

Australian Railway Kits

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NSWGR C36 Round Top 4-6-0 LOCOMOTIVE AND TENDER KIT

E164 Manufactured Exclusively for AR Kits by DJH Engineering from Patterns owned by AR Kits

PLEASE READ INSTRUCTIONS THOROUGHLY BEFORE COMMENCING ASSEMBLY

This kit is largely derived from the C36 Belpaire version kit. Because of this, you will find some components included which actually belong to the Belpaire version, e.g. the etched cab. Therefore please take care when selecting components. In addition, some castings have location holes for detail items which may not be applicable to the particular locomotive you are modelling, e.g. an early C36 without generator and electric lights.

CONSTRUCTION

It is important to ensure that all parts are clean, free of "flash" (excess metal on castings) and fit properly. The "flash line" is easily removed from most areas by scraping gently with a sharp hobby knife - a round blade is more effective than a straight pointed type. Pull the blade along the "flash line" - several light strokes are better than a single one. Some areas are better cleaned up with 6" jewellers' files. Take care not to flatten round parts by filing too heavily. All locating holes for detail fittings should be pre-drilled to the size specified in the instructions. Sometimes it is necessary to clean out these holes with a "rat tail" file; take care not to snap off the tip of the file. Gently wash the castings in warm soapy water to remove mould release residue.

Etched brass items are best removed from the fret by placing the fret on a scrap piece of hard timber (eg Pyneboard) and cutting the tabs with a large Stanley knife - cut the tab at the point furthest away from the part, then trim the tab off close to the part with a small pair of quality side cutters. Hold small parts with a pair of flat nosed (not serrated jaws) pliers while cleaning up with jewellers' files. Be careful not to distort the etchings; they are difficult to straighten if bent or twisted. Drill all required holes before assembly, noting the sizes shown on the drawing, because some holes will be difficult to drill after parts are assembled.

A detailed history of the C36 Roundtop locomotives is covered in John Thompson's book "C36", and an excellent Data Sheet is also available.

Modellers are advised to check photographs of the particular locomotive they have chosen to model, also keeping in mind the era they are modelling. For assistance in general detailing, modellers are referred to the C36 book and Data Sheet's plan and the many photos which appear in Australian railway books and journals.

These kits are designed to give many years of operating pleasure. A little extra time taken during construction will ensure that your kit will do this. It cannot be emphasised too strongly that the basis of a smoothly operating model is care when constructing the chassis and valve gear, i.e. you must double check every step. Check that the axles turn freely in their bearings, check again with the coupling rods on, then again with the connecting rods on, etc, etc.

Assembly methods

The two main construction methods are:

(a) Low melt solder - Low melt solder is an excellent medium for use with white metal kits. It is quick and easy

providing a stronger joint than can be achieved with glue. It has the added advantage of easily repairing minor casting flaws, and because of the relatively low temperature, many parts can be held in the fingers while soldering. Brass to white metal joints can also be made by "tinning" the brass first with normal solder. Low melt soldering requires the correct type of soldering iron (e.g. Dick Smith T2200). These irons have temperature control, as low melt solder only requires temperature between 70 degrees and 200 degrees Celsius. You must use special low melting point solder, such as that available from AR Kits.

IT IS ADVISABLE NOT TO ATTEMPT TO SOLDER ANY CASTINGS WITH A STANDARD SOLDERING IRON

(b) Glue - Superglue and Plastibond are two types of glues suitable for use with this kit. Some modellers prefer to superglue major joints first then "fillet" the joint with Plastibond. Small detail parts are best glued with Superglue. Glue is not recommended for those parts needing good electrical contact, such as the tender bogies.

It does not matter which method you choose but dry fitting parts will ensure a good fit.

The electrical system used on these kits is called "half live". Looking from the top facing forward the locomotive chassis collects current from the live wheels on the right-hand side, shown as LS (live side) on the drawings. The tender is insulated from the locomotive chassis by a plastic bush and current is collected from the wheels on the left-hand side of the tender.

Cleaning up/Painting

On completion, any areas which were soldered should be washed using a soft brush and methylated spirits. Alternatively an excellent pressure pack flux remover is also available from Dick Smith stores. Then wash thoroughly in warm soapy water. Rinse with clean water and allow to dry thoroughly before applying a suitable self-etch primer.

