

= London Underground departmental stock =

Departmental locomotives on the London Underground consist of vehicles of a number of types which are used for engineering purposes . These include battery locomotives , diesel locomotives , electric locomotives , sleet locomotives , pilot motor cars and ballast motor cars . Details of the first four types are covered elsewhere . Pilot motor cars and ballast motor cars are generally vehicles which have been withdrawn from passenger service , but continue to be used by the engineering department . Pilot motor cars are used to move other vehicles around the system , while ballast motor cars are used to haul ballast trains and engineering trains .

The first ballast motor cars were former trailer cars built for the Central London Railway in 1900 , which were converted to motor cars for trials of the first multiple system to be used in Britain , and were retained for departmental use after 1903 . These were followed by French and Hungarian Gate stock cars , built in 1906 , which were converted in the 1920s and 1930s . The next batch consisted of 14 standard stock cars converted in 1953 . Rolling stock reorganisation and replacement in the 1970s on the District and Metropolitan lines resulted in a number of surface stock cars being used for pilot motor duties . Subsequently motor cars of 1938 stock and 1960 stock were used for this purpose , and complete 4 @-@ car units of 1962 stock .

The London Underground has also owned several departmental self @-@ powered vehicles designed for other duties . These include a tunnel cleaning train , consisting of two 1938 stock motor cars and three purpose @-@ built cars , which act like a giant vacuum cleaner , and can hold 6 tons of dust before the filter tanks need to be emptied . Three Plasser & Theurer track tamping machines were purchased in 1980 , and two Unimog road @-@ rail vehicles were obtained in 1983 and 1986 , for use as depot shunters .

= = Early ballast motor cars = =

When the Central London Railway opened in 1900 , it used camel @-@ back electric locomotives hauling six @-@ car trains . The locomotives weighed 44 tons and were largely unsprung , causing severe vibration problems in properties near the line . In an effort to resolve the problem , four of the coaches were fitted with motors , in the first trial in Britain of the Sprague @-@ Thomson @-@ Houston multiple unit control system . The trials were a success , and multiple unit trains were running by 1903 . Two of the trial cars , numbers 201 and 202 , were retained and became the first ballast motor cars to work on the Underground . They worked in this form until about 1910 , when batteries were fitted . They were renumbered L22 and L23 in 1929 , and were scrapped in 1936 and 1937 .

The next batch of ballast motor cars were French @-@ built gate stock cars , originally constructed in 1906 , but converted in the early 1920s to run with the 1920 air @-@ door stock . 20 motor cars were converted , but were replaced by more modern cars in 1930 . Although 12 of the displaced cars were scrapped , six were kept as ballast motor cars , becoming numbers L24 to L29 in the service fleet . The final two were further converted to run as single cars on the Aldwych shuttle . During the Second World War they were used as pilot motor cars for refreshment trains on the Piccadilly line , which supplied food to people sleeping on the stations to escape from the bombing of the city . They returned to the Aldwych shuttle between 1946 and 1949 , but were again used as pilot motor cars after that , transferring cars between the engineering works at Acton and various depots . They were both coupled to a flat wagon for a period , and were used to transfer stores from Acton Works to Northfields depot , and also took stores to Croxley Green and Queens Park depots on the Bakerloo line .

Four Hungarian @-@ built gate stock motor cars were used as ballast motor cars , and were numbered L13 to L16 . The final one was stored in 1955 , in the hope that it would be restored and preserved , but by 1960 , the project appeared to be too costly , and so the gate end of the car was cut off , and the rest of it was scrapped . After refurbishment , the gate was displayed at the London Transport Museum . A further four Hungarian motor cars from the Piccadilly line were used as pilot motor cars during the reconstruction of the Hampstead line in 1922 , and were numbered L17 to L20

. Once a spur between the Hampstead line and the Piccadilly line at Kings Cross station was opened on 27 March 1927 , it became much easier to transfer ballast motor cars between lines . The 14 departmental vehicles which were operational in 1934 continued to be used until 1953 , by which time their age made maintenance very difficult . They were replaced over the next two years and scrapped .

