CONNOISSEUR MODELS

- 0 Gauge -

LNER Bulk Grain Hopper Wagon

PROTOTYPE. These wooden bodied enclosed hopper wagons were designed to be quickly filled from overhead through roof hatches. Often from mobile loading augers in country goods yards. The bottom discharged upon arrival at the customers bulk grain silo site. Built to diagram 73 these wagons first entered service in 1931.

KIT. A sophisticated kit for this large wagon designed to capture the essence of the prototype but with ease of construction in mind. As customers will probably want to build two or three for their layout. A pre-formed brass roof is included.

Wheels are required to complete. 3'1", 3 hole disc Wagon Wheels (Slater's Catalogue Number 7122). Available From Slater's Plastikard, Old Road, Darley Dale, Matlock, Derbyshire, DE4 2ER, Telephone 01629 734053.

Connoisseur Models, 1 Newton Cottages, Nr Weobley, Herefordshire, HR4 8QX, Telephone 01544 318263.

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 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.

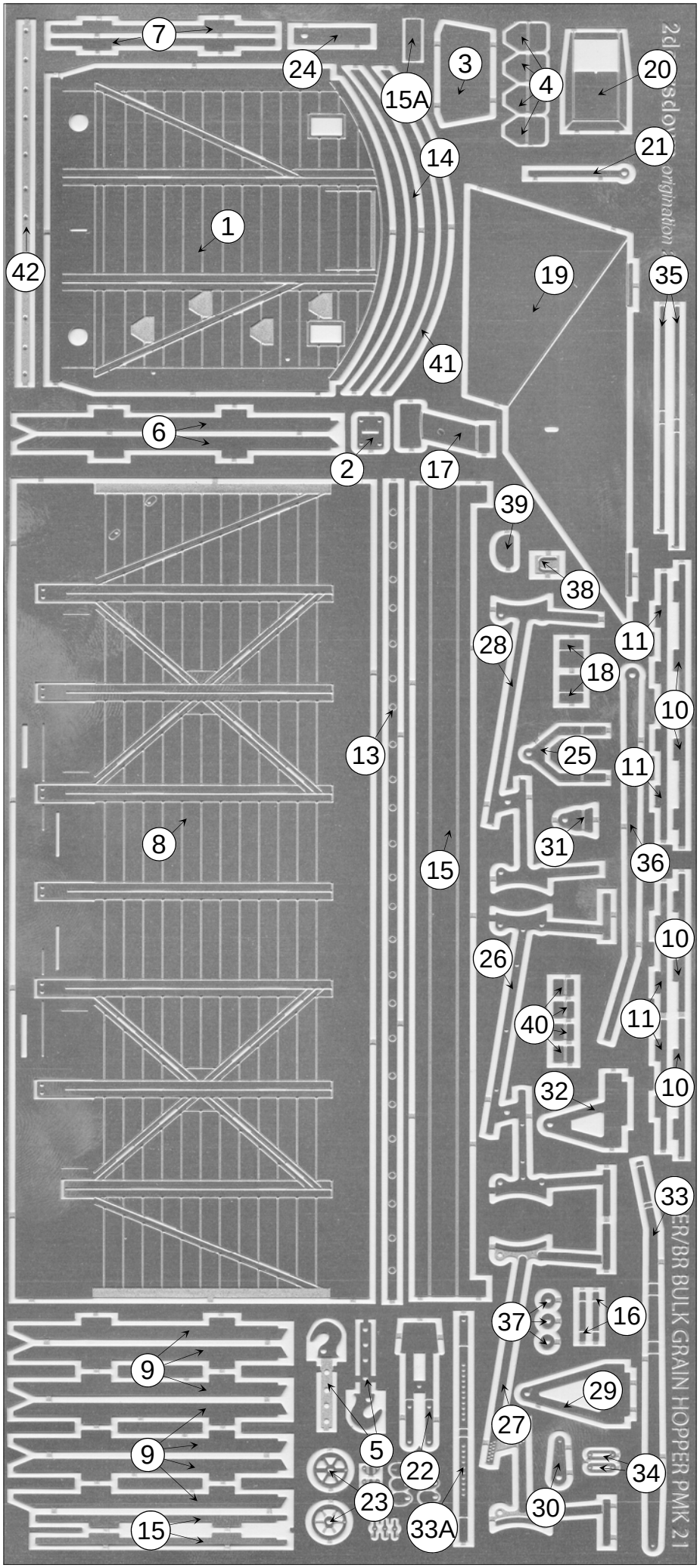
Three-dimensional parts are formed by folding. On an etched brass kit, the fold lines are normally half-etched on the inside of the fold. You'll be able to fold most parts using smooth-jawed pliers. For longer parts folding bars are desirable.

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 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.

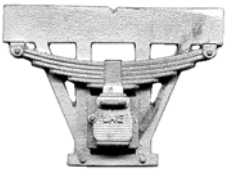


LNER Bulk Grain Hopper Wagon Parts Identification

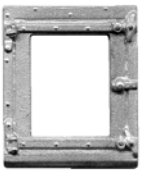
Two identical etches provide all the parts required for a complete wagon as most sets of parts are required twice. A few parts are singular so don't panic if you have a few left over.

The roof 157mm long X 65mm wide is guillotined from plain brass sheet and hand rolled by feeding through my rolling bars. To achieve the best results I try to slightly over roll so that you can tweak back with fingers and thumbs to achieve the required radius.

