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CT3 Caledonian Railway McIntosh 3570 Gallon Tender, Type M3

Prototype notes and building instructions

Parts required to complete

- 1 Wheels - 4'0" diameter, 12 spoke
- 3 Paint and transfers.
- 4 Couplings.

Part 1 Prototype Notes

These tenders were originally built for the Class 600 0-8-0s and the Classes 908, 918 and 179 4-6-0s in 1901-1914. As with many Caledonian designs, they were evolutionary rather than revolutionary being derived from a Lambie design of 1894 but with a wider platform and benefiting from a water-level gauge.

In the late 1920s and early 1930s as these classes were being scrapped (for example all 8 members of the 600 class were scrapped between 1927 and 1929) the tenders were decanted onto 4-4-0s such as the Dunalastair III displacing large bogie tenders. By the 1930s such massive tenders were no longer required for two main reasons :-

- 1) The L.M.S. had fitted the Caley main lines with water troughs, and
- 2) The Caledonian 4-4-0s were no longer top link locomotives making regular long runs.

Water capacity was no longer at a premium and the smaller 6 wheel tenders were lighter to haul and cheaper to maintain being mechanically less complicated than the bogie tenders.

3570 Gallon Tender Dimensions

Wheelbase :	
Total	13'0" (6'6" + 6'6")
Frames :	
Length	22'1'
Depth	2'4 ³ / ₄ "
Tank :	
Length	20'
Breadth	7'1 ¹ / ₄ "
Depth	4'4 ¹ / ₂ "
Well Length	15'0 ¹ / ₄ "
Platform Width	7'8"
Length over buffers	23'9 ¹ / ₂ " (tender only)
Wheel Diameter	4'
Coal Capacity	4 ¹ / ₂ T
Weight in Working Order	41T 0 ¹ / ₂ cwt.

Building Instructions

Section 1 Parts list

Please check the contents of your kit and inform me of any shortages. If for any reason you wish to purchase parts separately, I can give you a quote for any part unless it is on an etched fret. Normally complete frets only are available.

N.B. Numbers in brackets following a part name are the quantity supplied when other than 1; numbers preceding a part name are identification numbers which will be found along side the part on the appropriate etch. Wire etc. will be found taped to the box lid.

1 Tender etch containing :-

1 Footplate, 2 Tank frame and top, 3 Tank, 4a Tank coping — Right side (from front), 4b Tank coping — Rear, 4c Tank coping — Left side, 5 Sidesheets (2), 6 Floor plate, 7 Coal hole door, 8 Footplate boxes (2), 9 Footplate box lids (2), 10 Coalspace tool box, 11 Coalspace tool box lid, 12a Coalspace rear partition — Front, 12b Coalspace rear partition — Rear, 13 Coalspace rear partition supports (2), 14 Frames (2), 15 Valance (2), 16 Buffer beam, 17 Drag beam, 18 Upper step treads (2), 19 Lower step treads (2), 20 Brake cross shaft supports (2), 21 Brake rod coupling, 22 Handbrake coupling, 23 Handbrake clevis, 24 Doors (2), 25 Brake standard, 26 Tank top strengthening rib.

2 Tender chassis etch containing :-

Inside frames (2), Front, centre and rear frame spacers (one each 00 and EM/P4), Draw hooks (2 of differing lengths), Brake hangers (6), Brake pull rods (2).

3 Cast fittings :-

Tender axleboxes and springs (6), Tank fillers (2), Westinghouse pipe, Steam heat pipe, Vacuum pipe.

4 Miscellaneous parts:-

Compensation pack, 0.45mm wire, 0.9mm wire, Brass rod, Bolts (2), Nuts (2), Sprung buffers (2), 2mm bore bearings (6), Split pin.

Section 2 General

- 2.1 Read the instructions and identify all the parts. Note that the sketches are not to scale unless otherwise annotated.
- 2.2 Always refer to a photograph of your chosen prototype as you build the model. Small differences did exist between the various tenders, especially as they got older.
- 2.3 Please study the General Building Notes if you are not familiar with etched brass kit construction in general and Caley Coaches products in particular.

