Tyseley Carriage Sidings

Across the tracks from Platform Four at Tyseley Station are the Carriage Sidings with the modernised (but substantially original) single storey building, which after over hundred years still houses the facilities for the coach cleaning staff. At the start of the 20th century the Great Western Railway were planning to quadruple their main line through Birmingham, from Handsworth Junction to Olton. The widening of the permanent way would require the relocation of the existing Locomotive Shed and Carriage Sidings at Bordesley, so in 1903 sixty acres of land at Small Heath was purchased for £22,000. The land was locally known as Proof House, probably reflecting the use of the adjacent property as a firing range by the nearby Birmingham Small Arms (BSA) works.

Great Western Railway.

Office of Superintendent of the Line,
Paddington Station,
London, W.

L.637.
B.20.

February 18th 1903.

Dear Sir,

BORDESLEY AND OLTON WIDENING.
PROPOSED ENGINE SHED AND CARRIAGE SIDINGS AT SMALL HEATH.

With reference to previous correspondence on this subject, I have now received the amended plan from Mr Churchward showing how in his opinion the proposed Engine and Carriage Sheds can be provided at Small Heath, utilising practically the whole of the available land, and the maximum accommodation that can be given on the land proposed to be utilised.

I shall be obliged if you will carefully consider the plan, and let me have it back with any suggestions you may have to make, bearing in mind that to commence with I do not propose to ask for accommodation to be provided for more than about 250 Carriages, and I will ask you after allowing for say from 150 to 200 Carriages in the Shed, and the balance outside, to mark such of the Sidings as need not be provided to commence with.

Although for some reasons it is convenient to be able to get from Sidings at both ends, and this plan is undoubtedly desirable so far as the Sidings in the Carriage Shed are concerned, I am very doubtful whether, in the case of the Sidings in which the Excursion Carriages will for instance be stored, it would not be better at any rate a proportion of them to be constructed as Dead End Sidings, in which Carriages once placed could stand safely without risk of being pushed foul of adjoining lines. I shall be glad if you will consider this point carefully.

It is obvious that at the Tyseley end a good deal of otherwise waste space can be utilised, and more accommodation could be given at less expense if say the four Sidings nearest to the Carriage Shed were constructed as Dead Ends.

So far as the general arrangement is concerned it seems to me to work out very satisfactorily.

Please reply as early as possible as it is very desirable no unnecessary time should be lost in putting the matter forward.

Yours truly,

(Dictated) J. Collen for W.J.

E. Murphy Esq.

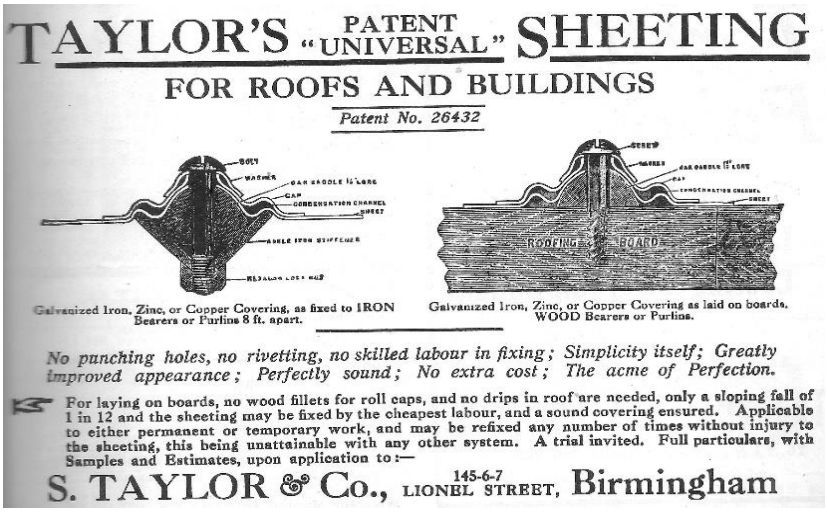
Plan Booked.

Great Western Railway correspondence from Mr Allen (Superintendent of the Line at Paddington) to Mr E Murphy (Birmingham Divisional Superintendent based at Snow Hill station) regarding the layout of the new facilities showed that the plans for the development were well advanced. The attached internal letter identifies that the initial arrangement of the Carriage Shed and Sidings was designed to accommodate more than 250 carriages, of which, 150 to 200 carriages would be stored undercover in a shed. It is worth noting that carriages in use at this time were typically only forty feet long (being six and four wheeled designs). The letter also suggests that installing a proportion of dead-end sidings instead of through sidings would save some costs.

The new Carriage Sidings were completed at the end of 1908 and in the January 1909 issue of the Great Western Railway Magazine (Vol XXI No1) the following photograph and short article appeared:-

New Carriage Shed at Tyseley *– The large new carriage shed adjoining Tyseley station has a length of 600 feet and a height to eaves of roof of 17 feet 6 inches. Its present width is 59 feet, four lines being accommodated. Special provision has been made in the building to admit of its being enlarged when required in the future. With this in view, while a brick wall is built on the side facing the main line, the opposite side, where the extension will be effected, is constructed with a steel frame closed in with the 'Universal Sheeting' manufactured by Messrs Samuel Taylor & Co of Birmingham. This material, in addition to giving a pleasant appearance (an important point with so large a structure), has the advantage over corrugated iron that it may be readily taken down for use elsewhere without injury. The sheeting is used in the roof, which is partially glazed, and at the gable ends also.*

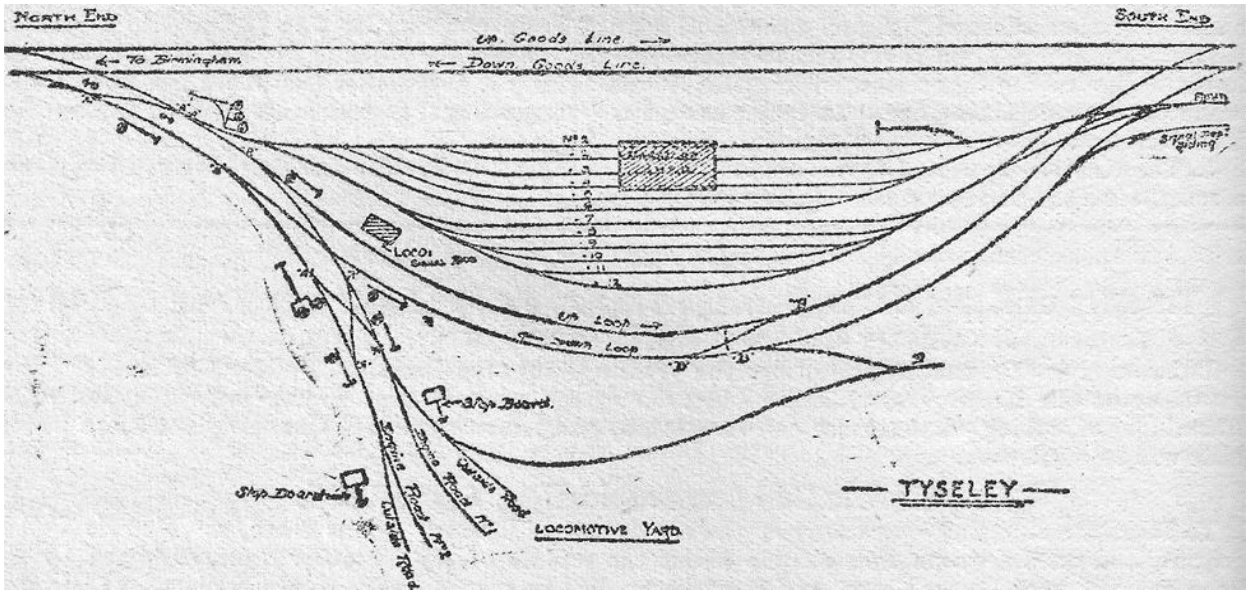
The Great Western Railway Magazine also carried an advert depicting the Samuel Taylor & Co 'Universal Sheeting', which was the type used on the roof and clad the walls on the new carriage shed.



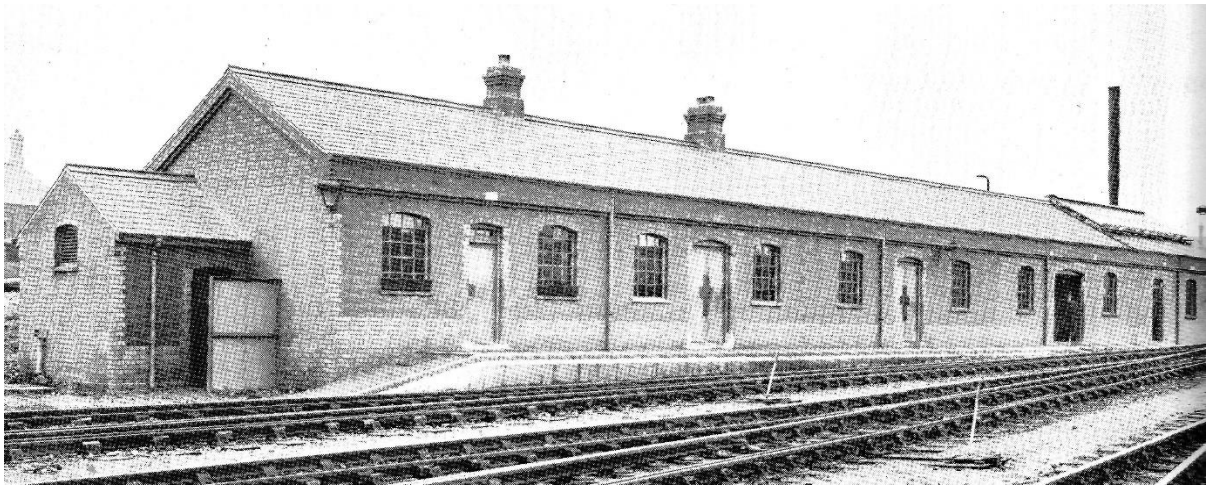
Tyseley carriage shed was never extended as originally intended, but in September 1925 the Great Western Railway Magazine records that a contract was placed with The Wolverhampton Corrugated Iron Co Ltd to renew a portion of the Carriage Shed roof covering.

This 1960's photograph was taken from the north end of the relief platform at Tyseley station. The six hundred foot long brick wall of the carriage shed can be seen on the far side of the down relief and goods lines.

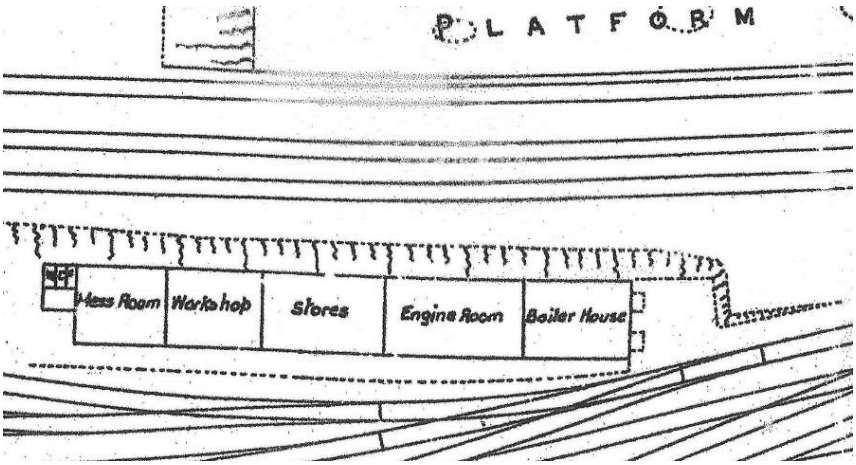
This plan from the Appendix to the Service Timetables for Birmingham Division (Section Nos.12 & 14) is dated March 1921. It shows the original layout with twelve long carriage sidings sandwiched between the Down Goods line and the new locomotive roundhouses. The Carriage Shed covered the four sidings closest to the Down Goods line. The instructions required siding No.6 to be always kept clear for receiving empty stock trains from Birmingham.



