MINISTRY OF TRANSPORT

RAILWAY ACCIDENTS

REPORT ON THE DERAILMENT which occurred on 1st July 1950 at EDGWARE ROAD STATION on the METROPOLITAN CIRCLE LINE LONDON TRANSPORT RAILWAYS

LONDON : HIS MAJESTY'S STATIONERY OFFICE

1951

PRICE 1*s.* 6*d.* NET

LONDON TRANSPORT RAILWAYS

MINISTRY OF TRANSPORT,
Berkeley Square House,
London, W.1.
15th November, 1950.

SIR,

I have the honour to report for the information of the Minister of Transport, in accordance with the Order of the 4th July, 1950, the result of my Inquiry into the derailment of an electric passenger train at 9.46 a.m. on Saturday, 1st July, at Edgware Road station, on the Metropolitan Circle line of the London Transport Executive. Of the 30 passengers in the train, only one was slightly injured.

The train concerned was No. 53 from Putney to Edgware Road. Just before it emerged from the tunnel at about 30 m.p.h., the aspect of the Home signal close ahead changed from Green to Red, and the trip valve operated and applied the brakes. The outermost facing points were reversed under the leading car, the front bogie of which took the crossover road to the Up loop line while the trailing bogie, and the remaining cars, travelled along the straight track to the Up main line. The train stopped in 251 feet with the leading car astride both tracks and fouling the Down loop line, and with the rear bogie derailed. The derailed car demolished one stanchion of the underbridge supporting the passenger concourse, and buckled another. The damage to the car was not serious and was confined mainly to the body ; this tilted off its bogies but was supported by the second stanchion.

There was no arcing, and the current on the affected lines was cut off without delay. A negative rail was crippled and there was slight damage to the permanent way and to the signalling equipment.

The train, which consisted of five cars, was 251 feet 6 inches long and weighed 147 tons. It was equipped with the standard Westinghouse air pressure brake.

Dislocation of traffic was slight and only two trains were cancelled. Eastbound trains from Hammersmith and Putney were terminated at Westbourne Park and High Street Kensington, respectively, and "outer rail" Circle services (trains running clockwise) were reversed at the latter station ; some westbound trains from the City were terminated at Edgware Road, but a normal Circle service on the "inner rail" was maintained. Special 'buses were run to carry passengers between Westbourne Park and High Street Kensington, and Edgware Road. Normal working over the Up Main line was resumed at 8 p.m. the same evening and over the Up loop on Sunday morning, after a complete and thorough test of the signalling equipment.

DESCRIPTION

1. The Hammersmith and the Circle lines from Paddington lie in tunnel and join each other at Praed Street Junction, about 300 yards west of Edgware Road station.

The attached diagram shows the layout of the station and of the junction, also the position of the relevant signals and track circuits. Signals are of the London Transport standard two aspect type with train stops, and repeaters are provided where necessary. The signals and the points are operated electrically from a frame of 36 miniature levers in the signal cabin at Edgware Road. The Home signal, No. 33, has a 3-way route indicator showing the numerals 1, 2 or 3, with the green aspect only, for the Up main, Up loop or Down loop respectively. Sighting distances are shown on the plan and it will be noted that signal 35 has a repeater under signal 36 B, as the view of the former is restricted by curvature. When repeating signals are under stop signals, they show no aspect when the stop signal is at Red.

Indications are given, above the levers in the frame, of the aspects of signals and the position of points, and there is a "normally dark" illuminated diagram. Lever 23, which operates the outermost facing points, is locked mechanically in the normal and reversed positions by the reversal of lever 33 ; it is also locked normal and reverse by the occupation of track circuit MM which commences 5 feet 9 inches in rear of the switches. The switches themselves have no independent track lock as is provided in some London Transport installations.

The levers of signals 33 and 36A have to be operated for each train movement, but signals 34 and 35 work automatically when their levers are reversed. The lever of signal 33 is approach backlocked ; at the time of the accident the locking was operated by track circuit L L, which starts from a point 105 feet in rear of the signal.

When the accident occurred there was a permanent 10 m.p.h. restriction over Praed Street Junction. There is also an instruction that all trains must stop at Edgware Road.

EVIDENCE

2. The following entries concerning eastbound trains were made in the Edgware Road signal cabin report sheets for Saturday, 1st July. They are quoted so as to make the sequence of events clear, but some of the times recorded are not entirely accurate.

Eastbound Line (Outer Rail)

Set No.	*Destination*	*Time Train due*	*Time arr.*	*Time dep.*	
90	Whitechapel	9.41 a.m.	9.40 a.m.	9.41 a.m.	from Hammersmith
167	Circle	9.44½ a.m.	9.43½ a.m.	9.44 a.m.	
53	Edgware Road	9.47 a.m.			Derailed at 9.46 a.m.

