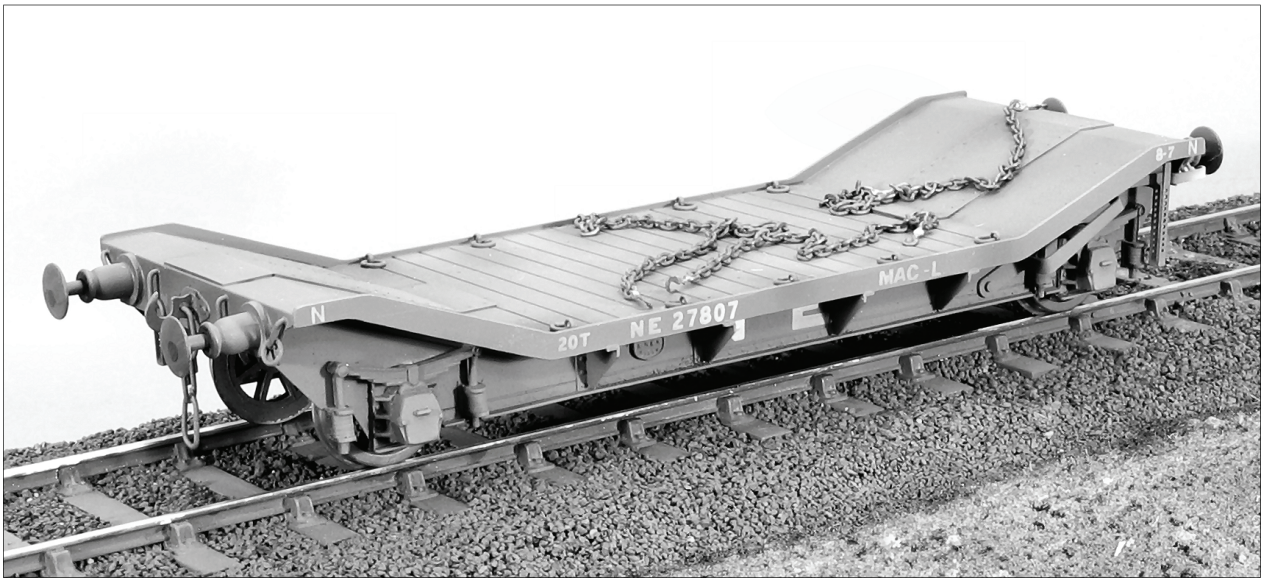
CONNOISSEUR MODELS

- 0 Gauge -

London & North Eastern Railway

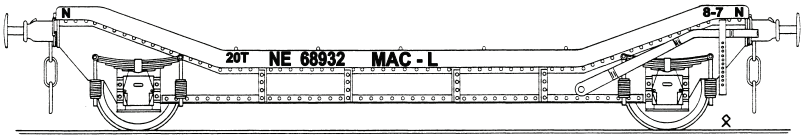
20 Ton MAC - L
Low Machinery Wagon



Prototype. The ten 20 ton capacity LNER Mac - L wagons were originally built in 1913 by the North Eastern Railway. This was the only design of four wheeled low machine wagon built by them and they were used for the transportation of traction engines and heavy machinery.

The wagons were designed so that tall road engines could be driven onto them from an end loading dock and then secured on the well deck within the railway loading gauge. These wagons ran in service into the 1960,s

Kit. This is a very straightforward kit to build. A number of parts require simple folding and a lot of push out rivet detail gives the finished model the appearance of being constructed from heavy plates. Separate load securing rings that the ingenious modeller can make to work, add extra interest.



Wheels, 2'9", 8 plain Spoke (7129) are required to complete, Available from Slater's, Temple Road, Matlock Bath, Derbyshire, DE4 3PG, Telephone 01629 583993.

Connoisseur Models, 33 Grampian Road, Penfields, Stourbridge, DY8 4UE, Telephone 01384 371418

GENERAL INSTRUCTIONS

Please read this section carefully, especially if this is your first etched brass kit. Many modellers fight shy of working in this medium, but the basic skills are relatively easy to acquire. Once you've learned how to form and solder brass, you'll find all kinds of modelling possibilities will open up for you.

Assembling an etched kit involves exactly the same skills that a scratchbuilder uses – the only difference is that the cutting out of the parts is already done for you. Some filing and trimming will, however, be necessary from time to time. Where this is the case, I have highlighted it in the instructions.

The main skill to master is soldering and I would recommend a Weller 40 Watt soldering iron. This has a 6mm diameter, removable copper bit. The bit is shaped like a screwdriver and has a bright coating of solder (tinned). This combination of iron and bit shape is ideal for running fillet joints and has a good reserve of heat, that is necessary for soldering small parts on to large components. Note the shape and condition of a new bit, as this won't last long and will need restoring back to this condition.

It is important to keep the bit clean and in good condition as you work. Get a soldering iron stand containing a damp sponge; old oxidized solder is wiped off on this before picking up fresh solder for each joint. If you haven't made a joint for some time you may find that a hard black crust has formed on the bit. Remove this with a brass wire brush (suede brush) and then feed some multicore solder onto each side of the bit to restore a bright surface (referred to as wetting or tinning the bit). After about 8 hours use you will find the bit is in poor condition, with holes and a ragged edge. File the bit back to its original shape using a hand bastard file and then polish the surfaces on emery cloth. Coat the bit with Fluxite Soldering Paste (traditionally used by plumbers) and this will prevent the bare copper oxidizing as the iron heats up. Then feed multicore solder onto the bit to form a generous coating and leave to bubble away for a couple of minutes before wiping excess off to give a bit almost as good as new.

A smaller Antex 25 Watt iron with a 3.2mm screwdriver bit is very useful for small assemblies and detail work such as handrails, but will have insufficient heat reserve for main assembly work. The Antex has a plated iron bit, after a little use with 145° solder a grey oxide appears on the bit that will prevent you from picking up the solder. Touch the bit to some multicore solder and it will flash over the bit, wetting it so that you can continue picking up 145° solder. I have found no problems with mixing the two solders in this way.

I use 145° solder for virtually all assembly work. I prefer it in wire form, available from Branchlines, but it is also produced in stick form by Carrs. I find that its lower working temperature helps to give a quick clean joint. Limiting the build up of heat in components, which may cause distortion. I find that I can hold parts together with my finger ends and make a joint before heat reaches my fingers or other etched parts drop off.

