

Brassmasters Scale Models

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**AUSTERITY, LNER/BR J94
and 50550 0-6-0ST LOCOMOTIVES**

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Instructions and prototype notes

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THE AUSTERITY, LNER/BR J94 and 50550 0-6-0ST LOCOMOTIVES

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1 Introduction

- 1.1 Several 4mm scale models of the Austerity have been and still are available in both ready-to-run and kit form, but they have all suffered from varying degrees of inaccuracy and lack of detail and there has never been a kit or r-t-r model of the 50550. Our aim in producing this kit were twofold - firstly to enable the modeller to build an accurate and detailed model of almost any variant.
- 1.2 Although the Hunslet 50550 was the predecessor of the Austerity/J94 it is more convenient from the modelling point of view to regard the latter as the standard and the 50550 as a variant thereof.
- 1.3 Please read the Prototype notes to establish details of the locomotive you are modelling before you begin to build this kit.

2 General Notes

2.1 This kit contains the principal components necessary to build the five main prototype types and most of the more common and/or interesting sub-variations. Obviously, it has not been possible to put every last item in, so those wanting such esoteric additions as tank side ladders, water softeners, air brake pumps, etc., will have to obtain these separately. The kit contains the standard pattern buffers: if you are building a BR J94 fitted with LNER Group Standard buffers or an Austerity fitted with heavy duty buffers, these must be obtained separately. The latter are best represented by the LNWR Bowen-Cooke pattern. The five main prototype types are:

Type A: 'Standard' Austerity and the LNER/BR J94 prior to the fitting of the extended bunker.

Type B: LNER/BR J94 with the extended bunker.

Type C: LNER/BR J94 with the bunker de-extended, retaining the narrow cab windows,

Type D: 'Lambton' version with the cut-down cab.

Type E: 50550 class.

2.2 The kit employs a mixture of traditional construction techniques, together with a few less conventional ideas. To take into account the need for painting and lining, and in particular with tank locomotives the problems of painting inside an enclosed cab, lining on the cab front and at the rear end of the saddle tank, and fitting the glazing, this has been catered for by making the body as two separate sections which interlock and are bolted to the chassis after final finishing. They are: (i) the boiler/tank/smokebox/ firebox, and (ii) the cab/bunker. The interlocking pegs on the back of the tank unit fit through the cab front either side of the firebox backhead. A further departure from established practice is that the firebox backhead, running plate and buffer beams are secured to the chassis. This enables the backhead to be painted more easily, the joins between the running plate, buffer beams, frames and gussets to be made secure, the footsteps to be stayed to the frames (as on the prototype) and facilitates fitting crankpin-driven lubricators where appropriate.

2.3 Although this kit can be built in OO gauge, the necessity for the frames to be closer together than the correct scale dimension leads to some compromises and inaccuracies (apart from the gauge itself) with fittings attached to or associated with the wheels and frames. Thus the sandboxes will not be in line with the fillers, the relationship between the frames, bufferbeam rivets and frame gussets will not be correct, and the handbrake pull rod below the footplate will not be in alignment with the handbrake standard in the cab. Problems may also be experienced with crankpin-driven lubricators and the inside motion.

2.4 In addition to the usual modelling tools, you will require a set of hornblock alignment jigs. Most soldering operations may be performed with 145 degree solder. For the lamp irons and brackets it is recommended that 188 degree solder is used for mounting the brackets to the body components, and 145 for fixing the lamp irons to the brackets.

2.5 The instructions will prompt and guide you when decisions on options are required. Please try to follow the assembly sequence given, even if at times you may wonder if you're doing the right thing at the right time!

2.6 Numbers in square brackets [] are part numbers. To assist with identification and location, the first reference to a part number has a numeric suffix applied for etched parts. This refers to the number of the fret on which the part will be found, e.g., part [123.4] is part 123 and will be found on fret 4. An alphabetic suffix is applied for non-etched parts: B = cast brass, T = turned brass, R = resin and W = white metal. Some parts, e.g. handrail stanchions, sections of wire, are not numbered.

2.7 Where practicable, each etched part has its part number shown on or adjacent to it. Some modellers prefer to remove all the etched parts from the frets before beginning construction, while others opt to cut them off as and when required. Choose whichever suits you best but

bear in mind that there are numerous alternative parts - make sure you use the right ones! If you are building the Lambton cab version, please note that the cab roof/sides require marking **before removal from the fret**.

2.8 Unless otherwise stated, on the etched components all folds and bends are made with the half-etched line to the inside.

2.9 On some of the etched components it is necessary to form rivet or bolt heads from the reverse side by using a punch, old scriber or a similar implement in half-etched holes. The instructions say 'form rivets' where this is required.

2.10 Most modellers will be familiar with soldering brass, nickel-silver and white metal, but for some this will be the first encounter with resin: a material which enables a large part of a kit to be made in one piece and reduces the amount of work in construction. It gives excellent surface detail and is easily cut, filed and sanded. Of course, it does not take solder, but cyanoacrylate adhesives will give an excellent bond with other materials. It will take both cellulose and enamel primer and colour paints.

2.11 Solder flux is highly corrosive! At the end of each work session involving soldering, wash components / assemblies in warm soapy water then rinse in clean water to remove excess flux. Do this in a sink with the plug in so that if anything drops off it won't go down the plug hole! The amount of soldering in proximity to the wheel tyres has been kept to a minimum, but it is recommended that the wheel tyres should be coated with a thin layer of paint and/or a non-corrosive flux used.

2.12 Resin is quite light, so to add weight to the model-two cast white metal weights are one for the boiler and one for the bunker.

2.13 The terms "fit" and "fix" as used in these instructions have definite and separate meanings. "Fix" means put in place but do not secure, e.g., fix the bearings in the axle slots. "Fit" means secure in place (using solder, adhesive, etc.), e.g., fix the dome to the tank.

2.14 Reference to left- and right-hand sides is made from the driver's position, looking forward from the cab. For example, the reverser rod is on the right-hand side.

2.15 These engines had a comparatively high-pitched boiler and one of the visual features which spoils some models is the motor/gears protruding from the front of the firebox into the space where the motion should be. Despite the size of the boiler and tank, the Austerity presents some difficulty in keeping the motor and gears hidden from view. None of the Escap motors can be easily accommodated, even with the commercially available conversion units. The four easiest options are as follows, all using the Mashima 12/20 "flat can" motor or the equivalent motor and gearbox from High-Level.

i A fixed motor and Alan Gibson 38:1 or 60:1 gears. A motor mount is included in the kit for this option.

ii A Branchlines single-stage 8R-C gearbox (40:1, 50:1 or 60:1).

iii A Branchlines slimline two-stage gearbox (60:1 or 80:1).

iv A Branchlines two-stage Multibox gearbox (40:1, 53:1, 67:1 or 80:1).

Options i and ii involve mounting the motor vertically in the firebox, with part of the motor body between the frames. In P4 this can be achieved within the firebox space with the motor's "flats" fore and aft, i.e. with the 14mm dimension across the chassis. In OO this cannot be done as the 14mm dimension cannot be accommodated between the frames: it will necessitate removal of the firebox front from the resin casting and omission of one frame spacer to accommodate the motor with the "flats" to the sides.

2.16 In connection with the above, if the motor/gears are kept within the firebox the space between the frames looks rather empty. Full working inside motion may be desirable, but I suspect most modellers will shy away from making cranked axles and the other associated gubbins. This kit includes a simplified resemblance of inside motion in that there are things which go up and down, round and round, and backwards and forwards, giving at least an impression of working connecting rods without the need to crank the centre axle. Fitting of this feature is optional and is not recommended in OO gauge due to the inadequate space between the frames.

2.17 Wiper pickups may be fitted relatively inconspicuously under the footplate. Sprung plunger pickups are an option - there are several types on the market and some modellers have their preferred choice. To those who are new to this type of current collection we recommend the products of Alan Gibson and Kean-Maygib.

2.18 The chassis is designed for "Flexichas" compensation with a "fixed" rear axle and a pivot beam for the front and centre axles. During the building process the frames act as jigs for the correct setting of the pivot beam height. A portion of the frame overlay is removed after this stage to permit the compensation to function. The wheelsets are retained by dummy representations of leaf springs which are easily removable should it be necessary to take out the wheelsets. For the same reason, the brake rigging is also made detachable.

2.19 4mm scale 14-spoke 4'3" wheels for the Austerity are available from Alan Gibson (ref G4851N) or Markits (ref BRe 680xx). Sharman Wheels (London Road Models) produces the 4ft 0½ in 12-spoke wheel for the 50550 but those of you modelling the Yorkshire Engine Co Austerities with their 4ft 3 in 12-spoke drivers are - at present - out of luck.

3 Construction - Part One

3.1 Refer to the scale drawings and the construction diagrams during building.

3.2 If you are building in OO gauge, file the frame spacers [1.1], [2.1], [3.1] and [4.1] and (if required) motor mount [14.1] down to the half-etched witness lines to give a spacer width of 13mm. Leave them as supplied for EM and P4 gauges.

3.3 Test-fit the bearings in the frames ([6.2] left and [6.3] right) and gently file out the bearing slots if required. The rear bearings should be a tight sliding fit, but the middle and front bearings should be slightly 'sloppy' to give a maximum of 0.5mm fore-and-aft travel in the slot. Don't panic - this is intentional! Note that the bearings have the grooves 'off-centre' - fit them with the narrow portion outside the frames for OO and

EM, or inside for P4. It is wise to identify each bearing to a specific slot once this exercise is complete: spots of paint will do (one spot for the front, two for middle and three for rear: use red for left and blue for right -easily remembered if you're into politics!). Remove the bearings.

3.4 The steam and hand brake arrangement is shown in fig.2. On the right-hand frame drill 0.5mm the holes in the steam brake cylinder ends and the brake return spring mounting, then fold out the cylinder ends and spring mounting.

3.5 Form and fix the steam brake cylinder wrapper [8.3] in place.

3.6 Fix the appropriate frame side overlays ([10.3] and [11.3] for the Austerity/J94 or [12.3] and [13.3] for the 50550) to the frame sides. Do not yet file out the aperture for the leading wheelset bearings.

3.7 Drill the following holes in the frames/overlays: From the 'outside' (i.e., through the overlay first) 0.7mm for the brake cross rods. 0.5mm for the footstep stay rods. From the 'inside' (i.e., through the frame inner first) 0.9mm for the reverser weigh-shaft.

2.5mm for Alan Gibson or 2.0mm for Kean-Maygib plunger pickups if required. Note that other makes may require different size holes). **Do not fix the pickups at this stage.**

3.8 Fix the spacers [1], [2] and [3] and (if required) motor mount [14] in the half-etched lines in left frame side, then fix the right frame side to the spacers ensuring that the assembly is true and square.

3.9 If you are fitting the inside motion, fold up the slidebars [5.1]. Solder the half-bars together, then fix them to spacers [1] and [2].

3.10 Drill the holes in the frame leaf spring mountings 1.3mm. Solder a 12BA nut to the top (fold side) of each and check that a 12BA bolt can be threaded in. Fold the spring mountings through 90 degrees and run a fillet of solder into the folds as shown in fig.3.

3.11 On leaf springs [9.1] drill the mounting holes 1.3mm to be a clearance fit for the 12BA bolts. Fold each unit as shown in fig.4 and trial-fit to the frames, then remove.

3.12 The rear spacer [4] has two half-etched holes in its surface. Drill one of the holes 0.5mm for the handbrake pull rod - that nearest the centre for OO, or that nearest the edge for EM/P4, and fix in position: note that the hole is to the left of centre and the body mounting holes are to the rear.

3.13 Cut three lengths of 0.7mm wire for the brake cross-rods: 18.5mm long for OO, 20mm for EM or 21mm for P4, and fix in the holes in the frames, with an equal amount outside on each side. Ensure that each is firmly soldered to both frame sides (apply solder in the recesses inside the frames), then remove the sections of wire between the frames.

3.14 Refer again to fig.2. Part [15.2] is the crank for the steam brake / right pull rod, part [16.2] is the crank for the hand brake / left pull rod, and part [17.2] is the handbrake lower pull rod. Drill 0.9mm the centre holes of parts [15] and [16], and the 0.5mm the outer holes of these parts plus all three holes in part [17]. Cut an 8mm length of 0.45mm wire to form the handbrake upper pull rod and fix this vertically in the hole in spacer [4]. Remove any excess solder from above the spacer (to allow the running plate to fit).

3.15 Cut a piece of 0.9mm wire for the brake crank rod - 13.5mm for OO, 16.5mm for EM/P4 - and fit in the frames, together with [15] and [16], ensuring they are on the right and left sides respectively, and correctly orientated. Fix the rod to the frames, then fix [15] vertically in alignment with the centre of the brake cylinder, and [16] in alignment with the hole in the spacer above. Fix a piece of 0.45mm wire through the steam brake cylinder so that it meets the crank, and another piece to represent the return spring between the crank and the mounting.

3.16 Fold up and fix the handbrake lower pull rod [17] between [16] and the upper rod, and fix a 3mm piece of 0.45mm wire through the holes in [16] and [17].

3.17 Assemble the coupling rods is shown in fig.5. Use the type appropriate to the model being built: ([18.1]-[21.1] for the Austerity/J94 or [22.1]-[25.1] for the 50550). A piece of 0.45mm wire fitted through the crankpin holes will assist in alignment of the components. Open out the crankpin holes so that the bearing jig 'axles' are a tight fit in the holes.

