



DEPARTMENT OF THE ENVIRONMENT

# RAILWAY ACCIDENT

**Report on the Collision  
that occurred on  
12th October 1972  
at Wimbledon Station**

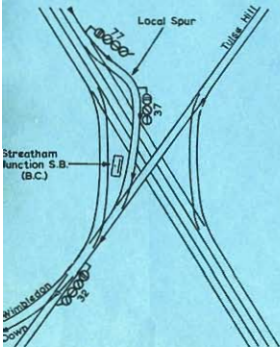
IN THE  
SOUTHERN REGION  
BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE  
1973

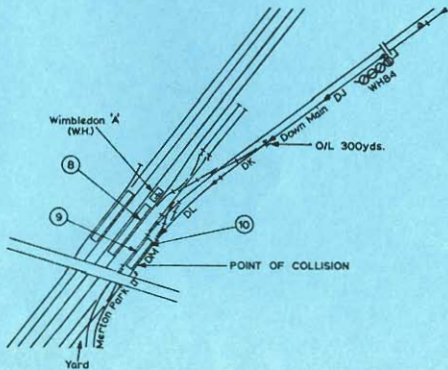
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# COLLISION AT WIMBLEDON

ON 12th OCTOBER 1972



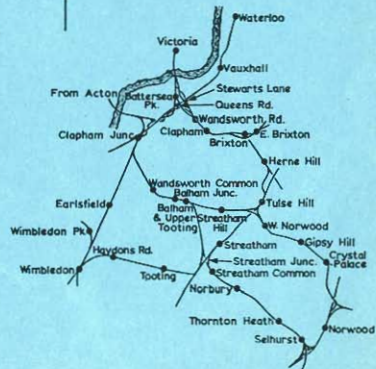
Streatham Junction



Wimbledon



Location Diagram



SIR,

I have the honour to report for the information of the Secretary of State, in accordance with the Order dated 13th October 1972, the result of my Inquiry into the collision between a goods train and an electric multiple-unit passenger train that occurred at 19.48 on 12th October 1972 in No. 10 platform at Wimbledon Station in the Southern Region, British Railways.

On a clear dry evening the 18.45 Acton to Wimbledon goods train, consisting of 22 loaded wagons and a brake van hauled by an electro-diesel locomotive, passed at Danger a colour light signal on the Down Streatham Junction line on the approach to Wimbledon Station and collided at about 25 mph with the rear of the 19.05 Holborn Viaduct to West Croydon 4-car electric multiple-unit train which was stationary. The passenger train was driven forward over 35 yards and its rear car badly stove in, its rear bogie being left embedded in the platform, 75 feet of which was also badly damaged. Both cabs of the locomotive, which was derailed, were stove in, and 7 wagons were derailed and 8 damaged.

The traction current was immediately and automatically discharged, and the emergency services were promptly called by members of the station staff and arrived quickly. 11 passengers were bruised or shocked, but although 4 were taken to hospital none was detained. The driver of the goods train suffered facial injuries and shock. Until repairs were completed during the night of 15/16th October, Central Division trains via Wimbledon were terminated at Streatham and St Helier Stations and connecting bus services provided.

## DESCRIPTION

### *The Site and Signalling*

1. The goods train's route approaches Streatham Junction, which lies 3 miles east of Wimbledon, from Balham on the Down Local Line as shown in the diagram opposite. Its route diverges left-handed climbing steeply onto the Down Local Spur and then curves right-handed over the main lines to connect with the Tulse Hill lines, which also pass over the main lines, beyond the two bridges and opposite Streatham Junction signal box (BC). The route then immediately diverges right-handed onto the Down Wimbledon line (called the Down Streatham Junction line in Wimbledon signal box). The Down local line from Balham has 4-aspect colour light signals. That protecting the turnout onto the Down Local Spur is equipped with a standard British Railways junction indicator (a line of five lunar white lights) controlled by lever BC 77 in Streatham Junction signal box and is 'approach-controlled' when reading to 3-aspect colour light signal BC 37 on the Down Local Spur which protects the trailing connection with the Tulse Hill line. A 4-aspect colour light signal with a right-handed junction indicator controlled by lever BC 32, signals trains to a fully automatic 2-aspect colour light signal CA 248 on the Down Wimbledon line situated 543 yards ahead of signal BC 32. There is an emergency trailing crossover, which is kept normally clipped and padlocked out of use, 354 yards on the approach side of signal CA 248.

2. All the lines described are fully track circuited and track circuit block with bell code signals applies between Streatham Junction and Wimbledon 'A' (WH) signal boxes. The actual aspects of all the signals protecting Streatham Junction, and the occupation of the track circuits including those up to the Wimbledon Home signal are indicated to the signalman, but he has no indication of the aspect of signal CA 248.

