DEPARTMENT OF TRANSPORT

RAILWAY ACCIDENT

Report on the Collision that occurred on 9th December 1983 at Wrawby Junction

IN THE
EASTERN REGION
OF BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE

£3.70 net

RAILWAY INSPECTORATE
DEPARTMENT OF TRANSPORT
2 MARSHAM STREET
LONDON SW1P 3EB

19th March 1985.

SIR

I have the honour to report, for the information of the Secretary of State, in accordance with the Direction of 21st December 1983 the result of my Inquiry into the collision between a freight train and a passenger train that occurred at about 18.18 on 9th December 1983 at Wrawby Junction, near Scunthorpe, in the Eastern Region of British Railways.

2. The 17.32 Cleethorpes to Sheffield 2-car Diesel Multiple Unit (DMU) passenger train was travelling along the Down Fast line at about 5 mile/h when it was struck about midway along the right-hand side of the leading carriage by Locomotive No. 47299 which was hauling the 15.02 Drax to Lindsey freight train comprising 9 empty oil tank wagons. Because a track-circuit failure prevented a set of points from operating and the protecting signals from clearing, the signalman had hand-cranked the points to the Normal position. He failed to clamp them Normal as he should have done. Both trains had been called forward under caution but the freight train driver failed to stop at the signal box. His train was diverted at low speed into the side of the passenger train through the points that had, in the meantime, reset themselves to the Reverse position.

3 The leading vehicle of the DMU was derailed and turned onto its side, the trailing vehicle was derailed but remained upright. There were 11 passengers on the DMU and I regret to report that one of them was killed instantly, the Emergency Services were quickly at the scene and 3 others were taken to hospital 2 of whom were discharged after treatment. The locomotive and the leading tank wagon of the freight train were derailed. The weather was fine after rain earlier that afternoon and the visibility was good.

DESCRIPTION

The Site

4. Wrawby Junction Signal Box is half a mile to the west of Barnetby Station on the Cleethorpes to Woodhouse Junction via Gainsborough and Retford line. The tracks lie north-east to south-west, the signal box being to the north. A line to Lincoln diverges southwards at the signal box and 100 yards to the west another line diverges in a westerly direction to Doncaster. From the signal box southwards the tracks are Up Slow, Up Fast, Down Fast, Down Slow, Down Goods and Down Siding No. 3. No. 89 points are 73 yards to the east and are facing in the Up Fast line. When reversed they give access to the Down Yard that lies between the signal box and the station. The plan at the back of the Report shows these details. Train working is in accordance with the Absolute Block system but with the additional protection of track circuits and electric locking in the junction area.

EVIDENCE

5. *Signalman A. D. Day* was in charge of Wrawby Junction Signal Box at the time. He signed on duty about half an hour before the accident happened. As he took duty a train had just passed along the route through Points No. 89 Reversed and into No. 2 Down Reception Siding in the Down Yard; it was then that Day noticed that a failure had apparently occurred on Track Circuit L which prevented him from replacing No. 89 points to the Normal position. This also prevented him from running any trains in the Up direction but he could run trains over the diamond crossing in the Down Fast line by handsignalling them past the Down Fast Home Signal.

6. *Leading Trackman K. P. Johnson* was with Day in the signal box; he was acting as handsignalman that day advising drivers of trains travelling towards Doncaster of a temporary speed restriction which had been imposed along part of that route. Johnson was therefore available to handsignal movements past the Down Fast Home Signal at Danger to Day's instructions and two passenger trains and a light locomotive were safely so signalled before the accident occurred. At about 18.10 the tanker train came to a stand at No. 8 Gainsborough Up Main Inner Home Signal. Day had already contacted the Signal and Telecommunications Engineer's technicians at Scunthorpe and reported the track circuit defect to them but he knew that Up trains would be seriously delayed before the technicians could reach Wrawby and rectify the fault. Accordingly Day decided the best course of action was to hand-crank No. 89 points to the Normal position himself with Johnson assisting him. They left the signal box, Day operated the crank handle and then together with Johnson checked that the points were correctly set for movements along the Up Fast line. On returning to the

signal box he checked the indicator for No. 89 points and saw that both the Normal and Reverse lamps were out but said that he did not attempt to restore No. 89 lever to the Normal position in the frame. In the meantime the passenger train had arrived at Barnetby Station and so Day therefore instructed Johnson to go to the Down Fast Home Signal and handsignal the passenger train past it. As Johnson was carrying out this instruction Day handsignalled the tanker train past the Home Signal in the Gainsborough Up Main by exhibiting a green handlamp from the signal box window. He waited at the window of his signal box to instruct its driver about proceeding beyond the signal box but the train did not stop and a few moments later the collision occurred. Day said that he at once carried out the necessary procedure to protect the site of the incident and then alerted the emergency services. Johnson corroborated Signalman Day's evidence where he was able to do so but he was unable to provide any additional details.

