DEPARTMENT OF TRANSPORT

RAILWAY ACCIDENT

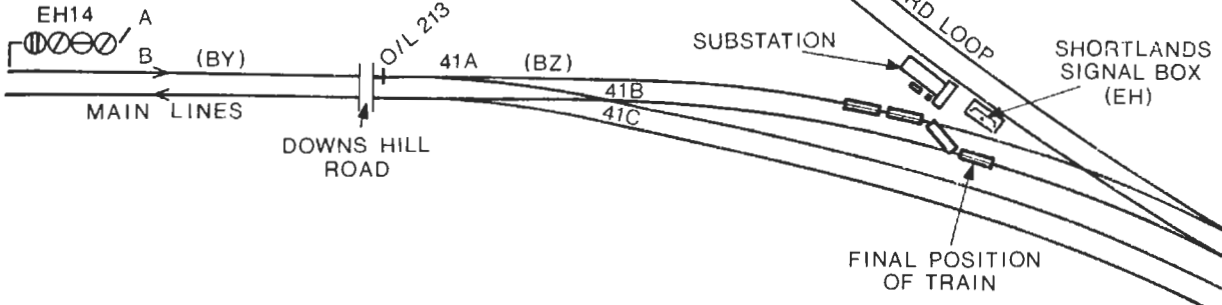
Report on the Derailment that occurred on 12th February 1976 at Shortlands Junction

