

NZR BP3866

30' Guards van kitset

KS030



Welcome to the NZFinescale 30' van kit. The kit takes advantage of (at the time of writing) the latest digital technologies to produce high fidelity parts that are hopefully relatively easy to build.

These instructions and associated information are provided in soft copy. This enables far fuller information than is practical in print form. Using the zoom feature on your pdf reader will allow closer inspection of the photographs.

As always I welcome comment and feedback. If you need any help we will always do what we can.

If there is some variation not covered that you would like, please get in touch as there are often parts available after release that may not be listed. The kit has versions with alternate footsteps and handrails.

Contact me at lawrence@nzfinescale.com. To contact me by mail or phone, look at the website (www.nzfinescale.com) for current contact details.

Parts Key

Note that unlabelled parts are either duplicates, spares, redundant or self-evident. With small parts, generally more are supplied than are required.

3D printed parts:

- 1 Body
- 2 Floor/underframe
- 3 Luggage end platform
- 4 Guard's end platform
- 5 Roof
- 6 Verandah end
- 7 Brake set (integral on BP5879 underframe)
- 8 Bogie side frames (4)
- 9 Bogie bolsters (2)
- 10 Side doors (L/R)
- 11 Side door shrouds (L/R)
- 12 Brake stand
- 13 Guard's seat left
- 14 Guards seat right
- 15 Dogbox left
- 16 Dogbox right
- 17 Roof vents/chimney (set)

Etched parts:

- 1 Fret
- 2 Bogie frames

Cast brass parts:

- 1 Footstep sprue
- 2 Small parts sprue

Other parts:

- 1 NY wheelsets (4)
- 2 Pinpoint bearings (8)
- 3 M1.4 screws (8)
- 4 M1.4 threaded inserts (8)
- 5 M2 screws (2)
- 6 M2 threaded inserts (2)
- 7 0.1mm glazing
- 8 0.6mm wire
- 9 0.3mm wire
- 10 0.4mm wire
- 11 Chain
- 12 Ply footsteps.

General comments

The kit is a representation of the NZR BP3866 30' guard's van on the semi wood (BP3862) or steel channel (BP5879) underframes with BP1656 bogies. The artwork and patterns were derived from copies of the original NZR prints obtained from various sources and photographs of the prototype. This style of van was covered in detail in a series of articles by Kevin Crosado in the NZMRJ from August 2007. Many of these vans were built, and they were quite long lived, so the real thing had some variations. Study of period photos should enable construction of an accurate model.

There is a wealth of detail in this kit, most of which is integrated into the major parts. Don't be afraid to leave out the brake rigging, and smaller parts if this is not your thing. Without doubt there are small and fiddly parts to assemble. However, these should all fit, and where possible guides, slots or tabs/spigots are provided to assist fixing.

In general, the specification for this kit has been exacting. Pattern work has been proven over many iterations.

Please consider following the instructions. There has been some learning on my part, and I'd hate you to have to repeat all the mistakes I made. In the photos, views are generally taken in progress and many are 'warts and all' rather than cleaned up. This is how the model really looked as I was building it. The order of the instructions is hopefully logically laid out, but where something really does need to precede another step I have tried to highlight this.

Technical preliminaries

Specification: This kit has been designed to finescale standards and incorporates a compensated bogie design. This not only helps keep the van on the track, but also reduces running noise and produces realistic movement when in motion. It is intended to take scale couplers. It is possible to carve the headstocks to take Kadee couplers if desired.

3D prints: The 3d printing process is able to capture levels of detail and precision that have been hitherto impossible in short run kits. However, all techniques have their limitations. 3D prints need to be supported and the sides with supports may show some scarring from their removal. In addition the supported faces are typically softer in resolution. These limitations can generally be worked around in the design, which is why the model may seem unusual in its division into parts.

There are advantages to printing parts directly on the build plate, but this has the downside that they may feature an 'elephant foot' or swelling within the first few layers. I generally arrange parts so this can be cut back invisibly.

Generally the resin used for these prints is quite tough but can be brittle. If cutting the print use an appropriate saw and abrasives rather than a knife or other cutter. Cut off discs can work quite well, but fast. Use with caution and avoid overheating the resin. Supports, if present, can generally be snapped off or scored and snapped. Note that the instructions may demand support removal, but this may have been done for you during production in some cases.

If printed parts are distorted they can be readily straightened by immersion in hot water, followed by cooling against a true edge. Use boiling water with caution as the parts will become excessive soft and hard to control.

Sometimes print artefacts (layering etc) may be visible. If these are a concern I suggest spraying with surface primer and reassessing. Most, if not all, such artefacts disappear after the first layer of paint. If any remain, they are easier to remove from a primed model.

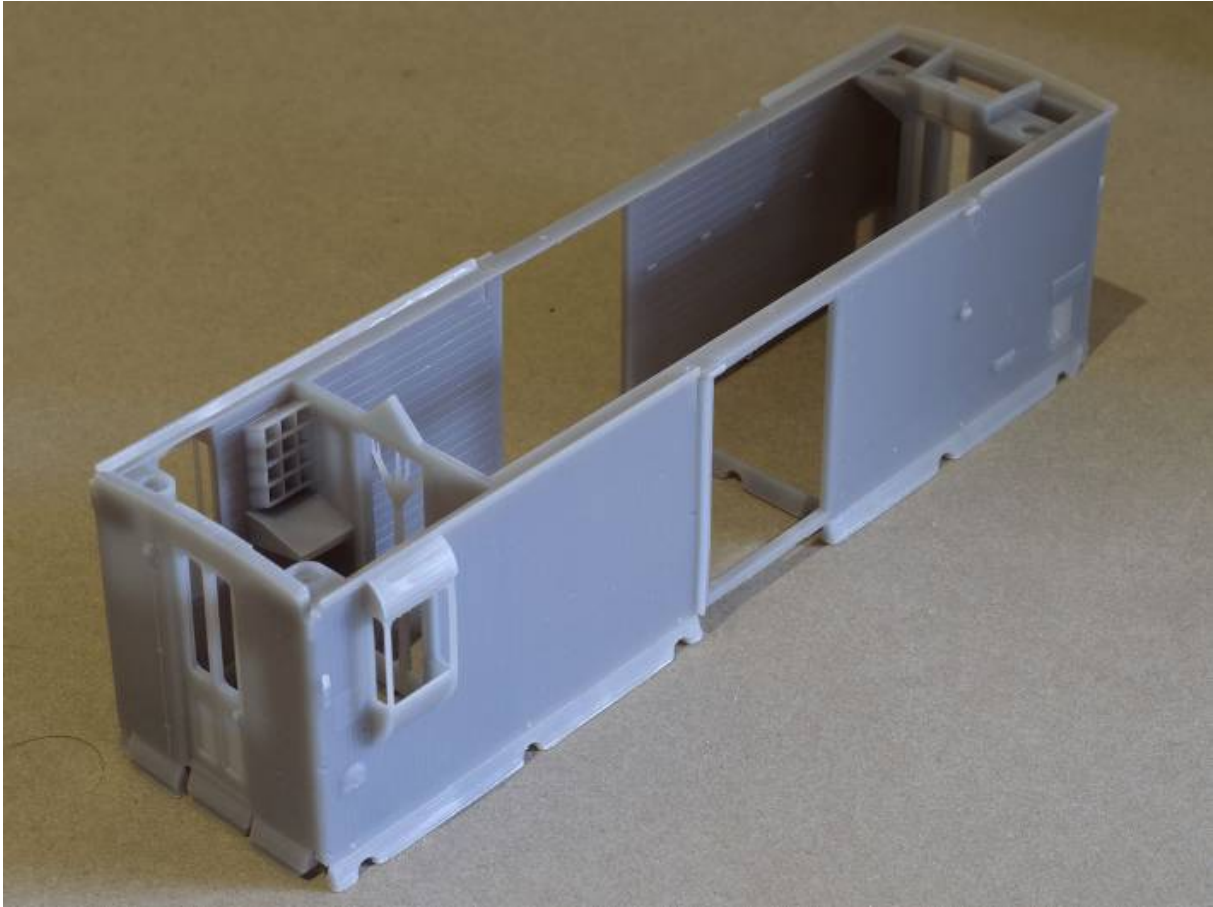
Naming conventions for parts: I have used what I consider to be a rational naming of parts, based on my fairly superficial knowledge. The aim is to guide the builder in construction of the model, not provide an accurate historical reference to mechanical nomenclature. I may not always be entirely consistent, but reference to the pictures and drawings should make matters clear.