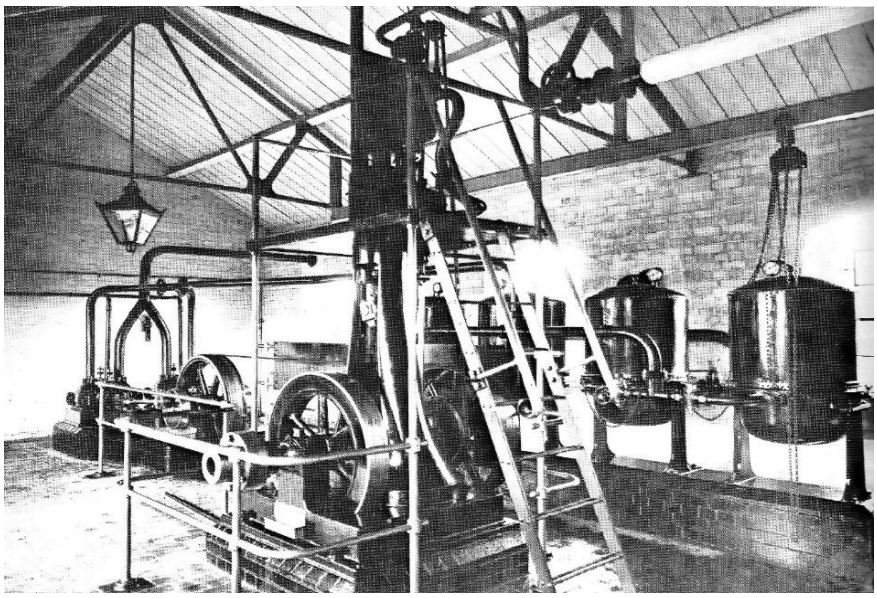
In 1924, £2,920 was authorised for the construction of three extra dead end carriage sidings (see later plan) and in April 1957 a short Diesel Shed was built over two of these extra sidings.



The single storey red brick building with gable end pitched slate roof at the station end of the carriage sidings housed the Carriage & Wagon Department's staff facilities (toilets and mess room). In addition the building contained a Workshop, Storeroom, Engine Room and Boiler House. The boiler powered a static vacuum cleaning plant located in the Engine Room.



This photograph of the vacuum cleaning plant at Tyseley was taken on 4th December 1912. It shows a belt driven suction pump and a number of associated storage tanks. At this time the vacuum cleaner was in its infancy and those institutions with large requirements like Hotels, Theatres, Department Stores, Hospitals, Barracks and Railway Companies had static arrangements like this, from which rigid and flexible pipes were taken to the point of work. The principle manufacturer of vacuum cleaning equipment in the UK, was the British Vacuum Cleaning Company, which had been incorporated in 1903 having been established the previous year by Hubert Booth. In 1901, he had patented an invention for the cleaning of carpets and other articles by suction caused by the creation of a vacuum.



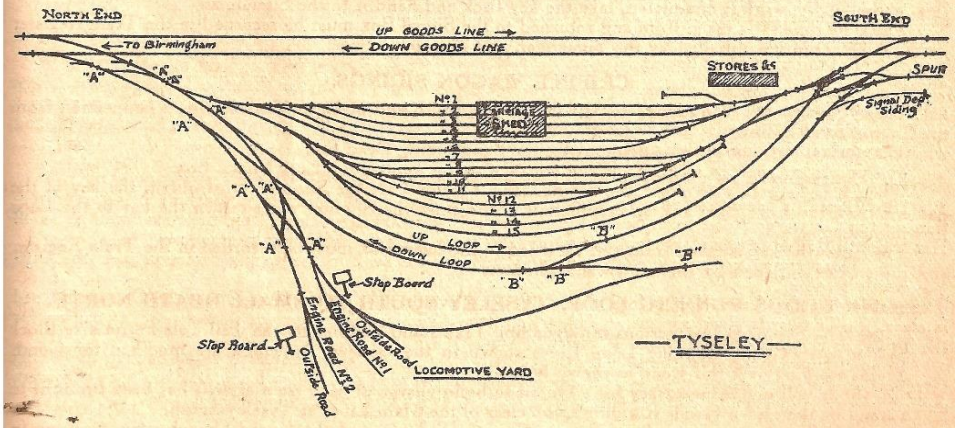
Operations at Tyseley Carriage Sidings

This extract from Great Western Railway Appendix to the Service Timetable for Birmingham Division (Sections No.13 & No.15) is dated March 1929. The plan differs from that in the March 1921 appendix (above) as it shows the three extra dead end sidings (numbered 13, 14 & 15), which were added in 1924.

Incoming down goods trains terminating at Bordesley Junction were accepted in Tyseley Carriage Sidings Nos.7 to 12. This relieved the occupation of the Down Goods Line and avoided congestion at busy times. The train's locomotive could also be released and sent to the Loco Shed. When the Down Goods Line was clear, the shunting locomotive employed in the Carriage Sidings would take the goods train forward to Bordesley Junction Yard.

The short siding adjacent to the single storey building (labelled STORES &c on the plan) is believed to be where travelling oil-gas tank wagons (telegraphic code: CORDON) were placed. A network of buried pipes allowed the oil-gas to be distributed

INSTRUCTIONS FOR WORKING THE CARRIAGE SHED AND SIDINGS.



The following instructions must be strictly adhered to, in connection with the movement of Engines and Passenger Stock to and from the Lines and the Engine Depot at Tyseley.

1. A Box, known as Tyseley Loco Box, and Signals worked therefrom is provided. Telephone communication is provided between Tyseley Loco Box and Small Heath South Box.

2. The connections with the Goods Lines at the South end of the Yard are controlled from Tyseley South Signal Box, and the connections (marked "A" on sketch) between the Carriage Sidings and the Locomotive Yard at the North end and the fixed Signals applicable to them are controlled from Tyseley Loco Box.

3. The Sidings are numbered from 1 to 15 as shewn on the diagram, and no Train or Engine must be turned into the Carriage Sidings from the South end without permission from the Shunter on duty, who will be responsible for seeing that everything is clear, and that nothing is allowed to foul the incoming Engine or Train.

No. 7 Siding is allocated for stabling Cripple Coaches.

4. When empty stock trains LEAVE the sidings at the South end, the Shunter must advise the Signalman at Tyseley South Box as each train is ready, and in the case of trains being PROPELLED out of the sidings, the Signalman at Tyseley South Box must on no account lower the signal until he is informed that the train is actually ready to back out.

In the case of Rail Motor Cars or trains with engine leading, the signal may be lowered in the usual way when the Signalman becomes aware from observation or engine whistle what movement is required. (P. 7732.)

5. The Lines marked Up Loop and Down Loop may be used for Engines or Trains running in the proper direction, but every Engineman must be prepared to stop short of any obstruction, and must stop **DEAD** at the Signal controlling the exit from the Line on which he is running.

6. **The Points marked "B" must be clipped and padlocked for the Loop Lines,** and must only be used in case of emergency. The keys are to be kept in Tyseley Loco. Box, and when it is necessary to use these Points, a Flagman must be stationed on the ground to protect the operations.

7. Trains of Empty Stock **must** be disposed of quickly at the North end to clear the Main Lines, and for this purpose the Hand Points must always be set for No. 6 Siding unless a Shunter is present to deal with the Train, when the Engineman will act under the Shunter's instructions.

When no Shunter is at North end of the Carriage Sidings, Trains must draw into No. 6 Siding, and the Engineman must stop clear of the connections at the South end, and be dealt with by the Shunter. **No. 6 Siding must always be kept clear for this purpose, and nothing must be put into it from South end.**

8. Shunting operations must be performed as far as possible at the South end where a Shunting Spur is available. When formed, Trains for the direction of Birmingham are to be placed in the Sidings in proper order, so that Engines from the Loco. Yard can back on coaches from the North end and leave from there as required.

When shunting has to be performed at the North end, the road must be set for the Departure Line and the Sidings Starting Signal lowered when practicable, but if this cannot be done, Enginemen **must not pass the Starting Signal at danger so as to foul the Incoming Road without the permission of the Signalman,** who must not give this permission if anything is approaching on the Incoming Road.

9. A "Limit of Shunt" Lamp Indicator is provided at Tyseley Carriage Sidings applicable to the Incoming E. & C. Line.

The Indicator, which is lettered "Limit of Shunt" in red letters on white ground, is fixed at an height of 14 feet on the same post as the Incoming Line Home Signals for the Loco. Box.

The Indicator will face Drivers when shunting in the wrong direction over the Incoming E. & C. Line, and the Engine or leading vehicle, as the case may be, must not pass the Indicator. (P. 7536.)

10. Trains **from** the Sidings at North end have to cross the Incoming Road of Light Engines and Trains, and Trainmen must be specially on the alert when entering or leaving the Yard.

11. **Whenever vehicles are required to be placed on any of the Traffic Department Lines at Tyseley Carriage Shed, or are required to be put into either of the Locomotive Department roads, such vehicles must never be gravitated to the respective lines, but must always be placed where required by means of an engine.**

12. The engine screw connection must be used when coupling engines to coaches. (Y. 684.)

13. When it is necessary for a Train, or Engine, or Engine and Vehicles to set back in the wrong direction on the Outwards Road from Small Heath South Box to Tyseley Loco. Box, the Signalman at Small Heath South Box must send by telephone to Tyseley Loco. Box the following message :—

"May train, or Engine, or Engine and Vehicles set back in the wrong direction over the Outwards Road ?"

The man at Tyseley Loco. Box, before giving this permission, must satisfy himself that the Outwards Road is clear, the Outwards Road signals at danger, and the Crossover Road points in the proper position for the Train, or Engine, or Engine and Vehicles to pass.

In no circumstances must the Signalman at Small Heath South allow anything to set back in the wrong direction on the Outwards Road unless the permission of the man at Tyseley Loco. Box has been obtained, and a Shunter is in attendance to accompany the Train, or Engine, or Engine and Vehicles.

across the site. Flexible hoses were used to connect to the individual carriage oil-gas storage tanks. Another network of pipes distributed water to locations where hydrants could be connected and a third was for the Vacuum Cleaning Plant. Manhole covers identified the various connection points.

Carriage & Wagon Department

The Carriage and Wagon Department was part of the Chief Mechanical Engineer's (CME's) Department. The Chief Mechanical Engineer operated from Swindon in Wiltshire, where the Great Western Railway's main manufacturing works had been established. Responsible to the CME was the Chief Outdoor Superintendent, who supervised seven (later increased to nine) Divisional Locomotive, Carriage & Wagon Superintendents,. These were based at various engineering works across the Company. After the Grouping in 1921, the Divisional Superintendents were based at the following locations:

Old Oak Common (London)	Cardiff Valleys & Barry	Wolverhampton
Bristol	Newport	Worcester
Newton Abbot	Neath	Oswestry

Each of these Divisional Superintendents was responsible for the organisation of the running work in their division. This meant providing suitable motive power and rolling stock for all the passenger, freight and engineering services being operated. Arrangements had to be made for; regular overhauls, maintenance, positioning, refuelling, and cleaning of the required locomotives, carriages and special wagons. Footplate staff and shed staff were also their responsibility, including; recruitment, training, progression, organising the rotas, providing welfare facilities, etc. They also had responsibility for the operation and maintenance of mechanical plant through-out the division, including; hydraulic systems, water pumping-engines, storage tanks and distribution pipework, gas and electric apparatus, as well as workshop and shed equipment, from lathes to turntables Their role was to achieve all these tasks in the most economic and efficient manner. Finally the Divisional Superintendents were responsible for recovering and repairing locomotives and rolling stock, which had been involved in accidents or had broken-down on the system.

The Divisional Superintendent at Wolverhampton was responsible for the Midlands and Northern areas, which stretched from Oxford to Birkenhead. He was based at Stafford Road Locomotive Works, near Wolverhampton. The Stafford Road Works were the largest works outside Swindon. They had initially been established by the Shrewsbury & Birmingham Railway. After that company had been absorbed by the Great Western Railway in September 1854, they became the main engineering works for the construction, repair and maintenance of all non-broad gauge locomotives and rolling stock. Following the Great Western Railway's amalgamation with the non-broad gauge West Midlands Railway in August 1863, new construction work was gradually concentrated at the larger Swindon Works. Some locomotive modifications and re-building continued to take place at the Stafford Road Works, but the main activities became the divisional repairs and regular maintenance work.

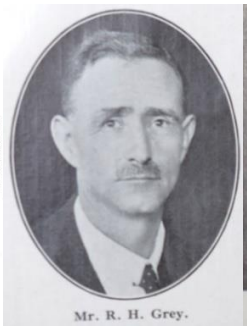
The post of Divisional Locomotive, Carriage and Wagon Superintendent at Wolverhampton was held in succession by the following gentlemen during the 20th century. This information and their photographs appeared in the Great Western Railway Magazine:

Mr James Armstrong Robinson	October 1897	Mr Rupert Hamilton Grey	January 1933
Mr Benjamin Giles	January 1919	Mr VJH Webb	May 1946
Mr Edward Gorden Wainwright	January 1924		


Mr J. A. Robinson


Mr. B. Giles.


Mr. E. G. Wainwright.


Mr. R. H. Grey.


MR. V. J. H. WEBB.

