



MINISTRY OF TRANSPORT AND CIVIL AVIATION

RAILWAY ACCIDENTS

REPORT ON THE COLLISION

which occurred on

2nd September 1958

near

LUNAN BAY

in the

**SCOTTISH REGION
BRITISH RAILWAYS**

LONDON: HER MAJESTY'S STATIONERY OFFICE

1959

ONE SHILLING NET

15th December 1958.

SIR,

I have the honour to report for the information of the Minister of Transport and Civil Aviation, in accordance with the Order dated 3rd September 1958, the result of my Inquiry into the collision which occurred at about 10.25 a.m. on 2nd September 1958, near Lunan Bay, just south of Montrose, on the double tracked section of the main line between Edinburgh and Aberdeen in the Scottish Region, British Railways.

The 7.30 a.m. Down express passenger train from Edinburgh to Aberdeen was travelling under clear signals at about 30 m.p.h. on the steep rising gradient approaching Lunan Bay when the fireman saw a van on the line ahead, and he warned the driver. The latter immediately applied the brakes fully but was unable to prevent the train colliding at about 20 m.p.h. with the van, which was standing athwart the Down line about $\frac{1}{2}$ mile short of the station. The train was not derailed and no one was injured. The van was pushed forward about 80 yards and was heavily damaged, and the front of the engine also received some damage.

The van was a four-wheeled vehicle used for fruit. It was the rearmost vehicle of the preceding 7.9 a.m. express passenger train, also from Edinburgh to Aberdeen, from which it had become detached after being dragged in a derailed state for about two miles.

Both the lines were blocked and the track was extensively damaged. The Up line was repaired by 4.30 p.m. when single line working was introduced, and the Down line by 7.40 p.m. when normal working was restored. The passengers from the 7.30 a.m. train were escorted to Lunan Bay where road transport had been made available. Many trains were diverted by other routes.

The weather was clear but cloudy.

DESCRIPTION

The trains

1. The 7.9 a.m. train comprised eight passenger bogie coaches with a bogie motor car van behind them and two four-wheeled covered fruit vans at the extreme rear. The weight of the rolling stock was 324 tons. It was hauled by a V-2 class 2-6-2 type engine which with its tender weighed 145 tons; it was driven from the left hand side and was not fitted with a speedometer. The brake power available on the train was 74% of its total weight of 469 tons. The rearmost four-wheeled van which became derailed had a wheel base of 10 ft. and was fully fitted; its tare weight was 8 tons 9 cwt. and it was loaded with fruit weighing 17 $\frac{3}{4}$ cwt. It was built in 1950 and underwent a general repair in 1956. It was marked "X.P." which means that it was allowed to be attached to passenger trains. The other fruit van was of similar design.

The 7.30 a.m. train consisted of eight passenger bogie coaches and it was drawn by the same class of engine. Its total weight was 409 tons.

The line

2. From Edinburgh to Aberdeen the line runs roughly northwards. From Dundee onwards it is double to Usan and single from there to Montrose South box where it again becomes double. The following table gives the relevant distances:—

	<i>Intermediate distance</i>	<i>Distance from Dundee</i>
Dundee Tay Bridge		
Arbroath	16 $\frac{3}{4}$ m.	16 $\frac{3}{4}$ m.
St. Vigeans	$\frac{3}{4}$ m.	17 $\frac{1}{2}$ m.
Inverkeilor	5 $\frac{1}{2}$ m.	23 m.
Point of derailment of van	297 yards	23 $\frac{1}{4}$ m.
Point of collision	2 m. 103 yards	25 $\frac{1}{4}$ m.
Lunan Bay	920 yards	25 $\frac{3}{4}$ m.
Usan	2 $\frac{3}{4}$ m.	28 $\frac{1}{2}$ m.
Montrose South Box	1 $\frac{3}{4}$ m.	30 $\frac{1}{4}$ m.
Montrose North Box	$\frac{1}{2}$ m.	30 $\frac{3}{4}$ m.
Kinnaber Junction	3 m.	33 $\frac{3}{4}$ m.
Aberdeen	37 $\frac{1}{2}$ m.	71 $\frac{1}{4}$ m.

