MINISTRY OF TRANSPORT

RAILWAY ACCIDENT

REPORT ON THE COLLISION

that occurred on

31st July 1963

between

PICTON and WELBURY

in the

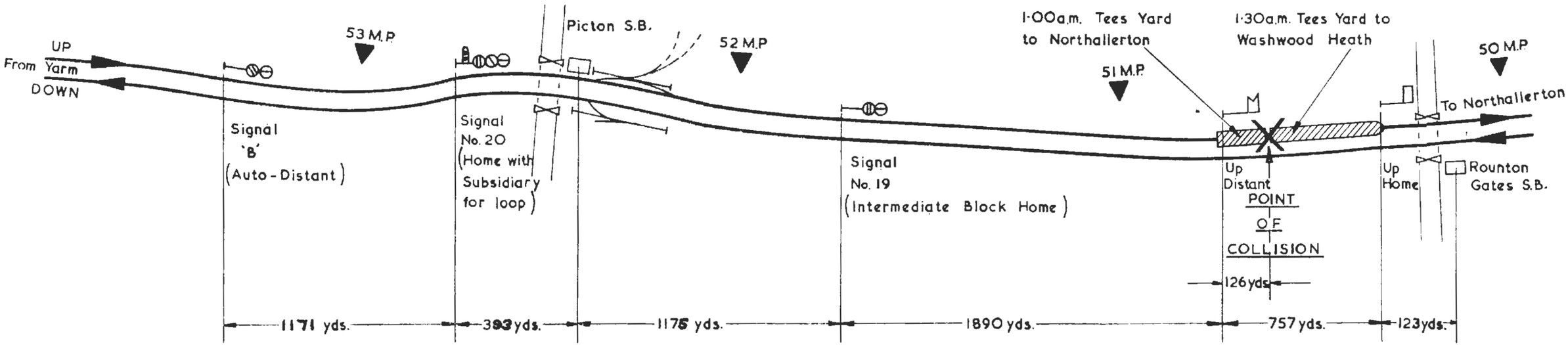
NORTH EASTERN REGION
BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE

