Rebuilt T14 4-6-0 Instructions

Please note that these instructions follow my method of kit building, you are more than welcome to use your own preferences. Note that all fold line should be on the inside. There's also a thread on RMWeb that covers the whole build of the kit. Just look up Paul Hills Workbench.

Fig. 1. Chassis Construction

The chassis can be built rigid or compensated so it's best to decide now which one you are going to make. If building a compensated chassis remove the sections from the front and rear axle holes and follow the compensation section.

Take the frames (1) and solder the **1/8th** axle bearings (2) into the frames (rigid only). Fold the chassis frames up and solder the frame spacer (7) in position.

Fold the cylinders (10) into shape with the fold lines inside and solder into position. Shape the cylinder sides (22) to match the cylinders and solder them in place. Solder the rear cylinder covers (11) and piston end covers (12) in to the holes in the cylinders.

Fold the front motion bracket (9) and solder into the vertical slots. Fold the outside sections and the centre section of the main motion bracket (8) down.

Solder the two spring detail etches (6) into the recesses under the rear axle holes.

Solder three lengths of the **0.45mm** brass wire (5) into the holes in the chassis to form the brake mountings. Take the brake hangers (19) and the brake blocks (20) and solder the blocks to the hangers, making three **L/H** and three **R/H**. Solder the assembled brakes to the wire **2mm** from the frames. Pass more brass wire through the bottom of the brakes, and then through the pull rods (21) noting that the pullrod with the extra lever goes on the left. Use a short length of **0.9mm** wire (23) to go through the rear brackets on the chassis and the rear of the pull rods.

Fig. 1a. Compensation

Solder the **1/8th** axle bearings (2) into the compensating beams (3). The compensating spindle should be cut from the **0.7mm** brass wire (5). The beams are held apart by the compensation spring (4). It is very important that no parts of this mechanism are soldered in a fixed position other than the spindle to the mainframe. Both beams must move independently of each other. The assembly of the beams is otherwise very simple. Make sure you fit the beams so that the large hole is over the centre brake pilot hole.

Fig. 1b. Slidebar Assembly.

The slidebars are formed by sandwiching together five individual parts. Firstly, before removing the parts from the fret, open out all the holes with a **0.95mm** drill, to take the **14ba** screws. If necessary, ease the holes out with a rat tail needle file. The screws need to be a tightish fit into the holes.

Take the centre part of the fixing bracket (13) and the two outer pieces (14) and screw them together. Run some solder around the edges. Then take the back piece of the slidebars (15), the two centre pieces (16) and the two outer pieces (17) and screw them together. The two centre pieces will stick out at the edges. Run some solder along the top and bottom edges. Try not to get the solder onto the end parts with the screws.

Solder the bracket into the slot on the slidebar back. Gently file away the top and bottom edges of the centre slidebar pieces so that they don't stand out too much. Remove the screws and nuts from

the end of the slidebars and gently fold the end pieces back and forth to remove them. If you got any solder in between these pieces, you will have to carefully remove them with a fret saw. Clean up the ends, check that the crossheads move freely and then solder the slidebar units into the slot on the chassis.

Fig. 1c. Bogie assembly.

Solder the four **2mm** bearings (27) into the axle holes in the dummy equalizing beams (18) and then solder these into the bogie (25). Fold down the sides at right angles to the centre stretcher. Next fit two pieces of **0.7mm** wire through the small holes at the front and back of the bogie to form the tie bars and trim off the ends. Shape the guard irons.

The bogie fits to the front body fixing screw. Fit the spring first (30), followed by a washer (28) and then an **8BA** nut (29).

Fig. 2. Main Body Assembly.

Take the running plate (1) and using the valances and their support frame (2) as a template gently form the front and rear running plate curves. When a reasonable fit is obtained solder the valance in place starting at the front and rear fold down points. Solder around the curves gradually holding firmly in place as you go. This way the curves will be formed exactly with the minimum of messing around. **DO NOT** remove the valance support frame yet!

Solder the buffer beam (3) and the drag beam (4) into their recesses and fit the riveted overlay (5) on top of the bufferbeam. Fold the splasher sides up at 90 degrees. Form the four large splasher tops (17) and solder them to the inside of the splasher fronts, not on top though.

Fit the cab window frames (35) into the half-etched recesses round the cab front windows, and then solder the cab front (6) into its slots. Solder the main cab sides (7 & 8) in place having first checked to see if they fit accurately. Remove the area indicated in blue if you are modelling an earlier cab. Solder the cab side overlays (9 & 10) for the later cab, or (11 & 12) for the earlier cab, onto the cab framework. Solder an 8BA screw (28) into the hole at the back of the running plate. You may prefer to solder a nut over the hole. Repeat for the front hole.

Refer to Fig. 2b. Bend the cab floor support (29) and solder in place, **0.5mm** in from the rear footplate edge, and with its ends against the inside faces of the running plate curves, then solder the cab floor (30) to it. Bend the two cab splashers (31 & 32) along the etched fold lines and solder them to the cab floor and cab sides. The front edge of these should be against the cab front.

Return to Fig. 2. Curve the rear splasher tops (16) and fit them in the same way as with the large splasher tops.

Now take the front frames (13) and angle the front section inwards very slightly at the blue line indicated, making one L/H and one R/H. When you are happy with the fit, solder them into their slots. Solder the smokebox saddle front (14) and rear (15) into their slots and over the frames. They are marked 'F' and 'R', make sure these marks are facing the inside.

Fold the Left (19) and right (18) motion brackets and solder them into the slots between the two front splashers. Solder a 14ba screw into both, with the head at the rear.

Now you can turn to the boiler (20). The boiler comes pre-rolled, unless you have asked me not to do that. Solder along the seam of the boiler. Form the lower firebox curves, these are marked by the half etched lines on the inside and are quite a gentle curve. Check that the lower part of the firebox sides fit between the two frame pieces.

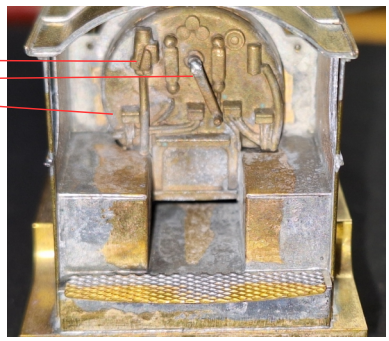
Next solder the smokebox inner (21) to the boiler and then the smokebox outer (22) on top of the inner. Both should be flush with the boiler front, noting that the inner is the longer of the two and sticks out at the back of the smokebox. Fit the three boiler bands (33) in place referring to **fig. 2c.** for the measurements. Check the fit of the boiler/firebox to the running plate and cab. The rear of the firebox locates into the slots on the cab front and the smokebox rests on the smokebox saddle. It should be level and any fettling will be minor. Make sure that the bufferbeam and drag beam line up and thentack the boiler in place. Once happy that all is level and square solder around all seams and joins. Do as much as possible from the inside, this will aid the cleaning process.

