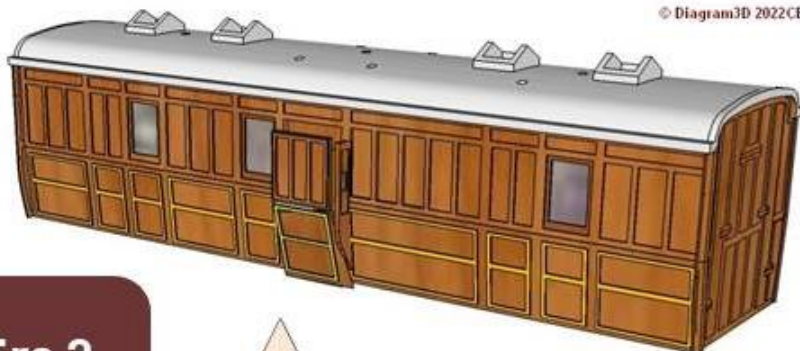




Great Northern Railway(GNR)  
Full Brake (D303) Coach Kit  
4mm Scale ("OO" "EM" "P4" etc.)



© Diagram3D 2022CE



**Era 2**

Pre-grouping

4mm Scale

**Era 2 Livery**

3D Printed Components

**TK-GN04-D303**



Diagram3D.com



## Introduction

### Contents of this kit

#### MDF Parts

##### SmartFrame

Upper and lower frame plus alignment clips.

#### MDF Parts

MDF parts are supplied pre-cut, partially attached to the panel which preserves their integrity and ensures that the right parts are present. Please do not separate the parts until it is time to use them.



#### MDF Parts

1x Ceiling

2x stretchers

2 x solebars

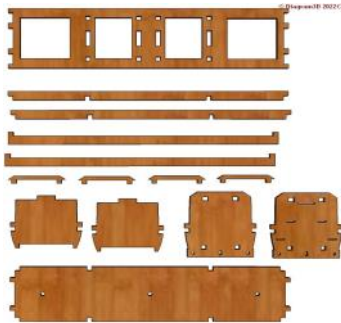
4 x roof supports

2x partitions

1 x end (steps)

1 x end (plain)

1 x floor



#### Cardboard panels

The card panels are packaged within the **SmartFrame** for protection.

The card panels are identified by the printed legend on the panels e.g. "Side 1 of 2" etc.

**Cardboard** panels – a total of 10 panels as described below:  
There are four layers for the sides.

Layer	Description
Layer 1	Window Frames and droplights
Layer 2	Coach side
Layer 3	Middle and upper panelling
Layer 4	Lower panels beading detail

There are two layers for the ends.

Layer	Description
Layer 1	Pre-printed end and guards lookouts
Layer 2	Pre-printed panelling

#### 3D printed parts

A 3D printed roof ( 2 x duckets , 4x buffers are provided ( all random colour)



#### Glazing

Acrylic glazing bars are provided

2 x lookout inserts & side glazing





## Not included

**Adhesive to attach the parts. PVA is recommended for the MDF parts.  
Craft knife, Clamps, weights or other tools.  
Paint and filler  
Wheels, bearings, Buffers, couplings etc.**

## Intended Audience

*This kit is intended to reduce the time, complication and labour associated with the construction of a detailed model of a carriage body using accurate pre-cut layers which can be conveniently assembled in the supplied **SmartFrame** without specialist knowledge to give the same quality, or better, as traditional methods.*

***This is not a complete kit of parts.*** The choice of underframe and other details is left to the modeller.

## Hints on assembly

**Separate parts by cutting the reverse side of the fret.**

**Pre-assemble and check parts at each stage.**

**Seal Cardboard components.**

**Video and Gallery**

*Separating MDF components cleanly is more easily accomplished by completing the half etched portions on the reverse of the fret rather than cutting from the front.*

***Do not separate components from layers until assembly is complete or instructed to do so.***

*At each stage, once the required components have been separated from the frets, test the assembly without glue to ensure that the parts are trimmed correctly and fit properly before final assembly with adhesive.*

*Allow as much time as needed for the adhesive to set.*

*Fill any gaps and smooth surfaces for optimal results*

***It is strongly advised that cardboard parts are sealed before assembly.*** For example, artists fixative, spray paint, varnish or even shellac can be used. Good results have been obtained using automobile primer spray. ***Visit our website for further constructional information including a video and gallery of similar models.***

***The assembly steps below are strong recommendations but should not be taken as definitive or prescriptive.***

## Copyright Statement

The entire contents of this document including but not restricted to the text, images, drawings and components, method of construction, design and intellectual content are the copyrighted property of Diagram3D. No part of this document or design may be used altered or copied without the express written consent of the design and copyright owners. This document was originally published in 2016 CE.

