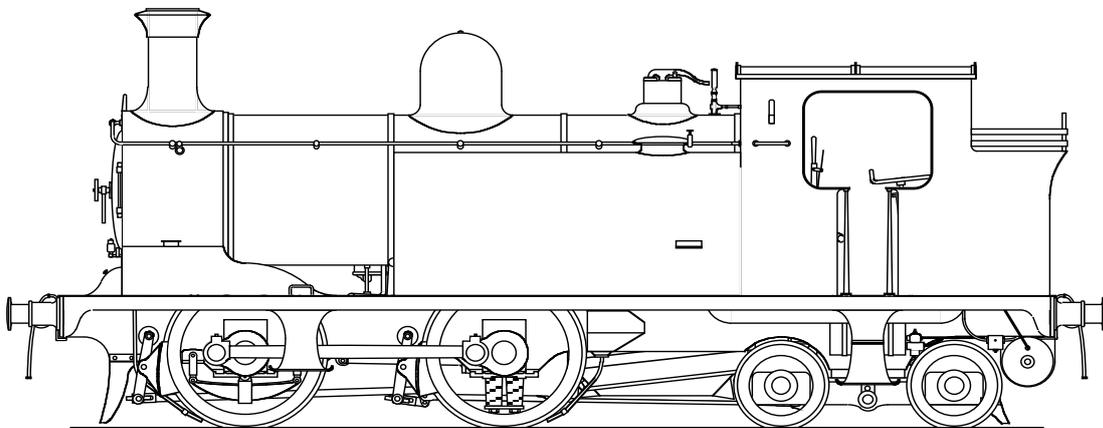


Caley Coaches Ltd

'True Line' kits in etched brass

15 Tay Crescent, Bishopbriggs, GLASGOW, G64 1EU

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**Building Instructions for kit CL4
Caledonian Railway Class 104
0-4-4T**

C.R. numbers 104-111, 167-170;

L.M.S. numbers 15147-15158

Parts required to complete

- 1 Motor Mashima 1220 "flat can" or similar recommended.
- 2 Gearbox Dependant on taste but High Level kits do a good range
[High Level Kits, 14 Tudor Road, Chester-le_street, Co. Durham, DH3 3RY.
www.highlevelkits.co.uk]
- 3 Wheels 2'6" diameter 8 spoke bogie wheels,
4'6" diameter, 16 spoke driving wheels [crankpin in-line with spoke]
- 4 Paint and transfers.
- 5 Couplings.

Section 1 Parts list

Please check the contents of your kit and inform me of any shortages. If for any reason you wish to purchase parts separately, I can give you a quote for any part unless it is on an etched fret. Normally complete frets only are available.

The supplied parts, together with these instructions, assume that you are building the kit with a compensated chassis. If you are not, please return the compensation pack to me (see item 7 in the following list) with a note of your name and address. I will then be happy to forward the required bearings and modified instructions to enable you to build rigid chassis.

N.B. Numbers in brackets following a part name are the quantity supplied when other than 1; numbers preceding a part name are identification numbers which will be found along side the part on the appropriate etch.

- 1 Loco body etch containing :-
 - 1 Footplate
 - 2 Sub-footplate
 - 3 Tank ends (x2)
 - 4 Cab Spectacles (x4)
 - 4a Alternative Rear Cab Spectacles for use when window guard bars fitted (x2)
 - 5 Bunker Rear
 - 6 Smokebox Inner Wrapper (Rolled)
 - 7 Boiler Bands (x3)
 - 8 Cab Roof Side Strips (x2)
 - 9 Cab Opening Beading (x2)
 - 10 Coal Rails (x2)
 - 11 Rear Step Treads (x2)
 - 12 Cab Front
 - 13 Cab Rear
 - 14 Smokebox Front
 - 15 Cab Roof
 - 16 Cab and Tank Sides (left and right)
 - 17 Cab-side Lamp Irons (x2)
 - 18 Cab Roof Stanchions
 - 19 Tank-side Steps
 - 20 Outer Smokebox Wrapper
 - 21 Tool Boxes (x2)
 - 22 Tool Box Tops (x2)

- 23 Bunker Floor
- 24 Front Steps (x2)
- 25 Lamp iron strip.

2 Loco chassis etch containing :-

- 1 Mainframes (Left and Right)
- 2 Bogie Sides (Left and Right)
- 3 Bogie Side Overlays (x2)
- 4 Firebox (Left and Right)
- 5 Firebox Underlays (Left and Right)
- 6 Brake Hangers (Left and Right x2)
- 7 Brake Block Overlays (Left and Right x2)
- 8 Brake Pull Rod (x2)
- 9 Reversing Lever (x2)
- 10 Reversing Lever Quadrant Overlays (x2)
- 11 Front Compensation Beams (x2)
- 12 Rear Compensation Beam
- 13 Bogie Bearing Plate
- 14 Bogie Link Arm
- 15 Brake Pivot Washers (x4)
- 16 Wheel Balance Weights (x2)

For the following parts the part suffix denotes the gauge : A = OO, B = EM and C = P4

- 17 Front Frame Spacer
- 18 Middle Frame Spacer
- 19 Rear Frame Spacer
- 20 Bogie Spacer
- 21 Brake Gear Transverse Rods (x2)

3 Motion etch containing :-

- 1 Coupling Rods (Front and Rear x2)
- 2 Reversing Gear Reach Rod
- 3 Reversing Gear Drop Link
- 4 Reversing Gear Counter Weight (x2)
- 5 Reversing Gear Counter Weight Overlays (x4)

4 Cast fittings :-

- CL4/1 Chimney,
- CL4/2 Dome,
- CL4/3 Ramsbottom safety valve,
- CL4/4 Ross pop safety valve,
- CL4/5 Smokebox door,
- CL4/6 Smokebox door dart,
- CL4/7 Cylinder lubricators (x2 of 2 types) + sandbox fillers (x2),
- CL4/8 Steam chest cover,
- CL4/9 Sandbox (x2),
- CL4/10 Tank fillers (x2),
- CL4/11 Backhead,
- CL4/12 Westinghouse pump,
- CL4/13 Westinghouse reservoir,
- CL4/14 Reservoir above bogie,
- CL4/15 Tank balance pipe (x2),