7. Day freely admitted that after cranking No. 89 points to the Normal position he made no attempt to physically retain them in that position either by applying a clip or by any other means. He told me that he had been instructed in the hand-cranking procedure by an Area Inspector about 18 months before the accident but that this instruction did not include applying clips to the points. In addition Day handed me a copy of a local instruction dated 6th December 1982 (Appendix 3). This instruction states that when points with locking mechanisms become facing during single line working or when making an authorised unsignalled move it is not necessary to clip them. Day claimed that allowing the tanker train to pass the Home Signal at Danger was making an authorised unsignalled move and that the local instruction had confused him so that he thought he was acting correctly in not clipping the points. Otherwise, Day was aware that the British Railways Sectional Appendix (Appendix 2) specifically lays down the requirements for clipping of points during failure conditions and he agreed that if he had followed these instructions the accident would not have happened.

8. *Driver A. T. Kerman* was driving the oil train and was alone in the locomotive's leading cab. He joined the train at Doncaster and had a normal journey via Gainsborough to Wrawby where he brought his train to a stand at the Outer Home Signal which was at Danger. Some 5 minutes later the signal was lowered and he drew his train forward to the Inner Home Signal which was at Danger and again he brought the train to a stand. After about 2 minutes he saw a green handsignal being exhibited from the signal box and so drew the train forward once more. Driver Kerman said he received no instructions from the signalman to stop at the signal box but saw the Barnetby East Outer Home Signal clear and decided to proceed but almost at once, and before he was able to take any action, his locomotive veered to the right and the collision occurred. Driver Kerman acknowledged that when he received the green handsignal from the signal box this authorised him to do no more than to pass the Inner Home Signal at Danger and proceed to the signal box to receive instruction (Appendix 1).

9. *Guard P. L. Howell* was travelling in the rear cab of the locomotive and saw nothing of the incident but his evidence concerning the train's movements corroborated that of Driver Kerman.

10. *Driver A. Faulkner* was at the controls of the DMU. His journey from Cleethorpes to Barnetby was uneventful. After completing station duties at Barnetby he said there was about a 3 minute delay before the signal at the end of the platform cleared. By this time the train's guard, P. A. Vernon, had joined him in the cab to ascertain the cause of the delay. When the signal cleared Vernon told him it was all right to proceed and Faulkner drew his train slowly forward towards Wrawby Junction Down Fast Home Signal which was at Danger. His train had almost stopped at the signal when he saw a green handsignal being exhibited from the ground ahead. Faulkner released the brakes and drew forward at between 5 and 10 mile/h with a view to stopping at the handsignal to receive instructions but, before the train had travelled more than a few coach lengths beyond the Home Signal, the accident happened.

11. *Guard P. A. Vernon* remained in the cab with Faulkner throughout this time but the driver assured me that this did not distract him in any way. Immediately after the accident both men did what they could to assist the passengers. Guard Vernon corroborated Driver Faulkner's evidence.

12. *Mr F. Guilliatt, Traffic Manager at Grimsby Town,* told me that on learning of the accident he attended the scene, arriving some 40 minutes after the incident happened. Mr Guilliatt inspected No. 89 points and saw they were in the Reverse position; he also noted that No. 89 lever was in the Reverse position and that No. 89 indicator was showing 'R' in the signal box.

13. *Mr W. G. Boddy, Divisional Signal and Telecommunications Engineer at Doncaster,* told me that the signalling equipment at Wrawby Junction was extensively modernised in 1982. The lever frame and semaphore signals were retained but the junction was fully track-circuited with full electrical interlocking to all points and signals and a number of points were converted to electrical operation.

