

C.R. numbers 887-902;
L.M.S. numbers 14337-48 (saturated), 14434-7 (superheated)

General Description

Built at the St. Rollox works of the Caledonian Railway between December 1899 and July 1900 to order numbers Y57 (900-902) and Y62 (887-899), the 16 locomotives of this class were designed by John F. McIntosh for top-link express duties. They were a logical progression in the development of Caledonian 4-4-0 designs which could be traced back to Drummond Class 66 of 1884 and which evolved through number 124 built by Dübs for the 1886 Edinburgh International exhibition, the 1888 "Coast Bogies" and the Lambie Class 13 of 1894, reaching its zenith in the famous Dunalastair series of designs of 1895-1904 and culminating in the Pickersgill designed Class 113 of 1916. Although no engine ever carried the name, the Class 900 are generally known as the Dunalastair III class, Dunalastair being an estate in Perthshire owned by the Caledonian's then deputy chairman, J.C. Bunten.

Set beside their immediate predecessors, the Class 766 or Dunalastair II, the firebox was lengthened by 6" and deepened by 3", the coupled wheelbase was increase by 6" and the boiler set 3" higher. The higher pitch of the boiler necessitated a shorted chimney so as to remain with the loading gauge and this in turn led to changes in the draughting. The design of the boiler was modified gaining 4 tubes to bring the total to 269, a slightly higher working pressure (180 lb.in.⁻² as opposed to 175 lb.in.⁻²) and an improved design of firebox crown which was stayed by two pairs of angle-irons, the members of each pair being linked by a bar. The tractive effort was raised by some 500 lb. from 17 900 lb. to 18 411 lb.

The shape of the cab lookout changed to a continuous curve which was much more in keeping with the lines of the engine than the rather boxy cut-out of the Class 766.

Gresham and Craven No. 9 combination injectors were fitted on the faceplate occupying most of the available space and displacing the driver's brake which was perforce attached to

the cab side. Gresham and Craven steam sanding apparatus was fitted for forward running, the valve being fitted on the faceplate to the left of the left-hand injector. The pressure reducing valve for the carriage steam heating was attached to the faceplate below the regulator handle.

McIntosh's patent water-level gauge protector as first fitted to the Class 721 (Dunalastair I) and which consisted of a cylinder of specially toughened glass, capable of withstanding a pressure of 3000 lb.in.⁻² were fitted.

Steam assisted reversing gear was fitted, operated via a manual lever which was coupled to the piston of a steam cylinder just above the floor of the footplate. To alter the cut-off, the catch of the lever was released from the notch in the reversing quadrant (which had nine notches on either side of mid-gear), the steam turned on and the lever moved backwards or forwards as required, damped by an oil cylinder brake, to the appropriate notch where the catch was re-engaged. The system could be operated without the steam-assistance should the engine not be in steam. Despite the oil damper the lever was prone to move at lighting speed and had the potential to inflict serious injury and so expansive working was discouraged. It was the usual practise of drivers to set the reverser in a particular notch and drive on the regulator keeping adjustment of the lever to a bear minimum.

The thirteen engines of batch Y62 were fitted with vacuum ejectors and pipes from new, this being authorised in April 1900 while the engines were still under construction. The remainder of the class gained vacuum equipment in 1901. At first the vacuum ejector exhaust pipe was hidden from view running inside the running angle from the smokebox back plate to the cab but it was fairly soon moved to the boiler side below the handrail — no doubt this eased maintenance but did little for æsthetics. Much later, when a vacuum connection was provided at the front of the

engine the vacuum ejector exhaust pipe was raised above the handrail.

In about 1910 the Caledonian started experiments with superheating which showed that a saving of around 20% in coal consumption could be realised and consequently in 1913 a design for superheating the Class 900 was drawn up. Only two engines were tackled initially, number 901 in March 1914 and number 898 in July 1914. Number 898 kept its original frames and was not officially classed as a rebuild while number 901 received new frames to match the new, longer smokebox and was classified as a rebuild — no doubt some accounting dodge. The working pressure of the boilers was reduced to 170 lb.in.⁻² and 18 element

“Consolidated” superheaters with long return loops and a hand controlled damper were fitted. New 19½" diameter cylinders with 8" diameter piston valves were also fitted. The retro-fitting of superheaters was not vigorously pursued and it was not until April 1916 that number 894 was so treated while the only other engine of the class superheated by the Caley was number 900 itself in May 1918. One further engine number 14346 (ex 897) gained a superheater in L.M.S. days — the circumstances of this are explained below. Some published accounts state that number 899 was superheated in 1923 but this appears to be erroneous; the L.M.S. boiler records show it was saturated during the 1930s and it would hardly have been converted back!

