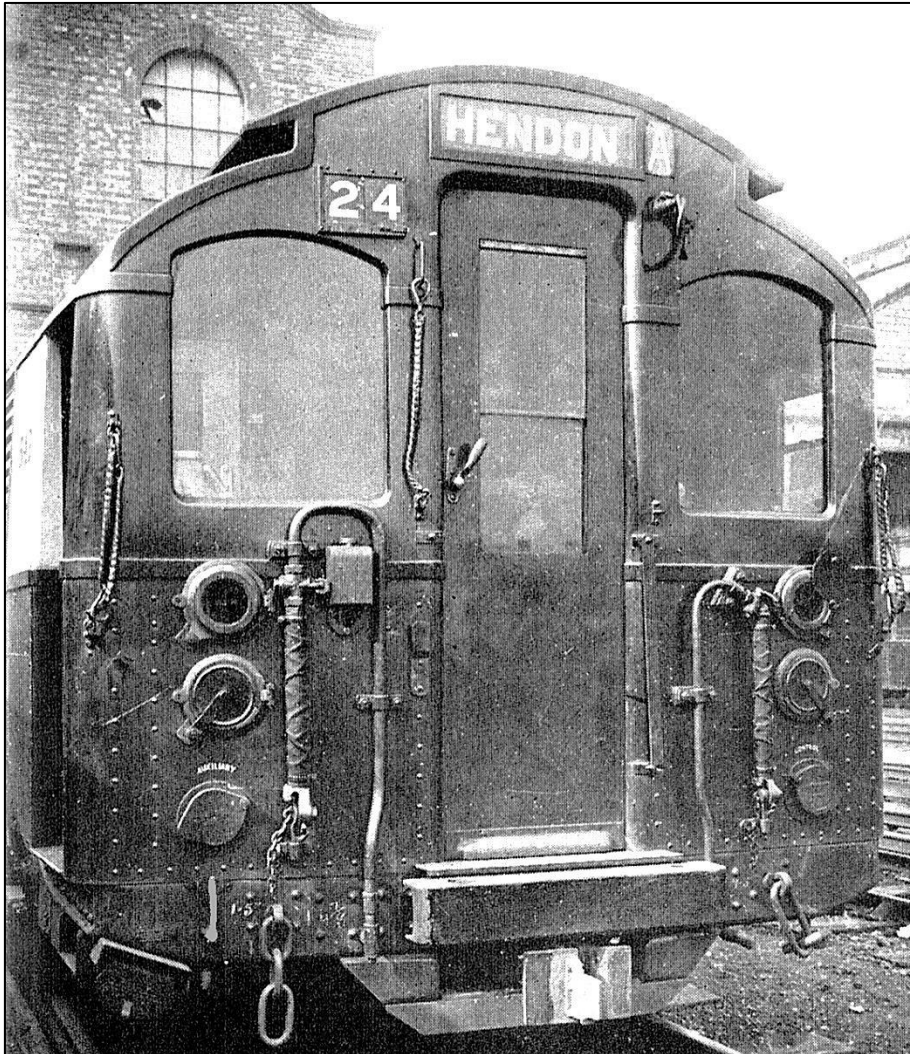


THE LONDON ELECTRIC TRAIN

18 – STANDARD STOCK EVOLUTION

by Piers Connor

DESIGN FEATURES



This month, after last month's detailed technical digest, I have selected a range of photographs so we can look at some of the variations in the design of the 1923-34 Standard LER stock. In Article 10 of this series (see *Underground News* No.655, June 2016) I described the six cars of the 1922 'Sample' stock, so I begin with the 1923 Stock and work on from there. The designs went through a period of development that reflected experience in service, partly because of modifications in equipment and partly due to expansion of routes into open country. The photos show how things evolved.