Spare Parts

Spare parts are available on a replacement basis. Should any part be missing or damaged contact AR Kits for a replacement. Should you have any problems with the Mashima motor please do not attempt to repair it yourself - return the motor to us. Mashima will not replace motors which have been tampered with.

Should you have any queries or problems with construction please drop us a note and we will do our best to advise. Likewise we would be pleased to hear any suggestions you may have for improving the kits or instructions.

General

The following drill sizes are required: 0.5mm, 0.6mm, 0.7mm, 0.8mm, 0.9mm, 1.0mm, 1.2mm, 1.5mm, 1.6mm, 1.9mm, 2.0mm, 2.1mm, & 3.7mm.

During construction refer to the drawings at all times. A number of parts are quite similar, so double check if in doubt. Note that attached to the instructions is a photocopy of the lost wax brass castings with each part numbered for easy identification. In the general instructions the part numbers are shown in brackets.

The instructions sometimes refer to the right hand ®/H) and left hand (L/H) side. This is taken as viewing the model from above and looking forward.

To minimise the risk of losing parts, do not remove them from the etched fret or the plastic packing until you are ready to use them. We recommend that you start construction with the tender.

Safety First

These models are not toys and are not suitable for young children. White metal castings contain lead and modellers are advised to wash their hands after working with unpainted white metal castings. When using superglue, solder or when spray painting, ensure your work area is well ventilated

In the wisdom of mice and men somewhere along the road in the development of this model kit something got slightly out of sequence. Generally speaking we would start with the tender and Part #1 and finish with the loco running. However, in the kits we start with the tender which is drawing 7 and then we continue with the rest of the locomotive from Drawing 1 and finish at Drawing 6. So on with the show.

Drawing 7 (Parts 129 - 169)

Bend up the tender body (129) as shown and solder the sides to the end making sure it is square. Glue in tender deck side supports (140x2), and tender deck back support (141), ensuring that they are correctly seated. Bend buffer beam (130) as shown and fix to the body. Fix the tender mainframes (131x2) to the tender body and buffer beam keeping everything square. Fit the draw bar pin (132) using the two M2 nuts (133x2). Fit the turret front (134) keeping everything square. Next fit the turret doors (135) noting that this component does not need soldering as the tabs can be folded back flat to secure in place. Fit tender steps/floor (136) to the turret front (134) and fit flat step treads (137x2). Fold ends of steps (138x2 & 139x2) before fixing in place. Bend the tender deck (142) as shown to form the coal bunker floor and test to make sure it fits correctly in the tender.

Fit the turret sides (144) and (145) to the tender deck/bunker floor, soldering or gluing the tabs at the back only at this stage. Solder in tender body lamp iron (156).

Fit the assembly to the tender as shown, gluing the deck sides to the white metal supports and soldering or gluing the front tabs of the turret sides to the tender floor/coal bunker floor (142) bending as shown so that the bent floor of this part is level and fits the turret front correctly. Fit the turret back (143).

Short one wheel of each of the tender axles (153x4) using 0.7mm wire. Bend up the bogic cross-members (151x2) as shown. Fit the axle bearings (150x8) to the bogic side frames (149x4) using low melt solder if necessary. Now assemble the bogics as shown using the shouldered screws (152x4), making sure that the shorted wheels are both on the same side of each bogic. Fit the bogic bearings (147x2) to the tender floor. These have been pre-tapped to accept the bogic fixing screws (168x2). Now fit the bogics to the tender using the bogic fixing screws and springs (169x2), making sure that the shorted wheels are all on the left side of the tender.

Fit tender air tank (146) and tender brake cylinder (148) under tender. Complete detailing of tender by fitting brake handle standard (154), brake hand wheel (155), footplate lamp irons (157x2), marker lights (158x2), buffers (159x2), air vent (160), water filler (161) tool box A (162), tool box B (163), brake pipe (165), fire irons (166x3) and tablet/staff exchanger (167). Slip six handrail knobs (164) onto a length of 4mm wire and fold as per the drawing. Fit remaining hand rail knobs to the tender before placing tender handrail (with previously fitted knobs) in place.

Drawing 1 (Parts 1 - 32)

Remove any tabs from the frames (1 and 2). Carefully clean out the axle holes with a 3.7mm drill bit and push fit the axle bushes (3x6). The bushes should be a firm fit in the frames - any loose bushes should be soldered in place.

Bend the motor mounting plate (10) as shown.