Locomotive Dimensions

Height above rail :

Chimney	12'11½"
Boiler centre line	8'

Width over :

Running plate	7'8"
Cab sides	6'8½"
Length over buffers	31'1½" (engine only)

Saturated:

Total weight in working order	51T 14cwt.
Total adhesive weight in working order	34T 13cwt.
Tractive effort (@ 85% WP)	18 411lb.

Superheated:

Total weight in working order	54T 10 cwt.
Total adhesive weight in working order	36T 5cwt.
Tractive effort (@ 85% WP)	18 315lb.

Frames and motion :

Frame length	29'5"
Frame thickness	1"
Coupled wheelbase	9'6"
Bogie wheelbase	6'6"
Total wheelbase	23'7" (engine only)
Driving wheel diameter	6'6", 22 spoke
Crankpin stroke	10"
Crankpin arrangement	In line with spoke
Bogie wheel diameter	3'6", 10 spoke
Cylinder size	19" by 26"
Cylinder centres	2'4½"
Port length	18"
Steam port breadth	1⅝"
Exhaust port breadth	3⅝"

Connecting rod length	7'1"
Eccentric length	5'6"
Driving journal length	7½"
Driving journal diameter	8½"

Boiler :

Max. external diameter	4'9¼"
Length between tubeplates	11'4½"
Outer firebox casing length	6'11"
Depth of firebox below boiler centre line :	
Front	5'9"
Rear	5'3"
Grate area	23 feet ²

Saturated:

Tubes	
Diameter	1¾"
Number	269
Working pressure	180 lb.in ⁻²
Heating surface :	
Tubes	1402 feet ²
Firebox	138 feet ²
Total	1560 feet ²

Superheated:

Tubes	
Diameter	1¾"
Number	159
Superheater tubes	
Diameter	5"
Number	18
Working pressure	170 lb.in ⁻²
Heating surface :	
Tubes	1094.3 feet ²
Firebox	138 feet ²
Superheater	214 feet ²
Total	1446.3 feet ²

Numbering and Allocation

No.	Date to service	L.M.S. No.	Super-heated	New	Known Allocations			With-drawn
					c1921	c1933	c1942	
887	04/1900	14337	—	Perth		Dalry Road	Forres	04/1947
888	05/1900	14338	—	Perth	Perth	Dalry Road	Avimore	03/1946
889	05/1900	14339	—	Perth	Dalry Road	Greenock	—	1941
						Ladyburn		
890	06/1900	14340	—	Perth	Ballornock	Ballornock	Inverness	12/1946
891	06/1900	14341	—	Perth	Ballornock	Motherwell	—	08/1939
892	07/1900	14342	—	Perth		Stirling	—	03/1939
893	07/1900	14343	—	Carlisle	Perth	—	—	1932
894	06/1900	14434	04/1916	Carlisle	Ballornock	Dalry Road	Avimore	04/1948
895	06/1900	14344	—	Carlisle	Ballornock	Ardrossan	—	1941

896	05/1900	14345	—	Dalry Road	Carlisle	Greenock	—	1941
						Ladyburn		
897	05/1900	14347	09/1930	Carlisle	Aberdeen	Polmadie	—	03/1939
898	05/1900	14437	07/1914	Carlisle	Carlisle	Dalry Road	—	06/1939
899	04/1900	14348	—	Dalry Road	Dalry Road	Dalry Road	Inverness	1944
900	12/1899	14435	05/1918	Polmadie	Polmadie	—	—	10/1928
901	12/1899	14436	03/1914	Polmadie	Polmadie	Polmadie	—	11/1937
902	12/1899	14346	—	Polmadie	Polmadie	—	—	10/1939

