Brassmasters Scale Models

www.brassmasters.co.uk

GREAT WESTERN RAILWAY
1854 / 2721 CLASSES
0-6-0 PANNIER TANK
LOCOMOTIVE KIT

Designed by Martin Finney

4MM SCALE
OO - EM - P4

INSTRUCTIONS AND
PROTOTYPE NOTES

PO Box 1137 Sutton Coldfield B76 1FU

SECTION 1: BRIEF HISTORICAL DETAILS

These two classes of Swindon built 0-6-0 tank engines were originally built with saddle tanks as follows:

Class	Lot	Numbers	Built
1854	79	1854 – 1873	1890
	83	1874 – 1893	1890 - 91
	85	1701 – 1720	1891
	88	1721 – 1740	1892
	89	1751 - 1770	1892 - 93
		905 - 907	
	98	1791 - 1800	1895
		1894 – 1900	
2721	112	2721 – 2740	1897 - 98
	115	2741 – 2761	1899
	122	2761 – 2780	1900
	129	2781 – 2800*	1901

* No. 2800 was renumbered 2700 in December, 1912

Apart from some significant mechanical differences between the two classes, which do not affect the appearance of the engines, the principal differences were:

	1854	2721
Coupling rods	plain	fluted
Springs	underhung	volute

These saddle tanks were amongst the first to be fitted with pannier tanks, from 1909 onwards, until all (except 1879) were so fitted by 1933. They were very long lived the majority being withdrawn after WW2 and all by 1950.

For a detailed history of this class, including details of boiler changes and the fitting of pannier tanks, Part Five of 'The Locomotives of the Great Western Railway' published by the R.T.C.S. is essential reading. So, from this kit any of either of the classes can be built as pannier from circa 1909 to 1950.

In designing the kit I used the following Swindon drawings.

No. 10476 Frame plan 1854 class
No. 8611 Arrangement or motion 1854 class
Diagrams A45, A46, B55 & B56.

Much information was unavailable and has had to be deduced from drawings of other similar classes and from photographs.

Great Western Engines - Vol 1 by J.H.Russell pages 99 - 101 and Vol 2 page 178 has some useful photographs. Note the two of the pictures in Vol 2. (fig 456 & 457) are either 1854 or 2721 class not 1813 class as captioned.

Variations/Modifications possible from the kit

Pannier tanks: Early, up to c.1917 flush riveted. From c.1917 to 1924 snap head riveted. After 1924 welded seams.

Smokebox/tank front: Early plain front with ringed door. Later snap head rivets. From c.1920 smokebox had pressed front with Churchward type door without the ring.

Bunkers: Early short with railed top later sheeted in. From c.1924 enlarged type were fitted.

Cabs: As built were open with a canvas covered wooden roof which was later replaced with steel. A significant number were rebuilt from c.1924 onwards with new enclosed cabs some whilst carrying the old style bunker.

Steam heating: Although essentially shunting and light freight engines many were fitted with steam heating.

Balance weights: Changed from large type with visible rivets to a smaller plain design.

SECTION 2: CHASSIS DETAILS

Note that many of the components for both chassis and body are handed left/right and care must be taken to ensure the correct component is used. I have not always identified left/right components separately but with care and common sense no problems should arise.

Before construction can commence you have to decide which chassis you are going to construct. The options are:

1. Gauge 00, EM or 18.83.
2. Suspension None, sprung, compensated.
3. Pick-ups Scraper, plunger or split axle/frame.
4. Whether you wish to fit the working inside motion.

No pick-up material is provided. The options are:

- Scrapers attached to printed circuit board fixed between the frames.
- Plunger - drill holes P and fit according to the manufacturer's instructions.
- Split axle/frame - I leave this to you!

It is not possible to use plunger pick-ups with the working inside motion because they will foul one another.

SECTION 3: FRAMES

Having decided which chassis to construct you can now start construction by preparing the frames (parts 1 & 2). For a rigid chassis open out the main axle holes to accept 1/8" top hat bushes (not provided) and solder them in place. If you are going to fit sprung horn blocks, you should remove the axle holes by cutting up the half-etched lines, leaving a standard 6mm wide slot and then follow the manufacturer's instructions.

To construct the kit as designed with a compensated chassis:
Remove all the axle holes as described above. Carefully widen the slot in the rear hornblocks (part 9) until the Flexichas bearings are a good fit. I find a significant variation in the bearings and once I have fitted a hornblock to a bearing I mark the bearing and hornblock so that they can be later assembled together. A good fit between hornblock and bearing is essential if the chassis is to run well.

Solder the rear hornblocks to the inside of the frames aligning them with the half-etched lines on the frames. The square bearings mean that they do not rotate.

Now open out the following holes in the frames:

B for brake hanger pivots - 0.45mm
R for reversing shaft - 0.9mm
A for compensation beam pivot - 1/16"
C for rear brake shaft - 0.9mm

For the 2721 class remove the spring hangers below the front and centre axles and the section of frame ahead of the front axle marked with a half-etched line and open out the holes in the brackets above the front and centre axles to accept part W6, then fold over the bracket and strengthen with a fillet of solder. For the 1854 class these brackets are removed.

Emboss the rivets on the ashpan sides and fold the ashpan to agree with part 6.

SECTION 4: FRAME SPACERS AND ASSEMBLING THE CHASSIS

Remove the spacers (parts 5, 6 & 7) to suit your chosen gauge. If you are fitting inside motion then modify part 7 as shown in the diagram.

Fold up parts 5 & 7 making sure the half-etched fold lines are on the inside and that each bend is a right angle. Check that all tabs on the spacers fit properly in their corresponding chassis slots so that the rest of the spacer is hard up against the inside of the frames. Fold up the small tabs on the front spacer (part 7) and solder the 0.8mm steel wire front compensation beam in place.

Now assemble the frames and spacers. Start by tack soldering the rear spacer to both sides. Check that everything is square and that the spacers are hard against the frames. Put an axle (or better a longer piece of 1/8" rod) through the rear bearings and place the chassis on a piece of graph paper to check that the axle is square to the frames.

If all is well solder the remaining spacers to the frames checking constantly that the chassis is square and the frames are straight.

SECTION 5: COUPLING RODS

The coupling rods are now made so that they can be used as a jig to align the remaining hornblocks accurately. First drill out all the crankpin holes to a convenient size which is well undersize for the crankpins and the fork joint holes 1mm so that the 1mm nickel silver wire is a tight fit. Remove all burrs caused by the drilling. Now drill the drill used for the crankpin holes into a small block of wood and leave the drill in the wood with its shank projecting. This projecting shank is used as a mandrill to accurately align the laminations of each rod.

Tin well the front face of the inner laminates and the rear face of the outer laminates and place them over the mandrill. Using plenty of solder and flux solder the two laminates together. You will now have rods with the crankpin and fork joint holes aligned.

The crankpin holes now need carefully opening out until they just fit, with no free play, the ends of the hornblock alignment jigs (available from London Road Models or Markits).

The fork joints are now pinned using the 1mm nickel silver wire. Retain the pins, which should be a tight fit, by lightly soldering on the inner face of the rods. The correctly assembled rods should now have a completely flush inner face.

SECTION 6: FITTING THE FLEXICHAS HORNBLOCKS

Prepare the remaining bearings and hornblocks as described in Section 3 and slide them over the hornblock alignment jigs with the springs between the bearings. Carefully compress the springs and clip the hornblocks between the frames and place the prepared coupling rods over the ends of the jigs. Make sure the hornblocks are square to the chassis and then solder them in place.

SECTION 7: CHANGING THE PORTESCAP GEARBOX

Disassembly of the existing gearbox

Remove the two screws which hold the motor to the gearbox and put the motor to one side. Using a 1.7mm drill countersink the ends of the three brass spacers ensuring that no swarf contacts the gears. Using firm pressure, prise the gear box side plates apart. Note the order of the three gear sets and lift them off their axles, then drift the axles out of the side plates.

