



DEPARTMENT OF THE ENVIRONMENT

# RAILWAY ACCIDENT

## **Report on the Collision that occurred on 12th November 1970 at Bexley Station**

IN THE  
SOUTHERN REGION  
BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE

1972

16p NET

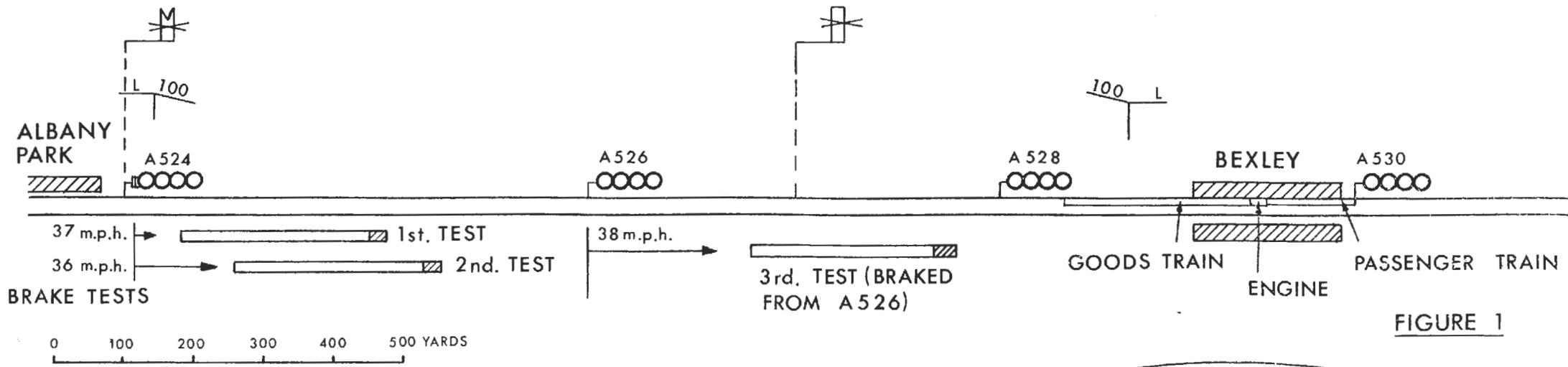
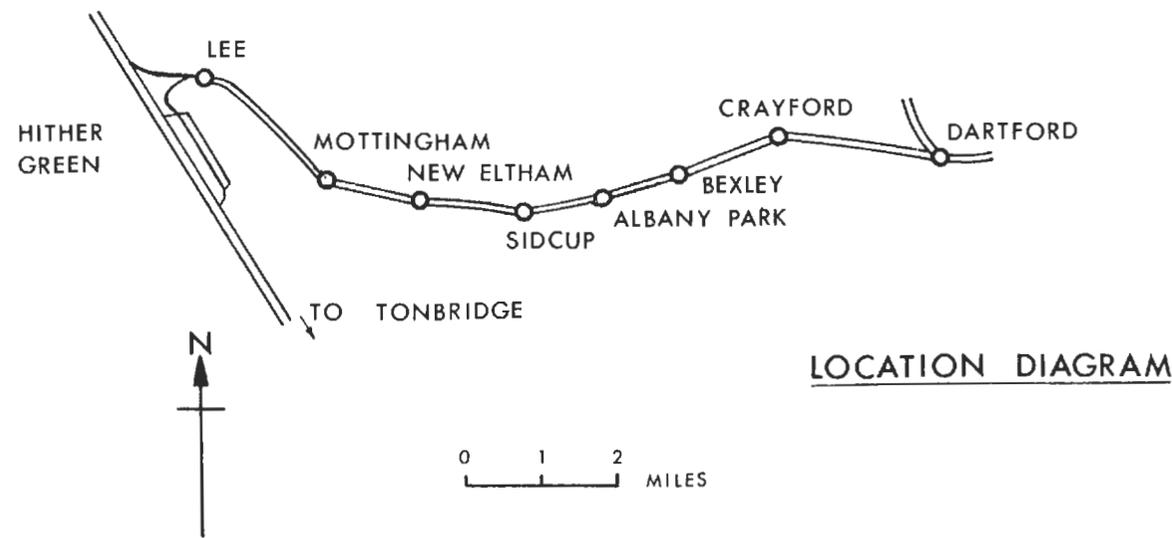


FIGURE 1



LOCATION DIAGRAM

COLLISION AT BEXLEY ON  
12th. NOVEMBER 1970.