3. From Arbroath northwards, the line rises for about 2 miles and then, after a short fall and another short rise, falls steeply at a gradient of 1 in 100 almost to Inverkeilor. After a further slight rise it continues to fall, mainly at much the same rate, to and for $\frac{1}{2}$ mile beyond the point where the van became derailed, and it then climbs at a gradient of 1 in 100 which increases to 1 in 92 through Lunan Bay.

4. From Inverkeilor to Lunan Bay the line is mainly curved. The van became derailed to the "six-foot" side of a left hand curve of 40 chains average radius. After being dragged for about two miles it became detached from the train at a point where the line curved at an average radius of 75 chains to

the right. In that position the van, which did not overturn, was 100 yards north of a girder underbridge and just beyond a set of catch points; it was 290 yards short of an overbridge beyond which the right handed curve continued.

5. The track in the Down line from Inverkeilor to Lunan Bay consists of both 95 lbs R.B.S. and 109 lbs flat bottom rail. For some distance up to the point of derailment it was 95 lbs rail on timber sleepers laid in stone ballast. The ballast was dirty and the clay subsoil had worked through it in places and some joints were "pumping" slightly. The track had not been disturbed when I inspected it. The gauge did not vary by more than 1/16 in. and the alignment and the "top" appeared satisfactory. The rails were slightly worn but their profile was good and they were not "side cut". Details of the track for about 100 yards back from the point of derailment had already been recorded and, at my request, measurements of the cross levels and voids were taken for a further 100 yards. They showed that there were some small irregularities in the cant and cross levels with the track under load, but they were not serious.

6. From the point of derailment to the underbridge mentioned above, a considerable number of chairs, base plates and elastic spikes were broken, but the alignment and the gauge of the track were not affected. The track beyond the bridge, and the catch points were badly damaged. Considerable damage was also done to both the Up and the Down lines in the length over which the derailed van was pushed by the 7.30 a.m. train.

7. The maximum permitted speed of trains between Edinburgh and Kinnaber Junction is 60 m.p.h., and between Kinnaber Junction and Aberdeen 75 m.p.h. Through Usan the speed must be reduced to 10 m.p.h. for picking up or delivering the single line token.

RULES AND REGULATIONS

8. The following is an extract from the Operating Instructions booklet dated 29th April 1957:—

*"Conveyance of 4-wheeled Non-Passenger-Carrying Stock
and Braked Freight Stock in Passenger Trains"*

2 (a). Passenger trains conveying vehicles with a wheel base of less than 15 feet must not exceed a speed of 60 m.p.h. at any point. In every case where four-wheeled vehicles of less than 15 feet wheel base are marshalled in the train the Guard must advise the Driver before starting so that the speed of 60 m.p.h. may not be exceeded at any point when such vehicle is, or vehicles are, attached to the trains. . . ."

9. The double line Block Regulations relating to the action to be taken by a signaller if a train passes without a tail lamp or if a tail lamp of a train is not seen, read as follows:—

Regulation 19. *Train passed without tail lamp.* (9 consecutively to box in advance, 4-5 to box in rear.) (a) Signallers must carefully watch each train as it passes, and satisfy themselves that it is complete with tail lamp attached before sending the Train out of Section signal.

(b) (i) Should a train pass without a tail lamp, or the Signaller be unable to satisfy himself whether or not the tail lamp is on the train, he must immediately place or maintain his signals at Danger to stop the first train proceeding on each line in the opposite direction, and inform the Driver what has occurred and instruct him to proceed cautiously so as to avoid danger in the event of any portion of the train having fouled the line on which his train is running. The Signaller must also send the Train passed without tail lamp signal (9 consecutive beats) to the box in advance; he must not send the Train out of Section signal to the box in rear, but must send the Train passed without tail lamp signal (4-5 beats) and maintain the block indicator at Train on line. Should he afterwards receive the Train out of Section signal from the box in advance or be advised by the Signaller at that box that the train is complete, he must send the Train out of Section signal to the box in rear. . . .

The Signaller in rear receiving the Train passed without tail lamp signal (4-5) must immediately place or maintain his signals at Danger to stop the first train requiring to proceed on any other line towards the signal box from which the signal was sent, inform the Driver what has occurred and, . . . instruct him to proceed cautiously.