The Wolverhampton Divisional Superintendent had reporting to them; a Works Manager (who was responsible for activities within the Stafford Road Works) and an Assistant Divisional Locomotive, Carriage & Wagon Superintendent (who acted as their deputy and was responsible for all activities outside the Stafford Road Works). Initially these two posts were combined, but from 1905 they became separate posts. The Assistant Divisional Superintendent had the day to day responsibility for the various Locomotive Sheds and Carriage Sidings across the Northern and Midlands area. From 1908 that included the recently constructed Tyseley Carriage Sidings.

The following Assistant Divisional Superintendents at Wolverhampton have been identified from the staff appointments recorded in the Great Western Railway Magazine:

Mr EE Lucy	1897	Mr WE Baines	July 1922
Mr EG Ireland	1904	Mr WN Pellow	July 1924
Mr EG Wainwright	January 1906	Mr VJH Webb	October 1929
Mr JWA Kislingbury	January 1913	Mr RF Wilson	July 1933
Mr ETJ Evans	June 1919	Mr AG Snell	July 1939
Mr HC Rodda	May 1920	Mr WN Griffiths	May 1946


MR. E. E. LUCY.


Mr E. G. Ireland.


Mr. E. G. Wainwright.


Mr. J. W. A. Kislingbury


Mr. E. T. J. Evans


Mr. H. C. Rodda.


Mr. W. E. Baines.


Mr. W. N. Pellow.


Mr. V. J. H. Webb.


MR. R. F. WILSON.


MR. A. G. SNELL.

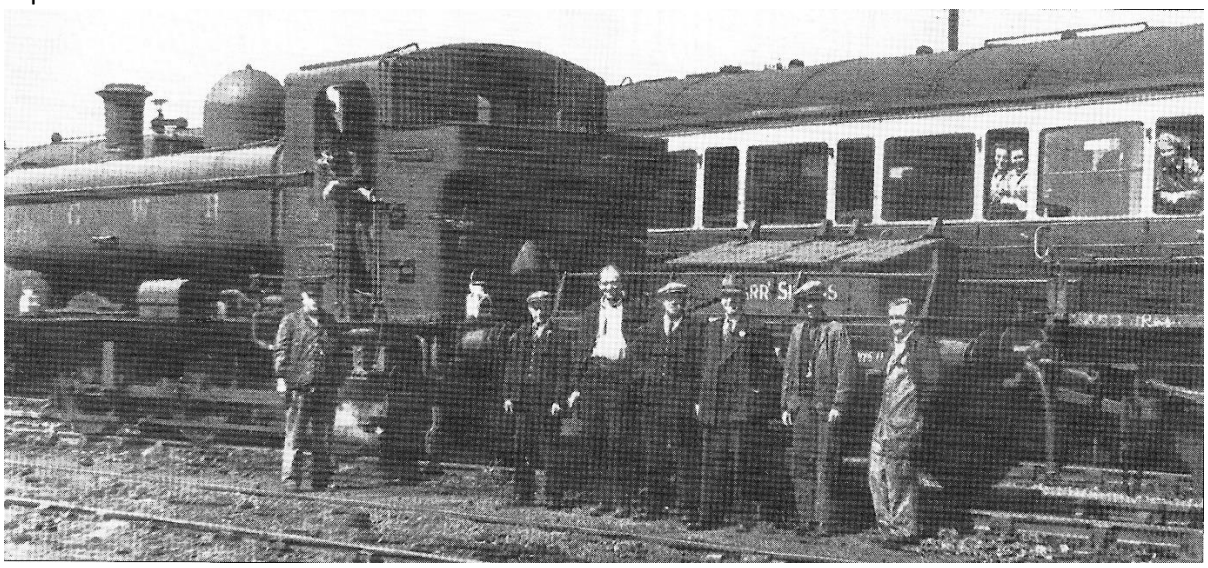
Staff employed at Tyseley Carriage Sidings

The following table gives the numbers of Carriage & Wagon Department staff allocated to Tyseley in 1924:

Carriage & Wagon Foreman	1
Carriage Cleaning Foreman	1
Clerks	2
Shop Grades (Carpenters, Glazers, Fitters, Electricians, etc.)	22
Carriage & Wagon Examiners	7
Carriage & Wagon Oilers and Greasers	7
Chargeman Carriage Cleaner	1
Carriage Cleaners	48
Total Carriage & Wagon staff (located at Tyseley)	**89**
Carriage Cleaning staff (out-stationed at Snow Hill Station)	26 (increased to 31 by 1929)
Wagon Repair staff (out-stationed at Bordesley Sidings)	19
Wagon Repair staff (out-stationed at Hockley Goods Depot)	13
Total Carriage & Wagon staff (including out-stationed staff)	**147**

The Carriage & Wagon Department staff at Tyseley were responsible for all activities associated with keeping the Company's coaching stock fully operational. The majority of the staff at Tyseley were involved in the daily task of keeping the coaches clean, but staff also carried out other duties. These included; storage and marshalling of the coaches into the required train formations, regular inspections, examinations, general maintenance and any required remedial repairs.

Prior to World War 1 the carriage & wagon staff were almost entirely male, but during the two world wars shortages of staff resulted in the recruitment of female workers (especially in the lower skilled jobs such as carriage cleaning). Thus, when built in 1908 the facilities for female staff at Tyseley was very limited, but this was resolved in 1943 by the construction of a staff canteen, which included separate female facilities.



Great Western Railway 0-6-0PT 8750 class pannier tank locomotive No.9635 and the Tyseley carriage sidings shunter's truck form the backdrop for this group of carriage sidings staff and the locomotive crew as they pose for this photograph by P Garland taken in May 1948. In the background some female carriage cleaners lean out of the door drop-light windows of a Collett designed main-line corridor coach. This is the corridor side of the third class compartments.

Pannier tank locomotive No 9635 was built for the Great Western Railway in January 1946 at Swindon Works as part of build lot 355. Another Pannier tank from the same lot, No.9600 is in the Tyseley collection. These locomotives were designed for shunting and light freight duties. The 8750 class was a development of the 57xx class Pannier tank with an improved cab, rectangular spectacles (front windows), plus sliding side shutters and hinged doors to prevent draughts. These pannier tanks had a capacity of 1,200 gallons and the bunker could hold 3 tons, 6 cwt of coal. All were fitted with Automatic Train Control (ATC). On the cab side under the number is a coloured circle with a letter. This indicates the route colour and power group classification. The 'group 20, class PJ' boiler operated at 200 lb and produced a tractive effort at 85% of 22,515 lb - Power Group C. The maximum axle weight was 17 tons, which restricted the class to Main Lines and some Branch Lines – Route Colour Blue, but in 1950 this restriction was relaxed due to their negligible hammer blow and the class was reclassified to operate over Yellow Routes.

Shunter's trucks were specially constructed to enable Shunters to quickly and safely travel within marshalling yards. They had a full length running-board and hand rail on each side to allow men to ride on them. A large tool box was provided to store spare equipment. They were usually permanently allocated to a specific location and this was painted on the side of the tool box (in this case 'CARR SIDINGS'). The shunter's truck in the photograph has angled back handrails and appears to have self-contained buffers with large (one foot, six inch diameter) round heads, which indicates it was constructed to diagram M5. A total of forty-five shunter's trucks were built to this diagram at Swindon works between 1940 and nationalisation at the end of 1948. They were fourteen feet long over the headstocks and had a relatively short, seven foot wheelbase. Those allocated to carriage sidings would have vacuum brakes to assist the shunting locomotive in braking. The vacuum pipework can be seen in the photograph, but in addition a diagonal white line was painted on the middle of the underframe to indicate this.

There is a similar Great Western Railway shunters truck (No.43958) in the Tyseley collection. The Tyseley truck was constructed at Swindon Works in 1899 to an earlier design (diagram M1) under build lot 246 (for fourteen shunter's trucks). It was allocated to the Locomotive Department at Swindon from where it was purchased by the Birmingham Railway Museum and moved to Tyseley in 1979. It has recently been restored by the volunteers at Tyseley.

Carriage Cleaning

Following the appointment in 1904 of Mr WH Waister as Chief Outdoor Superintendent in the Locomotive, Carriage and Wagon Department, carriage cleaning become the responsibility of the CME. With the exception of a few places (including Paddington and Cheltenham), this task had previously been undertaken by the Traffic Department using porters who had nothing else to do. This had been a most unsatisfactory arrangement and despite the additional cost, the company recognised the advantage of having staff dedicated to this activity and of providing covered facilities for storage of the coaches. Each Division was required to employ a Sub-Inspector specifically responsible for ensuring that standards were maintained.

This extract from the General Appendix to the Book of Rules and Regulations is dated September 1920. These instructions to Carriage Cleaners detail the proper methods to ensure that carriages present a smart appearance outwardly and that interiors shall be scrupulously clean. Contemporary accounts refer to the removal of rubbish from suburban coach compartments, comprising predominately of; abandoned newspapers, orange peel and empty cigarette packets. Quantities of lost property was also collected.

First class compartments had antimacassars (cloth head backs on the seats) which needed washing and ironing. A weekly stores coach would transport the dirty linen to the laundry at Swindon in exchange for clean and pressed items. Some specialist saloons, open excursion and main line coaches were also stored at Tyseley Carriage Sidings and these had lavatories to clean and refresh. Soap needed to be replenished, while the hand towels would be sent with the other dirty linen to the Swindon laundry. A few restaurant cars associated with the cross-country services to the West Country started from Birmingham, but cleaning and stocking these was the responsibility of the Hotel & Restaurant Department.

CARRIAGE CLEANING.

The attention of Station Masters, Inspectors, Guards, the Travelling Staff and others is specially directed to the subject of Carriage Cleaning, it being of the utmost importance that the Company's Trains, Motor Cars and Trailers shall at all times present a smart appearance outwardly and that the interiors shall be scrupulously clean.

All concerned are requested to be observant in this matter and to report any instances where a proper standard of cleanliness is not maintained and where there is cause for complaint in regard to the condition of the coaching stock.

At Stations where the Carriage Cleaning is performed by the Traffic Department, Station Masters are reminded that they are responsible for the efficient performance of this duty, and that constant personal supervision is necessary to ensure the proper standard of cleanliness being maintained.

Carriage cleaners must not walk through Restaurant Cars for the purpose of getting from one vehicle to another in the performance of their duties.

Instructions to Carriage Cleaners.—*In order to avoid any misunderstanding on the part of Carriage Cleaners as to the proper method to be adopted in cleaning Carriages, the following instructions are issued for their guidance.*

1.—INSIDES OF CARRIAGES.

The insides must first be dealt with in the following manner :—

(*a*) The rugs and cushions must be removed in every case. The rugs must be shaken and the cushions brushed outside the compartment, and if the cushions require beating, the work must be done sufficiently far away from the carriages to prevent the dust entering the compartments. The backs of each cushioned compartment must also be well brushed.

(*b*) The compartment must then be swept, particular attention being given to that portion of flooring under the seats, and to the seats under the cushions. The floor-cloth in all first class compartments must be washed with house-flannel and water; the lavatory pans, basins, metal fittings and floors must also be thoroughly cleansed and all metal fittings polished.

(*c*) The windows, lamp globes and reflectors must also be well cleaned and polished.

(*d*) When the compartment has been swept, the rug and cushions replaced, and time has been allowed for the dust to settle, the dusting of the compartment must be proceeded with, for which purpose hand brushes and dusters are provided. This duty must be thoroughly performed, attention being given to the cushions, arm-rests, window-ledges, racks, ventilators, panels and every part of the interior where dust is likely to accumulate.

2.—OUTSIDES OF CARRIAGES.

The outsides of Carriages must be cleaned with a special preparation supplied from Swindon, and no other must be used.

Any carriages which cannot be properly cleaned by the usual men after these instructions have been carried out, should be sent to the nearest Carriage Repairing Depôt where the Carriage Department Staff will attend to them; and all vehicles sent in for repair will be thoroughly cleaned before they leave the shops.

(*a*) The first duty of the men appointed to clean the outsides of carriages is to see that the doors windows, and ventilators of every compartment which is about to be cleaned are properly closed.

(*b*) After the panels and windows of the carriages have been attended to, the brass work must be cleaned and polished with pumice powder and water, or other authorised preparations, applied with a handful of waste and polished with a dry leather.

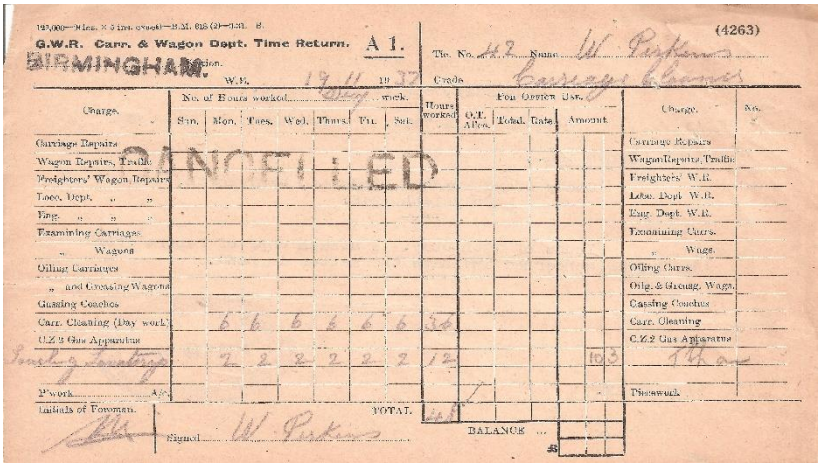
(*c*) The buffers and buffer rods must also be cleaned by using an oil strap with fine sand, or by rubbing the rods with oily waste. The screw connections must also be regularly cleaned and oiled.

