



MINISTRY OF TRANSPORT

RAILWAY ACCIDENT

REPORT on the COLLISION

that occurred on

22nd November 1962

between

VICTORIA and ST. JAMES'S PARK
STATIONS

on the

DISTRICT LINE
LONDON TRANSPORT RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE

1963

THREE SHILLINGS NET.

SIR,

I have the honour to report for the information of the Minister of Transport, in accordance with the Order dated 23rd November 1962, the result of my Inquiry into the following collision that occurred at about 11.4 a.m. on 22nd November 1962, between two eastbound passenger trains in the tunnel between Victoria and St. James's Park stations on the District Line of London Transport Railways.

The two trains concerned were no. 44 from Ealing Broadway to Mansion House and no. 45 from Wimbledon to Dagenham. About 15 minutes before the accident, a train stop failure occurred at the St. James's Park intermediate home signal and this caused that signal and the two signals on the approach side of it (St. James's Park outer home signal and Victoria advance starting signal no. A803) to be held at Danger. Signal no. A803 is an automatic and the other signals were working automatically, and in such circumstances motormen are required to pass them at Danger in accordance with the "Stop and Proceed" Rules. Train no. 44 left Victoria at 10.58 a.m. and the motorman stopped it at signal no. A803; he was about to restart the train and pass the signal in accordance with the Rules when train no. 45 ran into its rear end. Train no. 45 left Victoria at 11.2 a.m. and the motorman stopped it at the starting signal no. A801; that signal is also an automatic and it was held at Danger by the presence of train no. 44 ahead. The motorman "tripped" past the signal (see note below) in accordance with the Rules, but he failed to proceed cautiously prepared to stop short of any obstruction as required by the Rules, and he collided at a speed of 8-10 m.p.h. with the train ahead at a point 433 feet beyond Victoria station platform. The brakes of that train had been released in readiness for it to proceed past signal no. A803. The force of the impact pushed the train past the signal for a distance of about 15 feet and in passing it, the brakes became fully applied.

The damage was mainly confined to the rear car of train no. 44 and the leading two cars of train no. 45. Four passengers were slightly injured and five others complained of shock; these nine passengers were removed to hospital and they were discharged the same day. Thirteen other passengers complained of shock and were given first-aid treatment at Victoria station. Ambulances and the Fire Brigade were called at 11.23 a.m. and 11.26 a.m. respectively and they both arrived on the scene within a few minutes. No call was made for doctors.

The current was discharged between Victoria and Charing Cross at 11.5 a.m. by the guard of train no. 44 operating the tunnel telephone wires. It was restored at 11.12 a.m. in accordance with the Rules, but was removed again a minute later under the orders of the Line Traffic Control, after which it remained off. The current rail gap in the eastbound line is inside the tunnel towards St. James's Park and, to enable the passengers from the two trains to be detrained, the current was removed from the Victoria—South Kensington section also. This was done at 11.15 a.m. and it caused three trains to be immobilised between stations, two between Victoria and Sloane Square and one between Sloane Square and South Kensington.

There was delay in the detrainment of the 360 passengers in trains no. 44 and 45 and the last of them did not reach Victoria station until 12.10 p.m. Two of the immobilised trains were close to stations and there was no delay in detraining the passengers. There was however delay in detraining the passengers from the third train which was about halfway between Victoria and Sloane Square, and they did not reach the latter station until 12.23 p.m.

Breakdown gangs arrived quickly. Both the trains required considerable attention but they were removed in time for normal services to be reintroduced at 3.52 p.m., well before the evening peak traffic. In the meantime, arrangements were made to maintain the service outside the collision area by reversing inner rail and outer rail Circle trains at Gloucester Road and Aldgate respectively; eastbound District Line trains were diverted to High Street Kensington or reversed at Earl's Court, and westbound trains were reversed first at Mansion House and then at Charing Cross.

DESCRIPTION

The Site and Signalling

1. The eastbound and westbound lines between Victoria and St. James's Park lie in one shallow tunnel. In Victoria station the lines are on a gradient of 1 in 250 falling towards St. James's Park and the eastbound line continues to fall at that gradient for 110 ft.; it then becomes level for 60 ft. before rising at 1 in 200 towards St. James's Park. The east end of the Victoria eastbound platform is on a left-handed curve and the eastbound line continues to swing to the left on a curve of 15½ chains radius

NOTE. Extensive use is made in this report of the phrase to "trip" past a signal. It implies the procedure of passing a signal which for any reason remains at Danger, after waiting at it for a specified time; in passing the signal the trip cock on the train engages the train stop on the track and causes a full and sudden brake application to be made; the trip cock is then reset by the motorman opening the end door and pulling a cord and the train air line is recharged before restarting.

which ends roughly at the point of collision. On account of this curve, the view of the rear end of train no. 44 from the driving position on train no. 45 was restricted by the wall of the tunnel.

2. The diagram shows the signalling of the eastbound line between South Kensington and St. James's Park. The line is track circuited throughout and the signals are controlled by the track circuits. All the signals work automatically except that those with the prefix "EG" on the approach side of St. James's Park can be controlled to Danger from a signalbox at that station when an emergency crossover between the eastbound and westbound lines is required to be used. At the time of the accident, however, the signalbox was closed and all the signals were working automatically. There are no telephones at these signals.