Cast Parts Identification



4 X Axleguards



1 X Side Access Hatch

2 X Roof Loading Hatch

2 X Number Plate & Label Clip

4 X Buffer Bodies

4 X Buffer Retaining Collars

4 X Buffer Heads/Shanks

2 X Split Pins

6 X Coupling Links

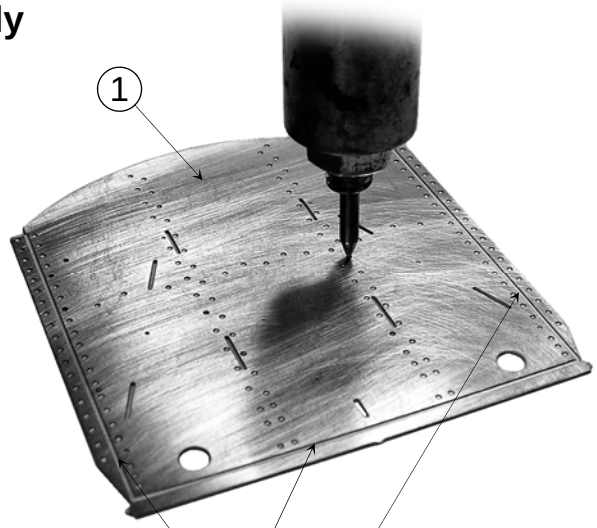
Wire

1 X 10”, 0.9mm Brass
2 X 10”, 0.7mm Brass
2 X 10”, 0.45mm Brass
1 X 6”, Spring Steel, (*buffers)*
2 X turns 29swg, TCW

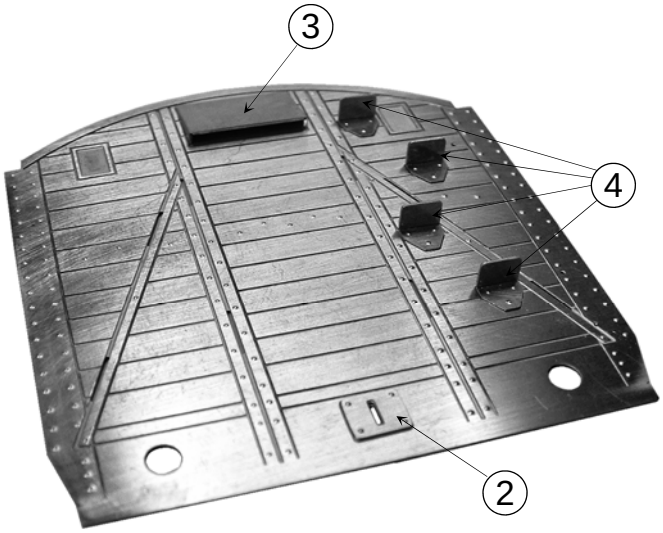
LNER Bulk Grain Hopper Wagon Assembly

Stage 1, end sub assembly

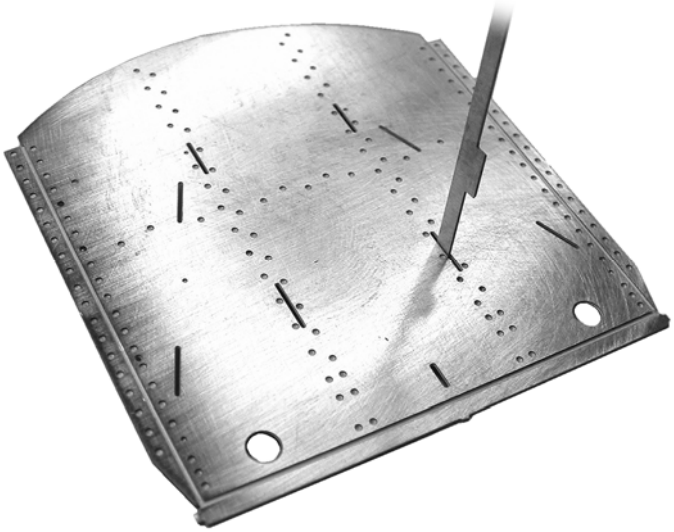
Take body ends (parts 1) and form all rivet detail on the reverse.

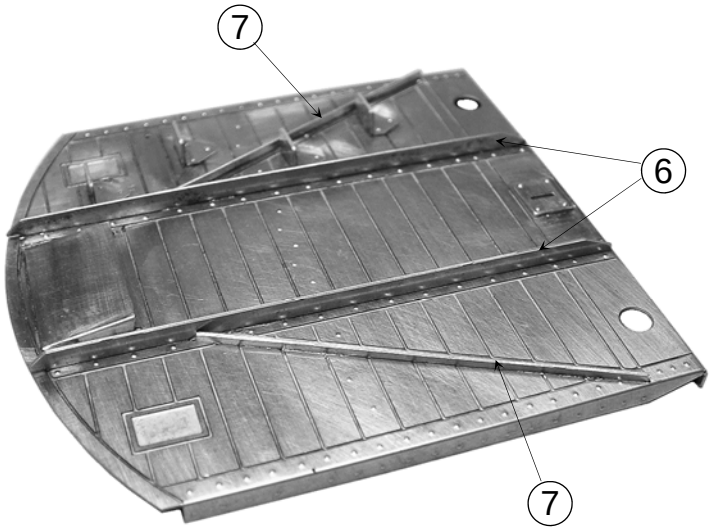


Fold up base and the sides. Protecting rivet detail with thin card (postcard) when clamping in bending bars.
The windows in the end may be glazed after painting or as in later variants plated over. Use scrap fret for this.



Add coupling plate (parts 2), form centre vent (part 3) and four steps (part 4). Solder coupling hook (part 5) back to back.
Fit three coupling links and check for fit, then place to one side.



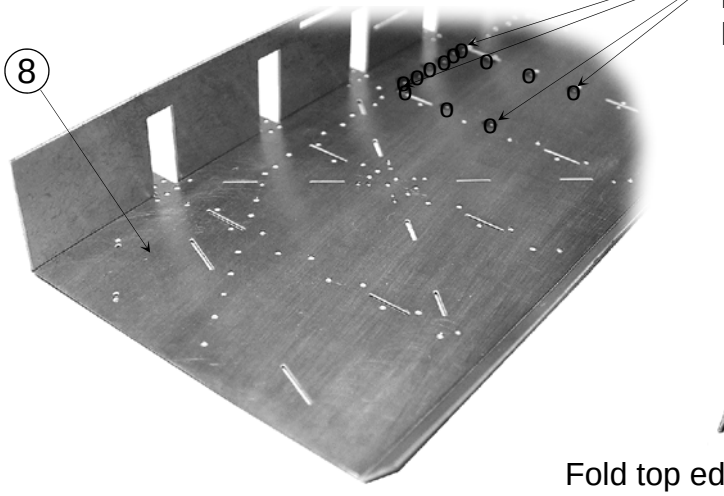


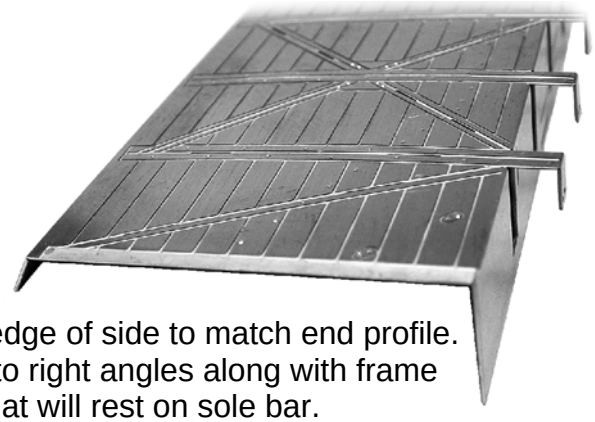
Fit the vertical (part 6) and angled (part 7) framing. Ease slots with scrap fret if necessary.

Completed end sub assembly

Stage 2, side sub assembly

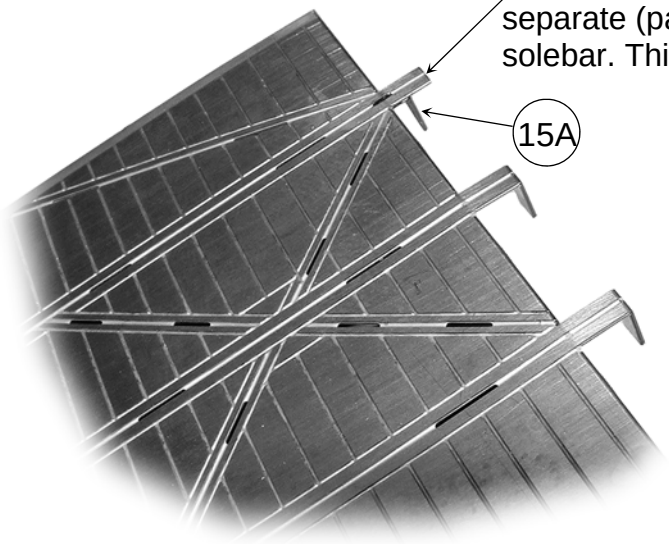
Form rivet detail on rear of body sides (parts 8). Note on one side do not form marked rivets in photo as the access hatch casting goes there.



