

SER/SE&CR/SR COAL WAGON - ASSEMBLY INSTRUCTIONS

Revised May 2013

PLEASE READ BEFORE STARTING THE KIT



INTRODUCTION

I produced the moulds for this kit in order to speed up my own model-making. Since there are hardly any kits for the SER, scratch-building was taking too long! So I hope the kits will encourage other modellers of this neglected railway. The drawings are very carefully researched, and I try to make the kits as historically accurate as possible.

RESIN PARTS

This kit has new high-quality resin parts which should not give trouble in normal handling, but please work in the warm.

Handling finished open wagons

Note that open wagons have scale thickness sides, of around 1.5mm thick. Even with the new resin, I recommend picking up completed wagons by the solebars or ends. If open wagons are likely to get rough handling (grandchildren?) consider a load to support the sides.

TO COMPLETE THE KIT, you will need 3'1" Mansell wheels (Slaters 'Furnace Railway' or equivalent), quick-set epoxy resin adhesive (eg. Araldite or Devcon), superglue, paint and transfers. A filler such as Milliput is useful. SER wagon transfers should become available from Fox Transfers during 2002. If you plan to model the wagon before about 1890, you may need safety chains, eyes and hooks, available from SER-KITS as an optional extra.

TOOLS NEEDED: medium and fine flat files and triangular files for cleaning up castings. A drill, which need only be a pin vice, or hand-drill, but preferably a 12V model drill. The following drills are useful: 1.4mm, 0.8mm, 0.6mm. (You can probably manage with 1/16", 3/64" and 1/32" if you're stuck.) Sharp point for marking. Craft knife, small set square, sandpaper and sanding block.

HEALTH AND SAFETY: Like all white-metal castings the ones in this kit contain small amounts of lead. Keep them away from young children. Dispose carefully of all filings, drill swarf and metal dust. Do not eat while handling parts, and wash your hands thoroughly. So far as I know, the polyester resin poses no health risk, but avoid inhaling filing dust.

PACKING LIST

2 Resin sides	2 Resin ends	2 solebars with axleboxes
4 buffer stocks	4 buffers	2 coupling hooks
4 small springs	4 10BA nuts	2 large springs & 2 split pins
6 large coupling links	2 medium coupling links	6 small links
1 brake casting	1 brake lever – packed with sides	1 brake catch
Styrene sheet for floor	Short length soft brass wire	
Wagon drawing	Instructions & history	

ASSEMBLY METHOD – OVERVIEW

1. Clean up resin castings
2. Scribe floor **and fix to ends**. **Do not** try to make a box of the sides and then fit the floor.
3. Fix sides
4. Clean up white-metal castings
5. Fix white-metal solebar assemblies with wheels into slots in headstocks (buffer beams)
6. Add buffers and coupling hooks
7. Add detail

Painting is best done before all the detail is added – see the notes for the time to paint. The wooden centres for the Mansell wheels are best painted before assembly, as are the insides of the solebar/W-iron/axlebox castings