3.18 Invert the chassis and place the bearings in the slots (remember the identification and orientation in step 3.3) and fit the alignment jigs. Place the coupling rods on the jigs to align the bearings. Fix the bearing guides [26.2] one at a time either side of the bearings of the centre and leading axles. Remove the rods, jigs and bearings.

3.19 Open out the holes in the coupling rods to suit the crankpin bushes.

3.20 Check that the (real) axles are a sliding fit in the bearings - if any bearings are tight, gently ream them until satisfactory.

3.21 Assemble the leading wheelset - wheels, axle and bearings. Similarly assemble the centre wheelset If you are not using the inside motion.

3.22 If you are using the inside motion, refer to fig.6. Open out the holes in eccentrics [27.1] to $\frac{1}{8}$ ". Fix one eccentric to the axle at 2.5mm off-centre. Clean off any excess solder. Take two of the connecting rod halves [28.1] and fit to the axle/eccentric so that they 'trap' the eccentric. Run a drop of oil round the eccentric, then solder the two connecting rod halves together. Fit the third (2nd pair inner) connecting rod half on the axle, then fix the second eccentric at 5mm spacing and 90 degrees to the first. Fix the remaining connecting rod half as before. Drill 0.9mm the hole in the end of each assembled rod and fix into it a 3mm length of 0.9mm wire. Fit the bearings and wheels to the axle.

3.23 If you are using a double-shafted motor (e.g., the Mashima 12/20), cut the shaft at the end opposite that which has the mounting holes. Select the motorising option (see fig.7) and follow the relevant instruction:

i. Alan Gibson gears. Fix the worm to the motor shaft. Assemble the axle, worm wheel, bearings and wheels. If necessary, open out the holes in the motor mount and test-fit the wheelset and motor, then remove.

ii/iii/iv Branchlines gearboxes. Assemble the motor, gearbox (see assembly instructions supplied with the gearbox), axle, bearings and wheels.

3.24 Check that the quartering is identical on all three wheelsets.

3.25 Cut a length of 0.9mm wire to form the inner pivot rod - 13mm for OO or 15mm for EM/P4. Cut two 5mm lengths of 1.5mm dia tube to form the outer pivot rod ends and one length -3mm for OO or 5mm for EM/P4 for the outer pivot rod centre. Drill the hole in pivot beam [29.1] 1.5mm and fit centrally on the outer pivot rod centre.

3.26 Temporarily fit the wheelsets: if inside motion is used, thread the ends of the connecting rods into the slidebars as the centre wheelset goes in.

3.27 Place the chassis on a flat surface, e.g., a sheet of glass. Ensure that the front and rear bearings are at the top of their travel and all wheels are in contact with the surface. Assemble the pivot beam / rods and fix in place between the frames with the beam located centrally and resting on the centre and leading axles, as shown in fig.8.

3.28 Remove the front wheelset and carefully file away that part of the frame overlay in the front bearing slots. Refit the wheelset and check that the pivot arrangement works correctly.

3.29 Fit the coupling rod bushes, rods and nuts. Push the chassis to and fro on a piece of track to check for 'tight spots'. If there are any, look for one of two reasons:

i) Inconsistent quartering. The quartering does not have to be at exactly 90 degrees - in fact slightly over is preferable - but it does have to be identical on all three wheelsets. Roll the chassis so that on one side the rods are at the bottom of their travel. Now look at the wheels on the other side - view a diagonal spoke of one wheel and check whether the equivalent spokes on the other wheels are at the same angle. If not, adjust the quartering (re-sighting if need be) until it is identical on all three.

ii) Tightness in coupling rods. Roll the chassis until the tight spot occurs - it will probably be with one set of rods either 'fully forward' or 'fully rearward' in line with the wheel centres. With a pair of tweezers, try moving the coupling rods, one at a time. One (or more) will be tight on the pin bushes. Either remove it/them and gently open out the appropriate hole(s) in the rods, re-trying at frequent intervals, or if the binding is severe, re-set the bearing guides.

When satisfied that the chassis runs freely, remove the rods.

3.30 Fix together the brake hangers [31.1] and shoes [32.1]. If you use a shoe either side of the hanger the assemblies will be 'universal' but if you use only one shoe per hanger do ensure that you make three left-hand and three right-hand! Fix these to the brake cross rods in alignment with the wheels. Remove the wheelsets.

3.31 Cut a piece of 0.9mm wire for the reverser weighshaft -14mm for OO or 17mm for EM/P4.

3.32 In reverser counterweight [33.2] drill the end holes 0.5mm. Fold up and solder the counterweight as shown in fig.9, then drill the central hole 0.9mm. Fix this together with the weighshaft in the frame, so that the weight is central, and 1 mm of the shaft protrudes from the right-hand frame side.

3.33 Fix the reverser drop links [34.1] outside the ends of the counterweight using a piece of 0.45mm wire, so that the lower ends of the links are either side of the pivot beam.

3.34 Fix the reverser rod crank [35.1] over the protruding end of the weighshaft.

3.35 Refer again to fig.2. Fix together the sections of the brake beams - [36.2] and [37.2] are for the front wheels and [38.2] and [39.2] for the centre and rear wheels. Drill the pull rod holes 0.5mm.

3.36 For OO gauge trim the ends to suit the distance between the brake hangers, and for all gauges file the end spigots to suit the holes in the hangers. Fit but do not fix the beams between the hangers. Form from 0.45mm wire and fit the pull rods in place. Fix them to the beams but not to the cranks. Gently remove the brake rigging.

3.37 Drill the sandpipe holes 0.5mm in the sandboxes [44.W] and fix them to the frames in the apertures in the overlays. Note that they may be soldered from inside the frames.

3.38 Cut, bend and fix lengths of 0.45mm wire to form the sand pipes - check your prototype for the required shape. For steam sanding, add lengths of 0.33mm wire between the bottoms of the sandpipes and the frames - see the scale elevations.

3.39 If required, fix the guard irons [45.2] in the apertures in the overlays (note some locomotives either lost their guard irons or had them removed).

3.40 If you will be using wiper pickups, file a small notch in each frame above the rear brake hanger to take the wire from the pickups to the motor.

3.41 Fix the appropriate balance weights to the wheels. Note that the front and rear weights are located opposite the crankpin and the centre ones adjacent to it. See the side elevation diagram. There are four types:

[40.2] Austerity/J94 - front/rear (quantity 4) [41.2] Austerity/J94 - centre (quantity 2) [42.2] 50550 - front/rear (quantity 4) [43.2] 50550 - centre (quantity 2)

3.42 If you are building an Austerity/J94, remove the lower portion of each buffer beam [48.2] and file the bottom edge. If building a 50550 leave this in place.

- 3.43 Fix together the buffer beams [48] and the appropriate overlays [49.3] for the Austerity/J94 or [50.3] for the 50550. Note that one of the beams has three half-etched holes near the top edge - these are for rear lamp irons on a 50550 (see step 3.52).
- 3.44 If you are building a 50550 and use Alex Jackson couplings, drill the central holes in the beams 0.3mm through the beams and overlays.
- 3.45 If you are building a 50550 and rear lamp irons are required, drill through 0.5mm the three holes in one of the beams/overlays. Fold up and fix three lamp-iron brackets [105.4] through the beam, using 188 solder, and add lamp-irons [107.4] using 145 solder.
- 3.46 If you are building an Austerity/J94 with single gussets, carefully file off the top row of gusset bolt heads from each side of each buffer beam overlay as shown in fig.10.
- 3.47 If you are building an Austerity, check whether your prototype had flush rivets in the upper centre portion of the front buffer beam. If so, gently file off the etched rivets as shown in fig.10.
- 3.48 Fix the buffer bodies to the buffer beams. Remove any excess metal and/or solder from the back of buffer beams.
- 3.49 Fix the buffer beams/overlays to the frames. If building a 50550 with rear lamp irons, ensure the beam with the irons is at the rear.
- 3.50 Fix the frame / buffer beam gussets [51.3] and corner plates [52.3] in place - on the 50550 there is one of each per corner and on the Austerity/J94 either one (early locomotives) or two (later) per corner. If using two gussets, fix each upper gusset and its corner plate first, then the lower ones. Single gussets locate in the lower positions.
- 3.51 The underside of the running plate [46.2] is marked for various items, some of which are optional depending on the type of locomotive being built. Form the half-etched bolt/rivet heads as required. Note that some locomotives had flush rivets ahead of the smokebox. Drill the appropriate holes using the half-etched holes on the underside, as follows:
- (a) Required for all locomotives
 - 1.4mm: front sandbox fillers, handbrake stanchion and reverser lever,
 - 0.3mm: cab handrails.
 - (b) Required for locos other than 50550 and YE-built Austerity) 1.0mm: injectors.
 - (c) Optional / variable depending on prototype
 - 0.5mm: lamp irons.
 - 0.5mm: J94 fire-iron retaining pillars.
 - 0.5mm: then form a slot for the drive to a lubricator worked off a crankpin. Note that such lubricators could be either central or forward, on one or both sides, and worked off either the front or centre crankpin. Check your prototype.
 - 0.3mm: Centre hand grabs and front hand grabs. Note that there are alternative positions for the front hand grabs, either in line with or to the rear of the footsteps.
- 3.52 If you are building a locomotive without a raised cab floor, fix the rear sandbox fillers [47.2] in the holes in [46]. If you are building a locomotive with a raised cab floor remove parts [47] and keep them safe for use later.
- 3.53 Fix the running plate to the frames and buffer beams, ensuring that it is correctly aligned.
- 3.54 Cut two pieces of 1 mm x 1 mm brass angle to form the valances and fix under the running plate between the buffer beams flush with the edges of the running plate.
- 3.55 Fix the six running plate / frame supports ([53.3] for the Austerity / J94 or [54.3] for the 50550) to the underside of the running plate in the slots in the frame overlays. If building a 50550, fix a length of 0.5mm wire through the sanding gear operating rod holes in the supports on each side, with the wire ends terminating above the sandboxes.
- 3.56 Four types of footstep can be used: two-tread or three-tread, each with or without safety side plates, and locomotives could have either two or three sets of steps per side. Front and rear steps were stayed to the frames but where centre steps were provided they were not. Check your prototype to establish (i) the type(s) of step, (ii) the number and positioning of step plates on each step assembly (iii) whether (on non-sided steps) the step treads had safety ends, and (iv) the number of step assemblies on the running plate.
- 3.57 Drill 0.5mm the stay holes in the appropriate front/rear step plates ([56.3] for two tread or [58.3] for three tread). Assemble the front/rear footsteps from parts [56] or [58] and [60.3], and (if required) centre footsteps from parts [57.3] or [59.3] and [60], removing the safety plates and/or step ends if not required. Fit the footstep assemblies to the running plate in the half-etched positions. Form from 0.5mm wire and fix the stay rods in the holes between the footsteps and frames.
- 3.58 Unless you are building a 50550 or a YE Austerity, fix the injectors [61.B] in place, bending the drain pipe to fix under the cab steps (see scale elevation drawings).
- 3.59 If you are using working lubricator drive, file the handles off the lubricator(s) [62.B] and drill a 0.5mm hole into the front centre. Fix into it a piece of 0.45mm wire to project 0.5mm. Fix the lubricator to the running plate so that it is central to the drive rod slot (formed in step 3.47 above) and with the projecting wire above the slot. If using the lubricator(s) without the drive mechanism, fit them now.
- 3.60 If appropriate, fold up and fix in place the lamp irons ([63.3] LNER/BR long or [64.3] short). These are applied from the underside through the drilled holes.

