MINISTRY OF TRANSPORT

RAILWAY ACCIDENT

Report on the Derailment that occurred on 21st January 1966 near Steventon

IN THE
WESTERN REGION
BRITISH RAILWAYS

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

30th November 1966.

SIR,

I have the honour to report for the information of the Minister of Transport, in accordance with the Order dated 26th January 1966, the result of my Inquiry into the goods train derailment that occurred at about 0345 hrs on Friday 21st January 1966 near Steventon in the Western Region, British Railways.

The goods train was the 0005 hrs Class 5 Paddington to Cardiff hauled by a diesel-hydraulic locomotive and formed of 35 vehicles and a brakevan. It was running at or just below its maximum permitted speed of 50 m.p.h. when, at a point just on the approach side of Causeway Level Crossing, an empty short-wheelbased banana van in the middle of the train became derailed on plain track at a point where there was a minor track irregularity. The train ran on with the van derailed for a distance of 1¼ miles until increasing track damage caused further vehicles to leave the rails and a vacuum brake connection to part, bringing the train to a stand.

Five vehicles in all were derailed, but fortunately the opposite line was not obstructed and no other trains were involved. There were no personal injuries. None of the derailed vehicles was seriously damaged and, after rerailing, the train was worked back to Didcot where it was stabled for examination.

The damage to the permanent way was extensive and the Down line was not reopened to traffic until 1215 hrs on the following day when normal working was resumed subject to a 15 m.p.h. speed restriction. During the time the line was closed trains were diverted via alternative routes.

The weather was very cold at the time of the accident, the temperature not having risen above freezing point for several days. There had been a light fall of snow on the evening before the accident.

DESCRIPTION

Site and signalling

1. As shown on the attached plan, Steventon lies 56½ miles from Paddington on the Western Region Main line to Bristol and South Wales. As far as Didcot the line is four-tracked and between Didcot and Steventon there are Up and Down Goods loops. Beyond Steventon the line is double-tracked. The former wayside station is now closed and the area is remotely controlled from the new power-operated panel signal-box at Reading, 21 miles distant. The line is worked on the track circuit block system with 3-aspect colour light signals at an average spacing of 2200 yards. A telephone communicating directly with the Reading signalman is provided at every signal.

2. There are two gated public level crossings at Steventon, each manually operated from an adjacent gate box worked as a ground frame. The more westerly of the two, at 56 miles 72 chains, is known as Causeway Crossing and the gate box stands on the Up side of the line to the east of the crossing, the gates of which are kept closed across the roadway except when required to be opened to allow the line to be crossed, in which case a release can be given by the signalman at Reading provided the controlled signals protecting the crossing in both directions are at Danger.

3. The next signalbox in the Down direction is at Uffington, almost 10 miles distant, all the intervening signals being automatic. Track circuit indications on the Reading panel extend as far as signal DM61, the fourth automatic signal beyond Causeway Crossing, on the Down line and from beyond signal UM62, the sixth signal in rear of the crossing on the Up line. None of these automatic signals is provided with any means of replacement to Danger by the Reading signalman.

Track

4. The line through Steventon is on a gradient of 1 in 754 rising in the Down direction and on a very slight left handed curve of 450 chains radius, which becomes straight about 120 yards before reaching Causeway Crossing. The track on either side of the crossing consists of 60 foot lengths of BS 110A FB rail on concrete sleepers, laid in 1963. Through the crossing itself and the separate footpath crossing adjacent to it on the Up side, which are both timbered, the track is on 12 in. by 6 in. timber sleepers secured on baseplates by Mills clips.

5. The maximum permitted speed for passenger trains at the time of the accident was 90 m.p.h.

The train

6. The goods train, which was hauled by Type 4 diesel-hydraulic locomotive No. D1052, was formed of 35 short-wheelbased vehicles and a brakevan. The overall length of the train was 821 feet. The automatic vacuum brake was connected on the leading 26 vehicles thus satisfying the requirements for a Class 5 train that the brake should be effective on at least half the vehicles.