3. The Down Wimbledon line from Streatham Junction falls at gradients of 1 in 94 and 1 in 82 for nearly one mile to Tooting Station. Thereafter the falling gradient eases to 1 in 191, 1 in 320 and 1 in 860 for a further  $\frac{3}{4}$  mile to a point, some 800 yards before 3-aspect colour light Distant signal WH 82, where the line begins to rise at 1 in 1060. Shortly afterwards signal WH 82, which is 3,362 yards ahead of signal CA 248, comes into view. The braking distance provided by signal WH 82 to its 4-aspect colour light Stop signal WH 84 is 911 yards on rising gradients of 1 in 300 and 1 in 200. Haydons Road Station lies immediately beyond signal WH 82, and after passing under a road bridge the line continues curving left at a radius of 50 chains and in a cutting until signal WH 84 comes into view at a distance of 295 yards. Signal CA 248 will automatically clear to a green aspect when the track circuits up to signal WH 84, and when a 300 yard overlap beyond that signal (track circuit DJ), are clear. Beyond the overlap there are facing and trailing connections before the line enters the right-handed Wimbledon No. 10 platform. Wimbledon 'A' signal box stands on the right of the line 474 yards beyond signal WH 84 and the end of the platform lies about 100 yards beyond the signal box. All track circuits from the approach to signal No. CA 248 are indicated in Wimbledon 'A' signal box including track circuits DK, DL and the platform track circuit DM, which together extend beyond the overlap of signal WH 84 through the connections and the platform. Signals WH 82 and WH 84 are fitted with standard BR AWS inductors, and the actual aspects they display are indicated in the signal box.

### *The Trains*

4. The passenger train consisted of a 4-car electric multiple-unit formed of 4 EPB suburban unit No. 5220. It was 257 feet long overall and weighed 135 tons tare. This stock is of steel construction with fixed centre couplings between the cars. Three of the cars were of the open saloon type, but the third car in the



direction of travel was of the compartment type. The stocks' underframes are of an early SR design which, as described in Colonel Reed's report on the collision which occurred between Slade Green and Dartford on 17th February 1959, is only about half as strong as the later BR stock. In particular, the coach ends of the BR stock are  $2\frac{1}{2}$  times stronger than this SR design in their ability to resist telescoping.

5. The goods train consisted of 22 wagons and a brake van hauled by Class 73/1(JA) electro-diesel locomotive No. E 6001 weighing 75 tons. The locomotive was not fitted with AWS equipment. This class of locomotive can operate at 430 HP at the rails under diesel power or at 1600 HP at the rails under electric power. It is also equipped to operate air, vacuum, or electro-pneumatic train braking, but the locomotive brakes are air brakes with a brake efficiency of 82.7%. The first six wagons in the train consisted of 21-ton vacuum-braked hopper wagons coupled to the locomotive to form a 'fitted head'. These wagons had one cast-iron brake block per wheel situated on the side between the axles and operated through fixed linkages by vacuum cylinders mounted centrally over a head stock so as to be clear of the bottom opening doors. The remainder of the train consisted of three 21-ton hopper wagons, seven 16-ton mineral wagons and one 21-ton coal wagon, a further four 21-ton hopper wagons, and a 20-ton brake van at the rear. The train was 586 feet long overall; all the wagons were loaded with coal or coke and the train's total weight, including the locomotive, was 544 tons, of which the total laden weight of the 6 wagons forming the fitted head was 136 tons. The calculated brake force from the panels on each wagon forming the fitted head was 36 tons, and the brake force of the locomotive was a further 31 tons making a total available brake force, excluding that of the brake van, of 67 tons. (The guard had stated 66 tons on the driver's slip).

#### *Accident Damage*

6. The point of collision was probably 208 feet beyond the end of the platform, and some 5 feet on the approach side of a staff and waiting room platform structure. It was thus about 650 yards beyond signal WH 84. The passenger train was driven forward about 110 feet, but the locomotive also crushed the rear of the passenger train a further 14 feet forward before it finally came to rest. The sides of the rear car were bowed out over 4 feet. The platform coping was badly damaged from a point 30 feet beyond the probable point of collision and slabs of concrete were thrown over a wide area. The rear bogie of the passenger train lay embedded in the platform coping 60 feet further on and 30 feet behind the final position of the front of the locomotive. All the platform coping stones thereafter had been dislodged a distance of 2 feet in the direction of travel. 155 feet of the track had to be re-sleepered.