- 3.61 If appropriate, fix in place four 2.5mm lengths of 0.45mm wire for the LNER/BR fire-iron retaining pillars.
- 3.62 Prepare the firebox backhead [65.W]. Do not remove all of the casting stalk - it locates the backhead on the running plate. File the plain side to a smooth finish and if necessary clean out the circular recess to accommodate the locating plate [66.5]. Fix the backhead to the running plate, with the stalk in the recess, ensuring that it is vertical (use a small square for this). Note that the security of backhead on the running plate is critical to the integrity of the assembled model, so do ensure that it is firmly fixed.
- 3.63 Drill 0.3mm the holes in the ends and 0.9mm the centre hole of regulator bar [67.2] and fix in place on the backhead, then fix a 2mm length of 0.3mm wire in each end hole to represent the handles.
- 3.64 Take the appropriate cab front inner ([68.4] for the J94, 'normal' Austerity and 50550, or [70.4] for the Lambton cab). Drill the holes 0.5mm in the brackets for the steam brake operating rod, then fold the brackets through 90 degrees. Fix together the cab front with the appropriate overlay ([69.4] for the J94, 'normal' Austerity and 50550, or [71.4] for the Lambton cab). Note that there are recesses in the inners to locate the roof eaves (fitted later).
- 3.65 If building a normal-cabbed Austerity/J94, file the top corners of the cab front overlay to a 1mm radius. Leave these corners 'square' for a 50550.
- 3.66 Cut two pieces of glazing material to fit the spectacle recesses. Do not fix them but put them aside in a safe place where you will (hopefully!) remember where they are when required later.
- 3.67 Fix a 17mm length of 0.45 wire through the steam brake brackets and fix the brake handles [72.2] to the ends, as shown in fig.11.
- 3.68 Place the locating plate [66] in the recess in the backhead, then place the cab front over it to trap the plate in place. Ensure that the front is centralised on the running plate, then fix the cab front to the locating plate, but not to the backhead.
- 3.69 If necessary, clean out the bore of tank casting [73.R] and remove the feed marks from the back face, but not the two locating pegs. If necessary, remove material from the inside the firebox sides to accommodate the width of the motor body.
- 3.70 Drill the chimney hole 6mm dia. in tank casting - there is a dimple in the casting to indicate the centre of the hole. If building a Giesl-fitted locomotive, score two parallel lines 3mm apart forward from this circle, as shown in fig.12. Form the aperture using drills, junior hacksaw and files. Note that the sides of the aperture have a slight inwards taper.
- 3.71 The various holes required in the tank casting are shown in fig.13. Drill the required holes in the tank casting, as follows (dimples in the casting indicate their positions):
- 0.7mm for handrail stanchions - four along the upper part of each side, three on the underside of each side of the tank, and two on the tank front.
 - 0.3mm for the handrails either side of the tank filler.
 - 0.5mm for the tankside steps, safety valves and whistle.
 - 0.9mm for the tank balance pipe.
 - 1.5mm for the tank filler and dome.
 - 2.0mm in the base of the smokebox saddle for the 8BA retaining bolt.
- If you are building an LNER/BR J94 fitted with diagonal tank handrails, mark then drill two 0.3mm holes for the handrails. Note that the exact positions of these handrails varied -check your prototype.
- If appropriate, mark and drill 0.5mm holes for the smokebox-mounted lubricators in the smokebox saddle.
- 3.72 Drill 2.0mm the hole in the retaining plate [74.1] and solder an 8BA nut over the hole. Fix [74] into [73] using Araldite, Isopon, Plastic Padding or similar adhesive, with the holes in alignment. An 8BA bolt fitted temporarily from below will ensure alignment but do not allow adhesive to come into contact with the bolt. Allow the adhesive to cure.
- 3.73 Hold the cab front in place against and located in the backhead, then fit the tank casting so that the pegs on the back end of the tank locate in the in holes in the cab front. With the cab front thus sandwiched in place and correctly aligned on the running plate, secure the tank in place with an 8BA bolt through the running plate and into the smokebox.
- 3.74 Fit the two peg surrounds [75.2] over the pegs and fix to the cab front. **Do not-fix them to the pegs.**
- 3.75 The tank /cab upper angle-brackets comprise parts [76.4] which fix on the cab front and [77.4] which must be curved to fix on the tank. There are four of each, and they are located either side of the spectacles as shown in fig.14. Do not allow the plates to become fixed to each other as it is necessary for the tank to be separated from the cab.
- 3.76 The tank / cab lower angle-brackets comprise parts [78.4] of which there are two: fold up and fix one on each side of the cab front under the tank as shown in fig.14. Do not allow the plates to become fixed to the tank.
- 3.77 Check whether your prototype had plain or rivetted angles between the running plate and smokebox saddle sides. Fold up and fix the appropriate parts - [79.4] plain or [80.4] rivetted -to the running plate either side of the saddle as shown in fig.14. Do not fix them to the saddle.
- 3.78 Remove the 8BA bolt and separate the tank, cab and chassis.

- 3.79 Fix the front sandbox fillers [55.W] in the holes in the running plate.
- 3.80 Fix the smokebox/tank angle-plates [81.4] in place as shown in fig.14.
- 3.81 If appropriate, fix the smokebox-mounted lubricators [82.B] in place.
- 3.82 If you are not using a Giesl chimney, proceed to step 3.84.
- 3.83 If building a loco with a Giesl chimney, curve the Giesl base plate [83.4] to fit the radius of the inside of the smokebox. Fix the Giesl chimney [84.W] to the base plate. Note that small plate on the side of the chimney (actually the Giesl patent plate) is normally on the left side. Fix the chimney and base plate into the smokebox such that the front edge of the base plate is set back 0.25mm from the front face of the tank. If your prototype had a cover plate over the front of the Giesl aperture fix part [85.4] in place. Proceed to step 3.85.
- 3.84 Fix the appropriate chimney in place. The standard Austerity / J94 chimney [86.W] is that which flares out from the base to the top, the 50550 chimney [87.W] is that which flares in from the base to the top, and the underfeed stoker cowl is [88.W].
- 3.85 Fix the tank-side and under-tank handrail stanchions and 0.3mm handrail wire.
- 3.86 Fix a 5mm length of 0.45mm wire to the underside of the tankside steps [89.4] and fix the steps in the holes.
- 3.87 Fix the tank filler [90.W], dome [91.W], safety valves [92.B] and whistle [93.T] in place.
- 3.88 Form handrails from 0.3mm wire and fix in the holes adjacent to the filler.
- 3.89 If you are building an LNER/BR J94 with additional tankside handrails and steps, bend the footsteps [94.4] as shown in fig.15 and fix to the tank. Form from 0.3mm wire and fix the diagonal handrails.
- 3.90 Form from 0.9mm wire and fix in place the balance pipe under the tank.
- 3.91 Fix the cast weight block [95.W] in the tank casting. Note that this may require shortening if the motor configuration places part of the motor in the boiler section. If you are building a Giesl fitted loco it is wise to fill the gap between the Giesl base plate and the weight block to eliminate the possibility of the base plate becoming detached from the tank.
- 3.92 The smokebox front [96.6] has two mountings on its outer face. That at the top is for a smokebox-mounted lamp iron, and that to the left side of the door aperture is the base of the smokebox door opening limiter fitted to some LNER/BR J94s. If either or both are not required gently file them off as appropriate.
- 3.93 If the smokebox door opening limiter is to be fitted, drill the hole in the mounting 0.5mm, then fold up and fix the limiter [97.6] in place as shown in fig.16.
- 3.94 If the smokebox-mounted lamp iron is required, check your prototype to see if the horizontal part is above or below the handrail. Fold up and fix in place the mounting bracket [98.4] using 188 solder, then a lamp iron ([99.4] LNER/BR long or [100.4] short) using 145 solder.
- 3.95 Fix the smokebox door handles [101T] to a 5mm piece of 0.45mm wire. Drill 0.5mm the hole in the smokebox door [102.W], then fix the handles to the door, and the door to the smokebox front.
- 3.96 If your prototype had a smokebox door vacuum relief valve, fix [103.4] in place on the door above the top hinge strap.
- 3.97 Fix two handrail stanchions in the front of the tank. If you are building a Giesl-fitted loco, check whether your prototype had a continuous or split front handrail. If the latter, drill a 0.3mm hole 3mm Inboard' of the handrail stanchions and fix separate handrails of 0.3mm wire. Otherwise fix a continuous handrail.
- 3.98 An assembly jig [104.5] is used in the construction of all cabs. The jig is folded as shown in fig.17 and temporarily tack-soldered between the cab front and rear while the other components are added, then removed at the end of the operation.
- 3.99 The assembly of the cab and bunker differs depending on the type and is therefore divided into five groups, as shown below. Follow whichever group applies to the locomotive you are building.

The cab inners have a half-etched witness line at the top of one side to assist with alignment with the roofs: this line must be to the inside of the cab.

Note: When you have the appropriate cab rear inner and overlay fixed together, cut pieces of glazing material to fit the spectacle recesses. Do not fix them, but put them in the same safe place as you did with the front ones.

Instructions relevant to all types re-commence with step 3.156.

A: Standard Austerity. Also LNER/BR J94 prior to fitting with extended bunker (i.e., with round rear spectacles). Instructions 3.100 to 3.117.

- 3.100 If an upper rear lamp iron is required, drill through the half-etched hole in the ventilator of cab rear inner [108.4], then fold up and fix one bracket [105.4] in place using 188 solder and fix to it one lamp iron [107.4] using 145 solder.
- 3.101 If an open rear ventilator is required, fold in the ventilator in the cab rear inner to the required amount.
- 3.102 Drill 0.3mm the holes around the spectacles in rear overlay [109.4] and form and fix from 0.3mm wire the spectacle bars.
- 3.103 Fix the inner to the overlay.
- 3.104 Fix the cab front and rear to the jig.

- 3.105 Take two cab eaves/spacers [110.1] and file a half-round on one long edge of each. Fix in place in the recesses in the cab inners.
- 3.106 Using a rule and scribe, mark a centre line on the underside of the cab/bunker sides/roof [111.5] as shown in fig 18.
- 3.107 Take the two remaining cab eaves/spacers [110] and reduce their length by about 2mm then temporarily tack-solder them to the sides, across the doorways, as shown in fig.18.
- 3.108 This step requires a great deal of care: proceed slowly! Place [111] underside-up on a flat surface. Invert the front/rear/jig onto it, aligning the half-etched lines on the inners with the scribed line on the roof. Beginning at this centre, solder the roof to the front and rear, as far as the eaves, then solder the roof to the inner edges of the eaves. Carefully roll the assembly to form the transition radius from roof to sides, then solder the roof to the outer edges of the eaves. Continue to solder down the joints between the sides and front/rear.
- 3.109 Remove the jig and spacers.
- 3.110 Fold the top of the bunker front [112.5] and fix to it the bunker door and runners f113.4) in either the open or closed position. Fix the bunker front to the cab rear.
- 3.111 Fix the roof ventilator [114.4] open or closed, and rain strips (from 0.45mm wire) to the roof.
- 3.112 Fix the bunker rear inner [116.6] to the overlay [117.5]. If rear lamp irons are required, drill through 0.5 mm the half-etched holes in the inner and fix lamp iron brackets [105.4] in place using 188 solder, then lamp irons ([106.4] LNER/BR long or [107.4] short) using 145 solder.
- 3.113 Fix the bunker rear in place between the bunker sides.
- 3.114 If cab doors are to be fitted, fix the door spacers [115.4] inside the cab doorways. Check whether your prototype had a raised cab floor. If so, remove the bottom sections of doors [118.4]. If not, leave them as supplied. If you are fixing them in the open position remove the narrow vertical section. Fix to the cab sides with their tops aligned with the tops of the doorways. If you are fixing the doors in the open position note that they hinged at the rear.
- 3.115 Fix a 10BA nut over each of the bolt holes in bunker bottom [119.6] then fold up and fix in the bunker at the bottom of the sides.
- 3.116 Fit the cab/bunker assembly on the chassis and secure with two 10BA bolts from the underside through the rear spacer and running plate into the nuts on the bunker bottom.
- 3.117 Cut four 15mm lengths of 0.3mm wire for the cab handrails - hold each one at a time in position with its top behind the support on the cab side and its bottom in the hole in the running plate. Fix them only to the cab side.

B: LNER/BR J94 with extended bunker. Instructions 3.118 to 3.128.

- 3.118 Fix the cab rear inner [120.4] to the overlay [121.4].
- 3.119 Follow steps 3.104 to 3.111 above.
- 3.120 Fix the bunker support [122.6] in place on the cab rear.
- 3.121 Fix the bunker rear inner [123.4] to the overlay [124.4].
- 3.122 Drill through 0.5 mm the half-etched holes in the inner and fix lamp iron brackets [105.4] in place using 188 solder, then lamp irons [106.4] using 145 solder.
- 3.123 Drill 0.3mm the half-etched holes for the bottom of the bunker ladder.
- 3.124 Follow steps 3.113 to 3.115 above.
- 3.125 Bend to shape and fix in place the bunker upper sides ([125.5] left and [126.5] right).
- 3.126 Follow steps 3.116 and 3.117 above.
- 3.127 Form from 0.3mm wire and fix in place the sides of the bunker rear ladder, then add the rungs from the same material (refer to the scale elevation drawings).
- 3.128 Fig. 19 shows the rear footstep assembly. Take the rear footstep vertical [127.4] and fix to it the step plates (top [128.4], centre [129.4] and bottom [130.4]), then fix this assembly under the bunker, soldering it to the buffer beam but not to the bunker. Fix the footstep stay [131.4] in place.

C: LNER/BR J94 with extended bunker removed but retaining narrow rear spectacles. Instructions 3.129 and 3.130.

- 3.129 Follow steps 3.118, then 3.114 to 3.117 above.
- 3.130 If your prototype retained the rear footsteps, follow step 3.128 above. D: Lambton (rounded) cab. Instructions 3.131 to 3.145.
- 3.131 If an upper rear lamp iron is required, drill through the half-etched hole in the ventilator of cab rear inner [132.4], then fold up and fix one bracket [105.4] in place using 188 solder and fix to it one lamp iron [107.4] using 145 solder.
- 3.132 If an open rear ventilator is required, fold in the ventilator in the cab rear inner to the required amount.

- 3.133 Drill 0.3mm the holes around the spectacles in rear overlay [133.4] and form and fix from 0.3mm wire the spectacle bars.
- 3.134 Fix the inner to the overlay.
- 3.135 Fix the cab front and rear to the jig.
- 3.136 Fix two of the cab eaves [110.1] in place in the recesses in the cab inners.
- 3.137 Before removing the cab sides/roof [134.4] from the fret, using a rule and scribe, mark the waist fold lines on the inside of the cab sides using the witness marks on the surrounding fret. Remove the roof/sides from the fret and form the folds against the edge of a steel rule.
- 3.138 Take the two remaining cab eaves/spacers [110] and reduce their length by about 2mm then temporarily tack-solder them to the sides, across the doorways, as shown in fig.18. Using a rule and scribe, mark a centre line on the underside of the roof as shown in fig 18.
- 3.139 This step requires a great deal of care: proceed slowly! Place [134] underside-up on a flat surface. Invert the front/rear/jig onto it, aligning the half-etched lines on the inners with the scribed line on the roof. Beginning at this centre, solder the roof to the front and rear, as far as the eaves, then solder the roof to the inner edges of the eaves. Continue to solder down the joins between the sides and front/rear.
- 3.140 Remove the jig and spacers.
- 3.141 Fold the top of bunker front [112.5] and fix to it the bunker door and runners [113.4] in either the open or closed position. Fix the bunker front to the cab rear.
- 3.142 Fix the roof ventilator [114.4] open or closed, and rain strips (from 0.45mm wire) to the roof.
- 3.143 Fix the bunker rear inner [116.6] to the overlay [117.5]. File the top corners to the same profile as the equivalent portion of the cab rear. If rear lamp irons are required, drill through 0.5 mm the half-etched holes in the inner and fix lamp iron brackets [105.4] in place using 188 solder, then lamp irons [107.4] using 145 solder.
- 3.144 Fix the bunker rear in place between the bunker sides.
- 3.145 Follow steps 3.115 to 3.117 above

E: 50550. Instructions 3.146 to 3.155.