7. The maximum permitted speed for the train was 50 m.p.h., this being the normal limit for Class 5 trains, and the maximum permitted at that time for any train including 4-wheeled vehicles of 10 ft. or less wheelbase.

The course of the derailment

8. The train left Paddington Goods station 100 minutes late at 0145 hrs and, after stops at Acton to take up traffic and at Southall where the engine crew were relieved, it ran unchecked as far as Didcot where it was held for about a minute while a train ahead cleared the junction. On restarting it was routed by the

Main line since it was running late, rather than being diverted into the Down Goods loop between Foxhall Junction and Steventon to allow a following train to pass which would have been its normal booked path. It had thus reached its normal running speed before passing Steventon at about 0345 hrs.

9. The initial point of derailment was between the footpath and road crossings at Causeway Level Crossing where there were flange marks on the head of the six foot rail.

10. The first sign of damage to the track was at the east end of the road crossing where the end of the cess side check rail of the Down line had been struck by a wheel. Tyre marks continued across the crossing, showing that a single pair of wheels had been derailed towards the Up line. The train ran on for about a mile, the derailed vehicle crossing over to the cess side at an intervening accommodation crossing, until increasing damage to the track caused further vehicles to leave the rails and a division to occur in the braked portion of the train, causing the brakes to be applied.

11. When the train came to a stand about 1¼ miles beyond Causeway Crossing, between signals DM57 and DM58, there were five vehicles in all derailed. They were the 15th, 16th, 20th, 21st and 22nd from the locomotive, all in the braked portion of the train. The division had occurred between the 15th and 16th vehicles, apparently by uncoupling. All the derailed vehicles remained upright and clear of the Up line.

Damage to vehicles

12. Of the five derailed vehicles, the first four were empty 10 ton banana vans and the last a loaded vanfit. All were of 10 ft. wheelbase with fixed shoe suspension and screw couplings. It was at once apparent, from the damage to its wheels and suspension, that the only vehicle that had run derailed for any distance was the 16th from the engine, a British Railways standard 8-ton capacity banana van with a tare weight of 9 tons 1 cwt. The van was 17 ft. 6 ins. over headstocks and was fitted with self-contained buffers of 20 inch projection. The main bearing springs were of the 5-plate type with riveted side spring shoes. It was fitted with solid rolled wheels with 9 in. by 4¼ in. journals running in fabricated steel open-front axleboxes. Axle box components from this van were found back along the line to within 50 yards of Causeway Crossing where one oil pad and tray were recovered from the left hand side of the track. The remaining vehicles were in good order except for minor damage sustained as a result of the derailment.

Damage to the track

13. Between Causeway Crossing and a point 300 yards in rear of where the train came to a stand, damage to the track was intermittent and consistent with a single vehicle having been derailed. In the immediate area of the final derailment 20 track sections were damaged beyond repair.

Evidence

14. *Driver A. L. W. Smith* described the trip from the time he took over the train at Southall. It was an uneventful journey as far as Moreton Cutting at a steady speed of 50 m.p.h. most of the way. After a check at signal DM51 he had a smooth getaway and was running at about 48 m.p.h. on three quarter throttle when the train lost vacuum and came to a stand near the 58 milepost. At this time Smith had no idea the train was derailed and he sent his second man back to inspect the vacuum pipes. However, he came back after a while and reported the derailment so Smith sent him forward to telephone to the signalman. He was already aware the the opposite line was not obstructed since two Up trains had passed since they had come to a stand.

15. *Passed Fireman A. W. Lloyd* confirmed his driver's evidence. His estimate of the speed of the train at Causeway Crossing was 45 m.p.h. and he had not been aware of any rough riding at this point. When he went back to examine the train after it had stopped he found the derailed wagons and, after assuring himself that the opposite line was not obstructed, went to inform the guard of the situation. He then went forward to telephone the signalman but found the signal post telephone at signals UM58 and DM58 out of order.

