



SHUNTER LOCOMOTIVES



## COMPANY OVERVIEW

### CLAYTON EQUIPMENT – SPECIALISTS IN RAIL EQUIPMENT

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#### A progressive company that strives to build for the future

Since 1931, Clayton Equipment Ltd is *the* UK based manufacturer specialising in bespoke locomotives.

We are one of the world's premier suppliers of above and below ground locomotive haulage equipment.

Clayton Equipment is the only locomotive manufacturer capable of designing and manufacturing locomotives from 1.75 tonnes to 150 tonnes, for track gauges from 457 mm to 1,676 mm.

Our reputation is built on innovative thinking, excellence of execution and solid, yet flexible, partnerships with our impressive list of clients.

Our philosophy isn't 'one size fits all'. Bespoke solutions meeting your needs – we understand that all our clients have different requirements and that's what makes Clayton Equipment Ltd the most versatile choice in over 60 countries worldwide.

The company designs and builds battery, low emission Diesel, overhead (trolley), rubber-tyre, battery-Diesel, Hybrid+™ and third rail locomotives.

Today, the future for Clayton Equipment remains firmly with rail locomotives and equipment, seeing the company expand and safeguard another 90 years of innovation.

#### From humble beginnings to an unsurpassed global reputation





Clayton

Made in Britain

Clayton

## SHUNTER LOCOMOTIVES

BATTERY, DIESEL-TO-BATTERY CONVERSIONS, LOW-EMISSION DIESEL, DIESEL ELECTRIC, HYBRID & HYBRID+™

Clayton's range of shunting locomotives are becoming the haulage solution of choice in industry

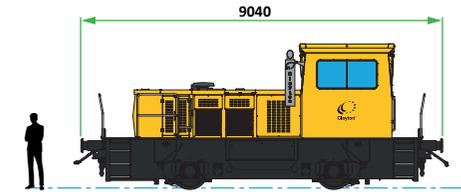
Being the workhorses of rail depots and manufacturing facilities, some shunters are 60 years old, possess high emissions levels and are increasingly unreliable, labour intensive and expensive to operate. They usually require at least two personnel and specialist maintainers. A good example can be found in the case of the 996 Class '08' shunters made in the UK between 1953 and 1962. Less than 10% of them remain operational today and the number is decreasing every year due to the obsolescence of critical parts and general age-related issues.

Clayton offers a new generation of shunters providing cost-effective haulage solutions:

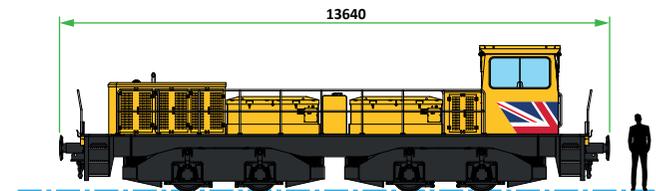
- 2-axle locomotives up to 50 tonnes
- 4-axle Bo-Bo locomotives up to 100 tonnes
- 6-axle Co-Co and Bo-Bo-Bo locomotives up to 150 tonnes
- Diesel-to-Battery conversions of existing shunters
- Power from 208 kW to 1,698 kW
- Tractive effort up to 440 kN

Benefits include:

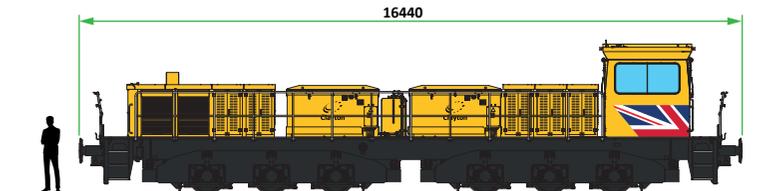
- Significantly lower operational costs
- Improved fleet availability
- Battery locomotives for use near built-up areas as they are emission free and low noise
- Single-driver operated, multiple locomotive option for increased performance and haulage capacity
- Increased safety including optional remote control for single driver operation
- Zero and low emissions (EU Stage V)
- Low maintenance solutions
- Short delivery time with purchase, lease, lease-to-buy or part exchange options available
- UK technical and project management support