Assemble the chassis using the chassis spacers (5x2), spacers (6 and 7), motor mounting plate, and screws (4x6).

Solder power clips (12 and 15) to the motor leads as shown. Mount the motor (11) to the motor mounting bracket using screws (13x2) (supplied with the motor), at the same time fixing the positive motor lead.

Cut M2 screw (14) to 10mm and fit to chassis using insulated bush (16), insulated washer (17) and M2 nut (18). Trim spring (19) to 6mm and fit as shown followed by loco tender connection (20), spring plate (21) and M2 nut (22). M2 screw (31) and M2 screw cut to 9mm (32) are used later to mount the body.

Remove the axle nuts (24x6) from the axles (9x3) and fit the live (un-insulated) wheels (26x3) in place with three of the axle nuts. Place a spacer washer (25) onto the front driving axle positioning the axle into the right hand front axle bush, locating the gearbox axle gear (8) onto the axle. Push the axle through the opposite axle bush, fit another spacer washer and then fit an insulated wheel (23), quartered so that the crankpin on the right hand wheel leads that of the left hand wheel by 90 degrees when the axle rotates forward, and fix with an axle nut.

Move the gear to one side of the axle, place a small spot of superglue or Loctite 601 on the centre of the axle and push the gear into the centre of the axle. Make sure that the gear is square with the axle. Be careful not to get any glue or Loctite in the axle bushes. Fit the other axles and wheels as per the drawing. Make sure that all axles rotate freely in the axle bushes.

Now fit the crankpins (27x6) to the wheels using Romford axle nut screw driver, a spot of superglue or Loctite 601 on the thread. Glue the counterweights (29x4) and (30x2) to the wheels. Note that not all of the C36 class locomotives had the extra counterweight parts on the centre drivers, and for those that did, the position varied in relation to that of the main counterweight. Check photographs of the locomotive you are modelling. Glue axle covers (28x6) to the axle nuts.

Drawing 2 (Parts 33 - 51)

Cut M2 cheese head screw (33) to length and then fix to the chassis spacer with nut (34). Fit a crankpin spacer washer (35x6) to each crankpin and fit the coupling rods (36x2). Place a piece of paper on the crankpins and then washers (37x6). The paper will prevent glue or solder from reaching the coupling rods when soldering the crankpin washers in place. Note: For easy removal of the coupling rods during testing, painting etc, strip a short length of insulation from some fine (approx lmm dia.) electrical wire. Push this "tubing" onto the crankpins as a temporary retainer. Complete both sides, cutting the crankpins flush on the front and rear drivers; leave the centre driver crankpins at this stage. File the front crankpin washers down to about half their thickness to help clear the motion gear. Remove the paper and oil all moving parts. Again make sure the moving parts move freely.

Fold rear brakes (38) and centre brakes (39) and fix to chassis. Locate pull rod (40) between frames and to the right hand side, then pass through the .7mm wire as shown. Again using .7mm wire fix leading brake shoes (41x2) in place. Trim .7mm wire flush with outside face of brake shoes.

Assemble the cylinders as shown, using cylinder blocks (44x2), cylinder bodies (45x2), front valve covers (46x2), front cylinder covers (47x2), rear valve covers (48x2), valve crosshead guides (49x2) and rear cylinder covers (SOx2). Then fit cylinder drain cocks (SIx2).

Fit the cylinders to the chassis making sure that the centerline of the cylinders lines up with the centerline of the centre axle.

Fold the motion bracket (42) as shown and glue or solder the motion bracket detail plates (43x2) (left and right hand) onto the motion bracket. Fix the motion bracket to the chassis.

Drawing 3 (Parts 52 - 72)

Trim the piston rod (54x2) as shown and fit to the slide bar (57x2) and then fold the slide bar as shown. Fit the slidebars to the cylinders, fitting the piston rods into the cylinders.

Fit the partly assembled valve gear (55x2) to the cylinder and then, together with partly assembled valve gear (58x2), to the motion bracket using short 14BA screw (59x2) and nut (60), making sure that (58) is outside (55) and both are inside the motion bracket frame.

Fit the small end of the connecting rod (52x2) and the valve gear (55) to the crosshead using the long 14 BA screw (53x2) and nut (56x2).

Making sure that the spacer washer (37) is still in place, fit the big end of the connecting rod to the crankpin of the centre driver, then washer (61x2) followed by the return crank of the valve gear (58). Set the return crank as per the inset drawing and glue or solder in place.