14. *Mr C. I. Weightman, the Area Signal and Telecommunications Engineer* at Grantham told me that the points in question were operated from No. 89 lever in the frame and were driven by an electric points

motor with relays repeating the full Normal and the full Reverse position of the lever. When the lever is reversed it causes these relays to actuate contactors which supply power to the points operating machine motor. When the machine reaches the full Reverse and locked postition a Reverse detection relay is energised which causes the contactors to de-energise and remove the reverse feed from the machine. If at any time this reverse detection is lost the feed is immediately re-applied to the points machine in an attempt to drive the points into correspondence with the lever in the frame. If the points machine fails to drive fully to Reverse a points machine protection timer operates to abort the attempt if the movement is not completed within 7½ seconds. The mechanism works similarly in the opposite direction when the lever is restored to its Normal position in the frame. When both ends of the points are in the Reverse position and the lever is reversed and the detection is showing Reverse the points are said to be in correspondence. If one end of the points is then manually wound towards the Normal position the reverse detection will be lost and the reverse feed will be applied to the machine. The machine will not operate, however, because placing the manual crank handle into the machine operates contacts which interrupt this feed. After 7½ seconds and once the crank handle has been removed from the machine the contacts must be reset before the machine will operate. The hand-cranking operation cannot easily be carried out in less than 7½ seconds.

15. Mr Weightman told me that there are several ways in which these contacts might have become reset to drive the points back to Reverse after Signalman Day had hand-cranked them from Reverse to Normal:-

a. By an attempt to move the lever in the frame from Reverse to Normal. The mechanical locking would prevent this but the lever will move sufficiently out of the Reverse position to cause the relays repeating the Reverse position to de-energise; this would allow the points machine protection circuit to de-energise. If the lever was then moved back to the fully reversed position the reverse feed would be re-applied to the machine which would then attempt to drive the points into correspondence.

b. A defective or incorrectly adjusted set of contacts in the detection circuit might have given rise to a momentary interruption of the circuit sufficient to de-energise the repeating relays if the contacts were subjected to severe vibration, perhaps as a result of the passage of a train. No defective contacts were found, however, and although attempts were made to shake the locations under similar conditions to those that prevailed at the time of the accident, no problems with electrical continuity came to light.

c. The circuit could also have been reset by an interruption to the public power supply to the signal box but extensive tests and investigations failed to reveal such an occurrence that evening.

DISCUSSION

Signalman's Local Instruction

16. Day claimed that he thought he was making "an authorised unsignalled move" within the remit of the Local Instruction (Appendix 3) when he handsignalled the tanker train past the Home Signal at Danger and that in such circumstances he was not required to clip No. 89 points. I am not convinced that Day was confused by this instruction since the circumstances in which the instruction applies are quite different from those that prevailed at Wrawby Junction that day.

17. The instruction states that all motor points apart from some specific exceptions are equipped with a locking mechanism and they do not, therefore, require to be clipped when they become facing during single line working. This instruction is clearly not relevant to points that are defective or that have to be operated by hand for reasons such as a track circuit failure affecting their release as was the case with No. 89 points when the accident happened.

Training

18. Day also claimed that when he was instructed in the hand-cranking of the points the instruction did not include applying clips to them. The requirement to clip and scotch points, that have had to be hand-operated in abnormal circumstances in order to ensure their security is fundamental and one which Day as an experienced signalman must have been aware of. The British Railways Sectional Appendix is quite clear that clipping and scotching of points, under the circumstances that Day encountered, is essential. Day admitted that he was aware of the requirements of these instructions and I can only conclude that knowing, as he did, that the points were equipped with a locking mechanism that clipping and scotching them may have seemed to him to be an over cautious requirement.

As to the Failure of Track Circuit L

19. After the accident there was considerable damage to track and equipment so that it was not possible to determine the cause of the original track circuit failure.

CONCLUSIONS

20. The accident happened because Signalman Day, having hand-operated No. 89 points to the Normal position and out of correspondence with No. 89 lever, which was reversed in the frame, failed to clip them in that position as he was clearly required to do by the instructions contained in the British Railways Sectional Appendix. How the points came to move back to the Reverse position must remain a matter for conjecture but I am of the opinion that Day probably attempted to restore No. 89 lever to Normal on his return to the signal box after hand-operating the points, although he has no recollection of doing this. This action would have reset the circuit so that the points motor restored the points to the Reverse position to correspond with the lever. As soon as this happened the 'R' indicator for No. 89 lever would have become illuminated as it was subsequently found to be by Mr Guilliatt; this indication passed unnoticed by the Signalman.