Additional parts: The kit is largely complete apart from couplers, since NZR modellers use a variety of these that are not always compatible and decals. Beautiful cast brass couplers to suit are available from NZFinescale.com. Some minor details from common modelling materials are also not included, but most will have these on hand, if they fit them at all.

Important note

The modelling hobby is supposed to be fun. If disaster strikes, don't be afraid to get in touch for help, guidance or replacement parts. Where possible we will endeavour to replace parts gratis or for a nominal charge. We get a kick out of seeing models built, not languishing in a drawer, so we do what we can to see that happen.

Body preparation



The body is supplied as a one piece resin print. The mating surfaces between the body and underframe require careful, but not excessive, cleanup to fit precisely. Exercise caution in handling the prints. Lookouts, dogbox door handles etc are relatively fragile and will not survive rough handling.

First remove all supports and remnants. Small conical supports can be carefully trimmed flush with a scalpel or similar. The larger knife edge supports on the lower faces are best scored with a knife and then carefully snapped off.

Smooth the tops of window openings, doorways etc with an appropriate abrasive (sanding stick/needle file etc), taking care not to remove too much material and keeping the openings square. This should take very little work.

Smooth the body side bottom faces by gently rubbing the body on a sheet of abrasive paper placed on a flat surface. Again this should be quite quick and easy as very little material needs to be removed. Note that the sides are well proud of the ends.

Clean up bottom edge of the body at the guard's compartment end. This is recessed by the thickness of the platform (1.2mm). At this point it is best to just rough it to size, pending final fitting when the underframe is available.

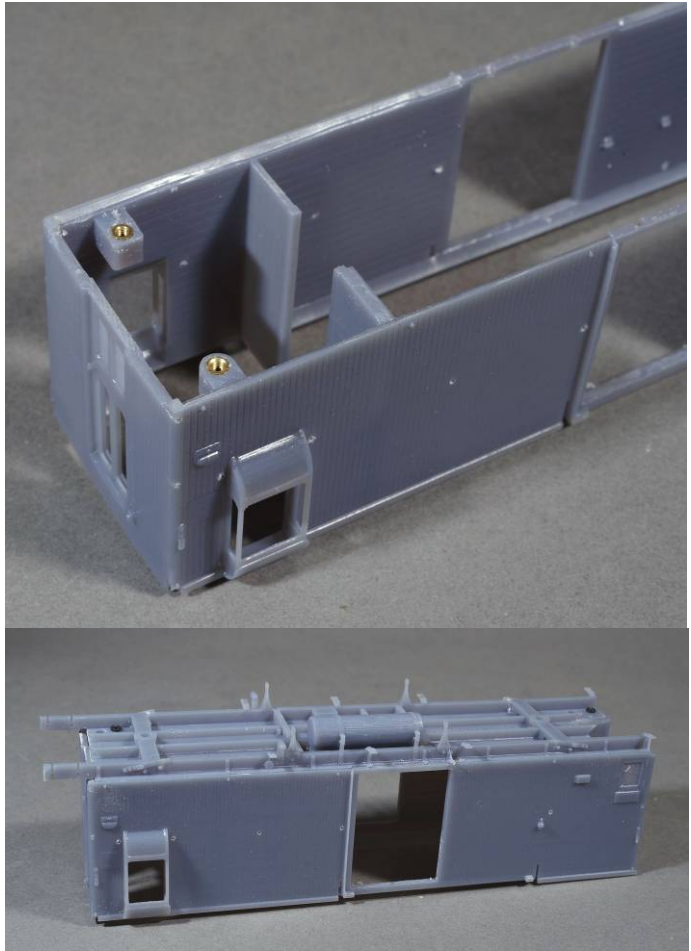
Clean up the body bottom edges at the luggage compartment end. This is a tricky bit as the end walls need to be 0.6mm above the sides, while the door and vestibule sides need to be 1.2mm above the sides. Again it is best to just rough these flat at this point and finally fit to the underframe/floor later.

Check 4x M1.4 threaded inserts to ensure screws move freely through them. These are very occasionally tight and may require clearing with a tap. Best to determine this prior to fitting them. Fit inserts to the locations at each body lower corner. These should be a press fit, but reinforce with epoxy glue taking care not to get adhesive inside the threads.

Clear roof fixing holes in body top corners 1.5mm if needed. It is convenient if they are tight as they tend to retain the screw which is useful.

Drill holes (0.3mm) for handgrabs and 0.6/0.8mm holes for handrail knobs as appropriate (Most of the knobs require a 0.8mm hole, check the knob shank). Locations are printed in for these. If fitting lamps now is a good time to make any mounting arrangements needed.

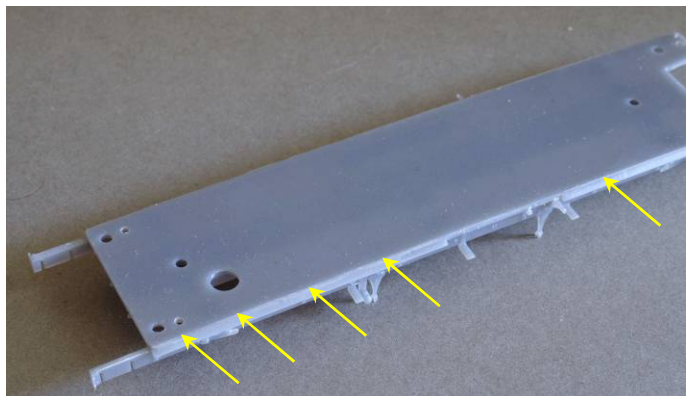
If fitting short footsteps, fill any handrail witness marks that will not be used.



