

THE LONDON ELECTRIC TRAIN

14 – 1926-29 STOCKS ARRIVE

by Piers Connor

NOT SO STANDARD

By the summer of 1927, all the 'new standard' cars ordered between 1923 and 1925 had been delivered and were in service on the newly combined Hampstead & City Line. The trains were being referred to as the 'new standard' stock but, with three different car body suppliers and two traction equipment manufacturers, there were already five possible variations of vehicle plus, as a result of experience (good and bad), there were detailed variations in the design from each supplier. Even the body dimensions varied.

The idea that the cars were 'standard' was more in the breach than the observance. Rather than try to show the variations for each batch separately, I think it is easier to present the various changes in body details, equipment and dimensions at the end of the delivery story, so this month we move on to the next phase of LER stock procurement.

MORE TRAINS FOR THE HAMPSTEAD



Figure 1: Morden depot about mid-1925, showing three 1924 Met. Carriage motor cars stored on No.1 road after delivery. The depot is a long way from complete. They have dug the pits and concreted some of them but they haven't put up any of the building structure yet. Storing cars for long periods leads to quite rapid deterioration and I suspect some cars needed work before they were fit for service. Photo: B.R. Hardy collection.

Although some 7-car trains (actually only 7 out of a total of 42 peak hour trains operated) had been introduced with the opening of the Edgware extension on 15 August 1924, the entry into service of new cars seems to have been slow and probably didn't match the dates recorded. I suspect this was due to modifications, particularly to the door control system, which did give some problems during the early years of operation. There were probably also problems with storing and maintaining the new cars (Figure 1).

The gate stock soldiered on and, when the Modern extension was opened on 13 September 1926, out of a total of 77 peak hour trains introduced for the new service, there were 7 x 5-cars and 21 x 6-cars of gate stock in service. The rest of the service was provided by 30 x 6-car and 19 x 7 car 'new standard' trains.

Encouraging traffic levels pushed the LER into providing more trains, so a 1926 order went to Met. Carriage for a total of 112 cars, broken down into 64 motor cars and 48 trailers. In plain terms we can surmise that, on its own, this order could provide 54 motors and 43 trailers for service, after allowing for the usual proportion of spares, and this would provide 10 x 7-car and 1 x 6-car trains with 22 motor cars left to lengthen some 6-car trains to seven cars. The first trailers started arriving in November 1927 and almost the whole order was recorded as in service by the end of May 1928. By this time, the original Morden extension service had been increased by 10 trains to 87 trains and by November 1928,

there were 46 x 6-car and 39 x 7-car new trains in peak hour service with only 9 x 6-car gate stock trains left, a total of 94 peak hour trains.

During this period, there seems to have been a six-month lag between cars being delivered and them actually being used in a new timetable. Cars were delivered from Birmingham to London by rail but they had to be moved to Morden or Golders Green by road, a time consuming and lengthy business. Although cars are recorded as being delivered in batches of six in a day, they must have been pushed to get that many off their railway bogies, on to road bogies, through London and then loaded back onto their bogies and into Morden depot in one day, particularly as the bogies came separately.

DOORS WERE IT

As soon as the new stock began to appear regularly in service in 1924, it became obvious that the air door trains were vastly superior to the gate stock in terms of their performance at stations. Boarding and alighting times were slashed and running both types of stock showed how far Rolling Stock design had developed in the 20 years since the gate stock was first introduced. It also demonstrated the savings in staffing levels, which were now halved on a six car air-door train. The operating department was most anxious to see the gate stock removed at the earliest opportunity.

Early in 1925, a wooden bodied Central London Railway (CLR) gate stock car was rebuilt so that the end entrance platforms were enclosed and two doorway openings were cut into the body sides at one third and two thirds distance along its length. Once it was shown with this prototype that the conversion was both possible and cost-effective, it was decided to convert the whole CLR fleet. This was done between 1926 and 1928.