3. The type of signalling on the District line is standard on London Transport Railways, except that a large number of home signals are provided at Victoria and at some other stations for "closing up" purposes. In addition to being controlled by the track circuits ahead in the usual way, they are, when the station platform is occupied, controlled to clear by the occupation of an approach track circuit for a certain length of time, which ensures that the speed of the train approaching the station has been reduced appropriately.

4. The signals are of the two-aspect type and each is equipped with a train stop which is raised when the signal is at Danger. If the signal is passed at Danger the train stop engages with the trip cock on a train, which automatically applies the brakes. The correct operation of a train stop is proved in the circuits of the signal concerned and of certain approach signals. The train stop at signal no. EG2A had failed due to the fracture of its detection arm, and that signal and also signals no. EG1 and A803 were therefore held at Danger.

The Power Supply

5. The electric power for traction is supplied at 600-650 volts D.C. from manned sub-stations at Charing Cross, Victoria and South Kensington. The current rail gap between the two sections is at Victoria and, in the eastbound line, it is 45 ft. east of the platform and in the tunnel. When the traction current is removed, lights situated at 50 ft. intervals along the tunnel walls become illuminated automatically.

The Tunnel Telephone System

6. All London Transport railways in tunnel are provided with "tunnel telephone wires" which consist of two bare no. 10 gauge phosphor bronze conductor wires set $4\frac{1}{2}$ ins. apart and supported on insulators attached at a convenient height to the tunnel walls; the wires run from sub-station to sub-station. At the end of each passenger platform the wires are connected to tunnel head wall telephones, and in the sub-station special telephones are linked to them. The wires normally carry a current of 6 volts and if this is short circuited by pinching the wires together a relay in the sub-station on each side is de-energised, the circuit breakers are opened, and the traction current is removed from the line concerned. The attachment to the tunnel wires of the leads of a special telephone handset carried by all drivers, or the lifting of the receiver of a tunnel head wall telephone, has the same effect. The illumination of a light and the sounding of an audible warning in the sub-stations indicate to the attendants that the circuit breakers have been opened by the operation of the tunnel telephone wires, and not for any other reason, and the light shows the section of the line where this has happened. While the tunnel wires are being pinched together or a head wall or driver's telephone handset is being used, the sub-station attendants cannot re-set the relays; this re-setting must be done to enable another telephone, called "Drico", which is part of the equipment of all trains, to be used. The re-setting of the relays does not restore the traction current.

The Trains

7. Both the trains concerned were six-car sets, composed of cars built between 1923 and 1938. The cars at the rear end of train no. 44 and the front end of train no. 45 were motor cars which were built in 1923 and 1927 respectively. Each train was 301 feet long and its tare weight was $174\frac{1}{2}$ tons. Trains of this type are equipped with the electro-pneumatic (E.P.) and Westinghouse air brakes and with a dead man's handle which operates in conjunction with the latter; when operated it switches off the power to the traction motors. The lighting of the cars is taken from the traction supply and there is no arrangement for standby electric lighting from batteries as there is on modern stock. Candle lights are, however, provided for use in an emergency. There is one electric tail lamp which is also fed from the traction supply, and it is on the left-hand side of the rear car. The failure of that supply would extinguish the tail lamp, and an oil tail lamp is therefore also provided; the bracket for it is just to the right of the centre door at the rear end of the train. On modern rolling stock oil tail lamps are not considered necessary because there are two electric tail lamps fed from the train batteries on independent circuits.

Train Communication

8. A motorman on a train can communicate with:—

- (i) the sub-station attendants, by means of the special telephone handset carried by all motor-men, when the leads are clipped on to the tunnel wires;
- (ii) the line traffic controller by means of the "Drico" telephone. The leads of this telephone also are clipped on to the tunnel wires;
- (iii) the guard by means of the train "Loudaphone" system.

With the first two systems the motorman can call the sub-station attendants or the traffic controller, but he cannot be called by them. On the train "Loudaphone" system, however, the motorman and guard can call each other. On the trains concerned, the removal of the auxiliary position switch key (known as the "auxiliary key"), which is one of two keys to be inserted in panel switches in the guard's compartment before a train is brought into service, renders the "Drico" telephone and the "Loudaphone" system inoperative. On modern rolling stock, however, the "Drico" equipment is available for use independent of any guard's position switch key.

The Damage

9. As already mentioned, most of the damage was in the rear car of train no. 44 and the leading two cars of train no. 45. The headstocks of these cars were forced downwards and the buffers were bent. The car floors were forced up at both ends and the body panelling was damaged. The train air pipes in both the trains were fractured. All the remaining cars in the two trains, except for the rear two cars of train no. 45, received some slight damage, this being mainly confined to raised floors and bent buffers. No windows were broken. The damage was consistent with an impact speed of 8-10 m.p.h.

RULES

10. It has been mentioned that trains were running under the "Stop and Proceed" Rules. This practice is authorised on London Transport Railway's lines to make it possible to continue to run the service when a failure of the signalling equipment or a train occurs. It is applied at automatic signals (such as signals no. A801, A803, EG1, EG2A) on the initiative of the driver, when the signal remains at Danger.

11. The following is an extract from the Rules governing the practice.

Rule 55(g) (iv). On London Transport Railways (except . . .) when a Driver finds an automatic stop signal . . . at Danger, he must bring his train to a stand, and, if a telephone is provided at the signal, communicate at once with the Signaller and inform him at which signal his train is detained and give description of his train.