Every vehicle must be cleaned before it commences its first journey in the day; and when it makes more than one trip in the day it must be swept out and dusted before it commences its subsequent trips if it be practicable to do so.

The windows and ventilators of all empty carriages standing in sidings or Carriage Sheds must be closed.

All articles belonging to the Refreshment Department found during cleaning operations must be collected and forwarded to the recognised depôt without delay. On account of the large amount of crockery broken, attention is directed to the necessity of carefully handling all such articles.

Coaches with lavatory facilities required the roof-top water tanks to be filled. On early coach stock, footplates at each end of the coach gave access to the roof from where a hose pipe would be used to fill the tanks. Later fixed filling pipes were incorporated into the coach structure to allow hoses to be connected at a lower level. The attached weekly Timesheet (dated November 1937) from a Birmingham Carriage Cleaner indicates that about a quarter of their working day was spent 'Towelling Lavatories'.



(4263)

G.W.R. Carr. & Wagon Dept. Time Return. A 1.

BIRMINGHAM.

W.E. 19 11 19 37

Tic. No. 42 Name W. Perkins

Grade Carriage Cleaner

Charge.	No. of Hours worked ... week. Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Hours worked	For Office Use. O.T. Allce.	Rdnd. Date	Amount.	Charge.	No.
Carriage Repairs												Carriage Repairs	
Wagon Repairs, Traffic												Wagon Repairs, Traffic	
Freighters' Wagon Repairs												Freighters' W.R.	
Loco. Dept. " "												Loco. Dept. W.R.	
Eng. " " "												Eng. Dept. W.R.	
Examining Carriages												Examining Carrs.	
" Wagons												" Wags.	
Oiling Carriages												Oiling Carrs.	
" and Greasing Wagons												Oilg. & Greasg. Wags.	
Greasing Coaches												Greasing Coaches	
Carr. Cleaning (Day work)		6½	6	6	6	6		36				Carr. Cleaning	
C.Z.2 Gas Apparatus												C.Z.2 Gas Apparatus	
Towelling Lavatories		2	2	2	2	2	2	12			10/3		
P'work ... A/c												Timework	
Initials of Foreman.								TOTAL					

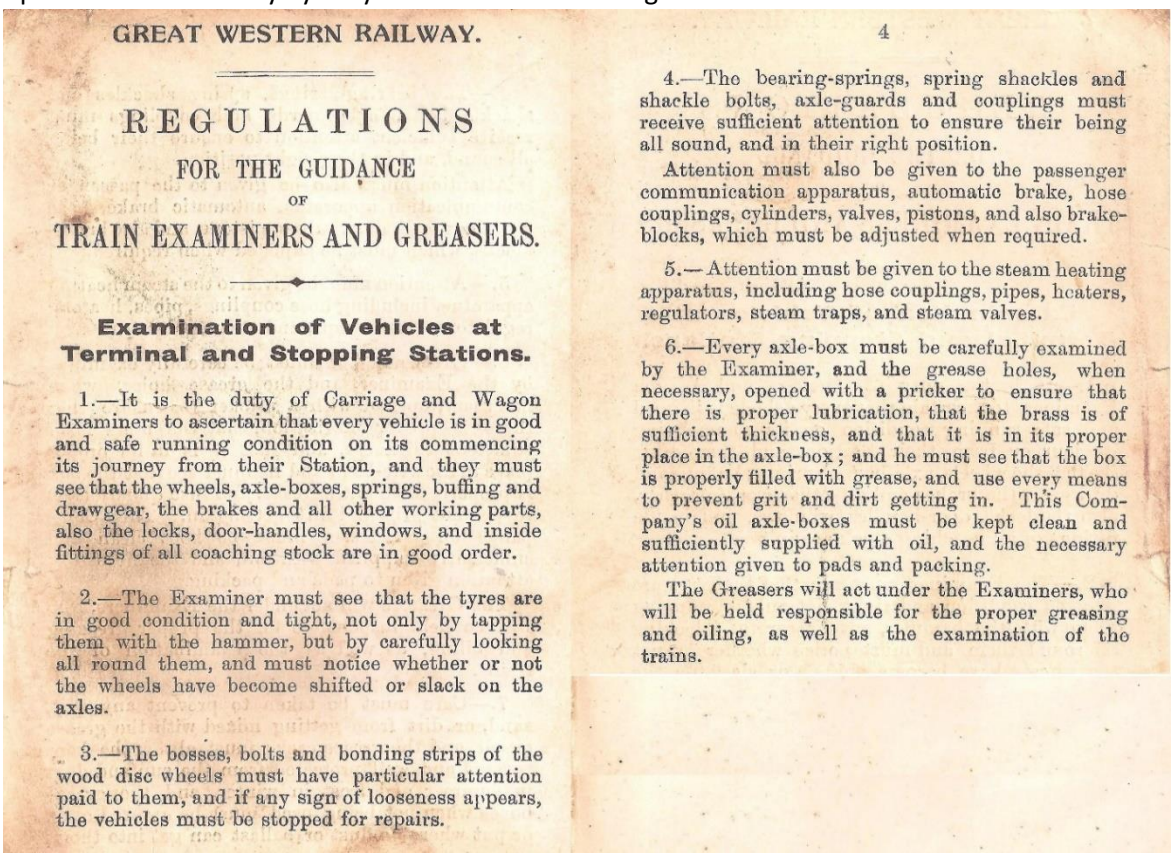
Signed W. Perkins

BALANCE ...

The staff would also ensure carriage information and warning notices were legible, replacing these where necessary. Any faded, damaged or out-of-date advertising would also be removed and replaced. When requested by the Traffic Department seat reservation tickets would be placed. Examination and replacement of the emergency fire appliances, tool cases and first aid outfits on coaching stock was identified in the General Appendix as being the specific responsibility of the carriage cleaning chargeman. The Board of Trade had criticised several railway companies during accident investigations for not having adequate procedures in place to ensure this equipment was in good condition and readily available.

Carriage Inspections and Examinations

Issued in January 1920 the attached extract gives guidance regarding the items on each coach that required examination by Tyseley's train examiners and greasers.



GREAT WESTERN RAILWAY.

REGULATIONS

FOR THE GUIDANCE

OF

TRAIN EXAMINERS AND GREASERS.

Examination of Vehicles at Terminal and Stopping Stations.

1.—It is the duty of Carriage and Wagon Examiners to ascertain that every vehicle is in good and safe running condition on its commencing its journey from their Station, and they must see that the wheels, axle-boxes, springs, buffing and drawgear, the brakes and all other working parts, also the locks, door-handles, windows, and inside fittings of all coaching stock are in good order.

2.—The Examiner must see that the tyres are in good condition and tight, not only by tapping them with the hammer, but by carefully looking all round them, and must notice whether or not the wheels have become shifted or slack on the axles.

3.—The bosses, bolts and bonding strips of the wood disc wheels must have particular attention paid to them, and if any sign of looseness appears, the vehicles must be stopped for repairs.

4

4.—The bearing-springs, spring shackles and shackle bolts, axle-guards and couplings must receive sufficient attention to ensure their being all sound, and in their right position.

Attention must also be given to the passenger communication apparatus, automatic brake, hose couplings, cylinders, valves, pistons, and also brake-blocks, which must be adjusted when required.

5.—Attention must be given to the steam heating apparatus, including hose couplings, pipes, heaters, regulators, steam traps, and steam valves.

6.—Every axle-box must be carefully examined by the Examiner, and the grease holes, when necessary, opened with a pricker to ensure that there is proper lubrication, that the brass is of sufficient thickness, and that it is in its proper place in the axle-box; and he must see that the box is properly filled with grease, and use every means to prevent grit and dirt getting in. This Company's oil axle-boxes must be kept clean and sufficiently supplied with oil, and the necessary attention given to pads and packing.

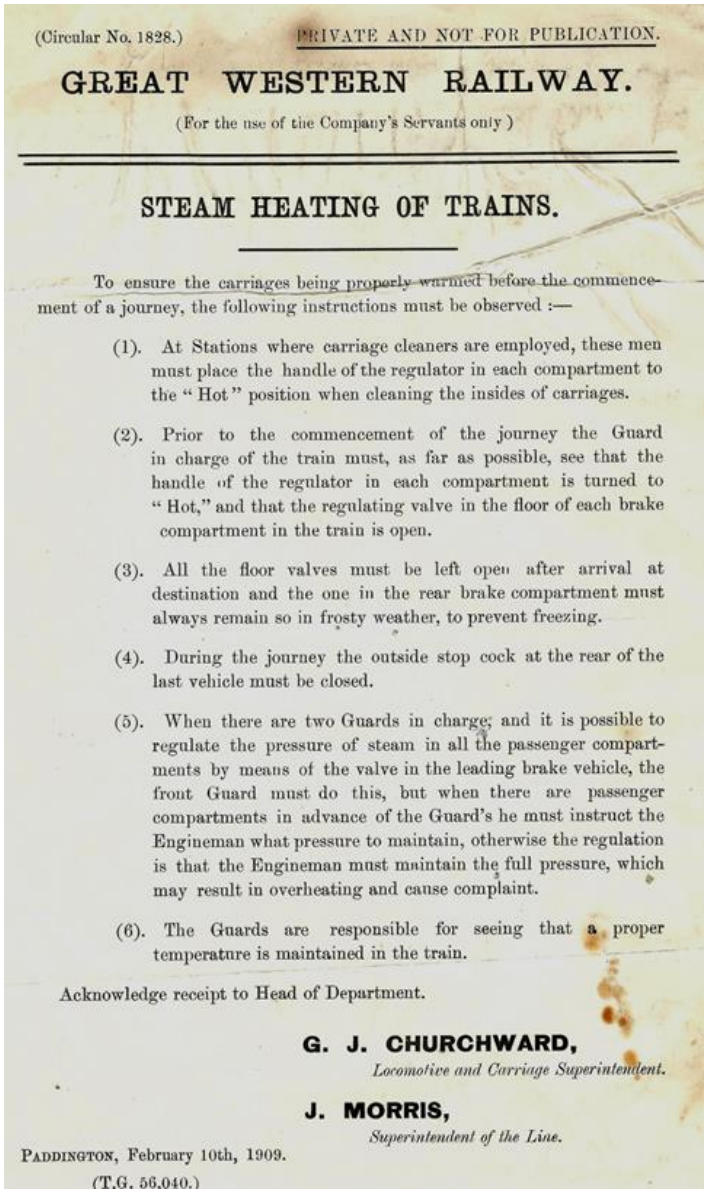
The Greasers will act under the Examiners, who will be held responsible for the proper greasing and oiling, as well as the examination of the trains.

These examinations and inspections would identify defects, which required more intrusive maintenance or remedial repairs. To resolve any minor defects various 'Shop-grade' staff were allocated to the Carriage Sidings including; fitters, carpenters, and painters. Major defects would be dealt with at the Carriage & Wagon Works at either Wolverhampton or Swindon. The type of work undertaken in the Carriage Sidings would include:

- Stripping out and repairing (or replacing) door locks
- Re-glazing damaged or broken windows
- Repairing minor damage to; woodwork, doors, and window casements
- Repairing the operating mechanism of; blinds, opening windows, gangway connections, etc
- Replacing worn brake-blocks
- Dismantling and reassembling vacuum brake and emergency communication systems
- Replacing damaged; brake and steam heating hoses, couplings, buffers, and axle boxes

Steam Heating maintenance and preparation

During the winter, railway companies had initially provided the option for individual passengers to hire 'Foot Warmers'. These would be filled with boiling water at the start of the journey. By the turn of the century, an improved heating system using radiators under the seats had been introduced. A two inch (52mm) diameter steam pipe beneath each carriage carried live steam from the locomotive's boiler. At each end of the coach a rubber hose provided a flexible connections to the adjacent coach. This was protected by a stop cock, which when operated also ventilated the hose allowing safe disconnection. Under each coach, at the lowest point, there was an automatic trap which removed condensation from the steam pipe. In each compartment a regulator allowed the Guard to control the flow of the steam to the radiators. The instructions were to maintain a temperature of 55°F (12.8°C).



