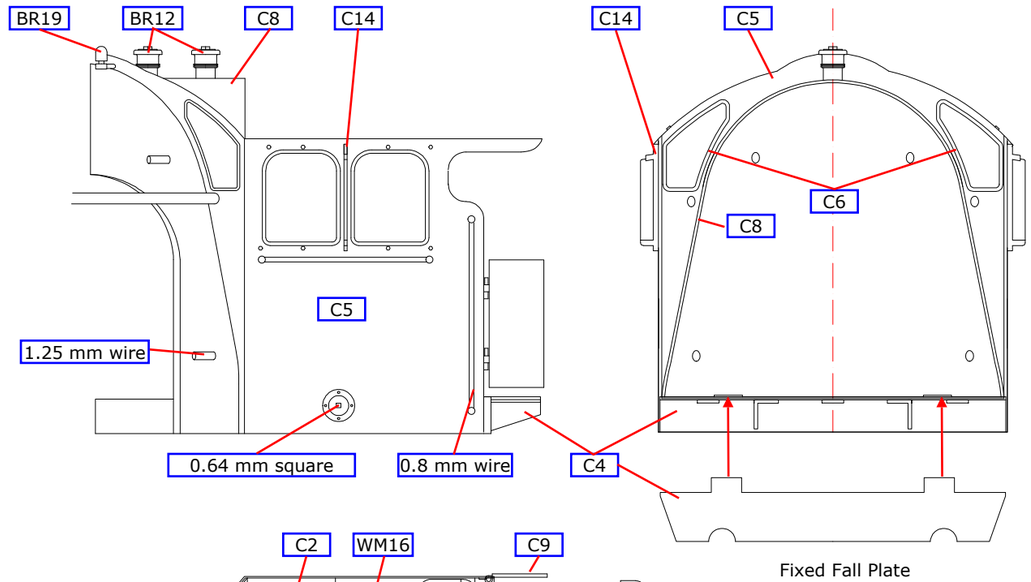


Fig 7. Cab Windows and Cab Interior





Fixed Fall Plate

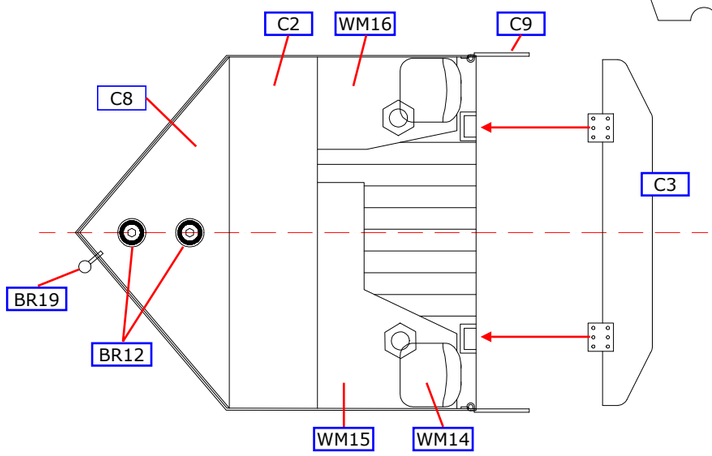


Fig 8. Cab Construction

FINAL ASSEMBLY AND DETAILING

CAB ROOF

Fold up the back, front and central roof rib of the cab roof former assembly (C15), to give a solid base upon which to build the removable cab roof. Roll the cab roof (C16), interior detail (C17), and the cab ventilator parts C19 C20 , C21 & C22) to shape. Solder the cab roof interior detail (C17) in place, on the inside of the roof, as shown in Fig 9, before soldering the roof in place on the former assembly. Complete by adding the ventilator parts as shown below and rain strips (C18). 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 etched lines. The edges of the formers will now need cleaning up.

FINISHING

Attach the cab assembly to the firebox former using wire to align both assemblies in the etched holes. Ensure that cab fits fully into the 'V' shape in the rear of the firebox and that the whole assembly is in line and fits on to the running plate. Some trimming of the tabs at the bottom of the firebox former might be required to allow them to fit into the mating slots.

Before fitting boiler and cab to the running plate check that the cab and firebox will sit without any gaps on to the running plate. Solder the contact points from the inside. Secure the smokebox to the saddle – it is possible to drill an 8 or 6BA clearance hole behind the nut already soldered to the running plate inside the saddle and use a nut soldered inside the smokebox to achieve this.

Fit the footplate steps (BR14), see Fig. 3, and the appropriate outside steam pipes (WM10 & 11 or WM12), see Fig 4 or 5.