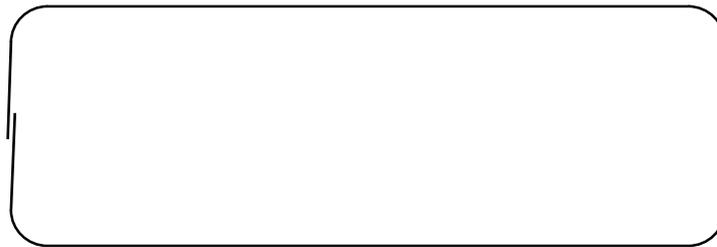
Section 3 Tender Chassis

- 3.1 Remove the frames from the fret and, if you are compensating the chassis, remove the sections around the centre and front axleholes along the half-etch lines with a piercing saw. It helps to keep the saw edge close to the end of the work bench at all times, and press down hard on the frame with your fingers. Keep the saw vertical and let the blade do the work on every down stroke. Saw up to the top of the line only then saw up the other vertical. Using a pair of pliers, push the sawn part back (folding it on the top half etched line) and wobble it until it breaks off cleanly.
- 3.2 Check that the flexichas bearings can easily slide up and down in the sub-hornblocks. If not, gently and carefully open the slots until this can be achieved. Take extreme care not to overdo this as a bearing that is able to slide back and forth in its block is not conducive to good running. It is a good idea to pair bearings and hornblocks as small manufacturing differences can be present in either.
- 3.3 Select the frame spacers appropriate to your gauge and bend to "L" forms. Working from front to rear, locate the spacers in the slots of one side frame and solder. Now solder the other sideframe to the spacers.
- 3.4 Locate the top-hat bearings in place for the rear axle (or all six axles if you aren't using compensation) opening up the holes slightly if necessary. Take care to keep the holes circular. Align the bearings with an axle and solder in place.
- 3.5 Solder the hornblocks to one of the sideframes (the spacing isn't critical) and then, taking care to keep everything square, solder the hornblocks to the other sideframe using the axles to ensure alignment. Fit the bearings and solder retaining wires across the bottom of the hornblocks.
- 3.6 The pivot of the compensation beam locates in the holes in the sideframes between the front and centre axle which should be drilled out to suit the diameter of the brass rod supplied. Cut a length of this rod to the dimension over the outside of the frames and a length of the tube which is a sliding fit on the rod to be a neat fit inside the frames. Locate the tube in position between the frames and insert the rod through it. Solder the rod to the outside of the frames taking great care that the tube is still able to pivot round the rod. Some Carr's solder mask smeared onto the ends of the tube prior to assembly should ensure that it doesn't get soldered solid. Use a length of brass rod as a compensation beam and solder it at right angles such that it is able to bear onto the centre of the front and middle axles.
- 3.7 Pass 0.45mm wire through each of the brake hanger locating holes in the chassis, solder in place then locate the brake hangers on them allowing due clearance for your chosen wheels.

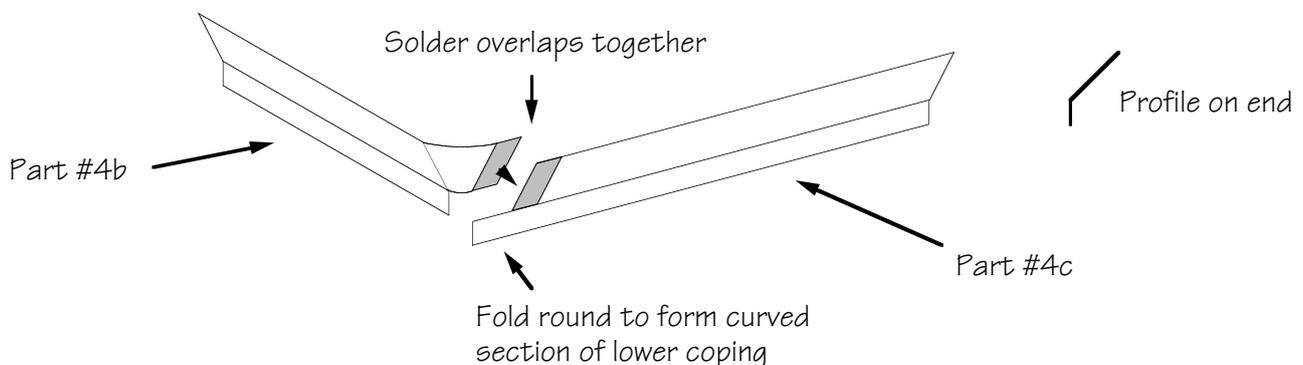
- 3.8 Clean up and paint the chassis then fit the wheels.
- 3.9 Your final task on the chassis is to pass 0.45mm wire through the lower holes on each pair of brake hangers and then to solder the brake pull rods to these.

