



MINISTRY OF TRANSPORT

RAILWAY ACCIDENTS

REPORT ON THE COLLISION

which occurred on

24th July, 1949, at

LONDON BRIDGE

in the

SOUTHERN REGION

BRITISH RAILWAYS

LONDON : HIS MAJESTY'S STATIONERY OFFICE

1950

THREEPENCE NET

SOUTHERN REGION
BRITISH RAILWAYS

MINISTRY OF TRANSPORT,
Berkeley Square House,
London, W.1.
14th October, 1949.

SIR,

I have the honour to report for the information of the Minister of Transport in accordance with the Order dated 29th July, the result of my Inquiry into the cause of the accident which occurred at approximately 10.42 a.m. on Sunday, 24th July, 1949, at London Bridge Station in the Southern Region, British Railways.

A light engine, which had been authorised to leave No. 10 low level platform on the Down Through line, ran past a signal at Danger and collided almost head on at a combined speed of about 15 m.p.h. with the 9.48 a.m. electric train from Tattenham Corner to Charing Cross which was passing from the Up Through line of the Central Section to No. 1 Up line of the Eastern Section. The train was carrying between 80 and 100 passengers, of whom 11 complained of injury or shock, and 3 were taken to Guys Hospital. The motorman of the passenger train and the driver and fireman of the light engine were also removed to hospital; the passengers and the motorman were not detained and the driver and fireman were discharged after three days.

The collision took place on a viaduct. First aid to the injured was rendered by a doctor who was a passenger in the Tattenham train and also by railway staff from London Bridge Station. Ambulances were called with commendable promptitude, two arriving in the street below within fifteen minutes; however, in view of the difficulty in moving the injured to the ambulances, an empty electric train was run to the site on an adjacent line, and the passengers and injured were loaded into it and taken to London Bridge Station, where the ambulances, which had been redirected, were waiting. The accident caused considerable dislocation to traffic; 44 trains were cancelled and the working of 42 others was altered.

The passenger train was a four coach all steel close-coupled suburban set with a motor coach in front and in rear and two trailing coaches in the centre; it was driven from the left hand side. Brake power was 59% of the total weight of 142 tons; the brake blocks on the driving bogies were of cast iron and of non-ferrous material on all other wheels. The light engine, which was travelling chimney first, was a "C" class 0-6-0 right hand drive freight engine with a six-wheeled tender; the vacuum brake operated on all wheels and its power was 26% of the total weight of 82 tons.

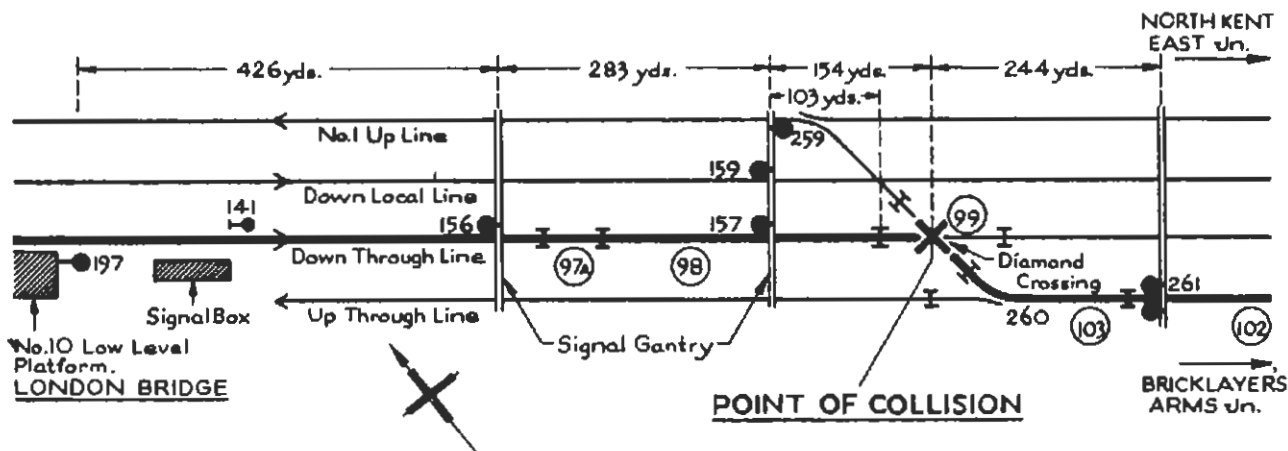
The engine struck the centre of the driving compartment of the leading motor coach and was derailed. The main frames of the engine were badly hucked and other damage, mainly at the front end, was sustained. The driving bogie of the motor coach was displaced and the front end was heavily damaged.