16. *Guard C. H. Lopez* was in charge of the train. He had examined it personally before leaving Acton and was satisfied that all was in order. He felt nothing unusual in the riding of the train, though in fact he remembered a slight bump in the neighbourhood of Steventon when he had worked the same train on three other occasions earlier in the week. When the train stopped he had no idea a derailment had occurred until the fireman informed him. After confirming with the fireman that the Up line was unobstructed he went back towards Causeway Crossing to protect in rear. On the way he passed signal DM57, but the signal post telephone was not working.

17. On duty at Causeway Crossing was *Crossing Keeper H. Strong*. He watched through the open window as the train passed at a speed which he estimated at 35 to 40 m.p.h. As the rear of the train passed he heard an unusual noise which he thought might be something dragging, and saw one or two sparks almost on the crossing. He at once telephoned the signalmen at Reading and Uffington to report that all was not well with the train. While he was speaking he heard a further banging and bumping noise, so he ran out and saw score marks on the sleepers on the Bristol side of the crossing. He then returned to his cabin and informed the Reading signalman that he thought the train was derailed. It was not until some half hour later that the guard reached his cabin and reported the derailment.

18. The signalman on duty on the Reading panel was *Signalman E. T. Blackall*. He confirmed that his first advice of the trouble was a telephone message from Causeway Crossing at 0349 hrs. He immediately sent the emergency signal to Uffington and then spoke to the signalman there who told him that two Up freight trains had already passed into the automatic sections towards Causeway Crossing. He was in fact already aware of this as they were showing on his panel but, because the automatic signals were not provided with replacement switches, there was nothing that he or the signalman at Uffington could do about it. He said that he had at once informed Control of the situation as he then knew it but that it was not until he received a telephone call at 0434 hrs, when members of the train crew reached Causeway Crossing, that he knew exactly what had occurred.

19. I asked Blackall whether he was aware that the signalbox telephones in the area of the derailment were out of order on the night of the derailment. He had not realised it, but said that there had been a number of previous failures which had been reported at the time.

20. Reports were called for from the crews of the 6 preceding trains to pass Causeway Crossing in the Down direction. These included three Class 1 passenger or mail trains that would have been travelling at high speed and three freight trains of Classes 5 and 6. None of the drivers or guards concerned had noticed anything unusual in the riding of their train in the neighbourhood of Causeway Crossing.

21. I did however interview *Guard W. Brown* who had worked the 2315 hrs Class 5 freight train from Paddington to Cardiff on the previous night. He told me he experienced a very severe bump and lurch at Causeway Crossing which made him think for a moment that his van had been derailed. He estimated the speed of the train to be about 40 m.p.h. at the time. He looked back along the line to see if he could see any reason for the lurch but though he had a clear view of the crossing he could see nothing to explain it. He had considered reporting the incident but did not do so since he had experienced rough riding at this point before and thought that it might possibly have felt worse than usual because the van in which he was riding was a very old one.

22. *Sub-Inspector K. Elias* had been in charge of the area where the derailment occurred for some two years. The last occasion on which he had looked at this length was on the Tuesday before the accident when he had walked the track from Wantage Road to Didcot. The weather was cold and the ballast was frozen solid. He was satisfied that the track was in a fit condition to carry traffic at normal speeds. The last occasion on which any maintenance work had been carried out in the vicinity of Causeway Crossing had been about a month before the accident when he had arranged for a gang to attend to the whole length of the Down Main line between the two level crossings. Fairly frequent attention to the joints in this length had been necessary.

23. The maintenance work, which had involved the lifting, packing and slewing of the 300 yards of track between the crossings had been carried out by *Ganger W. R. Lamble* who was in charge of a mobile gang. It was an area which needed more attention than some others because there was clay under the ballast, but Lamble was satisfied that when they had completed their work the track was in good condition. He had not had any call to go back to the area of Causeway Crossing again before the derailment.