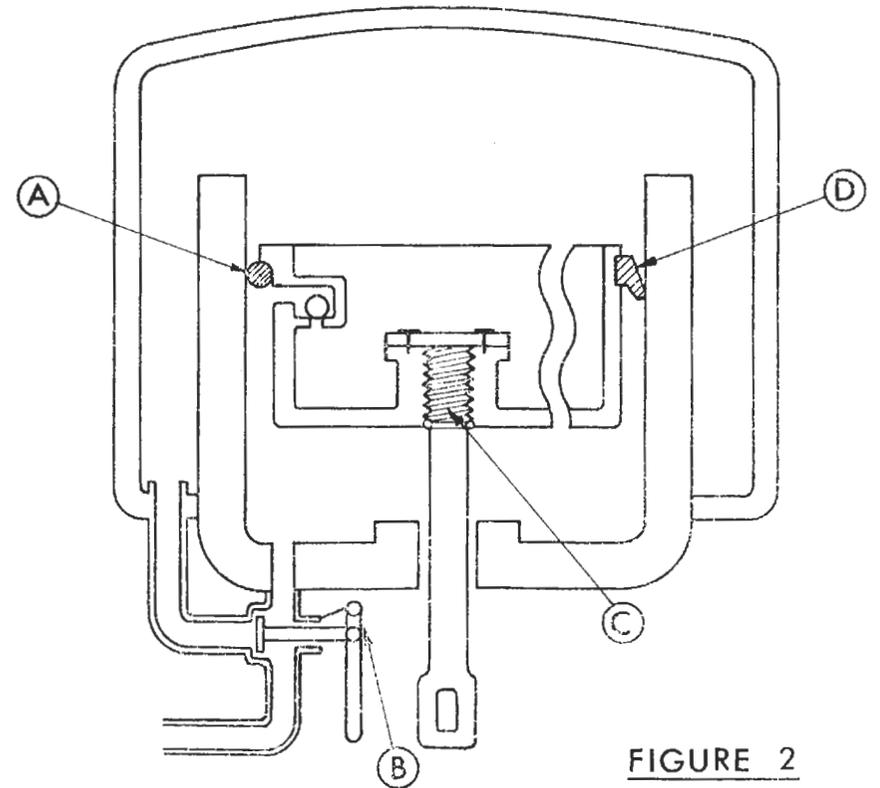


FIGURE 2

There are various types of cylinder but the sketch illustrates the faults found.

26th October 1971.

SIR,

I have the honour to report for the information of the Secretary of State, in accordance with the Order dated 18th November 1970, the result of my Inquiry into the collision between a goods train and an electric multiple-unit passenger train at 21.38 on 12th November 1970 at Bexley Station on the Dartford Loop line in the Southern Region, British Railways.

On a clear dry evening the 20.22 Class 5 Hither Green Sidings to Maidstone West goods train consisting of 44 loaded wagons and a brake van hauled by an electro-diesel locomotive, passed at Danger a colour light signal on the approach to Bexley Station and collided at between 10 and 15 m.p.h. with the rear of the 21.03 Charing Cross to Dartford electric multiple-unit train which was stationary. The impact was a light one, and although the passenger train was driven forward some 40 feet there were no casualties to passengers and no significant damage to either train, or to the track.

The emergency services were promptly summoned and arrived quickly but were not required. Arrangements were made for the passengers to be conveyed by London Transport bus services. Apart from the two trains involved, six Down passenger trains were delayed and two were diverted via Bexleyheath.

#### DESCRIPTION

##### *The Site*

1. Bexley Station lies some 4 miles beyond Mottingham and 7 miles from Hither Green Yard whence the freight train entered the Down Dartford Loop line. Approaching Mottingham the line rises at gradients of 1 in 100 and 1 in 250 but from that station it falls at 1 in 1,800 for some 2 miles followed by 1 in 165 for  $\frac{3}{4}$  mile before Albany Park Station where the line is level for about 400 yards through the platforms; and it then falls at 1 in 100 for a further  $\frac{3}{4}$  mile until it again levels out in Bexley Station.

##### *The Signalling*

2. Track circuit block with new four-aspect colour light signalling was introduced only 12 days before the accident. The automatic four-aspect signals which are repeated in Dartford Signalbox are spaced over 600 yards apart giving braking distances on the falling gradient approaching Bexley of over 1,200 yards as shown on the diagram at the front of this report. The diagram also shows the positions of the semaphore Distant and Home signals spaced 968 yards apart which formerly protected trains standing in Bexley Station. Signal A524 is first sighted when closely approaching Albany Park platform and the next signal A526 is sighted some 400 yards from that signal. Signal A528 which the goods train passed at Danger is sighted immediately thereafter some 900 yards from it, the line being straight and the view unobstructed down to Bexley Station. The next signal, automatic signal A530, is just beyond the station and can be replaced to Danger by the use of an emergency replacement switch provided in Dartford Signalbox.