Underframe/floor and platforms

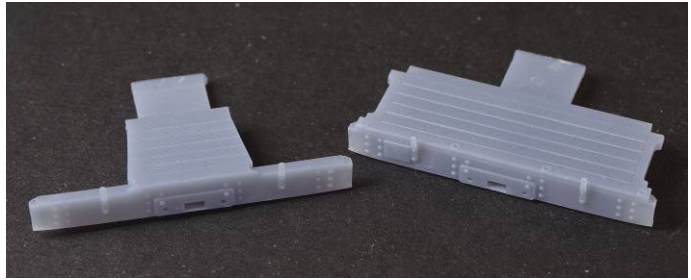
There are two underframe options for this kit. The one without truss rods is somewhat simpler, so the truss rod version is illustrated. The other underframe is generally similar and the steps that do not apply will be obvious. The underframe/floor is supplied as a single part incorporating much of the underframe detail. Firstly clean up under the side door sills. The edges should be square in this area. Work carefully around the various brackets, noting that the sills on the body are notched out to accommodate these.

Remove any elephant's foot along the sides of the floor (where indicated). I scrape this back using a knife edge. It doesn't matter if you remove a little too much, but if you leave any proud the body will not sit properly.



Clean up the platform/headstock parts removing any elephant foot and support scars. This is the area requiring the most fitting between parts so be patient and check fit often.

Check there is sufficient clearance in the coupler openings to allow free coupler movement. Drill the guard's end headstock to take the end railings (0.5mm) at the printed ferules.



Clean up the luggage end platform/headstock so that the headstock sits back against the brackets on the underframe and the platform is flush with the floor.

At the guard's compartment end of the underframe remove the knife edge print supports on the short underframe extensions and dress so that the guard's end platform fits hard against the underframe brackets and is flush with the floor.

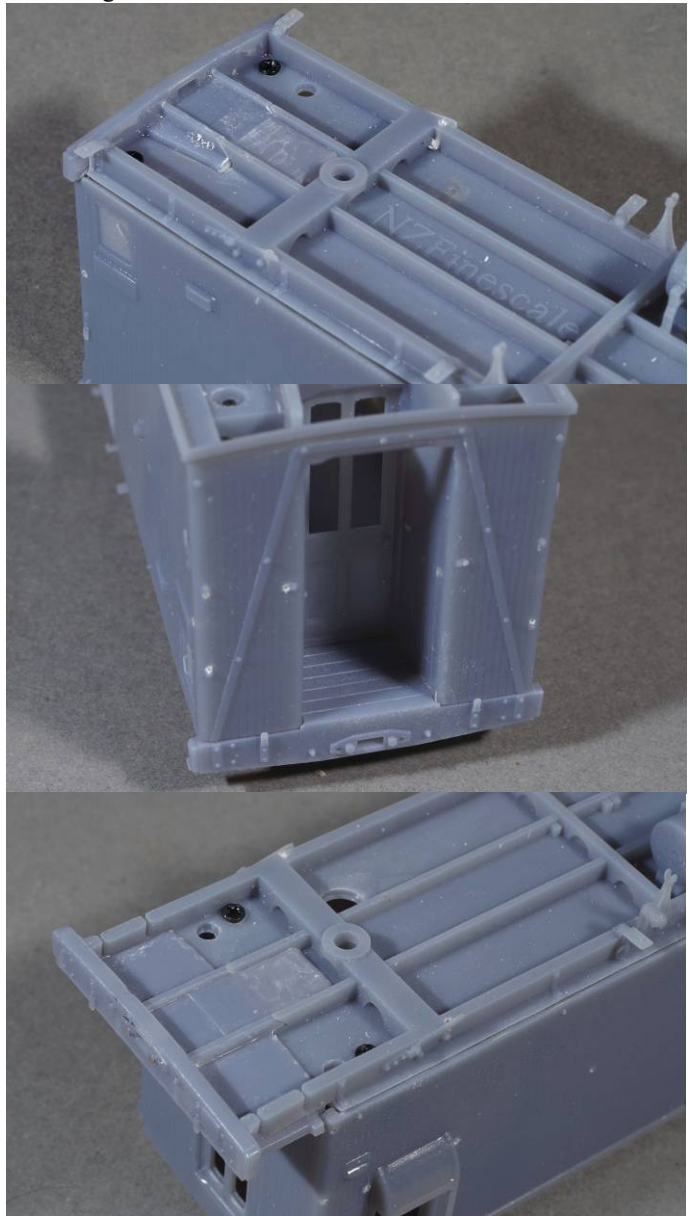
Open out the mounting holes in the underframe 1.5mm and the larger holes to take the shank of your favourite jeweller's screwdriver as you'll need to access the roof mounting screws via these.

Test fit the under frame to the body. The bottom of the sides should be flush with the underside of the floor. Be gentle. If the fit is not good, disassemble and relieve any tight areas.

Once you are happy with the fit of the body to the underframe, dry fit the luggage end platform. Dress the lower edges of body end so that the platform is flush with the floor, the headstock is hard against the end wall and the headstock is hard against the underframe brackets.

Make sure the fit is good and distortion free with the underframe screwed firmly to the body.

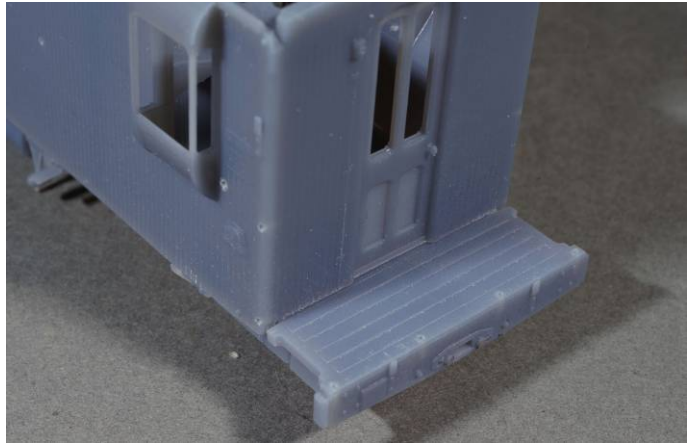
Note how the end walls are recessed into the platform planking.



Do a similar exercise at the guard's compartment end, making sure the platform is flush with the floor and the headstock hard against the brackets. Again, make sure the fit is good with the underframe screwed firmly to the body.

Make sure that the platform is level and sits on the underframe without stress.

With the underframe screwed to the body, glue platforms in place with CA glue, reinforcing with epoxy if desired. Be careful NOT to glue the underframe to the body.



Roof

Clean up the roof by carefully removing any elephant foot around the lower external edges. Take particular care at the guard's compartment end. It is important to remove any excess that may impact fit, but not critical if too much is removed as the roof should sit in the taper.

Fit 3mm M1.4 threaded inserts (after checking threads) to each corner of the roof at the recessed locations. Note that these need to remain proud as the roof is not deep enough to fully recess them.

Clean the dowelling holes in the end face 1mm.

Test fit roof to body with underframe removed. This should be a very neat fit.

