Caley Coaches

'True Line' kits in etched brass

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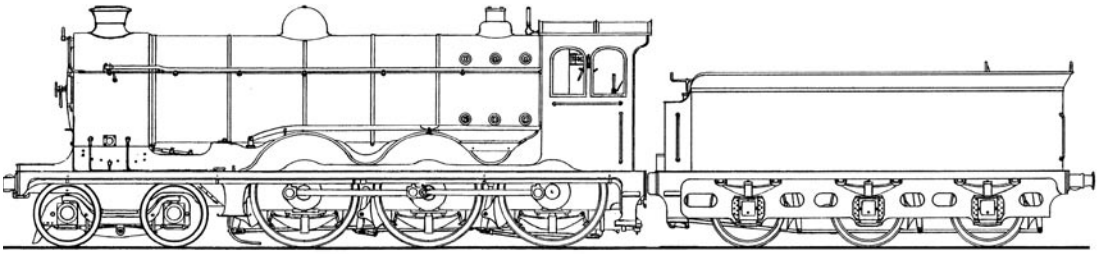


Building Instructions for kit CL07 Caledonian Railway Class 179 4-6-0 Engine and Tender

C.R. numbers 179-189;
L.M.S. numbers 17905-17915.

Parts required to complete

1 Motor — Mashima 1220 "flat can" or similar recommended.
2 Gearbox — High Level LoadHauler recommended.
[High Level Kits, 14 Tudor Road, Chester-le_street, Co. Durham, DH3 3RY. **www.highlevelkits.co.uk**]
3 Wheels — 3'6" diameter 10 spoke bogie wheels,
5'9" diameter, 20 spoke driving wheels [crankpin in-line with spoke]
[Alan Gibson 4868C (00/EM)/4S68C (P4) recommended]
4'0" diameter, 12 spoke tender wheels
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.

1 Locomotive Chassis Fret (nickel-silver) containing :-

Part #	Description	Quantity
1	LH Mainframe	1
2	RH Mainframe	1
3	Frame Spacer (P4, EM & OO)	1
4	Frame Spacer (P4, EM & OO)	1
5	Frame Spacer (P4, EM & OO)	1
6	Frame Spacer (P4, EM & OO)	1
7	Frame Spacer (P4, EM & OO)	1
8	Frame Spacer (P4, EM & OO)	1
9	Frame Spacer (P4, EM & OO)	1
10	Compensation Beam Short	2
11	Compensation Beam Long	2
12	Compensation Beam Spacers	2
13	RH Bogie Sideframe	1
14	LH Bogie Sideframe	1
15	Bogie Stretcher	1
16	(R & L) Bogie compensating Bars	2
17	Reversing Rod	1
18	Reversing Lever	1
19	Brake hangers and shoes	6
19A	Brake spacers	6
20	Brake cross beams	3
21	Brake rigging	1
22	Brake crank	1
23L	Coupling Rods (two layer)	2
23R	Coupling Rods (two layer)	2
24	Dummy Valves	1
25	Drawbar Long	1
26	Drawbar Short	1
27	Balance Weight Driver	2
28	Balance Weight Coupled	4
29	Guard Irons	2
30	Front coupling hook	1

31	Gauges and regulator	1
	Spacing Washers large	12
	Spacing Washers small	8

2 Locomotive Body Fret (brass) containing :-

Part #	**Description**	**Quantity**
33	Loco Footplate	1
34	(R & L) Footplate Valances	2
35	Front Steps	2
36	Rear Steps	2
37	Splasher top (wheels) RH	1
38	Splasher top (wheels) LH	1
39	Splasher top (rods) RH	1
40	Splasher top (rods) LH	1
41	Frame plate RH	1
42	Frame Plate LH	1
43	Frame Plate between wheels	2
44	Boiler and Firebox Wrapper	1
45	Boiler Butt Strap	1
46	Smokebox Wrapper	1
47	Smokebox Wingplate	1
48	Smokebox Front Non-Wingplate	1
49	Smokebox Front Former	1
50	Smokebox Rear Former	1
51	Firebox Front Former	1
52	Firebox Rear Former	1
53	Firebox Expansion Joint Cover	2
54	Firebox extender (inside cab)	1
55	Front Bufferbeam	1
56	Rear Buffer Beam	1
57	Sandbox RH	1
58	Sandbox LH	1
59	Cab Front and Sides	1
60	Cab Roof	1
61	Cab Roof Ribs	3
62	Cab Spectacles	2
63	Cab Beadings	2
64	Cab Window beads	4
65	Cab Floor	1
66	Cab Lamp Iron	2
67	Cab Seat top	1
68	Cab Seat side	1
69	Front Lampirons	3
70	Sandbox Fillers	2
71	Ejector Flange	1
72	Cylinder Cover	1
73	Reverse Lever Bracket (Cab)	1
74	Smokebox Steamchests	1
74A	Steamchest covers	2
	Spacing Washers assorted	12

3 Tender etch containing :-

Part #	Description	Quantity
1	Footplate,	1
2	Tank frame and top	1
3	Tank,	1
4a	Tank coping — Right side (from front)	1
4b	Tank coping — Rear	1
4c	Tank coping — Left side	1
5	Sidesheets	2
6	Floor plate	1
7	Coal hole door,	1
8	Footplate boxes	2
9	Footplate box lids	2
10	Coalspace tool box	1
11	Coalspace tool box lid	1
12	Coalspace rear partition — Front	1
12b	Coalspace rear partition — Rear	1
13	Coalspace rear partition supports	2
14	Frames	2
15	Valance	2
16	Buffer beam	1
17	Drag beam	1
18	Upper step treads	2
19	Lower step treads	2
20	Brake cross shaft supports	2
21	Brake rod coupling	1
22	Handbrake coupling	1
23	Handbrake clevis	1
24	Doors	1
25	Brake standard	1
26	Tank top strengthening rib	1

