



v2.0

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**Kit Reference CC17**  
**Caledonian Railway D87A/D101**  
**Covered Carriage Truck**

**Prototype Notes and Building Instructions.**

**Section A. Prototype and Livery Notes**

These Covered Carriage Trucks were built to both passenger diagram 87A and the identical goods diagram 101. Their stated capacity was 1770 cubic feet, with a floor area of 221.25 square feet and capable of carrying a 6 ton load. They were dual braked with an 18" Vacuum cylinder and an 8" Westinghouse cylinder.

There were a couple of minor variations between the batches which are noted on the original G.A. drawing :—

Lots H300 and G324 had 3'9" wheels, all subsequent lots had 3'6" wheels.

Lot G324 had Iracier axleboxes, all others are believed to have standard oil axleboxes.

Even though it was L.M.S. practice to renumber goods stock simply by adding a large constant to the pre-grouping number (30000 in the case of C.R. stock), D101 appears to have been given random numbers in the L.M.S. goods series. Only some of these numbers are currently known (see list). They were reclassified as Motor Car Vans sometime between 1927 and 1930 and allocated the number block 8305-8320 in the passenger list. The allocation of the numbers however appears to be random but may reflect the order in which the vans were shopped. The general renumbering of 1933 kept this order apart from sorting them into their two lots.

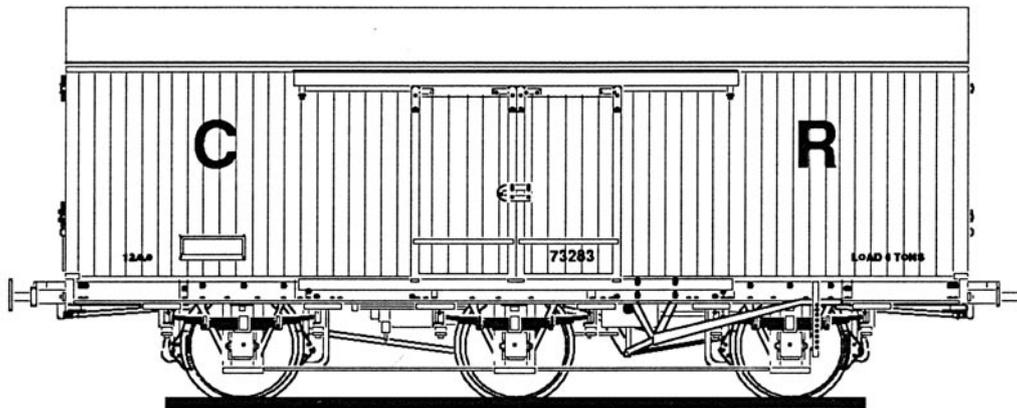
Generally speaking, the vans built to D87A lasted longer than those of D101; perhaps the earlier years of their lives had been easier being carriage stock as opposed to the workhorses of the goods fleet. Perhaps too they were better maintained for much the same reason! Curiously, lot H300 was shown as D101 in the 1955 B.R. stock list while lots H322 and H350 were listed as D87A; perhaps the age of lot H300 caused them to be marked down.

Photographs of the vans, except near the head of a train, are rare making the determination of livery problematic. The liveries shown on the accompanying drawings and described in

the following notes are “best guesses” based on standard practice.

## **C.R. Livery**

Non-passenger coaching stock was dark purple lake with yellow lining edge with a fine vermilion line at the outer edge. Lettering was medium chrome yellow with the initials “CR” shaded to the left and below in vermilion. After 1913 ironwork was normally black.



Goods stock carried a similar livery but was brick red with white lettering and wheel-tyres and black ironwork. Number plates were cast iron with white letters on a black background. The number would also be carried on the ends on the roof transom.

When new the roof was white. This, of course, would quickly weather to a grey/black in service. The underframe was black.

Reference: Britain's Railway Liveries 1825-1948. Carter (Harold Starke, London, 1952)

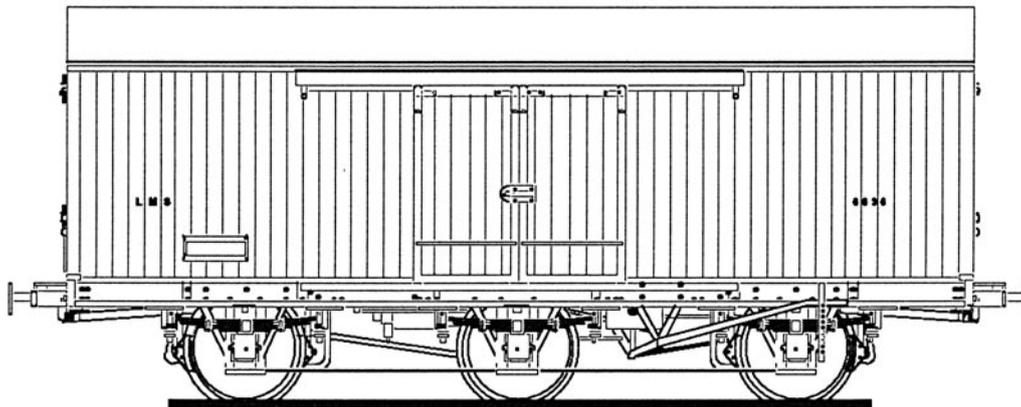
## **LMS Livery**

### **NPCS:**

Soon after its inception the LMS adopted the old Midland colour of crimson-lake for its coach livery. Roofs were generally painted lead grey but this would soon assume a muddy grey colour in service.

The insignia was applied in yellow transfers with the letters LMS (3" high) at waist height towards the right-hand end of the van. The number appeared towards the right-hand end. It believed that no lining was carried.

