Puffing Billy Passenger Car – NB

Scale: 16mm=1ft , 1:19

Design and documentation by David Fletcher
Produced and laser cut by Aus-Scene Models
Developed for Argyle Loco works
Made in Australia

Recommendations:

Read the instructions right through and understand the intent. There can be confusion during the chassis assembly as the frame is assembled up-side-down before inverted again for the body to be installed on top. We recommend using PVA as the basic glue to assemble these kits. Some of the parts come fixed in a sheet. Using a sharp hobby knife or scalpel cut the little notch holding the part in place. Use a small file to completely remove the notch of the part.

There is no need to sand off the charred edges to the wood. The glue and primers will soak through this fine layer just fine.

Layout all the parts and check them off against the part number diagram so that you know what number each part is before use.

Break up the parts into the lots associated with Chassis, Body and Roof. This will make part finding easier.

Painting:

The colours to use on the Puffing Billy Rolling stock can be easily matched using stock 'Heritage' range colours. The locomotives and rolling stock on the railway are today painted according to British Standard 381c of 1931. This is a paint standard developed in 1930 based on the pre-mixed standard colours of the 50 years to 1930 and hence is inclusive of many of the typical colours used in Victorian architecture,

vehicles, railway equipment and stations. Many of the stock heritage colour ranges sold at most paint and hardware stores, such as Haymes, Dulux and Resene are based on BS381c.

For painting this model, we recommend the following colours, available at Bunnings or Mitre 10:
Car body Maroon – White Knight Colour 'Gloss Burgundy'
Car interior Ochre – White Knight Colour 'Warm Ochre'
Car Frame – White Knight Colour 'Flat Black'
Car floor – wood stainer – Cabot's Woodcraft Stain, colour 'Light Mahogany'.
Dulux also supply similar Heritage Maroon and ochre colours based on BS381c.

Finally and importantly, it is best to seal the wood prior to painting with an undercoat, also available from White Knight at Bunnings. However this undercoat is white in colour. Traditionally red based colours, such as our Burgundy are translucent colours, just as they were in the 1800s. It will take a zillion coats of paint to get adequate colour coverage over a white base. The white paint will continually show through, especially in the etched detail. As such I recommend NOT using the white undercoat, rather spray the Burgundy areas with Flat Black paint first. This will both seal the wood and provide a deep colour to which the Burgundy will easily paint on top. Best still, as the Burgundy has difficulty providing cover around the etched detail, the black will show through in the etched detail and bring out that detail in a desirable way. Note in the photo below how the scribed lines are visibly black due to the black undercoat.

Paint the chassis assembly and car body as two completed but separate assemblies. Do not try to paint all the individual parts before assembly or the glue will not penetrate into the wood properly and hence the joints within the assemblies will be considerably weakened.

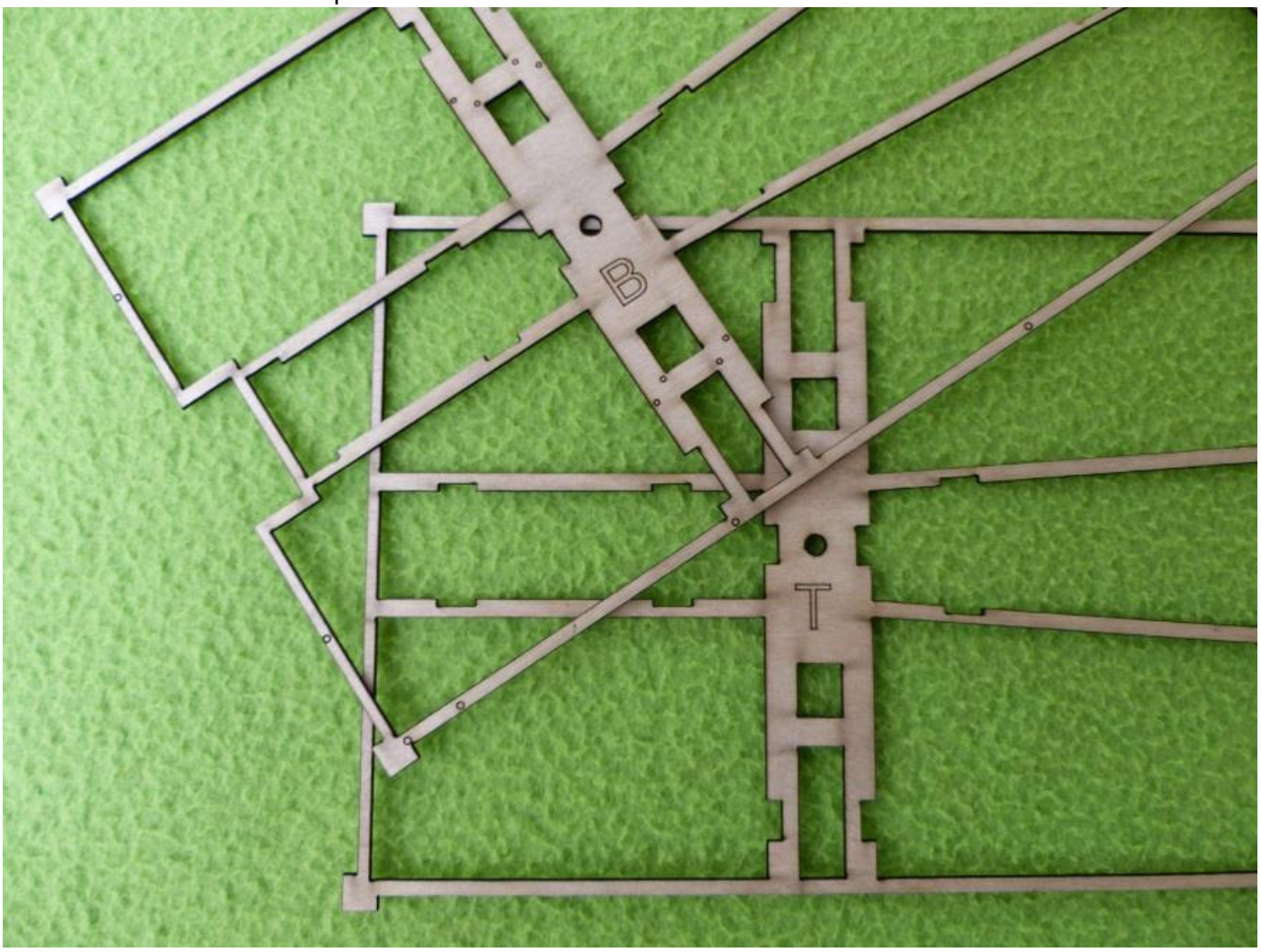
Decals: At the completion of all assemblies, apply the decals as provided in this kit.
Use bedding solution, such as 'Mr Soft' in order to bed the decal film down firmly into the wood grain and avoid the misty film look associated with poorly installed decals. When the decals are firm and dry, over spray the finished car body and chassis with either Matt clear coat or Semi-gloss clear coat (depending on preferences) to both seal and protect the decals and paintwork.

Bogies & Couplers: Suitable trucks/Bogies for the car can be obtained either as part of the kit or as separate items from Argyle Locomotive Works. The Die Cast Fox Bogie offered by Argyle are prototypical and accurate for this car. Alternatively plastic trucks from LGB or Bachmann can also be used although not the correct styling.

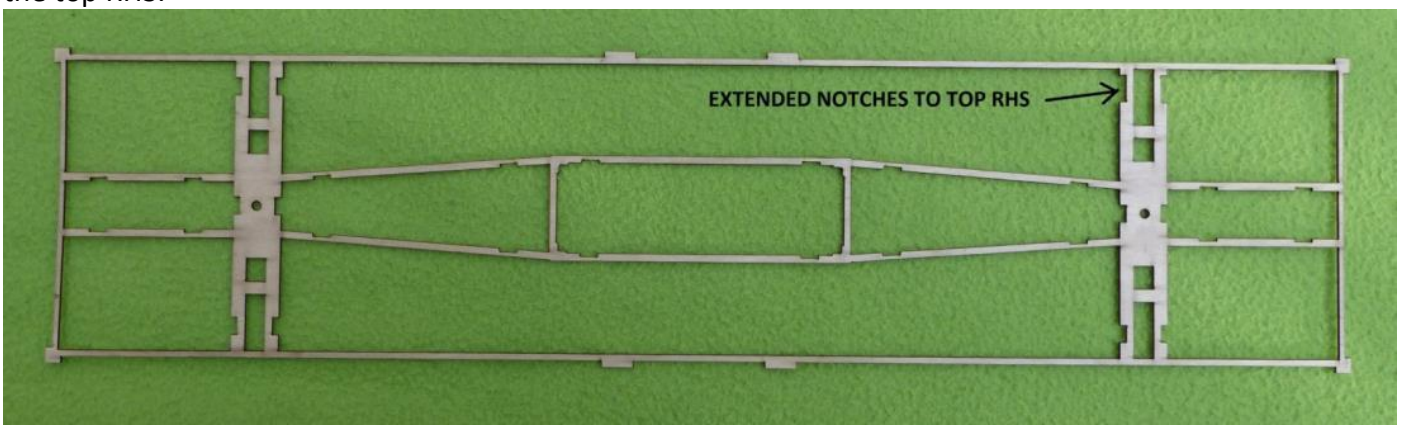
Finally Accucraft knuckle couplers have been provided with the kit, including bolts, which will bolt directly into the 4 holes laser cut into the end beams. The car is designed for the installation of these couplers. Modifications to the end beams will be required should modellers prefer to use KayDee or other coupler types. The Accucraft Knuckle coupler is the same type provided on the Argyle NA class 2-6-2T.

Step 1 – Chassis Construction.

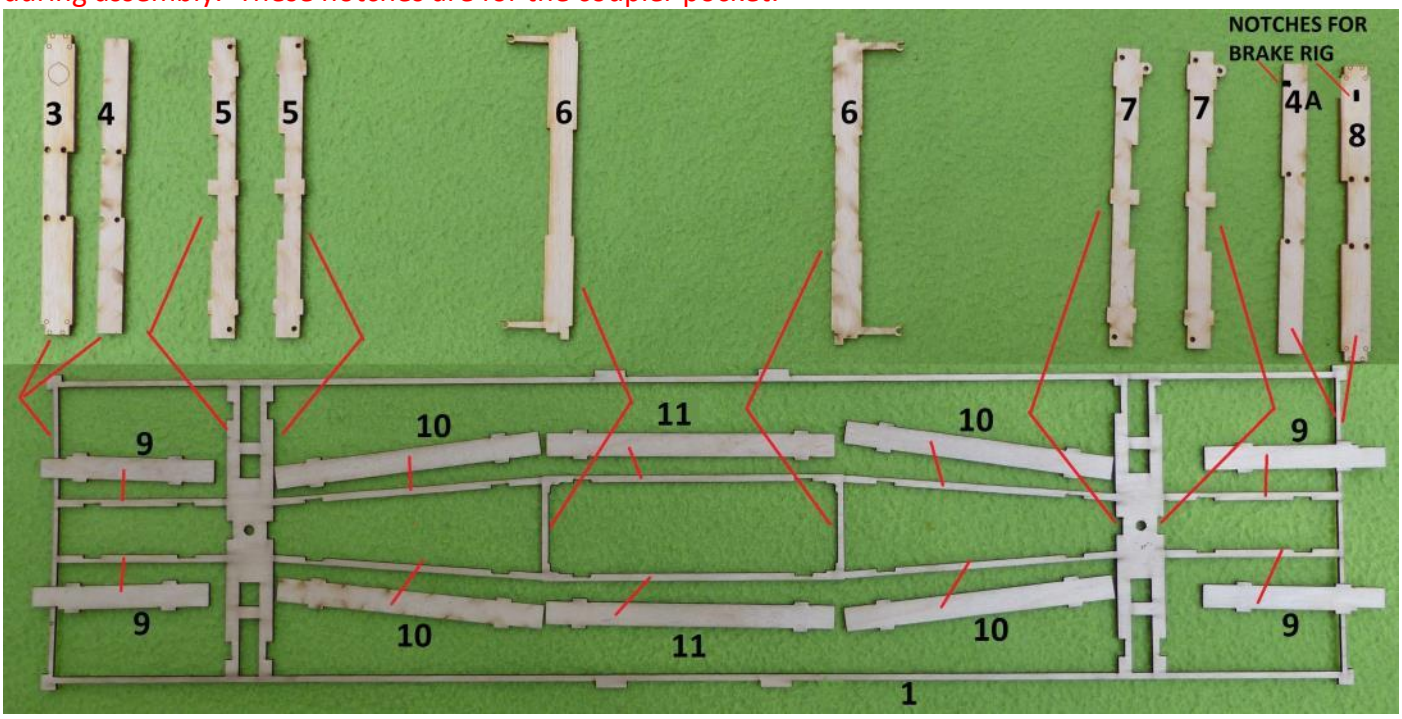
Take the frame plate elements part 1 and 2. Note 'T' and 'B' scribed onto the two parts denoting 'top and bottom' The T is the plate at the top of the chassis and the B is the plate for the bottom of the chassis. Start by laying the part marked 'T' face down on the bench. We shall be assembling the chassis **upside-down** to start with. Put the part marked 'B' aside for now.



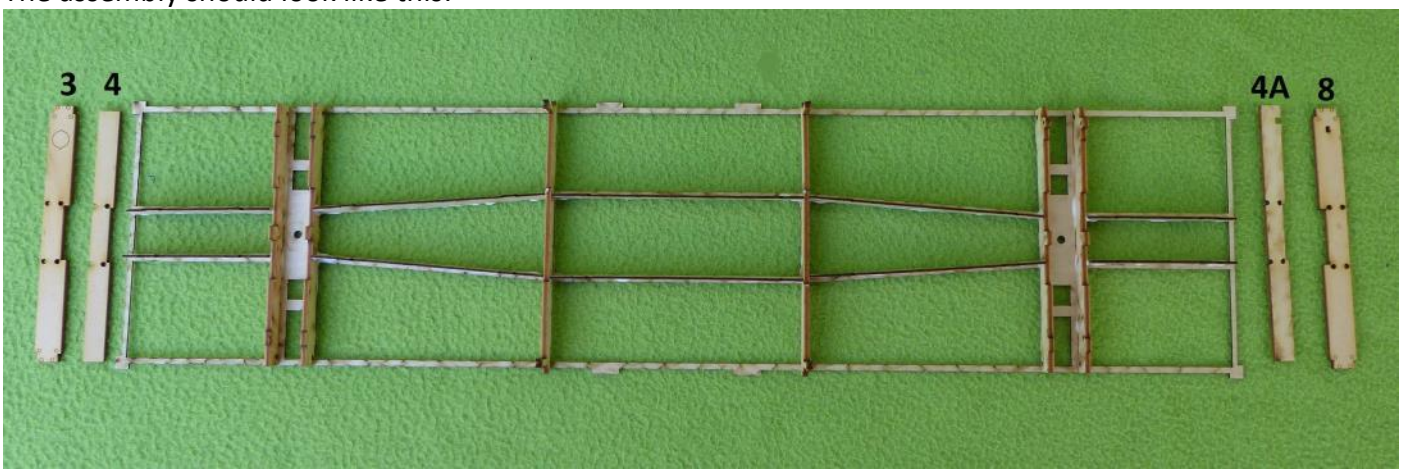
Note the two extended notches to the top RHS bolster – place on the bench with the extended notches to the top RHS.

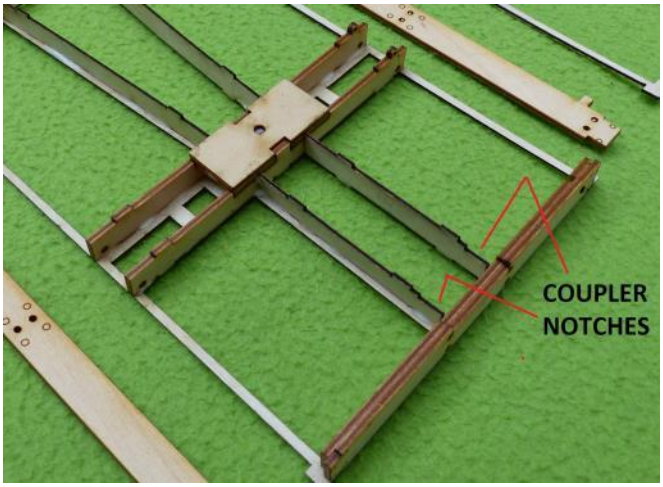


Lay out all the frame elements, parts 3 – 11. Note several parts are multiples of identical parts.
Note that 4 x PART 9 have a 'notch out' to one end which must face outward from the car and upward during assembly. These notches are for the coupler pocket.