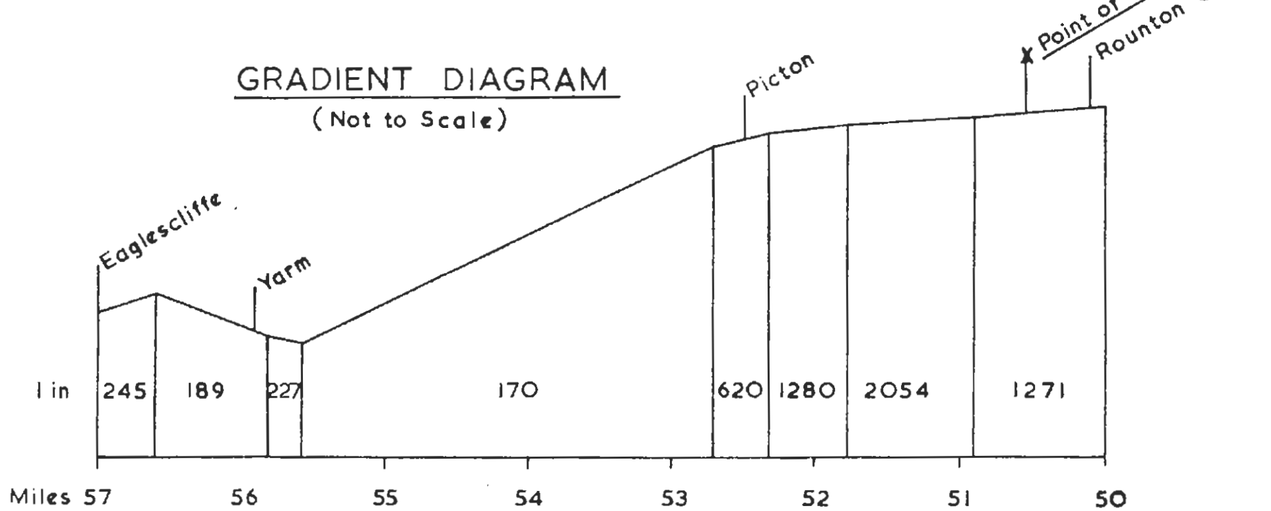
1964

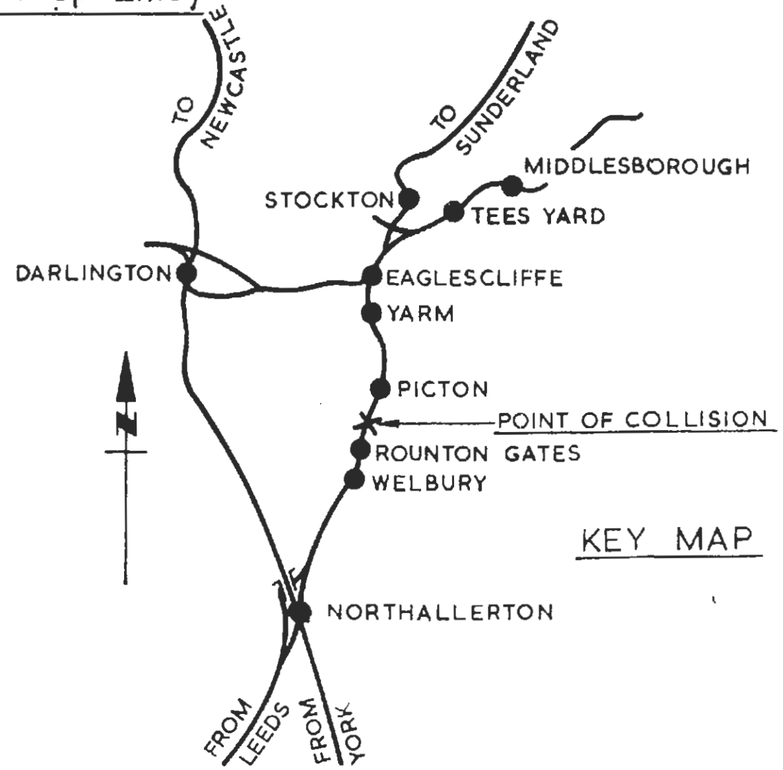
ONE SHILLING NET

COLLISION BETWEEN PICTON AND WELBURY



LINE DIAGRAM (with details of signalling on Up Line)





MINISTRY OF TRANSPORT,
ST. CHRISTOPHER HOUSE,
SOUTHWARK STREET,
LONDON, S.E.1.

18th December, 1963.

SIR,

I have the honour to report for the information of the Minister of Transport, in accordance with the Order dated 31st July 1963, the result of my Inquiry into the collision that occurred at about 2.17 a.m. on 27th July near Rounton Gates signalbox between Picton and Welbury on the Leeds Northern line in the North Eastern Region of British Railways.

The 1.0 a.m. Up freight train from Tees Yard to Northallerton, after passing at Danger Picton Intermediate Block Home signal, ran under power into the rear of the 1.30 a.m. Up freight train from Tees Yard to Washwood Heath just as the latter was pulling away from a signal check at the Rounton Gates Up Home signal.

The diesel locomotive of the rear train, which was propelling a brake tender, became derailed as the tender demolished the brake van of the leading train, fatally injuring the guard who was trapped in the wreckage of his van which caught fire. The wagon ahead of the brake van was separated from its bogies by the force of the impact and thrown upside down across the Down line. Lesser damage was also sustained by several other wagons in each train.

The emergency services were called promptly but because of the remoteness of the locality and difficulty in finding a road approach to the scene of the accident it was over half an hour before an ambulance arrived and an hour before the Fire Brigade arrived. In the meantime the guard had been extricated from the burning wreckage of his van by the railwaymen at the scene and made as comfortable as possible at the lineside, but I regret to report that he died shortly after reaching hospital. The guard of the second train was slightly injured in the collision and the driver received injuries whilst helping to rescue the guard of the first train but neither was detained in hospital.

Considerable disruption was caused to traffic, rerailing not being completed until 3.30 p.m. on 27th July. After completion of permanent way repairs normal working was resumed at 5.30 p.m. on the same day.

It was a fine night, dark but very clear.

DESCRIPTION

Layout and Signals

1. The drawing opposite shows the section of the Leeds Northern double track main line on which the collision occurred, a heavily trafficked link between Tees-side and the East Coast main line. In the Up direction from Yarm, the signalbox north of Picton, the line rises at a gradient of 1 in 170 for three miles, easing through Picton to 1 in 620 and from there continuing to rise, though less steeply, at 1 in 1280 for ½ mile, at 1 in 2054 for just over 1 mile and then at 1 in 1271 to beyond Rounton Gates. The actual point of collision was 1 mile 1426 yards south of Picton signalbox, and 126 yards south of Rounton Gates Up Distant signal.

