

BR BULLEID BATTLE OF BRITAIN CLASS

34070 MANSTON

Even before the Second World War, the Southern Railway desired a larger range of locomotives to accelerate services which were getting heavier to cope with increasing passenger numbers. Brighton Works drawing office first proposed a 2-6-0 design, as a replacement mixed traffic locomotive, but the Kent Coast lines demanded a 4-6-0 or 2-6-2 at the least.

Scaling down Bulleid's existing Merchant Navy pacifics with shorter wheelbases, narrower boilers and smaller cylinders allowed both the 44 strong Battle of Britain Class and their 66 West Country siblings to feature the same welded construction, steel fireboxes, oil bath chain driven valve gear, thermic syphons, Bulleid-Firth-Brown wheels, electric lighting powered from a steam generator and power operated reverser, firebox doors and clasp brakes.

21C170 *Manston* was the last light Pacific to be numbered using Bulleid's unusual system based on that used by continental railways. The first three digits show the loco's wheel arrangement [**2** leading axles, **1** trailing axle, **C** (six) driving wheels (i.e. 4-6-2) plus the last three digits indicate the series **1** (light Pacifics) and **70** relating to the order in which a loco was built and numbered.

It emerged from Brighton Works in November 1947 and was the last locomotive to be built by the Southern Railway before Nationalisation on 1st January 1948. As on the Merchant Navy class engines, the original boiler pressure was 280psi but was later reduced to 250psi to reduce maintenance costs. The smokebox housed the five-nozzle Lemaître blastpipe, arranged in a circle within a large-diameter chimney, and the locomotives were covered in an 'air smoothed' casing.

Electric lighting was provided both in the cab and outside around the locomotive. This was powered by a steam-driven turbo generator manufactured by J Stone and Company from Deptford, London. Their type TGH was regulated to supply 15 amps/400 watts at 24 volts DC and was fitted below the footplate underneath the Drivers position. Gauges were lit by ultra-violet light which enabled clearer night-time vision of the boiler pressure and brake pipe vacuum. It also reduced dazzle thus making it easier for the crew to see signals ahead.

Attention was paid to cab ergonomics so that controls required for operation were grouped according to the needs of both driver and fireman, thus promoting safer and easier operation. As an aid to the fireman, a treadle was installed when new which used steam pressure to open the firebox doors when firing. This was intended to reduce cold air being introduced into the firebox area. Unfortunately, due to variable maintenance, this often didn't work properly and firemen operated the doors manually as in other locomotives. The footplate was entirely enclosed with a high front to the tender - which improved working conditions in the depths of winter but made it somewhat hot and humid in summer.

Later engines, built from 1946 onwards, were intended for service on the Eastern Section of the Southern. They carried names with wartime connections, mainly being named after RAF Squadrons (and some airfields) which played such a key part in the Battle of Britain. They were therefore known as Battle of Britain class although they were identical with the West Country class. The tenders of 21C166–21C170 were fitted with TIA ("Traitement Integral

Armand”) chemical feed-water equipment that precipitated scale-forming constituents in the hard water of southern England into a non-adhesive mud that could be cleared using a manual blow-down valve. 21C170's first tender was LP Series I numbered 3319 which was coupled to the loco on 21st October 1947 before release into traffic. Tender 3319 eventually ended up coupled to 34023 Blackmore Vale and may still be in use with it at the Bluebell Railway.

21C170 was first allocated to Ramsgate shed being used on main line services to/from London. 34070 had departed Brighton Works un-named and the official naming ceremony did not occur until Tuesday 9th March 1948. According to a report in the 12th March edition of the Isle of Thanet Gazette, The Right Honourable The Lord Balfour of Inchrye MC & Bar, PC, MP for the Isle of Thanet 1929 – 1945 and Parliamentary Under Secretary of State for Air 1938-44 performed the unveiling ceremony at Ramsgate Station.

On Monday 31st May 1948 it had the distinction of working the inaugural “Thanet Belle” Pullman train between Ramsgate and Victoria via Chatham, Whitstable and Herne Bay calling at Broadstairs and Margate en route each summer. The train consist was believed to be Kitchen First FORMOSA and Parlour First CORAL with Guard Parlour Third 16; Kitchen Third 137; Kitchen Third 132; twelve wheeled Parlour Third 96; Parlour Third 11; Kitchen Third 135; Kitchen Third 133 and Guard Parlour Third 15 - but not all ran every time over the next 11 years.