The single line Regulations are similar to the above but, additionally, they lay down that the signaller concerned must not replace the token in the instrument.

REPORT AND EVIDENCE

10. The two fruit vans were attached to the rear of the 7.9 a.m. train at Edinburgh and the vacuum hose pipes were properly coupled up with the pipe at the rear end of the last van on the dummy. The vans were inspected and no defect was noticed. Before the train left, on time, the guard tested the brakes from the brake compartment and from the rear end of the rearmost van and noticed that the tail light was attached. He saw that the vans had a wheel base of 10 ft. and informed the driver. The journey to Dundee was normal but the train lost 14 minutes mainly on account of signal checks. The guard looked back on several occasions and noticed that the four-wheeled vans were oscillating but he did not consider that their movement was more than usual. The driver did not think that the speed of the train exceeded 55 m.p.h. He and the guard were aware of the Regulation mentioned in paragraph 8.

11. At Dundee the engine was changed and another engine crew and guard took over the train. The whole train was again examined and no defects were noticed. As was usually the case, the incoming and outgoing engine crews did not have the opportunity of speaking to each other. The Edinburgh guard did, however, meet the guard who was to take the train on to Aberdeen and told him the composition of the train. He did not, however, mention that the four-wheeled vans had a short wheel base and this fact had not been recorded in the journal which was taken over by the outgoing guard.

12. Instead of the normal arrangements whereby the guard informs the driver of the composition of a train, the arrangements at Dundee at the time of the accident were for a train reporter to be advised by telegram from Edinburgh of the composition of through trains and for him to give this information to outgoing drivers. J. Robertson was performing the duty of train reporter. He received the information about the train and he stated that he told the driver of the outgoing engine, which was standing on the second line from the platform, that it comprised 11 vehicles, including two four-wheeled vans, and weighed 328 tons. He said that he thought he mentioned that the vans were "10-tonners", as recorded in the telegram. There was no mention of the wheel base of the vans in the telegram, and he said nothing about this to the driver. He assumed, however, that the driver would appreciate that they were short wheel base vehicles. Robertson also noted the engine number and the driver's name and gave this information to the outgoing guard when the train arrived. Robertson knew that short wheel base vehicles were not allowed to travel on passenger trains at over 60 m.p.h.

13. The outgoing driver was A. McRobb of Dundee Motive Power Depot, who was 60 years of age, and had been driving on this main line for 21 years. He said that while the engine was standing on the line adjacent to the platform line at Dundee waiting for the train, Robertson shouted to him that it comprised 11 vehicles and weighed 280 tons. McRobb stated that nothing was said about any vans on the rear of the train and his fireman (Passed Fireman R. Marr, aged 31), confirmed this. McRobb assumed, however, that there must be some vans because the weight of 11 bogie coaches would have been at least 340 tons.

14. Guard G. Kessack, of Aberdeen, who was aged 58 and had been a guard for 20 years, took over the train at Dundee and stated that the Edinburgh guard said nothing to him about its composition. Kessack walked to the rear of the train to see that the tail light was attached but he did not test the brake. He saw that there were three vans behind his brake van and that two of them were four-wheelers, but he did not notice that they were short wheel based vehicles. He was given the engine number and the driver's name by Robertson and did not go to the front of the train. He did not give Robertson the detailed composition of the train but told him the total number of vehicles and the load and he thought that it was Robertson's responsibility to pass that information on to the driver.

15. The booked timings of the train from Dundee onwards are as follows:—

Dundee	...	...	...	dep. 9.09 a.m.
Arbroath	...	...	...	arr. 9.32 a.m.
"	...	...	...	dep. 9.35 a.m.
St. Vigean	...	...	...	pass 9.37 a.m.
Usan	...	...	...	pass 9.51 a.m.
Montrose	...	...	...	arr. 9.57 a.m.

The calculated booked speed between St. Vigean and Usan is approximately 47 m.p.h.