Preparing the new side plates (part 20)

Using the diagram identify the different holes and open out as follows:

Spacer centres: 1.5mm (drill size #53)
Gear axle centres: 1.5mm (drill size #53)
Final drive centre: 4.0mm

On one side plate open motor mounting holes to clear the motor mounting screws. On the other side plate carefully open holes enough to enable the steel screws to self tap a thread. Using a piece of fine emery paper remove all burrs from the side plates, then solder the 1/8" bearings (removed from the old side plates) into the final drive holes ensuring that the side plates present two mirror images.

Reassembly

Place the three brass spacers into their corresponding holes in one of the new side plates. Insert the three axles into their respective holes. The axles should be a tight fit, if not use a small drop of Superglue to locate one end of the axle only, then fit the second side plate temporarily in place to align the axles while the Superglue dries. Place the gear sets back onto their axles and fit the second side plate. Centre punch the spacers to retain them. Attach the motor to the gearbox using the old steel screws.

SECTION 8: FITTING THE COMPENSATION BEAMS

Please note: the compensation beams (part 12) on the main etch are incorrect and should not be used. A separate replacement etch has been provided for the compensation beams and it is these items that should be used in this section.

Cut a piece of 1/16" brass rod so that it fits through the holes A and is flush with the outside face of the chassis frames. Cut two pieces of 1/16" bore tube, each half the distance between the frames in length, and solder the compensation beams (part 12) to them close to one end. Modify the flexichas bearings on the two rear axles as shown in diagram and temporarily fit the beams.

Temporarily fit all the wheels and axles and confirm that the compensation works properly and check that the chassis is sitting level. The rear beams will be retained in place when the frame overlays are fitted.

SECTION 9: FRAME OVERLAYS

Emboss all the rivets in the frame overlays (parts 34 & 35). Solder the brake hanger pivot brackets (part 36 & 37) into the slots in the overlays as shown in the diagram. Fold down the sandpiper mounting brackets and strengthen with a fillet of solder. Use temporary lengths of 0.45mm wire through the brake hanger pivots to accurately locate the overlays which only need tack soldering around their edges. For the 2721 class, reprofile the overlays to match the frames. Fit the guard iron struts (parts 3 & 4) using 0.45mm wire as pins. Fit part 41 on the ashpan sides and make the pipe from the right side ashpan as shown in the diagram.

If you are fitting working inside motion then build it next following the separate instructions.

SECTION 10: COMPLETING THE CHASSIS MECHANICALLY

Fit the crankpins to the wheels making sure the screw heads do not project, countersinking them if necessary. Attach the balance weights to the wheels using photographs as a guide to the appropriate weight and its position. Assemble the wheel sets, bearings and rods (quartering the wheels by eye) selecting 1/8" axle washers of appropriate thickness to control side play. A thorough check of all clearances at this stage is important.

When you are confident of the clearances assemble the rear axle with the motor in place and quarter the wheels as follows. First quarter and fix (with Loctite) the wheels on the leading axle. (Carefully set the back to back measurement with a gauge). Attach the rods omitting the crankpin bushes on the third axle. Adjust the quartering on the second axle until the first two axles rotate freely with no binding. Fix the wheels to the second axle. Place the crankpin bushes on the rear axle fix the rods again and quarter the third axle. You should now have a mechanically acceptable chassis. Now connect the motor to your pick-ups and test run.

SECTION 11: FINISHING THE CHASSIS

The two leading axles are now retained by the springs (parts 13 & 14) for the 1854 class and by part 11 for the 2721 class. The rear axle is retained by the part 11 with three holes.

Assemble the brake hangers (part 15) first embossing the rivet on each lamination. The front of each hanger is detailed with part 40, as shown in the diagram, the small hole in the back of part 40 locating on the previously embossed rivet.

Fix the brake hangers in place using 0.45mm wire for the hanger pivots and for the cross shafts. Fit the pull rods (part 38) on the ends of the cross shafts and complete the brake gear by fitting the rear cross shaft, levers (parts 16, 17 & 18) and brake cylinder (part W16) as shown in the diagrams.
Complete the chassis detailing by fitting sandpipes (0.45mm wire), part 39 which passes under the pull rods and fitting the volute spring castings for the 2721 class.

SECTION 12: FOOTPLATE

Prepare the footplate (part 46) by embossing the rivets on the smokebox saddle sides. Fold the edges at right angles and fold up the smokebox saddle sides, splasher fronts, cab floor supports, reversing lever and lamp brackets. Solder part 8 in position locating it in the half-etched slots in the smokebox saddle sides and solder the body fixing nut in place. Prepare the footplate overlay (part 47) by embossing the rivets under the lamp brackets.

Place the overlay in place and temporarily join to the footplate with a screw through the body fixing holes at the rear. Now solder together all round, fix the rear body fixing nut in place and open out all the footplate holes to suit each part.

Emboss the rivets on the valence overlays (part 48) behind the steps, behind the buffer beam brackets and for each pipe clip, then fold down the pipe clips and fold up the steps before soldering the overlays in place. Attach part 58. Emboss the rivets on the bufferbeams (parts 49 & 50). If fitting steam pipes drill out the hole in the front beam and on the rear beam do the same or attach part 51. Photographs suggest the position of the steam pipe on the rear beam varied. Solder the bufferbeams in place and add the brackets (part 55), coupling hooks (part 19) and coupling hook pockets (part 53) if appropriate.

By referring to photographs bend the valence mounted vacuum pipe to shape using 0.7mm wire and attach it by bending the clips through the small slots and soldering inside. Use part 56 or 57 to represent the flanges of the pipe joints. If you have fitted steam pipes a similar pipe should be fitted on the right side.

Curve the splasher tops (parts 61, 62 & 63) to shape by rolling underneath a suitable rod or dowel on a resilient surface - a piece of rubber sheet. The rear splasher tops should be narrowed to match the width of the cab floor if you are not modelling in OO gauge. Solder the centre and rear splasher tops in place followed by the splasher backs (part 65) positioning them so that they will be directly above the frames.

Add the handrails above the front steps.

SECTION 13: SMOKEBOX, BOILER AND PANNIER TANKS

Laminate the three layers of the rear of the smokebox together aligning them with wire through the matching holes. The front layer is the rear smokebox former (part 67) then the ring between the smokebox and boiler (part 21) - round of the rear edge - and lastly the boiler former (part 70). If appropriate modify part 67 to clear the inside motion. Solder part 66 and the rear former in place against the smokebox sides positioning the rear former so that the top of the smokebox will be level.

Fit the front splasher tops (part 61) and backs (part 64). Emboss the rivets on the tank support brackets (part 79), fold up and solder in place on the smoke box sides. Roll the smokebox top (part 69) and solder in place.

Fold up the rear tank former (part 68) and solder in place on the footplate. Check that the cab front (it is located with part 68 using wire pins through the matching holes) has room to fit in the same slot in the footplate. Solder part 23 in place and the tank support brackets on the firebox sides. Note the special bracket (part 80) fits on the right side for the 2721 class. Fit the reversing rod in place into the slot in the firebox front for the 1854 class and bent to pass in front of the volute springs, through the tank support bracket and into the slot in the cab front for the 2721 class.

Before forming the tanks (part 76) their appearance must be decided. The easy option is the flush riveted tanks which were plain. The seams of the welded tank are represented by scribing down the half-etched grooves (between the rivets) - place the tank on a piece of card. For the riveted tank then I'm afraid it's out with the riveting tool for the over 500 rivets! I have provided a practise piece on the edge of the fret. Engines appear to have been fitted at a later date with stops for the tank fillers - made from 0.7mm wire and part 88. If you are fitting these then drill through the holes in the tanks.

Make the tank forming jig as shown in the diagram. The only accurate dimension that is required is the diameter of the forming rod - 3/16". Form the lower bend first - the folded part is shorter and hence causes fewer problems when clamping the jig together to make the second fold. Tight clamping is important. Clamp a piece of card under the rivets if you want them to survive.