Should the Driver receive instructions to pass the signal at Danger, he must give one long whistle and PROCEED CAUTIOUSLY as far as the line is clear or to the next stop signal in advance AT SUCH A SPEED AS WILL ENSURE THAT THE TRAIN CAN BE STOPPED SHORT OF ANY OBSTRUCTION THERE MAY BE, having regard to the prevailing conditions, such as curvature of line, a falling gradient, weather, etc., and to the possibility that the section may be occupied by a train which is displaying only an oil tail light or a tail lamp which may have become extinguished. . . . If the telephone is out of order and no reply is received or a telephone is not provided at the signal and the Danger indication is not changed, the Driver must wait one minute or other prescribed period, give one long whistle, and then proceed cautiously as above directed.

NOTE. A train ahead, an obstruction on the track, a broken or displaced rail may be the cause of an automatic stop signal being at Danger.

REPORT AND EVIDENCE

12. The failure of the train stop at signal no. EG2A occurred at 10.47 a.m., and, as already mentioned, it caused that signal and signal nos. EG1 and A803 to remain at Danger. Several trains passed them under the "Stop and Proceed" arrangement but this inevitably causes delay and it resulted in trains becoming bunched together to the west of Victoria.

Evidence of Crew of Train No. 44

13. As train no. 44 was approaching Victoria, Motorman B. W. Horn saw that signals no. 799 A, B, C and D were clear but signals no. 799 E, F and G were at Danger. He therefore stopped at each of the latter signals, "tripped" past them, and then entered the station. After the station duties were completed, he saw that the starting signal no. A801 was still at Danger. He drew up to it and "tripped" past it, and then proceeded slowly forward and stopped at signal no. A803, which was also at Danger. At no time had he seen a train ahead of him. Horn had released the brakes in preparation for passing the signal when he felt his train pushed forward. It went past the signal and the trip cock engaged the train stop and applied the brakes. He realised that another train had run into his train so he took his torch and got down on to the track, and stopped an approaching train on the westbound line. After being told of the situation, its driver proceeded slowly into Victoria.

14. Horn then tried to get in touch with Control on the "Drico" telephone but could get no reply. He then started to walk back through the train. He had noticed that the tunnel lights had become illuminated when he was on the ground and assumed that the traction current had been removed. He found the lights in the train were out and he started to light the emergency lamps. Horn soon met the guard, F. C. Taylor, who told him what had happened and also told him that the guard of the colliding train had gone for help. Horn said that he had not heard Taylor trying to speak to him on the train "Loudaphone" system. He did not use his telephone handset to inform the sub-station attendant of the situation.

15. Guard Motorman F. C. Taylor, who was the guard in charge of train no. 44, said that he had checked the oil tail lamp of the train at Ealing Broadway and had seen that it was alight. He generally confirmed what Horn had said and added that Horn had spoken to him on the train "Loudaphone" system at Victoria and had said that he was going to pass signal no. A801 at Danger. Consequently after

the train had stopped at signal no. A803, Taylor went from the guard's position at the front end of the rear coach to the driving compartment at the rear end of the train with the intention of satisfying himself that the oil tail lamp was still burning; he removed the auxiliary key and took it with him. He thought that he had just lifted the lamp off the bracket when he first heard, and then saw, a train approaching from the rear; he estimated that it was about one and a half coach lengths (about 75 feet) away when he first saw it. He heard the release of air from the brake valves and knew that it was being braked hard, but he realised at once that it would not stop before it hit his train. He therefore leapt back to the passenger compartment and shouted to the passengers to "hold tight"; the impact occurred immediately afterwards.

16. After the collision, Taylor ran back to the guard's compartment and pinched together the tunnel telephone wires, thus removing the traction current. He then tried to call the motorman on the train "Loudaphone" system but failed. After that he went to the rear end of the train again, found that the motorman of train no. 45 was unhurt, and so went forwards through his train, taking both the keys with him, and met Motorman Horn. The latter again tried to speak to the Control on the "Drico" telephone but could get no reply. Taylor did not realise that, having removed the auxiliary key, he had rendered that telephone and the "Loudaphone" system inoperative.

Evidence of Crew of Train No. 45 and of some Passengers

17. Guard Motorman A. Martin was driving train no. 45, having taken it over at Parsons Green; his position was on the left-hand side of the driving compartment. He had an uneventful trip from there until he was approaching Victoria, and then he found signal no. A797 at Danger. He stopped and "tripped" past the signal and proceeded cautiously towards signal no 799A. That signal was also at Danger and he carried out the same procedure. The remaining home signals then became clear progressively and allowed him to run into Victoria without stopping again. He also had not seen a train ahead of him at any time.

18. Martin said that whilst the train was at the platform, an inspector spoke to him and said he believed that the starting signal had failed, and that he should carry out Rule 55 and proceed carefully. Martin told the guard of the situation on the "Loudaphone" system and, after the doors had been closed, he proceeded towards the starting signal. It was still at Danger so he stopped and "tripped" past it. He reset the trip cock and said that he recharged the brake system fully before again proceeding. He thought that he was driving slowly when he suddenly, at a distance of only half a coach length, saw the outline of a train ahead. He immediately released the dead man's handle but the collision occurred almost at once. He said that he did not see the light of any tail lamp.