Also around February 1925, Hampstead Line trailer car No.194 was converted to have air doors (Figure 2). The work was done at the District Railway's Ealing Common depot and the car was apparently tried out on the Piccadilly Line later that year. Like the Central London car, No.194 had its end gangways enclosed but these were fitted with single doors, while a double doorway was cut into the centre of the car.



Figure 2: Hampstead gate stock trailer car No. 194 in the yard at Ealing Common depot after its conversion to air door operation. The two end platforms have been enclosed and side doors provided while a double doorway has been cut in the centre of the car. The layout was similar to the 1920 Cammell Laird stock. The door on the west end of the car is a special design to test the concept of a rotating door rather than a sliding door. Photo: LT Museum.

With this conversion, the opportunity was taken to try out a new idea put forward by the "Assistant Mechanical Engineer" working at Ealing Common in the early 1920s, whose name was William Sebastian Graff-Baker. The idea was to replace the traditional sliding door by a revolving door. The purpose of the design was to allow the door to open and close without the necessity of cutting a pocket

into the bodyside to receive the open door. It also removed the need to place the door engine in the cramped space behind a passenger seat.



Figure 3: Close-up of the enclosed end of Hampstead gate stock Car No.194 showing the revolving door trial proposed by W.S. Graff-Baker. Only this single door position was fitted with this type of doorway. All the other doors were of the conventional sliding type. The position of the door engine is not indicated in this photo, nor in the general arrangement drawing of the vehicle. Photo: LT Museum.

Initially, the design had the door operator mounted on the end bulkhead at waist level but a later drawing showed the door engine mounted below the floor. Which version was applied to the car as built is not clear. I suspect the earlier one. The design was not perpetuated, probably because it obstructed the gangway area and, I think the movement of the door would have been susceptible to jamming in either its top and bottom guides. Car 194 remained allocated to the Piccadilly Line until it was scrapped in 1930.

STRATEGIES FOR GATE STOCK REPLACEMENT

Having accepted, in principle at least, that the gate stock was no longer fit for purpose on the LER, early in 1927 a proposal for gate stock replacement was drawn up. Before examining this and the subsequent changes, it is useful to have a look at the gate stock situation in 1927 compared with that in 1907 when the stock was all delivered. This is shown in Table 1.

Line	Cars	1907	1927	Change	Comments
Bakerloo	Motors	36	55	+19	+ 10 Brush, + 2 Leeds Forge, + 7 ex Piccadilly Control Trailers.
	Control Trailers	36	44	+8	Piccadilly cars transferred in.
	Trailers	36	56	+20	+2 Leeds Forge & 18 Piccadilly cars transferred in.
	Total	108	155	+47	Increase for Queens Park Extension.
Hampstead	Motors	60	65	+5	Piccadilly cars transferred in.
	Control Trailers	50	60		+10 Trailers converted to Control Trailers.
	Trailers	40	55	+25	-10 Trailers converted to Control Trailers, +26 Piccadilly cars transferred in and -1 transferred to Piccadilly for air door experiments.
	Totals	150	180		Increase for Edgware extension.
Piccadilly	Motors	72	67	-5	-5 to Hampstead but 20 air door conversions.
	Control Trailers	72	34	-38	-7 to Bakerloo motors, -8 to Bakerloo Control Trs, -23 to Bakerloo or Hampstead trailers.
	Trailers	72	52	-20	+1 from Hampstead, -21 to Hampstead or Bakerloo.
	Totals	216	153	-63	40 air door cars added 1920, not in gate stock total.
LER	Totals	474	488	+14	+14 new Bakerloo cars in 1914,

Table 1: Distribution of LER gate stock, 1907 and 1927.

Looking at these figures we can see that there had been an overall increase of 14 cars up to 1920, the cars built by Leeds Forge and Brush for the Bakerloo in 1914. The addition of the 40 Cammell Laird cars for the Piccadilly in 1920 had allowed gate stock cars to be transferred to the Bakerloo and Hampstead lines for the extensions to Queen's Park and Edgware respectively.

