MINISTRY OF TRANSPORT

RAILWAY ACCIDENT

Report on the Collision that occurred on 30th October 1968 at Selside near Horton-in-Ribblesdale

IN THE
LONDON MIDLAND REGION
BRITISH RAILWAYS

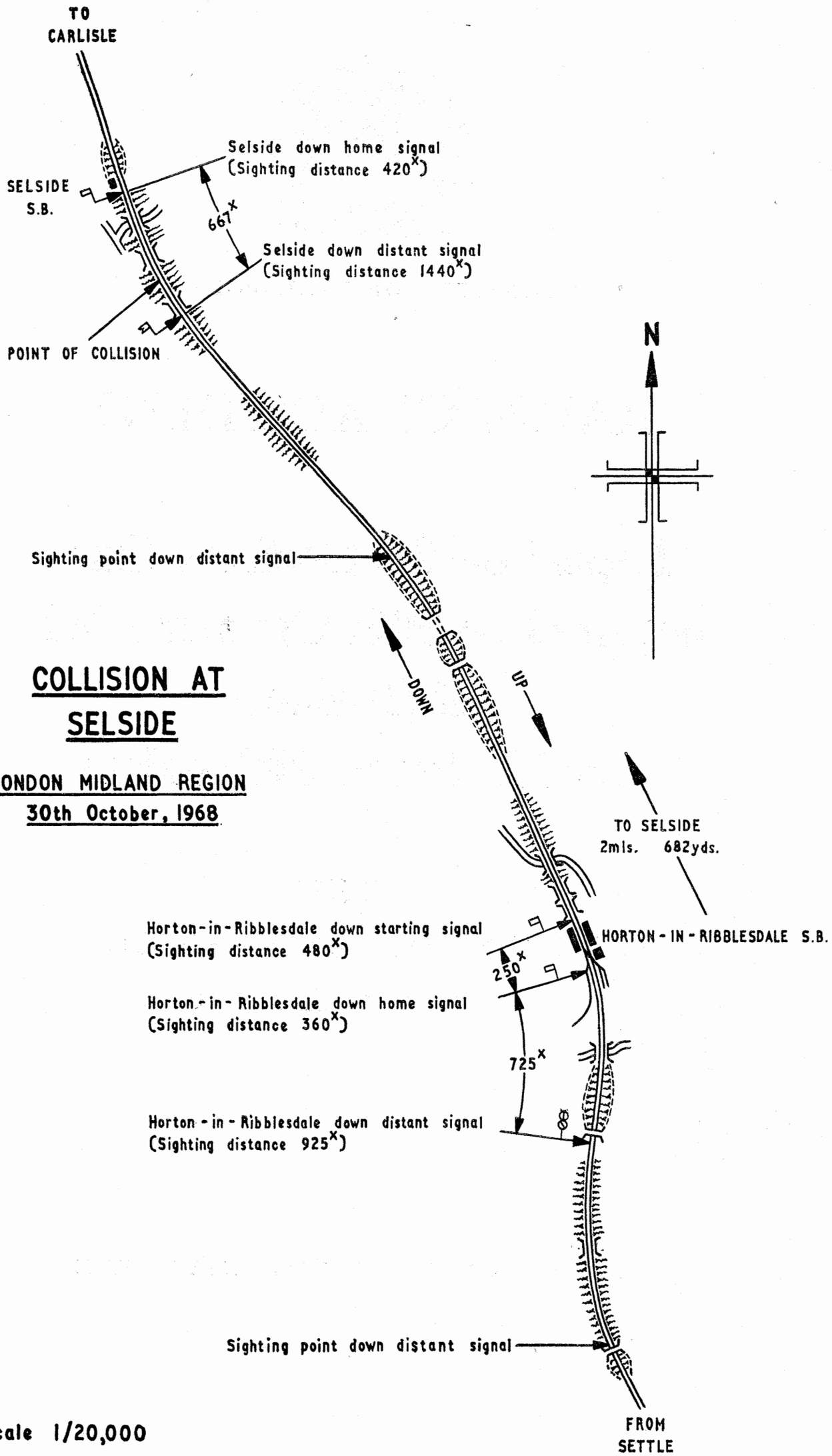
LONDON: HER MAJESTY'S STATIONERY OFFICE
1970
PRICE 1*s*. 9*d*. [9p] NET