I use 60/40, tin/lead, fluxed multicore electrical solder (melting point about 190°) mainly to keep the iron bits in good condition. As it gives a slightly stronger joint than 145° I sometimes use it for small spot joints on handrail wire, lamp brackets etc, but still use extra liquid flux.

For all brass and nickel silver work I use Carrs green label liquid flux. You will soon get the feel for how much to use but more problems are caused by too little flux than too much.

Before soldering components together, thoroughly clean both surfaces along the join line with a glass fibre burnishing brush. Using your tweezers or a knife blade etc, hold the parts together in the correct position and, with an old paintbrush, run some flux along the area to be joined. Still keeping the parts correctly aligned, pick up a small quantity of solder on the tip of your iron and carry it to the joint (unlike electrical soldering, when you feed solder into the joint). Hold the iron against the joint just long enough for the solder to flash between the parts. Don't let go of the parts until the solder has cooled – this takes from five to ten seconds. To run a fillet of solder along a joint, wait until the solder flashes between the parts and then pull the molten solder along

the joint with the iron tip. Don't load the iron tip with a lot of extra solder, but work the joint in 1" lengths, bringing in small quantities of solder. Brass is a very forgiving material and if you get something out of alignment, use heat from the iron to desolder the joint before starting again. For complicated assemblies, it is a good idea to only tack solder parts together. You can then make adjustments by desoldering until you are happy with the location of parts and then solder solid.

When you need to laminate two or more layers of brass together, align the parts and carefully clamp them together, either in the vice or by holding them with miniature crocodile clips. Run flux around the edges, and then go around with the soldering iron. Clean up thoroughly afterwards.

To fit small parts and overlays on to a larger assembly, such as strapping to a wagon side, when you need to prevent finely detailed areas such as planking becoming clogged up with solder. Tin the back of the small component first, then hold in place on the model and apply flux. Carefully wipe the tip of your iron on a sponge to remove any solder from it (dry iron), and then touch it against the parts to be joined. After a few seconds you'll see molten solder bubbling from the edges. Remove the iron, still holding the parts in place, and allow the joint to cool. An alternative is to use solder paint (I would recommend Carrs 188 solder paste). As the name suggests, this is a flux and solder in one. Simply apply a thin coat of solder paint to the back of the component instead of tinning. Still apply a small amount of liquid flux before you solder the part into place.

Any surplus solder should be removed using a craft knife, I find No 10 curved scalpel blades ideal, then burnish clean with a glass fibre brush. With practice, you'll learn how to use the minimum amount of solder to do the job. Flux is corrosive so, after each soldering session, give your model a good scrub with washing up liquid or Jif. After a day or two, any remaining flux residues will show as a green film, which should be washed away.

To cut parts from the fret, use a sharp Stanley knife on a piece of hardboard or a pointed scalpel blade on a block of softwood. Remove tags and burrs with a fine file.

Three-dimensional parts are formed by folding. On an etched brass kit, the fold lines are normally half-etched on the inside of the fold. You'll be able to fold most parts using smooth-jawed pliers. For longer parts folding bars are desirable.

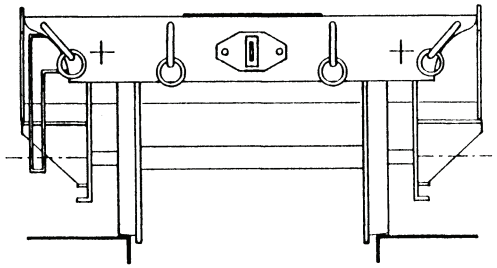
Other useful tools include a bench vice, a good pair of tweezers, a set of Swiss files (get a full set of cheap ones and then buy quality replacements for the three that you use the most), a pin vice with a selection of drills from 0.5mm to 2.1mm plus a few larger sizes that you use regularly (2.6mm for axle bearings etc), some square-nosed pliers and some very pointed-nosed ones, preferably with smooth jaws. Buy cheap tools first and duplicate the most used ones with quality.

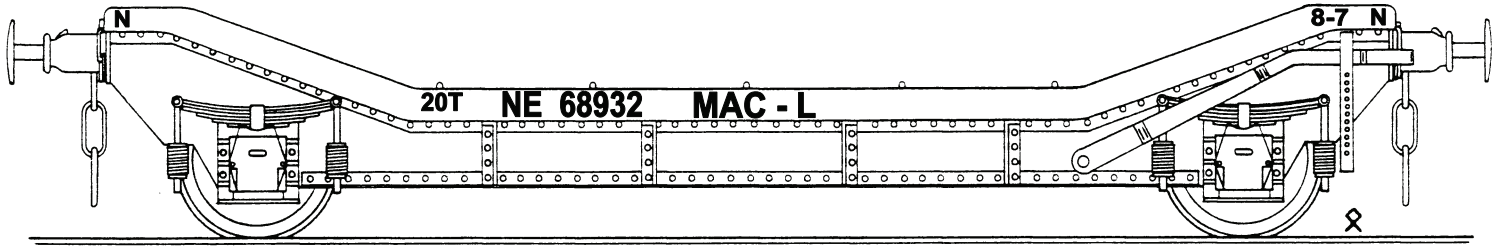
Try to complete all high-temperature soldering before attaching any of the cast whitemetal parts. These can be attached with two-part epoxy resin such as Devcon or Araldite Rapid. Ensure the surfaces to be glued are clean and free of grease.

