BR STANDARD CLASS 4MT 2-6-4T 80104

The British Railways (BR) Standard Class 4 tank was one of the range of BR Standard classes built during the 1950s. On the nationalisation of British Railways in 1948 the London Midland Region had a number of ex-London, Midland and Scottish Railway 2-6-4T and the Western Region a number of GWR Large Prairie 2-6-2T types. These tank engines were particularly suited to commuter and secondary services although, particularly in Scotland and on the Southern Region, the situation was not good with large numbers of pre-grouping types struggling on.

A series of 155 Class 4 tank locomotives was ordered, based largely on the ex-LMS Fairburn 2-6-4T engines with some modifications. The history of this class could be tracked back through to the LMS/BR Class 4 2-6-4T locomotives dating to the original Fowler design in 1927. Design work was done at Brighton, with the overall programme being overseen by Robert A. Riddles. The principal modifications to the Fairburn design involved reduction of their 'kinetic envelope' to enable them to fit into BR's universal L1 loading gauge. To do this, the side tanks and cab were made curved compared to the straight-sided Fairburn design.

The biggest mechanical change was a reduction in cylinder size, to 18 ins, which also reduced their cross-section, and a compensating increase in boiler pressure from 200 to 225 psi. The bunker contained 3½ tons of coal and the two side tanks had 2,000 gallons of water. In full working order these locos weighed 88 tons 10 cwt and had a Route Availability of RA4. The Driving Wheel diameter was 5 ft 8 ins with two outside cylinders having dimensions of 18 in diameter and 28 in stroke. The boiler was superheated and the loco was equipped with two sets of Walschaerts valve gear operating piton valves. Tractive Effort was calculated to be 25,520 lbft.

Between 1951 and 1956, 130 of the class of 155 were built at Brighton (80010-80053, 80059-80105 and 80116-80154), a another fifteen (80000 – 80009 plus 80054 - 80058) at Derby Works and a further ten (80106 - 80115) at Doncaster Works. The first to emerge was 80010 from Brighton in 1951. Fifteen that were due to be constructed in 1957 were cancelled, due to impending dieselisation, and the last five would have been too had they not been at an advanced stage of construction when the order came to cancel them.

80104 was part of Brighton works Lot No. 6167, made up of 14 engines, again for the Eastern Region, and it emerged on Thursday 31st March 1955 at a cost of £18,206. A feature of this batch of engines was there fitment with the early form of LMS (Hudd) Automatic Train Control attached to the rear bogie. A speedometer was also installed from new and, in due course, the BR Automatic Warning System replaced the LMS designed ATC equipment.

80104 was allocated straight away to 33A Plaistow Shed on BR Eastern Region's former London Tilbury & Southend Railway route. The locomotive's first overhaul was at Stratford in September 1956 and a heavy overhaul was undertaken at Darlington works during May 1958. During the four-week period ending 7th November 1959, it was re-allocated to 33B Tilbury Shed because Plaistow had closed. It's LT&SR service totalled just over 7 years, helping to operate the intensive suburban commuter services using the

Class's renowned electric-like acceleration. The route was fully electrified with the last scheduled steam service from Fenchurch Street with ex-LMS 3-Cylinder Stanier 2-6-4T number 42501 hauling the 18:10 to Thorpe Bay on 15 June 1962.

After the transfer of 80104's maintenance to Crewe works, on 17th June 1962, it received a heavy overhaul there in October 1962 followed by a heavy general repair which finished on 8th December 1962. Earlier, in July 1962 it came under Western Region ownership when it moved into storage at Old Oak Common depot. In November 1962, 80104 was allocated to 89B Croes Newydd shed near Wrexham on the former Cambrian Railways system. It's last allocation was to 89C Machynlleth shed, and its sub-shed at Aberystwyth , during March 1963. Under boundary changes on 30th December 1962 this shed was moved from Great Western Region to London Midland Region control with Machynlleth being re-numbered as 6F. All this time it's duties consisted mainly of local passenger services and pick up goods trains. It is very likely that it would also have traversed the line now owned by the Severn Valley Railway. The SVR owns 80079 and, when operational, helps hauls their services between Kidderminster and Bridgnorth.

80104 was withdrawn from Capital Stock during week ending 24th July 1965 after a working life with BR of just over 11 years 5 months. After withdrawal, 80104 languished on scrap lines until it arrived at Barry Scrapyard, in January 1966. All the non-ferrous and other fittings were removed almost straight away. The Southern Steam Trust reserved the loco so that funds could be raised and, by December 1980, enough money had accumulated to purchase it.