- CL4/16 Vacuum injector pipe elbow,
 - CL4/17 Leaf spring (x2),
 - CL4/18 Coil spring (x2)
 - CL4/19 Westinghouse pipe (x2),
 - CL4/20 Steam pipe (x2)
 - CL4/21 Vacuum pipe (x2),
 - CL4/22 Brake Stanchion.
- 5 Turned brass fittings :-
- Buffers (4),
 - Short handrail knobs (3),
 - Medium handrail knobs (6),
 - 2mm bearings (4),
 - Whistle.
- 6 Miscellaneous parts :-
- Boiler tube,
 - 0.45mm wire (2),
 - 0.3mm wire,
 - 0.7mm wire,
 - Brass rod,
 - "L" section brass,
 - Small bore tube,
 - Copper-clad strip,
 - Phosphor-bronze strip,
 - Small nuts (4),
 - Small bolts (4),
 - 14BA nuts and bolts(2),
 - Insulated wire.
- 7 Compensation components.
- 8 Printed matter :-
- Prototype notes,
 - General building notes,
 - CL4 building instructions (this document !)

Section 2 Motor and Gears

As with many 0-4-4T locomotives the choice of motor and gears is problematic should you wish to use simple flexichas compensation which dictates driving on the front axle — it is difficult to find a combination which will not compromise daylight under the boiler.

Dealing first with the simpler case of a fixed chassis where the rear coupled axle can be driven an Anchorage DS10 type motor (or a small "can") can be used, axle hung with a mounting bracket and Romford 40:1 gears or a BranchLines gearbox.

If compensation is required, the current availability of gearboxes probably makes it best to go for an all wheels floating arrangement and compensation beams are provided on the chassis etch (part #11) to enable you to do this.

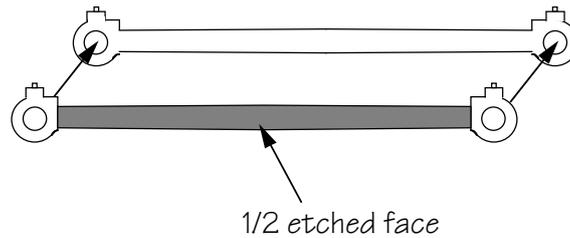
Whatever you choose, choose at the outset, some aspects of the construction may require modification for a particular motor or gearbox and it is far easier to do this as you go, referring to the parts concerned, than trying to shovel everything in after construction.

Section 3 General

- 3.1 Read the instructions and identify all the parts.
- 3.2 Always refer to a photograph of your chosen prototype as you build the model. Small differences did exist between members of the class, especially as they got older.
- 3.3 Please study the General Building Notes if you are not familiar with etched brass kit construction in general and Caley Coaches products in particular.

Part 4. Coupling Rods

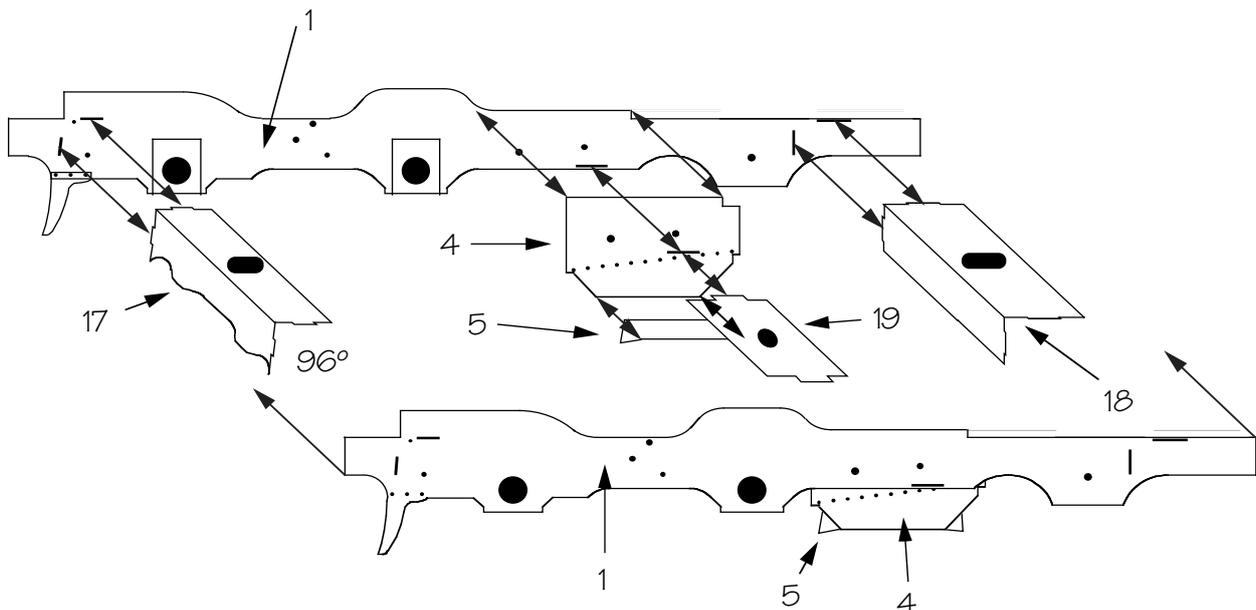
- 4.1 Each coupling rod is assembled from two of Part #1 from the Motion Etch as shown below.



- 4.2 Solder each coupling rod outer to its inner H etched faces outwards, aligning on the front crankpin holes.
- 4.3 Open out each crankpin hole until it is just a sliding fit on the crankpin of the wheels you intend to use.

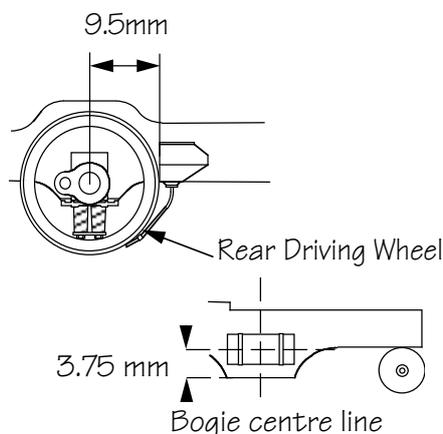
Part 5. Chassis

- 5.1 Remove the mainframes (part #1) from the fret and the sections around each of the floating driving wheel axleholes along the half-etch lines using a piercing saw. It helps to keep the saw edge close to the end of the work bench at all times, and press down hard on the frame with your fingers. Keep the saw vertical and let the blade do the work on every down stroke. Saw up to the top of the line only then saw up the other vertical. Release the blade and remove it. Using a pair of pliers, push the sawn part back (folding it on the top half etched line) and waggle it until it breaks off cleanly.
- 5.2 Press out the half-etched rivet detail at the guard-iron/mainframe joint.