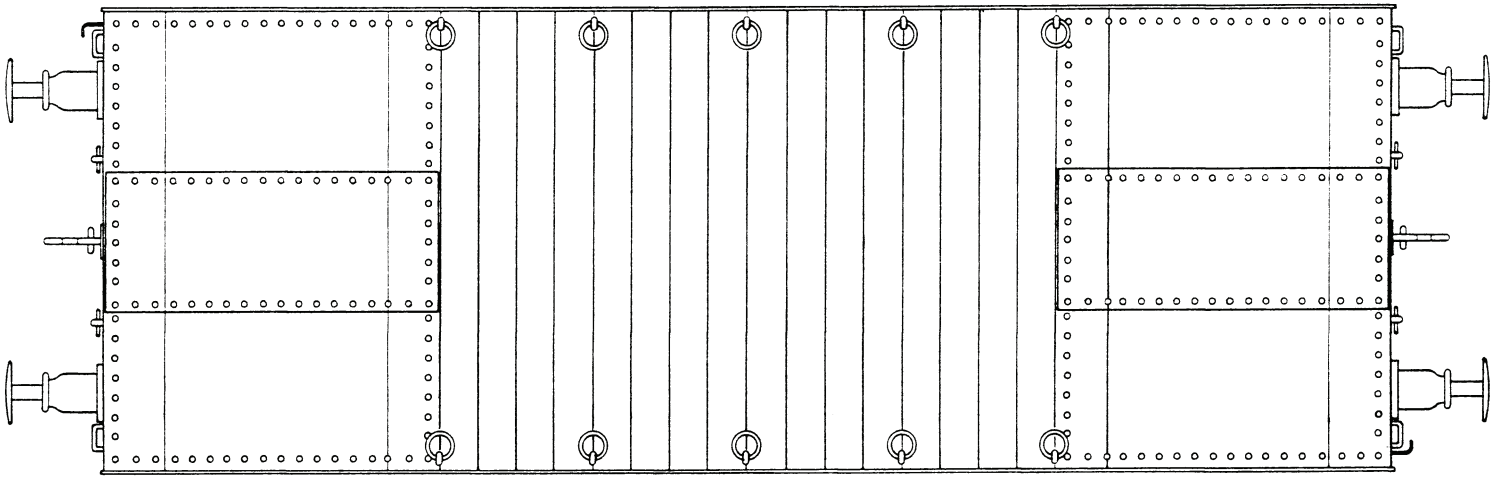
A better alternative is to solder your white metal castings using Carrs 70 degree low melt solder and Carrs red label white metal flux. The iron should be run at a much lower heat so that you do not melt the castings. I have a domestic light dimmer switch and plug socket fixed to a piece of wood, wired up with a lead and 3 amp mains plug to the input side of the dimmer switch and the output of the dimmer switch into the plug socket (remember to continue the earth). Plug your 40 Watt iron (25 Watt iron won't work) with a clean and freshly tinned bit into this and experiment with adjusting the switch until you find the range of temperature at which the solder melts, but a scrap casting does not. **Note** as the iron is running at a lower voltage it will take longer to heat up, so when you think the adjustment is correct do check a few minutes later on another scrap casting to see that it doesn't melt. Then scribe a mark on the switch knob to indicate this position.

When attaching white metal fittings to brass the surface of the brass must be tinned with 145° solder, to allow the solder to grip. The surface of the casting at the joint should be burnished bright. The casting can then be soldered into place with 70° solder and fillets of solder run into any gaps with no risk of melting the casting.

LNER 20 Ton LOW MACHINE WAGON MAC - L

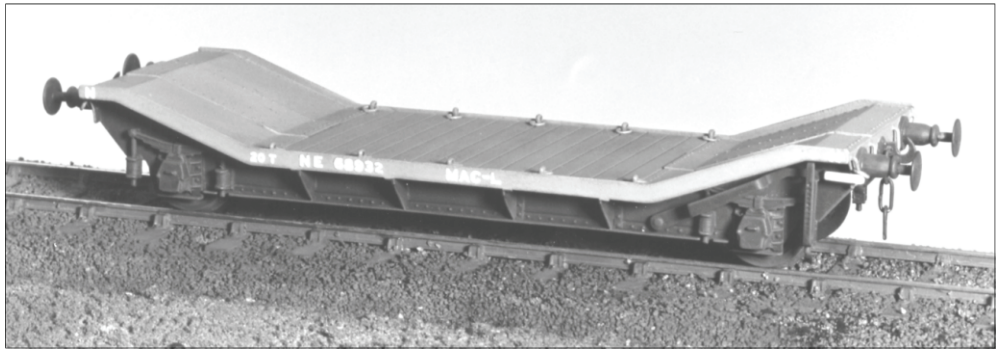






Livery. Grey (RailMatch paints LNER freight grey No 624) body sides (curb rail), buffer beams and steel sheeted end ramps. Black sideframes, axleboxes, buffers and couplings. White lettering. White end of brake lever. Dirty wood floor planks. Black/rusty load securing rings. In British Railways days the grey is slightly lighter (RailMatch paints BR early freight stock grey No 322) and the lettering was on black patches. The number is prefixed with E.