## Current Documents

The current version of documentation for this and any other of our products can be downloaded from [www.Diagram3D.com](http://www.Diagram3D.com) in PDF format.

## Feedback

We welcome your comments and suggestions, especially images of models "in progress" or completed.



### SmartFrame Preparation

(Applies to all versions of SmartFrame)

Attach the clips to the bottom section of the *SmartFrame* as shown below:



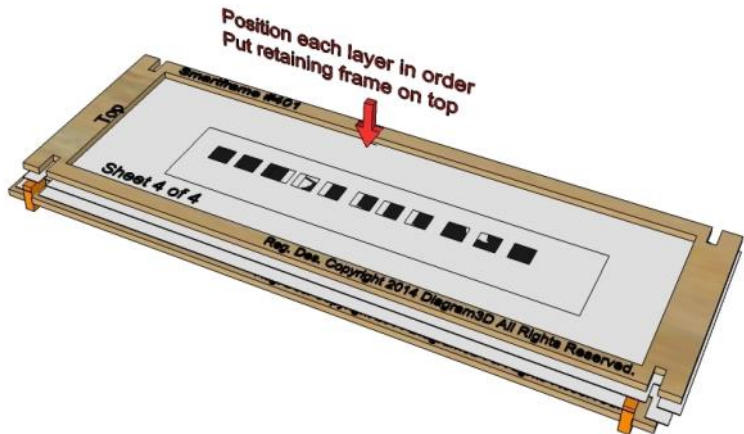
Total preparation and assembly time about 2 minutes.

*Hint: Partially insert the clips into the slots and gently press the clips into position on each side. An extra clip is provided. Avoid excessive pressure. Visit our website for further constructional information including a video and gallery of models.*

### SmartFrame

General Hints on using the SmartFrame

The following diagram illustrates how to use the *SmartFrame*:



Position the layers of the same description in ascending order on the lower frame beginning with the first layer. The layers have the legend "1 of x", "2 of x" and so on.

*Hint: Do not force the individual layers into position, assemble each layer at an angle so that one side is in position and then gently position the other side into place. When in position, extra pressure can be applied with rubber bands or "bulldog clips" on the ends of the frame.*



### Carriage Sides

There are four layers for the sides.

Total preparation and assembly time about 5 minutes.

Allow sufficient time for the adhesive to dry thoroughly

Layer	Description
Layer 1	Window Frames and droplights
Layer 2	Coach side
Layer 3	Middle and upper panelling
Layer 4	Lower panels beading detail

Insert these into the *SmartFrame* in order as described above. Apply adhesive and put aside until dry. To form the tumblehome, use a section of tubing and gently roll the cardboard on a rubber mat or similar surface. Alternately the tumblehome can be formed by using finger-pressure against a suitably curved surface. Hint: Practice this on some scrap card first.

### Carriage Ends

There are two layers for the ends.

Total preparation and assembly time about 5 minutes.

Allow sufficient time for the adhesive to dry thoroughly  
"Exploded"  
Diagram

Layer	Description
Layer 1	Pre-printed ends and ductet detail
Layer 2	Pre-printed panelling

Insert these layers into the *SmartFrame* in order as described above. Apply adhesive and put aside until dry. The steps can now be detached and place into the pre-cut holes individually in one end.

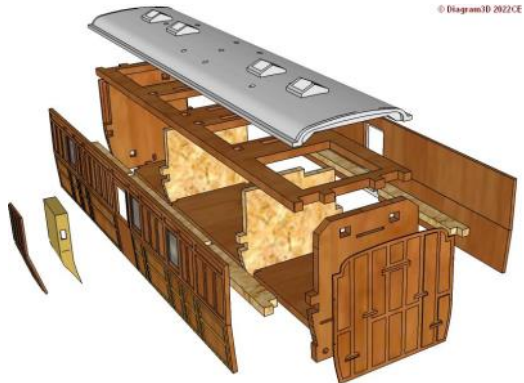
The diagram shows the main components of this kit. The sides and ends are assembled as described above.

The body shell is assembled from MDF components.

The roof is 3D printed.

The ductet panel is attached to the 3D printed ductet.

Note this diagram omits some components for clarity.



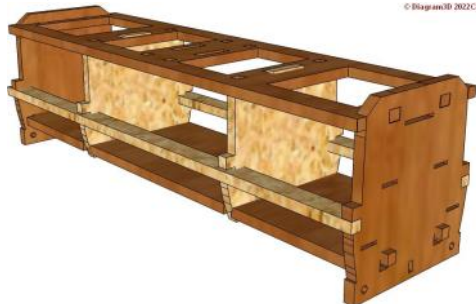
© Diagram3D 2022CE

### MDF Body Shell

Total preparation and assembly time about 10 minutes.

