THE METROPOLITAN RAILWAY ELECTRIC TRAIN

by Piers Connor
with Charles Horsey
14. GN&C ODDITIES

VARIATIONS

Although the GN&C rolling stock consisted of basically two types of car construction (wood and steel) and two types of vehicles (motors and trailers), there are a number of indications that there were variations within the types. The wood motor cars were originally provided with driving cabs at both ends but, as we have seen, some cabs had the driving controls removed from one end for fitting in trailer cars in order to convert them to driving trailers. Not all the motor cars lost their double-ended capability. Photographic evidence shows that some cars remained double-ended but no distinction appears to have been made in the car numbering, even by the Met. after the takeover. One way to determine those cars which remained double ended is to look for the trip arm protruding from the roof. Unfortunately, this is not always easily seen in many photos.

In another example, the entrance gates provided on the wood cars had a rectangular grid of bars (Figure 4 below) while the steel cars adopted a diamond pattern. Some cars had their gates covered by steel sheeting. It was not applied to all wood cars and not to any steel cars and it is not clear whether this was an original feature on certain cars or a later modification.

A feature of the GN&C cars was the provision of a means of escape in the case of a train becoming stalled in the tunnel. With single track tube tunnels, the only way to get out was through the front or rear of the train. To get passengers onto the track, a set of steps was carried on the train, usually under a seat on the passenger saloon. An early drawing of the 1906 steel cars shows steps provided on the leading end of the motor car. It is unlikely that they were ever provided in a fixed position but some sort of ladder system would have been carried in the driver's cab as there wasn't room under any of the passenger seats in the saloon. The steel motor cars carried the steps in the front end doorway.

Like the rest of the underground lines in London, passengers who were unfortunate enough to get evacuated into a tunnel because of a breakdown on the GN&C had no walkways available to them, apart from along the track. Passengers have to be guided by staff so they don't trip or fall over rails and other track mounted paraphernalia. Tunnel lights are provided to help light the way. The GN&C was a little better in this respect as the 'four-foot' wasn't normally obstructed by a negative current rail. However, there were still switches and crossings and in Figure 1 we see the current rail layout through the original crossover at Drayton Park.

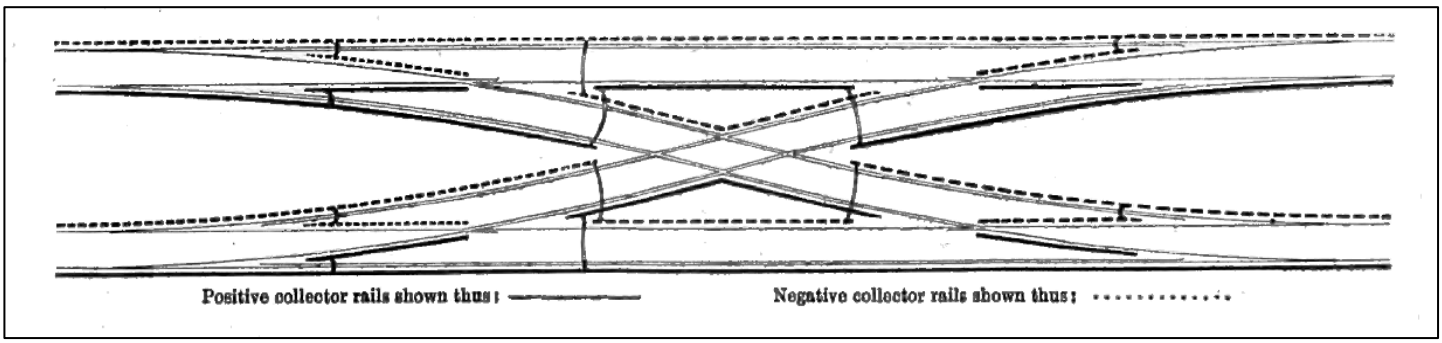


Figure 1: A diagram of the crossover at the south end of Drayton Park station on the GN&C, showing the layout of running rails and conductor rails. The cable connections between the current rails are also shown. Diagram from The Electrical Review, Vol.54, 26 February 1904, p.347.