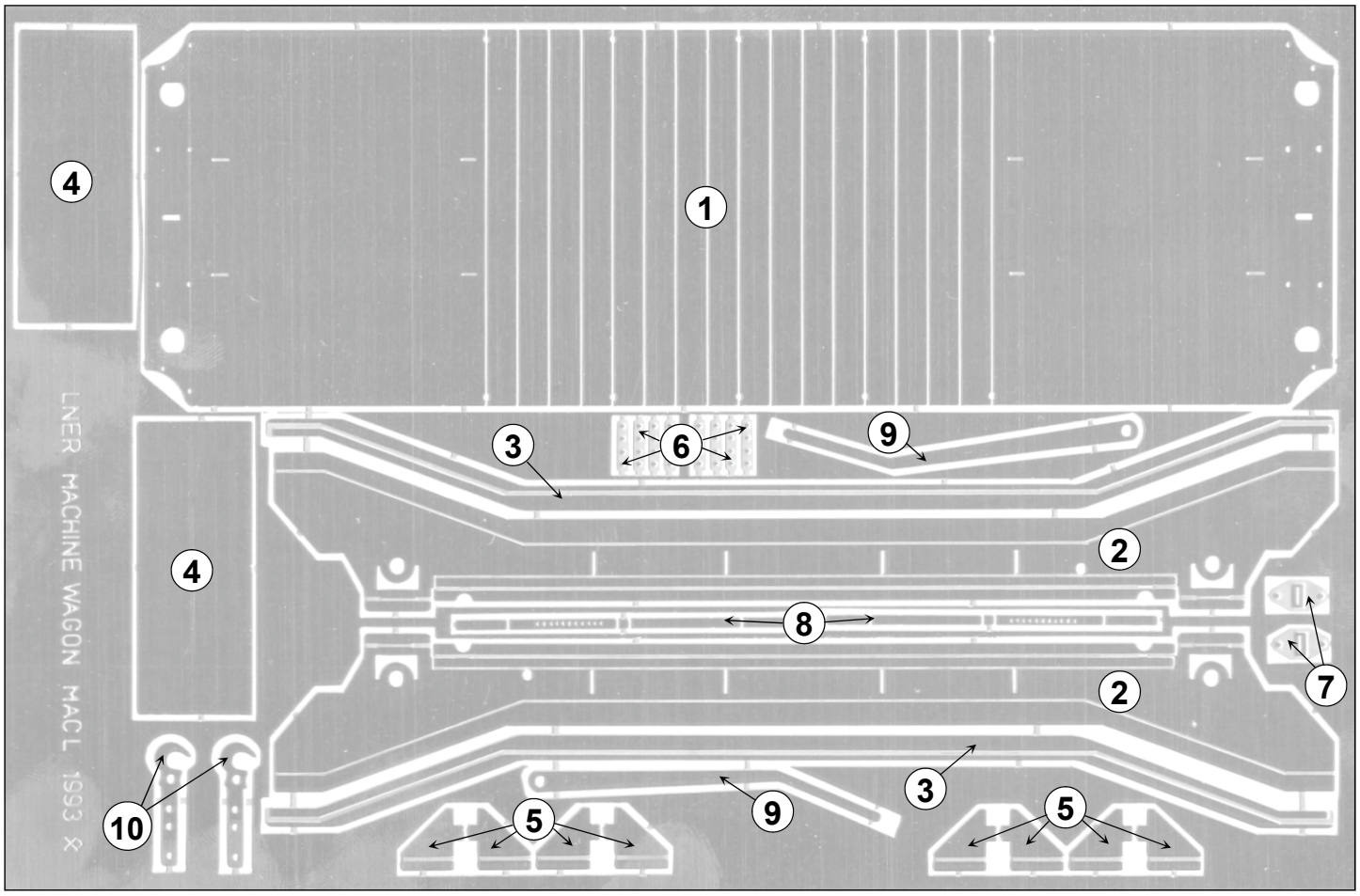
Transfers for LNER & BR lettering are available from the Historical Model Railway Society, 8 Gilpin Green, Harpenden, Herts AL5 5NR or stocked by some specialist retailers. These are Pressfix type and you will require sheet 12 LNER goods vehicles or sheet 25 BR revenue wagon. For waterslide type, Fox Transfers, 138 Main St, Markfield, Leicestershire, LE67 9UX, Tel 01530 242801.



Numbering. 68932, 5444, 72948, 22792, 9228,10294,18084, 27807,76804,78854.

References. A pictorial Record of LNER wagons, Peter Tatlow, OPC, ISBN 0-92888-92-7.

LNER Low Machine Wagon Etched Parts Identification



Casting Identification and Parts Check List

1 X 5” length of 1.6mm brass rod for brake cross shafts. 1 X 6” length of 0.7mm brass wire. 1 X 6” of spring steel Wire. 2 X 6” length of 22 swg tinned copper wire for winding load securing rings.

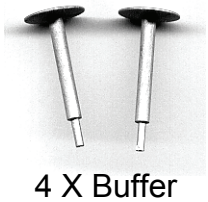
6 X Coupling links & 10 X Split Pins

4 X Axle Boxes

2 X Number Plates

4 X Buffers

4 X Buffer Retaining Collars



4 X Buffer Heads/Shanks

I try to include extra castings when I make the moulds for a kit to cover failures so hopefully you will have some spares.

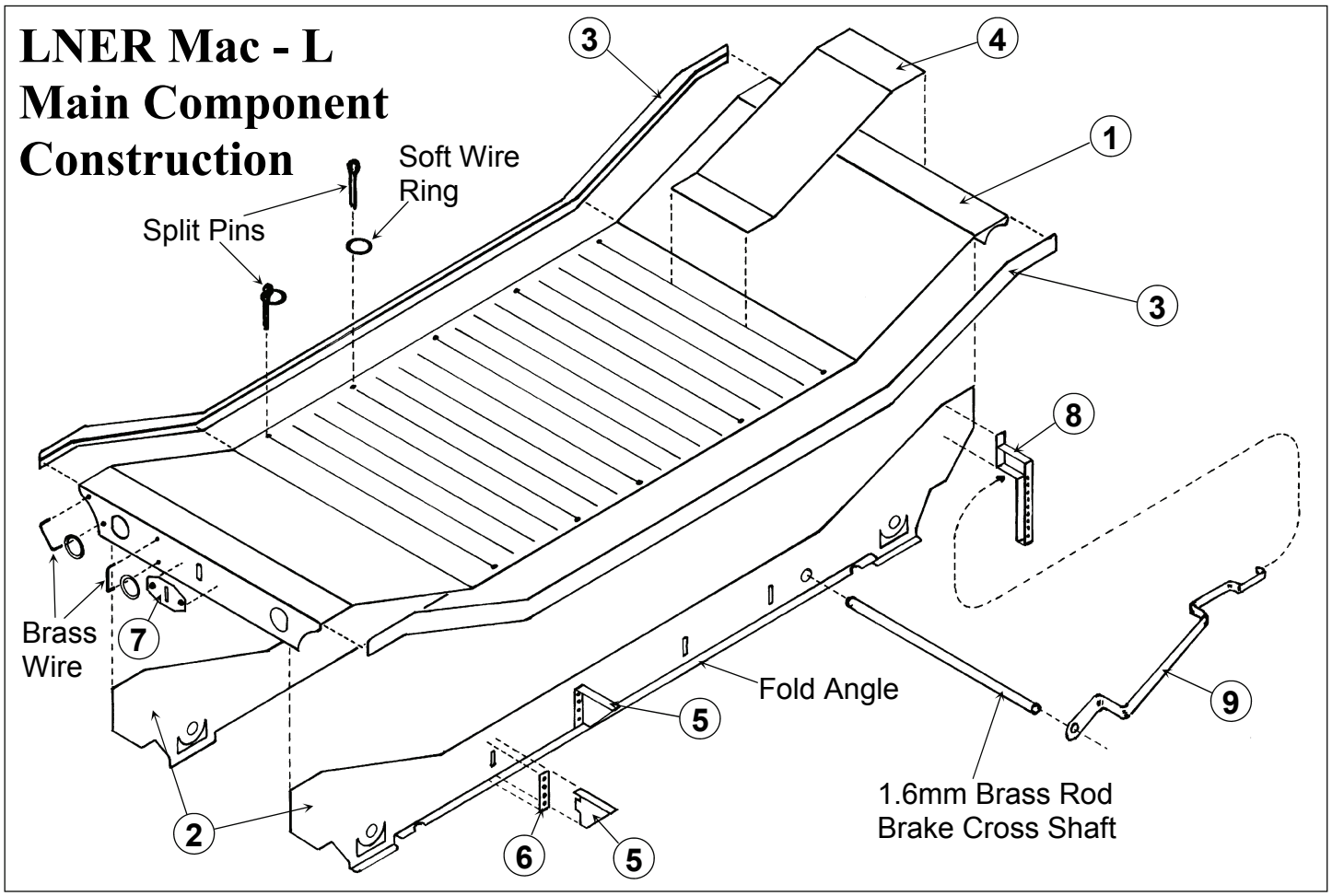
LNER Low Machine Wagon Suggested Assembly Order