7. The damage to the derailed rear car of the passenger train was serious. Most of the windows were broken and most of the seats were dislodged. The rear section of the car was totally destroyed. Damage to the compartment car ahead of it however was only slight and it was not derailed. The locomotive was derailed all wheels. Its leading (No. 1) cab was stove in and the control desk split but not sufficiently to trap the driver. The leading wagon of the train was derailed with its rear wheels lifted high off the rails and its forward end embedded into the rear (No. 2) cab of the locomotive which was also badly damaged. This wagon's rear buffers were embedded into the leading end of the second wagon which was also 'cocked up' at its leading end, and derailed all wheels. The vacuum cylinders were at the rear of the leading wagon and at the forward end of the second wagon and both had been crushed, the former by the body of the second wagon, and the latter by a buffer of the leading wagon. The 10th, 11th and 12th wagons were also derailed with the rear of the 10th and the forward end of the 12th lifted off the rails and buffer-locked over the buffers of the 11th wagon which was badly crushed and bowed out on both sides. The 19th wagon was derailed at its rear end and buffer-locked with the 20th wagon, and both these wagons were damaged.

#### EVIDENCE ON THE EVENTS

8. *Rest Day Relief Signaller A. J. Monk* was on duty in Streatham Junction signal box at the time of the accident. He 'described' the 19.05 Holborn Viaduct to West Croydon passenger train to Wimbledon at 19.30 and it passed his signal box on time at 19.32. He recorded that the 18.42 Acton to Wimbledon goods train passed his signal box at 19.42 and believed that he had 'described' it to Wimbledon at that time and that it was running about 1 minute late. As the train entered the Down Local Spur he set the route for it onto the Down Wimbledon line. Because signal BC 32 is controlled to a red aspect until a train is closely approaching it, signal BC 37 on the Spur was showing a yellow aspect as the train passed it. He told me that the goods train passed his signal box and approached signal BC 32 at between 5 and 10 mph and he was perfectly sure that when he pulled lever BC 32 to signal the train onto the Down Wimbledon line that the track circuits on that line up to the overlap beyond signal WH 84 were showing clear, and that both signal BC 32 and signal CA 248 must therefore have been showing green aspects.

9. His signal box records also showed that at 19.46 the Wimbledon 'A' signaller 'described' the 18.47 London Bridge to Holborn Up train to him, and 3 minutes later at 19.49 he received the 'Obstruction Danger' bell code signal and took the appropriate action.

10. The signaller in Wimbledon 'A' signal box working the Streatham Junction line at the time of the accident was *Signaller E. C. C. Browning*. There was no booking in the signal box but he thought that the Holborn train arrived in platform 10 on time. After its arrival he replaced the levers controlling signals WH 84 and WH 82 to their normal positions and saw signal WH 84 indicated as displaying a red aspect, and signal WH 82 a single yellow aspect. He was quite positive that when the 18.45 Acton goods train was

“described” to him the 19.05 was already standing in platform No. 10, for track circuit DM was showing occupied; also that there was no work going on on the line, and no signal technicians working on the signalling at the time. He had ‘described’ the 18.47 London Bridge to Holborn passenger train, which was standing in platform 9 waiting to depart, to Streatham Junction and had set the route and cleared the signals for it to proceed when he left the signal box to go to the lavatory leaving *Signalman S. E. Langton* in charge. Before leaving he saw the goods train being indicated on the approach track circuit to signal CA 248. Signalman Langton told me that he became aware that something was wrong when he heard a goods train running on the Streatham Junction line at a “far greater speed” than was usual. From its sound he thought it must have been travelling at between 30 and 40 mph as if it was running under clear signals on the open line, which he knew was not the case. He saw that the levers controlling the aspects of signals WH 82 and WH 84 were normal in the frame and went to the window in time to see the collision. He said that he did not hear the locomotive of this train sound its horn.

11. It was then that Signalman Browning came back into the signal box. The collision occurred as he entered the box and on seeing what had happened he immediately sent the ‘Obstruction Danger’ bell code signal to Wimbledon ‘B’ and Streatham Junction signal boxes. When the goods guard came into his signal box he asked him if he had protected his train and the guard left to do so. Almost immediately he was telephoned by Selhurst Electrical Control who said that the current was cut off on the Down line from Haydons Road to Wimbeldon ‘C’ and on the Spur line to Merton Park following a short circuit (the time it was cut off was recorded as being 18.48), and Browning told them not to re-energise.

12. Browning told me that when the goods train was running on time or late it might get a clear route through the platform into the Down Yard, but so far as he remembered, and he had been on duty every night that week, the train had been held at signal WH 84 on each of those nights. He thought that a usual speed for this train to pass his signal box was 10 to 20 mph.

13. The driver of the 19.05 Holborn Viaduct to West Croydon train was *Driver B. J. Hogben*. He had stopped his train at Tooting and Haydons Road Stations and when he passed signal WH 82 it was displaying a single yellow aspect. He approached signal WH 84 at 20 to 25 mph and he was stopped almost half a minute at it. He told me that it was the first time he had seen it at red, and that it was usually displaying a single yellow aspect which allowed him to proceed into the platform.