Now that the boiler/cab and running plate assemblies form an integral unit it is time to cut away the construction cradle. It is best to cut through the vertical supports with a slitting disk and use a razor saw to cut through the half etch tabs that support the valance. Once separated, the valance edge can be cleaned up. Exercise care to maintain a straight and tidy edge.

The fit of the chassis to the body can now be checked. Some trimming may be necessary to achieve a good, but not over tight fit. Items like the lower projections of the front sandboxes will need grinding off. Check that the upper side of the rear frames fits squarely to the underside of the cab. It might be necessary to adjust the join between the rear and main frames.

BACKHEAD

Drill out the holes in the backhead casting (WM13) to accept the steam distribution box (BR25) and the two injector valves (BR23 & 24) and the water gauges (BR26). Carefully drill the backhead regulator brackets to accept the regulator rods made from 1.0 mm wire and fit the rods in place. It is easier to make these as two rods rather than trying to drill the centre casting to take a single rod across the backhead. Make sure there is enough rod protruding from the left and right brackets to attach the regulator levers (C24) on each side. Attach the water gauges (BR26) over the regulator rods and fit the steam distribution and injector valve castings.

Punch the rivets on firehole door (C23) and fold the two screens out through 90° and attach to the backhead. Fit the appropriate gauge to the heater gauge bracket (C34) and fit the bracket to the backhead, use the drawing as a reference. Finally fit the cut off indicator (C28) and backplate shelf (C27) onto the backhead, again using the drawing as a reference.

Attach the vacuum injector valve to the left side of the backhead, a small grove in the casting marks the fitting location; attach the handle (C31) and fit a short piece of 0.45 mm wire at the end to complete the handle assembly. Attach a length of 0.6 mm copper wire to the top of the valve and route up the left hand side of the backhead and terminate behind the distribution box.

Attach lengths of 0.3 mm copper wire to the base of the water gauges for the drain pipe and run down the backhead past the tray and fire hole door guards to the floor. Four lengths of 1.2 mm copper wire are used for the drains from the two injector valves, route the same way as the water gauge drains to the cab floor. Fix a short length of 1.2 mm copper wire to the base of the firebox for the Mason reducing valve feed and fit the casting (BR21) on top, the height is not critical as pipe work in service varied, use the drawing as a general reference. Fit a length of 0.6 mm copper wire to the relevant gland (see drawing) on the Mason valve and route up the backhead, over the right hand side regulator rod and up behind the distribution box. Finally a length of 0.3 mm copper wire runs from the Mason valve to the gauge mounted on the backhead mid height right side, see drawing.

Fit the two large (C29) and three small (C30) hand wheels to the distribution box and the two injector handles (C25).

Attach the two cab roof gauge brackets (C32 & C33) to the cab roof, use Fig 9 for the longitudinal position and Fig 10 for the lateral position. Attach the relevant sized gauges (C35), see Fig 10.

Complete the cab fittings by attaching the Screw reverser column (WM17) to the raised cab floor (WM15) and attaching the handle (NS7) on top.

No.	Description	Sheet	No.	Description	Sheet
C15.	Cab roof former assembly	4	C26.	Cab seat support (2)	6
C16.	Cab roof	4	C27.	Backplate shelf	4
C17.	Cab roof interior detail	6	C28.	Cut off indicator	6
C18.	Cab roof rainstrip (2)	6	C29.	Steam distribution box handwheel, large (2)	4
C19.	Cab roof ventilator, front section	4	C30.	Steam distribution box handwheel, small (2)	4
C20.	Cab roof ventilator, rear section	4	C31.	Vacuum ejector handle	4
C21.	Cab roof ventilator, shutters - two positions	4	C32.	Bracket vacuum/steam chest pressure gauges	4
C22.	Cab roof ventilator safety valve plate	6	C33.	Bracket boiler pressure gauge	4
C23.	Firehole door and fire screens	6	C34.	Bracket heater gauge	4
C24.	Regulator lever (2)	6	C35.	Cab gauges (4)	4
C25.	Injector handwheel (2)	4			