##### *The Trains*

3. The passenger train consisted of a 6-car electric multiple-unit formed of 4 EPB suburban unit No. 5340 leading, and 2 EPB suburban unit No. 5720 trailing. It was 397 feet overall and weighed 208 tons.

4. The 20.22 Hither Green to Maidstone West goods train consisted of 44 wagons and a brakevan. The first 41 were loaded open wagons and covered vans all of 10-foot wheelbase and fitted with vacuum brake equipment although the brakes of only the first 28 wagons were coupled to form the fitted head of the train. None of these wagons had direct admission valves. There followed 3 unfitted loaded mineral wagons of 9 feet wheelbase and the brakevan. The train which was hauled by Class 73 electro-diesel locomotive No. E6015, was some 900 feet overall and weighed approximately 771 tons, the locomotive weighing 75 tons and the train 696 tons. Its nominal brake force was 135 tons, 31 tons of which were of the locomotive itself.

5. Class 73 locomotives are equipped with air brakes which are controlled by a brake lever on the driver's left side. These locomotives can control air-braked, electro-pneumatic-braked and vacuum-braked stock and can work in multiple with electric multiple-units and type 3 diesel electric locomotives. To work with vacuum-fitted trains the selection switch must be in the "automatic brake" position and the exhausters running. The brake controller causes air to be supplied to the locomotive brakes and to a type DV5 air vacuum relay valve. Through this valve air at 70 lbs/in<sup>2</sup> will maintain a vacuum of 21 inches of mercury in the train brake pipe. As the air pressure is reduced, the vacuum is also reduced until with a full service brake application made, the air pressure is reduced to 48 lbs/in<sup>2</sup> and the vacuum to zero. In reducing the vacuum in the train brake pipe, air from the electrical compartment of the locomotive itself is allowed into it through two wire gauge filters, each measuring 3" x 1 $\frac{1}{4}$ ", in the body of the DV5 valve.

6. A third brake control for emergency purposes is mounted near the floor on the left of the driver's seat. Lifting the brake handle allows admission of air into the vacuum train pipe direct, and air out of the locomotive air brake pipe resulting in an immediate and full application of all brakes on the locomotive and the wagons forming the fitted head of the train.

#### *Accident Damage*

7. There was no derailment as a result of the accident, and neither of the trains suffered any significant damage as a result of the collision.

#### EVIDENCE

8. *Signalman W. J. Williams* came on duty in Dartford Signalbox at 21.25. He told me that at 21.30 he was informed that the lamp in a temporary speed restriction board between Bexley and Crayford was out. He therefore used the emergency replacement switch to replace automatic signal A530 to Danger so that drivers of all trains could be cautioned before leaving Bexley Station. He said that the 21.03 Charing Cross to Dartford passenger train was then near Albany Park Station and it arrived at Bexley Station at about 21.36. At that time the goods train which was following it was between Sidcup and Albany Park. The signalbox 'information man' was talking on the telephone to the leading railman at Bexley Station when he told him that there was going to be a crash. Acting on this information Williams then sent the "Obstruction Danger" signal to Hither Green signalbox, and also protected the Up line, and the Regulator called for the emergency services. He told me that the accident occurred at 21.38, and he thought the passenger train had then been in Bexley Station for about 1½ minutes. He confirmed that all his signalling was functioning correctly.

9. *Driver B. W. Wakefield*, who was driving the 21.03 6-car Dartford passenger train, told me that he had a normal run to Albany Park which he left with signal A524 showing a Green aspect. Signal A526 halfway down the incline was showing a double Yellow aspect, A528 a single Yellow and signal A530 was showing a Red aspect. He stopped his train at the 6-car stop board which is some 2 to 3 car lengths from the departure end of the platform. He told me that his maximum speed between the stations had been 40 to 45 m.p.h. and that he first braked on passing signal A528 at Yellow. He said that station duties normally took him about 20 seconds, but after about one minute he called the guard on the train's loudaphone equipment and asked for permission to draw down to signal A530 just off the end of the platform so that he could call the signalman under Rule 55. He drew forward on receiving permission to do so and then applied some 20 to 25 lbs of air on the EP brake and got out of his cab to telephone. It was then that he heard a train's horn sounding, and looking back saw his guard running about and getting passengers out of the train. He ran back to the brake compartment but as he reached it the train lurched forward and he was hit on the head and dazed, but he remembered getting back into his cab and seeing that the brake pipe pressure was reading zero. He next went through his train on to the Up platform and saw that the Up line was not obstructed, and then returned to the Down platform to report the incident to the signalbox on the station telephone. Wakefield told me that he was well satisfied with the sighting distances of all the new signals on the Bexley line, and he found the new signalling an improvement.