IN THE
SOUTHERN REGION
BRITISH RAILWAYS

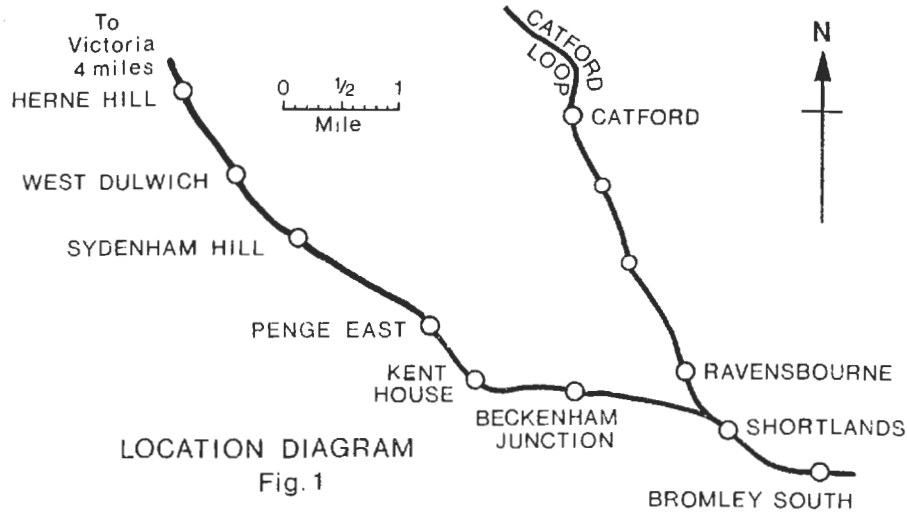
LONDON: HER MAJESTY'S STATIONERY OFFICE

35p net

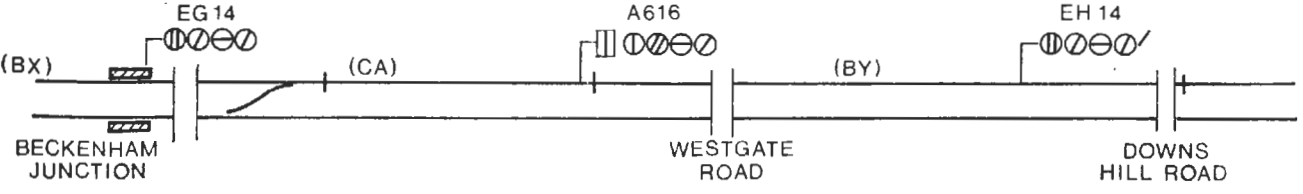
SHORTLANDS JUNCTION



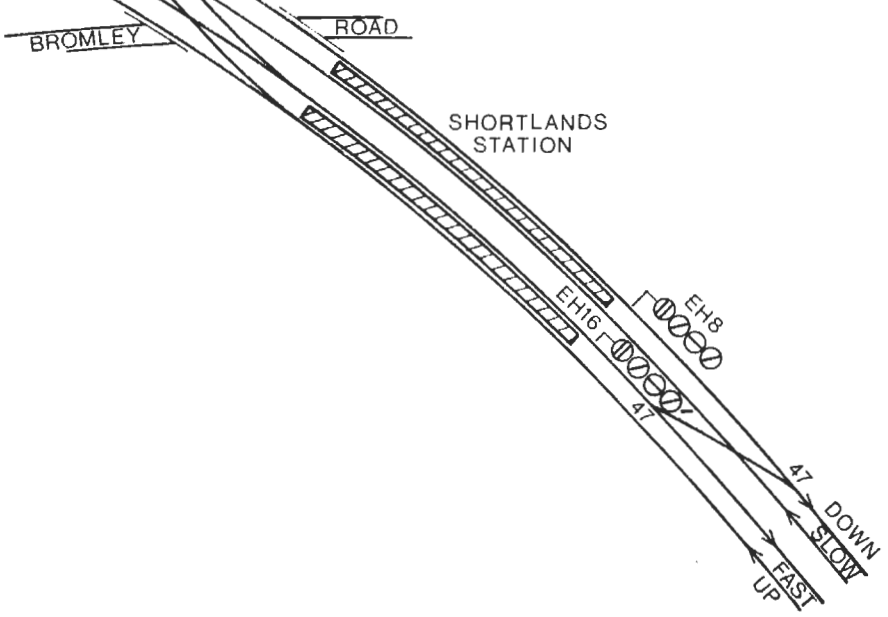
SIGNALLING DIAGRAM
Fig. 2



LOCATION DIAGRAM
Fig. 1



DETAIL DIAGRAM
Fig. 3



RAILWAY INSPECTORATE,
DEPARTMENT OF TRANSPORT,
2 MARSHAM STREET,
LONDON SW1.
29*th December* 1976.

SIR,

I have the honour to report for the information of the Secretary of State, in accordance with the Order dated 20th February 1976, the result of my Inquiry into the derailment of a passenger train at 16.10 on 12th February at Shortlands Junction on the Victoria to the Kent Coast Main Line in the Southern Region of British Railways.

In considering my recommendations I have also taken account of a similar derailment that occurred on the Brighton Main line at Earlswood on 13th May 1976.

Because a lorry had hit the low underbridge carrying the Slow lines over Bromley Road at Shortlands Station, the signalman was checking trains at the Down Main signal protecting the junction. As he was in the act of setting the route for a 4-car electric multiple-unit Victoria to Gillingham passenger train, it was driven past the signal at Danger and into derailment at the facing junction. The leading coach remained on the Down Fast line but was then directed through co-acting switch diamonds onto the Up Slow line. The third and fourth coaches were properly switched onto the Down Slow line but the second coach was derailed between the two Slow lines.

The emergency services were summoned promptly and responded quickly; only one lady passenger was slightly injured. The Up Fast line was reopened to traffic at 03.45 the following morning, but the Down Slow line was not cleared until 14.50 on 13th February and the Up Slow and Down Fast lines not until repairs had been completed at 14.00 on 17th February.

Light was failing at the time of the accident and it was raining.

DESCRIPTION

The Site and Signalling

1. As shown in Figure 2, Shortlands Junction Signal Box lies between the Main lines and the Branch lines which are known as the Catford Loop and which connect some 500 yards north of Shortlands Station. At this point the Down and Up Main lines from Victoria have divided into the Down and Up Slow lines to the north and the Down and Up Fast lines to their south, and the Catford Loop lines have connections to both. There is a large unmanned sub-station outside the signal box on its west side. Shortlands Station consists of two island platforms serving the Slow and Fast lines respectively which pass over two parallel bridges immediately north of the station; the bridges have a headroom clearance of only 12 feet.