Before fitting the cab roof (23) clean up the backhead (49) and fit the vacuum ejector (50) to it along with the regulator handle (51). Fit it into the cab.

Take either the early cab side overlays (11 &12) or the later cab side overlays (9 & 10) and solder them to the cab sides. The cab roof can now be formed. This is best done around a suitable sized brass bar, around **30mm** in diameter. The end pieces fold in the opposite direction, to match the cab front. Make sure the roof sits centrally and level and then solder in place. Solder the roof ribs (24) in place. The outside rainstrips can be made from **0.45mm** brass wire.

The next job is to form the rivetted smokebox overlay (34). Being half etched, it needs to be formed around a smaller diameter bar, around **20mm**. Form the round section first and then the top section of the 'wings'. Form the lower part of the 'wings' with a smaller bar. Offer the wrapper up to the smokebox and adjust as necessary, noting that the ends fit into the slots in the running plate. Make sure it is located centrally on the smokebox, the chimney hole helps with this. Also, note that the wrapper should overhang at the front about **0.5mm**. Start soldering from the top/centre and work around the edges. Fold the step on the smokebox front (38) up and strengthen with solder, then solder the riveted overlay (39) on top. The smokebox front can be left until chimney, snifting valves and some handrail knobs are fitted, as it is easier to solder them from the inside.

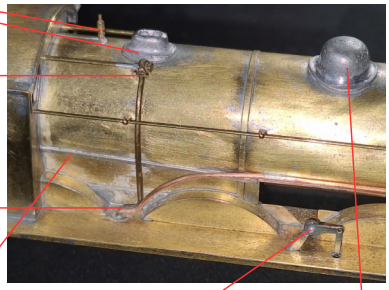
Now you can move on to detailing the body. Please note that as all the castings are in brass, thet are a bit harder to clean up. Any sprue ends are best cut with a carborundum disc.



Take the backhead (51) and add the ejector control (52) and the regulator handle (53).

Check the fit of the backhead into the cab, and adjust as necessary.

Fit the safety valve cover (43) and the whistle (58). Drill through the hole in the whistle with a **0.5mm** drill and insert a piece of wire. This then goes to the cab front. You can leave the whistle until after painting if you wish.



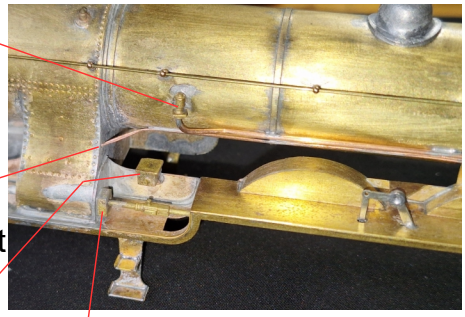
Take the firebox valves (49) and cut away the feed that goes into the top from the side. Drill into the point where the feed was with a **0.9mm** drill and solder a length of **0.9mm** wire into the hole. Make sure you have one L/H and one R/H. Form the pipe to the footplate, note the theres an **'S'** bend where it enters the footplate.

Using the **1mm** nickel strip (71) make up the conduit for the oil pipe feeds. Each conduit has to **37mm** long and the cab end is **10.5mm** up from the running plate and the front end is **8.5mm** up.

The valve gear lifting arm and reach rod can be secured to the motion brackets with a **14ba** screw and nut.

Solder the dome (42) in position.

Remove the clack valves (54) from the sprue and drill a **1mm** hole in the bottom of each one. Solder them into the holes in the boiler. Using the **1mm** copper wire supplied, make up the pipework as shown in the picture, and in the picture above. There is an 'S' bend where the pipework enters the running plate.

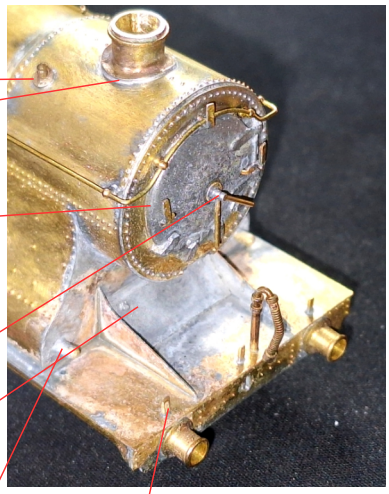


Using the fine copper wire (70), make up the oil feed pipes and insert them into the back of the saddle.

Solder the mechanical lubricator (47) to the frame.

Solder the valve stem/guides (45) into the holes in the back of the smokebox saddle rear. Note that they are handed.

Drill two holes for the snifting valves (44). From above they are **14mm** apart, **7mm** from the boiler centre line and **4mm** from the rear of the smokebox. Solder them in place.



Solder the chimney (40) in position.

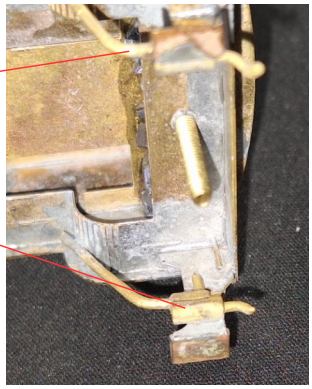
Solder the smokebox door (56) in position, drill out the holes for the lamp brackets (64) and smokebox door handle (57).

Assemble the three piece smokebox door handle and glue it in place.

Solder the centre cylinder valve chest cover (55) inbetween the front frames.

Solder the tail rods (50) into the holes on the front of the smokebox saddle.

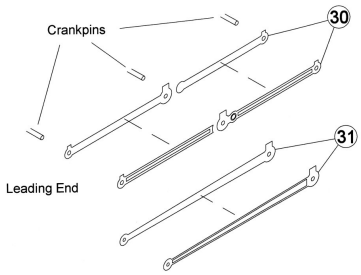
Fold the door lamp brackets as indicated, add some solder onto the folds and glue them into the holes drilled previously. Do the same for the top lamp bracket. The ones at the front of the running plate can be soldered from underneath. Solder the buffer shanks (61) and the Vacuum pipe (62) in place.



Clean up, and solder the injectors (46) behind the cab steps.

