

Clayton Equipment Ltd: Behind the Scenes

The name Clayton is perhaps most commonly associated with the centre cab Type 1 diesels, later dubbed Class 17s, which were hurriedly built as part of the British Railways Pilot Scheme in the early to mid 1960s. Clayton Equipment Ltd has a long and interesting history, however, and nowadays it is one of only a handful of loco builders left in the UK. In January Today's Railways was kindly invited to take a tour of the company's Burton-upon-Trent works to view progress on two CBD90 hybrid locos that are being built for use at Tata's Port Talbot steelworks. Ian Beardsley takes the story from here... All photos taken by the Author unless stated.

A little history

The Clayton Equipment Company Ltd, as it was then known, was founded in 1931 by Stanley Reid Devlin. Devlin is reputed to have been Chief Draughtsman at the Clayton Carriage & Wagon Co, which went into receivership at the start of the Great Depression, and saw an opportunity to produce goods and spare parts to support the ongoing operation of the existing product range. From here the business steadily grew and diversified.

Having taken an office at International Combustion Ltd, Sinfin Lane, Derby, from where he traded as Clayton Equipment, at the outbreak of World War II Devlin was seconded to run a factory producing "war materials". Upon his return, the company diversified further, going into the production of general and structural steelwork, as well as farm buildings, conveyors and elevators. This expansion led in 1946 to the acquisition of new premises at the Record Works, Hatton, the large site allowing new offices and workshops to be developed as the business continued to grow. Whilst here a wide variety of locomotives and items of industrial equipment were produced for both the domestic and export markets.

Pilot Scheme diesels

Clayton manufactured the bogies and superstructure for the first ten of the British Thomson-Houston (BTH) Type 1 Bo-Bos, D8200–D8209. Assembly of these locos, later classified under TOPS as Class 15s, took place at the Meadow Hall Works of the Yorkshire Engine Company. Hatton was responsible for the construction of a subsequent order of 34 locos, D8210–D8243, however. These were followed by the outshopping of 88 Class 17s, D8500–D8587 (construction of what became D8588–D8616 was subcontracted to Beyer Peacock in Manchester) and also a prototype Type 3, which was known as DHP1.

It is widely reported that Clayton was also responsible for the production of ten T975 2500 hp Co-Co diesels, 2501–2510, for Cuban National Railways. Although fitted with Clayton builder's plates, their similarity to the Brush Type 4s (Class 47s) being built at the time is a clue as to their true parentage. Hawker-Siddeley, the parent company

In 2006 Clayton Equipment moved to Centrum Business Park at Burton-upon-Trent. This gave the company a modern facility that better met with its needs than its previous premises at Hatton, the building being specially designed to ensure that products flowed through the factory in the most structured and efficient manner possible. Surprisingly, it measures just 1200 m², and when viewed from the outside there is very little to give away what takes place inside.



A busy scene at Hatton in the 1960s, with an unidentified Type 1, prototype DHP1 and a number of the Cuban Co-Cos occupying the workshop. Courtesy Clayton Equipment Ltd

of Brush, had significant involvement in the defence industry at the time and realised that, due to the political situation between America and Cuba in the wake of the communist revolution, to protect its US interests it would be better if this new contract wasn't widely known about. As such the press were told that the locos were built by Clayton. The bodyshells and most of the other components were manufactured at Brush's Falcon Works in Loughborough, however, with Clayton's involvement largely being limited to their final assembly and painting.

By this point the company had been taken over by International Combustion Holdings Ltd. It has since changed hands several times, eventually becoming part of the Rolls-Royce Industrial Power Group in 1989 and subsequently falling under the control of its Gateshead-based Materials Handling and later its Derby-based Industrial Business divisions. The company continued to operate as a subsidiary of Rolls-Royce for almost 16 years, but in March 2005 it once again became independent and, with the Hatton site no longer meeting its needs, the following year it moved both its factory and offices to new premises on a business park on the outskirts of Burton-upon-Trent. At present there are 28 members of staff employed here.