The engines entered service without much publicity and were originally allocated to Polmadie, Carlisle, Perth and Edinburgh, The Polmadie engines being employed on the "Corridor" and on some of the Glasgow-London night services regularly taking loads of 300 tons or so over Beattock unassisted — in fact for several years the engines could not be piloted since they lacked brake and steam connections at the front! Leaving aside the two slightly avant-garde 4-6-0s, numbers 49 and 50 which were built in 1903, the class shouldered the heaviest tasks emanating from traffic department which included several runs at an average stop-to-start speed in excess of 55 miles per hour which were a great feat in their day — no English railway could then manage it, at least not on a daily, timetabled basis. It was not until some five years later in 1904 that the larger Class 104 (Dunalastair IV) emerged to take a share of the load.

After they were superheated numbers 898 and 901 were stationed at Polmadie for working the crack Ardrossan and Gourock boat trains — the Caley was in stiff competition with the Sou' West for this traffic. They shared the duty with a pair of similarly superheated Class 766 (Dunalastair II) engines which were of virtually equal performance after their rebuilding.

The L.M.S. classified the saturated engines as 2P while the superheated variety was rated at 3P. The two categories were numbered in separate series but 14346 was never renumbered after it acquired its superheater!

The first withdrawal was the aforementioned number 14435 which was written off in an accident at Dinwoodie on 25/10/28. The accident happened when the engine was piloting an L.M.S. Compound on the down "Tourist" (or "The Royal Highlander" as the

L.M.S. had by then christened the working) from Carlisle. Ahead was a goods train hauled by an L.M.S. built Class 60, which was booked to shunt at Beattock to clear a path for the "Tourist" but on the night in question the driver, who had previously had trouble with one of the coupling rod pins, stopped the train for examination after hearing a noise. The train came to rest about $\frac{3}{4}$ of a mile north of Dinwoodie signal box. The driver proceeded to examine his engine and on finding that the mechanical lubricator actuator had become detached set about a running repair. For some reason the guard took no measures at first to protect the rear of his train but went forward examining wagons. Eventually he realised that the "Tourist" was due and hurried back in an effort to place detonators on the line. His train should of course have been protected by the Dinwoodie starting signal but the signalman in the next box at Wamphray had dozed off after accepting the goods and having it accepted by the box in front. He was awakened by the signal from Dinwoodie enquiring if the line was clear for the "Tourist" and, in view of the time, came to the conclusion that the goods had passed while he was asleep and cleared his instrument. Despite doubts as to why it had taken the goods so long to clear the line, the Dinwoodie man cleared all this signals for the express.

The "Tourist", running under clear signals, passed Dinwoodie box at well over 60 miles an hour and engine crews could do nothing more than close the regulators after they saw the red tail light of the goods brake van. Hitting the goods at almost full speed, number 14435 smashed through 14 wagons before toppling down the bank onto its side. The Compound slid over the top of number 14435 and finished about an engine's length ahead, its tender

jack-knifing to come to rest at right-angles to the track on top of number 14435. All four engine men were killed but fortunately strength of the modern coaching stock which the "Tourist" merited prevented injury to anyone else.

The framing of number 14435 was smashed beyond repair and the engine was subsequently scrapped. The boiler was only slightly damaged and after repair (see next section and table) fitted to number 14347 (ex 897) in conjunction with piston valves in 1930 so superheating this engine.

1932 was marked by two significant events in the collective life of the Class 900s :

- 1) Number 14345 was allocated to the ex-G & SWR shed at Girvan which, so far as can be traced, was the first posting to a non-Caley shed. It didn't last long at Girvan though being reallocated to Greenock Ladyburn in 1933.
- 2) The first "non-accident damaged" member of the class was withdrawn for scrapping, number 14343 being the victim towards the end of the year. No particular reason has been traced for this early withdrawal since the next withdrawal did not take place until 1937.

The coming of the versatile and capable Stanier "Black" 54-6-0s to Scotland in the mid-to-late 1930s did little to extend the life of many classes of Caley engines and as already stated general withdrawal of the class started in 1937. By 1944 there were only five surviving members of the class and they had been exiled to the highlands being stationed at Aviemore, Forres and Inverness. It was not until 1948 under B.R.'s auspices that the last was withdrawn from Avimore as number 54434 — the only member of the class allocated a B.R. number — but the withdrawal period was probably extended by the constraints imposed on the railways during the Second World War.