Printed and published by
HER MAJESTY'S STATIONERY OFFICE

To be purchased from
49 High Holborn, London W.C.1
13A Castle Street, Edinburgh EH2 3AR
109 St. Mary Street, Cardiff CF1 1JW
Brazennose Street, Manchester M60 8AS
50 Fairfax Street, Bristol BS1 3DE
258 Broad Street, Birmingham 1
7 Linenhall Street, Belfast BT2 8AY
or through any bookseller

Printed in England

SBN 11 550134 7


TO CARLISLE
Selside down home signal (Sighting distance 420x)
SELSIDE S.B.
667x
Selside down distant signal (Sighting distance 1440x)
POINT OF COLLISION
N
Sighting point down distant signal
DOWN
UP
COLLISION AT SELSIDE
LONDON MIDLAND REGION
30th October, 1968
TO SELSIDE 2mls. 682yds.
Horton-in-Ribblesdale down starting signal (Sighting distance 480x)
HORTON-IN-RIBBLESDALE S.B.
250x
Horton-in-Ribblesdale down home signal (Sighting distance 360x)
725x
Horton-in-Ribblesdale down distant signal (Sighting distance 925x)
Sighting point down distant signal
FROM SETTLE
Scale 1/20,000

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

19*th February* 1970.

SIR,

I have the honour to report for the information of the Minister of Transport, in accordance with the Order dated 20th November 1968, the result of my Inquiry into the collision between two goods trains that occurred at about 00.16 on Wednesday, 30th October 1968, on the Down Line at Selside near Horton-in-Ribblesdale on the Settle and Carlisle line in the London Midland Region of British Railways.

The 22.15 Class 5 train from Preston to Carlisle (5P31), after passing at Danger the Home and Starting signals at Horton-in-Ribblesdale, collided at about 30 m.p.h. with the rear of the 20.19 Class 5 train from Warrington to Carlisle (5P28), which was standing at Selside Down Home signal awaiting Line Clear from Blea Moor.

The diesel locomotive of 5P31 and 24 out of the 36 wagons of which it was composed were derailed, as were 14 wagons of 5P28. The collision resulted in much damage to the track and rolling stock, both lines being blocked with some wagons down or overhanging the embankment. Fortunately there were no casualties caused by the collision, though both the driver and guard of 5P28 received minor injuries at the scene of the accident.

Considerable difficulty was encountered in clearing the track at this remote locality and it was not until 04.30 on Friday, 1st November that the line was re-opened to traffic subject to a 20 m.p.h. speed restriction. In the meantime much dislocation had been caused to traffic, a total of 42 passenger and 125 freight trains being diverted or cancelled and widespread delays being caused to services on other routes. During the time the line was blocked an improvised bus service using a British Railways Civil Engineer's Department vehicle was introduced between Horton-in-Ribblesdale and Ribblehead to connect with local passenger trains terminated at these points.

The collision occurred on a dark and rainy night with fair visibility.

DESCRIPTION

The site and signalling

1. The Settle and Carlisle line diverges from the Leeds to Morecambe line of the former Midland Railway at Settle Junction, 234½ miles from St. Pancras. From the junction the line rises almost continuously at a gradient of 1 in 100 for 15 miles to a summit in Blea Moor tunnel. The line is double track throughout and is maintained to Class "B" standards, with a line speed limit of 80 m.p.h. The track consists of 109 lb FB rail in 60ft lengths on timber sleepers with elastic spike fastenings. Approaching Selside on the Down line at the point at which the collision occurred the track is on an embankment about 30 ft in height, on a long right-hand curve of 80 chains radius.

2. The signalbox at Selside (245 MP), where there are no connections, serves purely as an intermediate block post between Horton-in-Ribblesdale (242½ MP) and Blea Moor (248½ MP) signalboxes. The line is worked on the Absolute Block System, using Midland Rotary Block instruments with treadles at the home signals operating block releases on the starting signals of the signalbox in rear. There are no track circuits and the line has not been fitted with AWS equipment.