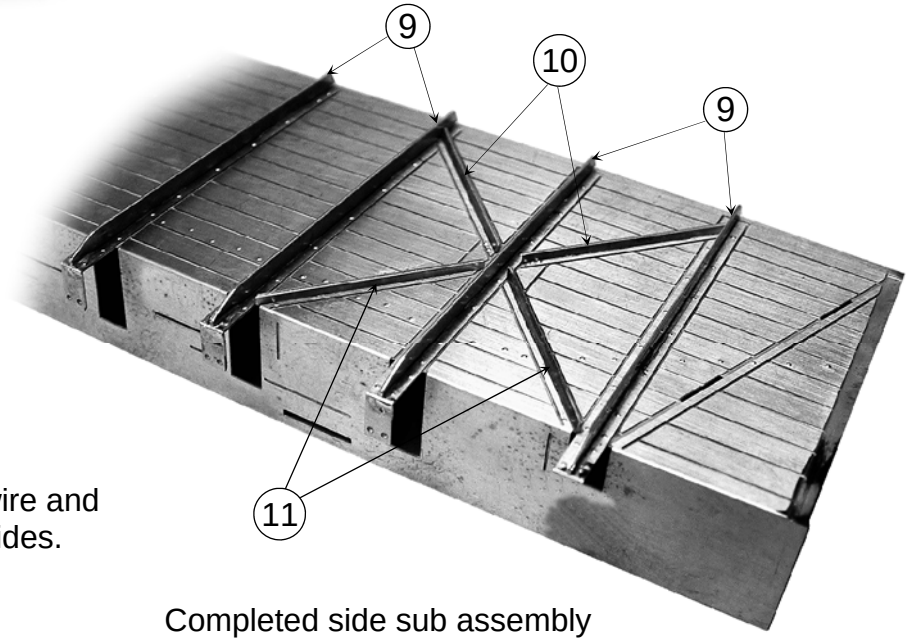


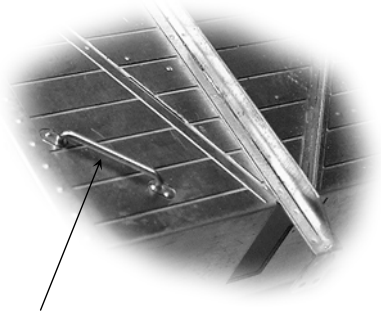
Fold top edge of side to match end profile. Fold base to right angles along with frame supports that will rest on sole bar.

Note end frame is slightly shorter and has a separate (part 15A) support that will rest against the solebar. This is to allow clearance for brake lever.



Add the seven vertical angles (parts 9) cut out at top. Add the ‘cross’ angles (parts 10) long on top (part 11) short beneath.



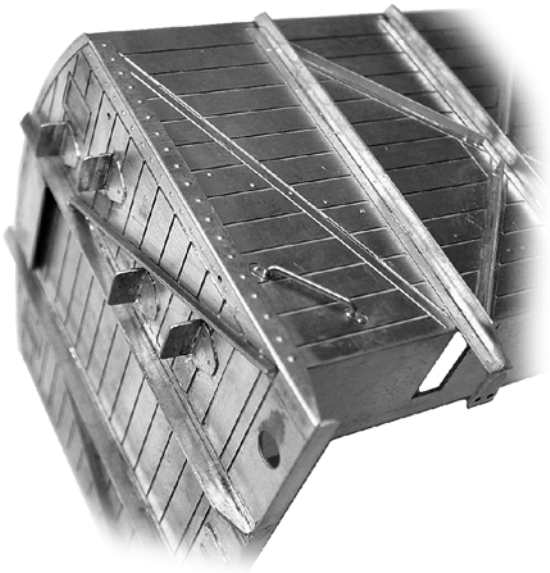


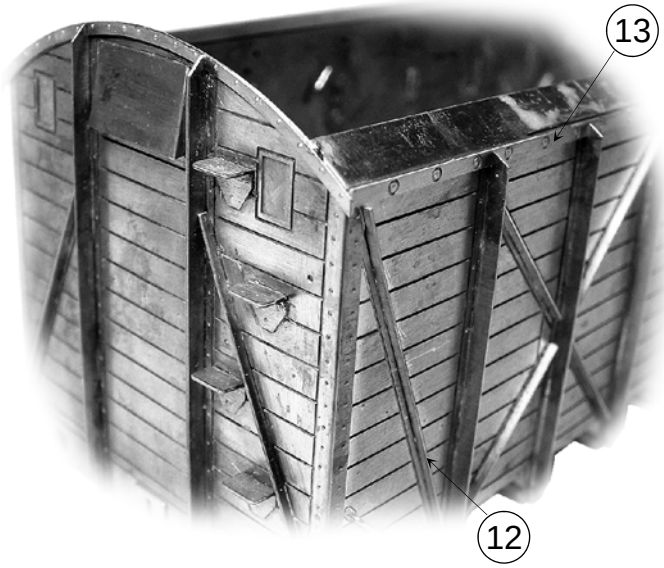
Form handrail from 0.7mm wire and fit to the bottom left on body sides.

Completed side sub assembly

Stage 3, body assembly

Solder one end to left hand side of body. Do the same with the other body side. Now solder the two halves together ensuring all is square.

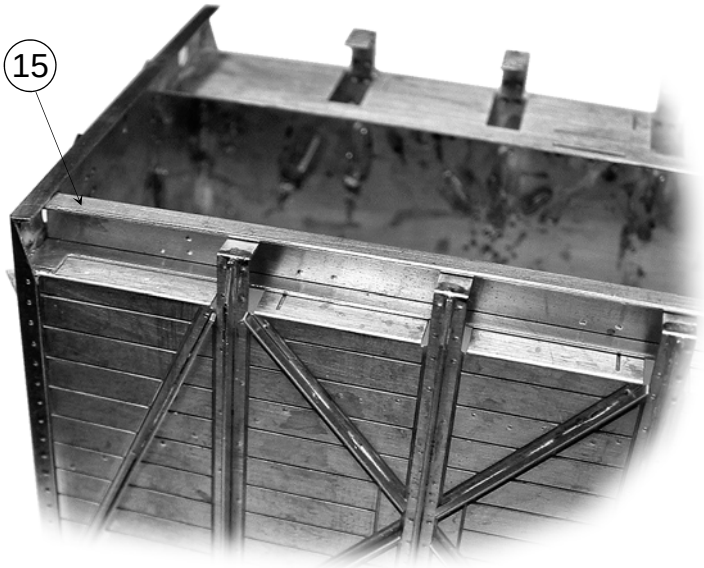




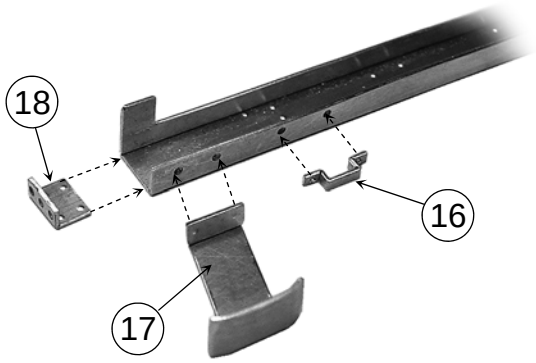
Solder end diagonal angle (part 12). Note the ends overlap the rivet detail.

Add top rail (part 13) to sides, it slots in vertical angles. Similarly add curved end rail (part 14). Trim off excess on ends.

Fold up solebar (part 15) then solder to body underside.