19. I questioned Martin closely about his actions and pointed out to him that from tests that I had made, the outline of part of the rear end of the train ahead could have been seen in the reflection of the train lights on the tunnel wall from a distance of well over 100 feet and the outline of the whole of the rear end was clearly in view from 100 ft. (see Paragraph 39). He was certain, however, that he was almost "on top of" the train before he saw it. He also thought that, when restarting from signal no. A801, he had not accelerated more rapidly than from signal no. A797 or no. 799A and that the speed the train had reached was not high; he agreed later, however, that he may have misjudged the speed and that it may have been higher than he imagined it to be. Martin stated that in restarting he had turned the control handle halfway (i.e. into full series) and that he had not, as is usual in a normal start, turned it fully, into parallel. He said at one time that he was expecting to run up to the next signal ahead (no. A803), as he had done from signal A797 to signal no. 799A, and that he was not expecting to find a train standing at signal no. A803; later, however, he said that that was not the case. He was also certain that he had not formed the opinion, from what the inspector had said, that it was the starting signal that had failed and that, having passed it, he had passed beyond the trouble. He agreed that there was a young London Transport Railways employee in his cab with him but said that they were not talking and that the lad was in no way interfering with his driving of the train. Martin said that he had switched on the cab lights after becoming "tripped" at signal no. A801 and had seen from the gauge that the air pressure had been restored, but he had switched off the lights again before he restarted.

20. Martin said that after the collision the guard of train no. 44 had come back and said that he had cut off the current. Martin then spoke to his guard on the train "Loudaphone" system and told him to go back to the station and call for assistance. He then tried to speak to the Control on the "Drico" telephone, but failed.

21. Martin is 35 years of age and has 16 years' service. He qualified as a motorman in March 1962, and had driven trains on over 50 occasions, all on the District Line. He said that he had had to apply Rule 55 (g) (Stop and Proceed) on one previous occasion and that he had then found the line clear to the next signal. He is a married man with a family and said that he was in good health and had no troubles at home nor anything on his mind.

22. Railway Training Apprentice Robert Hill, aged 18, joined the train at Earl's Court and, with the permission of the motorman, travelled in the driving compartment; he placed himself on the right-hand side of the compartment. He confirmed the evidence of the motorman regarding the run to Victoria and said that when the train was standing at the platform the station inspector had told the motorman that there was a signal failure and had said "trip past this one and proceed with caution", and he repeated the word "caution" several times. From this conversation Hill gained the impression that it was the starting signal that had failed and he thought that the motorman would have gained the same impression.

23. Hill said that the motorman then drew up to and stopped at the starting signal no. A801, went past the signal, reset the trip cock, and, after a short time, restarted. He had watched this procedure at two signals on the approach side of Victoria, and he had experienced it on one earlier occasion, and he did not think that the motorman had accelerated more rapidly when starting from the signal no. A801 than he had done from the other signals, or than the motorman in his earlier experience had done. He said later, however, "I do not think he was going as fast (after restarting from the starter) as he was when he started from other stations. I think slower". Hill had formed the impression that the motorman had not expected to find a train standing at the signal ahead.

24. Hill went on to say that the train had not gone far when he saw a dim red light ahead, and he thought that it was another signal. Then he thought he saw a train, but he did not say anything to the motorman for fear of distracting him. Then, he said, the motorman must have realised there was a train ahead for he released the dead man's handle. He thought that this was done "quite a little time, 15-20 seconds, maybe 20 seconds" after he (Hill) had first seen the red light; also, that there was "a bit of an interval" between the time when he realised there was a train ahead and the time the driver released the dead man's handle. He estimated that his train was then about three coach-lengths away from the train ahead and that its speed was the equivalent of "running speed", "definitely faster than walking speed".

25. Guard A. Dopwell generally confirmed Martin's evidence and thought that the train had not accelerated from signal no. A801 more rapidly than it had from signal no. A797. He did not think that there was any brake application before the impact, which, he said, was not severe. He went on to say that after the impact he spoke on the train "Loudaphone" system to the motorman who told him about the collision and also told him to go back to Victoria station. Before doing so, however, he first attended to a passenger who had been injured. When he went to Victoria he took both the keys with him; he did not know that by doing so he had rendered the "Drico" telephone system inoperative. On arrival at Victoria he reported what had occurred to the station inspector; he did not notice the time. He returned to the train with the station master and remained at the rear end while the station master went forward through the train. He recalled that someone, he did not know who it was, said "Let's detain the passengers" and he (Dopwell) placed the ladder in position at the rear centre door.

26. Mr. J. Willing, a booking clerk employed by London Transport Railways, joined the train at Victoria and was standing in one of the centre coaches. He had heard of some signal trouble and was not surprised when the train stopped at and "tripped" past the starting signal. He thought that it restarted in a normal way as if starting from a station, but then there was another jolt. It was slightly greater than when the train had "tripped" past the starter, and several people who were standing were thrown to the floor. He had not noticed any severe braking beforehand and he did not realise that there had been a collision.

27. After an estimated lapse of some 15 minutes, Mr. Impey, Station Master Victoria, came through the train and asked Mr. Willing to accompany him forward. On arrival at the front end they found the centre door was jammed, so Mr. Willing went out by the side door of the driving compartment and swung himself on to the train ahead. He proceeded through to the front of that train, where he found the motorman, and then returned and found that the station master had been waiting for him. The station master then returned through the colliding train but Mr. Willing remained and helped passengers from the front train through the centre doors which had by that time been broken open by firemen.