L.M.S. Boiler Records

A valuable primary source of information on Caley locomotives are the Locomotive Boiler Repair sheets which are available for inspection at The Scottish Record Office, Edinburgh having been deposited there by the late Alan Dunbar, the first President of the Caledonian Railway Association. The superheated boilers were described as "Round Top Superheated Class 59 N46A" by the L.M.S. while the others were described as "Round Top Non Superheated Class 60 N46"; the relevant SRO references are GD344/423 and GD344/424 respectively.

Loco Number	Boiler Number	Date Built	Build Cost	Date Card Started	Mileage @ Card Start	Date Scrapped	Mileage @ Boiler	Scrap Firebox
887	2130 ¹	1931	£863	19/11/31	0	19/04/47	399082	
888	1802 ²	1923	£1372	19/01/33	303185	28/12/46	718964	313288
889	1765 ³	1922	£1372	07/05/32	348054	28/11/41	Unstated	
890	1803 ⁴	1923	£930	03/09/32	273544	29/12/46	576609	303065
891	1571 ⁵	1919	£1263	18/02/32	411193	12/08/39	680390	86542
892	1646 ⁶	1920	£1263	25/08/30	344875	25/03/39	675386	330511 ⁷
893	No card found.							
894	1367	1914	£667	13/05/32	802827	13/07/35	929266	278098
	2351 ⁸	1935	£819	09/07/35	0	18/04/48	437466	
895	1805 ⁹	1923	£930	10/02/33	286182	17/05/41	471035	134574
896	1804 ¹⁰	1923	£930	09/03/32	348533	22/03/41	629838	153994
897	1806 ¹¹	1923	£1372	05/09/30	213193	25/03/39	502841	289648 ¹²
898	1368	1914	£667	24/12/31	661328	25/03/33	717336	307152 ¹³
	2232	1933	£913	25/03/33	0	16/06/39 ¹⁴		

899	1914 ¹⁵	1926	£930	16/04/32	187613	13/05/44	424929
900	No card found.						
901	2129	1931	£987	10/12/31	0	27/11/37	203466
902	1766 ¹⁶	1922	£1372	16/07/30	237384	04/11/39	446186 211802 ¹⁷

Notes on the Boiler Records Table

- 1 Repaired 14/03/36, receiving a set of new steel tubes; cost £26; mileage 107994.
Repaired 02/03/40, receiving 36 repaired steel tubes and 484 copper firebox stays; cost £73; mileage 208914.
Repaired 06/03/42, receiving a set of repaired steel tubes, a new copper tube-plate and 438 copper firebox stays; cost £194, mileage 270656.
- 2 Repaired 19/01/33, receiving a new set of steel tubes and 236 copper firebox stays, firebox also partly recaulked; cost £55, mileage 303185.
Repaired 13/02/35, receiving a new set of steel tubes and a new copper firebox; cost £299; mileage 405678.
Repaired 10/05/41, receiving a set of repaired steel tubes, 2 copper doorplate patches and 408 copper firebox stays; cost £81; mileage 599449.
- 3 Repaired 16/02/34, receiving a set of new steel tubes and a new copper firebox doorplate; cost £83; mileage 406260.
Repaired 05/03/36, receiving a set of new steel tubes a new copper tube-plate and 497 copper firebox stays; cost £112; mileage 479218.
- 4 Repaired 02/07/37, receiving a set of new steel tubes, 509 copper firebox stays and a new copper firebox doorplate; cost £102; mileage 378328.
Repaired 23/04/42, receiving a set of repaired steel tubes, a copper tube-plate and 460 copper firebox stays; cost £172; mileage 515057.
- 5 Repaired 26/08/33, receiving a set of new steel tubes and 60 copper firebox stays; cost £97; mileage 482359.
Repaired 03/06/35, receiving a set of new steel tubes and a new copper firebox; cost £243; mileage 593848.
- 6 Repaired 13/01/34, receiving 31 small steel tubes and ½ box copper filebox tubes setup; cost £9; mileage 448588.
Repaired 23/12/36, receiving a set of new steel tubes, a new copper tube-plate, a new copper firebox doorplate and 585 copper firebox stays; cost £177; mileage 579281.
- 7 Firebox new in 1930.
- 8 Repaired 30/12/42, receiving 159 small steel tubes, 18 superheated tubes, 18 element tubes and 602 copper firebox stays; cost £128; mileage 274192.
- 9 Repaired 10/02/33, receiving 31 new steel tubes and 373 copper firebox stays, firebox also partly recaulked; cost £71, mileage 286182.
Repaired 21/09/33, receiving 31 new steel tubes and 6 copper firebox stays, ½ box copper filebox tubes setup; cost 52; mileage 305438.
Repaired 06/06/35, receiving a set of new steel tubes, a new steel throatplate and new copper firebox; cost £285; mileage 336461.
- 10 Repaired 03/05/34, receiving 6 new steel tubes and 14 new copper firebox stays; cost £35; mileage 415618.
Repaired 15/10/36, receiving 1 set new steel tubes, ½ box of copper firebox stays and probably a new firebox although the record card is unclear on this; cost £222; mileage 475844.
Repaired 02/06/40, receiving 34 small steel tubes and 420 copper firebox stays; cost £76;

