



MINISTRY OF TRANSPORT

RAILWAY ACCIDENT

REPORT ON THE COLLISION

that occurred on

26th December 1962

between

WINSFORD STATION and

COPPENHALL JUNCTION

in the

LONDON MIDLAND REGION

BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE
1963

THREE SHILLINGS NET.

MINISTRY OF TRANSPORT,
ST. CHRISTOPHER HOUSE,
SOUTHWARK STREET,
LONDON, S.E.1.
11th June, 1963.

Sir,

I have the honour to report for the information of the Minister of Transport, in accordance with the Order dated 28th December 1962, the result of my Inquiry into the collision between two passenger trains that occurred at 6.1 p.m. on 26th December 1962, on the four tracked electrified line between Winsford Station and Coppenhall Junction signal boxes, just north of Crewe, on the former London and North Western main line of the London Midland Region, British Railways.

Severe weather conditions had caused some of the points in Crewe to freeze with the result that trains approaching that station were closing up on each other. The 4.45 p.m. Class I Liverpool to Birmingham passenger train (referred to as the Birmingham train), which consisted of 8 coaches hauled by an electric locomotive, was travelling on the Up Fast line. It had been stopped at signal no. 114, the first automatic signal beyond Winsford Station, and again at the next automatic signal, no. 110, both the signals having been held at red by the presence of a train in the section ahead (see Note below). When signal no. 110 changed to yellow, the driver released the brakes and was about to restart the train, when it was struck in the rear by the diesel-hauled 13-coach 1.30 p.m. Glasgow to Euston Class I train, the Mid-day Scot, which was travelling at about 20-25 m.p.h.

The Mid-day Scot had also stopped at signal no. 114 which was held at red by the presence of the Birmingham train ahead. The train crew tried to telephone to Coppenhall Junction signalbox in accordance with the Rules, but they were unsuccessful because all the signal telephones on the Up lines had failed just previously. The driver then acted on his own initiative and, without seeing or ascertaining that the line was clear to the next signal as required by the Rules, he passed the signal at red and proceeded forward at a speed much in excess of that demanded by the circumstances. He saw the next signal (no. 110) change from red to yellow for the Birmingham train, and it seems that he assumed that it had become clear for his train and accelerated. Neither he nor the fireman saw the Birmingham train until the last moment and consequently the brakes were applied only just before the impact.

The impact was severe. Both trains were equipped with Buckeye couplings throughout, but the coupling between the 7th and 8th coaches of the Birmingham train fractured and the 8th coach telescoped into the coach ahead for about half of its length. The impact caused the Birmingham train to be pushed forward some 140 ft., and the two trains stopped, 25 ft. apart, with the Mid-day Scot about 150 ft. beyond the point of impact.

Both the trains were well filled, the Mid-day Scot carrying about 500 passengers and the Birmingham train about 300 passengers. I regret to report that 18 passengers lost their lives and 33 others and the guard of the Birmingham train were seriously injured and were removed to hospital; all these casualties were in the last two coaches of that train. A great many other passengers received minor injuries or suffered from shock, and they were treated on the spot.

There was delay in calling for the ambulances, police and fire services, and they were not advised of the accident until 6.34 p.m., nor of the seriousness of the situation until 6.45 p.m. They then responded with commendable promptitude, and arrived on the scene very quickly. The site of the accident was remote and could be reached only over farm roads and fields which, fortunately, were frozen, yet the first ambulance arrived only a few minutes after 7 p.m., and the other services followed very soon afterwards. Doctors and members of the Women's Voluntary Service were also on the scene soon and they, together with the other services and many of the passengers on the trains and the railway staff, rendered valuable assistance to the injured.

The collision caused the 8th coach of the Birmingham train to come in contact with the overhead contact wire. This caused some arcing but the circuit breakers opened and removed the traction current. There were two electric trains ahead of the trains involved in the collision and three electric trains behind them, and they were all immobilised. It was therefore necessary for steam or diesel power to be used to move these trains and also those involved in the collision, and these arrangements inevitably took a long time. The Birmingham train, without the two damaged coaches, and all the coaches of the Mid-day Scot were eventually drawn into Crewe, the latter via the Down lines, at 1.40 a.m. and 2.22 a.m. respectively. Both trains had to be taken out of service and the passengers proceeded in improvised train sets at 2.35 a.m. and 3.58 a.m. respectively. The refreshment rooms at Crewe remained open all night and the staff rendered good service in meeting the needs of the passengers.

Only one pair of wheels of the leading bogie of the Birmingham train was derailed and none of the other three lines was obstructed. It was however necessary to block all the lines during rescue operations. The Down Slow and Down Fast lines were reopened at 8.30 p.m. and 10.0 p.m. respectively and were used for passing traffic, the Down Slow in the Down direction and the Down Fast in the Up direction. This arrangement was the best that could be made in the circumstances, but it inevitably resulted in considerable delays to all the main line train services.

Note: In the case of automatic signals, the prefix letters shown on the drawing are omitted in this report.

Breakdown equipment was ordered from Crewe and Edge Hill and arrived without delay. Considerable difficulty was experienced in separating the telescoped vehicles and in making them and the diesel locomotive of the Mid-day Scot fit to be moved. Neither the track nor the signalling equipment was damaged and normal working over all four lines was restored at 2.10 p.m. on the following day.

There was snow on the ground but the visibility was good; it was very cold.