2. The signalbox at Picton formerly controlled a double line junction with the branch to Battersby, now closed, but in 1960 the double junction was removed and replaced by a single lead to the Up goods loop, the ends of the former branch being retained as siding accommodation. The present colour light signalling was brought into use at the same time. The first signal reached on approaching Picton from Yarm is the 2-aspect auto-distant 'B', which displays a Yellow when the 3-aspect Home signal No. 20 is at danger and Green when it shows a proceed aspect. The distance from signal 'B' to signal No. 20 is 1171 yards. The next signal, 1568 yards beyond No. 20, is the 2-aspect Intermediate Block Home signal No. 19; when this signal is at danger it holds No. 20 to Yellow. The siting and visibility of all three signals is very good, the I.B. signal coming into view at about 1100 yards just on passing Picton signalbox.

3. The Rounton Gates semaphore Up Distant signal is 1890 yards south of the I.B. signal and the Up Home signal, also semaphore, lies 757 yards beyond the Distant and 123 yards north of the signalbox. It is also the section signal for the next section to Welbury. Though it is possible on a clear night to see the Rounton Gates Up Distant signal, which is oil-lit, from Picton signalbox there is no possibility of reading through owing to the contrasting brightness of the colour light I.B. signal.

Signal Controls

4. The line is worked on the Absolute Block System, with full block controls, including Welwyn control, at Picton. The I.B. signal, No. 19, cannot be cleared until line clear has been given by the signalman at Rounton Gates and then for one train only. The Up main line through Picton is track-circuited continuously from 734 yards on the approach side of signal No. 20 to a point 495 yards beyond signal No. 19, and a 'train running away' warning device is provided, actuated by the occupation of the track circuit beyond No. 19 signal when that signal is at danger.

5. Automatic Warning System equipment has not been installed on this line.

The Trains

6. The leading train of the two involved in the collision, the 1.30 a.m. Class 8 freight train from Tees Yard to Washwood Heath, was conveying an out-of-gauge load and was being signalled accordingly. It comprised 36 wagons and a brake van and included many heavy consignments of steel, being equivalent in total weight to 88 ordinary loaded goods wagons. It had a length of 407 yards. This heavy train was hauled by an English Electric Type 3 diesel electric locomotive of 1750 h.p. with a brake tender. The train was unbraked but the combined braking force of the engine and brake tender amounted to 109½ tons.

7. The following train, the 1.0 a.m. Class 8 freight from Tees Yard to Northallerton was running out of path; it comprised 11 wagons and a brake van equivalent in weight to 28 ordinary loaded goods wagons and had a length of 128 yards. It was hauled by a British Railways-Sulzer Type 2 diesel electric locomotive of 1250 h.p., No. D 5160, which was propelling a brake tender, the available braking force being 88½ tons.

Brake Tenders

8. The use of brake tenders with diesel locomotives to increase their brake power when working unfitted freight trains is now common practice in the North Eastern Region as well as in other parts of British Railways. The tenders have been constructed from old bogie carriage underframes cut down in length to 28 ft. 9 ins. and ballasted to a weight of 35½ tons. They are fitted with two 21-inch vacuum brake cylinders giving a braking force of 25 tons, and they may be either hauled or propelled as convenient, though when propelled a speed restriction of 45 m.p.h. is imposed. In the latter case the train headlamps are placed on the tender. Their profile is low, and when propelled they do not impede a driver's forward view.

Effects of the Collision

9. When the impact occurred between the heavy brake tender of the Northallerton train and the brake van of the Washwood Heath train the latter was torn from its underframe and demolished, its wreckage catching fire almost immediately, probably through spilt lamp oil coming into contact with the hot stove. The wagon ahead of it, a 40-ton bogie bolster loaded with rolled steel, was thrown off its bogies by the force of the collision and landed upside down across the Down line. The train became divided ahead of this wagon and the next two wagons were extensively damaged but not derailed.