3. Motorman R. Hooper, of Parsons Green Depot, who was driving train 53, said that after leaving Paddington (Praed Street) he saw signal R 36B at Yellow and 36B at Red. He applied the brake but before the train had quite stopped 36B turned to Green. He therefore put the controller to full series, where it remained as he traversed the junction. He had not noticed the aspect of signal R 35 when 36B changed to Green, but he saw signals 35, 34 and 33 showing green aspects, and the route indicator on 33 was showing an illuminated numeral 2. As he approached signal 33 he made a normal and slight brake application, but when he was about half a car length away it changed to Red, and the route indicator went out. Before he had time to make a further brake application, he passed the signal at, he thought, about 20 m.p.h., and the trip valve was opened by the train stop.

Hooper accompanied me on some tests which I conducted after the accident, as a result of which he agreed that he may have underestimated the distance of the train from the signal when its aspect changed, and that this may have occurred just before the train occupied track circuit L L.

4. Guard C. G. Russell said that approaching the junction signal 36B, the train was checked and he thought its speed was reduced from about 20 m.p.h. to 15 m.p.h. It then accelerated and, as it neared Edgware Road, he again felt the brakes ; soon afterwards there was an emergency application, and the train stopped rapidly in a series of "bumps". As he walked forward along the train to investigate the cause, the lights went out due to the current being removed. He then went to the station and made arrangements to detrain passengers.

5. Station Inspector J. J. Turner had been at Edgware Road for seven months. He said that he had no difficulty in qualifying to work the frame in the signal cabin, and that he relieved the signalman five days every week from about 9.30 a.m. to 10.30 a.m., while the latter was having his breakfast. On the day of the accident he took charge just after 9.40 a.m. The signalman told him the position of trains and, as they were talking a westbound Circle train left from platform 4 at 9.41 a.m. Thereafter the Inspector dealt with three further westbound trains.

Inspector Turner said that on the "outer rail" he passed Hammersmith to Whitechapel train 90 through platform 1 and it was followed by Circle train 167 which was received on the same platform. He cancelled the description of train 167 when it was on track circuit F F, and immediately afterwards a terminating train from Putney (No. 53) was described. When train 167 had passed track circuit F F, he put lever 36 to normal and reversed it again, so that the signal would clear for train 53 as soon as track circuit occupation permitted. He said, however, that he did not set up the route for the latter train to enter platform 2, on which he knew it was to be received, because he was engaged with westbound trains. He watched train 53 clear the junction, and then he cancelled its description and put back lever 36 to normal. Shortly afterwards he heard the noise of a train being tripped and of a crash, but he did not know which train was concerned. He thought that he may have made a remark such as "is he tripped ?", followed by another to the effect that fortunately he was not responsible. He looked at the frame and saw that lever 23 was normal and 33 was reversed.

Inspector Turner had, at the L.T.E. Inquiry, stated categorically that he had not touched signal lever 33 nor points lever 23 after the arrival of Circle train 167. He told me, however, that although he could not remember having moved them, he may subconsciously have done so : he said also that he had to reverse lever 22 for shunting a westbound train into the siding, and that he may possibly have pulled lever 23 by mistake. He further stated that he had, on reflection, concluded that a westbound Hammersmith train had traversed the junction before eastbound Circle train 167, and not after it as he had stated at the earlier Inquiry.

6. Signalman W. E. Payne had been a relief signalman at Baker Street for one year and had qualified for working the signal cabin at Edgware Road. On the 1st July he was relieving a regular signalman at that station, and he came on duty at 6.0 a.m. Payne said that Inspector Turner came into the signal box at about 9.35 a.m., and was told the position of traffic ; there was no other conversation. The last movement he made before handing over to the Inspector was to start the westbound Circle train mentioned earlier.

He saw eastbound Circle train 167 arrive in platform 1, and was certain that he saw the Inspector put back signal levers 36 and 33 after it ; he also noticed that as the train was passing the cabin a terminating train from Putney (No. 53) was described, and he saw the Inspector operate lever 36 for it. He could not see whether he had operated levers 23 and 33 as by that time he was eating his breakfast, and the Inspector, who was standing at the frame, obscured his view of the levers : he was aware, however, that other lever movements had been made as he heard them and saw the movement of the Inspector's arms.

Payne then heard the noise of escaping air and a crash. He realised at once that train 53 had been tripped and he heard the Inspector exclaim "I have tripped a train" or "Have I tripped a train", or words to that effect. Payne immediately went to the frame and saw that levers 23 and 36 were normal and 33 was reversed, and he put safety collars on them. He said the indicator above lever 33 was showing Red but he did not observe until a little later that the indicator showed that points 23 were normal. He also noticed that the description of train 53 had been cancelled and another eastbound Circle train had been described.