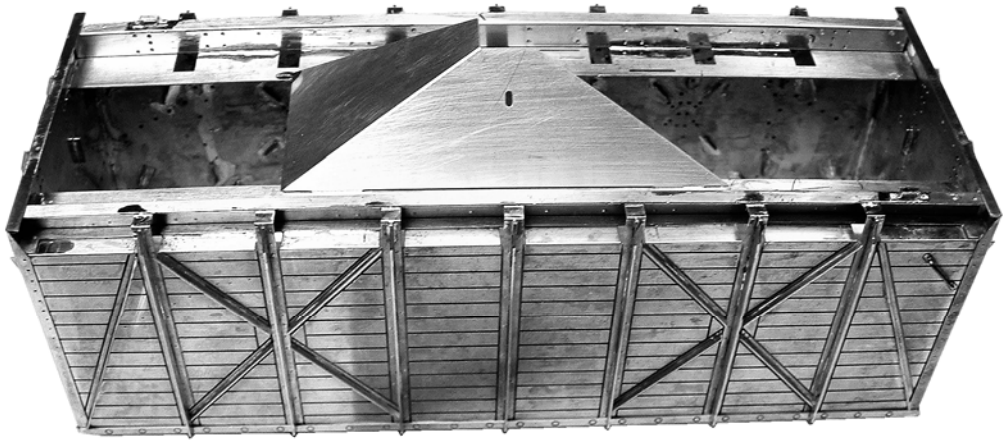


Stage 4, Solebars

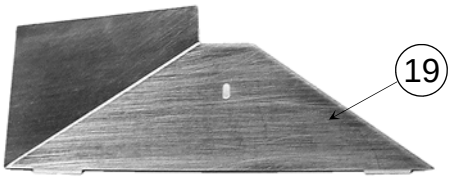


Prepare other items that fit on the solebars, rope hook (part 16) step (part 17) and brackets (part 18). The step and hook are on the underside of the left hand end aligning with rivet detail.

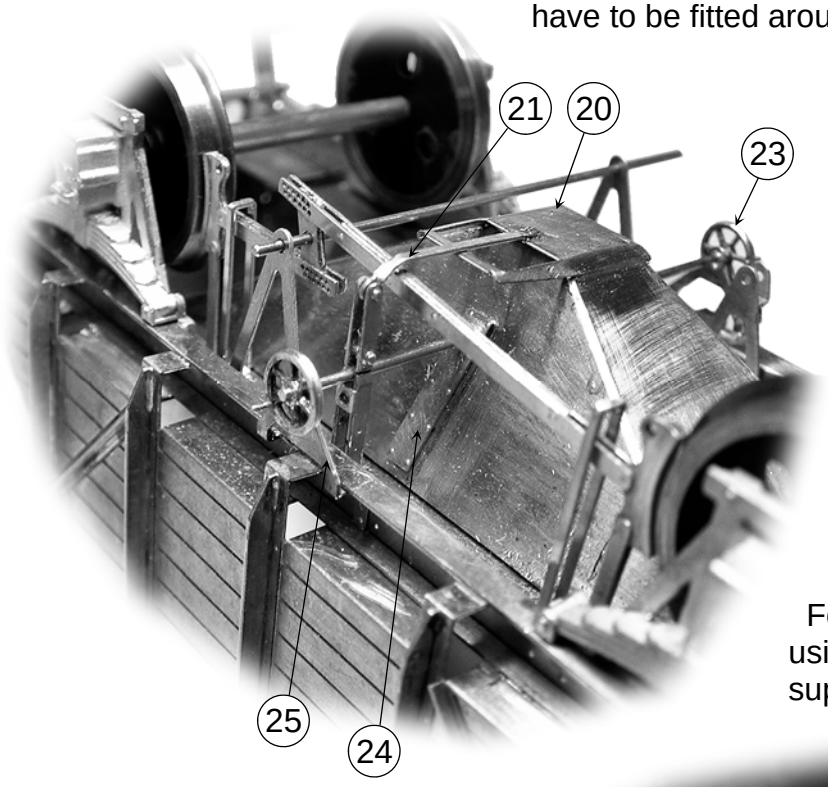
Stage 5, Hopper and control gear



Take hopper sides (parts 19) and fold round to 90 degrees. Fold tabs vertically then tack solder to slots on underside. Repeat with other side and solder along seams.



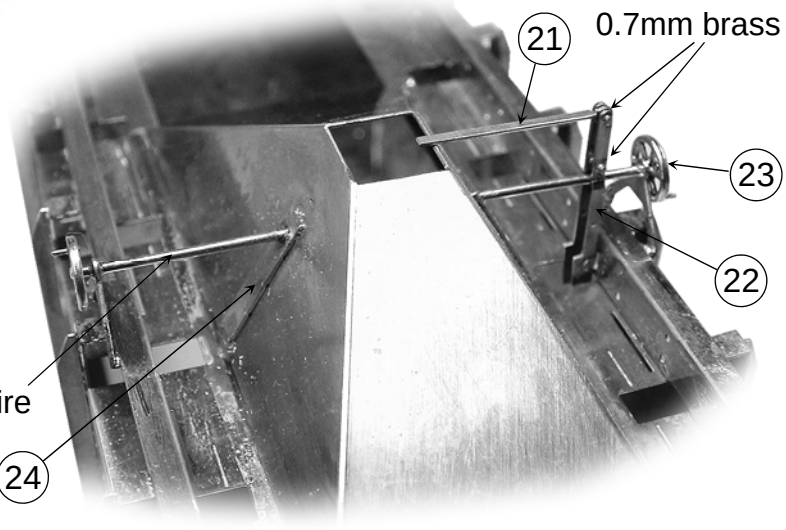
Overview of hopper control gear and wagon wheel brake gear. Note that components will have to be fitted around each other.



Take the hopper slide (part 20). Fold up the short end and then the sides, offering it up to the hopper base.

Prepare rest of hopper mechanism, take pull rod (part 21) and twist end to 90 degrees. Do not fit pull rod or hopper slide until you have fitted the brake gear.

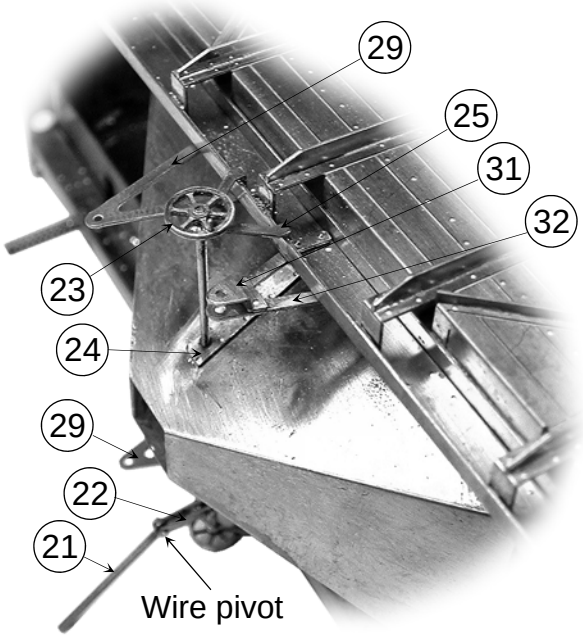
Fold up support mechanism (part 22) using 0.7mm wire for supports. Bottom support is for pull rod.