Glue all the parts indicated above into vertical position onto the frame base (part 1).
Make sure the scribed detail on the end beams parts 3 and 8 are facing outward. Note location of parts 4A and 8 as these form the brake wheel end of the car.
The assembly should look like this:



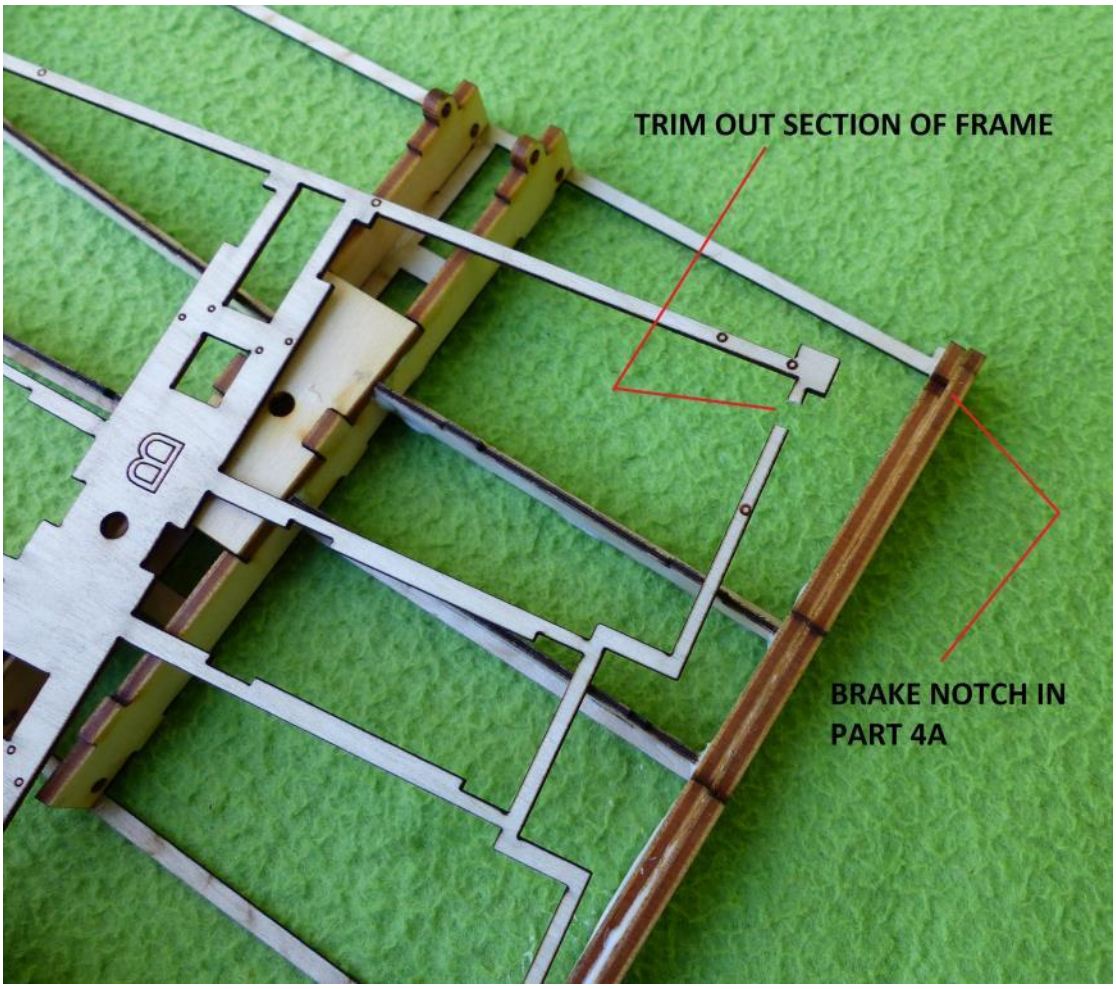


Part 12, Bolster Block shown place see over page

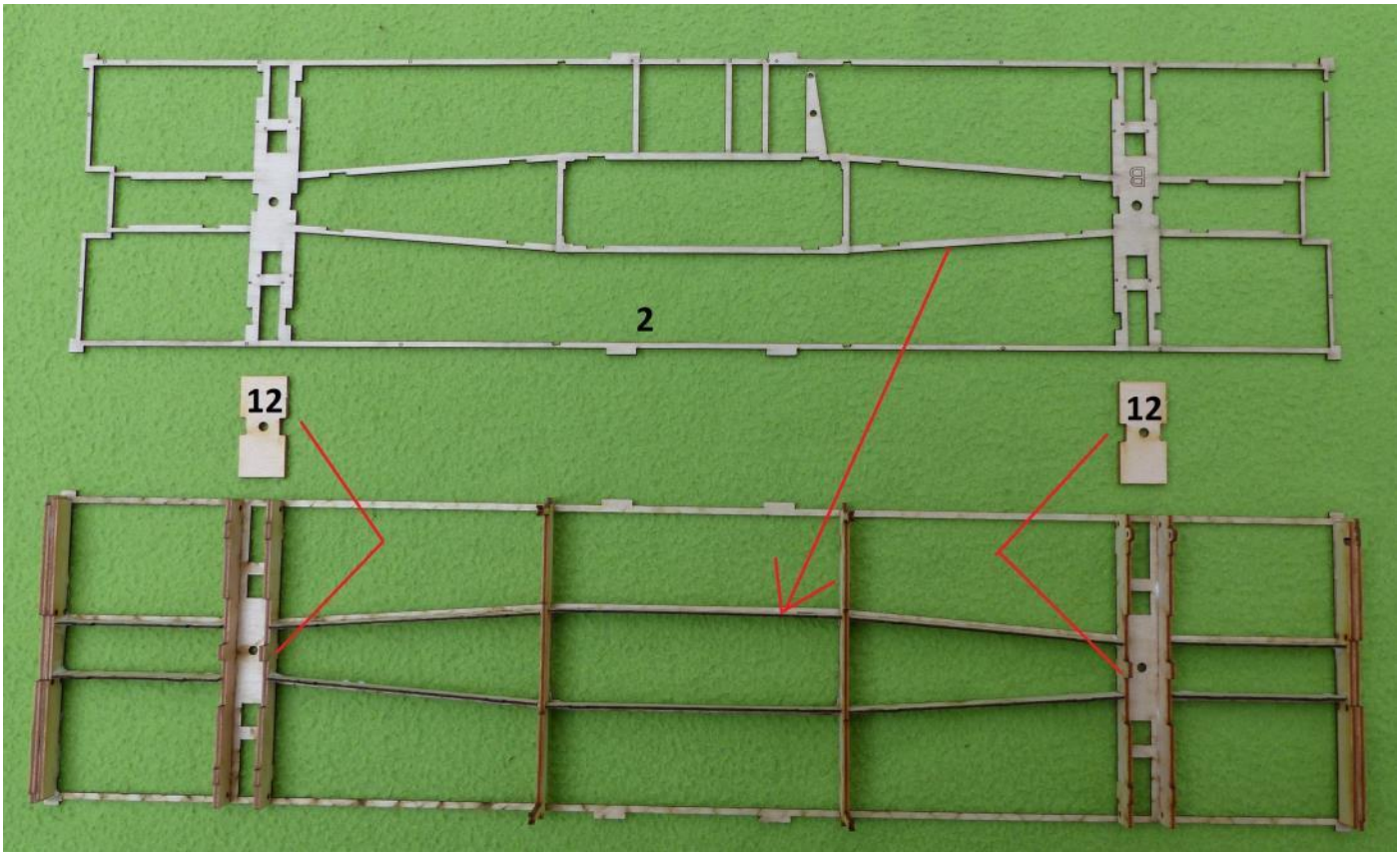
Bolster Blocks: Apply 2 x Part 12 Bolster blocks onto the top of chassis frame, they will slot into the two beams (part 5 and 7).

Apply Part 2, the 'Bottom' chassis frame onto the top of the assembly. When the chassis plate is applied to the top of the chassis, allow the 'B' to face upward, which will ensure the brake elements align to the correct side. Carefully check all the vertical parts slot into the correct tabs of Part 2 and that both the top and bottom chassis plates are perfectly parallel and not lifting above any of the vertical members. The two chassis plates with vertical members set between them combine to simulate the classic 'C' channel chassis frame typical of the Puffing Billy standard frame.

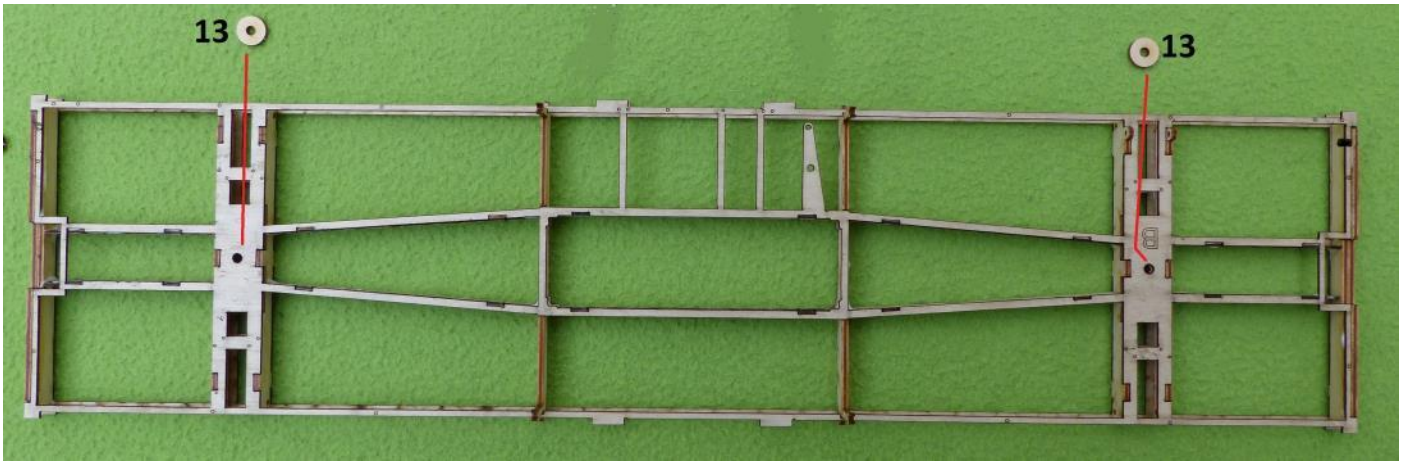
When applying part 2, bottom plate onto the assembly, trim out a small chunk of thee frame to align with the brake rig slot in part 4A, to the RHS of the assembly as follows:



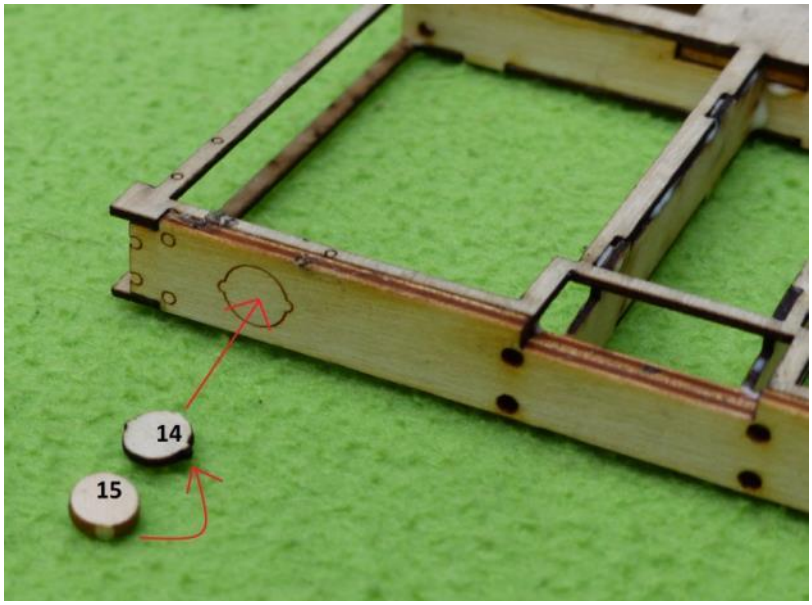
Apply part 2, frame plate onto the assembly now



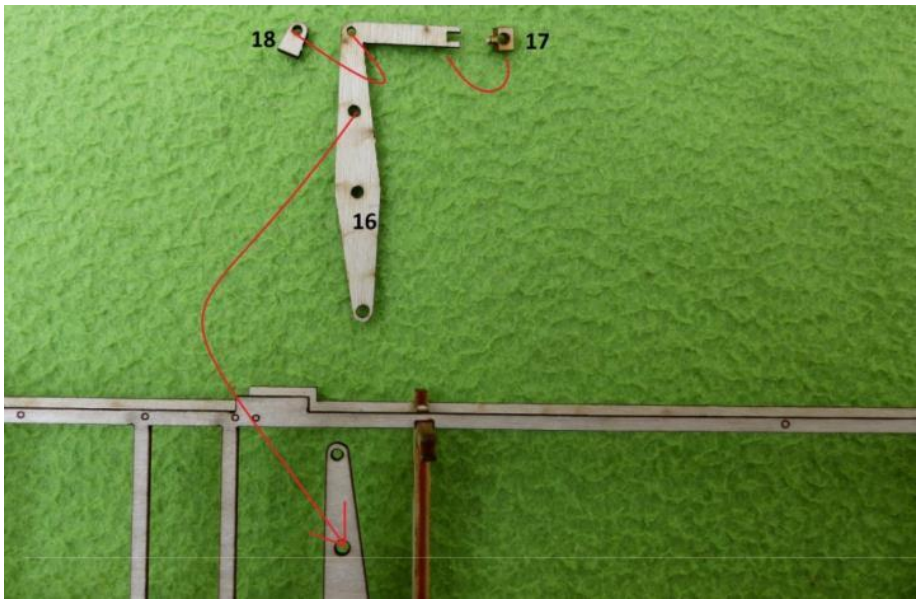
Truck Bearing Plate: With the bottom chassis plate installed with 'B' facing upward as indicated below, glue 2 x part 13 onto the bottom of the Bolster, align the hole in part 13 with the hole in the chassis frame.

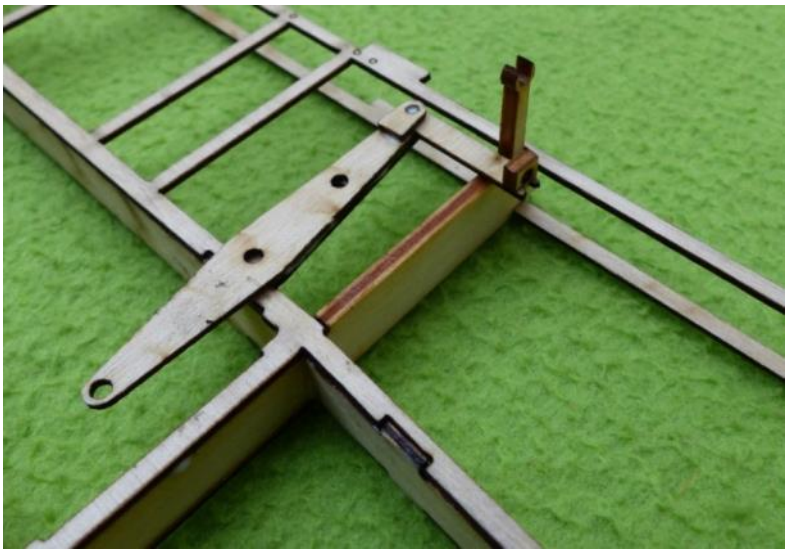


Brake Gauges: Install the brake pressure gauge to the car end where the location is scribed: Apply part 14 (gauge mounting plate) directly to the end beam with part 15 (gauge) on top of that:

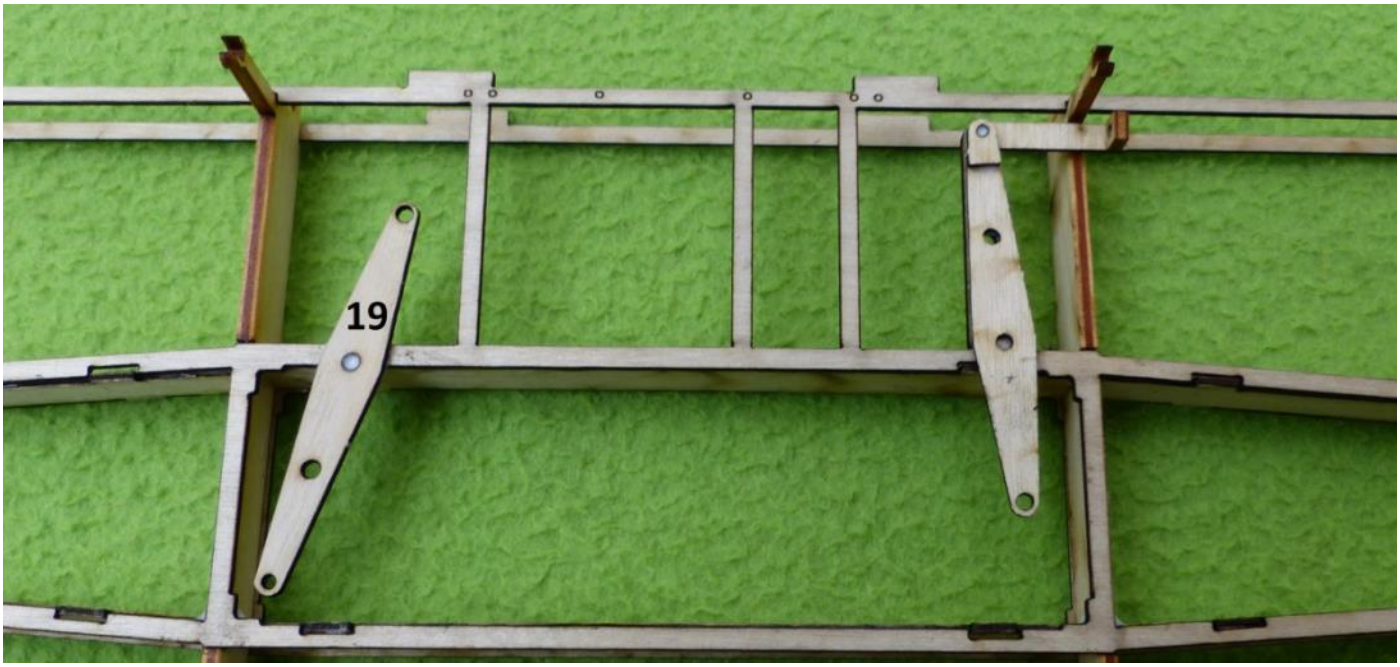


Brake Lever: Apply Brake lever parts 16, 17 and 18 onto the chassis plate part 2:



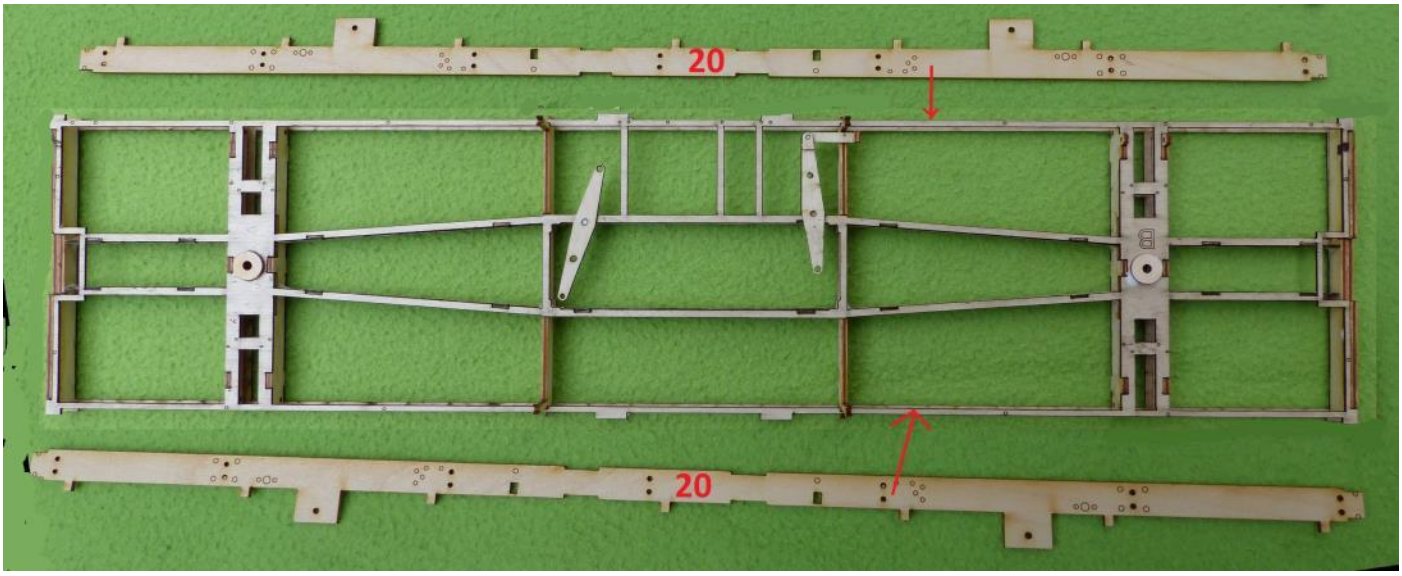


Then apply the 2nd brake lever, part 19 to the frame as follows:



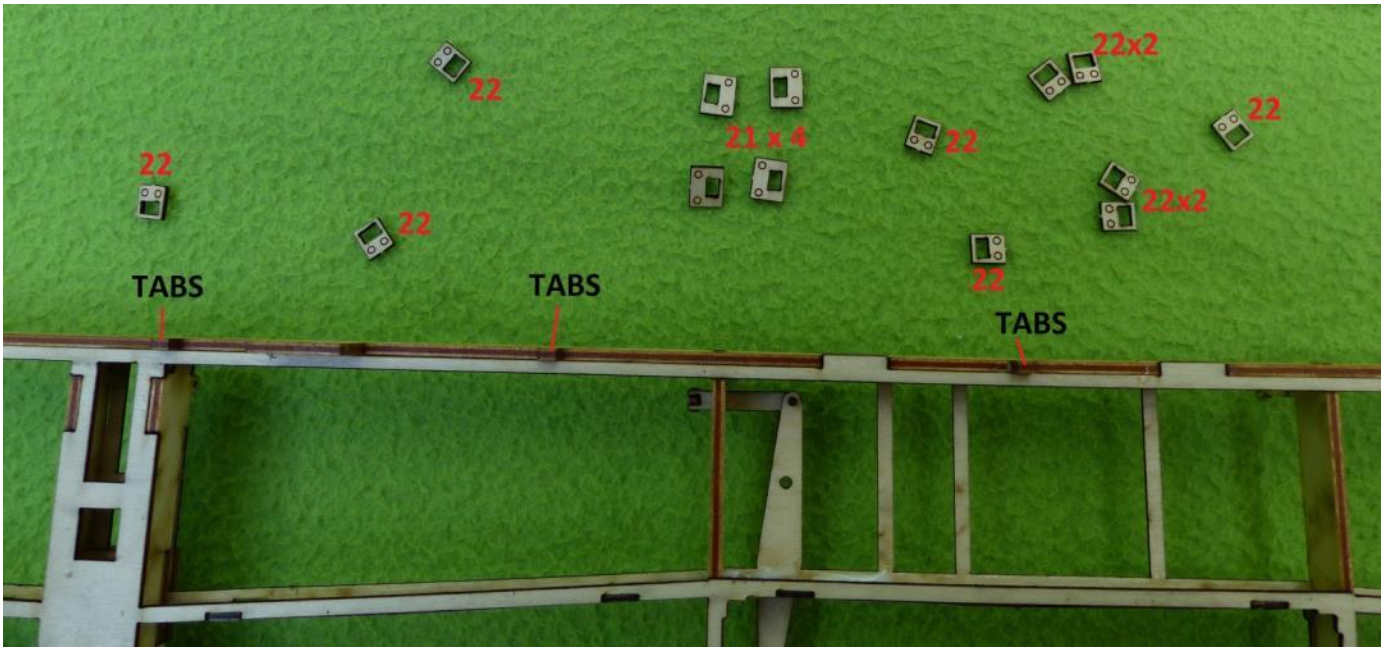
Chassis Side Frames: Apply side frame members, Part 20, to the sides of the chassis assembly. Allow the side members to slot into the tabs provided on the top and bottom chassis plates. Make sure the scribed detail on the side parts is facing outward.

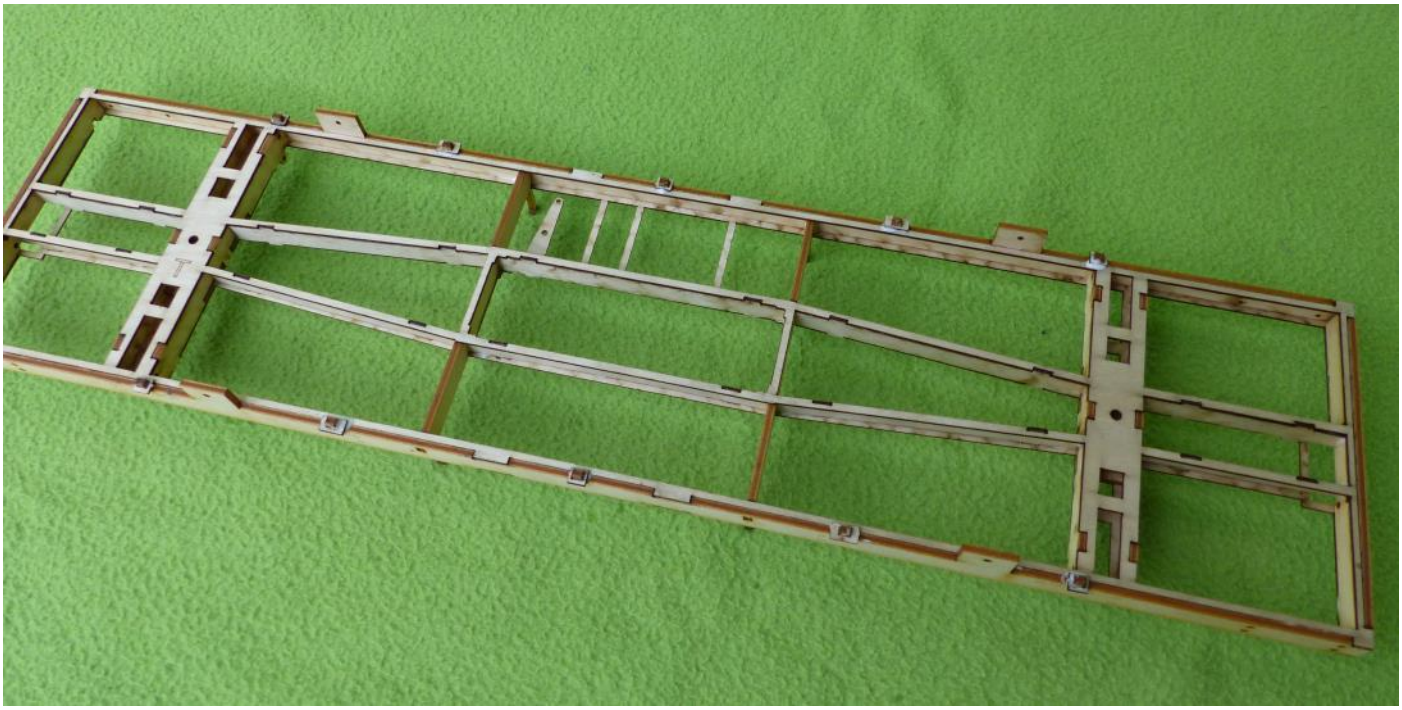
Most importantly, the tabs along one edge of part 20 side frames must face downward when installed onto the frame assembly. This means, when the frame is again inverted to the right way up for the body to sit on top, these tabs will be facing upward to receive the car body.



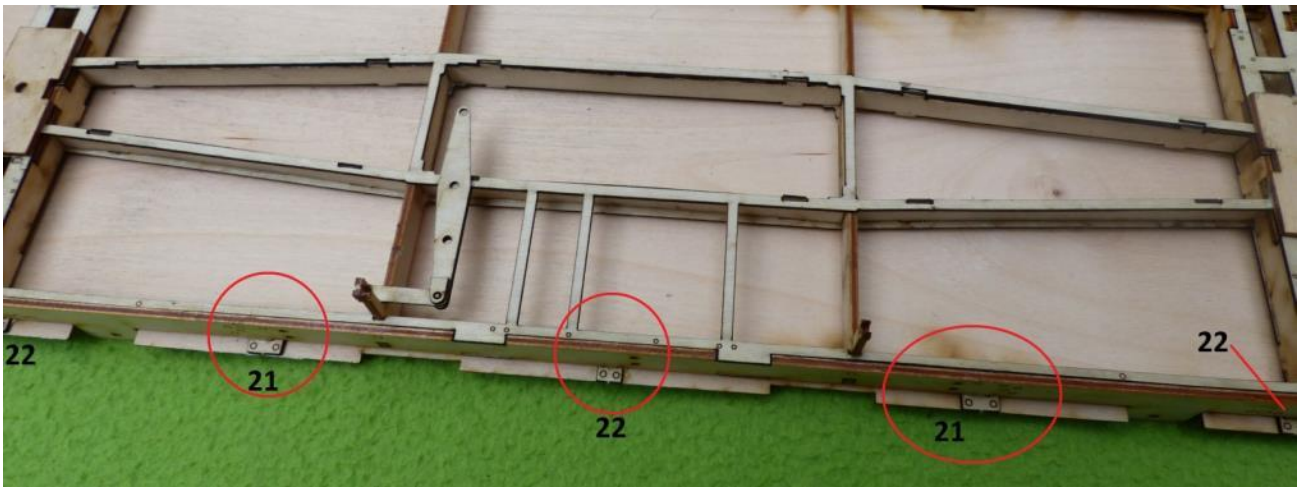
Now invert the chassis frame such that the chassis plate, Part 1, with 'T' inscribed on it, is now facing upward.

Install all the body mounting brackets, Parts 21 and 22 onto the top of the frame. Parts 21/22 insert onto the chassis tabs. There are two sizes of bracket, note their locations – the 4 larger ones are install onto the 3rd tabs on part 20 from both ends. The 10 smaller brackets are installed on all other vertical tabs. Parts 21/22 once installed form the angle brackets that hold the body to the chassis on the real car. Make sure the scribed detail on the brackets is facing downward. The car body does not sit hard on the chassis frame, but is elevated above the chassis via these angle brackets, just like the prototype.



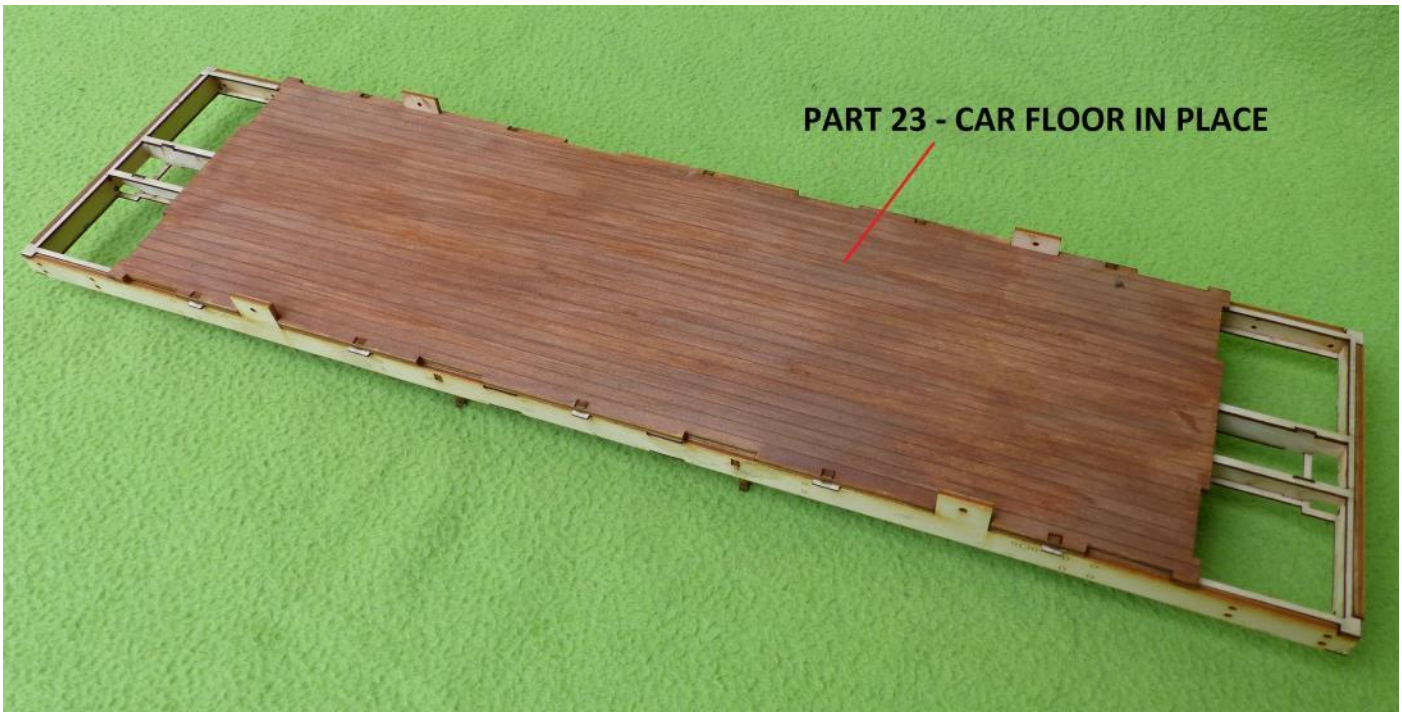


View of chassis frame with parts 21 and 22 shown fully installed.

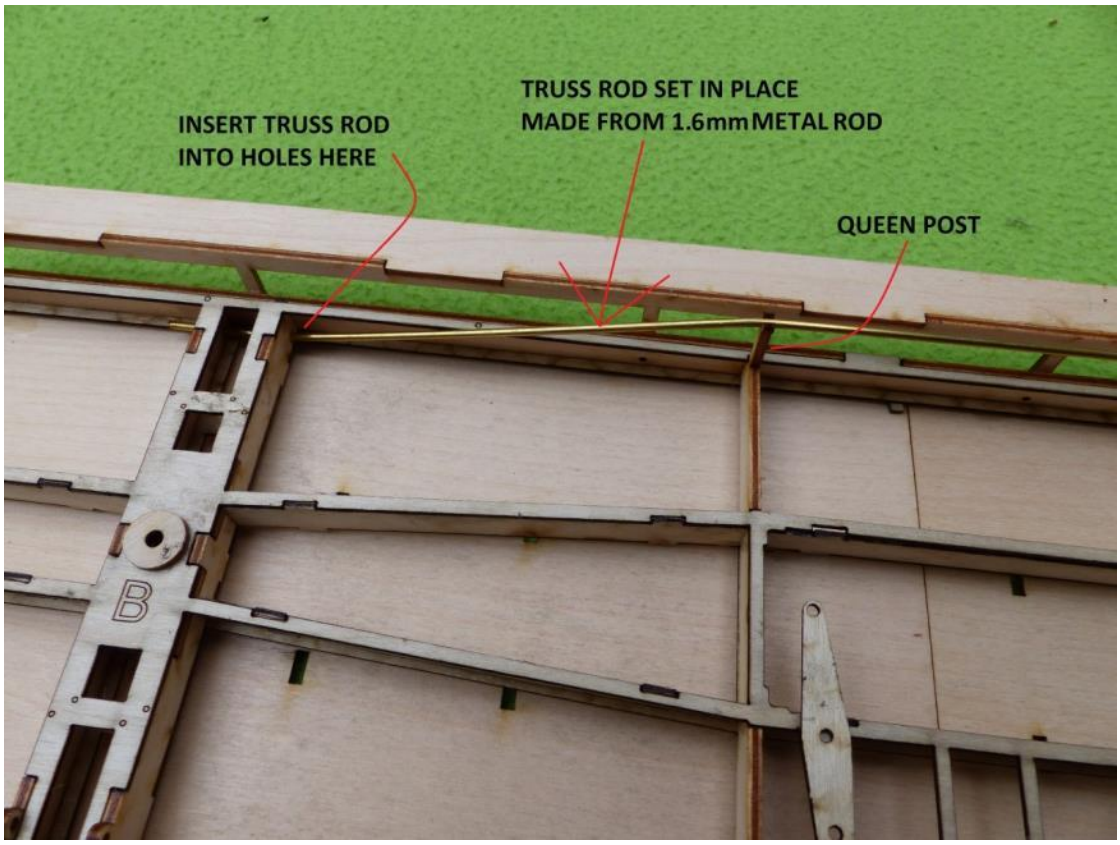


The above view showing the bracket parts, 21 and 22 installed as viewed from under the chassis. Note car floor shown in place.