24. *Patrolman T. James* carried out an examination of the length three times each week. The last occasion on which he did so before the derailment was on Wednesday, 19th January. He reached Causeway Crossing at about 1100 hrs and watched a fast train pass on the Down line. He saw no movement in the track whatever, the ballast being frozen hard. He then looked back along the line from the Didcot side of the crossing and had not seen any noticeable kink or misalignment, though the gates were open at the time and he had a clear view down the line.

Further Investigations

The condition of the track

25. *The Assistant Divisional Civil Engineer, Mr. J. Black*, reported on the examination of the track leading up to the point of derailment which was carried out immediately after the accident. An especially thorough examination was made going back for a quarter of a mile. In addition to taking levels at each sleeper the track was marked out in 10 ft. stations and further measurements made at each station, including details of side wear, variations in gauge, and errors in alignment by measurements of the versine on a 120 ft. chord length.

26. As far as cross levels were concerned, these were in fact correct at the actual point of derailment, but there was a point 10 sleepers back where the cess rail was 0.7 ins. low and a further point at sleeper 19 where the six-foot rail was 0.55 ins. low. The effect of this variation in cant was to produce a maximum cant gradient of 1 in 192 at the sixth sleeper before the point of derailment.

27. The gauge of the track was generally correct though there were several points, including the actual point of derailment, where it was $\frac{1}{8}$ in. wide. The actual condition of the rail itself was good with negligible sidewear.

28. The maximum deviation from a straight alignment measured as a versine on a 120 ft. chord, was $\frac{3}{4}$ in. at 8 and 12 sleepers back from the point of derailment, with a local misalignment amounting to $\frac{1}{2}$ in. over a chord length of 30 ft. in the same area.

29. It is usual in such a case to measure also the voids under the sleepers. On this occasion, however, since the track was frozen at the time of the derailment, and it was not possible to take void meter readings until after the Down line had been repaired, by which time a thaw had set in, these readings could not be regarded as applicable to the actual state of the track when the derailment took place.

30. I asked *Mr. C. M. Diggory, Divisional Civil Engineer*, whether these variations in cant and alignment were within the permitted tolerances and whether he would have regarded the piece of track in question as in need of urgent attention if no derailment had occurred. He assured me that these irregularities were within the permitted tolerances and should not in themselves have justified the imposition of a speed restriction of any kind, but that they certainly required attention.

31. *Mr. F. R. L. Barnwell, Chief Civil Engineer, British Railways, Western Region*, who also attended my Inquiry, agreed with Mr. Diggory and described the track fault as a minor misalignment that needed putting right but not anything to cause any alarm.

The speed of the train

32. A careful check of the starting and passing times recorded for the train over the whole journey from Southall showed that it had been running consistently at a steady speed and that there was no indication to show that the speed had at any time exceeded the permitted maximum of 50 m.p.h.

33. After the accident a special check was made of the speedometers fitted to locomotive D.1052. Though they both read 0.5 m.p.h. slow at 10 m.p.h., they were very accurate at higher speeds, with the needles moving smoothly throughout the speed range.

The condition of the wagon

34. *Carriage and Wagon Inspector, H. R. Town* made a very careful examination of banana van B 881577, which was the only vehicle which actually left the rails at Causeway Crossing. Apart from damage caused as a result of the derailment he could find no defects which could in any way have been regarded as a cause of the derailment. There was no indication, such as wear and tear on the bearings or elsewhere, that the wagon had been hunting, and the variation in camber of the springs when under the wagon was well within the permitted tolerances.

35. The van had been built at Darlington Works in 1958 to a B.R. standard design. It had last received a heavy repair in March 1965 with a brake overhaul the same month. The last pad examination was carried out on 26th October 1965 and the last oiling date was 17th January 1966. All these examinations were within the authorised periods.