Solder the handrail knobs for all the tank hand rails in position and then solder the tanks to the formers. Fit the support bracket packing pieces (part 22 or 81). Now that the footplate assembly is strengthened by the tanks the centre section of the footplate - under the firebox - can be removed by cutting down its centre and then breaking off along the half-etched lines.

Select the required smokebox/tank front (part 82 or 83) emboss any rivets and solder in place. Attach the steps (part 85 or 86) and part 84.

Roll the boiler lower - front (part 71) to match the curve in part 72. Fold the boiler band joining brackets by bending near the small hole and fit through the small slots. Complete with a short piece of 0.3mm wire to represent the tightening bolt. Solder part 72 in place between the tanks so that it will be near the rear of part 71 - check that it will not foul any of the holes for mounting components on the top of the tank. Now solder part 71 in place, at the front to part 70 and the rear to part 72. Similarly form and fit part 73 using part 74 to get the correct radius at the front and soldering to the top of part 6 at the rear. If all is well both boiler sections should align and the motor should pass through the chassis when the body is removed. The small gap between the two sections is disguised by fitting the balance pipe (part W15).

Completing the tanks by fitting the tank top is probably best delayed until the bunker and cab are fitted but I will describe it now. The tank top overlay (part 77) has an awkward curved section in the middle. To form this first scribe, with a sharp point the fold lines on the underside. The lines run from the centres of the small points at the front to the edges of the slot over the firebox at the rear. First curve the centre section by rolling and then make the bends along the scribed lines. Remove the marking points when satisfied, emboss the rivets around the firebox top and solder the overlay in place.
All the remaining parts and castings can now be fitted to complete the top using fig.456 in Great Western Engines Vol. 2 as a guide. The lifting rings are made by wrapping 5 amp fuse wire around a 1.6mm drill shank.

SECTION 14: BUNKER

Fold up the bunker former (part 109). For the extended (later) bunker first release the rear flap by cutting through the four small ties. Solder the former in place on the footplate together with the appropriate bunker front (part 110 or 111). First emboss the handle on the coal hole door. For the original bunker break off the rear 'ears' and form the upper flare in the wrapper (part 112).

Form the corner bends in the bunker wrapper(s) (part 112 or 115) around a 1.4mm drill shank. Solder the wrapper(s) in place aligning them with the handrail holes. For the extended bunker curve part 116 and solder in place making a generous filet at the side seams before filing the corner to match the curve of the top and bottom. For the original bunker form the corner bends in part 113 or 114 and solder in place then complete the flared corners by filling in between the 'fingers' with solder and filing to shape. Add the handrails - vertical with knobs and 0.45mm wire - horizontal no knobs and 0.3mm wire. Assemble the cab seats (parts 128 & 129) which are designed to be working. Now remove the seats from the brackets and solder the brackets to the front of the bunker.

SECTION 15: CAB

Solder part 93 in place inside the cab front and solder the cab front in place. Fit the injectors adding the lower pipe which passes through the footplate and the pipe which passes behind into the inside hole in the cab front.

Solder the floor supports (part 107) in place and fold up the floor (part 108). Emboss the rivet at each end of the reversing lever quadrant lamination and solder them together leaving a slot in the middle then solder the assembly in place in the holes in the floor. For the 1854 class attach the spring casting (part W7) to the floor. For the 2721 class cut this casting in half and attach the upper half (make new wire pins) to the cab floor and the lower half under the rear axle to part 11. Solder the floor in position.

For the open cab cut off the rearmost section of the top edge of the cabside (part 94), cutting down the centre of the small square of rivets. Attach the cabside cut-out beading (part 95) fitting the etched groove over the edge of the

cabside. Solder the cabsides in position and attach the rear handrails. Bend part 91 to follow the shape over the firebox top and fix in place - it has been made over length and so will need trimming back level with the cab sides.

For the open cab solder part 98 between the rear edges of the cabsides, ensuring the cab roof line will be horizontal. Curve the cab roof (part 96 or 103) and complete the roof following the drawings.

For the closed cab emboss the rivets on 118 then fold out the flap for the top of the cut-out giving clearance to the brake handle and solder together with part 117. Solder the rear window grills (part 119) in place and solder part 120 to the cab rear locating it with the slots in part 117. Curve the brake handle cut-out wrapper (part 121) and solder in place. Note the top left corner is mitred off and the corner bent to fit - this gives clearance for the window grill - just! See Great Western Engines Vol. 1 fig.255.

Now solder this assembly in place in the bunker slots - if you have fitted the extended bunker then first file the sides of the cab back flush and break off the ends of part 120 along the half-etched lines. Solder the rear of the cab sides to the front of the cab back.
Complete the closed cab curving and detailing the roof.

SECTION 16: FINAL DETAILING

Form the main handrail and attach - the medium length knob is used on the smokebox front.

Attach all the remaining parts and castings using the drawings and photographs as a guide to position.

Using the drawing of the cab interior the backhead can be assembled and the cab interior detailed. Use copper wire of a suitable size for the pipes.

I hope, like me, you enjoy the challenge of building your Pannier Tank.

Best wishes

Martin Finney
April 1991

If you have any problem with the kit or any criticisms or suggestions please feel free to contact Brassmasters.

COMPONENT DESCRIPTION - 0.020" NICKEL SILVER

1 Frame - Left
2 Frame - Right
3 Guard iron strut - front - (2)
4 Guard iron strut - rear - (2)
5 Frame spacer - Rear
6 Frame spacer - Firebox front
7 Frame spacer - Front
8 Front body fixing nut plate
9 Hornblocks - Rear coupled axle - (2)
10 Hornblocks - Leading/centre coupled axle - (4)
11 Hornblock ties - (6)
12 Compensation beam - (2) (**now on a separate etch**)
13 Spring - 1854 class - middle lamination - (4)
14 Spring - 1854 class - outer lamination - (8)
15 Braise hanger/shoe lamination - (12)
16 Brake lever - steam cylinder to cross-shaft - (2)
17 Brake lever - handbrake to cross-shaft - (2)
18 Brake lever - cross-shaft to pull rod - (4)
19 Coupling hook
20 Portescap gearbox side - (2)
21 Smokebox/Boiler ring
22 Tank support packing piece - (4)
23 Firebox side bracket - (2)
24 Cab reversing lever quadrant - (2)
25 Washer - 1/8"
26 Coupling rod - plain - front - inner lamination - (2)
27 Coupling rod - plain - front - outer lamination - (2)
28 Coupling rod - plain - rear - inner lamination - (2)
29 Coupling rod - plain - - rear - outer lamination - (2)
30 Coupling rod - fluted - front - inner lamination - (2)
31 Coupling rod - fluted - front - outer lamination - (2)
32 Coupling rod - fluted - rear - inner lamination - (2)
33 Coupling rod - fluted - rear - outer lamination - (2)

COMPONENT DESCRIPTION - 0.012" BRASS

39 Brake pull rod safety bracket - (2)
40 Brake hanger overlay - (6)
41 Mud door bracket - (2)
42 Balance weight - early - leading/rear axle - (4)
43 Balance weight - early - centre axle - (2)
44 Balance weight - later - leading/rear axle - (4)
45 Balance weight - later - centre axle - (2)
46 Footplate
47 Footplate overlay
48 Valence overlay - (2)
49 Buffer beam - front
50 Buffer beam - rear
51 Buffer beam - rear – steam pipe bracket overlay
52 Steam pipe valve handle - (2)
53 Coupling hook pocket
54 Coupling - (2)
55 Valence to buffer beam bracket - (4)
56 Pipe union - circular - (8)
57 Pipe union - oval - (6)
58 Rear step tread - upper - (2)
59 Reversing rod - 1854 class
60 Reversing rod - 2721 class