4 Tender chassis etch containing :-

Part #	Description	Quantity
1	Inside frames	2
2	Front, centre and rear frame spacers	1 each 00 and EM/P4
3	Draw hooks	2 of differing lengths
4	Brake hangers	6
5	Brake pull rods	2

5 Cast Fittings :-

Part #	Description	Quantity
CL7/1	Chimney	1
CL7/2	Dome	1
CL7/3	Ramsbottom Safety Valve	1
CL7/4	Smokebox Door	1
CL7/5	Smokebox Door Dart	1
CL7/6	Westinghouse Pump	1
CL7/7	Westinghouse Pipe	2
CL7/8a	Vacuum Pipe (underslung)	1
CL7/8b	Vacuum Pipe (tall)	1

CL7/9 Steam Pipe	2
CL7/10 Backhead	1
CL7/11 Vacuum Injector Pipe Elbow	1
CL7/12 Leaf Spring	6
CL7/13 Sniffing Valve	2
CL7/14 Tender axleboxes and springs	6
CL7/15 Tank fillers	2
CL7/16 Wakefield lubricator	1

6 Turned Brass Fittings :-

Alan Gibson Drummond Type Buffers	1 pk.
Short Handrail Knob	3
Medium Handrail Knob	10
Whistle	1
2mm bore bearing (large)	2

7 Miscellaneous Parts :-

0.45mm Wire	4
0.9mm Wire	1
2mm Tube	1
Copper-clad Strip	3
Phosphor-bronze Strip	1
8BA Nuts and Bolts	5
Insulated Wire	1

8 Compensation Components :-

MJT $^{1}/_{8}$" bore pack	1
MJT 2mm bore pack	1

9 Printed Matter :-

Prototype Notes,
General Building Notes,
Exploded drawing,
CL7 Building Instructions (this document !)

Section 2 Motor and Gears

The recommended gearbox allows the rear [fixed] axle to be driven in true Flexichas fashion with the motor hidden [vertically] in the smokebox this is by no means the only way do do it. 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.

3.4 The "exploded" constructional drawing are central to these instructions. Study them carefully and

don't lose them!! (Spare copy by request!)

Section 4 Coupling Rods

4.1 Fold over the bosses of the coupling rods (inner and outer - part #23) and solder in place.

4.2 Solder together the flat faces of the each coupling rod inner/outer pair alighing on the fron or rear crankpin holes then file off the remains of the tags.

4.3 Open out each crankpin hole until it is just a sliding fit on the crankpin of the wheels you intend to use.

Section 5 Chassis

5.1 Remove the mainframes (part #1 and 2) from the fret and press out the half-etched detail above the bogie pivot.

5.2 If you are using compensation, remove the sections around the bearing holes of the front and middle coupled axles 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.

5.3 Assemble four $^{1}/_{8}$" bore sub-hornblocks as detailed in the separate instructions in the MJT pack.

5.4 Fold over the spring location brackets below each axle.

5.5 Select the frame spacers (parts #3-9) appropriate to your gauge and bend parts #6 and 7 to shape along their half-etched lines. Fold up the brake crank support from spacer #9.

5.6 Solder a nut to the upper surface of part #4.

5.7 Locate spacers #4 and 7 in the appropriate slots in one of the mainframes and solder in place.

5.8 Locate spacers #3, 6 and 9 in the appropriate slots in the **other** mainframe and solder in place.

5.9 Now bring the two mainframes assemblies together locating spacers #6, 7 and 9 in the slots of the opposite mainframe and solder in place. Now crank each mainframe in equally until spacers #3 and 4 can be located in their slots in the other mainframe and solder in place.

5.10 Solder spacers #5 and 8 in place as shown in the exploded drawing.

5.11 Locate the top-hat bearings in place for the driven axle, opening up the holes slightly if necessary. Take care to keep the holes circular. Use a Puffer's axle/hornblock alignment jig to check the alignment of the bearings and when satisfied solder the bearings to the mainframes. Leave the jig in place.

5.12 Using the previously assembled coupling rods and the set of Puffer's axle/hornblock alignment jigs fit the hornblocks and bearings as follows :-

a) Locate the hornblocks and bearings for the centre axle, using the spring of the jig to hold them in place,
b) For each side, slip the appropriate section of the coupling rod over the spigot of the jig in the fixed axle bearings and over the spigot of the jig in the centre axle bearings adjusting as required,
c) Once happy with the alignment of both sides, solder the hornblocks to the sideframes,
d) Repeat from a) using the other sections of the coupling rods and the centre axle as the reference point for the other axle.

5.13 Remove the coupling rods and jigs and solder the spring castings onto the location brackets.

5.14 The bogie is built essentially rigid with only the front axle pivoting on a rod as shown as shown in the exploded drawing. The "compensating beams" (parts #16L& R) are cosmetic only.

5.15 Fold up the bogie stretcher (part #15) and solder each of the bogie sideframes (parts #13 and 14) to it taking care to keep every thing square.

5.16 Open up the holes front and rear on the bogie sideframes to accept a length of 2mm tube and solder a length of the rod in place front and rear.

