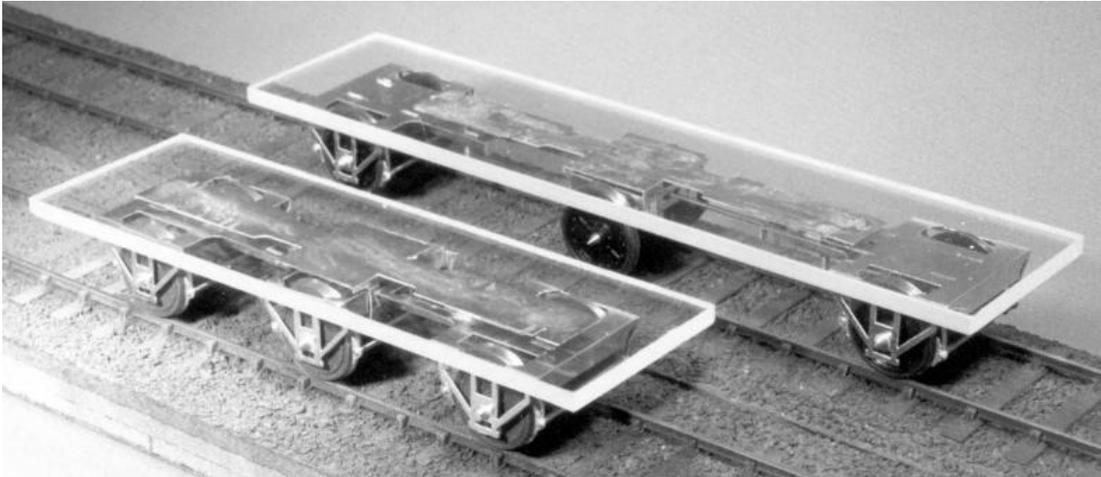


# Brassmasters

Scale Models

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## Cleminson 6-wheel underframe kit

PO Box 1137 Sutton Coldfield B76 1FU

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## 1 Introduction

- 1.1 The purpose of this booklet is to guide the modeller in the building of the Brassmasters kit for the Cleminson truck. The prototype information is not, and was not intended to be, a comprehensive history.
- 1.2 This chassis may be used with any 6 wheeled vehicle built to the scale of 4mm/ft, which has wheels of 3'7" diameter and a wheel base between 18' and 27'6" in length. The kit caters for any wheel base between these sizes, in 6" intervals, eg. 18', 18'6", 19', 19'6" etc.
- 1.3 This kit contains only the functional parts required to build the Cleminson Truck, and may be used either in scratch built vehicles or to replace functional chassis components in kits which use other chassis designs.
- 1.4 The instructions cover only the construction of the kit components. Modifications to other kit designs to accommodate the Cleminson Truck, and the fitting of detail components eg. axleboxes, has not been included.

## 2 Prototype Notes

- 2.1 Whilst the parts provided in this kit are not intended to assemble into a representation of a full size original, the mechanical principles on which the kit has been based have been tried and tested on railways around Britain. The first passenger coaches to be used on the North Wales Narrow Gauge Railway were six-wheelers with Cleminson trucks. They were roofed and fully glazed above the waistline, weighing 4½ tons each and were 30 ft long, with seating for 42 passengers. The Ffestiniog Railway, the Southwold Railway and the Manx Northern Railway have also used vehicles based on the Cleminson truck.

## 3 Construction - General Notes

- 3.1 The kit contains the principal components necessary to build the chassis. Numbers shown in the instructions in square brackets [ ] are part numbers. These numbers appear on the parts. Certain parts, e.g., nuts, bolts etc. are not numbered.
- 3.2 On the etched components all folds and bends are made with the half-etched line to the inside.
- 3.3 Soldering operations can be performed with 145 degree solder and Carr's 'green label' flux or similar, using a 25 watt iron.
- 3.4 Solder flux is highly corrosive and leaves deposits on the metal surface. At the end of each work session involving soldering, wash the components / assemblies in warm water and gently apply 'Jif' or a similar cleaner using an old paint brush. Rinse the parts thoroughly in warm water and allow to dry. Do this in a sink or basin with the plug in place so that if anything falls off it won't go down the plug-'ole!
- 3.5 Try to keep the amount of soldering in close proximity to the wheels' steel tyres to a minimum. It is recommended that wheel tyres be coated with a thin layer of paint to prevent corrosion during assembly, then cleaned off when construction is complete.
- 3.6 The terms 'fit' and 'fix' as used in these instructions have definite and separate meanings. 'Fit' means put in place but do not secure, e.g., fit the wheel sets in the bearing units. 'Fix' means secure in place (using solder, adhesive, etc.).
- 3.7 The term 'fold' as used in these instructions means bend the brass component to 90° along a half etched fold line.
- 3.8 Some of the etched components are delicate and easily damaged, so do take care in handling them. Components should be removed from the fret using a small scalpel and the tabs removed with a small fine-cut file.
- 3.9 To achieve the correct wheel base for the selected vehicle, it is necessary to assemble some components both in the correct position and in the correct orientation. Table 1 shows the component

positions and orientation which should be used. The instructions give a step-by-step build-up of the components, stating which column of the table should be used at each stage.