The Site

DESCRIPTION

1. In the Up direction the main lines from Liverpool and the North converge at Weaver Junction and run roughly southwards for a distance of about 16 miles, through Winsford Junction, Winsford Station and Coppenhall Junction, to Crewe.

The approximate relevant distances are:—

	Point to point distance	Distance to Crewe
Winsford Junction		8½ miles
	1½ miles	
Winsford Station		7 "
	1½ "	
Site of accident		5½ "
	2½ "	
Coppenhall Junction		3 "
	3 "	
Crewe		—

Between Winsford Junction and Winsford Station the line is double, but there are four lines between Winsford Station and Crewe and they are, from east to west, the Up Slow, Up Fast, Down Fast and Down Slow.

2. The drawing shows the arrangements of the lines at Winsford Station box and from that box to Coppenhall Junction; it also shows the curvature of the lines, and the signalling. It will be noted that at signal no. 114 the Up lines lie on a slight right-handed curve of 265 chains radius; the curve continues for about 600 yards beyond the signal after which the lines run straight for some 700 yards to the point of collision, and on to signal no. 110. The distance between signals no. 110 and 114 is 1566 yards. The gradients are negligible.

The Track

3. For a distance of some 650 yards on the approach side of the point of collision the track in the Up Fast line is of 109 lbs. flat bottom continuously welded rail, on concrete sleepers.

The Signalling

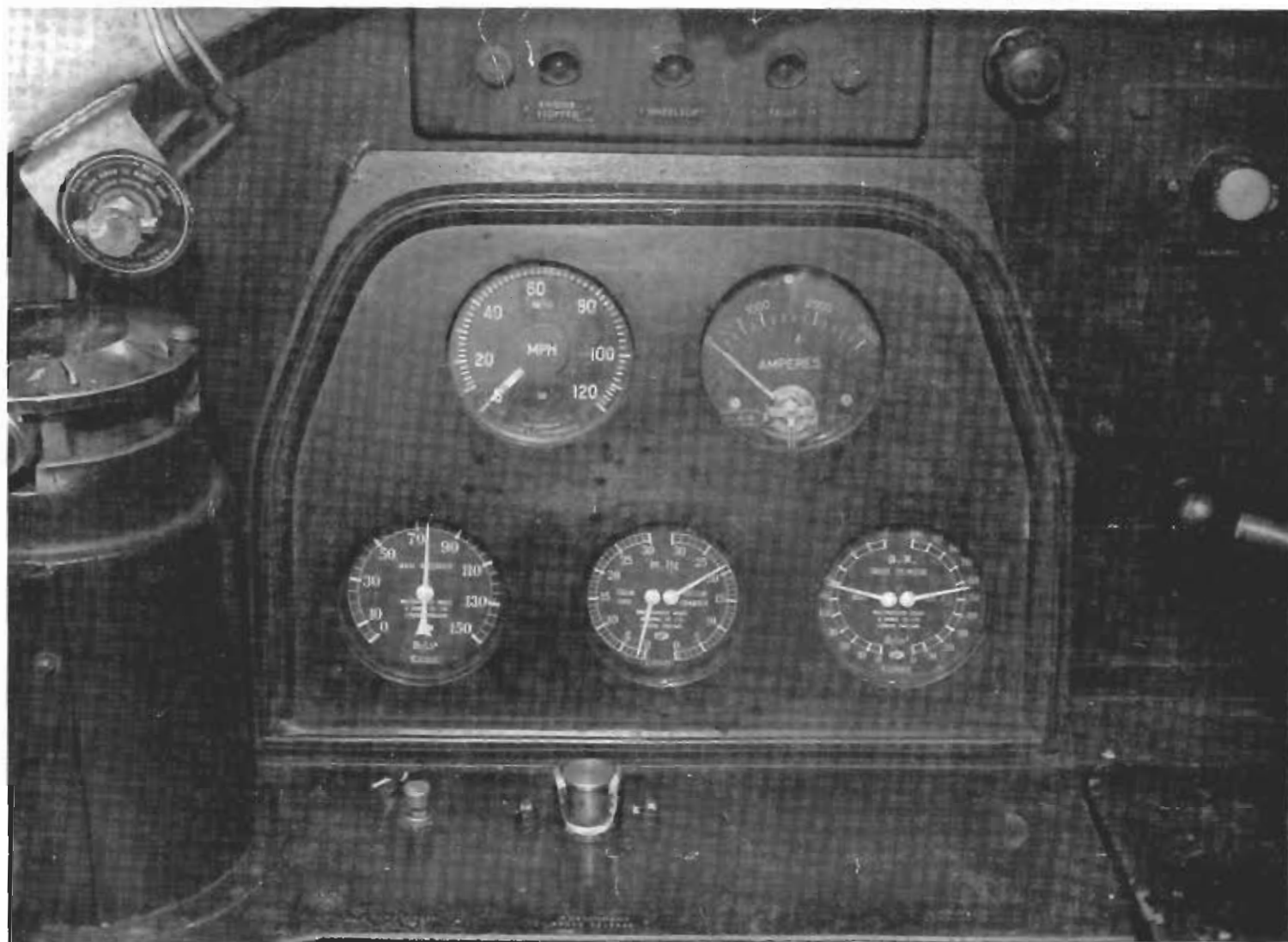
4. It will be seen from the drawing that signal no. WS 28/29 is worked from Winsford Station box and that it controls the entry to the Up Fast and Up Slow lines ahead. The subsequent signals on these lines, up to Coppenhall Junction home signals, are automatic; they are nos. 114 and 116, 110 and 112, 106 and 108, and 102 and 104. Each pair of signals is supported on one cantilever structure; the lower numbered signal of each pair applies to the Fast line and the other to the Slow line. Each signal is situated just to the left of the line to which it applies. On the Down lines between Coppenhall Junction and Winsford Station the signals are also automatics and the accident occurred almost directly opposite signals no. 103 and 101 on the Down Slow and Down Fast lines respectively. Signals no. WS45 and WS46 are respectively the Winsford Station Down Slow and Down Fast line home signals, and they are situated about 500 yards on the Winsford Station side of signals no. 114 and 116 on the Up lines.