10. *Guard R. Potter* was in charge of the 21.03 train and was travelling in the brake compartment in the rear of the 4th car. He noticed signal A528 showing a Yellow aspect, and after his train had come to a stand he saw signal A530 at red. After about one minute, when his driver called him for permission to draw the train forward, he told the railman on the platform and then gave permission to his driver. After about half a minute he heard a series of short blasts on a train's horn and looking back saw the head code lights of another train approaching. He gave his driver a series of short rings on the loudaphone and then jumped out blowing his whistle to get passengers out of the train. Some had in fact got out when the goods train hit the rear of his train at a speed he estimated to be not more than 15 m.p.h. His train was then pushed forward some 40 feet. He checked the rear cars of the train first and did not find any passengers who had been hurt in any way, and he stayed until they had all left.

11. *Carriage and Wagon Examiner E. Tullah* was on duty in Hither Green marshalling yard on the night of the accident. He examined the 20.22 Maidstone West goods train from 19.30 to about 19.55. He started at the brake van and worked towards the head of the train and then back on the other side looking at the buffers, couplings, wheels and axleboxes, and he noted that all the brake pistons were in the lowered position with the brakes off. There was no locomotive on the train, but some handbrakes were on at both ends of it including that of the brake van. He told me that at 20.45 he saw that the locomotive had been attached but did not see the driver, although he admitted he could have been inside the engine compartment, nor did he see the guard in the brake van. He told me that he stayed near the train for about 15 minutes and then left for other duties, but saw it depart at about 21.15.

12. When I questioned him on his duties as an examiner, he said that it was his task to use a gauge to test the brakes on a fully fitted train but not on a partly fitted train. He also told me that since the accident he had found wagons with defective brakes by noting that the brake cylinders were still in the lowered position after the locomotive brake had been applied, the vacuum having been previously created throughout the train. He had 'carded' such wagons for repair, but he added that not much could be done at that stage because of the delay it would cause to trains. Tullah had been a railwayman for about 5 months. After attending courses he had, at the time of the accident, worked as an examiner for 4 weeks under instruction and 3 weeks on his own. His normal turn of duty was 8 hours, but throughout the week of the accident he had worked 12-hour turns each night from 18.00 to 06.00.

13. *Guard J. W. Moore* was due to book on duty in Hither Green marshalling yard at 19.15 on the night of the accident. He told me that he walked across to his train which was standing in 'A' section on the other side of the yard and he first checked it from the front end towards the rear noting on a piece of rough paper the wagons, their loads and brake forces, and checking that the brake pipe was properly coupled and that the pipe on the last wagon of the fitted head was on the dummy coupling. He then went to his brake van to deliver his kit, checked that the handbrake was on, and attended to his lamps. He estimated that all of this took him some 15 minutes including 5 minutes to walk down the train, and that he went into the inspector's office which was quite close to his brake van to collect his train preparation form (BR 20896) at about 19.45. At about 20.15 he examined the nearside of his train and when he arrived at the front, the locomotive had arrived and he coupled it on to the train. He then saw the driver create vacuum and when he walked to the back of the fitted head all the brakes were off. He went between the wagons and removed the vacuum pipe from the dummy coupling on the last vehicle of the fitted head, heard the air rushing in, visually checked that the brakes were applied on the last two or three vehicles, and then replaced the hose. He told me that it was "jolly difficult" to get the hose off the dummy coupling against the vacuum, but that this was the normal practice of most guards, although they sometimes checked that the brake was effective on each wagon. He said that on this occasion the hose was off for more than a minute, and he then returned to the locomotive to report that the brake test had been satisfactory. He told me that because his train was unusually delayed they did not pull down to the sidings' exit signal until about 20.30, and they finally left the sidings at 21.15 but were held at the Lee Spur exit for a further 10 minutes or so before being signalled out on to the Dartford Loop line at about 21.30. He recorded the 21.15 timing in his journal.

14. Moore told me that they had an uneventful run as far as Sidcup. He applied the van's handbrake approaching Sidcup as was his usual practice, and felt the brake bite. As they passed through Albany Park he saw the signal at the end of the platform showing a double Yellow aspect and he felt the wagons buffer up, indicating that the driver had applied the brakes. He then tried to apply more brake but it was already fully on. Shortly afterwards the collision occurred which caused him to hit his head against the side of the brake van making him feel rather giddy. He then got out of his rear door, noticed that his lamps were still intact and alight, and walked forward down the nearside of his train to check his wagons. He met the guard of the passenger train on the way and followed him down to the station.