COMPONENT DESCRIPTION - 0.012" BRASS (cont'd)

61 Splasher top - front - (2)
62 Splasher top - middle - (2)
63 Splasher top - rear - (2)
64 Splasher back - front - (2)
65 Splasher back - centre/rear - (2)
66 Smokebox/tank - front former
67 Smokebox - rear former
68 Tank - rear former
69 Smokebox top
70 Boiler front former
71 Boiler lower section - front
72 Boiler lower section - front - rear former
73 Boiler lower section - rear
74 Boiler lower section - rear - front former
75 Boiler band joining clips - (4)
76 Pannier tank - (2)
77 Tank/boiler - top overlay
78 Tank/smokebox - overlay - (2)
79 Tank support bracket - (4)
80 Tank support bracket - right rear - 2721 class
81 Tank support packing piece - (4)
82 Smokebox/tank front - early style - 2 types
83 Smokebox/tank front - later style - 2 types
84 Cylinder cover flap
85 Tank front step - early style
86 Tank front step - later style
87 Joining strip on top of tank - (2)
88 Water filler stop bracket - (2)
89 Lifting ring eyelet - (4)
90 Lifting ring bracket - (4)
91 Tank/cab angle
92 Cab front
93 Window frame - inside cab - (2)
94 Cabside - (2)
96 Open cab roof - steel
95 Cabside cut-out beading - (2)
97 Open cab roof - steel - rain
98 Open cab roof - rear support
99 Open cab roof - steel - rear edge angle - (2)
100 .Closed cab roof
101 Closed cab roof - rainstrip - (2)
102 Closed cab roof - ventilator
103 Cab roof - canvas covered wood
104 Canvas covered roof - side moulding - (2)
105 Canvas covered roof - front/rear moulding - (2)
106 Canvas covered roof - transverse strip - (2)
107 Cab floor support - (2)
108 Cab floor
109 Bunker former
110 Bunker front overlay - open cab
111 Bunker front overlay - closed cab
112 Bunker wrapper - original style
113 Bunker upper plate - original style - with coal rails
114 Bunker upper plate - original style - without coal rails
115 Bunker wrapper half - later style - (2)
116 Bunker rear section - later style
117 Cab rear - inner overlay

(cont'd)

COMPONENT DESCRIPTION - 0.012" BRASS (cont'd)

118 Cab rear - outer overlay
119 Cab rear - window frame with bars - (2)
120 Cab rear horizontal section
121 Cab rear - brake handle cut-out wrapper
122 Weather sheet support - (3)
123 Fire iron bracket - (3)
124 Lamp bracket - smokebox top
125 Lamp bracket - front buffer beam/sandbox/bunker rear
126 Lamp bracket - upper - original bunker
127 Lamp bracket - upper - later bunker
128 Cab seat bracket - (2)
129 Cab seat - (2)
130 Backhead shelf
131 Cab pressure gauges
132 Gauge glass lever
133 Brake lever
134 Whistle lever - (2)
135 Washer - 10 BA
136 Washer - 1/8"

OTHER COMPONENTS FOR CHASSIS

1/8" Flexichas bearing - (6)
Brass 10BA C.H. screw - (2)
Brass 10BA nut - (2)
Nickel silver wire - 1mm - for coupling rod fork joints
Brass wire - 1/16" - for compensation beam pivot
Brass tube - 3/32" outside diameter - for compensation beams
Steel wire - 0.8mm - for front compensation beam
Brass wire - 0.45mm - for brake hanger pivots
Brass wire - 0.9mm - for brake shaft

OTHER COMPONENTS FOR BODY

Brass wire - 0.3mm - for bunker handrails
Brass wire - 0.45mm - for handrails
Brass wire - 0 .7mm - for vacuum pipe
Whistle - (2)
Handrail knob - short - (24)
Handrail knob - medium - (1)
Buffer heads, bushes and springs - (4)

BRASS CASTINGS

B1 Dome
B2 Safety valve casing
B3 Tank water filler - (2)
B4 Injector - (2)
B5 Vacuum pipe - front
B6 Vacuum pipe - rear
B7 Steam heating pipe - (2)
B8 Brake handle
B9 Smokebox door handles

WHITEMETAL CASTINGS

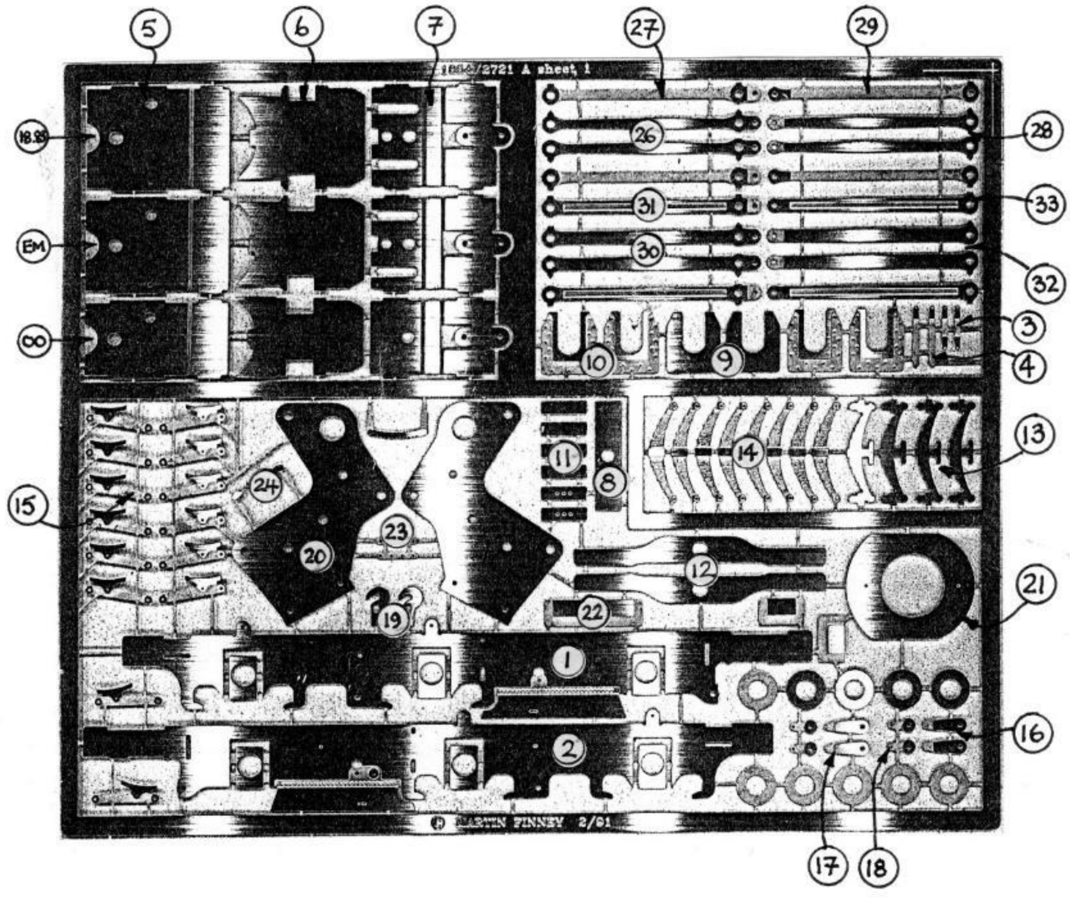
W1 Chimney
W2 Inside of dome
W3 Safety valve base
W4 Safety valve springs - (2)
W5 Dome lubricator
W6 Spring nest - leading/centre – 2721 Class – (4)
W7 Spring nest - rear - inside cab - (2)
W8 Buffer - (4)
W9 Sandbox - (2)
W10 Sandbox lid - (2)
W11 Smokebox door - later type
W12 Smokebox door - old type with ring
W13 Tank vent - (2)
W14 Toolbox - (2)
W15 Tank balance pipe
W16 Steam brake cylinder
W17 Steam lance cock
W18 Backhead
W19 Combined ejector/brake
W20 Regulator mounting
W21 Regulator handle
W22 Water gauge
W23 Clackbox - (2)
W24 Lever reverse handle
W25 Firebox door handle
W26 Sight feed lubricator
W27 Firebox top