80104 was moved, in September 1984, to Swanage where it was cosmetically restored and placed on display in the head shunt at Swanage. It remained for a number of years. The locomotive was sold by the Southern Steam Trust to a group of supporters in January 1988. However, restoration would not be possible in the near future so it was then sold to new owners who called themselves 80104 Limited.

The locomotive was moved to the former Swindon Works Weighbridge, for restoration, in November 1989 where it joined 34072 *257 Squadron* which was already undergoing restoration. In January 1991 80104 was moved to the Avon Valley Railway following eviction from Swindon. In November 1994, ownership of 80104 was transferred again, this time to Southern Locomotives Limited.

As a result of both the opening of Herston works and the negotiation of finance, to speed its rebuilding, 80104 returned to Swanage Railway metals during Autumn 1995. During the following year all wheels were installed. The side-tanks and bunker were rebuilt at the Avon Valley Railway's site at Bitton with the boiler being refurbished by a specialist contractor. By March 1997 the boiler passed its hydraulic test and steam tests required whilst the boiler was out of the frames.

Once the boiler (actually the repaired boiler from 80078) had been fitted into the frames the final assembly of the cab and other fittings could take place. 80104 left Herston Works on a low-loader for the road journey to Norden on 17th April 1997. The locomotive was drawn from the low-loader at Norden by Midland Railway class 1F 41708 before being towed to Swanage.

On 30th April 1997, the Insurance Company's boiler inspector gave his approval allowing the locomotive to move under its own power for the first time since July 1965. That day

the loco completed 24 miles with no problems being encountered. The locomotive had been booked for the 30th Anniversary re-run of the Dorset Coast Express in May 1997 and a final flurry of activity saw the engine completed in plain black livery bearing the number 80011. The locomotive made a few test trips up and down the line and then made its first public appearance with 257 Squadron which was disguised as 34023 Blackmore Vale for the re-enactment of the Dorset Coast Express.

The locomotive was then given a final paint and lining out before joining the operational fleet of the Swanage Railway. 80104 spent several years of operating services at Swanage including short-term visits to the Avon Valley, Mid-Hants and Great Central Railways. After this it was withdrawn from traffic in January 2005.

The Herston restoration team were fully occupied with 34070 *Manston* and the contracted job of completing GWR 0-6-2T No. 6695 - whose owners had found it impossible to finish themselves. So, it was decided to send 80104 to contractors in Wigan for much of the repair work needed. Unfortunately, during 2005, they were given notice to vacate their workshops which disrupted their work schedule. 80104 was transferred to their new facility at Embsay but progress was slow, so it was decided to bring the loco back South to an alternative contractor in Portland, Dorset. This was close enough for local staff to assist with the work and 80104 was brought back in to traffic during 2006.

In early 2014, 80104 was taken out of Service with some boiler stays leaking. The boiler was removed and sent off-site for repairs with it returning in October. After a total of 10 years of service, 80104 was withdrawn in May 2016 for another overhaul returning during September. After a regular piston & valve examination it was found that the right hand cylinder had to be bored out and a liner fitted and this was accomplished in October 2016 with the loco fully serviceable and repainted by late February 2017.

Unfortunately, during shunting operations at Swanage, 80104 was involved in a head-on collision with 34070 on 24th July 2017. After having a buffer replaced the loco was expected to be operational again shortly afterwards but it failed a regular exam with six blown superheater elements. The loco was re-assembled and test steamed on 3rd September 2017 with the expectation that, by October 2017, 80104 would be operational again.

On Tuesday 11th May 2021, the boiler certificate expired with costly work being needed on the copper firebox amongst other items. The loco had worked up to the very last day of it's certificate but there were no immediate plans to overhaul the locomotive as funds were not available.

However, in June 2021, it was reported that a Southern Locomotives Limited shareholder had offered to provide an interest free loan to cover three quarters of the cost of overhauling the locomotive. Tyseley Locomotive Works, in Birmingham, provided a quote for the work which, it was hoped, would be completed by the start of 2023. Copper sheet for the firebox was ordered and 80104 travelled to Tyseley on Tuesday 26th October 2021.

