= BR Standard Class 7 =

The BR Standard Class 7 , otherwise known as the Britannia Class , is a class of 4 @-@ 6 @-@ 2 Pacific steam locomotive designed by Robert Riddles for use by British Railways for mixed traffic duties . Fifty @-@ five were constructed between 1951 and 1954 . The design was a result of the 1948 locomotive exchanges undertaken in advance of further locomotive classes being constructed . Three batches were constructed at Crewe Works , before the publication of the 1955 Modernisation Plan .

The Britannia Class was based on several previous LMS locomotive designs , and also significantly influenced by the Bulleid SR Pacifics , notably in the boiler and rear truck design , incorporating the best practices in locomotive technology as regards labour @-@ saving and lowering maintenance costs ; various weight @-@ saving measures also increased the route availability of a Pacific @-@ type locomotive on the British Railways network . The Britannias received a positive reception from their crews , with those regularly operating the locomotives giving them favourable reports as regards performance . However , trials in some areas of the British Railway network returned negative feedback , primarily due to indifferent operation of the locomotive , with its effects on adhering to timetables .

The Britannias took their names from great Britons , former Star Class locomotives , and Scottish firths . The class remained in service until the last was withdrawn in 1968 . Two survived into preservation , the first @-@ of @-@ class , number 70000 Britannia , and 70013 Oliver Cromwell . Number 70000 has hauled mainline excursions and 70013 , after a period of display following limited steaming , returned to mainline steam in 2008 for the first time since leaving British Railways ownership . 70000 was returned to the main line in 2011 .

= = Background = =

Locomotive exchanges were commissioned by the fledgling British Railways (BR) during 1948 , to test the best and worst aspects of locomotive design within the Big Four railway companies that had existed before nationalisation . The research gained from operating the best designs of the GWR , LMS , LNER and Southern railways on different areas of the British Railways network paved the way for several new classes of standardised locomotives to be constructed . These new locomotive designs were intended to replace some of the ageing designs inherited by British Railways .

The new classes were designed by Robert Riddles , who had previously designed the WD Austerity 2 @-@ 8 @-@ 0 and WD Austerity 2 @-@ 10 @-@ 0 locomotives for wartime use . The first design requested by the Railway Executive was for a new express passenger " Pacific " locomotive , designed specifically to reduce maintenance and using the latest available innovations in steam technology from home and abroad . Various labour @-@ saving devices were utilised to produce a simple , standard and effective design , able to produce equivalent power to some of the " Pacifics " that were still available as legacies of the Big Four .

= = Design features = =

The basic design of the " Britannias " owed much to LMS building practices , especially when considering Riddles ' previous career with the said railway . However , in keeping with the necessity to follow best practice in creating standardised steam locomotives , they utilised a variation of both boiler and trailing wheel of the Merchant Navy Class , while weight was kept within the margins laid down by the Light Pacifics , all of which were designed by Oliver Bulleid . The firebox was also similar in having a rocking grate , which allowed the fire to be rebuilt without stopping the locomotive , removing both ash and clinker on the move ; but unlike the SR Pacifics , the inner firebox was constructed of copper instead of steel , and lacked thermic syphons . A self @-@ cleaning smokebox was used , which enabled ash to flow into the atmosphere , reducing the workload of the engine cleaner at the end of a working day . A single chimney was placed on top of the smokebox , which was unusual for a " Pacific " type of locomotive . This was because the blastpipe was

designed by S.O. Ell at Swindon Works , who claimed that " better results could be obtained from a well @-@ designed single chimney than some of the previous double chimney arrangements " . The " Britannias " had 6 ft 2 in (1 @.@ 88 m) driving wheels , a compromise that took into account the intended mixed @-@ traffic role they were designed for . This meant that they were large enough for sustained fast running with heavy passenger trains , yet small enough to allow them to undertake more mundane tasks such as freight haulage .

The design also featured raised running plates above the wheels , which allowed easy access to the inside of the frames for purposes of lubrication . The lack of wheel splashers on this running plate also reduced the risk of the bearings overheating , by allowing more air to flow around the axles when at speed . Wheel splashers were used on older locomotive designs to box @-@ in the top portion of the driving wheels for aesthetic reasons , and to prevent water and dirt from being thrown at the cab windows . The " Britannnias ' " footplate was designed around the requirements of the operating crews , with a mock @-@ up being constructed at Crewe to test ergonomics and usability . For ease of maintenance , availability of spare parts and increased reliability , two sets of Walschaerts valve gear were used , along with the largest cylinders capable of staying within the British loading gauge . The " inside " cylinders located between the frames of a three- or four @-@ cylindered locomotive are difficult to access for maintenance ; the two @-@ cylinder design of the Class 7 ? with all the valve gear on the outside ? avoided these maintenance problems . Boiler ' plumbing ' was also generally exposed to maintain ease of access . In common with other BR standard designs there was no exhaust injector , as this device was temperamental unless rigorously maintained .