3. The signals on the Down line approaching Selside are shown on the plan opposite. Apart from an intermediate block home signal at Stainforth, which is a colour light controlled from Settle Station signalbox, all the stop signals from Settle Junction to Selside are oil-lit semaphores. Of the distant signals those for Settle Station, Stainforth IB signal, and Horton-in-Ribblesdale are colour lights, whilst those for Helwith Bridge and Selside are semaphores.

4. The sighting distance of the Down line signals at Horton-in-Ribblesdale and Selside are shown on the plan, the colour light distant at Horton being particularly well sited and fully visible over the whole sighting distance. In contrast the oil-lit semaphore distant for Selside, although visible from a distance of 1,440 yards under good conditions, might have only been effectively visible from about half that distance on the night of the collision.

The trains

5. Both of the trains involved in the collision were hauled by 2,000 h.p. diesel-electric locomotives of Class 40. These locomotives were built by the English Electric Company and first introduced in 1959. They have a 1Co-Co1 wheel arrangement and weigh 133 tons in working order. The locomotive body is double ended with a short nose section extending beyond the cab at each end. Heating is provided by 6 heaters, each of 648 watts, in each cab and circulation of fresh air is provided for by means of a single extraction-type ventilator mounted centrally in the cab roof. The Drivers Safety Device (DSD) on this class of locomotive is of the original treadle design, consisting of a hinged strip that can be held in the operative position by the toes of either or both feet.

(135658) A 2

6. The leading train of the two involved in the collision was the 5P28, 20.19 from Warrington to Carlisle. It was formed of 46 2-axle wagons and a brake van, the automatic vacuum brake being connected on the leading 40 wagons. The weight of the train had been assessed as equivalent to 56 BWU and its length as 50 standard wagons lengths. It had been remanned at Hellifield, from where it had departed at 23.35. It had been brought to a stand at Selside at 00.08 as a result of a locomotive failure on a train ahead at Blea Moor.

7. The following train was the 5P31, 22.15 from Preston to Carlisle. It was formed of 36 wagons and a brake van including a fitted head of 17 wagons. Most of the wagons forming the train were of 2-axle type, but included in the unbraked portion of the train, marshalled immediately ahead of the brakevan were 2 bogie bolsters and 5 empty freightliner wagons. The weight of this train was assessed at 50 BWU and its length as 51 standard wagon lengths. It had been remanned at Blackburn from where it had departed at 22.57, passing Settle Junction at 23.59. Its average speed from Settle Junction to passing Horton-in-Ribblesdale at 00.14 was 34 m.p.h.

8. The maximum permitted load for a Class 5 freight train hauled by a locomotive of Class 40 over the Settle and Carlisle line is 70 BWU with a length limit of 70 standard wagons lengths.

The damage

9. Of the total of 38 wagons derailed, 14 from 5P28 and 24 from 5P31, at least 23 were damaged beyond economic repair. It was not possible to assess exactly how far forward the rear portion of 5P28 had been pushed by the impact, but a spillage of salt from one damaged wagon indicated that it had been moved a distance of 30 yards. Diesel locomotive No. 305 sustained fairly light damage considering the speed of the collision. The leading wheels of the leading bogie were derailed, the end nose door was dented, the buffers bent and a jumper cable socket broken. There was also minor damage to the running gear of the derailed bogie, which after lifting was found to have a bent and fractured side frame.

10. Ten lengths of track were damaged in the accident and the telegraph pole route at the lineside was severed, interrupting block and telephone communications between Selside and Horton-in-Ribblesdale.