ASSEMBLY – THE RESIN BODY

1. File away the rough edges under the sides and ends. Take care with the delicate 'tongues' on the end of each side which overlap the ends. Find and remove the less obvious ridges under the end stanchions and side-door hinges. Clean up the visible edges of the resin castings with a file and glass-paper. The ends are prone to little residues in the corner between the right-hand stanchion and the planking. Occasionally pin-holes occur (air bubbles in the casting) and these can be filled with resin glue or filler. Finally, it's best, but not essential, to take off the shiny surface and any slight irregularities with a fibre-glass pen.
2. Clean out the buffer holes with a round needle file. You may prefer to clean up the metal buffer stock castings at the same time and ensure they fit without forcing.
3. Clean out the hole in the resin end for the coupling hook, using a fine needle file. The hook should slide smoothly in and out without sticking.
4. If modelling the wagon as running before about 1890, it may need to be fitted with safety chains in addition to the normal couplings. (See later Historical Notes) Refer to the drawing, and drill at 7mm. on both sides of the coupling hook with a 0.8mm drill. The safety chain eyes will fit in these holes later on. NOTE – safety-chain packs are an optional extra.
5. Check that the corners of the styrene floor are square. It is intended to be 94.5 x 50.5 mm.
6. Scribe the floor planking at 4mm intervals with a sharp metal point and set-square.
7. Make a trial assembly of one end, one side, and the floor so that you understand how they are intended to fit together. Because resin shrinkage is variable, the side overlaps (to fit against the ends) are longer than necessary. The wagon body is nominally 14' plus the thickness of the corner plates, so the overall side measurement should end up at 98.5mm. Trimming the overlaps is best done after you have assembled the body, but if you need to enlarge the lower corner rebates (which fit over the headstocks) do this now. It may also be necessary to trim the floor width.
8. Glue the floor to the ledge on the end, then glue one side to the end and floor. Allow to set
9. Glue the second end to the side and to the floor, assembling on a sheet of glass or other truly flat surface. As the glue sets, offer up the final side, and glue in place.
10. Clean off any excess glue before it goes rock-hard. Leave to set for at least an hour and preferably overnight.

11. At this stage, you may wish to fill any cracks and gaps, and paint the inside of the wagon to represent bare wood.

WHITE-METAL UNDERFRAME - PREPARATION

1. Before assembly, check the castings against the drawing, and file or cut off any excess metal ('flash') left over from casting, including casting ridges behind the W-irons. Run a file over the top edge and make sure it's straight. If not, it can be gently bent. (Unlike some white metal, this kind is fairly pliable)
2. Referring to the scale drawing, drill out the horse-hook (or hand-hold) holes in both solebars (underframe sides) with a 0.6mm (No 73) drill. There are 'dents' to guide you. NB: small drills bind easily in white metal and snap. Use a sharp drill, slow speed and remove frequently to clear swarf.
3. Check the cube-like brake hanger mounting fits into the slot behind the left W-iron. It's much easier to trim the mounting now than when the wagon has been assembled.
4. Check that the wheel bearings fit in the axlebox holes, and if necessary, clean out the holes. Gently scraping the inside is usually enough. If necessary, when using Slater's wheelsets, you can use a 2.5mm (No 39) drill held in the fingers or a pin vice. Careful, there isn't much spare depth! NB: because the clearances inside these early axleboxes are so small (they're to scale!) there are occasional pin holes in the casting. These can be filled with model filler after assembly.
5. Gently offer the solebar castings into the slots in the resin ends, trimming as necessary. Check that they fit snugly into place without forcing. There is a gap of approx. $\frac{3}{4}$ mm between each solebar and the resin side.

UNDERFRAME ASSEMBLY

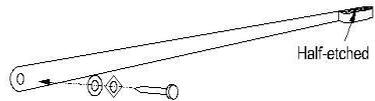
1. Place the resin body upside down on a small block of wood so that it's steady.
2. Take your time over the next few steps - the good running of the wagon depends upon it. Put the bearings into the holes, and sandwich the wheelsets between the solebar & axlebox units. Feed them into the slots in the resin ends. Do NOT use any force or you may crack the resin. If necessary, file down the solebar ends until the axles are at right-angles to the sides.
3. Check that the w-irons are vertical, viewed from the end. If not, file the ends of the solebars so that they sit further apart in the end slots.
4. Holding the solebars in place, turn the wagon over. (Yes I know, it usually all falls apart at this point, so try again!) Place the wagon on a sheet of glass and check that the wheels sit level. Check also that the body is level. If necessary (and it's normally not), gently file down the top of the offending solebar until everything is true. When you're satisfied with the fit...
5. PAINTING: Before gluing the solebars, this is a good point to paint the solebars and resin body, particularly if you intend to spray. (If you spray later, you may gum up the buffers and drawhooks.)
6. Run a thin smear of resin glue into the solebar slots and along each side of the floor. Lower the solebars (with wheels!) in position. (Note that there is a small space about $\frac{3}{4}$ mm. wide between solebar and side.) Again, check the wheels are parallel with the lines drawn on the floor. Let the glue begin to set. Then - holding the solebars in place - turn the wagon over and stand it on the glass. Make sure all four wheels touch.
7. Let the resin glue set, preferably overnight.