GN&C LOCOMOTIVES

As we've seen, the original plan for the Great Northern & City Railway (GN&C) was for it to work a selection of Great Northern Railway trains from a connection with their main line at Finsbury Park to Moorgate. The GN&C was to purchase electric locomotives specifically for this purpose. As the plans for this scheme fell through, the locomotives were never built. However, the GN&C did obtain one locomotive but this was provided as a yard shunter for the line's depot at Drayton Park. The history of this locomotive was researched by Ken Benest and published in his book 'Metropolitan Electric

Locomotives'[1] and I have used some of his material to retell the story of this machine and the replacement locomotive that appeared in 1921.

When the GN&C received its deliveries of its new rolling stock in 1903, it was quickly realised that once the cars had arrived they didn't have a way of moving them around the yard unless they had motors that worked. As with any depot, a traction unit capable of moving 'dead' vehicles was always useful, indeed essential, and the GN&C was no exception. Rather than buy a new locomotive (too expensive?) Pearson's, the line's contractors responsible for the building the line and supplying its equipment, decided to make one themselves. They had some spare sets of both traction equipment and bogies already, so all they had to do was build a body.

There do not seem to be any photos or drawings of this locomotive that have survived, but Benest described it as having a "*small central cab with small equipment compartments at either end'.* The locomotive was built of hardwood including the frames, apparently. The cab was positioned in the centre of the machine and the roof was only eight feet high so the cab formed a well between the two bogies. The cab had no side doors, they were open to the elements but at least the cab windows were glazed.

The length of the locomotive was said to be about 25 feet excluding the buffers and the standard GN&C link and pin couplers provided for the stock. The loco had two McGuire motor bogies, each with a single BTH GE 66 motor, just like the motor cars. It had a total of 250 hp. According to Benest, the locomotive was so light that it had problems with adhesion and had to have 'granite setts' added to increase the weight.

The locomotive was designed by John Pattinson Thomas and constructed under his direction. He was the BTH company's site engineer at Drayton Park. He later became the site engineer on the Bakerloo Line and eventually Operating Manager of the Underground Group[2]. Although the locomotive is first recorded in the annual returns in 1904, Thomas said that the locomotive was built earlier with parts delivered for the BTH rolling stock contract so that they had a means of getting the newly arrived motor car bodies into the shed to have their equipment fitted[3].

Benest wrote, in the late Victorian gothic style he lapsed into from time to time, that *"As on the motor cars, the control equipment … was arranged for "open-circuit" transition between the series and parallel connections of the motors. Largely owing to this, every movement produced the visual and aural accompaniment of a Crystal Palace display, thus engendering the soubriquet "Old Fireworks" by which endearment it was held in the affection of the staff".* This description surprises me, as I would have thought that the duties of the machine would have limited the speed necessary to carry out its duties and that it would have been rare that it was required ever to reach more than 'series' in its control sequence, so the fireworks of the 'open circuit' transition into parallel motor operation should have been very rare.

REPLACEMENT

The GN&C locomotive survived World War 1 but the Metropolitan decided to replace it when the opportunity arose with the replacement of their own electric locomotives in 1919-21. With the decision to scrap the existing main line locos and replace them with new machines, a withdrawn British Westinghouse locomotive, No.1, was stripped of most of its equipment and converted to become the new Drayton Park shunter. As a Metropolitan Railway locomotive, it was renumbered 21. It was fitted with McGuire bogies, motors and BTH control equipment, including a CP14 compressor. The open circuit transition was modified to allow bridge transition and the standard GN&C shoegear was provided on the bogies.

No.21 was provided with the capability for multiple unit control, by means of a multi-pin socket centrally mounted above the locomotives end louvres. Quite why this was necessary for a yard shunter escapes me, since most of the movements would normally be limited to a couple of cars being pushed into or pulled out of the shop. On the original stock, the jumpers were connected between cars under the roof above the end platforms so and special long jumpers cables were carried on the locomotive to span the greater distance between the sockets. Benest also notes that "the peculiar" GN&C brake pipe connections were added to the locos in place of the permanent flexible half-length hose and coupling

---

1 Published (2nd edition) by LURS 1984.

2 I was once invited to meet J.P. Thomas at his home. He was in his 90s then but spoke clearly about his experiences and the early days of electric traction on the Underground.

3 Benest, K. (1983), *'The Drayton Park Shunter', Underground News* No.260, August 1983,

usually found on Westinghouse-braked vehicles. The GN&C had standpipes at the car ends that were connected with a full length inter-car hose that was carried separately on the vehicles until needed. Benest suggested that the system *"had the advantage of permitting rapid replacement in case of hose failure".* Again, I doubt they were used very often as cars would usually be shunted as 'swingers', i.e., without working brakes.