16. The train left Dundee at 9.24 a.m., 15 minutes late, and Arbroath at 9.51 a.m., 16 minutes late. It passed St. Vigean at 9.53 a.m. and Inverkeilor at 10.0 a.m. The signalman at the latter box thought that the speed was normal for an express train and he did not notice any excessive oscillation at the rear end. Ganger C. Taylor was on the track just south of Inverkeilor box and saw the train go past. He said it was travelling at the usual very fast speed of expresses at that point, and the vans at the rear were certainly oscillating, but not more than usual.

17. Shortly after passing through Inverkeilor all the four wheels of the rearmost van became derailed and the van was dragged in that condition for about two miles. It struck the "six-foot" girder of the underbridge and must have been thrown in the air and fallen heavily across the track beyond it. After being dragged a further 100 yards, the front coupling of the van jumped out of its gudge slot, which had become extended, but the coupling remained on the rear hook of the van next ahead. The rearmost van thus became detached from the train and was left straddling the Down line. The vacuum hose pipe was torn off the rear swan-neck pipe of the second van from the rear and remained connected to the front hose pipe of the derailed van. As a result of the complete loss of vacuum, the train stopped in 343 yards just short of Lunan Bay with the rear end beyond the overbridge and consequently out of sight of the derailed van.

18. Driver McRobb said that the engine was in good fettle and that up to the time the vacuum was lost the run had been normal. He stated that the train was tightly timed and that it was necessary to run at the maximum speed (which, at the District Officer's Inquiry, he said he thought was 70 m.p.h.) to keep time. He informed me, however, that he did not think that the speed had exceeded 60 m.p.h. although he agreed that it may have been slightly more on the falling gradient beyond Inverkeilor where the speed of a train was usually probably the highest between Arbroath and Montrose. He had no complaints about the track near Inverkeilor and had felt no lurch. He knew the Regulations about short wheel based vans but said that on many occasions he had not been told at Dundee about vans on the rear of his train. He had looked back along the trains but said that the rear vehicles were not oscillating more than usual. He thought that the maximum speed beyond Kinnaber Junction was 70 m.p.h.

Passed Fireman Marr and Guard Kessack also said that the run was normal and that they felt no lurch near Inverkeilor. Marr thought that the speed of the train through Inverkeilor was 60-65 m.p.h. and that the maximum speed of the line was 60-70 m.p.h. He looked back after passing through Inverkeilor but noticed nothing wrong. Kessack had also looked back from the brake van and had observed no more oscillation of the rear vans than usual.

19. When the train stopped McRobb sent Marr back to find out what was wrong. Marr met Kessack and they saw that the vacuum hose pipe was missing from the rear van. Kessack said he would get a plug for the pipe, but Marr suggested disconnecting the vacuum hose pipe from the front of the van and releasing its brakes, and Kessack did this. Kessack did not notice that a van was missing from the back of the train, and neither he nor Marr noticed that there was no tail light on the last van; nor did they see that there was an extra coupling on its rear hook. Neither of them gave a serious thought as to why the hose pipe was missing. Marr said he was probably a bit excited and keen to get the train re-started and avoid a delay on the main line, and Kessack gave the same impression. Marr told McRobb what had been done.

20. The box at Lunan Bay was shut, and the porter signalman went towards the train when he saw that it had stopped. After it had re-started the fireman shouted to him to telephone to the staff at Montrose to have a vacuum hose pipe ready to fit on to the rear van. In the meantime the driver had been thinking over the matter and realised that it was strange that the hose pipe should have come off and questioned the fireman about it, but he did nothing more. As the train passed, the porter signalman did not notice that it had no tail light, and he went to the station and conveyed the message about the hose pipe to Montrose.

21. Signalman J. Middleton, who is 39 years of age and had been a signalman for 10 years, was on duty at Usan. He handed the single line token to the fireman of the train, as it passed at 10.20 a.m., from the token platform on the left hand side of the track, and he remained on the platform until the last vehicle had passed. He did not notice that it had no tail light, and he attributed this to the fact that he was concentrating on the missing hose pipe about which he had heard on the telephone. He then went back to the box and gave "Train Entering Section" to Montrose South and "Train out of Section" to Inverkeilor.