Following experience of occasional cracks appearing near the spring brackets had one or more further batches of Class 7 Standard Pacifics been built to complete the intended 91 engines the chassis would have been rearranged to be similar to that used on the solitary BR Standard Class 8 Duke of Gloucester and that drawn up by Derby Drawing Office for the 2nd batch of Class 6 Standard Pacifics . This would have resulted in the locomotive riding on cast steel " sub @-@ frames " carrying the spring brackets . Unlike the smaller BR Standards the exhaust steam manifold within the smokebox saddle (along with the BR Standard Class 6 engines) was an intricate steel casting .

= = Construction history = =

Designed at British Railways ' Derby Works , the new class was constructed at British Railways ' Crewe Works between 1951 and 1954 . The initial order was for 25 locomotives , but such was the demand for the Britannias on the Eastern Region that more were rushed through construction before the teething problems had been ironed out on the prototypes . In total , 55 members of the class were constructed over three batches at Crewe Works , where each was given improvements to improve reliability and efficiency , and to overcome flaws with the original design .

First batch : 70000 ? 70024 , constructed between January and October , 1951
Second batch : 70025 ? 70044 , constructed between September 1952 and October 1953
Third batch : 70045 ? 70054 , constructed in 1954 .

= = = Variations and modifications = = =

Problems with the class were experienced immediately , with the first 25 locomotives being withdrawn in October 1951 after several complaints were received from crews regarding the driving wheels shifting on their axles . They were subsequently modified , and released back into revenue @-@ earning service . Initially the return cranks on the main driving wheels were of LNER block type , as seen on Arthur Peppercorn 's A1s and A2s , but this was changed to the simpler LMS four @-@ stud fitting . This was the result of a problem of overheating bearings within the cranks , and difficulty in removing the LNER @-@ type casings . 70035 ? 70039 were built with roller bearings on the leading and trailing coupled axles only and plain bearings on the remaining axles , whilst 70040 ? 70049 were built with plain bearings throughout . However throughout their service the roller

bearings used in remaining cases showed no advantage in reliability or cost .

An unusual fault with the first engines of the class was fore @-@ and @-@ aft vibration , strong enough to prompt passengers to complain and to cause fire @-@ irons stowed in a longitudinal compartment on top of the tender to work their way forward into the cab . The passengers ' complaints were dealt with by reducing the tension in the drawbar spring .

Locomotive tenders were also changed as new , improved designs became available . Some examples of the second batch (70025 ? 70029) were equipped with the BR1A tender , which had a higher water capacity of 5 @,@ 000 gallons . Members of the third batch (70045 ? 70054) were equipped with another tender design , the BR1D , which had 9 tons of coal and 4 @,@ 750 gallons of water , due to the fact that they were intended for use on longer runs in the north of the railway network . This tender design also featured a steam @-@ powered coal pusher , which eliminated the need for crew members to mount the tender to pull forward coal when the locomotive was at a stop .

Nos.70043 and 70044 were delivered with Westinghouse airbrakes fitted alongside the smokebox and with no smoke deflectors . The two locomotives , which looked radically different from the rest of the class , were allocated to Manchester (Longsight) and ran a series of brake trials on the London Midland main line during the mid @-@ 1950s . Subsequently both had the equipment removed and deflectors fitted .

No. 70045 was fitted with LMS @-@ style oval buffers in the course of repairs after collision damage (see photograph) .

On 21 January 1960 , the Settle rail crash , which cost the lives of five passengers , was caused when the piston rod , cross @-@ head and connecting rod of No. 70052 came loose and damaged the opposite line as a freight train was approaching . The locomotive of the freight train was derailed towards 70052 's train and tore out the sides of three passenger coaches . Part of the slide assembly was redesigned , and was fitted as the locomotives were routinely " shopped " .

Western Region based examples had hand / foot holds cut into the smoke deflectors rather than steps , to improve forward visibility after one of the class was involved in a major derailment .

= = = Naming = = =

From 1948 until the mid @-@ 1950s , the responsibility for recommending names for locomotives on British Railways rested with a Locomotive Naming Committee of three senior railway officers , E.S. Cox , George Dow with Derek Barrie as chairman .

The Committee set itself several rules and over the years developed many practices . The names had to be euphonious (they had to have a pleasant sound) . Also , their meaning had to be readily apparent to anyone interested , whether railwayman or member of the public . There had to be good publicity value in the names as well as providing good morale for the staff , and the collection of names for a class had to provide some form of class identity . Another rule was not to use names of people who were still alive at the time , and some on the Committee had a strong dislike of names or associations with the military (largely because they were fed @-@ up with the recently ended war) . There was a preference for names of heroes and other well @-@ known people . However , slavishly following a single theme to an absurd extent was discouraged .

The name that was to be bestowed on the first class member caused great debate on the Committee and the wider executive of British Railways . However noted enthusiast Bishop Eric Treacy suggested the name " Britannia " . This set the general theme of the naming process , which featured great Britons , although several deviations from the theme were allowed . These exceptions were allocated to those that operated on the Western Region , which were given names of former Star Class locomotives , and those of the Scottish Region , which were granted the names of the various Scottish firths . The locomotive naming ceremonies were carried out at various railway stations around the British Railways network . No. 70047 was never named .