No arcing occurred and there was no fire; the current was cut off without delay. There was no damage to the track. The engine was re-railed and normal working was resumed at 7.30 p.m.

It was a fine sunny day.

DESCRIPTION.

2. The relevant features of the layout, signals and track circuits at London Bridge are shown in the sketch. The approach to the Home signals, over the Up Through line, is straight as also is the line from No. 10 platform on to the Down Through. Gradients are negligible.



3. Multi-aspect colour light signalling is installed. Signals No. 157 and 159 are of the three-aspect type and are mounted on a 16 ft. gantry; they are located 3 ft. and 2 ft. to the left of the Down Through line and Down Local line respectively. Signal No. 156, which requires the two aspect shunt signal No. 141 to be "off" before it can be cleared, is also of the three-aspect type; signal No. 197 has four aspects. The last controlled signals on the Down Through and Down Local lines are Nos. 157 and 159. The next signals on these lines, A6 and A4, and the subsequent signals up to Bricklayers Arms Junction are automatic

The view of signals Nos. 156 and 157 is good, it being possible to see the former from Platform No. 10 and the latter from a point on the Down Through line opposite the signal box. The complicated layout and the intensity of traffic at London Bridge has necessitated the acceptance of reduced overruns ; normally this is not less than 200 yards but beyond signal No. 157 it is 103 yards.

Signals and points are controlled from one large signal box containing a Westinghouse electric power frame with 277 miniature working levers. The levers are interlocked mechanically and track circuits operate electric controls. Red, yellow and green bull's eye lights immediately above the miniature levers repeat the aspect of the signal. Two large illuminated diagrams (duplicates) are provided in the box. Trains are worked by block bells and train describers.

EVIDENCE.

4. The Sunday morning services were being worked normally and trains were running on time. Inspector S. Jones, who was on duty in the signal box at London Bridge, saw the light engine, which had arrived at No. 10 Low Level platform at 10.33 a.m. from North Kent (East) Junction, and was informed that it was bound for New Cross Gate on the Down Through line. Shortly afterwards he noticed from the diagram that track circuit No. 98 on that line became clear ; he realised that the light engine must have passed signal No. 157 at Danger as at the same time he saw track circuit No. 103 occupied by the Tattenham train, which he knew was approaching on the Up Through line and would pass over crossover No. 260. It was evident that a collision would occur. He immediately examined the frame and saw signal levers Nos. 156 and 157 were normal with their indication lights at red ; he also saw levers Nos. 260 and 261 were reversed. He stated that the levers of all signals on the Down Local line were normal and that the last train over that line had left from No. 13 platform at 10.35 a.m.

Inspector Jones went on to say that no question was raised regarding preference to either the passenger train or the light engine over the diamond crossing ; if there had been any discussion on this point it would have been referred to him. He explained that as crossover No. 260 had been reversed for the passenger train, signal lever No. 157 was locked normal ; also that had lever No. 157 been pulled before the crossover had been reversed, then the signal lever could not have been replaced to normal after approach track circuits Nos. 97A and 98 had been occupied, until they had been cleared or until the lineman had given a back-lock release (which had not been done), and hence lever No. 260 could not be reversed.

Inspector Jones had been at London Bridge for 10 years and he had no knowledge of any recent signal or point failure in the vicinity of signal No. 157 ; he recalled that the few failures which had occurred elsewhere were all safety side failures. He said he was present when the lineman tested the relevant electrical circuits at about 11.30 a.m. and also when the mechanical locking was tested later, and that both tests revealed that everything was in order.