(Circular No. 1828.) PRIVATE AND NOT FOR PUBLICATION.

GREAT WESTERN RAILWAY.

(For the use of the Company's Servants only.)

STEAM HEATING OF TRAINS.

To ensure the carriages being properly warmed before the commencement of a journey, the following instructions must be observed :—

(1). At Stations where carriage cleaners are employed, these men must place the handle of the regulator in each compartment to the "Hot" position when cleaning the insides of carriages.

(2). Prior to the commencement of the journey the Guard in charge of the train must, as far as possible, see that the handle of the regulator in each compartment is turned to "Hot," and that the regulating valve in the floor of each brake compartment in the train is open.

(3). All the floor valves must be left open after arrival at destination and the one in the rear brake compartment must always remain so in frosty weather, to prevent freezing.

(4). During the journey the outside stop cock at the rear of the last vehicle must be closed.

(5). When there are two Guards in charge; and it is possible to regulate the pressure of steam in all the passenger compartments by means of the valve in the leading brake vehicle, the front Guard must do this, but when there are passenger compartments in advance of the Guard's he must instruct the Engineman what pressure to maintain, otherwise the regulation is that the Engineman must maintain the full pressure, which may result in overheating and cause complaint.

(6). The Guards are responsible for seeing that a proper temperature is maintained in the train.

Acknowledge receipt to Head of Department.

G. J. CHURCHWARD,
Locomotive and Carriage Superintendent.

J. MORRIS,
Superintendent of the Line.

PADDINGTON, February 10th, 1909.

(T.G. 56.040.)

Fitters at the Carriage Sidings were responsible for draining the steam heating system when required and would repair or replace any damaged / leaking fittings or pipework. They would also test and calibrate automatic traps.

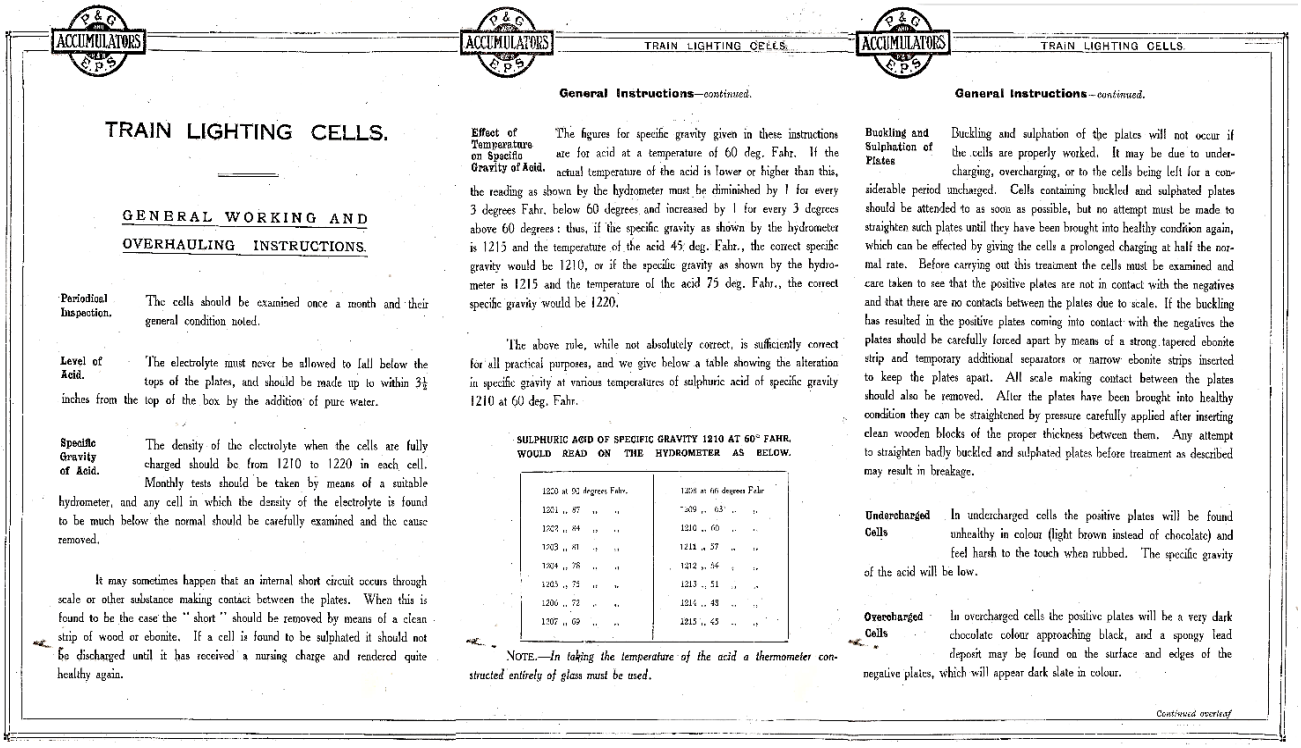
In winter, when requested by the Traffic Department, steam heating systems would be preheated by the Carriage Cleaners prior to dispatching the coaches from the carriage sidings (see circular).

Carriage Lighting inspection and maintenance

The inspection and maintenance of carriage lighting systems was another specialist area. The 'Shop-grade' staff at the carriage sidings would have also included both gas fitters and electricians as several different lighting systems were in use. An appendix describing the development of carriage lighting systems has been included at the end of this document to give a basic understanding of the various systems employed.

a) Oil-gas lighting systems required the following daily activities:
   - Visual inspection of pipework for damage
   - Confirmation of correct operation of regulator and all valves and gauges
   - Refilling of the pressurised oil-gas reservoir tanks under the coach
   - Inspection of gas mantles (and replacement when required)
   - Lighting of pilot lights
   - Cleaning of residue from all lamp globes

b) Electric lighting systems
   - Operation was tested before every journey and if necessary light bulbs replaced
   - Visual examination of: Dynamo belts - check tightness and for damage
     Connection leads between coaches
     Accumulator cells – check electrolyte level and plate condition
   - Voltage and specific gravity measurements were recommended monthly on each accumulator cell in the batteries. The cells may require; cleaning, topping-up with distilled water or sulphuric acid and re-charging. P&E/EPS were one of the main suppliers of accumulator cells and issued the following inspection and maintenance instructions:



P&E ACCUMULATORS EPS

TRAIN LIGHTING CELLS.

GENERAL WORKING AND OVERHAULING INSTRUCTIONS.

Periodical Inspection. The cells should be examined once a month and their general condition noted.

Level of Acid. The electrolyte must never be allowed to fall below the tops of the plates, and should be made up to within 3½ inches from the top of the box by the addition of pure water.

Specific Gravity of Acid. The density of the electrolyte when the cells are fully charged should be from 1210 to 1220 in each cell. Monthly tests should be taken by means of a suitable hydrometer, and any cell in which the density of the electrolyte is found to be much below the normal should be carefully examined and the cause removed.

It may sometimes happen that an internal short circuit occurs through scale or other substance making contact between the plates. When this is found to be the case the "short" should be removed by means of a clean strip of wood or ebonite. If a cell is found to be sulphated it should not be discharged until it has received a nursing charge and rendered quite healthy again.

General Instructions—*continued.*

Effect of Temperature on Specific Gravity of Acid. The figures for specific gravity given in these instructions are for acid at a temperature of 60 deg. Fahr. If the actual temperature of the acid is lower or higher than this, the reading as shown by the hydrometer must be diminished by 1 for every 3 degrees Fahr. below 60 degrees and increased by 1 for every 3 degrees above 60 degrees: thus, if the specific gravity as shown by the hydrometer is 1215 and the temperature of the acid 45 deg. Fahr., the correct specific gravity would be 1210, or if the specific gravity as shown by the hydrometer is 1215 and the temperature of the acid 75 deg. Fahr., the correct specific gravity would be 1220.

The above rule, while not absolutely correct, is sufficiently correct for all practical purposes, and we give below a table showing the alteration in specific gravity at various temperatures of sulphuric acid of specific gravity 1210 at 60 deg. Fahr.

SULPHURIC ACID OF SPECIFIC GRAVITY 1210 AT 60° FAHR. WOULD READ ON THE HYDROMETER AS BELOW.

1203 at 92 degrees Fahr.	1208 at 66 degrees Fahr.
1204 ,, 87 ,, ,,	1209 ,, 63 ,, ,,
1205 ,, 84 ,, ,,	1210 ,, 60 ,, ,,
1206 ,, 81 ,, ,,	1211 ,, 57 ,, ,,
1207 ,, 78 ,, ,,	1212 ,, 54 ,, ,,
1208 ,, 75 ,, ,,	1213 ,, 51 ,, ,,
1209 ,, 72 ,, ,,	1214 ,, 48 ,, ,,
1210 ,, 69 ,, ,,	1215 ,, 45 ,, ,,

NOTE.—*In taking the temperature of the acid a thermometer constructed entirely of glass must be used.*

General Instructions—*continued.*

Buckling and Sulphation of Plates Buckling and sulphation of the plates will not occur if the cells are properly worked. It may be due to undercharging, overcharging, or to the cells being left for a considerable period uncharged. Cells containing buckled and sulphated plates should be attended to as soon as possible, but no attempt must be made to straighten such plates until they have been brought into healthy condition again, which can be effected by giving the cells a prolonged charging at half the normal rate. Before carrying out this treatment the cells must be examined and care taken to see that the positive plates are not in contact with the negatives and that there are no contacts between the plates due to scale. If the buckling has resulted in the positive plates coming into contact with the negatives the plates should be carefully forced apart by means of a strong tapered ebonite strip and temporary additional separators or narrow ebonite strips inserted to keep the plates apart. All scale making contact between the plates should also be removed. After the plates have been brought into healthy condition they can be straightened by pressure carefully applied after inserting clean wooden blocks of the proper thickness between them. Any attempt to straighten badly buckled and sulphated plates before treatment as described may result in breakage.

Undercharged Cells In undercharged cells the positive plates will be found unhealthy in colour (light brown instead of chocolate) and feel harsh to the touch when rubbed. The specific gravity of the acid will be low.

Overcharged Cells In overcharged cells the positive plates will be a very dark chocolate colour approaching black, and a spongy lead deposit may be found on the surface and edges of the negative plates, which will appear dark slate in colour.

Continued overleaf

All repair and maintenance work to electric lighting systems was originally the responsibility of the local Carriage & Wagon staff, but in 1929 the CME Department took responsibility for all the electrical equipment and opened a central workshop (Shop No.5) at Swindon. All new carriage lighting equipment was subjected to acceptance tests here, in addition to the repair and refurbishment of dynamos and the cleaning, reconditioning and recharging of individual accumulator cells as well as complete batteries. The monthly tests on cells and topping-up remained a local responsibility.

Storage of Suburban Coach Sets

Initially local passenger services in Birmingham were catered for by trains composed of four and six wheeled short coaches. Steam Rail Motors (SRM's) supplemented by Auto-Trailer coaches, were introduced in 1908 to develop the passenger traffic on the newly opened North Warwickshire Line from Tyseley to Stratford-upon-Avon.

The gradual quadrupling of the main line between Moor Street and Olton, allowed a suburban service to be developed on this line. With new stations in the newly developed suburbs, longer passenger trains with greater capacity were introduced to Birmingham by the Great Western Railway in 1911. These four trains were each comprised of a four coach set (designated B sets) with seating for 64 x 1st class and 220 x 3rd class passengers. Each coach was fifty-seven feet long on two four-wheeled bogies and had electric lighting powered from a Leitner-Lucas system in the Brake vehicles. Designed for moving large numbers of people over relatively short journeys, they had no corridor, gangway or toilet facilities. At either end of the train was a small compartment for the guard, which contained a brake. This meant these coach sets did not need to be turned around for the return journey.

By 1913 the usage of SRMs had peaked. They had done their job and passenger numbers now outstripped their capacity. As the SRM's were relocated, four more four coach sets (designated A sets) were introduced using longer seventy foot coaches. Each of these sets had seating accommodation for 80 x 1st class and 280 x 3rd class passengers. In 1922 four more B sets arrived. These were the first to be provided with electric lighting from a Leitner-Rotax system.

With three extra sidings laid down in Tyseley carriage sidings during 1924, the main influx of coaches occurred in 1925. That year another fourteen B sets were added to the Birmingham coach stock. These were modern metal panelled coaches with bow-ends and no toplights. Half of these had fixed close-coupling arrangements, which dispensed with the buffering between coaches in an attempt to shorten the length of the train. The passenger demand was such that often two pairs of B sets were operated together as a single eight coach train at peak times.

The total number of B sets allocated to the Birmingham Division again doubled between 1927 and 1930, when another twenty-six new B sets arrived. Then finally in 1932, as the first of three five-coach (designated C sets) arrived, six of the oldest B sets were relocated.

