THE METROPOLITAN RAILWAY ELECTRIC TRAIN

by Piers Connor
with Charles Horsey
23. CODES

VARIETY

The 1931 Stock was the Metropolitan Railway's last rolling stock purchase. Some of the coaches were delivered just before the company was taken over by the London Passenger Transport Board (LPTB), in 1933 when the Metropolitan went into public ownership but the rest of the order arrived afterwards. When the LPTB took over, the Met had a hotchpotch of rolling stock, some of it over 30 years old. The Met had adapted to events on the hoof. Sudden changes in circumstances, like the learning curve resulting from the transition from steam to electric operation, the imposition of the 4-car Circle train policy by the District in 1907, the decision to enclose the gated platforms, the unreliability of the Westinghouse electric equipment, the First World War, the subsequent rising traffic levels and the passengers' resistance to saloon style trains had all contributed to a variety of rolling stock equipment and train formations, a variety that seemed to grow on an annual basis. By 1914, just ten years after electrification, there were ten different types of electric traction, plus the steam hauled stock formations. This variety continued to grow after the First World War right up to the end of the company's existence in 1933.

The variety of equipment created a need for some sort of rolling stock management process that provided the company's engineers and operators with an understanding of what stock was wanted where and when. It gradually dawned on them that some sort of identification system was needed to show staff a vehicle's orientation, what type of equipment a vehicle had and what it could be coupled with to form trains. It was slow to happen. Initially, a form of coding for train types began with the use of letter codes in the working timetables (WTTs) to indicate which type of train and formation was to be used for each train path. This coding included locomotive hauled and multiple unit trains.

TRAIN CODES

The train codes were listed in the front of each WTT (Figure 1) and took the form of letters. The early timetables in electric days had the stations displayed across the top of the page and train codes listed in the left hand column but later, station and times were listed down the page so that the code for each train was at the top of its timing column of the timetable, together with the train running number, to show which type of stock was to be used on that trip. Just to keep everyone on their toes, the Met. had at least two WTTs, one for the Extension (the St. Johns Wood) line services, known as the No.1 Section and one for the Circle and Hammersmith services known as the No.2 Section and they used different codes in each. From time to time, they had three or four timetables, with a separate one for the City Widened lines and another for loco hauled operations on the Extension. Then, around 1912, they swapped the timetable titles so that the Extension line services became the No.2 Section and the Circle and Hammersmith services became the No.1 Section[1]. Unfortunately, not many old timetables appear to have survived, so the timings of changes are difficult to track accurately. However, we can piece together some trends in the use of codes.

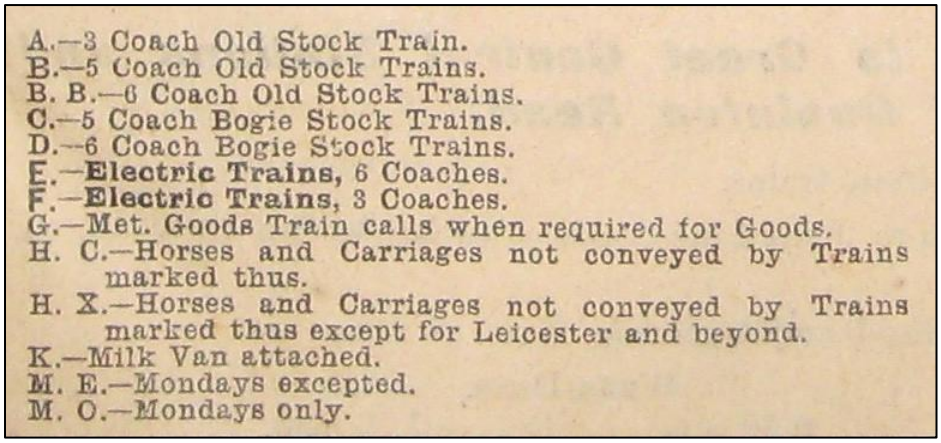

A.—3 Coach Old Stock Train.
B.—5 Coach Old Stock Trains.
B. B.—6 Coach Old Stock Trains.
C.—5 Coach Bogie Stock Trains.
D.—6 Coach Bogie Stock Trains.
E.—**Electric Trains,** 6 Coaches.
F.—**Electric Trains,** 3 Coaches.
G.—Met. Goods Train calls when required for Goods.
H. C.—Horses and Carriages not conveyed by Trains marked thus.
H. X.—Horses and Carriages not conveyed by Trains marked thus except for Leicester and beyond.
K.—Milk Van attached.
M. E.—Mondays excepted.
M. O.—Mondays only.

