Prototype
Replica Model Railway Products PRMRP

Stockists of 7mm Modern Image Kits

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Building Instructions

7mm/0Gauge BRL-067
Class 67

SCALE MODEL PRODUCT FOR ADULT MODELLERS ONLY.
WHITE METAL CONTAINS LEAD - WASH HANDS AFTER USE.
MAY CONTAIN SMALL PARTS. ETCHED BRASS HAS FUNCTIONAL SHARP EDGES - HANDLE WITH EXTREME CARE

Thank you for purchasing this kit.

This instruction pack should provide a guide for building this model, given some experience of soldering and the basics of etched kit construction.

<u>Please read all the pack before starting to build.</u>

Drawings and photos are essential for builders to acquaint themselves with the prototype they wish to model.

For builders of modern image in 7mm, consider joining MIGO+1, the Modern Image Gauge 0/1 Organisation. For more details check out the website www.migo.org.uk

Transfers are available from Fox Transfers

Suggestion of tools that maybe required and general kit assembly

Preparation

Before any parts are cut from the etched frets, push through any rivet holes from the back of the fret. These are represented by half etched holes on the rear of the fret. The same also applies to pre-formed loco.

Forming the Etched Parts

When forming the etches, unless otherwise instructed, the fold lines are on the inside. A pair of bending bars are ideal for this job or a vice, (without serrated jaws), would suffice.

Soldering

The key word for a successfully soldered joint is cleanliness. If the parts to be joined together are clean metal surfaces and are well coated in a good flux and providing the soldering iron tip has sufficient heat, a perfect joint which is also very strong will result.

A good strong joint can be achieved with glues but it is not easy to rework. A soldered joint can be easily undone, altered, corrected etc. by just re applying some flux and heat from the soldering iron. The flux transfers the heat from the tip to the metal surfaces to be joined and stops oxidization at the joint. I allow the multi-core solder to stay molten on the joint and, when the iron is taken away, will cool to form a solid metal joint.

When undertaking any kind of soldering always hold the parts to be joined together securely and comfortably. You will learn with experience how long to hold the iron on and in turn how much pain your fingers can endure. The use of small clamps such as hair clips, mini G clamps, (not rubber bands!), a small vice, various pliers etc. will make life easier. A simple jig soldered together out of scrap metal or made from wood may also help for holding parts you find awkward to hold.

You can use the various temperature range solders to your advantage during building. Multi-core for larger pieces will give you the main structure. A solder called Carrs 145 or 177 solder is used to apply the finer etches and laminates. Finally white metal solder, Carrs 70 Red Label, is used to fix the castings on.

Remember to take care not to apply too much heat near laminates or casting you have already joined as you may disturb them.

Cleaning Up

When assembly is finished, all excess solder should be cleaned from the model. Files, small wire brushes, fibre pens and Wet & Dry paper are all useful aids when performing this task.

On your model there are joints between etches and castings that may require some filling. Car body fillers such as Isopon are ideal, (avoid flexible/elastic fillers). When any solder or filler has been cleaned up the body should be washed in warm soapy water to remove any grease or flux that would prevent paint from adhering. Some washing up liquids leave a film on models, so it is recommended that VIM is then used in a second wash.

Plastic window boxes sold in the big DIY stores make an ideal size container for washing your models.

Rinse the model in clean water and leave to dry naturally over night.

Tools

- **A soldering iron with range of bits from large to very fine, for example a Weller temperature controlled iron (60 watt)**
- **Multi core solder, Carrs "Green Label" flux aids the running of the solder#18-24"**
- **Steel rule**
- **Folding bars such as those sold by M&M Models**
- **Range of Swiss files**
- **Medium cut bench knife such as Stanley Knife or short bladed scissors for cutting out etches.**
- **Evo Stick/Super Glue and Epoxy**
- **Good quality side cutters**
- **Fine pliers and duck billed pliers**
- **Mini drill and a good range of drills**

ORDER OF CONSTRUCTION

It is recommended that you complete the kit in the following order:

- **Chassis**
- **Bogie Etches**
- **Fuel Tanks & Underframe equipment**
- **Body**
- **Cab Detail**
- **Bogie sides**
- **Motors, Gears and Delrin**
- **Finishing touches**

Chassis Construction

Separate Chassis etching E1 from the main sheet, carefully removing the bogie end struts, cab seats and nameplates from within. Fold the 2 side wings up to form a right angle on each side of the chassis. Proceed to fold the 2 buffer beams at either end, also to a right angle. Take care when performing this process as the thin brass etch shape must not be distorted.