Once inside, the building is deceptively spacious. The workshop can handle a maximum of two large locos at a time. Here, with 932 nearest the camera, we see the two CBD90s under construction on 21 January. Notice the multiple track gauges beneath the loco.

From coal mines to the capital

Clayton's products have similarly changed over time. Although already in high demand for the export market, the removal of pit ponies from UK mines in the early 1960s saw British Coal express an interest in the use of small flameless locos for its mining operations. Asked to develop a machine that could cope with steeper gradients, Clayton then started the production of special rubber tyred locos, these going on to become the standard design for British Coal.

The decline of the UK coal industry saw Clayton change its focus once more, from a company largely focussed upon the domestic market to one that could compete on the global stage, this seeing a major marketing drive and further diversification into the construction sector. Thus far it has supplied equipment to over 60 countries, and today over 90% of the company's output is for export.

Its current product range is extensive and includes battery, diesel, electric and hybrid locos, and the company proudly boasts that nowadays it is the only independent loco builder left in the UK capable of designing and manufacturing locos from 1.75–135 tonnes for track gauges 457–

1676 mm. These include not just its traditional locos for mining and tunnelling operations, but also examples used on metro systems and for shunting at industrial complexes. As well as the CBD90 locos for Tata Steel, recent orders have included seven CD40 type locos for use in the construction of Crossrail, a CD45 for shunting Ford's Dagenham plant, plus two battery-diesel hybrids for use on the Snowdon Mountain Railway.

There is more to the company than just loco building, however. Clayton also undertakes overhauls and re-engineering of existing locos, for example the ten London Underground Schöma diesels that were converted to battery-electric operation, and the construction of bespoke rail engineering equipment, such as a 500 m-long works train that was supplied to aid the installation of cable supports in the Channel Tunnel.



LoCo is a low cost design that Clayton offers for tunnelling and construction projects. Compared to traditional locos, it offers a 40% reduction in capital costs and an increase in traction of 50% – enabling it to haul greater loads and giving improved breaking distances.



The centrally located battery compartment. Despite the increasing prevalence of lithium-ion types, Clayton prefers to use lead-acid batteries. These, it explains, are ideal for heavy shunting locos as they add weight and thus improve tractive effort. They are also significantly cheaper and are much more durable and longer lasting than lithium-based batteries, and pose little by way of a fire risk.



The cab of the CBD90 offers excellent visibility and staff are provided with separate desks for driving in either direction. Although outwardly similar, all Clayton products can be adjusted to suit the customers' needs. For example, other designs might feature a control desk that swivels so that it can be adjusted according to the direction of travel, whilst other locos might have their controls built into the arms of the driver's seat.

The CBD90s

In September 2018, having proposed a bespoke design to suit its operations, Clayton won the contract to supply Tata Steel with a new loco for its Port Talbot complex in South Wales. A further two locos were ordered in June 2019. Known as the CBD90s, these 90 tonne Bo-Bo hybrids would replace a number of Tata's existing locos at the site, bringing reduced operational costs, increased loco availability and also environmental benefits, through reduced emissions. Clive Hannaford, Managing Director at Clayton, explains that these factors are becoming increasingly important and in recent years the company has seen a market shift. Its customers are no longer looking for traditional diesel shunting locos. Older designs are becoming increasingly difficult and costly to maintain, as spare parts are getting harder to come by, and often these locos are also loud and highly polluting and do not make for good neighbours!

The locos feature an EU Stage V compliant Deutz diesel engine. Rated at 55 kW, this is used solely to charge the on-board traction battery and operates at the optimum speed to achieve the highest fuel and emissions efficiencies, automatically stopping and starting when the charge in the battery reaches predetermined levels. The battery supplies power to four maintenance-free high-torque electric motors totalling 416 kW. This arrangement gives the loco a high haulage capacity, with a similar tractive effort to a Class 68. As would be expected in industrial use, its maximum speed is much less than that of main line locos, however.