10. In the Northallerton train the rear of the brake tender, which was derailed towards the cess, was overridden by the locomotive which followed the tender into derailment coming to rest about 95 yards beyond the original point of collision tilted over at about 25° away from the line, the brake tender being almost demolished and the leading end of the diesel locomotive severely damaged. One wagon of this train, the first behind the engine, was also derailed and three others sustained minor damage, one, a hopper wagon, discharging its load of coal into the four-foot when the shock of the impact caused its bottom doors to open. All the damage was consistent with a speed differential between the two trains of about 30 m.p.h. at the moment of collision.

11. Damage to the permanent way, which consisted of long welded 95 lb. B.H. rail on chaired timber sleepers, necessitated relaying about 80 yards of the Up main line.

Evidence

12. *Signalman T. W. Russell* who was on duty in Picton box described how he had signalled the Washwood Heath train which he had had to check because the preceding freight train had not cleared Rounton Gates. In these circumstances, Russell explained, it was his habit to hold his No. 20 signal at danger and thus keep the Up auto-distant at yellow until the berth track showed occupied and then to clear No. 20 to allow the train to move slowly forward towards No. 19 in the hope that he would be able to get line clear in time to avoid stopping it on the up grade. In this instance the Washwood Heath train had arived at No. 20 at 2.02 a.m. and had moved slowly forward towards No. 19 which he had cleared at 2.07 after receiving line clear from Rounton Gates.

13. The next train was the Northallerton Goods which he accepted at 2.05 a.m. after the Washwood Heath train had cleared the track circuit beyond No. 20 and had freed his Block control. Russell went on to describe how, by the time the Northallerton train had reached the berth track circuit of No. 20 the preceding train had passed the track circuit beyond No. 19 and he was able to clear No. 20 to yellow. The Northallerton train passed Picton box at 2.13 a.m. at a speed which Russell estimated at 35-40 m.p.h. and, though it was a short train which should have been able to stop he felt worried about it; when he saw it run on towards No. 19, which was clearly visible at danger from his box, without any slackening of speed he realized it was not going to stop, but there was nothing he himself could do about it.

14. Russell went on to describe how, as soon as the alarm bell rang he signalled "Train or vehicles running away in right direction, (4-5-5)" to Rounton Gates at 2.14 a.m. and spoke at once to the signalman there on the telephone, telling him that the Northallerton train had passed the Block Home at danger and that he had better try to get the other train moved on at once. About 1½ minutes later, and before 2.17 a.m., he heard the sound of the collision at a distance of nearly two miles. He immediately called out the station master and, after a further telephone call to Rounton Gates, asked Control to send for the Fire Brigade.

15. *Signalman I. R. Payling* who was on duty at Rounton Gates confirmed Signalman Russell's account of the signalling of the two trains and said that when he received the 4-5-5 emergency bell signal from Picton he had not yet seen the out-of-gauge train to Washwood Heath nor had he received "Train out of section" from Welbury for the train ahead of it. However, by the time he had spoken on the telephone with Signalman Russell and realized the situation, he was able to get the out-of-gauge train accepted by Welbury and immediately pulled off his up signals for it. He then looked out and saw the train just passing his distant signal which he replaced to caution as soon as he was sure the head of the train had passed it.

16. Payling then described how the heavy train came slowly on towards his box at a speed of 10 to 15 m.p.h. and how, when the engine had passed his home signal but not reached the level crossing, he heard the noise of the collision and saw the illuminated route indicator of the engine of the Northallerton train tilted over towards one side and a glare which made him think, at first, that the diesel engine itself was on fire. As the engine of the Washwood Heath train passed his box he shouted to the enginemen to tell them of the collision, sent the "Obstruction Danger" signal and took steps to stop a freight train approaching on the Down line.

17. *Passed Fireman J. C. Marshall* the driver of the Washwood Heath train described the progress of his train through Picton and on to Rounton Gates. He said he had received a yellow at Picton auto-distant but by keeping his speed down to a mere walking pace had not actually had to stop at the I.B. Home which had cleared just as he was approaching it. He then continued slowly towards Rounton Gates and had just passed the distant signal when he saw the home signal come off. He then started to put on power and had reached about 15 m.p.h. with his very heavy train when he felt a jolt which to him felt like the loss of power due to an earth feed fault. A moment later there was another jolt and he hit his head on the windscreen wiper and the Rounton Gates signalman shouted that something had run into the back of them. He stopped his train and sent his fireman forward at once to stop a train which he could see approaching on the down line.