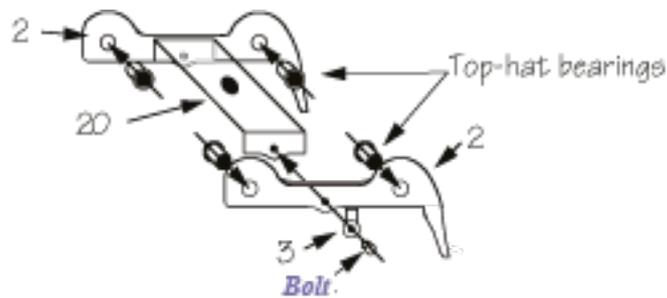


- 5.3 Assemble the hornblocks and bearing per separate instructions provided by their manufacturer.

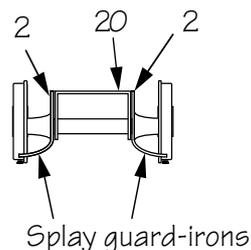
- 5.4 Select the frame spacers (parts #17-19) appropriate to your gauge. The front spacer (part #17) bends up to slightly more than 90° to simulate the pitch of the cylinders — use the location slots in the mainframe to guide you to the correct angle. The rear spacer (part #18) bends to a right angle.
- 5.5 Press out the rivet detail on the two firebox sides (part #4) and solder the underlays (part #5) inside their lower edges.
- 5.6 Solder the firebox assemblies inside the mainframes using spacer #19 and the cutout in the upper corners as location guides. Spacer #19 may be soldered to one of the mainframes at this point.
- 5.7 Locate spacer #17 in the appropriate slots in one of the mainframes and solder in place.
- 5.8 Locate spacer #18 in the appropriate slots in the other mainframes and solder.
- 5.9 Now bring the two mainframes assemblies together locating spacers #17 and #18 in their appropriate slots and trapping spacer #19 in its slots. When you are happy everything is square, solder the spacers in place.
- 5.10 Locate the top-hat bearings/first set of hornblocks in place for the driven axle. Use an axle/hornblock alignment jig to check the alignment of the bearings and when satisfied solder the bearings/hornblock carriers to the mainframes. Leave the jig in place.
- 5.11 Using the previously assembled coupling rods and another axle/hornblock alignment jigs fit the hornblocks and bearings as follows :-
 - a) Locate the bearings/hornblocks for the other axle using the spring of the jig to hold them in place,
 - b) For each side, slip the coupling rod over the spigot of the jig in the fixed axle bearings and over the spigot of the jig in the other axle bearings adjusting as required,
 - c) Once happy with the alignment of both sides, solder the hornblocks to the mainframes,
- 5.12 Remove the coupling rods and jigs and solder the spring castings (coil on rear, leaf on front) across the bottom of the slot in each sub-hornblock.
- 5.13 Solder locating wires for the brake hangers to the mainframes.
- 5.14 Solder the sandboxes and air tanks to the chassis frames in the positions shown in the sketches below.