The following lists gives the details of all the Suburban coach sets known to have been operating in Birmingham Division in early 1932:

Birmingham Division Suburban trains - 4 coach (A & B) sets

Set	Date set	Brake Third Coaches			Composite Coaches			Notes
	formed	Diagram.	Lot	Running Nos.	Diagram	Lot	Running Nos.	
No. 1	Apr 1911	D49	1188	2388 & 2389	E89	1187	6662 & 6663	Replaced 1932
No. 2	Apr 1911			2390 & 2391			6598 & 6604	Replaced 1932
No. 3	Apr 1911			2392 & 2393			6664 & 6665	Replaced 1932
No. 4	May 1911			2394 & 2395			6596 & 6597	Replaced 1932
No. 5	Nov 1913	D55	1227	1070 & 1071	E97	1226	6863 & 6864	70' (A Set)
No. 6	Nov 1913			1072 & 1973			6865 & 6866	70' (A Set)
No. 7	Nov 1913			1074 & 1075			6867 & 6868	70' (A Set)
No. 8	Nov 1913			1076 & 1077			6869 & 6870	70' (A Set)
No. 9	Feb 1922	D67	1283	3817 & 3818	E103	1282	7919 & 7920	Replaced 1932
No. 10	Feb 1922			3811 & 3812			7913e & 7914e	Replaced 1932
No. 11	Mar 1922			3813 & 3814			7915 & 7916	

No. 12	Mar 1922			3815 & 3816			7917 & 7918	
No. 13	Sep 1924	D86	1336	4652 & 4664	E124	1335	6666 & 6678	Close coupled
No. 14	Oct 1924			4653 & 4665			6667 & 6679	Close coupled
No. 15	Oct 1924			4654 & 4666			6668 & 6680	Close coupled
No. 16	Oct 1924			4655 & 4667			6669 & 6681	Close coupled
No. 17	Oct 1924			4656 & 4668			6670 & 6682	Close coupled
No. 18	Nov 1924			4657 & 4669			6671 & 6683	Close coupled
No. 19	Nov 1924			4658 & 4670			6672 & 6684	Close coupled
No. 20	Jan 1925	D91	1335	4692 & 4693	E125	1336	6721 & 6737	
No. 21	Jan 1925			4694 & 4695			6742 & 6877	
No. 22	Feb 1925			4696 & 4697			6934 & 6872	
No. 23	Mar 1925			4698 & 4699			6871 & 6905	
No. 24	Mar 1925			4700 & 4701			6933 & 6936	
No. 25	Mar 1925			4702 & 4703			6926 & 6935	
No. 26	Apr 1925			4704 & 4705			6937* & 6966	
No. 27	Jul 1927	D98	1377	4955 & 4956	E131	1376	6255 & 6256	
No. 28	Jul 1927			4957 & 4958			6258 & 6259	
No. 29	Jul 1927			4959 & 4960			6260 & 6264	
No. 30	Jul 1927			4961 & 4962			6272 & 6329	
No. 31	Jul 1927			4963 & 4964			6331 & 6344	
No. 32	Aug 1927			4965 & 4966			6345 & 6346	
No. 33	Aug 1927			4967 & 4968			6349 & 6350	
No. 34	Aug 1927			4969 & 4970			6357 & 6360	
No. 35	Sep 1927			4971 & 4972			6370* & 6362	
No. 36	Sep 1927			4973 & 4974			6364 & 6369	
No. 37	Jun 1927			4950 & 4954			6250 & 6252	
No. 38	May 1927			4945 & 4946			6231 & 6233	
No. 39	Jun 1927			4947 & 4948			6235 & 6236	
No. 40	Jun 1927			4949 & 4951			6237 & 6242	
No. 41	Jun 1927			4952 & 4953			6248 & 6249	
No. 42	Feb 1929	D98	1389	5511 & 5512	E131	1388	6634 & 6635	
No. 43	Feb 1929			5513 & 5514			6636 & 6637	
No. 44	Feb 1929			5515 & 5516			6638 & 6639	
No. 45	Sep 1930	D109	1406	5589 & 5590	E141	1405	6431 & 6432	
No. 46	Sep 1930			5591 & 5592			6433 & 6434	
No. 47	Oct 1930			5593 & 5594			6436 & 6437	
No. 48	Oct 1930			5595 & 5596			6438 & 6439	
No. 49	Oct 1930			5597 & 5598			6440 & 6441	
No. 50	Nov 1930			5599 & 5600			6442 & 6443	
No. 51	Nov 1930	D109	1450	5601 & 5602	E141	1449	6336 & 6337	
No. 52	Nov 1930			5603 & 5604			6339 & 6340	

Birmingham Division Suburban trains - 5 coach (C) sets

Set	Date set formed	Brake Third Coaches Diagram D110, lot 1460	Full Third Coaches Diagram C61, lot 1459	Composite Coach Diagram E142, lot 1458
No. 53	Feb 1932	5631 & 5632	5667 & 5668	6970
No. 54	Feb 1932	5633 & 5634	5669 & 5670	6972
No. 55	Feb 1932	5635 & 5636	5671 & 5672	6974

Birmingham Division 2 coach (D) sets – Allocated to Leamington, Stratford and Worcester route

Set	Date set formed	Brake Composite Coaches		Running Nos.
No. 1	Aug 1930	Diagram E140	lot 1445	6589 & 6590
No. 2	Aug 1930			6703 & 6704
No. 3	Aug 1930			6722 & 6723
No. 4	Sep 1930			6894 & 6895

Notes:

The words 'BIRMINGHAM DIVISION' and the Set No. was painted on the ends of the brake vehicles.

First digit in running number indicates coach type – 1, 2, 3, 4 or 5 = 3rd class coach, 6 or 7 = composite (multi-class) coach.

Letter prefix of coach diagram number indicates coach type C = All 3rd class coach, D = 3rd class with Brake, E = Composite.
* indicates running number was missing from original NRM document.
e indicates coach was fitted with 'Earls' Electric Lighting System.

Storage of Saloons

There were thirteen saloons allocated to the Birmingham Division in 1910 and it is believed that they were stored in Tyseley Carriage Sidings when not in use. Individual saloons were available for hire by groups and parties, and they would be attached to timetabled passenger trains. To hire a saloon coach, the journeys must exceed 50 miles and required a minimum number of fares depending upon the saloon type; four fares for an invalid or family saloon, seven fares for a First Class Saloon and ten fares for a Third class saloon. Travel on other railway company's lines was possible as some saloon coaches were fitted with both Westinghouse and Vacuum brakes, but such travel arrangements attracted additional charges. The details of the individual Saloons stationed at Birmingham Division in 1910 are provided in the following table:

Running Number		Description	No. Wheels & Roof type	Dimensions	Dia No.	Lot No.	Construction Date	Disposal
New	Pre1907							
9065	507	Family Carriage	4 Clerestory	31'0"x 8'0"	G42	304	1884	Converted to Parcel Van
9034	230	Family Carriage	8 Clerestory	45'6"x 8'6"	G32	924	November 1899	
9004	11	1st Class Saloon	4 Clerestory	27'0"x 8'0"	G17	543	August 1890	
9052	488	1st Class Saloon	6 Single Arc	29'0"x 7'6"	n/a	28	1870	
9202	34	Nondescript Saloon	6	31'0"x 8'0"	G27		1887	Converted to Milk & Fruit Van (O14)
9310	2504	3rd Class Saloon	6 (3 centre)	31'0"x 8'0"	G19	632	May 1892	Condemned 1932
9311	2505	3rd Class Saloon	6 (3 centre)	31'0"x 8'0"	G19	632	May 1892	Condemned 1935
9336	2530	3rd Class Saloon	6 (3 centre)	31;0"x 8'0"	G20	774	May 1896	Condemned 1933
9337	2531	3rd Class Saloon	6 (3 centre)	31'0"x 8'0"	G20	774	May 1896	Condemned 1933
9349	2543	3rd Class Saloon	6 (3 centre)	31'0"x 8'0"	G20	824	December 1896	Condemned 1933
9359	2553	3rd Class Saloon	6 (3 centre)	31'0"x 8'0"	G20	888	August 1898	Condemned 1934
9365	2597	3rd Class Saloon	8 Clerestory	46'6"x 8'6"	G18	984	December 1901	Ambulance Coach
9366	2598	3rd Class Saloon	8 Clerestory	46'6"x 8'6"	G18	984	December 1901	Ambulance Coach

All of these saloons are identified as having incandescent oil-gas lighting in 1920. The two newest saloons (Nos.9365 & 9366) were withdrawn during the First World War for conversion into Ambulance coaches. They were returned to the Great Western Railway after the war and rebuilt as nondescript saloons in 1921.

According to a January 1928 lecture on 'Great Western Passenger Train Special Traffic' the use of Saloon coaches had significantly declined and most of the 6 wheeled saloon coaches were condemned in the 1930's. Traffic remained sufficient however for a number of new eight wheeled bogie saloons to be built and one of these (W9110W) was photographed at Tyseley Carriage Sidings in the 1950's, sporting British Railways blood and custard livery. This was a Great Western Railway fifty-eight foot long, third class brake saloon to diagram G58. Ten of these saloons were completed at Swindon Works in May 1929, under build lot 1400. They were given running numbers 9101 to 9110. These saloons could seat forty-four passengers in two open saloon compartments (with inward facing bench seats) and one standard compartment. There was a full length side corridor, two lavatories and a small guard's compartment with brake. They were built for private hire and excursion work, but the

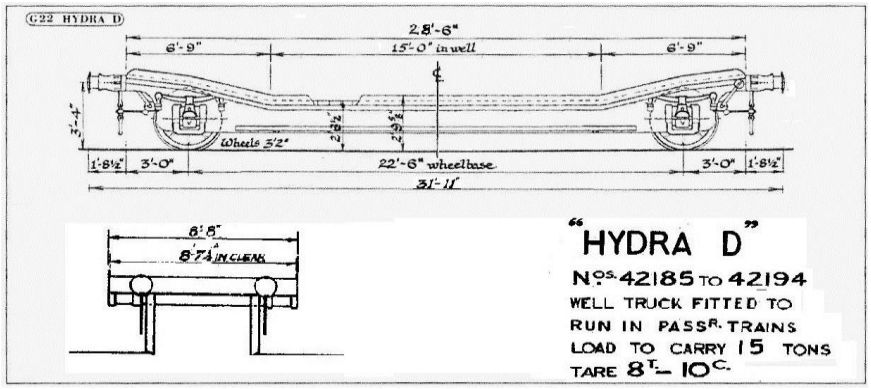
open arrangement meant that they received a new lease of life as brake thirds in the 1950s. All were condemned by 1962, with one surviving (No.9103) as part of the Westwood Television exhibition train before being preserved at the Severn Valley Railway.

Storage of other Specialist vehicles

The Carriage and Wagon Department also stored non-passenger stock, which was rated for operation in passenger trains. These were termed 'Brown Vehicles' due to the brown livery that they carried. The lettering was a yellow ochre colour. To be rated to operate in passenger trains the stock had to have; oil axle boxes, vacuum brakes (or through brake piping) and an acceptable wheelbase. The minimum wheelbase length was fifteen feet.

The types of rolling stock included:
Flat wagons for transporting carriages or road vehicles (telegraphic codes - MAYFLY & SCORPIAN)
Covered box wagons for transporting horses and prize cattle (telegraphic codes – PACO & BEETLE)
Covered wagons for transporting road vehicles (telegraphic code - PYTHON)
Covered wagons originally designed for transporting milk churns (telegraphic code - SIPHONS), but later used for express delivery of parcels and newspapers
Well wagons for transporting trams and buses (telegraphic code - HYDRA).

A well wagons rated to carry a load of 15ton (No.42194) is in the Tyseley collection. This particular wagon was built at Swindon Works in 1917 to diagram G22. The Great Western Railway diagram drawing of this wagon is attached:



Changes in the Carriage Siding during the last fifty years

Various additions to the track layout around the carriage sidings were gradually removed in the early 1970's. This included the wagon repair and cripple sidings, which had been accessed from the down through road. Also connected to the down through road was the Signal & Telegraph Department siding and its removal allowed Ground Frame No.2 at the southern approach to the carriage sidings to be taken out of use. In February 1971 a pair of sidings were re-laid on the track-bed of the wagon repair sidings and these have been used as private sidings for the waste contractor and scrap metal dealer Allen Rowland & Co. Ltd.