Throughout the assembly of the valve gear make sure that all components move freely.

Short one wheel on each of the locomotive bogie axles (67x2) using 0.7 mm wire. Fit the wheel inserts (69x4) to the wheels and assemble the bogie (66) using keeper plates (68x2) making sure that both shorted wheels are on the same side.

Fit the bogie to the screw on the front spacer of the chassis using the washer (70), spring (71) cut to length as shown, and M2 nut (72), making sure that the shorted wheels are on the right hand side of the chassis.

Assemble the gearbox (62) as per the accompanying instructions trimming the worm shaft as shown. Do not force the worm onto the shaft. Carefully ream the worm bore using a 2.0 mm drill or hand reamer so that the worm fits the shaft without undue force. Use a spot of superglue or Loctite 601 to permanently fix in place. Clean the shaft of excess glue or Loctite thoroughly.

Trim the rubber sleeving (63) to length as shown and fit to the worm shaft of the gearbox - check that the ends of the worm shaft and motor shaft are free of sharp edges which could damage the tubing. Fit the sleeving to the motor and fit the gearbox onto the axle gear. Fit the gearbox keeper plate (64) to the gearbox using screws (65x2).

Drawing 4 (Parts 73 - 91)

Before folding the cab (73), add window detail (79x2) as shown and fit step (76x2).

Solder M2 nut (77) to the cab floor (73). Fit left and right cab backing plates (78). Fit the cab to the cab valance plate (75).

Fold the cab steps and drawbar (84) as shown and fix the other steps (85x2) (A) and (86x2) (X). (A and X are etched on the back of the steps). Fix the left and right hand injectors (87) and (88) to the back of the steps and then fix the unit to the underside of the cab valance plate.

Glue the plasticard (90) to the fall plate (89) and trim the plasticard to 0.5mm larger than the fall plate on the sides and rear (away from the tabs). Bend the tabs on the fall plate and fix to the cab floor using 0.7 mm wire as shown. Fix cab floor (74) followed by cab seats (80 and 81), then boiler back head (82). Note: some modellers may find it easier to fit the cab floor, seats and boiler back head after the cab assembly has been fitted to the footplate/firebox.

Fix handrails to the front of the cab as shown using short handrail knobs (91x7) and the handrails (0.4 mm wire) to the sides of the cab.

Fix the cab roof (83) in place.

Drawing 5 (Parts 92 - 120)

Clean up the footplate (92) removing flash and feed sprue remnants and make sure it is flat and square. Glue or solder an M2 nut (93) to the footplate as shown. Test fit the footplate to the cab and adjust the locating lug if necessary.

Drill all holes in the footplate, boiler (95), firebox (94) at this stage (noting the spigot sizes of the fittings) because some holes would be difficult to drill later on.

Place the boiler and firebox on a flat surface (hang the smokebox end over the end of the flat surface) and glue or solder together.

Glue or solder the cab to the footplate. Fit the boiler/firebox assembly to the footplate and fix in position with the back of the firebox flush with the end of the footplate and butted to the cab.

Noting the drill sizes shown on the drawing, fit detailing parts (96) through (120). Also note that there are optional sandbox fillers (115x2) or (116x2); check photographs of the locomotive you are modelling.

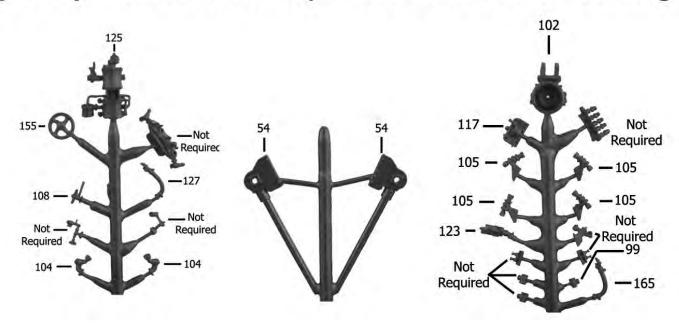
Drawing 6 (Parts 121 - 128)

Fold guard irons (122x2) and buffer beam step (126) as shown before fitting. Finish detailing the locomotive body using steam generator (121), whistle (123), dome safety valve (124), pump (125) and brake pipe (127). Noting wire sizes shown on drawing fashion handrails and fit using hand rail knobs (128Ax19), handrail knobs long (128Bx3) and split pins (128Cx10).