2. Track-circuit block applies controlled from Shortlands Junction Signal Box (EH). All signals are 4-aspect colour lights and no automatic warning system is provided. The box controls only one signal, No. EH 14, on the Down Main line protecting the junction, but track circuit indications are given from Beckenham Junction Station. The sequence of signals on this line are:

Beckenham Junction Station		
Platform Starting Signal	EG 14	577 yards to
Automatic Signal	A 616	573 yards to
Shortlands Junction Signal	EH 14	569 yards to the Signal Box

Signal EH 14 is fitted with a left-hand Junction Indicator reading to the Down Slow line. There are bridges immediately ahead of Signal EG 14, 175 yards ahead of A 616 (Westgate Road) and 210 yards ahead of EH 14 (Downs Hill Road). The line rises at gradients of 1 in 170 and 1 in 115 to Downs Hill Road where it starts to fall at 1 in 105 to Shortlands Station. The line speed is 60 mile/h on both Slow and Fast lines.

3. The signalman in Shortland Junction Signal Box stands with his back to the Main lines and facing an entrance-exit push button signalling panel installed in 1959. By looking over his left shoulder through a side window he can see Downs Hill Road Bridge and a train approaching under it, but because of the rising gradient beyond it he cannot see a train at Signal EH 14. The panel does not indicate train descriptions but a magazine-type train describer indicating the destinations of the next three trains signalled, stands to its left.

4. The layout of the junction is illustrated in Figure 2. Certain signals, including the Down Slow and Fast Platform signals EH 8 and EH 16, can be set to work automatically with crossover No. 47 set Normal so that the signalman does not have to reset those routes after a train has passed. Signal EH 14 will only clear to EH 16 on the Down Fast line if points No. 47 are set Normal or Reversed. The route is approach locked when Signal EH 14 is displaying a proceed aspect and track circuit CA is occupied until BZ or BY is occupied. Route 14A to signal EH 8 requires points No. 41 Reversed and route 14B requires them Normal. Once track circuit CA is occupied and signal EH 14 is showing a proceed aspect, the route, and hence points No. 41, are approach locked until either the train has passed or 2 minutes have elapsed. Once route EH 14B is set to signal EH 16 points No. 47 are locked Normal or Reverse whichever way they are set until track circuit BZ is occupied and BY is clear or 2 minutes have elapsed.

5. The berth track circuit BY is extended to give an overlap of 213 yards beyond signal EH 14, terminating 2 yards short of the tips of the blades of facing points No. 41, which are one yard on the Shortlands side of Downs Hill Road bridge. The signalman also controls detonator placers on all six lines outside his signal box.

The Track

6. Nos. 40 and 41 points, including the switch diamonds No. 41 were relaid in October 1973 in 113 lb flat bottom rail with standard carbon steel switches and manganese crossings on jarrah timbers. The junction is laid flat with no elevation although it is on a nominal 90 chains right-handed curve. Points No. 41 are electrically driven but a mechanical facing point lock is provided in the four-foot. Tests have sbown that it takes about 1¼ seconds to unbolt the facing point lock, a further 2 seconds for the points to move and 1½ seconds for them to be rebolted. The relays operate in about 1 second making a total of 6 seconds before the setting of a route from Signal EH 14, involving a change in the lay of the points, can be accomplished.

The Train

7. The train was the 15.50 Victoria to Gillingham 4-car EMU consisting of 'VEP' stock unit No. 7868. It was booked to run via the Down Catford Loop line but because Loughborough Junction was already occupied the signalman at Shepherds Lane box routed it along the Down Main line. The train weighed 148 tonnes with a braking efficiency of 85·9 per cent and was 266 feet long overall.

The Course of Derailment and Accident Damage

8. The right-hand switch of No. 41 facing points was bruised and there was a mark of a wheel derailing towards the four-foot from the six-foot stock rail. The tip of the left-hand switch was also bruised, and the marks on it suggested that a tyre had passed on the stock rail side of it. The front of the train came to a stand on the Up Slow line 350 yards past the points. Only the second coach was derailed all wheels and marks on the sleepers showed that its leading bogie was dragged into derailment near the switcb diamonds, while its trailing bogie became derailed on the Down Slow line nearer to No. 41 facing points than to the switch diamonds. The rear two cars followed on the Down Slow line and were not derailed. Only the second car of the train was damaged. Fifty feet of rail was buckled and also the diamond switches. 48 base plates and 40 conductor rail insulators were broken and 6 switch and crossing timbers required replacing.

