version 3 Sept 2024

"EASY-BUILD" BRC&W CLASS 104 DMU ASSEMBLY INSTRUCTIONS.

SAFETY FIRST! CONSTRUCTION REQUIRES THE USE OF VOLATILE SOLVENTS, ALWAYS FOLLOW THE MANUFACTURERS INSTRUCTIONS AND ENSURE ADEQUATE VENTILATION. YOU WILL ALSO REQUIRE SHARP TOOLS AND THE EDGES OF THE ETCHED PARTS CAN BE VERY SHARP SO TAKE CARE WHEN HANDLING. WORK STEADILY AND SAFELY AT ALL TIMES.

INTRODUCTION

The general idea for assembly is to construct a box with a removable floor. In order to get the most from your kit we recommend you read these instructions in full prior to commencing construction making notes as to any assembly options, or changes to the suggested order you think would suit your method of building better. However, we suggest you do follow to the order of construction as we know it works! These are 'honest' instructions inasmuch as they are based on our actual experience of building the kit. If we have encountered a problem we will tell you how to get around it and, where practical, future examples of this kit will be modified. Diagrams and photo references will be found throughout these instructions. The images are of preserved units and so one should be aware that they might not represent precisely how the unit might have looked in service. Images from our other DMU kits found on the CDROM might also be referenced to illustrate a construction idea. To help you find the images they are identified by class and name of photo. You will also find numerous additional prototype and model images to assist you create an outstanding model.

KIT CONTENTS (per box)		
1x Floor Molding	1x Roof Molding	2x Side Molding
1x Cab Molding (Driving Cars Only)	1x Plain End (2x for TSL/TCL)	1x Bogie Pack
1x Casting Pack (See illustrations p23 & p24)	1x Other Parts Pack (See illustration p25)	4x Roof Partition Inserts
Wire (2 Sizes Brass, 1x Spring Steel)	Styrene Sheet (False Floors)	3x Molded Floor Stretchers
Etched Brass Details (See illustration p18 & p19)	Molded Seats	1x Laser-Cut Interior Partitions (See Illustration p19)
3D PRINTED LAMP IRONS SUFFICIENT FOR 2 AND 3-CAR SETS ON ONE SPRUE (FOUND IN DMBS BOX ONLY)		

For those building a 3-car set, please note you **will not** find a separate set of etches for the centre car! This is because we have created the design for the driving car etches in such a way as to produce the extra items for the 3-car units too. This has obviously saved considerable expense, which benefits everyone and, for those building 2-car sets, a sizeable number of spare parts. Even if you are building a 3-car unit, you will still find spare parts for the most delicate items. To build a centre car, the instructions for a DTCL should be followed since the only difference between them are the cab and associated details. Disregarding those steps and simply adding a plain end to 'the front' will produce exactly what is required. Should you discover something we've overlooked in that assessment please let us know, or call for advice, but we're quite sure that advice is correct. You will also note we have labelled the steps as those required for each type of car if it is specific to that car, or 'All Cars' for the other steps. This *should* clarify what's to be done to which cars.

BEFORE STARTING...

We always stress to customers that 'Easy-Build' does not mean, nor imply 'quick to build', but with patience and care you can produce an accurate model that will serve you well for years to come. The instructions are written assuming you are building a single unit so the operations need repeating for all additional vehicles.

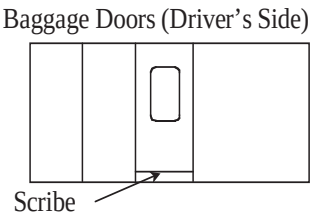
GETTING STARTED

Let's get started by unpacking the etches, which have had to be folded in order to be fitted inside the Easy-Build box. Carefully unfold the short flap with the **EASYBUILD** name on with a 12 inch steel rule slipped inside the fold as a lever in order to prevent any distorting of the parts. You might wish to snip this small panel off entirely rather than attempt to make it lay flat - probably a good idea, but not essential. Now you can move on to inspecting the rest of the components supplied, there's no point getting involved in construction only to find a damaged part. Start with the large molded parts (ends, floor, sides, roof and bogie stretchers) checking for severe warping and/or twisting. The floor and roof sections will have a degree of bow along their lengths due to the production process, but you should be able to flatten out the bow without any real effort. Whilst we take great care to weed out sub-standard parts prior to packing, some still slip through occasionally, so remember that any severely mis-shaped parts will be promptly replaced upon return to EasyBuild. Once you're satisfied with the contents, wash all the plastic components with a household detergent to remove oils and contaminents left from the manufacturing process. Now...

PREPARING THE SIDES

1) (All Cars) Check each side molding against the edge of the end moldings. Whilst we take great care to ensure the ends of the side molding are true and square, take a few moments to check that the ends will make a good joint with the sides. Also check all window openings for cutting burrs and remove as necessary.

2) (DMBS) The power car have guard's doors that, on the prototype, open inward. To help you identify the sides they are marked inside 1DMBS and 2DMBS in marker-pen. The guard's compartment is located in the baggage area, so the guard's door is one of the double (baggage) doors with a window on each side. On the 1DMBS that is the first door with a window at the right hand end; on 2DMBS the first door with a window at the left hand end (as you look at the side flat on the table), see right. To depict the guard's doors simply scribe a line across the bottom of the door 2mm up from the bottom of the side molding between the scribe marks for the door.



3) (All Cars) With the exception of the guard's compartment, all doors have externally fitted hinges. Drill through all the holes in the sides 0.7mm dia. for door hinges, handles and door bump-stops.

4) (DMBS) Guard's doors also have vertical handrails either side of the door, these too need holes drilling through 0.7mm dia.

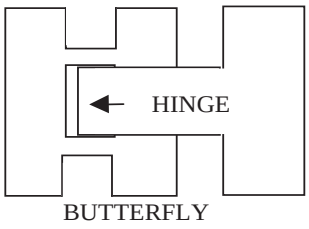
5) (All Cars) Check the depth of score lines at the door positions and deepen if you prefer. Carefully remove the raised burr from the door opening scores, work slowly and re-open score marks as necessary until desired effect has been achieved.

***TIP - Use a gentle scraping action followed by 1200 wet-n-dry (wet is best) for these two operations. Alternatively, a small chisel can be used to shave off the burrs. Old flat needle files can be ground into small chisels and are ideal for this purpose, however be careful not to dig into the surrounding surface of the sides.* .

6) (All Cars) Now would be a good time to give the sides a rub down with fine grit wet & dry abrasive paper to really see what the final job looks like, 800 grit works well here. At this stage you can go over the body prep. steps quite easily until you are fully satisfied with the results. Once the door hinges are in place it is much more difficult to do so.

7.1) (All Cars) Initially you will need 10 sets of hinges for a DMBS, or 6 sets for DMCL/DTCL/TSL and each set comprises of hinge pins **E12** - 2 large and 1 short hinge per door. Remember that the

short hinge goes in the centre with a large hinge top and bottom. Remove an equal number of 'butterflies' from the etch (**E11**), 1 for each hinge. The hinge piece is pushed through a butterfly shaped backing piece then glued into the hole in the side trapping the butterfly with the hinge. Remember - the guard's doors open inward so have no visible external hinges.



***TIP - You will find that the application nozzle on most brands of superglue (the 2gram tubes) will fit neatly over the hinge's spike. Once pushed through the body side push the nozzle over the protruding spike and gently squeeze a small amount of glue into the hole.*

7.1) Once the glue has hardened, remove the excess pin from the inside of the body side for a better finished appearance.

8) (All Cars) Door bump-stops are not fitted to all doors (e.g. none on the guard's doors because they open inwards). Remove sufficient numbers of bump-stops and press through the pre-drilled holes and secure in the same manner as the door hinges. Do not fit door 'T' handles and commode handles until after painting.

9) (DMBS) Now would be a good time to form the handrails for the guard's doors. Bend up from 0.7mm wire (provided) and set aside (don't lose them!), these are better fitted after painting.

That completes the sides for now.

ROOF PREP

You will notice your roof has a curve due to the molding process this is useful when fitted as it ensures the roof is a tight fit in the centre of your coach.

10) (All Cars) Clean off any burrs of plastic then put a strip of masking tape down the centre of the roof onto which you can mark the positions of roof vents etc. from the drawing provided (Drawing 1 p20).

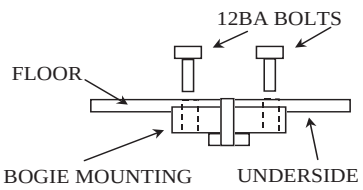
11) (All Cars) Drill 2mm dia. mounting holes for the roof vents at the locations marked and a 1.3mm hole for the water filler casting (DMCL/DTCL/TSL only). Do not fit the vents at this stage.

FLOOR PREP

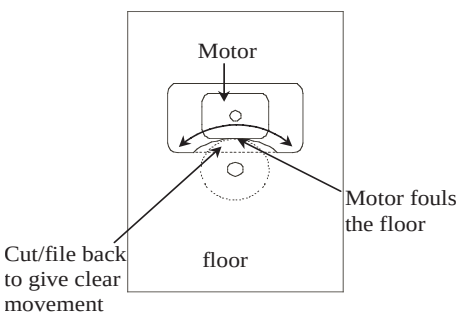
12) (DMCL/DTCL/TSL) Mark the front of the floor as that with the bogie pivot CLOSEST to the end of the floor molding. The power car does not need marking because the motor cut-out in the floor makes orientation obvious.

13) (All Cars) Check the floor molding for flatness - if it appears too distorted (some curvature is quite normal) gently bend it in the reverse direction to correct.

14) (All Cars) Locate the two aluminium bogie mounting turnings and prepare them by scoring their upper surface (the spigot faces downward when in use see right). Treat the mounting areas likewise. Using a strong adhesive fix the two round turned bogie mounts in the holes in the floor.



15) (All Cars Optional) It is highly recommended that to make a much stronger job of fixing the bogie pivots in place, you might consider a 'belt and braces' approach by adding a mechanical fixing to the mounting. Good results have been achieved by drilling two 1mm holes through the bogie mountings and floor (once the mounting has been fixed in place) either side of the bogie pivot bolt and tap 12BA. Now secure the bogie pivot in place by bolting down through the coach floor with short 12BA bolts, see diagram upper right.



16) Since the floor of the power car was designed we've had to obtain our gear sets from a different supplier. This change meant we had to alter the position of the motor, which in turn created a problem with the aluminium bogie mounting. With the round aluminium mounting securely in place as described above, file off the edge of the floor motor opening and mounting sufficiently to allow the motor to move through

its full range - see diagram right

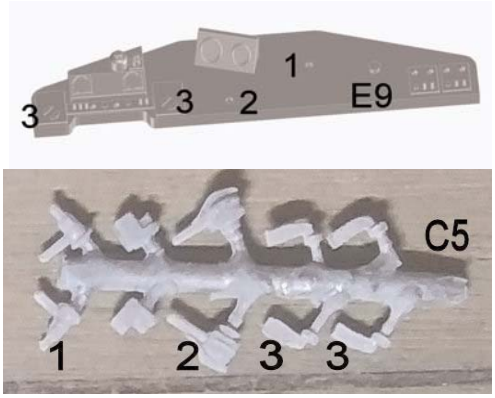
CAB ENDS PREP (DMBS/DMCL/DTCL)

17) Check the ends for flash, removing as required (there should be very little) then drill two 0.4mm dia. holes 1mm above and in the centre of the main left and right hand windows openings to mount the windscreen wipers later.