36. At my request a further examination of the wagon was carried out at Swindon Works on 28th January 1966 including tests under load of the main bearing springs after removal from the wagon. Three of the four springs were approximately matched in free camber, but the fourth spring was deficient in free camber, possibly as a result of the derailment, to the extent that the maximum permitted variation between the free cambers of the four springs was exceeded by $\frac{5}{16}$ in. No other fault of any substance could be found on the wagon.

37. I asked *Mr. S. Ridgway, Chief Mechanical and Electrical Engineer, British Railways, Western Region*, who was also present at my Inquiry, whether he considered that a degree of imbalance of this order, if it had been present before the derailment, could have affected the running of the wagon in any way. He agreed that a degree of imbalance of this order might be sufficient to make a wagon of this kind leave the rails at a minor track irregularity of the kind recorded at Causeway Crossing, and he thought it quite possible that the wagon had been out of balance before the accident but not to the extent that an examiner could have been expected to notice it.

Similar derailment at Hullavington on 14th December 1965

38. I asked the Railway Officers who attended my Inquiry to let me know their findings with regard to an accident that had occurred on the Up Main line between Badminton and Swindon, near Hullavington, on 14th December 1965, when another 10 ft. wheelbase banana van was derailed when running in a Class 4 (fully braked) train from Barry Dock to Old Oak Common. The van, which was of similar but not identical design to the one involved at Steventon, was lightly loaded and marshalled 46th in a train of 47 vehicles and brake van. When approaching Hullavington at about 48 m.p.h. on a falling gradient of 1 in 300 the guard saw sparks coming from the derailed vehicle, applied his brake valve and so brought the train to a stand. No other vehicles were derailed, the train was not divided, and the opposite line was not obstructed. Considerable damage was done to the track over a distance of 1200 yards. A careful examination of the wagon revealed it as in good condition with no defects other than those caused by the derailment except that, as at Steventon, one of the main bearing springs after removal from the wagon was found to be deficient in free camber. Mr. Ridgway considered that in this case, as at Steventon, the wagon defect was not one that an examiner would have been able to detect. An examination of the track leading up to the point of derailment, which was straight and laid in continuously welded 110 lb FB rail on concrete sleepers, revealed some variation in cross-levels but well within the accepted tolerances.

Conclusions and Remarks

39. Both these accidents follow the same general pattern in which a single empty or lightly loaded wagon of 10 foot wheelbase or less in an express goods train running on plain line at or near its maximum permitted speed leaves the rails at a point where there is a minor track irregularity. As in these instances, the derailed wagon often runs derailed, but upright and in line, for a considerable distance before increasing damage or the presence of connections causes a general derailment to develop. The major hazard in such a derailment arises from the obstruction of the opposite line and consequent risk of collision to trains travelling in the opposite direction. It was fortunate that the opposite line was not obstructed either at Steventon or Hullavington and thus no other trains were involved.

40. In neither of these derailments can the condition of the track or the state of maintenance of the vehicle, which are discussed in the preceding paragraphs, be regarded as the main cause of derailment, nor is there any evidence of any mishandling of the train by the driver. In each case the train had reached its normal running speed and the driver had reduced power to prevent further acceleration. It is under these conditions, when traction forces are reduced and buffers still out of contact, that damping forces are at a minimum, allowing short-wheelbased vehicles to develop a lateral oscillation known as "hunting," which in conjunction with a small degree of imbalance in an empty or lightly loaded wagon and a *minor track irregularity* can result in a derailment.

41. Accidents of this kind have been referred to by the Chief Inspecting Officer of Railways in his Annual Report in recent years as "short wheelbase derailments," but this description is only intended to apply to unresolved derailments of empty or lightly laden 4-wheeled goods wagons with a wheelbase of 10 ft. or less occurring on plain line at a point where there is a minor track irregularity whilst the train concerned is running at a steady speed at or near the maximum permitted. Derailments involving wagons which are clearly defective or occurring at points where the condition of the track is outside the normal maintenance tolerances are not included within the definition, nor are those caused by human error such as mishandling of the brakes, clearly excessive speed or faulty loading.

