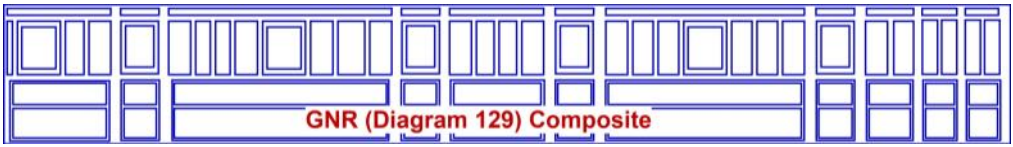
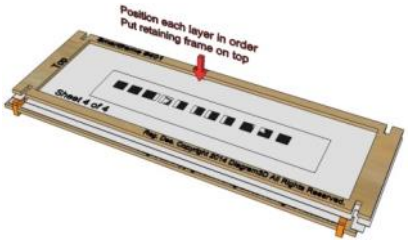
Great Northern Railway bogie Composite body kit (Diagram 129)
4mm scale (“OO” “EM” or “P4”)



Includes Smartframe.

Lasercut **MDF and card kit**



4mm scale kit, **(“OO” “EM” “P4”)**
Adhesive, paint not included

GN04-D129 ***GNR 45ft Composite*** ***www.Diagram3D.com***

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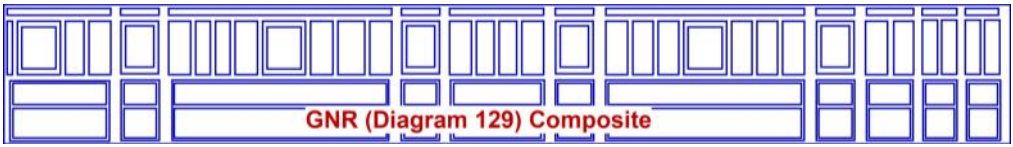

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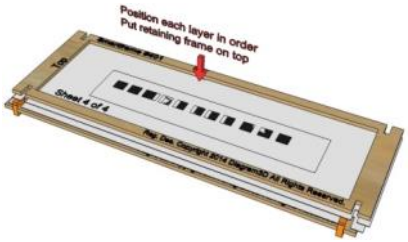


4mm scale kit, **(“OO” “EM” “P4”)**
Adhesive, paint not included

GN04-D129 ***GNR 45ft Composite*** ***www.Diagram3D.com***

Introduction

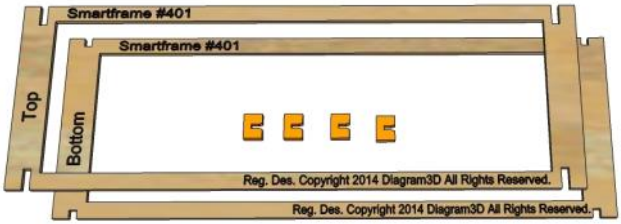
Contents of this kit

This kit contains:

SmartFrame

Upper and lower frame plus alignment clips.

MDF parts



Floor for this vehicle.

Cardboard panels

Cardboard panels – a total of 8 layers

There are four layers for the sides.

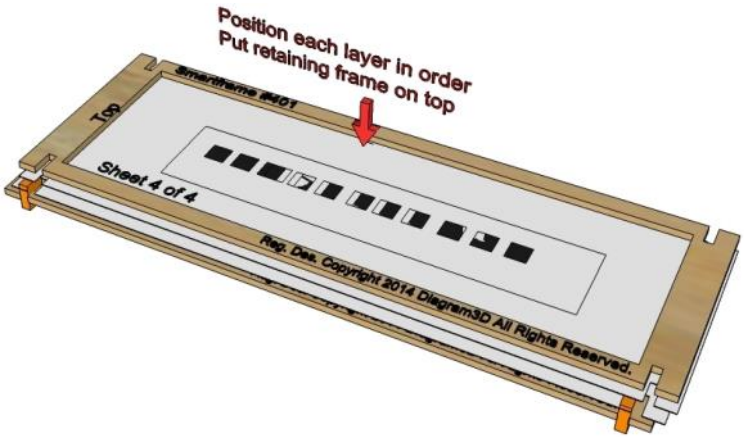
Layer	Description
Layer 1	Window Frames and droplights
Layer 2	Coach side
Layer 3	Middle and upper panelling
Layer 4	Lower panels beading detail

There are four layers for the ends.

Layer	Description
Layer 1	Internal support, end cornice
Layer 2	Internal support, end cornice
Layer 3	Plain ends, end cornice
Layer 4	Panelling, end cornice, steps, one internal partition

There is one layer for the remaining partitions and internal bracing of the model.
There is one layer for the roof.

Sundry Parts	Sundry parts include acrylic glazing bars.
Not included	**- Adhesive to attach the parts. PVA ("woodworking glue") is recommended for the MDF parts.** **- Craft knife, Clamps, weights etc.** **- 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 coach 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.* *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 multiple 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. A fine razor saw blade can be used to clear slots in MDF components.* *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 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.*
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 published in 2015 CE.**

SmartFrame Preparation ***(Applies to all versions of SmartFrame)*** ***Total preparation and assembly time about 2 minutes.***	Attach the clips to the bottom section of the *SmartFrame as shown below:*  *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.

Coach Sides

Total preparation and assembly time about 5 minutes.

Allow sufficient time for the adhesive to dry thoroughly

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

Insert these into the *SmartFrame* in order as described above. Apply adhesive and put aside until set.

