

Brassmasters Scale Models

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GREAT WESTERN RAILWAY

**2301 CLASS 0-6-0 DEAN GOODS
LOCOMOTIVE KIT**

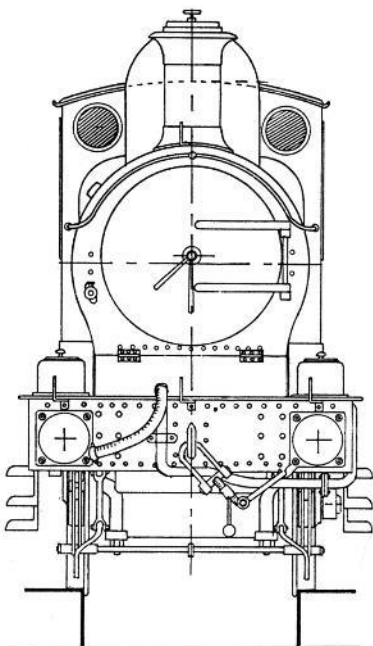
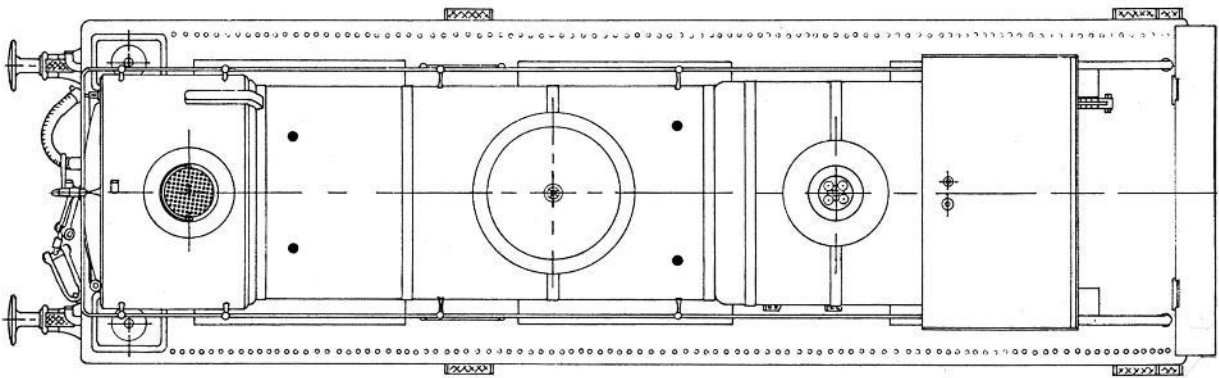
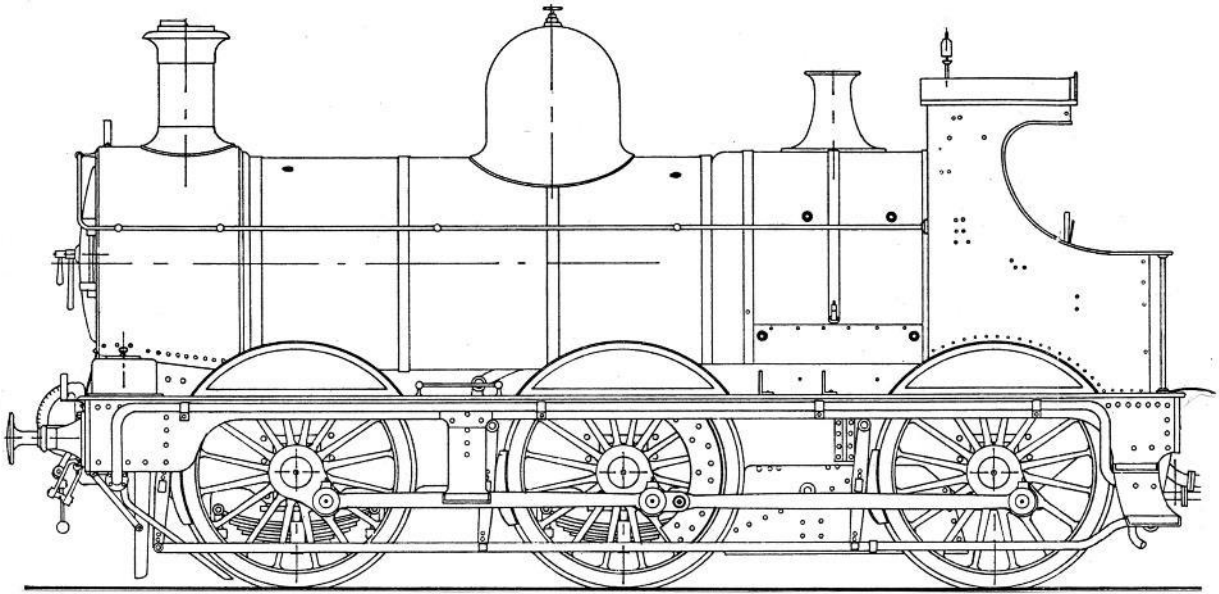
Designed by Martin Finney

**4MM SCALE
OO - EM - P4**

**INSTRUCTIONS and
PROTOTYPE NOTES**

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GWR 2301 CLASS 0-6-0
MARTIN FINNEY 8-9-92

SECTION 1: BRIEF HISTORICAL DETAILS

The 260 engines of the 2301 class, designed by William Dean, were built over a period of 16 years, on 12 lots, as follows:

Lot	Numbers	Built	Original Boiler	Footplate	Coupling Rods
61	2301-2320	1883	S0	Narrow	Plain
62	2321-2340	1884	S2	Narrow	Plain
63	2341-2360	1885	S2	Narrow	Plain
82	2381-2400	1890	S2	Narrow	Plain
87	2401-2430	1891-92	S2	Narrow	Plain
92	2431-2450	1893	S2	Narrow	Plain
99	2451-2470	1895-96	S4	Wide	Plain
100	2471-2490	1896	S4	Wide	Plain
104	2491-2510*	1896	S4	Wide	Fluted
107	2511-2530	1897	S4	Wide	Fluted
108	2531-2550	1897	S4	Wide	Fluted
111	2551-2580	1897-89	S4	Wide	Fluted

* Between 1907 and 1910 all the engines in this lot were rebuilt by Churchward as 2-6-2 tank engines becoming the 3901 class.

With such a large number of locomotives, built over a long period, and lasting in service for over sixty years, there are considerable variations between individual engines many of which I have attempted to cover by including alternative components in the kit.