Prototype photographs reveal that not all units carried windscreen wipers on both windows, you may wish to fit just a single wiper and thus only need to drill a single hole above the right hand windscreen.

18) Remove the ejector pin nubs from the inside of the cab front molding (if evident) These will prevent the control desk fitting neatly against the inside of the cab front.

19.1) Fold cab control desk support **E19** along the half etched fold lines making the fold towards the etched lines. The resulting folded support can be adjusted slightly by opening, or closing the folds slightly to fit the entire space across the cab front.



19.2) Being as we're dealing with the control desk (**C10**), now would be a good time to detail them as shown right and check for fit inside the cab. The details casting (**C5**) includes casting details for both driving cars. The brake wheels (**E9**) can be formed by two laminations for a thicker cross-section wheels, or as a single piece. You will notice the power and gear selector handles have tiny guide marks molded into the desk top to help position them in more realistic positions, both point inwards towards the driver.

20) If you intend to illuminate the end lights and headcode panel (if fitted to your unit) these should now be drilled out as required. No provision is made for illuminating these in the kit and so it is up to the builder to determine how best to achieve the installation.

21.1) Carefully remove the windscreen wipers (**E10**) from the etch and trim off the burrs (there are spares provided).

21.2) Bend the blade 90° using the dimple on the rear as a guide.

21.3) Place the wiper in position so that the top of the arm is half way between the top of the windscreen and the point where to cab roof starts to curve away with the blade against the window edge and drill a small hole through the cab front using the hole in the wiper arm as a guide - it is a very small hole!

21.4) Secure a small piece of wire through the hole in the wiper arms and set aside (don't lose them).

ENDS PREP (ALL CARS)

22) Remove any flash from the ends if present and burrs left from machining the window openings (DMBS only). Pay attention to the inside edge of the top of the molding as this will butt up against the end of the roof when the body is assembled.

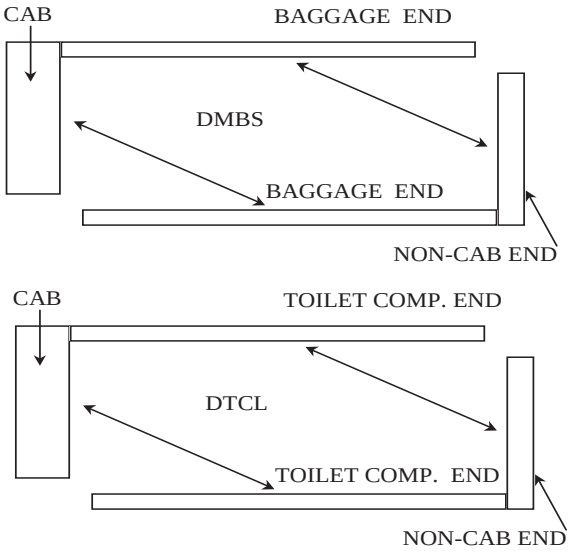
23) Mark the positions of the exhaust silencers mountings (small scribe marks is all the's required). The lower mounting should be 17mm up from the bottom of the molding and 14.5mm from the centerline of the back.

BODY ASSEMBLY - NOW FOR THE FUN PART!

Whilst the solvents used to assemble the components evaporate very quickly the joints they produce take considerably longer to achieve maximum strength. DO NOT RUSH THESE NEXT STEPS. Leaving ample time for the joints to harden is essential and you will be rewarded for your patience by not having unsound joints later on.

24) (DMBS) Fix a cab end to one side at the opposite end to the baggage compartment and the non-cab end to the other side adjacent to the baggage compartment to form an 'L' shape half box as shown below right.

25) (DTCL/DMCL) Fix a cab end to one side at the opposite end to toilet compartment (the small window opening at the end is the toilet) and the non-cab end to the other side adjacent to the toilet compartment to form an 'L' shape half box as shown right.



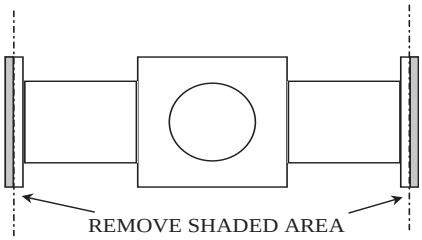
Assuming care was taken when preparing the ends and sides your sides will be level at the bottom. Ensure the outside faces of the sides are a good match, in profile, to the outside of the ends at the door line. Allow the ends to harden before attempting the next step.

***TIP - Working on a glass sheet will aid accurate bottom alignment of the sides and ends.*

26) Assemble the two half boxes again using a flat surface to aid alignment. The box may twist a little to during this process due to the flexible nature of the materials, but do not worry unduly as the roof will bring everything back in line later.

LEAVE TO SET HARD AND BUILD THE BOGIES (ALL CARS)

The instructions here initially refer to an un-powered bogie. Note also that the bogie spues contain parts that are not intended for the DMU so please refer to the illustrations to identify the appropriate parts to use. Also note the etched brass part numbers for the bogie refer to the power-bogie etch ***NOT*** *the main etches and are referenced from the Bogie Fret image shown on page 20 as well as on the disk. Some additional bogie parts (end channels, steps and speedo drive parts are also provided on the main etch with different part numbers for those etches. A little confusing, yes, but not horrendouosly so (we hope!).*



27.1) Remove three bogie frame stretcher plates from the molding sprue and cut off the ends level with the inside edge of the molded angle (see right). Clean up and square off as necessary.

27.2) Push brass bearings into the axle holes making sure they are an easy sliding fit, but not sloppy - if necessary clean hole with a 2.5mm drill. Do not fix in position as adjustments will be made later.

27.3) Using a pin, add a tiny drop of oil, NOT WD 40, into the bearing surface.

27.4) Place two non-driving axles in the bearings of one side frame and, ensuring correct orientation of bogie frame stretcher plate (reinforcing cross members down), assemble the side frame to the frame stretcher.

27.5) Once the first frame is reasonably firm, assemble second side frame onto frame stretcher in the same manner. When the side frames are secure enough to hold themselves in place, make certain all is square and in line, minor adjustments can still be made at this stage by applying more solvent to soften the joints and adjusting as required. Note: wheels should be a loose fit in the bearings at this stage. Leave the bogie to set for at least 1 hour, 2 is better.

With the joints set hard you can now set the axle bearings:

27.6) Centralise the wheelset and insert a thin piece of card between each wheel and the side frame to prevent lateral movement.

NOTE: Do not over-pack the wheelsets as this might cause the sides to spring when you remove the card later resulting in stiff wheel movement.

27.7) Push in the bearings from the outside until the bearings connect with the axle ends.

27.8) When satisfied that the bearings are (just) against the pinpoint ends fill the bearing hole with the 2.5mm sprue supplied, or microrod (not supplied) and fix with liquid solvent from the outside and

leave to harden.

27.9) When set, remove spacing card and trim any excess rod flush with axle box face

27.10) Remove the bogie pivot mounting from the molding spue and remove any flash. Test the bogie pivot bolt is an easy sliding fit in the mounting hole. If tight, open the slightly with a 3.5mm drill to ensure a smooth swivel movement.

27.11) Drop the bogie pivot mounting into its locating holes in the top of the bogie stretcher plate and, using only sufficient glue to attach the plates, fit keeper plates over pivot spindles. Ensure pivot remains free to move until the liquid solvent has evaporated.

You may prefer to use a larger piece of sheet styrene (not supplied) rather than the moulded keeper plates supplied.

27.12) If desired, fit the brake shoes on the inside of the sideframe. They should be positioned just off the wheels with the circle detail on the shoe just visible below the bottom of the side frame.

27.13) Fit the bolster detail centrally to the inside of the sideframe by placing the square beam against the back of the sideframe and butt against the underside of the bogie stretcher.

While the basic bogie assembly sets, identify and remove the bogie front channel, guard irons, speedo drive mount and bogie steps from the etched sheet.

27.14) Fold up the bogie channels **E7** (extras part **E17** on the main etch) & **E5** (with slots for guard irons).

27.15) Locate the guard irons (**E10**) in the channel with the top of the guard iron firmly against the top of the channel section and passing through the slots and solder in place. See Bogie end channel 1.jpeg for clear view of channel. Note that only the front bogie, i.e. the cab end, has guard irons fitted.

27.16) Remove the dynamo mounting bracket (**E26**) from the etch, fold to form a U and solder centrally into one of the channels. Close the legs sufficiently to meet the mounting lugs on the dynamo and solder in place (see Dynamo mounting.jpeg)

NOTE:The clearances at the inner end of the bogies is very tight on the DMBS and DMCL so you might want to leave off the channels to allow the bogies a greater degree of freedom to rotate. Adding the channels later if you don't need the extra movement is probably better than removing them afterwards. However...

27.17) Glue the bogie channels to the front and rear of each bogie with the bottom of the channel level with the bottom of the sideframe (superglue is recommended for this). The arrangement of these channels should be:

DTCL & DMBS Front bogie: guard irons and plain channel

DTCL Rear: dynamo assembly (to inside) and plain channel

DMBS Rear (powered): plain channels front and rear

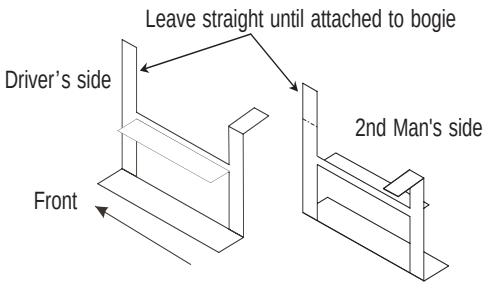
TSL: plain channel both ends

See also Bogie end channel in place.jpeg

27.18) Fold up the bogie step tread supports and mounting brackets (**E8** (**E23** extras on main etch)). See right and Bogie step and speedo drive.jpeg

27.19) Glue the speedo drive mounting (**E12**) to the front left axlebox. The spike faces right and down when fitted in place.

27.20) Glue the bogie step mountings in place. The front mounting is in line with the front spring hanger and the bottom step tread should be (approximately) level with the large spring mounting bobbin. Ensure the step is kept parallel to the side frame and attach the rear mounting to the top of the side frame. See Bogie step and speedo drive.jpeg.



***TIP Flattening the front spring hanger 'bobbin' back to the level of the leaf spring greatly simplifies the fitting of the step mountings. Although un-prototypical, once painted the flatness is hardly noticeable.*

POWER BOGIE (DMBS)

All the photographs referenced in this section will be found in the 'Power Bogie' folder on the CDROM, however you will find more images of bogies showing details in the various DMU construction folders.

IMPORTANT: Before removing the main stretcher plate from the fret please use the images 'Bogie Fret TOP.jpg' & 'Bogie Fret BOTTOM.jpg' to identify the top and bottom faces. This is very important because the outline of the stretcher plate is symmetrical, but there is a top and bottom. The bottom is most easily identified by the balance beam pivot groove, shown circled in red on the image. Mark the underside of the plate so that you know which way up you've got the stretcher plate when assembling.

28.1) Remove the Main Stretcher Plate (**E1**) and Strengthening Channel (**E2**) from the fret and remove all burrs.

28.2) Fold up the Strengthening Channel into a channel shape and fold down the end piece to meet the edges of the channel.

28.3) Lay the Main Stretcher Plate on a flat surface with the underside uppermost and position the Strengthening Channel on the centerline using the holes as guides.

Tip: insert the bogie pivot bush into the centre hole first and then align the position of the channel using the second hole.