mileage 594850.

- 11 Superheated boiler, ex-locomotive number 900.
Repaired 24/03/34, receiving 27 small steel tubes, 8 superheater tubes and 240 copper stays; cost £43; mileage 317087.
Repaired 11/10/35, receiving a set of new steel tubes, a set of superheater tubes, 220 copper stays and a new copper doorplate; cost £86; mileage 392342.
- 12 Firebox new in 1930
- 13 Firebox new in 1925
- 14 Date engine laid aside, boiler noted as being recovered, no further details of usage or mileages are given.
- 15 Repaired 21/08/35, receiving a set of new steel tubes, a new copper tube-plate, a new copper firebox doorplate and 636 copper firebox stays; cost £196; mileage 259430.
Repaired 25/08/37, no details stated; cost £15; mileage 290599.
Repaired 01/04/40, receiving a set of repaired steel tubes; cost £26; mileage 330650.
- 16 Repaired 07/04/33, receiving 46 steel tubes and 228 copper firebox stays, firebox also partly recaulked; cost £41, mileage 306461.
- 17 Firebox apparently new on 16/07/30 when record card started.

All of these locomotives were reboilered by the Caledonian, either when they were superheated or between 1919 and 1923 — it is probable that the smokebox wing plates disappeared and Ross “Pop” safety valve appeared during this exercise; there were certainly few of the former by grouping while the latter were common. Number 14434 (894) appears to have been the exception to this retaining wingplates until 1932 — probably until the overhaul in May of that year at which the L.M.S. record card was started. Unfortunately the records relating to the original boilers have been lost making it impossible to determine the overall mileages run by the class. The cards start at various dates between 1930 and 1933 (see table) which probably represents the date of the locos first major overhaul after the introduction of the L.M.S. format record cards, salient points being copied over from the old records. They log all repairs to the boiler, giving the nature of the work carried out, the date, the cost and the mileage run by the boiler at that date. There was no interchanging of boilers during the period covered by the cards and it is assumed (particularly in the comments about mileages below) that none took place prior to this — I feel that the L.M.S. would be more inclined to introduce the practice than discontinue it, particularly since they built spare boilers to allow engines of other classes to be returned

to service while their original boiler was overhauled.