Figure 1: Part of the front matter of Metropolitan Railway WTT No.65, of 1 November 1906. This shows some of the codes used. The train code appeared at the top of each column showing train times. At this time, they were still referring to the Saloon Stock vehicles as 'coaches'. Later they became 'cars'. The 3-coach 'F' electric trains were used on the Uxbridge shuttle service only. The 'E' trains ran full length all day for this timetable.

[1] WTTs were still divided this way when I worked trains on the Metropolitan in the 1960s-70s.

The codes shown in Figure 1, dating from 1906, show that the letters A to D were reserved for locomotive hauled trains, both steam and electric. The letters E and F were used from the start of electric services to describe the Saloon Stock trains required for the Extension line timetables and these were quickly expanded to include other types of electric stock. By 1909, the electric Bogie Stock units had been allocated the letters M (for BTH equipped trains) and N (BW equipped trains) and these stuck into LPTB days. Another letter that appeared quite early on was 'V'. The 'V' represented Vestibule, or Saloon Stock. It was first used to indicate 7-car trains of Saloon Stock and is believed to have come into use around 1916. At some point, probably before 1912, the letters A, B, BB, C and D were dropped for the different formations of locomotive worked trains and they were then simply given train numbers that were listed in the front of their timetable with the classes of coaches to be used in each, e.g. 'No.27: Formed of 3 3rd, 2 1st, Pullman attached at Aylesbury'. From 1926, loco hauled trains were designated 'SS' (Steam Stock) plus the number of coaches, even if the loco was electric for part of the trip.

Other codes added were 'S' for the 1919-built, experimental 'Hustle' train and the letter W, introduced in 1921 to indicate the Bogie Stock trains with Saloon Stock motor cars. Then, as we've seen in earlier articles, the letters MW were introduced in 1925 for newly delivered cars equipped by Metropolitan Vickers while the code MV appeared in 1927. The MV code referred only to vacuum braked Metropolitan Vickers trains, not to all Metropolitan Vickers trains. Contrary to popular belief, there were only three MV trains; the rest were MW trains, also equipped by Metropolitan Vickers but with Westinghouse brakes. The three MV trains were later converted to MW trains by replacing their vacuum brakes with Westinghouse brakes so, from 1935, the MV, designation was no longer valid. Just in case you weren't already confused, the MW stock code also included the GEC equipped trains that the Met acquired in 1932. Regardless of this confusing jumble, the whole fleet was always referred to by the staff as "The Vickers". They all became 'T Stock' from 1940.

As we might expect, separate codes were used for the early Circle & Hammersmith line timetables and these were originally listed as follows:

M: Metropolitan Circle Trains
ML: Metropolitan Local Circle Trains (Aldgate or Moorgate to South Kensington)
D: District Circle Trains
H: Hammersmith Trains
K – Addison Road Trains (Aldgate to Addison Road.)[2]
KL – Addison Road Local Trains. (Edgware Road – Addison Road)
X – Extension line trains between Baker Street and Aldgate.

Each train also had a running number, which it retained all day. The codes for the Hammersmith and Circle trains remained largely unchanged until the late 1920s, when they were dropped[3] and trains were then only identified by their numbers.

Figure 2: A Metropolitan Railway lady guard operating the uncoupling chain on a saloon stock train about 1916. Women were employed by the Met to replace men who had joined the military during the 1914-18 war. The letter W can be seen on the car end just above the lady's head. This is an early example of stock equipment identification on the Metropolitan. The W indicated BW control lines. The letter T was used for BTH control. Photo: LT Museum

[2] Addison Road is now Kensington Olympia.
[3] Assistance received in correspondence with Natalie Jones, January-February 2024.

By 1921, codes for trains in the Extension line timetables had evolved with additional codes being allocated to define formations more closely. These were listed in the front matter of each timetable. They were allocated as shown in Table 1. After the Metropolitan was absorbed into the LPTB, the train codes evolved further so that they ended up in 1938 as shown in Table 2. A few years after electrification, Met timetables stopped showing train types in the trip columns and just showed a list in the front matter with the train numbers and the code for the stock to be used.