18. *Fireman A. W. Spurr* of the Washwood Heath train confirmed his driver's evidence and said that he thought that they were about a train's length past the Rounton Gates distant when they saw the home signal come off and the driver started to apply power. It was not very long after this, perhaps 30 or 40 seconds before they felt the first jolt which they had thought at the time was due to a fault on their engine and then another 10 or 15 seconds before the second jolt which caused his driver to bump his head on the windscreen wiper. This had happened when they were passing Rounton Gates signalbox.

19. *Driver J. E. Aconley* was in charge of the Northallerton train and had signed on duty at Northallerton at 10.00 p.m., after being off duty since 7.25 a.m. He had worked a train to Tees Yard, arriving about 11.50 p.m., where he had taken over another engine, No. D 5160, for the trip back to Northallerton. They had left Tees Yard at about 1.20 a.m. and he described the trip as quite normal as far as Yarm from where he had been running up the bank towards Picton at a speed of between 20 and 25 m.p.h. He remembered passing two yellow colour lights in succession at Picton, the distant and home, but after that could remember nothing more, apart from recalling a slight feeling of dizziness until he realised his cab was on a slant and he felt shaken up.

20. Aconley did not remember seeing the Intermediate Block Home signal but did not question the fact that he had passed it at danger. He knew the line well and described the signalling as perfect. He felt sure he had not fallen asleep but recollected that he had been preoccupied with thoughts about a wasps nest in his garden at home which he had planned to destroy that day, something he had been unable to do because the wasps had not all returned to their nest before he left home that evening.

21. I questioned Driver Aconley, who is nearly 62 years of age, at length about the state of his health and he admitted that he had not been well on and off since March 1962 when he had had a dizzy turn whilst working in his garden and had been away from work for about three weeks under his own doctor. He admitted that he had come to the time of life when he did not like to confess to others that he was ill and, though he was worried about his health and his stomach had been troubling him since he started to drive diesels in March of this year, he had felt he was fit enough to do his job. When asked about his stomach trouble he revealed that when working on diesels he vomited every day after taking food and that the smell of cooking affected him in the same way so, when his fireman wished to cook, he was in the habit of sending him to the back cab. On this occasion the fireman had left him near Yarm and he had thus been alone in the front cab when the collision occurred.

22. Aconley blamed the diesel exhaust fumes for making him feel ill and said that, if the cab windows were open, the fumes came in when two diesels passed one another. On this occasion he had had the windows shut as it was a coolish night.

23. I asked Driver Aconley about the deadman's device fitted to this particular type of locomotive (British Railways-Sulzer, Type 2) and he described it as an organ pedal on which both his feet rested. It was held down by his own weight without conscious effort or exertion and he thought that if he had lost consciousness for any reason the pedal would have remained depressed. He said that he had tested the deadman's device before leaving Tees Yard and that it had been functioning normally.

24. *Fireman E. Martin* was second man to Driver Aconley on the Northallerton train. He had known and worked with Aconley on and off over a period of 20 years and confirmed that the latter had been suffering from stomach trouble since they had changed to diesels; he had seen Aconley vomiting whilst at work on several occasions. He knew Aconley's feelings about cooking and on this occasion he had gone to the back cab when near Yarm to fry bacon and eggs. Aconley had seemed alert and well when he left him.

25. Martin said that their speed when he left the front was about 25 m.p.h. but he had not looked at the speedometer in the back cab nor had he looked out for signals. Martin described the collision, which was not preceded by a brake application, as "terrific" and said that the engine had jumped about for quite a time before stopping. He was about to get out to see what had happened when Driver Aconley came through to the rear cab, and to Martin he seemed to be in a very dazed state.

26. When asked about the rules on leaving the footplate Martin said that he thought it was in order because the locomotive had a deadman's pedal but added that he had only gone to the back because of Aconley's dislike of the smell of cooking.

27. *Goods Guard A. L. Hodgson* was the guard of the Northallerton train but he remembered little of the journey from the time of leaving Tees Yard until he was thrown out of his seat in the left-hand ducket by the force of the collision causing injury to his left eye. He thought that their speed had been about 25 m.p.h. for most of the trip but he had not observed any signals since leaving Tees Yard. When asked whether he normally travelled without looking for signals he admitted that he only glanced out now and again.

Tests and Observations

Signalling

28. Although the integrity of the signalling was not called into question, it was checked after the accident and found to be in order.