As is usual for Great Western engines the most obvious variation is in the boilers. The first twenty were built with domeless S0 boilers with flush smokeboxes. The next 110 had S2 boilers fitted. The remainder were constructed with the S4 boiler included in the kit. From around the turn of the century rebuilding began with the B4 Belpaire boilers until by 1927 all were so fitted. For a detailed history of this class, including details of boiler changes, Part Four of 'The Locomotives of the Great Western Railway' published by the R.T.C.S. is essential reading. So, from this kit any of the class can be built from circa 1900 to withdrawal.

In designing the kit I have used the following Swindon Drawings:

8573		Frame plan Lots 82,87,92,99,100,107,108 & 111
11476	4/194	General Arrangement - 2301 class
11532	8/1940	Arrangement of motion - 1700, 2301, 2700 classes

Great Western Engines - Vol 1 by J.H.Russell on pages 79 - 87 has some useful photographs to which I shall refer.

Variations / Modifications possible from the kit

Footplate: Two different widths as above.

Coupling rods: Plain or fluted as above. Photographic evidence suggests that many of those built with fluted rods subsequently acquired plain rods.

Cab: The cabsides of the first sixty engines had a large sweeping cut-out whereas the later engines had a standard two arc opening. With the fitting of Belpaire fireboxes the cabs were raised to allow the spectacle windows to be refitted and there were two distinct cab roof profiles. Cab roofs were latterly of steel replacing the earlier canvas covered wood.

Smokebox: The early smokeboxes had a plain front with ringed door. Later snap head rivets were used and from c.1920 the smokeboxes had a pressed front with Churchward type door without the ring.

Firebox: Two different B4 firebox wrappers are provided with alternative positions of the washout plugs.

Steps: The front step and upper rear step were different on the first sixty engines.

Reversing rod: The first sixty had a straight rod whereas the remainder were fitted with a curved rod.

Chimney: Early built up parallel type. From 1919 tapered cast iron type began to be fitted.

Top feed: From about 1913 onwards some forty on the class carried B4 boilers with top feed.

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

ATC: A large number of the class were fitted with ATC equipment most between June 1930 and August 1931.

Lamp brackets: Most have the front lamp brackets attached to the buffer beam but a few have the outer brackets fixed to the sandboxes.

Tenders

Many of the earlier engines appear to have come out with second-hand iron frame or double frame Armstrong tenders which were to be found on the class up to about 1912. Later engines were paired with standard Dean 2500 gallon tenders. In later years a significant number acquired larger Dean tenders of 3000 gallons capacity. At least one (2398) was paired with a diminutive Dean 2000 gallon tender.

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.
- The 'American' system with the wheels on the loco are shorted out on one side and the tender on the other. I can supply the etched shorting strips required. The drawbar between the loco and tender can be used to carry the current.
- 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 1/2 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 8) 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"

Emboss the rivets on the ash-pan sides and fold the ash-pan to agree with part 5.

SECTION 4: FRAME SPACERS AND ASSEMBLING THE CHASSIS

Remove the spacers (parts 4, 5, 6 & 7) to suit your chosen gauge. If you are fitting inside motion then modify part 6 as shown in the diagram and tap the hole for the inside motion fixing screw 10 BA.

Fold up parts 4 & 6 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 6) 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 using the drill used for the crankpin holes drill a hole into a small block of wood and leave the drill in the wood with its shank projecting. This projecting shank is used as a mandrel 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 gearsets and lift them off their axles, then drift the axles out of the side plates.

Preparing the new side plates (part 16).

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

Spacer centre: 1.5mm (drill size #53)

Gear axle centres: 1.5mm (drill size #53)

Final drive centre: 4mm

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 3 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 gearsets 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

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 11) 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 37 & 38). Solder the brake hanger pivot brackets (part 39 & 40) into the slots in the overlays as shown in the diagram. Fold down the sand pipe 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.

Fit the guard iron struts (part 3) using 0.45mm wire as pins. Fit part 46 on the ash-pan sides and make the pipe from the right side ash-pan as shown in the diagram. Fix the steam brake cylinders (parts W12 & W13) to the frames.

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 12 & 13) and the rear axle by part 10.

Assemble the brake hangers (part 14) first embossing the rivet on each lamination. The front of each hanger is detailed with part 45, as shown in the diagram, the small hole in the back of part 45 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 brake pull rods (parts 41, 42 & 43). Complete the chassis detailing by fitting sand pipes (0.45mm wire) and part 44 which passes under the pull rods.

SECTION 12: FOOTPLATE

Fold the edges of the footplate (part 49) at right angles and fold up the splashers fronts, reversing lever and lamp brackets. 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 front and rear. Now solder together all round, fix the rear body fixing nut in place under the footplate and open out all the footplate holes to suit each part.

If you have fitted inside motion remove the section of footplate shown by the half-etched line to clear the mounting bracket.

For engines 2301-2360 remove the front step plate from the valence overlays (parts 52 & 53 or 54). Then emboss the rivets behind the steps and for each pipe clip, then fold down the pipe clips and fold up the steps before soldering the overlays in place. Attach parts 56, 57, 58 as appropriate. Emboss the rivets on the bufferbeam (part 59) and drag beam (part 60) before soldering in place and then add the drag beam rubbing plates (part 61), coupling hook (part 15) and coupling hook pocket (part 62).

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 65 or 66 to represent the flanges of the pipe joints.

Curve the splashers tops (parts 69-74) to shape by rolling underneath a suitable rod or dowel on a resilient surface - a piece of rubber sheet. The rear splashers 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 splashers tops in place followed by the splashers backs (part 76).

Add the handrails above the front steps.

SECTION 13: FIREBOX & BOILER

B4 BOILER - BELPAIRE FIREBOX

Solder together the two laminations of the firebox front (part 29). The firebox front and rear (part 30) must now be spaced apart by using suitable long bolts and washers through the pairs of holes in both front and rear. I use some old brass chassis spacers joined together with studding. When correctly spaced apart (20.2mm outside) the front will fit in the half-etched recess in the footplate and the cab front together with the firebox rear (dowelled to the with 0.45mm wire) will fit in the half-etched slot in the footplate.