By late in 1927, firm proposals for the replacement or upgrading of all the pre-1920 LER rolling stock had been drawn up it and can be summarised as follows in Table 2.

Line	Change	Cars	Comments
Hampstead		444	1923-1925 Stock already available.
	New stock	+112	1926 Stock to allow more 7-car trains and additional trains.
	Scrap 180 cars	-180	.
	Replacement stock	+170	1927 Stock for gate stock replacement.
	Total	726	All new stock.
Piccadilly	Transfer	-60	Air door stock to Bakerloo.
	Replace	+60	Gate stock rebuilt with air doors.
	Scrap 133 cars	-133	
	Replacement stock	+136	1927 Stock for gate stock replacement.
	Aldwych stock	2	1906 cars 148 and 144.
	Total	198	136 of new stock, increase of 5 over existing fleet.
Bakerloo	Transferred stock	+60	Air door stock from the Piccadilly Line.
	Rebuilt gate stock	102	Gate stock fitted with air doors.
	Total	162	All converted gate stock, increase of 7 cars over existing fleet.

Table 2: Late 1927 gate stock fleet replacement strategy and stock cascade programme.

The service requirements were to be: Hampstead 91 x 7-cars, Piccadilly 27 x 6-cars and Bakerloo 23 x 6-cars. The Bakerloo service to Watford was excluded from these figures as the stock (the Watford Joint Stock) was regarded as entirely separate. Orders for the replacement Hampstead were placed first (170 cars) in 1927, followed later by the order for 136 new cars for the Piccadilly Line. All the 1927 cars were ordered from Met. Carriage.

It was intended that the gate stock cars that were to be rebuilt with air doors were to be done at either the Union Construction Company (UCC) works at Feltham, where the CLR cars had been done or at the Wednesbury works of the Birmingham Railway Carriage and Wagon Company. During 1927 some cars were sent to both places to try out various conversion methods. Hampstead car 186, already renumbered as 1542, went to Birmingham and eight Piccadilly cars went to Feltham.

There were some odd features of this programme. Why, for example, was it planned to send 10 x 6 cars of 1920 Cammell Laird stock to the Bakerloo and replace it on the Piccadilly with 10 trains of upgraded gate stock? Why not keep all upgraded gate stock on one line? In this case it would have been the Bakerloo. And why was the Hampstead gate stock being replaced and not upgraded to air doors while the Piccadilly was being given part replacement and part upgraded stock? There is a definite feel for 'accountantitis' in this programme, where capital cost was regarded as more important than the poorer reliability and greater running costs that one could expect with mixed fleets. The Hampstead & City probably got all new cars because it was the most heavily used line of the three lines.

As part of the rebuilding programme, all converted gate stock cars, including the 1920 new and converted air door stock, were to have new motors and bogies and to have their traction equipment modernised. At first it was intended that all the gate cars to be converted were to be of Piccadilly stock but then a revised plan drawn up early in 1928 changed the scheme.

In the new plan, the Bakerloo was to get all new stock (162 cars). They were actually ordered and they were to be built new by UCC. Although the Piccadilly Line's new stock had been ordered (1927 Stock), the plan showed that the Piccadilly was to keep its Cammell Laird trains and none of its gate stock

trains were to be rebuilt. More accountantitis. Presumably, under this scenario, the 1927 stock order for the Piccadilly was to be used on the Bakerloo.

Arguments and plan changes seem to have gone on all through 1928. At one point, it was suggested that the new motor cars ordered to replace gate stock would be fitted with the electric traction equipment and motors removed from the gate stock bodies before scrapping. Doubtless there was considerable resistance to this idea from both the mechanical engineering department and the traffic department. The new motors and traction equipment with automatic acceleration used on the air door trains was generally much better than the old equipment with manual acceleration dating from the early 1900s. It gave better acceleration and was more powerful.