Ensure the channel is straight and square to the edges of the Main Stretcher Plate. Tack solder in place.

28.4) Once happy with the position of the Strengthening Plate, solder in place securely. Clean up any excess solder.

28.5) Solder a length of 0.9mm wire into the balance beam pivot groove ensuring it is flat to the face of the Stretcher Plate. Clean away any excess solder.

28.6) Fold down the balance beam securing tabs at each end of the balance beam pivot (see Bogie 1.jpg) and test fit the pre-assembled Balance Beam and axle (**E9**), which is held in place by sliding a length of wire through the holes in the tabs. Carefully reduce the height of the pivot if required until the balance beam securing wire can be slid in place without difficulty without bending. The balance beam should rock easily with the wire in place, but it shouldn't be able to lift off the pivot. If you take too much material off the pivot, remove it and try again. Remove the balance beam.

28.7) At the front of the stretcher plate the end is folded down at 90^0 and then lowered using the other half etched grooves (on the top and bottom of the part) to form a joggle. The exact shape will be determined by the front channel later.

See Photo: Bogie 1.jpg & Bogie 2.jpg to see how the stretcher plate should look at this stage.

28.8) Remove the Sideframe Mountings (**E3 & E4**) from the etch, clean the edges and fold 90^0 along the half etched grooves.

28.9) Take the two sideframe moldings and clean off any flash. Attach a sideframe to each of the mountings using the moulded pins as locators and noting that the folded sides of the mountings hang downward. Secure with superglue. See Photo: Bogie 3.jpg.

The bogie uses miniature ball races rather than pinpoint bearings you must be very careful completing the next step as not enough care could result in permanent damage to the ball races. ***Unfortunately we cannot offer our usual no quibble replacement guarantee for the ball races in the event of damage during fitting, but replacements can be purchased from our Camelford address.***

28.10) The ball race is gently pressed into the rebate in the rear of the plastic sideframe, however it needs retaining. To retain the ball race run a very small amount of superglue around the edge of the outer race using a knife blade to apply the superglue. If you would rather keep away from the actual

bearing whilst applying the glue, cut a small groove away from the hole at each side of the bearing insert the bearing and let the glue run to the edge of the bearing down the groove. See Photo: PBogie Ball Race.jpg. This photo shows where to make the small gluing grooves as a pair of red lines.

28.11) Clean up as required two centre bolster moldings and attach to the rear of the sideframe moldings. The bottom of the square section should be level with the underside of the sideframe molding and the horizontal position should be central between the axle boxes.See Photo: Bogie speedo drive.jpg

28.12) Use the supplied nuts and bolts to (loosely) affix the sideframe mountings to the underside of the main stretcher plate. The mountings butt up to each side of the strengthening channel. Insert the drive axle in place using the supplied small nylon washers to reduce axle end float and tighten the bolts.

28.13) Remove the Rear End Channel With Location Lugs (**E6**) from the etch, clean the edges and fold into a channel along the half etched grooves (the lugs may need triming back slightly). Attach to the end of the strengthening channel by first locating the lugs into the grooves in the back of the bogie sideframe molding. See Photo: Bogie 4.jpg & Bogie 5.jpg.

28.14) Remove the Front End Channel With Guard Iron Slots (**E5**) and two Guard Irons (**E10**) from the etch, clean the edges and fold into a channel along the half etched grooves and affix the guard irons into the slots ensuring they are kept tight into the etched grooves.

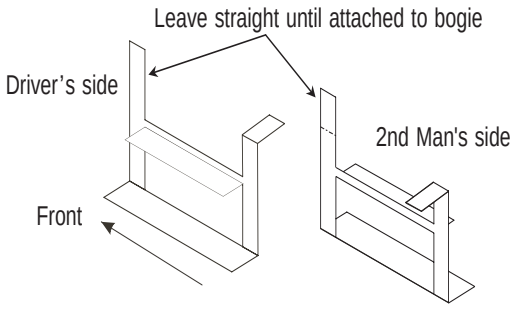
28.15) Attach the front channel to the previously folded joggled mounting (Step 28.7). The exact position of the folds can now be adjusted so that the channel is level with the outer edges of the moulded sideframes.

28.16) Insert the Balance Beam Assembly making sure the chain sprocket is on the same side as the drive axle and secure in place with a wire retainer. See Photo: Bogie 6.jpg.

28.17) Fabricate pickups from the supplied wire and copper-clad components. Fitting the pickups is a bit tricky with this new arrangement as there's a lot of stuff to get around, but it can be done!

28.18) Fit the motor in place and attach the drive worm. Ensure the worm and worm-wheel are centred together. Fit the drive chain ensuring it is not too tight as that will cause poor running, noise and excessive wear and chain stretch.

TIP: initially it is better to have the chain a little too slack than too tight. The chain will stretch at first (all chains do) but once the initial stretching has occurred removing a link, or two will result in long term reliable operation



28.19) The guard's door have additional steps fitted to the rear of the bogie, align the steps with the guard's door. Fold the step mounting as shown in the diagram, but fold over the top of both mounting legs. See Photo: Bogie Showing Guard Steps.jpg. These steps are located on the main etch as noted earlier (**E23**).

28.20) There are two different types of axle box covers supplied in the kit, use the slightly domed Timken covers.

28.21) Cut step treads 15mm long from the supplied 5mm wide styrene strip. Sand the edges of the treads to a slightly rounded shape and fix to the step supports as required.

BODY ASSEMBLY CONTINUED...

OK, the sides and ends will now be firmly fixed so will withstand the handling necessary to fit the roof.

29) (All Cars) Find the roof captive nut castings (**OP6**) and insert a nut (**OP7**) into the hex recess securing with a little superglue. Slide the fixings into the moulded channel on the underside of the roof. A third captive nut is included as method of preventing the floor of the DMBS/DMCL from sagging in the middle once all the underframe castings are in place (probably not required on the DTCL/TSL types. This is not an ideal solution, but there are alot of casting hanging on the underside of the floor so needs must - unless you can think of a better solution, if so, please share it

NOTE: If you building both driving cars together, before proceeding make sure you have got the correct roof and body paired together, the DMCL & DTCL roofs have a water filler hole at the rear.

30) (All Cars) Assuming everything has been assembled accurately the roof should fit neatly between the cab molding at the front and the rear molding. When the roof is in place the top of the sides will locate in the groove under the rainstrip. Fix the roof in place by initially applying solvent from the inside along the joints of the cab/roof and roof/rear molding then along the joint between the roof and the side moldings, again from the inside. Being as the roof will require some degree of filling to blend the joints applying solvent to the outer surface of the roof joints can done. Be very generous with the solvent here as the ABS can be reluctant to soften.

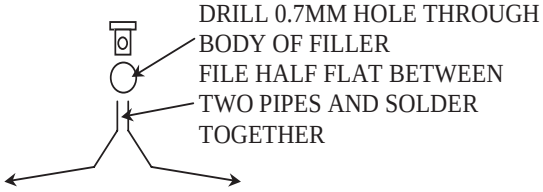
LEAVE BODY TO HARDEN

31) (All Cars) Once the roof has firmly set, take time now to inspect the fit of the roof outline against the end molding. Due to the different means by which the roof and ends are produced, it will be found that the alignment of the roof line and the ends requires some blending with an appropriate car body, or modelling filler. Apply filler in thin layers pressing it into the joint lines and sanding with fine abrasive paper (we recommend 400 grit intially) used wet for the best results. Finishing with finer grades will create a seamless roofline.

Once again, do take your time with these steps not least because the roof and end joints will be very visible on the finished model.

32) Remove 19x roof vents (**OP2**) from the sprues and trim off any flash. There is one vent directly on the centerline at the cab end, it is recommended that this one is NOT fitted at this time, the reason being the two lines of vents provide better stability to the body when it's being worked on upside down, that stability is lost if theat vent is in place. Insert the vents into their holes and secure with superglue. Don't lose the centre one if you don't fit it now!

33) **(DMCL/DTCL/TSL)** Form and fit the water pipes into the filler casting (**C27**) as shown in the diagram and shape down the end of the body. Pipe brackets (a pin with a eyelet part **E27)** is provided for the bottom fixing.



34) **(DMCL/DTCL/TSL)** Drill 0.6mm holes approximately 10mm up from the bottom of the end and 1.5mm in from the outer edge. The water filler pipe is then passed through the eyelet and then pinned to the back of the unit. Either glue, or solder the pipe to the eyelet to secure in place then trim the pipe ends to about 3mm below the fixing and bend slightly outward.

UNDERFLOOR ASSEMBLY

NOTE: The molded ribs on the floor molding determine the underside of the floor molding!

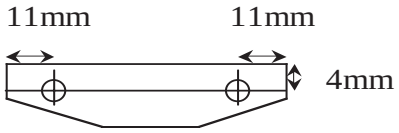
35) (All Cars) First check the floors will fit within the sides and end moldings. It is likely that you will have to adjust the floor width to gain the best fit. Do this carefully removing the minimum amount evenly from each side to keep the floor central to the body. This is best done by using a scraping action with a sharp blade. Reduce the floor width until it is a comfortable fit between the body sides. Remember you will be painting the various parts and that can also make the parts difficult to separate. For that reason making the floor a slightly looser fit than you might think ideal is probably better, BUT it must still locate on the beading inside the bottom of the body side and must **not** fall through. Remember, you can always take a bit more off much easier than adding width to a too narrow floor!

For those of you that have built other Easy-Build DMUs we now have a complete change of approach. The bufferbeams are metal castings due to the unusual shape of the bufferbeam and very complex arrangement of the buffer assemblies. So...

36.1) (All Cars) Find the bufferbeams (**C12** (rear) and **C13** (front)), the buffer stocks mountings (**C14**), MU fittings (**C20a/b/c/d**), lamp iron mountings (**E20**) and buffer stocks (**OP1**). Clean up all parts and open up the buffer and coupling hook holes in the bufferbeams (TSLs have 2x **C12**).

36.2) Put the bufferbeams in place under the cab and rear molding to make sure they sit squarely,

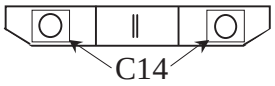
i.e. the faces hang vertically and not slightly angled up or down. File the top of the bufferbeam castings to bring vertical as necessary.



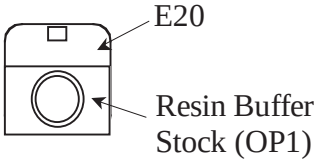
36.3) (Front Bufferbeam) Drill two 2.4mm mounting holes through the bufferbeam as shown (right) and remove any burrs.

36.4) With the floor in place in the body, sit the front bufferbeam (**C13**) onto the cab floor aligned centrally and mark the positions of the mounting screws. Remove the bufferbeam and drill through with a 2mm drill.

36.5) (Both Bufferbeams) Test fit the buffer stocks mountings (**C14**) into the holes in the front of the bufferbeams and once a snug fit is achieved secure in place with superglue whilst taking care to keep the castings horizontal and flat against the bufferbeam front.



Please read the next few steps through before proceeding in order to get a firm grasp of what is required. The end result is that the buffers and lamp irons should be parallel to the line of the body whilst protruding from the 17 degree angled bufferbeams. Creating these parts as single castings was not practical.



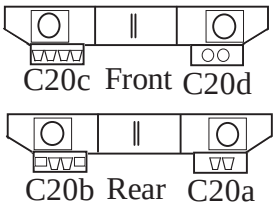
36.6) (Both Bufferbeams) You have a choice of sequence here, an alternative sequence will be apparent once one has been described. Take the lamp iron mountings (**E20**) and attach a resin buffer stock to it, once again ensuring the stock is horiziontal.