Evidence

9. *Mr. D. W. Perry, Divisional Signal Engineer,* after describing the signalling, told me that it had been very fully tested after the accident and that nothing untoward had been found. In particular the 2 minute thermal timers which release the approach route locking had been tested and the shortest time recorded was 119 seconds. The locking was as stated in the Control Tables.

10. At the time of the accident *Relief Signalman L. R. Rubie* of Herne Hill was on duty in Shortlands Signal Box. He told me that he had qualified in 1967 and for working at Shortlands in 1972. Because of staff movements connected with the manning of London Bridge Signal Box he had worked from 10.00 to lunch time at Hither Green Signal Box under training and then from 14.00 to 22.00 at Shortlands. He had worked thus for two weeks from Mondays to Saturdays and on alternate Sundays. He usually left Hither Green at about 11.45 to have some dinner at home and arrived at Shortlands at about 13.30. On 12th February he had taken over that box at 13.25.

11. At about 14.45 he heard a collision between a road vehicle and the bridge carrying the Slow lines over Bromley Road; as there were no trains approaching he cancelled all routes and telephoned the booking clerk at Shortlands. He was later informed by the porter that the bridge had been only slightly damaged, so he decided to caution all trains on the Slow lines.

12. At 16.02 he described to Nunhead Signal Box the 15.22 Sevenoaks to Holborn EMU which ran via the Up Slow line onto the Catford Loop, and at 16.06 he described to Chislehurst Junction the 15.42 Victoria to Orpington EMU via the Down Main into the Down Fast platform to signal EH 16, which was working automatically. He had no 'signal box lad' to record train timings but the times that the trains were described have been checked from the other two boxes. The next train, the 15.50 Victoria to Gillingham EMU was described to him from Beckenham Junction on the Down Main line. Its first stop was at the Bromley South Down Slow platform where passengers were waiting. It was normal for him to signal Down Gillingham trains onto the Down Slow line so that they were correctly routed for the junction at Bickley.

13. The signalman at Beckenham Junction normally telephoned to give him prior information of the running of Down trains but on this occasion he had not done so, but had described the train to him as it was passing through Kent House Station at 16.05, some 3 minutes before its arrival at Signal EH 14. Rubie also knew that it was following the 15.42 Victoria to Orpington train, before that train had passed his box at 16.06.

14. He watched the 15.50 train occupy track circuits BX and CA approaching Signal A 616 and then track circuit BY, the berth and overlap track circuit of signal EH14. After waiting a short while to ensure that the train was under control approaching the signal he set the route from EH 14 to EH 8 in the Down Slow platform, exactly as he had done previously for the 15.40 Victoria to Ramsgate train. He used this

method because he considered that to wait until a driver telephoned from the signal would incur too much delay as not all drivers used a signal post telephone straight away.

15. As he was setting the route he looked over his left shoulder and saw the train coming under Downs Hill Road bridge. He then saw the leading car running on the Down Fast line towards him and the rear of the train on the Down Slow line with the second car between the two lines. The front of the train came to a stand on the Up Slow line just opposite to his signal box and only a few yards from his detonator placers. He immediately sent the 'Obstruction Danger' signal to Beckenham Junction and received in return the 'Train Running Away in Right Direction' signal. He then cancelled the automatic working of Signal EH 3 to stop the 16.00 Orpington to Victoria train which was approaching Bromley at that time.

16. Having informed Beckenham Junction and Chislehurst Junction signal boxes by telephone he attempted to contact the Lewisham Electrical Control on both the exchange and direct telephones, but was unable to do so on either line. He therefore telephoned the Beckenham Control and was told by the Controller that the current had been isolated. He then tried to call the emergency services but was at first unable to obtain a GPO line.