Emboss the rivets for the ends of the cladding fixing bands on the firebox wrapper (parts 121 or 122). In pencil mark the wrapper centre on its inside and outside. Using the notch in the top of the formers as a guide centre the wrapper and mark in pencil the position of the top bends. Form the bends over a suitable rod held in a vice. When happy with the forming solder the wrapper to the formers ensuring a large fillet of solder around the front join. Check the fit on the footplate, remove the temporary spacers and cut away the centre of the front and rear held on by the half-etched tags to give clearance for the motor/gearbox. Round the front edges and corners of the firebox with a file using photographs as a guide. Fold the firebox band joining clips (part 124) by bending near the small hole, solder in place from inside and complete with a short piece of 0.3mm wire to represent the tightening bolt. Solder the washout plugs in place (parts 123).

Remove the boiler from part 117 by cutting behind the rearmost boiler band. This is easily done with a sharp blade on a hard surface. Emboss the rivets on the dome boiler band. If you wish to fit the separate washout plugs (part 120) then drill out the half-etched ones before forming the boiler by rolling. Check for fit around the formers (parts 31 & 32). Bend

the boiler band joining clips on part 118 and fit through the small slots from inside the boiler. If the fit is good and the formers fit then solder the wrapper ends together with part 118 and fit the formers so that they are almost flush with the ends. The cut-outs in the formers are to clear part 118 and the etched notch at the top of the rear former must align accurately with the small slot in the wrapper. Solder two short pieces of 0.45mm wire into the holes in the rear former to act as dowels to locate the boiler with the firebox. Check the boiler/firebox fit. Represent the bolts in the joining clips using 0.3mm wire. Top feed can be fitted by using parts W7 and 119 together with 0.8mm wire for the pipes.

S4 BOILER - ROUNDTOP FIREBOX

This follows in a similar way as the Belpaire firebox except that boiler and firebox are in one piece and there is no need to use spacers between the firebox formers.

SECTION 14: SMOKEBOX

Fold the smokebox base (part 108) into an inverted tray and solder a 10 BA nut over the hole for the body fixing screw. Early fireboxes have a square front edge whilst later they have a pressed front plate giving a rounded edge. The position of the smoke box door also changed. All smokebox variations are possible with the components supplied.

For a square front edge use part 109 to the front of the base and for a rounded front edge use part 109 or 110. Emboss the four rivets on the front former and drill through the hole for the steam lance cock if needed. Solder the appropriate front former and rear former (part 111) to the base. Roll the smokebox wrapper (part 113 or 114) to shape and solder in place with its edges flush with the front and back formers.

Round the edge of the second rear former (part 111) and solder to the rear and do the same for the front if appropriate.

If you have fitted inside motion remove the section under the half-etched line on the lower edge of the smokebox rear so that it will fit over the cylinder front.

Now similarly round the edge of part 112. Tap the hole in part 32 to 10 BA and open out the holes in parts 111 & 112 to clear 10 BA so that the smokebox and boiler can be screwed together. Now check fit the boiler/smokebox to the firebox. Remember the bottom of the boiler is horizontal and so parallel to the footplate. When happy with the alignment solder the boiler/smokebox to the firebox and solder the firebox to the footplate.

Fit the front splasher tops (part 61) and backs (part 64) and the reversing rod (part 67 or 68) locating it in the slot in the firebox front. The firebox side bracket (part 33) or covers (part 34) visible in later years are soldered in place on the firebox sides between the splashers. Solder the smokebox lamp bracket (part 105), cylinder cover flap (part 115) and steps (part 116) in place. Solder four small knobs in the holes in the smokebox and four medium knobs in the boiler holes. Form the handrail to shape, thread on the front medium knob, and fix the handrail in place checking its location in the holes in the cab front.

SECTION 15: CAB

Emboss the rivets on the cab front (part 77, 78 or 79) and attach the inside window frames (part 80 or 81) before soldering in place. Reduce the height of the cab sides (parts 82, 83, 84 or 85) to match the cab front if you have built a round top firebox. Attach the cab cut-out beading (part 86), to the cab sides fitting the etched groove over the edge of the cab side. Assemble the cab seats (part 103 & 104), fitted to some of the class in later years, which are designed to be working. Now remove the seat from the bracket and solder the bracket to the inside of the cab side. Solder the cab sides in position and attach the rear handrails.

Solder part 97, 98 or 99 between the rear edges of the cab sides ensuring the cab roof line will be horizontal. Curve the cab roof (part 87, 89 or 93), and detail according to the diagrams before soldering in place.

Slightly curve the fall plate (part 102) and hinge to the footplate as shown in the diagram.

SECTION 16: FINAL DETAILING

Attach all the remaining 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.

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 cab floor. Solder the backhead to the cab floor so that they become a removable unit. When removed the gearbox passes through the opening in the cab front to allow the body to be removed from the chassis.

I hope, like me, you enjoy the challenge of building your Dean Goods.