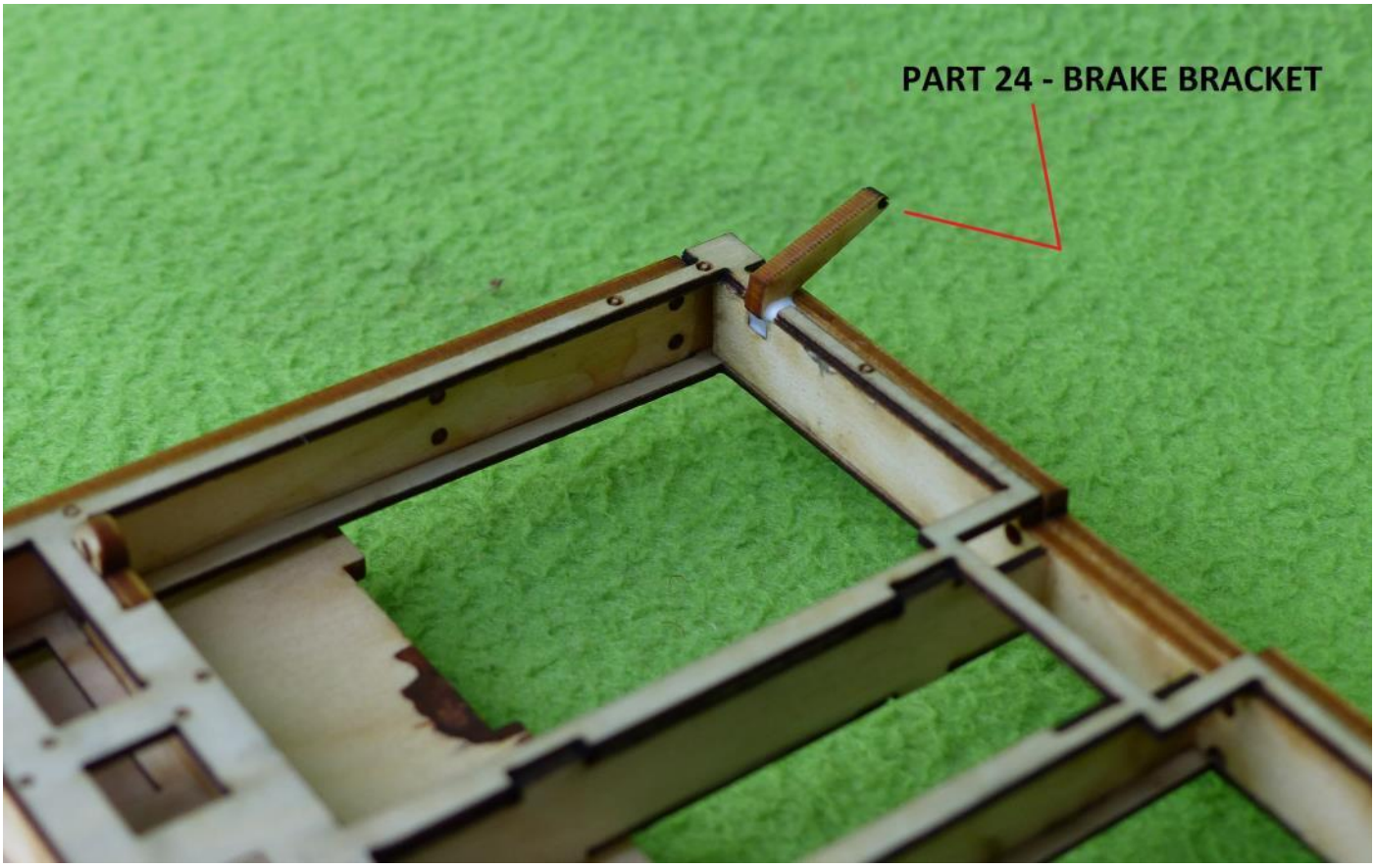
Car Floor: Apply part 23, the car floor onto the frame. Glue the floor down onto the tabs, hard and flat onto parts 21/22 that separate the floor from the car chassis by 1mm as seen above. We recommend staining and finishing the car floor prior to installation as shown in the photo below:



Truss Rods: Invert the chassis again at this point and complete chassis by installing the two bracing truss rods. These are made from 1.5mm metal rod supplied in the kit. Bend the rods according to the metal parts diagram and insert the ends of the rods into the holes provided in the bolsters. The truss rods will set into the underside of the vertical 'queen posts' as follows:

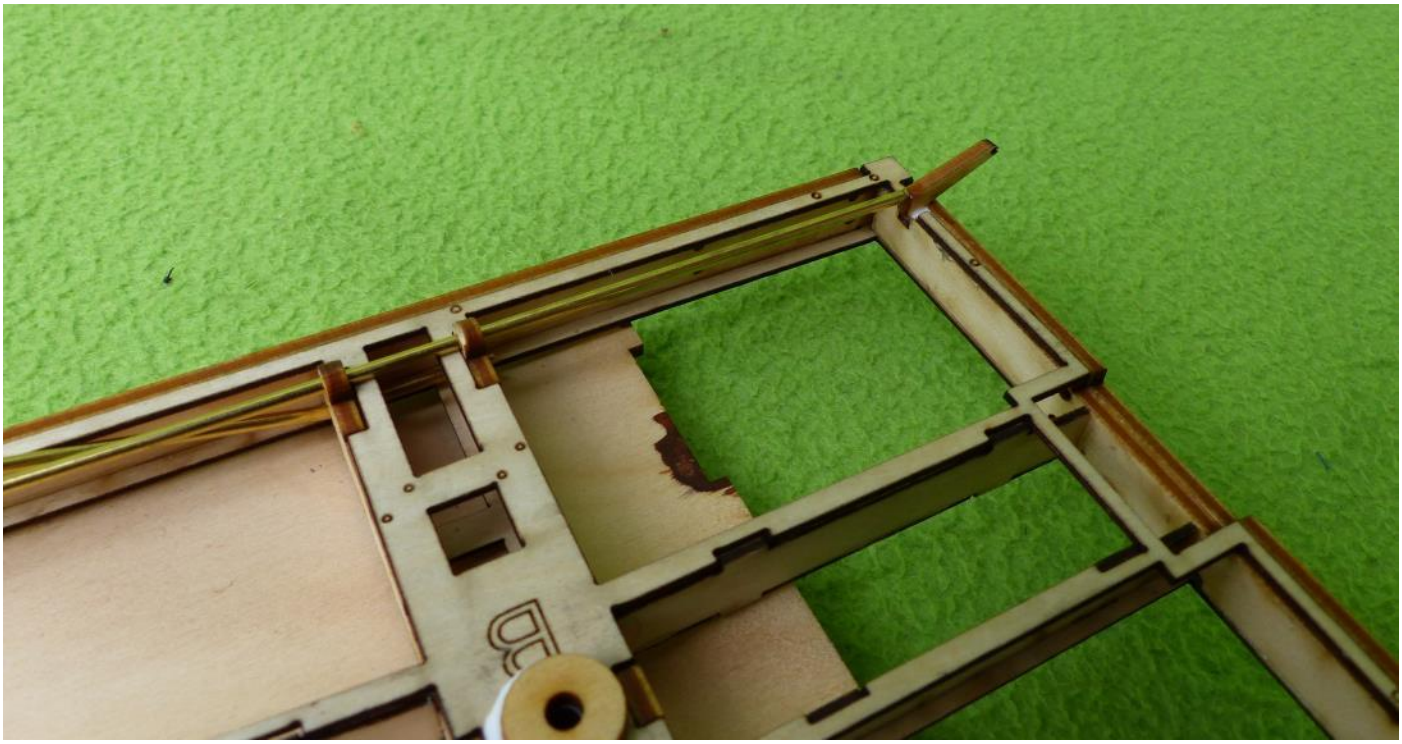


Brake Rod: Install tiny brake bracket, part 24 into the notch in part 4A at the end of the chassis:



Insert the brake wheel/rod into the chassis frame through the 2 loops provided as indicated. Insert the end of the rod into the brake lever cleat part 17, already installed:

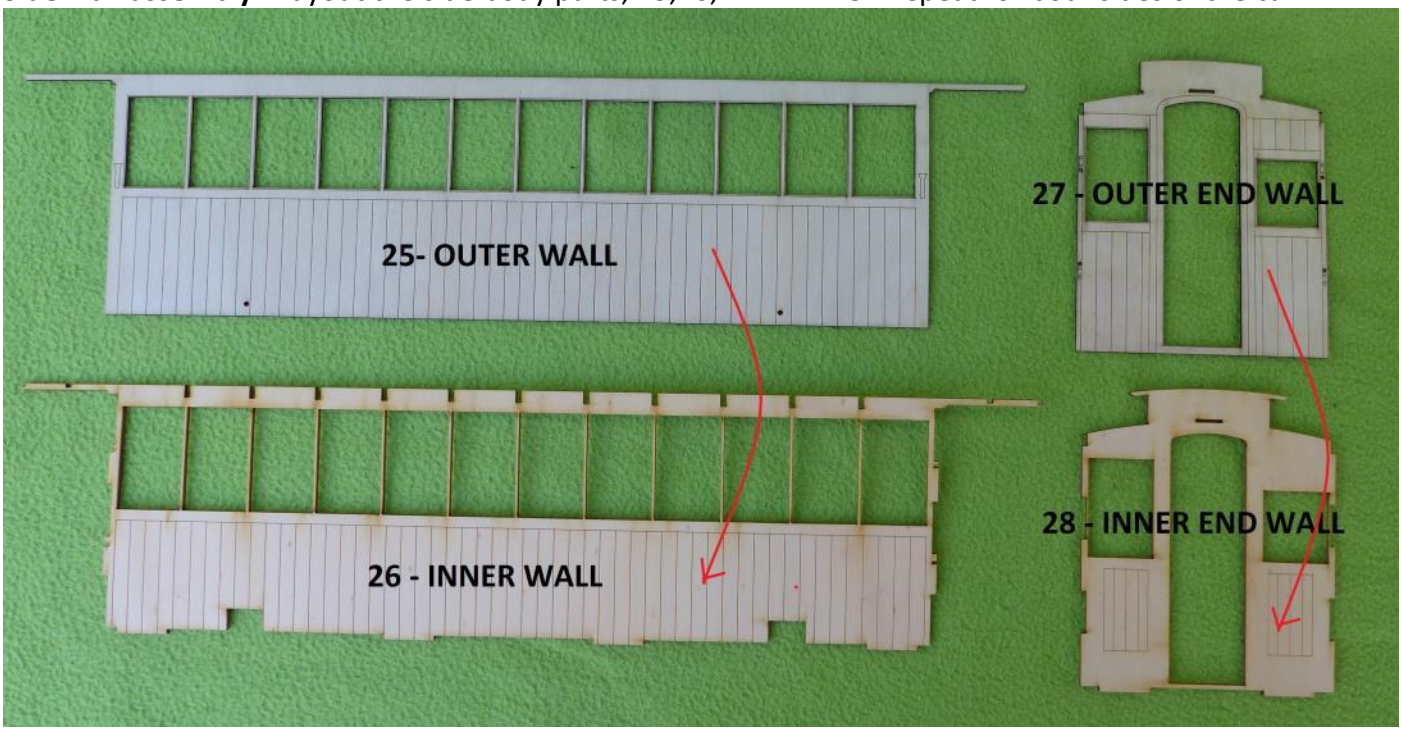
Allow the brake rod to butt into the Part 24, Brake Bracket as shown:



Set the chassis aside at this point. We shall install the end platforms and railings onto the chassis after the car body is assembled.

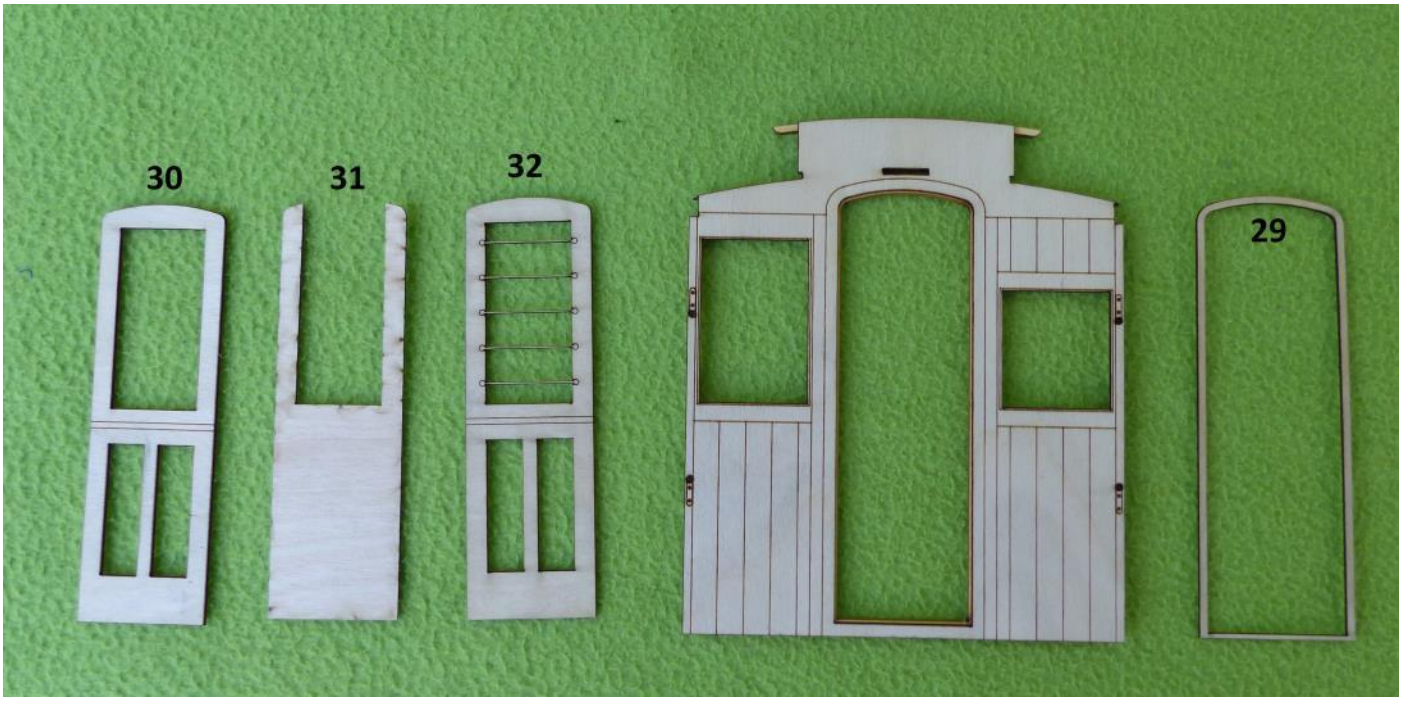
Step 2 – Body Construction.

Side wall assembly - Layout the side body parts, 25,26, 27 AND 28. Repeat for both sides of the car.

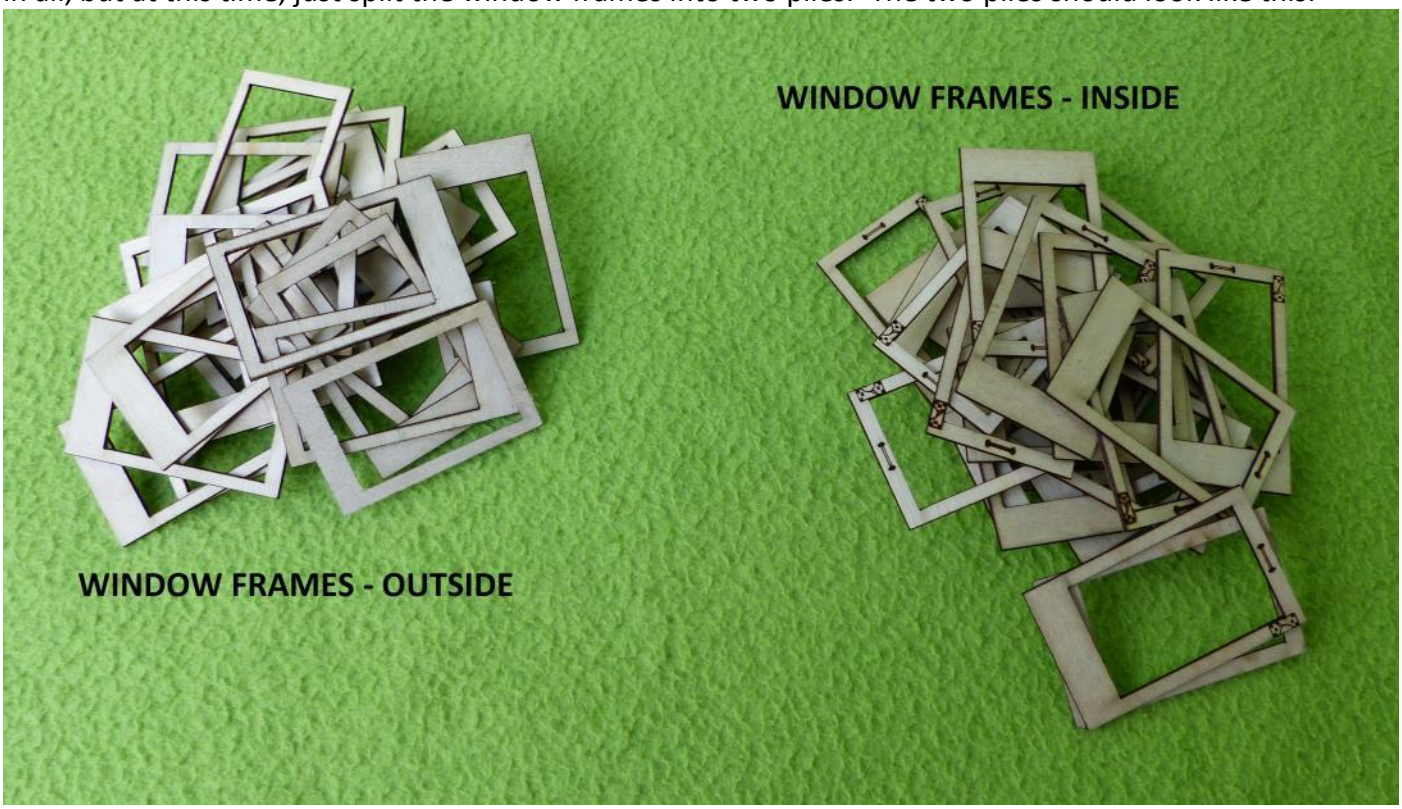


Apply glue to the back of the Inner layers 26 and 28. Make sure you apply glue only to the back, do not apply glue onto the scribed face. Apply outer wall layers 25 and 27 directly to the face of inner Wall layer 31 and 33. Note that the scribed faces of both wall layers will face outward with the plain side of both walls glued to each other. Note that the LHS, RHS ends and bottom edge of the layers DO NOT ALIGN. To align the two layers, align the top edge of both layers, centre the windows and align the eave extensions. Place the glued layers on a hard flat surface and use weights to ensure the two parts are fully glued and perfectly flat.