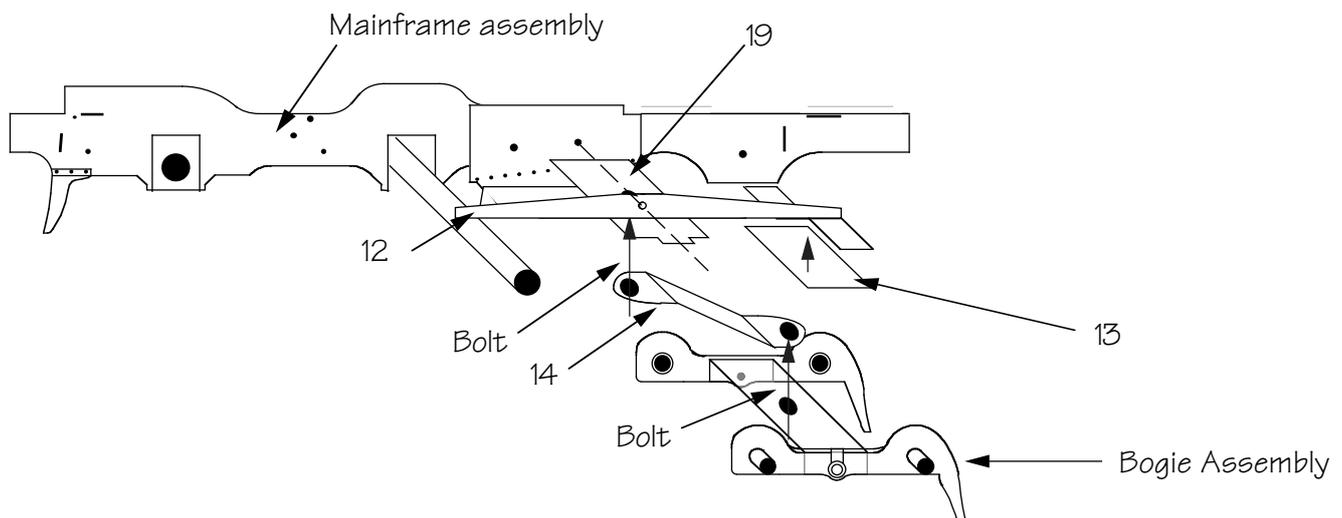
Part 6. Bogie



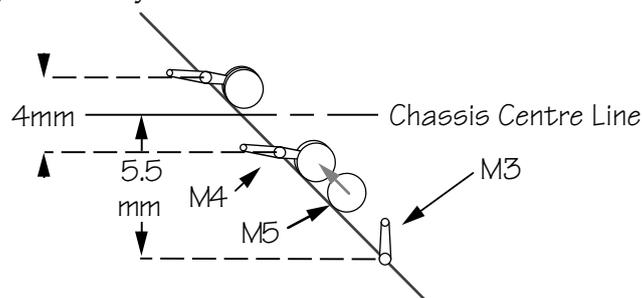
- 6.1 The bogie is designed to be flexible but may be soldered solid if so required — it will hold the track much better if you don't.
- 6.2 Solder an overlay (part #3) to the outside of each of the bogie sideframes (part #2) aligning on the hole in the centre lower side of the sideframe.
- 6.3 Fold up the required bogie spacer (part #20) into a "U" shape. Reinforce the folds with a fillet of solder.
- 6.4 Insert a 14BA bolt into the hole in the bogie sideframe assembly such that it projects through to the inside of the frame. Place the spacer over the bolt and do up the nut fixing it in place with a touch of solder leaving the sideframe free to pivot around the spacer. Cut off the excess bolt length. Repeat for the other sideframe.
- 6.4 Insert a top-hat bearing into each of the axle holes in the bogie sideframes from the inside. The body of each bearing should project through to the outside.
- 6.6 Using a set of the bogie wheel you intend to use as a gauge, adjust the bearings such that the projections are equal all round and do not project so far that they will foul the wheels once they are mounted. Solder the bearings in place.
- 6.7 Pass a bolt through the bogie spacer with its head inside the "U" of the spacer and secure with a nut on the other side of the spacer.
- 6.8 Bend out the guard-irons as shown in the drawing — they will require trimmed back for the narrower gauges.



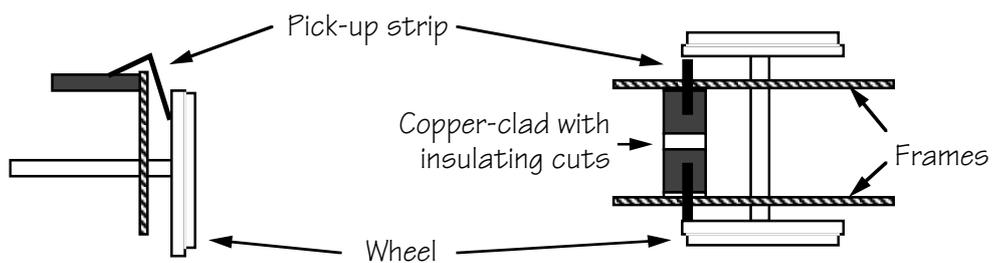
Part 7. Compensation



- 7.1 Fold out the bogie bearing plate mounting tabs on the rear compensation beam (part #12) and solder the bogie bearing plate (part #13) to their underside.
- 7.2 Cut a length of brass rod to the width over the outside of the mainframes. Open out the holes in the mainframes above the middle spacer (part #19) and in the rear compensation beam to accept this rod.
- 7.3 Cut two lengths of the small bore brass tubes to act as washers either side of the compensation beam.
- 7.4 Pass the brass rod through one mainframe, thread on a washer followed by the compensation beam followed by the second washer. Finally pass the rod into the other mainframe. Solder the rod to each of the mainframes and the washers to the rod. The compensation beam must be free to pivot on the rod with as little sideplay as possible.
- 7.5 Bolt the bogie link arm (part #14) to the central spacer, bend it down and bolt the bogie to it — pass the bolt through from the underside of the bogie in the : the bolt bears onto the bogie bearing plate and is used to adjust the ride height of the rear of the engine but it is best left overlong at the moment.
- 7.6 Fix any required motor mounting plate in place.
- 7.7 If your motorising arrangement will allow it, the reversing gear counter weights (part #4 and 5 on the motion etch) may be fitted together with the reversing gear drop link (part #3 on the motion etch) as shown in the sketch below. Thread a wire into the hole at the top of the mainframes just in front of the rear brake pivot hole, thread on the drop link and counter weights and finally pass the wire through the other mainframe. Secure the wire to the mainframes with solder and trim back flush. Secure the counter weights as indicated (workers in OO may have to compromise on the dimensions) but the drop link is probably best left free until it can be positioned using the reach rod as part of the body assembly.



- 7.8 If you can't find the room then the reversing gear drop link may be fitted onto a short length of wire protruding inside the chassis or it may be treated as part of the body and fitted later with the reversing gear reach rod.
- 7.9 Clean the chassis thoroughly at this point and paint. Try to avoid getting paint on the brake hanger wires as there is more soldering to be done in these areas. Ream any paint out of the axle bearings.
- 7.10 Mount the driven axle in its bearings, locating the gears in place at the same time.
- 7.11 Mount the other driving wheel axle in its bearing and mount the driving wheels.
- 7.12 Fix the motor in place.
- 7.13 Cut two strips of the copper-clad fibreglass to be a tight fit between the frames. Remove a little of the copper at each edge to make sure of insulation from the frames.
- 7.14 Glue the strips to the inside to the chassis level with either the top or bottom edge of the frames, as allowed by the motor etc., in line with one edge of each wheelset. Then solder a phosphor bronze strip to the strip in line with one edge of the wheel. Stick a small piece of insulating tape over the edge of the chassis and then bend the pick-up strip over the chassis and down (or up) the face where it will bear on the back of the tyre. (See diagram.) Pick-up can be improved by soldering a small piece of brass (or gold!) wire to the business end of the phosphor bronze strip where it bears on the back of the wheel.