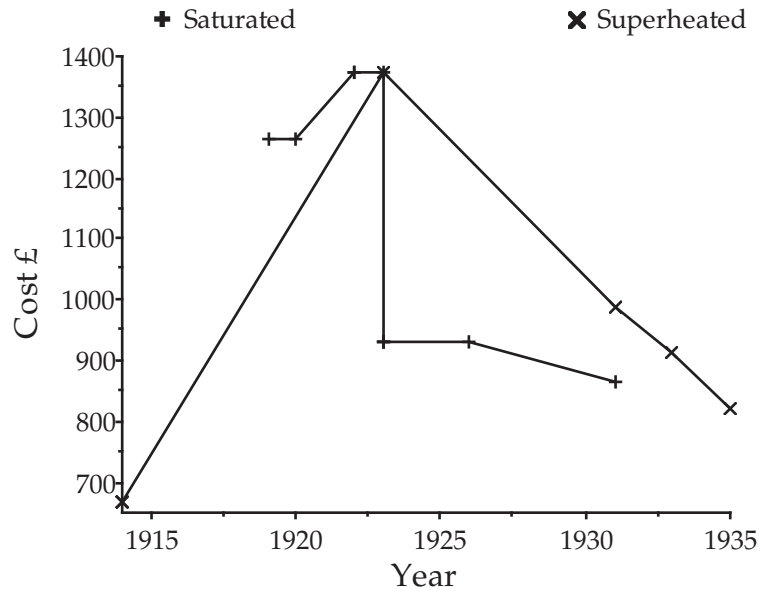
The tubes of the original boilers were made of copper but it is unclear if the replacement boilers originally had copper tubes or whether they had always been steel. Certainly any tube replacements mentioned on the record cards were of steel. Note that new tubes were always used until the war years when repaired tubes were used — whether the original tubes fitted to the boiler or not is unclear.

Some interesting statistics can be gleaned from the cards, for example the cost of a new boiler : in 1914 a superheated boiler cost £667, after the ravages of inflation during and just after the first war this cost had more than doubled to £1372 but fell dramatically back during the 1930s to £819 when the last boiler was built in 1935. The first replacement saturated boiler cost £1263 in 1919 and interestingly again peaked at £1372 in the first half of 1923. The cost fell dramatically in the second half of 1923 and declined gradually until when the last was built in 1931 the cost was at a low of £863. These figures give a glimpse of what appears to be creative accounting by the Caley — by their reckoning in early 1923 a superheated and a saturated boiler cost the same to build which is clearly nonsense given the additional cost of the superheater etc. and just a few months later in late 1923 the L.M.S. was

building the same boiler at $\frac{2}{3}$ of the cost. Somebody somewhere was telling porkies! The dramatic surges and slumps in costs can be best seen in the graph below :-

It is hard to give meaning figures due to the varying periods covered but the overall average annual mileage worked by the class while carrying these boilers was about 31475.

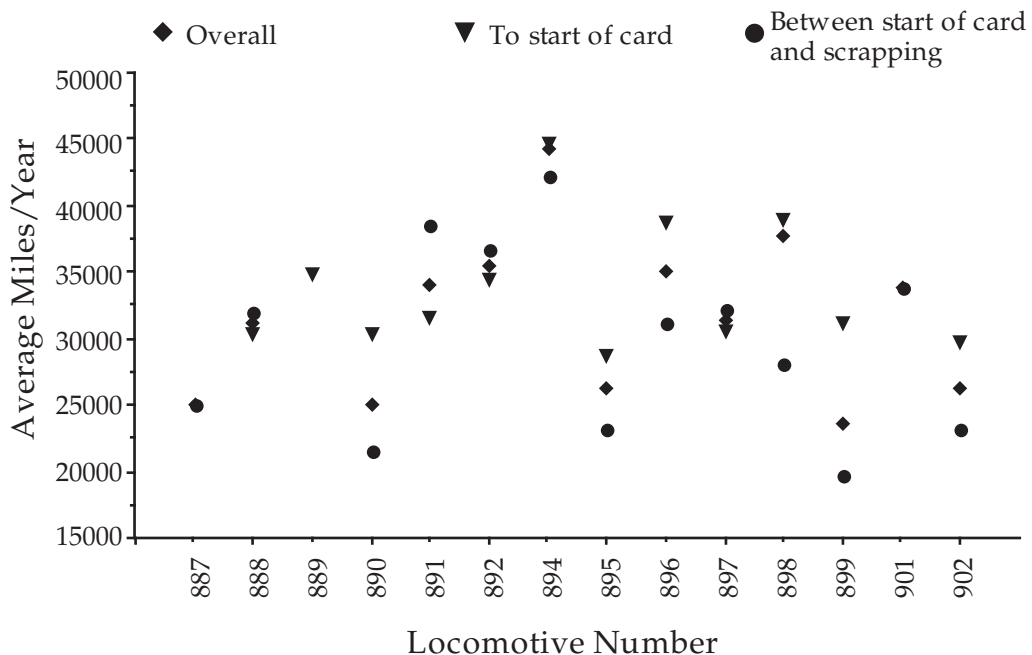
Caledonian Railway Class 900 Replacement Boiler Costs 1914-1935