Figure 2: The replacement Drayton Park shunter No.21, ex-Metropolitan Railway 1905 loco No.1, after its conversion in 1920 to work on the GN&C as the yard shunter at Drayton Park depot. Photo: LT Museum, March 1934.

In its converted form, the locomotive retained its two driving positions, although its suitability for coupling was very bad and we might wonder today why they didn't use one of the Metropolitan's later series of former BTH locos with the box type body (Nos.11-20). These had driving positions at the ends and would have been much easier to use for shunting purposes.

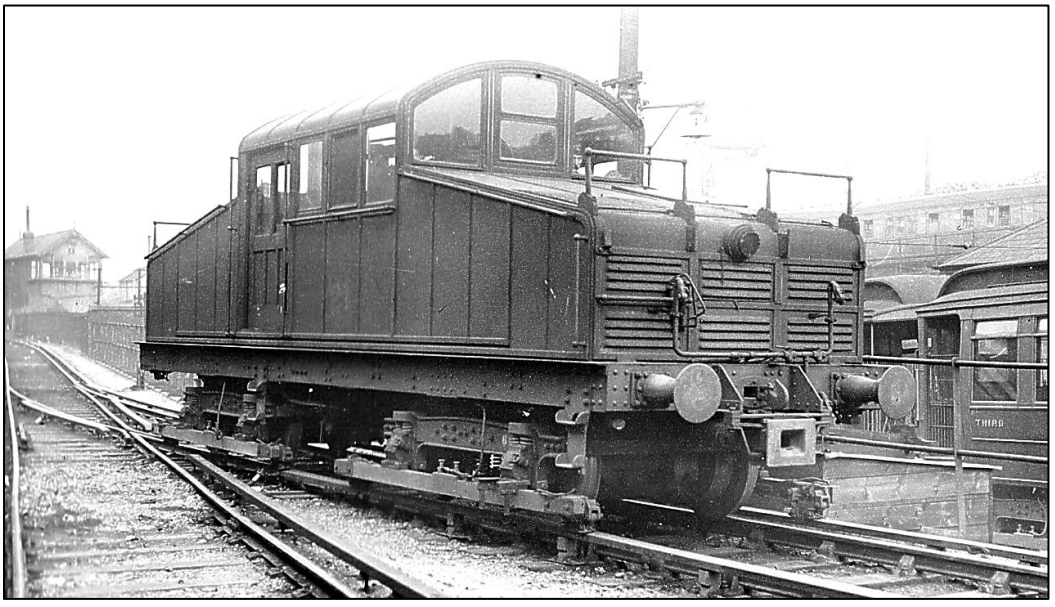


Figure 3: GN&C Shunter No.21 The loco body is substantially the same as it was when working on the Metropolitan main line services but it has now got McGuire bogies with the typical GN&C shoegear. In the centre of the body end, a jumper socket has been fitted to allow multiple unit control between the locomotive and a train it was coupled to. Also, the link and pin coupler mouth can be seen below the loco's original coupler hook. Photo: B.R. Hardy collection.