Consult photographs if unsure of the positioning of pipes and handrails or the drawing seems unclear. Test fit to the chassis using cheese head screws (31) and (32) (trimmed as per drawing 1).

Lightly oil the mechanism and test run, checking for electrical "shorts" on sharp curves etc. Also check that the motor does not overheat due to chassis binding.

(E164) - C36 Round Top - Lost Wax Brass Castings



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(164) - C36 - Round Top Parts List Page 1

	<u>ing 1.</u>			0.7mm dia. Wire	
1.	R/H Main Frame	E			
2.	L/H Main Frame	E	Draw	ing 3.	
3.	Bushes x 6	T			
4.	Spacer Screws x 6	T	52.	Connecting Rods x 1 Pair	Е
5.	Spacers x 2	T	53.	14BA x 1/4" C/H Screws x 2	T
6.	Rear Chassis Fixer Plate	E	54.	Crossheads x 1 Pair	L/W
7.	Front Chassis Fixer Plate	E	55.	Radius Rod Assemblies x 1 Pair	E
8.	Gear	T	56.	14BA Nuts x 2	T
9.	Axles x 3	Ť	57.	Slidebars x 1 Pair	Ē
10.	Motor Mounting Plate	E	58.	Return Crank Assemblies x 1 Pair	Ē
11.	Motor	-	59.	14BA x 1/8" C/H Screws x 2	T
12.	Power Clip	E	60.	14BA Nuts x 2	T
13.	Motor Mounting Screws x 2	T	61.	Crankpin Washers x 2	T
14.		T	62.	Gearbox	P
	M2 x 12mm CS Screw	E			P
15.	Powerclip		63.	Rubber Sleeving	P
16.	Insulated Bush	P	64.	Gearbox Keeper Plate	
17.	Insulated Washer	P	65.	Gearbox Screws x 2	T
18.	M2 Nut	T	66.	Bogie Body	W/M
19.	Spring		67.	10.5mm dia. Bogie Wheels x 2	T
20.	Loco Tender Connection	E	68.	Keeper Plates x 2	W/M
21.	Spring Plate	E	69.	Wheel Inserts x 4	E
22.	M2 Nut	T	70.	Bogie Mounting Spring	15
23.	Insulated Driving Wheels x 3	T	71.	Bogie Mounting Washer	E
24.	Axle Fixers x 6	T	72.	M2 Nut	T
25.	Axle Spacing Washers x 6	E			
26.	Live Driving Wheels x 3	T	Draw	ing 4.	
27.	Crankpins x 6	T			
28.	Axle Covers x 6	E	73.	Cab	E
29.	Small Balance Weights x 4	E	74.	Cab Floor	W/M
30.	Large Balance Weights x 2	E	75.	Cab Valance Plate	W/M
31.	M2 x 16mm C/H Screw	T	76.	Cab Step x 2	E
32.	M2 x 16mm C/H Screw	T	77.	M2 Nut	T
			78.	Cab Backing Plates x 1 Pair	E
	Insulated Wire		79.	Window Detail x 2	E
			80.	Cab Seat L.H.	W/M
Drawing 2.			81.	Cab Seat R.H.	W/M
21411	<u></u>		82.	Boiler Backhead Detail	W/M
33.	M2 x 16mm C/H Screw	T	83.	Cab Roof	W/M
34.	M2 Nut	Ť	84.	Cab Steps and Drawbar	E
35.	Crankpin Spacer Washers x 6	Ť	85.	Large Step Treads x 2	Ē
36.	Coupling Rods x 1 Pair	E	86.	Small Step Treads x 2	E
37.		T	87.	L.H. Injector	W/M
	Crankpin Washers x 6				
38.	Rear Brakes x 1 Pair	E	88.	R.H. Injector	W/M
39.	Centre Brakes x 1 Pair	E	89.	Fall Plate	E
40.	Pull Rod	E	90.	Plasticard	P
41.	Leading Brakes x 1 Pair	E	91.	Handrail Knobs x 7	T
42.	Motion Bracket	E		And the Control of the Control	
43.	Motion Bracket Detail Plates x 1 Pair	E		0.4mm dia. Wire	
44.	Cylinder Blocks x 2	W/M		0.7mm dia. Wire	
45.	Cylinder Bodies x 1 Pair	W/N			
46.	Front Valve Covers x 2	W/M	Draw	<u>ing 5.</u>	
47.	Front Cylinder Covers x 2	W/M			
48.	Rear Valve Covers x 2	W/M	92.	Footplate	W/M
49.	Valve Crosshead Guides x 1 Pair	E	93.	M2 Nut	T
50.	Rear Cylinder Covers x 2	E	94.	Firebox	W/M
51.	Cylinder Drain Cocks x 2	E	95.	Boiler	W/M
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(E164) - C36 - Round Top Parts List Page 2