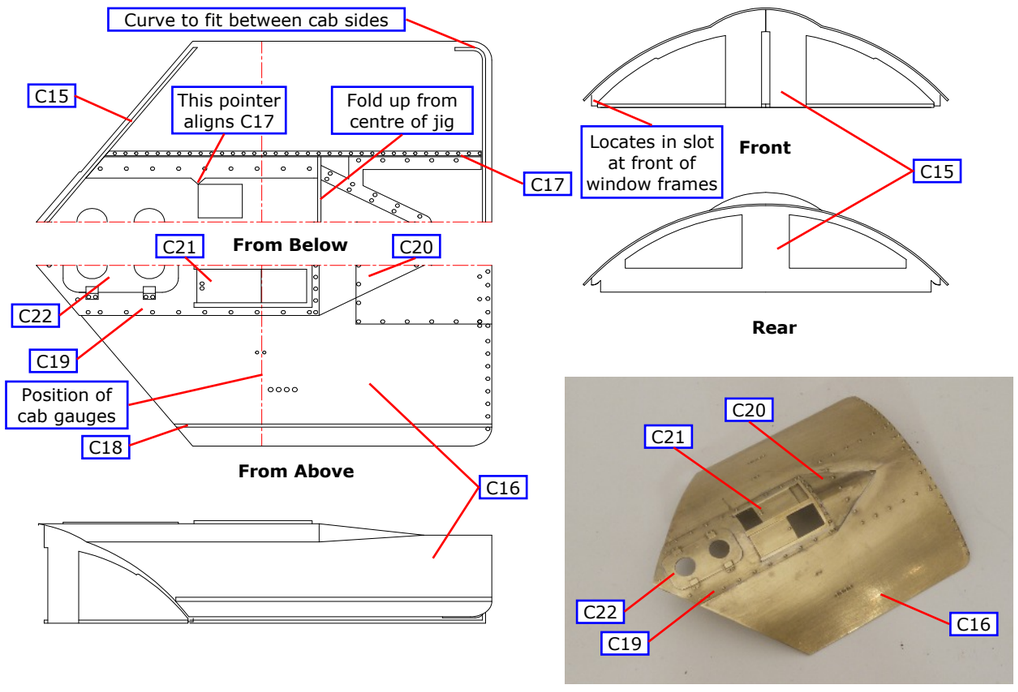


Fig 9. Cab Roof

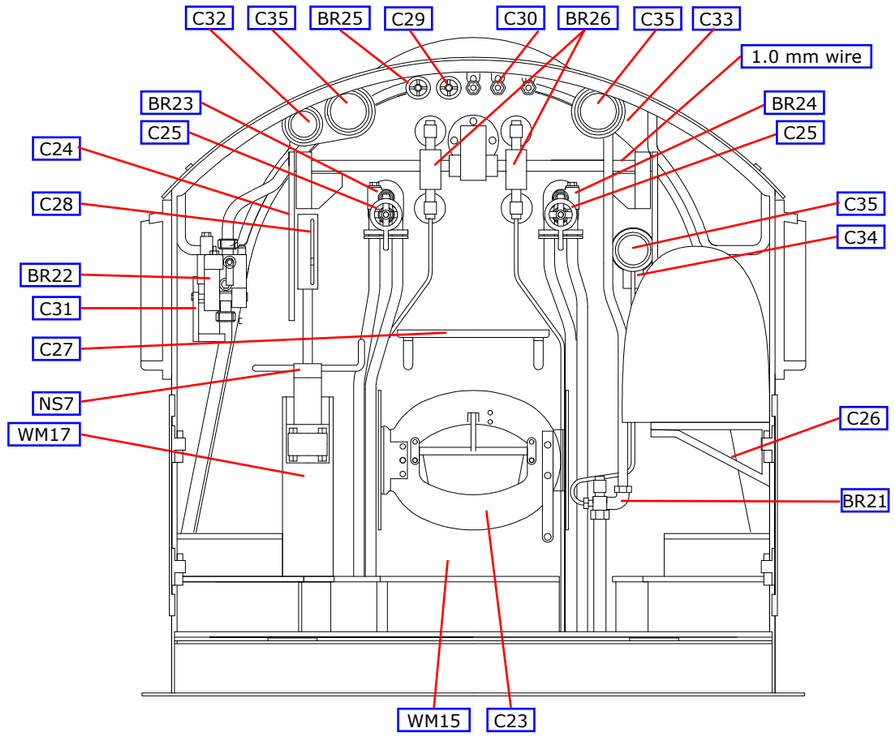