15. *Driver H. C. Bishop* told me that he took over locomotive E6015 at Hither Green at 19.40 and left the shed at 19.55 arriving on his train a few minutes later. He said that he did not leave his locomotive but he went into the engine compartment to change ends and later to put the auto brake switch into the On position. Soon after arrival his guard coupled his locomotive on to the train and then came into his cab and saw the vacuum made. The guard handed him the driver's slip from the completed BR 20896 which showed that he had a load of 761 tons and a brake force of 141 tons which was more than the basic minimum requirement of 125 tons brake force for a load of 800 tons. It also quoted his maximum speed as 45 m.p.h. Bishop told me that his guard then said that they had a fitted head of 27 vehicles but that two of them were through-piped (unbraked wagons) and hence only 25 were braked. When the guard did his brake continuity test by removing the vacuum pipe from the dummy coupling behind the last fitted vehicle in the train Bishop was winding the head code indicator, but he said that he saw that the gauge had fallen to 10 inches of mercury vacuum, and he then watched it build up to 21 inches again. The guard did not ask him to apply the train brake as they stood in the siding, and he did not do so. Bishop told me that they moved to the exit signal some time between 20.45 and 21.00. He told me that he did not see the wagon examiner at any time before the train was signalled on to the Lee Spur at 21.15, a time he noted in his record, and they were soon signalled on to the Main line. He said that they travelled at about 25 m.p.h. through Mottingham, but he cut off all power approaching Sidcup which they passed at 35-40 m.p.h. He told me that he made an initial application of 25-30 lbs on the locomotive air brake to buffer up his train on the falling gradient between Sidcup and Albany Park. When they ran through Albany Park, signal A524 was showing a double Yellow aspect and he then applied about 10 inches vacuum on the train brake, although he did not look at the gauge. The line curves to the left hereabouts and soon signal A526, showing a single Yellow aspect, came into view. He told me that he then realised that the train was not slowing down as it should have been, so he made a full application of the train brake by which time he was approaching signal A526 and could see signal A528 ahead at Red. He glanced at the vacuum gauge before making the full application and noticed that it was reading about 11 inches of mercury vacuum (e.g. 10 inches of brake had been applied). When he realised that his train was not going to stop at the Red signal and saw the two red screens on the rear of the passenger train he began sounding 'pop whistles' on his horn, which he continued to sound until his locomotive entered the platform when he jumped out at a speed he estimated to be some 15 m.p.h. He fell over and after picking himself up went straight to the telephone on the platform to tell the signalman what had happened. He then went back to examine his train and met his guard. Bishop told his guard that he had already informed the signalman of the accident, and he then checked that the Up line was clear, and returned to the station to tell the signalman that it was so.

16. In giving evidence to the Railway Officers on 12th November Bishop had said that he first applied the vacuum brake directly he sighted the single Yellow aspect and had made the full brake application on seeing signal A528 at Red as he was passing signal A526. This statement did not agree with his evidence to me, and when I questioned him on it he said that when he made the statement he had been in some pain from his fall and had been misunderstood.

17. I also questioned him on whether he had made a running brake test on approaching the falling gradient beyond Sidcup and he replied that he had not, and that the gradients and the speed of his train at

the time made it impossible. He told me he had been driving for 13 years and, prior to joining Hither Green Depot, had driven electric multiple-unit trains at Bricklayers Arms and other Depots and had been a 'dual' driver on both goods and passenger trains, driving both locomotives and multiple-unit trains.

18. *Senior Railman R. Congram* told me he was travelling home to Bexley from Dartford on the 21.38 multiple-unit train. When it arrived at Bexley he found no staff on duty on the Up platform, so he attended to the train himself and saw it depart. The Down train was still in the other platform and he saw Leading Railman Collins talking to the guard. Almost immediately he heard the goods train's horn and saw it entering the platform at a speed he estimated to be 10 to 15 m.p.h. He saw the driver jump out and the trains collide, and he then ran through the passenger subway to call the emergency services on the telephone and then telephoned the signalbox. He met Collins who said he would look after the passengers, so he next went back on to the Up line to check that it was not obstructed, and found it was not.