42. This type of derailment first showed itself as a serious problem in 1960 when a series of derailments occurred in each of which a short-wheelbased van was the first vehicle to leave the rails at a speed of less than 60 m.p.h., which was at that time the maximum permitted speed for any train including short-wheelbased 4-wheeled vehicles. This speed limit had obtained for many years, but with steam traction comparatively few goods trains exceeded 45/50 m.p.h. for any considerable distance and, though derailments involving short-wheelbased vehicles had occurred from time to time, they were generally ascribed to the defective condition of the vehicle itself or the state of the track at the point of derailment. With the introduction of powerful diesel locomotives on express goods trains the actual mileage covered at speeds over 45 m.p.h. increased considerably and it became evident that certain types of 4-wheeled vehicles of short wheelbase were derailment-prone even when apparently in good order and that when running at speed on plain track only a very slight variation in cross levels or alignment could be enough to throw the vehicle into derailment.

43. Since 1960 the problem of the unresolved short wheelbase derailment has received continuous attention from the British Railways Board and its predecessor the British Transport Commission, and to understand the reasons for the action taken by the Board subsequent to the Steventon derailment, it is necessary to review briefly the events of the past six years as far as short wheelbase derailments are concerned. This review was referred to by the Chief Inspecting Officer in paragraph 21 of his Annual Report for 1965.

44. During 1961 and 1962, despite a special drive to improve the standard of maintenance of freight rolling stock and the withdrawal from traffic of one particular type of vehicle, the pallet van which had a particularly bad derailment record, the total number of short wheelbase derailments continued to increase. The number and manner of these derailments led to considerable discussion between the Inspecting Officers and Officers of British Railways, and by the end of the year the possible need for a reduction in the maximum speed permitted for certain classes of train was being urgently considered.

45. A general speed limit of 50 m.p.h. was placed on all trains including short-wheelbased vehicles in April 1963 after a further run of derailments in the early months of that year. There were altogether 21 unresolved short-wheelbase derailments in 1963, but amongst these there were 5 cases where speed was certainly over 60 m.p.h. and a further 4 where the condition of the wagon itself might have been sufficient cause for derailment. Despite the 50 m.p.h. speed limit and the closer attention being paid to the examination and maintenance of freight rolling stock the incidence of short wheelbase derailments did not decrease, the 1963 total of 21 being equalled both in 1964 and 1965, most of the derailments occurring at speeds close to the permitted maximum of 50 m.p.h. though there were 4 cases in 1964 and 3 in 1965 where the speeds were somewhat higher.

46. The problem was referred by the British Railways Board in 1963 to their Research Department at Derby where a series of experiments was put in hand to evaluate the dynamic characteristics of typical short-wheelbased wagons and to observe their actual behaviour when running over track including known irregularities. Amongst the wagons used for these tests was a 12-ton covered van with fixed shoe suspension, basically similar in design to the banana van derailed at Steventon. It had long been known that 4-wheeled vehicles had a tendency to hunt when running at speed and the experiments carried out at Derby shed light on the onset of hunting and the lateral forces that could arise between the wheel flange and the rail when it was fully developed. The speed at which hunting begins to develop was found to vary according to the design of the wagon and its state of wear, particularly tyre wear. In the case of the van with fixed shoe suspension, this speed was about 35 m.p.h. with worn tyres and 45 m.p.h. with new tyres. Above these speeds the lateral forces were found to increase sharply.

47. It was apparent that derailment was most likely to occur when the peak lateral force between the wheel flange and the rail caused by hunting occurred at the same instant as the vertical load on that particular wheel was reduced to a minimum as a result of the reaction of the wagon suspension to a track irregularity and the tests showed that all 4-wheeled short-wheelbased wagons with the conventional types of suspension were to some extent derailment-prone due to hunting and that the risk of derailment increased sharply with speed.