## L.M.S. c1923 NPCS Livery



The foregoing describes the initial LMS livery but many changes took place before the demise of the LMS and are tabulated below. Remember, however, that coaches and vans were only due for repaint about every 7 years and that in the late 30's and during the war it was quite usual only to 'touch up and revarnish'. Therefore each individual van would not sport every change.

- 1933            Coaches renumbered using plain yellow transfers. Roof colour specified as metallic aluminium.
- 1936            End colour specified as black.
- Wartime        Roof colour specified as grey.

Reference: LMS Coaches, an illustrated history. Jenkinson & Essery (OPC, Oxford 1977)

### Goods Stock:

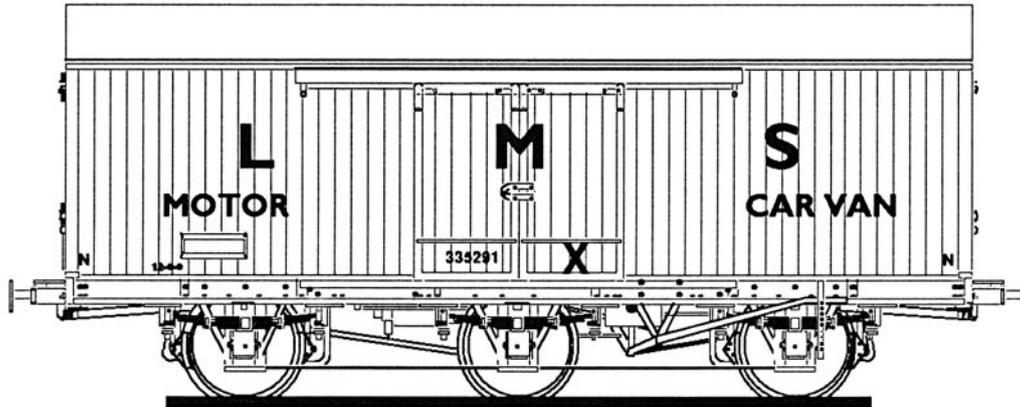
The basic body and solebar colour was mid-grey (the 1935 paint specification giving a lighter shade than the 1929 one but much variation existed) with black lacquered ironwork and light grey roofs. In 1936 the livery changed to bauxite but that need not concern us here since all these vans were by then classified as NPCS—indeed it is interesting to speculate how many were actually repainted in grey!

The vans would have been lettered in white as follows :-

	Height	Location
Company Initials	18"	On door.
Running Number	4"	On door (and on a cast plate fixed to the solebar).
Tare weight	3"	Towards the lower left-hand end of the body. Given in tons, cwts and quarters in figures only with a small hyphen between each.
Non-common user	4"	"N" on the lower edge of the body at each end.
Vacuum marking	12"	"X" on door.
Wheelbase	2"	Right hand end of the body. Given in feet and inches prefixed by the letters "WB". Little used in this livery.
Traffic Branding	12"	(Approx.) On lower body side below the "L" and "S" of the

company initials. This is based on the evidence of one photograph and was probably not carried by all vehicles. Conversely it may have been carried by some vehicles in Caley days.

### **L.M.S. c1923 Goods Livery**



### **BR Livery**

No information is really available but the livery would probably be all over crimson devoid of any lining. The number would be prefixed "M" at first (possibly prefixed "Sc" and suffixed "M" later) and painted in approximately 3" high figures at the right hand end just below waist height.

### **Acknowledgements**

My thanks are due to the following people have supplied or checked information for these notes :-

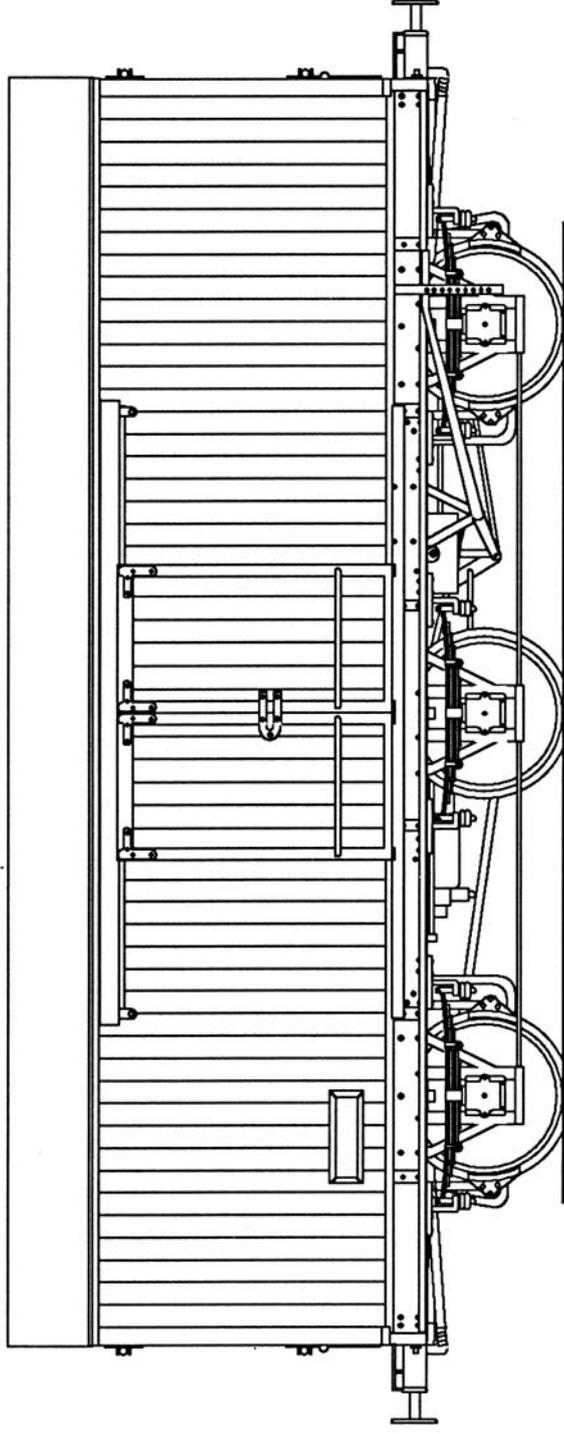
The late Duncan Burton, Richard Casserley, Niall Ferguson and Peter Tatlow.