Best wishes

Martin Finney
September 1992

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

ETCHED COMPONENTS

1	Frame - Left	58	Front step overlay - 2301-2360 - (2)
2	Frame - Right	59	Buffer beam
3	Guard iron strut - (2)	60	Drag beam
4	Frame spacer - Rear	61	Drag beam buffer rubbing plate - (2)
5	Frame spacer - Firebox front	62	Coupling hook pocket
6	Frame spacer - Front	63	Coupling
7	Frame spacer - ATC shoe mounting	64	Drawbar
8	Hornblocks - Rear coupled axle - (2)	65	Pipe union - circular - (4)
9	Hornblocks - Leading/centre coupled axle - (4)	66	Pipe union - oval - (6)
10	Hornblock ties - rear axle - (2)	67	Reversing rod - straight - 2301-2360
11	Compensation beam - (2)	68	Reversing rod - curved - 2381-2580
12	Spring - middle lamination - (4)	69	Splasher top - front - flush rivets - (2)
13	Spring - outer lamination - (8)	70	Splasher top - middle - flush rivets - (2)
14	Brake hanger/shoe lamination - (12)	71	Splasher top - rear - flush rivets - (2)
15	Coupling hook	72	Splasher top - front - snap head rivets - (2)
16	Portescap gearbox side - (2)	73	Splasher top - middle - snap head rivets - (2)
17	Coupling rod - plain - front - inner lamination - (2)	74	Splasher top - rear - snap head rivets - (2)
18	Coupling rod - plain - front - outer lamination - (2)	75	Splasher back - front - (2)
19	Coupling rod - plain - rear - inner lamination - (2)	76	Splasher back - centre/rear - (4)
20	Coupling rod - plain - rear - outer lamination - (2)	77	Cab front - round top firebox
21	Coupling rod - fluted - front - inner lamination - (2)	78	Cab front - Belpaire firebox - high roof
22	Coupling rod - fluted - front - outer lamination - (2)	79	Cab front - Belpaire firebox - low roof
23	Coupling rod - fluted - rear - inner lamination - (2)	80	Window frame - round top firebox - (2)
24	Coupling rod - fluted - rear - outer lamination - (2)	81	Window frame - Belpaire firebox - (2)
25	Balance weight - early - leading/rear axle - (4)	82	Cab side - 2301-2360 - without rivets - (2)
26	Balance weight - early - centre axle - (2)	83	Cab side - 2301-2360 - with rivets - (2)
27	Firebox front - Round top	84	Cab side - 2381-2580 - without rivets - (2)
28	Firebox rear - Round top	85	Cab side - 2381-2580 - with rivets - (2)
29	Firebox front - Belpaire - (2)	86	Cab side - cut-out beading - (2)
30	Firebox rear - Belpaire	87	Cab roof - steel with side rainstrips
31	Boiler former rear	88	Cab roof side rainstrip - (2)
32	Boiler former front	89	Cab roof - steel with angled rainstrips
33	Firebox side bracket - (2)	90	Cab roof angled rainstrip - (2)
34	Firebox side bracket cover - (2)	91	Steel cab roof rear angle - high roof
35	Cab reversing lever quadrant - (2)	92	Steel cab roof rear angle - low roof
36	Washer - 1/8"	93	Cab roof - canvas covered wood
37	Frame overlay - left	94	Canvas covered roof - side moulding - (2)
38	Frame overlay - right	95	Canvas covered roof - front/rear moulding - (2)
39	Brake hanger pivot bracket - back/front - (4)	96	Canvas covered roof - transverse strip
40	Brake hanger pivot bracket - centre - (2)	97	Cab roof support - round top firebox
41	Brake pull rod - front - (2)	98	Cab roof support - Belpaire firebox - high roof
42	Brake pull rod - rear - inner - (2)	99	Cab roof support - Belpaire firebox - low roof
43	Brake pull rod - rear - outer - (2)	100	Cab floor
44	Brake pull rod safety bracket	101	Cab floor platform
45	Brake hanger overlay - (6)	102	Fall plate
46	Mud door bracket - (2)	103	Cab seat bracket - (2)
47	Balance weight - later - leading/rear axle - (4)	104	Cab seat - (2)
48	Balance weight - later - centre axle - (2)	105	Lamp bracket - (1)
49	Footplate	106	Lamp bracket - buffer beam - centre - (1)
50	Footplate overlay - narrow - 2301-2360, 2381-2450	107	Lamp bracket - buffer beam - outer - (2)
51	Footplate overlay - wide - 2451-2580	108	Smokebox base
52	Valence overlay - left	109	Smokebox front - early
53	Valence overlay - right	110	Smokebox front - later
54	Valence overlay - right with ATC conduit brackets	111	Smokebox rear - (2)
55	ATC conduit bracket strip	112	Smokebox/Boiler ring
56	Rear step tread - upper - 2301-2360 - (2)	113	Smokebox wrapper - flush rivets
57	Rear step tread - upper - 2381-2580 - (2)	114	Smokebox wrapper - snap head rivets

ETCHED COMPONENTS (cont'd)

- 115 Cylinder cover flap
- 116 Smokebox step - side - (2)
- 117 Boiler/round top firebox wrapper
- 118 Boiler jointing strip
- 119 Top feed overlay
- 120 Washout plugs - boiler - (4)
- 121 Firebox wrapper - Belpaire firebox - early
- 122 Firebox wrapper - Belpaire firebox - later
- 123 Washout plugs - firebox - (6)
- 124 Firebox band joining clip - (3)
- 125 Backhead shelf
- 126 Cab pressure gauges - (3)
- 127 Gauge glass lever
- 128 Brake lever
- 129 Whistle lever - (2)
- 130 Washer - 10 BA
- 131 Washer - 1/8"

OTHER COMPONENTS

- 1/8" Flexichas bearing - (6)
- Brass 10BA C.H. screw - - (3)
- 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 dia. - for compensation beams
- Steel wire - 0.8mm - for front compensation beam
- Brass wire - 0.45mm - for brake hanger pivots and handrails
- Brass wire - 0.3mm - fall plate hinges
- Brass wire - 0.7mm - for vacuum pipe
- Brass wire - 0.8mm - for top feed pipe
- Whistle - (2)
- Handrail knob - short - (8)
- Handrail knob - medium - (5)
- Buffer heads, bushes and springs - (2)