22. As soon as the signalman at Inverkeilor received that block signal, he asked for and was given "Line Clear" by the Usan signalman for the 7.30 a.m. express train which had in the meantime been stopped at Inverkeilor. The signal was cleared and Driver A. Fraser started the train which, as already mentioned, reached a speed of about 30 m.p.h. on the steep climb towards Lunan Bay. Fireman A. Morrison had just finished putting coal on the fire and looked up and from his side of the engine saw the derailed van about 100 yards ahead, and he shouted to Fraser. The latter, who thought the distance was only 30-40 yards, immediately closed the regulator, applied the brakes and started to put the engine into reverse gear but he could not avoid the collision which took place at about 20 m.p.h.

I asked Fraser about the maximum speeds permitted between Dundee and Aberdeen, and he was very vague. He thought that a Down express would reach 65-70 m.p.h. through Inverkeilor.

23. Signalman A. Pert at Montrose South, who is 64 years of age and has been a signalman for over 40 years, received the message from Lunan Bay about the missing hose pipe on the 7.9 a.m. train and advised the carriage and wagon examiner to have a spare one ready. When the train arrived, at 10.24 a.m., he saw that there was one small van at the end of the train and that there was no tail light on it. He therefore rang the Inverkeilor signalman and he realised that the signalman at Usan was on the line at the same time; he asked the former how many vans were on the back of the train and got the reply that there was one van. Consequently he placed the token in the instrument and gave "Train out of Section" to Usan, and then asked for and was given "Line Clear" for an Up train. The token was given to the driver who started the train at 10.27 a.m. Signalman Middleton of Usan said that he also was asked by Pert how many vans were on the 7.9 a.m. train and gave the same reply. When he heard that the train had arrived at Montrose without a tail lamp, he realised that he had missed seeing it when the train passed Usan, and he said that he told Pert about this. Nevertheless, Middleton did not refuse to accept the Up train when it was offered to him by Pert.

24. After the 7.9 a.m. train arrived at Montrose, Guard Kessack went to the back of the train to see about the replacement of the vacuum hose pipe. He said "*I very nearly dropped when I discovered I had a tail lamp missing and an extra coupling hanging to the rearmost vehicle. I shouted to the platform foreman to get on the phone at once to Montrose South and let them know we had left a vehicle in the section.*" Pert was advised and sent "Obstruction Danger" to Usan and the station master telephoned the signalman in the latter box. In the meantime, however, the latter had heard from the porter signalman at Lunan Bay that the 7.30 a.m. Down express train had stopped in the section, and he replaced the signals which he had cleared for the Up train to danger. He heard about the collision a short time later, but he did not send "Obstruction Danger" to Inverkeilor.

25. Signalman Pert admitted frankly that he had failed to comply with the Regulations which he said he knew well, and gave the excuse that he was trying to save delay to the Up train. He said that he had never been reprimanded for delaying trains and that no undue pressure had been put on signalmen to avoid delays, and Mr. D. Moore, Station master, Montrose, confirmed this. The latter said that he had made frequent checks on both Pert's and Middleton's work and had found nothing to criticise.

26. Mr. A. Harris, District Signalman's Inspector, said that he last examined both Pert and Middleton in December 1956, and found that they both had a sound knowledge of the Rules and Regulations. He had visited both boxes regularly and found no evidence of slack or incorrect working by either man, and he could offer no explanation for their failures.

27. Mr. J. Mercer, District Locomotive Inspector, Thornton, said that when examining men to become passed firemen and drivers, he invariably asked them, among other things, questions about the maximum speeds of the lines over which they are likely to work. He said that after a man has qualified as a driver he is not normally examined again in the Rules and Regulations. He could not account for the lack of knowledge of the maximum permissible speeds on various sections, as displayed by some of the footplate staff.

28. Ganger Taylor said that the Down line near Inverkeilor needed more attention than other sections in his beat on account of its clay foundation. He had packed the sleepers at the end of July. He returned to duty, after five weeks absence, the day before the accident and noticed that about four joint sleepers needed re-packing; otherwise he considered that the track was in good order.

29. An examination of the four-wheeled van which became derailed showed that the flanges and the profiles of the tyres were good and that none of the springs was broken. On account of the damage it was not possible to ascertain whether the springs were correctly adjusted.