On this inaugural trip, beauty queens from the various Thanet towns were invited to travel down from London Victoria and, on arrival at Ramsgate, there was a civic reception. Usually, “The Thanet Belle” ran with 8 to 10 Pullman Cars in summer but only two or three in winter. The off-season train formation was then augmented with ordinary SR corridor coaches.

After the Festival of Britain in 1951, it divided at Faversham sending three coaches to serve Canterbury East and Dover, normally hauled by a humble tank engine. This proved unpopular with passengers and was discontinued after one year. During this period the train name was changed to “Kentish Belle” which it retained to the end. It proved to be moderately successful throughout but was withdrawn at the end of the 1958 summer season - before the major upheaval to services caused by works connected with the Kent Coast Electrification scheme.

During the period ending 3rd May 1949 it was re-numbered by BR into 34070 and then, during December that same year, it was re-allocated to London's Stewarts Lane shed. This transfer enabled 34070 to work on Eastern Section services to Folkestone and Dover as well as Central Section services to Brighton. On 25th October 1951, 34070 was noted as having received attention in Eastleigh Works and by March 1953 had been repainted into BR Passenger Green livery.

Apparently during October to early December 1953 the loco was stored briefly, for some unknown reason, but later in December it was re-instated – presumably to help cope with an upturn in seasonal passenger traffic. It was then stored again until re-instatement in June 1954 – presumably for the busier summer timetable.

In June 1955 it was re-allocated to Dover Marine shed where 34070 was used on Continental boat trains such as the “Night Ferry”. By March 1958 the BR totem had been added to the tender sides. On 10th March 1960, it was noted in ex-works condition outside Eastleigh Works again having received some sort of overhaul no doubt plus the addition of a speedometer.

Completion of the Kent Coast electrification meant that there was no longer any suitable work at Dover Marine shed and 34070 was transferred to Ashford shed during the period ending 6th May 1961. In the period up to 9th Nov 1961, 34070 was transferred to its final shed at Exmouth Junction. In common with other Exmouth Junction based locomotives it worked over the Southern's extensive system in Devon and North Cornwall as well as the main line between Exeter and Salisbury.

On 20th January 1963, 34070 was noted inside Eastleigh Erecting Shop undergoing another overhaul and the tender had been modified with cut down sides to the rear to assist with coaling/watering and driver vision when running tender-first. In March 1963, 34070 received the BR Automatic Warning System that was being installed nationwide. On 9th September 1963 it was seen at Exeter Central ready to haul the 13:10 stopping service to Salisbury.

Its working life with BR was not to last too long as it was finally withdrawn on Monday 10th August 1964 and sent for scrap to Woodham Brothers yard in Barry, South Wales. It had covered a total of 702,614 miles during almost 17 years service with the Southern Railway (two months) and British Railways.

34070 Manston was the 146th loco to leave Barry yard being purchased by the Manston Locomotive Preservation Society. In June 1983 it was delivered to Richborough Power Station sidings in Kent. Restoration work and fund-raising progressed slowly, but steadily, over the next 12 years. However the impending closure of the power station meant the group was requested to vacate the site and negotiated a new 'home' on the Great Central Railway at Loughborough.

During its restoration No.34070 briefly found a home there arriving on the GCR on 30th March, 1996. Restoration work continued but mainly off site and in 1998 a decision was made to group together Southern Locomotives Limited being restored and No.34070 left the GCR on 25th September.

Subsequently, the engine was moved to Sellindge in Kent where it joined a number of other Bulleid pacifics in various stages of overhaul. Work commenced on preparing 34070 so that the boiler and frames could be lifted from the wheels. In 2001 a crane was hired to do the necessary lifting of the boiler and frames with the loco becoming a kit of parts.

During 2002 and 2003, the frames were grit-blasted and painted plus the superheater elements and tubes were removed from the boiler. The driving wheels were sent to Swindon for turning. The bogie and pony truck were sent to Herston works for overhaul together with the cab and numerous small fittings.

In 2004 the overhauled bogie and pony truck were returned to Sellindge and fitted to the newly overhauled frames so that they could be moved by low-loader to Herston works to complete the restoration. The boiler was sent to Crewe, for complete overhaul, together with that from 34053 *Sir Keith Park*.