Figure 1 (left): The driving end of a 1923 Met. Carriage motor car at Golders Green Depot showing all the paraphernalia of the day. The 1923-25 series of cars all had a roller blind destination indicator over the end door. They obviously didn't work too well as they were all eventually replaced with destination plates below the offside

cab window. Next to the roller blind is the plate indicating this is the 'A' end of the car. The 'A' plate was added after the cars were delivered and as a result tended to be randomly located. Below the 'A' plate is the emergency lighting jumper, coiled out of the way. This jumper was the only one at this level and frequently got forgotten when cars were uncoupled so it tore apart as the units were separated. It was moved lower down below waist level from the 1926 order onwards and these cars were modified to match. The window on this side of the car is the driver's window. Next to it is the side safety chain. These were soon replaced by fixed handles. Below the window is the main line hose, tail/marker lights and the control jumper socket. The train line hose is on the other side, with the little box containing the train line angle cock switch at the top end of the hose next to the angle cock handle. The switch was used to mark the end of the train for the door circuits. Of the four lights on the car front, the top two were available as marker or tail lights and the lower two were plain marker lights. Below the auxiliary jumper socket on the headstock is the tripcock isolating cock handle. The handle is pointing up showing the tripcock is operative. The tripcock always had to be cut out on any car coupled in the middle of the train and the handle was positioned on the front so it could be seen on an approaching train that it was operative. An oddity peculiar to the 1923 Stock was the absence of a matching deadman valve isolating cock on the other side under the driver's position. This became a standard fitting from 1924. On the 1923 Stock, if the valve became defective, the exhaust port of the valve had a plug screwed into it to stop the loss of air. Also hanging from the headstock was a hook on one side and a chain on the other. These were supposed to be connected between cars to act as a safety coupling, if the main coupler under the centre buffer broke. The hook was supposed to be secured on a hook of its own (as seen here) but the chain, being shorter, was allowed to hang loose. In the report on the fatal accident of 8

April 1953 near Stratford, Central Line, it was said to be one of these hooks hanging down which broke a trainstop on the eastbound road east of Stratford and caused two stop signals to remain at danger. One of the trains allowed through this section “under the stop and proceed rule” was moving too fast and collided with the train ahead with the loss of 12 lives. Many years later, I worked with the guard on one of the trains involved in this accident. **Photo: LT Museum.**



Figure 2 (above): A 1923 Stock Cammell Laird trailer car standing outside the factory in Nottingham. This car’s design was a combination of the Leeds Forge and Cammell Laird sample cars of 1922. Cammell Laird took over Leeds Forge in 1923. The livery was the Underground’s finest effort in this field – red below the waist, cream above, with maroon doors, grey roof and black lining. For the 1923-25 orders, the cream was applied to the car ends, as shown here, apart from the driving ends, which were all red. From the 1926 order, all car ends were red and the maroon doors became red too. This was the beginning of the gradual abandonment of red/cream/maroon combination which finally ended with the directive to end the cream round the side windows early in 1952. The 1923 cars were unique in having side windows that dropped open about 3 inches to provide ventilation. They were obviously dangerous and were later covered with a fixed glazed plate on the outside. The particular feature of the 1923 Cammell Laird cars was the rectangular air scoops on the roof. **Photo: Official Cammell Laird.**



Figure 3 (left): The end of a 1925 Met. Carriage trailer car showing the details of the attachments. The three horizontal slots were provided for ventilation and just to the left of the top left corner of the end doorway is the socket for the emergency lighting cable. Its position shows this to be the “B” end of the car. Below the waist line are two air hoses and three jumper sockets. Each jumper socket has a cover with a clip above it to hold it when the car is “jumpered up” to the next car. The three sockets are, from the far side, for Control, Heater and Auxiliary jumpers. The two hoses are (far side) for the Main Line air supply, while the nearside is the Train Line hose for brake control. The pipework is on the outside of the car body, making it look a bit busy. From the 1926 order, the pipework was hidden behind the body end paneling. Note that there are four handrails, one either side of the doorway and one on each corner. **Photo: Official MCW.**