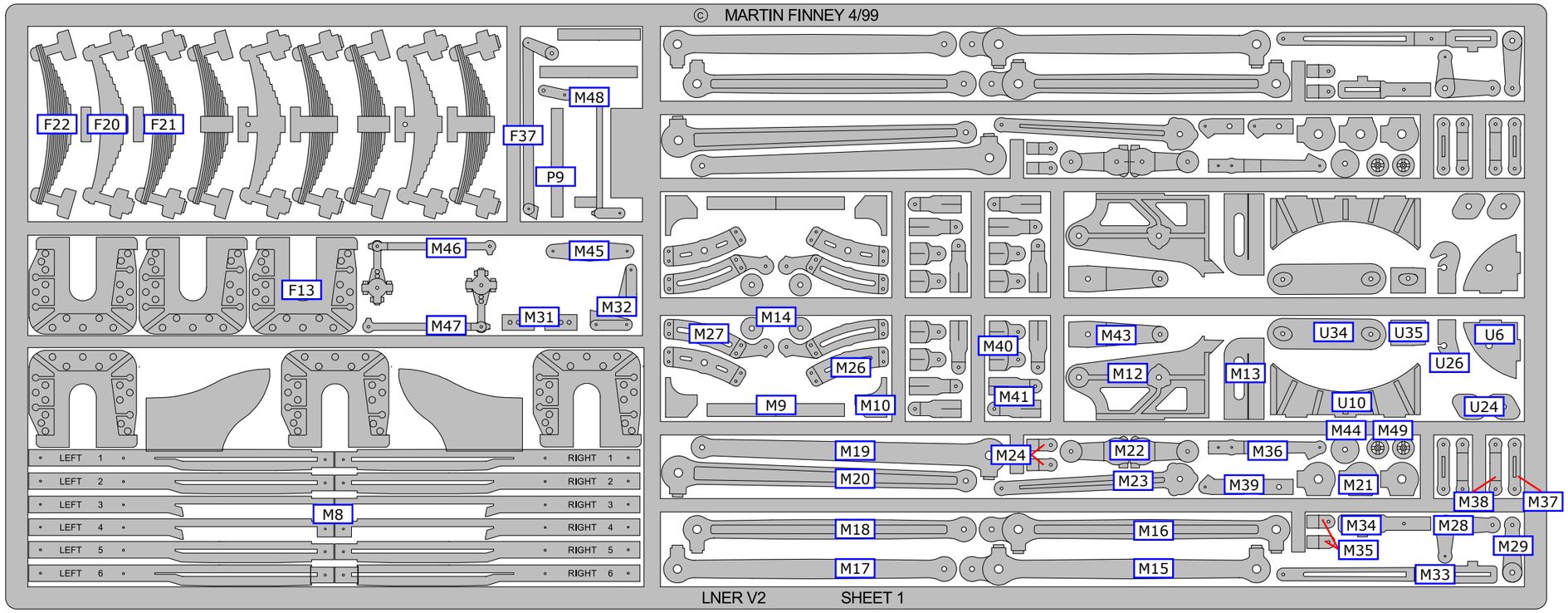
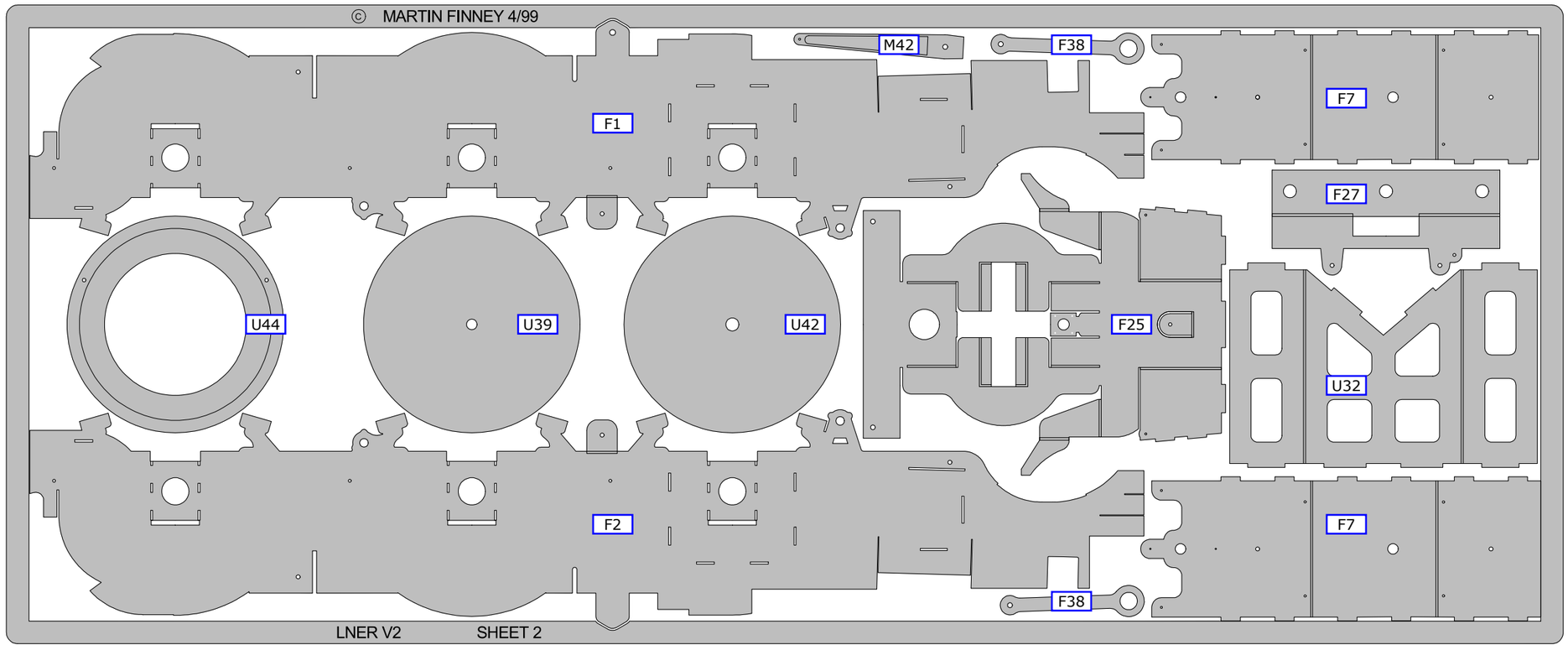