34040 *Manston*, in common with most Bulleid pacifics rescued from Barry, did not have a tender so the team at Herston made a new one. Steel plate for the frames had to be specially rolled as imperial thicknesses are no longer produced. The cost of the production was shared with other Bulleid owners who also needed tenders and enough plate was produced to make six tender frames.

34070 *Manston* entered service on the Swanage Railway on Sunday 14th September 2008 when it double headed a service train with 34028 *Eddystone*. On 25th September, *Manston* was hooked up at Swanage to a special train of 9 coaches plus 80078 at the far end. This

would have amounted to a load of about 400 tons. It then hauled this train to Norden as well as banking 80078 on the return journey. The 'test' was passed with no problems.

Both 34070 *Manston* and 34028 *Eddystone* attended the Eastleigh Works Centenary commemoration between 23rd and 25th May 2009. Before returning from Eastleigh *Manston* was lifted in the workshop so attention could be given to its front bogie bearings which had run hot whilst being towed from Swanage to Eastleigh.

34070 has visited other heritage railways including the Severn Valley Railway and then on to the North Yorkshire Moors Railway. It also took part in the West Somerset Railway's Autumn Steam Gala in October 2011. On Wednesday 25th September 2013 it journeyed to the Great Central Railway for their Autumn Steam Gala (3rd - 6th October).

The boiler ticket for 34070 *Manston* was due to run to mid-2018, however it suffered a low speed shunting collision on 24th July 2017, and it was decided to withdraw it for overhaul in addition to repair of the crash damage.

In September 2019 it was reported that SLL hoped to have the locomotive back in operation in 2020. However, in August 2020, SLL reported that Tyseley Locomotive Works had been contracted to overhaul the locomotive which, it had been hoped, would see 34070 *Manston* in operation in 2021.

In June 2021, it was reported that work at Tyseley had progressed well, with authority given to re-tube the boiler. Now back on all three sets of coupled wheels, and motion reassembled, 34070 awaited both hydraulic and steam tests in July.

34070 *Manston* was scheduled to return to Herston Works for final refitting work, such as pipework and brake gear, before entering traffic on the Swanage Railway. It was intended that the same paintwork would be retained so that, initially, it would run in a 'weathered' condition.

By September 2021, an update was issued by SLL that things has progressed well at Tyseley with work on the locomotive almost completed. SLL volunteers had been painting the boiler and working on the casing so that it was ready to reinstate as soon as the steam test was completed. However lengthy delays had been incurred awaiting the inspectors attendance to the hydraulic test which couldn't then take place until the end of the month. The ensuing two or three week delay ensured that the locomotive would not be back at Herston Works until November at the earliest.

The loco's return was delayed until December 2021 due, in part, to a shortage of boiler lagging material. 34070 *Manston* returned to the Swanage Railway's Herston Works for completion of it's overhaul. All the valves were then removed along with the cross shafts and bearings. The piston heads and rings had to be replaced as they were very worn but, fortunately, it wasn't been necessary to bore any of the valves, although new pins and bushes have had to be fitted where appropriate. A new piston was organised, for the centre cylinder, with new rings being manufactured at Tyseley before refitting.

The electrics were reinstated and the damaged chimney repaired. All the cab fittings were refitted after various gauges had been recalibrated. The main steam pipes were fitted before the boiler had it's hydraulic test before steaming. Brake rigging was gradually reinstated with most of it already refurbished. The long job of overhauling lubricators and pipework commenced.

Touching up of the cladding paintwork occurred, where essential, and new smoke deflectors

were fitted with fresh paint [mix of gloss and undercoat] specially applied to match the care-worn paintwork on the rest of the engine. A full repaint was planned to take place at a later date.

A bent rocker arm was repaired and the valves are all installed, and setting the valve timing is in progress. A new cab floor has been made, all the grate is fitted and working. A new steam brake has been installed, the injectors and associated pipework are complete and with the elements installed the steam pipes have been reinstated in the smokebox.

In October 2022 it was reported that the overhaul had been delayed due to the discovery of slipped white metal in one of the trailing truck axle boxes. This discovery led to the whole locomotive being lifted so that the truck could be rolled out, which meant complete dismantling of all the pipework at the back end along with several other items. Having moved it from beneath the locomotive the truck's frames were found to have considerable wastage and some of the plate work needed to be replaced.