Figure 4 (overleaf, top): A 1923 motor car on the traverser at the Met. Carriage factory in Saltley, Birmingham. The design was very similar to the Cammell Laird motor cars but the roof design was arranged with eaves covering small slanting ventilator scoops. The long curved rain gutter over the centre doorway was another feature of Met. Carriage cars, together with the large number of exposed rivets on the bodyshell exterior. The double doorway has a central dividing pillar. This was a feature of all Standard LER motor cars built up to the second UCC order of 1928. The pillar was structural. It was a serious impediment to boarding and alighting and would only have been left in place if it were essential. The motor bogie end of the car has been fitted with some sound reducing panels but these

were found to be an obstruction during maintenance and were soon removed. A peculiar feature of the 1923 cars was the use of the old blocked numbering style with the word UNDERGROUND in Johnston font. Someone must have spotted this and the Johnston font was used for car numbers from the 1924 order (Figure 5). The 1923 order was also the first for which the name Underground was applied to the outsides of vehicles. **Photo: Official MCW.**

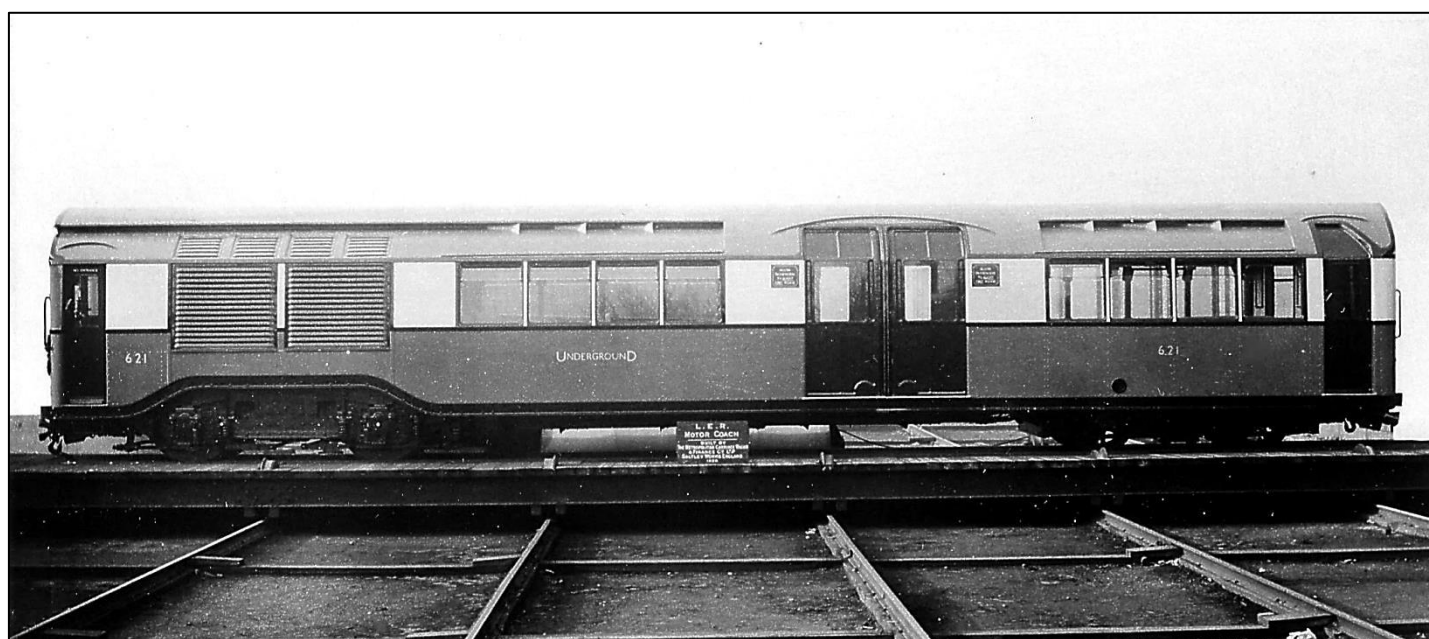


Figure 5 (above): This is the Met. Carriage Company's motor car for the LER's 1924 order. There were two visible differences from the 1923 version (Figure 4). The most obvious was the design of the roof over the guard's door. In the 1923 design, the clerestory of the roof was extended to the end of the car over the guard's door so that the top of the door curved into the lower roof (Figure 4 above). On the 1924 and later cars, the roof was arched to match the shape over the passenger doors, reducing the sharpness of the curve at the top of the door. The other feature was the introduction of cast aluminium doors in place of the more traditional prefabricated doors made with wooden frames and steel panels. The cast doors could be quickly identified by the strengthening ribs visible on the outside and by the circular housings for the door guide wheels. The 1924 order was also the first to have separate toplights over the side windows in place of the droplights of the 1922-23 cars. With the 1922-23 cars, the window nearest the passenger doors did not open and remained that way for their operating life. **Photo: Official MCW.**