Once you are happy, test fit with screws tightened and adjust as required. Avoid distorting the roof as it will not sit flat if you do. Note that there should be a gap above the top of the side door sills, as shown.

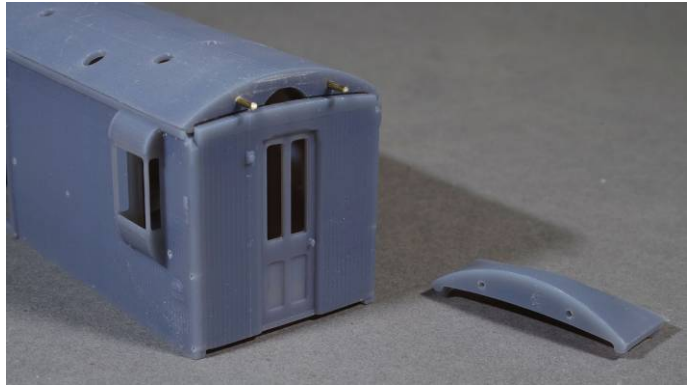
Clean up the verandah roof section. Remove any elephant foot from the underside, but leave the upper surface as is. Drill out the dowelling holes in the joint face 1mm.

Test fit the verandah roof to the body/roof assembly. It should be nice and tight with minimal gap anywhere. Make sure it is fully home – the facing under the roof edge should appear continuous, not stepped.

The idea here is to make sure everything can fit and that there is nothing preventing parts locating as they ought. In this image the verandah is not fixed, just firmly held due to good fit.

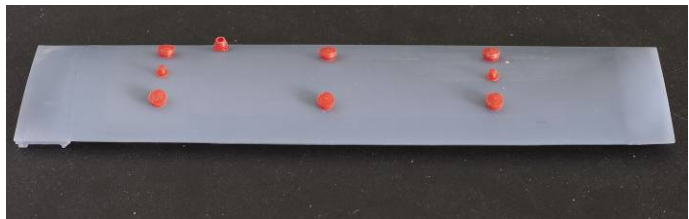


Disassemble, dry fit 1mm brass wire dowels and fit the verandah to the roof. Reassemble to the body and ensure everything fits well. Generally this is the case. If it does, remove the roof and glue the verandah in place with CA glue OR use low viscosity CA and glue with roof in place. If the latter course is taken make sure not to glue the roof to the body.



Apply filler to the joint if required and allow to dry. Also fill any vent/chimney holes that are not required (Stoves were not always fitted and some of these vans lacked the centre pair of ventilators). When everything is hardened, sand the roof smooth removing all print layering. Be careful not to damage the edges and corners of the roof.

Open up the holes in the roof, if required, and fit the ventilators, lamp vents and chimney, fixing with CA glue.



Drill out the end railing holes on the verandah moulding at the marked locations 0.5mm.

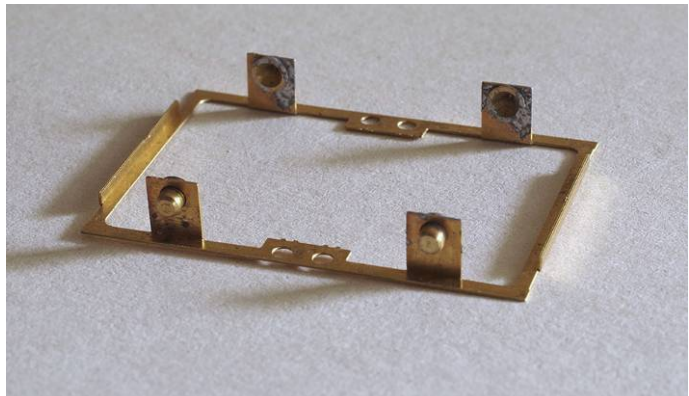
Also fit rain strips to the roof above the side doors.

Bogies

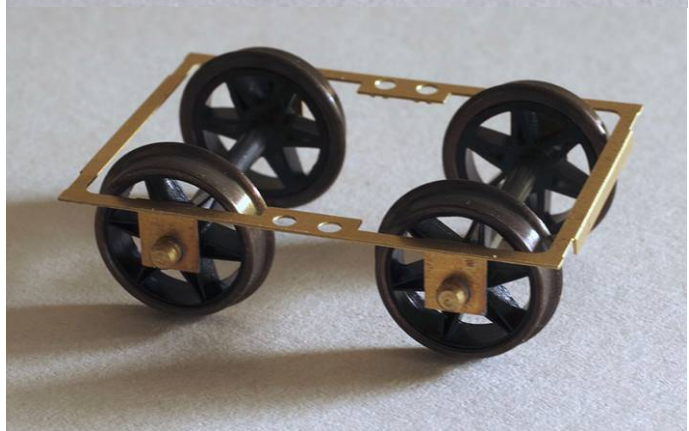
Note: Parts may vary from those shown depending on bogie type, but the procedure is similar. B60 bogies shown

Clean up etched bogie sideframes. If stretchers have them fold, the angles 90° (as shown). Fold bearing hangers 90° and reinforce sparingly with solder.

Glue/solder pinpoint bearings in place.

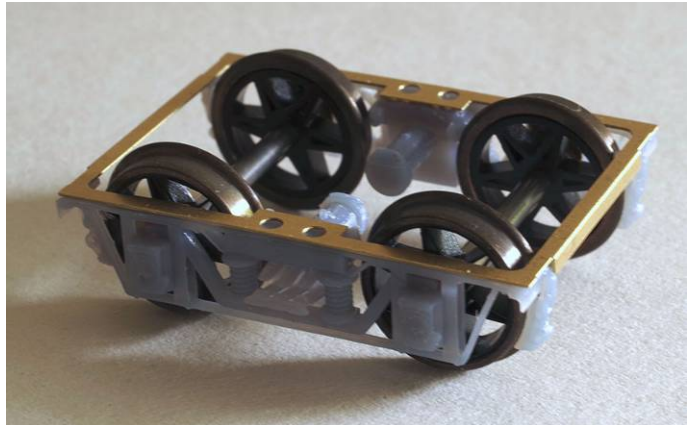


Clip in wheelsets and check free running.



Clean up cosmetic sideframes, making sure the areas that sit against the etched parts are flat.

Glue sideframes in place at bearings and along top edge.

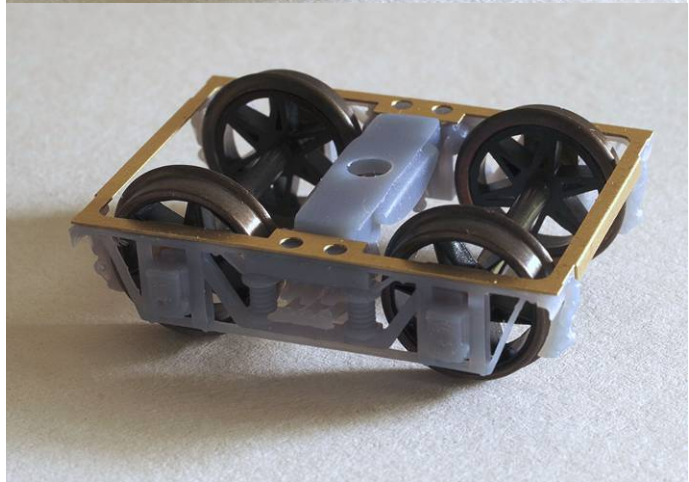


Clip bolster in place taking care not to put force on the printed sideframe details. This is best done by forcing the spigots on the sideframes into the bolster with a thumbnail.