Hint: The individual layers can be painted in advance to simulate the window frames, main body and lining detail.

When thoroughly set, detach the coach sides using a sharp craft knife.

To form the tumblehome, use a length of tubing and gently roll the completed side on its reverse face on a rubber mat or similar surface. It is strongly recommended that this technique is practiced on some scrap cardboard beforehand.

Coach Ends

Total preparation and assembly time about 5 minutes.

Allow sufficient time for the adhesive to dry thoroughly

There are four layers for the ends.

Layer	Description
Layer 1	Internal support, end cornice
Layer 2	Internal support, end cornice
Layer 3	Plain ends, end cornice
Layer 4	Panelling, end cornice, steps, one internal partition

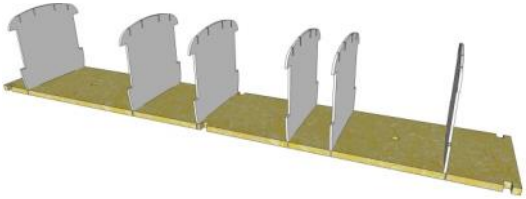
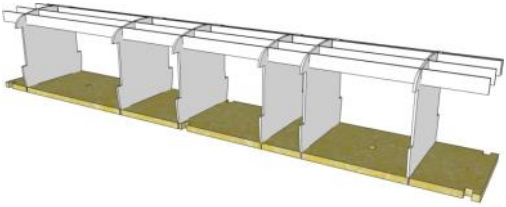
Remove the internal partition on the first layer and set aside for use with the floor.

Insert the layers into the *SmartFrame* in order as described above. Apply adhesive and put aside until set.

Hint: The individual layers can be painted in advance

Apply adhesive to the ends and put aside until dry. The steps can now be detached and placed into the pre-cut holes in one end.. The other end has communication cord equipment.

When thoroughly set, detach the coach ends and other parts from the *SmartFrame* using a sharp craft knife.

Floor ***Total preparation and assembly time about 5 minutes.*** ***Allow sufficient time for the adhesive to dry thoroughly***	Detach the partitions and longitudinal roof formers carefully from the layer using a sharp craft knife. Insert the partitions into the floor and apply adhesive. When set, attach the longitudinal roof formers and allow to set. ***Hint: If required, the slots in the floor can be opened up using a fine razor saw while holding the floor in a vice or clamp. Be careful not to overdo this procedure.***  The resultant framework will become rigid when the roof, sides and ends are attached. 
Roof ***Total preparation and assembly time about 15 minutes.*** ***Allow sufficient time for the adhesive to dry thoroughly***	Detach the roof from its layer. The roof section is lightly scored on one side and has holes which locate the positions of ventilators and lamps. To bend the material, use a rod or tubing and gently roll this over the cardboard on a rubber mat or similar surface. Use a small diameter rod to create the sharper end profiles. It is strongly recommended that this process is practiced on some scrap material beforehand. Attach the roof to the body. When set, detach the cornices from the roof layer and attach at the edge of the roof so that the rain guards are above the doors.
Glazing & Final assembly ***Total preparation and assembly time about 20 minutes.*** ***Allow sufficient time for the adhesive to dry thoroughly***	The coach ends are designed to butt against the longitudinal formers. The floor and longitudinal formers are fractionally shorter than the coach sides by to accommodate the ends. The end panelling overlaps the sides. Attach the sides and ends taking care to centralise these components. Finally the cornices are applied to the sides and ends of the vehicle. The glazing bars supplied are intended to fit into the slots which are pre-cut into the partitions. ***Hint: the glazing can be delayed until the coach is painted by the modeller. The glazing bars can be slotted into position prior to the attachment of the final end of the coach body.*** 

Underframe	The optional underframe is assembled by inserting the lugs on the solebars into the corresponding holes in the floor of the vehicle. The buffer beams butt onto the ends of the solebars as shown below (body omitted for clarity). 
	This short 45 foot coach built to diagram 129 (D129) was one of several types which were designed by Howlden for the GNR in the 1890's.. This vehicle combined an open third class area and separate first class accommodation. Smoking facilities were included in both classes. Approximately 50 of these vehicles were in service in the early 20th century. The coach was a logical extension of existing design on the GNR. It had a wooden underframe. This vehicle is described in "Historic Carriage Drawings" Volume 1 by N. Campling. (ISBN 1 899816 04 6) page 94. Some example vehicle numbers for the GN period were: 61,140, 144,284,313,322,485,486 and 626 which became 4061… 4486 at grouping. 1302,1379,1452,1467,1550 which became 41302… 41550 at grouping.  GNR stock 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. Eventually, post-grouping, the class designation numeral moved to the lower panel, the crest and lining was omitted for surviving stock. According to GNR contract specifications coach underframes were painted "teak" colour, ironwork was black (or bronzed green) and the coach roof was painted lead white (with some sections of the visible roofline 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. After 1905 or thereabouts onwards roofs were painted white.
Underframe	This was a bogie coach. The diagram wheelbase was 28 feet 11½ inches between bogie centres. In general, they were equipped with gas lighting, vacuum brakes and heating apparatus. Originally they were equipped with Fox's pattern bogies and later with standard Gresley bogies.
Finally…	Congratulations on completing this kit. We hope you enjoyed making it as much as we did. Please take time to visit our website www.Diagram3D.com for further information Email: info at Diagram3D.com