48. Thus when, shortly after the derailment of Steventon took place, the British Railways Board took the highly restrictive step of reducing the maximum permitted speed of all trains conveying wagons of 10 ft. wheelbase to 45 m.p.h. for an exploratory period, the decision was not reached purely on account of this latest accident but on the wealth of evidence which has been accumulating over the past 6 years to show that, on track maintained to the standards laid down by the Board and accepted as safe for bogie vehicles at far higher speeds, there was an unacceptable risk involved in continuing to run existing designs of 10 ft. wheelbase vehicles up to the previously permitted speed of 50 m.p.h.

49. It has been shown that there are three factors involved in this type of short wheelbase derailment, the design of the vehicle, the standard of maintenance of the track and the speed of the train, alteration to any one of which can provide a solution to the problem. The quickest solution, and the one adopted as a temporary measure by the British Railways Board is to reduce the speed at which short-wheelbased wagons are permitted to run to a figure at which the risk of derailment is so small that it can be regarded as acceptable.

There is every indication so far that the present limit of 45 m.p.h. is having an effect in reducing the incidence of this type of derailment but it also has an extremely restrictive effect on traffic movement, widening even further the speed differential between passenger trains and freight trains. It cannot be regarded therefore as a satisfactory long-term solution.

50. It would be possible to raise the standards of track maintenance to such a point that there was nowhere on British Railways a vertical irregularity sufficient to lighten momentarily the wheel load of a hunting short-wheelbased wagon to the extent that it could mount the rail. This solution would be extremely expensive and also unrealistic in that it would accept that track in fit condition for passenger trains at 100 m.p.h. might not be safe for freight traffic at half that speed.

51. The third solution is to redesign the wagon, to give it a suspension that has no tendency to hunt at speeds within its normal operating range and that will respond to track irregularities in a safe and forecastable manner. I have been assured by Mr. A. E. Robson, Chief Engineer (Traction and Rolling Stock) British Railways Board, that as a result of the research and study applied to rolling stock problems in recent years it is now possible to do this and that a short-wheelbased van with a modified suspension has been run safely at speeds of up to 90 m.p.h.

52. The decision as to whether the present fleet of short-wheelbased wagons should be modified to permit safe operation at higher speeds or whether it should be allowed to waste out as it is replaced by modern wagons designed specifically to cater for modern conditions of operation is one that can only be taken by the British Railways Board. In the meantime it seems clear that the incidence of plain line derailments of the kind described in this Report can only be kept down by the strict observance of the 45 m.p.h. speed limit on all existing types of short-wheelbased wagon.

53. A disquieting feature of this accident was the disclosure by the signalman on duty in the Reading signalbox that, although he was aware that a train proceeding westwards from Steventon was probably derailed and possibly foul of the Up line, he was unable to stop oncoming traffic because none of the seven automatic signals on the Up line between Uffington and Steventon was provided with any means of replacing it to danger from the panel, the provision of such replacement switches not being called for in the British Railways Board standard signalling principles in force at the time the Reading installation was designed.

54. Since this accident drew attention to the value of replacement switches as a means of stopping traffic approaching a possible obstruction the matter has been discussed with the Officers of the British Railways Board, who have now laid down standard conditions under which replacement switches will be provided in all future signalling schemes, as follows:—

(i) On signals on the approach side of tunnels and long viaducts.

(ii) On signals on the approach side of automatic half barrier level crossings.

(iii) On the last automatic signal approaching an interlocking, where specially asked for by the traffic department.

(iv) On at least 1 in every 5 signals in a long sequence of automatic signals where there was no other reason for the provision of a replacement switch under (i), (ii) or (iii) above.