21. Driver Kerman was also partly responsible for what happened. Had he stopped his train at the signal box to receive instructions, as he should have done in accordance with Rule E.8.1, then he would have been authorised to proceed and his train would still have been diverted at No. 89 points but by then the passenger train might well have been clear of the junction.

22. I am sure that both Signalman Day and Driver Kerman acted in good faith in trying to keep traffic moving with the minimum delay. The railway signalling system is designed to ensure the safe running of trains but at times of failure some of the built-in safeguards of the system are of necessity removed. In such circumstances every precaution must be taken to ensure that the line of action being adopted to get traffic moving again is without risks and all the relevant Rules and Regulations must be followed. In failing to clamp the points Signalman Day failed to do this. I am satisfied that, had the correct procedures been adopted on this occasion, the accident would not have happened.

RECOMMENDATIONS

23. The instruction of staff in the clipping and scotching of motor points under fault conditions should be reviewed to ensure that the reasons for securing them are adequately emphasised.

I have the honour to be,

Sir,

Your obedient Servant,

D. A. SAWER

The Permanent Under-Secretary of State
Department of Transport

APPENDIX 1

EXTRACT FROM BRITISH RAILWAYS RULE BOOK

Section E. Signals, Points, Track Circuits and Other
Signalling Equipment — Failures, Repairs and Renewals

8. Duties of Drivers

8.1 Passing signal at Danger

In every case when a train is required to pass a signal at Danger, the Driver must give one long blast on the horn and proceed cautiously in accordance with the Signalman's instructions, or handsignal and instructions given by the Handsignalman. The Driver must travel at low speed prepared to stop short of any train or other obstruction on the line ahead. He must not exceed a speed of 10 m.p.h. when passing over any facing points, switch diamonds or swing nose crossings and, where practicable, must satisfy himself that they are correctly set in position for the route over which the train is to run.

If, however, a train is detained at a defective stop signal in rear of the signal box and a green handsignal, held steadily, is exhibited by the Signalman, the Driver must accept this as an authority to pass the signal at Danger and proceed as far as the signal box for instructions.

EXTRACT FROM BRITISH RAILWAYS SECTIONAL APPENDIX

Electrically Operated Points — Working by Crank Handle During Failure

In the event of failure of electrically operated points, or the track circuits controlling the lever/switch operating such points for which no release is provided, the Signalman must immediately communicate with the person in charge who must arrange to call out the man specially appointed to operate the points by crank handle referred to herein as the Point Operator, the S & T Technician and any Handsignalmen that may be necessary.

A list of the men who are competent to act as point operators must be exhibited in the Station Manager's office and also in the signal box.

When the point operator is given the crank handle, the Signalman must ensure that the man clearly understands the number and location of the points which he is required to operate. The Signalman must then instruct the Point Operator to proceed to the site, place the crank handle in the point machine, and:-

(a) examine the points for damage.

(b) ascertain whether the points are correctly fitting in the position in which they are laid.

(c) advise the Signalman the result of the investigation made in paragraphs (a) and (b).

Provided the points are not damaged the Signalman must direct the Point Operator to:-

(i) clip and scotch them in the position in which they are laid, or

(ii) change the position of the points by using the crank handle and clip and scotch them in the altered position as traffic working requires.

The Signalman must ensure the Point Operator understands that the clip and scotch must not be removed, the position of the points must not be altered, nor must any movement be authorised over the points except in accordance with the Signalman's instructions.

The Signalman must, whenever possible, operate the lever/switch to the position corresponding with the lie of the points.

If the signals applicable to the points are in the immediate vicinity the Point Operator may also act as Handsignalman; if they are not in the immediate vicinity of the points one or more Handsignalmen may be appointed to act under the instructions of the Signalman.

The Signalman must instruct the Point Operator to return the crank handle to its normal location when:-

(i) He has received an assurance from the S & T Technician that the failure has been rectified and that the points are in proper working order, or

(ii) The points themselves are not damaged and traffic working permits them remaining in the normal or reverse position provided:-

(a) That he has received an assurance from the point operator that the points are clipped, padlocked and scotched in the required position. The key for the padlock must be retained by the Signalman or where the points are remote from the signal box by the person in charge, and

(b) That the points lever/switch is in the position corresponding with the lie of the points, and the appropriate indication has been obtained.

The Signalman must not instruct a Handsignalman to allow trains to pass over the points or crossings affected or to pass the signal concerned until the Signalman has received an assurance that the points are set for the proper direction and that they have been clipped and scotched.