5.17 Similarly open up the hole on the front of the upright of the bogie stretcher and solder a length of 2mm rod between it and the front rod installed at step 5.16.

5.18 Fold up the bogie compensation beams (parts #16L & R) to form "U" shaped channels then fold down the central "flaps" to the outside of the "U" on both sides. Open out the rear holes and front slots to clear a 2mm axle.

5.19 Using the various holes and slots as an aid to alignment solder the compensation beams to the sideframes.

5.20 Solder the guard irons (parts#29) to the bogie sideframes.

5.21 Fold the rear compensation beam (part #10) to form a double thickness piece and solder along the seam.

5.22 Solder a length of 0.45mm wire into the slot at the bottom of one of the compensation beam spacers (part #12). Solder to the other spacer with the slots to the inside as shown in the drawing.

5.23 Align the beams with the hole at the rounded end of the two parts #11 either side of the hole in part #10 and assemble by inserting a short length of 0.45mm wire into the hole and soldering the wire to both parts #11. Part #10 **must** be free to pivot on the wire.

5.24 Likewise pass part #12 between the two parts #11 and align by passing a piece of wire through the holes. Do not solder. Gently tweak in the front of the two parts #11 until the "golf club" heads are touching along the length of the head and solder together – make sure that part #12 can still pivot. Remove the aligning wire and part #12 just now.

5.25 Measure the width inside the frames, subtract from this the width of the compensation beam at part #12 and divide by two (take away the number you first thought of... No! I'm only kidding!). Cut two lengths of the small bore tube to this length.

5.26 The compensation beam pivots on a wire installed between the frames. Open out the holes just behind the crank in the frames to accept a 0.9mm wire. Thread a length of 0.9mm wire through one frames. Thread one of the lengths of tube, the compensation beam and the other length of tube into the wire and then pass the wire through the other side frame. Check that things are neither too loose (use a small washer or two) or too tight (file the tubes shorter). When you are happy solder the wire to the frames then trim back flush.

5.27 Pass three lengths of 0.45mm wire through the frames to act as brake pivots and solder in place – you will probably need to cut the rear one inside the frames to clear the gearbox.

5.28 Fold up the dummy valves (part #24) and fit to spacer part #5.

5.29 It is probably best to fit the brakes themselves after the wheels so clean up and paint the chassis now.

Section 6 Motor and Wheels

6.1 Ream any paint out of the axle bearings.

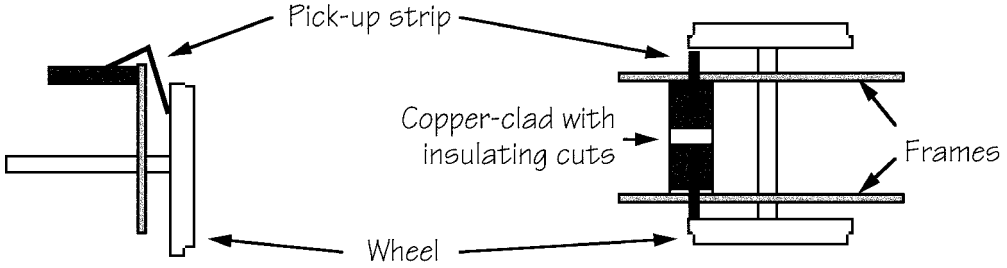
6.2 Assemble the gear box and motor as per the separate instructions which come with the gear box.

6.3 Mount the driven axle in its bearings, locating the gear box and motor in place at the same time.

6.4 Mount the other driving wheel axle in its bearings and mount the driving wheels on the axles.

6.5 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.

6.6 Glue the strips to the inside to the chassis level with the top edge of the frames, 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 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

6.7 Link the strips together and to the motor with fine insulated wire.

6.8 Quarter the wheels as follows (unless you are using Romfords!) :-

a) Starting with the driven axle adjust all the wheels to approximately the correct quarter aligning by eye to the nearest spoke,
b) Fit the coupling rods and bushes to the driven and centre wheels,
c) Freewheel the chassis up and down and feel for binding,
d) If binding occurs, adjust only one wheel on the centre axle $^1/_2$ a spoke clockwise,
e) Again freewheel the chassis up and down, repeatedly adjusting the quartering anti-clockwise on the same wheel until no binding occurs,
f) Fit the coupling rods between the centre and rear axle and repeat the process from c), adjusting only the quarter of one of the rear wheels.

6.9 Glue the balance weights (part #27 and 28) in place on the wheels taking care not to cause a short between tyre rim and axle if you are using Romfords.

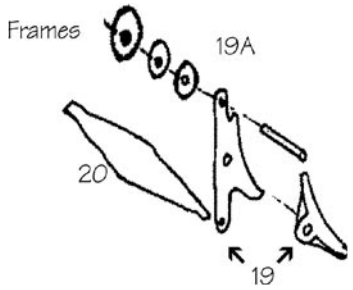
6.10 Mount the bogie wheels in position adjusting the gauge until correct then splay the guard irons to suit.

6.11 Mount the bogie assembly using a short bolt which bolts into the nut soldered to spacer part #4, trapping the side control wire projecting from the compensation beam spacer (part #12) in the slot at the rear of part #15.

6.12 Place the chassis on a level surface — chances are it will be sitting either "nose low" or "nose high". This can be cured by adjusting the tweaking plate on the bogie stretcher (on which the end of the compensation beam rests) until everything is level.