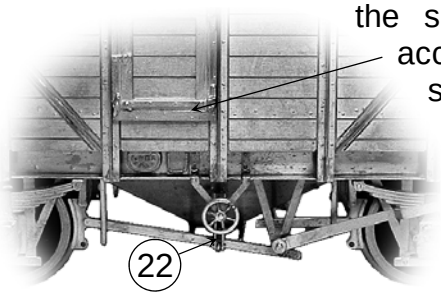
Make up control wheels (parts 23) using 0.45mm wire for handle. Form rivets on hopper detail (parts 24)

Stage 5 *continued*
Hopper control gear

Form support brackets (part 25) for either side. Solder centrally to sole bar, aligning with centre angle. Pass 0.9mm wire through bracket, thread on mechanism (part 22) and detail (part 24). Continue passing through hopper and add detail (part 24) for that side and finally through the bracket (part 25). Allow enough wire to add control hand wheels.

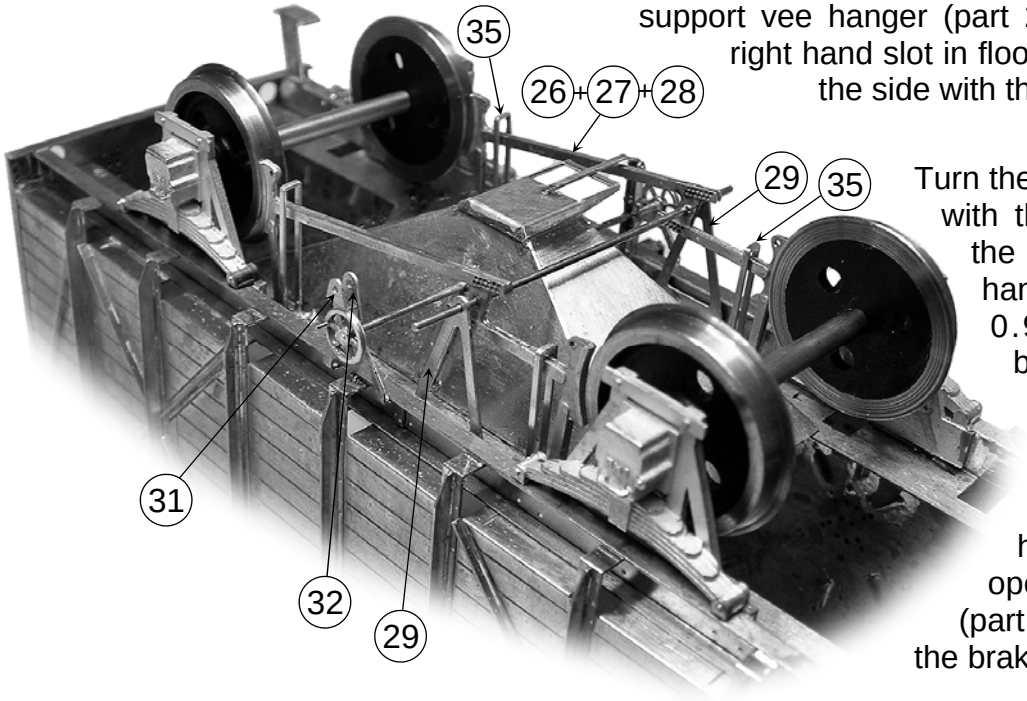


A point to remember, mechanism (part 22) goes on the side that has the cast access hatch and is soldered against the rear of the solebar. Detail (part 24) is fitted vertically.



Stage 6, Brakegear

Make up two pairs of brake gear, soldering (part 26, 27) back to back, sandwiching (part 28) between. The tops of the brake hangers fold over and solder to the floor, but first take support vee hanger (part 29) and solder to the right hand slot in floor. This is viewing from the side with the cast access hatch.

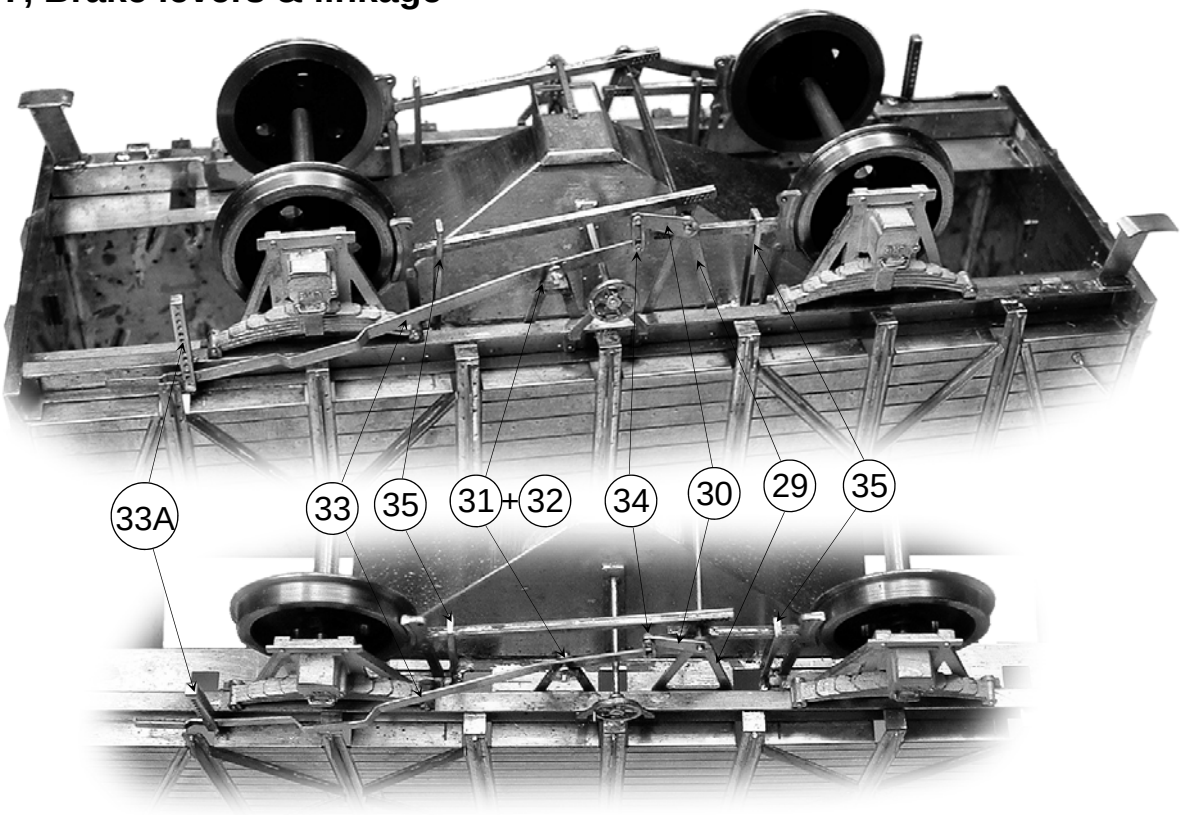


Turn the body over and repeat with the other side but put the bracket in the left hand slot. A length of 0.9mm wire goes between these vee hangers and will support the brake gear. A point to remember this vee hanger will have operating crank arm (part 30) between it and the brake lever.