Any error is however my own!

## Numbering Information

Diagram	Lot	C.R. #	LMS 1923 #	LMS c1930 #	LMS 1933 #	Built	Scrapped	Notes
D101	G324	73283		8319	(37462)	1913	11/33	
D101	G324	73284		8305	37455	1913	06/56	
D101	G324	73285		8306	37456	1913	11/47	
D101	G324	73286	335291	8307	37457	1913	2/63	May have been destroyed by enemy action, Plaistow 09/09/40
D101	G324	73287	308250	8320	37463	1913	11/57	
D101	G324	73288		8317	37461	1913	5/52	
D101	G324	73289		(8314)		1913		Withdrawn by 1933
D101	G324	73290		8313	37459	1913	4/56	Underframe to 395357
D101	G324	73291		8316	37460	1913	11/51	
D101	G324	73292	335293	8308	37458	1913	4/57	
D101	G346	73537		8309	37464	1913	2/58	
D101	G346	73538	309318	8318	37469	1913	9/57	
D101	G346	73539	305943	8312	37467	1913	12/41	Destroyed by enemy action, Dagenham Dock 16/04/41
D101	G346	73540		8310	37465	1914	4/57	
D101	G346	73541	304748	8315	37468	1914	1/55	
D101	G346	73542	335313	8311	37466	1914	11/51	
D87A	H300	125	6636		37167	7/12	8/57	Body used as a store at St. Rollox 10/58
D87A	H300	134	(6645)			7/12		Listed 7/27 (as 134). Replaced 1930—presumably an accident victim, 1927-30.
D87A	H300	180	6691		37168	7/12	3/50	
D87A	H300	181	6692		37169	7/12	3/52	
D87A	H300	182	6693		37170	7/12	3/56	
D87A	H300	183	6694		37171	7/12	3/55	
D87A	H300	184	6695		37172	7/12	8/56	
D87A	H300	185	6696		37173	7/12	1/56	
D87A	H300	186	6697		37174	7/12	11/57	
D87A	H300	187	6698		37175	7/12	6/56	
D87A	H322	123	6634		37176	6/14	4/57	
D87A	H322	133	6644		37177	6/14	7/59	Body became a mess at Craigentiny 1959
D87A	H322	191	6702		37178	6/14	5/58	
D87A	H322	192	6703		37179	6/14	10/57	
D87A	H322	193	6704		37180	6/14	6/55	
D87A	H322	194	6705		37181	6/14	10/60	To carry elephants
D87A	H350	11	6524		37182	6/20	3/58	
D87A	H350	14	6527		37183	6/20	10/57	
D87A	H350	89	6601		37184	6/20	6/59	
D87A	H350	152	6663		37185	6/20	1/59	
D87A	H350	170	6681		37186	6/20		
D87A	H350	195	6706		37187	6/20	5/57	

**Caledonian Railway D87A/D101 Covered Carriage Truck**



— 10' —

*Jim Smellie, Sept '92*

## Section B. Building Instructions

### CC17 CCT Parts List

Etched parts comprising :-

- |     |   |  |
|-----|---|--|
| 1   | Main Body                                 |  |
| 2*  | Ends x 2                                  |  |
| 3*  | Solebar                                   |  |
| 4*  | Solebar                                   |  |
| 6   | Doors x 2                                 |  |
| 7   | Roof Formers x 3                          |  |
| 8   | Roof                                      |  |
| 9   | Chalk panels x 2                          |  |
| 10  | "J" hangers x 12                          |  |
| 11* | Buffer Beam                               |  |
| 12  | Roof Strap                                |  |
| 13* | Buffer Beam                               |  |
| 14* | End Drop Door Strapping x 2               |  |
| 15* | End Folding Door Lower Strapping x 2      | } <b>N.B. leave the 1/2 etched tabs attached to these when removing from the etch.</b> |
| 16* | End Folding Door Upper Strapping x 2      |  |
| 17* | End Folding Door Lock Plates              |  |
| 18* | "W" Iron A                                |  |
| 19* | "W" Iron B                                |  |
| 20* | "W" Iron C                                |  |
| 21  | Left Hand Brake Hangers and Overlays x 4  |  |
| 22  | Right Hand Brake Hangers and Overlays x 4 |  |
| 23  | Single Link "V" Hanger                    |  |
| 24  | Double Link "V" Hanger                    |  |
| 25* | Brake Gear Link                           |  |
| 26* | Brake Gear "A" Frame                      |  |
| 27* | Brake Gear "A" Frame                      |  |
| 28  | Clutched Brake Lever                      |  |
| 29  | Clutchless Brake Lever                    |  |
| 30  | Brake Gear Pull Rod                       |  |
| 31  | Westinghouse Cylinder Link                |  |
| 32  | Brake Lever Ratchets x 2                  |  |
| 33  | Vacuum Cylinder Link                      |  |
| 34  | Brake Gear Pull Rod                       |  |
| 35  | Door Catches                              |  |

Lost-wax cast parts comprising :-

- |   |                        |
|---|------------------------|
| 1 | Westinghouse cylinder  |
| 2 | Vacuum cylinder        |
| 3 | Buffer stocks x 4      |
| 4 | Steam pipes x 2        |
| 5 | Westinghouse pipes x 2 |
| 6 | Vacuum pipes x 2       |
| 7 | 5' springs x 6         |
| 8 | Oil axleboxes x 6      |

(Note : these may be exchanged for Iracier axleboxes on request—please return them directly to *Caley Coaches* with a note of your name and address.)