You can now add the handrails to the cab and the boiler. The six short handrail knobs (66) are for the smokebox and the mediums (65) go along the side of the boiler.

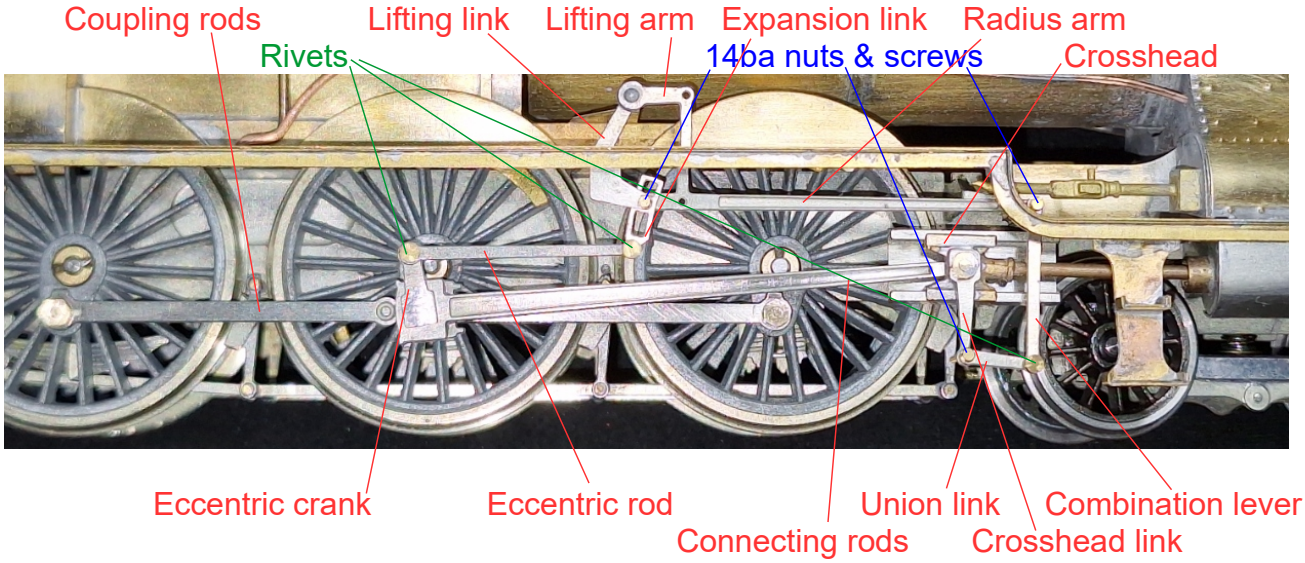
Valve Gear



Assemble the jointed coupling rods (30) and connecting rods (31). Check the movement of the crossheads (24) in the slidebars and adjust as necessary. Solder the crosshead links to the crossheads and then attach them to the connecting rods with **14ba** nuts & screws. Fit the coupling rods to the wheels, the method depends on which crankpins and wheels you are using.

For attaching the valve gear to the brackets I supply **14ba** nuts & screws.
You may feel that they are a bit bulky, if so you can get 0.6m or 0.8m hex head nuts & screws from Prime Miniatures, unfortunately they are too expensive for me to supply in the kit.

Study the picture below carefully.



Note that the eccentric rod, the combination lever and the union link are slightly tapered. The combination lever has an extra hole at the top, in case anyone would like to try to make the valve stems working. If not, cut the extra hole away.

Rivet the eccentric crank to the eccentric rod, and then the eccentric rod to the expansion link. Then rivet together the combination lever and union link. Using the 14ba nuts & screws, attach the riveted parts to the brackets. The combination lever sits on top of the radius arm and the expansion link is sandwiched between the bracket and the radius arm. Solder the eccentric crank to the crank pin.

Fig. 1. Chassis Assembly.