Section 7 Brakes and Fittings

7.1 Mount the brake bell cranks (part #22) on a short length of wire passed through the pair of holes in the brake crank support which folds up from spacer part #9. The long arm points to the rear of the loco but leave the cranks free to rotate if only slightly for the moment.



7.2 Solder the brake block overlays to the brake blocks (part #19)

7.3 Thread one large and two small brake block spacers (part #19A) onto each of the brake pivot wire followed by one of the brake block assemblies. Adjust until level with the wheel rim and as close as possible to the rim while not causing the danger of a short — it is especially important to allow sufficient clearance on the compensated axles — and solder in place.

7.4 Position the ends of the brake cross beams (part #20) in the lower holes in the brake block assemblies then hook the forks of the brake rigging (part #21) onto the centres of the cross beams. Note that the rigging passes above the cross beams at the rear axle.

7.5 Solder the loose end of the rigging to the bell crank at the rear and when happy that all the brake parts mate properly solder the various loose parts together then trim back the brake pivot wires.

7.6 Clean up and paint the brake gear using a fine brush.

7.7 Your chassis is now complete.

Section 8 Body

8.1 Fold up the wheel splashers from the footplate (part #33) and solder the valances (part #34) to the footplate noting that they go inside the well of the footplate at the wheels to form the sides of the splasher extensions. The footplate lip is very thin in this area so don't dwell with the iron or you are liable to distort the section.

8.2 Fold up the buffer beam (part #55) into a double layer assembly and solder to the front of the footplate locating it in the cutout.

8.3 Similarly fold up the drag beam (part #56) and fit to the rear of the footplate. The top edge should be flush with the footplate and the overhang at each side of the valance equal. The slot goes nearer the top.

8.4 Solder two nuts to the footplate over the front and rear chassis mounting holes having first opened out the holes to clear the bolts supplied.

8.5 Fold the cabs sides at 90^0 to the front on part #59 and solder to the footplate locating the piece in the slots near the rear of the footplate.

8.6 Press out the rivet detail on the frames plates (parts #41 and 42), locate in the slots towards the front of the footplate and solder in place. Fold over the bracket on the right hand one.

8.7 Starting at the front, solder the lip of the right rod splasher top (part #39) to the footplate at the front of the rod splasher side and then working backwards gentle form and fix the part to the

splasher sides until you reach the cab. Here the inner tang folds up following the line of the cab side and fixes to the cab while the outer tang follows the line of the rod splasher and fixes to the footplate at the rear of the splasher. Repeat for the left rod splasher top (part #40) and then file back any surplus metal until the there is no overlap at the rod splasher side/top join.

8.8 In a similar (but larger) vein, solder the lip of the right main splasher top (part #37) to the footplate at the front of the splasher and again working towards the rear gentle form and fix the part to the splasher sides until you reach the cab. Take care to keep the curve consistent over the width of the piece. Repeat for the left hand side (part #38) then clean up.

8.9 Fold the locating tab in the firebox locating ring (part #52) to 90^0, pass through the front of the cab and solder in place.

8.10 Press out any rivets required, then roll the smokebox wrapper (part #46) into a cylinder. Using the smokebox inner front (part #49) as a template, bend back the lower edges of the wrapper until it matches the shape of the inner front. Solder the inner front inside the front of the wrapper and the smokebox rear former (part #50) inside the lower rear having first soldered the smokebox steam chests (part #74) and steamchest covers (part #74a) in place on the rear former.

8.11 Solder the required smokebox front (part #47 with wingplates, part #48 without) to the assembly using the tab on the wrapper for alignment.

8.12 Roll the smokebox inner wrapper (part #46) and solder it inside the inner wrapper such that it projects by 1.75mm.

8.13 Roll the boiler (part #44) then tin the boiler seam butt strap (part #45) and sweat in place along the seam on the inside of the rolled boiler and fold out the lower skirts of the firebox using the firebox front former (part #51) as a guide then solder the former in place.

8.14 Slide the boiler assembly into the smokebox assembly and position the whole on the footplate. The smokebox front and rear formers have tabs which fit in slots on the footplate and the firebox has a tab which fits into the cab front. Adjust the positions until everything is true and level and then solder in place.

8.15 Fold up the expansion joint covers (part #53) and sweat in place at the bottom of the firebox.

8.16 Tin the rear of the frame plates which fit between the middle and front wheels (part #43) and sweat in place.

8.17 Form the rear of the cylinder cover (part #72) to an arc which match the curve of the front of the frame plates and solder in place.

8.18 Check that all joints in the area are sound then remove the locating pieces linking the footplate and the rear of the splashers.

8.19 Fit the cab floor (part #65) after folding over the rear portion at 90^0.

8.20 Fold up and solder the cab seat side/rear (part #68) and solder to the cab floor. Fit the top (part #67) in place.

8.21 Pin the reversing lever (part #18) to its bracket (part #73) and fit to the cab floor.

8.22 Tin the cab spectacles (part #62) and cab window beads (part #64) and sweat in place on the cab front and side.

8.23 Bend the arm of the cab lamp irons (part #66) forward to 90^0 and pass through the slots in the cab side-sheets securing on the inside. Using a piece of scrap brass as a spacer, bend the arms upwards parallel with cab side.

8.24 Form the cab-beading (part #63) to approximately the right shape then, starting at the bottom solder in place working upwards pushing it into the final shape at the top as you do so.