End Door Assembly: Apply part 29 – Door frame onto the outer face of the car end walls. Repeat to both sides. Assemble the door leaves by applying parts 30 and 32 to either side of centre layer 31. Part 32 is the outside face of the door, part 30 is the inside face of the door. You can press fit the doors into the end walls at this time, but DO NOT GLUE DOORS.



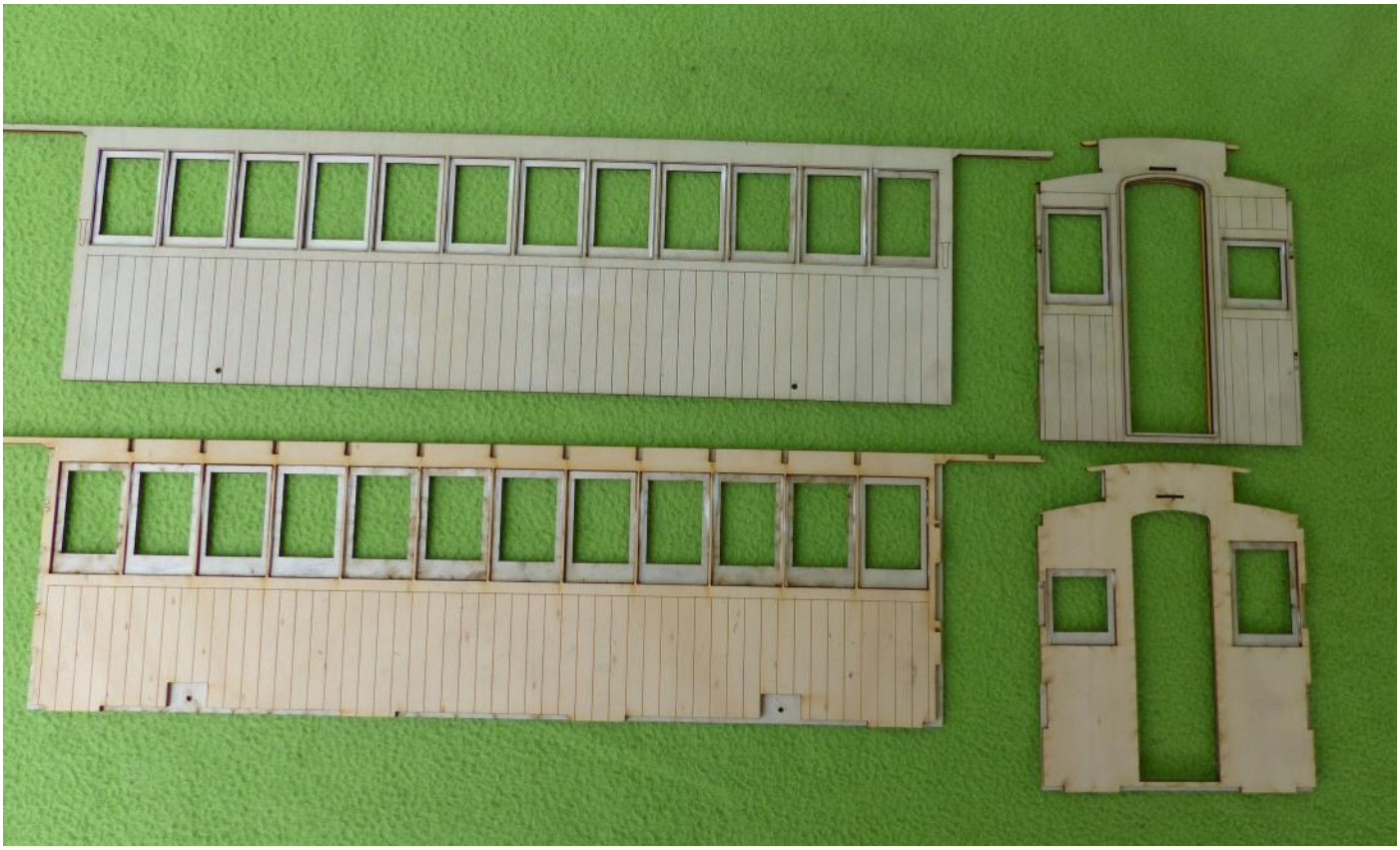
Car Windows: Collect all the window frames parts together and short them all into two piles. Outside window frames and inside window frames. The outside window frames are plain and have no etched detail. The inside window frames have etched detail for the window latches. There are 3 sizes of windows in all, but at this time, just split the window frames into two piles. The two piles should look like this:



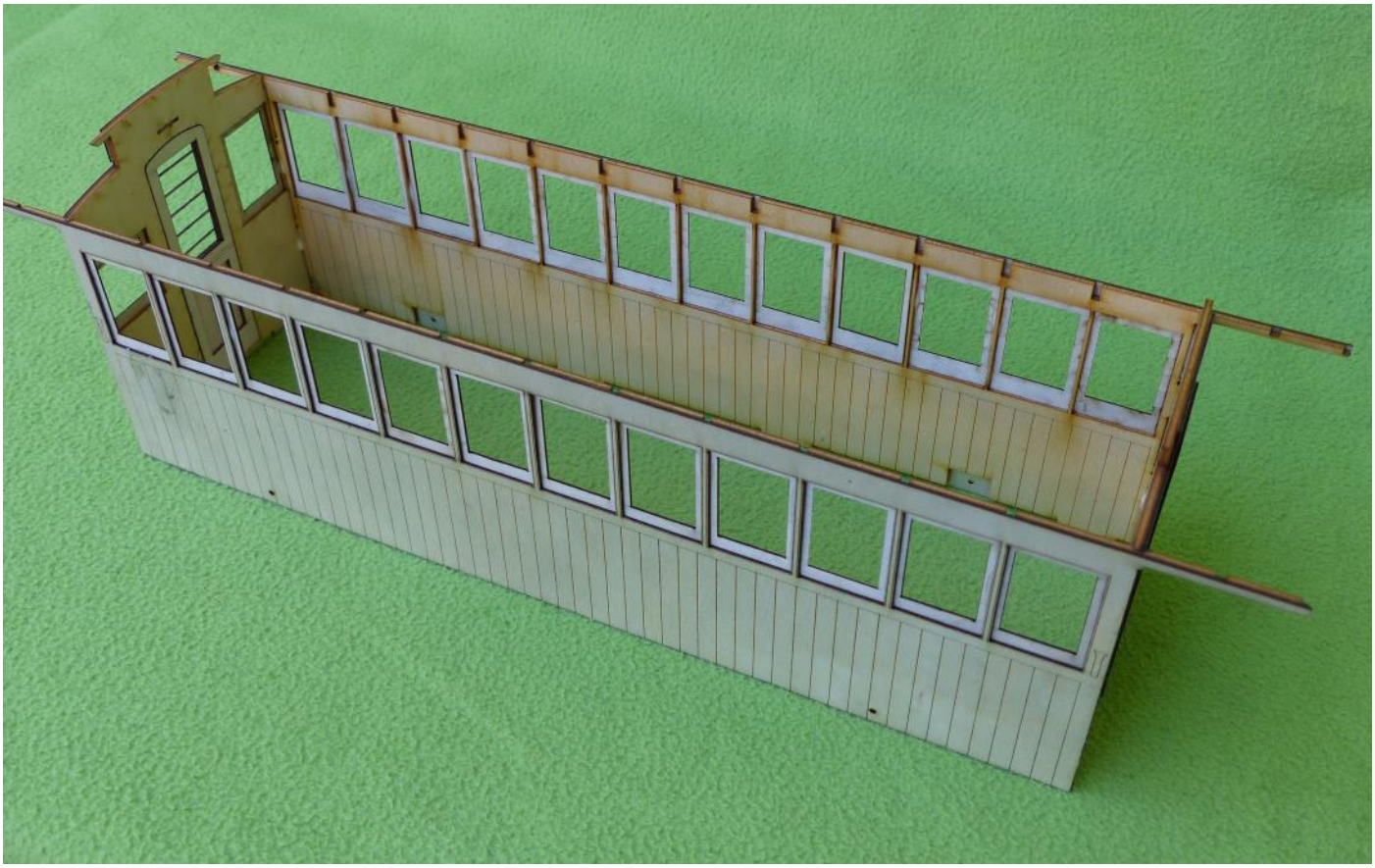
In stall 24no outer window frame Part 33 into the external side walls. Glue the window frames into place from inside the car.

Next install window frame parts 34 and 35 into end walls, apply also from the inside the car.

The completed car walls with window frames 33, 34 and 35 fully installed will look like this. Place all 'internal' window frames aside until after the car body is painted. The internal window elements are parts 36, 38 and 38. The view below shows the outer window frames installed as viewed from outside the walls and as viewed from inside the walls.



Body Assembly: – at this point glue the 4 wall assembly together via gluing down the vertical seams between the 4 walls. You will find the lugs and tabs from the mid wall layers all align and interlock. Peg the 4 walls to keep them in place. The 4 walls fully assembled will look like this:

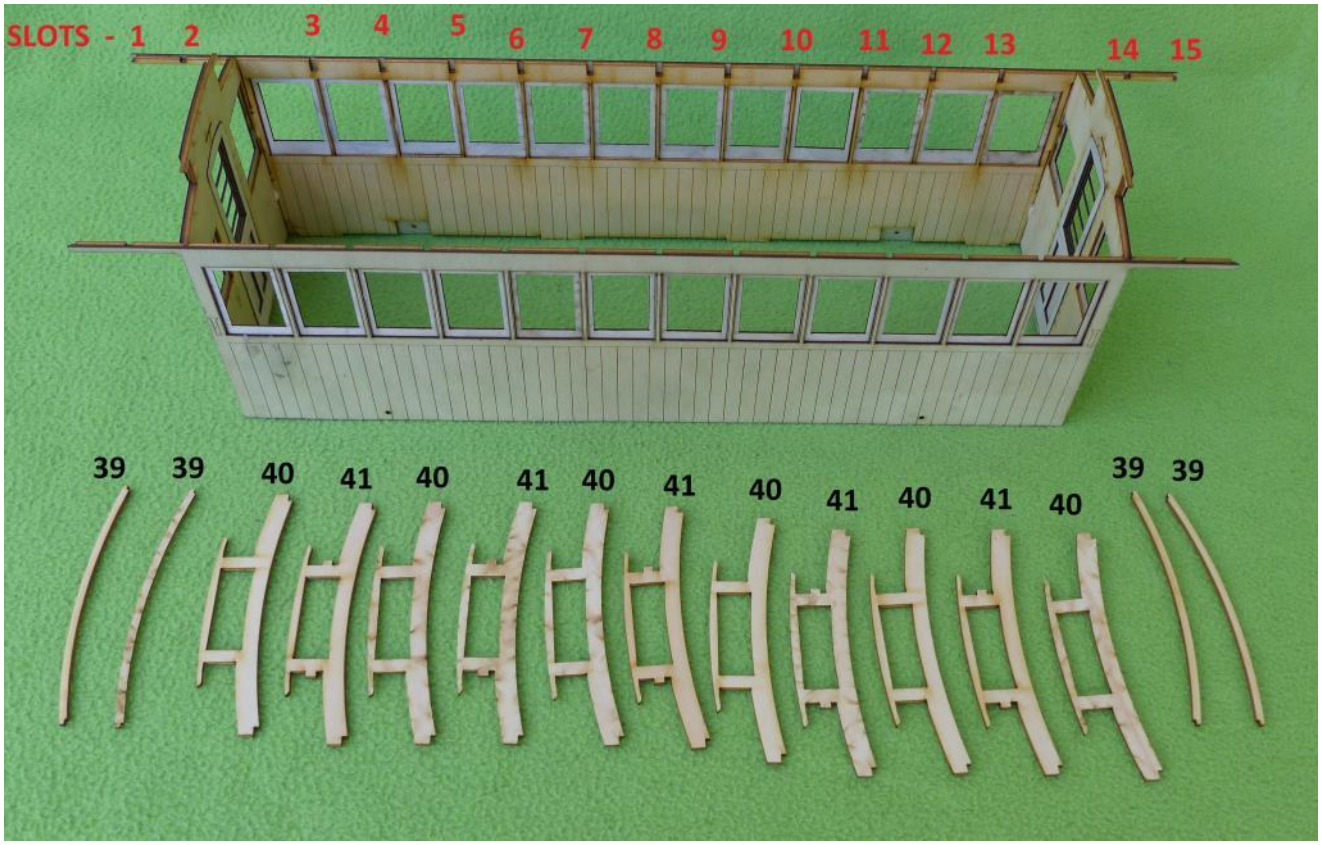


Step 3 - Roof Assembly:

There are 3 different rafter elements to be used in the roof construction – put them into piles as follows:

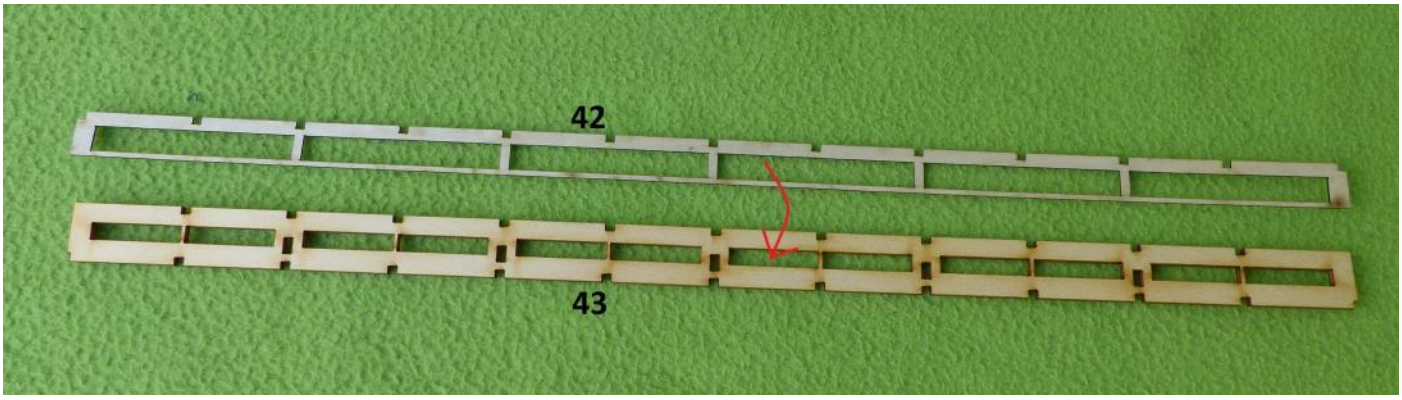
- 4 x rafter part 39 – used in wall slots 1, 2, 14 & 15
- 6 x rafter part 40 – used in wall slots 3, 5, 7, 9, 11, 13
- 5 x rafter part 41 – used in wall slots 4, 6, 8, 10, 12

Check and recheck each rafter part to make sure they don't get mixed up. Every 2nd rafter slots into the clearstory window layer with a tab in the upper side of the rafter. Rafter locations as referred to are as per this photo:



Insert and glue all 15 rafter into the 4 assembled walls. The assembly will look stylishly like this:

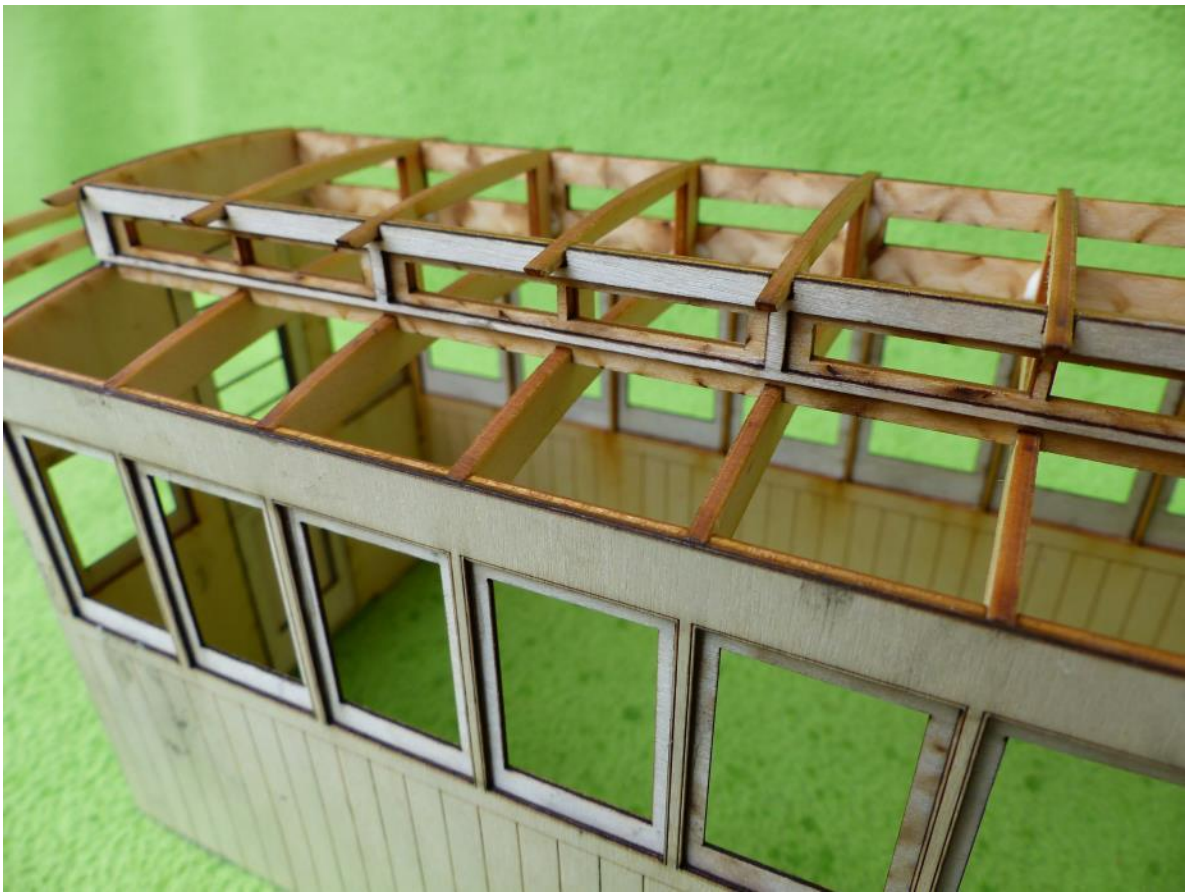
Clearstory Windows: Layout parts 42 and 43 (2 of each) as follows:



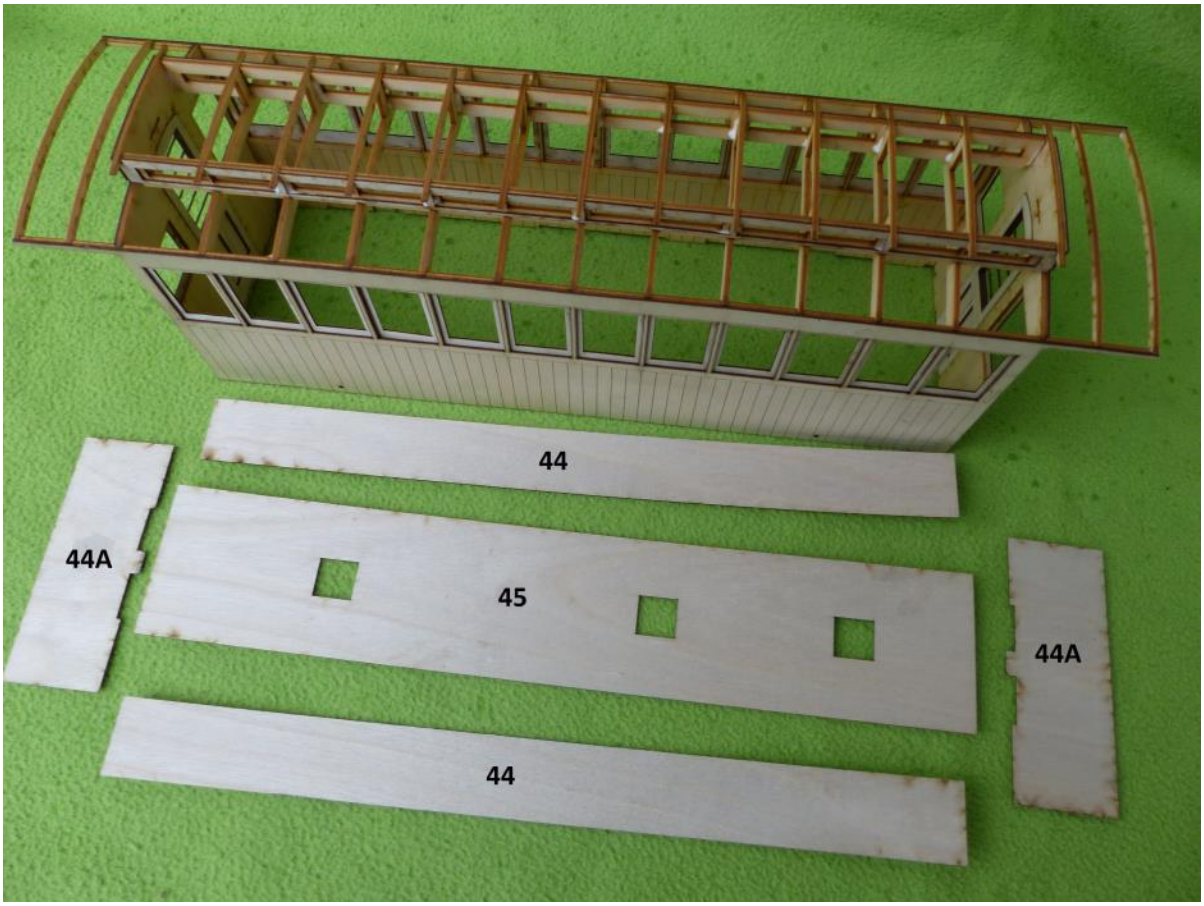
Glue part 42 on top of part 43. Align the small slots along the top of part 42 and 43. The longer slots in part 43 will slot into the vertical tabs on the rafter parts 41.

Insert the Clearstory assemblies with part 43 set into the rafter tops and pressed into the vertical face of the rafters with rafter tabs locking into the slots in the back of part 43. Take care in this installation, the clearstory is a tight fit.

Installed, the clearstory windows will look like this:



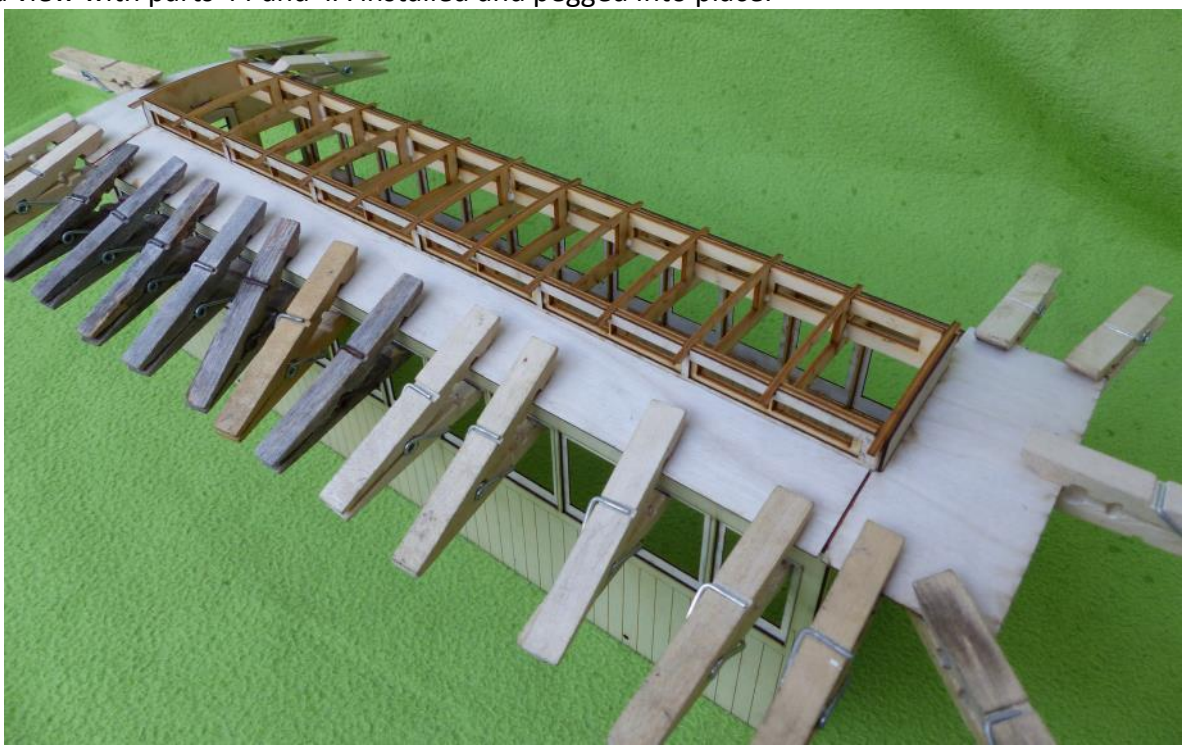
Assembling the roof – Setout lower roof parts 44, 44A, and upper roof part 45 with planked scribed detail facing downward as follows:

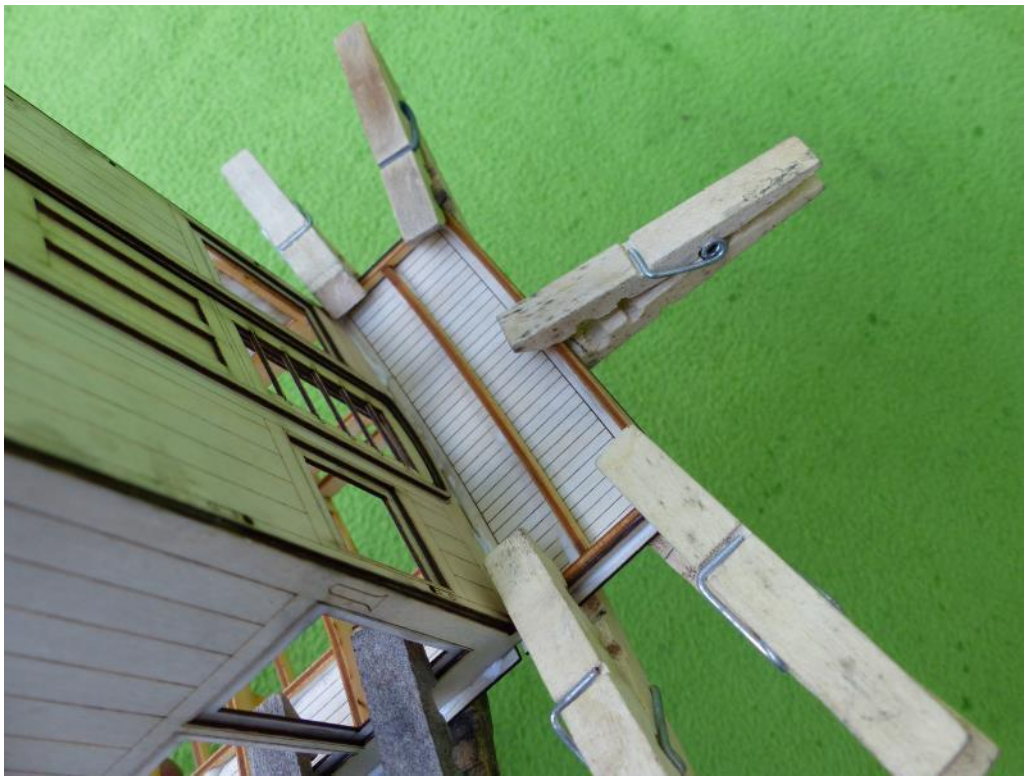


Lower Roof: - Install 2 x roof sheets part 44 on top of lower rafters of roof. Note that the long edge of the roof shall slot below the clearstory outer layer, part 42. With the roof slotted below the clearstory, hold the outer edge of the roof down onto the rafters and down to the top of the car walls via tape and pegs. There is only a minor curve in this roof sheet, so the stress of holding the roof in place should be minimal. Make sure the scribed linework to one side of part 44 faces inside the car. MAKE SURE YOU USE REMOVABLE MASKING TAPE, BLUE OR GREEN IN COLOUR, OR RISK TEARING PLY AWAY FROM THE WALLS WHEN REMOVING THE TAPE!

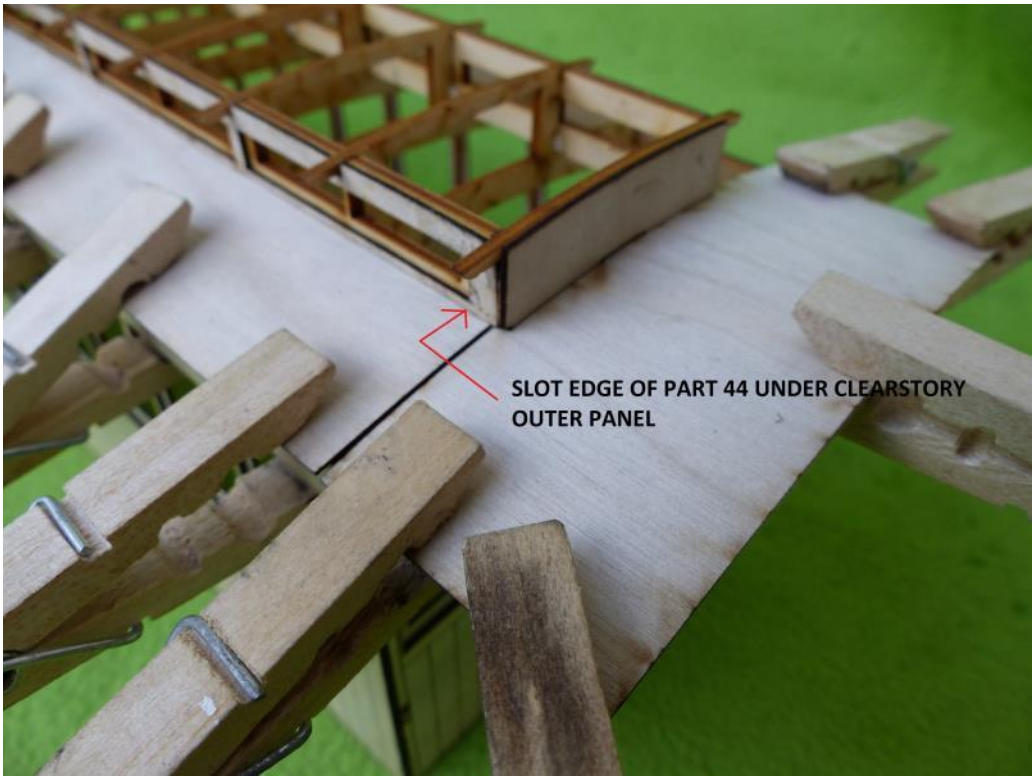
Apply parts 44A to both ends of the car. Press the edges of part 44A as tight as possible against parts 44. Use model putty or fillers to fill and sand the joints between parts 44 and 44A.

Here is a view with parts 44 and 4A installed and pegged into place:





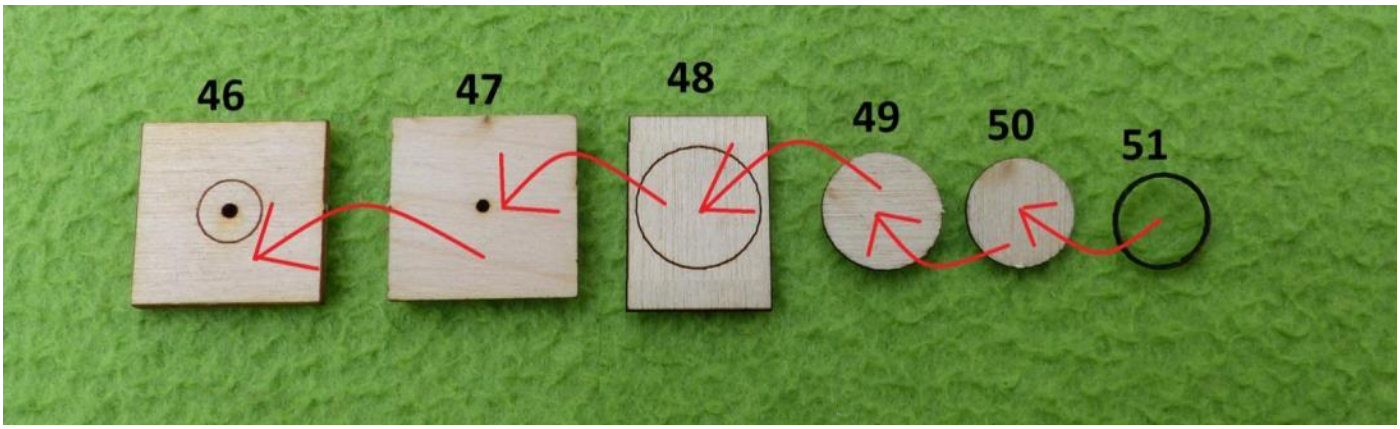
View under part 44A, pegged into place.



Note in the above photo how the edge of the roof is set below the clearstory outer layer, which will hold that long edge in place, while the outer roof edge will be held down to the car walls via tape and pegs. Remove the tape and pegs 1-2 hours later. Do not leave overnight.