Solder the buffer beam to the side wings making sure that the buffer beam is square and at a right angle to the chassis. Proceed to solder the thin strips to the ends of the wings which will form the under part of the cab. (see figure 1)

Solder rectangular bogie mounting E2 in position ignoring the half etched lines on the under side of the chassis. Centre the hole in this mounting 68mm from the back side of the buffer beam. This will be where the bogie attaches to the chassis by way of the nylon screw as detailed later.

Fold E3 as indicated (see figure 2) and solder on top of E2 with the folds facing down.

Fold E4 to form a box shape, solder the 6BA nut inside. (See figure 3). This is to be fixed to E3 as indicated, but it is suggested that this is only secured in place once you have constructed the Bogies, as it is designed to allow the adjustment of the ride height of the locomotive. There are two of these one at each end of the chassis for attachment of each bogie. (See figure 4).

Bogies

Cut the bogie U-section etch E5 from the main bogie etch and cut away 5mm from each end as indicated by the ½ etch line, then bend in the shape of a U-section as detailed. (See figure 5) Fold down the inner strengthener and solder into ½ etched marks provided. Make sure this whole assembly is square otherwise, your Class 67 will develop a list to one side or another. Fold both wheel saddles E6 + E7 into a U-Section these will then be soldered over the main U-Section in order to accommodate the correct wheel spacing for the Class 67. Fix E6 4mm from the end that housed the drop down inner strengthener, with the bearing whole facing towards the centre of the Bogie as shown. (See figure 6). Fix the motor bearing saddle 13mm from the end of the Bogie, this time ensuring that the axle hole is facing towards the end of the bogie (See figure 7). This should give you 68mm Bogie centres.

Solder the wheel bearings into position, ensuring that they run square and test fit the wheels accordingly. It always helps to ream out the bearing holes in order to aid smooth running. (See figure 8). Another point to note is the fact that the if PRMRP have provided the wheels for your model, then the axles need trimming where they meet the front of the wheels.

Fold bogie pivot angle and attached to the top of the completed U-Section as shown. (See figure 9).

Repeat this process for the second bogie. Now that you have two bogies, you will be able to secure E4 ride height adjusters as mentioned in the chassis construction paragraph. The ride height is down to personal preference and also depends on the height of other rolling stock if you have any. I would always recommend the construction of a 'buffer template' which is as simple as attaching two buffers to a piece of wood/plasticard at the desired height and then using this to offer up to any new model built, so that your stock all rides at the same buffer height. You may have your own methods and this approach will not fit all!

You should now have a rolling chassis

Fuel Tanks & Underframe equipment

Shape the main fuel tank E8 section as shown (See figure 10) the half etch section represents the outer side of the tanks! Bend the two flaps on the fuel tanks ends E9 (See figure 11) and attach to the main tank etch starting by lining the ½ etched marks on the insides, solder tagging your way round the tank to ensure that you achieve a smooth curve, repeat this at the other end. The finished article should look like this (See figure 12).

Fit the two cast fuel gauges 67/14 into the round holes on each side of the fuel tank. Then proceed to do the same with the square fuel filler caps 67/29. Solder taps 67/24 to the top of the tanks 47mm from the end furthest away from the filler cap and fuel gauges. Fit the completed fuel tank unit to the chassis 245mm from the centre of the tank to one of the buffer beams making sure that the filler caps and fuel gauges are nearer to the centre of the locomotive. (See figure 13).