- 3.146 Fix the cab rear inner [120.4] to the cab rear overlay [135.5] If an upper rear lamp iron is required, drill through 0.5mm the half-etched hole in the cab rear inner, then fold up and fix one bracket [105.4] in place using 188 solder and fix to it one lamp iron [107.4] using 145 solder.
- 3.147 Fix the cab front and rear to the jig.
- 3.148 Fix two of the cab eaves/spacers [110.1] in place in the recesses in the cab inners.
- 3.149 Fix the cab/bunker sides ([136.5] left and [137.5] right) to the cab front and rear.
- 3.150 Fix the cab roof [138.6] in place.
- 3.151 Remove the jig.
- 3.152 Fold the top of bunker front [112.5] and fix to it the bunker door and runners [113.4] in either the open or closed position. Fix the bunker front to the cab rear.
- 3.153 Fix the ventilator [114.4] (open or closed) to the roof.
- 3.154 Fix the bunker rear inner [116.6] to the overlay [139.5], then fix fit bunker rear in place between the bunker sides.
- 3.155 Follow steps 3.115 to 3.117 above.

Steps 3.156 onward apply to all types.

- 3.156 Remove the cab/bunker assembly from the running plate and fix the weight block [140.W] in the bunker.
- 3.157 If you are building an Austerity with a raised cab floor, fold the supports in floor [141.5], then fix the sandbox fillers [47] in place. Fix the floor to the running plate, butted against the firebox backhead.
- 3.158 Fix the handbrake standard [142.B] to the running plate.
- 3.159 Fix the reversing lever support / damper lever [143.4] to the reversing lever [144.W] and fix this assembly to the running plate.
- 3.160 Remove from the fret the halves of the reverser rod [145.2] and solder together, then drill the hole 0.5mm and fix in it a short length of 0.45mm wire which will fit into the reverser link on the chassis, but do not fit or fix the rod in place.
- 3.161 Remove the damper rod [146.2] from the fret but do not fit or fix it yet.
- 3.162 If you are building a C&HP J94 with oval buffers, fix the buffer overlays [147.1] to the buffer heads, then gently file the overlays to produce a slightly convex surface.
- 3.163 If using working lubricator drive(s), cut the relevant drive rods [148.1] - [151.1] from the fret and drill the holes 0.5mm.

3.164 Separate the assemblies and prepare them for painting.

3.165 If appropriate, prepare the required number, shed, name and builders' plates. Included with the MOD plates are four small fold-up brackets for mounting the nameplates on the running plate. Also supplied are the backing plates for the Royal Engineers' crests carried by some locomotives, and the crests themselves.

The Royal Engineers' crest is that with the leaves, and is applicable to the following locomotives: *Ahwaz, Brussels, Greensleeves, Jullundur, Rennes, Royal Engineer, Royal Pioneer and Sapper. Errol Lonsdale* also carried the RE crest in the area above the name. The RAOC crest is that with the eight-pointed background and is carried on the cabsides of *McMurdo* and *Waggoner*, the latter also carrying the Army 92 plates.

4 Painting, Lining and Finishing

4.1 Most modellers have their preferred methods and materials. My own recommendation for primer is car aerosol primer direct from a new can, but this can be a bit "ferocious" and the inexperienced are advised to practice before attacking this model for real! Alternatively, primer may be sprayed from an aerosol into an airbrush jar, thinned with cellulose thinner, and airbrushed onto the model.

4.2 The bearing slots, beam pivots and slide bars should be masked before spraying - use either tape or a masking fluid such as Humbrol "Maskol". Similarly, the buffer holes should be blocked with small pieces of Blu-tak. The wheels are best primed with a brush - spray some primer into a small clean jar and apply it from there. Do not allow paint to get in the motor/gears, axles/bearings or on the crankpins. Do not forget to prime and paint the separate items: brake rigging assembly, spring units, damper rod, reverser rod and buffer heads. Name, number, etc. plates are best painted while still in the frets.

4.3 Before going to the trouble of painting and preparing the builders' plates do check whether or not they are required! Most of the LNER/BR J94 locos lost their builders' plates at an early stage, and it was not uncommon for industrial locos to lose plates, either by accident, during repairs, or to avoid screwdriver-equipped gricers! Nameplates carried by MOD locos were often 'owned' by the depot at which they were fitted and were sometimes removed for safe keeping if the loco was transferred elsewhere.

4.3 In general the backgrounds of MOD nameplates and above-plate crests were red, with the exception of *Black Knight* which, not surprisingly, was black. *Waggoner's* special Army 92 cab side plates also had red backgrounds. The Royal Engineers' crest had a gold (brass) garter and crown with silver leaves, while the RAOC crest had a gold garter, red centre, and silver star and crown. The Black Knight crest had a black knight's head on a white ground. Black tended to predominate for the backgrounds of industrial loco name and builders' plates but some had coloured backgrounds. After painting, carefully rub the plates with very fine abrasive paper to polish the lettering and frames, then apply varnish. For the BR J94 smokebox door plates, paint them with white primer first, then the black (enamel or acrylic), and while the black is still wet gently wipe it from the raised surface of the numbers. Some NCB locomotives were fitted with the large NCB tankside plates which had black backgrounds with red lettering.

4.4 When the primer is dry apply the colour coats, lining, transfers, plates and varnish. Note that a reasonable representation of the NCB circular emblem can be made by 'doctoring' an LMS coach crest. Although NCB painted lettering varied, the most common form is obtainable from Railtec (ref 4415 or 4416 for West Ayr Area).

4.5 Fit the cab glazing (here's the ones you made earlier!).

4.6 Weathering is preferable carried out with the locomotive assembled in order to obtain an 'overall' effect.

4.7 Thoroughly clean the wheel treads and backs of the tyres when finished.

5 Construction - Part Two

5.1 Fit the buffer heads and springs to the buffer bodies.

5.2 If using 'functional' three-link or screw couplings, fit these. Brassmasters sell these (ref MC005, MC006-009).

5.3 If using Alex Jackson couplings, make and fit these in your normal way - below the buffer beam of the Austerity/J94 and through the holes already drilled in the case of the 50550.

5.4 Fix the pickups in place. For wiper pickups, fix a small piece of copperclad sleeper strip to the underside of the running plate ahead of each wheel. 2mm/ft scale sleeper strip is ideal. Fix to these lengths of phosphor bronze strip or 0.3mm brass wire to bear lightly on the wheel treads. For improved reliability, beryllium wipers are available from Ambis Engineering (ref LCPU1). Connect the pickups together with fine wire and thread the motor leads through the notches previously formed in the frames. For plunger pickups, fix them as described in the instructions supplied with the pickups, then connect them together with fine wire.

5.5 Fit the wheelsets and motor/gears/gearbox to the chassis, retaining the rear wheelset bearings with pieces of 0.45mm wire fixed across the bearing slots. If using a 'fixed' motor with Alan Gibson gears, fit the screws through the motor mount and into the motor, then mesh the worm and wheel before tightening the screws. Connect the motor to the pickups.

5.6 Fix the spring assemblies to retain the wheelsets, using 12BA bolts.

5.7 Fit the brake rigging into the brake hangers and cranks.

5.8 Fit the crankpin bushes, coupling rods and nuts. If appropriate, fix the lubricator drive return crank(s) [155.1] to the drive rod(s) using a valve gear rivet. Fit the drive rod(s) through the running plate and onto the lubricator(s) and fix the return crank(s) to the crankpin(s).

- 5.9 Apply light lubrication to all moving surfaces. Place a weight block on the chassis and test-run, checking for shorting (brakes too close to wheels?) and direction of travel (reverse the motor leads if necessary).
- 5.10 Fix the cab/bunker, then the tank to the chassis.
- 5.11 Fit the damper rod in position alongside the firebox with the rear end located against the cab front. Fix it to the firebox side with a minute drop of cyano, **but ensure that it is not fixed to the cab**. Fit the reversing rod in position alongside the firebox with the projecting wire in the hole in the reversing link and the rear end located against the cab front. Fix it to the link with a minute drop of cyano, and again **ensure that it is not fixed to the cab or firebox side**.
- 5.12 If required, apply weathering. When dry, clean the wheel treads and backs of the tyres.
- 5.13 Fix some coal in the bunker - use PVA or a similar adhesive.

Parts list

No.	Description	Sheet	No.	Description	Sheet
1	Frame spacer, front / cylinder block	1	51	Frame / buffer beam gusset	3
2	Frame spacer / slidebar support	1	52	Frame / buffer beam corner plate	3
3	Frame spacer, centre	1	53	Frame / running plate support, Austerity/J94	3
4	Frame spacer, rear	1	54	Frame / running plate support, 50550	3
5	Slidebar	1	55	Sandbox filler, front	W
6	Frame side inner, left	2	56	Footstep vertical, 2-step, front/rear	3
7	Frame side, inner, right	2	57	Footstep vertical, 2-step, centre	3
8	Steam brake cylinder wrapper	3	58	Footstep vertical, 3-step, front/rear	3
9	Leaf spring	1	59	Footstep vertical, 3-step, centre	3
10	Frame side overlay, left, Austerity/J94	3	60	Footstep	3
11	Frame side overlay, right, Austerity/J94	3	61	Injector	B
12	Frame side overlay, left, 50550	3	62	Lubricator, Wakefield	B
13	Frame side overlay, right, 50550	3	63	Lamp iron, front bufferbeam mounted, long	3
14	Motor mount for Alan Gibson gears	1	54	Lamp iron, front bufferbeam mounted, short	3
15	Crank for steam brake / right pull rod	2	65	Firebox backhead	W
16	Crank for hand brake / left pull rod	2	66	Firebox/cab locating plate	5
17	Hand brake lower pull rod	2	67	Regulator bar	2
18	Coupling rod, Austerity/J94, front, outer	1	68	Cab front inner, Austerity/J94/50550	4
19	Coupling rod, Austerity/J94, front, inner	1	69	Cab front overlay, Austerity/J94/50550	4
20	Coupling rod, Austerity/J94, rear, outer	1	70	Cab front inner, Lambton	4
21	Coupling rod, Austerity/J94, rear, inner	1	71	Cab front overlay, Lambton	4
22	Coupling rod, 50550, front, outer	1	72	Steam brake handles	2
23	Coupling rod, 50550, front, inner	1	73	Tank/firebox/boiler/smokebox	R
24	Coupling rod, 50550, rear, outer	1	74	Retaining plate	1
25	Coupling rod, 50550, rear, inner	1	75	Peg surrounds	2
26	Bearing guide	2	76	Tank/cab upper angle bracket, cab-mounted	4
27	Inside motion eccentric	1	77	Tank/cab upper angle bracket, tank-mounted	4
28	Inside motion connecting rod	1	78	Tank/cab lower angle bracket	4
29	Compensation pivoting beam	1	79	Smokebox saddle/running plate bracket, plain	4
30	number not used	1	80	Smokebox saddle/running plate bracket, riveted	4
31	Brake hanger	1	81	Smokebox/tank angle brackets	4
32	Brake shoe	1	82	Lubricator, smokebox-mounted	B
33	Reverser counterweight	2	83	Giesl ejector base plate	4
34	Reverser counterweight drop link	1	84	Giesl ejector chimney	W
35	Reverser rod crank	1	85	Giesl ejector aperture cover plate	4
36	Brake cross beam, front, outer	2	86	Austerity/J94 standard chimney	W
37	Brake cross beam, front, inner	2	87	50550 chimney	W
38	Brake cross beam, centre/rear, outer	2	88	Underfeed stoker cowl	W
39	Brake cross beam, centre/rear, inner	2	89	Tankside step	4
40	Balance weight, Austerity/J94, front/rear	2	90	Tank filler	W
41	Balance weight, Austerity/J94, centre	2	91	Dome	W
42	Balance weight, 50550, front/rear	2	92	Safety valve	B
43	Balance weight, 50550, centre	2	93	Whistle	T
44	Sandbox	W	94	LNER/BR J94 additional tankside step	4
45	Guard iron	2	95	Weight block for tank	W
46	Running plate	2	96	Smokebox front	6
47	Sandbox filler, rear	2	97	Smokebox door opening limiter	6
48	Buffer beam	2	98	Lamp iron bracket, smokebox-mounted	4
49	Buffer beam overlay, Austerity/J94	3	99	Lamp iron, smokebox-mounted, long	4
50	Buffer beam overlay, 50550	3	100	Lamp iron, smokebox-mounted, short	4