97.	Safety Valve	W/M	149.	Bogie Side Frames x 4	W/M
98.	Safety Valve	W/M	150.	Pinpoint Bearings x 8	T
99.	Steam Generator Valve	L/W	151.	Bogie Cross Members x 2	E
100.	Dome	W/M	152.	Bogie Side Frame Fixing Screws x 4	T
101.	Chimney	W/M	153.	10.5mm dia. Pinpoint Tender Wheels	
102.	Headlight	L/W		x 4 Pairs	T
103,	Smokebox Door	W/M	154.	Brake Handle Standard	W/M
104.	Clack Valves x 2	L/W	155.	Brake Handwheel	L/W
105.	Anti Vacuum Valves x 4	L/W	156.	Tender Body Lamp Iron	E
106.	Marker Light x 2	W/M	157.	Footplate Lamp Irons x 2	E
107.	Injector Valves x 2	W/M	158.	Marker Lights x 2	W/M
108.	Smokebox Door Handle	L/W	159.	Buffers x 2	W/M
109.	Small Air Tank	W/M	160.	Air Vent	W/M
110.	Buffers x 2	W/M	161.	Water filler	W/M
111.	Dummy Coupler	W/M	162.	Tool Box A	W/M
112.	Lamp Irons x 2	E	163.	Tool Box B	W/M
113.	Footplate Steps x 2	E	164.	Handrail Knobs x 18	T
114.	Steam Pipes x 2	W/M	165.	Brake Pipe	L/W
115.	Short Sandbox fillers x 2	W/M	166.	Fire Irons x 3	E
116.	Tall Sandbox Fillers x 2	W/M	167.	Tablet /Staff Exchanger	W/M
117.	Mechanical Lubricator	L/W	168.	Bogie Fixing Screws x 2	T
118.	Air Tanks x 2	W/M	169.	Bogie Mounting Springs x 2	
119.	Reversing Rod	E			
120.	Screw Reversing Rod Housing	W/M		0.4mm dia. Wire	
				0.5mm dia. Wire	
Drawin	ng 6.			0.7mm dia. Wire	
121.	Steam Generator	W/M		Drill Sizes - Key	
122.	Guard Irons x 1 Pair	E			
123.	Whistle	L/W		0.5mm dia A	
124.	Dome Safety Valve	W/M		0.6mm dia B	
125.	Pump	L/W		0.7mm dia C	
126.	Buffer Beam Step	E		0.8mm dia D	
127.	Brake Pipe	L/W		0.9mm dia E	
128a.	Handrail Knobs Short x 19	T		1.0mm dia F	
128b.	Handrail Knobs Long x 3	T		1.2mm dia G	
128c.	Splitpin x 10	T		1.5mm dia H	
				1.6mm dia I	
Drawin	<u>ng 7.</u>			1.9mm dia J	
	4.34.			2.0mm dia K	
129.	Tender Body	E		2.lmm dia L	
130.	Buffer Beam	E		3.7mm dia M	
131.	Main Frames x 1 Pair	E			
132.	Drawbar Pin	T			
133.	M2 Nut x 2	T			
134.	Turret Front	E			
135.	Turret Doors	E			
136.	Steps/Floor	E			
137.	Flat Step Treads x 2	E			
138.	Large Step Treads x 2	E			
139.	Small Step Treads x 2	E			
140.	Tender Deck Side Supports x 2	W/M			
141.	Tender Deck Back Support	W/M			
142.	Tender Deck	E			
143.	Turret Back	E			
144.	L.H. Turret Side	E			
145.	R.H. Turret Side	E			
146	Tender Air Tank	W/M			

W/M

W/M

146.

147.

148.

Tender Air Tank

Tender Bogie Bearings x 2 Tender Brake Cylinder