8.25 Form the fireboc extender (part #54) to match the profile of the backhead casting, solder to to the rear of the backhead and then fit the assembly in place on the front wall of the cab. Various small gauges etc. are suppled on the tender etch to allow detailing after painting.

8.26 Form the cab roof (part #60) to a gentle arc then form a reverse curve at the outer edges — the roof angles (part #61) serve as a useful template for these curves.

8.27 Fold up the lips at the outer edges of the roof then solder the roof angles in place, one in the centre and one at each end.

8.28 Fit the cab roof unless you prefer to leave this off until after painting.

8.29 Fold the step treads at 90^0 on the front steps (part #35), tweak up the outer edges of the tread slightly as shown on the G.A. drawing and solder into the slots in the footplate.

8.30 On the rear steps fold the lower step treads at 90^0 and fit the upper treads (part #36).

8.31 Fold up the sandboxes (part #57) and fit to the underside of the footplate behind the front steps not forgeting to include a length of wire to represent the sand pipe. The box fillers are made by layering up three discs (part #70) and fitting them to the half etched recess in the footplate.

8.32 Fit the chimney, dome, safety valve and whistle to the boiler.

8.33 Fit the smokebox door to the smokebox front then fit the door handle in place.

8.34 Add the cast sniffing valves to the lower smokebox sides and the Wakefield lubricator to the bracket on the right hand frame plate.

8.35 Fit the Westinghouse pump on the left-hand side (when looking from the front of the footplate just in front of the cab.

8.36 Thread a short handrail knob onto a length of 0.45mm wire then from the handrail. Thread one short and five medium knobs onto either side and fit to the boiler locating the stems of the knobs on the etched holes.

8.38 Fold up grab handles from 0.45mm wire and fit, one horizontally on each side of the cab below the lamp irons, one vertically to each side of the cab near the rear and one to the each side of the frames above front steps.

8.39 Fit the buffer bases and any pipes you may require to the front buffer beam — the pipe arrangements varied over the years so a photograph is your best guide.

8.40 Fit the cast vacuum ejector elbow on the smakebox side and make up the rest of the pipe from tube and fit in place.

8.41 Fit any pipes your loco may have been fitted with below the footplate, making these from brass rod. Once again photos are your best guide!

8.42 Tin then fold over the bracket representation on the reversing rod (part #18), sweat in place then dress off the tags. Fit the rerversing rod in place on the right hand side of the footplate.

8.43 Finally (unless I've forgotten anything!) fit lampirons (part #69) as required — one at the base of the chimney (always) plus three along the footplate above the buffer beam in L.M.S. days.

Section 9 Final Assembly (Engine)

9.1 Thoroughly clean the body to remove all trace of flux etc.

9.2 Paint, line and letter according to your chosen prototype and period.

9.4 Glaze the cab spectacles.

9.5 Fit the sprung buffer heads, adjusting the fixing nuts until the projection of the heads is correct.

9.6 Mate body and chassis using the supplied 8BA bolts.

Section 10 Tender Chassis

10.1 Remove the frames from the fret and, if you are compensating the chassis, remove the sections around the centre and front axleholes as detailed as step 5.2.

10.2 Assemble four 2mm bore sub-hornblocks as detailed in the separate instructions in the MJT pack.

10.3 Check that the flexichas bearings can easily slide up and down in the sub-hornblocks. If not, gently and carefully open the slots until this can be achieved. Take extreme care not to overdo this as a bearing that is able to slide back and forth in its block is not conducive to good running. It is a good idea to pair bearings and hornblocks as small manufacturing differences can be present in either.

10.4 Select the frame spacers appropriate to your gauge and bend to "L" forms. Working from front to rear, locate the spacers in the slots of one side frame and solder. Now solder the other sideframe to the spacers.

10.5 Locate the top-hat bearings in place for the rear axle (or all six axles if you aren't using compensation) opening up the holes slightly if necessary. Take care to keep the holes circular. Align the bearings with an axle and solder in place.

10.6 Solder the hornblocks to one of the sideframes (the spacing isn't critical) and then, taking care to keep everything square, solder the hornblocks to the other sideframe using the axles to ensure alignment. Fit the bearings and solder retaining wires across the bottom of the hornblocks.

10.7 The pivot of the compensation beam locates in the holes in the sideframes between the front and centre axle which should be opened out to accept a 0.9mm wire. Cut a length wire to the dimension over the outside of the frames and a length of the 2mm tube which is a sliding fit on the wire to be a neat fit inside the frames. Locate the tube in position between the frames and insert the wire through it. Solder the rod to the outside of the frames taking great care that the tube is still able be pivot round the rod. Some Carr's solder mask smeared onto the ends of the tube prior to assembly should ensure that it doesn't get soldered solid. Use a length of brass tube as a compensation beam and solder it at right angles such that it is able to bear onto the centre of the front and middle axles.

10.8 Pass 0.45mm wire through each of the brake hanger locating holes in the chassis, solder in place then locate the brake hangers on them allowing due clearance for your chosen wheels.

10.9 Clean up and paint the chassis then fit the wheels.

10.10 Your final task on the chassis is to pass 0.45mm wire through the lower holes on each pair of brake hangers and then to solder the brake pull rods to these.

Section 11 Tender frames and body

11.1 Remove the footplate (part #1) from the body etch, remove and carefully store parts contained within it. Solder a nut to the top of the footplate at each of the chassis mounting points. Note that the half-etched grooves in the footplate go on the bottom.