1. I prefer to emboss all the rivet detail of the main components before forming any bends (you may wish to remove components from the etched fret to achieve this but don't separate parts 3 yet). This is best achieved with a rivet forming tool. Alternatively you can use a scriber with the point rounded off slightly on an oil stone. Place the part face down onto a block of softwood and firmly press the point of the scriber down into the half etched hole. Work your way along the row of rivets. You may find that this distorts the parts. Gently correct this by bending back with finger and thumb pressure about every six rivets.

2. Now using the top profile of a side frame (part 2) as a guide form up the main floor and buffer beams (part 1). The bend lines are etched on the underside. It is best to use the jaws of a vice for the 90° buffer beam folds but I find that using gentle finger pressure with the floor held against a square cornered block of wood will form the slopes of the end ramps.

Now form the bottom angles of the sideframes (parts 2). To achieve this I deepened the fold line by pushing a sharp triangular file up it until a faint witness mark appears on the reverse side (don't widen the fold line). You can then clamp the angle in the jaws of a vice and fold the sideframe through 30° towards you. Work towards the other end of the angle and then return folding through 60° and then back to form the final 90° of the angle.

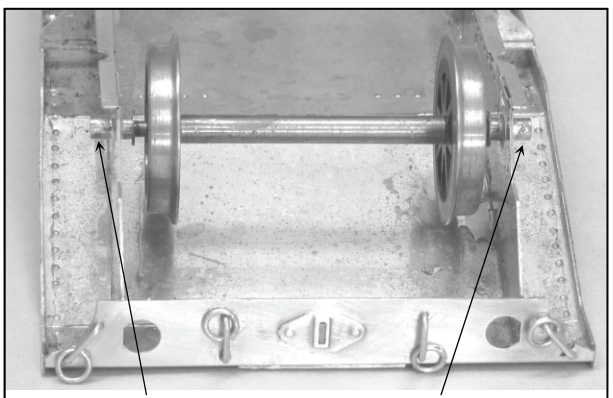
By deepening the fold line it reduces the amount of force required to make the fold and this should reduce the distortion of the unfolded sections of the angle as you work along it. If you overlap the folded and unfolded section in the vice jaws this should flatten out any slight distortion and once the angle is at 90° stroke along it with a block of wood to give a clean straight edge.



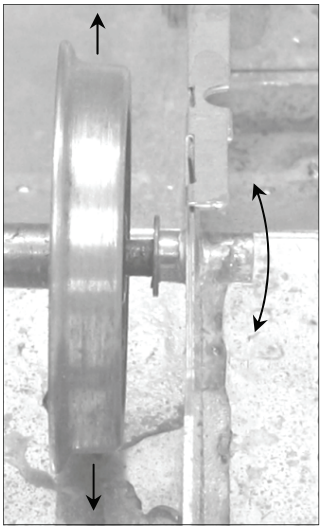
Once the angles are folded the sideframes (parts 2) can be soldered into place on the underside of the floor. Fit the sideframe that you used to form up the floor with first. There are etched grooves on the inside of the buffer beams into which the ends of the sideframes fit. Also dotted lines on the underside of the floor to give a guide to position. Solder the first sideframe solidly into place and then check that the body is not twisted.

Then offer the second sideframe into place. As with all parts that are marked out by eye and hand drawn you will find that the top profile of the two sideframes is not exactly identical (particularly with the angle of the sloping ends). To get the sideframe to sit into place snugly it may be necessary to dress slightly with a file one slope or accept a slight gap (that can be filled with solder) on the other slope (check that the axle bearing holes will still be opposite each other before filing). The temptation is to force the floor to follow the side frame profile but this may produce a twisted body. Once you are happy with the fit of the side frame fit bearings onto axles and spring wheel sets between frames so that the bearings locate into their holes. Then solder second sideframe solid.

The wheel bearings must now be fixed. As the sideframes are wider than the normal distance between axleguards the bearings must be pushed inwards on the axle ends to centre the wheel sets. I hold the bearing on one side in place with my finger end and the bearing on the other side into place with my thumb nail. I then quickly spot solder from the outside this bearing into the hole in the side frame (if you have wenches fingers you may wish to use a file end or piece of card between thumb and bearing to prevent burning your thumb).


Note bearings pushed inwards

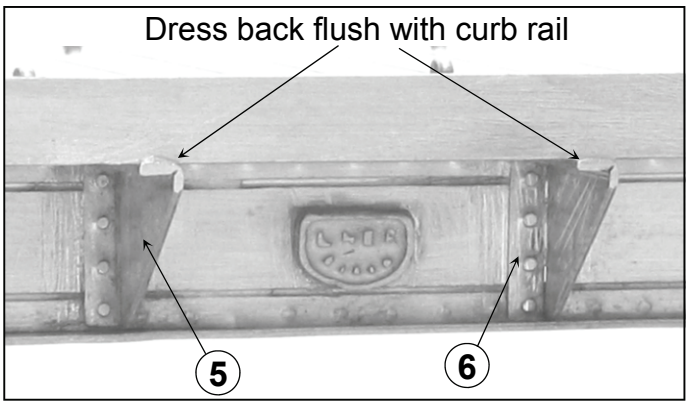
Then holding the unsoldered bearing steadily in position (I use a file end to hold the bearing steady) solder it solidly into its hole. Then return to the spot soldered bearing on the other side and resolder this solidly into place. Repeat for the wheel set at the other end and then check that the wagon sits on a flat surface without rocking. You can adjust any offending wheels by repositioning and resoldering the bearings (again I use a file end to Manipulate the bearing).