Section 4 Tender frames and body

- 4.1 Remove the footplate (part #1) from the body etch, remove and carefully store parts contained within it. Solder a nut to the top of the footplate at each of the chassis mounting points. Note that the half-etched grooves in the footplate go on the bottom.
- 4.2 The tank frame (part #2) is formed by folding the tank side supports down at 90° to the tank top/ coalspace floor then gently bending the coal space floor to the profile of the side supports and soldering in place. Fold over the front extension at 90° along the half-etched line.
- 4.3 Solder the frame to the footplate locating the tabs of the frame in the slots of the footplate.
- 4.4 Form the tank body (part #3) by making 4 2mm radius 90° bends — the start and end of each is indicated by a pair of half etched lines on the rear side. The body should now be shaped as per the diagram below.



- 4.5 Place the tank over the frame with the half etched area of the sides and rear to the top. Note that the tank has an area of overlay at the coal hole which is half-etched — carefully align the top edges here and taking care that the width is correct solder the overlapping sections together. Working on the inside of the tank, solder the tank to the frame.
- 4.6 Fold the tank coping (part #4) out at 45° along the half-etched line on each section. Form the corners on the rear section to give a conical section as per the sketch below. Leave the beading attached but do not fold over yet.

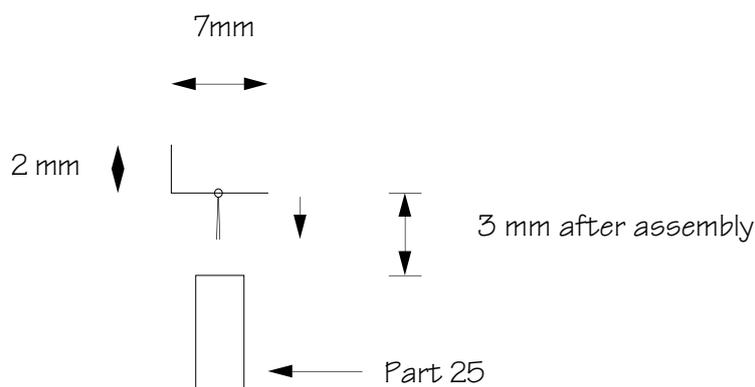


- 4.7 Solder the rear section of the coping (part #4b) centrally to the half-etched recess on the rear of the tender. Solder one of the side coping pieces to the rear piece overlapping the half-etched sections. Now solder the side section to the tank gently forming it to follow the curve of the tank at the front. Repeat with the other side section. Fold the lower extension

pieces on the side round the rear curves to meet the rear section and solder in place.