Evidence

11. *Driver G. Foster*, stationed at Carlisle, had travelled passenger to Hellifield where he took over 5P28, working single-manned. He had clear signals through Horton-in-Ribblesdale but he found the Selside Down Distant signal at Caution and brought his train to a stand at the Home signal. After a minute or two he left his cab to go to the signalbox just in case something was wrong, although he was not specifically required to do so at this signal under Rule 55. On his way he met the signalman coming towards him with a red light to warn him that the following train had run through the signals at Horton. Foster's first thought was for his guard and he ran towards the rear of the train. When about half way back, he saw the guard jump down and they met about three-quarters of the way down the train. By this time they could hear the other train approaching under power and though they ran back it was too late to do anything. When they realised the collision was imminent they jumped down the embankment side out of the way. In doing so, Driver Foster bruised his leg.

12. In charge of 5P28 was *Goods Guard R. Farish*, but he was unable to be present at my Inquiry since he was suffering from delayed shock as a result of the accident. He had also sustained a slight burn and damaged his clothing by stepping into some spilt caustic soda whilst picking his way down the derailed vehicles of his train.

13. On duty at Selside signalbox was *Signalman G. T. Horner*. Shortly after 5P28 had come to a stand at his Down Home signal he received a "Train running away, right line" bell signal from Horton-in-Ribblesdale. He immediately took up a red hand lamp and detonators and set out to warn the driver of 5P28. After meeting the driver and warning him he returned to the signalbox, sending the "Obstruction Danger" signal as soon as the collision took place. He then went out again to protect the Up line with detonators and red lamps.

14. Horner then returned to the signalbox and advised Carlisle Control of the situation and asked them to call out the emergency services. He then found he had no means of communication with Horton-in-Ribblesdale. Signalman Horner confirmed that he had tested his signals and instruments when he took up duty and that everything had been functioning correctly prior to the collision.

15. *Signalman E. Armes* was on duty at Horton-in-Ribblesdale. He had obtained "Line Clear" and pulled off his Down line signals for 5P28 which passed his signalbox without stopping at 00.04. The brake van was displaying a good tail lamp and side lamps as required for a Class 5 train. When he accepted the following train, he was unable to pull his signals off for it since the section ahead was still occupied and his starting signal was locked by the rotary block. As the train approached his Home signal, still under power, he realized that it was not going to stop and he took up a red lamp and waved it at the driver who did not react. This was the only course of action open to him since his signalbox is not provided with detonator placers. He went on displaying the red hand signal until after the train had passed and then sent the "Train running away" bell signal to Selside. It was not long afterwards that he received the "Obstruction Danger" signal whereupon he placed detonators on the Down line and turned the Up line commutator on the rotary block instrument to "Train on Line" in order to lock the Up starting signal at Selside.

16. Signalman Armes estimated the speed of both 5P28 and 5P31 as about the same, quite normal for a Class 5 train.

17. The locomotive of 5P31 was double-manned by *Driver F. Bond* and *Passed Fireman R. A. Watton*, both of Blackburn, at which point they had taken over the train at the beginning of their turn of duty, which involved a round trip to Carlisle. When taking over the locomotive Driver Bond had not noticed whether the cab ventilator was blocked, but was aware that on many diesel locomotives the ventilators were either blanked off or blocked with newspapers. Watton, who was qualified to drive locomotives of Class 40, had driven as far as Hellifield where they had changed over on the move. Bond was able to recall the signal aspects between Blackburn and Hellifield and from Hellifield as far as Helwith Bridge, where he recalled that all the signals were "off". From there, until he suddenly became aware of red lights immediately ahead of his locomotive, he could recall nothing whatever and freely admitted that he must have fallen asleep. He just had time to make a brake application before impact, but the power controller was still open. He was so close, in fact, that he could only see the two red side lights on the brake van, the tail light being obscured by the nose of his own locomotive.

18. Driver Bond, who was 49 years of age, had been a driver since 1960 but had only 12 months experience of driving main line diesels. He told me that although he had heard of drivers falling asleep at the controls, he had never thought it could happen to him. He recalled that, after leaving Blackburn they had controlled the heat in the cab by turning off the heaters and opening the windows on two occasions, but when the accident occurred the windows were closed and the cab heater switched on. The door to the engine room was shut and the cab lights were out.