= = Operational details = =

The class was well liked by crews in most regions of British Railways , with especially glowing reports from those operating them from Stratford depot on the Eastern Region , where its lower weight and high power transformed motive power over the restricted East Anglian lines . However , negative feedback was received from various operating departments , most notably on the Western Region . The criticism was primarily out of partisan preference for GWR @-@ designed locomotive stock among Western Region staff ; in particular , the class was ' left @-@ hand drive ' in contrast to ' right @-@ hand drive ' GWR locomotive and signalling practice , a factor in the Milton rail crash of 1955 .

For this reason , the Western Region locomotive depots at Old Oak Common and Plymouth Laira declared that the class was surplus to requirements . However Cardiff Canton depot displayed its liking for the class (despite being part of the former GWR empire) and managed to obtain good results on South Wales passenger traffic .

The Midland Region also had favourable reports , but a marked consistency in losing time on the longer runs between Holyhead and Euston was recorded , although all complaints were down to the individual techniques of the operating crews . This was compounded by the irregular allocation of the class to depots all over the network , meaning that few crews ever had a great deal of experience in driving them . The Southern Region also had an allocation of seven in May 1953 , when all Merchant Navy Class locomotives were temporarily withdrawn for inspection after 35020 " Bibby Line " sheared a crank axle on the central driving wheel .

Repairs to the class were undertaken at Crewe , Swindon and Doncaster Works until the financial constraints of the British Railways Modernisation Plan in terms of expenditure on steam began to preclude the regular overhaul of locomotives . During the mid @-@ 1960s overhauls were carried out exclusively at Crewe Works . The first locomotive to be withdrawn from service was number 70007 " Coeur @-@ de @-@ Lion " in 1965 , and the entire class was gradually transferred to Carlisle Kingmoor and Glasgow Polmadie depots as steam was displaced by the dieselisation of British Railways . A succession of bulk withdrawals began in 1967 , and the last , of number 70013 " Oliver Cromwell " , took place in 1968 , at the very end of steam operation in Britain . Subsequently that locomotive was selected to represent the class in the National Collection . Only 70000 " Britannia " , which was privately preserved , saw main line service during the preservation era ? until 2008 , when 70013 " Oliver Cromwell " ' s restoration was completed , and she worked part of the " 15 Guinea Special " ? a special train run to commemorate the final BR steam working in 1968 . 70013 is now to be found operating main line railtours over the Network Rail system .

= = Accidents and incidents = =

On 20 November 1955 , locomotive No. 70026 Polar Star was hauling an excursion train that was derailed at Milton , Oxfordshire due to excessive speed through a crossover . Eleven people were killed and 157 were injured .

On 21 January 1960 , locomotive No. 70052 Firth of Tay was hauling an express passenger train that was derailed at Settle , Yorkshire due to a defect on the locomotive . Five people were killed and nine were injured .

= = Livery and numbering = =

The first member of the class was given a livery of plain black without lining ; this was changed to the new standard British Railways Brunswick green that was applied to express passenger locomotives after nationalisation , despite the locomotive being classed as mixed traffic . This was lined in orange and black , and the class was given the power classification 7MT . The " Britannias " were numbered under the new British Railways standard numbering system in the 70xxx series . The locomotives were numbered between 70000 and 70054 , and featured brass nameplates with an initial black background , followed by red , located on the smoke deflectors . Towards the end of steam plain green livery was substituted , with the touching @-@ up of existing paintwork being preferred to full aesthetic overhaul .

= = Preservation = =

Two Britannias have survived , the original , number 70000 Britannia , and 70013 Oliver Cromwell . Number 70000 was originally selected to represent the class in the embryonic form of the future National Railway Museum , but she was ultimately rejected due to the poor mechanical condition the locomotive was in . As a result , 70013 was eventually selected to represent the class for the benefit of future generations .

However , 70000 had been purchased privately from British Railways by the Britannia Locomotive Group , therefore ensuring that the doyen of the class was to survive into the preservation era . Subsequently utilised on mainline railtours , the locomotive was out of use in the late 1990s , requiring work to bring it back to steam ; it was eventually sold to Pete Waterman and stored at Crewe . After a spell in storage on the Bressingham Steam Museum in Diss , Norfolk , 70013 was moved to the Great Central Railway (preserved) , following an ownership dispute between Bressingham and the National Railway Museum . The locomotive returned to steam in May 2008 on the Great Central Railway after the readers of Steam Railway magazine contributed towards its overhaul . In July 2008 it appeared in WCRC 's Open Weekend at Steamtown , Carnforth . August saw the locomotive return to the main line . Its first turn was the 1T57 ' Fifteen Guinea Special ' re @-@ run from Manchester to Carlisle , 40 years after it performed the same duty in 1968 . As a result , both preserved members of the class have operated on the mainline in preservation .

After its sale to the Royal Scot Locomotive and General Trust , 70000 was overhauled at Crewe and returned to the main line in 2011 (its 60th anniversary) , initially in unlined black without name plates as originally outshopped in 1951 (the plates were first fitted for the Festival of Britain later that year) .

For location details of the preserved locomotives , see : List of BR ' Britannia ' Class locomotives

= = Gallery = =