3. Fit the curb rails (parts 3) to the edge of the floor. I pin with drawing pins the etched fret containing the curb rails to a flat surface and then offer the assembled wagon to this. Locate the edge of the floor into the etched groove in the curb rail. It is easier to solder squarely a large object like the floor to a secured narrow strip than it is to solder a separate strip to a large object. I then solder into place using plenty of flux and touching the iron tip to the curb rail only. In this way the flux will draw the solder into the joint but should not flood into the plank lines or over the rivet heads. Once cleaned up with a fibre glass brush this should give you a neat gap free joint.

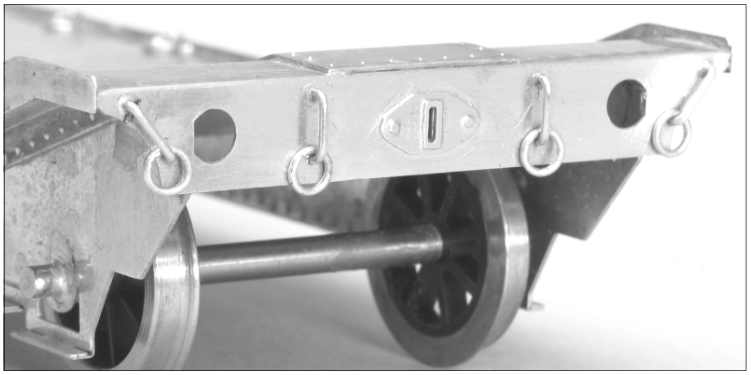
4. Form the reinforcing plates (parts 4) to match the end ramp profile and fit to the end ramps. As we are now getting a fair lump of metal together I find it helpful to tin around the edges of the underside of part 4 first. Then holding part 4 into place with the end of a file I apply plenty of flux. Then with a little solder on the iron bit I slowly work around the edges. The flux will help to draw the solder under the plate to melt the tinning and sweat the plate into place. This will make maximum use of the heat available from the iron and leave a minimum of cleaning up to do with knife blade and fibreglass brush.

5. Fold the tops of the triangular reinforcing plates (parts 5) through 90^{o} . Fit tab into slot in side frame so that the top angle touches the curb rail (note that they are handed around the wagon centre line). Tack solder tab into slot from the inside of the sideframe. Check that they are square and gently bend any that are not with pliers (there should be a little give at the tab if it is only tack soldered). Once happy solder the top angle where it touches the curb rail and then remake the tack joint at the tab to give a nice fillet joint on the inside face.



6. Fit the riveted plates (part 6) to the side frames hard against parts 5 to represent the other web of the triangular reinforcing plates. I tin the backs of part 6 before removing them from the etch. Then I hold them into place with a knife point and apply plenty of flux. Then with a very small amount of solder on the iron bit just to help transfer the heat. I touch the iron to their edge and allow heat to build up until the tinned solder flashes around all edges. A little cleaning up with a knife blade should then give crisp edges. Dress back the projecting top angle flush with the curb rail.

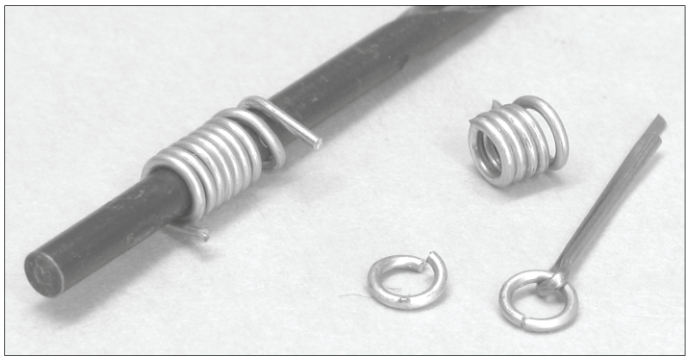
Now fit the two brake cross shafts made from 1.6mm brass rod. Cut two rods and square off the ends so that they will pass through the hole at the R/H end of the side frame and locate into an etched rebate on the inside face of the other side frame. Make the length of the rod such that the end projects about 3mm from the side frame (about 45mm long).



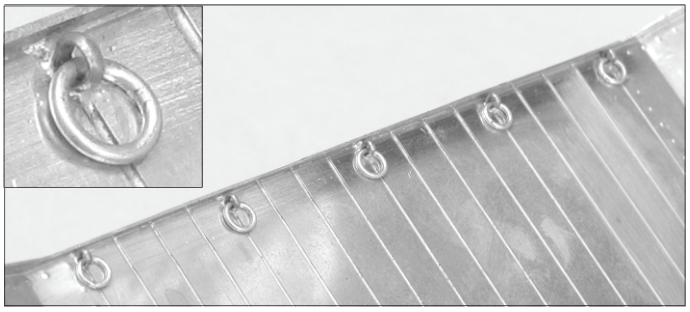
7. Fit the coupling reinforcing plates (parts 7) so that they correspond with the coupling slots in the buffer beam. Ensure that the coupling slot does not get blocked with solder. I find it helpful to tin the backs of the plates before removing from the fret and solder them into place in a similar way to parts 6.

I think that this is a suitable point to fit the load securing rings. I first fit the rails for the buffer beam rings. These are made from 0.7mm brass wire and formed into U shapes using long nosed pliers. They should be a snug fit into the holes so that they will remain in position as they are soldered into place from the rear. I set their spacing away from the buffer beam by eye but you could use a sliver of thin ply or card as a spacer. I trim the tails of the outer rails to length before inserting so that they will be almost flush with the back of the buffer beam after soldering.

The rings are made from 22 swg soft tinned copper wire. Wind the wire around a 2.5mm drill shank (similar to a spring) and then snip into individual rings using flush cutting side cutters. Straighten up the rings using long nosed pliers and then slightly open the ring out so that it will spring over the brass wire rail. Once in place gently close up the ring with pliers. I solder the joint closed with a tiny spot of 60/40 electrical solder on the iron bit and a very quick touch.