28. Mr. A. W. Meacham and Mr. L. S. Lawrence, both members of the Signal Department of London Transport Railways, were travelling in the rear compartment of train no. 45. They had not heard of any trouble but, having "tripped" past two signals on the approach to Victoria, they had realised that there was a signal failure somewhere. They were not surprised, therefore, when the train "tripped" past the Victoria starting signal, but they both considered that, having done so, the train accelerated rapidly and in much the same way as it would in a normal start from a station. They realised that the driver must have passed the signal under Rule 55(g); Lawrence thought that the speed was too high, while Meacham said that it alarmed him somewhat. Neither of them noticed any application of the brakes before the impact. They both knew that a collision had occurred but they thought that it was a slight one.

29. Meacham said he looked at his watch immediately after the collision and noted that the time was 11.2 a.m. He had heard the conversation over the "Loudaphone" system between the guard and the driver and he saw the guard leave the train and proceed to the station some 5-10 minutes later. Some 15 minutes later still, according to Lawrence, the station master arrived with another member of the staff and the police. They started to detain the passengers and the station master then proceeded forward along the train. Meacham and Lawrence were among the first to arrive at the platform and Meacham thought the time was then 11.20 or 11.25 a.m.

30. Mr. C. R. Salter, a retired surveyor and a regular and, quite clearly, an observant traveller on the District Line, arrived on the platform at Victoria when train no. 44 was stationary with the doors shut, and the guard's compartment opposite the platform entrance. He spoke to the guard and learnt that there was a signal failure. He then saw the train draw slowly away and noticed that the tail lamp was alight. He said that train no. 45 followed it closely into the platform and he entered the leading car. He saw some senior railway official "do something with a box which is on the wall just as the train goes into the tunnel" and heard him speak to the motorman.

31. Mr. Salter had previous experience of the "tripping" procedure and he had no difficulty in recognising it soon after leaving the station. He said that he was, however, surprised that the train seemed to restart with what he described as "a perfectly normal acceleration" and he estimated that the train reached a speed of 15 m.p.h. He then realised that the brakes had been suddenly applied, not hard, and then the impact occurred, throwing people off their feet and off their seats. He estimated the speed of impact at 10 m.p.h.

32. Mr. Salter said that the train lights went out with the collision or very soon afterwards, but the tunnel lights came on and gave a certain amount of illumination in the train. Some 35 minutes after the impact he heard people working at the door at the rear end of his compartment, which had become jammed. It was eventually freed and someone, he did not know who, asked them "to walk back down the train where you will find someone to help you on to the line and back to Victoria". He was one of the last passengers of that train to reach the platform and he observed that the time was then 11.55 a.m.

Evidence of Station Staff and Traffic Controllers

33. Station Inspector L. Harvey was on duty at Victoria. He heard that there was signal trouble and telephoned from the inquiry office to the signal lineman, saying that he thought that the eastbound starting signal had failed. When he returned to the platform, train no. 44 was just leaving and he noted that the time was 10.58 a.m. Then train no. 45 arrived; Harvey spoke to the motorman and told him that the starter was remaining at Danger and the motorman replied that he would carry out Rule 55. Harvey said that he had not told the motorman that the starter had failed, but that he had warned him to proceed cautiously after passing it. He noted that train no. 45 left at 11.2 a.m.; while it had been at the platform he had turned on the tunnel lights by operating a switch in a box on the tunnel headwall. He saw the train leave, stop for "tripping" past the starter, and restart. He thought that when it restarted it went "rather slowly".

34. Harvey went on to say that shortly after no. 45 had left, another train entered the station. He was speaking to the motorman when Guard Dopwell, of train no. 45, ran out of the tunnel and told him about the collision. Mr. Impey was nearby and Harvey repeated the information to him at once. According to Harvey, Mr. Impey went upstairs to speak to the controller; he then returned to the platform, removed the traction current from the section Victoria—South Kensington and went into the tunnel towards train no. 45 with another member of the staff. Later, members of the police, ambulance and fire services arrived and went into the tunnel towards the train. Later still the line traffic controller telephoned and instructed Harvey to go into the tunnel to the west of the station and to detain the passengers from a train that was immobilised just over 100 feet inside it. Harvey said that at the time of the accident and just after it there was no member of the staff on the westbound platform.

35. Mr. G. Impey, Station Master Victoria, was on the eastbound platform when Station Inspector Harvey told him about the collision. He immediately went upstairs and telephoned to the line traffic controller. He said he did not know whether there had been any casualties and did not mention them to the controller; he did, however, say that he intended to go into the tunnel in order to find out what had happened. He then returned to the platform, removed the traction current from the section Victoria—South Kensington, told Harvey to get the current removed from the westbound line and to collect staff and hurricane lamps, and then went into the tunnel with the guard of train no. 45; the guard had already told Mr. Impey that the current had been removed between Victoria and Charing Cross. Mr. Impey left the guard at the rear of the train and started to walk through it. He saw Mr. Willing and asked him to accompany him forward. They found that the centre door at the front of the train was jammed so Mr. Willing swung himself into train no. 44 and went through it. Then a fireman arrived and broke down the door. Mr. Impey had remained at the front end of train no. 45 and was still there when Mr. Willing returned and he then went back through train no. 45. When he reached the rear end he found that the passengers were being detained by the police and members of the fire service. He did not see any member of the staff present. He himself then helped in the detrainment.