Allow sufficient time for the adhesive to dry thoroughly

Insert the partitions into the floor and glue into position. When set, attach the ceiling, side stretchers and ends as shown below.



© Diagram3D 2022CE

Hint: This is an appropriate time to paint and otherwise complete the interior of this model.



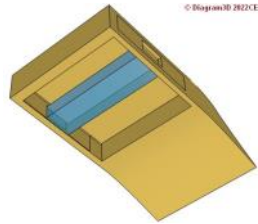
### **Glazing & final assembly**

**Total preparation and assembly time about 20 minutes.**

*Allow sufficient time for the adhesive to dry thoroughly*

Attach the sides to the body, taking care to align with the floor and allow to set.

Paint the 3D printed ducket overlay with a suitable shade of "teak" - an orangey brown colour. The small glazing pieces snap into the 3D printed ducket lengthways.



**Note: The ducket is now supplied with panelling so the panelling overlays are redundant.**

Finally the ducket is attached to the centre of the vehicle. The curve of the ducket matches the tumblehome.

The long window glazing bars supplied fit into the slots (one per side) which are pre-cut into the partitions.

The end panels overlap the sides and fits into the recess in the roof under the moulded cornice. Attach the ends taking care to centralise these components

### **Roof**

**Total preparation and assembly time about 15 minutes.**

*Allow sufficient time for the adhesive to dry thoroughly*

The 3D printed roof is designed to fit over the ceiling and attach to the (optional) roof supports which locate in the ceiling. It is possible to make the roof removable if the roof supports are placed into their locating holes without glue.

The roof will need some cleaning up and painting before installation.

Although positioning holes are provided for ventilators throughout, vehicles were fitted with alternate ventilators and lighting throughout their working lives and a reference photograph will assist in determining which, if any, of the ventilators should be used for a given era.



**Underframe**

The underframe is assembled by inserting the lugs on the solebars into the corresponding holes in the floor of the vehicle.

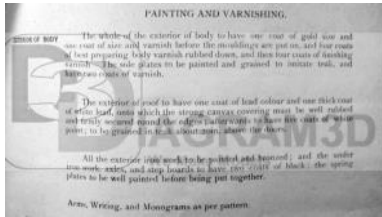
The axleguards are assembled according to the instructions in the kit D3D-05 which is suitable for this vehicle.

Suitable wheels for "OO" are D3D-01 (three axles Mansell wheels).

**Historical Notes**

Approximately 180 vehicles of this type of luggage van were in the Great Northern Railway company inventory around the beginning of the 1900's. There were a number of minor variations in length, buffer types, wheelbase and lighting. The most numerous type was designated as D303. Sample numbers for this van for the approximate period 1890 onwards are quoted below:

943,945,947,948,950,953,954,955,957,960,961,963,965,966,968,971,973,974,977,978,979,991,993,995,997,1005,1006,1009,1010,1012,1013,1014,1015,1016,1017,1018,1020,1024,1025,1026,1028,1030,1034,1035,1040,1042,1046,1049,1050,1054,1055,1058,1062,1063,1068,1072,1073,1074,1079



According to contract specifications the underframe was painted "teak" colour, ironwork was black and the roof was painted white. However a section of the visible roofline was painted "teak" colour.

Depending on the frequency of washing the visible roof colour could be anything from "teak" to black, giving rise to various rumours about the colour of GNR roofs and the apparent discrepancy in colour between main line and suburban stock. After 1905 or thereabouts onwards roofs were painted white.



GNR livery was varnished teak with gold lettering and lining shaded blue. Earlier livery had the class designation with the GN crest in the lower panel of the door. In later years this was replaced by a large numeral. Eventually, post-grouping, the class designation numeral moved to the lower panel, the crest and lining was omitted for surviving stock. It was customary for a "pattern coach" to be provided for inspection by external contractors.

In 1896, Moore's Journal noted that GNR teak vehicles were of uniform colouring, unlike other companies that used varnished teak.

**Underframe**

This was a six wheeled coach. The diagram wheelbase was 20' 1/2" and the body length was 29 feet. By the 1890's these vehicles were generally equipped with gas lighting, vacuum brakes and heating apparatus.

**Finally...**

Congratulations on completing this kit. We hope you enjoyed making it as much as we did.. If you enjoyed making this kit then take time to visit [www.Diagram3D.com](http://www.Diagram3D.com) to find similar items. Our website has free downloads of historical information. Downloadable assembly instructions for all of our products

Email: [info@Diagram3D.com](mailto:info@Diagram3D.com) E&OE document updated November 2025