Table 1: Allocation of train codes, WTT No. 172 No.2 Section, 21 October 1921

Code	Formation	Comments
V	Electric train, 7 cars	
W	Electric train, 8 vehicles	Bogie Stock trailer coaches with Saloon Motor cars.
E	Electric train, 6 cars	
F	Electric train, 3 cars	
GW	Great Western Train	The Met. were renting some.
LH	Loco Hauled	Presumably steam or electric.
M	7-coach Bogie Stock train converted	
N	6-coach Bogie Stock train converted	

Table 2: Allocation of train codes, WTT No.66 No. 2 Section, 28 November 1938

Code	Formation	Comments
V	8-car train.	Saloon Stock
VT	Electric train, 8 vehicles	Saloon Stock trailers with MW Motor coaches.
W	8-coach train	2 MW motor coaches either end of 6 Bogie Stock trailer coaches
M	8-coach old type stock train	Bogie Stock
N	4-coach (2 MCs) old type stock train	Bogie Stock
MW	7 or 8-coach Westinghouse new type train.	Presumably steam or electric.
SS	Steam Stock train	
Eng or Engine	Steam Locomotive	
Loco	Electric locomotive	

Codes denoting the stock types to be used for each train remained part of timetable compilation on all Underground lines until only one stock was to be used on a line, when the codes just disappeared.

VEHICLE CODES

Metropolitan trains were not kept as units. Motor cars and trailers had different maintenance regimes so they were pulled out of trains as needed for examination, repair or modification and a replacement vehicle inserted in its place. With all the different types of equipment, it must have been a real problem for the depot foreman to sort out the train formations and ensure that each train was made up with matching traction. In the case of the two types of traction control, the BW system used 9-core jumpers between cars while the BTH system used 10-core jumpers, so it was impossible to couple different cars electrically. However, it would be very inconvenient if this were only discovered when you had two cars coupled mechanically and then you find the jumper sockets didn't match. Now you had to uncouple them and hunt around the yard looking for a car of the right type. There were adaptor jumpers that could couple BW to BTH train lines but these were only used in special formations.

IDENTIFICATION

Eventually, someone came up with the idea of providing jumper identification on the car ends. They started by creating separate codes for the two types of traction equipment. They used the letter W for BW equipped cars and T for BTH equipped cars[4]. Photos suggest this scheme was probably introduced around the time of the delivery of the 1913 Stock. Examination of several photos shows the letters were widely used on the Saloon Stock (Figure 2 above). Some examples had numbers added to the traction letter, as shown by the W2 seen in Figure 3. Other photos show cars coded W1. The photos suggest that the number was added to identify the motor power – 1 for 150hp, 2 for 200hp but this is just an educated guess. Then, just to confuse everyone, beginning in 1921, the newly converted Bogie Stock formed into trains with Saloon Stock motor cars (the W Stock) were listed in timetables as W1 to W5.

[4] It could be said that the Met. had 'T Stock' long before the 'T Stock' title was added to the official list of trains in 1940.

Figure 3: The breakdown gang hard at work after a buffer stop collision at Moorgate in the early 1920s. The interest for us here is that close examination of the car end shows the code W2 (circled). The W indicates a BW equipped train. Probably the '2' indicates a 200hp motor car as this was 1913 Stock. Photo: Author's collection.

Around 1913, the letters A and B were introduced to differentiate between car ends. Their use doesn't seem to have been consistent but, in Figure 4, the letters T, W and A can all be seen on the end panel of a 3rd class trailer. The T and W indicate that the trailer could be coupled into a train powered by either a BW or BTH motor car. The letter A indicates that this was the Up or south end of the vehicle, i.e. facing towards Baker Street or Aldgate. It first appears alone on a photo of a new 1913 Stock 3rd class trailer car. The letter B was the Down or north end. Detailed examination of other photos, including the original electric locomotives shows these[5]. What is odd about this scheme is that, until 1925 when the Watford extension was opened, the Metropolitan didn't have any triangles or loops that would cause trains to be turned. It is likely that the letters were dropped around 1926 when, as we will see later, a new coding system was introduced.