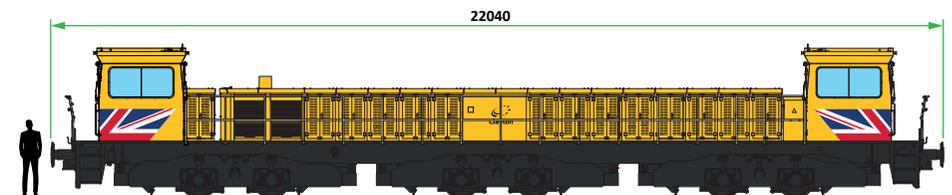
0-4-0 Hybrid+™, Battery, Diesel-Electric or Diesel-Hydraulic



Bo-Bo Hybrid+™, Battery or Diesel-Electric



Co-Co Hybrid+™, Battery or Diesel-Electric



Bo-Bo-Bo Hybrid+™, Battery or Diesel-Electric

FOR MORE INFORMATION ☎ +44 (0) 1283 524470 or ✉ [contact@claytonequipment.co.uk](mailto:contact@claytonequipment.co.uk)



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Clayton



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## SHUNTER LOCOMOTIVES CASE STUDIES UP TO 150 TONNES

BATTERY, DIESEL-TO-BATTERY CONVERSIONS, LOW-EMISSION DIESEL, DIESEL ELECTRIC, HYBRID & HYBRID+™

### Battery Locomotives:

- Zero emissions, maximum CO<sub>2</sub> reduction, no fumes inside workshops
- Low noise, increasingly important near residential areas and for 24/7 operations
- Lowest operational and maintenance costs
- Highest availability in service
- Regenerative braking, resulting in reduced brake wear and reduced charging times

### Hybrid+™ Locomotives:

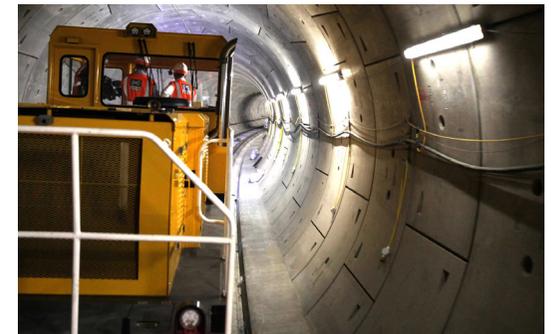
- All the benefits of battery locomotives
- Battery charging on the locomotive and depot based
- Small engine enables low maintenance costs

### Diesel to Battery-Electric conversions:

- Benefits same as battery locomotives
- Maximises capital cost saving
- Retain existing certification in most cases
- Lowest driver/maintainer retraining cost
- Improved safety

### Diesel and Diesel-Electric Locomotives:

- Lowest emissions with EU Stage V
- Reduced idling, the latest engines can be shut down and restarted quickly
- Improved line of sight



## CASE STUDIES

### BATTERY, DIESEL-TO-BATTERY CONVERSIONS, LOW-EMISSION DIESEL, DIESEL ELECTRIC, HYBRID & HYBRID+™

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#### 2 x CB16 Stadler for SPT Glasgow Metro

The Glasgow Subway is owned and operated by Strathclyde Partnership for Transport (SPT). The Subway is the world's third oldest underground railway, after London and Budapest, opening 125 years ago and is currently undergoing a major multi-million modernisation programme, completely transforming the whole system. All of the passenger railway is underground, contained in twin tunnels which are very small, at only 3.4 metres in diameter and the trains run on a track gauge of 1220mm.

To support the new fleet of passenger rolling stock in use on the Glasgow Subway, Clayton Equipment designed and supplied 2 x zero emission Clayton battery 16 tonne locomotives. Both CB16 locomotives contain 104kW maintenance free traction motors with a 166kWh traction battery capable of shunting up 1.16.6 (6%) gradients.



#### 1 x CD45 for Ford, UK

Ford UK Dagenham plant is a major engine manufacturing operation and also a vast logistics hub.