Miscellaneous parts comprising :-

- 1 8BA nut and bolt
- 2 “Waisted” pin-point wheel bearings x 6
- 3 Buffer heads and shanks x 4
- 4 Buffer bushes x 4
- 5 Buffer springs x 4
- 6 Phosphor Bronze wire
- 7 0.45mm wire

Notes :-

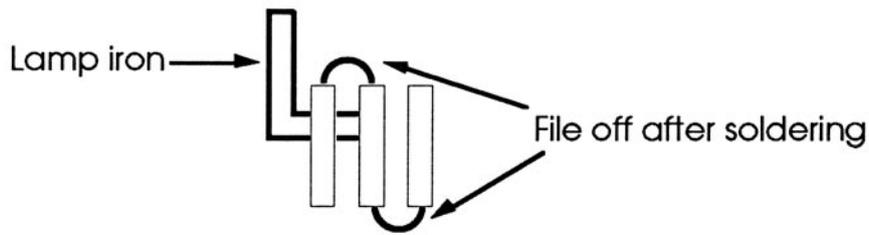
- 1 There is a commonality of part numbering between kits CC17, CC18 and CC19. not all parts numbers are used by each kit.
- 2 Parts marked with an \* above gave half-etched rivets which require pressed out.

## **Part 1 Basic Body Shell**

- 1.1) Solder the chalk panels (part 9) in place on the lower body sides. This is easiest achieved by tinning the rear of the panels, positioning them and then applying the iron to the two small holes in the main body.
- 1.2) Remove the sub-frets containing parts 5 & 35 and 5, 9 & 10 from the door openings in the main body shell (part 1).
- 1.3) Fold the narrow strips on the tops of the sides on the outside of the sides after tinning the sides and the strips. Sweat together to form a bead on the top of the sides.
- 1.4) Press out the rivet detail on the two ends (parts 2) and solder one side/end join after locating the tab on the end in the cut-out in the side. Take care the parts are square to each other. Solder the other three side/end joins in a similar manner.
- 1.5) Press out the myriad of rivets on the solebars (parts 3 and 4), fold each to an “L” shape and solder in position on the underframe. Note that the parts are handed and will only fit one way round.
- 1.6) Fold up the van sides from the floor pan on part 1 and then fold down :-
  - a) Underframe cross-member ends,
  - b) V hanger,
  - c) Location tabs for W irons “B” and “C” and
  - d) Buffer beam location plates.

**Do not fold down the wire guides either side of W iron B.**

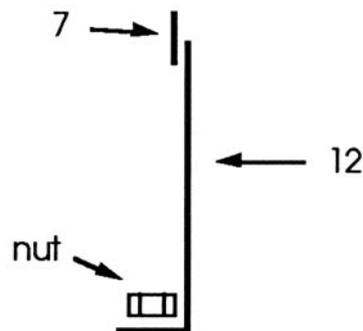
- 1.7) The buffer beams (parts 11 and 13) are a three layer sandwich. Fold the lamp irons on the central layer to 90° and then tin both sides of this layer. Fold up the sandwich, passing the lamp irons through the slots in the front layer and solder the layers together. File off the linking tabs and fold the lamp irons back up parallel to the beam. (Use a piece of scrap fret as a spacer.)



- 1.8) Solder the buffer beams in place on the floor pan lining up the safety chain holes with those on the CCT ends.