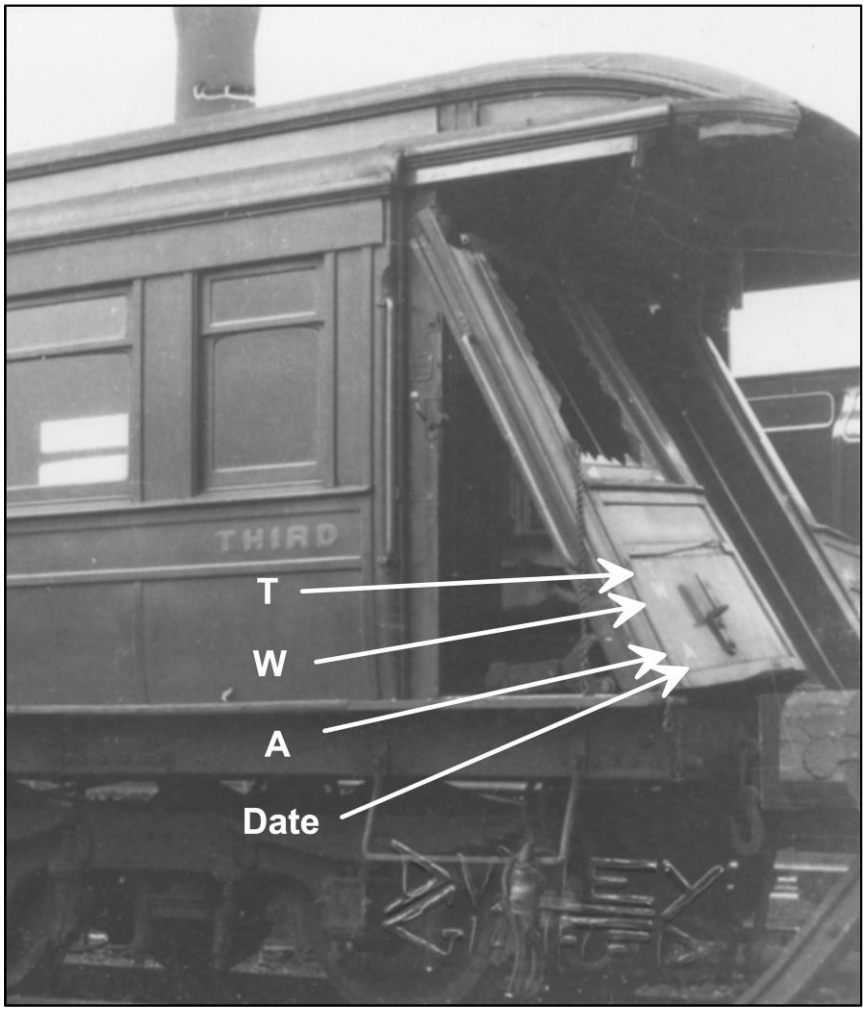


Figure 4: The damaged end of a Saloon Stock trailer, probably the victim of a shunting accident ca. 1926, provides some clues about the vehicle codes. Close examination of the car's damaged end panels shows the letters T, W, denoting traction wiring and A (indicating Up end), with a date below the letter A. The date was the overhaul date. The letters T and W indicates that it had both BTH and BW control sockets. Photo: Brent Libraries.

UNCOUPLING

From quite soon after electrification (the exact date isn't known but likely after 1907), some Metropolitan trains were scheduled to divide into two units for the midday off-peak service and in the evenings. Some Extension line timetables showed that trains were neatly scheduled to re-form and couple using the same two units. Only the Circle fleet remained the same length all day. The full-length trains that didn't divide were stabled after the morning peak and then re-entered service for the evening peak.

In Metropolitan Railway days, divided trains retained their running numbers and were classified in timetables as 'a' for the Up (or Aldgate) half of the train and 'b' as the Down (Harrow) half. When 7-car trains were introduced, the letter 'c' was