3.10 To enable the chassis to be used in a wide range of vehicle types, the centre axle may be supported in one of two ways. For the majority of vehicles, which had centre W-irons mounted on the inside of the solebars, the Centre W-iron Unit [7] which enables the centre axle to be mounted between pin-point bearings should be used. For vehicles such as Great Northern Railway 6 wheel coaches, which had centre W-irons mounted on the outside of the solebars, one of the Centre Axle Carrier units [8], [9] or [10] should be used, and the kit's W-irons should be fitted cosmetically to the solebars.

3.11 When fitting items below solebar level (e.g., foot boards) remember to allow for the 'swing' of all three wheel sets.

3.12 For those using Alex Jackson automatic couplings, mounting holes and height rests for have been provided in the chassis design.

3.13 Wheels are not included in the kit and must be sourced by the modeller. You will require three axles of 3'7" diameter wheels to a pattern appropriate for the vehicle being modelled. Please remember to specify the gauge (OO, EM or P4) when ordering.

## **4 Chassis Construction**

4.1 Identify and highlight or underline the required wheel base for the vehicle on Table 1.

4.2 Fold the four locating arms on the Baseplate [1] and secure each with a small fillet of solder.

4.3 Fold the tabs on each end of the Pivot Location Plates [2].

4.4 Fix the Pivot Location Plates [2] to the ends of the Baseplate [1], locating the plates in the correct orientation and position as follows:

If the wheel base of the vehicle has an even number of whole feet, the tabs will locate in the slots marked E, if there are an odd number of feet the tabs will locate in the slots marked O, this can be read directly from Table 1 in the 'Chassis Position' column. The plates at both ends of the vehicle will be in slots marked with the same letter.

The plates must also be orientated correctly. Use the 'Arrow' column in Table 1 to identify whether the half etched arrows on the plates should point towards the centre or the ends of the vehicle. The arrows on the plates will both point either towards the ends of the vehicle or the centre.

Example: For a vehicle with a 24'6" wheel base, the Pivot Location Plates [2] should be located in the slots marked E and the arrows on the plates should point towards the Ends of the vehicle.

4.5 File away the excess length of the tab which projects through the Baseplate [1] to restore a smooth flat top surface.

4.6 Fix a 10BA cheese head screw to each Pivot Location Plate [2], locating the screw in the correct position as follows:

Place the head of the screw into the half etched circular recess marked 1, 2 or 3, using the location indicated in the 'Screw Position' column in Table 1.

Example: For a vehicle with a 24'6" wheel base, each screw should be located in a recess numbered 2.

4.7 Fix the Baseplate [1] to the underside of the floor of the vehicle. Use the half etched marks at the ends and sides of the base plate to position the plate centrally.

4.8 Fold up the W-iron Unit [3], making five folds to form the ends, W-irons and beam location tab. Run a small fillet of solder into the folds formed by the W-iron units to secure them firmly.