Wheelsets can be removed if required by removing the bolster and gently flexing the bogie.

Stretchers for the brakes are also supplied where appropriate. Fold these 180°, solder and clip behind the brake shoes.

Fit bogies with M2 screws and printed bushes. Use etched washers provided to adjust vehicle height if required.



Underframe detailing

Note that many steps here are not required for the BP5879 underframe.

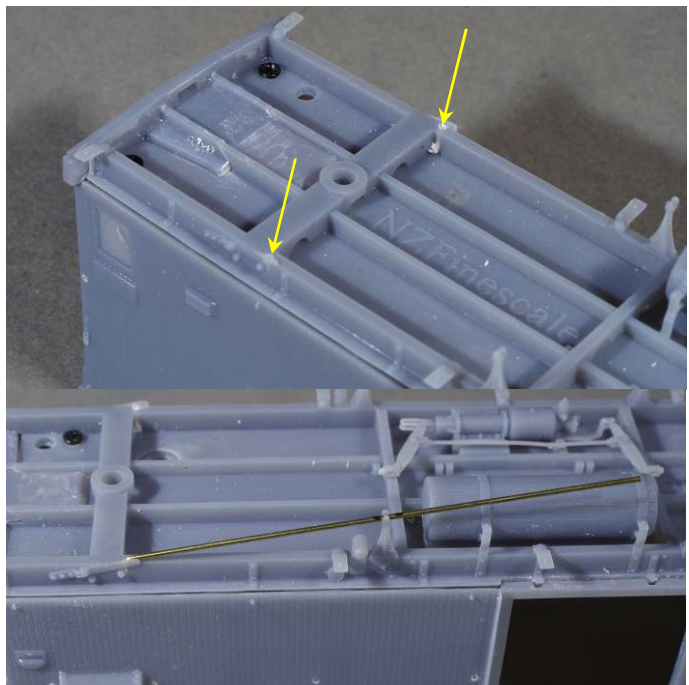
Open up 0.6mm holes at the base of the truss rod fitting as shown. Note that these are not square, being hard against the outside of the solebar at the lower face through to the inner face at the top edge. The printed holes should guide the drill.

Fit M2 threaded inserts to bogie centres.

Bend up and fit truss rods from 0.6mm wire.

Bend the solebar end first and fit as shown. Mark the queenpost location and then remove to form. Do not lever against the queenpost.

Alternately use nylon monofilament (fishing line) for truss rods. This is somewhat easier and more robust, though you'll rely on glue for the turnbuckles rather than solder.



Clean up and prepare turnbuckles and carefully open out 0.6mm. Fit truss rods by CA gluing in place and fitting turnbuckles with solder or CA glue.

Clean up the Westinghouse set so that it fits the openings in the underframe. If you want to fit brake rodding, open out the ends of the clevis joints 0.4mm (arrows).

Glue brake set in place.

Fold and fit etched strip safety loops (yellow), fixing into printed slots.

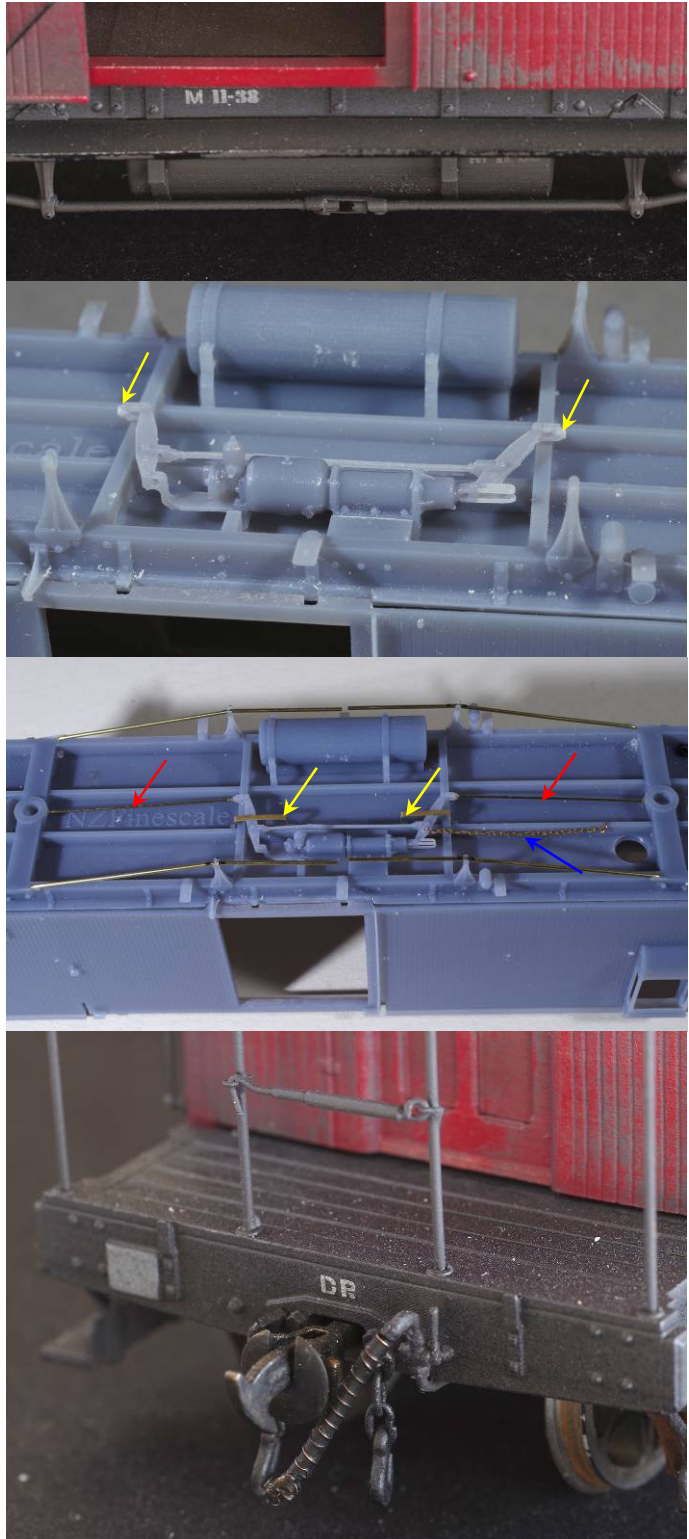
Fit brake rods from 0.4mm wire (red)

Fit handbrake chain (40LPI; blue, not supplied).

Drill headstocks at each end (0.5mm) to take the spigot on the brake cock assembly and fit as shown.

Make up a hose from supplied soft plastic tube and fit gladhands. (Leave this until after painting)

Run a 0.5mm wire brake pipe between the cocks underneath the van if desired.