36.7) (Both Bufferbeams) Now fit the assembled buffer stocks and mountings to the fronts of the castings **C14** previously fitted to the bufferbeams, again ensuring squareness both vertically and horizontally.

*The alternative is to fix the lamp iron mounting **E20** to the buffer stocks mountings first then attach the plastic buffer stock to the lamp iron mounting. Both offer advantages without a clear benefit either way really.*

36.8 (Both Bufferbeams) Drill 0.5mm holes into the bottoms of the MU plugs **C20c** (4 required), **C20b** and **C20a** (2 required). Insert short lengths of 0.5mm wire and affix with superglue. These pins will have silicon tubing added during finishing to represent the flexible cables.

36.9) (Both Bufferbeams) Take the MU castings and arrange as follows:



C20a: Rear bufferbeam Right

C20b: Rear bufferbeam Left

C20c: Front bufferbeam Left

C20d: Front bufferbeam Right

Affix to the bottom of the bufferbeams adjacent to the angled outer edge as illustrated (above right) ensuring the castings sit horizontal.

***TIP: It is recommended to leave fitting the lamp irons and vac pipes until all the major construction is completed. Indeed the lamp irons are better left until final assembly once all painting is finished too.*

36.10) (Front Bufferbeam (NOT TSL)) Attach the horns (**C1**) inside the outer edges of the bufferbeam, one each side

Set the bufferbeams aside for the moment and finish off adding the remaining body details.

ADDING THE REMAINING BODY DETAILS

37) (All Cars) On the driver's side of the cab you will need to drill three 0.7mm dia. holes through the seam between the cab end and the body side molding. These should be positioned to align with the other door hinges (approx. 5mm, 20.5mm and 28.5mm as measured from the bottom of the body). Also, drill holes for the grab handles at 15mm and 20mm. 1mm from the right hand edge of the door.

The grab handles should be left off until after painting.

***Note - Door hinges are always on the left of the door as you look at them.*

38) Locate the moulded floor stretchers, clean off any flash and affix across the body in line with the passenger doors. These will provide the main fixing points for the underfloors so do make sure you create strong joints on these parts.

(DMCL/DTCL/TSL) Affix another stretcher across the rear of the body.

(DMBS) The rear of the floor is held in place by the captive nut and long bolt to the roof.

39) (All Cars) The front of the floor is held in place by a tab fitted to the underside of the cab/bufferbeam. This is created from a piece of scrap etch material (approximately 18 mm x 10 mm) and fitted between the two molded ribs in the floor. It will need bending towards the underside of the floor, but shouldn't be pressed to hard against it as this will make sliding the floor under it more difficult. Ideally this should be soldered to the underside of the bufferbeam, but superglue will also work

40) (All Cars Optional) If your units have the two digit headcode boxes these can now be fitted. The headcode boxes are formed by two etches - **E13a** and **E13b.** Part 'a' should be mounted directly onto the cab front centrally and 2.5mm up from the bottom of the cab and is used to accurately locate the glazed cover later. Part 'b' is the cover to be fitted over this backing piece once it has been painted and glazed, etc. .

That about completes the basics of the body construction

UNDERFRAME DETAILS

Before commencing detailing the underframes please familiarise yourself with the underframe detail castings for both cars. The castings offer a considerable amount of load to be held upside down so strong adhesives are required. We have tried Evostick followed up with superglue run around the edges of the castings with very good results.

ALL UNDERFRAMES

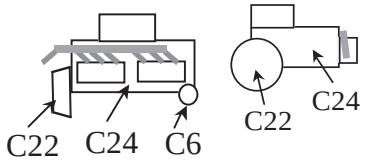
41) There are two strips of 5mm x 0.5mm styrene supplied to be used to deepen the solebars. Attach these to the outside face of the molded solebar and trim to length. Work from one end pressing the strip firmly into the corner of the solebar/floor overhang and secure with solvent.

42) Refit the floors into the body and mark the sides of the solebars with the locations of the various doors. You can either mark just the centre of each door, or the positions of the door outline scribe marks, just remember which method you decided upon otherwise the steps will not align properly with the doors later!

DMBS/DMCL UNDERFRAME PREP

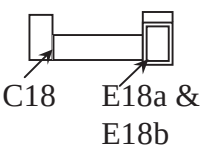
Detailing the underframes requires working with the floor molding upside down (obviously), this can become quite confusing at times. We recommend starting with the DMBS because it's obvious which end of the floor is the rear because of the motor cutout. So, working with the front pointing to the right and with the underframe upside-down, the solebar nearest to you is the driver's side of the car. See DMBS Drivers side.jpeg and DMBS Second Man side.jpeg.

NOTE: All the casting should be fettled before either being formed into sub-assemblies, or fitted to the underfloor to achieve the best appearance on the finisshed model.



43.1) Start by assembling the two diesel engines as shown right.

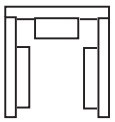
43.2) The space heaters have grills at the intake end, These are made up from two etched parts **E18a** and **E18b**. First attach the backing piece (**E18a**) to the face of the casting as shown, then add the meshed detail (part b) over that. You can laminate both etched parts first and add them as a single piece first. Either way, ensure the etched details are aligned with the bottom edge of the casting when viewed as



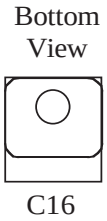
shown here (right). Repeat for both space heaters.

43.3) Likewise, add the mesh grills (**E14**) to the two main radiators (**C25**) as shown right.

43.4) Part **C21** should be carefully folded into U shape. This is facilitated by the V notches in the frame (folding into the notches of course), but these notches also make the part quite weak. Once folded, the brave amongst us could drop a little solder into the fold for added strength, the rest of us might use superglue!



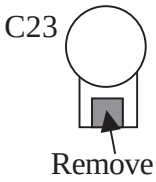
43.5) Finally, a bit of heavy engineering is required! Due to the sheer number of castings we have struggled to find room for adequate floor fixing positions. Unfortunately this didn't become obvious until we'd made all the castings masters. In order to have two such fixing points it is necessary to drill holes through the fuel tanks **C16**. The diameter of the hole being about 6mm ($^1/_4$ inch) and whilst not a difficult task in itself, it can be a bit trying due to the softness of the metal grabbing the drill bit. We suggest starting with a 2.5mm, or 3mm bit and working up to the finish size, the use of a liquid lubricant certainly helps. The position of the hole isn't critical, but you should remember a body fixing screw with be accessed throught it, therefore you need to be able to hit the stretcher that runs across the doors with the hole you drill. Check the positions of the castings using Drawing 3 to determine exactly where to drill the holes.



43.6) Affix a fuel gauge (**E4**) in the centre of the tank and about 5mm up from the bottom.

43.7) The large air tank is supplied in three pieces (only one part number). It cannot be assembled incorrectly (please don't consider that a challenge!) so all you need to do is ensure both mounting legs are facing downwards and the bottom edges are horizontal to one another thus preventing the assembly from rocking.

43.8) The mounting legs of **C23** need modifying (see right) to allow it to be positioned as close to the inside edge of the space heater as possible - almost touching in fact. Remove the area shown so the casting can straddle the molded rib in the floor.



DMBS/DMCL underframe assembly

See the underfloor diagram to see how the undframe components are laid out. The critical areas are immediately behind the bogies so make sure you don't encroach on the bogies too much and thus hinder their movement.

44.1) Once again remember you're working upside down. Start by orientating the floor with the front to your left, you now have the Second Man's side nearest to you. Now, using a square, score the floor at each measurement shown in Drawing 3 for that side. It would be a godd idea to spin the floor around and mark the positions of the castings for the Driver's side now too as once the castings are in place you might not get your square in across the floor.

44.2) Check the clearance between the bogies and the first and last castings by putting them into position with the bogies in place.

44.3) Assuming all is OK, start at one end affixing the castings to the floor. With but a few exceptions, the castings should be kept very close to, or even butted up against, the inside face of the solebars. **C16**, **C21**, **C26**, **C25**, **C7b**, **C8**, **C18** all go against the solebar. The diesel engine assembly sits in between the two molded ribs in the centre of the floor.

44.4) The assembled casting **C23** straddles the rib to fit snuggly against the back of the space heater. The two supports are off-centre so position the airtank with the longest overhang facing away from the bogie.

44.5) Finally, the gearbox (**C19**) should be placed between the ribs at 248mm (measured from the front as all the other castings). This is not shown on the drawings as it sits behind other castings. The largest ractangular shape on the casting is its mounting.

Now spin the floor around and afix the castings for the driver's side...

45.1) If you didn't score the floor with the positions of the castings previously , do so now using the dimensions shown in Drawing 3 - a 25mm square will be needed now.

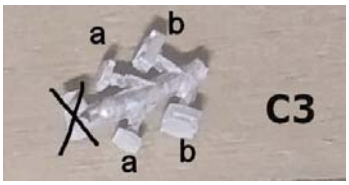
45.2) Once again position the first and last castings against the marks and check the bogie movements are not impeded.

45.3) The castings **C7a**, **C18**, **C25**, **C26**, **C15**, **C17**, **C16** all fit up against the solebar and the diesel engine assembly sits between the molded ribs.

45.4) Casting **C11** (the large dynamo) is positioned against the outside face of the closest molded rib with the molded pulley (the thin end!) towards the diesel engine.

45.5) The gearbox can now be afixed 105mm from the front and placed between the molded ribs.

46) Fit the speedo drive backing **E22** to the driver's side solebar 37mm from the front of the floor with the spike facing downwards. Attach casting C3a over the top of the etched backing. You will need to flatten the back of the casting to get it to sit squarely.



THE EXHAUSTS (DMBS/DMCL).

This is probably the most difficult part of the job, it certainly is from writing the instructions perspective! With that in mind here are two images of what you need to create (above). Start by annealing the 1.7mm wire (heat to cherry red and allow to cool) this will make forming the sharp bends much easier. Notice both exhausts 'joggle' to either move it forwards (second man's side), or backwards (driver's side) around objects. Once out of sight simply bend towards the floor for a secure fixing point. Once satisfied with the formed shapes secure to the exhaust stubbs on the diesel engines.

Exhaust: second man's side. The brackets around the space heater can be formed from part **E25**. The lower portion of the part is half etched to make rolling around the exhaust pipe easier.

Exhaust: driver's side.

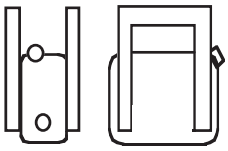
To add to the confusion, these pictures are the right way up - sorry!

47) (Both Cars) Affix the exhaust silencers to the rear of the vehicle using the marks made previously (step 23). To reiterate the information, the bottom mnounting is 17mm up from the bottom of the endmolding and the enter of the silencer pipes are 14.5mm from the end centerline (29mm centre to centre). The silencers do overlap into the window space (where fitted) this is corrrect so do not be tempted to push the silencers closer togethr, or getting the corridor connection and scissors in might be more challenging than the should be.

48) Both Cars) Form the lower exhaust pipes from the remnants of the 1.7mm wire. These just bend into and through the bufferbeam immediately beneath the end molding and can be permanently fixed in place - you might prefer not to drill through the bufferbeam, but just butt the 'pipe' up against the outer face of it, the choice is yours.

