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## CT1 Caledonian Railway McIntosh 3000 Gallon Tender, Type M2

### 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

Evolving from an original Dugald Drummond design of 1883, these tender were first built for the class 812 0-6-0 locomotives in 1899. They were also built for the class 652 0-6-0 (a development of the 812) of 1908, the class 30 0-6-0 and the class 34 2-6-0, both dating from 194. In L.M.S. days they were also often to be seen behind the "Jumbo" or class 294 0-6-0 in place of their original smaller tenders as the first recipients were either scrapped (in the case of the 30 and 34 classes) or received other tenders from scrapped 4-4-0 locomotives.

Some fifty of these tenders (and the class 812 locomotives to which they were originally coupled) were built by the three then separate constituent companies of the Noth British Locomotive Co., Dübs, Neilson Reid and Sharp Stewart, and here lies a small mystery. The Neilson Reid drawing shows the toolbox running along the length of the tender but all photographs which I have available show the toolbox sited across the tender just behind the coalplate. Unfortunately the Mitchell Library does not hold the negative of the official Neilson Reid photograph and those from Dübs and Sharp Stewart have both been heavily retouched to blank out the background rendering the toolbox invisible. I am thus left wondering if any tenders ever had the toolbox sited in the position shown in the original drawing. Was the resiting a late change to the specification or an early change once the engines were in service ?

In later L.M.S./B.R. days tender swapping became rife and so the above list of classes to which these tenders were coupled should not be regarded as exhaustive during this time. Judging by

the classes to which it is known these tenders were coupled they should have become extinct in about 1963 with one honorable exception still in existence coupled to C.R. number 828, preserved at Boat of Garton on the Strathspey Railway. One can never be too sure about the withdrawal of tenders however - the operating department tended to hold on to serviceable examples for many purposes such as service in weed-killing trains etc. although at the time these would have been withdrawn many newer examples would be going a-begging.

## Dimensions

Wheelbase	: 6'6" + 6'6"
Outside frames :	
Length	: 22'1"
Depth	: 2'4¾"
Tank outside dimensions :	
Length	: 20'0"
Breadth	: 7'1¼"
Depth	: 3'7½ "
Inside well	
Length	: 15'1¼"
Breadth	: 4'0"
Platform width	: 7'8"
Wheel diameter	: 4'0", 12 spoke
Coal capacity	: 4½ tons
Water capacity	: 3000 gallons
Weight in working order	: 37T 18cwt.
Weight when empty	: 19T 10cwt.

## 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.

The supplied parts, together with these instructions, assume that you are building the kit with compensated chassis for the loco and tender. If you are not, please return the compensation packs to me unopened with a note of your name and address. I will then be happy to forward the required bearings and modified instructions to enable you to build rigid chassis.

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 Valances (2), 3 Frames (2), 4 Buffer beam, 5 Drag beam, 6 Tender body, 7 Tender front, 8 Tender top/bunker inset, 9 Front footplate, 10 Front footplate side supports (2), 11 Front footplate front support, 12 Front side panels (2), 13 Right hand side box, 14 Right hand side box top, 15 Left hand side box, 16 Left hand side box top, 17 Toolbox, 18 Toolbox top, 19 Toolbox supports (2), 20 Coal plate, 21 Coal plate brackets (2), 22 Top flare panel, 23 Upper steps (2), 24 Lower steps

(2), [Unnumbered] Tank top strenghtening 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 :-

Brake stanchion, 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, 10BA bolts (2), Sprung buffers (2), 6 2mm bore bearings.

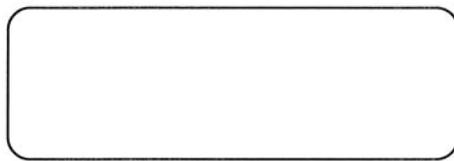
## **Section 2 Tender Chassis**

- 2.1 Remove the frames from the fret and remove the sections around the centre and front axleholes along the half-etch lines with a piercing saw.
- 2.2 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.
- 2.3 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.
- 2.4 Locate the top-hat bearings in place for the rear axle opening up the holes slightly if necessary. Take care to keep the holes circular. Align the bearings with an axle and solder in place.
- 2.5 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.
- 2.6 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 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 be pivot round the rod. Some Carr's solder mask smeared onto the ends of the 1mm bore 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.
- 2.7 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.
- 2.8 Clean up and paint the chassis then fit the wheels.

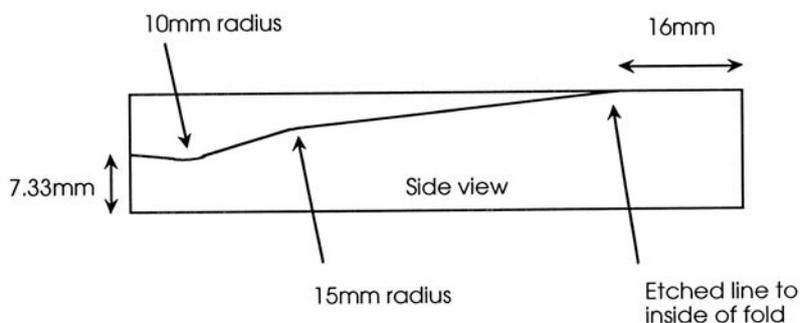
- 3.9 Your final task on the chassis is to pass 0.45mm wire through the lower holes on each pair of brake hangers and then to solder the brake pull rods to these.