19. I asked Driver Bond about the DSD pedal on the Class 40 locomotive. He told me that with a man of his build—he is tall and long-legged—sitting in a relaxed position in the driving seat, the pedal is held down by the weight of his feet without conscious effort and he agreed that the pedal would have remained depressed when he was asleep.

20. Driver Bond had worked the same turn on the previous night, and he described how he had spent the day after booking off at 08.15 that morning. He was in bed by 08.45, getting up at 15.20. During the evening he had visited the British Railways Staff Club in Blackburn of which he is the secretary, to conduct some club business, arriving there about 20.45. Whilst at the club he drank a pint of beer and a bottle of shandy. It was not his normal habit to drink before going on duty and, because he was driving his car that evening, he was particularly careful about the amount he consumed. He left the club in plenty of time to book on at 22.39.

21. I asked Driver Bond about his health and he told me that he was fit apart from having a sore throat and husky voice for a few days prior to the accident. His wife had suggested on the Monday evening that he took some "Anadin" tablets to relieve his throat and, though he did not often take medicines of any kind he had put some in his pocket. On the night of the collision, he took two tablets to try to ease his throat while on the way between Blackburn and Hellifield, about an hour before the accident occurred. After the collision, in which he sustained no injuries, Driver Bond was fit to continue duty and, at the request of the Divisional Movements Inspector, had taken over the locomotive of 5P28 from Driver Foster, who had injured his leg, and worked the undamaged portion of the train, amounting to 33 wagons, forward, leaving Selside at 04.58 and reaching Carlisle at 06.45.

22. Fireman Watton could add little to his driver's account of the events prior to the collision. He, too, admitted to being asleep until just before the impact, when he was woken up by a sudden shout from Driver Bond. The last signal he could remember seeing was the Helwith Bridge distant which he recalled as showing Green. He could not remember feeling drowsy or heavy-eyed and said that, if he had, he would have opened the window again. He had last left his seat to visit the engine room on leaving Hellifield about half an hour before the collision. Fireman Watton was physically fit and properly rested before coming on duty. He had taken no alcohol, but had drunk a cup of cocoa with his meal before leaving home. Like Driver Bond, he had often seen diesel locomotive cab ventilators stuffed with newspapers.

23. In charge of the 5P31 was *Goods Guard C. Chadwick*, stationed at Blackburn; his turn of duty was the same as that of the engine crew, involving a round trip to Carlisle. He had only four months experience as a guard and had only worked over the Settle and Carlisle line nine times, each time after dark, since he had signed for the route in August. He was satisfied that he had an adequate knowledge of the route and signalling but admitted that he was not as experienced as he might have been if he had worked the route more often. He recalled that though the night was dark and wet, visibility of signals was reasonable. However, he could not remember seeing the adverse signals at Horton-in-Ribblesdale and claimed that he was attending to his stove at the time; he was insistent that he had not been asleep.

24. After the collision Chadwick had conferred with the guard of the other train and then set out to protect his own train in rear, walking through the section to the signalbox at Horton-in-Ribblesdale.

25. After the collision, the signalling equipment at Selside and Horton-in-Ribblesdale was examined by *Technician L. Hughes*, responsible for the area from Settle to Appleby. Apart from the damage caused by the accident the equipment was in good order and he was satisfied that there was no possibility of the signals at Horton-in-Ribblesdale having been irregularly in the Clear position. The signalman could not have pulled off the signals without a "Line Clear" from Selside and the commutator of the rotary block instrument for the Down line was locked in the "Train on line" position. Hughes also made a special examination of the colour light distant signal and had observed that both the home and starting were showing very good lights.

26. *Chief Maintenance Foreman M. Stephens* had examined diesel locomotive No. 305 at Carlisle where it was taken after the accident. Apart from the damage caused in the collision, described in paragraph 9 above, he found the locomotive in good order. The brake blocks were in good condition and both the air and vacuum side of the brake equipment functioned correctly. The delay on the DSD pedal was within the proper limits at 6 seconds. He examined the cab ventilators and found the one at No. 2 end, which was leading at the time of the collision, blocked by a newspaper bearing a July date. The ventilator at the other end was clear of obstructions.