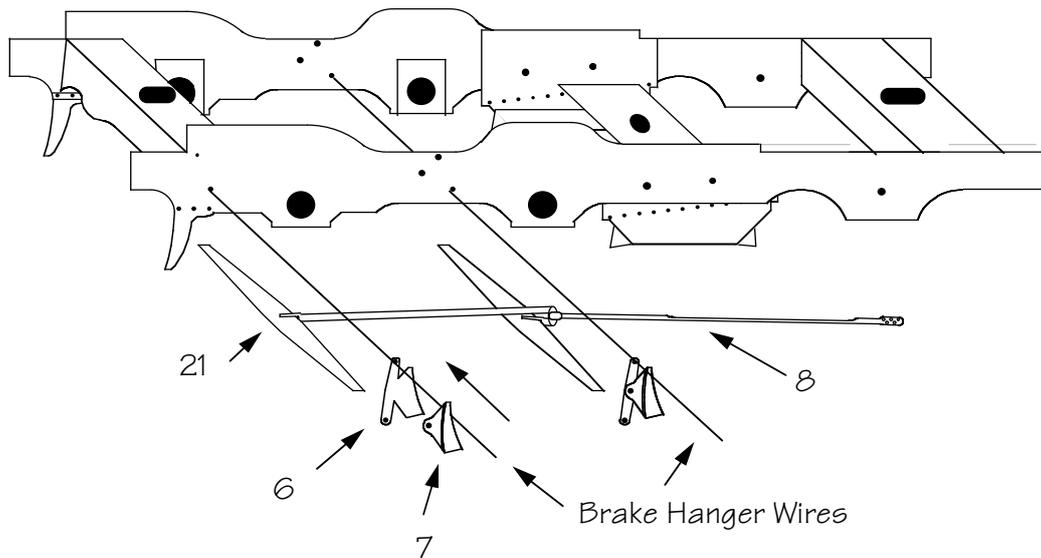


Pick-up arrangement

- 7.15 Link the strips together and to the motor with fine insulated wire.
- 7.16 Glue the balance weights (part #16) in place on the wheels taking care not to cause a short between tyre rim and axle.
- 7.17 Quarter the wheels as follows (unless you are using Romfords!) :-
- Starting with the driven axle adjust all the wheels to approximately the correct quarter aligning by eye to the nearest spoke,
 - Fit the coupling rods and bushes to the driven and the other wheels,
 - Freewheel the chassis up and down and feel for binding,
 - If binding occurs, adjust only one wheel on the non-driven axle H a spoke clockwise,
 - Again freewheel the chassis up and down, repeatedly adjusting the quartering anti-clockwise on the same wheel until no binding occurs,
- 7.18 Mount the bogie wheels in position and place the chassis on a level surface. The bogie mounting bolt will be causing the rear to sit too high — adjust the bolt, trimming its length if necessary until the chassis sits level and then firmly secure the bolt so that it can't wander.

Part 8. Brakes

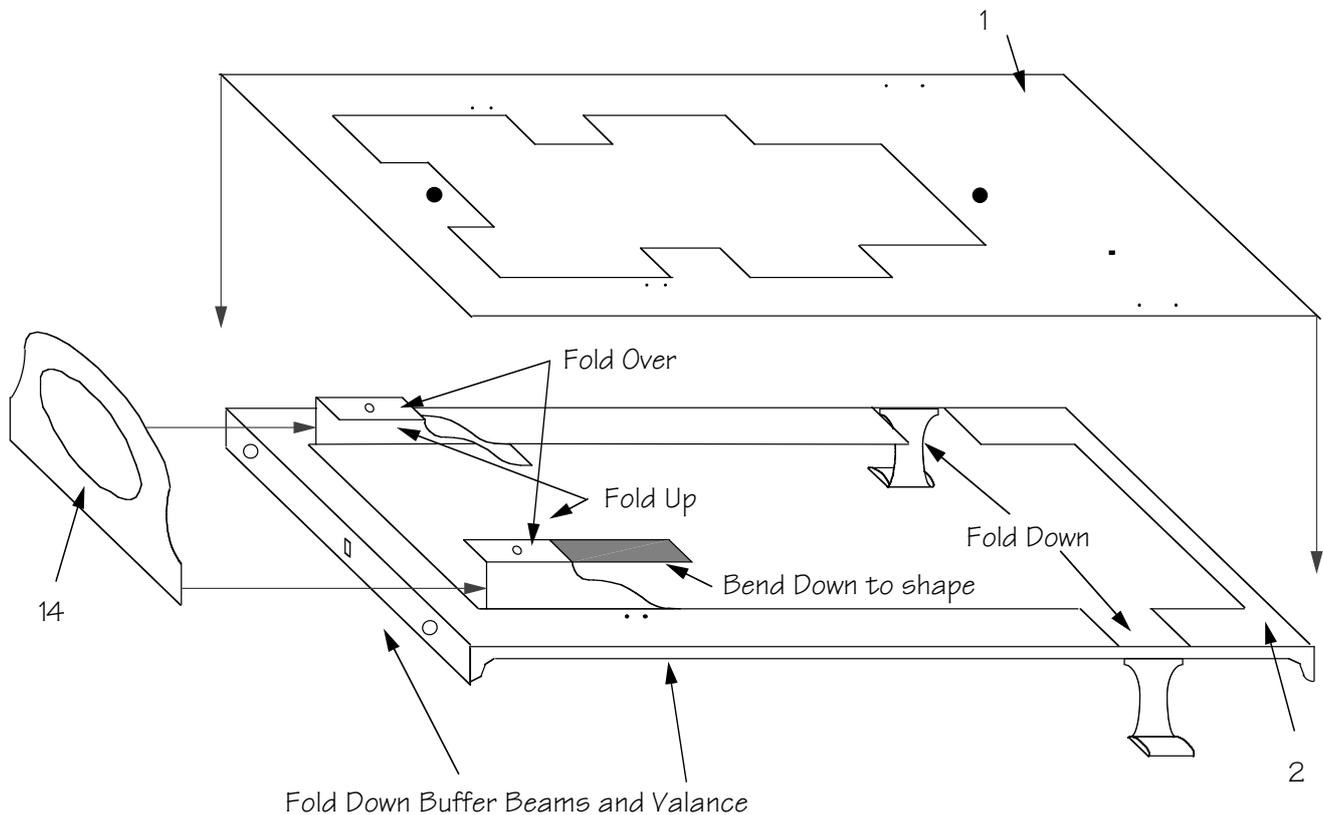
- 8.1 Solder the brake block overlays (part #7) to the brake blocks (part #6) — remember you require two left hand and two right hand.
- 8.2 Solder the brake block assemblies, each followed by a washer (part #15) to their locating wires such that they are sufficiently clear of the wheel rims not to cause a short — remember to allow for the movement in any floating wheel.
- 8.3 Locate the brake gear transverse rods (part #21) in the bottom holes of the brake blocks opening out the holes if required and fix in place.
- 8.4 Solder the two halves of the brake pull rod (part #8) together with the half-etched surfaces to the outside to give a double thickness part. Locate the “forks” at the centre of the two brake gear transverse rods and solder in place.



- 8.5 Bend the sand pipes to shape.
- 8.7 Clean up and paint the brake gear using a fine brush.
- 8.8 Your chassis is now complete.