11.2 The tank frame (part #2) is formed by folding the tank side supports down at 90^0 to the tank top /

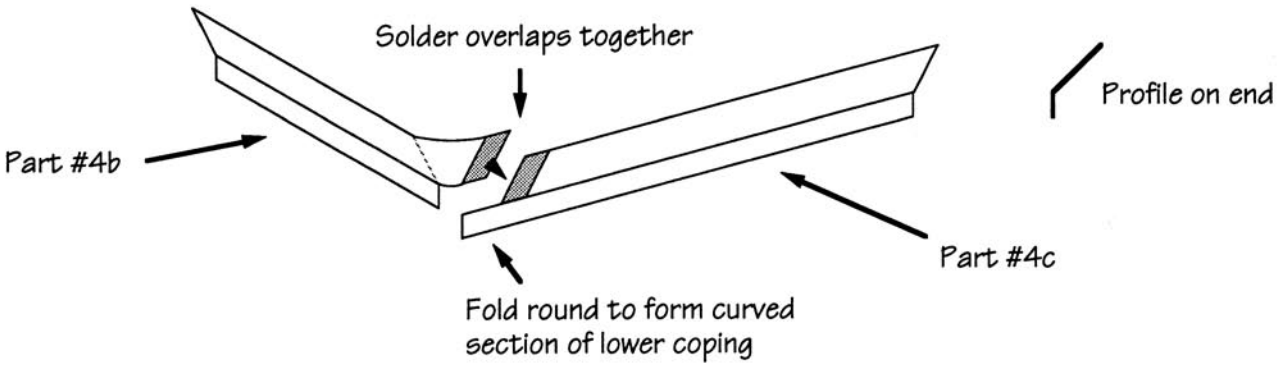
coalspace floor then gently bending the coal space floor to the profile of the side supports and soldering in place. Fold over the front extension at 90^0 along the half-etched line.

11.3 Solder the frame to the footplate locating the tabs of the frame in the slots of the footplate.

11.4 Form the tank body (part #3) by making 4 2mm radius 90^0 bends — the start and end of each is indicated by a pair of half etched lines on the rear side. The body should now be shaped as per the diagram below.

11.5 Place the tank over the frame with the half etched area of the sides and rear to the top. Note that the tank has an area of overlap at the coal hole which is half-etched — carefully align the top edges here and taking care that the width is correct solder the overlapping sections together. Working on the inside of the tank, solder the tank to the frame.

11.6 Fold the tank coping (part #4) out at 45^0 along the half-etched line on each section. Form the corners on the rear section to give a conical section as per the sketch below. Leave the beading attached but do not fold over yet.



11.7 Solder the rear section of the coping (part #4b) centrally to the half-etched recess on the rear of the tender. Solder one of the side coping pieces to the rear piece overlapping the half-etched sections. Now solder the side section to the tank gently forming it to follow the curve of the tank at the front. Repeat with the other side section. Fold the lower extension pieces on the side round the rear curves to meet the rear section and solder in place.

11.8 Solder the front sidesheets (part #5) in place using the tabs on their bottoms for alignment.

11.9 Starting with the rear section, tin the outside of the coping bead and fold over at 180^0 such that it lies flat on the coping. Form the rear section round the curves and solder in place. Now work along the side sections and at the front of each side curve the beading round and down the over the top of the sidesheets — the sidesheets should locate in the half-etched groves in the beading. All this sounds rather complicated but in fact once you start working with the metal it should all fall into place !

11.10 Dress the top of the coping with a file to remove all traces of the tabs which held the beading in place.

11.11 Fold down the sides of the floor plate (part #6) and solder in place with the pair of slots with run across the width of the tender to the front.

11.12 Bend up the edges of the coal hole door (part #7) at 90^0 and solder in place over the coal hole — this helps to disguise the soldered overlap!

11.13 Fold the two footplate boxes (part #8) to form Ls and solder to the floor. Fit the lids (part #9) with the one with the hole to the left when looking from the front of the tender towards the rear.

11.14 Fold up the brake standard (part #25) into a U and fold over its top. Solder in place passing it through the hole in the left-hand footplate box.

11.15 Fold up the coalspace tool box (part #10) and solder down the seam. Bend over the bottom of the legs at 90^0. Fit in place in the right-hand side of the coalspace just behind the bulkhead (see G.A. drawing).

11.16 Fold over the hinges and hasp of the tool-box lid (part #11) and solder in place — the two hinges go nearest the coping.

11.17 Tin the insides of the two halves of the coalspace rear partition (part #12) and sweat together. Solder in place to the tank top using the tabs and slots for alignment — remember, the rear is the side with the two upright supports.

11.18 Form the coalspace rear partition supports (part #13) into Ls and solder to the rear of the partition.

11.19 Fold over the bottom and sides of the tank top strengthening rib (part #26) to form an L and solder in place to the top of the tank 6mm behind the coalspace rear partition — the leg of the L goes towards the rear.

11.20 Solder the footplate valances (part #15) into the locating grooves on the underside of the footplate, checking that the footplate overhang is equal front and rear.

11.21 Solder the buffer beam (part #16) below the rear of the footplate and to the valances.

11.22 Solder the drag beam (part #17) below the front end of the footplate and to the valances.

11.23 The (dummy) outer frames (part #14) locate in notches along the edges of the hole in the footplate with the little cutouts (which are there to clear the buffers) to the rear and the half-etches recesses to the inside. Solder the frames in place.

11.24 Fold the step treads (parts #18 (lower) and #19 (upper)) into Ls and solder to the half-etched recesses on the step supports which are integral with the valance.