BRASS CASTINGS

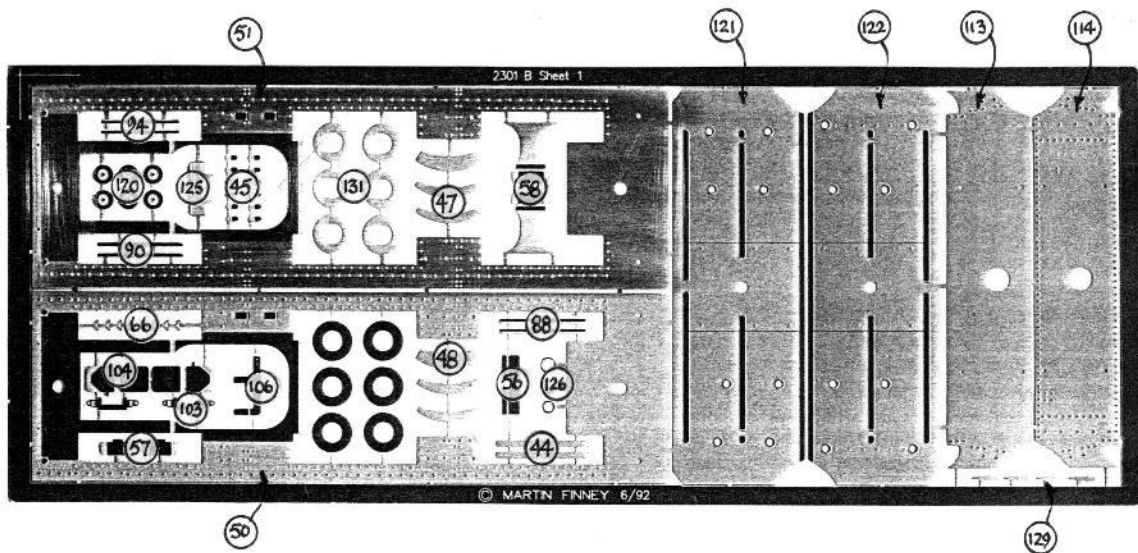
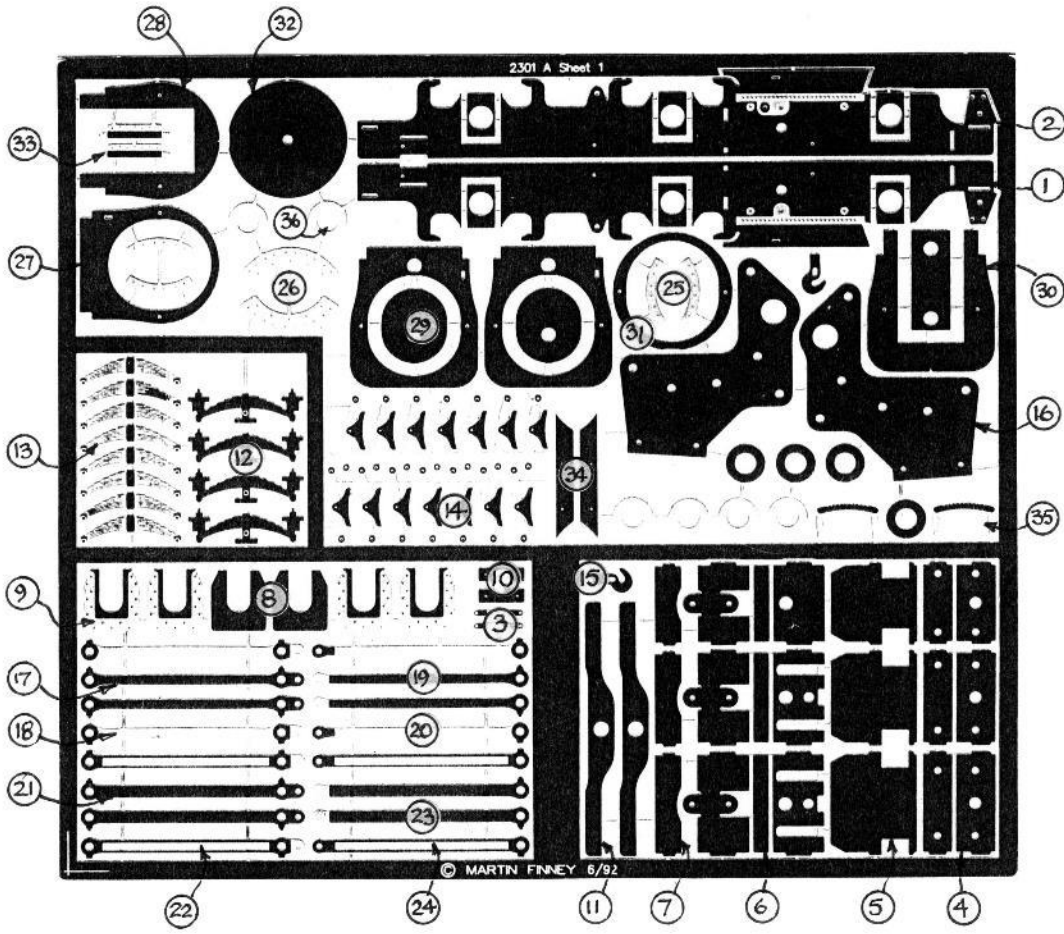
- B1 Dome
- B2 Safety valve casing - Belpaire firebox
- B3 Safety valve casing - round top firebox
- B7 Smokebox door handles
- B8 Vacuum pipe