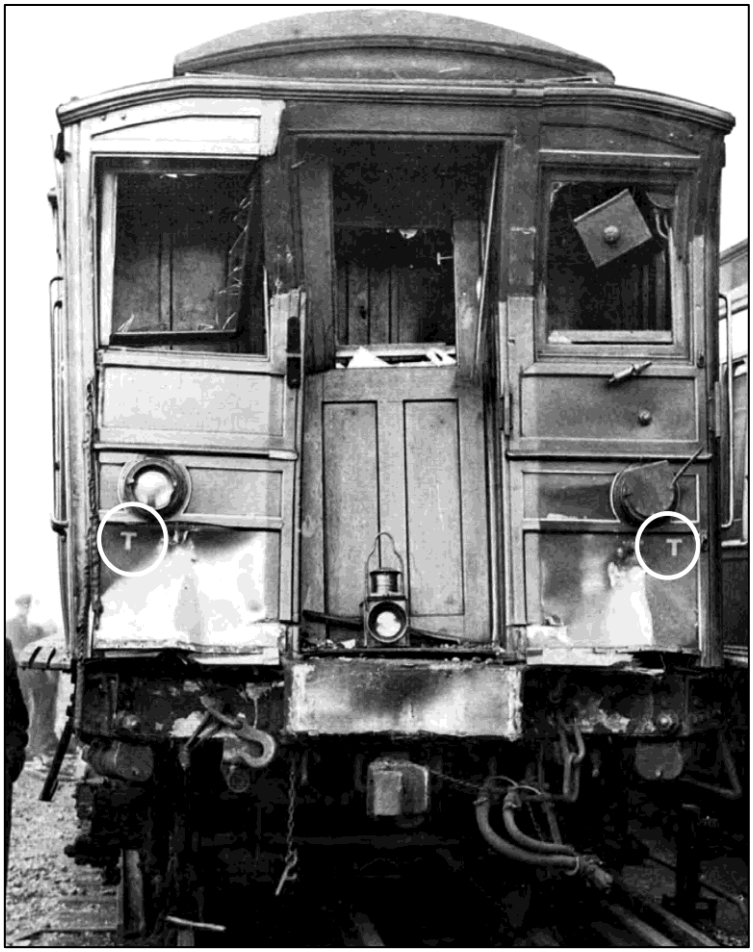
[5] Information from Charles Horsey and Ken de Groome.

added to indicate the 4-car portion at the Up end of the train. No other letter was allocated to a 4-car portion at the Down end. From this and photos, it seems that the 4-car portion of a 7-car train was always run at the Up end. This generally avoided mis-matches of equipment but there must have been times where this didn't work out.

If there was any disruption to the service, the units could easily operate out of turn or get cancelled. For those days, they must have allowed greater flexibility for swift shunting shuffles and there would have been occasional instances when out-of-sequence coupling might have been tolerated. The Metropolitan placed a high priority on First Class cars and coaches being in the correct place in train formations, so it would be important to get the reformations right entering the afternoon peak so that the high-value 'punters' were not put out.

Timetabling was not always consistent. On the Hammersmith & City Line, some of the divided trains were renumbered when uncoupled but with the letter 'a' added to the east end unit and 'b' to the west end. It was arranged so that the number of uncoupled 'a' sets going to depot was equal to the number of uncoupled 'b' sets so that they maintained the stock balance. The 1919 timetable for the Hammersmith & City service showed that trains were uncoupled at Hammersmith after the morning peak and split into two 3-car sets. Some 6-car trains went directly into the depot to await the evening peak. Train numbers were not aligned. For example, train 1 was divided into 1a and 5b but recoupling in the afternoon saw 1a coupled to 12b and became train 3, while 5b was coupled to 2a and became train No.11.

For 3 October 1921 timetable, the timing changed again so that some H&C trains were uncoupled haphazardly during the weekday midday off peak period but that not all trains were divided. Some ran as 6-car sets during the day, mostly on the New Cross route but they were mixed with 3-car sets. After the evening peak, the whole H&C service was reduced to three cars. All the uncoupling was done at Hammersmith. The time allowed for uncoupling and coupling on the H&C was usually about 6-8 minutes. This included the time to uncouple, moving the front unit from the platform to the depot, which at Hammersmith was very close to the platforms, followed by a brake test and the resetting of the route for the 'a' unit to proceed to Aldgate or New Cross. In cases where the 'a' unit was being kept as the service train, it was easy as this portion left first. The 'b' unit then went to depot. Coupling was a reverse of the process.