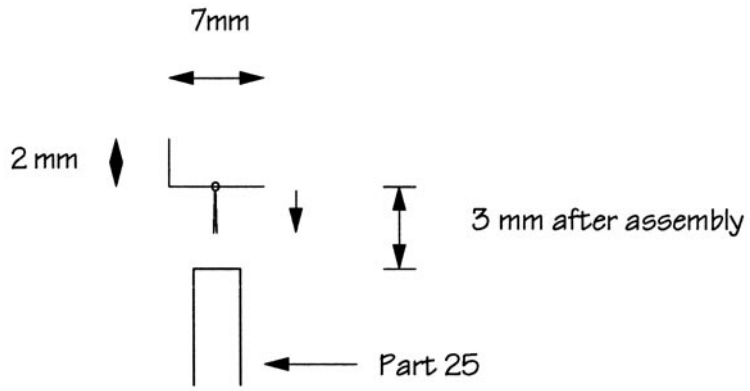
11.25 Solder the brake cross shaft supports (part #20) to the recesses in the inside front of the frames. Looking from the front and working left to right, thread a length of brass rod through the left-hand support, thread the hand brake coupling (part #22) onto the rod followed by the brake rod coupling (part #21) and finally pass the rod into the right-hand support. Solder the rod to the supports and trim back flush.

11.26 Fold over the end of the handbrake clevis (part #23) and solder this flap to the underside of the tender floor such that the main length projects down in line with the etched hole. Align the hand brake coupling on the rod and solder to the clevis and to the rod.

11.27 Moving on to the cast fittings, solder the tank filler, hinge to the rear, in place on the rear tender top.

11.28 Solder the six axleboxes and springs in place on the dummy outer frames.

11.29 Cut a 9mm length of 0.45mm wire. Fold to form a 2x7mm L and wrap another piece of wire round the 7mm arm as shown below. Pass the tails of the second piece into the hole in the top of the brake standard as secure by soldering.



11.30 Bend up the four handrails from 0.45mm wire in fit in place.

11.31 Fit the rear buffer bases —the heads are probably best left off until after painting.

11.32 The tenders had varying arrangements of hoses and pipes according to period and the brake etc. arrangements of the loco to which they were coupled. As ever photographs are your only true guide. Make up any pipes you require and fit together with the appropriate hoses.

Section 12 Final Assembly (Tender)

12.1 Thoroughly clean the all parts to remove all trace of flux etc.

12.2 Paint, line and letter according to your chosen prototype and period.

12.4 Fit the sprung buffer heads, adjusting the fixing nuts until the projection of the heads is correct.

12.5 Mate body and chassis using the supplied bolts — the draw hook goes through the slot in the drag beam as it pivots on the front bolt.

12.6 Align the brake rod coupling with the pull rods on the chassis the solder the coupling to the support rod such that it looks as though the coupling and pull rod are joined.

Acknowledgements

My thanks are due to Alistair Wright for the engine artwork and design. I must also thank you for buying the kit.

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Jim Smellie

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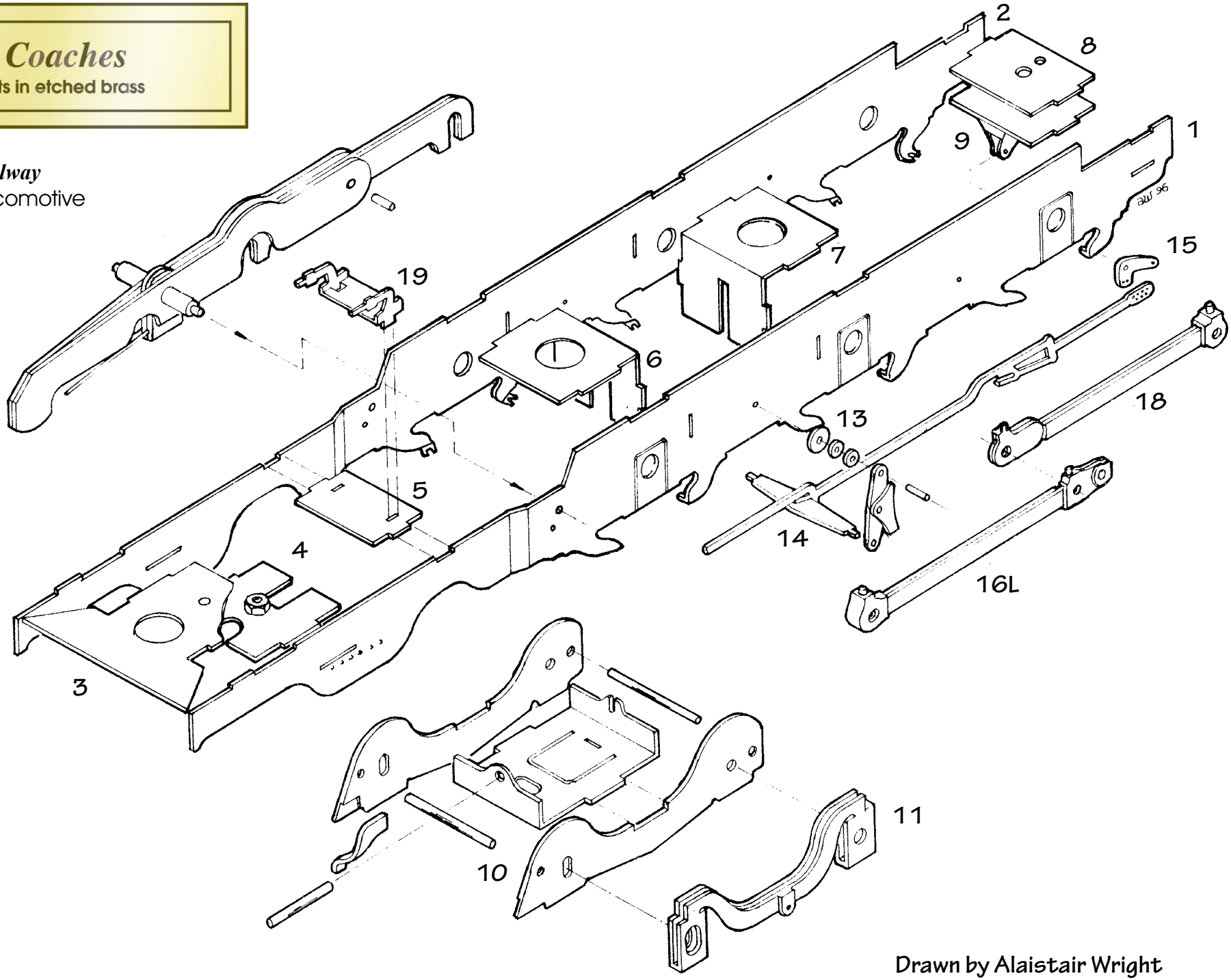
'True Line' kits in etched brass