4.9 Fix the Strengthening Bars [4] to the underside of the W-iron Unit [3] using the locating slots provided.

4.10 File away the excess length of the locating tabs at the wide end of each Strengthening Bar [4].

- 4.11 Using the 'W-iron Hole' column in Table 1, identify the hole in the W-iron unit which will be used for the pivot. File away the round topped stabilising tabs adjacent to the holes which will not be used.  
Example: For a vehicle with a 24'6" wheel base, stabilising tabs should remain only adjacent to the hole lettered C.
- 4.12 Fold up the W-iron Unit [5], making five folds to form the ends, W-irons and beam location tab. Run a small fillet of solder into the folds formed by the W-iron units to secure them firmly.
- 4.13 Fix the Strengthening Bars [6] to the underside of the W-iron Unit [5] using the locating slots provided.
- 4.14 File away the excess length of all the locating tabs to restore a smooth flat top surface.
- 4.15 Fix pin point bearings to bearing location holes in W-iron Units [3] and [5].
- 4.16 Temporarily fit axles to W-iron Units [3] and [5]. Adjust position of brake blocks to align correctly with the wheel tyres. Remove the axles.
- 4.17 Fix lengths of 0.9mm dia. brass wire through holes in the brake blocks. Cut the wire to length and clean up the ends as necessary with a small file or grinding disc.
- 4.18 Cut two lengths of 0.9mm dia. brass wire to the length shown in the 'Beam Length' column in Table 1. Clean off any burrs or sharp ends with a fine file.
- 4.19 Fit beams to W-iron Units [3] and [5], passing the beam through the aligned holes in the fold down sections. To ensure adequate clearance for the nut which secures the W-iron unit, the beam should not project more than 0.5mm through the inner hole (nearest to pivot hole C).
- 4.20 The centre axle may be supported either in pin-point bearings using the Centre W-iron Unit [7], or by inside bearings using one of the Centre Axle Carrier units [8], [9] or [10]. If using the Centre Axle Carrier units [8], [9] or [10], move directly to instruction 4.26.
- 4.21 Fold up the Centre W-iron Unit [7], making five folds to form the ends, W-irons and beam location tab. It may be necessary to trim the width of the ends to enable the W-irons to fold correctly. Run a small fillet of solder into the folds formed by the W-irons to secure them firmly.
- 4.22 Fix pin point bearings to bearing location holes in Centre W-iron Unit [7].
- 4.23 Temporarily fit axles to Centre W-iron Unit [7]. Adjust position of brake blocks to align correctly with the wheel tyres. Remove the axles.
- 4.24 Fix lengths of 0.9mm dia. brass wire through holes in the brake blocks. Cut the wire to length and clean up the ends as necessary with a small file or grinding disc.
- 4.25 Fit the wheels to the Centre W-iron Unit [7]. Move directly to instruction 4.30.
- 4.26 Select the correct Centre Axle Carrier unit. For OO use part [8], for EM use part [9] and for P4 use part [10].
- 4.27 Fold up the Centre Axle Carrier unit, making five folds to form the ends, inside bearing legs and beam location tab. Run a small fillet of solder into the folds formed by the inside bearing legs to secure them firmly.
- 4.28 Open up the holes in the inside bearing legs as necessary, to provide running fit for the axle.
- 4.29 Fit the wheels to the Centre Axle Carrier unit.
- 4.30 Assemble W-iron units [3] and [5] onto Baseplate [1]. Pass the beams through the slots in the sides of the Centre W-iron Unit [7] or Centre Axle Carrier [8], [9] or [10], and then through the holes in the centre web. Lower the centre axle unit between the locating arms on the baseplate, and the end W-iron units over the pivot screws using the correct locating holes as identified earlier (instruction 4.11).
- 4.31 Fit the wheels to the W-iron units [3] & [5].

4.32 Place the chassis on a piece of straight track and check for height. Add washers between the W-iron units [3] and [5] and Baseplate [1] to raise height if necessary. Fit retaining nuts to pivot screws.

4.33 Fix lengths of 0.9mm dia. brass wire through the holes in the locating arms on the Baseplate [1] to retain the centre axle unit.

4.34 If necessary, adjust the position of the axle units relative to the base plate, by bending the wire beams. Only very slight adjustment should be required if any, to get the chassis to run correctly.

4.35 Fix Alex Jackson couplings if required. Pass the wire through the small hole adjacent to the beam and solder in place. Adjust the coupling using the outer end of the W-iron unit to control the height of the coupling from the rail head.

## Reference Works

Scalefour Society - 4mm Finescale Narrow Gauge News No. 13 -April 1998 Pages 6 & 7

A History of the Welsh Highland Railway - By Alun Turner, edited by Richard Beton