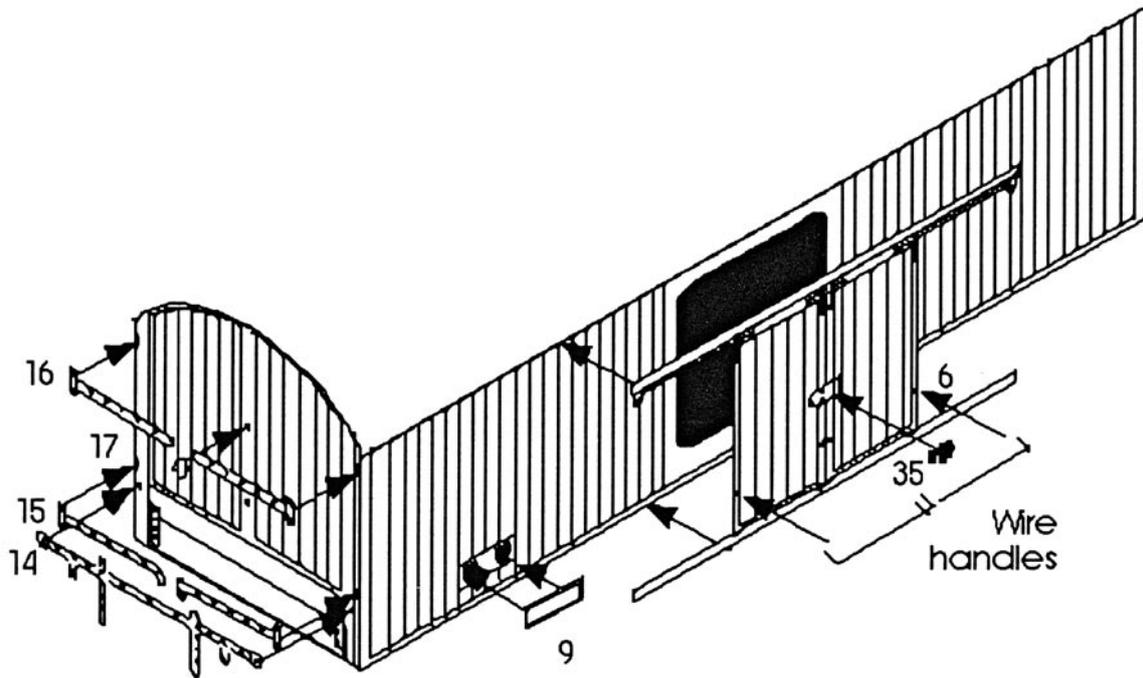
## Part 2 Roof

- 2.1) The roof is fabricated from three formers (parts 7), a skin (part 8) and a fixing bracket (part 12). Note that the former marked "D" is the central one and mates with the end of part 12 which is similarly marked.
- 2.2) The curvature of the skin is best formed by placing a piece of tube ( $\frac{1}{2}$ " central heating pipe, broom handle etc.) along the axis of curvature while pressing against a firmish (but not too firm) surface—a pile of newspapers on top of the workbench should do. Take things gently and the curve should soon start to form—check regularly against the formers to make sure you don't over do it.
- 2.3) Solder the shaped skin to the formers starting with a tack in the centre of each and gradually working outwards.
- 2.4) Solder an 8BA nut over the hole in part 12 and fold over the end to form an "L".

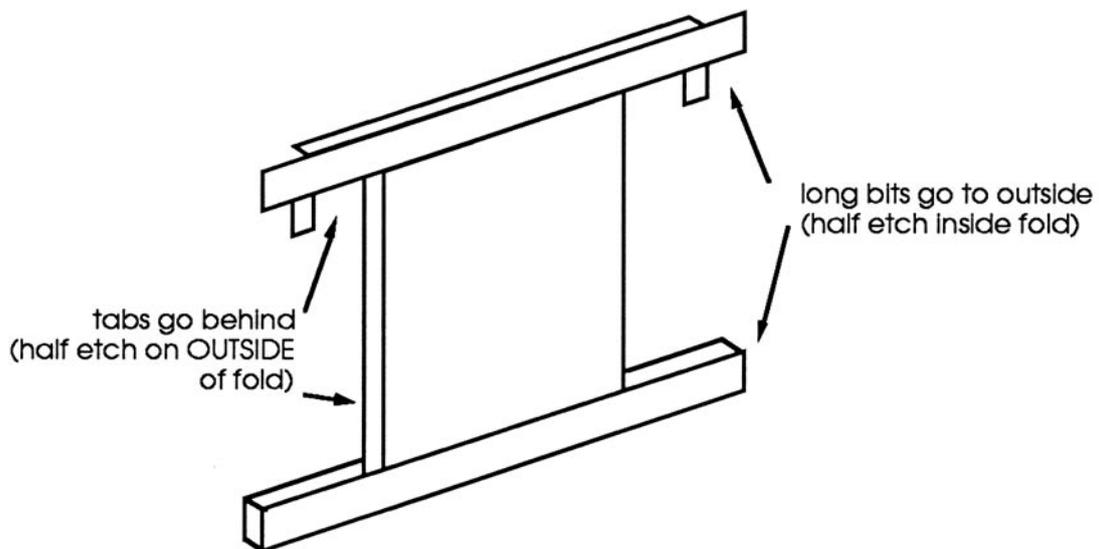


- 2.5) Solder part 12 to the section of the central roof former marked "D".
- 2.6) Check the fit of the roof on the body and adjust as required. A bolt passes through the central hole in the floor pan into the captive nut to hold everything firm.
- 2.7) Remove the roof and set it aside while further construction proceeds.

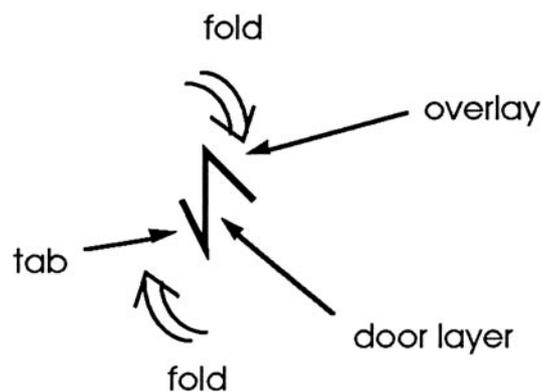
### Part 3 Body Detail



- 3.1) Doors (part 6): fold over the long section above and below the doors to 180° with the half-etch line to the inside. Fold the tabs down the side of each door and below the door hangers back to 180° with the half etch to the **outside** to give the correct depth.



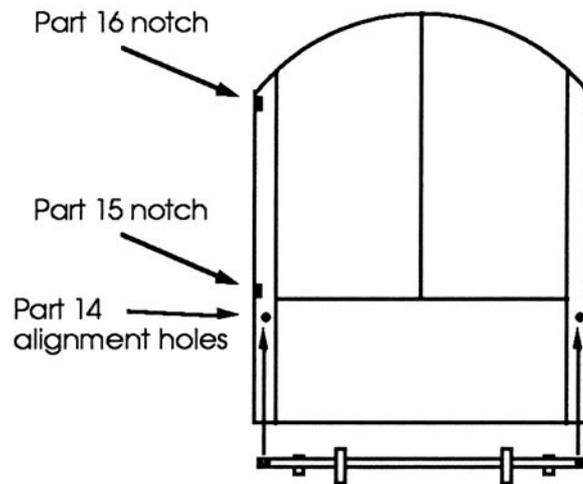
The top door hangers are thus comprised of three layers :-



- 3.2) Solder the doors in place on the sides taking care that they are central and with the

hangers to the tops. (See 4mm scale drawing.)