17. While he was thus engaged *Assistant Signal and Telecommunications lineman E. Taylor* came into the signal box followed by the driver and guard of the train and the S. & T. lineman, *Parker* followed by the Motive Power Assistant from Beckenham, *Mr. Lelew*. The guard asked him if he should protect his train to which Rubie replied that all trains had been stopped and all signals were at Danger and it was therefore unnecessary. The driver then said to him "I'm sorry mate, I skated by" and asked if he could telephone the motive power inspector at Victoria: this he was allowed to do.

18. Signalman Rubie assured me that at no time had he routed any Slow line train via the Down Fast line and then via points No. 47 reversed onto the Slow lines into Bromley Station, and he was adamant that he had not first set that route for the 15.50 Gillingham train and cancelled it again. He told me that the bridges at Shortlands were struck by a lorry about once every three months and the usual procedure was for the Station Manager to send someone to inspect the damage; in the meantime trains were cautioned as he had done on this occasion.

19. *Senior Technician R. A. Parker* was walking down the Catford Loop towards the signal box when the accident occurred. He heard the circuit breakers disengage in the sub-station and saw the train standing foul of both Slow lines; he hurried into the signal box via the rear door. He met the driver upstairs and asked him if he had 'run by' to which he replied that he had slid or skidded. Parker noted that the individual switch for points No. 41 was set in the central or 'automatic' position and he thought that the route lights on the panel showed that a route along the Down Slow line had been set.

20. *Permanent Way Supervisor O. Meagan* arrived at the scene of the derailment soon after 17.00. He found No. 41C facing points set for the Down Slow line; the tip of the right-hand switch rail had received a slight blow and the left-hand switch had marks towards the top of the planing, but the switches were still fitting well. However the right hand diamond switch blade was crippled, several base plates had been broken and the stretcher bars were all bent. He had last inspected the points on 30th January when he found them little worn and fitting well.

21. In a statement, *Track Chargeman F. D. H. Scroggins* said that he inspected the junction on the day prior to the accident and found the points set for the Down Fast line and fitting well. He noted nothing untoward about them.

22. The driver of the 15.50 Gillingham train was *Driver J. M. Maunsell* of Victoria. He took over his train in Victoria Station and after completing a brake test, departed on time; his first stop was at Bromley South. At Shepherds Lane Junction he realised that he was being routed via the Main lines which, although unusual for that particular train, did not surprise him. He told me that he ran behind the 15.42 Victoria train which he saw ahead of him as he was approaching Dulwich and he received a double yellow aspect signal at Shepherds Lane, a single yellow in Brixton platform 'and so on all the way down to Shortlands'. Coming into Kent House he received a yellow aspect as he did thereafter, and he was finally stopped at Beckenham Junction Home Signal. Thereafter, Signal EG 14 was displaying a double yellow aspect and Signal A 616 a single yellow. He saw both these signals when passing through Beckenham Junction and he saw Signal EH 14 at Danger just before he passed Signal A 616. Maunsell said that he was braking his train to between 10 and 15 mile/h to stop at the signal when he saw it clear to a single yellow aspect without a junction indicator when he was only 10 or 15 yards from it. He said that he assumed he would be routed via the Down Fast and points 47 into Bromley South Down Slow platform as on several occasions previously.

23. He felt a severe jolt as his train was mis-directed at the switch diamonds, and partly applied his brakes: he fully applied them when he saw, out of his cab window that his train was derailed. After applying his handbrake he walked back through his train to see that his passengers were all right. He met his guard and together they went up to the signal box; it was raining at the time. He denied that he had admitted to the signalman or technician that he had 'slid by' and claimed that he had only asked the signalman what had happened. Assuming he was 'under the signalman's jurisdiction' he had not thought it necessary to put down detonators on the Up Slow line.

24. On 12th February 1976, Driver Maunsell was interviewed by Railway Officers as to the course of the derailment and the signal aspects seen. He then said that he saw Signal EH 14 clear to a single yellow

aspect when he was halfway between West Gate Road bridge and the signal, but he later said, as he said to me, that it cleared when he was only 10 to 15 yards from the signal, but its aspect only remained visible until he was 8 or 9 yards from it.