Part 9 Footplate

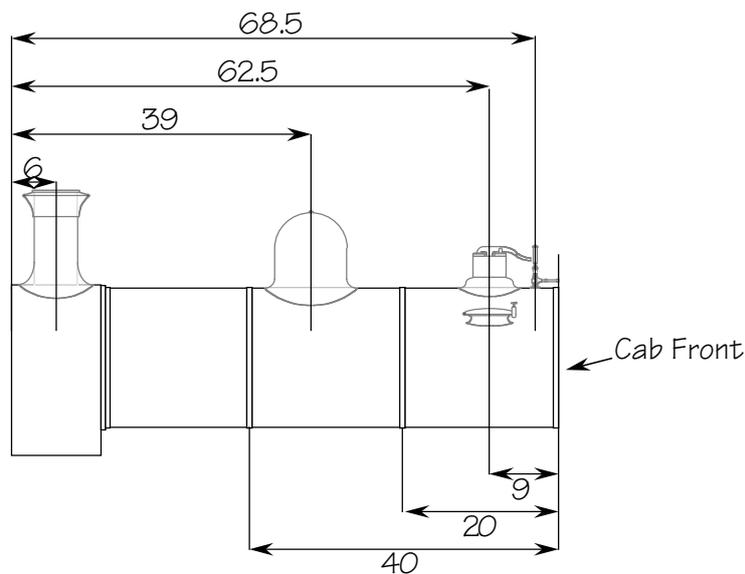
- 9.1 Remove (and store carefully) the various parts found within the footplate (part #1) and sub-footplate (part #2) — do not remove the cab steps from the sub-footplate.
- 9.2 The footplate (part #1) fits over the sub-footplate (part #2). First fold down the valances and buffer beams from the sub-footplate. Reinforce the folds with solder. Next fold up the front splashes and fold down the cab steps. Fit the footplate over the splashes and solder to the sub-footplate alining all holds etc.
- 9.3 Solder a nut to the top of the footplate at each of the chassis mounting points.



9.4 Solder the smokebox front (part #14) to the footplate and splashers.

Part 10. Boiler

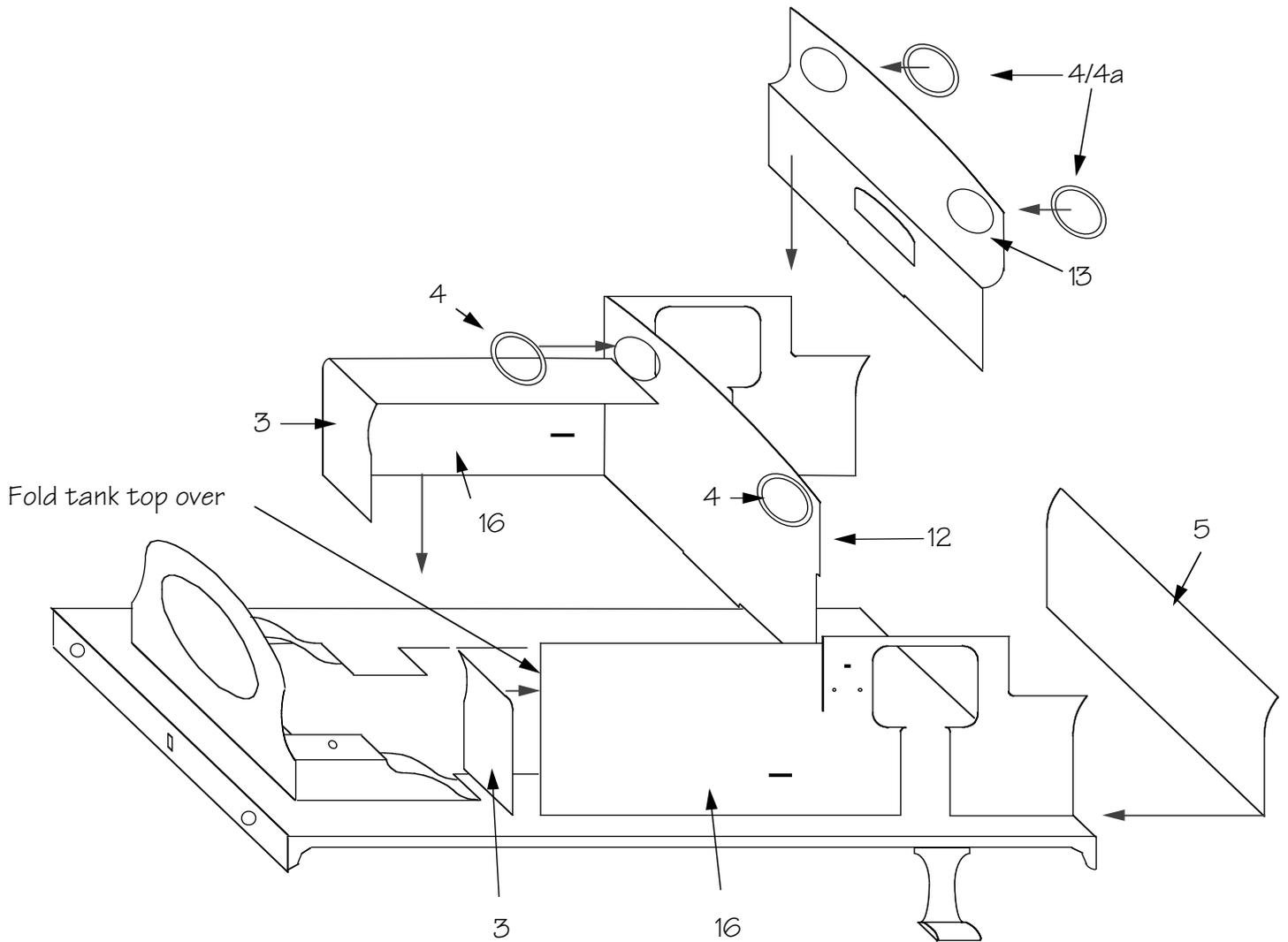
- 10.1 Place the footplate assembly onto the chassis and using this as a guide make cut-outs in the boiler tube to clear your chosen motor and gears.
- 10.2 Tin the inside of the smoke box inner wrapper (part #6) and the front section of the boiler.
- 10.3 A photograph of your prototype is now essential. If you are modelling later LMS days then the smokebox is probably riveted. If so, push out the rivets from the rear on the outer smokebox wrapper (part #20) using a map tack.
- 10.4 Form the outer smokebox wrapper round the boiler, or preferably a slightly smaller tube after tinning it on the inside. Don't worry if it doesn't keep a circular shape — it will tend to spring back a little.
- 10.5 Place the two wrappers in position on the boiler aligning on the chimney hole and tack to the front edge of the boiler tube. Continue round the smokebox front, seam soldering the parts together. Remove any excess length from the wrappers if you are using a motorising scheme which requires the underside of the smokebox to be cut away.
- 10.6 Place the assembly in a vice (it can get rather hot). Apply flux to the rear smokebox / boiler junction and heat the wrapper with a dry iron. When you see liquid solder at the junction, remove the heat and allow to cool. Remove any solder that has leaked out afterwards.
- 10.7 Drill the boiler tube to accept the chimney, dome, safety valve and whistle as shown in the sketch.
- 10.8 Solder the boiler bands (part #7) in place in the indicated position.