5. The signalling is of the most modern type. The signals are mainly 4-aspect multi-lens colour lights, and the lines are fully track circuited. The aspects of the automatic signals no. 114 and 116, and 110 and 112 are normally green, and each is controlled to double yellow, yellow or red in the usual way by the occupation of the track circuits ahead. When a train is standing at signal no. 110, signal no. 114 is held at red, and it will not clear until the train has passed beyond the 200 yards overlap ahead of signal no. 110; it will then become yellow and the next signal on the approach side (no. WS 28/29) will, provided the signalman has reversed the lever, become double yellow. To avoid confusion, the track circuits are not shown on the drawing. Each of the signalboxes concerned is equipped with an illuminated diagram and the drawing indicates the extent to which the signals and the track circuits are shown on them. Each box is also equipped with an electric clock controlled from a Master clock in Crewe. The standard Automatic Warning System of Train Control is provided and the track magnets are situated roughly 200 yards on the approach side of the signals.

6. Each signal has a telephone with selective ringing on a coded system. In order to telephone to the signalman a switch must be turned against a spring and released, and the code is despatched by the return movement of the switch. If the switch does not return completely to the normal position, the code is not completed, and it is then not possible for a code to be sent from any other telephone on the same circuit. All the signal telephones on the Up lines concerned are one circuit and are connected to Coppenhall Junction signalbox; those on the Down lines are on another circuit and are connected to Winsford Station signalbox. The signalman has a clear indication of the number of the signal from which a call is being made.

Other Telephone Circuits

7. Telephones are provided at regular intervals on overhead electrical structures for the control of the electric power supply. They are connected directly to the electrical control room at Crewe. The position of one such telephone, near the site of the collision, is shown on the drawing.



Instrument Panel of Diesel Locomotive.

8. There is a private railway telephone system with an exchange at Crewe, to which all the local signalboxes, stations, control offices etc. are connected. It is an automatic system. There is also a Post Office telephone in the station buildings at Winsford Station.

The Trains

9. The eight coaches of the 4.45 p.m. Birmingham train weighed 275 tons and the electric locomotive weighed 80 tons, giving a total weight of 355 tons. The coaches were all of the modern British Railways' "all steel" type. The 7th coach was an open second and it was constructed in 1959; the 8th (rear) coach was a corridor second brake and it was constructed in 1960. As already mentioned Buckeye couplings were in use between all the coaches.

10. The 13 coaches of the Glasgow train weighed 441 tons and they were also equipped with Buckeye couplings. The locomotive was a Class 4 diesel of 2,200 h.p. with 1 Co-Co 1 wheel arrangement, and it weighed 133 tons. It was equipped with the compressed air brake operating on the driving wheels and worked from the combination lever for the vacuum brake on the train coaches; all the coaches except the eleventh and twelfth from the front were equipped with direct acting valves. The brake power on the train was 78% of its total weight of 574 tons.

11. The diesel locomotive had a driving compartment at each end and the driving position in each is on the left-hand side. Each compartment was equipped with a speedometer on an instrument panel situated in front of the driving seat. A photograph of the panel is reproduced opposite. It will be observed that there are no graduations between the 0 and 10 m.p.h. marks on the speedometer and that there is no figure against the latter mark.

12. As already mentioned, the Buckeye coupling between the rear two coaches (the 7th and 8th) of the Birmingham train fractured and the 8th coach telescoped into and destroyed the coach ahead for about half of its length. The brake compartment of the rear coach was leading and it was badly crushed. The pivot pin of the coupling head at the rear end of the 7th coach was sheared in two places (the pin is $1\frac{3}{4}$ ins. diameter and of grade VI steel with a tensile strength of 40-45 tons per sq. in.) and the whole coupling was driven through the $\frac{3}{4}$ in. thick steel headstock of that coach, punching out a section some 1 ft. 7 ins. wide and 9 ins. deep. The pivot pin of the coupling head at the front of the 8th coach was also sheared in two places and the cast steel head itself was fractured. The fracture of the coupling enabled the front end of the underframe of the 8th coach to rise, the rear end possibly being forced down by the body work of the diesel engine of the Mid-day Scot (the buffers of the engine are on the bogie), and the underframe was driven through the bodywork of the coach ahead which, though of steel, could not resist such heavy forces.

13. The damage to the remaining coaches of the Birmingham train was generally superficial and was confined to broken axle boxes and fittings. The leading bogie of the diesel locomotive of the Mid-day Scot was forced backwards for about 2 ft., and came in contact with the underframe equipment. The coaches on that train were not damaged but the pivot pins of the Buckeye couplings on the 3rd and 7th coaches were sheared.