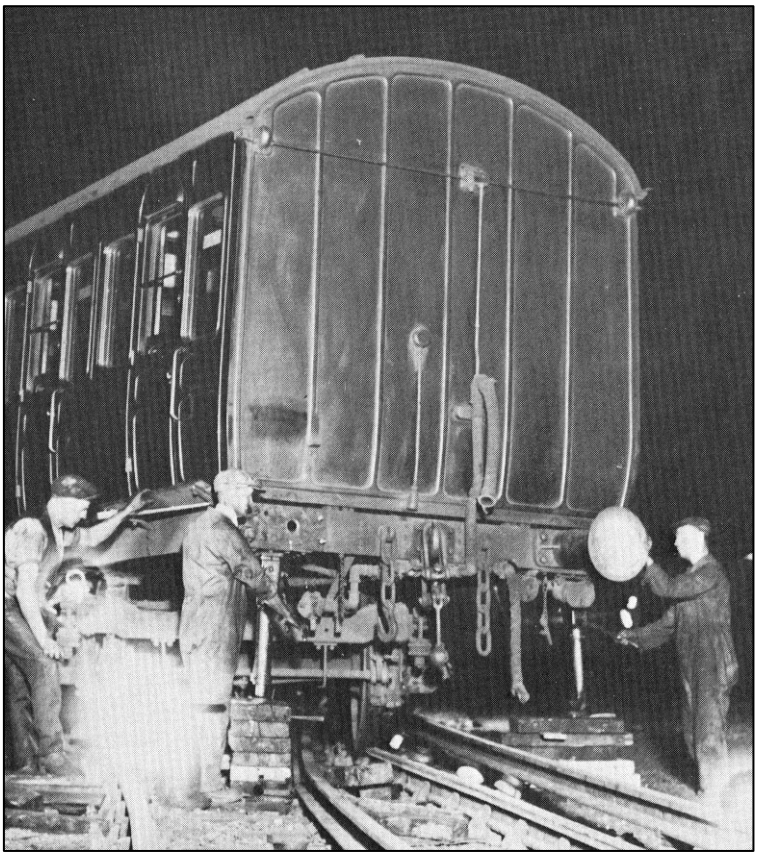
HOSES AND JUMPERS

It is worth remembering that the coupling process was quite complex. Once cars had been mechanically coupled, there were other things to do. First, there was the brake pipe connection, using a hose provided at both ends of all vehicles. These were provided close to the coupler head so they would always be capable of being connected under the coupler regardless of which way round a car faced. Another hose, the main reservoir pipe, was needed to supply air for brakes and, on BW equipped trains, the traction control system.

Figure 5: The damaged driving end of a 1906 BTH equipped Saloon Stock driving trailer car. It was involved in an accident on 3 January 1923 at New Cross LBSC (now New Cross Gate) when the train collided with a steam locomotive due to a signalman's error. Fortunately, no one was killed but there were several injuries. What is interesting for us is the letter T that can be seen (ringed) on each side of the front just below the marker lights. The T shows it is a BTH equipped car with jumpers on both sides. The letter A also appears faintly below the left hand T, indicating the car's Up end. Photo: Backtrack Issue 249.

As we've seen in earlier articles, electrical connections were made through jumpers plugged into sockets, known as receptacles, at the ends of cars. The Met's Saloon Stock was fitted with a twin (positive and negative) power busline along the length of the train connecting the collector shoes on the leading motor car with the shoes on the rear motor car. These supplied power for the lights and heaters on each car and provided a safeguard against the train getting 'gapped' where the shoes on a single car could be off the current rails. When dividing trains into short sets for off-peak operations, the jumpers between the driving trailers were unplugged and stored in the driver's cab.

The trains with BW equipment had to be kept separate from the BTH trains because, as we've seen, the control lines were different. On BTH trains, a 'pump line' was also provided. This was a 600 volt cable linking the compressor governors on the two motor cars so that they switched on and off together. On BW trains, the compressors operated independently on each motor car. Quite why the two types were different isn't clear to me. The idea of synchronized compressor control was quite new then. It didn't appear on the other Underground lines until new stock was introduced by the LPTB in the late 1930s. Up to that time, compressor operation was reliant on the air pressure registered by the governor on that car.



Jumper sockets were positioned at the corners of vehicles under the headstock. There was a multiplicity of variations as to which side of the headstock the sockets were fixed. The then current status for each vehicle was listed in Metropolitan rolling stock data sheets that were first produced around 1929 as part of a diagram book. These showed details of all the Met's vehicles in use at the time. It was updated from time to time as changes took place, at least until 1932. The records show that BTH trains generally had train, control and pump lines on both sides. Trailers and driving trailers generally matched their respective motor cars but a range of variations developed over the years on individual vehicles as they were converted or modified.

Figure 6: The end of a Dreadnought coach that has suffered a derailment. Conveniently for us, the end of the coach shows the vacuum 'bag' standpipe and, next to it, the lighting control jumper. Photo: P. Connor collection.