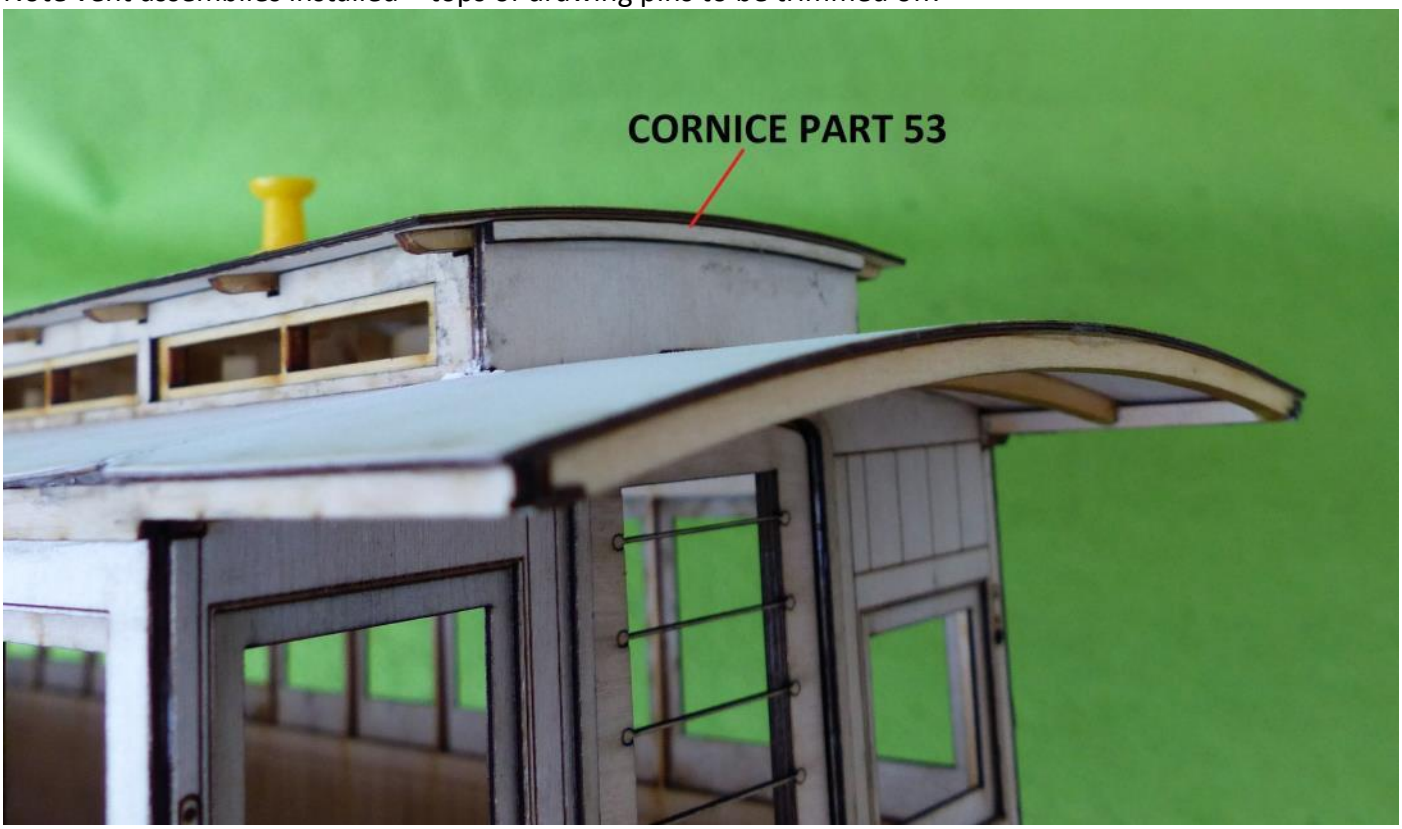
Upper clearstory roof: Install roof part 45 onto to the top of the car roof framing. Make sure you manually centre the roof sheet to all sides. Again make sure the scribed planked detail is facing to inside the car and the smooth face is facing outward. Glue and peg the roof sheet onto the rafters as follows:

Roof Vents: Assemble three sets of inner lamps and outer roof vents as follows – parts 46 – 51 are stacked as shown below.
When stacked and aligned, insert a plastic head drawing pin into the top of part 46. Make sure you trim off the bottom of the pin to about 4mm and insert into the hole provided in parts 46-47. Trim off the very top of the drawing pin plastic to better simulate the roof vent of the real car. Install the vent assemblies into the roof by applying into the square roof holes from inside the car. Glue from the inside.



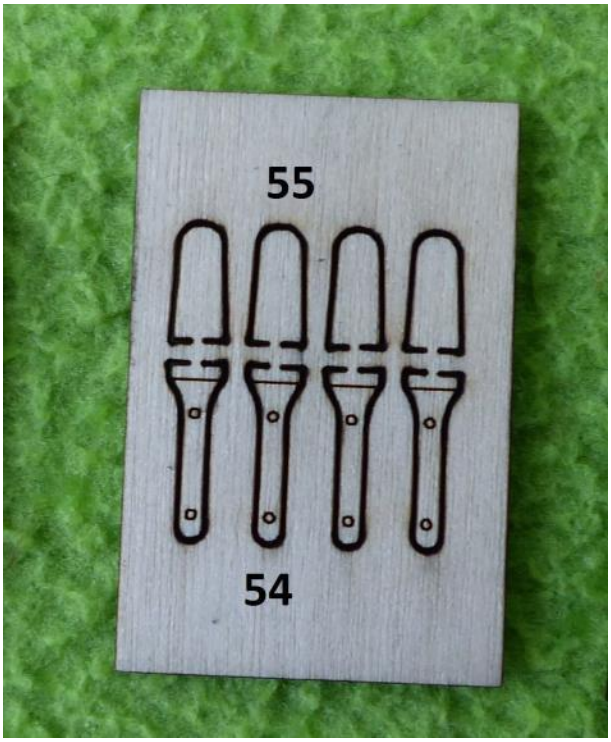
Roof Cornices: Apply cornice trims to the edges of the roof as follows:
Long part 52 to be installed along the upper edge of the side walls, hard against the under edge of the roof. Apply to both sides of the car and centre up. Finally install 2 x cornice part 53 on the end wall, hard against the underside of the upper roof – one to each end of the car. With the cornice and trims in place the end walls will look like this:

Note vent assemblies installed – tops of drawing pins to be trimmed off.



Car side details:

Lamp Cleats: There are 4 lamp cleats on the NV van, 2 on the side walls. These are iron brackets on the real car. We make these by gluing bracket base, part 54, directly onto the car body in the locations scribed into the car side. Part 55, the actual cleat, is then glued on top of part 54 already in place on the car. Apply the brackets to the 4 corners of the car.

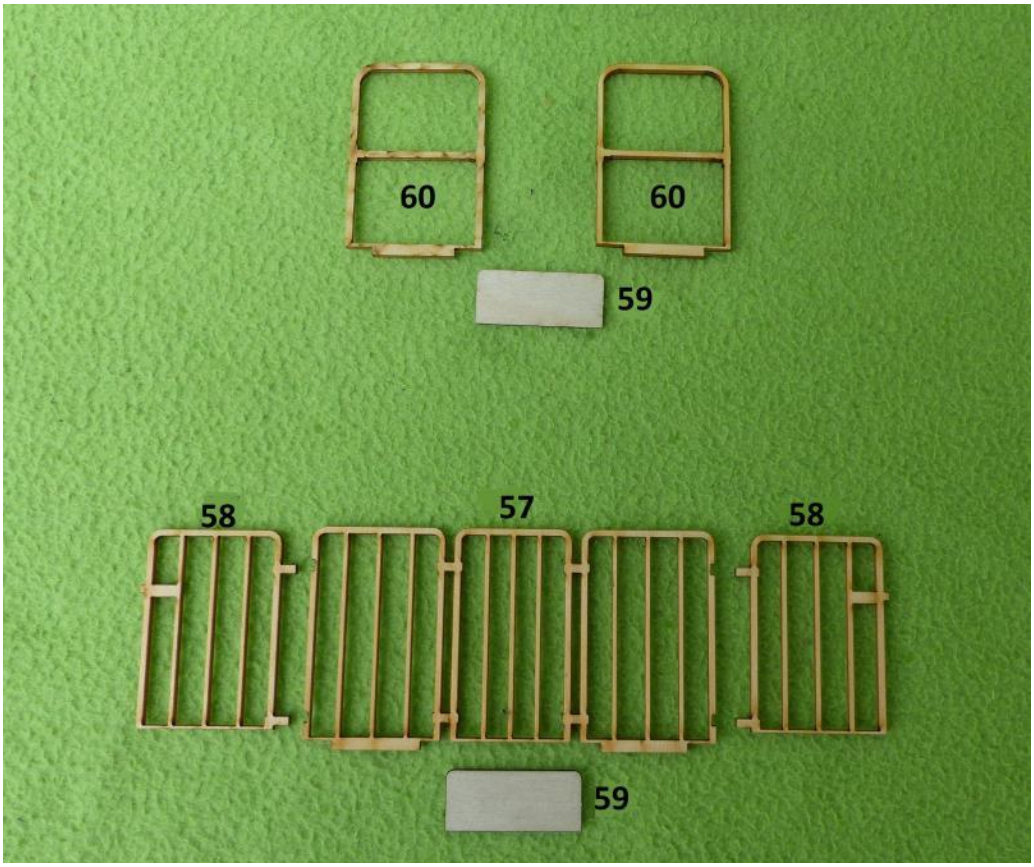


Completing the Chassis End Platforms:

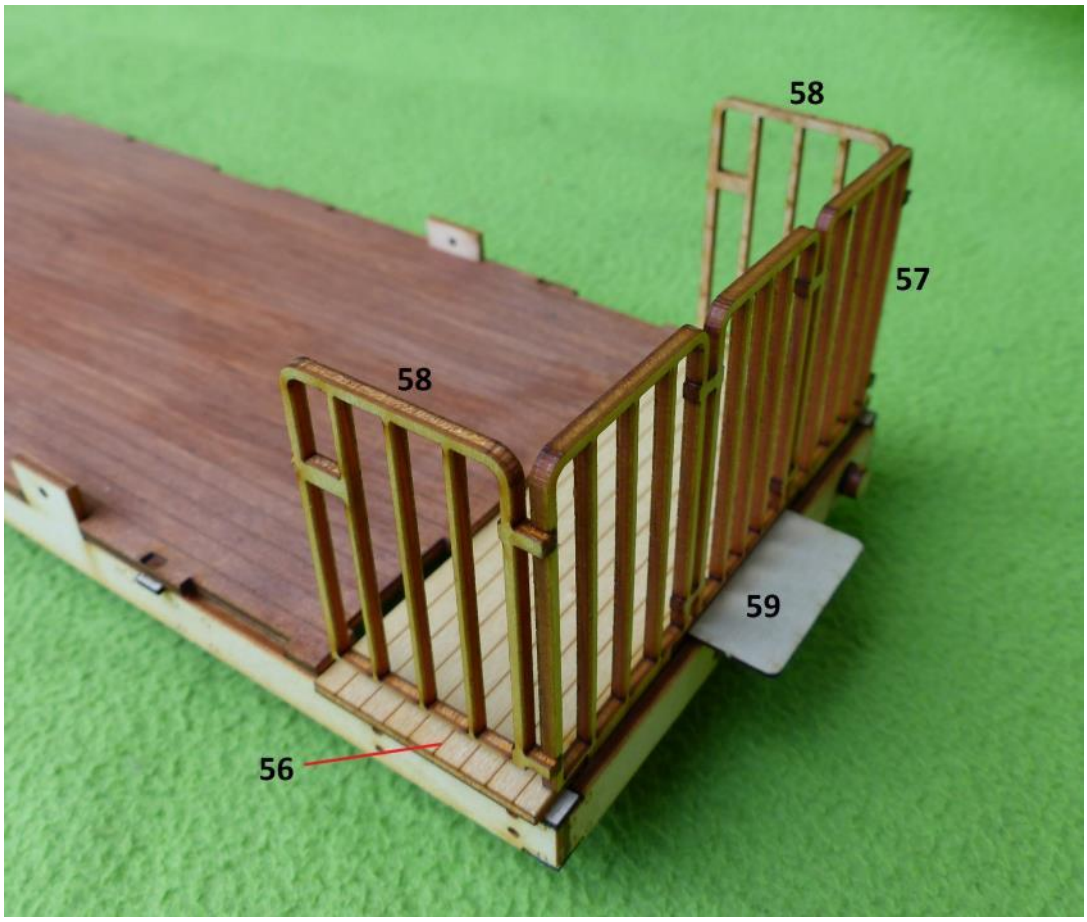
At this point test fit the car body onto the chassis. Fit the body snug onto the car floor. If you wish, you can even bolt the car body into place to hold in true until the end platforms are made.

Next take out end platforms, part 56 x 2. These need to be glued onto the chassis top on the remaining exposed chassis frame. Glue the end platforms hard onto the chassis top (no cleat spacers). Do not glue the car body, nor glue the end platform parts to the car body. Make sure the edges of the end platform fit snug, but not tight into the end walls of the car body. Once the end platforms are glued and dried, then lift the car body off the chassis again.

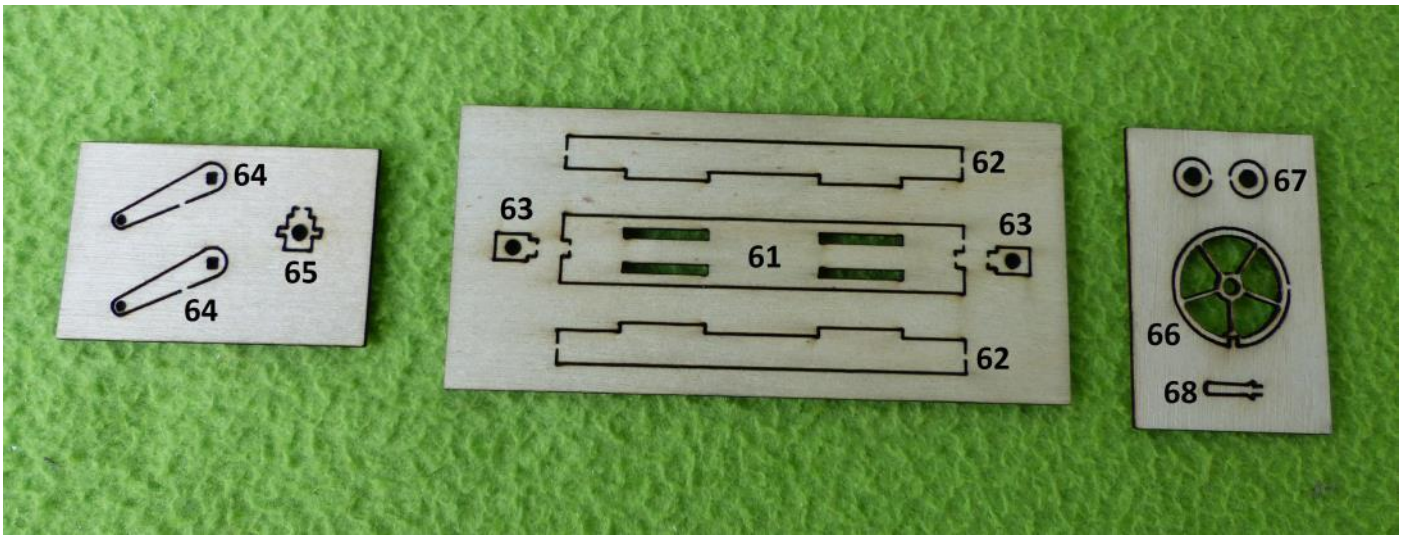
End Railings: - Layout end railing parts 57, 58 and 59, as well as 60. Parts 60 are the original turn of the century end railings, while parts 57 and 58 are the modern day end railings. You will need to choose – original end railings, or modern end railings. Part 58 are the swing gates to the sides of the end railings, while the original design, using part 60 had no gates or protection, only end railings. For these instructions, we'll demonstrate installation of modern end railings, using parts, 57, 58 and 59. If doing the original end railings, substitute part 57 with 2x60, delete 58, and still use 59 (gang way).



Slot railing part 57 into the end of platform part 56 (or 2 x part 60 for original railings). The hang gate parts 58 off the edges of end railings 57. Slot the tab in the bottom of the gate part 58 into the end platform deck to make the whole railing assembly stable, glue the gang way, part 59 into place (either up or down). 59 shown in down position in photo below. In 'up' position, glue part 59 onto the lower face of part 57 railing.



The Brake Wheel Assembly:
Parts 61, 62, 63, 64, 65, 66, 67, and 68 make up the brake wheel assembly to be installed onto the 'brake' end of the chassis. The brake end is the chassis end where the brake bracket, part 24, was installed on the chassis end.