COMPONENTS NOT PROVIDED

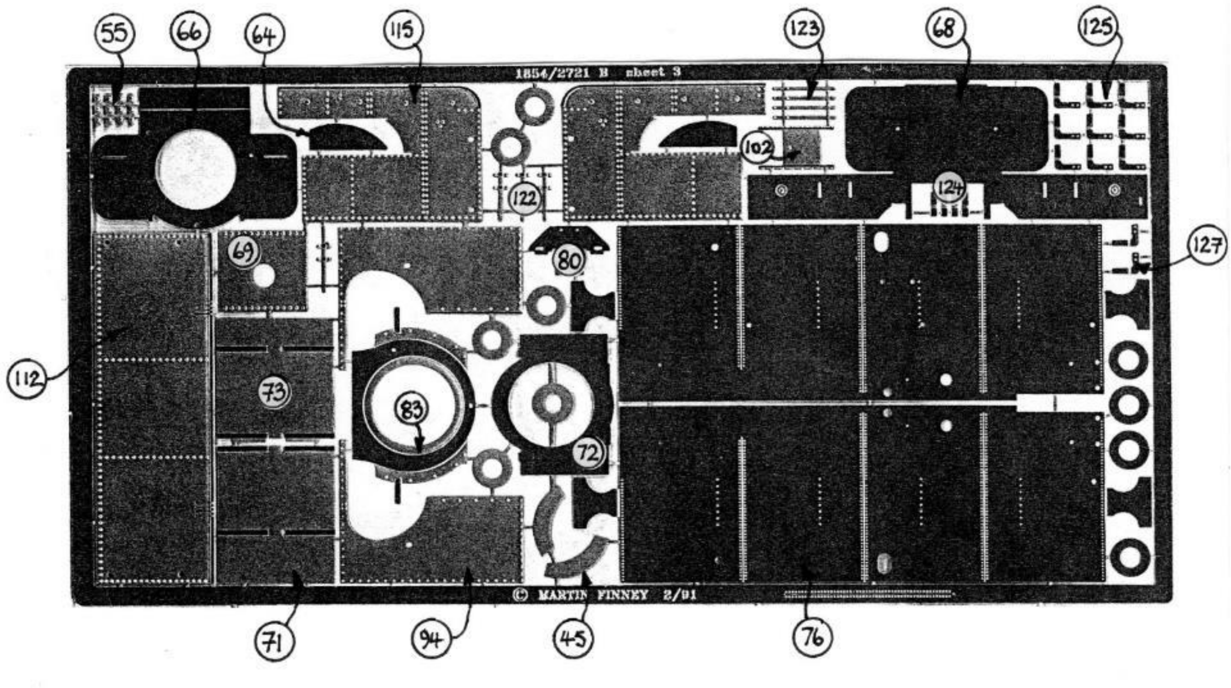
Wheels + crankpins
(prototype - 4' 7 ½" - 16 spokes, 10" throw, pin between spokes)
- Ultrascale
- Alan Gibson
- Markits

Motor and gearbox
- Hi-Level - Mashima 1220 + Road Runner Plus 54:1
- Branchlines
- Portescap 1219 (available second hand only)