36. Mr. Impey said that he had not authorised the detrainment of passengers. It was his intention to investigate the situation in both the trains and then to return to the station and report to the controller, and obtain his authority for the detrainment. He said that he had considered the desirability of not removing the traction current between Victoria and South Kensington to enable the trains between these points to move forward, but he thought it more important to remove the current to enable the passengers in the two trains involved in the collision to be detained. It had not occurred to Mr. Impey to try to speak to the controller on the "Drico" telephone from either of the trains.

37. Mr. K. James, Line Traffic Controller, had been informed that a train had been delayed between Victoria and St. James's Park and was about to arrange to reorganize the service when he received a message at 11.4½ a.m. from the sub-station attendant at Charing Cross that the current between Charing Cross and Victoria had been discharged. The attendant said that no one had spoken on the tunnel telephone line and that he had been able to reset the line. Mr. James heard nothing more for some time so he told the attendant to restore the current under the "seven minute rule"; the time was then 11.12 a.m. A minute later he received a telephone message from the station master at Victoria that train no. 45 had collided with train no. 44, and that there were some casualties; he was under the impression that the guard was with the station master at the time. He interrupted the conversation and telephoned to the sub-station attendant to remove the traction current again. He then passed information about the collision to the headquarters traffic control office. The station master had said that he was proposing to go into the tunnel to investigate the situation and report back, and Mr. James agreed to

this course. He learnt later that the station master had cut off the current from the section Victoria—South Kensington. He said that the question of the detrainment of passengers from trains no. 44 and 45 was not discussed. At no time had he been consulted about this and he did not know when the detrainment had started or when it was completed. He had, however, arranged for the current on the westbound track to be discharged.

38. Mr. S. G. Coleman, Headquarter's Traffic Controller, heard about the collision from the line traffic controller at 11.13 a.m., but said that there was no mention of injuries. He advised the various officers concerned and as a precautionary measure he called an ambulance at 11.23 a.m., and the Fire Brigade at 11.26 a.m. At 11.32 a.m., he heard from Victoria Station that some persons had been injured and he called for additional ambulances at 11.36 a.m. He did not call for a doctor. He gave no instructions about the detrainment of passengers and presumed that the line traffic controller had that matter in hand with the station master.

TESTS AND OBSERVATIONS

39. I carried out various tests before taking the evidence of Motorman Martin of train no. 45. A train of similar composition to train no. 44 was placed in the position in which that train had stood at signal no. A803, and I approached it in a train of similar composition to train no. 45, travelling in the driving compartment. I noted that the distance at which various features of the stationary train came into the clear view of the motorman were as follows:—

	<i>Distance between trains</i>
(a) Oil tail lamp	187 feet
(b) Electric tail lamp and the outline of part of the rear end of the stationary train in the reflection of the train lights on the tunnel walls	155 ..
(c) Outline of the whole of the rear end of the stationary train ...	106 ..

40. The distance from the Victoria starting signal (no. A801) to the point of collision is 385 ft. The distance the train would have had to travel to reach certain speeds after being restarted from that signal and travelling on the rising gradient of 1 in 200, with the control handle in full series and in parallel, have been calculated as follows:—

<i>Speed</i>	<i>Distance with handle in full series</i>	<i>Distance with handle in parallel</i>
10 m.p.h.	69 ft.	69 ft.
15 ..	300 ..	155 ..
20 ..	2,268 ..	276 ..
25 ..	—	498 ..

The braking distance from certain speeds with a full brake application by the release of the dead man's handle, with normal air pressure and not allowing for the motorman's reaction time, have been calculated to be as follows:—

<i>Speed</i>	<i>Distance to reduce speed to 10 m.p.h.</i>	<i>Distance to reduce speed to 8 m.p.h.</i>	<i>Distance to stop train</i>
25 m.p.h.	189 ft.	197 ft.	212 ft.
20 ..	125 ..	133 ..	148 ..
15 ..	70 ..	78 ..	93 ..
10 ..	—	38 ..	53 ..
5 ..	—	—	21 ..

41. Consideration has been given to the possibility of the air pressure in the braking system being low, having regard to the fact that a considerable amount of air was exhausted in "tripping" past two signals on the approach side of Victoria, in stopping at the station and in "tripping" past the starting signal. Normally the air pressure in the train air line, the equalising reservoirs and the auxiliary reservoirs, is the same, i.e. 70 p.s.i. on this type of stock. The control governor is set at 55/40 p.s.i.; that is to say, when the air pressure in the train air line has been built up to 55 p.s.i., the governor closes and allows power to be applied to the motors; when a brake application reduces the pressure to below 40 p.s.i., the governor opens and cuts off the power. In an emergency stop or when "tripping" past a signal, the pressure is reduced to below 40 p.s.i. and the train cannot therefore be restarted until the pressure has been built up to 55 p.s.i. The governor is not controlled by the pressure in the auxiliary reservoirs which feed the brake cylinders. Calculations show however that after all the above mentioned stops, and assuming that there was no build up of pressure in these reservoirs when the train was standing at the station due to the brake handle being in the holding position, the pressure in them would have built up to at least 60 p.s.i. by the time the train had reached a point 280 ft. beyond the starting signal. This slight reduction in pressure would have had no effect on the braking distances quoted in the paragraph above, because the triple valves pass to "quick action" in an emergency stop and allow air to pass direct from the train air line, where the pressure would by then have been built up to 70 p.s.i., into the brake cylinders.