Driver's Medical Condition

29. Driver Aconley had been examined and passed fit for main line driving duties by a Railway Medical Officer at a routine medical examination, at which his blood pressure gave no cause for worry, on his reaching the age of 61 in December 1962. At this examination he did not tell the doctor about his dizzy spells nor, since it was before he started working on diesels, about his stomach troubling him. At my request, he was re-examined by the Regional Medical Officer on 5th September, about six weeks after the accident, when his blood pressure was found to be raised to a level which, in the doctor's opinion, could well produce attacks of dizziness or light-headedness and possibly affect his powers of concentration. The doctor considered him to be unfit for main line driving.

Deadman's Device

30. In view of Driver Aconley's evidence and in the light of the Regional Medical Officer's report on the state of his health I made a special examination of the deadman's device fitted to the type of locomotive concerned which should have operated to shut off the power and apply the brakes in the event of the driver becoming unconscious for any reason.

31. The device fitted to the British Railways-Sulzer Type 2 locomotive takes the form of a treadle, 11 inches square, pivoted about its forward edge and almost horizontal in its "off" or unloaded position. The pressure required to actuate the switch mechanism is specified as 16 lbs. applied at the centre of the treadle plate and the reduction in pressure to allow it to return to the "off" position as 8.6 lbs. The treadle is so placed that, when seated in the driver's seat, the feet rest squarely upon it in a naturally relaxed posture. No conscious effort whatever is required to depress it or hold it depressed since the weight of the lower legs transmitted through the heels to the point of maximum leverage at the back edge of the treadle is in itself more than sufficient to hold the switch in the "on" position. The driver's main controls, the power handle and the vacuum brake handle, are located one at each side at waist level in front of him and the driving position is a natural and comfortable one. In my opinion, in the event of the driver falling asleep or becoming unconscious for any other reason, he would be unlikely to fall out of his seat, and the relaxed weight of his legs would continue to hold the deadman's treadle depressed and thus allow the locomotive to run on under power.

32. At my request the deadman's treadle in No. 1 cab of locomotive D5160 was tested and the actual pressure required to operate the switch was found to be only 12½ lbs. with a reduction of 5 lbs. allowing it to return to the "off" position. The minimum pressure required to maintain the switch in the "on" position was therefore very close to the design figure at 7½ lbs. Apart from the damage caused as a

result of the collision, which included an earth fault on the deadman's valve at the trailing (No. 2) end of the locomotive which would in itself have caused the power to be shut off and brakes applied when the collision occurred, both the deadman's and brake equipment were in correct working order with no apparent defects.

Speed of Trains

33. Using the times given by Signalman Russell in his evidence, all of which are consistent with the running of the trains as described by other witnesses, the approximate speeds of the trains between Picton and the point of collision can be estimated, though not with great accuracy because the times were only recorded to the nearest minute.

34. The Washwood Heath train reached No. 20 signal at 2.02 a.m., passed the clearance point near Picton box at 2.05 and passed No. 19 signal between 2.07 and 2.08. Its engine had passed the Rounton Gates distant before it was pulled off between 2.14 and 2.15 and the brake van had passed it by 126 yards when the collision occurred about 2 minutes later. On this basis the average speed of the Washwood Heath train between Picton and the point of collision was between 8 and 10 m.p.h.

35. The Northallerton train had left Yarm at 2.05 a.m. and passed Picton box at 2.13 representing an average speed of about 25 m.p.h. up the 1 in 170 gradient. Assuming that the position of the power handle was not changed it would have started to accelerate on the flatter gradient after passing No. 20 signal probably reaching about 30 m.p.h. as it passed Picton, and continuing to gain speed on the almost level track as it ran past No. 19 signal at danger at 2.14. Its average speed between Picton and the point of collision works out on this basis at just under 35 m.p.h. and it seems reasonable to assume that its actual speed when the collision occurred was not far short of 40 m.p.h.