25. Driver Maunsell is aged 45 and had been driving for 9 years, the last 7 years on the South Eastern Division of Southern Region. He had had a rest day on Saturday 7th February and had worked the 10.10 Victoria to Ashford train (Main to Slow at Shortlands) on Sunday, the 14.50 Victoria to Sittingbourne train (Catford Loop to Slow) on Monday and Wednesday, and the 16.24 Holborn to Orpington (Main to Fast) and the 17.45 Holborn to Maidstone (Catford Loop to Slow) trains on Tuesday 10th February. (The accident occurred on the Thursday). He told me that prior to the accident he had had a good lunch before taking over the train but had drunk no alcohol. He was alone in the cab: his cab lights were off, the instrument and headcode lights were lit, and his windscreen wipers were working well.

26. Driver Maunsell lives at Peckham and had finished work the previous day at 22.27. He had slept well and assured me that he had no personal problems that could have taken his mind off his driving, which he enjoyed. He did not think that he had misjudged his distance to the signal or the state of the rails and he was satisfied with the train's brakes. He agreed that it was very common for Signal EH 14 to clear as a train closely approached it and he was expecting this to happen as it had happened at other signals all the way down the Main line. He had driven trains past signals at Danger on two previous occasions and on one of these it was the same signal that he had passed on this occasion. They were:

21 Jan 1964	Passed at Danger Signal EH 14 when under instruction
13 Oct 1964	Moved a train without permission and ran through a set of points
15 Nov 1974	Passed at Danger Signal EU 1 at Newington.

He had driven trains fitted with the automatic warning system, and he agreed that it might not have prevented him passing the signal at Danger, but he suggested that it would have kept him "more alert".

27. *Guard P. Martin*, the train's guard had been in charge of the 14.30 Orpington to Victoria train and had taken his break prior to joining the 15.50 Gillingham train at Victoria. He confirmed that he had carried out a brake test. He had been in charge of that train on every day that week and described the journey down the Main lines on 12th February as a very slow one, so that they were about three minutes late as they approached Shortlands Station. When they nearly stopped in Beckenham Junction Station he looked out and saw the signal ahead (EG 14) displaying a double yellow aspect and A 616 a single yellow aspect. He thought the train was stopping again at Signal EH 14 but when he looked out he saw the signal displaying a single yellow aspect without any junction indicator. When I asked him whether he was absolutely sure of this he replied "I'm pretty positive—yes".

28. He had never met Driver Maunsell before and had not spoken to him before the accident occurred. As soon as the train stopped he ran forward to the signal box, asked the signalman if the train was fully protected, and was told that it was. Guard Martin was 47 years old, and had been in railway service for one year and a guard for almost six months.

Discussion

29. I am satisfied that Signalman Rubie had not first set and cancelled a route for the train from Signal EH 14 down the Fast line to Signal EH 16, which he might have done to divert trains off the Slow line's bridge, or inadvertently by pressing the button for Signal EH 16 instead of that for EH 8. Not only did he flatly deny that he had done either of these things, but had he done so there must have been a delay of about two minutes before the points could have moved. Even if the train had averaged only 15 mile/h on its approach to Signal EH 14 it would have travelled 900 yards after first occupying track circuit CA (which commences 960 yards before the signal), but to have moved from the Normal to the Reversed position for the Slow lines the signal would have displayed a junction indicator which, according to both driver and guard, it had not. For the points to have moved under the train the signal cannot therefore have displayed a proceed aspect as the train approached it, because to do so requires the points to be set, locked and detected in the required position.

30. The points must have moved between the bogies of the second coach, ie while the train travelled a little over 38 feet, for the marks on the switch blades indicate that they were moving when the innermost wheel sets passed over them. As it takes 2 seconds for the points to move, the train was probably travelling at about 25 to 20 mile/h as Driver Maunsell said it was. The relays had to operate and the facing point lock unbolt prior to this which took about 2½ seconds; the front of the train was therefore at least 13 yards short of the tip of the facing points when Signalman Rubie set the route and at this point the train would hardly be visible under the bridge.