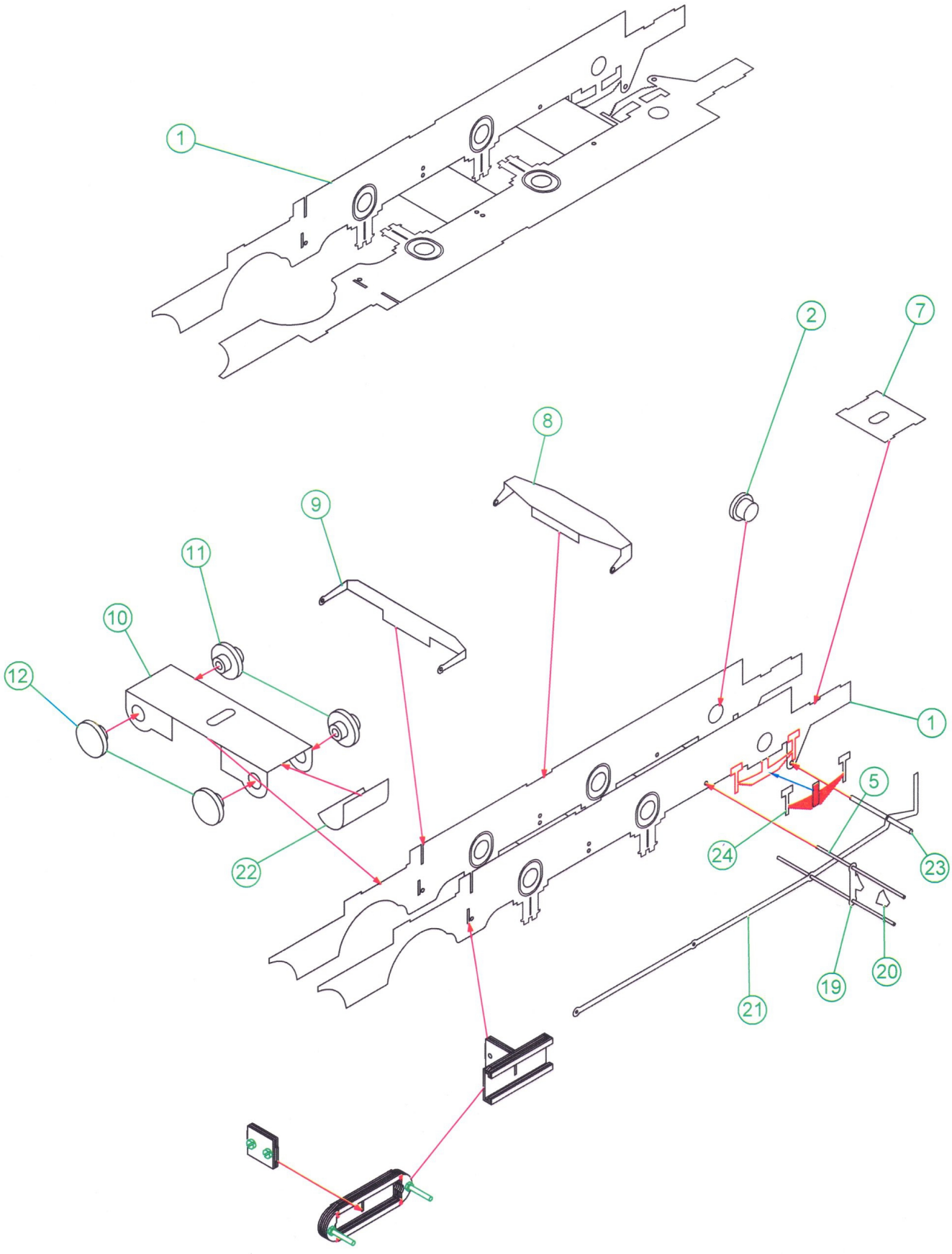


Fig. 1b. Slidebar Assembly.

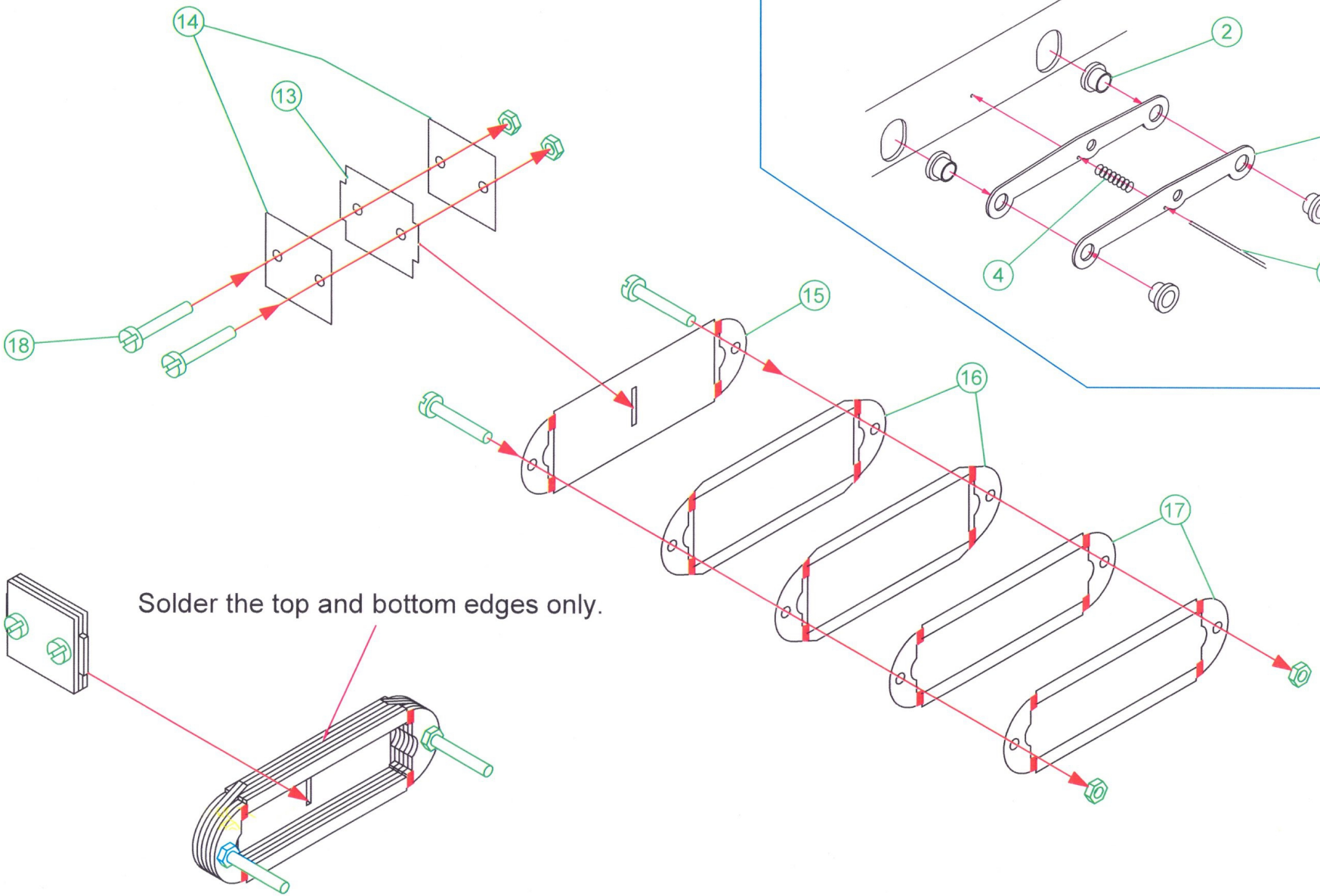


Fig. 1a. Compensation Beams.

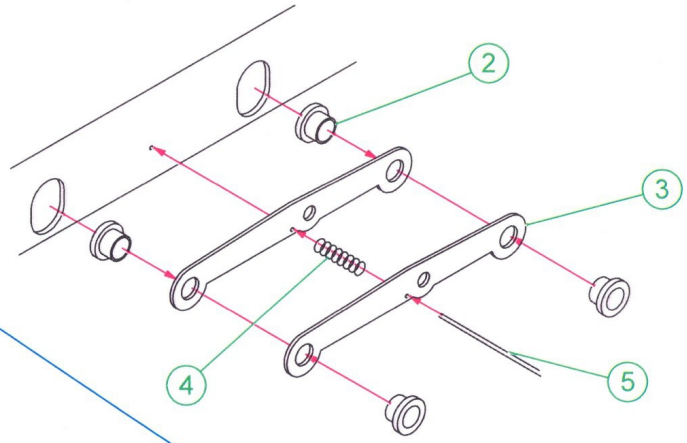


Fig. 2. Main Body Assembly Assembly.