Figure 6 (opposite, top): A comparison of the front ends of a 1925 Cammell Laird motor car (on the left) and a 1923 MCW motor car. The roof lines and the banding around the front upper body ends were different. The Cammell Laird car has leather covered safety chains on the front corners instead of fixed handrails, even though other photos show 1924 and 1925 cars with handrails. The trains shown here are stabled at Edgware in the shed next to the station. The photograph also shows that the depot was fitted with colour light shunt signals, the backs of which can be seen. They survived until May 1940. **Photo: LT Museum.**

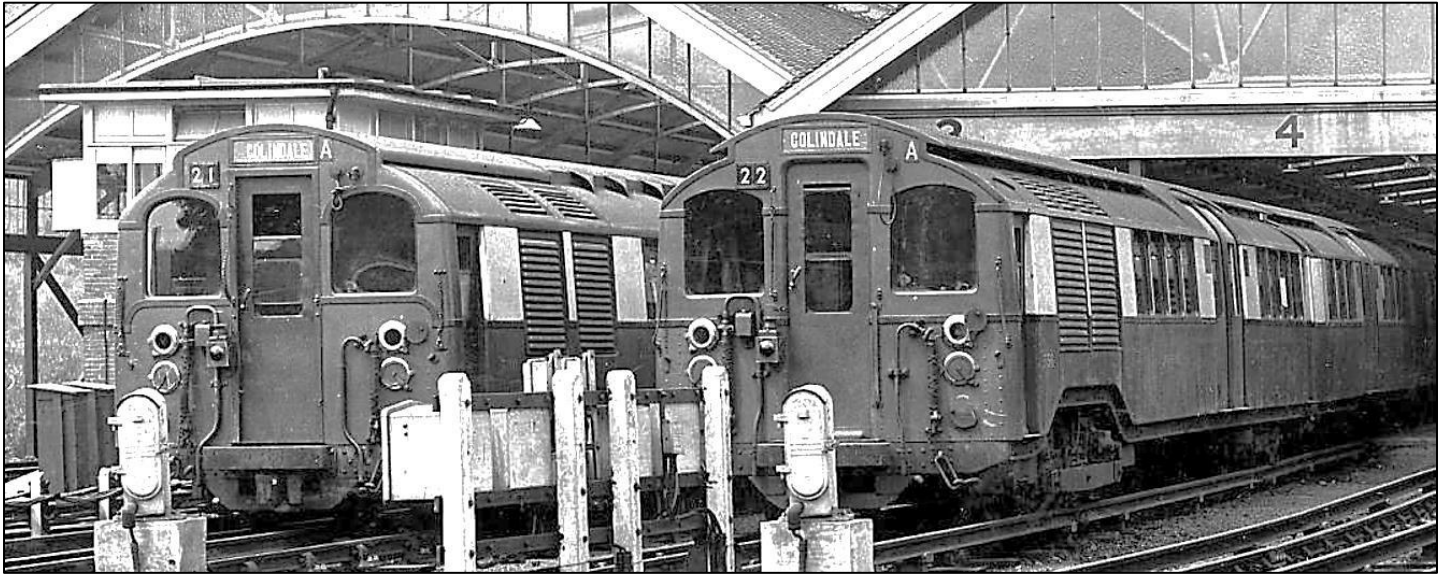


Figure 7 (below): A 1926 Met. Carriage motor car at the Saltley factory. The design has been considerably tidied up with the sides having a smoother finish and no waist rails. The offside of the switch compartment now has plain external doors that opened upwards. The driver's side louvered panels were retained. The underframe in this photo is painted grey to show the detail. **Photo: Official MCW.**