14. The damage was consistent with the speed of impact of at least 20 m.p.h.

RULES

15. The following are extracts from the relevant Rule in the British Railways' Rule Book:—

Rule 55

(g) (i) When a train has been brought to a stand owing to a stop signal being at Danger and a telephone (. . .) is provided, (. . .) the Driver must wait two minutes or other prescribed period and except where special instructions are issued to the contrary communicate with the Signaller by telephone, inform him at which signal his train is detained and give the description of his train. If it is necessary for the train to remain at the stop signal the Signaller must so advise the Driver and the Driver must communicate with the Signaller at intervals of not more than five minutes unless otherwise instructed.

If it is necessary owing to a failure of the signal or other emergency, for the train to pass the signal concerned at Danger, the Signaller must advise the Driver of the circumstances and instruct him to proceed cautiously.

(ii) In every case when a train proceeds past a stop signal at Danger, in accordance with the preceding paragraph (i) or clause (h), as the case may be, the Driver must give one long whistle and proceed cautiously as far as the line is clear towards the next stop signal in advance and at such speed as to enable him to stop short of any obstruction, due regard being paid to such conditions as curvature of line, weather, etc.

The Driver must realise that the signal is possibly at Danger due to the presence of a train ahead, a broken or displaced rail, or an obstruction on the track or to the points ahead not being properly set, and he must, therefore, exercise the greatest caution.

In such cases if the next stop signal in advance, whether automatic or not, is not at Danger, the Driver must continue to proceed cautiously to the next stop signal beyond.

(h) (i) Should the telephone have failed at an automatic stop signal at which a train is detained, the Fireman (or Driver in the case of trains or engines the driving cabs of which are single manned) must, unless special instructions to the contrary are in force, proceed to the nearest telephone in working order applicable to the line on which the train is standing or to a line with the same direction of travel, where he can communicate with the Signaller and act in accordance with clause (g), but if the Driver can see or ascertain that the line is clear to the next stop signal, he may proceed in accordance with clause (g) (ii) to such stop signal.

16. Supplementary operating instructions applicable to the electrified lines north of Crewe were issued on 3rd March 1962 by the General Manager, London Midland Region. They read as follows:--

"In the circumstances mentioned in Rule 55 clause (b) (i), the Fireman or Driver must proceed to the next nearest available telephone whether applicable to the line on which the train is standing or not but, in this case, the person responsible must ensure that the Signaller understands the message is being given from a telephone other than that located at the signal at which the train is detained."

REPORT AND EVIDENCE

Up to the Time of the Collision

17. The circuit breakers feeding the Up Fast line between Winsford and Crewe opened on fault at 6.1 p.m., and this establishes the time of the collision.

18. The Birmingham train passed Winsford Station box at 5.26 p.m. The signaller had no difficulty in seeing that the tail lamp was alight, and he described the intensity of the light as "average". The train was stopped at signal no. 114 which was at red. The driver telephoned from that signal to the signaller at Coppenhall Junction box and was told to wait until the signal became clear. After some time the signal cleared to yellow and the driver proceeded to signal no. 110 which was also at red. He and the fireman both tried to telephone to the signaller at Coppenhall Junction from both the Up Fast and Up Slow line telephones, but could get no reply. (The telephones on the Up lines had become out of order after the earlier call from signal no. 114, because the switch had not returned fully to its normal position; the signaller had called the signal lineman and had also informed the signaller at Winsford Station of the situation). The fireman therefore telephoned to the signaller at Winsford Station from signal no. 103 on the Down Slow line, and was told that the Up line telephones were out of order and that the driver should await the clearance of signal no. 110. That signal then cleared to yellow and the driver had released the brakes and had applied power to re-start, when the collision occurred.

19. The Mid-day Scot had had a normal run from Glasgow though it had passed through some snow showers and the driver, J. Russell of Polmadie Motive Power Depot, described the locomotive as "on the weak side". The signaller at Winsford Junction and Winsford Station boxes recorded the time of passing as 5.50 p.m. and 5.51 p.m. respectively. The signaller at Coppenhall Junction recorded that the train occupied his first track circuit (the first of two track circuits on the approach side of signal no. 114) at 5.54 p.m. Signaller H. Sutton, at Winsford Station box, said that he remembered that the train passed at one minute past the 50 or 55 minute marking on the clock, but he thought that he had made a mistake and that the correct passing time was 5.56 p.m. He subsequently agreed however that it was probably 5.51 p.m. and, as will be seen later, it must certainly have been 5.51 p.m. and not 5.56 p.m. Sutton watched the train as it passed and thought that it was travelling rather fast.

20. Signal no. 114 was held at red by the presence of the Birmingham train ahead. Russell stopped his train somewhat short of the signal and then restarted and pulled up to it. The fireman, V. McCallum, got down from the engine and tried to telephone to the signaller at Coppenhall Junction from signal no. 114. He could get no reply so he tried the telephone on the Slow line signal no. 116, but again could get no reply. Russell therefore got down from the engine himself and tried both the telephones, but with similar results.

21. Russell said that he knew of the Supplementary Instruction (see paragraph 16) but added "The telephone on the Down line seemed pretty far away. I said (to the fireman) we have wasted enough time in the section, the road looks clear ahead to signal no. 110, and we will make for there." He said that he could see the Fast line signal no. 110 at red and the Slow line signal alongside it (no. 112) at yellow. He could not see the electric train standing at signal no. 110. He thought that he had by then been standing at signal no. 114 for 6-7 minutes, so he restarted the train and, he said, proceeded forward at a speed that he estimated at 5/6 m.p.h.; he added that in order to keep the train moving steadily, he kept opening the control handle slightly and then closing it. Russell went on to say that, at a point that he estimated to be halfway between signals no. 114 and 110, he saw the latter signal change from red to yellow. He said, however, that he did not accelerate, because he had intended to stop at signal no. 110 to telephone to the signaller and report the failure of the telephone at signal no. 114. Very soon afterwards he heard McCallum shout "Stop" and he immediately applied the brakes and released the dead man's pedal; almost simultaneously he saw, at a distance that he estimated at less than one coach length (60 ft.), a "black object" ahead. The collision occurred almost at once at a speed that he estimated at 2-3 m.p.h.