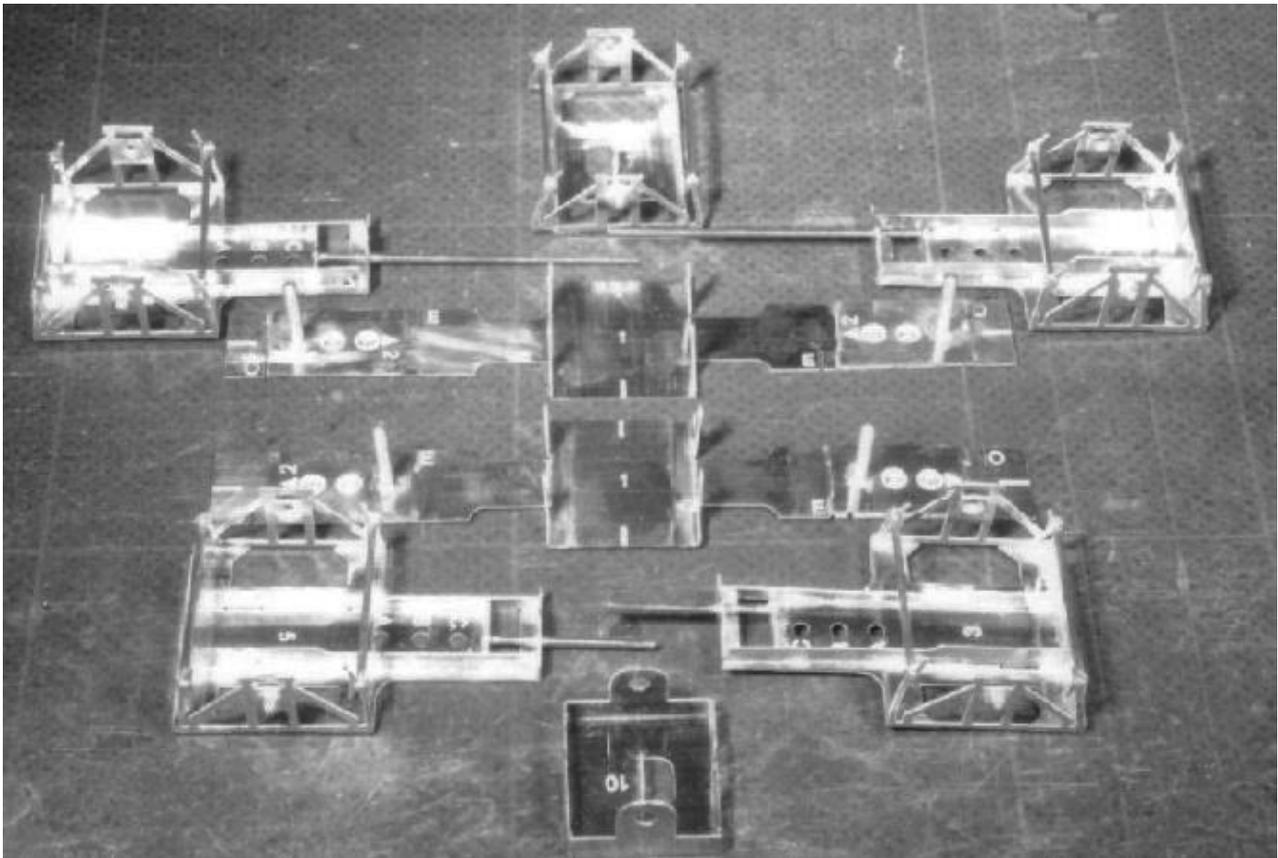
[http://www1.roke.co.uk/WHR/history/nwngr\\_stock.html](http://www1.roke.co.uk/WHR/history/nwngr_stock.html)

**Table 1**

Wheel Base	Chassis Position	Arrow	Screw Position	W-iron Hole	Beam Length (mm)
18'	Even	End	1	A	18
18'6"	Even	Centre	3	A	19
19'	Odd	End	1	A	20
19'6"	Odd	Centre	3	A	21
20'	Even	End	1	B	22
20'6"	Even	Centre	3	B	23
21'	Odd	End	1	B	24
21'6"	Odd	Centre	3	B	25
22'	Even	End	2	B	26
22'6"	Even	Centre	2	B	27
23'	Odd	End	2	B	28
23'6"	Odd	Centre	2	B	29
24'	Even	End	2	C	30
24'6"	Even	Centre	2	C	31
25'	Odd	End	2	C	32
25'6"	Odd	Centre	2	C	33
26'	Even	End	3	C	34
26'6"	Even	Centre	1	C	35
27'	Odd	End	3	C	36
27'6"	Odd	Centre	1	C	37

**Table 2**

Description	Quantity
Brass Fret	1
0.9mm Brass Wire	2 lengths
10 BA Bolts	2
10 BA Nuts	2
Pin-Point Bearings	6



Above: Completed sub-assemblies. The upper set is for the 27ft 6ins wheelbase with the centre W-irons on the wheelset carrier. The lower set is for the 18ft 0ins wheelbase with the plain centre wheelset carrier (W-irons to be mounted on tthe vehicle's solebar).

Below: The finished 18ft 0ins wheelbase unit on a 2ft radius curve (18.83mm gauge) showing how the lateral displacement of the centre wheelset angles the end wheelsets.