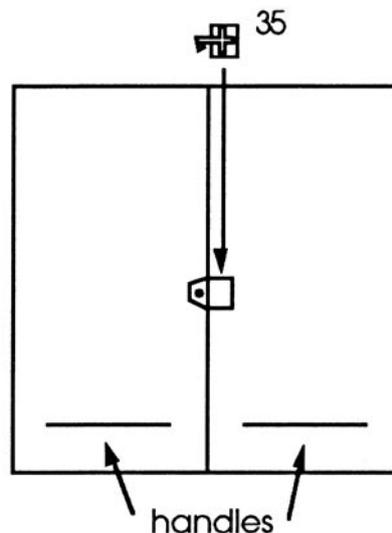
- 3.3) End Strapping : solder parts 14 to 17 in place on each end as per the sketch below :-



- 3.4) The holes in the outer end of part 14 align with the holes 6mm above the lower edge of the end. Solder a piece of wire into these after assembly to represent the catches.
- 3.5) Fold over the  $\frac{1}{2}$  etched tabs of parts 15 and 16 to 90° (rivet detail to the outside) and fit these tabs into the notches in the sides. Part 15 goes just above part 14 while part 16 goes near the top of the doors.
- 3.6) The hole in the door lock plates (part 17 which can be found inside the central hole of part 19) aligns with the upper hole on the centre line of the end, the cross bar of the "T" going to the right. i.e.



- 3.7) Side Door Detail : fix the side door catches (part 35) in place on the doors with a piece of wire protruding about 1mm from the hole.



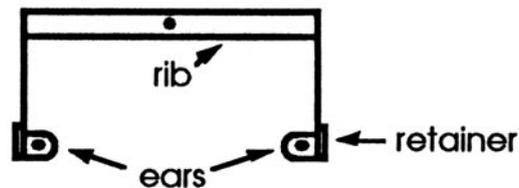
- 3.8) Form a wire handle for each side door and fix in place.
- 3.9) Drill out the buffer bases to 1mm, fit bushes to the rear and fix in place on the van. Fit the heads and springs either now or after painting as preferred.

Tip—take a small piece of 60 thou. plasticard and cut a notch in it. Place this behind

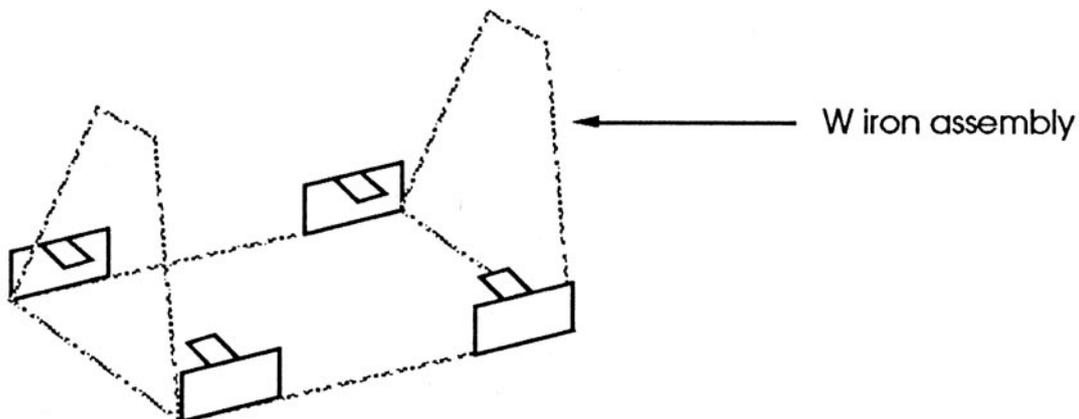
the buffer head to space it out from the buffer body and then fold over the tail of the buffer shank. This ensures a constant standoff for each buffer.

#### Part 4 Running Gear

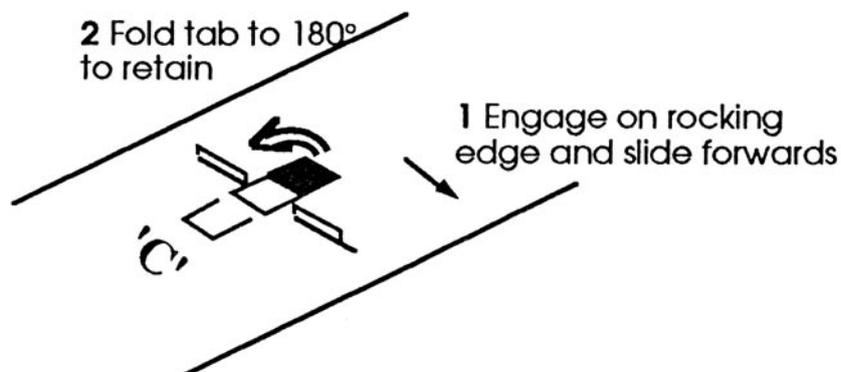
- 4.1) Press out the rivet detail on the W iron assemblies (parts 18, 19 and 20) and on each fold down the W irons and longitudinal strengthening ribs—reinforce the folds with solder. Bend back the “ears” which carry the tie bars to 90° and fold the axlebox retaining plates to 180°, the latter going outside the main W iron, and solder in place.



- 4.2) Solder assembly A (part 18) to the floor pan in the position marked by the corresponding letter.
- 4.3) Place assembly B on the floor pan between the lugs either side of location B on the floor pan. Retain in place by bending over the tangs of the lugs.