= = Standard stock cars = =

In 1953 , fourteen standard stock motor cars were withdrawn from passenger service , and were converted to ballast motor cars , with the final one completed in early 1955 . All of the vehicles chosen had been built in 1923 , four by Cammell Laird and ten by the Metropolitan Carriage Wagon & Finance Co . At least three of them were chosen because they were at Acton Works for repairs to collision damage . They were numbered L62 to L75 , and were painted grey . In 1957 , they were all repainted in Metropolitan maroon . L72 was the first to be scrapped , after a collision in 1963 . At the time , the standard stock was being withdrawn and replaced by 1959 / 62 Stock , and so rather than repair it , it was replaced by a 1927 motor car . The replacement also carried the number L72 . A 1931 motor car was used to replace L73 when it was badly damaged in 1967 , but in this case it carried a new number , becoming L77 . During the 1970s , the ballast motor cars were gradually withdrawn . The last two to be used were L63 and L68 , which performed leaf @-@ clearing duties in late 1977 , and all had been scrapped by September 1978 .

While single passenger cars were sometimes moved around the system , either between depots or to Acton Works , these movements were infrequent , and when they were necessary , standard stock motor cars borrowed from the passenger fleet were normally used . Following the introduction of the 1959 passenger stock , single cars and parts of units were moved around much more frequently , and normal passenger motor cars could not be used to perform this task , as the equipment they needed to operate was spread around the unit , rather than confined to the motor car . Eight Standard Stock motor cars , dating from 1927 and 1934 , were therefore allocated as pilot motor cars . In 1967 , they were painted maroon , numbered L130 to L137 , and became part of the ballast motor fleet . Four were withdrawn in 1971 without performing this work , however . Following withdrawal , L137 was shipped to the Isle of Wight , to replace a car on the Island Line which had been damaged . The remaining four cars worked as two pairs , and were still working as pilot motor cars in 1987 , but had been withdrawn by 1993 .

= = Surface stock cars = =

From time to time , the Underground has needed to move surface stock cars around the system , and several motor cars have been set aside as pilot motor cars for this purpose . In 1971 , the trains on the District line were rearranged into 7 @-@ car units , and in 1974 , District line stock was removed from the East London line . This resulted in a large number of spare cars , which were transferred to Ruislip Depot for eventual scrapping . One Q23 stock motor car and one Q27 stock motor car were allocated as pilot motor cars for this task in 1967 , but did not receive departmental numbers . They also toured the system with a gauging car , to check clearances . They were joined by four Q38 stock motor cars in 1971 , which were renumbered L126 to L129 in 1972 . Shunting of the scrap cars and the new stock being delivered in Ruislip Depot between 1970 and 1972 was handled by six pilot motor cars , two each drawn from Q23 , Q27 and Q38 stock . Four were scrapped in 1972 , and the final two in 1974 . L126 and L127 were painted yellow in 1983 , They were subsequently repainted in red , and their departmental numbers were replaced by their original passenger car numbers . Following withdrawal , they have been retained by the London Transport Museum .

When delivery of C67 stock began in 1977 , two pairs of CO / CP stock motor cars were used as pilot motor cars to shunt the new stock at Ruislip Depot , and to marshall the scrap stock displaced by the new units . The C77 stock could be driven under its own power to Hammersmith Depot , as it was commissioned at Ruislip . The D78 stock was different , in that delivery was still to Ruislip , but

the commissioning took place at Ealing Common Depot , and therefore pilot motor cars were needed to transfer the stock . Two pairs of CO / CP stock motor cars were allocated to do this in 1979 , with a further three pairs joining them in 1980 . New trains were transferred with a pilot motor car at each end , as were trains that were withdrawn for scrapping . The pilot motor cars carried large stencils at both ends , so that they would not accidentally be scrapped until their duties were complete . Three pairs of R stock motor cars were used as pilot motor cars after the R stock was scrapped . Most of the surface stock pilot motor cars were scrapped when the deliveries were complete , although one each of the CO / CP and R stock cars have been privately preserved .