BUFFERS AND DRAWGEAR

1. Since 2012, the self-contained buffers are supplied assembled, but it may be best to disassemble until after gluing and painting. Clean up the buffers and buffer stocks. Scrape the 'flash' (little casting ridges) off the buffer shanks.
2. Glue two of the buffer stocks in place, checking that the buffers are perpendicular to the headstock when viewed from the side and from above.
3. Repeat for the other end of the wagon.

4. In turn, insert each coupling hook and thread one of the larger springs over it. Hold the spring in place with a split pin bent apart.

DETAILING

1. At this stage, do any final filling and cleaning up, using files and sandpaper.
2. Bend small pieces of the soft wire to make four horse-hooks and stick in place in the holes drilled in the solebar earlier.
3. The brake is on one side only. The casting should be manoeuvred into a slot behind the W-iron and glued in place. NOTE: two rivet heads must be removed for the outside bracket to fit snugly.
4. Brake guard (catch): Clean up the cast brake catch strap and locate in position with its lugs in the holes cast into the solebar. Glue in place. You should have filled the holes in the other solebar earlier on.
5. Brake levers: when available, an etched lever with square nut and round washer will be supplied. Curve the end with the half-etch inside as in the diagram and assemble onto the brake casting with a pin.
 
6. Cast levers: Some brake levers have a locating pin to go into the pivot hole. Those that don't will be stronger if you drill the pivot with a 0.6mm (No 73) drill and hold the lever in place with a cut down dressmaker's pin.
7. Glue the brake handle into place. It may be stronger if you drill the pivot with a 0.6mm (No 73) drill and hold the lever in place with a cut down dressmaker's ('Lill') pin.
8. Fit the four safety-chain eyes, if using them. Cut the fine chain to fit, open out the links at each end and fit in place, hanging one of the cast hooks at the end of each chain.
9. To make 5-link (SER) coupling chain - clench together three of the smallest links, and clench a medium link on one end and a large link through the other. The large link is threaded into the hole in the coupling hook. To make SE&CR chain, join together 3 large links on each hook. Coupling hooks and links are scale size, and if you work to 'coarse' standards, you may need to replace them with larger, non-scale versions.

PAINTING AND LETTERING

1. In SER days, the wagons were painted 'light red' - an oxide of some sort. Southern Wagons Vol. 3 states this was Venetian Red – an oxide of iron - but it's not clear what the source of that information is. In any case, Venetian Red as bought in artists' shops is way too bright. A watercolour painting of Folkestone Harbour in the Folkestone Public Library shows the wagons as somewhere between pink and red with a trace of orange – a kind of terracotta. No doubt the colour darkened with age.
2. A good colour can be obtained by using Humbrol red-brown 100, and adding a little black to taste.
3. Take the red down onto headstocks and solebars including the buffer stocks. Below the solebars, black. The body strapping was originally painted black. But rust and weather...?
4. The interior was presumably left unfinished wood, and should therefore be a yellowy-grey for a new wagon. Or coal black after the first load!
5. In theory, the Mansell wheel axles were painted blue as a distinguishing feature. The wheel centres were varnished hardwood (ie. brown) and the tyres white when new.
6. The 'SER' is in white serifed letters 8" high (4.7mm) on the bottom plank on the left. The number, also serifed, is on the right bottom plank. The number is repeated on both ends in 3 1/2" lettering, centred on the bottom plank. Transfers are available from Fox's. Note that the drawing of SER wagon lettering in Southern Wagons Vol. 3 contains many inaccuracies
7. In SE&CR days, wagons may have eventually been repainted a mid or dark grey. The SE&CR lettering is non-serifed, and before 1917 of a similar in size and position to the SER's. After 1917 Maunsell had very large lettering higher up, presumably to make it clear during pooling who the wagons belonged to. Again, Fox can supply.