5. Signalman F. A. Kenward was in charge of the eastern section of the frame. He was advised of the Tattenham train by Signalman Beach, in charge of the central section, and when he saw track circuit No. 102 become occupied, he set the road for the train by drawing levers Nos. 260 and 261, the indication light above the latter changing to Yellow. At the time he was not aware that there was a light engine on No. 10 platform to go along the Down Through. He drew lever No. 259 after track circuit No. 99 became occupied and the indication turned to Yellow. The first he knew of anything being wrong was when Inspector Jones saw from the diagram that the light engine had passed signal No. 157. Kenward said that at that time levers Nos. 259, 260 and 261 were drawn, signal No. 259 was still showing Yellow and No. 261 had turned to Red as soon as the train had passed it. He could not see the position of levers Nos. 156 and 157 as they were some way from where he was standing.

6. Signalman A. V. Beach said that the Tattenham train was described to him at 10.39 a.m. and he informed Kenward who would signal the train. Shortly afterwards the driver of a light engine telephoned from No. 10 platform saying that the engine was for New Cross. Beach replied "*All right, you will be going down the Through*" and then pulled levers Nos. 197, 141 and 156 for it to proceed along the Down Through line. He said that he did not touch lever No. 157, knowing that the road over crossover No. 260 would be set for the passenger train and that he would not be able to draw it. The light indications in the frame were then as follows :—

Above lever No.	197	double yellow.
"	"	" 141 green.
"	"	" 156 yellow.
"	"	" 157 red.

Beach stated he did not tell Kenward about the light engine and there was no discussion with Inspector Jones about it ; there was no necessity to speak to either as lever No. 157 which would control its movement, was in his section of the frame. He followed the passage of the engine on the diagram, replacing signals Nos. 197, 141 and 156 after they had been passed and then Inspector Jones drew his attention to the fact that track circuit No. 98 had become clear. At that time the indication above signal 157 was Red ; he took particular note of this fact. Signal No. 159 on the adjacent Down Local line was also showing Red and all levers affecting that line were normal.

On being questioned, Beach said that had signal No. 157 been cleared before levers Nos. 260 and 261 had been reversed, then it would have changed to Green, as the section ahead was clear and the next signal (an automatic) would be at Green. In that case signals Nos. 156 and 197 would also have shown Green aspects. He stated that at the time of the accident there was a lineman in the box but he had not been given any possession and had not removed the covers from any of the locking.

7. Leading Motorman H. H. Atkins of the Tattenham train knew the road thoroughly, having been 10 years at Tattenham Corner. He had, he said, a clear run up to the last automatic signal, which was at Yellow. Signal No. 261 was at Red but turned to Yellow when his train was about two coach lengths away; he passed it at a speed which he estimated at 15 to 20 m.p.h. He observed the set of points No. 260 and as he was taking the turn-out he looked up to see the aspect of the next signal, No. 259, and saw it turn from Red to Yellow. At the same moment he saw the light engine approaching on the Down Through with no controlling signal between it and his train. He applied the brake fully and released the dead man's handle, but he did not have time to whistle. The train came to a stand on the diamond crossing but the light engine struck the centre of the cab at a speed which he estimated to be 10 to 15 m.p.h.

8. Guard W. Temple, who also knew the route well, said that the passenger train had a clear run and was on time. The rear brake compartment which he occupied was fitted with a periscope, and he was using it. He stated that he saw the signal No. 261 change from Red to Yellow; he added that it is difficult to judge distances through the periscope, but he estimated that the train was five yards away from the signal when the aspect changed. As the leading coach was taking the turnout he noticed the chimney of a light engine on the adjacent Down track; he endeavoured to make an emergency brake application but the motorman had already acted. The collision occurred almost immediately afterwards.