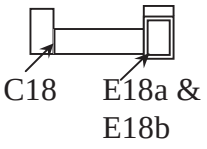
49) (All Cars) Drill 4x 0.6mm holes just inside the inside line of the exhaust silencers to take the mounting pins of the corridor connection 'scissors'. The lower pins should be about 1.5mm up from the bottom of the end molding. Again, using the corridor connections as a guide (they have to fit between the scissors) the scissors should be about 24mm apart, which places them just clear of the inside edge of the silencer mountings themselves, it's pretty tight in there. Use the scissors to locate the upper holes.

DTCL/TSL/TCL UNDERFRAME PREP



50.1) (All Cars) Start by assembling the fuel tank as shown right from the four castings (**C28**). The filler needs a mounting hole drilling into the top corner of the actual tank. Assemble the two halves of the mounting frame to form a U and then insert the tank between as shown right. Add a fuel gauge (**E4**) to the centre front to complete.

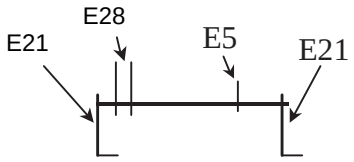
50.2) The space heaters once again have grills at the intake end, These are made up from two etched parts **E18a** and **E18b**. First attach the backing piece (**E18a**) to the face of the casting as shown, then add the meshed detail (part b) over that. You can laminate both etched parts first and add them as a single piece first. Either way, ensure the etched details are aligned with the bottom edge of the casting when viewed as shown here (right). Repeat for both space heaters.



50.3) Drill a 1.2mm hole into the centre dimple of the brake cylinders (**C29**) and insert a piece of brass wire (no more than 15mm) secured with superglue.

50.4) Remove the etched brake hangers and levers (**E5** x2**, E21** x4**, E28** x4**)** from the fret and remove all burrs and fold to 90° the bottoms of the hangers (**E21**) to form a mounting foot.

50.5) Cut two lengths of 1.6mm brass rod 40mm long and thread each through the hole in a brake hanger ensuring the 'foot' is on the same side as the long end of the rod and solder (or use superglue) in place making sure all is square, the end of the rod should protrude about 0.5mm through the hanger.



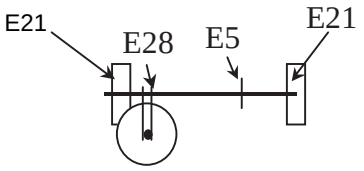
50.6) Next thread on 2x long levers (**E28**), 1x short lever (**E5**) and finally another hanger (**E21**), this time with the foot on the outside (so both feet point in the same direction). Leave the levers loose on the shaft for now.

DTCL/TSL/TCL UNDERFRAME ASSEMBLY

51.1) With the floor upside down, scibe the floor with the positions of the various castings using the dimensions in Drawing 4, paying particular attention to the areas adjacent to the inside end of the bogies, checking the clearance between the bogies and the first and last castings by putting them into position with the bogies in place.

51.2) Assuming all is OK, start at one end affixing the castings to the floor. The castings should be kept very close to the inside face of the solebars. These underframes are much simpler to assemble that the motor cars so simply following the diagram in Drawing 4 should be sufficient to produce what is required.

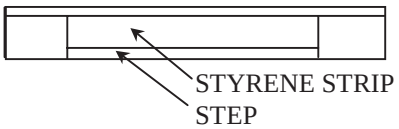
51.3) With the brake cylinders in position, take the assembled brake hanger and levers and affix to the floor so that the long levers reach to the pushrod in the centre of the cylinder, see right.



51.4) Solder, or superglue the long levers each side of the pushrod ensuring the levers are parallel and horizontal to the floor surface. The short lever (**E5**) should be aligned with the centre of the floor and fixed in place hanging towards the floor.

51.5) (Optional) Attach a length of 1mm wire to the short lever (**C5**) towards each bogie to depict the brake pullrods.

52) (All Cars) From the supplied 5mm x 1mm styrene strip, cut 6 off 20mm and 2 off 30mm (DMBS ONLY), the 20mm steps are for the passenger and cab doors and the 30mm steps for the baggage/guard's door. The steps should be aligned with the previously made marks and level with the bottom of the solebar. Additional strength can be gained by adding a strip of styrene (0.3mm is sufficient - not supplied) to the front of the solebar in line with the step, once painted it is hardly noticeable (see right).



***TIP - The outer edges of the steps should not be left square cut so round off the upper edges and slightly round the corners. The steps were made of wood and soon became worn.*

INTERNAL DETAILS (ALL CARS)
CREATING THE INTERIOR PARTITIONS

See Drawing 1 for layout of the interior of the two cars including the partitions as described in the following steps. Study the photos of the interior details (Seats 1 to 6 - Cl. 108 model) to get a clearer idea of what is now being described remembering these images are of a class 108 so show the 'idea' only.

Unlike all of our other kits, the interior partitions are laser-cut from a wood-like material, the reason being the prototype partitions were wood-grain effect laminate. Using this material certainly makes finishing much easier since you can just fit them without further finishing, or just add a coat of clear varnish for a more glossy appearance.

53.1) (All Cars) If you want to varnish the components do not remove them from the fret at this stage, varnish first. However, you need to add the doors to the relevent partitions now. So carefully remove the doors **INT 1D** and **INT 2D** and affix to **INT 1** and **INT 2** respectively (the partitions are symetrical so at this stage it down't matter which side you attach them to).

53.2) The cab partitions have a horizontal grab rail on the passengers side of the partition. Holes have been provided so simply bend a pievce of 0.7mm wire to fit between the holes and secure into place with superglue. The passenger side of the partition is the side with the door fixed to.

That is really the only preparation the interior partitions need, but a little trimming to allow for a snug fit during final assembly might be required.

54.1) (Driving Cars) Cut two styrene cab floors 14mm x 55.0mm (check your body width).

54.2) (All Cars) Clean and fit the cab seat (**C2**) to the cab floor positioned to align with the curved recess in the cab desk and its back just clear of the partition.

55) (All Cars) We have made some small moldings that can be fitted into the roof channel at an appropriate place to ensure the partitions stand vertical, especially the cab partition. These can be fitted now, or painted the same colour as the roof and fitted with the interior components. Unfortunately they don't have a part number.

56) (DMCL/DTCL/TSL) Fold the toilet compartment (**E29**) to form an 'L' shape. Check the cubicle will fit in place and still allow the floor to be fitted. Paint and fit toilet cubicle as appropriate.

SALOONS SEATING

57.1) Prepare the coach seats by removing the ejection pin marks (small round marks on seat back) and molding feed joints.

57.2) To form the seat, flex the molding until the joint between the base and seat back shows a thin white line. Gently score along the white line (not too deeply) from the rear of the seat with a craft knife and fold up the back towards the base. Apply solvent to the joint holding together briefly to prevent the back from initially springing apart.

57.3) The arm rests can be added to create first class type seats if/as required. If you intend to put figures in the seats they very often will not sit between arm rests - they don't squash like real people so you might want to leve the arm rests off.

57.4) To mount the seats cut a set of false floors onto which to mount the seats. It is better for you to determine the exact lengths required in your model, but the following dimensions are an appropriate starting point, 20mm wide for twin seats & 26mm wide for triple seats:

95mm (front saloons);

150mm (centre saloons both units);

110mm (rear saloon).

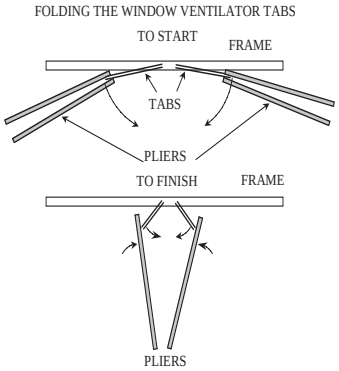
When installing them, they will sit under, and be affixed to, the body stretchers so cut them a little too long and trim to length when doing the final assembly.

58) (DMCL/DTCL/TSL) Remove the toilet cubical from the etch, smooth the edges and fold 90°. There is a half etch line at the bottom which can be removed to allow the cubical to be positioned over the end stretcher (if fitted). Put in place and make any adjustments to allow it to fit snuggly against the side and end.

FINISHING

59) (All Cars) With the main construction now complete it is time to prepare the model for painting. Whilst this consists of mainly cleaning and washing of all the parts, it also gives you another opportunity to check the security of the various fittings. Anything that cannot stand cleaning will probably not withstand long-term use, so it's better to have bits falling off now than later - refit as required!

60) (All Cars) A word here about the windows. They are of the 'frameless' variety, but unlike our other units and coaches that have this style of windows, these units have etched brass window details and glazing bars. Why? It's simply because of the small windows with opening vents detail. Our molded framless glazing panels do not have this small window and to produce the opening vent detail in brass just for those windows would have resulted in an odd window look. We recommend the etched glazing bars and window details are painted whilst still attached to the remnants of the main etch then carefully cut from the fret and fixed in place.



60.1) (All Cars) Carefully bend the tabs of the opening vents (**E1, E2, E3**) of all the window detail part forwards to 90°. First bend the tab slightly outwards before using small pliers both in a squashing action, but don't close the tabs tight together leave a small gap between.

61.2) (All Cars except DMBS) Affix the toilet window vent to the main toilet window detail. Snip it from the main detail and then superglue it onto the solid panel ensuring all is square.

61.3) (DMBS) Don't forget to paint part **E30** too (the plain glazing bars for guard's comp. and baggage area).

Painting is not a subject to be condensed into a few lines, so we will assume that you already have the means to produce the required livery (if not we can help). All our demo units are painted with Phoenix Precision Paints. We recommend the excellent transfers supplied by Fox. Please note we are not affiliated, nor rewarded in any way for these recommendations, they are offered purely based on our personal experience.

WINDOW GLAZING

***TIP: If your windows have turned out a little loose fitting, brush neat canopy glue around the edges of the openings, allow to dry for a few minutes then press the glazing into place. Apply dilute glue from inside as before and allow to cure.*

62) (Driving Cars) Find the windscreens you put in a safe place some time ago and fit using RC Modellers Glue (Canopy Glue) diluted with a small amount with water (and a single drip of detergent) and apply from the inside with a small brush to the edge of the glazing allowing capillary action to draw the liquid into the joint.

63.1) (All Cars) Remove sufficient window panels from the laser-cut fret for the unit you're building and trim off the edges of the tabs. Once the protective films have been removed you will notice a small raised burr on one side (usually only one side) so take a knife and gently scrape it away. If the burr is put to the inside it won't be noticeable, but you then have to inspect every pane as you're fitting them so removing the burr is better.

*Before fitting the toilet window, gently rub the inside face with 1200 grit abrasive paper to create a frosted appearance and install with the frosted side facing **outwards**.*

63.2) Fit all windows by gently pressing the into the openings ensuring they are parallel to the

body profile and slightly inset from the outside face of the side by about the thickness of the brass etches. Now run a bead of dilute canopy glue around the inside edges of the pane to secure in place (repeat if necessary).

***TIP: bending the ferrule of a small paintbrush about 45° will allow access to areas a straight brush won't reach.*

63.3) Once the window panes are secure find the painted window vent and glazing bars details and remove them from the fret not forgetting to trim off any sharp edges (don't overdo that).

63.4) Once again there's a couple of ways these can be fitted; one is to apply a thin film of canopy glue to back of the detail and place in position on the face of the appropriate window pane (tweezers are recommended for this), or put the detail in place then with a fine brush apply small amounts of dilute adhesive into the various corners and allow capilliary action to draw the mixture under the details. Both work and both have advantages and disadvantages. The main thing is to ensure the details are horizontal and butted firmly against the top of the window openings, except for the plain window bars, which should be in line with the bottoms of the the main window details of course.