THE END

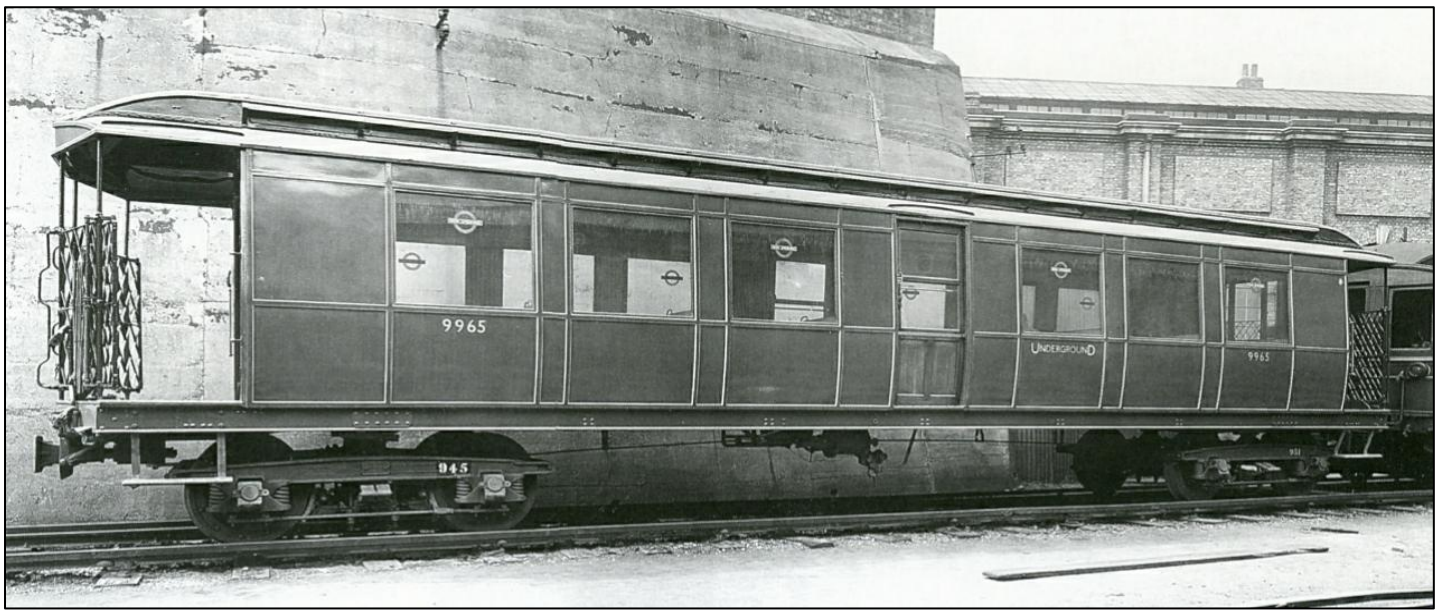
In common with all the other London Underground lines, the Metropolitan Railway and GN&C were taken over by the London Passenger Transport Board in 1933. The new Board soon decided to end the GN&C's isolation with a scheme to include the line in an extension to the Northern Line and the replacement of the existing stock by 'Standard' tube stock. The original GN&C rolling stock was pretty much life expired by then anyway but it was included in the LPTB's renumbering scheme for the whole Metropolitan fleet pending its replacement. This included distinguishing the directions in which cars faced. As there were no loops, triangles or turntables on the GN&C, this might seem a ridiculous

exercise but the cars were taken to Neasden for overhauls and perhaps, for the sake of uniformity, the effort in devising a 'handed' numbering scheme was worth it.[4]

Figure 4: The wooden bodied 1st class GN&C trailer car No.94 awaiting scrapping at Neasden. The car is in Metropolitan Railway livery and hasn't been renumbered into the LPTB series. The side window adjacent to the centre doorway has been blanked off as part of the conversion to first class. Note the adjacent car platform has plain steel sheeting over the gate. A number of cars had this feature. Photo: B.R. Hardy collection.

Under the new numbering scheme, north-facing cars were given even numbers and south facing cars odd numbers. In common with other cars formerly owned by the Metropolitan, the motor cars were numbered in the 2000s, driving trailers in the 6000s and the trailer in the 9000s. Not all the cars were renumbered before they were scrapped and very few of them ever got painted into "London Transport" colours but a very early attempt appears in Figure 5. However, the car is branded "Underground" as opposed to London Transport, perhaps in homage to the fact that, in reality, the Underground group was taking over the Metropolitan, something they had wanted to do since before the First World War. Scrapping of the GN&C cars had begun back in 1935 by the withdrawal of two motor cars. The worst cars were henceforth scrapped in preference to heavy repairs in view of the forthcoming takeover of the line by tube stock.

Figure 5: GN&C steel trailer car No. 9965 in 'Underground' livery, probably a unique example. It would have looked most handsome in red, lined in gold with gold lettering and a grey roof. In this photo, we can just see, next to this car is the front of one of the six Metropolitan Railway 1905 Stock BW 150 hp motor cars sent to the GN&C in 1930. Photo: LT Museum.



The GN&C upgrade planned by the LPTB included modernisation of the traction current system. This meant converting the line's unique 4-rail system to the standard Underground system with a central negative rail. It was done at the same time as the replacement of the existing stock by tube stock over

[4] Connor, P., (1983), 'GN&C Rolling Stock – Some Notes', *Underground News* No.255, March 1983, pp.66-68.

the weekend of 13-14 May 1939. The new negative rail was installed before the changeover date but the positive rail had to be moved to the new position 4½ inches further out from the running rail along the whole line during a period of 34 hours – no mean feat.