19. *Leading Railman W. Collins* was on duty at Bexley Station on the night of the accident. He confirmed Driver Wakefield's account of the incidents at the platform prior to the accident and said he was talking to the signalman at Dartford to ask why signal A530 was showing a Red aspect when he heard the goods train approaching. He ran out on to the Down platform and he saw the driver of the goods train jump out on to the platform and fall. Seeing what was about to happen he shouted to passengers who had their heads out of the windows to jump clear, and within seconds the accident occurred. He estimated the speed of collision to be about 10 m.p.h. He went back to the telephone and told the signalman what had happened and then checked the passengers through the barrier. He told me that so far as he knew none of the passengers was in any way hurt.

#### SUBSEQUENT INVESTIGATIONS

##### *The Train*

20. I inspected the train, to which locomotive No. E6015 was still attached, in the sidings at Crayford on 13th November. I first walked along its lefthand side after making sure that the vacuum brake had been applied. I found all the brake blocks of the 28 wagons forming the fitted head tightly against their wheels except for the 5 wagons mentioned in Appendix A at the back of this report. A sixth wagon had its brakes operative on one side only. I also noted that 4 wagons in the fitted head had not had their brakes overhauled within the last 3 years and one not for 4½ years. There were also two wagons which seemed to carry no markings to indicate when they were last overhauled. On inspecting the remainder of the train, I noted one wagon (the 32nd) which bore the brake overhaul date of November 1965, showing that it had not been overhauled for 5 years, and this wagon was also later found to be defective.

##### *The Locomotive Brakes*

21. In carrying out a vacuum brake test on locomotive E6015 fitted to the train the vacuum gauges took 15 seconds to fall from 21 inches of mercury to 11 inches, and 51 seconds to fall from 21 inches to 3 inches at which figure the gauges remained. When the train was disconnected the gauges still took nearly 50 seconds to fall to 3 inches and still did not fall below this figure. The normal time for the gauge to fall from 21 inches to zero vacuum should have been between 15 and 20 seconds according to the length of the train, and because of this fault it was decided not to carry out an immediate brake test on the main line with the train involved. I took the opportunity however of testing the brake when a replacement locomotive E6047 was coupled to the train and found that the vacuum gauge fell to almost zero in 17 seconds. The speedometer reading in Bishop's cab in E6015 was tested soon after the accident and was found to be reading 10% high throughout its range. This means that when reading 40 m.p.h., the locomotive was travelling at only 36 m.p.h.

22. Later I examined the air-filters taken from the type DV5 Air-Vacuum Relay Valve of locomotive E6015. This valve is mounted in the electrical compartment high up on the driving cab bulkhead behind the driver's position. One filter faces the side of the locomotive being about 12 inches from it while the other faces the electrical compartment. The side filter was thickly coated with what was later found to be a mixture of brakeblock dust and diesel oil on its outer surface, while the front filter appeared clean on the outside as if it had been wiped, but the inside of the filter was similarly coated. I was informed that during tests when coupled to 3 brake vans the vacuum gauges at the two ends of the locomotive fell to 3 inches of vacuum in 10.8 and 8 seconds respectively, but with new filters fitted they fell in 2 and 1.8 seconds, indicating that the delay in the application of the brake was due to the blocked air filters.

##### *Wagon Brakes*

23. I was also present when the 5 defective wagon brake cylinders were examined in Hoo Junction Wagon Repair Depot. In addition to the 5 wagons, 4 wagons whose brakes were due for overhaul were also examined. The results, which are tabulated in Appendix A and illustrated in figure 2, were as follows. In two wagons (the 18th and 32nd) the pistons were found to have rotated until they had unscrewed themselves from their piston rods which are not free to rotate because of the brake rigging to which they are attached. In both cases the threads had been damaged by impact between the pistons and the ends of the rods. That on the 1st wagon had been fitted in February 1970 with a rolling ring which had become stretched and twisted and allowed the vacuum to pass by. That on the 4th wagon had a release valve, the lever pivot of which was seized in the open position so that pressures on both sides of the piston were permanently equalised, while it was the brake rigging itself on the 11th wagon which had seized so that the brake cylinder had badly bent

the rodding to the seized handbrake journal which had prevented it operating. Nothing could be found wrong with the 19th wagon's brake cylinder, and when it was reassembled and fitted to the vehicle the brakes worked properly. The failure was probably due to foreign matter which affected either the sliding band on the piston or the release valve, making one of them inoperative.

24. Because the number of 5 defective wagons in a fitted head of 28 (17.8%) seemed to be a very high proportion I asked Southern Region to examine the brakes on a large sample of fitted wagons. Checks were accordingly made in two marshalling yards, and 12 wagons were found with defective brakes out of a total of 1002 checked in Eastleigh yard, and 39 out of a total of 453 wagons checked in Hither Green yard. The percentages found with defective brakes in each yard were therefore 1.2% at Eastleigh and 8.6% at Hither Green, or taken together the overall percentage at the two yards was some 3.5%. For a wagon's brakes to be 'defective' does not necessarily mean that it is devoid of all braking (although 5 of those in the train involved in the accident had no vacuum brake) but that the vacuum brakes were not fully in working order when inspected.