42. I saw both the tail lamps of train no. 44 very shortly after the accident. The lens of the electric tail lamp was dirty and it was difficult to see even from a short distance whether the lamp was alight. The reflector of the oil tail lamp was blackened by burnt oil, and that lamp also gave an extremely poor light.

CONCLUSIONS

43. Motorman Martin was entirely responsible for this accident through failing to comply with the very clear Rules which required him to drive train no. 45 with caution after "tripping" past starting signal no. A801, and to be prepared to stop short of any obstruction. The need for the exercise of caution is emphasised in the Rules by the use of capital letters. Martin had "tripped" past two signals before reaching Victoria and had realised that there was a signal failure somewhere, and I have no doubt that he understood from the station inspector that it was the starting signal that had failed; the inspector denied having told the motorman that the starting signal had failed but he mentioned that signal when he telephoned to the signal lineman. I also believe that, having passed the starting signal, Martin assumed that he had passed beyond the area of trouble and had a clear run at least to the next signal, and that he accelerated in a normal way turning the control handle into the parallel position. Martin had, however, no justification whatever for making such an assumption. As already mentioned he is 35 years of age and had been a motorman for 8 months; he had a clear record.

44. I have little doubt that the train must have reached a speed of nearly 20 m.p.h.; also that, as Martin was not expecting to find a train ahead, he was looking for the next signal and not for tail lamps, and neither of the tail lamps on train no. 44 was bright enough to have attracted his attention. Martin could not, however, have failed to have seen the outline of the whole of the rear end of the stationary train when it came clearly in view at a distance of just over 100 ft., and I think that in all probability he must have seen part of it from a still greater distance (see paragraph 39). According to Hill who was in the motorman's compartment, Martin's reaction was rather slow and it seems that he did not apply the brakes, by releasing the dead man's handle, until the train was 75-100 ft. from the train ahead. If Martin had been driving with caution (i.e. 5-7 m.p.h. or even a maximum of 10 m.p.h.) the train could have been stopped in that distance without difficulty; but from the speed that it had reached the distance was too short for it to be stopped, though the brake application reduced the speed to 8-10 m.p.h. when the impact occurred (see paragraph 40). Not more than 3-4 seconds elapsed between the application of the brakes and the impact and it is not, therefore, surprising that Mr. Meacham and Mr. Lawrence, who were passengers, and the guard did not notice the application, though Mr. Salter who was also a passenger had done so. It will also be recalled that the guard of the stationary train first realised that train no. 45 was approaching when it was about $1\frac{1}{2}$ coach lengths (75 ft.) away, that he heard the noise of the air escaping from the brake valves and realised at once that it would not stop before striking his train. It will further be recalled that Mr. Salter had estimated that the train reached a speed of 15 m.p.h. and that the speed of impact was 10 m.p.h.

45. It is easy to be wise after the event, but I think that Mr. Impey, Station Master Victoria, made two errors of judgment. Firstly, I do not think that he should have removed the traction current from the section Victoria—South Kensington so soon and without consulting the line traffic controller. The current had to be removed for the detrainment of passengers from trains no. 44 and 45 because the current rail gap is in the tunnel towards St. James's Park, but if it had been left on for only a few minutes longer the immobilized trains between Victoria and Sloane Square and between Sloane Square and South Kensington could have been moved forward and the detrainment of passengers would have been easier and more expeditious; the train in Sloane Square station could have been held there. Secondly, except for telling staff to prepare lamps, etc., Mr. Impey apparently made no arrangements for the detrainment of the passengers from trains no. 44 and 45 and he did not obtain the line traffic controller's permission to detrain them (as is required by the Rules). His intention was to walk through and assess the situation in both the trains and then to return to the station and telephone to the controller for permission for detrainment, but this would have resulted in an unnecessary waste of time; it did not occur to him to try to use the "Drico" system on the train to speak to the controller. In the event, he found on returning through train no. 45 that the detrainment of the passengers had been started without authority and without supervision by any senior railway staff.

REMARKS AND RECOMMENDATIONS

46. I commented on the "Stop and Proceed" arrangement in my report on the accident near Stratford on the Central Line on 8th April, 1953, and said that it was necessary for it to be retained on London Transport Railways in order to prevent the entire dislocation of the service in the event of the failure of a signal or a train. The arrangement requires a motorman to exercise some judgment of the speed at which he drives a train after passing a signal at Danger, to ensure that he can stop it short of any obstruction he may encounter. The Rules do *not* however permit him to exercise *any* judgment on the *cause* of a signal remaining at Danger or on the *need* for proceeding cautiously after passing it. It was in exercising judgment on this latter point that the motorman failed, and caused this accident.

47. The motorman had driven trains for only some eight months. He had been examined in the "Stop and Proceed" Rules and had applied them on one occasion previously, but on that occasion, and when he applied the Rules at two signals on the approach to Victoria just before this accident, the line had been clear to the next signal. Colonel W. P. Reed recommended in his report on the collision near Watford on 16th October, 1962, that drivers should, during their period of training, be required to apply the "Stop and Proceed" Rules under the supervision of a driving instructor. I fully endorse that

recommendation and I hope that it will be accepted. I would suggest further that when this is done, arrangements should be made for the drivers or motormen to experience the varied conditions that may obtain. A recently developed method of simulating running conditions on a screen would, I am sure, be of considerable help in such training.