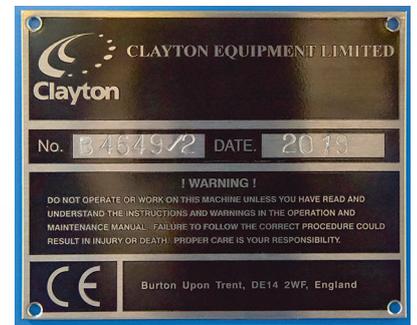
Becoming the largest loco to be built in the UK since the Eurotunnel Class 9/7 Bo-Bo-Bos, built by Brush in the late 1990s/early 2000s, 930, the first of the three locos was completed in February 2019, and following type testing at the nearby Ecclesbourne Valley Railway it was delivered to South Wales the following month. Its manufacture, testing and commission took a mere 24 weeks! It has since been put to work hauling "torpedoes" of molten steel between the blast furnaces and the Basic Oxygen Steelmaking plant and also moving rolled steel to the main line exchange sidings. This typically involves trains loading up to 2500 tonnes and negotiating gradients of up to 1 in 60, but the loco takes all this in its stride.

Construction of the second and third locos, 931 and 932, is ongoing. At the time of our visit 931 was approaching completion. It is expected to be delivered to Port Talbot during February; 932 will not be far behind.

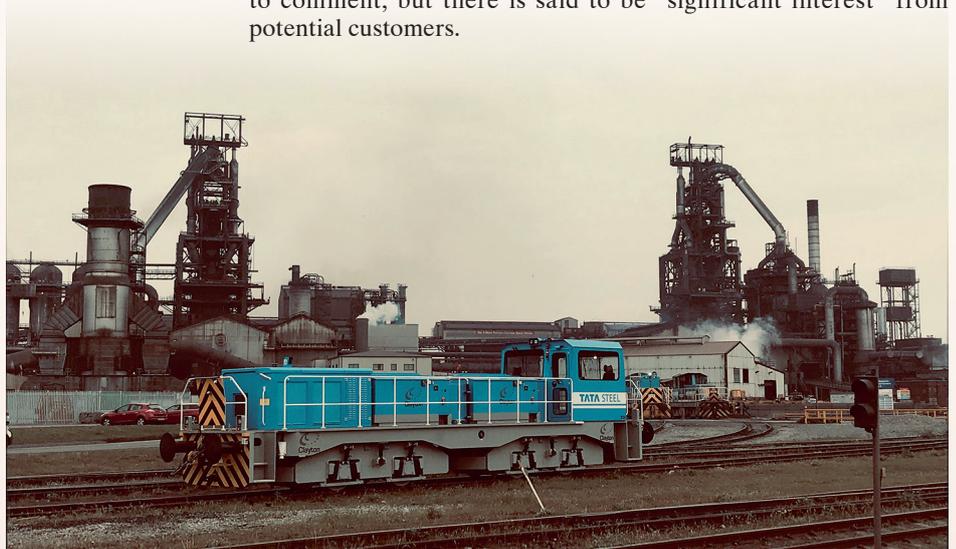
The future

Upon completion of the Tata order attention will then be turned to the two locos for the Snowdon Mountain Railway, which are due to enter service in advance of the railway's peak summer season. Like the much larger CBD90s, these locos will also be hybrids, but in addition to their on-board diesel generators they will also use regenerative braking to charge the traction batteries. This will offer significant cost savings, and the locos will be much more environmentally friendly than the 1980s/90s Hunslet diesels that they will replace. So as to increase the railway's passenger carrying capacity, unusually, the locos will feature "pods" with room for 12 additional persons to be carried on each journey.

Asked what would come next, Mr Hannaford was unable to comment, but there is said to be "significant interest" from potential customers.



A close-up of the builder's plate of 932, which is found inside the cab, showing its works number B4649/2.



Still remarkably clean, 930, the first of the three locos to be completed, stands out against the industrial backdrop of Port Talbot steelworks. Courtesy Clayton Equipment Ltd