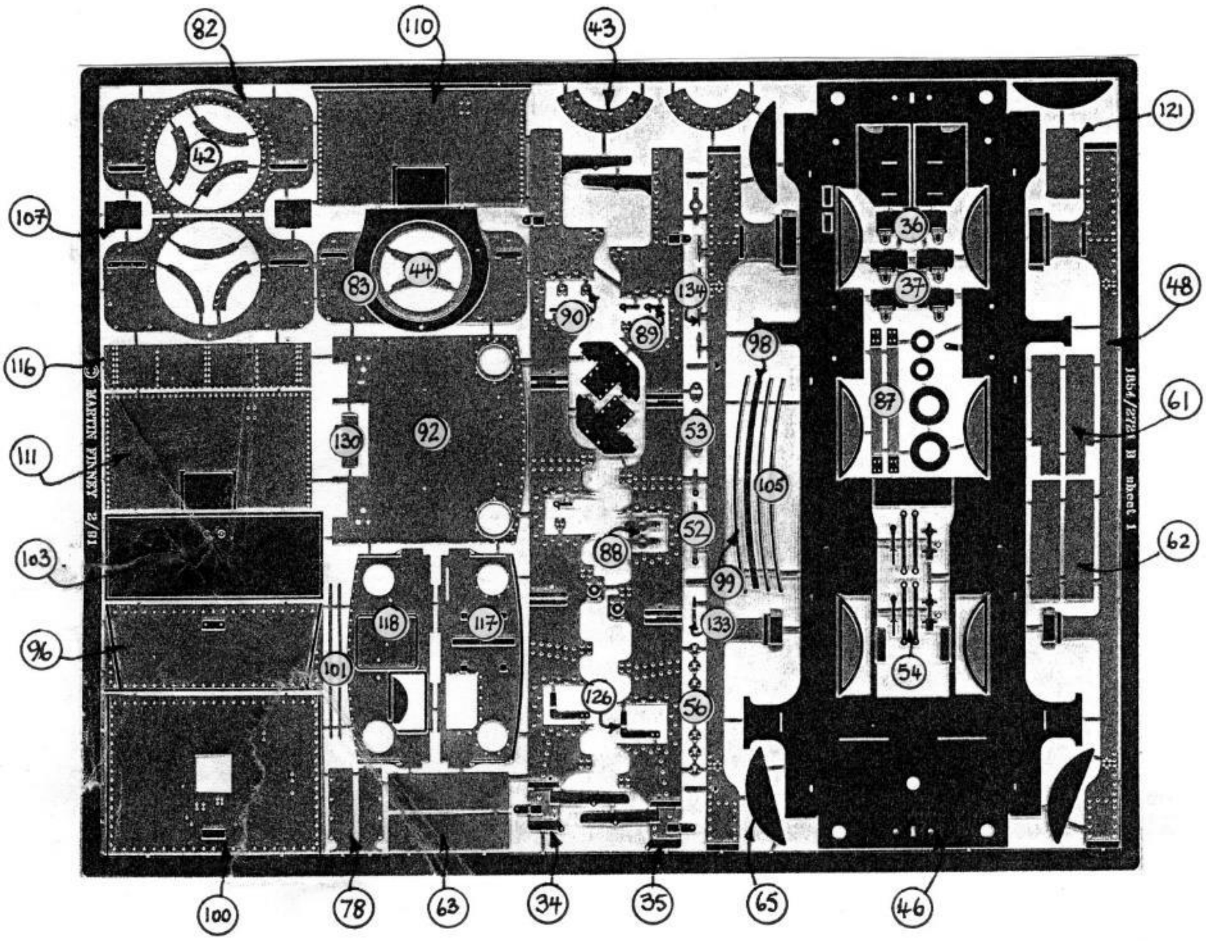
Suitable pickups

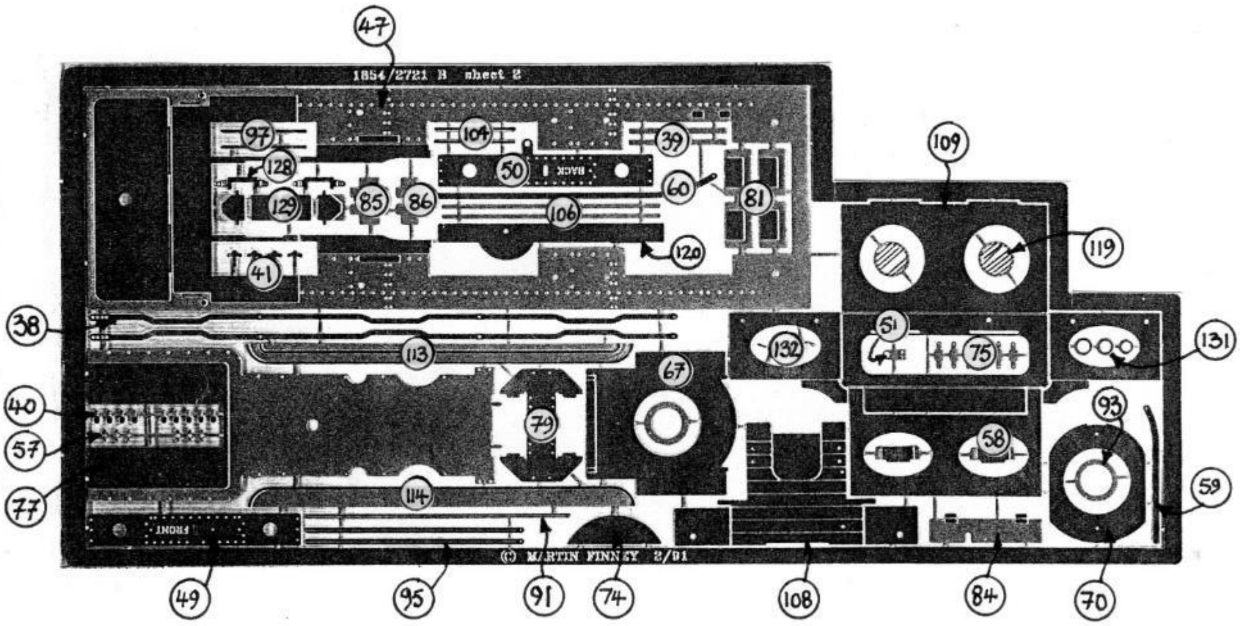


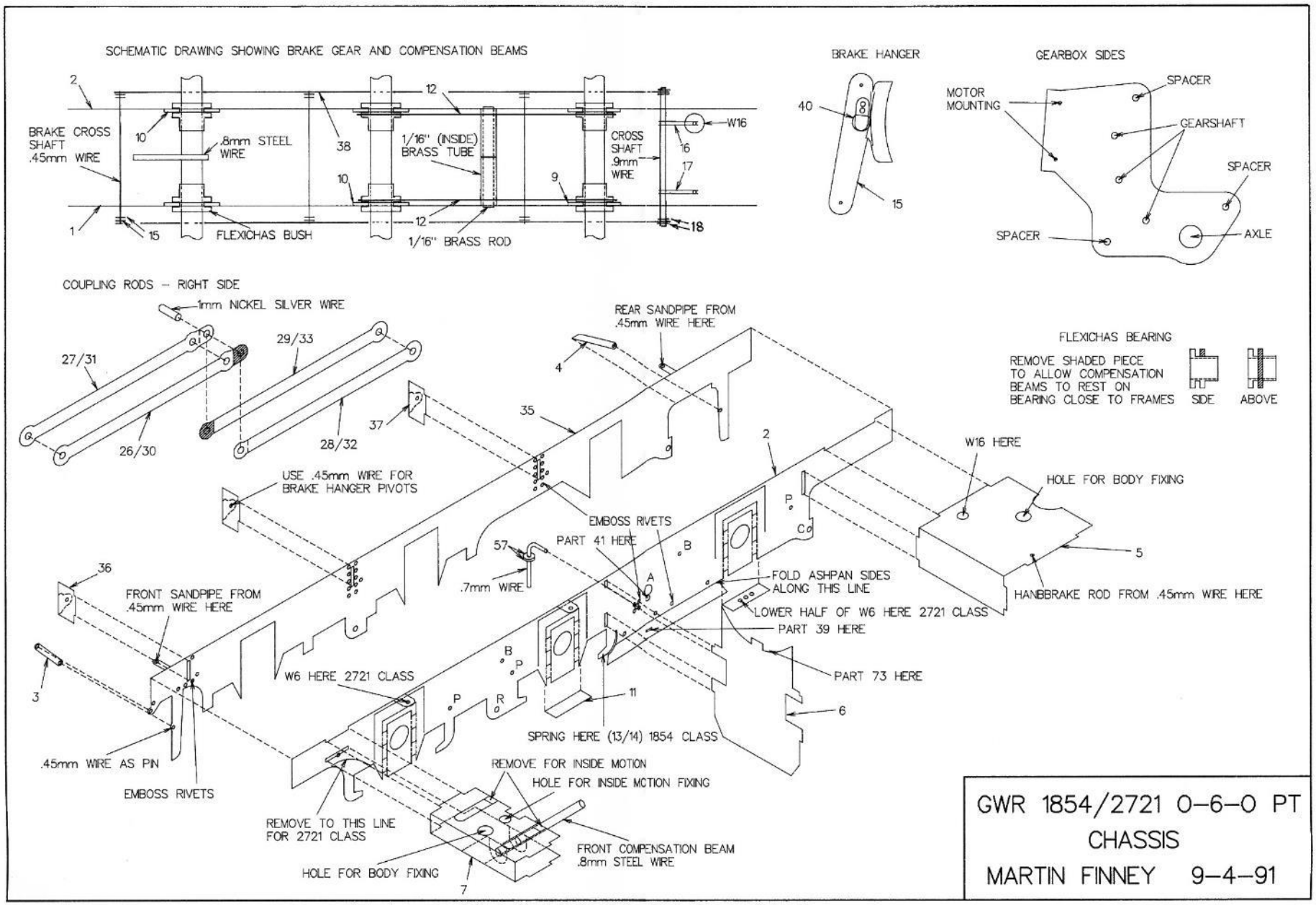
1854/2721 A sheet 1
© MARTIN FINNEY 2/91
5
6
7
27
29
18.83
EM
00
26
28
31
33
30
32
3
4
10
9
15
24
23
20
19
11
8
14
13
12
22
21
1
2
16
17
18