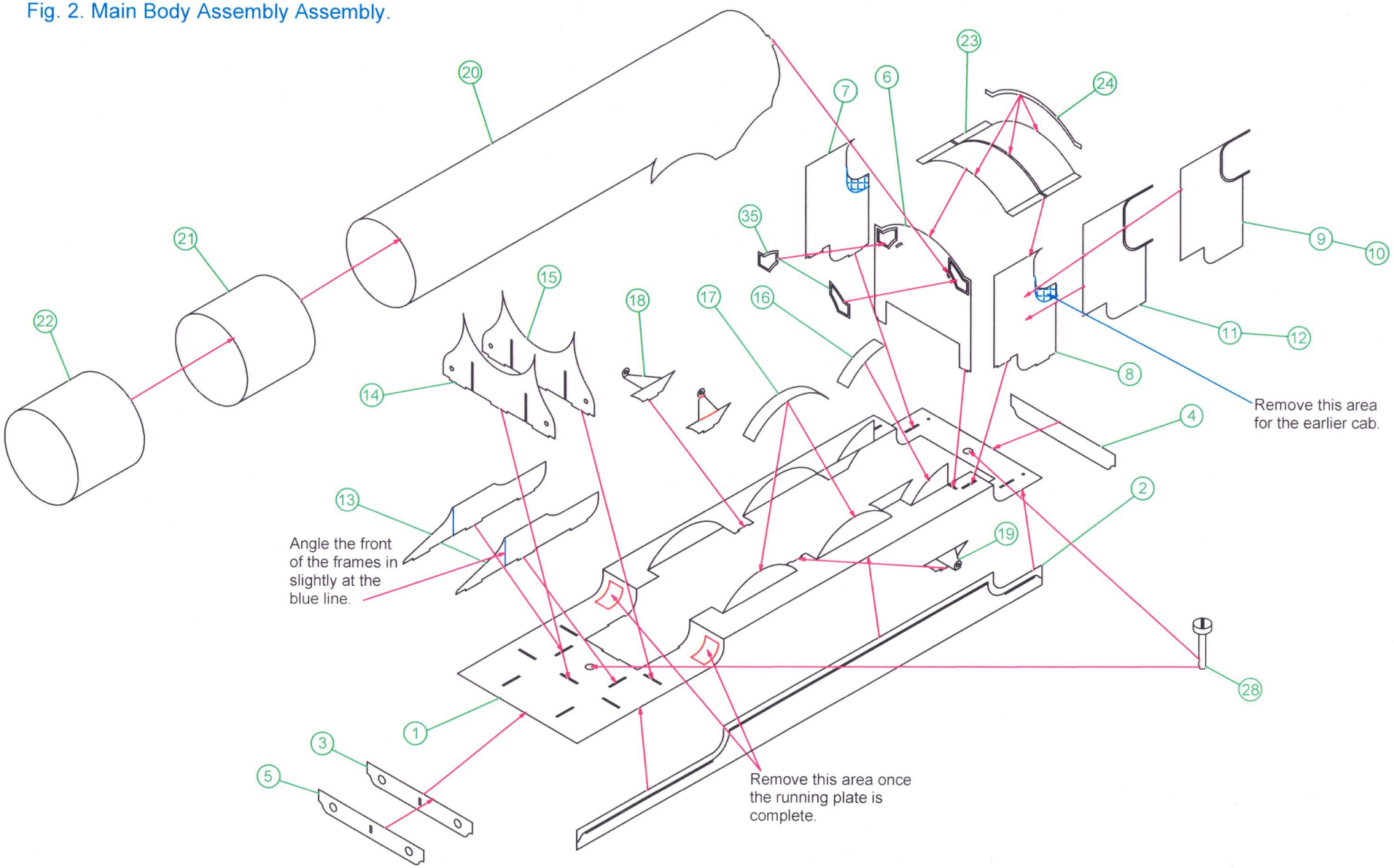
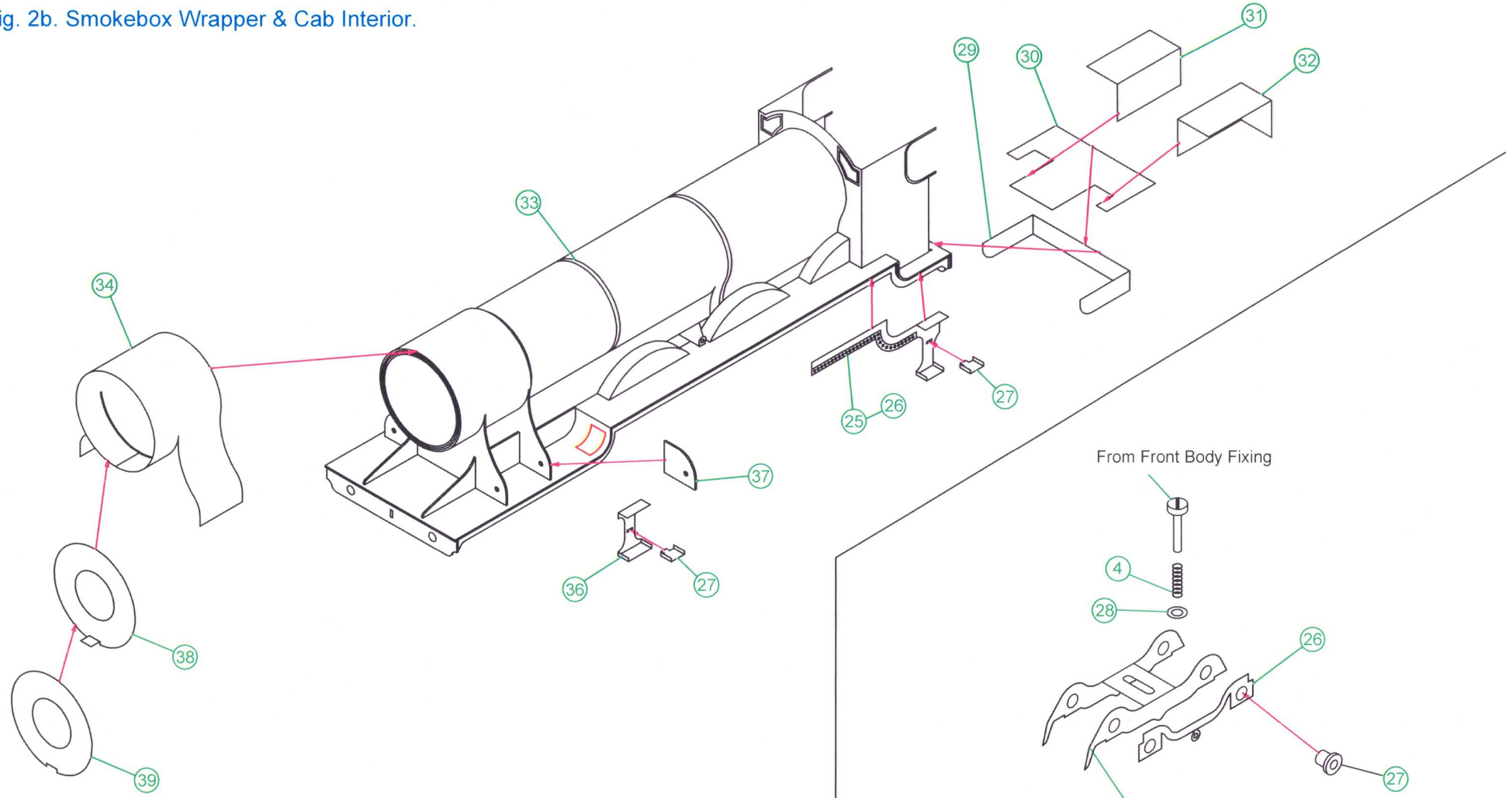


Fig. 2b. Smokebox Wrapper & Cab Interior.