9. Driver R. Hilson, in charge of the light engine, was entirely familiar with the route, having worked over it for the past 10 years. The engine arrived at No. 10 Low Level platform at about 10.33 a.m. having travelled via North Kent (East) Junction; after waiting a few minutes, Hilson telephoned to advise the signalman that the engine was to go light to New Cross Gate. He said that he was not certain exactly what the signalman replied but he took it to be somewhat sarcastic and uncivil and he told Fireman King about it. Almost immediately Hilson observed that the Platform Starting signal No. 197 was at Double Yellow for the Down Through line; he mentioned this fact also to King and then started the engine.

Hilson went on to say that the next running signal (No. 156) showed a single yellow aspect; he stated that before passing it he shut off steam expecting to find the next signal (No. 157) at Red, but he opened the regulator again when he saw that it also was at Yellow. He again shut the regulator before reaching signal No. 157, which he said he passed at about 15 to 20 m.p.h.; almost immediately he saw an electric train come on to the crossover directly in the path of his engine. He made a full brake application but before it could take effect the engine struck the front of the train.

Hilson stated that he did not see signal No. 156 at the same time as No. 197; also that he did not observe No. 157 until after he had passed No. 156. He was sure that he did not see signal No. 157 change from Red to Yellow and asserted that at no time did he see signal No. 157 at Red. He said that he could not see the aspect of the first automatic signal beyond No. 157 on account of the sun but that this did not affect his vision of the controlled signals.

Hilson was certain that apart from the remarks mentioned above, there was no conversation on the footplate. He did not notice the aspect of signals on the adjacent Down Local line, though he agreed that he had probably done so subconsciously. He related that, having seen the aspect of signal No. 157, he looked out "unconcernedly" through the spectacle glass and saw the electric train some distance ahead on the Up Through line; a little later he looked out of the side of the cab and saw the train take the turnout in his path. He had not observed the head code on the train and said that had he done so he would not have recognised it nor would he have known that the train would be crossing over to No. 1 Up line.

Hilson was questioned closely but was adamant that he never saw signal No. 157 at Red nor any signal at Green; he remarked that the former was a "good clear yellow" which he could not possibly mistake. When asked his reactions if told that it was impossible for signal No. 157 to be at Yellow he said he would never believe such a statement.

Fireman King had not recovered sufficiently to attend my Inquiry; he had, however, previously stated that he had been firing and attending to the injector and that he had observed no signals and could give no useful information.

10. Lineman G. P. Hurst was in the signalbox at the time of the collision, endeavouring, unsuccessfully, to obtain possession to work on points on the Down lines. As soon as he heard of the collision he examined carefully the position of levers in the frame and found Nos. 156 and 157 normal with red indications Nos. 260 and 261 reversed, the latter with a red indication, and No. 259 reversed with the indication at Yellow. He then went to the site of the accident, observing en route that signals Nos. 156 and 157 were at Red and were giving good indications. He recalled that both the driver and the motorman, when questioned by him, replied that signals Nos. 157 and 261 respectively were at Yellow, but as they had been injured he did not press the matter with them.

Hurst then returned to the box and made a cable test and also tested the electrical controls on the levers concerned ; he stated that the result of both was satisfactory. Later, after the re-railment, he tested the mechanical locking of the frame and found that also in order. He stated that signal No. 157 had given no trouble and that during the 17 years he had been responsible for the signalling installation at London Bridge there had been no danger side failures.

11. Mr. F. Evans, Signal and Telegraph Inspector, London East Area, happened to be at London Bridge when the accident occurred. He went straight to the signal box and saw that the position of the levers and the aspects of visuals were as described by Lineman Hurst. He then proceeded to the site of the accident and he also saw that signal No. 157 was giving a good red light ; he said too that it was correctly focused. He returned to the box and was present when the electrical tests were undertaken and confirmed that the results of these were satisfactory. He stated that it was not possible for the light indicators in the frame to show an aspect different to that of the signal to which they referred, nor for signal No. 157 to show anything but a red aspect with levers Nos. 260 and 261 drawn unless the connections were deliberately transposed ; he added that this would become immediately evident to the signaller and also when tests were made.