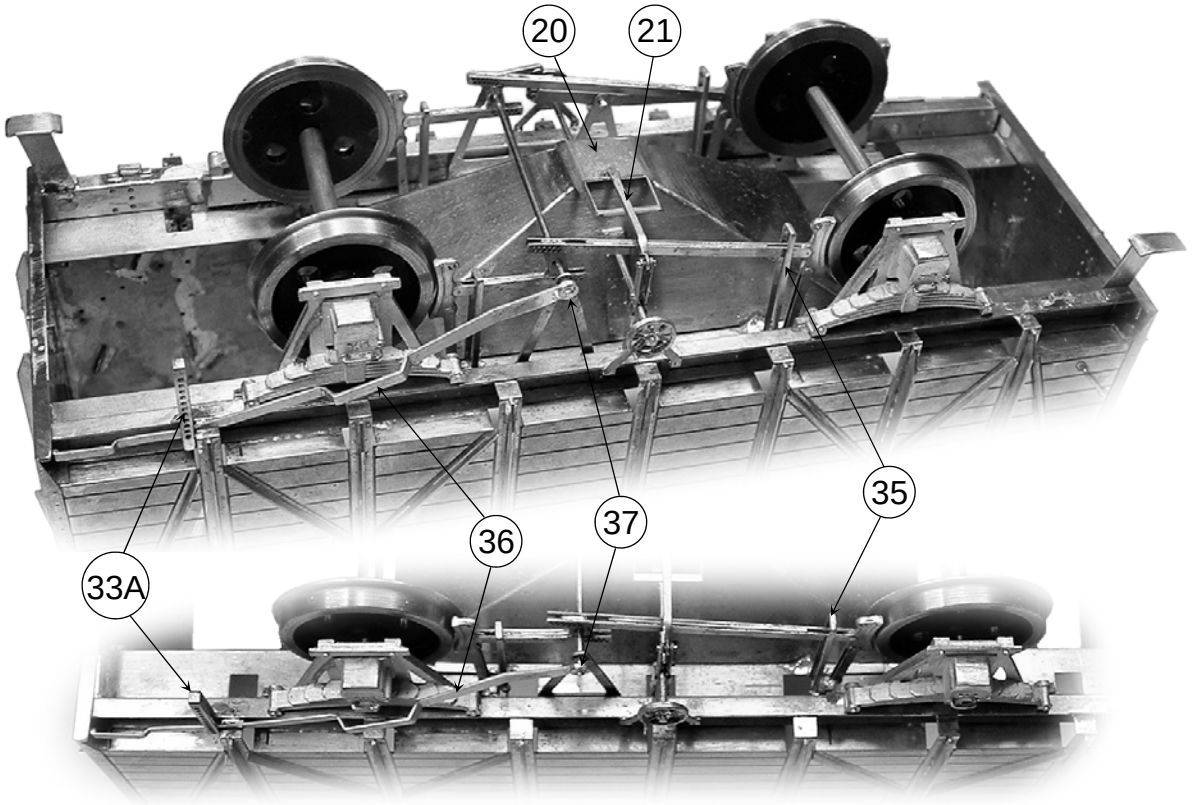
Fit axle guards and wheel sets. Drill out 2.6mm diameter the hole to take the brass axle bearing. Use a drill held in a hand pin vice (chuck) and by applying a gentle sideways pressure as you drill out the hole, you will be able to ensure it is square to the back of the axle guard. Then fit the axle bearing into the slightly oversize hole with a blob of Evostick, as this takes a little time to set you can make adjustments to the axle guards and then leave the wagon on a flat surface for the glue to set.

Slip wheel sets with the axle guards on between the solebars and tack solder each axle guard with low melt solder to the solebar (note etched marks to help with positioning). Check that the axles are parallel and the wheel centres are about 73.5mm apart. Place the wagon onto a flat surface and adjust if necessary, by re-soldering each axle guard until the van sits without rocking, when happy solder solid. Then leave for Evostick to harden.

Stage 7, Brake levers & linkage

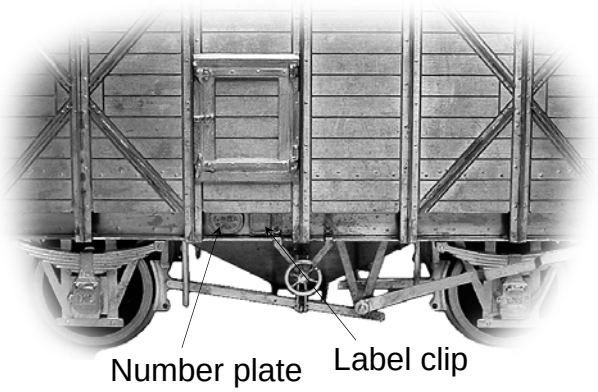


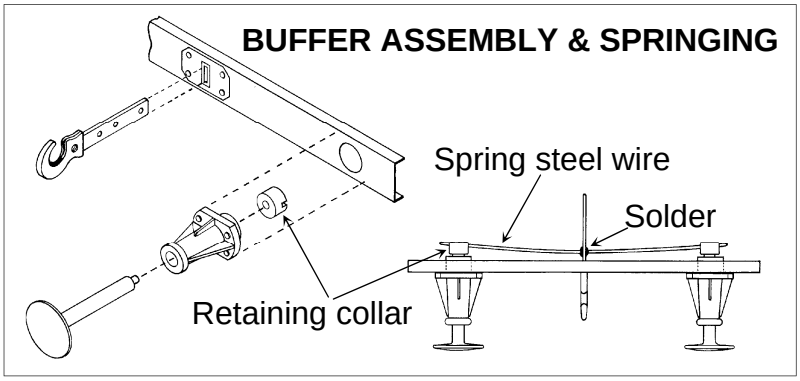
Working now on the non access hatch side, fold up bracket (part 31) and add to vee hanger (part 32). This fits to right hand slot in the floor. Make up brake ratchet guide (part 33A) and brake lever arm using (part 33) operating crank arm (part 30) and lifting link (parts 34). These are joined using 0.45mm wire. Also fit push rod safety straps (parts 35).



Fold up lever (part 36) and fit to ‘hatch’ side. Point to note on lever ratchet guide on this side is fitted to the solebar to the right of vertical angle and on the other side it fits to the left. Parts 37 can be used to detail end of lever arms to represent the thickened flanges at the pivot point. Hopper slide (part 20) and pull rod (part 21) can now be fitted.