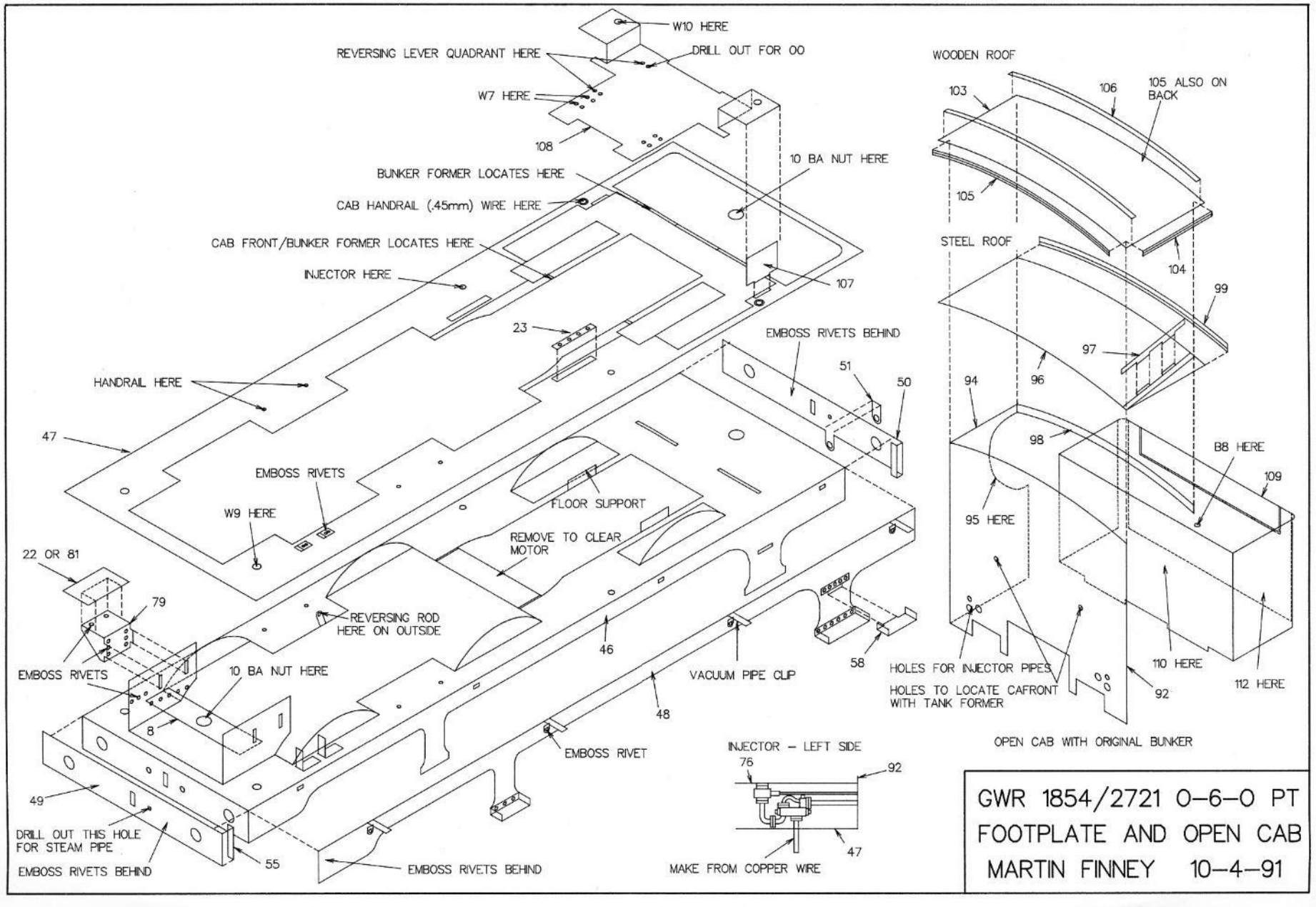


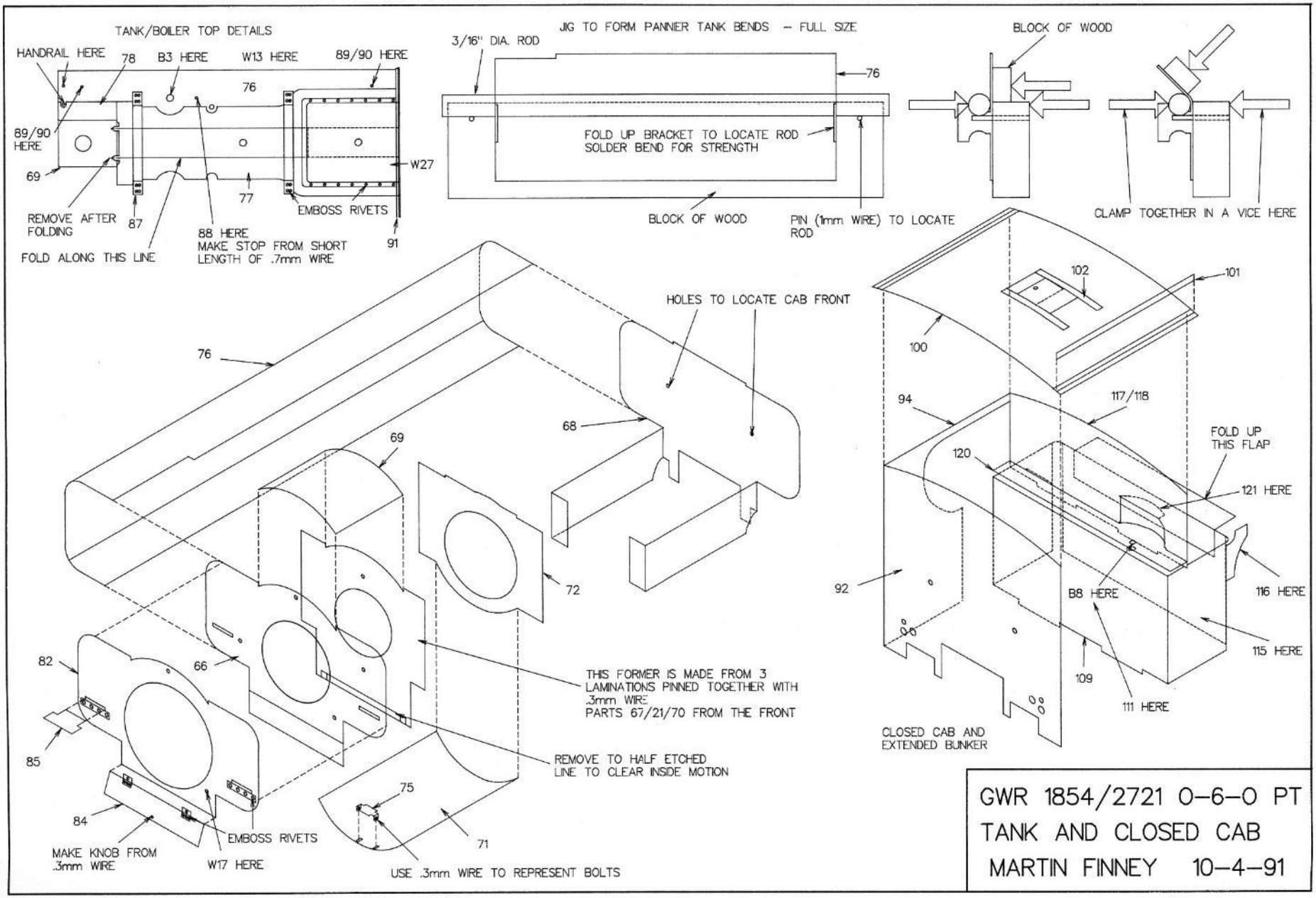
1854/2721 B sheet 3
© MARTIN FINNEY 2/91
55
66
64
115
123
68
125
102
122
124
69
80
127
112
73
83
72
71
94
45
76

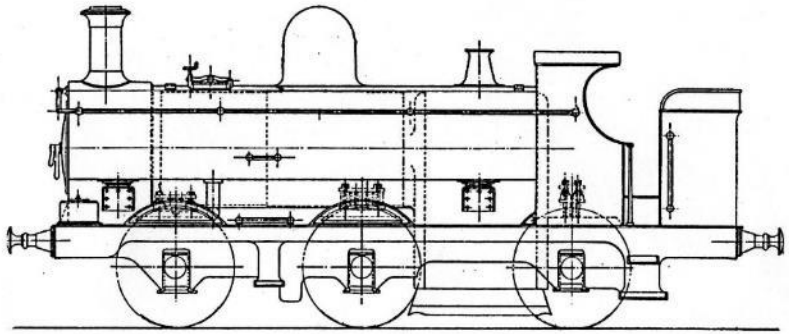

82
110
43
121
107
42
44
83
36
37
48
134
90
89
116
98
1854/2721 B sheet 1
MARTIN FINNEY 2/91
87
61
130
92
53
111
105
52
62
103
88
99
118
117
133
96
101
54
126
56
100
78
63
34
35
65
46


47
1854/2721 B sheet 2
97
104
39
109
128
50
BACK
60
81
129
85
86
106
119
120
41
38
113
51
132
75
131
67
93
40
79
58
57
59
77
114
FRONT
(C) MARTIN FINNEY 2/91
49
95
91
74
108
84
70