Bend the two battery boxes E10 and fit next to the fuel tanks approximately 3mm away. (See figure 14 & 15)

Using spare brass from the etch, fashion a bracket to support the two are tanks 67/17 as shown and then add the condenser 67/8 as shown. (See figure 16).

It is appreciated that this gives a very rough representation of the underframe detail and I am sure that some of you will be able to scratch build more detail as required.

Body

The body is formed E11 and will need any remaining tabs removed and any rough edges filed down. Do not worry about getting the roof profile right at this stage. It is recommended that you proceed as follows with attaching the body to the chassis and then undertake the final profiling of the body shape.

Bend the two chassis mount channels E12 in to L shapes and solder 2 8BA nuts to the top of each channel, these should align with the holes already in the chassis. The channel may need to be trimmed slightly to ensure that it fits exactly into the half etch line on the bottom of the inside of the body sides.

Solder each channel into the half etch line, using this to line up the bottom of each channel. This will ensure that that when the body mounts the chassis, there will be a slight overhang on each side. Attach the body to the chassis. You may need to elongate the fixing holes in the chassis to ensure that the body ends are level with the bufferbeams.

With the body in position, solder the cast nose front 67/3 in place and then the windscreens 67/4. (See figure 17a) Repeat this for the no.2 end.

Attach the cast roof piece 67/2 fixing at the front to start with. Manipulate the main etch roof section to match and then fix the rest of the roof using low melt solder to fill in any gaps to match the roof profile. A degree of filling will be required at this stage and the end result will need filing to shape. (See figure 17b pre-filing) Once again repeat for the no.2 end. Take time to clean and fill the ends, so that you have a complete body, ready to begin the roof, grills and other body parts. (See figure 18)

Fit the seven roof formers to the under side of the roof section, ensuring that the correct profile remains throughout the length of the body. The locations are indicated in figure 19. Five formers offer up to the edge of each of the three sections of roof and the remaining two at the ends of the exhaust cut out.

Fit the two cab bulkheads, E13, sliding them into the etched lines provided and solder in place (see figure 20). Now turn the body over and you will notice that you have three distinct channels in the roof. Bend the etch strip part E14 to the shape of the roof and fit into this channels accordingly. (See figure 21). You will have one remaining strip, which is to be fitted to the cab end next to the grill cut out.

Now take a piece of scrap brass provided and cut a platform to fit underneath the exhaust cut out. Mount this as show in figure 22. Cut out the three etch parts that for part of the exhaust system E14,15 & 16. Roll E16 to the shape of the curve on E14 & 15 and solder in place as shown in figure 23. Fit the exhaust system as show in figure 24, using silencer casting 67/23.

Bend and fit the roof grill E17. (see figure 25a) As you can see, you are able to see through the grill into the inside of the model. Although not provided, I have chosen to solder a scrap piece of brass across the topside of where the body meets the grill, so that you are unable to see all of the way through.

Now fit the four engine cover doors. (see fig 25b). After fitting these, add the small square grill E18 to the cab roof next to the silencer/exhaust pipe. (see fig 26). Turn to the two cab ends and fit the airhorn housing to the front of the roof ends as shown on fig 27. I have choosen to cut away the roof, where the top head light fits. This can be achieved by using a drill, knife, files and a little patience. Add Top light casting 67/12 (It is worth noting that this will be altered in time and the cut out will be included in the roof when a new master is made).

Fit the body side grills E19 & E20 as shown, remembering to push through the rivets from the reverse of the grills.

Fit the front end castings 67/9 ETH Terminals, you can cut away the cast wire and add a piece of brass wire if desired. Add 67/11 Headlamps and 67/13 MU Sockets. The front end is shown in fig.28.

The windscreen wipers need to be fitted I would suggest this is completed once the loco has been painted and glazed.

The body is now complete.

Cab Detail

Bend Etch Cab Desk E21 (see fig.29). bend and add the instrument panel E22 and solder the Instrument Panel top to it E23. Fix this to the Cab Base etch E23 and secure onto the chassis, note that the hole in the cab base, which is furthest from the side goes on the left hand side of the body. Before securing the cab, test fit it to ensure that the body still fits. Add the two cast seats and repeat for the no.2 end.