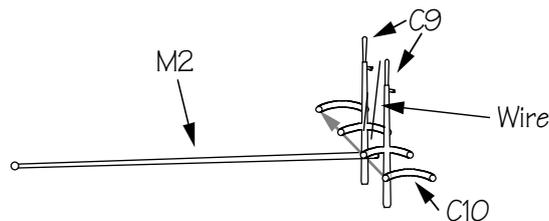
All dimensions are in millimeters

Part 11. Body

- 11.1 Solder the spectacles (part #4) to the cab front (part #12) around the window apertures.
- 11.2 Slot the cab front assembly into the slot in the footplate and solder in position making sure that it is square.
- 11.3 Solder the boiler assembly to the smokebox front and cab front making sure that it is level
- 11.4 Slot one of the cab/tank sides (part #16) into the cab front and solder together near the lower edge only making sure that the two parts are square and that the half etched lines on the cab/tank sides are on the inside.
- 11.5 Fold over the tank top using the tank ends as templates. The tank sheets are fined at their junction with the boiler and should be flared up slightly into the boiler curve.
- 11.6 Any "edging" which has occurred on the rounded portion of the tank can be cured by filling the half etched lines with solder then lightly dressing the outside with a file.
- 11.7 Solder the tank end in place.
- 11.8 Firm-up the cab front/side sheet joint.
- 11.9 Repeat from 11.5 using the other cab/tank side sheet.
- 11.10 Solder the beading (part #9) around the cab apertures. Mark the centre of the strip and align with the centre of the cab opening at the upper edge: tack solder in place at this point locating the side in the half etched groove. Work from the centre round one side pushing the beading into shape and securing with solder. Repeat for the other side.
- 11.11 Fold the tool box front and sides (part #21) into "L" shapes and solder to the floor either side of the cab such that the inner wall of the cab front and cab side sheet complete the boxes. Solder the lids (part #22) in place.
- 11.12 Solder the backhead in place, centrally to the inner wall of the cab front.



- 11.13 Assemble the reversing lever from parts #9 and 10 from the chassis etch as shown in the sketch. Trap a piece of wire in the groove in the mating faces of part #9 to simulate the latch.



- 11.14 Solder the reversing lever assembly into the slot in the cab floor.

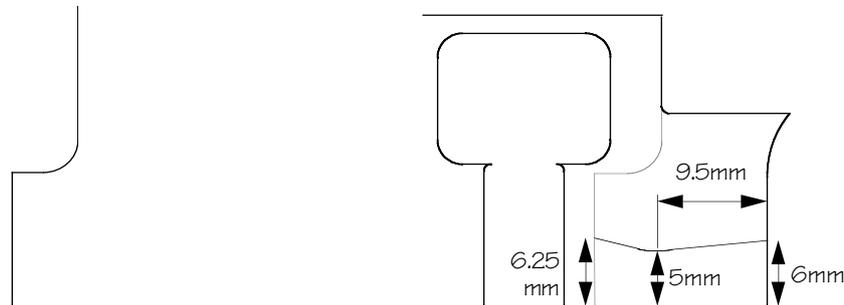
- 11.15 The reversing lever reach rod (part #2 on the motion etch) passes through the cab front and along the inside of the left-hand tank (as viewed from the cab looking forward) running between the reversing lever and the drop link. I would tend to solder it to the reversing lever and the tank ends, leaving it free at the drop link (so that the body and chassis cab still come apart). It may be cut inside the tank as required to clear the motor etc.

- 11.16 Temporarily mate the body and chassis and use the reach rod to locate the drop link such that the two appear to meet. Secure the drop link in place and then remove the chassis to a safe place.

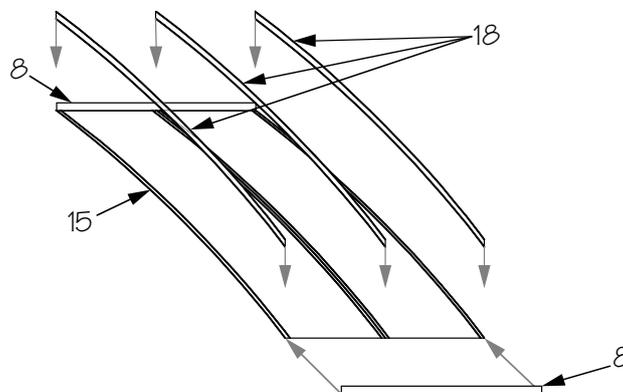
- 11.17 Bend the cab rear (part #13) as shown in the sketch using the half etched lines to guide you. Using either part #4 or #4a (if fitting window bars), solder the spectacles to the cab rear. Solder the

assembly in place to the footplate and side-sheets.

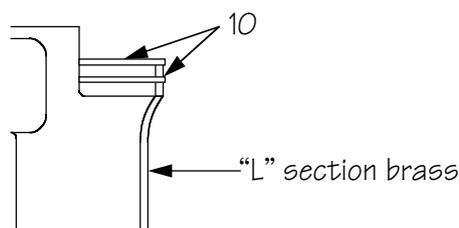
Tip : if using part #4a bend up some 0.3mm wire into "U" shaped "staples" to fit the holes, thread part #4a on them and then thread the legs into the holes on the cab rear. Only then solder in place from the inside of the cab and trim off the legs of the wire. This way you won't block the holes with solder!