A TIDY UP

In 1925, with letters, numbers and dates scattered over the end panels of cars, it was decided there should be a standardisation of the codes. This gave an opportunity to provide for the new traction equipment and ratings that were appearing and also introduce a code for vehicle body varieties. Photos suggest that the new standard series of codes was first brought into use with the arrival of the two experimental motor cars delivered in 1925. They were the first cars to be provided with traction equipment supplied by Metropolitan Vickers, so they brought yet another type of equipment to the Metropolitan Railway. Although the Met. Vickers control train lines had 10 cores like the BTH stock, the traction control had automatic acceleration, as opposed to the manual operation of the BTH system and, as a result, the use of the various wires was different, so the need for better identification was becoming even more critical.

The new combined equipment codes were detailed in drawings originally issued in April 1926 titled 'Classification of Passenger Rolling Stock' and subsequently updated for GEC equipment in 1932. The drawings included a diagram showing where the code (termed "class symbol" on the drawing) would appear on the ends of cars. It was positioned up to a foot below the offside cab window or in the equivalent position on a trailer car. It was supposed to be provided on all passenger vehicles, including

loco hauled stock. The code was painted on the car end in a small rectangle measuring 3 inches wide and 3½ inches deep (Figure 7).

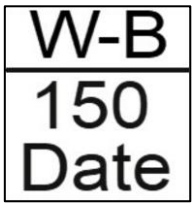


Figure 7: A diagram of a Metropolitan Railway rolling stock 'class symbol' as introduced in 1925-26. This particular example would have appeared on the four British Westinghouse equipped (W) Bogie Stock (B) motor coaches fitted with 150hp motors (150). The date would show the last overhaul. These motor coaches were formed into the N Stock trains in the Working Timetable. For trailer cars, the motor hp number was replaced by the letter T, DT, TB or B to indicate its type. Source: Metropolitan Railway drawings S11396-400.

The codes were divided into types of equipment, styles of carbody and types of cars. The letters W and T were retained for the electrical equipment, with the letter V added for Metropolitan Vickers equipment. In 1932, the letter G was added for the GEC equipped stock delivered that year, as shown in Table 3, adapted from an original prepared by Charles Horsey. The list of codes finally generated showed that there were 14 types of motor car, 9 types of driving trailer and 22 types of trailer vehicle. The Hammersmith & City fleet was not included in the car coding system. It was a self-contained fleet and they were all BTH 150hp equipped so there was no need for coding.

Table 3: Metropolitan Railway vehicle coding system adopted from circa 1925. Source C.I. Horsey.

Electrical equipment/control/through wiring

W	British Westinghouse Electric (BW) traction equipment/controls/train wires.
T	British Thomson-Houston (BTH) traction equipment/controls/train wires
TW	DT Driving controls work with T or W. Train wires compatible with BWE and BTH/M-V/GEC equipment.
V	Metropolitan-Vickers traction equipment and/or controls and ten train wires – also applies to associated intermediate coaches
G	General Electric (GEC) traction equipment and/or controls and ten train wires – also applies to associated intermediate coaches

Bodywork

C	'Car' (also known as 'Saloon') Stock
B	'Bogie' Stock - the formal Met. name for the family of compartment stock built and acquired from 1898.
D	'Dreadnought' steam stock and the 1910 single motor coaches. Extended to cover compartment-bodied electric stock built 1926 to 1932. The term Dreadnought had obviously acquired official status by this time.
L	Locomotive

Vehicle Type or Traction Rating

DT	Driving Trailer (coach or car)
T	Trailer (coach or trailer car)
TB	Trailer Brake Van (Dreadnought brake van with collector shoes for working with the electric locos)
B	Brake Van.
'nnn'	Motor Cars, Motor Coaches and Electric Locomotives – 3-digit numeral (nnn) denoting motor horsepower rating (i.e. 125; 150; 200; 210; 275 or 300).

BOGIE CODES

Not to be left out, the Metropolitan's bogies were also given codes. Each type was given a letter, beginning with A, which was allocated to the 1922 electric locomotive bogies, so this is probably when the coding started. Earlier motor bogies were then given letters in an inconsistent reverse order of appearance. The 1927 Stock and later motor bogies were given the code AA. Trailer bogies also got letters in an inconsistent scattering, even using the letter I, which was usually left out of any alphabetical identification system because of its likely confusion with the number 1. The H&C bogies were included in this range of coding, despite it being left out of the Met's other coding systems. The GN&C bogies were included by the LPTB when they allocated new pairs of letters for all the Met bogies beginning with the letter M. Table 4 shows the full list.