In addition to Diesel engine manufacturing, it is also home to Ford's Transport Operations which is responsible for the transport logistics of Ford components and vehicles across the UK.

Clayton Equipment Ltd were engaged to replace Ford's old unreliable, high emissions Diesel locomotive. Ford required a reliable low emissions locomotive for shunting car transporter wagons throughout the logistics hub.

Clayton designed and built the CD45 to suit the task.

The 45-tonne locomotive, 0-4-0 Diesel-Hydraulic with a 390kW EU Stage IV (now EU Stage V) engine is capable of a maximum haulage load of 1200 tonnes. Unique to this loco is the pivoting central driver's control desk which allows for easy bi-directional working and improved line of sight.

The locomotive configured to deliver significant maintenance and fuel savings with lower carbon emissions met the investment requirements of Ford UK.



## CASE STUDY

### BATTERY, DIESEL-TO-BATTERY CONVERSIONS, LOW-EMISSION DIESEL, DIESEL ELECTRIC, HYBRID & HYBRID+™

#### 1 x CD28 for Balfour Beatty, Malaysia

Balfour Beatty Rail is an international rail engineering, design and construction business.

One of the largest rail contracts ever undertaken by Balfour Beatty Rail (BBR) in Malaysia was the Rawang-Ipoh Electrification Project.

This involved the installation of 180km of double-track overhead catenary system, plus a traction supply system, upgrading of the existing railway line, converting single track to double track and the complete electrification system with new signalling on the stretch running from Rawang on the outskirts of Kuala Lumpur to Ipoh in the north.

The electrified track is designed to allow trains to reach speeds of up to 160kph.

A major challenge of the contract was Malaysia's tropical climate. All the equipment needed to be 'tropicalised' to prevent corrosion in high humidity and high temperatures.

A reliable diesel locomotive was required to work on the 1,000mm track site moving stock near Kuala Lumpur.

Clayton worked with Balfour Beatty designing, building and supplying a CD28 diesel locomotive.

The CD28 used the highest quality components to optimise locomotive reliability and reduce maintenance. Using the "best in class" engine and transmissions ensured reliability and fuel economy.

Clayton has provided the safest locomotive through many decades of experience.





## CASE STUDY

### BATTERY-DIESEL HYBRID+™

#### 2 x CBD80 and an additional 1 x CB40 for Sellafield Ltd

Sellafield Ltd a wholly owned subsidiary of the Nuclear Decommissioning Authority is a global centre for nuclear engineering management.

The site in West Cumbria covers 6 square kilometres and is home to more than 200 nuclear facilities and is one of the biggest construction sites in the UK. As part of their plan to replace the existing fleet of solely diesel locomotives, which have high emissions, are not environmentally friendly and to make their rail operations 100% electrically powered, Clayton Equipment secured the order to supply two innovative Hybrid+™ Diesel CBD80 locomotives.

The role of the CBD80's in Sellafield rail fleet is to safely move nuclear materials and waste across the internal rail network that criss-crosses the site.

The CBD80 locomotive which is a self-contained 80-tonne Hybrid+ Bo-Bo locomotive with on-board battery charging. Battery charging is undertaken from a three-phase supply, providing emission-free solutions or from the low emission EU Stage V diesel engine. The CBD80's are designed to enable Sellafield to realise significant commercial savings from reduced operation and maintenance costs as well as the greener benefits of reduced emissions from the cleanest diesel engines, a reduced carbon footprint, reduced noise levels, greater haulage capacity and increased reliability.

Following the supply of the two hybrid CBD80 tonne locomotives, Clayton Equipment has agreed an additional contract to supply an innovative CB40 locomotive to Sellafield Ltd as part of their investment in greener technology.

The Clayton Equipment CB40 is a 40 tonne 0-4-0 battery locomotive and is self-contained, with on-board battery charging. Battery charging is undertaken from a 3-phase supply, providing 100% maximum emission free solutions.

Fitted with a large battery, the CB40 has low operational and maintenance costs and is capable of long-range use without recharging. In addition, the regenerative braking ensures lower brake wear and reduced charging times.