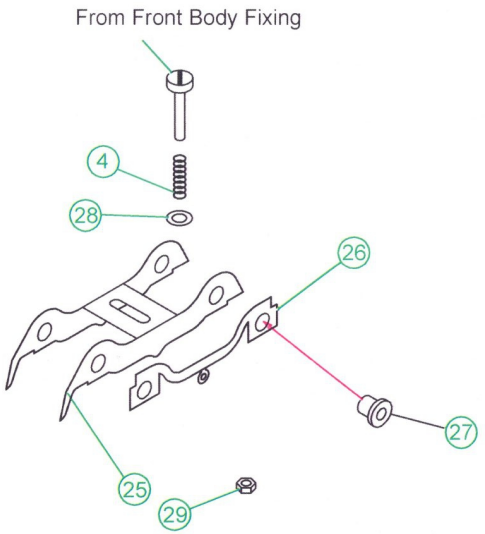


Fig. 1c. Front Bogie.

Fig. 2c. General Arrangement.

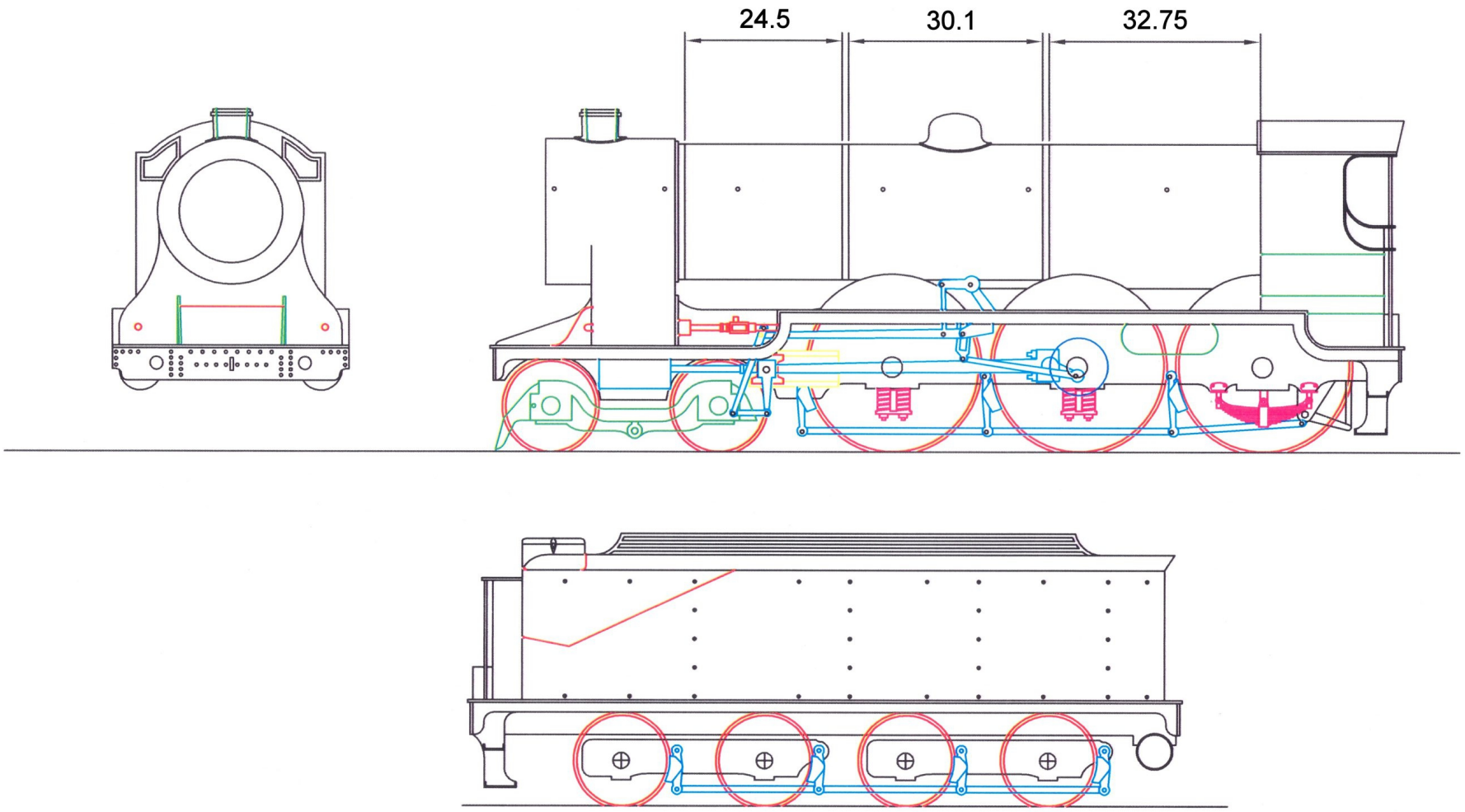


Fig. 3. Watercart Tender

Take the frames (1) and bend up the sides along the half-etch line to form a channel. Solder an 8BA screw (2) into each hole (screw head inside the channel, with the threaded section protruding below the channel). Now take the footplate (3) and solder the drag beam (7) into the half etched recess at the front. Slot the frames into the half etched lines in the footplate, against the drag beam and solder it in place and then solder the bogie bearing plates (4) to the underside of the channel over each **8BA** screw.

Solder the buffer beam (5) into the half etched recess at the back of the footplate. Then solder the valances (6) to the footplate, in the half-etched recesses, just in from the edge. Note that there are cut outs in the valances that line up with the slots for the body.