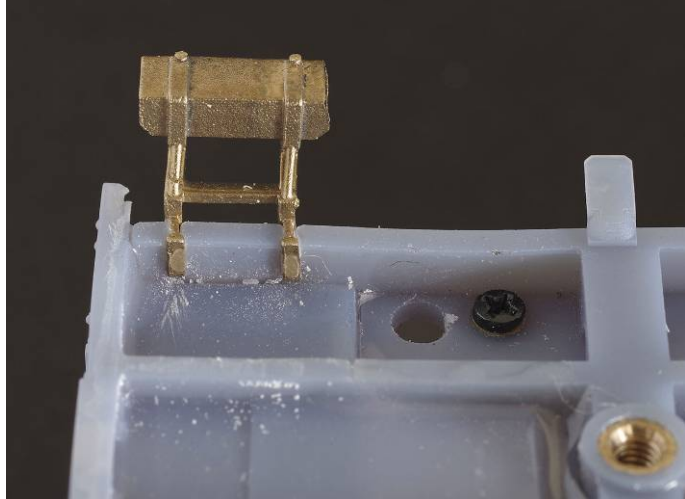
Open out holes in headstocks for sidechain eyes (0.5mm).

Open out eyes and fit to headstocks, gluing from behind.

This is a good time to do any modifications that may be needed to suit your choice of couplers.



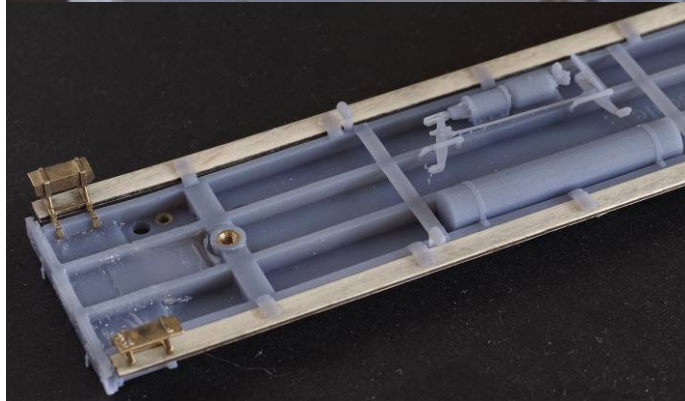
Fit cast foot steps clipping into slots in the solebars and fitting with CA glue. There is a thin web in the slot that needs to be removed before the steps can be clipped in.



Fit laser cut ply footsteps (cut down as required if building later vans).

I find that the printed brackets for the footsteps do not always sit horizontal. I rectify this by very cautiously heating them, one at a time, with a soldering iron (Don't touch the resin, just hold the iron close.) Gently push the bracket to the desired position and allow to cool for a few seconds.

Attach steps with CA glue and clamp until cured.



Side doors

Clean up side doors, removing all support scars and truing edges.

Open out holes in sliding guides at door top 0.5mm.

Open out holes for diagonal handgrabs 0.3mm.

Drill for handrail knobs 0.8mm.

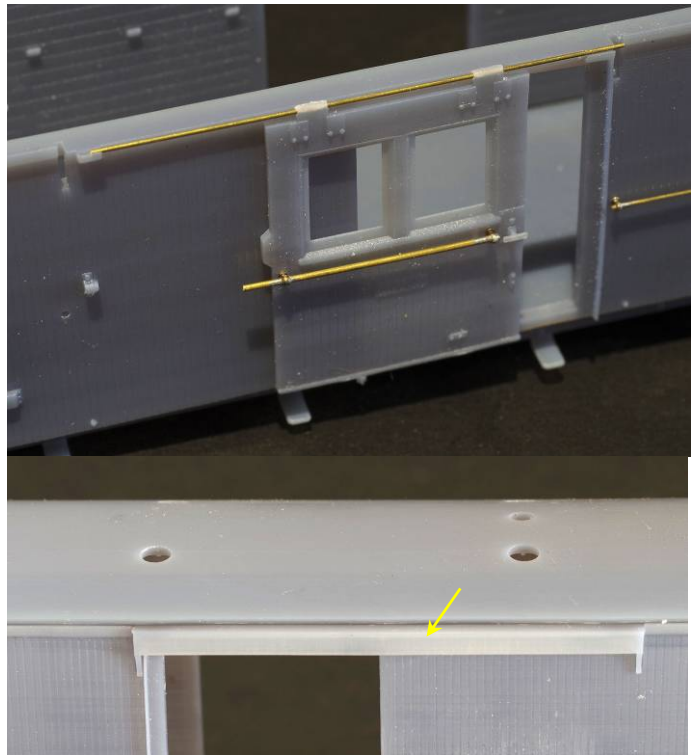


Cut lengths of 0.4mm wire around 47.5mm so that they fit neatly in the slots at the top door sill in the body. Thread the doors onto the wire and place the wire in the slots.

With the roof in place the door shrouds (which are handed) should clip into place and retain the door, which should be free to slide.

With the shroud in place I remove any elephant foot that is present (on the edge indicated by the arrow) with a knife blade used as a scraper.

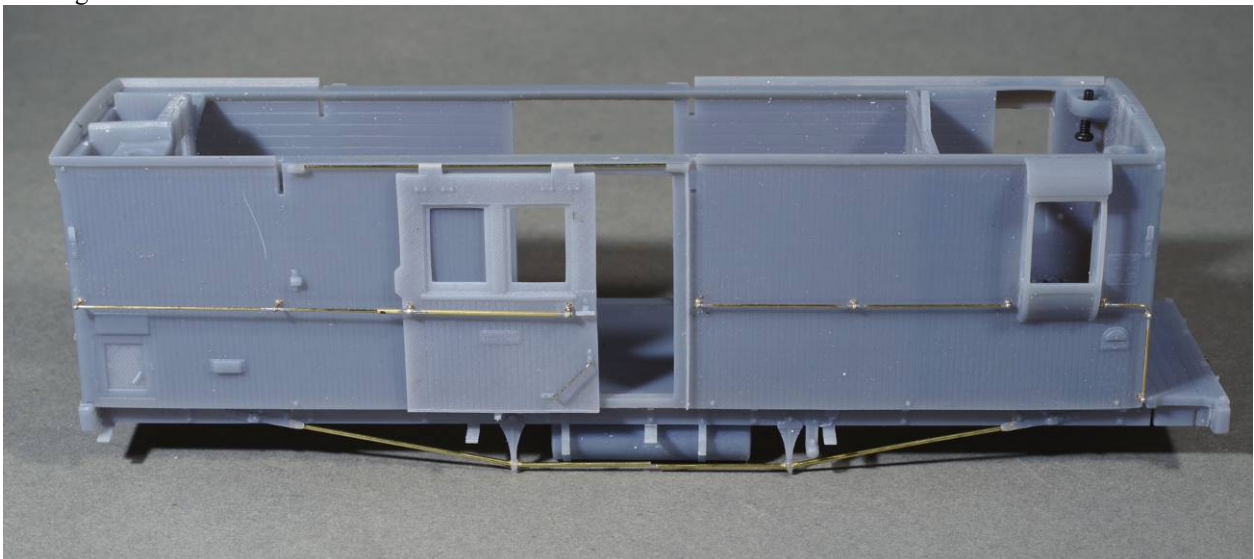
Do not finally fix doors and shrouds until after painting and glazing.