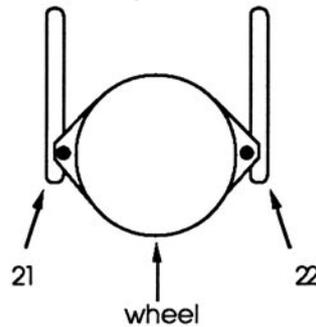
- 4.4) Place assembly C on the rocking edge at location C and retain by bending one of the tabs provided at 180° to the floor of the rocking W iron assembly. (The other tab is provided as a spare to allow later dismantling.)



- 4.5) Thread a length of phosphor bronze wire through the holes in the strengthening ribs of all three W iron assemblies. Firmly solder this to the outer end of assembly A only. Fold down the wire tensioners from the floor pan either side of assembly B until they engage the wire lightly. These are finally adjusted once the van is up and running on

its wheels. Crank the wire at W iron assembly B to clear the roof fixing bolt hole.

- 4.6) The brake hangers and blocks are handed—part 21 being left handed, part 22 right handed. On all eight hangers, fold over the block detail overlay and solder in place. Open up the holes with a small drill or a taper broach to suit the brake gear cross ties.



- 4.7) The hangers locate in the slots on W iron assemblies A and C, each having two possible locations. Use the outer set of slots for P4 and EM or the inner ones for OO and solder in place.
- 4.8) STUDY THE DIAGRAM OF THE BRAKE RIGGING CAREFULLY BEFORE PROCEEDING.

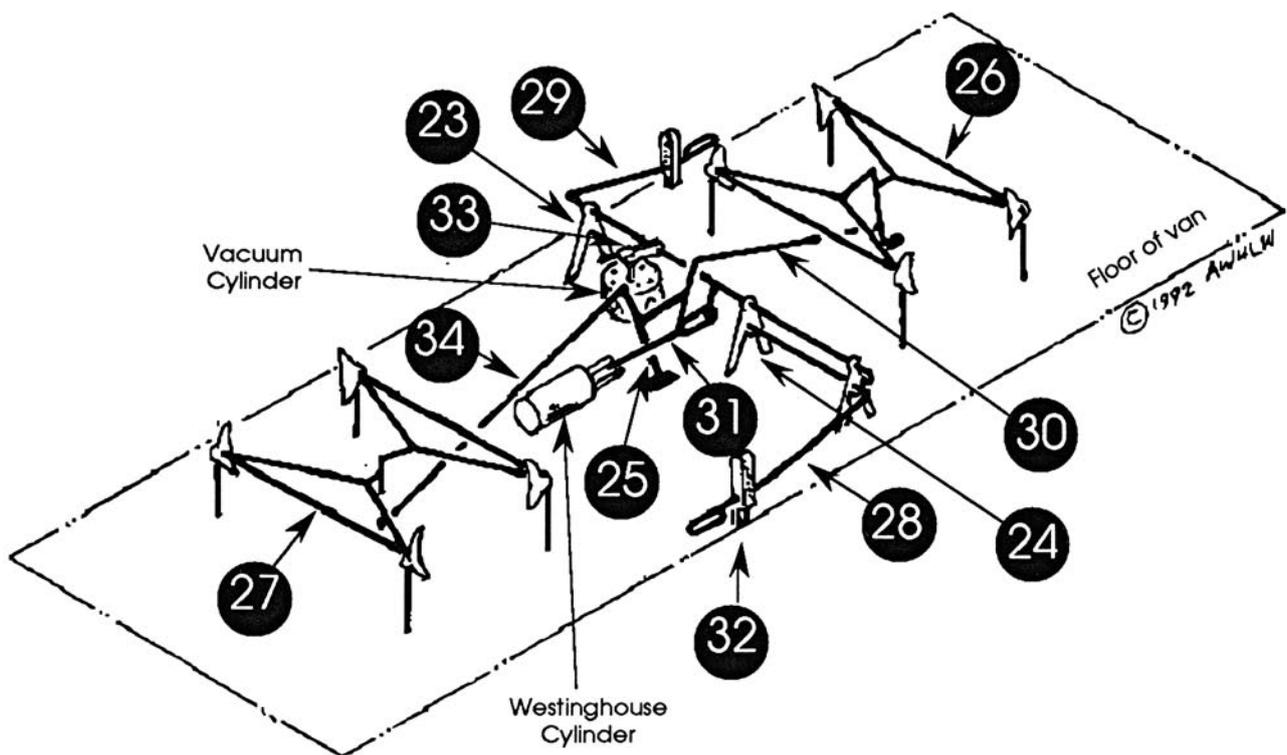


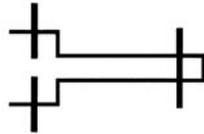
DIAGRAM OF BRAKE RIGGING

5522-080-0

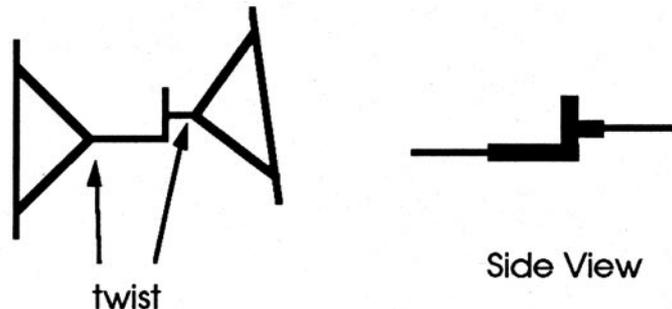
- 4.9) Solder the Westinghouse and Vacuum brake cylinder castings to the floor pan in the indicated positions. Note that the smaller diameter end of the Westinghouse cylinder goes nearest the centre of the van.
- 4.10) Solder the V hangers to the floor pan in line with the fold down one. Part 24 with the holes for two link rods goes near the van centre line, part 23 (with a hole for only one

link rod) goes inside the opposite solebar.