### Section 3 Tender frames and body

- 3.1 Remove the footplate (part 1) from the body etch, remove and carefully store the steps (parts 23 and 24) contained within it.
- 3.2 Solder the footplate valances (part 2) into the locating grooves on the underside of the footplate, checking that the footplate overhang is equal front and rear. Note that the rear of the footplate is the end with the two location slots for the tank body.
- 3.3 Solder the buffer beam (part 4) below the rear of the footplate and to the valances.
- 3.4 Solder the drag beam (part 5) below the front end of the footplate and to the valances.
- 3.5 Solder a nut to the top of the footplate at each of the chassis mounting points.
- 3.6 The (dummy) outer frames (part 3) locate in notches along the edges of the hole in the footplate with the little cut-outs (which are there to clear the buffers) to the rear. Solder the frames in place.
- 3.7 Form the tender body (part 6) by making 4 2mm radius 90° bends centered on the two pairs of rear handrail location holes and the half etched dots about 2mm from either end of the piece. The body should now be shaped as per the diagram below.



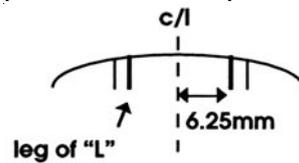
- 3.8 Solder the tender front (part 7) to the body such that they are level top and bottom, the width inside the body is consistent throughout its length and that the curved side of the coal hole is uppermost!
- 3.9 Match the tender top/bunker inset (part 8) to the profile shown in the following drawing and solder in place inside the body.



- 3.10 Solder the tank assembly to the frames using the pips at the rear of the body as a location guide.
- 3.11 Take the front footplate (part 9) and solder its front support (part 10) to it at right angles along one of the long edges. Now solder the side supports (parts 8) in place along the short

edges and fix the assembly in place on the footplate in front of the tank.

- 3.12 Fix the front side panels (parts 12) in place, locating with the tank front and the front footplate.
- 3.13 Fold up the front boxes (parts 13 and 15), fix to the front footplate and then solder their tops (parts 14 and 16 respectively) to them. Doing it this way makes sure you get a handed pair as required.
- 3.14 Fold the lower section of the top flare panel to about 30° as shown below and then solder it around the half etch in tank body top. Perhaps the easiest way to do this is to start at the back, centering the section between the two sets of "fingers", and then work round the sides bending the panel as you go. Flare the "fingers" at the corners to the correct profile and then fill in the gaps with electrical solder. Be quick with iron to keep the Carr's 188 solder (which won't fill well enough for this job) from melting.
- 3.15 Solder a length of 0.45mm wire along the half etch in the top of the flare panel as a beading.
- 3.16 Solder the coal plate (part 20) in place at the bend 16mm from the rear of the tender top/ bunker inset and bead with 0.45mm wire.
- 3.17 The coal plate brackets (part 21) locate on the rear of the coal plate as shown, 6.25mm from the centre line to the leg of the "L". There is a small error on the etch here as the parts should be handed so you will need to fold one of them inside out - i.e. with the half etched line to the outside of the fold. Fold up and solder in place.



- 3.18 Fold over the bottom and sides of the tank top strengthening rib (unnumbered) 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.
- 3.19 Fold up the toolbox (part 17) and solder up its seam. Bend up the hinges and hasp of the box top (part 18) and solder onto the box.
- 3.20 Fold the toolbox supports (parts 19) to "L" shapes and solder the long arms to the bottom of the toolbox, one at either end.
- 3.21 As mentioned in the prototype notes, there is a small problem about the toolbox position but unless you have photographic evidence to the contrary I would fit it transversely across the top of the tender body front (part 7), flush at the right hand end (when looking from the front of the tender).
- 3.22 Recover the steps (parts 23 and 24) which you carefully stored earlier (didn't you?) and fold to "L" shapes. Solder the lower steps (part 24) to the bottom of the step supports (etched integrally with the valances) and the upper steps (part 23) 5.75mm above them (or to match your loco).
- 3.23 Moving on to the cast fittings, solder the tank filler, hinge to the rear, in place on the rear tender top.

- 3.24 Drill a small hole down through the right hand side box to take the brake lever and fit in place.
- 3.25 Solder the six axleboxes and springs in place on the dummy outer frames.
- 3.26 Bend up the four handrails from 0.45mm wire in fit in place.
- 3.27 Fit the rear buffer bases. Again the heads are probably best left off until after painting.
- 3.28 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 4 Final Assembly**

- 4.1 Thoroughly clean the all parts to remove all trace of flux etc.
- 4.2 Paint, line and letter according to your chosen prototype and period.
- 4.4 Fit the sprung buffer heads taking care to get the projection of the heads correct.
- 4.5 Mate body and chassis using the supplied 10BA bolts.

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*Jim Smellie* Last revision August 2007

*Caley Coaches*  
'True Line' kits in etched brass

**Caledonian Railway  
McIntosh 3000 gallon tender**

Type M2