***TIP: Take your time here as wonky window details will be obvious later. Allowing the glue to cure a little before making any fine adjustments to the position of the detail will help to prevent adhesive smearing onto other areas and the detail will stay in postion more easily.*

SEATING

64.1) (Drivng Cars) Fit the control desks into the cab fronts and secure with two-part epoxy. If you're installing working lights these must be fitted now too of course.

64.2) Find the cab floors and cab partitions secure in place. The floors should be positioned sabove the molded rib on the side of the body sides, but do ensure they are horizontal and the cab partitions are vertical and level with the bottom of the cab floors.

65.1) (All Cars) Take the false floors and, with the body upside down, lay them in position. They are intended to sit on the underside of the body stretchers, but still allow for the body fixing screws to be inserted as needed. Trim and label them as appropriate.

65.2) Take the now painted seats and mount onto the appropriate false floors using the floor plans (Drawing 2), make sure the seats are positioned so that they will be close to the body sides when inserted into the body, i.e towards the outside edge of the floors.

OTHER INTERNAL DETAILS

66) (All Cars) Install the remaining saloon partitions and toilet cubicals ensuring they stand vertical and no lower than the bottom of the body stretchers.

67) (All Cars) Insert the false floors and secure in psotion with adhesive tape across the various stretchers. Once the underfloors are secured in place the false floors cannot then move so the tape is just to hold things initially.

68) (All Cars) Assemble bodies on to appropriate floors and secure in place.

FINAL ASSEMBLY

69) (All Cars) Check the fit of the buffers in the stocks once again for a sliding fit, adjust as necessary. Fit the buffers into the stocks (don't forget the springs!) and secure in position with a short length of wire pushed through the hole in the shank and bend to keep in position. Also fit the couplings and if you didn't fit the vac pipes and air horns earlier, now is the time to do so.

70) (All Cars) Mount the bogies and ensure they are free to rotate. The speedo drives are cut from silicon tube (supplied), but do not make the link too short as it will restrict bogie movement, however too long and it may snag on track side components. Start with about 35mm and work back from there until it looks right.

71) (Driving Cars) Fit the wipers ensuring the blade is against the glass and hanging roughly vertical.

72) (All Cars) Fit all door T handles, commode handles (**E8**) and baggage door handles (**E22**).

It should also be noted the guard's door has a special etched cranked door handle (**E6**).

73) (Driving Cars) If fitted, the headcode front cover can now be fitted over the backing plate. We print a headcode on ordinary paper then laminate that with Sellotape (other brands are available!). Cut out and secure with canopy glue to the inside face of the cover and then secure the cover over the back plate, again with canopy glue.

74) (All Cars) Fix the corridor connections and associated scissors as appropriate.

75.1) (All Cars) Locate the 3D-printed lamp iron sprue and carefully remove each lamp iron with a sharp knife. You will see there's a small recatngular mounting lug on the rear, this locates into the hole at the top of the etched brass mounting plate **E20** fitted between the resin buffer stocks and the cast metal parts. Don't force the lamp iron into the hole, a few passes with a fine file, or abrasive paper is all that's required, secure with superglue. The assembled lamp irons should look as shown here (right).

75.2) Paint the lamp irons once in place.

76) (All Cars) Cut short lengths of silicon tube (about 20mm) and slip over the pins inserted into the MU connectors. Those between the cars can be connected together if the complete DMU is to remain on a layout for long periods, however, by looping them back onto an adjacent pin gives a credible impression of being connected whilst enabling the set to be put on and taken off the layout easily, the choice is yours.

We hope you have enjoyed building this kit and welcome your comments.

SHAWN KAY 2024

"EASY-BUILD"

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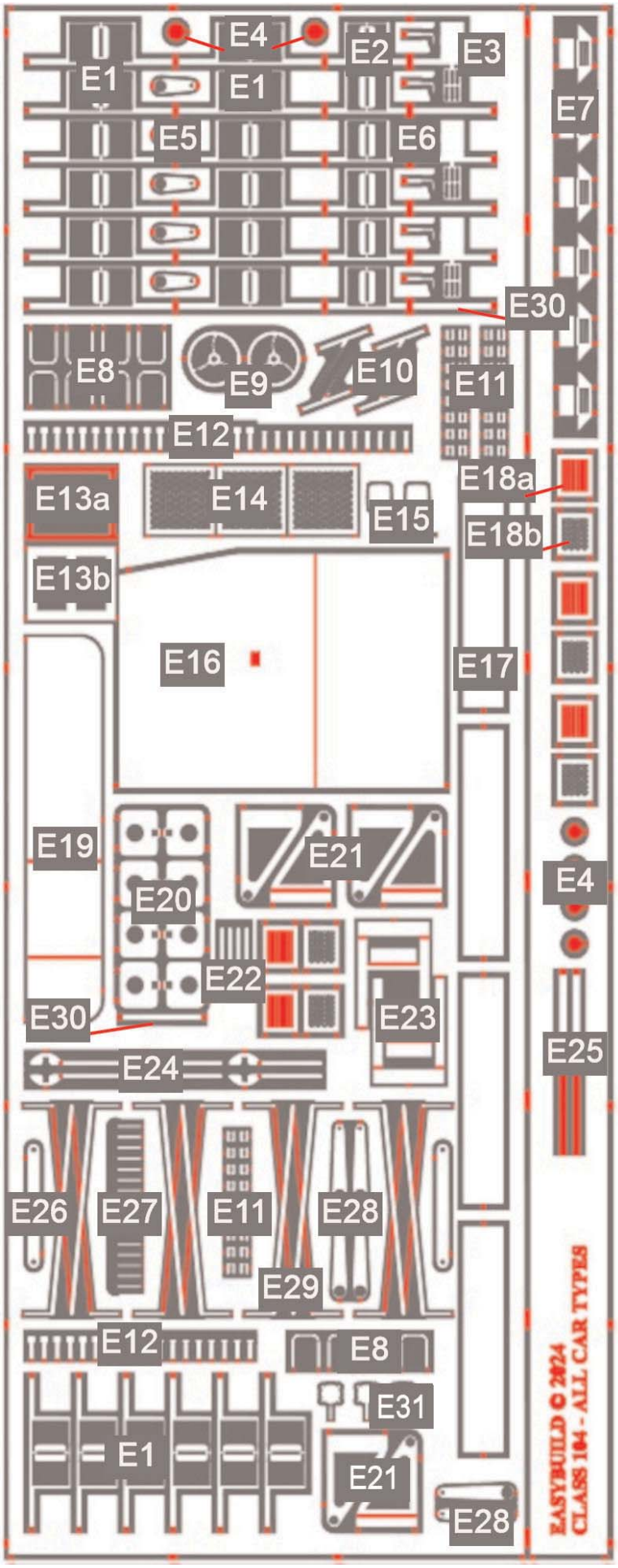
ETCHED PARTS (1 SHEET PER DRIVING CAR)

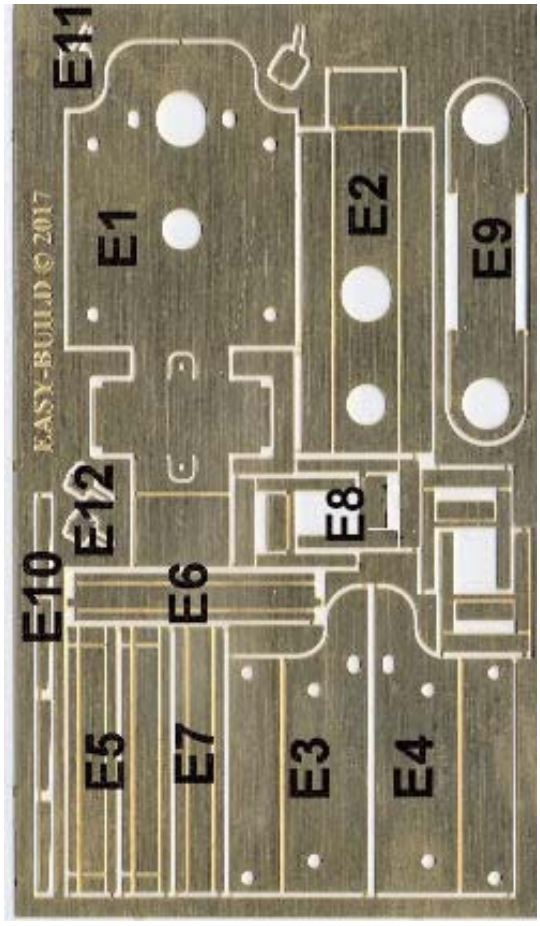


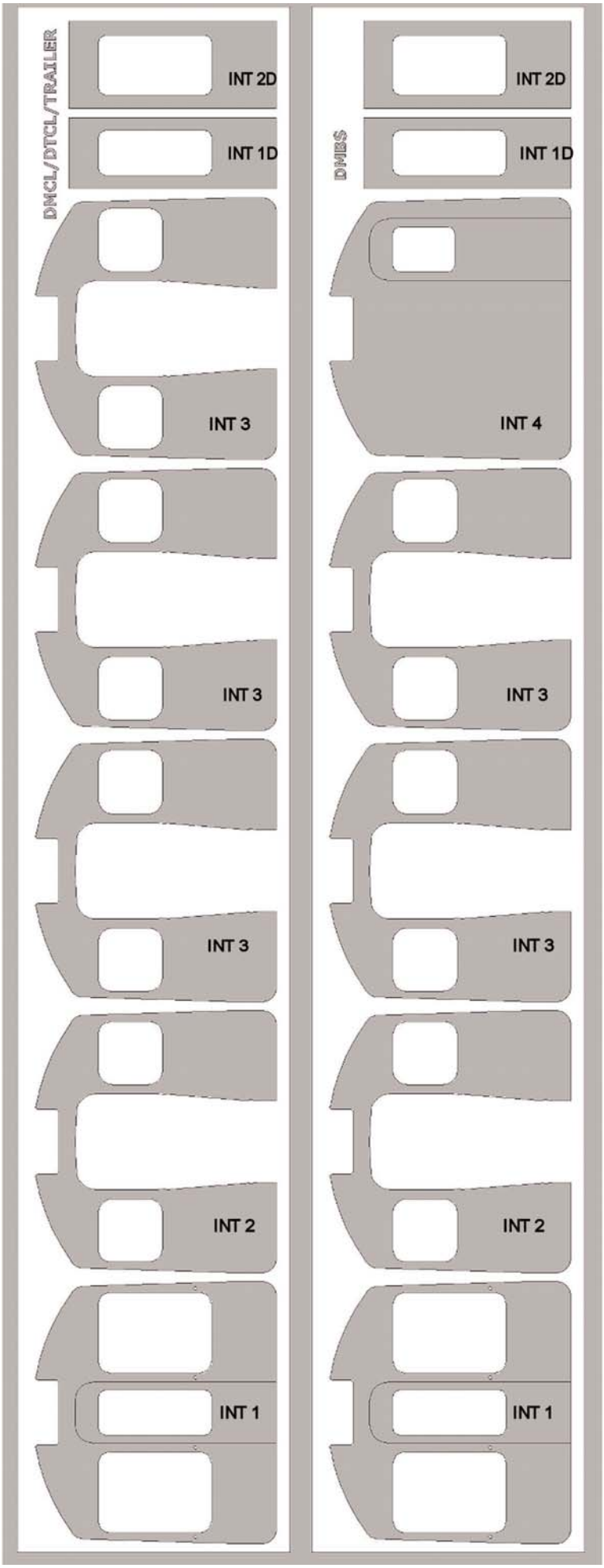
KEY TO ETCHED PARTS	
E1	Main Window Vents
E2	Small Window Vents
E3	Toilet Cubical Vents
E4	Fuel Tank Gauges
E5	Short Brake Levers
E6	Guard's Door Handles
E7	End Steps
E8	Door Commode Handles
E9	Control Desk Brake Wheel
E10	Windscreen Wipers
E11	Door Hinge Butterflies
E12	Door Hinge Pins (2 sizes)
E13 (a&b)	Two-Digit Headcode Box
E14	Main Radiator Grills
E15	Bogie Speedo Backplate
E16	Toilet Cubical
E17	Bogie End Stretchers
E18 (a&b)	Space Heater Grills
E19	Control Desk Support
E20	lamp Iron Mountings
E21	Brake Pivot Hangers
E22	Baggage Door Handles
E23	Bogie Steps
E24	Oleo Buffer Lamp Irons
E25	Silencer Mounting Straps
E26	Bogie Dynamo Mountings
E27	Pipe Mounting Pins
E28	Long Brake Levers
E29	Corridor Conns. Scissors
E30	Plain Window Bars
E31	Speedo Solebar Mounting