= = Tube stock cars = =

Deliveries of 1972 stock enabled 1938 stock to be withdrawn , and several cars were converted for use as ballast motor cars . The task was more complicated than for earlier stock , as 1938 units had compressors mounted on the trailer cars . The motor cars therefore had to be fitted with compressors , and the couplings were changed from Wedgelock to Ward type . The first four were numbered L140 to L143 , and the conversion was carried out at Acton Works in 1972 . Another six were converted , two in 1975 , two in 1976 , and the final two in 1977 , which were numbered L144 to L149 . L151 and L152 were converted in 1978 , and were additionally fitted with weed killing equipment . Another four were added in the same year , numbered L153 to L156 . Although the ballast motor cars were normally worked in pairs , some engineering trains had a ballast motor car at one end and a battery locomotive at the other . One advantage of the ballast motor cars over battery locomotives was that the interiors could be used by personnel and for storing small tools , although they were less powerful , and could only work when the traction current was switched on . By 2002 , all except the weed killing pair had been withdrawn .

Two of the 1960 stock cars were converted to work as pilot motor cars in 1987 . The conversion was carried out at British Rail Engineering Limited 's works at Derby . They were numbered L132 and L133 , and were used to haul a track recording car around the system . The recording car is numbered TRC666 , and was converted from a 1973 @-@ built trailer car .

27 cars of 1962 stock , supplemented by three cars of 1959 stock , were retained after most of that stock was withdrawn . These were formed into seven 4 @-@ car units , which were used as pilot motor units , while the remaining two cars were used for training by the Emergency Response Unit of the British Transport Police . Two units were fitted with Automatic Train Protection ( ATP ) equipment to allow them to work on the Central line , two were based at Ruislip Depot , and two were owned by TransPlant . The seventh unit was stored at Ruislip by 2002 , waiting for disposal . The units were not renumbered in the engineering series and continued to carry their passenger fleet numbers . One of the driving motor cars based at Ruislip was repainted in olive green .

= = Other self @-@ powered vehicles = =

London Underground has owned a small number of departmental vehicles which were not ballast motor or pilot motor cars . Between 1935 and 1950 , the District line had a weed @-@ killing train , initially consisting of a 1905 @-@ built B stock driving motor car and a control trailer . The two cars were kept at Ealing Common depot , but the control trailer was scrapped in 1937 and replaced by a second motor car , to provide more power . Weed @-@ killing duties were not carried out during the Second World War , and the vehicles were not refurbished subsequently . They were scrapped in 1950 .

In 1977 , a tunnel @-@ cleaning train was completed . This consisted of two 1938 driving motor cars , and three purpose @-@ built vehicles . The middle vehicle of the five contains a fan unit , which supplies large volumes of low pressure air to a series of nozzles , which disturb the dust on the tunnel walls and track . The cars on either side of it draw the dust @-@ laden air into filter chambers , and are fitted with conveyors for discharging the dust at depots . To enable the train to operate sufficiently slowly for the cleaning process to be effective , a hydraulic drive was fitted to one of the motor cars , with settings to allow speeds of 0 @-@ 5 mph ( 0 @-@ 8 km / h ) , 1 @-@ 5 mph

( 2 @. @ 4 km / h ) , 4 @. @ 5 mph ( 7 @. @ 2 km / h ) and 6 mph ( 9 @. @ 7 km / h ) . Up to 6 tons of dust can be held in the filter bags , and the units are fitted with carbon dioxide and water mist fire fighting equipment , because of the combustible nature of fine dust particles . There were teething problems when the train began work in 1978 , but by 1980 , these had been resolved .

In 2002 , the company also owned three Plasser & Theurer track maintenance machines , which were built in 1980 . One was fitted with ATP equipment to allow it to work on the Central line . They had previously owned six other tamping machines , which were acquired between 1959 and 1975 . The 1959 model was scrapped in 1970 , and the oldest four of the others were withdrawn in 1984 and 1985 . One of the machines built in 1967 went to the Southern Steam Trust at Swanage , and another , built in 1973 , was acquired by the Severn Valley Railway .

In 1983 and 1986 , London Underground purchased two Unimog road @-@ rail vehicles , which were used as depot shunters . They are fitted with small railway wheels just outside the road tyres , which can be lowered when working in railway mode , and ensure that the road wheels run along the top of the rails . They are numbered L84 and L85 . They previously owned a Unimog tractor @-@ trailer pair of vehicles , purchased in 1982 , which were used for leaf @-@ clearing duties . Nozzles on the tractor unit were used to suck up the leaves , which were then stored in a 570 @-@ cubic @-@ foot ( 16 m<sup>3</sup> ) bin mounted in the trailer .