14. He stopped his train in platform 10 with the cab a few feet short of the ‘3 and 6 car’ stop board (in estimating the probable point of collision I have assumed it to be 4 feet). Having made a full application of the air brake he put the master switch to ‘off’, the brake handle to the release position and removed his ‘EP’ key. He said that he would normally also apply the handbrake but he could not remember whether he had done so on this occasion. As they had 7 minutes to wait, he met his guard at a small kiosk half way down the platform for a cup of tea and he neither saw nor heard the approach of the goods train which collided with his. His guard, *Guard H. B. Strong* had seen signal WH 84 at red as they stood at it, and he too said that he had never seen it display a red aspect before. Nor did he hear the goods train’s approach as they were having their tea. He thought that there was 25 to 30 passengers in the train and his first concern after the accident was to help them.

15. Locomotive 6001, was driven earlier on 12th October 1972 by *Driver F. Holloway*, who had booked on duty at Waterloo at 12.39, and had taken over the locomotive at 13.25. His first task was to take 16 fully fitted milk tank wagons to Clapham Junction where he collected two more tanks and took them to Acton Yard. He was positive that all the brakes were working correctly then. He placed the locomotive at the head of a coal train in Acton Yard and left it to go for his personal needs break. At about 18.15 *Guard J. Lambert* came to the locomotive and coupled up. Having carried out a satisfactory brake test Lambert handed him a driver’s slip showing him that they had 22 wagons in the train, that it weighed 500 tons, had a calculated brake force of 66 tons and, because the train included short wheelbase wagons, it was limited to 45 mph. As they had plenty of time Holloway said that he also tested the Driver’s Safety Device.

16. They left on time at 18.45 and had a clear run to the Viaduct Junction Distant signal where Driver Holloway buffered his train up with the locomotive’s straight air brake and used the automatic (vacuum) train brake on the falling gradient which, he said, eased the train up nicely. They were held at the Latchmere Junction Home signal and again at the Starting signal where they had to wait 6 minutes, and the brakes worked well on each occasion. He noticed no unusual leakage and did not require to use the booster to maintain vacuum. He drove the locomotive under diesel power until handing it over to *Driver W. Tielus* at Clapham Junction where he thought that they were about 10 minutes late arriving. Holloway said that the brake selector switch was in the ‘vacuum normal’ position, and the ‘fitted/unfitted’ switch in the ‘unfitted’ position. (The latter was in fact in the ‘fitted’ position—see paragraph 29). Driver Tielus was waiting on the platform as they arrived and Holloway gave him the driver’s slip, and when he had got out of the cab reminded Tielus that it was a 45 mph train. He saw Tielus go to the telephone and the signal cleared almost immediately. Holloway told me that he did not have the heater on, and that his windscreen was reasonably clear and he did not have occasion to use the windscreen wiper.

17. *Guard J. Lambert* who had entered the railway service in 1938 and had been a guard 22 years, being 61 years of age, confirmed Driver Holloway’s evidence. He said that after the shunters had assembled the

train at Acton he had coupled it up using the Instantan couplings in the short position. He also coupled the locomotive onto the train and asked the driver to create vacuum and then to apply the automatic brake. He said that he then tested, by kicking them, all the brake blocks on the fitted head on both sides of the train and they were all hard on the wheels. He then made out a driver's slip which he gave to Holloway and, as he knew that he was to hand over the train at Clapham Junction, he asked him to remind the relieving driver that the train was limited to 45 mph. On his way back to his brake van he checked that the brakes on the wagons had all been properly released. He said they left on time and had a good run to North Pole junction but thereafter they had to brake several times and he fully applied his own brakes on the bank down into Kensington.

18. Guard Lambert told me that, after changing drivers, they left Clapham Junction at 19.29 and when his brake van was about 100 yards beyond the platform and while he was still taking off his brake there was a rather bad snatch owing he thought, to the locomotive changing over to electric traction. He said that it was a common occurrence and was certainly not bad enough to cause wagons to buffer lock. They had a reasonable run to Streatham Junction travelling, he thought, at 45 mph on the way, and they were not stopped through the Junction which they took at a steady, but usual, speed. He saw the white lights of the left-handed junction indicator above signal BC 77, and also of the right-handed indicator above signal BC 32 which he was certain was showing a green aspect, as was signal CA 248. He thought that they were travelling at about 45 mph down the bank through Tooting and they continued at a good pace to between Haydons Road and WH 84 signal when an Up train passed them on the other line. He knew that that train left Wimbledon at 19.46 and that the 19.50 would therefore still be in platform 10 ahead of them. As they were travelling at about 30 mph and too fast to be able to stop at signal WH 84 he realised there was going to be a collision so he fully applied his brake, and he was still holding on to its handle as hard as he could when the collision occurred. His brake van came to rest opposite Wimbledon 'A' signal box and after reporting to the signalman he went back to protect the rear of his train by placing six detonators on the approach to signal WH 84.