LASER-CUT INTERIOR DETAILS 1 PER BOX, TYPE AS APPROPRIATE

INT 1	Cab Partition
INT 2	First Saloon Partition
INT 3	Second & Third Saloon Partitions
INT 4	Guard/Baggage Partition
INT 1D	Door For Cab Partition
INT 2D	Door For 1st Class Saloon

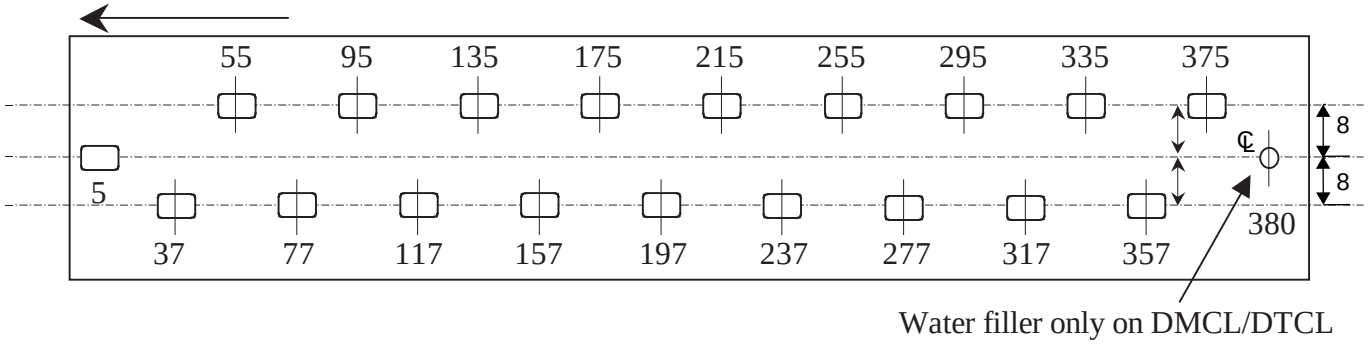
POWER BOGIE ETCH (DMBS ONLY)



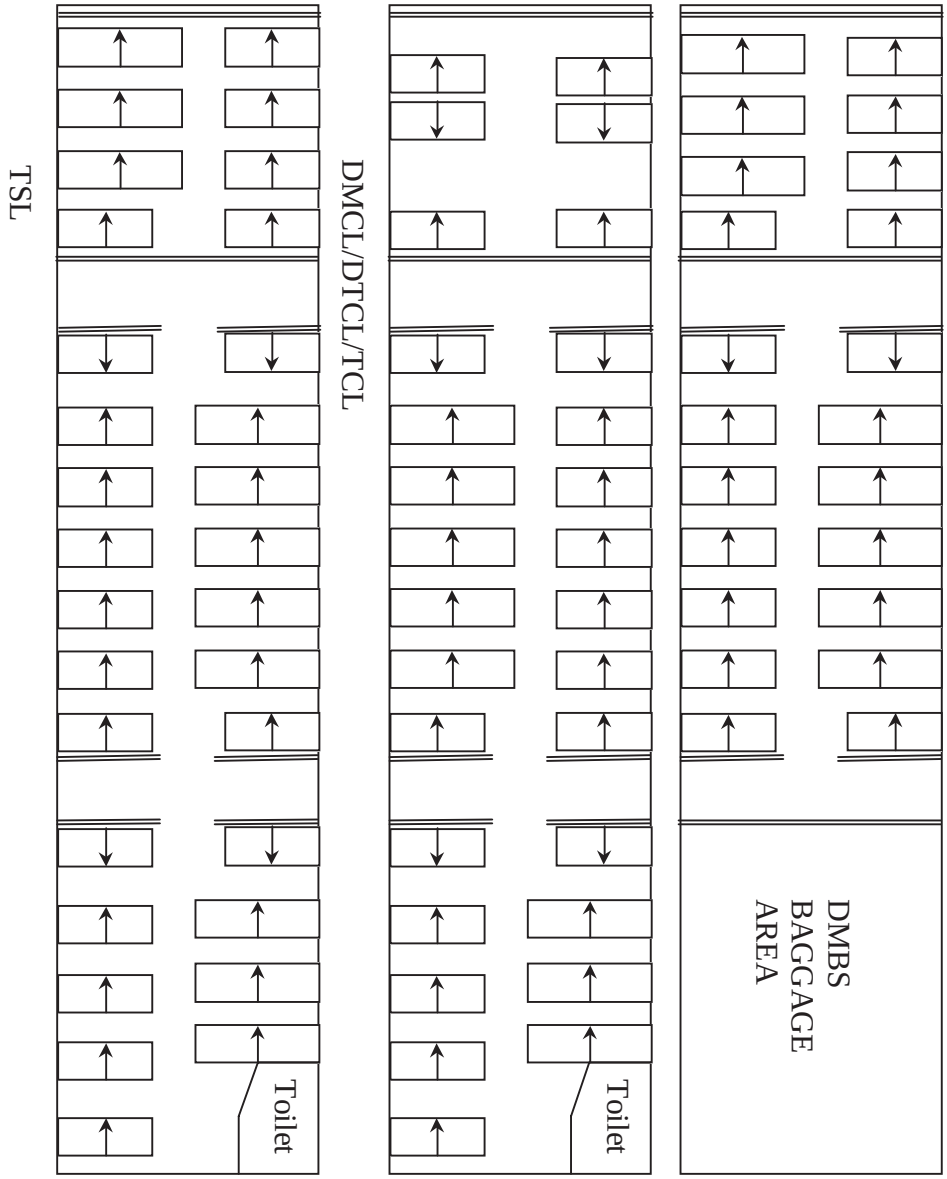


DRAWING1

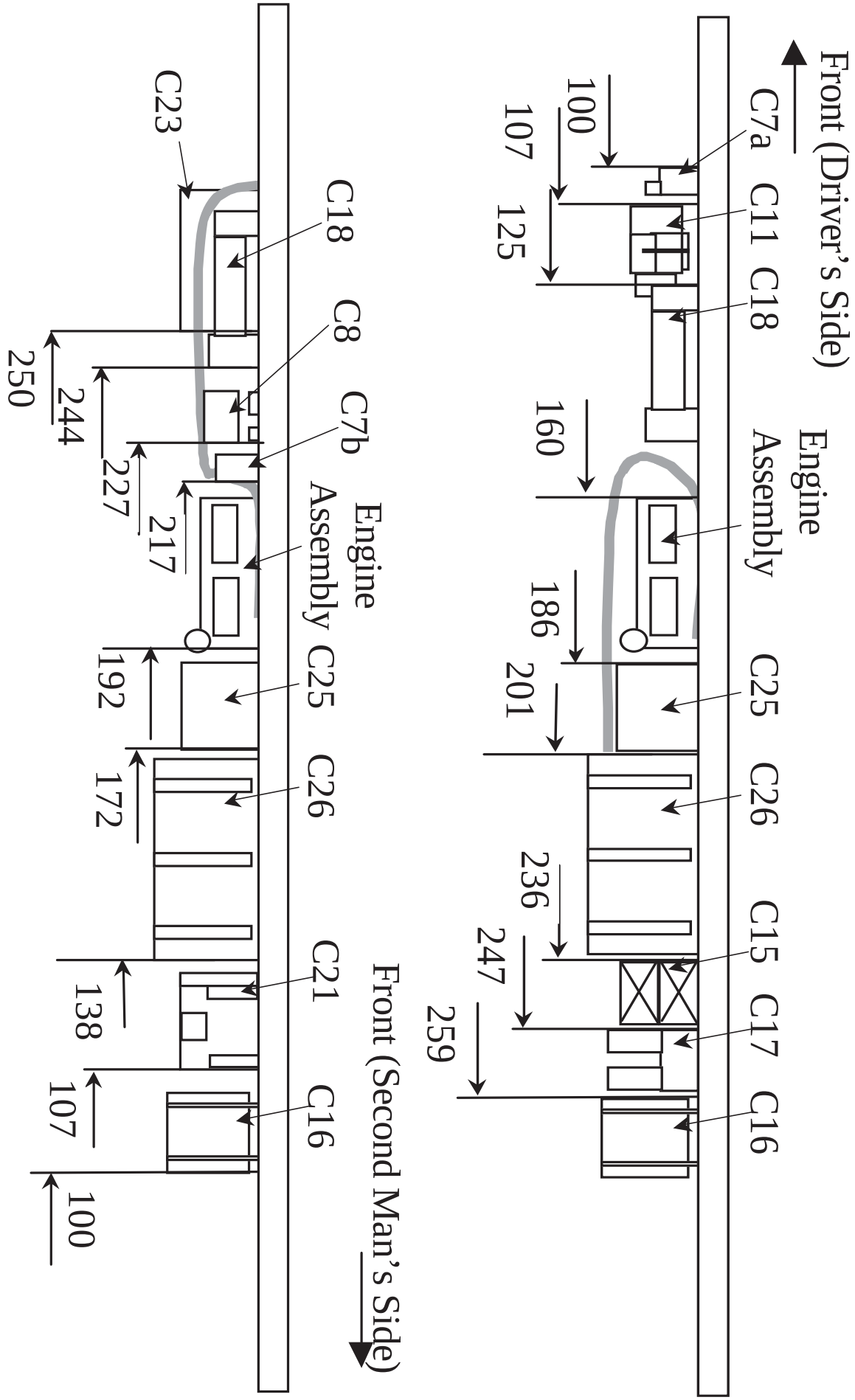
DMBS/DMCL/DTCL - All measurements (in mm) taken from the front of the roof molding.