Its time standing in the open at Tyseley had exacerbated the problem of water sitting in remnants of ash and dirt unable to escape. SLL staff at Herston Works made drain holes in the relevant areas to prevent the problem reoccurring and will be looking at other locomotives for the same problem.

Manston left Herston on 2nd November and was carried to Norden where it rejoined its tender and 'landed' on Swanage Railway's track after five years and three months since its withdrawal for repair and overhaul. It was then towed to Swanage where a fire was put into the locomotive on the 7th. Everything was fine and it was moved under its own power for the first time on 14th. Two days later it was passed for running by our boiler inspector, and successful loaded test runs took place on Thursday and Friday. Some work has been needed on the tender with needle guns removing some corrosion and a few weld repairs were also necessary on the tender tank.

SLL were pleased that following the inspection a completely new boiler ticket was granted so it has until 2033 before someone has to start the whole process again. Hopefully it will be back in revenue earning traffic very shortly to celebrate its 75th birthday - as many will know this locomotive was the last Southern engine to be built prior to nationalisation in November 1947 and had the last 21C number allocated, whilst *257 Squadron* was the last locomotive to be painted Malachite Green.

One of the issues which contributed to *Manston's* delayed return to the rails was the weaknesses found in the frames of the Bissel truck. Significant corrosion was found in the structure, needing new steel sections to be welded in. Part of the cause was the current design which has undrained areas where ash and water can gather. Cut-outs have been added to the frames to reduce such accumulation. Ash has also tended to gather above the axle boxes and covers were added to prevent this.

Leaving *Manston* in weathered condition, and the Herston painting gang's skill of matching the paintwork on its new smoke deflectors, has proved really popular with the photographic fraternity. In the Spring it underwent some maintenance, the major task being to renew the rings on both outside valves, and it's now back in service.

With all the valve rings replaced, and the valves reset, it partially cured the problem of *Manston* getting stuck occasionally in reverse gear! 34070 visited the Bluebell Railway for their 'Giants of Steam' event over the weekend of 13th -15th October where it joined 34027 *Taw Valley* in its temporary black livery.

After its return it was only a few weeks before 34070 was on its travels again. This time it was transported to the Mid-Hants Railway, at the end of November, as a last minute 'stand in' for failed ex-GWR 2-8-0T No. 5239 "Goliath". "Manston" hauled their seasonal 'Train of Lights' and will stay on for early season services. This was to cover a short term loco shortage.

34070 "Manston" returned to Swanage on 21st May in time to help out during the 2024 summer timetable.

However, of more immediate priority, it had a planned appearance, with seven other Bulleid Pacifics, in the Swanage Railway's "Strictly Bulleid II" weekend sponsored by Trackside magazine. This will be the largest number of Bulleids in one location since the end of Southern Steam on 9th July 1967.

"Strictly Bulleid II" takes place between 7th - 9th June 2024 with a preview day on Thursday 6th. In addition to 34070 *Manston* it is planned to have SLL's 34028 *Eddystone*, 34053 *Sir Keith Park* and 34072 *257 Squadron* in service. Visiting locos are scheduled to be 34081 *92 Squadron*; 34092 *City of Wells* plus two Merchant Navy Class locos 35006 *Peninsular & Oriental S.N.Co* and 35018 *British India Line*.

LOCOMOTIVE SPECIFICATIONS			
Configuration	4 – 4 - 0	Axle Load	15 ¾ tons
Working Boiler pressure	250 psi	Locomotive Weight	86 tons
Cylinders	Three	Tender Weight (fully laden)	42 tons 12 cwt
Cylinder size (dia. & stroke)	16 ³ / ₈ ins x 24 ins	Coal Capacity	5 tons
Valve Gear	Walschaerts	Water Capacity	4,500 gallons
Tractive Effort	27,720 lbs ft	Leading Bogie Wheel dia.	3 ft 1 ins
Overall Length	54 ft 2 3/8 ins	Driving Wheel dia.	6 ft 2 ins
Height	13 ft 2 ³ / ₄ ins	Trailing Pony Truck Wheel dia.	3 ft 1 ins
BR Power Classification	7P6F		

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

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