The Signalman must record in the Train Register the time the crank handle is removed from and also the time it is restored to, the receptacle or case in which it is normally kept. Where the crank handle is kept in the signal box, these entries must be countersigned by the point operator.

APPENDIX 3

BRITISH RAILWAYS LOCAL INSTRUCTION

Ref: 0.12/MLC
Date: 6th December 1982

Rule Book, Section N, Clauses 2.7 and 3.1.1 (f)

I would advise you that for some years now, it has been the policy to equip all "motor points" (this includes rail clamp lock points and all power worked points) with a facing point lock mechanism irrespective of whether the points are facing or trailing.

So far as the Doncaster Division is concerned all motor points except the following are equipped with a facing point lock mechanism:-

Keadby Canal — nos. 1001 and 1002 points.
Bottesford West Up Loop — nos. 34 (trailing end) and 36 (trailing end) points.
Hull Paragon Station, Platform 4 crossover ("A" end) points.
Scunthorpe West Yard — 27 sets of points.

With the exception of the points listed above, it will not be necessary to clip power points which become facing during the single line working or when making an authorised unsignalled move *provided* any conditions laid down in the instructions to the signalman at the signalbox concerned in relation to the Rule Book, Section 'E' are complied with — for example — if the points are in a remote interlocking area, the signalman must check that he can obtain both normal and reverse detection.

J. F. L. Reeves

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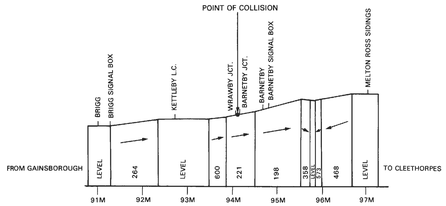
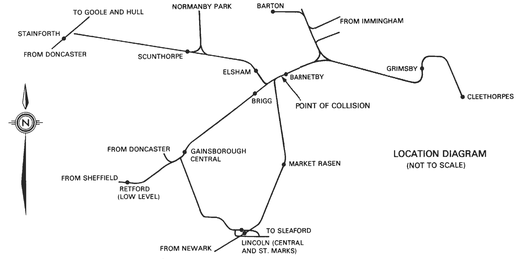


GRADIENT DIAGRAM



LOCATION DIAGRAM
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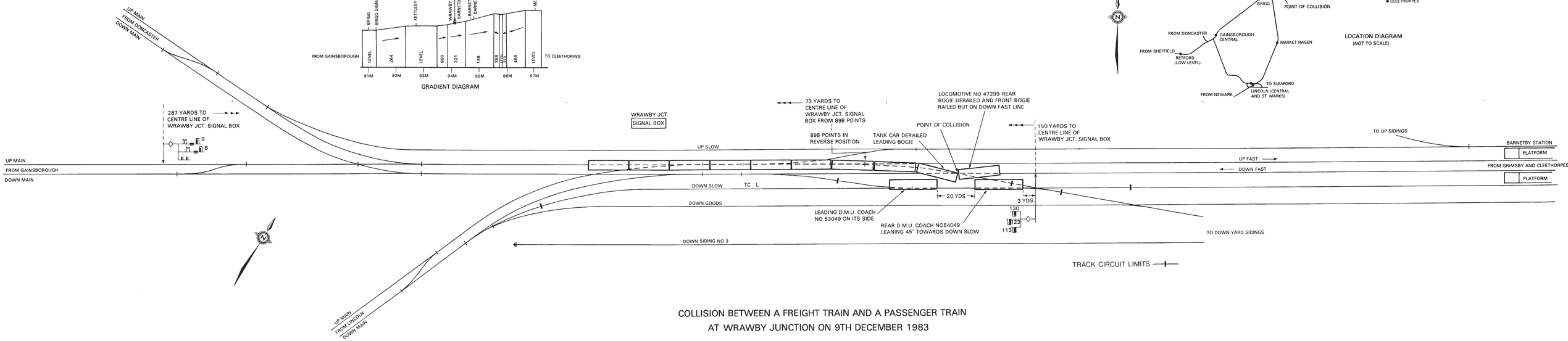

COLLISION BETWEEN A FREIGHT TRAIN AND A PASSENGER TRAIN AT WRAWBY JUNCTION ON 9TH DECEMBER 1983

Department of Transport
RPHP3 Drawing Office 85: 41