22. Russell recalled that as he drove forward from signal no. 114 the lights in the driving cab were not alight and that he was alternately looking ahead and watching the speedometer; the needle of the latter was just moving up and down as he opened and closed the control handle, and it was "not showing any speed". He said that he did not see the light of the tail lamp of the train ahead at all nor the outline of the train itself until just before the impact, and he thought that this was on account of the powerful light of the signal. No Down train passed him at that time. Russell said that he knew Rule 55 well, but added that he had never before had to apply section (b) (i). I explained to Russell that if he had been travelling at 5 m.p.h., it would have taken about 9 minutes to reach the site of the collision after restarting from signal no. 114. The collision had occurred at 6.1 p.m., not more than 10 minutes after his train had passed Winsford Station box (see paragraph 19), at least 2 minutes of which time must have been taken up in travelling from the box to the signal, stopping and then drawing up to the signal, and at least 5-6 minutes in trying to telephone to Coppenhall Junction box (see paragraphs 25 and 48). He could not, therefore, have taken more than 2-3 minutes in travelling from the signal to the point of collision, which puts his average speed at between 15 m.p.h. and 22 m.p.h. Russell was adamant however that his train never reached any such speed.

23. I interviewed Russell again later and questioned him very closely. I again explained to him the time calculations mentioned above and then told him about the tests that I had carried out (see paragraphs 46 and 47). These showed that even if the speed had been 20 m.p.h. and the brakes had been applied when the outline of the train ahead came into view, the collision would not have occurred. He was however still insistent that the train was not travelling nearly so fast, though from what he said it seemed clear that he was not watching the speedometer as closely as he had stated earlier, and that he thought that he could judge the speed quite well without watching it. It also seemed that he may have taken the unmarked 10 m.p.h. speedometer graduation for zero. He agreed that when he saw signal no. 110 change from red to yellow, he may have thought that it applied to his train, but he still maintained that he did not accelerate, that he continued to look out for an obstruction on the line, and that he was intending to stop at that signal and telephone to the signalman about the failure of the telephones at signals no. 114 and 116.

24. Russell is 63 years of age; he has been a driver for 26 years and has driven diesel engines regularly during the last 12 months. He was in good health and had good eyesight. He said that he had taken no alcohol and that he was almost a total abstainer. He also said that there had been no conversation between himself and McCallum.

25. V. McCallum, aged 32, had 11 years' service as a fireman and had worked regularly with Russell for 6 months. He said that the train first stopped about 2 engine lengths short of signal no. 114 and the driver then drew up to it. McCallum confirmed the driver's statement about trying to telephone and thought that the train stood for 5-6 minutes at the signal. He also thought that the train proceeded forward at a speed not exceeding 5-6 m.p.h., and he said that he judged the speed by watching the reflection of the signal ahead on the rail. He saw the signal change from red to yellow at, he thought, rather beyond the halfway point between the signals, but the driver said that he would stop at it. Shortly afterwards he saw the outline of the standing train at a distance of only about one coach length and shouted to the driver who applied the brakes immediately. He said that he did not see the tail lamp until just before the buffers met.

26. McCallum said that when he saw the train ahead he was concerned about whether his train would be able to stop in time, and he blew the engine horn. He did not think this distance was sufficient for the brake application to reduce the speed. He confirmed that there was no conversation between himself and the driver. He said that the cab windows were shut and that the heater was on.

27. I also interviewed McCallum again later and questioned him closely. He repeated his previous statement and said that when he saw the signal change to yellow, he did not assume that it was for his train. He agreed that he was not looking for the light of a tail lamp; he said that it passed through his mind that there had been a signal failure, and that he was looking for a broken rail or a fallen buffer. I also explained to McCallum that from a point about 100 yards from the stationary train, the outline of that train obscured the view of the signal, but he still maintained that he did not see the train until his train was within about a coach length of it; also that he did not think that his train was travelling at more than 5 m.p.h.

28. Guard K. McRae, who had been a guard for 14 years, was in charge of the Mid-day Scot, and was travelling in the 10th coach from the front. He had not noticed that the driver had stopped the train short of signal no. 114 and had then drawn up to it. He booked a stop of 5 minutes at that signal; he assumed that it was red but did not see it. He then assumed that the signal had become clear, because the driver restarted in what McRae described as "a normal manner". He estimated the speed at the time of impact at 10 m.p.h. but then agreed that it was probably higher. He said that the train restarted from signal no. 114 at about 6.0 p.m. and that the accident occurred at about 6.3 p.m.

29. McRae said that he had not felt any brake application before the impact which was followed very closely by a second and quite distinct second impact. He was thrown from his seat to the floor.

30. Guard R. Wilkinson of the Birmingham train was travelling in the brake compartment of the rear coach. He had a remarkable escape. He was seriously injured, but he volunteered to give evidence at my inquiry. He said that the train had stood at signal no. 110 for about 10 minutes. He saw it change to yellow and about a minute later he felt the brakes being released. He then heard the whistle of the Mid-day Scot and simultaneously the collision occurred. He remembered nothing after that.