Figure 6: GN&C cars at Neasden awaiting scrapping. A single-ended wood motor car is nearest the camera with the cab end provided with proper cab doors instead of the gates originally provided. The trailing end has gates although it retains the wooden windscreen and end doors of the former cab end. The car is stripped of its shoegear. The second car is a wood 3rd class trailer with steel plated gates. Photo: B. R. Hardy collection.

They also had to reposition all the trainstops. The trainstops installed in 1935 were positioned to fit between the current rail and the running rail and the position was different from the standard Underground arrangement. To operate with the incoming tube stock, all the trainstops on the line had to be moved once the positive current rails had been repositioned.

Only four trains were used on the Saturday service before the shutdown, running to a special timetable. Services were suspended at 15.20 and current was switched off on the Saturday afternoon along most of the line. It went off at Drayton Park depot at 20.00 when all the GN&C stock had been removed to Clarence Yard[5], just south of Finsbury Park LNER station, where it was left for later transfer to Neasden via the City Widened Lines. LNER steam locos were used for the transfers and a battery loco was stationed at Drayton Park for shunting purposes.

Six 5-car 1923-27 Tube Stock trains were brought into the depot from noon on the Sunday. Current was switched on at 00.30 on the Monday morning to allow test running and "training if necessary"[6]. The public service started on Monday morning as usual. To get all this work done in what was effectively a 32 hour possession was a remarkable effort, considering that the concept of 'Project Management' as a separate discipline wasn't yet invented.

THE SURVIVOR

Strangely, although the GN&C stock had been replaced by tube stock and Loco No. 21 wasn't really suitable for shunting it, it survived at Drayton Park. It had its shoegear modified to conform to the standard Underground system and it must have been used during the stock changeover to shunt the old cars up the ramp for collection by the LNER steam locomotive. If it was to be retained for shunting after the changeover, it would have been necessary to change the couplings to allow it to couple to tube

[5] This yard later became the location of Finsbury Park Diesel Depot.

[6] LPTB (1939), Supplement to Traffic Circular (Railways) No.18, 3 May 1939.

stock. A photo of it in the yard at Drayton Park taken after the conversion of the line for tube stock shows it stabled in the loco siding at the bottom of the ramp (Figure 7) but it does not show any evidence of tube stock couplings and it retains its side buffers. For this reason, it is likely that the loco was only used after the changeover for occasional wagon moves to and from the yard.

Benest recorded that, in March 1942, No.21 was painted in grey and a new number, L.33, was displayed on the solebars along with the initials LPTB. Benest suggested that the old name, number and Metropolitan crests remained clearly detectable underneath the paint job until the locomotive's final withdrawal on 4 March 1948 but there is no photographic evidence for this. Later the loco appeared with London Transport transfers on the cab sides (Figure 7).

It was suggested that No.21 was to have been retained for preservation *"as an interesting early electric locomotive".* This might have been the case and there was an intention to preserve and number of early Underground cars. These were collected and stored at Lillie Bridge for a time.

Apparently, the plan was to remove the loco from Drayton Park for preservation but, by this time, the link to the Great Northern main line at the top of the ramp had been removed and replaced by a new connection through a long concrete-covered approach of tube structure-gauge only. This was on the other side of the GN&C line and was part of the plan to integrate the line with the Northern Line. This made the locomotive too big to fit in the new tunnel, so a fitter was instructed to remove the roof portion of No.21, so that it could negotiate the new route. Benest wrote that the job was said to *"have been undertaken with such enthusiasm that the resultant carnage of No.21 was written off as fit only for scrapping".* A sad end for a pioneer locomotive.

Figure 7: The former Metropolitan Railway electric locomotive in the yard at Drayton Park displaying the title London Transport and the number L33. The photo was taken after May 1939 as the loco has its shoegear modified for standard Underground 4-rail current collection. The yard also has been relaid with the standard 4-rail system. It is difficult to see but there is no evidence of tube stock couplings to allow it to shunt tube stock. Photo: B.R. Hardy collection.

Amongst the collection of vehicles kept at Lillie Bridge from around 1936 with a view to retaining them for preservation was a GN&C car. Unfortunately, most the vehicles there, apart from the City & South London locomotive and trailer car, were cut up during the 1939-45 war.

To be continued …