19. Two witnesses saw the goods train entering Wimbledon Station. *Leading Railman B. W. Oliver*, who had worked as platform staff for eighteen months, was walking northwards half way along platform 8 when he saw the train approaching over 500 yards away under a road bridge. He told me that its head code was alight but not the driver's cab light, and he estimated its speed to have been between 30 mph and 40 mph when he first saw it, but no faster than some trains travelled when they had a clear run to enter the Down yard. He heard no buffering up of wagons until the collision actually occurred. *Guard T. J. Attwater* was on platform No. 10 also walking northwards. He first saw the train after it had passed WH 84 signal, and because there was already a train in the platform he knew there was going to be a collision, so he went back to the porter's room and got under the table. His first impression was that the train was approaching at a speed normal for one entering an unoccupied platform. He also noted that the red blinds on the rear of the passenger train were lit, as was the head code of the approaching locomotive. He too heard no sound of braking or buffering up before the collision occurred, nor did he hear a horn sounded. Guard Attwater later helped get the goods train driver out of his cab. He told me that the latter was very shaken and his face was cut but that he seemed to be sober.

20. *Motive Power Supervisor I. Morgan* was on duty at Norwood Depot when the driver of the goods train *Driver W. Tielus* was due to report for duty. Supervisor Morgan told me that Driver Tielus was scheduled to report to him at 17.00, and to travel passenger via Clapham Junction and Battersea to Stewarts Lane Depot to 'conduct' another driver, who was still learning the route, to Herne Hill. He was then to return to Clapham Junction to take charge of the goods train at 19.29. At 17.30 Driver Tielus telephoned him on the railway telephone from Thornton Heath Station and explained that he had overslept and asked for permission to go straight to Stewarts Lane depot to do his 'conducting' duty. Supervisor Morgan knew it was Driver Tielus because of his broad Scottish accent, and said that he sounded lucid and spoke quite clearly over the telephone. He said that he gave him a "mild chastisement" and told him to go straight to Stewarts Lane. Supervisor Morgan told me that, following a serious accident at Eltham Well Hall (before which the driver had signed on by telephone) he had received instructions on the subject from the shed master, but it had to be left to the Supervisor's discretion to ensure that trains were manned (there were already 9 schedules for which he had no driver available on 12th October) and the shed master had not required supervisors to report the names of drivers who had signed on by telephone. Supervisor Morgan told me that Driver Tielus had also signed on by telephone on the previous Wednesday, but on that occasion he had done so at 17.00 the time at which he was due to book on duty.

21. Before starting to take any evidence I had asked *Driver W. Tielus*, driver of the goods train, to remain in the room to hear all the evidence given and I heard his evidence last. He told me that he had booked off duty from his previous turn at 00.55 on 12th October and then had a 16 minute walk home following which he had made himself a cup of coffee and gone to bed. He had slept well until 08.30 and in the morning had been to Norwood to collect his pay. He had just become separated from his wife, and he had therefore done some shopping and had visited a public house where he had drunk two pints of ginger beer and Guinness shandy before returning home. He had had a good meal and was dozing in a friend's house after watching television when he was woken up by his friend at 17.10. He thought he must have slept for about 45 minutes.

22. Having telephoned his Depot from Thornton Heath at 17.30 he made his way to Stewarts Lane Depot (the next train leaves Thornton Heath at 17.45 and arrives at Battersea Park via Clapham Junction at 18.06) but on arriving there he saw the train on which he was to have 'conducted' leaving the yard. After

visiting the driver's room there he decided he should go straight to Clapham Junction to await his next duty, that of driving the goods train. He assured me that he had not drunk anything between visiting the public house at mid-day and taking over the locomotive of the goods train at Clapham Junction just before 19.29.

23. He confirmed that the previous driver had handed him the 'driver's slip' giving him his "load and the rest of it" and had told him that the locomotive was on diesel power. After he had telephoned the signalman the Starting signal soon cleared and he started the train on diesel power. He felt a slight snatch as he changed to electric power shortly after leaving the platform, but not a bad one. He received restrictive signal aspects most of the way to Streatham Junction and Signal BC 77 reading onto the Down Local Spur cleared to a yellow aspect as he approached it. He drove onto the spur at about 18 mph and the next two signals, that on the spur, BC 37, and BC 32 reading onto the Wimbledon line, both cleared to single yellow aspects as he approached them, the latter with its junction indicator lit. He approached the next signal CA 248 very slowly, and when he was an engine's length from it its red aspect changed to a green one.