Although no overall mileages can be deduced it is possible to derive figures for the class after reboiling. The average annual mileage over this period, together with the average to the date the record card started and the average between the start of the card and scrapping are plotted below :-

It can be clearly seen from the plot that, as might be expected, most of the class was less hard worked in the 30s than in the 20s, the annual average being about 10% lower at around 29800 compared with about 33650. The exception to this was number 891 which had obviously found useful employ at

Caledonian Railway Class 900 Mileages After Reboiling



Motherwell — indeed between repairs in 1933 and 1935 it averaged some 49550 miles per annum.

Some engines had an easier life than others during the period, number 890 having the lowest average despite being stationed at Inverness for much of the 30s, it obviously never ventured too far, too often. Number 894 on the other hand must have been much favoured at the various sheds where it was stationed clocking up around 42000/43000 miles per annum ever since it was superheated in 1914.

Tenders

The class was originally coupled to a massive 8 wheel bogie tender which was evolved from the tenders fitted to the Class 766 having the same capacity at 4125 gallons of water and 4½ tons of coal (unheaped) but a slightly higher coping to match the higher pitched boiler of the Class 900. The bogies were repositioned, lengthening the front overhang, shortening the rear and bringing the bogie centres 3" closer together with the effect that the overall engine plus tender wheelbase was the same as the earlier engines — was 49'2½" governed by the size of a turntable somewhere?

The tank was carried on double frames, the inside pair forming the outer walls of the well. Two bolsters connected the outside frames and provided the bearing surfaces for the bogies which had a circular bearing plate 18"

4125 Gallon Tender Dimensions

Wheelbase :

Total	16'6"
Bogie	5'6"
Distance between bogie centers	11'0"

Frames :

Length	24'7"
Depth	1'5"

Tank :

Length	22'6"
Breadth	7'6¼"
Depth	4'1½"
Well Length	17'3"
Platform Width	7'8"
Length over buffers	26'3" (tender only)
Wheel Diameter	3'6"

in diameter. Suspension of the bogies was via an inverted laminated spring between the two axleboxes and fixed to the bogie frame by a pin passing through the buckle. The ends of the spring were linked to a compensating beam which rested on the axleboxes. The swing of the bogies was rather restricted and meant that a single brake cylinder below the footplate could actuate the brakes on all eight wheels.

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 Class 900 were no longer top link locomotives making regular long runs.

Water capacity was no longer at a premium and the bogie tenders were dispensed with being replaced with smaller 6 wheel tenders reclaimed from scrapped locomotives. These tenders were lighter to haul and cheaper to maintain being mechanically less complicated than the bogie tenders. The majority of the Class 900 received McIntosh pattern 3570 gallon tenders which were originally built for the Class 600 080s and the Classes 908, 918 and 179 460s in 1901-1914. Most would come from the Class 600 engines all eight of which had been scrapped between 1927 and 1929. These tenders were derived from a Lambie design of 1894 but had a wider platform and benefited from a water-level gauge.

Coal Capacity	4½T
Weight in Working Order	49T 10 cwt.

3570 Gallon Tender Dimensions

Wheelbase :

Total	13'0" (6'6" + 6'6")
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Frames :

Length	22'1'
Depth	2'4¾"

Tank :

Length	20'
Breadth	7'1¼"
Depth	4'4½"
Well Length	15'0¼"
Platform Width	7'8"
Length over buffers	23'9½" (tender only)
Wheel Diameter	4'
Coal Capacity	4½T
Weight in Working Order	41T 0½ cwt.