Fig 10. Backplate

ETCH SHEET 1 & 2





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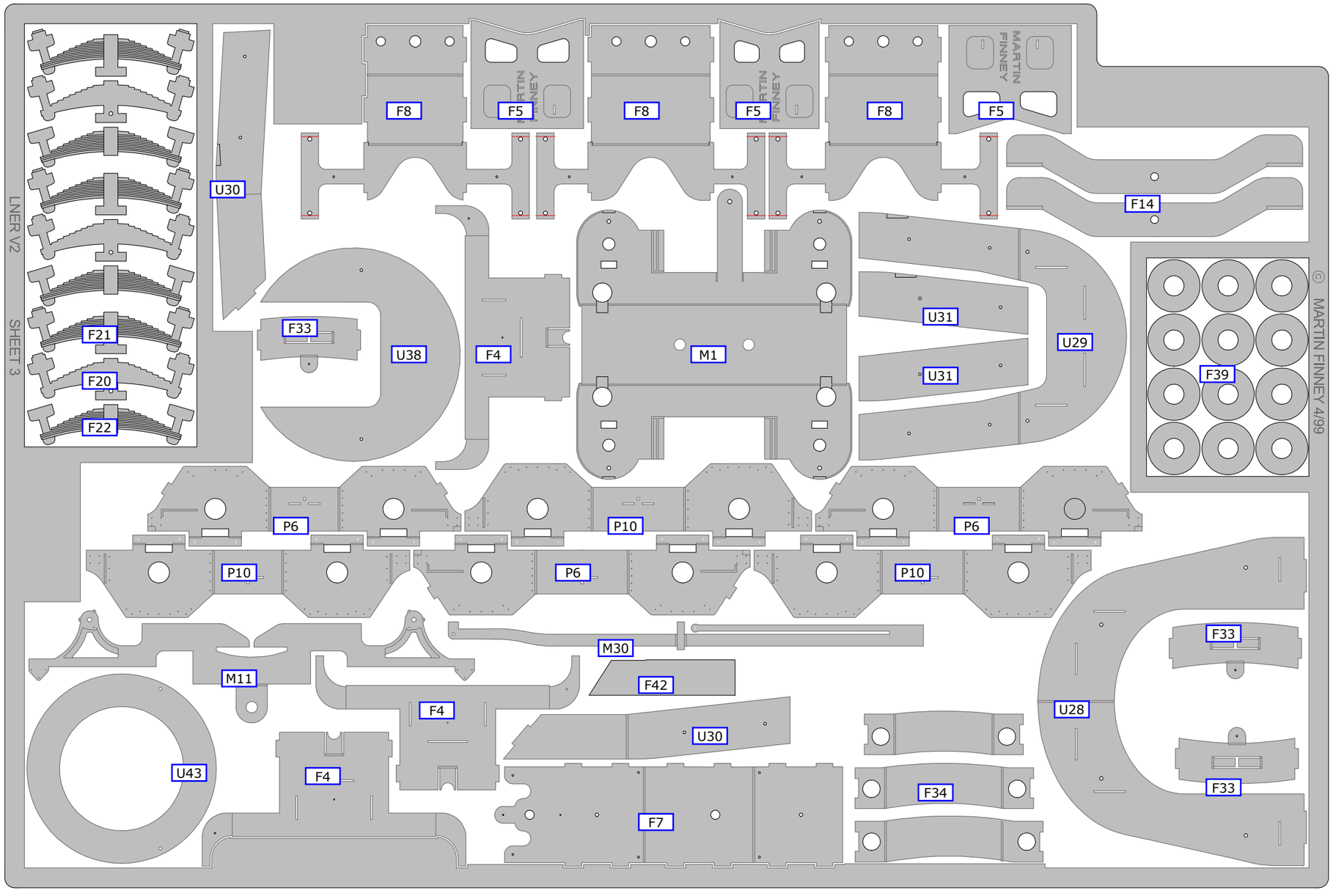
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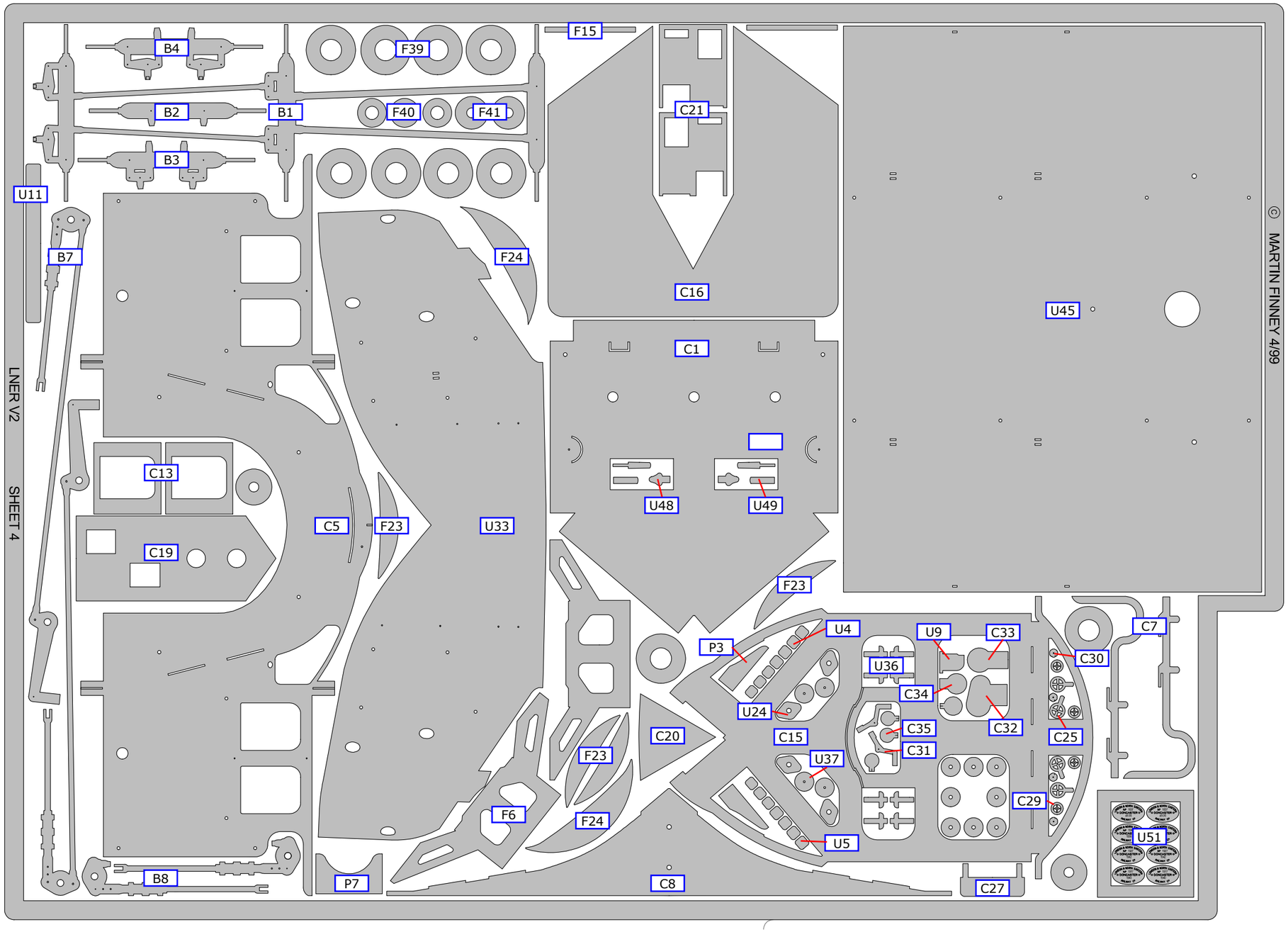