In October 1928, another revision to the plan suggested keeping 83 cars of gate stock to enable services to be increased by 8 x 6-car trains on the Hampstead and 3 x 6 car trains on the Bakerloo or Piccadilly lines, a total of 66 cars with the addition of 17 spare cars. All the gate stock was to be used on the Bakerloo and the new stock used on the other lines in proportion as required.

Date	Builder	Car Type	Original Numbering	Car Totals incl. cumulative for year & fleet			Notes
1926	Met. Carriage	M (GEC)	681 – 744	64			Hampstead additional stock. 556 = 112 added to 444 of 1923-25 Stocks.
	Met. Carriage	T (GEC)	1054 – 1101	48	112	556	
1927 (i)	Met. Carriage	M (GEC)	329 – 391	63			Hampstead “Gate” stock replacement.
	Met. Carriage	T (GEC)	1102 – 1208	107	170	726	
1927 (ii)	Met. Carriage	M (BTH)	282 – 328	47			Piccadilly “Gate” stock replacement.
	Met. Carriage	CT (BTH)	1921 – 1956	36			
	Met. Carriage	T (BTH)	1209 – 1261	53	136	862	
1928	UCC Feltham	M (BTH)	225 – 281	57			Bakerloo “Gate” stock replacement.
	UCC Feltham	CT (BTH)	1957 – 2024	68			
	UCC Feltham	T (BTH)	1262 – 1298	37	162	1024	
1928	UCC Feltham	M (BTH)	205 – 224	20	20	1044	French air door motor car replacement.
1929	UCC Feltham	M (BTH)	187 – 204	18			Hampstead additional stock. Actually replaced 1927 stock transferred Piccadilly to Hampstead.
	UCC Feltham	CT (BTH)	2025 – 2042	18			
	UCC Feltham	T (BTH)	1299 – 1315	17	53	1097	

Table 3: Final 1926-1929 Stock totals by manufacturer, type of car and type of equipment. GEC = General Electric Company, BTH = British Thomson-Houston.

In March 1929, the 20 converted motor cars of 1906 vintage working on the Piccadilly Line with the 1920-built Cammell Laird trailers were earmarked for replacement. It was decided that a further 20 new cars were to be ordered from Feltham to replace them. A few months later in June 1929, the idea of keeping 3 x 6-car trains for increased services was abandoned. Now it was intended to keep only 8 x 6-car car gate stock trains on the Bakerloo (plus 10 spare cars). These were all to be of the original Bakerloo type instead of the Piccadilly type that was originally envisaged.

Three months further on, in September 1929, pressure from the traffic department finally succeeded in getting rid of all the gate stock. It was decided that the remaining 8 x 6-car gate stock trains were now to be of new stock, known as the 1929 Stock, and were to be built by UCC at Feltham (together with five spare cars) and were to be used on the Piccadilly Line. The beneficiary of this decision was the Hampstead & City Line, which was to receive an additional 8 x 6-car trains from the existing Piccadilly air door stock order. The final ordering scheme is shown in Table 3. Finally, it seems an attack of common sense had broken out and all the gate stock was to go.

The transfer of eight trains from the Piccadilly to the Hampstead & City Line allowed an increase of the existing 91 train H&C¹ service to a 99 train service. Bearing in mind that, in the days of 1938 Tube Stock on the Northern Line (as the Hampstead later became), the maximum service was 100 trains including coverage of the Barnet and Mill Hill services (opened in the early 1940s), the figure of 99 trains to cover services that did not go north of Highgate, was an extraordinary feat of timetabling. The current Northern Line timetable uses a maximum of 96 trains.