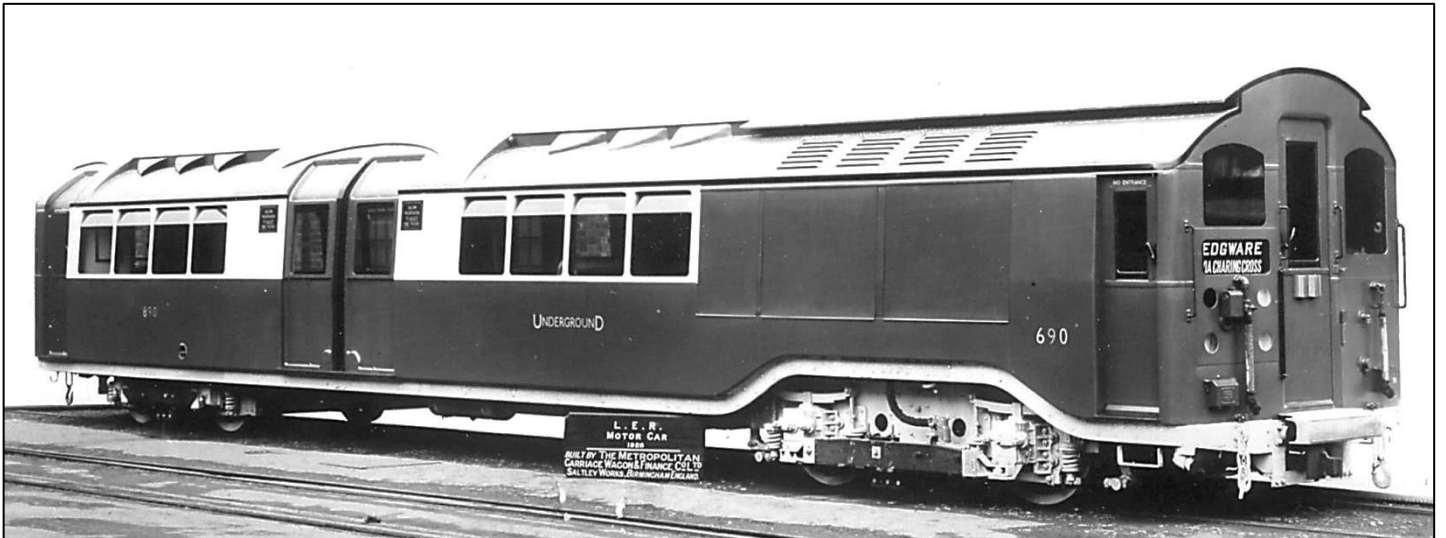


Figure 8 (left): The 1926 front end was also altered so that the marker lights and tail light were grouped into a box on the offside of the cab and the destination signs were moved from the original position over the end door to the offside box. The train set number was now positioned on the front door just under the window, instead of being higher up. The emergency lighting jumper is now low down, with the socket under the marker light box. **Photo: LT Museum.**

Figure 9 (overleaf, top): A 1927 Metropolitan-Cammell control trailer. This was the same company as Met. Carriage but it had taken over Cammell Laird in this year. The batch design was very similar to the 1926 Stock. There are only two jumper sockets on the front of this train as the auxiliary supply system on the post-1926 cars was rationalised so that the heater supplies were fed through the



auxiliary circuits rather than having a separate stand-alone circuit and jumper. By this time the trains were being fitted for one-guard operation with the train telephone added circuit to the emergency lighting jumper. **Photo: Official Metro-Cammell.**