Handgrabs and handrails

I refer to handgrabs as the wrought iron grips with tails that bolt to the body. Handrails are of pipe through cast knobs. Grab tails are integral with the body and the grab proper is formed from 0.3mm wire. Handrails are generally of 0.4mm wire through cast brass knobs. In both cases there is a printed dimple in the body to locate a drill. Neatly forming the hand grabs and rails is probably the trickiest part of the kit. Generally I form and fit grabs to the body prior to painting. Handrails are formed and fixed to knobs, but not fixed to the vehicle until after painting.

Cast knobs generally have a well formed hole, but this is typically neither truly round nor of sufficient diameter. This is partly intentional to improve print/cast success. The holes may be cleaned up with root canal reamers, broaches and/or drills. Broaching/reaming is preferred as the holes tend to stretch rather than break. Be careful not to abuse and fatigue the knob shanks.



This is the long handrail version. Note that the handrail over the door is a 0.6mm telescoping tube over the fixed rail. Knobs are threaded onto 0.4mm wire (or in the case of the sliding door 0.6mm tube). For the curved handrail, make the curve around a 2mm drill shank with the wire over length. Fit handrails to van by locating the knobs in the predrilled holes. I solder the knobs to the rail, but CA glue is an alternative. Trim to length after fixing knobs. Note that knobs differ. They should be used as follows (L to R referring to the image above): 2x long, 2x short fat head, 3x

short standard, 1x short standard, 2x short rectangular base.

Note the 0.3mm wire grab fitted to the lower corner of the door. Ensure this and the knob shanks are smoothed flat on the inside of the door so the door can slide freely without damaging the van sides.

Note also the rail at the roof line for the door to slide upon.

Using the etched (or fabricated) eyes, add the attachment points for the telescopic rails at the luggage end.

Telescopic railings are not supplied. I fabricate these from length of 0.8/0.6mm telescoping tubing (Albion Alloys) and wire.

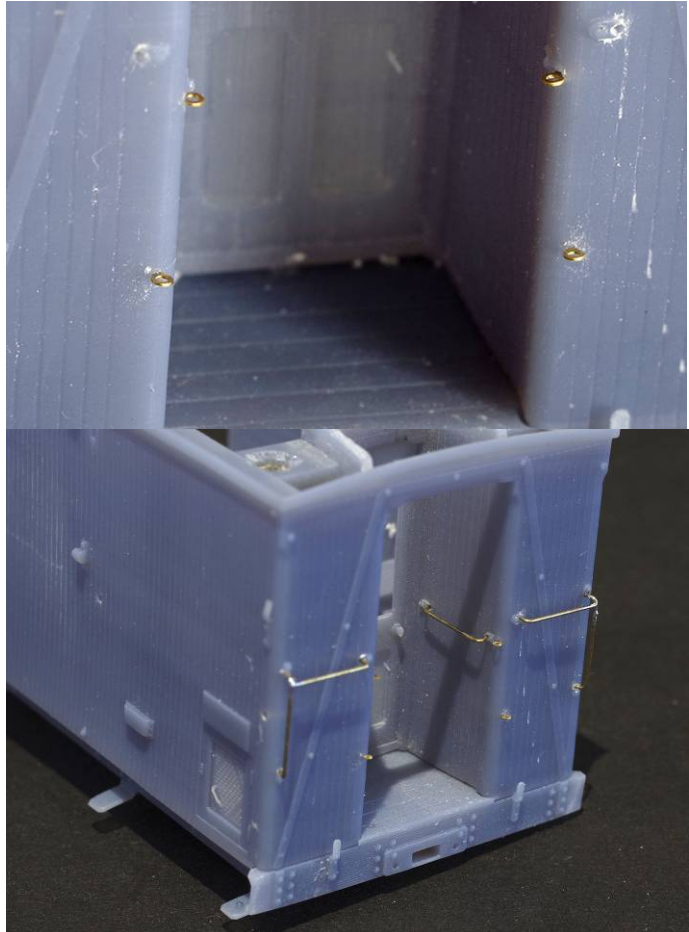
Add end hand grabs.

Drilling holes for those in the vestibule is tricky, but no need to get them square. At an angle works fine.

For the three leg grabs, fit the vertical first and then make a horizontal to suit.

Space them off the body with something appropriate (I used 0.8mm ply) and solder up in place.

Fix grabs from inside, using a spacer (ply again) to get uniform distance from the body.



End Railings

A 3D printed jig is supplied to assist in fabricating the end railings. Note that my preferred method is described here, but there are other ways and there are some etched parts supplied that could be used.

This method is not too tricky and is quite robust, without appearing heavy.

The jig and a finished railing are shown on the right.



First cut some verticals over length from 0.5mm wire, deburring the ends. Next form a couple of eyes from 0.2mm copper (sourced from some electrical cable).

These are just wound up around a wire former. Cut the 'stems' to a few mm length.

The horizontal is of 0.6mm OD tube. Cut this by gently scoring - roll under a scalpel blade and then snap. Easier than it sounds. The stems of the eyes should fit the bore of the tube nicely.

Next form the little '8's that attach the telescopic rails.

I make these from single chain links around a simple former made from 0.4/0.5mm wire.

Slip the link over the former and gently squeeze with plier jaws to form an oval that conforms to the wire former.

Then with a pair of fine tweezers, crimp between the wires to form an '8'.

The finished part. You'll need 4 of these. A pair at the height of the horizontals and another pair around half way to the floor.



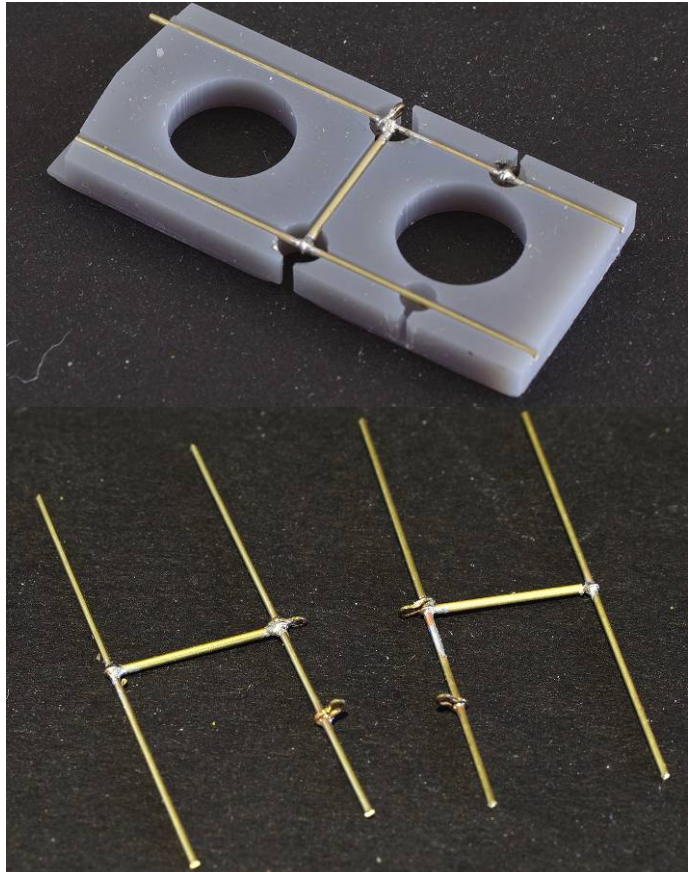
Assemble the 0.5mm wire verticals, 0.6mm OD tube horizontal, eyes and '8's into the jig as shown.