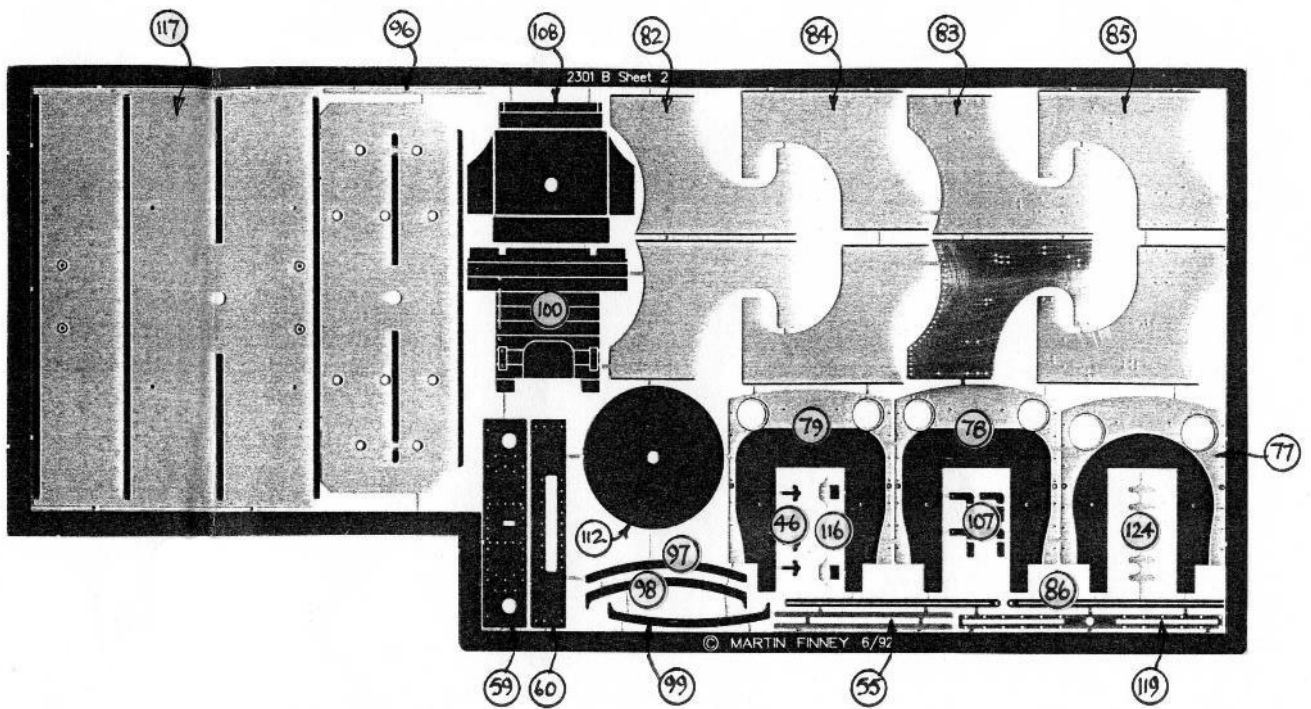
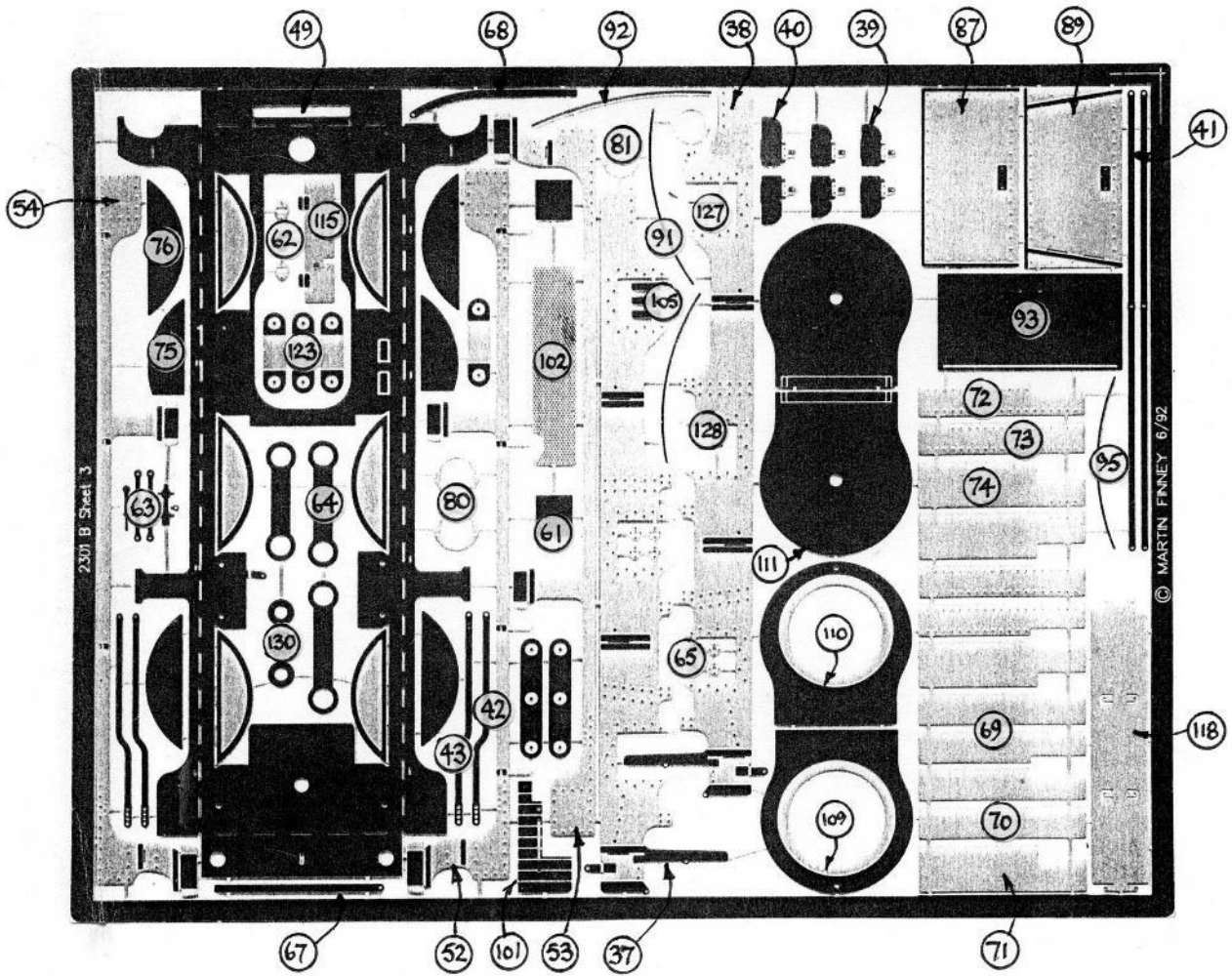
WHITEMETAL CASTINGS

- W1 Chimney - parallel
- W2 Chimney - tapered
- W3 Inside of dome
- W4 Safety valve base
- W5 Safety valve spring - (2)
- W6 Dome lubricator
- W7 Top feed
- W8 Buffer - (2)
- W9 Sandbox - (2)
- W10 Smokebox door - later type
- W11 Smokebox door - old type with ring
- W12 Steam brake cylinder - left hand
- W13 Steam brake cylinder - right hand
- W14 Steam lance cock
- W15 Smokebox pipe cover
- W16 ATC Shoe
- W17 Backhead - Belpaire firebox
- W18 Backhead - found top firebox
- 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 Rear springs - (2)
- W28 ATC bell
- W29 ATC tank
- W30 ATC battery box

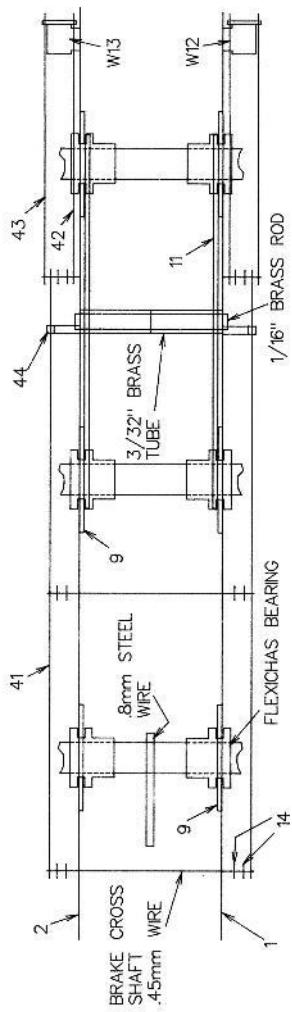
COMPONENTS NOT PROVIDED

- Wheels + crankpins
(prototype - 5' 2" - 16 spokes, 10" throw, pin between the spokes)
 - Ultrascap
 - Alan Gibson
 - Markits
- Motor and gearbox
 - Hi-Level
 - Branchlines
 - Portescap 1219 (available second hand only)
- Suitable pickups