- 4.8 Solder the front sidesheets (part #5) in place using the tabs on their bottoms for alignment.
- 4.9 Starting with the rear section, tin the outside of the coping bead and fold over at 180° such that it lies flat on the coping. Form the rear section round the curves and solder in place. Now work along the side sections and at the front of each side curve the beading round and down the over the top of the sidesheets — the sidesheets should locate in the half-etched grooves in the beading. All this sounds rather complicated but in fact once you start working with the metal it should all fall into place !
- 4.10 Dress the top of the coping with a file to remove all traces of the tabs which held the beading in place.
- 4.11 Fold down the sides of the floor plate (part #6) and solder in place with the pair of slots with run across the width of the tender to the front.
- 4.12 Bend up the edges of the coal hole door (part #7) at 90° and solder in place over the coalhole — this helps to disguise the soldered overlap!
- 4.13 Fold the two footplate boxes (part #8) to form Ls and solder to the floor. Fit the lids (part #9) with the one with the hole to the left when looking from the front of the tender towards the rear.
- 4.14 Fold up the brake standard (part #25) into a U and fold over its top. Solder in place passing it through the hole in the left-hand footplate box.
- 4.15 Fold up the coalspace tool box (part #10) and solder down the seam. Bend over the bottom of the legs at 90°. Fit in place in the right-hand side of the coalspace just behind the bulkhead (see G.A. drawing).
- 4.16 Fold over the hinges and hasp of the tool-box lid (part #11) and solder in place — the two hinges go nearest the coping.
- 4.17 Tin the insides of the two halves of the coalspace rear partition (part #12) and sweat together. Solder in place to the tank top using the tabs and slots for alignment — remember, the rear is the side with the two upright supports.
- 4.18 Form the coalspace rear partition supports (part #13) into Ls and solder to the rear of the partition.
- 4.19 Fold over the bottom and sides of the tank top strengthening rib (part #26) to form an L and solder in place to the top of the tank 6mm behind the coalspace rear partition — the leg of the L goes towards the rear.
- 4.20 Solder the footplate valances (part #15) into the locating grooves on the underside of the footplate, checking that the footplate overhang is equal front and rear.
- 4.21 Solder the buffer beam (part #16) below the rear of the footplate and to the valances.
- 4.22 Solder the drag beam (part #17) below the front end of the footplate and to the valances.

- 4.23 The (dummy) outer frames (part #14) locate in notches along the edges of the hole in the footplate with the little cutouts (which are there to clear the buffers) to the rear and the half-etches recesses to the inside. Solder the frames in place.
- 4.24 Fold the step treads (parts #18 (lower) and #19 (upper)) into Ls and solder to the half-etched recesses on the step supports which are integral with the valance.
- 4.25 Solder the brake cross shaft supports (part #20) to the recesses in the inside front of the frames. Looking from the front and working left to right, thread a length of brass rod through the left-hand support, thread the hand brake coupling (part #22) onto the rod followed by the brake rod coupling (part #21) and finally pass the rod into the right-hand support. Solder the rod to the supports and trim back flush.
- 4.26 Fold over the end of the handbrake clevis (part #23) and solder this flap to the underside of the tender floor such that the main length projects down in line with the etched hole. Align the hand brake coupling on the rod and solder to the clevis and to the rod.
- 4.27 Moving on to the cast fittings, solder the tank filler, hinge to the rear, in place on the rear tender top.
- 4.28 Solder the six axleboxes and springs in place on the dummy outer frames.
- 4.29 Fold up a length of 0.45mm wire as shown below, trap in the split-pin and pass the ends of the split pin into the hole in the top of the brake standard.



- 4.30 Bend up the four handrails from 0.45mm wire in fit in place.
- 4.31 Fit the rear buffer bases —the heads are probably best left off until after painting.
- 4.32 The tenders had varying arrangements of hoses and pipes according to period and the brake etc. arrangements of the loco to which they were coupled. As ever photographs are your only true guide. Make up any pipes you require and fit together with the appropriate hoses.

Section 5 Final Assembly

- 5.1 Thoroughly clean the all parts to remove all trace of flux etc.
- 5.2 Paint, line and letter according to your chosen prototype and period.
- 5.4 Fit the sprung buffer heads taking care to get the projection of the heads correct.

- 5.5 Mate body and chassis using the supplied bolts — the draw hook goes through the slot in the drag beam as it pivots on the front bolt.
- 5.6 Align the brake rod coupling with the pull rods on the chassis the solder the coupling to the support rod such that it looks as though the coupling and pull rod are joined.

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Jim Smellie Last revision August 2007

Caley Coaches

'True Line' kits in etched brass

Caledonian Railway McIntosh 3570 gallon tender

Type M3