Stage 8, Body castings

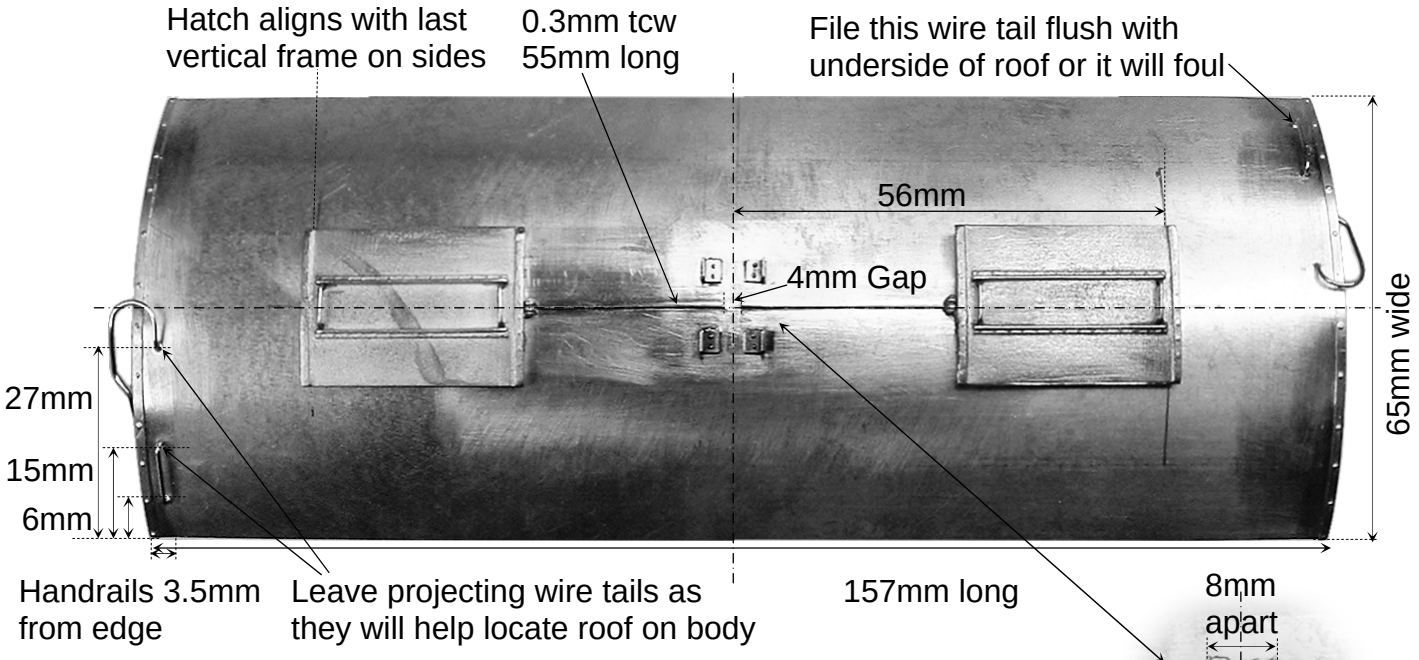




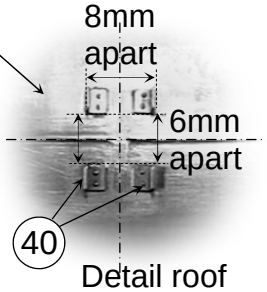
The cast access hatch can be fitted at this stage along with etched label clip (part 38) and number plate (part 39) to the sole bars. Alternative castings are also included for these. Drill out buffer bodies 2.1mm diameter, pass shank/head through and fit retaining collar. Open up holes in buffer beam using a tapered reamer and fit assembled buffers. Pass coupling hook through slot and retain with spring steel wire.

Stage 9, Roof

Take the roof and ensure it matches the curvature of the body ends. Mark out as diagram for the fittings and drill 0.7mm holes for handrails.

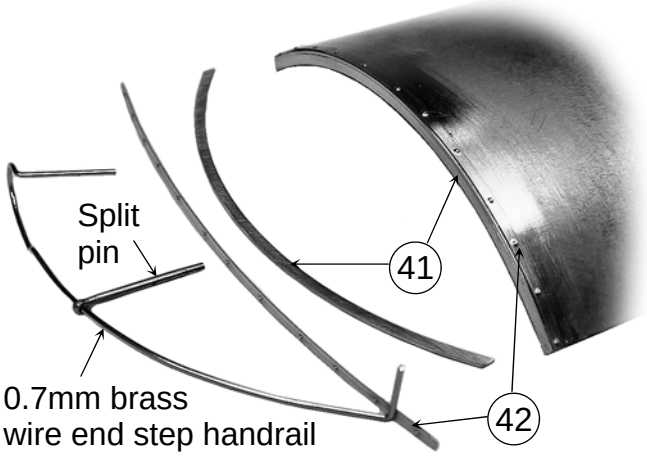


Score centreline and solder a length of 0.3mm (29swg) tined copper wire. File away at the centre point to create a 4mm gap



Detail roof before fitting

Fold up and position the hatch bump stops (parts 40).



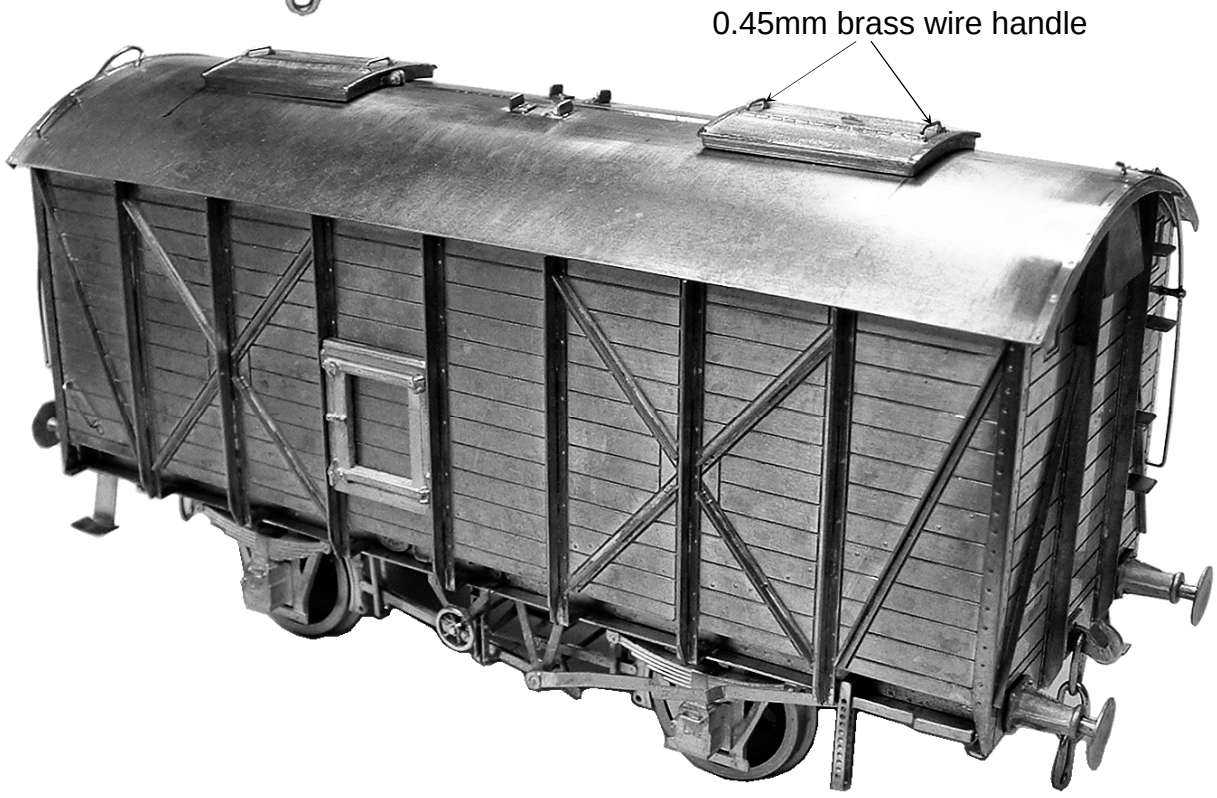
Secure roof ends (parts 41) flush with edge and add strapping (part 42) to top. Fold up and fit grab handrails. Use a split pin for the upper hole on ends.

Stage 10, final detailing

When roof is firmly fixed fit end step handrails.

Drill and fit 0.45mm wire grab handles to cast roof hatches. Prior to fitting to roof file a groove on end wheel so it sits on the 0.3mm wire guide.

A number of small etches are supplied for padlocks, catches and clasps to make up latches and locks as required.