Bogie Sides

Fix the Damper Bracket 67/7 to the underside of the Damper 67/6 and mount on the bogie frames as indicated in fig 30. Also add the single bogie damper as shown.

There are two ways of fitting the bogie sides to the main etched Bogie. The first is to solder them directly to the bogie, but be mindful that this will make maintenance difficult going forward, as they will need to be unsoldered every time you wish to take the wheels out etc.

The second option is to make the bogie frames independent from the bogie etch. Cut a scrap piece of brass and cap off each end of the bogie etch unit. Fold the bogie stretchers E24 and fix to the bogie ends with a suitable nut and bolt (not provided). Cut these to your desired width and solder the Bogie sides to them. Add the Disc brake units 67/10. Fix the guard irons 67/20 to the front of each bogie. Care should be taken as these are handed.

Fold up the bogie steps and fit these to the bogie side frames.

Repeat for the second bogie.

Motors, Gears and Delrin. (Not supplied in kit)

The can motors as supplied have fixing screws, which pass through the bogie etches as indicated by the pre-drilled holes.

Now check that the fixing holes in chassis top line up with motor and enlarge if necessary. The brass sleeve m9 fits inside the steel worm m10 ensuring that it is proud by 2.5mm at the shouldered end. For the worm to grip onto the motor shaft , use a 3/32 drill and bore a hole through the brass sleeve in the side of the worm and tap 6BA.

By enlarging the hole in the chassis top, the motor complete with worm can be fitted or removed with ease. Fit the motor followed by driving axle and brass gear m11 adjusting as necessary to produce a good mesh. Sometimes, inserting a shim of scrap brass between one end of the motor and saddle can improve this. Fix solder tags m2 to inside ends of chassis. Decide on the type of pickups you want to install and proceed. Before continuing it is advisable to test the bogies.

Fit wheels, attach wires and couple up to a nylon terminal block. If the motors turn in different directions swap the motor wires on one bogie.

Do not fix the Delrin cogs at this stage as once in place they are not easily removed. The chassis can now be dismantled and along with the wheels, painted before final assembly.

If fitting Delrin note:

- **that the cogs are in line with the bulkhead cut-outs**
- **they are fitted to the outer axles**
- **you may have to file the shank of the cog if there is insufficient room on the driving axle.**

The bogies can now be reassembled and Delrin added if desired.
Useful Tip : Use Loctite Lock 'n' seal to prevent the wheels unscrewing.

Finishing touches

Turn to buffer beam detail and add the ETH unit 67/15 & 67/16, the Cosmetic Coupler 67/22 and buffers as shown in fig 31. Finish off by adding the two air pipes and your model is now ready for final preparation before painting. Clean any excess solder from the model and fill any areas with a suitable filler, such as P38 car filler. Sand down and prepare for painting.

Part Ref. No.	Part Description	Qty
	Instructions	
	Etches	
	Buffers	4
	Frame bushes	8
	Nylon screw/nuts	2
	Black sheet	
	Black/red wire	
	Cab seat support	2
	Glazing	
	Air pipes set	2
67/1	Bogie sides	4
67/2	Cab roof	2
67/3	Nose front	2
67/4	Windscreen	2
67/5	Thick roof former	7
67/6	Dampers	8
67/7	Damper brackets	8
67/8	Condensor	1
67/9	ETH terms	4
67/10	Disk brake unit	8
67/11	Headlamps	4
67/12	Top light	2
67/13	MU Sockets	2
67/14	Fuel Gauges	2
67/15	ETH Unit	2
67/16	ETH Unit	2
67/17	Air tanks	2
67/18	Bogie dampers	4
67/19	Taps	2
67/20	Guard irons	2 pairs
67/22	Cosmetic couplers	2
67/23	Silencer	1
67/25	Socket covers	4
67/26	Sockets	4