- 11.18 Bend the bunker floor (part #23) using the dimensions in the sketch above as a guide and solder in place.
- 11.19 Flair out the top of the bunker rear (part #5) to match the profile of the side sheets and solder in place.
- 11.20 Fit the brake stanchion to the hole in the cab floor just in front of the bunker wall.
- 11.21 Using 0.45mm wire, fit handrails between the projections on the cab beading and the holes in the footplate.
- 11.22 Curve the roof (part #15) to match the profile of the cab front. Fit the stanchions (parts #18) and the roof side strips (parts # 8) as shown in the diagram. The roof is probably best not fitted in place until the final assembly.

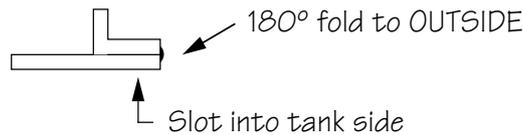


- 11.23 Bend two lengths of "L" section brass to fit angle-in inside the bunker rear / side-sheet joints such that they project about 5mm. Bend the coal rails (parts #10) into "U"s and fit the legs into the slots on the cab rear. Adjust until level and then solder to the "L" section brass which should then be trimmed off flush with the upper rail

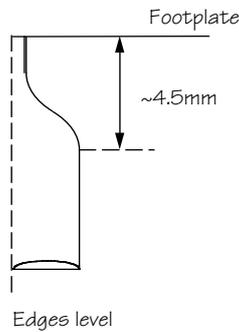


- 11.24 Fold up the tank side steps (part #19) as shown below and fit by soldering the projection into the

slot in the tank sides from the inside.

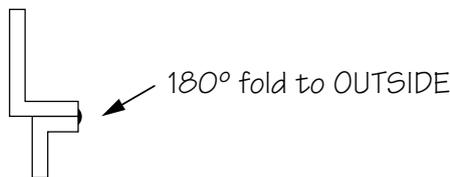


11.25 Bend the cab steps as shown in the diagram. The edge of the step should be level with the footplate. Fold the ends of the tread up as shown in the G.A. drawing. Fold up and fit the upper tread (part #11).



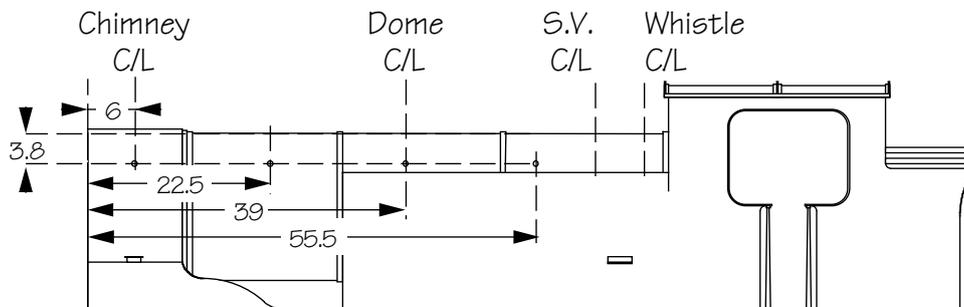
11.26 Solder the front steps (part #24) to the inside of the valance centred on the grab rail holes in the footplate. Crank in a similar manner to the cab steps so that the edge of the step is level with the footplate.

11.27 Fold up the cab lamp irons as shown and solder to slots in the cab side sheets from the inside.



Part 12. Fittings

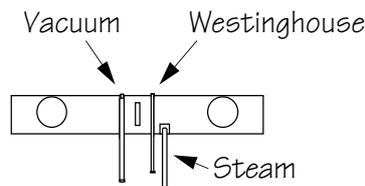
12.1 Drill the boiler for handrail knobs as shown above. Thread a short handrail knob onto a length of 0.45mm wire and fold the wire to match the profile of the handrail at the smokebox. On either side, thread on another short handrail knob followed by 3 medium ones. Fit the ends of the knobs into the holes and fix in place — a dot of solder paste placed in the holes prior to locating the knobs can be useful here.



All dimensions are in millimeters

12.2 Solder the chimney, dome, safety valve and whistle in place using the previously drilled holes in the boiler.

- 12.3 As shown in the diagram for instruction 10.8, drill holes in the top of the side tanks 9mm from the cab front to take the tank fillers. Solder the tank fillers in place.
- 12.4 Fit the tank balance pipe below the cab using the holes in the footplate as an aid to location.
- 12.5 Solder the smokebox door in place and then solder the dart to it.
- 12.6 Fit the steam chest cover centrally to the footplate at the smokebox front/footplate junction.
- 12.7 Solder the cylinder lubricators in place on the smokebox front.
- 12.8 Solder the sandbox fillers into the holes in the splasher tops.
- 12.9 Fit the buffer bases front and rear. The heads are probably best left off until after painting.
- 12.10 Fit the Westinghouse and steam pipes together with the vacuum pipes if appropriate to your model. The diagram below shows their arrangement.



- 12.11 Fit the Westinghouse pump at the tank front as shown in the G.A. drawing.
- 12.12 If appropriate to your period, drill the smokebox to take the vacuum injector pipe elbow. Bend up an appropriately shaped pipe, fit the cast elbow and fit in place on the model. The modifications drawing shows a typical arrangement of this pipe but a photograph of your prototype is your best guide.
- 12.13 There are a total of 6 grab rails to be fitted.
 - a) One above each of the front steps,
 - b) One on each cab side sheet below the lamp irons,
 - c) One below the spectacles on either side of the cab front.

Bend up wire "staples" to fit the holes at each location and solder in place.

- 12.14 Make up lamp irons from the strip provided (part #25) and fit as shown in the G.A. drawing.

Part 13. Final Assembly

- 13.1 Thoroughly clean the body to remove all trace of flux etc.
- 13.2 Paint, line and letter according to your chosen prototype and period.
- 13.4 Glaze the cab spectacles and then fit the cab roof by gluing in position.
- 13.5 Fit the sprung buffer heads, adjusting the fixing nuts until the projection of the heads is correct.
- 13.6 Mate body and chassis using the supplied bolts.
- 13.7 Your loco is now ready for service.

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