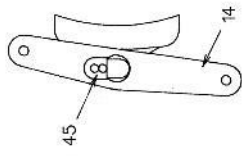




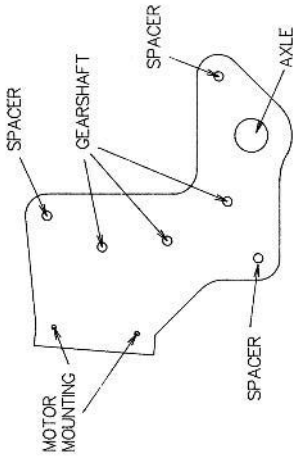
SCHMATIC DRAWING SHOWING BRAKE GEAR AND COMPENSATION BEAMS



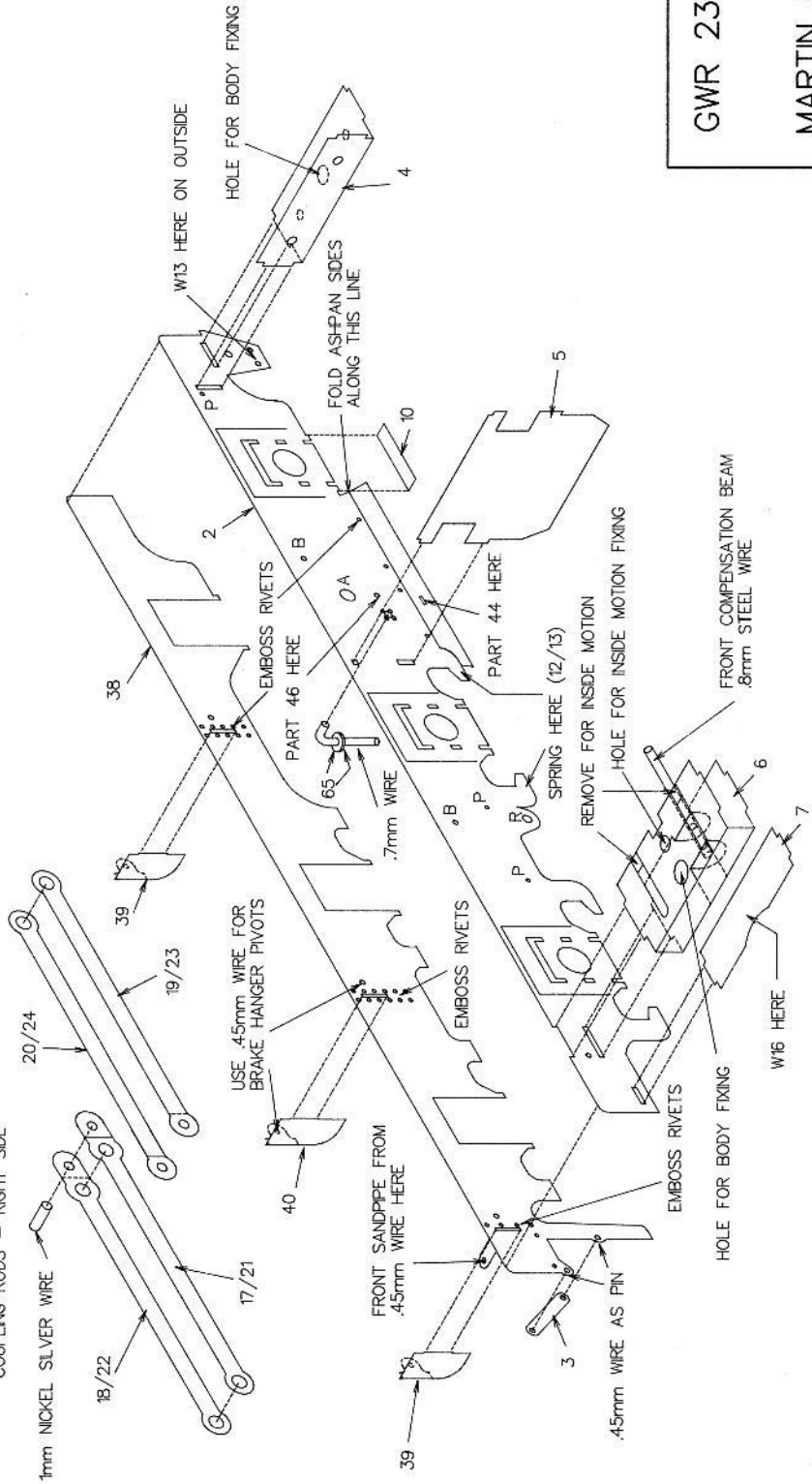
BRAKE HANGER



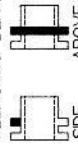
GEARBOX SIDES



COUPLING RODS - RIGHT SIDE



FLEXICHAS BEARINGS

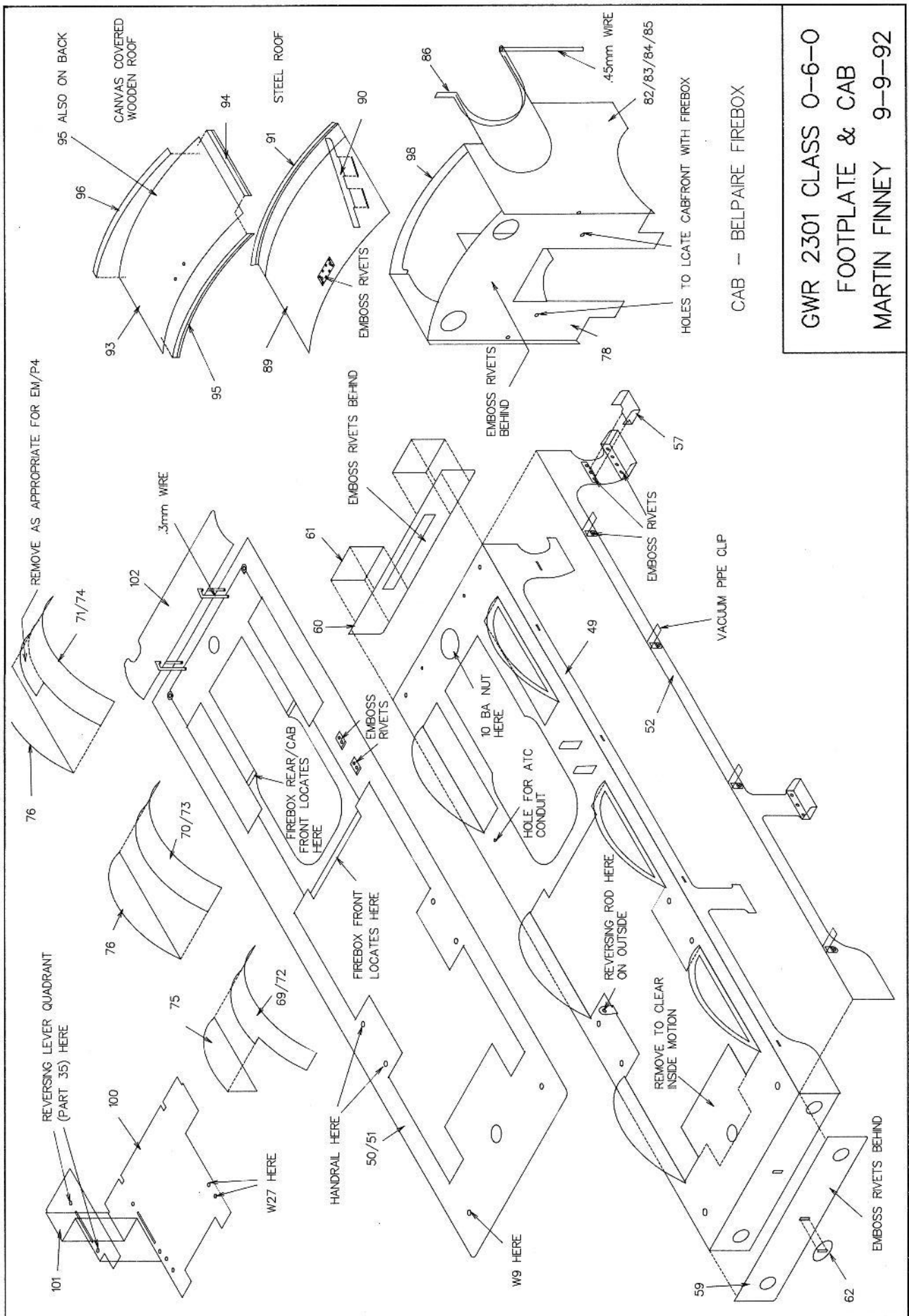