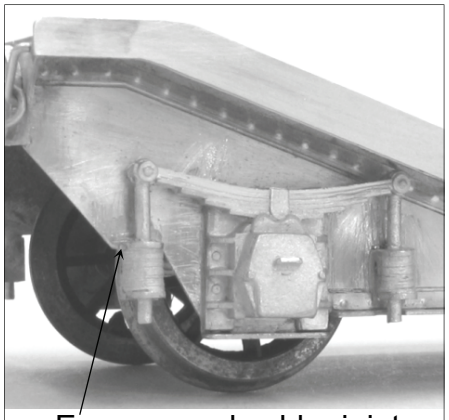


For the ten rings on the planked wagon floor I solder the rings closed first and then thread a ring into the eye of a split pin. I pass the split pin through the hole in the floor and grip its tail in the jaws of a miniature electrical crocodile clip. I then turn the wagon upside down and using the crocodile clip pull the split pin so the eye is against the floor. I then spot solder the split pin to the underside of the floor and snip the tail off flush. With the wagon upside down the ring should hang down away from the wagon floor and there should be no risk of solder flowing through and soldering the ring solid.

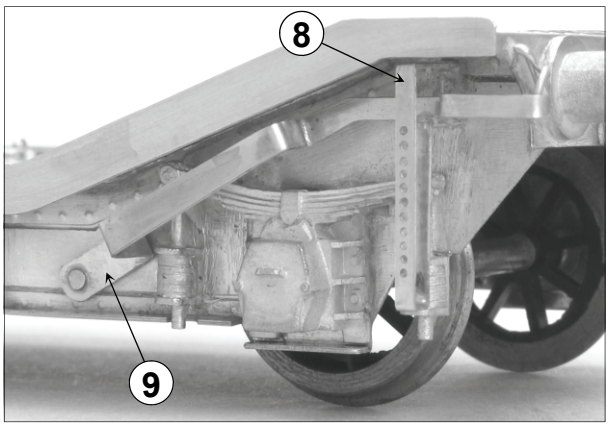


I prefer to fit the rings in this way and at this point of construction as then I know that they are all soldered securely and I like the novelty of them working. If you wished you could make up and paint the rings separately and glue them into place after painting the wagon.

Now fit the cast axle boxes and springs. The hole in the axle box may need deepening slightly to allow the casting to fit over the axle bearing and sit down flat onto the sideframe. Ensure that the back of the outer spring fixing is soldered solid to the sideframe to give it strength.

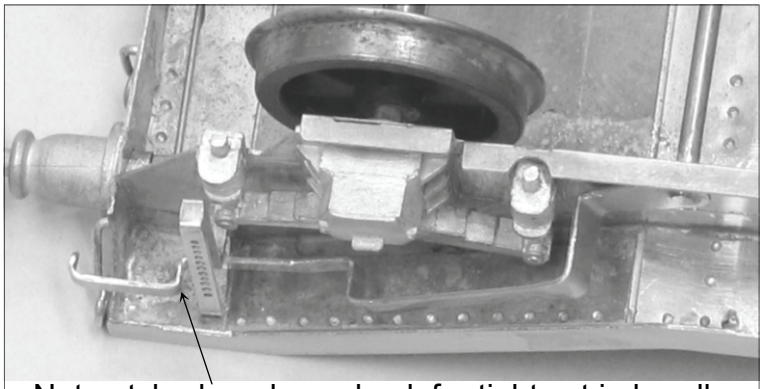

Ensure good solder joint

8. Fold up the brake pin guides (parts 8). As this part is a little vulnerable on the finished wagon I reinforce each fold with 60/40 solder. I place a blob of flux into each fold line and then touch the edge of the pin guide with the soldering iron bit carrying only a small amount of solder on it. The flux will draw the solder into the fold line. Solder the top ends of the pin guide together and then solder solidly to the sideframe (see main drawing for exact position). If the top of the pin guide is tinned and you use plenty of flux you should be in and out quickly with the iron before there is any risk of melting the axlebox castings (if you wish you could fit castings after fitting pin guides).

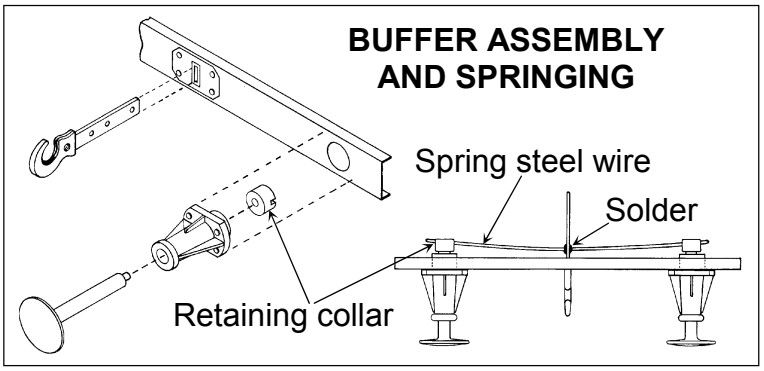


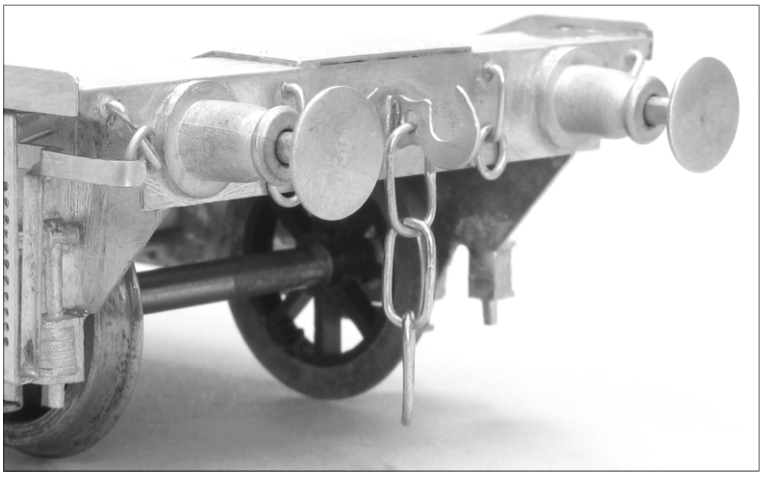
9. Using long nosed pliers form up the brake lever (so that it would clear the axlebox if applied). I find it easier to form up by eye (refer to photos) than using exact dimensions. There are two etched marks to help form the tight set at the handle end.