Work continued apace on the boiler thanks to SLL's sponsor who lent the majority of the funds for the extensive repairs being carried out. Whilst the front tubeplate had to be renewed it was thought that the rear one was in satisfactory condition. However, on

removal of the tubes it was discovered that most of the firebox tubeplate holes have been expanded to an unacceptable size. Upon examination after the flue tubes had been removed, it was discovered that the majority of the holes, into which the bottle ends of the flues are screwed, would be oversize once the threads had been cleaned up this time around. This problem has accumulated during previous overhauls whilst undertaking this task which has resulted in the holes gradually getting bigger.

These larger holes means there is less material between them which could compromise seriously the integrity of the tubeplate. So, according to the BR handbook, SLL now has to repair the damage. The cost of a new copper tubeplate would be astronomical, so it was relieved to be advised by Tyseley that the current one can be repaired. Tyseley's experience with GWR copper tubeplates is much valued, though the additional repair work will cost around £20,000 - money SLL didn't currently have.

The SLL Tyseley volunteer team worked on the rest of the locomotive preparing it for quite extensive work to be undertaken at Herston on its return. Many parts, including the brake gear, had been transferred to the Works already. As 80104 hasn't had a full overhaul in its 25+ years in service there is much to do. Not least is the copper lubrication pipework which is beyond repair by the normal annealing process.

The frames and wheels were steam cleaned at Tyseley but with the driving wheels in situ there were some areas which couldn't be reached. Therefore much time was spent manually cleaning the hard to get at places before painting could commence. At the last working party in November 2022, all the driving wheels were painted black along with much of the frames that could be accessed.

More recently, work continued at Tyseley but with an unfortunate discovery that not only has SLL to pay the £20,000 to have the tube holes sizes reduced but another £5,000-£10,000 to repair small stress cracks in between some of those holes.

80104's boiler cladding sheets were delivered to SLL's Sellindge site for stripping, repairing where necessary and priming. Prior to this it was necessary to visit to a container suppliers located next to Thamesport again. Having now bought five from them they're getting to know SLL quite well, but still no discount for quantity!

SLL always has the ceilings sprayed with insulation material which totally prevents condensation (£400 well spent) and, fortunately, these suppliers have drivers who can manipulate their Hiab lorry cranes to position the containers into almost impossible spaces, which is essential for Sellindge! The cladding work at Sellindge has now started in earnest with a very competent tinsmith on site to help where repairs are needed.

The September 2023 SLL update mentioned that most of the brake gear was removed at Tyseley. The crossbeams were being stripped back to bare metal and repainted with primer and undercoat in Herston Works. The next task was to inspect the pins and bushes to see what was life expired. Pins will probably need replacing and these will be manufactured at Herston.

Work on the boiler continued at Tyseley with the painstaking task of building up every hole on the rear tube plate for the flue tubes. The boiler was laid on its side to allow the welder to build up another quarter of each hole, and whilst in this position the new inner copper firebox sides were welded into position. Once one side was completed the whole operation took place again after the boiler was turned on to its other side.

The new front tubeplate was ready to be fitted but could not happen until the above work was completed. Various rivets are being replaced under instruction from the boiler inspector and the fitting of patch screws, to replace rivets between the outer firebox sides and the doubler plate (alongside the firebox crown space), was underway.

A new laser process is to be used in building up of 80104's radius rods rather than by conventional welding. Another loco group has been found this to be cheaper and less likely to create distortion during the repairs.

Whilst at Tyseley the steel plate below 80104's cab floor will be removed so that the frame stretchers can be examined after needle gunning. Meanwhile at Sellindge, inroads were being made into cleaning and priming the various items of cladding sent across from Swanage, although some may need to be replaced due to the discovery of excessive corrosion.

00 Gauge modellers might still be able to obtain Bachmann's version of 80104 (Stock code 32-360A) which was new in 2015. It was presented in Lined Black with Late BR Crest.

LOCOMOTIVE SPECIFICATIONS			
Configuration	2 – 6 - 4T	Tractive Effort	25,515 lbs ft
Leading Pony Wheel dia.	3 ft 0 ins	Overall Length	44 ft 10 ins
Driving Wheel dia.	5 ft 8 ins	Height	13 ft 0 ins
Training Bogie Wheel dia.	3 ft 0 ins	Axle Load	18 tons
Working Boiler pressure	225 psi	Coal Capacity	3½ tons
Cylinders (outside)	Two	Water Capacity	2,000 gallons
Cylinder size	18 ins x 28 ins	Locomotive Weight	88 tons

ACKNOWLEDGEMENT

Southern Locomotives Limited: https://www.southern-locomotives.co.uk/

Information compiled by Peter Sykes 26th January 2024