Conclusions

36. The cause of this collision was the passing at danger of the Picton Up Intermediate Block Home signal, No. 19, by the 1.00 a.m. Tees Yard to Northallerton freight train, and for this the responsibility rests with Driver Aconley. Whether he had fallen asleep as a result of being alone and without distraction in his warm cab with the windows closed or whether his alertness and power of concentration had been so lowered by the state of his health that, coupled with his absorbtion in a train of thought on a matter remote from his work, he was no longer aware of his surroundings, there is no doubt that he never saw the signal or the tail and side lamps of the train ahead and only came to himself after his engine had come to a stand derailed and tilted over to one side. He remembered nothing even of the period between the initial impact and the final plunge into the cess during which time his engine travelled 95 yards which would certainly have been both memorable and frightening to a man in the full possession of his senses. In the circumstances I think it is probable that Driver Aconley was asleep when the collision took place, but it is possible that this may have been due in part to the state of his health and his consequently lower powers of concentration.

37. The accident occurred during the early hours of the morning, when all diesel locomotives are required to be double-manned, regardless of whether a second man is required for other duties, for the sole purpose of assisting the driver to maintain his vigilance at a time when a man finds it hardest to remain alert. Despite this, Driver Aconley deprived himself of the assistance of his fireman by his insistence that the latter should go to the back cab to do his cooking.

38. It is also quite clear from the evidence that, from the time the train passed Picton at about 2.13 a.m. until it collided, still under power, with the rear of the Washwood Heath train some three or four minutes later, neither of the other two members of the train crew were paying any attention whatever to their duties. The fireman should have looked out for and have seen the Intermediate Block Home signal, a well sited bright colour light which would have been clearly visible at a distance of over 1100 yards, coming into view as the engine passed Picton signalbox and, at a speed of 30 m.p.h., remaining in view for about 75 seconds. Fireman Martin, however, had been cooking in the back cab for about 15 minutes during which time he had observed neither speed nor signals. Had he been in front with the driver and alert he would have seen the signal and, if necessary, drawn the driver's attention to it thus averting the accident. Guard Hodgson, on his own admission, had not observed a signal since leaving Tees Yard some 45 minutes earlier. If he had been alert, and carrying out his duties as laid down in Rule 148 he would have realized that the train was running into danger and made an effort to attract the driver's attention by applying his van brake. In the circumstances, however, I doubt whether he would have succeeded in averting the accident.

Remarks and Recommendations

39. One of the most disquieting features of this accident is the fact that the deadman's device on the locomotive, though found to be in working order after the accident, failed to carry out its function of bringing the train to a stand when the driver fell asleep or otherwise became unconscious, and my own subsequent examination of the equipment leads me to suppose that even if the driver were to collapse and die whilst at the controls there would be more than a chance of his weight continuing to keep the treadle depressed.

40. Though the provision of a deadman's device in no way relieves the driver of his responsibility for maintaining a high degree of alertness whilst on duty, in my opinion it should be so designed that, in order to keep the control in the "on" position, it requires some degree of positive action by the driver, either continuously or at close intervals, of a nature that would become neither tiring nor distracting to a man who was awake and alert but which would not be carried out sub-consciously by one who was drowsy or asleep.

41. I am given to understand that this problem is at present under examination by the British Railways Board in regard to all types of locomotive, but I hope that early action will be taken to modify the equipment on the British Railways-Sulzer Type 2 locomotives similar to No. D5160 in view of its present undesirable characteristics.

42. As far as Driver Aconley's health is concerned, I have little doubt that he knew in his own mind, as surely as it was later confirmed by the Regional Medical Officer, that he was not a fit man; also that because he was worried about his job he had concealed his symptoms at his last railway routine medical examination, and had carried on although, in addition to his occasional dizzy spells, his stomach had been causing him trouble during the four months since he had been transferred to driving diesels.

43. While the retiring age for drivers is 65 there must be many of the older men who are worried about what might happen should their health or eyesight fail before retiring age. Drivers are required to undergo annual medical examinations after reaching the age of 60, but such examinations cannot be entirely effective without the full co-operation of the men concerned; moreover, a man who is apparently fit at the time of his examination may no longer be so a few months later. The matter should be watched carefully by supervisors and where they have any reason to suppose that a driver is in any way unfit he should be encouraged to report sick rather than risk being responsible for causing an accident.

44. Though this collision would probably have been prevented had the line been equipped with the Automatic Warning System, the majority of the traffic it carries at present consists of slow-moving freight trains and I consider there are no grounds for pressing for any special priority to be given to its installation.

I have the honour to be,

Sir,

Your obedient Servant,

I. K. A. McNAUGHTON,
Lieutenant-Colonel.

The Secretary,
Ministry of Transport.

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