7. Signal Linesman F. Askew said that he returned to Edgware Road from Paddington on a Circle train at 9.37 a.m. He went straight to the cabin and met Inspector Turner who was then entering it. The Inspector questioned him about a reported failure of the lamp of the repeater of signal 35, which he had just examined and found in order. Askew said the Inspector then took over the frame from Signalman Payne. Apart from the usual conversation about the position of trains, there was no other talking. Askew was standing near the signalman and did not notice any lever movements. He suddenly heard a hissing noise and someone, he thought the Inspector, exclaimed "I have back tripped him".

Askew immediately ran down to see what had occurred and met the motorman of the derailed train who said that signal 33 "went back in his face". He then returned to the cabin and examined the frame, and found the levers to be in the positions stated by Signalman Payne ; he also saw that the indicators showed that signals 33 and 36 were at Red and that points 23 were Normal. He asked the Inspector what had happened, and he replied that all he had done was to "restroke" lever 36. Askew said that, during the previous week when he had worked at Edgware Road, he had no occasion to give any backlock releases, and he had certainly not done so that morning.

8. Mr. A. Watkins, Station Master, Edgware Road, was in the booking office when he heard the noise of the accident. He immediately went down to the platform and after arranging for the current to be cut off, he assisted in the detrainment of the passengers ; then, about five minutes after the accident had occurred, he went to the signal cabin. He saw the points lever 23 was normal and signal lever 33 reversed, but he did not notice the point or signal indications. He did not enquire about the cause of the accident and said that neither Station Inspector Turner, who was at the frame, nor relief signalman Payne, volunteered any information. Mr. Watkins stated that eastbound Circle train 167 was standing at platform 1 when he first arrived there.

9. Mr. H. Chanter, Assistant to the Permanent Way Engineer, London Transport Executive, said that he arrived at Edgware Road at about 10.10 a.m., 25 minutes after the accident, and found that points 23 were set correctly for platform 1, with the right hand switch hard against the stock rail. After the leading car was rerailed, and the train drawn away, he made a careful examination of the track. He found no defect in the switches and no repairs to them were required. The only mark on them was a slight burr on the left-hand switch, which did not, however, prevent it from closing properly ; it was not the type of mark made by a wheel riding over the switch, but it suggested that the switch had tried to move under load. The first marks of derailment were found near signal 31.

10. Mr. R. Dell, Signal Engineer, London Transport Executive, reported that after the accident the mechanical locking and the electrical controls on points and signals were thoroughly tested and found in order.

There was also satisfactory evidence that the braking equipment of train 53 was carefully examined and tested after the accident, and that it was in proper working condition.

Conclusions

11. Consideration of the evidence and other facts, leads me to accept the statement of Motorman Hooper that signals 33, 34 and 35 were at Green when he first saw them, and that signal 33 changed to Red as he approached it. Even if he was travelling at a normal speed, it was impossible for him to stop short of points 23, and no responsibility for the accident therefore rests with him.

It should be recorded, however, that having regard to the distance the train travelled after being "tripped", Hooper must have approached signal 33 at about 30 m.p.h. and to attain this speed he must have traversed Praed Street Junction at well over the authorised 10 m.p.h. This aspect of the case has been discussed with the Officers of the London Transport Executive, who explained to me the method employed for checking the speed of trains over restrictions, and I was assured that it was fully used.

12. The points, the locking and the electrical controls were all working correctly, and so the change in the aspect of signal 33 and the reversal of points 23 under the leading car must have been due to some action by Inspector Turner, who was working the frame. I can only assume that after Circle train 167 had arrived in platform 1, he set up the route for train 53 to enter platform 2, its proper line. Signalman Payne had definitely seen the lever of signal 33 put back to normal after train 167, and Inspector Turner must have again reversed it ; otherwise the signal could not have been at Green (with the numeral 2 on the route indicator) when Motorman Hooper first saw it.

It will be recalled that Inspector Turner had cancelled the description of train 53 as it passed the junction ; having thus deprived himself prematurely of this reminder of its approach, he observed that another Circle train for platform 1 was described, while points 23 were still set to receive train 53 into platform 2. I have little doubt that he thought that train 53 had arrived there, though he could have verified the true situation from the track circuit diagram, and that he consequently restored lever 33 to normal ; he then put back point lever 23, intending to direct the following Circle train into platform 1, at the very moment that train 53 was, in fact, reaching the points and before it occupied track circuit M M. His next movement in the natural course would be to reverse lever 33 again to clear the signal and he evidently did so, for the lever was found in that position after the accident.

The points, being electrically worked, did not respond to the lever movement as rapidly as electro-pneumatic points ; consequently the switches did not begin to move until the front bogie of the leading car was on them, and it restrained them and went on to the line leading to platform 2. As soon as the pressure was removed, the switches swung to the normal position, and the rear bogie, and the remaining cars, travelled towards platform 1.