24. He kept the train in check using his locomotive's straight air brake because of a temporary speed restriction which began at the emergency cross-over and ended at Tooting Station, but thereafter allowed his train to accelerate down the bank until, when passing Haydons Road, he thought he was travelling at about 25 mph. The Distant signal WH 82 was showing a single yellow aspect and he therefore started to apply his straight air brake (he said he applied 20 lbs of air) thinking it would buffer up the train, but it did not do so. He said that as he applied more and more brake he felt the train surging forward three times, and each time the surge was "bad enough to keep me going". He then said "I waited until I got round the corner and I had plenty of room for WH 84 and was sitting with the straight air (locomotive) brake on with about 40 lbs pressure, and with the automatic (train vacuum) brake in my hand, and I was going to start to brake . . . and I said to myself 'it is not pulling up' so I put it (the train vacuum brake) down to 10 ins of vacuum". He was then very close to signal WH 84 which was at Danger.

25. He told me that he knew that there must be a passenger train in the platform although he was so busy he did not see it. He made a full application of the automatic brake (which applies both the locomotive's air brakes and the train's vacuum brakes) but nothing seemed to happen and he thought he passed signal WH 84 at about 15 mph. He then released the automatic brake and re-created vacuum using the high-speed exhauster, hoping that a second application of the train's brakes would prove more effective. He also operated the sander and took his foot off the driver's safety device (which, after a short delay, fully applies all brakes) and he also lifted the emergency brake handle which immediately fully applies both air and vacuum brakes, and he sat like that until the collision occurred. He thought that the locomotive's wheels had "picked up" just before the collision occurred.

26. Driver Tielus told me that when driving the same train on the previous evenings that week he thought he had been held at signal WH 84 on most occasions. The Up passenger train had generally passed him as he was approaching Haydons Road Station, or else it was stopped in the station as he passed it, but on the day of the accident he was already past signal WH 84 when it had passed him.

27. Driver Tielus was 42 years old. He had entered railway service in 1953, and had been a driver for 5½ years. I asked him whether he thought that his personal problems could have affected his work, but he replied that they had done so when they first began but they had all been cleared up and settled in his mind long ago, and he thought that he was no longer affected by them.

#### EVIDENCE ON SIGNALLING TESTS

28. *Signal Supervisor J. E. Smith* was called to Wimbledon 'A' signal box by a technician and arrived at 20.05. He saw that levers No. 82 and No. 84 were normal in the frame and that track circuits DM, DL and DK were all showing occupied on the signal box indicators. The overlap track circuit to signal WH 84, track circuit DJ, was showing clear. He then fully tested the controls and circuits appertaining to WH 82 signal and found all in order. He was unable to test the circuits of WH 84 signal because the line was occupied by the trains, but he fully tested them the following night and found all in order. Signal CA 248 was not indicated in the signal box and he did not test the circuits, but he did test the AWS inductors at signals WH 82 and WH 84 and they also were in order.

#### EVIDENCE ON THE TRAIN'S BRAKING

29. The locomotive was examined by *Mr. K. Weatherley, Divisional Traction Engineer*, as it stood in No. 10 platform about half an hour after the accident. He found the driver's controller key still in position, the reverser handle in the 'forward parallel' position (enabling the driver to take full power) and the power controller in the 'off' position. The straight air (locomotive) brake handle was in the 3 o'clock position which is about one third applied, and the control air gauge showed 32 lbs per square inch. The automatic brake handle was in the fully released position and the duplex vacuum gauge was reading 20 inches of vacuum. The 'fitted/unfitted' switch in No. 1 cab was in the 'fitted' position and all the gauges and meters on the driver's desk were at zero. The cab heating switches were 'off' and both windows on the left hand side of the locomotive were closed but the secondman's drop light was ¼ inch open and the right hand door drop light was 2 inches open. He felt the brake blocks on the locomotive and they were still slightly warm.

30. He also examined the wagons forming the 'fitted head' of the train. The vacuum pipe between the locomotive and the first wagon was still connected and that on the rear of the sixth wagon was on its dummy. The pipe between the second and third wagons had been torn apart in the accident. He felt the brake blocks on the right hand side of the first three wagons (two blocks on each wagon) and they were all cold. The brakes were applied on the third and the remaining wagons and Mr. Weatherley told me that when he pulled the release strings on these wagons he heard an inrush of air into each cylinder proving that there was still some vacuum in the cylinders.

31. Mr. Weatherley showed me the wagons which had formed the 'fitted head'. Photographs taken after the accident show how the first and second wagons had become buffer-locked with each other. Their vacuum cylinders had been crushed in the collision leaving their pistons in the lower halves of the cylinders which makes it certain that at the moment of collision the brakes on these wagons cannot have been applied. The leading wagon's brake blocks were not touching their wheels but those on the second wagon had been pulled into the applied position by damage to the brake rigging.