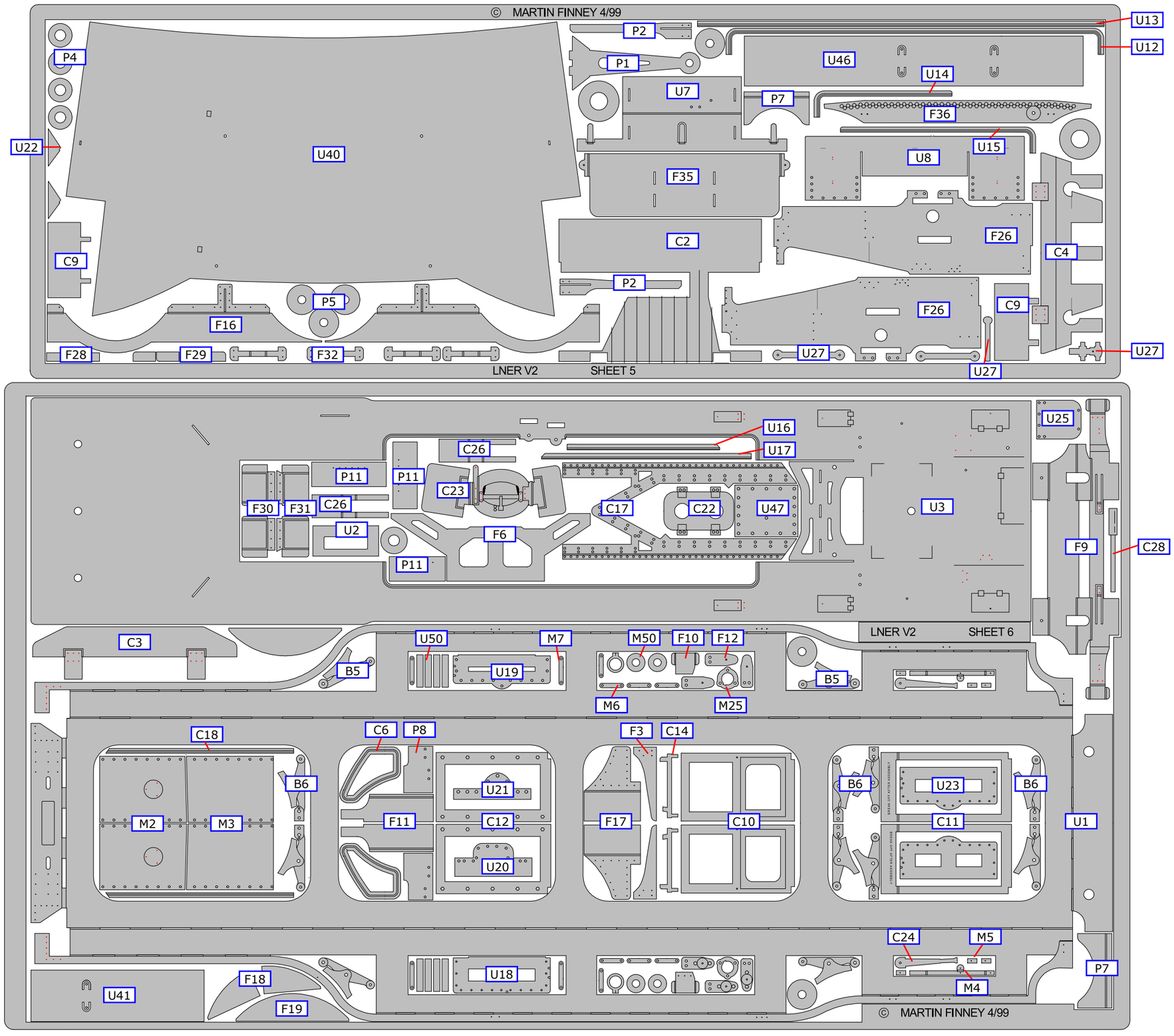
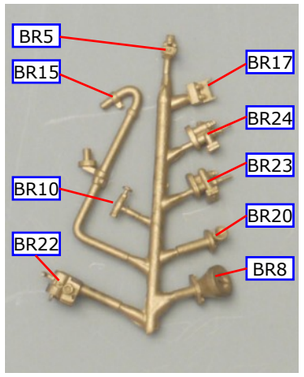
ETCH SHEET 4