The speed of the train and the time of movement of the switches are consistent with this hypothesis, but it is tenable only if the lever of signal 33 was restored to normal before the train occupied track circuit L L ; otherwise it would have been backlocked. As I have mentioned, Motorman Hooper subsequently agreed that the signal may have changed from Green to Red before track circuit L L was occupied.

Inspector Turner must, therefore, be held entirely responsible for this accident. I think that his cancellation of train descriptions was premature and contributed in no small way to his subsequent actions. The evidence which he gave at my Inquiry was not of great assistance and it differed substantially from that given at the Executive's Inquiry. Inspector Turner is 35 years of age and had been a Station Inspector for two years ; his record, hitherto, had been clear and he was commended on one occasion for prompt action.

Remarks

13. This accident, the results of which might well have been more serious, was brought about by a bad lapse on the part of the man in control of the signal frame. It was possible only because of the short length of the track circuit which applied the approach backlock control to the Home signal ; this was remedied, with commendable promptness, on the evening after the accident, by extending the control to the two preceding track circuits. A general review has disclosed that there are a few other places on the Executive's system where similar action seems desirable.

14. The train travelled 251 feet after it was "tripped" at the Home signal, and it was finally stopped by the collision of the leading car with the bridge stanchions. If the points had moved just before the front bogie of that car reached them, instead of between the bogies, the whole train would have travelled towards platform 1, and might then have collided with the Circle train which was standing there.

The overlap track circuit extends for 232 feet beyond the Home signal ; this includes the usual margin of 30%, and is equivalent to a speed of about 23 m.p.h. approaching the signal. In this case the train was travelling at about 30 m.p.h. for which an overlap, again including the same margin, of some 390 feet would be needed. I understand that as far as Edgware Road station is concerned, this matter is receiving attention, but it would appear that consideration should also be given to the general question of the relationship between the actual speed at which the trains approach the signals, and the length of the overlaps, as now provided.

I have the honour to be,

Sir,

Your obedient Servant,

D. McMULLEN,

Colonel.

The Secretary,
Ministry of Transport.

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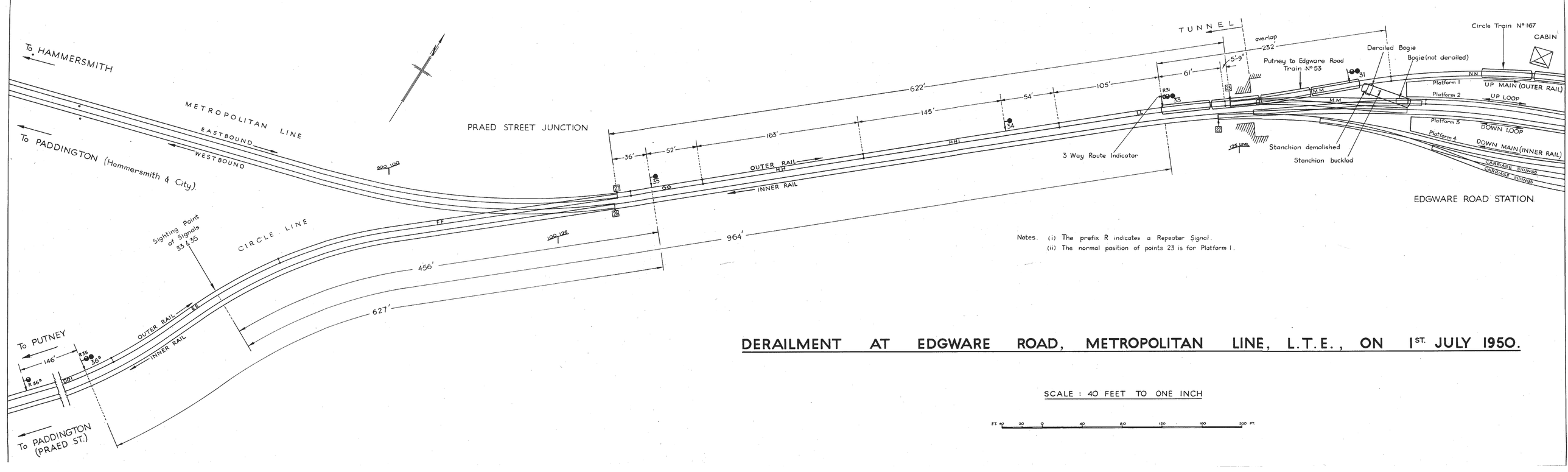

Notes. (i) The prefix R indicates a Repeater Signal.
(ii) The normal position of points 23 is for Platform 1.

DERAILMENT AT EDGWARE ROAD, METROPOLITAN LINE, L.T.E., ON 1ST. JULY 1950.

SCALE : 40 FEET TO ONE INCH

FT. 40 20 0 40 80 120 160 200 FT.