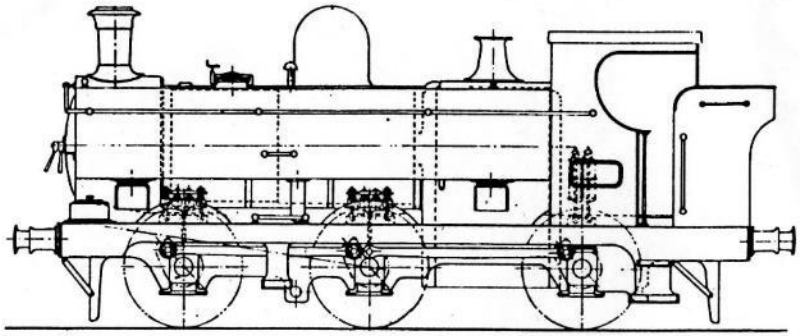

SCHEMATIC DRAWING SHOWING BRAKE GEAR AND COMPENSATION BEAMS
BRAKE CROSS SHAFT .45mm WIRE
.8mm STEEL WIRE
1/16" (INSIDE) BRASS TUBE
CROSS SHAFT .9mm WIRE
W16
FLEXICHAS BUSH
1/16" BRASS ROD
BRAKE HANGER
GEARBOX SIDES
MOTOR MOUNTING
SPACER
GEARSHAFT
AXLE
COUPLING RODS – RIGHT SIDE
1mm NICKEL SILVER WIRE
27/31
29/33
26/30
28/32
REAR SANDPIPE FROM .45mm WIRE HERE
USE .45mm WIRE FOR BRAKE HANGER PIVOTS
EMBOSS RIVETS
PART 41 HERE
.7mm WIRE
FRONT SANDPIPE FROM .45mm WIRE HERE
W6 HERE 2721 CLASS
.45mm WIRE AS PIN
EMBOSS RIVETS
REMOVE TO THIS LINE FOR 2721 CLASS
HOLE FOR BODY FIXING
FRONT COMPENSATION BEAM .8mm STEEL WIRE
REMOVE FOR INSIDE MOTION
HOLE FOR INSIDE MOTION FIXING
SPRING HERE (13/14) 1854 CLASS
FOLD ASHPAN SIDES ALONG THIS LINE
LOWER HALF OF W6 HERE 2721 CLASS
PART 39 HERE
PART 73 HERE
W16 HERE
HOLE FOR BODY FIXING
HANBBRAKE ROD FROM .45mm WIRE HERE
FLEXICHAS BEARING
REMOVE SHADED PIECE TO ALLOW COMPENSATION BEAMS TO REST ON BEARING CLOSE TO FRAMES
SIDE
ABOVE
GWR 1854/2721 0–6–0 PT
CHASSIS
MARTIN FINNEY 9–4–91


W10 HERE
REVERSING LEVER QUADRANT HERE
DRILL OUT FOR OO
W7 HERE
108
10 BA NUT HERE
BUNKER FORMER LOCATES HERE
CAB HANDRAIL (.45mm) WIRE HERE
CAB FRONT/BUNKER FORMER LOCATES HERE
INJECTOR HERE
107
23
EMBOSS RIVETS BEHIND
51
50
HANDRAIL HERE
47
EMBOSS RIVETS
W9 HERE
FLOOR SUPPORT
REMOVE TO CLEAR MOTOR
22 OR 81
79
REVERSING ROD HERE ON OUTSIDE
46
EMBOSS RIVETS
10 BA NUT HERE
8
VACUUM PIPE CLIP
58
48
EMBOSS RIVET
49
DRILL OUT THIS HOLE FOR STEAM PIPE
EMBOSS RIVETS BEHIND
55
EMBOSS RIVETS BEHIND
INJECTOR – LEFT SIDE
76
92
47
MAKE FROM COPPER WIRE
WOODEN ROOF
103
106
105 ALSO ON BACK
105
STEEL ROOF
104
99
97
94
96
98
B8 HERE
109
95 HERE
HOLES FOR INJECTOR PIPES
HOLES TO LOCATE CAFRONT WITH TANK FORMER
92
110 HERE
112 HERE
OPEN CAB WITH ORIGINAL BUNKER
GWR 1854/2721 0–6–0 PT
FOOTPLATE AND OPEN CAB
MARTIN FINNEY 10–4–91

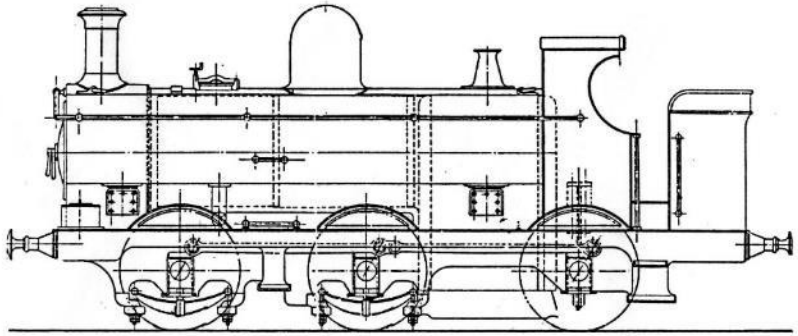

TANK/BOILER TOP DETAILS
HANDRAIL HERE
78
B3 HERE
W13 HERE
89/90 HERE
76
89/90 HERE
69
W27
77
EMBOSS RIVETS
REMOVE AFTER FOLDING
87
88 HERE MAKE STOP FROM SHORT LENGTH OF .7mm WIRE
91
FOLD ALONG THIS LINE
JIG TO FORM PANNIER TANK BENDS – FULL SIZE
3/16" DIA. ROD
76
FOLD UP BRACKET TO LOCATE ROD SOLDER BEND FOR STRENGTH
BLOCK OF WOOD
PIN (1mm WIRE) TO LOCATE ROD
BLOCK OF WOOD
CLAMP TOGETHER IN A VICE HERE
HOLES TO LOCATE CAB FRONT
76
68
69
72
82
66
85
84
MAKE KNOB FROM .3mm WIRE
EMBOSS RIVETS
W17 HERE
THIS FORMER IS MADE FROM 3 LAMINATIONS PINNED TOGETHER WITH .3mm WIRE
PARTS 67/21/70 FROM THE FRONT
REMOVE TO HALF ETCHED LINE TO CLEAR INSIDE MOTION
75
71
USE .3mm WIRE TO REPRESENT BOLTS
102
101
100
94
117/118
FOLD UP THIS FLAP
120
121 HERE
92
B8 HERE
116 HERE
115 HERE
109
111 HERE
CLOSED CAB AND EXTENDED BUNKER
GWR 1854/2721 0–6–0 PT
TANK AND CLOSED CAB
MARTIN FINNEY 10–4–91



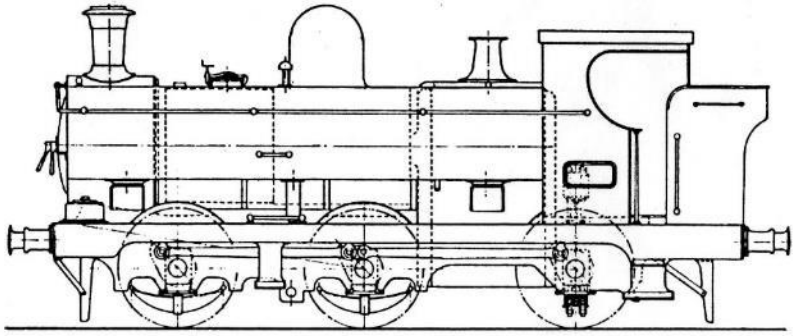
2721 CLASS – ORIGINAL BUNKER – OPEN CAB



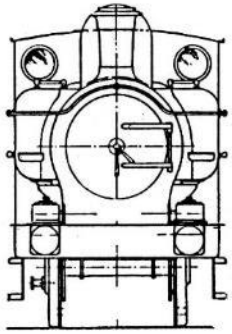
2721 CLASS – EXTENDED BUNKER – CLOSED CAB



1854 CLASS – ORIGINAL BUNKER – OPEN CAB



1854 CLASS – EXTENDED BUNKER – CLOSED CAB



GWR 1854/2721 0–6–0 PT
DIAGRAMS
MARTIN FINNEY 10–4–91