Take care to make 1 left and 1 right railing.

Carefully solder all parts together.

Once complete, cut the verticals to length flush with the jig. Note that at the top there is a step. Use the full length for the inner vertical and the step to cut the shorter outer vertical.

A finished railing pair.



Painting

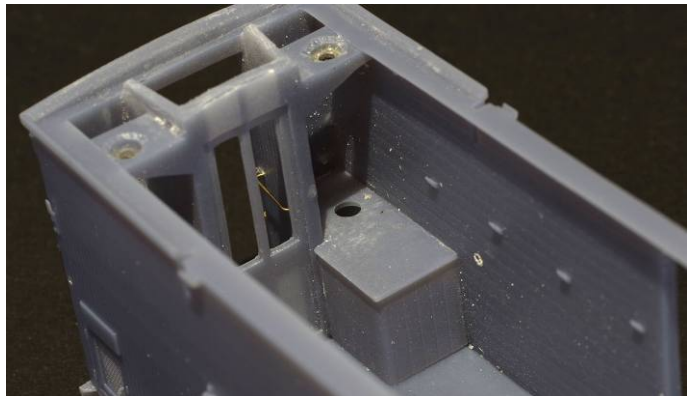
I suggest doing the majority of painting prior to final assembly. This will assist in separation of colours and make the job considerably easier. Be sure to clean up all parts to be fitted later prior to painting.

- Paint roof, bogies, handrails/grabs and underframe black (preferably dark grey).
- Paint body carriage red (depending on period this varied and pre-1926 Pullman green).
- Paint ceiling white (or preferably pale grey)
- Paint interior walls and surfaces dove grey. In the guards compartment the ceiling colour is extended down to the lower edge of the end door window.
- Paint brake stand black and guards seat squabs dark red/brown.
- Paint the etched window guards interior colour.
- Paint floor as unpainted wood boards. Scuffed pale grey/brown. Floor planking is 8" (3.2mm) and can be drawn in with a very fine lining pen.

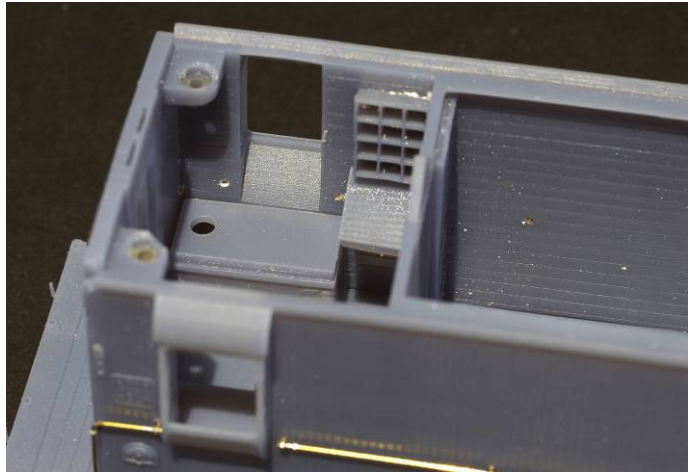
Interior detailing

Clean up dog boxes so they are a neat fit into the van end. With floor firmly fitted to the body, glue the dog boxes in place to the body only. Use CA glue sparingly. The bond can be reinforced from beneath later. This can be done prior to painting.

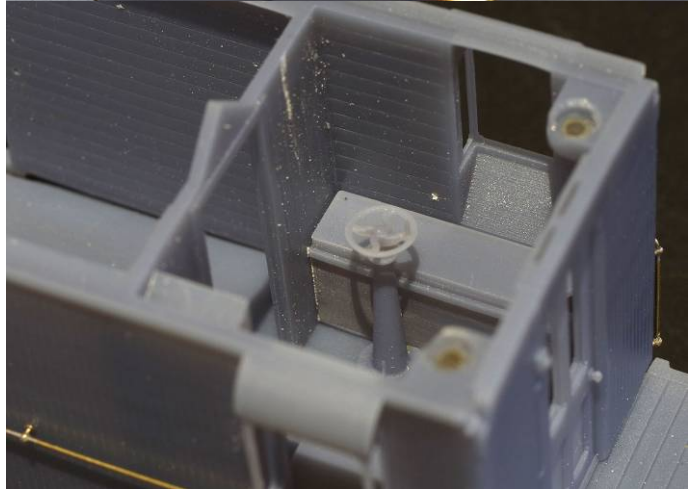
Etched luggage racks fit to the 4 printed hinges on the inside faces of the sides (R of image).



Fit guard's seats in similar fashion to the dog boxes.



Fit hand brake to the underframe/floor noting that there is a flat that locates in the adjacent seat so orientation is important.



Pre-paint test assembly of a BP5879 underframed van.

Glazing

Glaze all windows using 0.1mm acetate sheet.

End doors: Cut glazing to suit and fit into slots within the doors (3.3mm wide strip). Fix pre-painted guard bar etch over luggage end door.

Side doors: Fit glazing into the recess in the door from the inside. Fix pre-painted guard bar etch over to retain.

Lookouts: Cut glazing 14 x 11mm. Score so that the glazing has panels 3, 8, and 3 mm wide. Fold side panels 90°. This unit can then be clipped into the lookout from inside. Retain with minimal glue if you wish, but the natural spring of the material should hold it in adequately. (Gloss varnish also works well).

Note that it may be useful to fit sacrificial 'glazing' as part of the masking process prior to painting.

Assembly and Finishing

At this point I generally have a pile of bits that need to be assembled. This should be clear from all the trial fitting that has gone before. Typically I glue the floor to the body as a final step as the body sides are a little flimsy around the lower door sill, but leave the roof removable. Door shrouds need to be fixed to the body but doors can be left free to open if desired. I leave end railings captured in the holes but unfixed.

Add side chains and cast hooks.

Number plates.

Plates should be black with yellow raised details.

Tips on painting van plates can be found here: (<https://nzfinescale.com/painting-car-and-van-plates/>)



Additional finessing

Gas lines: I use invisible thread to make the roof gas lines (make sure these appear to connect to the one running up the open end). Make the saddles from thin paper attached with matt varnish.

Rain strips: over centre doors cut from scrap card/styrene/thin ply.

Add telescopic rails

Brake hoses. See my blog (<https://nzfinescale.com/connections/>) for tips on how to make convincing brake hoses.