This new order to supply Sellafield Ltd with sustainable, low emission, environmentally compliant equipment meets their commitment to invest in technology and provide cost savings with long term durability.





## CASE STUDY

### BATTERY-DIESEL HYBRID+™

#### 5 x CBD90 and a further 2 x CBD90 for Tata Steel, Port Talbot

Tata Steel is one of Europe's leading steel producers, with steel making in Port Talbot, Wales, as well as manufacturing plants across Europe. Tata Steel is the largest steel company in the UK.

Port Talbot Steelworks is an integrated steel production plant capable of producing nearly 5 million tonnes of steel slab per annum, making it the larger of the two major steel plants in the UK and one of the largest in Europe.

As part of Tata Steel's requirement to replace their ageing locomotive fleet at the Port Talbot works, Clayton Equipment secured the contract to design, manufacture and supply a number of new Battery-Diesel Hybrid+™ locomotives.

The Port Talbot steelworks fleet will eventually include a total of seven Hybrid locomotives supplied from Clayton Equipment.

The Clayton Equipment CBD90 locomotive is a 90 tonne, Hybrid Bo-Bo locomotive. Power is delivered by the traction battery and 416kW maintenance free, high torque electric motors. The locomotive is self-contained with on-board battery charging from a low emission, EU Stage V compliant Diesel engine. This configuration enables Tata Steel to realise significant financial savings from reduced fuel costs and lower maintenance.

With 24/7/365 operation, the locomotives' higher availability allow Tata Steel to maintain and grow their planned productivity.

The locomotive design offers high torque, high haulage capability with over 300kN tractive effort, delivering the 2,500 tonne loads safely across the Port Talbot works, operating on their maximum gradient of 1:60 (1.7%). In these conditions the weight of the locomotive needs to be high and this led to a design based on standard lead-acid battery which provide the necessary weight, are cheaper than Li-ion batteries and are easier to replace and recycle.

The Clayton Equipment CBD90 is becoming the shunter of choice, rapidly replacing the '08' shunters in the UK due to its zero emissions, low noise, low maintenance and ease of operation.





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## CASE STUDY

### BATTERY-DIESEL HYBRID+™

#### 15 x Class 18 CBD90 for Beacon Rail Leasing

Clayton Equipment has a contract with Beacon Rail Leasing for the supply of 15 innovative Hybrid+™ CBD90 locomotives. Beacon Rail supports customers in the UK and Europe with flexible rail leasing solutions. To meet the increased demand for lower emissions, new technology, more capacity and cost-effective assets, this new partnership with Clayton Equipment will serve to meet this demand.

The Clayton CBD90 (Class 18) is a new generation of shunting locomotive designed to replace the classic Class 08 0-6-0 diesel shunters at railway yards large and small. Beacon Rail Leasing has ordered 15 of the locomotives as a modern, low-emission alternative to ageing diesel shunters still in use around the country.

The Class 18/CBD90 locomotives are designed to haul more than 2,000 tonnes and offers operators significant savings on fuel costs and emissions along with a safer, more comfortable driver environment. The locomotives have a maximum speed of 20 km/h, weigh 90 tonnes and are powered by a battery which can be charged from a three-phase mains power supply or using the on-board 55kW diesel generator.

The generators are manufactured in the UK by JCB Power Systems and comply with EU Stage V emissions regulations.

The locomotives are being assembled at Clayton's factory in Burton-on-Trent and are the largest locomotives built in the UK for nearly a quarter of a century.

The Class 18 designation was selected as the next in sequence from the Class 17 shunters built by Clayton. On 1<sup>st</sup> February, 2022 the first Class 18 locomotive, numbered 18001, was delivered to Whitemoor marshalling yards to begin operation by GB Railfreight.

This unique agreement with Beacon Rail Leasing ensures the two companies maximise the potential to supply our customer base with sustainable, low emission, environmentally compliant equipment. In the fast-changing environment, the increased demand for lower emissions, new technology, more capacity and cost-effective assets, this new partnership will serve to meet this demand.





Clayton Equipment Ltd

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