32. The locomotive was very fully tested in the presence of *Mr. R. G. Jupp, Engineering Assistant (Rolling Stock Development), Croydon*, and his report indicates that the locomotive was in excellent working order and that its braking system should have been working satisfactorily. Mr. Jupp tested the brake cylinder control chamber, which still retained 8 inches of vacuum 14 hours after the accident (compared with 20 inches noted by Mr. Weatherley half an hour after it), which indicates a low rate of leakage and a well maintained system.

33. Mr. Jupp also closely examined the wagon brakes. The brakes on the type of hopper wagon forming the fitted head are not 'equalised'; each block is directly applied by the brake cylinder instead of being balanced against the block on the paired wheel. He carried out a brake test on the third to sixth wagons of the fitted head (the first two wagons were too badly damaged to test) using locomotive E6033. The brake cylinders were all working satisfactorily and the release valves were closing correctly. The wagons had almost new brake blocks and he found that when the vacuum was reduced to 13 inches of vacuum one block on two wagons and two blocks on two other wagons were not in good contact, and with a full brake application one block on three wagons and two blocks on one wagon were still not fully applied. One of the blocks not fully applied was that on the leading wheel on the right hand side of the third wagon, which Mr. Weatherley had felt. I asked for the release valves on the leading two wagons to be checked, but only one of them could be found; it was however in a satisfactory condition.

34. Mr. Jupp told me that both the sand boxes on the left hand side of the locomotive which are operated from No. 1 cab were empty of sand, and the two on the right hand side were missing. Those which are operated from No. 2 cab were all present and were  $\frac{3}{4}$  full of sand.

#### SUBSEQUENT INVESTIGATIONS

35. On 25th October I travelled in the cab of locomotive E6004 hauling a similar train on the same route. The calculated brake force was 66 tons and the train's weight was 640 tons, compared with 67 tons and 544 tons of the train involved in the accident. The train was driven as was described by Driver Tielus in his evidence, and the weather conditions were similar. After having been brought nearly to a stand at signal CA 248 it was allowed to roll down the bank to Tooting at a speed not exceeding 20 mph. The controller was placed in Notch 1 under electric power and the train achieved 26 mph as signal WH 82 came into view where power was shut off. Shortly afterwards the locomotive's straight air brake was applied to 20 lbs per square inch, and speed was reduced to 16 mph when the application was increased to 40 lbs per square inch. The train passed through Haydons Road Station at 12 mph and came to rest, without any use of the automatic vacuum brake on the train, 498 yards short of signal WH 84. The elapsed time from leaving Streatham Junction to coming to rest was 7 minutes 25 seconds.

36. The performance curves of a Class 7 train similar to that involved in the accident observing the 20 mph temporary speed restriction approaching Tooting, and thereafter travelling at 30 mph, then 35 mph down the bank, and attaining 38 mph approaching signal WH 82 and braking to stop at signal WH 84, shows that such a train would take about 5-6 minutes over the journey. At an average speed of 20 mph a train would take about one minute to travel from signal WH 84 to the point of the collision. The curves also show that such a train braked from a point closely approaching signal WH 84 would approach the point of collision at up to 20 mph.

37. I asked *Mr. P. Perry, Mechanical and Electrical Engineer (Running Maintenance) Southern Region*, if he could, from an assessment of the accident damage, and from his experience, estimate the speed of collision with the passenger train. In his opinion it was unlikely to have been below 20 mph, or above 30 mph.



#### ADDITIONAL EVIDENCE

38. Following the accident Driver Tielus was taken to hospital by ambulance. Following an allegation that Driver Tielus had been drinking *Mr. C. A. Rose, Chief Personnel Officer* Southern Region and *Inspector A. Scarll* of the Metropolitan Police based on Wimbledon Police Station visited him in hospital. Mr. Rose has told me that at 22.45 after Tielus had received treatment there was a faint smell of drink on his breath, but his speech was perfectly clear and distinctive and he was perfectly rational, although obviously suffering from shock. Inspector Scarll has told me that when he visited him at about 21.30 he also could smell drink on his breath but he was satisfied that Tielus was "in no way drunk". When I asked him whether he had required Tielus to give a specimen he said that he had no legal authority to do so.

#### CONCLUSIONS AND REMARKS

39. The accident occurred because Driver Tielus failed to control his train correctly as he approached signal WH 84. It occurred at 19.48 as recorded in the Selhurst Electrical Control Office, some 6 minutes after the time that the goods train was recorded as having passed Streatham Junction signal box, and it is likely therefore that the train had a fast run, but there is no evidence that it had exceeded the 45 mph speed restriction.