After the Accident

31. Driver G. F. W. Hedgecock, of the Birmingham train, had seen signal no. 110 clear to yellow and had released the brakes and just applied power to restart when the impact occurred. He said it was not violent but it pushed his train forward for, he thought, about $1\frac{1}{4}$ engine lengths. He looked out and saw some arcing and the escape of steam and realised that a train had run into his rear end. He therefore told his fireman to go forward and protect the Down lines while he himself took detonators and ran back along the right-hand side of his train, i.e. between the Up Fast and the Down Fast lines, and he telephoned to the signalman at Winsford Station box from the telephone at the Down Fast signal no. 101. The rear of his train was then roughly opposite that signal.

32. Hedgecock said that when he spoke to the signalman he explained that he was the driver of the Birmingham train, that a train had run into his train and said "Get ambulances and assistance at once". He thought that he must have telephoned within about 3 minutes of the accident. He knew that his train was well filled and, having seen the arcing and the telescoping, he realised that the situation was serious. He had no doubt that he had conveyed the seriousness of the situation to the signalman.

33. *Passed Fireman F. W. Kelly*, who was working as fireman to Driver *Hedgecock*, said that immediately after the accident he took detonators and went forward to protect the Down lines. He placed detonators on those lines and spoke to the signalman at Winsford Station from the telephone at Down Slow signal no. 107, some 800 yards ahead of his train. At that time Kelly knew only that there had been a collision and was unaware how serious it was. He gathered from the conversation that he was the first person to give the information to the signalman, but was not certain on that point.

34. Kelly then went back to the train and after speaking to his driver, he telephoned again to the signalman at Winsford Station from Down Slow signal no. 103. He reported then that the line was clear but that persons in the Birmingham train were trapped; the signalman said that help was coming. Kelly thought that the time then was about 6.20 p.m.—6.25 p.m.

35. Guard *McRae*, of the Mid-day Scot. went forward after the impact and met Fireman *McCallum*, and then went back to protect the Up lines. He said that he knew he passed an electrification telephone but did not use it. He spoke from signal no. WS46 to the signalman at Winsford Station at about 6.20 p.m. and told him of the collision. He also formed the impression that he had given the signalman the first information about it.

36. *Travelling Ticket Collector D. Mulhearn* of the Mid-day Scot saw the extent of the damage and realised help must be called without delay, so he ran across some fields to a farm, where he thought there would be a telephone; in doing so he passed, without realising it, the electrification telephone near the site of the accident. The telephone at the farm was out of order but someone from there went on a motor bicycle to another one to call for help.

37. Fireman *McCallum* went back along the train and also passed the electrification telephone mentioned above, without realising it was there. He met the guard who agreed to protect the Up lines. *McCallum* then assisted in the relief work.

38. *Relief Signalman C. Jackson*, who was on duty at Coppenhall Junction box, said that he received the Obstruction Danger bell signal from Winsford Station at 6.5 p.m. Immediately afterwards, the signalman at Winsford Station telephoned him and said that the Mid-day Scot had run into the back of the Birmingham train and that two or three passengers had been injured; Jackson was certain that this was the message. He then took detonators and went to protect the Down lines, but to do so he had to walk round one electric train which had stalled through loss of power. On returning to the box, he thought some seven or eight minutes later, he tried to telephone to the Traffic Control office at Crewe, but he had to wait 2-3 minutes for a reply. When he became connected, he repeated to the Controller the message from the Winsford Station signalman. He assumed that the signalman at Winsford Station was making all the relief arrangements and he did not ask the Controller to take any action. Jackson said that visibility at the time was good and that he could see signals no. 109 and 111 on the Down lines, over one mile away.

39. *Signalman H. Sutton*, of Winsford Station box, said that at 6.5 p.m. some member of the train staff of the Birmingham train, he thought the fireman, telephoned from signal no. 103 and said that a train had run into the rear of his train, that there were people trapped and that assistance was required. Sutton immediately sent Obstruction Danger, recording the time 6.5 p.m. in his Train Register, and replaced his Down line signals to Danger. He then telephoned to Coppenhall Junction box and told the signalman about the accident, saying that two or three people were hurt. After that he had to deal with a call from signal no. 27 (not shown on the drawing) and he thought that the next thing he did was, at about 6.10 p.m., to telephone the porter/booking clerk at Winsford Station to tell him about the accident and to call ambulances and the police. Sutton said that at that time he did not know where the accident had occurred, except that it was somewhere near a former station called Minshull Vernon; also, that he did not think that the accident was serious.

40. After that Sutton had many telephone calls to make, including calls to the Traffic Control office, the District Inspector at Weaver Junction, and to another station to stop Up trains coming towards his box; he also had many incoming calls. He did not record the time of any of them, but the call to the Control office was recorded in that office as having been received at 6.16 p.m. Sutton also sent a sub-ganger to call the station master from his home. He thought that the latter arrived in the box at about 6.30 p.m., while he was receiving a further telephone call from signal no. 103. That call was also from one of the crew of the Birmingham train who said that "bodies and people are all over the track". Even then, however, Sutton did not appreciate that the accident was serious.

41. Sutton was insistent that he had telephoned to the porter very soon after he had heard of the accident. However, when he was questioned again later and it was explained to him that the porter, not knowing of the accident, had telephoned to Coppenhall Junction to enquire about a train, probably at about 6.25 p.m. (see next paragraph), Sutton agreed that he may have got the sequence of his conversations mixed up and misjudged the length of time which had elapsed before he spoke to the porter. He said that when he rang, the latter answered the telephone at once.