HISTORICAL NOTES

A few drawings of SER Coal Wagons exist in the HMRS collection, and one of them is the part-source for the drawing enclosed with this kit. There are also few photographs, and those are not much help in sorting out a detailed history. For the modeller, the best compendium of photographs is 'An Illustrated History of Southern Wagons' Vol 3 – SE&CR, by G. Bexley, A. Blackburn, R. Chorley, M. King, OPC.

Early coal wagons may have been bought in from independent manufacturers, and one at least was drop-sided – it's at the edge of shots taken of Cudworth's locomotives on Tonbridge turntable. During the 1850s, what may have been a standard type emerged, typified by arced ends (flattened on top) and with the ends joined to the sides by a number of distinctive horizontal angle brackets, showing up as black against the body. There are one or two photos of this type, and an HMRS drawing (SER drawing No.034). They were probably built at the Ashford works. The drawing of an SER coal wagon from 1864 in Southern Wagons, Vol. 3, should be treated with caution concerning date and detail. More research is needed.

At some point during the 1860s or 70s the 'standard design' with angle brackets was modified so that the ends were joined to the sides with the steel corner plate that became typical of many later open wagons, not just on the SER. At the same time, the ends became a true arc of a circle. This type is represented by Ashford drawing, No. 773 of 1883 and by this kit. Some batches (of 1876 and perhaps 1879) were built to the same general appearance and dimensions, but with the somewhat retrograde dumb-buffers. There is a photograph of Grove Park in the archives of the South Eastern and Chatham Society showing one such wagon.

Drawing No.773 has had 42" wheels sketched in and so there may have been an express variant of the same dimensions. This possible variant is drawn as a fact in Southern Wagons, Vol 3.

Note that the photograph of a dumb-buffered coal wagon (Southern Wagons, Vol. 3, plate 145) shows the brake catch to have been located between axlebox and headstock, not between axlebox and wagon centre. The kit and the accompanying drawing reflects the photograph.

Later in the 1880s, the design was enlarged to a 9'4" wheelbase, similar to the standard SER round-ended open wagon, and with a nominal body length of 15'5". This larger version did exist as an express wagon, with the SER standard 3-ribbed long (express) buffers and 42" wheels. By the 1890s, wagons of the same dimensions and general appearance were being produced with a distinctive tarpaulin rail which meant that they could also be used as general goods wagons. At about the same time, steel underframes were introduced, and variations of this later type continued to be produced after the working union between the SER and the LCDR (the SE&CR). Details of these variants are discussed in Southern Wagons, Vol. 3.

A good number of the 1883 wagons (as in this kit) survived into Southern Railway days, and at least one ended up on the East Kent Railway.

SAFETY-CHAINS: In addition to the normal draw-hooks and couplings, all SER wagons were fitted with safety chains and hooks (2 at each end, 1 foot either side of the draw-hook) until the mid-1880s at least. They were then discontinued. The Ashford drawing No.773 on which the kit is based shows no safety chains although this could be an omission, since they are shown on all other extant drawings prior to this date. It is probably safest to add safety-chains to wagons with numbers in the 4000s, and to omit them from wagons in the 7000s. Wagons with safety chains would probably have retained them into SE&CR days, but not into SR ownership.

WAGON NUMBERING

SER/SE&CR (Confirmed by photographic evidence) 4768 – 4792, 4803-4822, 4833 – 4932, 7369 – 7423

SR: 9663-4, 9676-82, 9689-99, 9709-22

FINALLY:

I hope you've enjoyed assembling this kit. If you've had any problems, let me know, and I'll try to find a solution for later kits.

If you want to know more about the SER, the LCDR and the SE&CR, why not join the South Eastern and Chatham Society? Membership is £20 per annum in 2012, and the membership secretary is John Arkell, 30 Meadow Road, Rusthall, Tunbridge Wells, Kent TN4 8UL.

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