40. Signalman E. C. C. Browning thought that the train had passed Wimbledon signal box at a far greater speed than was usual, and probably between 30 mph and 40 mph; and Guard Lambert also thought it was unusually fast and about 30 mph, and he was a man of considerable experience. Leading Railman Oliver who had less experience estimated the train's speed to be 30 mph to 40 mph after it had passed signal WH 84; Guard Attwater thought that it was being driven as if the platform were unoccupied, and Mr. Perry estimated the speed at impact to be at least 20 mph and possibly 30 mph.

41. The braking distance provided between signals WH 82 and WH 84 is more than that required for 45 mph Class 7 freight trains under the British Railways Standard Signalling Principle No. 34 Appendix F—'Braking Distances for Multi-Traffic lines'.

42. The train was not a heavy one and the available braking force should have been more than adequate. Nothing in the very thorough examination of the locomotive and braked wagons forming the 'fitted head' of the train indicated that there was a brake failure of any kind. The fact that one brake block on each axle on some of the wagons forming the 'fitted head' were not in full contact with the wheels, as noted by Mr. Jupp, does not mean that these wagons' brakes were faulty, for the remaining blocks would have had a greater than normal force applied to them through the 'non-equalised' linkage, until they had bedded in and shared the load. Furthermore, according to Driver Holloway, up to the time that Driver Tielus took over the train at Clapham Junction both the locomotive's air brakes and the train's vacuum brakes were operating efficiently. The position of the automatic brake controller and of the pistons in the brake cylinders of the first two wagons show that the train's vacuum brakes were not applied at the moment of impact. Although only one brake block felt by Mr. Weatherley was subsequently shown to have been in full contact with the wheel when applied, it was cold when he felt it which indicates that the wagon brakes had been little used.

43. I have studied the records in Clapham Junction and Streatham Junction signal boxes to see what the pattern of traffic was on the nights prior to the accident when Driver Tielus was driving the same train. On 9th October he left Clapham Junction at 19.23 and was running ahead of the 19.05 Holborn Viaduct to London Bridge and may have had a clear run into the Down yard at Wimbledon. The following night he was running very late and left Clapham Junction at 19.54 and followed not only the 19.05 train but also the 19.35 Holborn Viaduct train. On Wednesday, 11th October, when he had also signed on by telephone, he was running at about the same time as on the following night when the accident occurred, and must have been stopped at signal WH 84, and the 19.46 Wimbledon to Holborn Viaduct train must have passed him near Haydons Road on both evenings because that train ran on time to Streatham Junction on each evening of the week. There is therefore nothing which could have caused Driver Tielus to believe that the platform ahead of him was unoccupied on the night of the accident; indeed the passing of the Up train served as a very clear warning to Guard Lambert that a collision was imminent. I therefore do not believe that the reason Driver Tielus passed signal WH 84 at Danger was because he was expecting its aspect to clear having seen signal WH 82 showing a caution aspect.

44. Driver Tielus stated in his evidence that signal CA 248 was at Danger as he approached it, but this cannot have been so. Signalman Browning was sure that the line ahead was clear at that time, and so was Signalman Monk, and Guard Lambert saw signal BC 32 showing a green aspect. Furthermore from a study of the passing times of the Down trains it must have been displaying a green aspect when it first came into his view. The most likely explanation of the accident was therefore that he dozed off or allowed his concentration to wander and failed to see signal WH 82 displaying a yellow aspect. It is possible that he was brought to his senses by the passing of the Up train and it was then too late for him to prevent his train colliding with the passenger train. It is also possible that he left it even later before he began to take emergency action. By his own evidence he never saw the passenger train ahead of him and he took no action, even at the last moment, to get clear of the driving cab.

#### RECOMMENDATION

45. Had the locomotive been fitted with the standard British Railways Automatic Warning System (AWS) equipment I believe that Driver Tielus would have been brought to his senses in time properly to control his train. Had he not reacted to its warning even then, the train would have been automatically stopped and the collision avoided.

46. Personal problems probably contributed to Driver Tielus' lack of concentration, although he thought they had not done so. Having been late for work for the second day running, and having missed his first duty must also have given him much to worry about (he had signed on by telephone on both days). I believe that he was sober at the time of the accident, although the allegations, and the fact that his breath still smelt some nine hours after he said he took his last drink, must leave some element of doubt in this matter. (He had about one hour to wait between missing his "conducting" duty and taking over the goods train). Had there existed the machinery for establishing a driver's blood alcohol level after an accident that was recommended by Colonel Robertson in his report on the derailment that occurred on 11th June 1972 at Eltham (Well Hall) station then there need have been no doubt about this aspect.

I have the honour to be,

Sir,

Your obedient Servant,

A. G. TOWNSEND-ROSE

*Lieutenant Colonel.*