On 4th January 1976, a new connection was laid down at the northern approach and an additional road constructed on the mainline side of the carriage shed. This through siding was on the track-bed of the up and down goods lines which had been taken out of use on 28th January 1968. It was brought in to use on 4th April 1976 and equipped with a drive-through carriage washer. The following year the carriage shed was demolished and the sidings were reconstructed. Twelve parallel through roads were provided with 300 metre covered aprons and overhead lighting gantries to facilitate night-time working. Half of the aprons were provided with refuelling points. The twelve through roads were complimented by a two road maintenance shed, while three other sidings were retained for storage. The layout of the carriage sidings can be seen in this recent aerial image of the site:

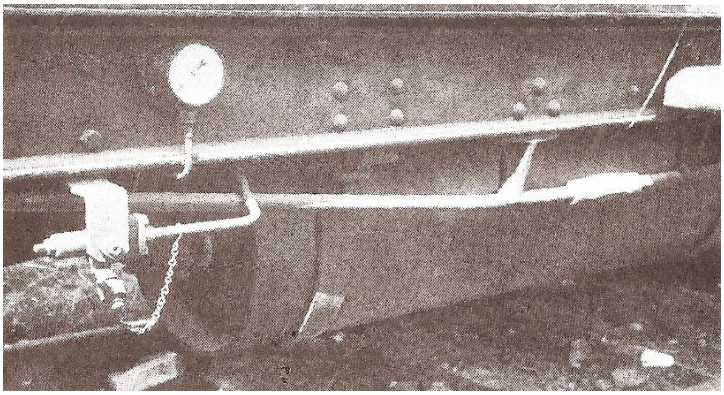
In 2007, an underframe washer was installed to complement the drive-through carriage washer. In 2010, Network Rail funded the installation of a replacement drive-through carriage wash plant on a dead-end siding next to the junction on the other side of Tyseley station. The wash plant equipment was reported as costing £1.6m. It has soft flail cleaners with three wash settings (no wash, wash detergent and wash-acid). The used water is collected and filtered for recycling. When introduced Tyseley based trains were required to be washed every 48 hours. The thirty year old wash plant was removed and the wash road became another storage siding. The carriage sidings continue to be used for storage, interior cleaning, battery charging and maintenance of the local region's diesel multiple units.

In addition, all the local rolling stock is fitted with controlled emission toilet (CET) retention tanks, so facilities are also provided to hygienically flush and rinse these. The waste water is treated before disposal. There are also facilities for filling the train tanks with clean drinking water. Sand is supplied in sacks for refilling train sand boxes. The sand can be dispensed onto the track adjacent to powered bogies to increase the adhesion of the rolling stock's wheels (to avoid delays from ice or leaves on the line).

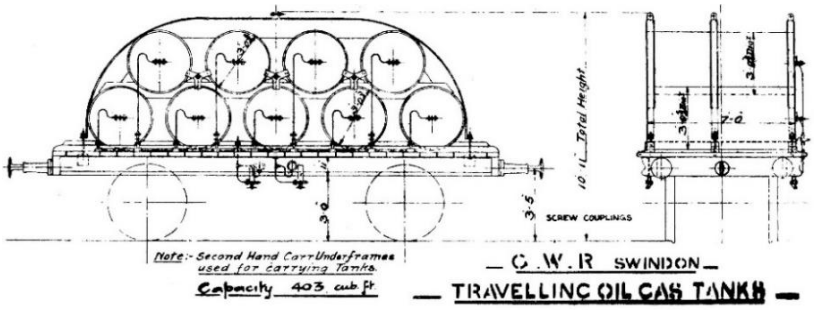
Appendix 1 – Development of Carriage Lighting on the Great Western Railway

Carriage lighting arrangements developed over time, with older systems sometimes being modified, but often remaining in service for the lifetime of the carriage. Initially individual oil lamps were employed, with each compartment's lamp being suspended beneath a chimney in the carriage roof. The individual lamps were lifted out to refill the oil reservoir and to trim the wick at the start of each journey

Flat Flame Oil-Gas Lighting



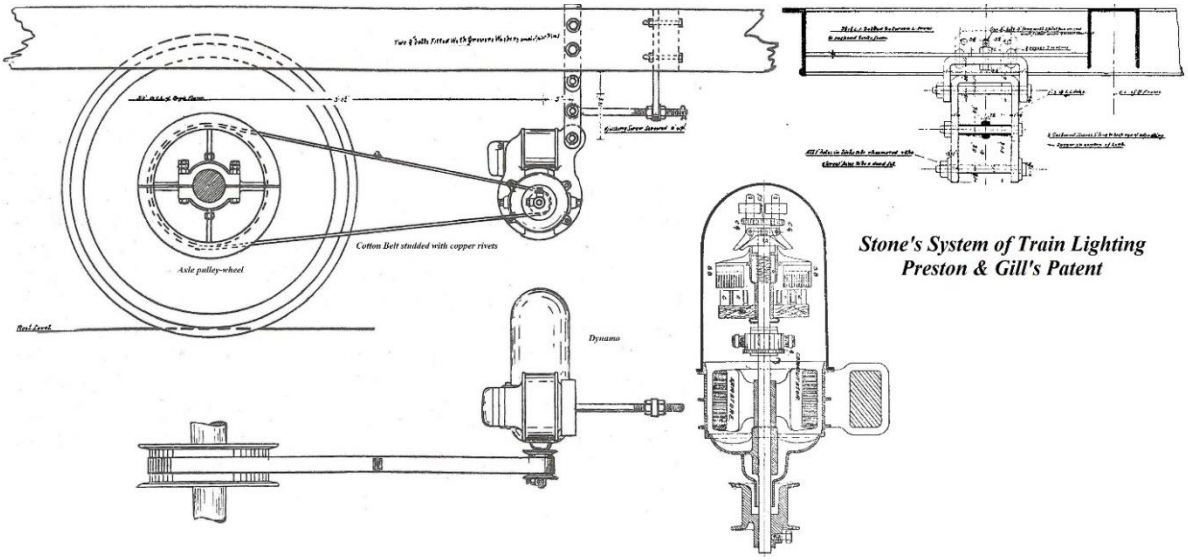
In 1884, the Great Western Railway introduced gas lighting in their new London suburban stock. The improvement in illumination was such that in 1898 the Company authorised £20,000 to replace all existing oil lamps with flat flame gas lighting. The gas lights were feed by pipework from a pressurised cylindrical storage reservoir(s) located underneath the carriage floor (see photograph). The flat flame light fittings were installed in a central clerestory running the length of the coach roof. This allowed the light fittings to be ventilated and concealed them above the compartment ceiling. It also however restricted the position of each light to the centre of the roof, which was not ideal in the recently introduced main-line side-corridor coaches. Oil-gas was used, as this could be compressed (unlike town or coal-gas) for storage in the pressurised cylinders. A gas regulator ensured the gas reaching the lamps was maintained at a constant pressure. The cylinders needed to be regularly refilled and travelling oil-gas tank wagons were regularly dispatched to the carriage depots from the oil-gas producing plants situated at; Stafford Road Locomotive Works, Wolverhampton and the Swindon Locomotive Works.



Official drawing and photograph of a Great Western Railway travelling oil-gas tank wagon (telegraphic code CORDON) to diagram DD4. The photograph was taken on 20th February 1939 at the Northwood carriage sidings (located north end of Snow Hill Station). Between March 1903 and January 1933, forty of these wagons were built on the wooden underframes of withdrawn four-wheeled carriages. The nine transverse gas receiving tanks were secured in place with iron straps. These tanks were seven foot long with a three foot diameter and held about 45 cubic feet of oil-gas each. The gas was compressed to 150 psi. Most of these wagon's underframes were renewed in the 1920's and lever brakes fitted.

Stone's System of Electric Lighting

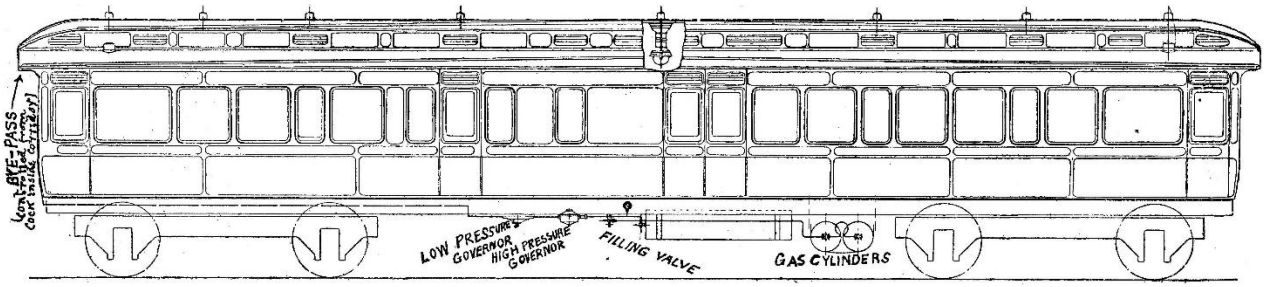
In 1890 the Great Western Railway installed its first electric lighting in three Royal Saloons. This was the 'Stone's double battery system'. A dynamo suspended beneath the carriage underframe on a hinged bracket had a belt driven from a pulley-wheel fixed to one of the rotating carriage axles. This meant that the dynamo's output was dependent upon the speed of the train with the output voltage would fluctuating during the journey. The difference between the diameters of the axle pulley-wheel and dynamo shaft meant that the dynamo rotated about three times as fast as the axle and at high speeds the resulting output voltage of the dynamo could over-charge and damage the accumulators. This was resolved by using a cotton drive belt studded with copper rivets and adjusting the tension on the belt such that it slipped on the pulley-wheel at speeds over 12mph. At low speeds the opposite problem occurred, as the dynamo output voltage would be insufficient to power the electric lights in the carriage. This was resolved by powering the carriage lights from one battery of accumulators, while a second battery of accumulators was connected to the dynamo for recharging when the train was moving. Having two sets of batteries. As these early dynamos were non-reversible having two batteries of accumulators arranged with opposite polarities meant one battery could be charged when the train travelled in one direction and the other battery charged on the return journey. An automatic switch was provided to reverse the connections when the train changed direction. The diagram below shows the dynamo arrangement:



In 1900, the Stones system of electric lighting was installed in ten new main-line coaches destined to form the Ocean Express between London and Milford in Wales. Two sets each comprising; one first class coach (diagram A6), three third class coaches (diagrams C18 & D32) and one Buffet Second Car (diagram H5). In 1904, four new Dining Cars (diagram H8) were also fitted with this system of electric lighting.

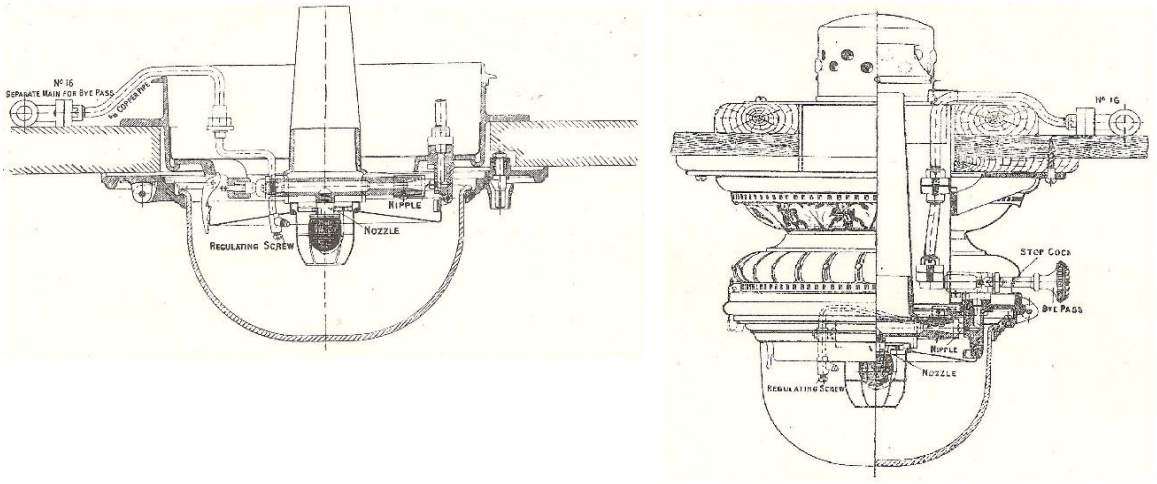
Inverted incandescent Gas Mantle Lighting

In 1886, the incandescent gas mantle was invented and this gave off a bright white light. This was further improved by inverting the mantle to shine the light downwards. In 1905, Mr Riley of the Great Western Railway's Swindon Gasworks reported a trial that he had undertaken. He confirmed that a lamp with an incandescent gas mantle would burn over almost 50% brighter (20 candles) than a conventional oil-gas light, while consuming only a third of the fuel. To address concerns about the fragile nature of the gas mantles in moving carriages, experiments were also undertaken with an installation in a converted coach.