REMOVE SHADED PIECE TO ALLOW COMPENSATION BEAMS TO REST ON BEARING CLOSE TO FRAMES

GWR 2301 CLASS 0-6-0

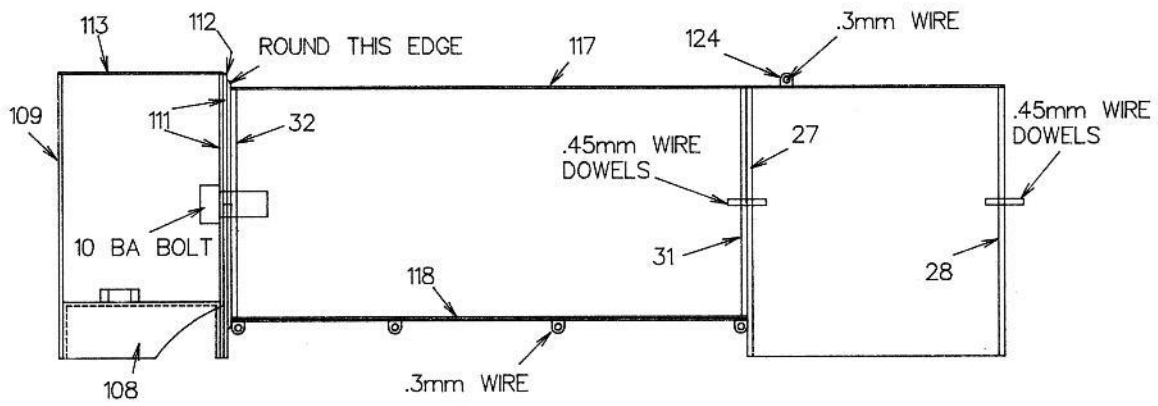
CHASSIS

MARTIN FINNEY 8-9-92

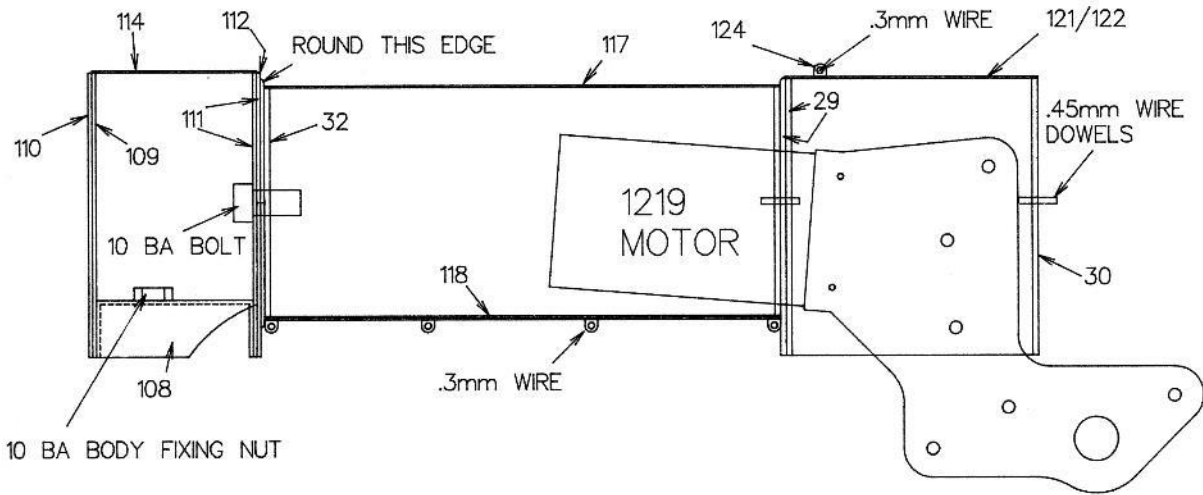


GWR 2301 CLASS 0-6-0
 FOOTPLATE & CAB
 MARTIN FINNEY 9-9-92

SECTION THROUGH SMOKEBOX/BOILER/FIREBOX



ROUNDTOP (S4) FIREBOX – EARLY FLUSH FRONT SMOKEBOX



BELPAIRE (B4) FIREBOX – LATER PRESSED FRONT SMOKEBOX