Livery

In C.R. days these locomotives would have carried the full blue passenger livery. This was likely to be Prussian blue prior to 1906 and Ultramarine (or perhaps just a slightly lighter shade of the Prussian blue — there is some controversy over this point) afterwards although the change would not have happened overnight — as with any change of livery policy the old and new styles would coexist for several years. Lining, consisting of a black band 1¾" wide edged either side by a white line ¾" wide, was applied to the cab sides, cab front, splashers, tenders sides, tender rear, gangway doors, Westinghouse pump and boiler bands (note that the width of the black band effectively meant the bands were painted black and edged with a white line). The cab roof, smokebox, chimney and tender interior were all painted black. Polished parts included the smokebox door hinges, handle and wheel, the whistle, handrails and cab spectacles although it was not uncommon for individual crews to polish other parts such as the edges of the wing plates. The buffer beams, valance and step brackets (but not the steps themselves which were black) were painted crimson lake and lined white inside black. The buffer housings were also painted crimson lake with a band of standard lining near the front end. The upper half of the cab interior was painted

a creamy yellow colour and the lower half black.

The outside of the frames were painted black with vermilion used for the insides. The motion plate, and axles were also vermilion. The bosses, spokes and rims of the wheels were painted blue to match the superstructure and sometimes, after 1919, white lined tyres were to be seen.

A vermilion panel, edged with white, was applied to the front buffer beam between the buffers and the letters C.R. (with a square full stop between them) appeared on this panel to the left of the hook and the number to the right in gilt with a red shading below and to the left. The number also appeared in gilt (shaded red) on the centre of the tender rear. The crest was applied to the tender sides flanked by some fancy scrollwork and the letters C and R and also to the leading splasher of the engine. The number plate was carried on the cab side and surrounded on the cab panel by a black border which was edged with a white line to the outside. These number plates were of the "McIntosh" style which was a cast brass oval plate 18" by 11½" with raised figures, lettering and border. The background of these plates could be blue or red (which seems to have

disappeared by 1922) with some sources also listing black as a possibility.

The plates were lettered as shown in the sketch below. The height of the locomotive number was 3⁷/₈".



Works plates were not originally carried by these engines as the information was incorporated in the number plate however the L.M.S. affixed small oval works plates with raised lettering which were fitted to the splashers. These were rather anachronistically lettered as illustrated below with the third row being the year of building — i.e. many a year before the formation of the L.M.S. !



After the demise of the Caley all the locomotives would have firstly been painted in L.M.S. crimson lake and then, following a policy change in 1927, most of them would be repainted in black. In both cases lining would be carried. At least some of the later survivors gained a plain black livery which was characteristic of cost cutting in the late 1930s.

In the first L.M.S. livery the entire superstructure of the locomotive and tender was painted crimson lake with the exception of the smokebox, footplate and splashers tops and cab roof which were all black and the buffer beams and shanks which were vermilion. Lining was yellow with black edging and was applied to the cab sides, cab front, splashers, gangway doors, boiler bands, Westinghouse pump, footplate valance, tender sides, tender rear and buffer beams. Below the running plate everything was painted black. The locomotive number was carried in large figures on the tender side with the L.M.S. crest carried on the cab side. Smokebox number plates were normally carried at this time.

After the policy change, these locomotives no longer qualified for the crimson lake livery (it being reserved for the large "top link" express passenger engines) and they became lined black. The lining was now a single red line, generally where there had previously been a yellow one but this is difficult to corroborate as photographic emulsions of the day were not very sensitive to red light and it is usually difficult to detect lining on photographs of engines in this livery. It can only be presumed it was there since it should have been there and St. Rollox normally went by the book in such things. Smokebox numberplates were officially dispensed with at this time and the power classification mark began to appear in 2¹/₄" figures just below the cab-side lamp bracket.

Confirmed liveries include :-

Pre-1928 (both lined Crimson Lake)

18" figures, L.M.S. coat of arms

14338/41/42/43/44/45/46/47

14434/35/36/37

Post-1927 (Unless otherwise stated, all are lined black with 53" letter spacing and six wheel tenders)

Gold shaded red insignia, 12" figures

14341/45/47

14436/37 (with bogie tender)

Gold shaded red insignia, 14" Midland style figures

14341

14436/37 (both with bogie tenders)

Gold shaded black insignia, 12" figures

14339/42/48 (with bogie tender)

Gold shaded black insignia, 14" Midland style figures

14343 (with bogie tender)

Unlined black, Yellow shaded red insignia, 10" figures

14340

14434

Drawings

The drawings which accompany this article show the locomotive in original condition, the 4125 gallon bogie tender and the 3570 gallon tender ex-Class 600 which was the most common type of replacement 6 wheel tender.

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