CL07 ***Caledonian Railway***
Class 179 4–6–0 loocomotive



Drawn by Alaistair Wright

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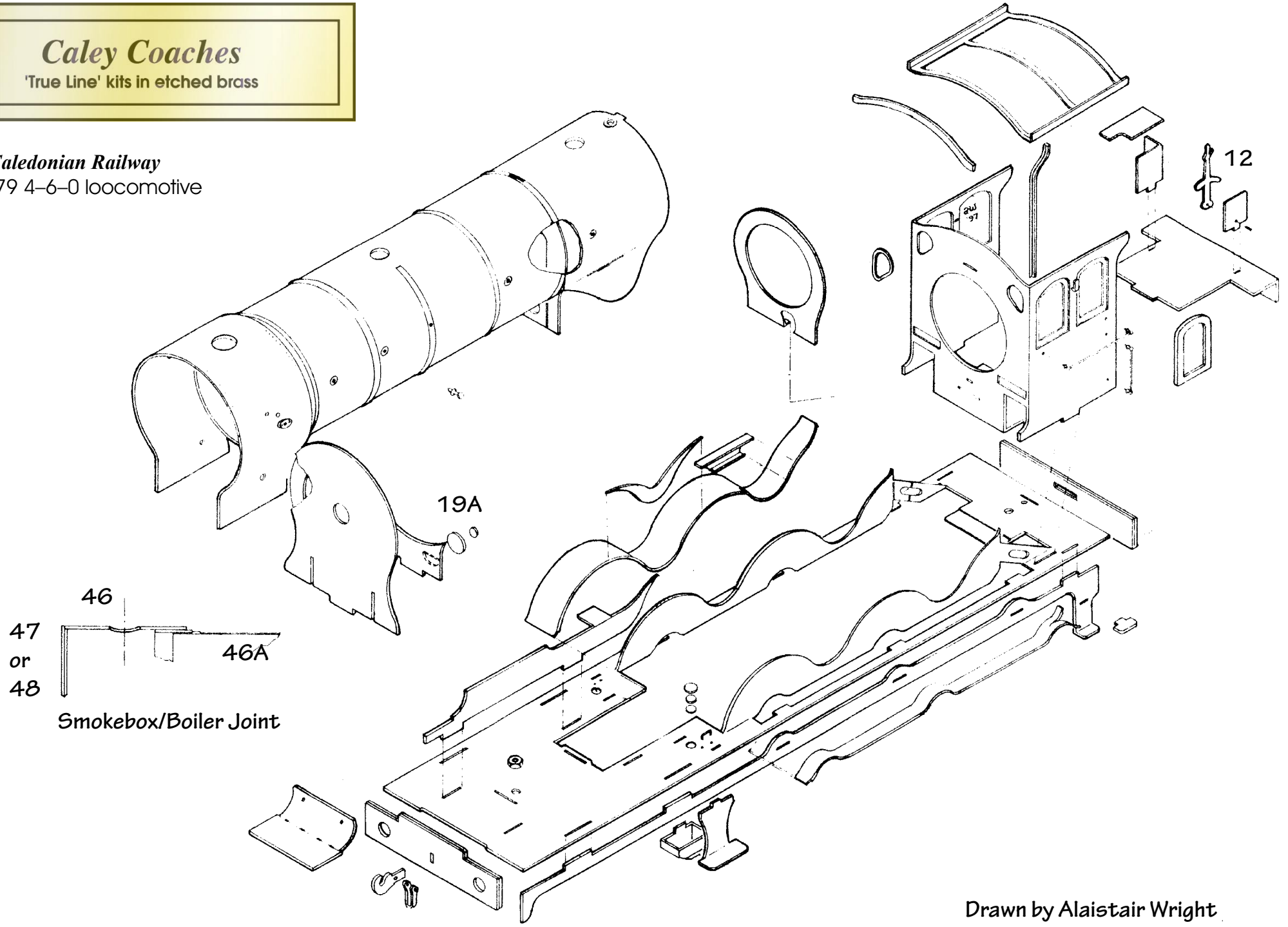

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