Now take the tender body (9), and punch through the rivets from the back, using a sharp scriber. Then bend the corners to **2mm** radius (use a piece of **4mm** dia. bar). This must be done accurately and squarely to ensure the correct fit of the body to the footplate and also to ensure the correct fit of other body parts. The front corners of the body must also be curved at **2mm** radius for a full **90** degrees. The top of the sides and back should be flared outwards at 30 degrees to the vertical. Once the tender body is satisfactorily formed it can be slotted into the footplate and soldered in place. Take the front plate (10) next, bend over the top sections at right angles, then slot it into the footplate and solder in place. It should fit between, and level with, the front edges of the sides.

Bend five of the lamp brackets (11) and fix into the holes in the rear of the tender, then fix the two internal supports (12) into the slots in the footplate. Next bend the coal plate (13) along the fold lines and fit it into the body, resting on top of the internal supports. The front edge should be level with the bottom of the coal hole in the front plate. Next take one of the overlays for the flared part of the coping (15), curve at the front and at the corner to fit the body, solder in place, then repeat with the other side. Some 'trial and error' will be needed to get them right. The two pieces join in the middle of the tender back (any overlap will need to be cut away).

Bend up the steps (6a) (These are seperate from the valances on the 5800 gallon tender) and solder them behind the valances. Then bend up the smaller steps (8) and fix them into the slots above the bottom steps.

Now solder the two coal rail sections (16) to the top edges. These go centrally on the sides. Fix the water filler cap (17) and the upper toolboxes (18) into their respective holes. Fold the lower toolbox bodies (19) and fit into the corners on the footplate, then bend the tops (20) at an angle to match the toolbox fronts, and fit to the toolboxes. Bend the ends of the floor support (21) at right angles, and solder it to the footplate, then slot the floor (22) into the coal plate and solder it to the floor support.

Two sizes of draught plates (23) are provided. The full length ones are for later locos with the small cab cut out. Solder the beading pieces (24) to the top of the plates you are using. Fit the plates into the slots in the running plate. Make the two front handrails at the same time from the **0.45mm** wire.

Next take the brake column (25), fit the brake wheel (26) to it and fix the assembled column into the hole in the floor.

Put the piece of **0.9mm** brass wire through the hole in the centre of the footplate behind the drag beam and solder it to the back of the drag beam to form the coupling pin (27), trim to length.

Fit the buffers (28) into the holes in the buffer beam. Fit the vacuum pipe (30) through the hole in the buffer beam, fit the double vacuum reservoir tanks (31) into the half round cut outs at the rear end of the frames, and fix the vacuum cylinder (32) into the hole in the underside of the front end of the tender.

Turn now to the bogies (33), fold down the sides and the centre strengtheners. solder along the joints and folds inside the central section, then solder the 2mm axle bearings (34) into the axle holes. Solder pieces of the **0.7mm** wire through the small holes to form the brake gear supports (35), then fit the wheels to the bogies.

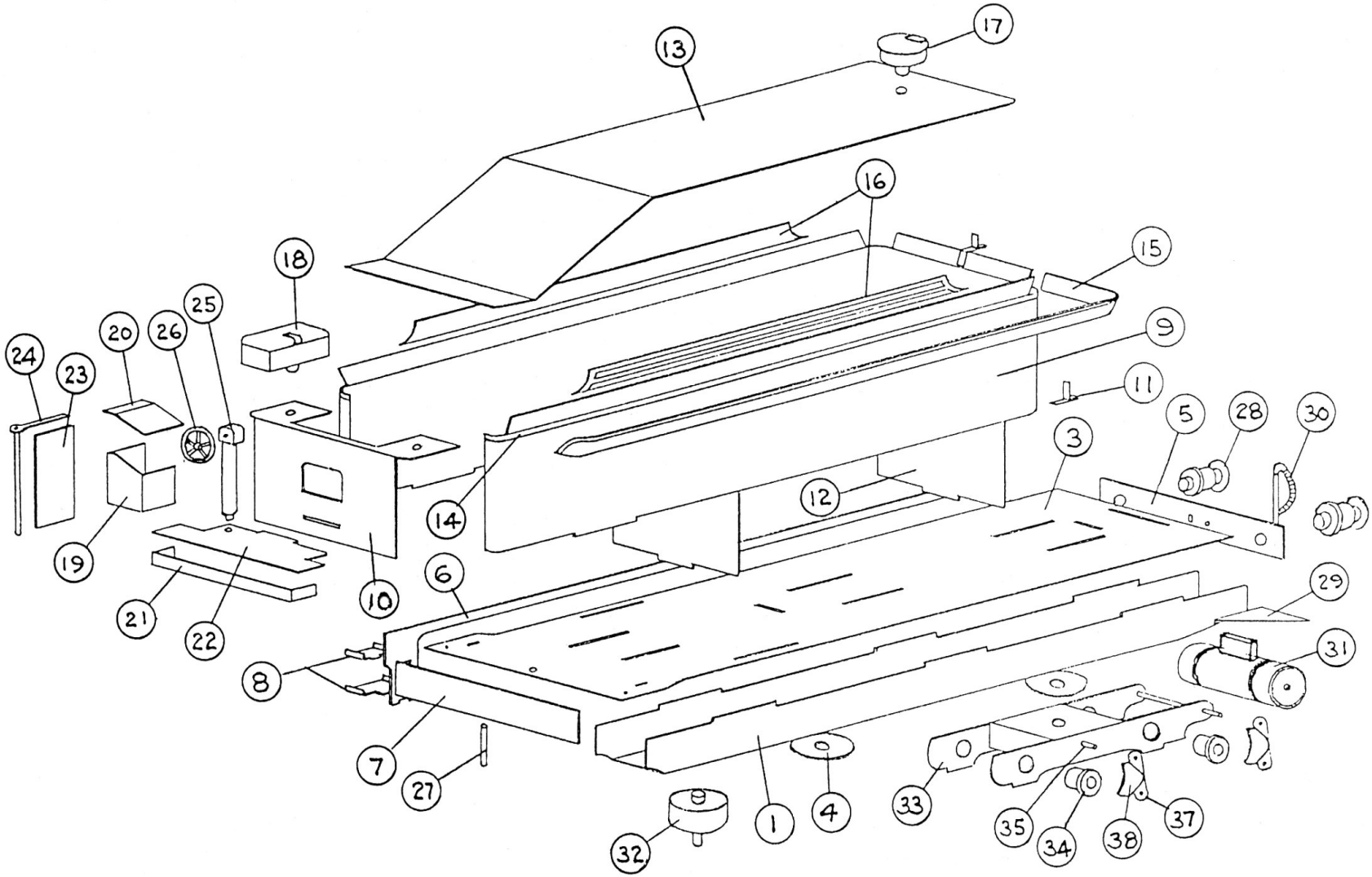
Take the brake hangers (37) and solder the brake blocks (38) to them, making four left hand and four right hand. Solder the assembled brakes to the wire supports, then solder pieces of the remaining **0.7mm** wire through the lower holes in the hangers to form the tie bars, fitting the pull rods (36) at the same time. Finally, secure the bogies to the body using two 2mm bearings and two 8BA nuts (39).