No.	Description	Sheet	No.	Description	Sheet
101	Smokebox door handles	T	139	Bunker rear overlay, 50550	5
102	Smokebox door	W	140	Weight block for bunker	W
103	Smokebox door vacuum relief valve	4	141	Cab floor, raised	5
104	Cab assembly jig	5	142	Handbrake standard	B
105	Lamp iron bracket, rear	4	143	Reverser lever support / damper lever	4
106	Lamp iron, rear, long	4	144	Reverser lever	W
107	Lamp iron, rear, short	4	145	Reverser rod halves	2
108	Cab rear inner, Austerity / pre-extended J94	4	146	Damper rod	2
109	Cab rear overlay, Austerity / pre-extended J94	4	147	Overlay for oval buffers, C&HP J94	1
110	Cab roof eaves/spacer	1	148	Lubricator drive horizontal rod, long	1
111	Cab / bunker sides / roof, Austerity / J94	5	149	Lubricator drive horizontal rod, short	1
112	Bunker front	5	150	Lubricator drive vertical rod, long	1
113	Bunker door and runners	4	151	Lubricator drive vertical rod, short	1
114	Cab roof ventilator	4	152	Lubricator drive rod return crank	1
115	Cab doorway / cab door spacer	4			
116	Bunker rear inner, non-extended bunker	6		Name, number, shed and works plates	6/7
117	Bunker rear overlay, Austerity / non-extended J94	5			
118	Cab door	4		Other parts	
119	Bunker bottom	6		Sprung buffers, square base parallel (4)	
120	Cab rear inner, 50550 / extended/de-extd bunker J94	4		Handrail stanchions, short (16)	
121	Cab rear overlay, extended / de-extended bunker J94	4		Whistle	
122	Bunker support, extended bunker	6		Smokebox door handle	
123	Bunker rear inner, extended bunker	4			
124	Bunker rear overlay, extended bunker	4		Coupling rod rivets (4)	
125	Extended bunker upper side, left	5		1/8" bearings and springs (6)	
126	Extended bunker upper side, right	5			
127	Rear footstep vertical, J94	4			
128	Rear footstep step plate, top, J94	4		1rnm x 1mm brass angle for running plate valances (2)	
129	Rear footstep step plate, centre, J94	4		Brass wire, 0.3mm, 0.45mm, 0.7mm, 0.9mm	
130	Rear footstep step plate, bottom, J94	4			
131	Rear footstep stay plate, J94	4			
132	Cab rear inner, Lambton	4			
133	Cab rear overlay, Lambton	4			
134	Cab / bunker sides / roof, Lambton	5		Bolts and nuts, 12BA (12 of each)	
135	Cab rear overlay, 50550	5		Bolts and nuts, 10BA (2 of each)	
136	Cab / bunker side, left, 50550	5		Bolt and nut, 8BA (1 of each)	
137	Cab / bunker sides, right, 50550	5			
138	Cab roof, 50550	6			

Parts needed to complete - not supplied

Wheels and axles

Austerity and J94 4'3" 14-spoke
50550 4ft 0½ in 12-spoke

Motor and gears

Pickups

Three link / screw couplings

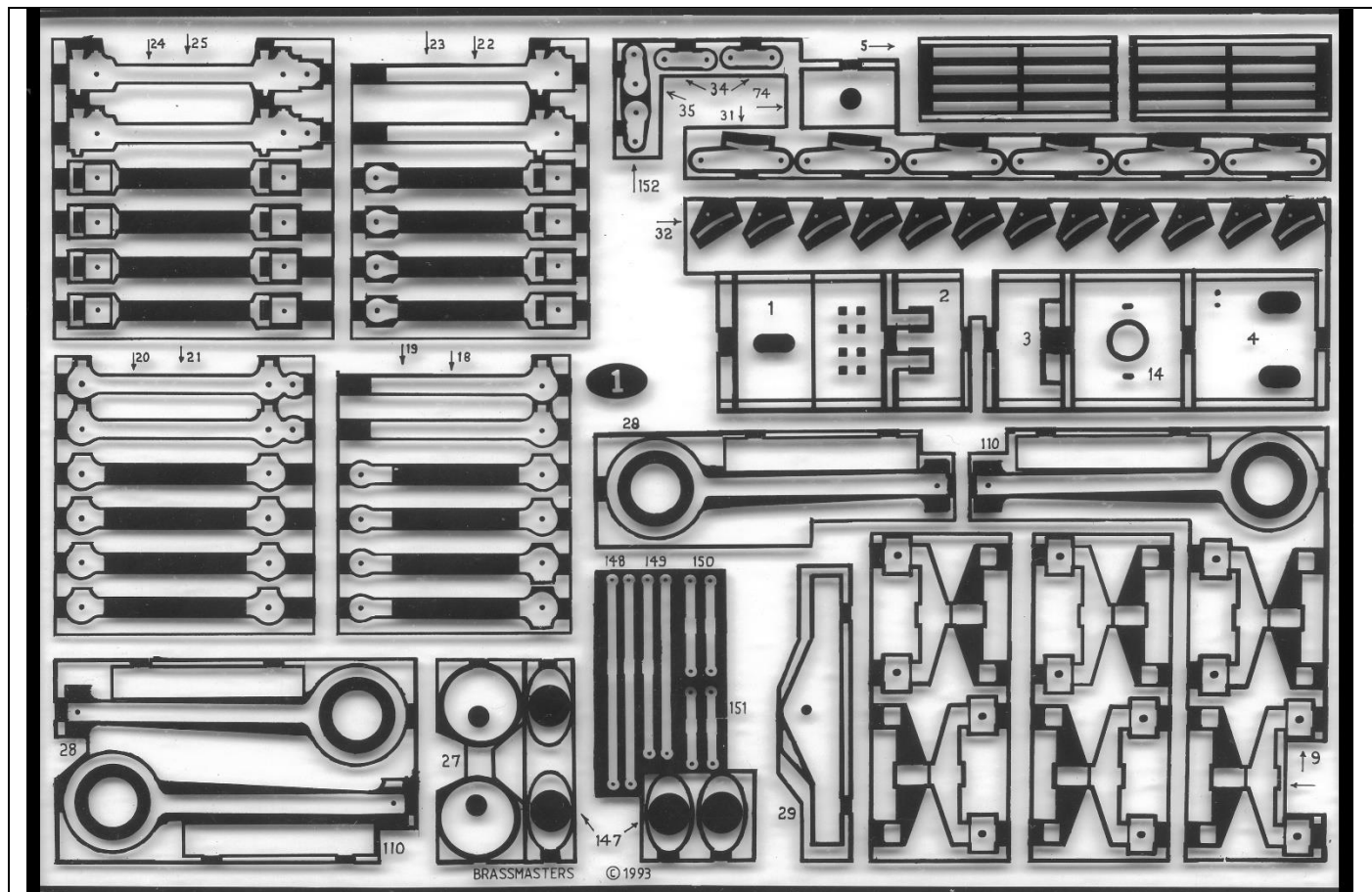
Transfers

Alternative parts – not supplied

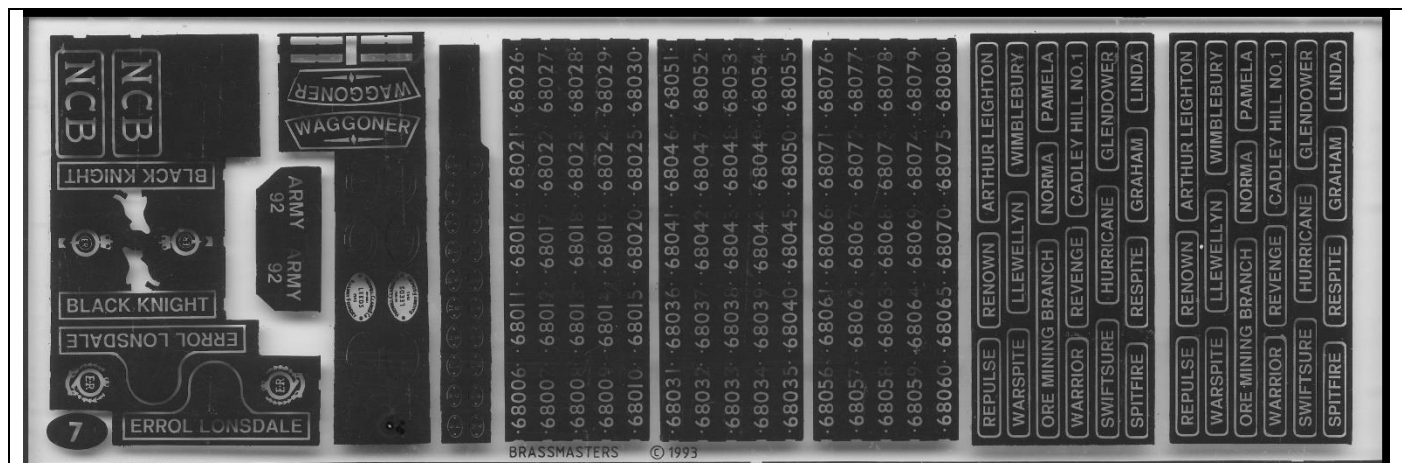
Westinghouse pump and vacuum/Westinghouse brake pipes

LNER/LNWR alternative buffers

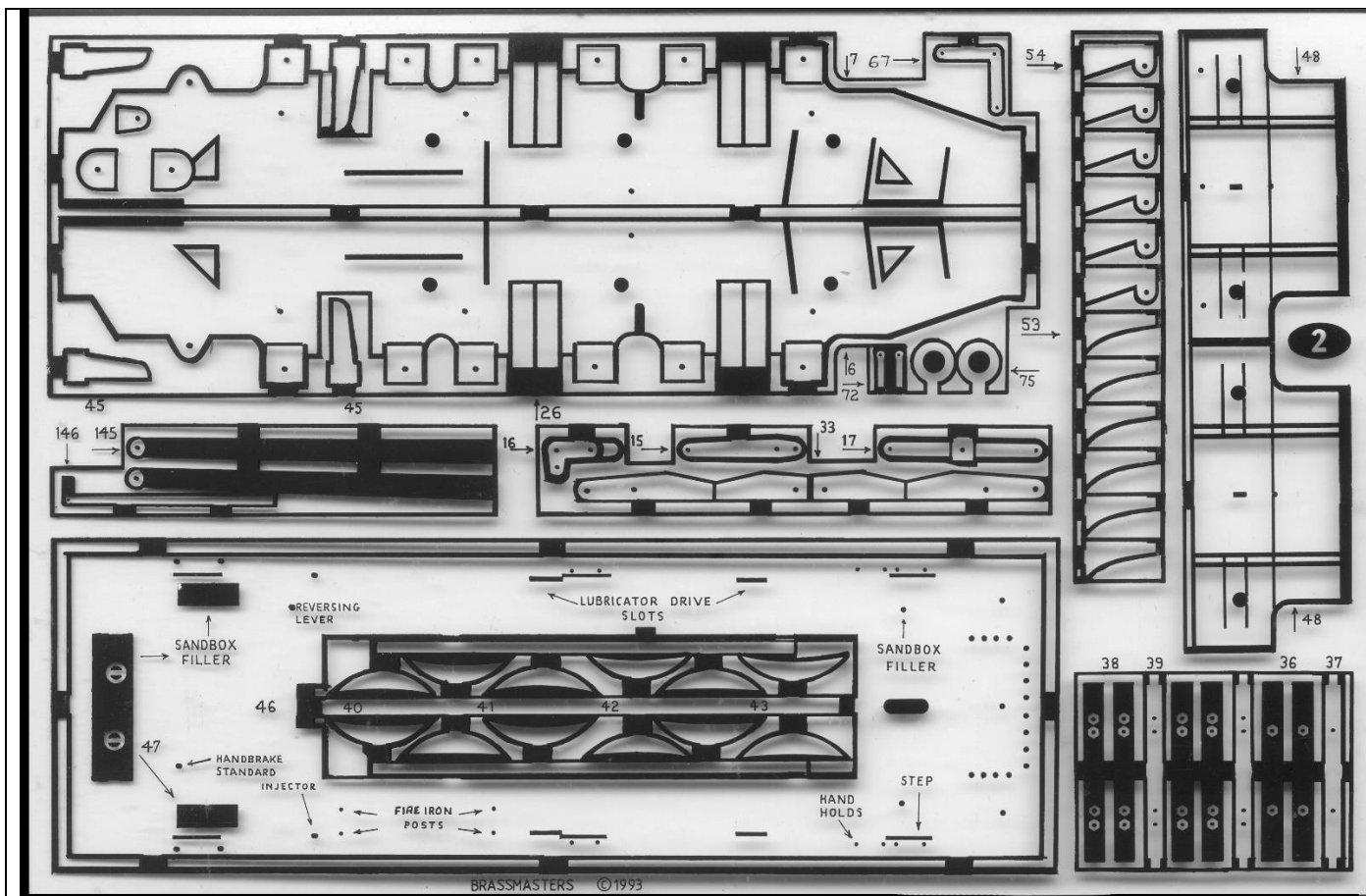
Laddering for locomotives with tankside ladders