Conclusions as to the Shortlands Derailment

31. The derailment was caused because the train was driven past Signal EH 14 at Danger and the signalman then operated the points before track circuit BZ, the occupation of which would have locked them, was occupied.

32. Driver Maunsell's train was running about 3 minutes late because the derailment occurred at 16.10 whereas the train was due to stop at Bromley South at 16.09. From a study of the available data concerning the running of the trains on 12th February, and from tests subsequently carried out, I do not

believe that Driver Maunsell could have seen the 15.42 train ahead of him because it must have been well beyond Sydenham Hill having left Herne Hill at 15.51 as his train approached West Dulwich when he said he saw it. By the time he passed through Beckenham Junction, however, he could have been close enough to have seen it approaching Signal EH 14 at Shortlands Junction.

33. It is not certain that the provision of AWS would have prevented the accident. I believe that Driver Maunsell had seen the signal at Danger and wrongly assumed that the passage of the train ahead of him through the junction and onto the Fast line would release the signal for his move onto the Slow line. This was a common experience for all drivers especially at junctions such as that at Shortlands, and especially when following a slow train. In my opinion he drove his train expecting the signal to clear and when it did not do so he passed it at Danger. In these circumstances standard BR AWS cannot prevent an accident.

The Earlswood Derailment

34. *Driver W. Kenchington* of Brighton, who was driving the 18.04 Victoria to Brighton passenger train on Thursday, 13th May 1976, admitted to having passed the 3-aspect colour-light Down Main Inner Home signal, No. CR29 at Earlswood, at Danger.

35. A sketch of the junction is shown in Figure 5 at the end of this report. Absolute Block applies between Earlswood and Redhill 'B' Signal Boxes 831 yards in rear using Sykes 'Lock and Block' instruments. Although a 70 mile/h speed restriction applies over the line, there are 30 mile/h restrictions through the connections from the Down Redhill platform line and through the Down Main to Down Fast line connection over which the train was signalled. The yards of the former Redhill engine sheds stand on the Down side of the 'Through' lines between the two signal boxes.

36. The train was formed of 12 cars of CIG stock with its braking fully modified for running at 90 mile/h. After the accident the brakes were found to be in good order.

37. The signalman had previously set the route for the 18.02 Victoria to Gatwick Airport train from the Down Through to the Down Local line via points No. 22 reversed and was in the act of setting the route for the Brighton train from the Down Main to the Down Through line via points No. 57 reversed and No. 22 Normal when the front of the train passed over No. 57 facing points as they were moving, and travelled a further 50 yards with its leading bogie derailed before coming to a stand. The train suffered little damage.

38. A single track circuit 24T forms the berth and 49-foot overlap track circuit of signal CR 29. This signal stands only 54 feet from the tips of No. 57 points which are track locked by track circuit 25T commencing only 5 ft 5 in before the tips of the switch blades. As at Shortlands it takes about 4 seconds for points No. 57 to complete their movement after the operation of the controlling lever. The preceding signal No. CR 28 is approach controlled by the occupation of track circuit 23T when points No. 22 are reversed.

39. Although the signalman has a good view of the train's approach around a left-handed curve approaching the signal he was busy pulling or replacing six levers with his back to the railway during the critical moments before the derailment and could not have been aware that the train was passing the signal at Danger.

40. I interviewed Driver Kenchington at Croydon on 13th July 1976, when he told me he had correctly stopped the train at Redhill at the right time. Approaching signal No. 28 its aspect had changed from red to a single yellow and he had allowed his train to run forward on the falling gradient at some 20 mile/h. He remembered looking to his left into the old shed yard where he had once worked as a driver on steam locomotives and his next recollection was when he was only 40 yards from signal No. 29 which was still displaying a red aspect. In spite of an immediate application of the emergency brake he was unable to stop the train from its speed of about 22 mile/h.