LSWR/SR No.	BR No.	Built	Rebuilt	Withdrawn
443	-	Mar 1911	Jul 1931	May 1949
444	-	Apr 1911	01/03/31	Feb 1950
445	-	Feb 1911	Jul 1931	Nov 1948
446	30446	Aug 1911	Jul 1931	Apr 1951
447	-	Jun 1911	Sep 1930	Dec 1949
458	-	Dec 1911	Nov 1930	Oct 1940
459	-	Jun 1912	Jan 1931	Nov 1948
460	-	Jan 1912	Apr 1930	Nov 1948
461	30461	Mar 1912	Jun 1931	Jun 1951
462	-	Apr 1912	Aug 1930	Feb 1950

446 and 461 were the only ones to receive a BR number.

Tender Parts

1. Frames.	E	22. Floor.	E
2. 8BA Screw.	TB	23. Draught Plates.	E
3. Footplate.	E	24. Beading.	E
4. Bogie Bearing Plates.	E	25. Brake Column.	LW
5. Buffer Beam.	E	26. Brake Wheel.	LW
6. Valences.	E	27. Coupling Pin.	W
6a. Steps.	E	28. Buffers.	TB
7. Drag Beam.	E	29.	
8. Middle Steps.	E	30. Vacuum Pipe.	LW
9. Body Sides and Rear.	E	31. Vacuum Reservoir.	LW
10. Front Plate.	E	32. Vacuum Cylinder.	LW
11. Lamp Brackets.	E	33. Bogies.	E
12. Internal Supports.	E	34. 2mm Axle Bushes.	TB
13. Coal Plate.	E	35. Brake Gear Supports.	E
14. Lower Coping Strip. (Not used on 5800 Gallon Tender).	E	36. Brake Pull Rods.	E
		37. Brake Hangers.	W
15. Flared Coping Strips.	E	38. Brake Blocks.	E
16. Coal Rails.	E	39. 8BA Nuts.	TB
17. Water Filler.	LW		
18. Upper Toolboxes.	LW		
19. Lower Toolboxes.	E	E = Etched LW = Lost Wax Brass	
20. Lower Toolbox Lids.	E	TB = Turned Brass W = Wire	
21. Floor Support.	E		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Chassis Parts List

1. Main Frames.	E	17. Slidebar Fronts.	E
2. 1/8th Bearings.	TB	18. 14BA Screws & Nuts.	TB
3. Compensating Beams.	E	19. Brake Hangers.	E
4. Spring x 2.		20. Brake Blocks.	E
5. 0.7mm Wire.	W	21. Brake Rodding.	E
6. Spring Detail.	E	22. Cylinder Sides.	E
7. Rear Frame Spacer.	E	23. 0.9mm Wire.	W
8. Main Motion Bracket.	E	24. Crossheads.	LW
9. Front Motion Bracket.	E	25. Front Bogie.	E
10. Cylinders.	E	26. Dummy Compensating Beams.	E
11. Rear Piston Guides.	LW	27. 2mm Bearings.	TB
12. Front Cylinder Covers.	LW	28. Washer.	E
13. Slidebar Bracket Centre.	E	29. 8BA Nut.	TB
14. Slidebar Bracket Outers.	E	30. Coupling Rods.	E
15. Slidebar rear.	E	31. Connecting Rods.	E
16. Slidebar Centres.	E	32. Valve Gear.	E

E = Etched LW = Lost Wax Brass TB = Turned Brass W = Wire

Body Parts List

1. Running Plate.	E	39. Smokebox Front Overlay.	E
2. Valances.	E	40. Stovepipe Chimney.	LW
3. Bufferbeam.	E	41. Earlier Chimney.	LW
4. Drag Beam.	E	42. Dome.	LW
5. Bufferbeam Overlay.	E	43. Safety Valve Cover.	LW
6. Cab Front.	E	44. Snifting Valves.	LW
7. R/H Cab Side.	E	45. Valve Stems/Guides.	LW
8. L/H Cab Side.	E	46. Injectors.	LW
9. R/H Later Cab Side.	E	47. Mechanical Lubricator.	LW
10. L/H Later Cab Side.	E	48. Safety Valves.	LW
11. R/H Early Cab Side.	E	49. Firebox Valves.	LW
12. L/H Early Cab Side.	E	50. Tail Rods.	LW
13. L & R Front Frames.	E	51. Backhead.	LW
14. Smokebox Saddle Front.	E	52. Vacuum Ejector Control.	LW
15. Smokebox Saddle Rear.	E	53. Regulator Handle.	LW
16. Rear Splasher Tops.	E	54. Clack Valves.	LW
17. Front & Centre Splasher Tops.	E	55. Centre Cylinder Valve Chest Cover.	LW
18. R/H Frame Section & Motion Bracket.	E	56. Smokebox Door.	LW
19. R/H Frame Section & Motion Bracket.	E	57. Smokebox Door handle.	TB
20. Boiler/Firebox.	E	58. Whistle.	LW
21. Inner Smokebox Wrapper.	E	59. Tender Drawbar Pivot.	W
22. Outer Smokebox Wrapper.	E	60. Tender Drawbar.	E
23. Cab Roof.	E	61. Drummond Buffers.	TB
24. Cab Roof Ribs.	E	62. Vacuum Pipe.	LW
25. L/H Cab Step & Reinforcing Structure.	E	63. Steam Pipe.	LW
26. R/H Cab Step & Reinforcing Structure.	E	64. Lamp Brackets.	E
27. Middle Steps.	E	65. Medium Handrail Knobs x 8.	TB
28. 8BA/M2 Screws x 2.	TB	66. Short handrail Knobs x 6.	TB
29. Cab Floor Support.	E	67. 0.45mm Brass Wire.	W
30. Cab Floor.	E	68. 0.7mm Brass Wire.	W
31. R/H Cab Splasher.	E	69. 1mm Copper Wire.	W
32. L/H Cab Splasher.	E	70. 0.4mm Copper Wire.	W
33. Boiler Bands.	E	71. 1mm Nickel Strip.	E
34. Riveted Smokebox overlay.	E		
35. Cab Spectacle Frames.	E		
36. Running Plate Steps.	E		
37. Cylinder Backs.	E		
38. Smokebox Front.	E		