- | | |
|---|---|
| <ul style="list-style-type: none"> 1 Frame spacer, front / cylinder block 2 Frame spacer / sidebar support 3 Frame spacer, centre 4 Frame spacer, rear 5 Slidebar 9 Leaf spring 14 Motor mount for Alan Gibson gears 18 Coupling rod, Austerity/J94, front, outer 19 Coupling rod, Austerity/J94, front, inner 20 Coupling rod, Austerity/J94, rear, outer 21 Coupling rod, Austerity/J94, rear, inner 22 Coupling rod, 50550, front, outer 23 Coupling rod, 50550, front, inner 24 Coupling rod, 50550, rear, outer 25 Coupling rod, 50550, rear, inner | <ul style="list-style-type: none"> 27 Inside motion eccentric 28 Inside motion connecting rod 29 Compensation pivot beam 31 Brake hanger 32 Brake shoe 34 Reverser counterweight drop link 35 Reverser rod crank 74 Retaining plate 110 Cab roof eaves/spacer 147 Overlay for oval buffers, Cromford & High Peak J94 148 Lubricator drive horizontal rod, long 149 Lubricator drive horizontal rod, short 150 Lubricator drive vertical rod, long 151 Lubricator drive vertical rod, short 152 Lubricator drive rod return crank |
|---|---|

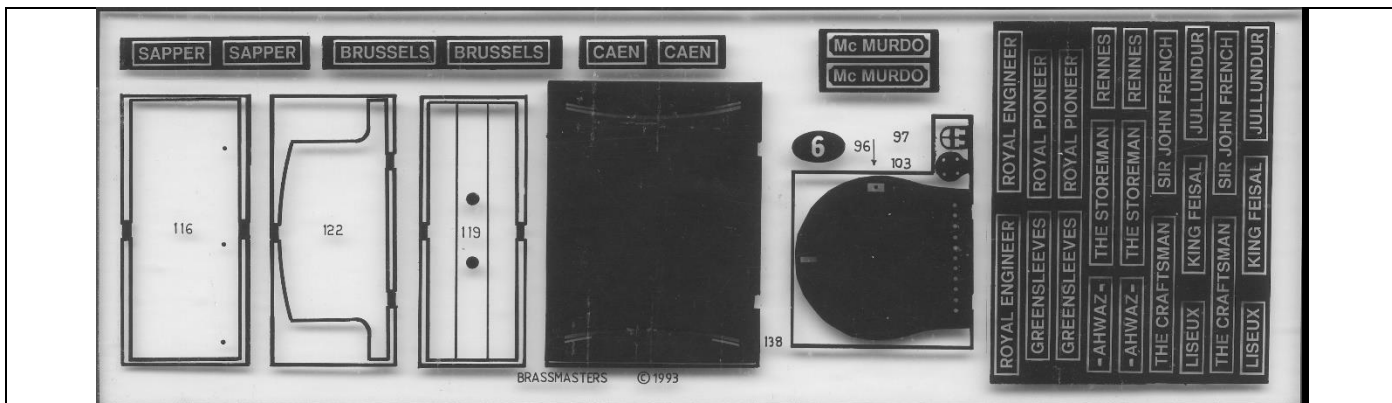


Sheet 2 - brass

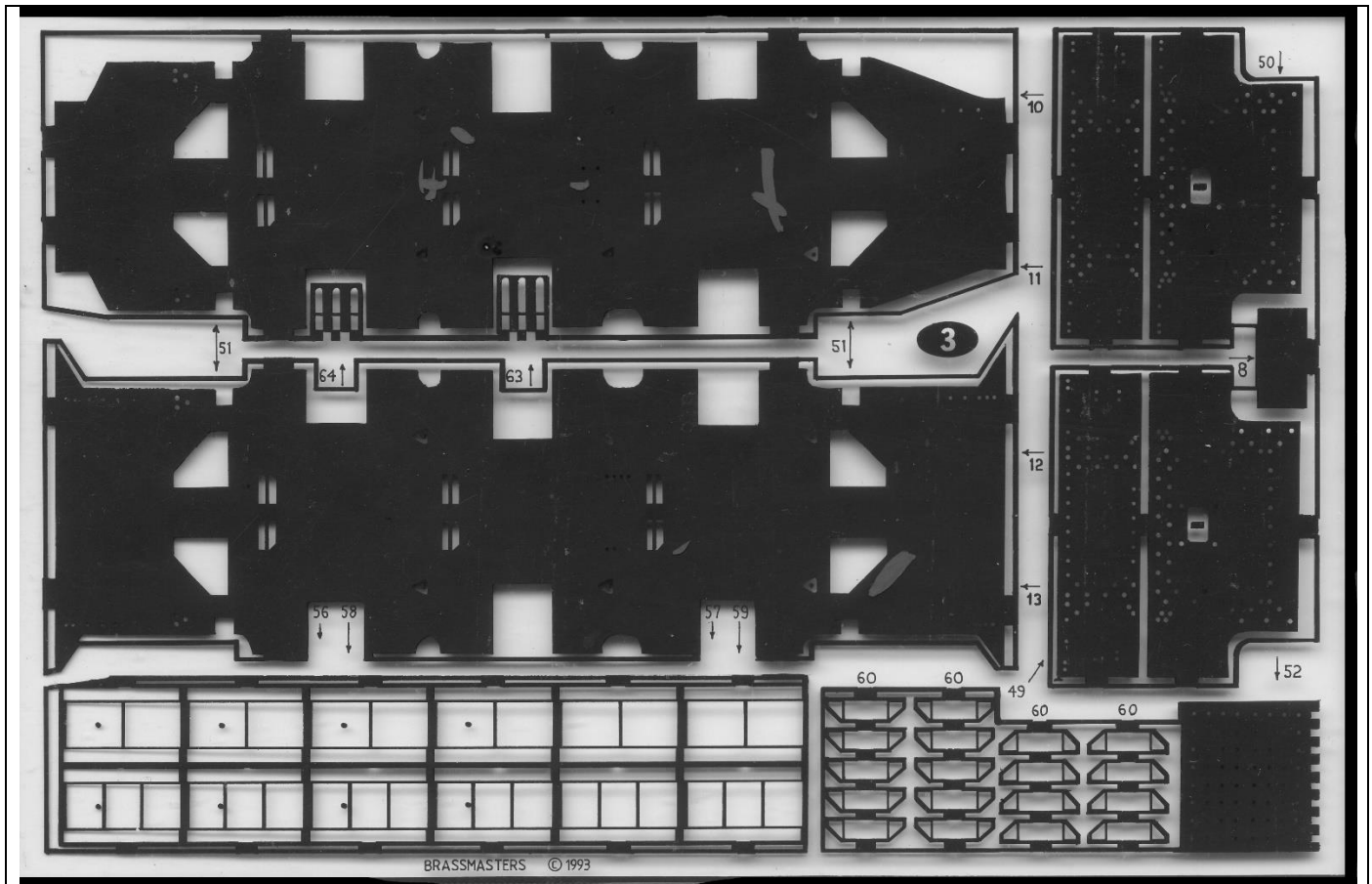


6	Frame side inner, left	42	Balance weight, 50550, front/rear
7	Frame side, inner, right	43	Balance weight, 50550, centre
15	Crank for steam brake / right pull rod	45	Guard iron
16	Crank for hand brake / left pull rod	46	Running plate
17	Hand brake lower pull rod	47	Sandbox filler, rear
26	Bearing guide	48	Buffer beam
33	Reverser counterweight	67	Regulator bar
36	Brake cross beam, front, outer	72	Steam brake handles
37	Brake cross beam, front, inner	75	Peg surrounds
38	Brake cross beam, centre/rear, outer	145	Reverser rod halves
39	Brake cross beam, centre/rear, inner	146	Damper rod
40	Balance weight, Austerity/J94, front/rear		
41	Balance weight, Austerity/J94, centre		

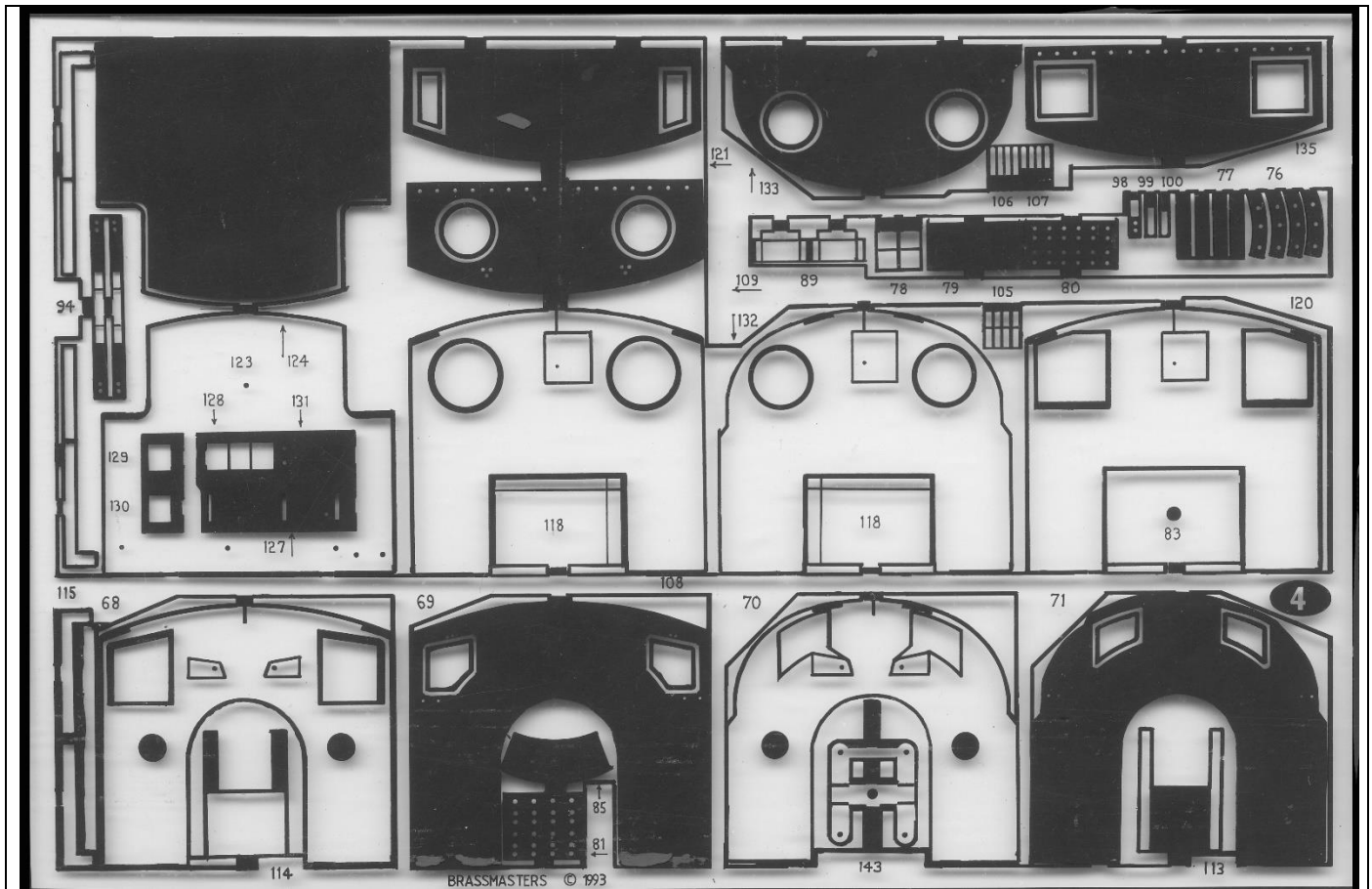
Sheet 6 - brass



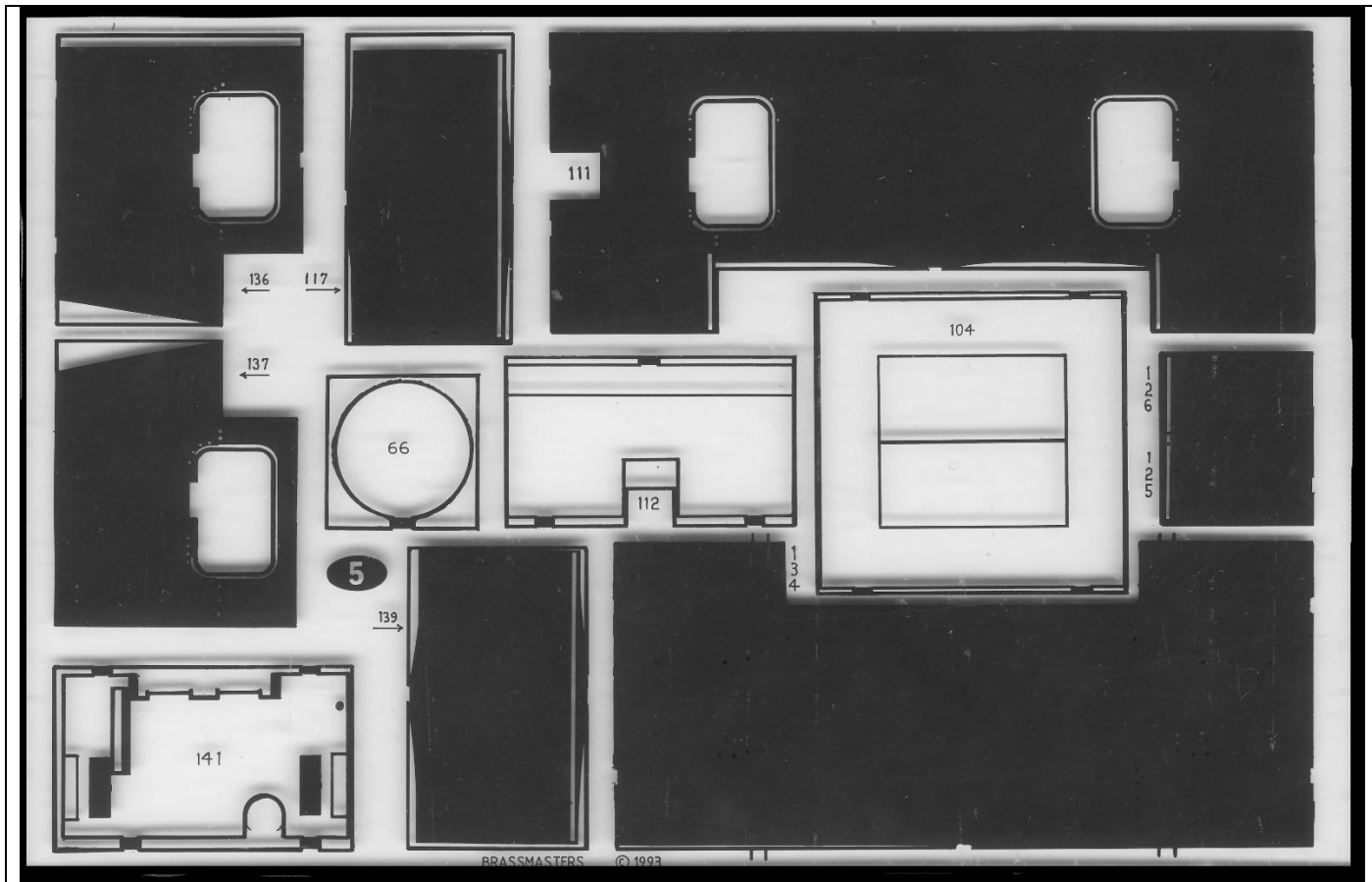
96	Smokebox front	119	Bunker bottom
97	Smokebox door opening limiter	122	Bunker support, extended bunker
116	Bunker rear inner, non-extended bunker	138	Cab roof, 50550