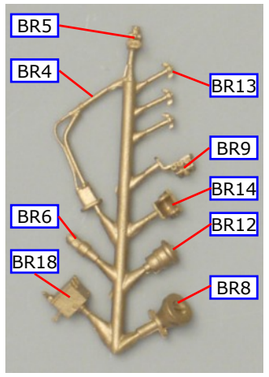


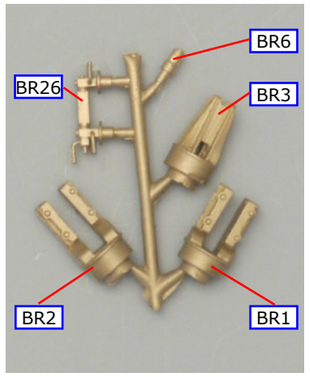
ETCH SHEETS 5 & 6

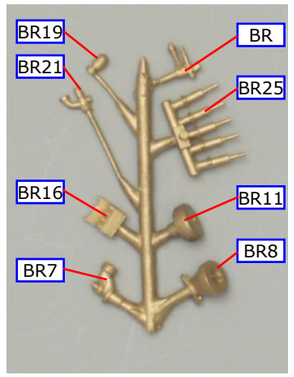


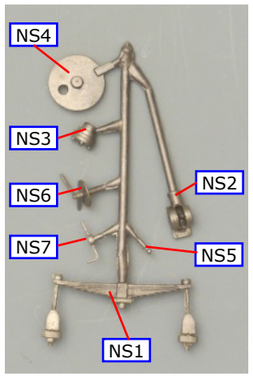
CAST PARTS











BRASS CASTINGS

BR1 Valve crosshead guide, front (2)
BR2 Valve crosshead guide, rear (2)
BR3 Valve crosshead guide, front old type (2)
BR4 Steam sanding pipes (2)
BR5 Drain cock (4)
BR6 Cylinder relief valve (4)
BR7 Blowdown tap
BR8 Sandbox filler(4)
BR9 Anti carboniser (2)
BR10 Anti carboniser valve
BR11 Anti vacuum valve
BR12 Safety valve (2)
BR13 Mudhole door clamp (6)
BR14 Footplate step (2)
BR15 Vacuum pipe
BR16 Lubricator, large
BR17 Lubricator, small
BR18 Mechanical lubricator (2)
BR19 Whistle
BR20 Ejector exhaust pipe elbow
BR21 Mason reducing valve
BR22 Vacuum ejector
BR23 Injector valve left
BR24 Injector valve - right
BR25 Steam distribution box
BR26 Water gauge (2)
BR27 Buffer Housing (2)
BR28 Buffer spring gaiter (2)

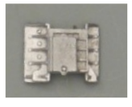
NICKEL SILVER CASTINGS

NS1 Cartazzi axlebox spring (2)
NS2 Crosshead/piston rod (2)
NS3 Piston rod gland (2)
NS4 Cylinder front cover (2)
NS5 Smokebox door knob
NS6 Smokebox door handles
NS7 Screw reverser handle

WHITEMETAL CASTINGS

WM1 Cartazzi axlebox, left

WM2 Cartazzi axlebox, right



WM3 Pony truck axlebox/springs (2)

WM4 Smokebox door

WM5 Banjo dome

WM6 Single chimney

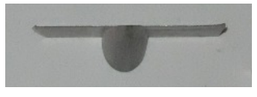
WM7 Double chimney

WM8 Smokebox superheater cover (2)

WM9 Smokebox saddle

WM10 Left steam pipe, monoblock cylinders

WM11 Right steam pipe, monoblock cylinders



WM12 Outside steam pipe, separate cylinders

WM13 Backplate

WM14 Cab seat (2

WM15 Cab left footplate platform

WM16 Cab right footplate platform

WM17 Screw reverser column

OTHER COMPONENTS

3/16" Bearing (6)
5/32" Top hat bearing (2)
6BA Cheese head screw, long (3)
6BA Cheese head screw, short (5)
6BA Nut (4)
Valve gear rivet (2)
Vacuum pipe
Buffer head, buffer sleeve, spring & nut (2)
Handrail knob - (30)
Glazing material

Nickel Silver Wire

1.6 mm for coupling rod pins, crosshead pins, radius link pivots & 2 to 1 lever pivot
1.25 mm for Cartazzi axlebox ties & radius rods
0.8 mm for valve gear pins & handrails
0.45 mm for radius link bolts

Brass Wire

1/16" for compensation beam pivots
1 /8" for exhaust steam injector pipe
0.8mm for brake hanger pivots, sandpipes
1 mm for cab regulator shaft
1.4 mm for valve rods
1.8 mm for reversing cross shaft & vacuum ejector exhaust pipe
2 mm for brake cross shafts
0.64 mm square- for washout plugs

Misc Wire & Tube

Steel wire 1/16" for front compensation beam
Brass tube 3/32" outside diameter for compensation beams
Phosphor bronze wire 0.7 mm for pony truck and trailing truck springs
Copper wire 0.3 mm for lubrication pipes
Copper wire 0.6 mm for cylinder drain cock pipes
Copper wire 1.2 mm for injector overflow pipes & backplate pipes
Rubber tubing for vacuum, steam and flexible pipes between loco and tender