Drawing showing the position of the principle Gas Lighting components in Director's Saloon No.249 (diagram G3). This coach was ordered on 24th August 1894 (Lot 745) and completed at Swindon Works on 22nd October 1894 with conventional oil-gas lighting. It was modified by Mr Riley for the experiments with inverted incandescent gas mantles. By 1910 this saloon was stationed at Old Oak Common and renumbered No.9045.

These experiments resulted in one mantle requiring replacement after 4,464 route miles and a total of seven mantles requiring replacement after 15,624 miles. Although existing oil-gas lighting installations could be adapted relatively cheaply, the Great Western Railway took the opportunity to fit new burners with a permanently burning pilot (or flash) light. This pilot light was fed from a second small bore pipe to each gas fitting. It was a wasteful arrangement, but allowed an additional valve to be installed in the main gas pipework and this valve provided a single control point for all the lighting in a carriage.



The drawings show; (1) a conventional Pintsch oil-gas light fitting adapted to allow an incandescent gas mantle to be fitted and (2) a new Pintsch oil-gas light with an incandescent mantle and a separate pilot light supply.

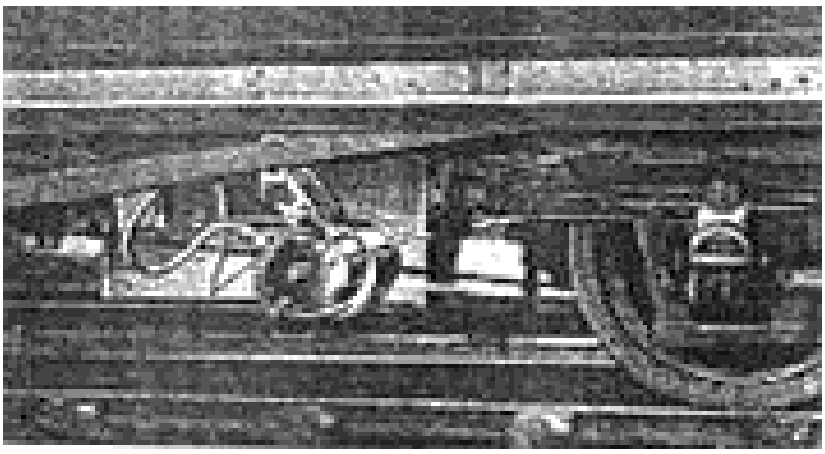
Although the oil-gas reservoirs under the coaches still needed regular refilling and the individual incandescent gas mantles needed checking after every journey, the main concern with all types of gas lighting was the risk of fire. The first recorded incident involving a fire caused by gas escaping from a carriage lighting system occurred on 2nd September 1898. A Midland Railway express was derailed at Wellingborough station by a platform trolley on the track. The report stated: 'The under-framework of the second carriage from the tender took fire, apparently in consequence of an escape of gas from cylinders under the carriage.' All five passenger fatalities were from this third class brake coach, which was reported as being damaged beyond repair. More incidents involving fires from gas lighting equipment continued to occur, with one of the worst happening at Hawes Junction on the morning of Christmas Eve 1910. A Midland Railway express collided with two light engines due to an error by a signalman and pressurised gas cylinders under at least one coach were perforated in the collision. Two coaches were burn out in the ensuing fire which subsequently spread to another four carriages. Twelve passengers lost their lives, with one passenger trapped by debris being overcome by the smoke and burnt alive.

Leitner-Lucas System of Electric Lighting

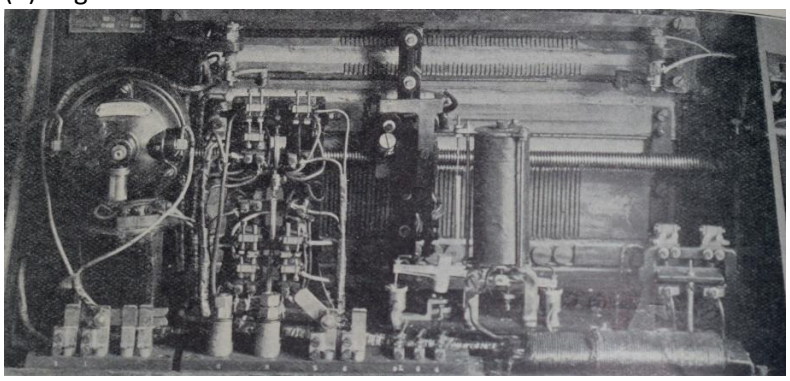
The fire risk turned the public's attitude against gas lighting and in 1909 the Great Western Railway decided to standardise on electric lighting for all their new carriage construction and choose the Leitner-Lucas system. This decision was helped by the development in 1906 of the tungsten filament lamp. These were introduced to Britain by GEC under the Osram brand. This produced a superior light using only a third of the electrical power required by the original Swan/Edison light bulbs. The knock on effect was a considerable reduction in the cost of the required electrical equipment. The required capacity of the accumulators was reduced and one dynamo (the most expensive item) could now be used to supply power to up to four coaches. This was called the 'brake vehicle method', as a dynamo was fitted (with a single battery of accumulators) under the brake coach in the train and jumpers between the carriages connected to the lighting wiring in the adjacent coaches.

The Leitner-Lucas system encompassed the latest advances in electrical engineering, which meant the uniformity and polarity of the output voltage could be maintained from the dynamo irrespective of the train's speed or the direction of travel. This was achieved by introducing a second smaller coil on the same shaft as the main dynamo to produce a current opposing that in the main dynamo's magnets. This resulted in the output voltage remained just above 20V when the train was travelling between 16mph and 80mph and this was sufficient to charge the accumulators. Below 16mph an automatic switch disconnected the dynamo from the circuit to prevent power being drained from the accumulators and wasted. A regulator was provided to control the voltage seen at the carriage lights ($20\ ^{+}/_{-}2\frac{1}{2}$Volts). The three photographs below show the three main components of an early Lucas-Leitner system:

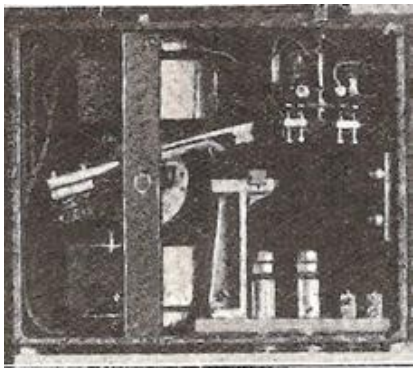
(1) Variable reversible Dynamo (attached by a belt to the axle pulley wheel):



(2) Regulator:

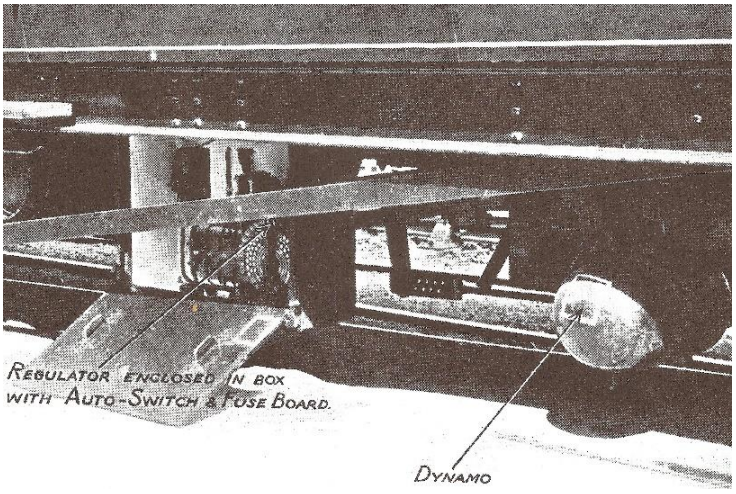


(3) Automatic Switch:

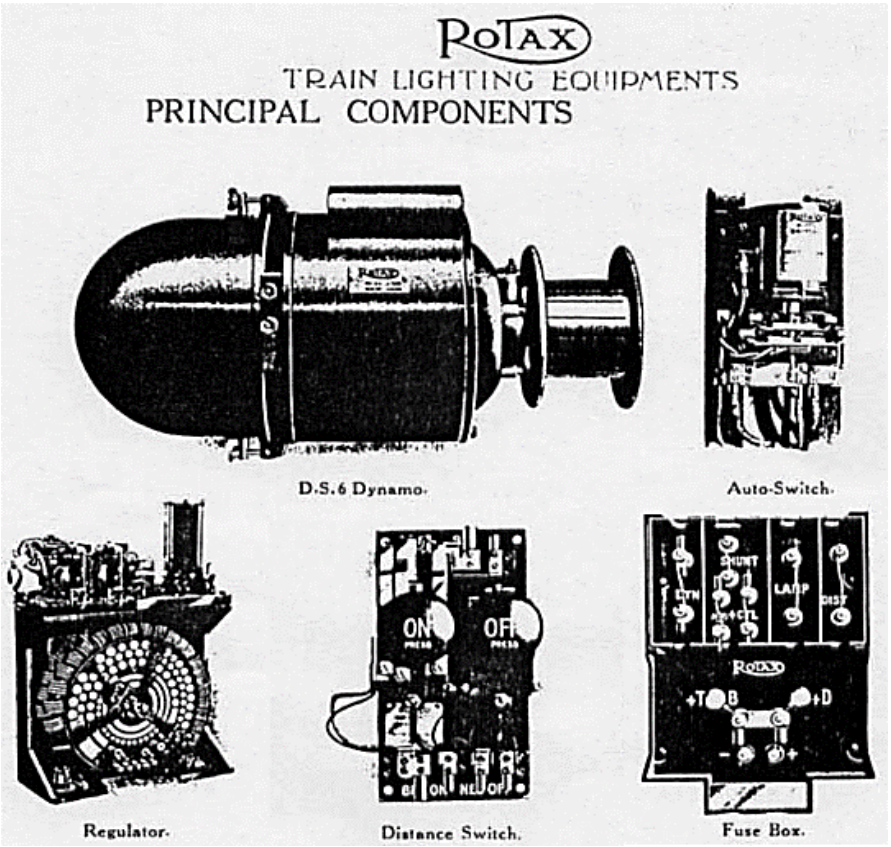


Leitner-Rotax System of Electric Lighting

When the hard-setting, mouldable insulating material 'bakelite' became available in the early 1920's, the cost of electrical equipment reduced. The brake vehicle lighting method could be discontinued and every coach economicly equiped with its own; Leitner-Rotax dynamo, batteries and the associated control equipment. The name Rotax came from a subsidury of Lucas and was used to differentiate from the earlier Leitner equipment.



The photogragh shows a typical installation under a Great Western Railway coach in 1924.



A contemporary advert shows the use of moulded resin insulating material in the electrical components.

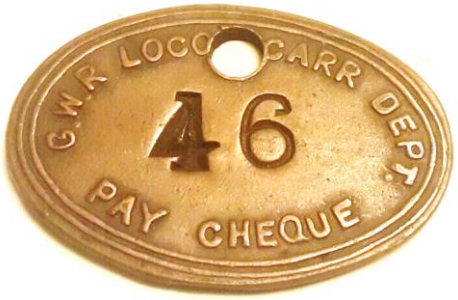
The Leitner-Rotax system continued to be installed on all new coaches built at Swindon Works, until British Railways introduced their own standard.

The table below illustrates the changes in train lighting methods that occurred on Great Western Railway passenger stock. It excludes the 'brown vehicles' (eg horse boxes, etc.), some of which had lighting. The figures are somewhat distorted by the addition of a large number of coaches with a range of lighting arrangements from the various absorbed railways at the Grouping in 1921.

Lighting in Great Western Railway Passenger Coach Stock							
	Oil	**0il-Gas**		**Gas**	**Electric**		
Year		Flat flame	Incandescent	Acetylene	Stone's	Leitner	Other
1910	58	3664	1526	0	18	257	1 (B&S)
1915	15	1265	3689	0	15	704	1 (BTH)
1920	0	416	4451	0	21	687	0
1925	4	138	4925	12	318	1399	2 (Earls)

The remaining oil, flat flame oil-gas and acetylene systems had all disappeared by 1930, but many coaches with incandescent oil-gas lighting remained, with some retaining their oil-gas lighting until the coaches were withdrawn in the 1950's. The Stone's electric lighting system had by now introduced a reversible dynamo and this was widely used by several railway companies, but on the Great Western Railway these non-standard systems were gradually replaced with the Leitner-Rotax equipment The removed equipment was reused for lighting in 'brown vehicles'. The two coaches with the 'Earls' electric lighting system were diagram E103 composite suburban coaches (Nos.7913 and 7914). These were both from Birmingham Division B Set No.10, which was built at Swindon Works in March 1922, as part of lot 1282.

Robert Ferris
Volunteer Archivist for Vintage Trains
January 2023



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Information from both John Lewis and David Burton has been used to write this article.