8	Steam brake cylinder wrapper	53	Frame / running plate support, Austerity/J94
10	Frame side overlay, left, Austerity/J94	54	Frame / running plate support, 50550
11	Frame side overlay, right, Austerity/J94	54	Lamp iron, front bufferbeam mounted, short
12	Frame side overlay, left, 50550	56	Footstep vertical, 2-step, front/rear
13	Frame side overlay, right, 50550	57	Footstep vertical, 2-step, centre
49	Buffer beam overlay, Austerity/J94	58	Footstep vertical, 3-step, front/rear
50	Buffer beam overlay, 50550	59	Footstep vertical, 3-step, centre
51	Frame / buffer beam gusset	60	Footstep
52	Frame / buffer beam corner plate	60	Lamp iron, front bufferbeam mounted, long



68	Cab front inner, Austerity/J94/50550	108	Cab rear inner, Austerity / pre-extended J94
69	Cab front overlay, Austerity/J94/50550	109	Cab rear overlay, Austerity / pre-extended J94
70	Cab front inner, Lambton	113	Bunker door and runners
71	Cab front overlay, Lambton	114	Cab roof ventilator
76	Tank/cab upper angle bracket, cab-mounted	115	Cab doorway / cab door spacer
77	Tank/cab upper angle bracket, tank-mounted	118	Cab door
78	Tank/cab lower angle bracket	120	Cab rear inner, 50550 / extd/de-extd bunker J94
79	Smokebox saddle/running plate bracket, plain	121	Cab rear overlay, extended / de-extended bunker J94
80	Smokebox saddle/running plate bracket, rivetted	123	Bunker rear inner, extended bunker
81	Smokebox/tank angle brackets	124	Bunker rear overlay, extended bunker
83	Giesl ejector base plate	127	Rear footstep vertical, J94
85	Giesl ejector aperture cover plate	128	Rear footstep step plate, top, J94
89	Tankside step	129	Rear footstep step plate, centre, J94
94	LNER/BR J94 additional tankside step	130	Rear footstep step plate, bottom, J94
98	Lamp iron bracket, smokebox-mounted	131	Rear footstep stay plate, J94
99	Lamp iron, smokebox-mounted, long	132	Cab rear inner, Lambton
100	Lamp iron, smokebox-mounted, short	133	Cab rear overlay, Lambton
103	Smokebox door vacuum relief valve	135	Reverser lever support / damper lever
105	Lamp iron bracket, rear		
106	Lamp iron, rear, long		
107	Lamp iron, rear, short		



66	Firebox/cab locating plate	134	Cab / bunker sides / roof, Lambton
104	Cab assembly jig	135	Cab rear overlay, 50550
111	Cab / bunker sides / roof, Austerity / J94	136	Cab / bunker side, left, 50550
112	Bunker front	137	Cab / bunker sides, right, 50550
117	Bunker rear overlay, Austerity / non-extended J94	139	Bunker rear overlay, 50550
125	Extended bunker upper side, left	141	Cab floor, raised
126	Extended bunker upper side, right		

Lostwax brass castings		Whitemetal castings	
61	Injector	44	Sandbox
62	Lubricator, Wakefield	55	Sandbox filler, front
82	Lubricator, smokebox-mounted	65	Firebox backhead
92	Safety valve	84	Giesl ejector chimney
142	Handbrake standard	86	Austerity/J94 standard chimney
		87	50550 chimney
Resin		88	Underfeed stoker cowl
73	Tank/firebox/boiler/smokebox	90	Tank filler
		91	Dome
Turned parts		95	Weight block for tank
93	Whistle	102	Smokebox door
101	Smokebox door handles	140	Weight block for bunker
		144	Reverser lever

Fig.1. Spacers, motor mount and slidebars

Fig.2. Brake arrangement

Fig.3. Leaf spring mountings

Fig.4. Leaf springs

Fig.5. Coupling rods

Fig.6. Inside motion

Fig.7. Motorising options (using Mashima 12/20 motor)

THE AUSTERITY, LNER/BR J94 AND 50550 0-6-0ST LOCOMOTIVES

Fig.8. Pivot arrangement

Fig.9. Reverser counterweight

Fig.10. Austerity buffer beam bolt/rivet heads

Fig.11. Steam brake handles in cab

Fig.12. Giesl ejector aperture

Fig.13. Holes in tank casting

Fig.14. Tank brackets and plates

Fig.15. Tankside steps for some J94s

Fig.16. Smokebox door limiter

Fig.17. Cab assembly jig

Fig.18. Preparing cab sides/roof

1 Introduction

1.1 These notes are not, and were not intended to be, a comprehensive history of the Austerity locomotives: its purpose is as a guide to modellers building the Brassmasters' 4mm/ft scale kit. As such it is concerned only with those aspects which affect the construction and use of the model, i.e., variations in external appearance, liveries, names and numbers, and locations and periods of operation.

2 Origins and Early Production

2.1 The origin of the Austerity goes back to 1923 when the Hunslet Engine Company of Leeds introduced a "standard" 0-6-0ST having 3ft 9in driving wheels and 16in x 22in cylinders, examples of which were built into the 1950s. From this design a larger type was developed in 1937: the 48150 class with 4ft 0½in wheels and 18in x 26in cylinders. A further development resulted in the 50550 class of 1941 which introduced the distinctive full-length saddle tank.

The 50550 was designed specifically at the request of Stewarts & Lloyds Minerals Ltd for use between a planned new ironstone quarry at Islip and the company's Corby steel works. However, the project was abandoned and of the eight locomotives built only one became the property of S&L. Three were taken over by the War Department. At that time the Ministry of Supply was looking for a robust heavy shunting locomotive which could be produced quickly and in quantity for war service, for which the LMS "Jinty" was a candidate. However, the MOS accepted Hunslet's proposed design, based on the 50550 but with 4ft 3in wheels and other minor differences.

2.2 The first Austerity was steamed at Hunslet's Leeds works on 1st January 1943 and further examples followed quickly. Such was the demand that other companies built them too - W G Bagnall, Andrew Barclay, Hudswell-Clarke, Robert Stephenson & Hawthorns, and Vulcan Foundry. By the end of 1945 some 370 had been built, all but one for the MOS / War Department, and many were shipped overseas. The end of hostilities found the War Department with surplus locomotives but no work for them, and many were "demobbed".

2.3 Twenty seven were loaned to and later purchased by the Dutch State Railway (Nederlandsche Spoorwegen). Eleven went to the Dutch State Mines (Nederlandsche Staatsmijnen) of which two were returned to the WD. Others were acquired by various light railways, principally in France, and six ventured as far as North Africa to the Chemin De Fer Tunisiens.

2.4 British purchasers were found too, including the Port of London Authority, the Manchester Ship Canal Company, Guest Keen & Baldwins, and United Steel. Seventy five were bought by the LNER as class J94, but the largest contingent went to the newly-formed National Coal Board and they were soon to be found throughout the NCB system. The War Department, later to become the Ministry of Defence, retained some for use at various installations, the best known being the installations at Longmoor in Hampshire and Bicester in Oxfordshire.

3 Post-War Production

3.1 Despite the influx of surplus ex-WD locomotives into industrial use, production of new Austeries continued after 1945, albeit in lesser quantities. The WD/MOD purchased a further 14 in 1953, 15 went to the steel industry, and 77 to the NCB. They were built by Bagnall, Barclay, Hunslet, RSH and the Yorkshire Engine Co. The last Austerity left Hunslet's works in 1964 and, with the exception of recent replicas, was the last new standard gauge steam locomotive built for use in Great Britain.

3.2 During the period 1961-69 Hunslet rebuilt 14 locomotives and gave them new builder's numbers. A fifteenth engine due for rebuilding was scrapped at Hunslet in 1970 after allocation of its new builder's number.

4 Variations and Modifications

4.1 As may be imagined, with 484 members the class was not uniform in appearance and the variations may be grouped into four principal types: (i) 50550, (ii) Austerity as built, (iii) LNER/BR J94 and (iv) post-construction modifications (excluding LNER/BR J94).

4.2 50550

Although the 50550 preceded the Austerity, it is more convenient in the context of considering variations to regard the type as differing from its successor. The principal visual differences are the deep frames at front and rear, dropped centre sections to the buffer beams, sloping bunker back, and square windows in the rear spectacle plate. Other variations are the shape of the chimney, sanding gear operating rods more visible below the running plate, positioning of the rear lamp irons, overhanging cab roof, absence of injectors under the cab, and 12-spoke 4ft 0½ in wheels. These locomotives had coupling rods with adjustable cotters - a feature not normally found on British industrial locomotives.

4.3 Austerity - Variations when built

Early locomotives had single triangular gussets between the frame and the buffer beam at each corner but it was found that arduous shunting tended to bend the buffer beam and later locomotives had twin gussets fitted: this resulting in additional buffer beam rivets. Some locomotives had flush rivets at the top centre of the buffer beam.

Some of the locomotives supplied to the War Department were equipped with train braking equipment.

The eight 1954-built Yorkshire engines had 12-spoke wheels instead of 14-spoke, oval heavy-duty buffers, and no injectors under the cab.

Following the rebuilding of some earlier locomotives (see 4.5 below) the last three new engines were built with the Hunslet gas-producer system fitted. The external evidence of this was the distinctive chimney cowl.

Most locomotives had two sets of footsteps per side - one under the cab entrance and one adjacent to the front sandbox, stayed to the frame. However, some locomotives were fitted with a set of centre steps which were not stayed. In most cases each set had two steps, but some had three, and a few locomotives had various combinations of two and three step arrangements. A further variation was the provision of full safety sides to the steps. In some cases these variations were applied to the locomotives when built and in others they were post-construction modifications.

4.4 LNER/BRJ94

The 75 locomotives purchased by the LNER had two modifications applied quite quickly - fitting of cab doors and standard lamp irons. In 1947 two received enlarged bunkers, which necessitated fitting of narrow cab rear spectacles, together with rear ladders and footsteps below the ladders. Most of the remaining locomotives received these modifications after nationalisation. An additional footstep and a diagonal handrail either side of the tank were fitted to most of the class, although there were variations in the exact length, angle and positioning of the handrail. Posts were added on the left-hand side of the running plate to retain fire-irons. Some were equipped with an additional footstep midway along the running plate. Locomotives allocated to the Cromford & High Peak line were fitted with LNER group standard buffers with oval heads as a precaution against buffer locking on sharp curves. The hopper bunker caused difficulties in hand-coaling at Middleton Top on the Crompton & High Peak, thus the bunker extension was removed but the narrow spectacles were retained.

4.5 Industrial Locomotives

In industrial use some of the Austerities were equipped with all manner of additional features to suit local conditions. Examples are tank side ladders, mechanical lubricators worked off a crankpin, electric headlights, heavy-duty buffers, additional footsteps and/or handrails, extended bunkers, cab weatherboards, raised cab floors, and even aerials for radio communication.

Locomotives working on the NCB's lines of the former Lambton, Joicey & Hetton Collieries in the North East had rounded cabs to cope with the restricted loading gauge.

Several NCB engines were fitted with the Giesl ejector multiple blast pipe and the associated distinctive chimney. This necessitated removal of a section of the tank ahead of the chimney forming a 'keyhole' shaped aperture. In some cases a vertical plate was fitted to the front of the tank and in others the aperture was left open.

The requirements of the Clean Air Act outlawed the emission of black smoke and Hunslet produced a gas producer system designed to eliminate such emissions. It comprised a screw-feed mechanical stoker below the footplate and a different grate, combined with a larger brick arch and a revised blast pipe. During the period 1960-69 Hunslet repurchased, rebuilt and resold fifteen engines of which ten received the stoker equipment, together with a distinctive chimney cowl and a vacuum relief valve in the smokebox door. Exchanges and renewals of smokebox doors resulted in vacuum relief valves appearing on hand-fired locos and stoker-fired locos losing this feature. One of the 50550 type (HE 2414) was rebuilt in 1963 with a stoker, and at the same time received buffer beams and frames of "Austerity" profile.