Continuing, Mr. Evans stated that there had been no failure of signal No. 157 for as long as he could remember. The wiring of the signal circuit had not been disconnected for the past 18 months, but the periodical cable tests had been made, the last one being on the 16th March, 1949. The mechanical locking of the frame had also been tested at about the same time. During the last 20 years, for 16 of which he had been in charge at London Bridge, he had not known of any danger side failure.

CONCLUSION

12. The interlocking and electrical control of the signals and points concerned in this accident are quite straight-forward and there is reliable evidence that they were fully tested after the accident and found to be in good working order. The road was set for the Tattenham train and levers Nos. 260 and 261 were drawn ; in these circumstances lever No. 157 could not have been reversed and the aspect of the signal must have been Red. The accident was therefore clearly caused by the light engine passing signal No. 157 at Danger.

13. Driver Hilson, was, however, very certain that signal No. 157 was at Yellow and Lineman Hurst related that the driver mentioned this to him a few minutes after the accident in which he (Hilson) had been injured. It is necessary, therefore, to consider whether the aspect of that signal might have been other than Red at any time during the approach of the light engine. Such a circumstance could have arisen only if, in addition to levers Nos. 197, 141 and 156, Signaller Beach had drawn lever No. 157 for the light engine before Signaller Kenward had reversed lever No. 260 for the Tattenham train. However, had Beach pulled lever No. 157, thinking that the light engine could have cleared the crossover without checking the incoming train, or had he reversed the lever accidentally before Kenward had started to make the lever movements for the train, then signal No. 157 and also signals Nos. 156 and 197 would all have assumed a green aspect, the automatic signal ahead being at Green. Driver Hilson was as definite that none of these signals were at Green as he was that signal No. 157 was at Yellow. Again, had lever No. 157 been drawn it could not have been replaced to normal after the engine had occupied approach track circuit 97A and 98, and then the crossover could not have been reversed nor signal No. 261 cleared for the passenger train.

Hilson was very certain that he did not see at any time signal No. 157 at Red and that he did not observe it change from Red to Yellow. Yet he agreed that when he saw signal No. 156 at Yellow signal No. 157 must have been at Red. I observed, when viewing the site, that signals Nos. 156 and 157 could both be seen clearly from a point on the Down line opposite the box and it is difficult to appreciate that a driver could see one without noticing the aspect of the other.

The possibility of Hilson having mistaken signal No. 159 on the adjacent Down Local line for his signal does not arise. Hilson stated that he had not done so and the levers relating to that line also must have been in their normal position before the road could be set up for the Tattenham train.

14. I am, therefore, in no doubt that signal No. 157 was at no time during the approach of the light engine showing an aspect other than Red, and I have no alternative but to place full responsibility for the accident on Driver Hilson for having passed that signal at Danger. The nature of his evidence suggested that he was not concentrating his attention on signals and it also seems possible that he was feeling some resentment against the signaller whom he considered, without any apparent justification, had been rude over the telephone ; although denied by Hilson, I would not be surprised if he and the Fireman King were discussing the matter. I can only conclude that Hilson completely missed signal No. 157 and that the signal which he was so certain was at Yellow was, in fact, the previous signal, No. 156.

Hilson is an experienced driver with 31 years service with the Railway, during the last 14 of which he has been driving, and he has a good record. His sight is good and there is no question of any colour blindness.

15. No blame is attached to Leading Motorman Atkins, who is to be commended on his alertness in stopping the passenger train in so short a distance as 40 yards.

REMARKS

16. The over-run beyond Signal No. 157 is only 103 yards but this is not in any way considered to be a contributory cause to the accident, for the driver of the light engine did not apply the brake until he had passed the signal and saw the electric train take the crossover in front of him.

17. I have no recommendation to make regarding this accident which was brought about by an inexcusable lack of concentration on the part of the driver of the light engine who failed to observe and obey a well-sited colour light signal at Red.

I have the honour to be,

Sir,

Your obedient Servant,

D. McMULLEN,

Colonel.

The Secretary,
Ministry of Transport.

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