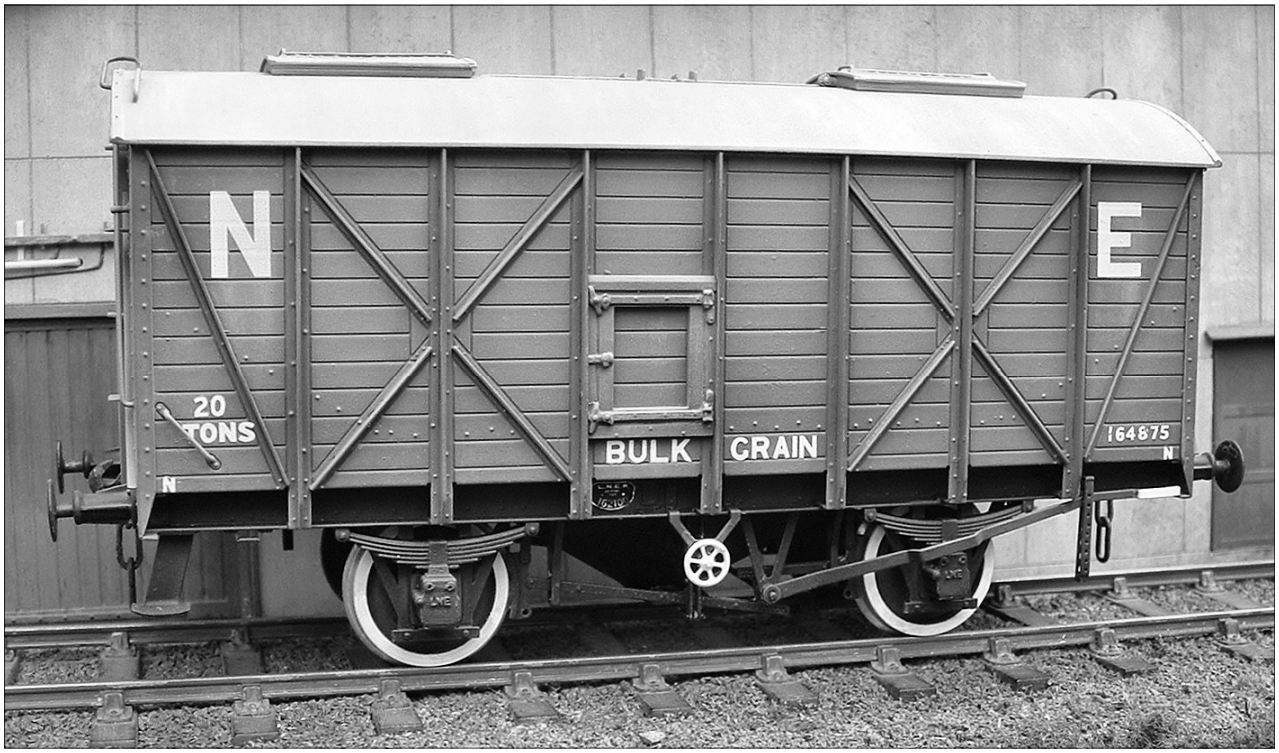


Livery. LNER bodywork-grey, solebars and running gear-black, roof-light grey lead, lettering-white, pre 1936 as photo, post 1936 'NE' were reduced in size to 4", placed over the capacity in 3" which in turn was above the running number in 4". All to the bottom left hand corner with 3" spaces between lines. The tare weight was shown in 3" letters on the bottom right hand corner.

Livery. BR bodywork-light grey, solebars and running gear-black, roof-grey to very dirty, lettering-white on black patch with number prefixed with E below $22^{1}/_{2}$T (note increase in load capacity) to the bottom L/H corner, Tare R/H corner.

Sample running numbers are 164865-84, 187972-8006, 203803-52, For BR numbers prefix with E.

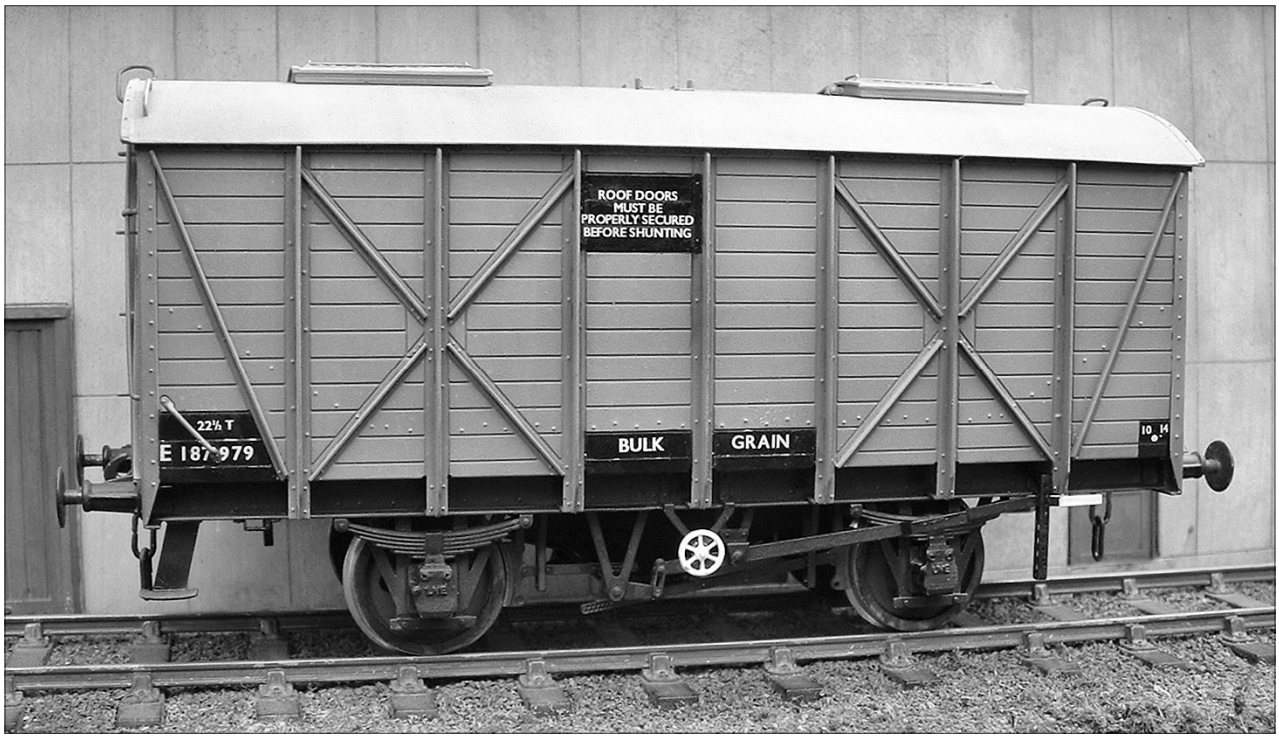
Reference Book, LNER Wagons, Volume 4B, Peter Tatlow, Wild Swan Books Ltd, ISBN 978 0 953877 11 9, Page 159-162.



Transfers for LNER & BR lettering are available from the Historical Model Railway Society, Brian Webb *(volunteer sales 0fficer),* 8 Gilpin Green, Harpenden, Herts AL5 5NR *(SAE for list & order form)* 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.

These sheets were used to finish these sample models and with a bit of ingenuity you can put together the required lettering. If you have the sheets in stock make them your first choice.

An alternative you may wish to investigate is the range of transfers produced by Railtec Models, Web: www.railtec-models.com Email: info@railtec-models.com



This kit was designed and originated by my good friend Robin Arkinstall from Two Doors Down.