25. I carried out three brake tests on Sunday 6th December in which the train was driven and braked by Driver Bishop in the same manner as he said he drove the train involved in the accident. The first test was with a Class 7 train of Basic Load 800 tons having the minimum required brakeforce of 125 tons. Bishop used his locomotive air brake to get his train under control and applied 10 inches of vacuum brake as he passed signal A524 at 37 m.p.h. The vacuum fell to 11 inches in 3 seconds and the train came to a stand in 371 yards. In the second test the DV5 valve filters were blanked off with tape until, with the train connected, the vacuum gauge took 51 seconds to fall to 3 inches, which I checked. The brakes on the wagons marshalled in the positions of those with defective brakes in the original train were then blanked off and the train braked at signal A524 in a similar manner as before from 36 m.p.h. The vacuum gauge fell to 15 inches in 3 seconds, to 10 inches in 14 seconds and to 3 inches in 51 seconds and the train came to a stand after 60 seconds in 454 yards. The weight of this train was 772 tons and its brake force was 117 tons. In the third test a train of 801 tons with a brake force of only 108 tons was braked from signal A526 (which was showing a single Yellow aspect at the time of the accident) which was passed at 38 m.p.h. In this test the filters on the DV5 valve were not blanked off, and the gauge fell to 3 inches in 3½ seconds. The train came to rest in 535 yards, 66 yards before reaching signal A528.

26. Prior to each test a running brake test was made on the 1 in 1,800 falling gradient shortly after leaving Mottingham Station and I do not consider that Bishop could have been expected to notice any difference in the braking between the trains at this point.

27. I also accompanied guard Moore as he prepared a train preparation sheet for one of the trains, and I found that he took 15 minutes to find the wagon loading slips and the basic wagon panels and to fill in the loads and brake forces and sum the two columns for the 28 wagons of the fitted head. Moore told me that adding the unfitted portion of the train would not take so long, but that in the dark and when it was raining the task of writing and adding columns was much more difficult.

#### CONCLUSIONS AND REMARKS

28. The accident occurred because Driver Bishop failed to control his train correctly on the falling gradient approaching Bexley Station. The three braking tests on 6th December were made from slightly different speeds of 37, 36 and 38 m.p.h., but they were close to the speed at which Bishop said he was driving, taking into account the 10% speedometer error. The signals from which the tests were made and the positions in which the trains came to a stand in each case are shown in figure 1, and I am confident that Driver Bishop began his final braking as he passed signal A526 at single Yellow as he stated to Railway Officers after the accident, and not at signal A524 as he stated in his evidence to me.

29. The third brake test which I made on 6th December was from signal A526 which was passed at 38 m.p.h., but the air filters on the locomotive were not blanked off. Nevertheless the test confirmed, within 22 yards, the calculated braking distance for such a train, and I am satisfied that Bishop's train must either have been travelling at 40 m.p.h. or more as it passed signal A526 or he must have left his final braking until even later.

30. Even under the previous semaphore signalling the 909 yard braking distance was adequate for 40 m.p.h. goods trains, and under the new signalling this distance has been increased to over 1,200 yards. Goods train drivers may therefore be tempted to leave their braking until they are much closer to Stop signals and it is when the unusual occurs that accidents can result. Bishop was following a passenger train which was unusually delayed so that the Danger signal ahead of him did not clear as he approached it. When he applied his brakes he found they were not up to his expectation by some 22% and he was then unable to stop his train. Finally in the emergency, he failed to apply his emergency brake which would probably have prevented him hitting the train ahead. I believe that driver Bishop was expecting signal A528 to clear from a Red to a proceed aspect but in leaving his braking so late he forfeited the margin of safety the signalling provides.

31. A considerable safety factor has been applied in calculating the tables of maximum load which are permitted with specific brake forces (Tables E) in the pamphlet 'Preparation and Working of Freight Trains'. Nevertheless, for 18% of the fitted head of a train to have defective brakes indicates a poor standard

of maintenance. Because of the figures found defective in Eastleigh and Hither Green Yards British Railways Board carried out a check between January and March 1971 on the overall state of vacuum brake maintenance, which showed that 34% of such wagons were overdue their 3-year overhaul. As a result increased funds are being allocated to improve their maintenance. There are at present some 142,200 vacuum fitted wagons of which 41,000 are to be scrapped in 1971 and 1972. I am assured that the backlog of overdue maintenance will have been dealt with on the remaining 101,000 wagons by the end of 1973.