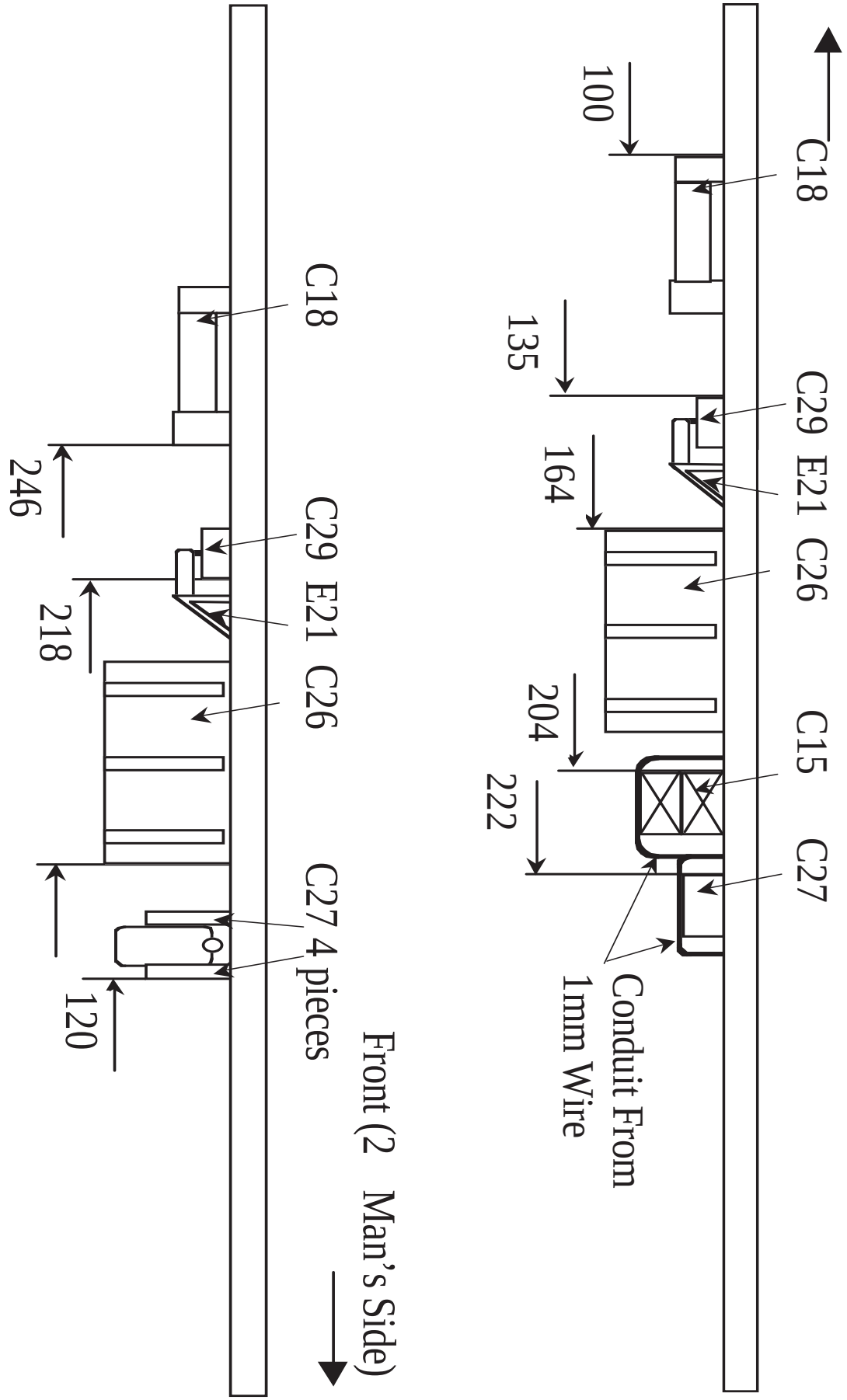
DRAWING2



DRAWING 3. DMBS/DMCL UNDERFRAME DETAILS LAYOUT



DRAWING 4: DTCL/TSL/TCL UNDERFRAME DETAILS LAYOUT

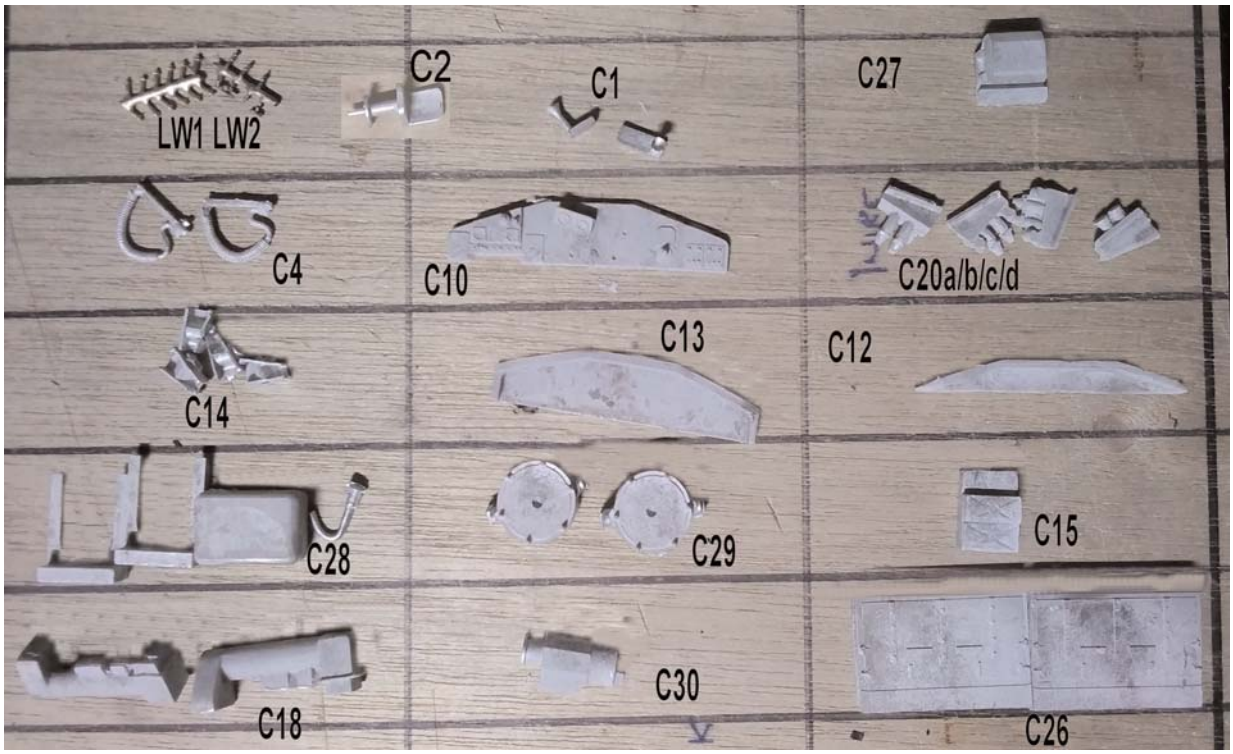


DMBS/DMCL CASTINGS

DMBS/DMCL CASTINGS KEY

C1) HORNS
C2) DRIVER'S SEAT
C3) SPEEDO DETAILS
C4) VAC PIPES
C5) CONTROL DESK DETAILS
C6) OIL FILLERS
C7a/b) FIRE CONTROL LHS/RHS
C8) ELECTRICAL BOXES
C9) EXHAUST SILENCERS
C10) CONTTROL DESK
C11) MAIN DYNAMO
C12)RERAR BUFFERBEAM
C13) FRONT BUFFERBEAM
C14) BUFFER STOCKS
C15) ELECTRICAL BOXES2
C16) FUEL TANKS
C17) FUSE BOXES
C18) SPACE HEATERS
C19) GEAR BOXES
C20a/b/c/d) MU CONNECTORS
C21) GROUP OF VARIOUS BOXES
C22) FLYWHEELS
C23) AIR TANK (3 PIECES)
C24) ENGINES
C25) RADIATORS
C26) BATTERY BOXES
LW1) DOOR BUMP STOPS
LW2) DOOR 'T' HANDLES

DTCL/TSL/TCL CASTINGS

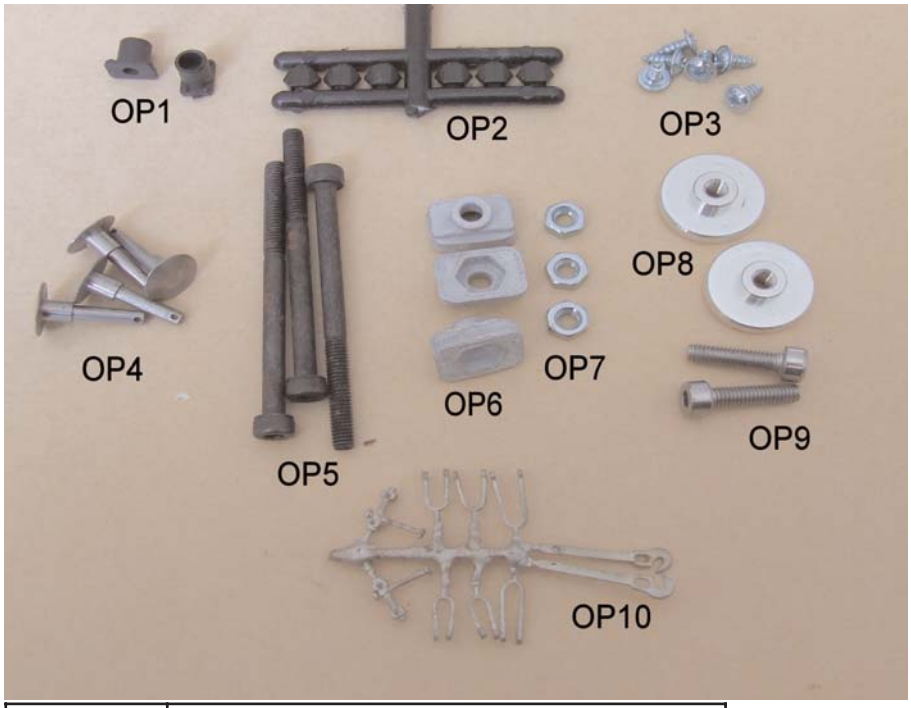


DTCL/TSL/TCL CASTINGS KEY

NOTE: The castings in this image use the same part numbers as those in the DMBS/DMCL units where the parts are the same. This is why the part number do not follow sequentially in the picture. Casting that only feature on the DTCL/TSL/TCL vehicles have part numbers that carry on from the end of the other casting list.

C1) HORNS
C2) DRIVER'S SEAT
C4) VAC PIPES
C10) CONTROL DESK
C12) REAR BUFFERBEAM (x2 TSL/TCL)
C13) FRONT BUFFERBEAM (DTCL)
C14) BUFFER STOCKS MOUNTINGS
C15) ELECTRICAL BOXES2
C18) SPACE HEATERS (taller than on DMBS/DMCL)
C20a/b/c/d) MU CONNECTORS
C26) BATTERY BOXES
C27) ELECTRICAL BOX3
C28) FUEL TANK (4 pieces)
C29) BRAKE CYLINDERS
C30) SMALL DYNAMO
LW1) DOOR BUMP STOPS
LW2) DOOR 'T' HANDLES

OTHER PARTS PACK



OP1	Resin Cast Buffer Stocks x4
OP2	Resin Cast Roof Vents x24 (4x 6 Vents)
OP3	Body Fixing Self Tapping Screws x6
OP4	Turned Buffers x4
OP5	Body Fixing Bolts x3
OP6	Cast Metal Captive Nut Fittings x3
OP7	Nuts for Captive Nuts Fittings x3
OP8	Bogie Mountings x2
OP9	Bogie Mounting bolts x2
OP10	Cast Couplings x1
OP11	Buffer springs (NOT SHOWN)