27. Mr. Stephens also confirmed that he had examined the door between the No. 2 cab and the engine room. He found the seal in good order and there was no risk of fumes penetrating the cab with the door properly closed.

28. I asked *Mr. N. R. Peach, Divisional Maintenance Engineer* at Preston, whether it was part of any routine periodic examination of locomotives to look at the cab ventilators and, if necessary, clear them of obstructions. He told me that, prior to the Selside collision, no such inspection was made, but that since this accident he had instructed that the ventilators would be examined at every "A" inspection, i.e., after 50 hours in traffic, and cleared if necessary. He had since been informed, however, that as fast as the maintenance staff clear out the ventilators they are found blocked up again.

Condition of DSD on locomotive No. 305

29. Arising from the evidence given by Driver Bond, which clearly revealed that the DSD pedal remained depressed whilst he slept at the controls, I asked for measurements to be made of the actual pedal loadings on this locomotive and for them to be compared with the design standards laid down for this equipment. I have since been informed that no limits were laid down for the loading of the "deadman's pedal", as it was called when these locomotives were built, but the actual loadings recorded on this locomotive, which were 13 lb at No. 1 end and 8 lb at No. 2 end, were compared with those of a complete switch and pedal assembly by the British Railways Materials Inspection Department at Derby. The assembly was tested with both new and used springs in lubricated and unlubricated conditions and it was concluded that in the "as new" condition and unlubricated the switch would close under a load of 11·6 lb and re-open when the load was reduced to 8·3 lb. The spring in the equipment at the No. 2 end of locomotive No. 305 was therefore slightly weaker than standard.

The effects of a combination of alcohol and pain relieving drugs

30. In view of the possibility that Driver Bond's alertness could have been affected as a result of his having consumed the equivalent of 1½ pints of beer and 2 "Anadin" tablets, I asked for an opinion from the Principal Medical Officer of the London Midland Region, who stated in his reply:

> " 'Anadin' tablets have four ingredients and act on the Central Nervous System. In general, the combination of alcohol and drugs which act on the Central Nervous System may have consequences. The specific effect on any individual could differ from time to time, and may depend on the illness for which the drug was taken.
>
> It is unlikely that a dose of two 'Anadin' tablets would affect the ability to concentrate. However, the possibility of some effect in any individual cannot be excluded. This could be of a soporific nature, induced more so by the alcohol than the drug, and in my opinion the effects may have to be considered as contributory in this instance."

Conclusions

31. The cause of this accident was that the driver of the 22.15 goods train from Preston to Carlisle was asleep when the train ran past both the Down Home and Starting signals at Horton-in-Ribblesdale at Danger into the section ahead when it was occupied by another train. The driver woke up when only a few yards short of the brake van of the train ahead, which was standing at Selside Down Home signal, too close for a brake application to have any effect. The speed of the impact was about 30 m.p.h.

32. Both the semaphore stop signals concerned are well sited and were showing a good light; they were preceded, moreover, by a powerful colour light distant signal, clearly visible from a distance of over half a mile. I am satisfied that both the stop signals were in the Danger position as the train approached and that the Distant signal was correctly showing a single yellow aspect.

33. Though the prime responsibility for the collision rests with Driver Bond, Passed Fireman Watton must share some of the blame. When the single manning of all types of freight train was agreed in 1965, one of the provisos was that drivers should have time to accustom themselves to single manning during the day and evening before being called upon to drive alone between 01.00 and 05.00. At the time when this collision occurred this arrangement still applied, though single manning is now permitted at any hour of the day or night subject to limitations in the total time on duty, the time actually spent driving, etc. In this instance the presence of a second man on the locomotive did nothing to prevent the accident. Driver Bond did not receive the support he should have done from Passed Fireman Watton, in fact, it seems probable that the latter was the first to fall asleep.