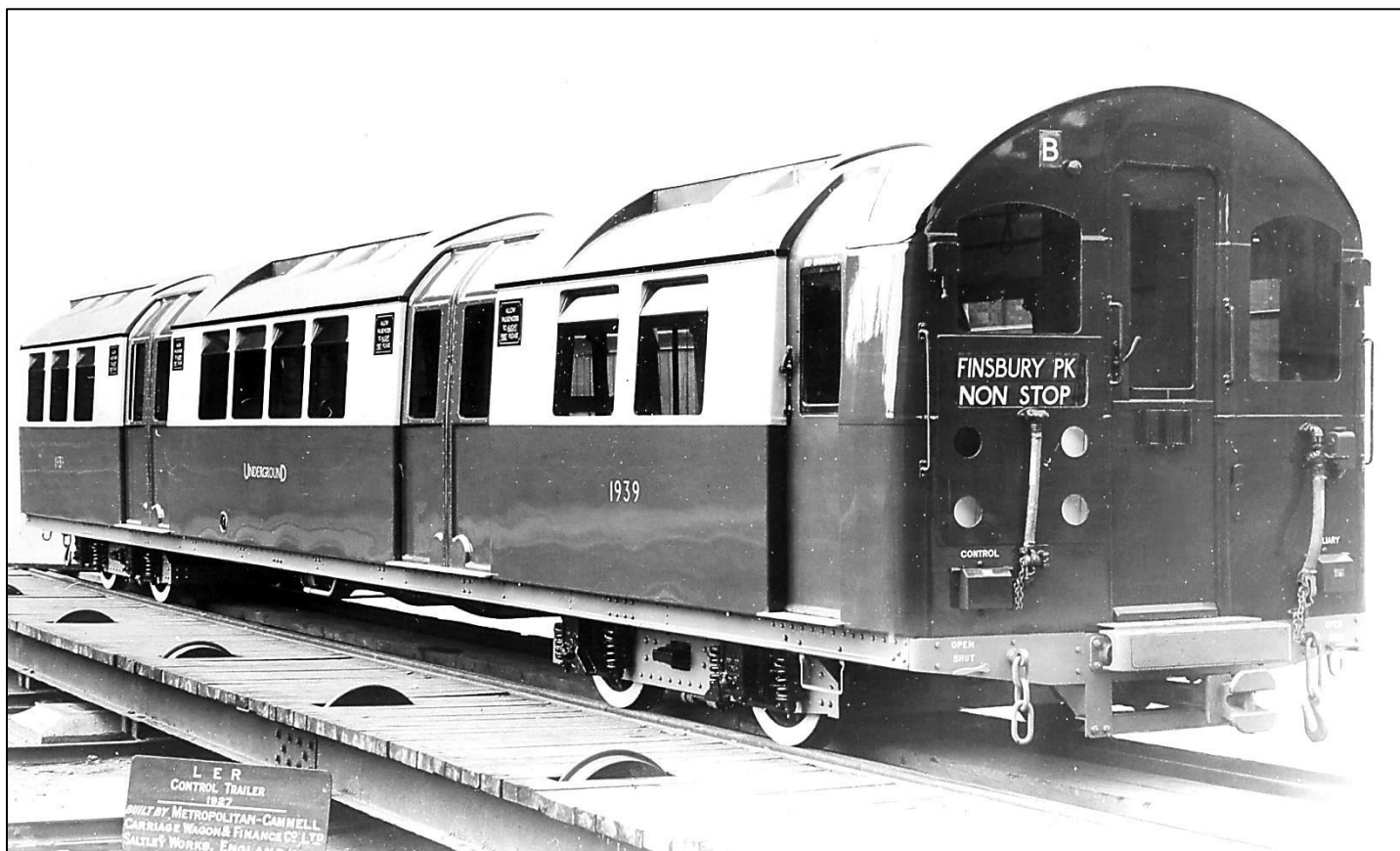


Figure 10 (below): A 1929 Union Construction Co. (UCC) control trailer. The UCC cars were very similar to the 1926-28 Met. Cammell stocks but the gutters above the door were horizontal instead of curved and the lower body panels showed a distinctive outward curve, as seen here. The Met. Cammell cars had flat panels. This was the first stock to be equipped from new with electro-pneumatic (EP) brakes and the additional jumper socket can be seen under the driver's window. There were now three main jumpers, auxiliary, brake and control. This stock also had a cream patch on the driving end corners to highlight the position of the door close plungers. Door close plungers were introduced on the 1927 Stock control trailers (Figure 9) but the cream patch seems to have been added later to help staff find them. Older stocks had the patches added. The plungers were used to close doors on part of the train as staff checked cars were empty at terminating stations. The leading bogie is fitted with a shoebeam but no current collector shoes were fitted. The shoebeam was only fitted to the offside driving end of control trailers to provide somewhere to hang the tripcock. In this photo the air hose for the tripcock can be seen hanging over the top of the shoebeam. **Photo: LT Museum.**