42. *Porter/Booking Clerk D. A. Leigh*, who was on duty at Winsford Station, said that there were some passengers in the waiting room for the 6.19 p.m. Down local train. When it did not arrive they asked him the reason and he, not knowing about the accident, telephoned to Coppenhall Junction box to enquire about the delay. Sometime later, Signalman Sutton telephoned about the accident and he, Leigh, immediately rang 999 on the public telephone. He had formed the impression from what the signalman had said that the accident was not serious, and when he was put through to the ambulance service, he reported that there had been an accident near Minshull Vernon and that an ambulance was required.

The person in the ambulance control asked for further information about the location, and while this conversation was in progress, the station master arrived. Leigh did not notice the time when the signalman had telephoned him but he repeated that he had made the emergency call immediately afterwards.

43. The Head Postmaster, Northwich, gave evidence that the time of the emergency call referred to in the paragraph above was recorded as 6.34 p.m.

44. Mr. T. O. Staley, Station Master, Winsford Station, said that he did not know the time when the sub-ganger, sent by the signalman, arrived on his auto-cycle at his house, about 1000 yards from the station, and reported that there had been an accident between Winsford Station and Coppenhall Junction; the report was "one passenger train into another, none killed, one or two hurt". Mr. Staley dressed rapidly and went on foot to the station, taking about ten minutes to reach there. When he arrived at the station the porter was telephoning to the ambulance service and said that more information about the site of the accident was required. Mr. Staley tried to speak to the Traffic Control office but the number was engaged, so he immediately proceeded to the signalbox and found the signalman calling for doctors. From there he made some telephone calls to obtain the information required about the site, and he telephoned to the ambulance service and then to the local police officer, who recorded that call at 6.45 p.m. Mr. Staley said that although Sutton had told him the gist of the second telephone call from signal no. 103 (see paragraph 40), he did not realise that the accident was serious. Nevertheless, when he spoke to the police officer, he asked for the full emergency procedure to be put into effect. He did not realise how serious the accident was until he reached the site a few minutes after 7.0 p.m. By then, two ambulances and the Winsford Fire Brigade had arrived.

45. The Deputy Clerk, Cheshire County Council, said that the Fire and Ambulance Services did not know that there had been a train accident until they reached the site. They heard of the location of the accident in a telephone call from a local farm (see paragraph 36).

TESTS

46. I carried out some acceleration and braking tests with a train similar in composition and weight to the Glasgow train, and hauled by a similar type of engine. The results are shown in the graphs in Appendices A and B.

47. I also arranged for a train to be placed in the same position at signal no. 110 as the Birmingham train had stood, and I approached it in the trial train, riding in the driving cab. There was still snow on the ground. The tail lamp of the stationary train was an ordinary one, not specially cleaned. It was not possible to see that train from signal no. 114 but its tail lamp came into view from a road underbridge situated some 400 yards from the point of collision; it was however dim in contrast to the bright light of signal no. 110 and it was not conspicuous. The silhouette of the stationary train, in the light of the signal which was kept at yellow as at the time of the accident, became visible at a range of 156 yards and the reflection of the train lights could be seen in the snow on the ground at that range. At a range of 115 yards, the outline of the stationary train began to obscure the light of the signal from the fireman's side of the cab.

48. I noted that the time taken for both the fireman and the driver of the Mid-day Scot to use the telephones at signals no. 114 and 116 would not have been less than 5 minutes.

49. I inspected the Buckeye couplings that were fractured and found that the pivot pins were not worn. They have been metallurgically examined and the pin of the coupling at the rear end of the last but one coach on the Birmingham train, which was driven through the headstock, was found to be without fault and of the correct steel (grade VI, 40/45 tons sq. in. tensile strength). The fractured pins of the couplings on the 3rd and 7th coaches of the Mid-day Scot were also without fault and of the correct steel. The steel of the pivot pin of the coupling at the front end of the rear coach of the Birmingham train was however not according to specification and was only of grade IV (28/33 tons sq. in.).

50. The speedometers in the driving cabs at both ends of the diesel locomotive on the Mid-day Scot were thoroughly tested. It was found that they read between 1 m.p.h. and 2 m.p.h. high in the working range from 5 m.p.h. to 15 m.p.h. At 20 m.p.h. the error did not exceed 1 m.p.h. in any of the tests.

CONCLUSIONS

51. This accident would not have occurred if the signal telephones on the Up lines had not gone out of order, but even then it should not have occurred if Driver Russell of the Mid-day Scot had obeyed the Rules.

52. I have no doubt whatever that, after standing for some minutes at signal no. 114 at red, Russell assumed that the line was clear to the next signal, no. 110, and that consequently he could proceed to that signal under Rule 55 (h) (i) (see paragraph 15). He could not, however, see that the line was clear and he took no steps to ascertain that it was clear, and he had no justification whatever for making such an assumption. Furthermore, although Russell said that he was aware of the modification of Rule 55 (h) (i) (see paragraph 16), he admitted that he disregarded it in order to save time. Again, he had no right whatever to adopt such an attitude. If he had used a telephone on the Down line and had spoken to the signalman at Winsford Station, he would, like the driver of the Birmingham train, probably have been advised of the situation and told to wait at signal no. 114 until it cleared.