48. There can be no excuse for the electric and oil tail lamps of the stationary train giving such a poor light on account of the dirtiness of the lens and the reflector respectively. If either had given a good light it might have attracted the attention of the motorman of the following train and caused him to apply the brakes in time to prevent the collision or at least to reduce the effect of the impact, even though the speed at which he was travelling was too high. The cleaning of lamps is a routine maintenance matter and I am informed that serious notice has been taken of this neglect of duty on the part of some men, and of the lack of supervision.

49. It has been a requirement of the Ministry of Transport that if London Transport trains are not equipped with two electric tail lamps fed from the train batteries on independent circuits, an oil tail lamp must be provided. I understand that it will be many years before all the trains can be equipped with two independent electric tail lamps. I am, however, glad to report that London Transport Railways have developed a portable flashing tail lamp fed by a dry battery. I have inspected a prototype lamp which gives an arresting light in a wide beam which the motorman of a following train could not fail to notice. This type of lamp is to be introduced experimentally on the Northern City line, and I hope that it will soon replace oil tail lamps generally on London Transport Railways.

50. The main cause of the delay in the detrainment of the passengers in trains involved in the accident was the lack of information available to the line traffic control office about the situation in the tunnel. The "Drico" telephone system has been provided at considerable expense to enable a train crew to speak to the line traffic controller and inform him about a delay to a train, an accident, etc. The system had been rendered ineffective after the fire that occurred between Shepherds Bush and Holland Park in July 1958, by the guard removing the auxiliary position switch key, and I commented on this in my report on that accident. The "Drico" telephone was again rendered ineffective after this accident by the guards of both the trains removing that same key. Both the guards have short service in their grade and neither was aware that by removing the key he had rendered the system ineffective. This indicates that the training of guards requires to be reviewed, and I am informed that this is being done. I am also informed that the whole question of communication between train crews and the line traffic control offices is being reviewed.

51. The cause of the delay in detrainment of the passengers from the train that was immobilized halfway between Victoria and Sloane Square was the unnecessary early removal of the current from that section by the station master, without consulting the line traffic controller. I am informed that arrangements are being made to hold regular courses for senior members of the staff such as station masters at which, among other things, the action to be taken in accidents such as this will be thoroughly considered and discussed. Such courses will, I am sure, have a beneficial effect and should go a long way towards preventing the repetition of the kind of mistakes that were made in this case.

52. No call was made for a doctor even when the second call was made for ambulances after it became known to the headquarter's traffic controller that some passengers were injured. In the event the services of a doctor were not essential, but I consider that in such circumstances a doctor should invariably be summoned.

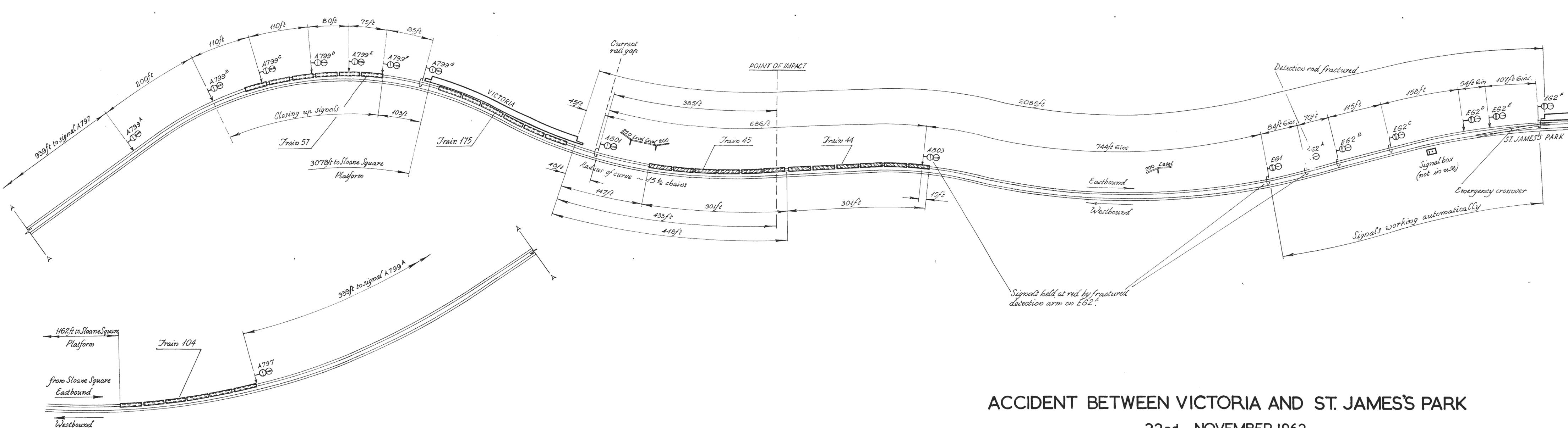
I have the honour to be,

Sir,

Your obedient Servant,

D. McMULLEN,
Colonel.

The Secretary,
Ministry of Transport.



ACCIDENT BETWEEN VICTORIA AND ST. JAMES'S PARK

22nd. NOVEMBER, 1962