Figure 11 (above): A 4-car Piccadilly Line train at Sudbury Town about 1953. The leading car is a 1929 motor car by UCC and has the typical curved lower panels and straight gutters of this builder. Note that the roof ventilation louvres have been covered to reduce water ingress. Note also that the train line angle cock switch has disappeared, having been replaced by an internally mounted “pneumatic interlock” on EP brake equipped trains. From early 1952, cars coming out of Acton Works after overhaul lost all the cream paintwork and were perhaps poorer for it. A modification seen here is the provision of a window wiper for the driver. Drivers didn’t get window wipers until the introduction of the 1931 Stock. **Photo: B.R. Hardy Collection.**

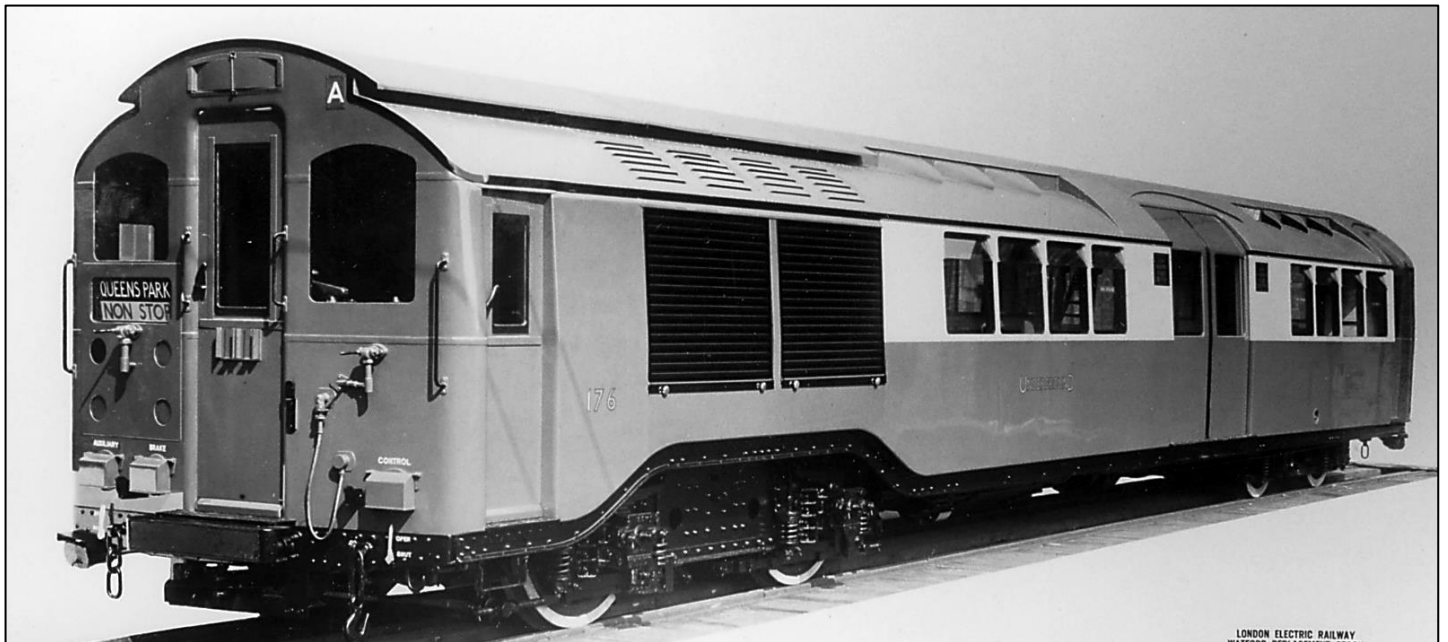


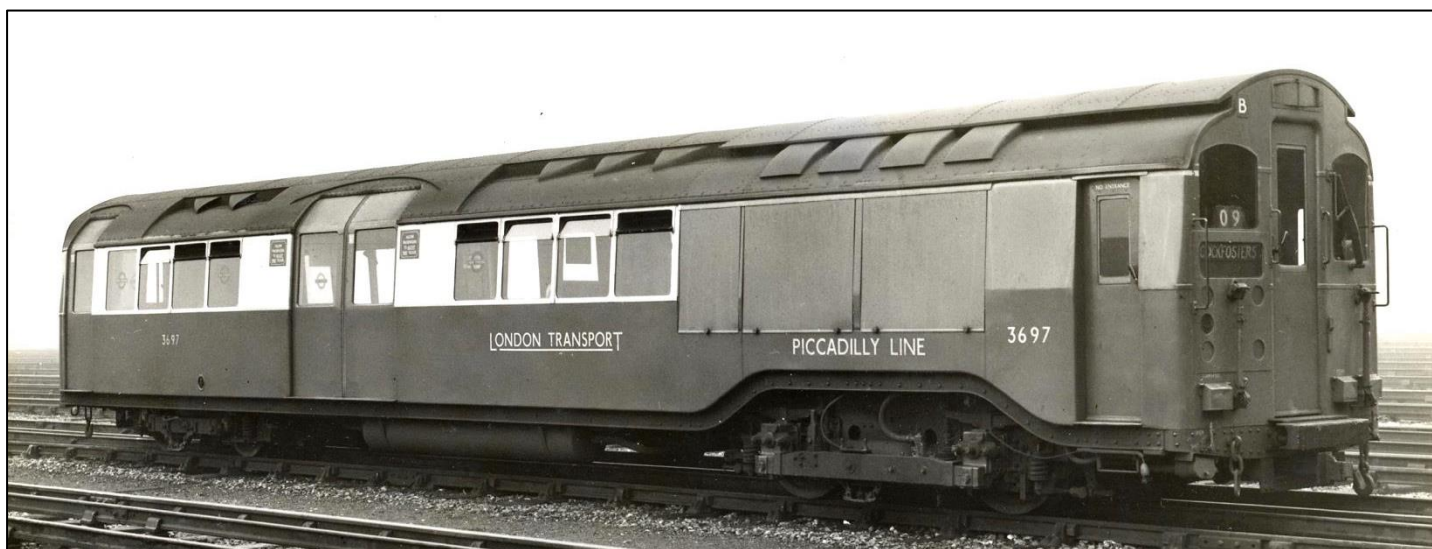
Figure 12 (above): Watford Replacement Stock motor car of 1930 by Met. Cammell. This was a virtual copy of their 1927 design without the central door pillar adapted for the larger wheels needed for the long distance trips to Watford. The covers applied to the roof ventilators on the 1929 UCC cars were not provided on this stock. Presumably no one from the Underground had thought to tell Met. Cammell that they wanted them. However, they did get a new feature of a large ventilation opening over the end door, a modification later applied to all the earlier cars.

Figure 13 (overleaf, top): A new 1931 Birmingham-built trailer at their Smethwick factory prior to dispatch. This was a new car design that was a foot longer than earlier vehicles and which had slightly tapered ends to allow the car to negotiate the numerous sharp curves on the older tube lines. The design allowed single ends doors to be added, a feature that has carried on to this day. The 1931 cars

were all ordered for the Piccadilly Line extensions to Hounslow, Uxbridge and Cockfosters. **Photo: Official Birmingham RCW Co.**



Figure 14 (below): A 1934 Met. Cammell motor car at Cockfosters depot. This was the final design of the LER's Standard stock and was virtually identical to the 1931 design. The line name on the side of the car was a short-lived idea introduced shortly after London Transport was formed in 1933. **Photo: LT Museum.**



To be continued