32. In addition, plans are being made to test the brakes on every wagon on at least 10% of trains in yards and depots so that, on average, every wagon fitted with the vacuum brake will be tested in service 3 or 4 times a year. In this way those wagons with defective brakes will be picked out of the running fleet in the most economical way. The way in which this is carried out will of course vary according to the circumstances in each yard or depot.

33. Although the British Railways Rule Book (Rule 131) requires guards to satisfy themselves before the commencement of a journey that the prescribed brake power is available and in proper working order, the Regulations contained in the General Appendix to Working Timetables and books of Rules and Regulations (clause 12 on page 15—Test with Partially Fitted Train) does not require guards to specifically test the brake on each wagon. Clause 12 was amended as the result of Colonel J. R. H. Robertson's Report on the Derailment that occurred on 11th January 1965 at Coton Hill, and the clause now reads:

"12. To avoid the possibility of Drivers starting away before creating the necessary amount of vacuum with freight trains of which only a portion of the vehicles are fitted with the vacuum brake and connected to the engine, the guard must satisfy himself in all cases that vacuum has been created and the brakes applied. Unless he can obtain an assurance from a member of the C. & W. Department staff that this has been done, he must himself see that the brakes are applied and released on the last vehicle of the fitted portion."

34. In his report Colonel Robertson pointed out that for a Guard to ease off the rear hose pipe from the dummy coupling of the last fitted vehicle which would involve going between vehicles whilst the vacuum is created and the brakes released would be dangerous. Nevertheless this was the method used by Moore, and I was told that it is still common practice.

35. The dangers of going between wagons have long been recognised and Rule 12 of the Rule Book covers the precautions to be taken. Although accident statistics do not show the practice of removing a brake hose between vehicles to be dangerous, I consider that guards should use the method given in Clause 12, which however might be more clearly stated. After the vacuum has been created by the locomotive, guards should watch the brakes on the last vehicle going on as the driver makes a brake application, and should then watch them come off as he re-creates vacuum.

36. Driver Bishop failed to carry out a running brake test on the main line as he is required to do, but I am satisfied that had he done so he would not have noticed any appreciable loss of braking effort, although had he watched the vacuum gauge closely he might have noted its slower rate of fall to 11 inches.

37. The British Railways Rule Book and Appendices to Working Timetables and books of Rules and Regulations are at present being re-drafted to make clear to each employee what his duties are. The test which guards are required to carry out will be called the "brake continuity test" for this is what it is. Because there will remain some confusion between Rule 131 and the redraft Clause 12 I have asked the Officers of the British Railways Board to consider suitably amending Rule 131 to make it clear that guards are only required to carry out the brake continuity test, and not a full brake test.

38. Southern Region, British Railways has included the cleaning of the air filters of the DVS air-vacuum relay valves of Class 73 locomotives in the periodic maintenance schedule, which should prevent similar trouble occurring in the future.

I have the honour to be,

Sir,

Your obedient Servant,

A. G. TOWNSEND-ROSE,  
*Lieutenant Colonel.*

The Permanent Secretary,  
Department of the Environment.

| WAGON                   |          |      | BRAKE         |                                      |
|-------------------------|----------|------|---------------|--------------------------------------|
| Position in train       | No.      | Type | Last Overhaul | Fault or Cylinder Travel             |
| <i>In Fitted Head</i>   |          |      |               |                                      |
| 1                       | S 12541  | Open | 2/70          | Defective rolling ring (A)           |
| 2                       | M 140754 | "    | 9/67          | 3" (Overdue overhaul)                |
| 4                       | M 419674 | "    | 4/69          | Seized release valve lever (B)       |
| 11                      | B 489813 | "    | 3/67          | Seized rigging (Overdue overhaul)    |
| 16                      | B 760753 | Van  | 4/66          | 3¼" (Overdue overhaul)               |
| 18                      | B 763123 | "    | 5/69          | Piston adrift (C)                    |
| 19                      | B 851116 | "    | 12/69         | No fault found (D)                   |
| 20                      | B 762001 | "    | 9/67          | 1¾" (Overdue overhaul)               |
| 23                      | S 59386  | "    | 6/68          | Brakes operative one side only       |
| 25                      | B 756264 | "    | 10/67         | 3" (Overdue overhaul)                |
| <i>In Rear of Train</i> |          |      |               |                                      |
| 32                      | B 850185 | Van  | 11/65         | Piston adrift (Overdue overhaul) (C) |

Letters (A) refer to illustration figure 2 at the front of this Report.