55. I have been assured by the Chief Signal and Telecommunications Engineer, Western Region, that this new policy is being implemented forthwith. In the case of the line between Steventon and Uffington I recommend that two of the intermediate automatic signals in each direction, those protecting the emergency crossovers at Challow and Wantage Road, are provided with replacement switches as indicated on the attached plan.

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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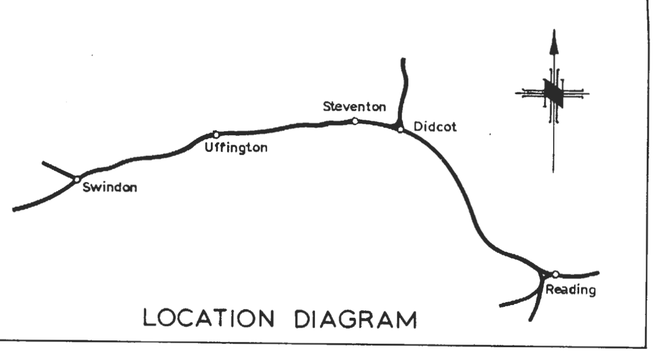
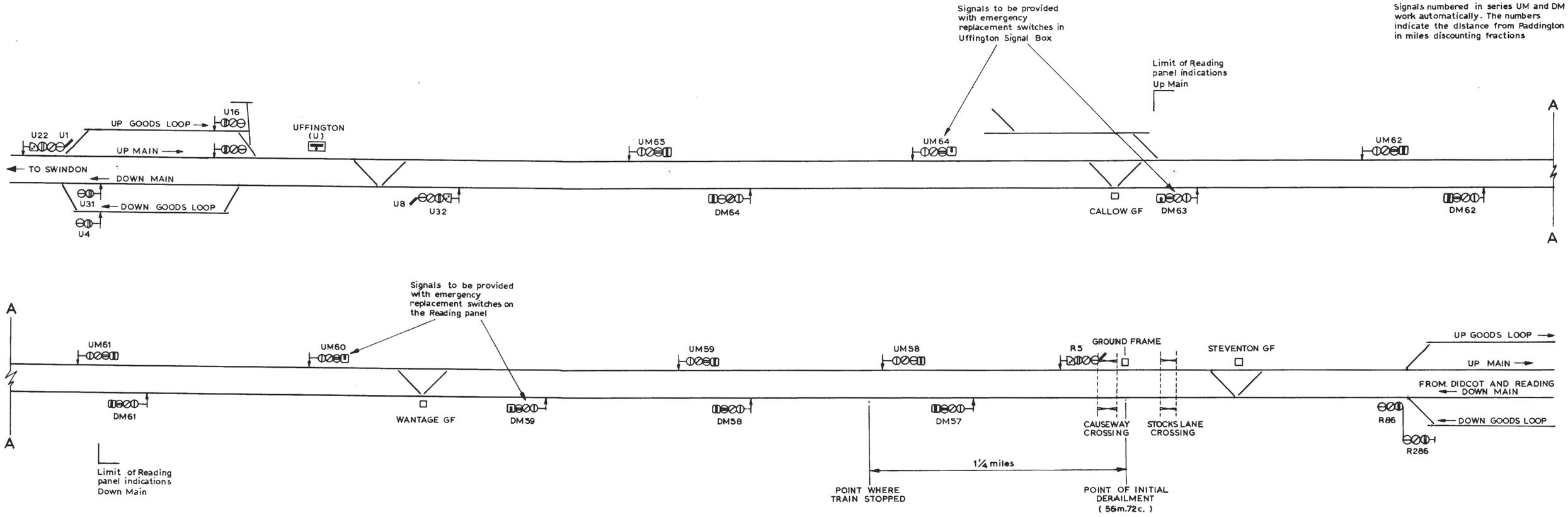
DERAILMENT OF A GOODS TRAIN AT STEVENTON, WESTERN REGION — 21st. JANUARY, 1966



LOCATION DIAGRAM



NOT TO SCALE