Table 4: Code letters for bogies used by the Metropolitan Railway and LPTB. Source: LPTB Drawings Nos. 20947 and 20948, 19 July 1934. Note the use of the term 'Truck' instead of bogie, as used by the Underground.

Met Code	LPTB Code	Details	Comments
	MA	GN&C Motor truck 6'-1"	Dwgs. 7336A & 25851
E	MB	7'-0" Motor Truck 36" wheels	Met. Saloon Stock
F	MC	7'-0" Motor Truck 36" wheels	On BW converted Bogie Stock motor coaches
H	MD	7'-0" Motor Truck 38" wheels	H&C Stock with BTH 150hp motors Dwg. 21362
G	ME	7'-0" Motor Truck 38" wheels	Dwg. 22764 on BTH Bogie Stock motor coaches
D	MF	7'-6" Motor Truck 38" wheels	1913 Stock ex BTH locos, Dwg. 21857 & 21872A Date 9-3-10.
C	MG	7'-6" Motor Truck 36" wheels	BW86 200hp on locos 1-10 and on 1921 Stock, Dwg. 1422.
B	MH	7'-9" Motor Truck 36" wheels	BW86 200hp, new 1913 motor bogies, Dwg. 24572
A	MJ	9'-3" Motor Truck 43½" wheels	MV339 300hp, Dwg. 27107, 1922 loco bogie.
AA	MK	8'-0" Motor Truck 38" wheels	MV153 275hp, Dwg. 24064 1927 and 1929 Stock motor coaches.
AA	ML	8'-0" Motor Truck 38" wheels	WT545 220hp, Dwg. 21519 1931 Stock
	MN	GN&C Trailer truck 6'-1"	Dwg. 23704
K	MO	7'-0" Trailer Truck 40¾" wheels	Bogie Stock Dwg. 21061
L	MP	7'-0" Trailer Truck 40¾" wheels	Bogie Stock Dwg. A10328. Outer headstock lowered to clear coupler.
I	MR	7'-0" Trailer Truck	Met & H&C trailer cars, Dwg. 21192c
J	MS	7'-0" Trailer Truck	Met & H&C trailer cars, has upturned inner headstock
M	MT	7'-0" Trailer Truck	Dwg 23911, 1929 Stock. (Roller bearings)
	MU	7'-0" Trailer Truck	Dwg 23886, 1931 Stock.

GOLD STAR

The Metropolitan Railway used another symbol on its electric stock. This was a gold star, located on the car body side just below the letterboard, next to one of the end doors (Figure 7). This was to show which end of the car the heating and lighting switches were located. It seems to have been introduced after the First World War, perhaps even as late as the mid-1920s but it survived into LPTB days, probably until trains were scrapped or refurbished. It is likely that it disappeared from the Dreadnought Stock when coaches were painted brown in place of the varnished teak during the Second World War. Sometime later, photographic evidence shows that coaches appeared with the letters HS (Heater Switches) in a circle on the upper panel at the appropriate end, probably in place of the gold star.

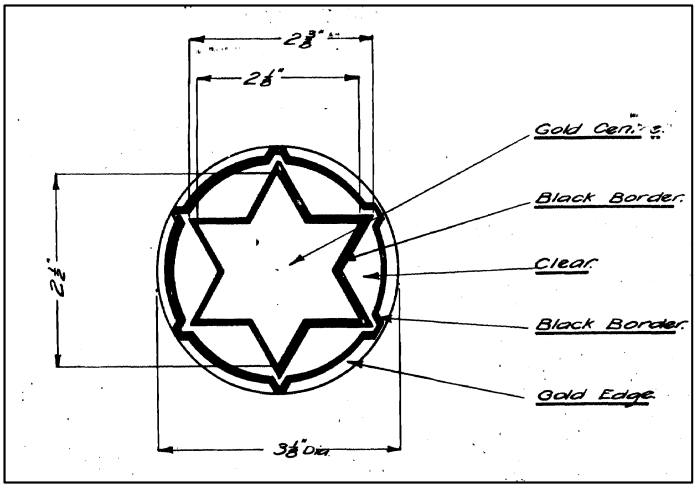


Figure 7 (Left) shows the location of the gold star next to the end door. Figure 8 (Right) shows part or an LPTB drawing dated 5 December 1935 with the dimensions and colour of the gold star transfer. Earlier versions of this that appeared on some of the Saloon Stock were displayed on small circular pads fixed to the bodyside.

To be continued …