CONCLUSIONS AND REMARKS

30. I have no doubt that the cause of the derailment of the van was excessive speed combined with some slight imperfections in the track and, probably, some small maladjustment of the lightly loaded van springs. Calculations based on the distance travelled on the steep rising gradient after the vacuum was destroyed as a result of the van becoming detached show that the speed of the train was about 51 m.p.h. It is clear that Down trains generally attain a high speed on the descending gradient approaching and just beyond Inverkeilor in preparation for the coming ascent to Lunan Bay, and I consider that the train in question was travelling at not less than 70 m.p.h. when the van became derailed. This compares with the overall maximum permissible speed of 60 m.p.h. on this section of the line, and the same maximum permissible speed for trains with four-wheeled short wheel base vehicles attached.

31. I consider that the track was safe for a speed of 60 m.p.h. and that the van was probably quite fit to be run at that speed. This accident therefore shows, as other accidents have done in the past, that when speeds are high, minor defects in different items of equipment can work in combination to cause sufficient oscillation to derail a short wheel based vehicle, and it draws attention to the importance of the Regulation mentioned in paragraph 8. In this connection it will be remembered that the speed limit beyond Kinnaber Junction is 75 m.p.h. and the driver should have been informed at Dundee about the vans at the back of the train. The arrangements at that station for giving this information to drivers were not satisfactory, and they are being reviewed.

32. I was surprised to find that some of the drivers and passed firemen whom I interviewed in this case were ignorant of the maximum permissible speeds on sections of the line on which they run regularly. The certificate which the footplate staff are required to sign before undertaking driving duties reads as follows:—

“ I hereby certify that I am thoroughly acquainted with the roads and signals, in both directions (except where otherwise stated), on the sections of lines shown above against which I have placed my initials and the date and that I consider myself competent to work trains safely thereover.

.....”

This certificate clearly means that a man should know the overall maximum permissible speed limits on the sections of the line against which he has placed his initials, and it is evident that some of the staff need to be reminded of this fact.

33. The driver of the 7.30 a.m. express train could not have avoided the collision, the responsibility for which falls, firstly, on the guard and fireman of the 7.9 a.m. express for failing, when the train stopped, to detect that it was incomplete, and, secondly, on the signalman at Usan who did not observe that the train had no tail lamp and gave “ Train out of Section ” to the box in rear.

34. It is difficult to understand how both the guard and the fireman, and particularly the former, failed to realise that the van had become detached, even though it was out of sight. They noticed that there was no vacuum hose pipe at the rear end of the last vehicle but they did not see that the tail lamp was missing nor that there was an extra coupling on the rear hook. On their own statements they were anxious to get the train moving and to avoid further delay, and it is quite clear that they gave no serious thought to what had occurred. The driver became suspicious when told about the hose pipe but he took no action. He was a man of considerable experience and I think that he should have appreciated that a van might have become detached and stopped the train for further examination.

35. The actions of the signalmen at Usan and Montrose South constitute a chapter of irregularities. The former committed a breach of the fundamental Block Regulations by giving “ Train out of Section ” for the 7.9 a.m. express without having seen its tail lamp. His excuse about the hose pipe is quite

unacceptable. He realised his error when he heard that the tail lamp had not been seen on arrival of the train at Montrose, and he again failed to comply with the Regulations in accepting the Up train over the single line and in clearing his signals for it, although he replaced these to danger after the Up train had left Montrose. The Montrose South signalman was in no way responsible for the accident. However, he saw that the 7.9 a.m. train had no tail lamp and, in giving "Train out of Section" and in starting the Up train, he also disobeyed the Regulations. He was a man with 40 years' experience and excused himself by saying that he was actuated by a wish to avoid a detention to the Up train.

36. Punctuality of trains is most desirable but unthinking actions, such as those of the guard and the fireman, and the disregard of the Regulations, as displayed by the signalmen, are not the way to achieve it. They can have serious results.

I have the honour to be,

Sir,

Your obedient Servant,

D. McMULLEN,

Colonel.

The Secretary,

Ministry of Transport and Civil Aviation.