34. At the time of the accident both enginemen had been on duty for only 1 hour 37 minutes after a period of 14 hours 24 minutes off duty. They were properly rested and unable to account for what had happened. There may have been two contributory factors, however, to Driver Bond's loss of concentration which led to his falling asleep. In the first place, he had taken a small amount of alcohol before coming on duty and, about an hour before the collision, he had swallowed two "Anadin" pain relieving tablets; it seems likely that this combination had a soporific effect. In the second place, the ventilation in the cab was inadequate because the roof ventilator had been blocked with newspaper. There is no suggestion, however, that Driver Bond was actually aware that the ventilator was blocked on this particular locomotive.

35. These contributory factors may have been reasons for Driver Bond's falling asleep, but they are not excuses. A driver's duty is a responsible one, to be carried out without immediate supervision, and he must learn to discipline himself, both on and off duty, so that he can perform it in a proper manner.

36. Nor can Goods Guard Chadwick escape some degree of criticism. Because of the empty freightliner vehicles at the rear of his train he had an unobstructed view forward from his brakevan and, had he been more alive to his responsibilities and properly acquainted with the signalling on the Settle and Carlisle line, he would have seen the adverse signals at Horton-in-Ribbledale or the signalman's hand Danger signal and at least made an effort to attract the driver's attention. As it was he seems to have been more concerned with his own comfort, in that he claimed to be attending to the stove in his brakevan.

Remarks and Recommendations

37. Though the provision of a Driver's Safety Device in no way relieves the driver of his responsibility for maintaining a high degree of alertness whilst on duty, the device is of little value unless it can be relied upon to bring the train to a stand in an emergency. As in a number of previous accidents into which Inquiries have been held, the DSD fitted to the locomotive involved in this collision signally failed to carry out the function for which it was designed, remaining in the operative position without conscious effort on the part of the driver.

38. The need for a more reliable vigilance device has, however, been recognised for some years and after prolonged trials an improved type of DSD with a pedal that has to be maintained normally in a mid-position and depressed at intervals to reset a timing device has been approved by the British Railways Board for installation on all locomotives to be retained in service. The introduction of this modification has proved to be more difficult than at first anticipated on certain classes of locomotives. This is owing to the reliability of the electronic equipment being adversely affected by the existing circuitry of the locomotives. The Class 40 locomotive is in this group, and it is intended to have 10 locomotives fitted experimentally within the next three months. It is anticipated that this equipment will be fully evaluated so that a firm programme for fitting the new DSD to the Class 40 locomotives can be embarked on towards the end of 1971.

39. This accident is not the first case in which the lack of ventilation in the cab of a diesel locomotive has been a contributory factor to a driver's loss of concentration. The need for a proper supply of fresh air to maintain alertness is well appreciated by the British Railways Board and I understand that development work is being carried out on a combined heating and ventilating unit for the cabs of diesel locomotives. This unit, which would use a proportion of recirculated air, would also permit a reduction in the number of bulkhead heaters, thus improving cab environment by minimising reliance on radiated heat. In the meantime, the need to allow the free circulation of fresh air has been brought to the attention of all enginemen and instructions have been issued to ensure that the practice of blocking up the ventilators is discontinued forthwith.

40. This accident was one that would almost certainly have been prevented by the British Railways Automatic Warning System, which is in general use on most of the important main lines in the country. Even if the Settle and Carlisle line were planned to form part of the long-term railway network of the country, it would still come fairly low in the priority list for installation of AWS; this route, however, is planned for closure within the next few years and the very considerable capital expenditure which the installation of AWS would involve could not possibly be justified.

41. A very much simpler safety device, the apparatus to enable a signalman to place detonators on running lines without leaving his signalbox, had it been available, might well have been effective in preventing this accident by bringing the driver to his senses as he passed the Home signal at Danger. The provision of such apparatus is a standard requirement of the Minister of Transport for passenger lines signalled on the absolute block system and I am not aware of the reasons why it has never been installed at Horton-in-Ribblesdale. I do not, however, feel that the circumstances of this one accident can be taken as justifying even the cost of detonator placers for the remaining time this route is to remain open for traffic.

I have the honour to be,

Sir,

Your obedient Servant,

I. K. A. McNAUGHTON,
Lieutenant Colonel.

The Secretary,
Ministry of Transport.

(135658) Dd. 501031 K.9 5/70 Hw.