Once you are happy with the shape of the levers thread the handle end through the top of the pin guide and solder the other end over the brass rod cross shaft just clear of the side frame. Then spot solder the handle end to the top of the pin guide.

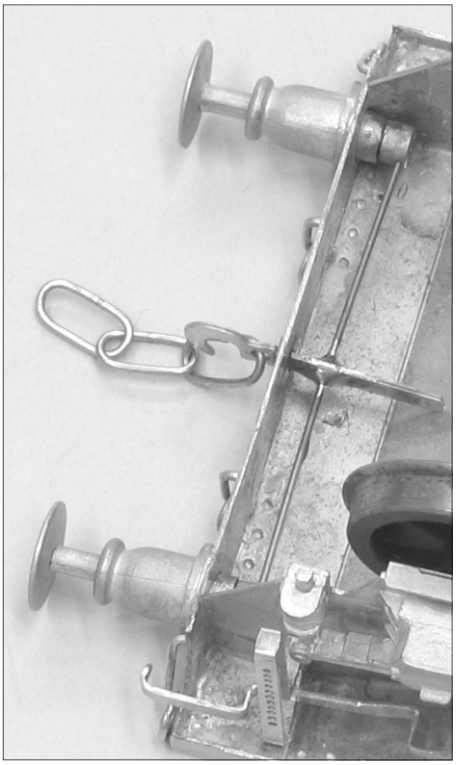

Note etched marks on back for tight set in handle

10. Drill out the buffer bodies with a 2.1mm drill to take the cast buffer head/shank. Hold the drill in a hand pin vice (chuck) and grip the buffer body between finger and thumb. Drill through the body from each end so that the hole breaks through in the middle. Use a little spot of spit on the end of the drill (some more technical people have a block of furniture polishers bees wax that they smear on the drill end) and this will help prevent the drill wandering in the white metal and breaking through the side of the buffer. Then fit shank through buffer body, snip off some of the narrow end of the shank to leave just over 1mm from the step and solder a retaining collar onto the shank. File a slight flat onto the back of the buffer body so that it will locate into the D shaped holes in the buffer beam. Solder buffers into place but check that the retaining collars don't jamb on the backs of the side frames when fully depressed.



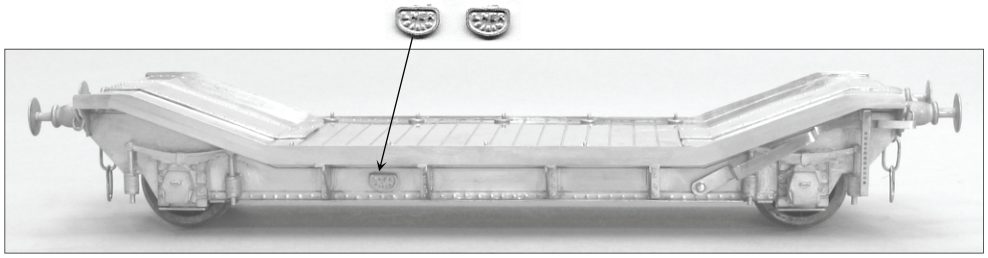


Make up the coupling links and fit to the coupling hooks (parts 10). I close up the links by holding the curved end in the jaws of a pair of round-nosed pliers in one hand and squeeze the flat parts of the link parallel with long-nosed pliers (angled long-nosed pliers with serrated jaws are even better) held in the other hand. Once you have six even-shaped closed links, you can open each one slightly with long-nosed pliers and thread three together. The last link passes through the hole in the coupling hook. I reinforce the joint of each link with a spot of 60/40 solder.



Pass the coupling hook through the buffer beam slot and retain it with a length of spring wire. Polish the centre of this wire with emery cloth first so that you can solder it to the coupling hook shank once you are happy that the buffers spring freely.

Finally fit the cast wagon number plates to the sideframes between the first and second triangular reinforcing plates.



11. Painting is a vast subject that cannot be covered fully here. The important thing with a metal model is to get a good base coat of primer. Hopefully you have been cleaning up and washing the model at the end of each modelling session, but it will still need thoroughly cleaning before painting. I give my models a good scrub with a stiff-bristled paint brush in a sink full of hot (as hot as your hands can bear) water and cheap washing up liquid (the expensive stuff that's kind to your hands has an oil in it that will stop the paint keying to the metal). If you know somebody who works in catering and can scrounge you some industrial-strength liquid this is better still. Then rinse the model a couple of times in clean warm water and place in a dust-free box to dry. I use car aerosol primer and Halfords grey primer is one of the best. For the best results you want to spray at room temperature (25°C) on a dry (avoid cold, damp or humid) day. I find it helps to warm the model to about 30°C (put it in the airing cupboard overnight) and I warm up the paint tin by putting it onto a radiator (about 40°C, but use your common sense as I don't want anybody blowing themselves up). I find it best to prime the model in two light coats, about 15 minutes apart and then leave for 48 hours to harden off (in the airing cupboard in a dust-free box).

I brush-paint my models with Humbrol enamel. For years I just stirred it up and painted straight from the tin but I was never completely happy with the results. Recently two things have transformed my painting. The first was a copy of Martyn Welch's book, The Art of Weathering, Wild Swan Publications, ISBN 1 874103 11 9. Martyn's basic techniques are very useful and almost foolproof. Martyn's method of creating worn and weathered planking for wagon floors by blending brown and grey paints to form a base. Then dry brushing darker shades to represent the wood grain is particularly effective on this type of wagon. The second thing is to mix the paint in the tin and then transfer it to a palette (a sheet of clean plasticard) with blobs of lighter and darker shades of paint surrounding the main colour. Then work the paint with the brush on the palette, slightly varying the tones of the paint. This seems to totally change the texture of the paint and the way it goes on and covers on the model.

Can You Help Me?

If you have enjoyed building this kit and have been satisfied with the quality, I would be most grateful if you could recommend it to your friends and fellow modellers. Although my kits are not perfect, I try to put a lot of time and effort into producing them. If I can get extra sales of a kit through customer's personal recommendation and I find that word of mouth is the best form of advertising. This will help me to put extra time and money into developing the next kit. Hopefully this will give me more satisfied customer to recommend my kits to their friends.

If you are not happy with this kit then please tell me. Hopefully I will then be able to help and sort out any problem.

Best Regards And Happy Modelling

Jim McGeown