A further variation concerned sanding: some had steam gear but others relied on gravity. In the rough and tumble of industrial use other items were removed or fell off and not replaced - lamp irons, guard irons, spectacle bars, etc. Some examples were fitted with hooks for a shunting pole, located under the bunker overhang. The NCB Kent Area increased the coal capacity of at least one of its Austerities by extending the bunker rearwards.

Locomotives owned by the Ministry of Defence were subject to numerous modifications including conversion to oil burning, fitting of air brake equipment, and safety footsteps.

Some of the early locomotives which returned to Hunslet for overhaul were fitted with twin buffer beam gussets.

5 Liveries, Names and Numbers

5.1 The original WD livery was khaki with 2in yellow lettering This was applied to HE 2849-93 and HC 1737-41/44-55. The remainder were painted dark green with 6in lettering. Some retained khaki until demobbed and entered LNER stock in this condition. In post war years the MOD used both plain dark green and royal blue. The green is sometimes described as 'Brunswick

Green' but in fact more akin to olive drab than the GWR/BR colour. No.171 The Black Knight was black. The attractive royal blue was usually lined in white or red. Additional touches included red coupling rods, white tyre rims and polished fittings. With typical Army "spit-and-polish" an Austerity so bedecked could look extremely smart.

5.2 WD numbers originally ran from 5000 but the series was changed in 1943 to 75000 onward. This continued to 75199, then 71437 to 71536 and finally 75250 to 75331. After the disposal of surplus locomotives in 1947 the remaining 90 were renumbered 100 to 189, being joined by the 1953 additions 190 to 203. By 1968 eleven locomotives were still in MOD ownership, and of these all but two were renumbered again. 190-194 and 198 became 90-94 and 98, while 200-202 became 95-97. 196 and 197 were not renumbered.

5.3 Naming of selected MOD locomotives began in 1947. Initially the names were painted on the tanks, but soon rectangular brass plates were fitted midway along the running plate. In some cases these were surmounted by the crest of the Royal Engineers on a backing plate. *Errol Lonsdale* had nameplates on which the brass surround encompassed both name and crest. Locomotives allocated to the RAOC had the corps crest on the cabsides. *Waggoner* had a plate of unique design and after the 1968 renumbering carried additional Army 92 plates on the cabsides. *Black Knight* was painted black and had a black background to the name-plates, whereas other plates had red backgrounds.

5.4 When first delivered to the LNER, some of the J94s were in WD livery and carried shaded LNER numbers and letters. Other than these, the LNER/BR J94 locomotives were always plain black. LNER locomotives generally had plain yellow lettering with numbers on the tank with the company's initials above, but some had the number on the bunker. In the BR period the number was normally placed centrally on the tank with the totem / coat of arms above but one or two had the number on the bunker. A smokebox door number and shed plate was fitted, but most J94s lost their builders plates at an early date. The LNER number series was 8006-80, later BR 68006-80.

5.5 Industrial liveries were diverse, to say the least. In particular the NCB never attempted to introduce a "corporate" livery and individual areas used their own schemes. The North East generally favoured a plain medium blue but there were exceptions - for example Backworth's no.49 in 'LNER' green with black and white lining, and plain black at Lambton/Philadelphia, Kent used a darker blue with white lining, while Yorkshire used dark red or maroon with or without lining. Wales employed a variety of greens. One or two appeared in bizarre combinations: for example, Comrie Colliery's light blue with yellow cab and bunker for their No.19 seemed most inappropriate!

5.6 Industrial names ranged from those which reflected the power of the machine, for example "Warrior" and "Spitfire", through personal names "Robert", "Pamela", etc., to the more mundane "Ore Mining Branch" and "Cadley Hill No.1". Although most names appeared on tankside-mounted plates, some were painted on.

6 Withdrawal and Preservation

6.1 The BR class J94 remained intact until September 1960 and the last was withdrawn in October 1967. The MOD retained several locomotives in working order until the 1970s. During the 1950s and 1960s numerous industrial Austerities fell victim to dieselisation: the influx of surplus ex-BR class 08 and 14 shunters at NCB and British Steel Corporation sites led to mass withdrawals. In addition, the 1960s saw the closure of many industrial rail systems, but a few locomotives survived in regular service into the early eighties.

6.2 As relatively modern machines, the Austerities generally outlived older industrial types and thus survived into the preservation era. Many were retired at a comparatively young age and being robust, powerful, reliable, easy to maintain and simple to drive, they were a favourite choice of preserved railways. Over seventy Austerities are still in existence in Britain, together with three of the eight 50550s. Most are ex NCB or MOD, and post-war engines predominate. Some of the preserved locomotives are no longer in original condition, having been fitted with train brake equipment for working passenger services, and often are painted in the current owners' liveries.

6.3 Although enthusiasts often refer to the type as "J94" this appellation strictly applies only to the ex-BR engines of which just two survive - 68077 and 68078. As previously noted, the BR number series was 68006-68080, but several ex-industrial locomotives have been given non-authentic BR-type numbers.

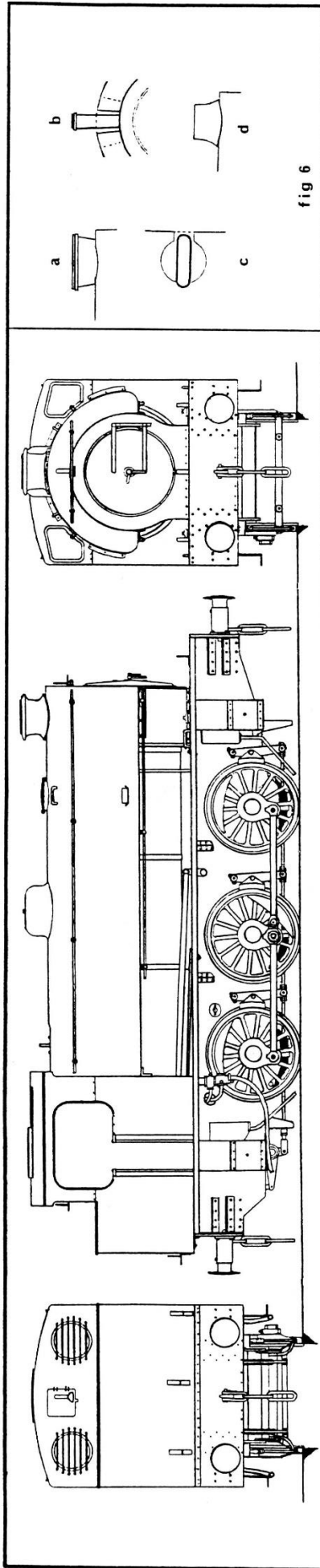


fig 1

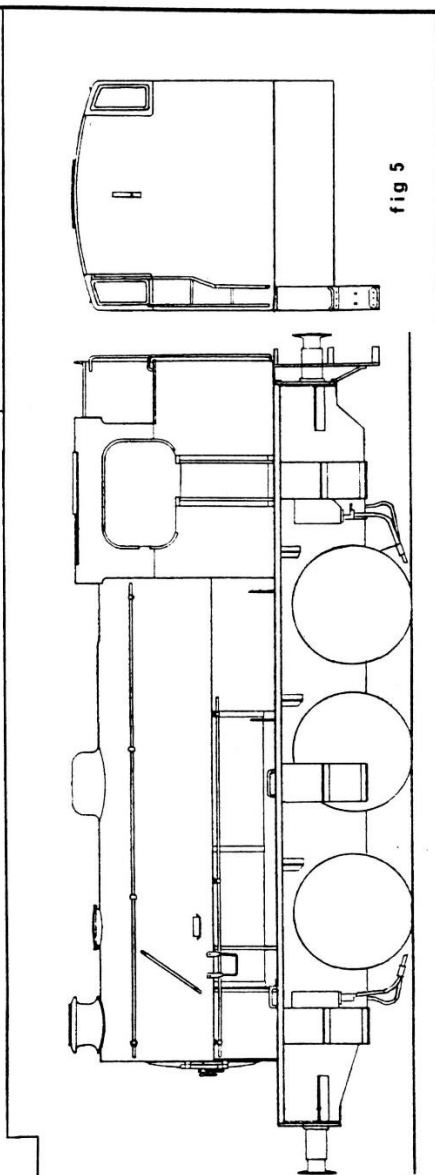


fig 2

fig 3

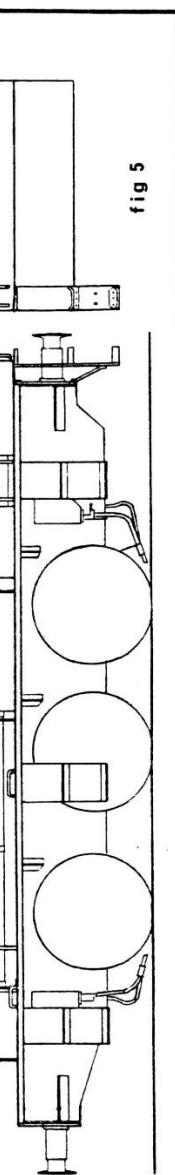


fig 5

THE AUSTERITY, LNER/BR J94 AND 50550 0-6-0ST LOCOMOTIVES

- Fig.1 Side and end elevations of a standard post-war Austerity. Twin buffer beam / frame gussets (wartime locomotives had single gussets), and gravity sanding. Hand-grab located to the rear of the front footstep (some were in line with the steps). Locomotives built by the Yorkshire Engine Co had 12-spoke wheels and no injectors under the cab.
- Fig.2 Side and rear elevations of the cut-down cab applied to some locomotives working on the NCB Philadelphia / Lambton system in Northumberland. Eight vertical spectacle bars instead of six horizontal ones.
- Fig.3 Side and rear elevations of 50550 frames, buffer beams and cab. Cab roof overhangs sides, square rear spectacles with no bars, sloping bunker back and deep centre section to buffer beams. Lower rear lamp irons mounted on buffer beam. 50550s had 4ft 1 1/2in 12-spoke wheels, cottered coupling rods, no injectors under the cab, and a chimney which flared out from the top to the base.
- Fig.4 Plan view of standard Austerity.
- Fig.5 Simplified side and rear elevations of LNER/BR J94 with steam sanding, extended bunker, rear ladder and footstep, additional centre footstep, diagonal handrail and step on tankside, cab doors, and fire-iron retaining posts on running plate.
- Fig.6 a, b and c are views of the Giesl ejector chimney with or without front cover plate (shown dotted). d is the cowl fitted to locomotives equipped with the underfeed stoker.

Alan Ribby
3-11-85 revised 1-5-93

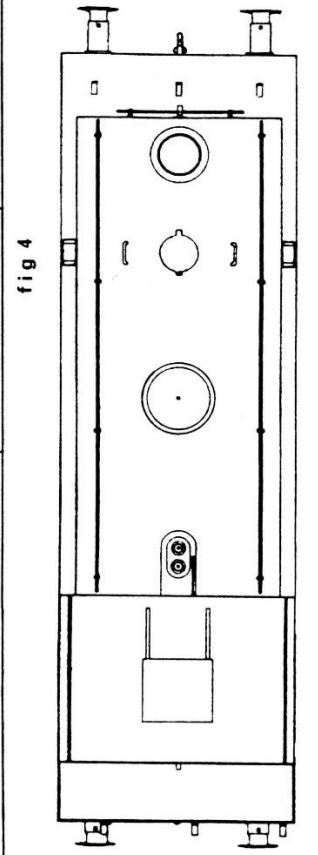


fig 4

7 Prototype photographs

Photographs of your chosen prototype are essential when building a model of a particular engine. Rail-Online.co.uk has a large selection of pictures of the Austerities and J94s, examples of which are shown below.



Class J94 0-6-0ST Mo 8068 shunting in Grimsby Docks on 25th June 1947. Photo: John P. Wilson/Rail Archive Stephenson



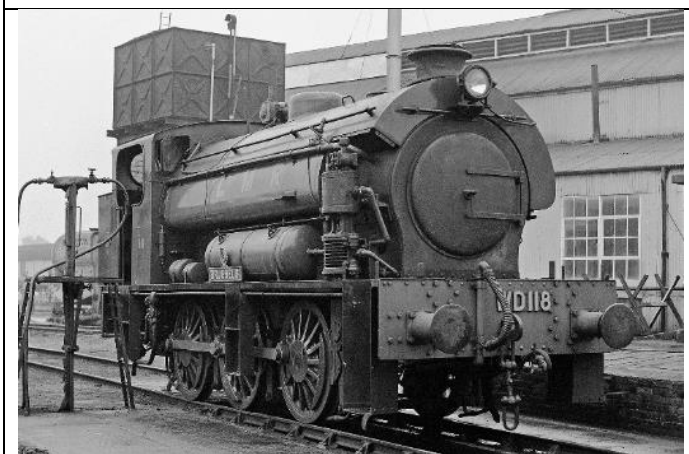
68045 at Darlington on 25th September 1960 Photo: Rail-Online



68006 at Cromford in 1966c Photo: Rail-Online



Lambton NCB 44 with Giesl injector 1968c. Photo: Rail-Online



WD 0-6-0ST No 118 Brussels on the Longmoor Military Railway in the 1960s. Photo: Brian Stephenson



WD J94 No 75061 on loan to DOCP at Upper Portland opencast coal screens on 16 May 1947. Photo: T.G. Hepburn / Rail Archive Stephenson