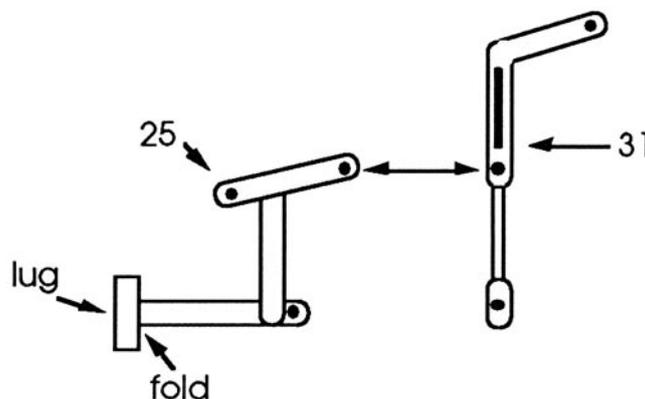
- 4.11) Thread a length of 0.45mm wire through the upper holes of part 28 and the fold down V hanger and solder in place. Leave the end of the wire protruding below the solebar for now.
- 4.12) Crank the ends of the vacuum cylinder link (part 33) and fold it in half to produce the shape sketched below.



- 4.13) Thread a length of 0.45mm wire through the remaining hole on all three brake hangers, threading the Westinghouse cylinder link (part 31) and the vacuum cylinder link onto the section between the two V hangers attached at §4.10—check the brake rigging diagram for the orientation etc. Leave the wire overlong below both solebars.
- 4.14) Align part 31 with the Westinghouse cylinder and solder in place. Similarly align and fix part 33 to the vacuum cylinder.
- 4.15) Solder a wheel bearing to each W iron and mount the wheels of your choice.
- 4.16) On parts 26 and 27, twist the two A frame sections to 90° relative to their central linking section (see sketches below and the brake rigging diagram) and fix to the brake hangers noting the correct orientation.



- 4.17) Part 25 has a fold over lug for fixing it to the van floor. Fold this lug to 90° and tin with solder. Align the hole furthest away from this lug with the hole next to the slot on part 31 (see sketch) keeping the lug flat on the underside of the floor and solder in place.



- 4.18) The pull rods (parts 30 and 34) link part 25 with the central sections of the A frames. Align and fix as per the brake rigging diagram.

4.19) Fold up the two brake lever ratchets to form a U shape thus :-



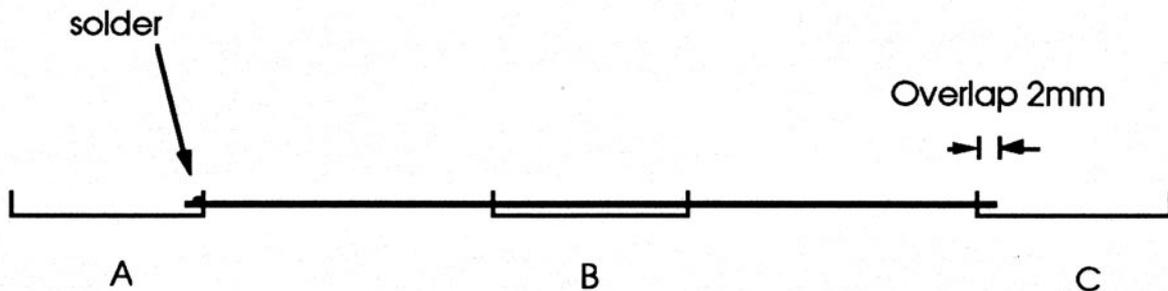
(All folds are marked by  $\frac{1}{2}$  etch lines.) Solder in place on the underframe—the locations being denoted by small slots in the floor outside of the solebar.

4.20) Fold up the ends of the hand brake levers (parts 28 and 29) to form handles thus :-



4.21) Pass the ends of the brake levers through a ratchet and mate with the wires protruding from the corresponding V hanger—part 28 to the side with 2 wires, part 29 the other. Solder in place and trim back any excess length of wire.

4.22) Take two lengths of 0.45mm wire about 71mm long. Starting at the outer end of the rocking W iron assembly (C), thread through the lugs on the three W irons to form the tie bars.



Solder in place at end A only so that the motion of the other two W irons is not impeded.

4.23) The chassis is completed cosmetically by fixing (by glue or solder) the axleboxes over the wheel bearings and the springs to the solebars above them.

4.24) Paint, line and letter your van according to period.

4.25) Fit the roof and the buffer heads if you have not already done so.

## Part 5 Suspension Tuning

Adjust the tension in the phosphor bronze wire using the two adjuster lugs either side of W iron assembly B so that there is slight downward pressure on the central axle when the van is placed on the track.

You are aiming at the minimum amount of pressure required to hold the central axle on the track (so that 3 point suspension is achieved via the outer two axles). A little trial and error while test running the van should give you this.

## **Acknowledgements**

My thanks are due to Alistair Wright for the artwork and design, Owen Lancaster and Laurence Griffen for patternmaking and Ian Young for the lost-wax casting. I must also thank you for buying the kit!

## **Other items in the *Caley Coaches* range**

*Caley Coaches* now produces a wide range of kits and accessories in 4mm scale (plus a few 7mm scale items) for devotees of the Caledonian Railway. See [www.caley.com](http://www.caley.com)

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*Jim Smellie*