By March 1928, after unsuccessful attempts to find a cheap method of conversion to air doors, a number of gate stock cars that had been sent to Feltham for trials were broken up. These consisted of a total of three former Piccadilly motor cars, three trailers and two control trailers. The single Hampstead trailer at Birmingham was disposed of there and two other Hampstead cars, a motor car and a trailer were broken up at Acton.

The abandonment of the trial conversions as early as March 1928 is interesting as it suggests that the plans to retain gate stock after that date meant that management accepted that they would have to run in their original condition despite the fact that it was already obvious that mixing them with the new air door trains was going to give service reliability problems during peak hours. One can only imagine the discussions that went on when the accountants amongst the management told the operators that the Bakerloo and Piccadilly lines were going to have mixed fleets of old slow trains and fast new ones. Somebody obviously put their foot down.

THE GATE STOCK GOES

Once the procurement starting pistol had been fired for the Hampstead replacement stock, the first batch of 1927 Stock, they couldn't get rid of the gate stock fast enough. Indeed, the first gate stock cars were withdrawn months before any of the 1927 Stock was delivered. The first gate cars went in January and February 1928 while their official replacements didn't start arriving until July 1928. This wasn't really a problem as the supply of trains for the H&C was generous and they also had to make room for the new cars in the stabling yards. By the time of the introduction of the new timetable of November 1928, only 9 x 6-car gate stock trains were required for service. The rest was new stock.

The Hampstead gate stock trains were replaced at the rate of about one a week until the last ran in passenger service on 31 January 1929. Some cars were hanging around for a few months longer, while they were looking for ways to dispose of them and considering whether any were suitable for retention as engineer's vehicles. Only two Hampstead cars were retained – two motor cars that were rebuilt so that they were joined back to back to become the Acton Works shunting loco L10, being recorded as complete in June 1930.

The Piccadilly's gate stock also started to be withdrawn at the beginning of 1928 but this was no more than removing cars with defects that were not worth repairing. Bulk removals from service had to wait for new cars to arrive and ran almost in parallel with the new stock, delivery starting in April 1929. The cars used to displace the old stock on the Piccadilly were almost entirely from the Bakerloo replacement order, the 1928 Stock built by UCC. This was because the UCC cars were delivered before the 1927 Stock order from Met. Carriage, the official "Piccadilly Replacement Stock". As a result, the last public service gate stock ran on the Piccadilly in June 1929, three months before its official replacements began to arrive, although the French-built air door converted motor cars remained until new stock to replace them arrived in the form of the 20 1928 UCC motor cars in the spring of 1930.

In the whole gate stock replacement story, the Bakerloo ended up at the back of the queue but the line's replacement programme, when it did start at the end of September 1929, was quick. Most of the actual cars delivered were from the Piccadilly replacement order, the 1927 Met. Carriage Stock, and they entered service between September and December 1929, so that the last officially recorded operation of a gate stock train was on 1 January 1930 with the 00.15 Elephant & Castle to Queen's Park. This date has a definitely 'staged' feel about it.

At the end of 1927, the last year on the books of the complete fleet of gate stock built between 1906 and 1914, the number of cars was 468 (490 delivered, less 2 Piccadilly cars that never entered service and 20 French cars converted for air door operation). By the beginning of 1930, an equal number of

¹ It was not uncommon for the Hampstead & City to be referred to as the H&C by the Underground group, which may have been why the name was changed to the Edgware, Highgate and Morden line in November 1933 after London Transport took over the LER and were about to absorb the Hammersmith & City Line along with the Metropolitan Railway. It was quickly simplified to the Morden-Edgware line in June 1934 and eventually became the Northern Line in 1937.

new cars (162 for the Bakerloo, 170 for the Hampstead and 136 for the Piccadilly) had been delivered and the gate stock withdrawn. The whole replacement programme was done in 18 months, giving an average new car rate of 26 a month. Towards the end, they had speeded up the process so much that the Bakerloo stock was replaced at double the rate to over 50 cars a month or two trains a week. Even then, they were not done. There was more to come.

To be continued