41. I questioned him at some length as to why he had passed the signal. He did not think that it was because he was expecting the signal to clear; he was either checked or stopped at the signal 3 or 4 times each week and had been stopped at it on the previous Monday. He thought that he must have allowed his attention to wander and accepted that he was in a reverie during the critical time. He was sure that the sounding of an AWS horn 200 yards before the signal would have brought him to his senses and prevented the derailment.

42. Driver Kenchington was 47 years old and had 18 years driving experience on the line. He had a rest day on the previous Saturday. Having finished duty at 22.55 on the day before the accident, he had slept well and had signed on duty at 14.50. This was the first occasion he had passed a signal at Danger and he was unable to account for it, nor was there any record of Signal No. 29 having been passed at Danger by any other driver. I found Driver Kenchington an absolutely open witness and I could find no reason as to why he had allowed his attention to lapse.

Recommendations

43. At each site, had the occupation of a separate overlap track circuit beyond the signal protecting the junction locked the facing points on which the trains became derailed, the accidents would not have occurred. At Earlswood this can be achieved when the signalling is replaced in 1977. Signals CR 28 and 29 will then be replaced by a single colour-light signal positioned between the two existing signals and a separate overlap track circuit should then be provided.

44. The provision of standard British Railways AWS at Earlswood would have prevented the derailment but at Shortlands, because I believe the driver was expecting the signal to clear before he arrived at it, it would not have done so.

45. The bridge carrying the railway over Bromley Road at Shortlands Station is a very low one and is being regularly hit by transport vehicles. I therefore recommend that the warning signs and markings at this bridge be significantly improved.

I have the honour to be,

Sir,

Your obedient Servant,
A. G. TOWNSEND-ROSE,
Lieutenant Colonel.

The Permanent Secretary,
Department of Transport.

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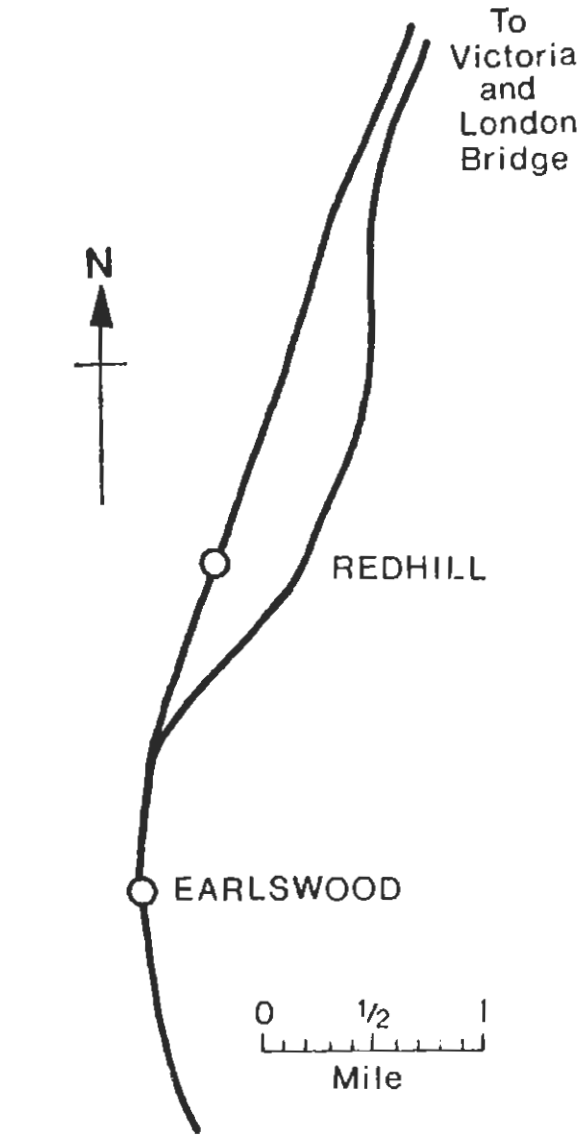
EARLSWOOD



LOCATION DIAGRAM
Fig. 4

DETAIL DIAGRAM
Fig.6

SIGNALLING DIAGRAM
Fig. 5