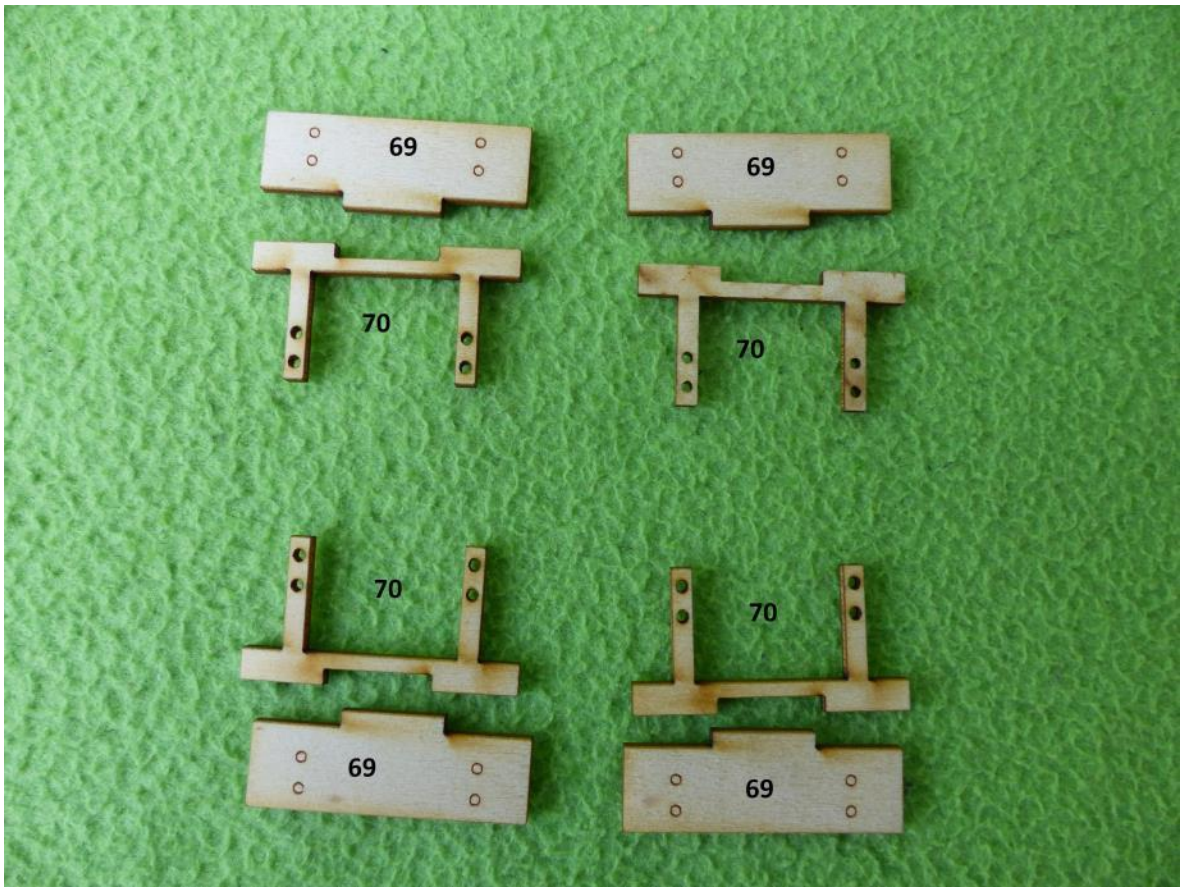
Install 2 x 62 into the slots of backing board 61. Insert 2x 63 to the top and bottom end of part 61. Together these 5 parts form an open box.

Next install part 65 into the slot in the end beam of the chassis – this is the open slot in end beam part 8 of your chassis. Glue 2x parts 64 into the tabs on the either side of part 65. Glue the long ends of part 64 onto the bracket part 24 on the chassis.

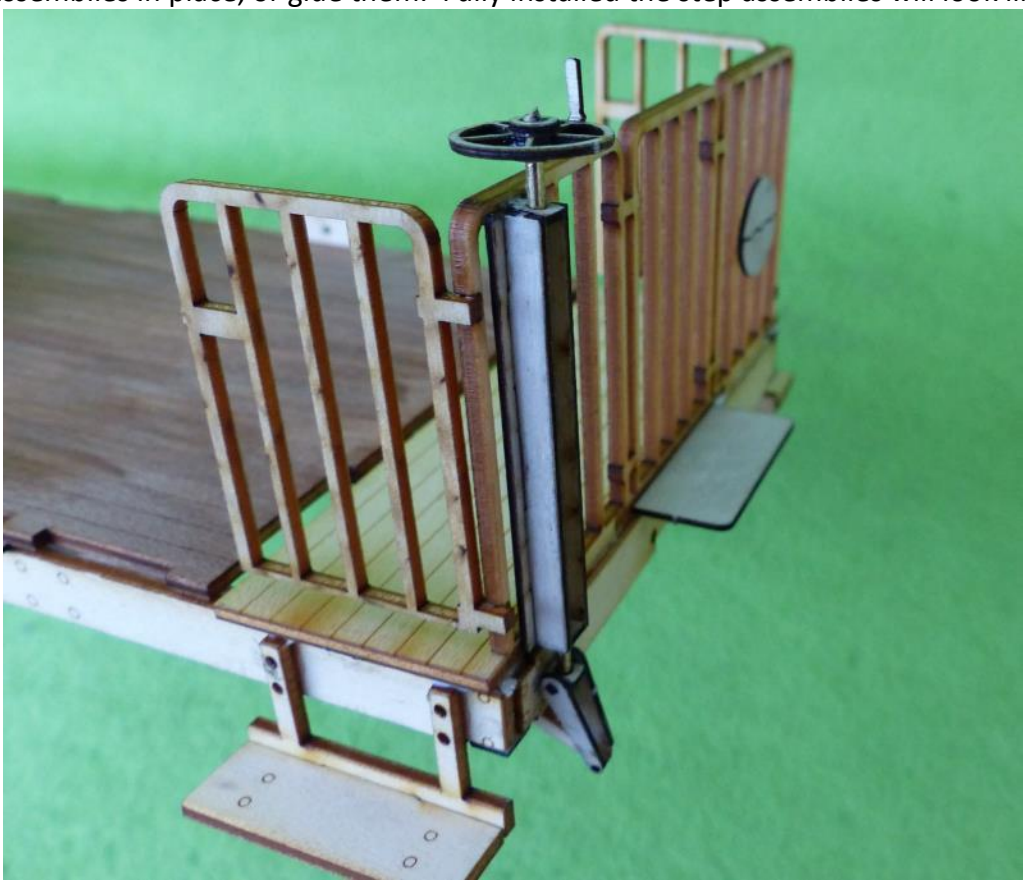
Next install part 68, into the slot in brake wheel 66. Apply part 67 either side of the centre of part 66. Trim a length of 1.6mm metal rod to 66mm length per the metalwork drawing. Glue the brake wheel to one end of the metal rod. Run the rod through the holes in part 63. Glue the brake wheel assembly, including brake wheel and support box (parts 62, 62, 63) onto the end railing, with the end of the metal brake rod extending into part 65 in the chassis.

The completed brake wheel assembly, installed onto the end railings will look like this:

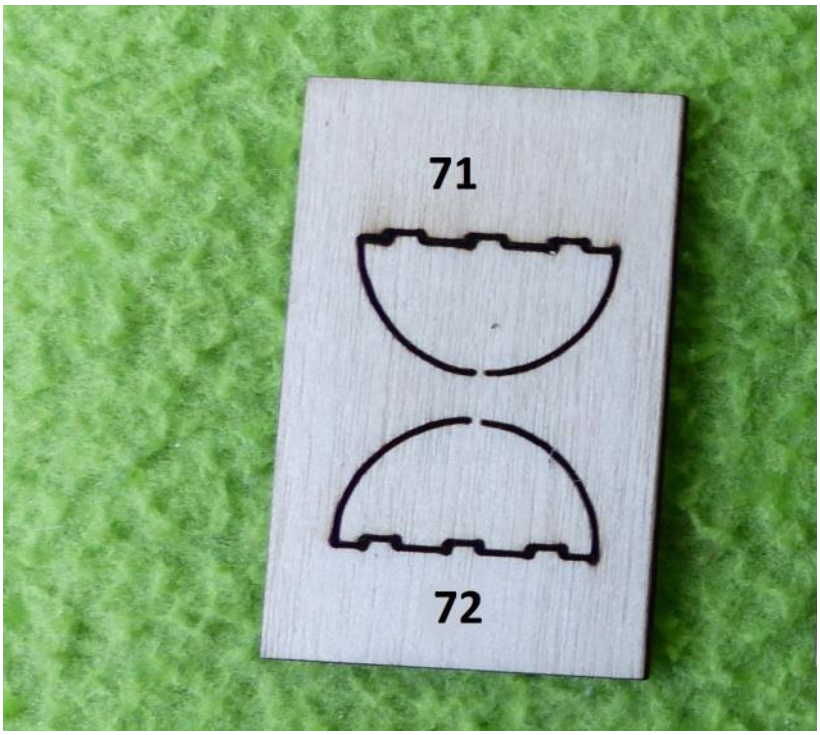
End Platform Steps: Glue parts 4 x 69 and 4 x 70 together to create the 4 step assemblies for the end platforms:



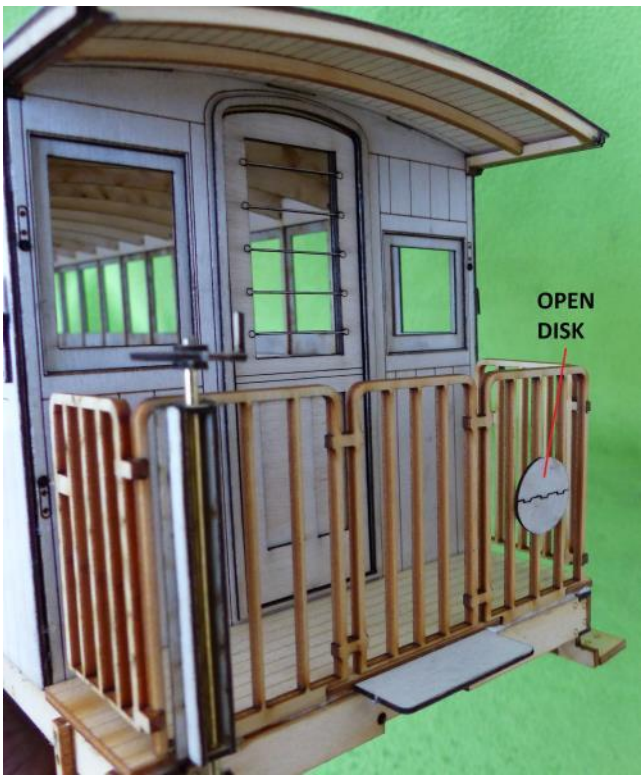
Glue parts 70 onto the top back edge of 69. Make sure the bolt head detail of part 69 is facing upward. Install the step assemblies onto the sides of the chassis frame below the end platforms. You can either bolt the step assemblies in place, or glue them. Fully installed the step assemblies will look like this:

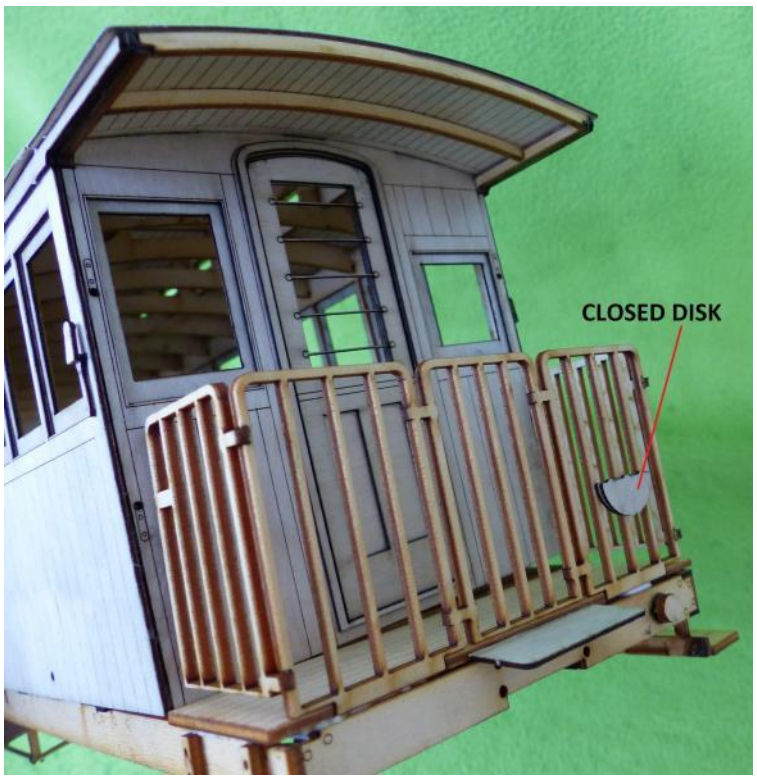


End of Train Disks: These are the folding white disks that are set on the end of the cars to signify end of train. They are applied to both ends of the car, but one end is always in folded position, while the other is open to expose the full white disk when the car is on the end of the train. The disks are made from 2 each of part 71 and 72 as follows:



Glue the disks into place on the car end railings, Glue one disk in fully closed position and one in open position, or if you like the car to always be in the centre of train and use one of our very stylish NV brake vans for end of train, then glue the disk in closed position to both sides of the car.





Final Metalwork:
Fabricate 4 x small hand rails 'car end rails' of 1mm metal rod for the car end walls, follow the profile on the metalwork drawing. Insert the rails into the holes provided on the end walls of the car. This is the car rails as fully installed and later painted:

Painting:
At this point separate the chassis from the car body. Mask the stained internal car floor and paint the entire chassis flat black to all sides. The entire chassis is to be black, including under floor, all metal work, end platform floors and railings, plus brake wheel assembly. The only element of the entire car chassis assembly to be not painted black is the wood stained floor for inside the car. Keep that floor masked while spraying the entire chassis black.

Paint the entire interior of the body Ochre, sprayed in from the inside. You can either spray the car end doors with the body, or push the doors out and paint them separately. The car door shall be painted ochre to the inside and burgundy to the outside. Remember, the outside face of the door is the side with bars across the window. At this point also, spray paint the remaining un-installed car window frames in the ochre colour and set aside to dry Make sure you paint the side with the visible scribing in the frames. Do not install the window frames just yet.

Mask the inside of the car by masking the backs of the windows, door opening and back of clearstory windows. Spray paint the whole car exterior flat black, taking care not to allow the black paint to get inside and spoil the interior ochre colour. The roof areas shall be retained black after the rest of the car is painted Burgundy, so if you want the dusty look to the roof, this is the time is mist onto the roof a dusting of light grey to give the black roof some visual texture. Go lightly.

Then leaving the masking in place to the interior, mask all the roof areas to the surface of the roof only, allow the edges to be exposed. **Spray the entire body Burgundy.**
Remove all masking – you should now have a fully Ochre coloured interior, Burgundy exterior and black roof.

Hand paint the grab rails and lamp irons black. Hand paint the surface of the end of train disk in white, only the disk which is fully open to be painted white. The disk that is in the closed position at the other end of the car shall remain black. The painted car shall look like this:

Decals:
The decals provided with the kit are a water slide format.
Importantly trim the various decal elements close to the edges of the lettering to reduce the amount of clear film visible around the lettering.
Use the PDF diagram of both sides of the car as a guide. Several NB numbers are included in the kit. Also note we have also included options for the NB to be second class with 'SECOND' applied to the car side and we have also include NBD letting for those who wish their car to represent the NBD class. Contact Argyle locomotive works if you would like any special requirements for additional numbers.

Soak the decals in cold water one at a time and apply one at a time. The decal will loosen on the paper in amazingly short time – usually not more than 1min.
Apply the decal to the car body as indicated. Dob on a drop of Decal bedding solution in the location where the decal will go. This is key to making sure the decal beds down into the wood grain and will completely hide the decal film when finished. A decal bedding solution we recommend is Mr Mark Softer, available from model shops. Don't underestimate the good the decal bedding solution can provide. No more visible milky decal film. Let the bedding solution sit under the decal a few seconds and then dab off with tissue paper and push the decal down into the wood grain. Apply another dob of solution on top and dab off a few seconds later.
Allow to dry. Once dry, seal and protect the finished car and decals via spraying the entire car body with a layer of satin, or semi-gloss clear coat. Spray on lightly, mask out the glazing on both sides, or apply the

glass and inner window frame after decals/clear coat. The clear coat we recommend is Mr Hobby Top Coat, either 'Matt' or 'Semi-gloss'. I prefer semi-gloss, but some modellers prefer Matt. Don't bother clear coating the roof.

Installing the Glass:
At this time trim the glass sheet material provided to match the exact profile of the inner window frames. The inner window frames for the side walls and end walls should be currently painted ochre to the outside, but not yet installed. Carefully glue the glass panels into the inside walls – I recommend providing a glue line of Tarzan's grip to the top and bottom edge of the glass only, not do the side edges. As each glass panel is inserted into the walls from behind. Immediately drop in the inner window frame onto the glass from the inside. The glue on the glass should be sufficient to hold the inner window frames in place with no additional glue. Make sure the inner window frames have the scribed detail facing inward.

Cut out two glass panels to insert into the end doors. Slip the glass into the top of the door and slide down into place within the centre layer of the door. Run a glue line along the top edge of the door to prevent the glass sliding out again. At this point you can glue the doors into place in the end walls. Note the doors in this car were sliding doors, so if you want to have operating swing doors, note the NB didn't have swing doors.

Fix car body to chassis: Now attach the car body onto the chassis by placing the assembled car body down onto the chassis floor. Align the tabs in the bottom of the car walls with the slots in the edge of the floor. When aligned, DO NOT GLUE. The car body and chassis shall always remain separate elements to enable access to the car interior in future. Instead, you'll notice the two remaining large up stand cleats on the chassis frame that slot behind the car body walls. With the body in place, insert 4 x small 1.5mm diameter bolts through the holes in the car will into the car chassis tabs.

The Trucks: The finished car is ready to roll as soon as you install the trucks. Preferably you'll install the special die cast prototypical Fox Bogies as supplied by Argyle Locomotive Works/ Fit them with a nom 3mm diameter bolt into the chassis. Set the height using washers. The car is also capable of running with LGB or Bachmann standard arch bar trucks, with small Bachmann wheels. Install the Accucraft Knuckle couplers, using the 4 bolts provided with the couplers. Apply a drop of CA onto the bolt tip and screw into place in the 4 holes provided in the end beams.
The finished car thus:

2 NB

2 NB