53. Concerning the movement of the Mid-day Scot forward from signal no. 114, the undisputable facts are as follows:—

- (i) The accident occurred at 6.1 p.m. The Mid-day Scot passed Winsford Station box not earlier than 5.51 p.m. (see paragraph 19) i.e. not more than 10 minutes before the accident: it took at least two minutes to reach signal no. 114 (see paragraph 22): and it stood at that signal for not less than 5 minutes (see paragraphs 21, 25, 28 and 48). The train could not therefore have taken more than three minutes in travelling from signal no. 114 to the site of the accident, which indicates an average speed of *not less than* 15 m.p.h. If its average speed had been 5 m.p.h. this travelling time alone would have been about 9 minutes.
- (ii) The extent of the damage indicated a speed of impact of at least 20 m.p.h.
- (iii) The light of the tail lamp of the electric train was burning and could have been picked up at a distance of some 400 yards, though in the light of the signal ahead it would not have been conspicuous. The silhouette of that train could be seen **against the light** of the signal at a distance of just over 150 yards when the reflection of the train lights in the snow was also noticeable. At a distance of just over 100 yards, the outline of the train obscured the light of the signal.

54. It is not possible for me therefore to accept the assertions of Russell and his fireman, McCallum, that the Mid-day Scot was driven forward from signal no. 114 cautiously and at a speed of about 5 m.p.h., and I have no doubt that at the time of the impact the speed of the train was between 20 and 25 m.p.h.

55. It is, I think, possible that if Russell looked at the speedometer he misread it, and that the needle was in the region of the 20 m.p.h. mark while he thought that it was in the region of 10 m.p.h. mark. On the other hand, I think it more likely that he did not look at the speedometer at all and estimated his speed, as he was wont to do on steam locomotives. McCallum certainly estimated the speed and did not look at the speedometer. I am sure that the estimation of speed is more difficult on modern main line diesel locomotives than on steam locomotives (on which drivers become expert), because on diesel locomotives the driver sits in an enclosed cab and is more remote from the track, and also because the speed of the locomotive is not necessarily related to the speed of the power unit. The smooth riding qualities of these locomotives and the absence of rail joints on long welded track are also factors. Whatever the cause, Russell certainly misjudged the speed of the train seriously.

56. According to Guard McRae, the Mid-day Scot accelerated in a normal way after restarting from signal no. 114. It could therefore have attained a speed of about 30 m.p.h. by the time it reached the halfway point between that signal and signal no. 110, although I think that the speed was then not so high and was probably nearer 20 m.p.h. Russell said that it was near the halfway point that he saw signal no. 110 clear to yellow, and I have no doubt that he assumed that it had become clear for his train. He insisted however that he did not accelerate and that he had intended to stop at the signal to report the telephone failure, but I find it difficult to accept either of these statements. There was no reason for him to stop as he was only a short distance from Crewe from where he could have made a report.

57. It is understandable that neither Russell nor McCallum noticed the tail lamp of the electric train because it is quite clear that they were not looking for one, and the light would have been overpowered by the light of the signal. I find it extremely difficult, however, to understand how neither saw, at a distance of some 150 yards, the silhouette of the train ahead against the light of the signal and how McCallum failed to notice that the signal light started to become obscured by the train at a distance of about 100 yards. If an emergency brake application had been made at the point where the silhouette could first have been seen, the impact might have been avoided. Even if it had been made at the closer point, the speed of the train would have been reduced considerably before the impact. As it was, neither Russell nor McCallum noticed the train ahead until it was about a coach length (22 yards) away. I can only conclude therefore that neither of them was on the alert to the extent that the circumstances demanded.

58. Full responsibility for this accident must therefore be placed on Driver Russell of the Mid-day Scot, though I do not consider that he received the assistance which he could have expected from his fireman, McCallum. Both were experienced men. Russell's record for the past 10 years had been clear and McCallum's record was entirely clear.

59. The Obstruction Danger signal was sent by Signalman Sutton of Winsford Station at 6.5 p.m. (4 minutes after the accident occurred) on receipt of a telephone message from a member of the crew of the Birmingham train. That message must have been the one given by Driver Hedgecock, and it is evident that he lost no time whatever because he sent it from a telephone on the Down Fast line which was almost opposite the rear end of his train. Although at that time he had no idea of the extent of the injuries, he realised that the damage was severe and that help was urgently necessary, and he asked for ambulances and assistance to be sent at once. Hedgecock was an excellent witness, and I have no doubt whatever that he intended to convey the urgency of the situation to the signalman.

60. It is quite clear, however, that Signalman Sutton did not appreciate the urgency of the situation, though it is difficult to understand how he failed to do so, especially when he received the further telephone message from a Down Slow line signal which mentioned "bodies and people all over the line". He could not explain how he had come to mention "two or three injuries" when he spoke to the signalman at Coppenhall Junction and when he sent the message to the station master; I am sure that Hedgecock

had said no such thing. I have no doubt whatever that Sutton did not telephone to Porter Leigh at Winsford Station to call for assistance until about 6.30 p.m., and he must therefore bear the responsibility for the delay in calling the emergency services. It may be the case, though he said that it was not, that he tried to telephone to Leigh earlier but found the line engaged, and then forgot to telephone again for some time. I do not think that Sutton lost his head, but it seems that he lacked the proper sense of urgency that is necessary when dealing with a situation of this kind.

61. I am satisfied that when Leigh received the message from the signaller he called for an ambulance immediately, but there was delay in trying to ascertain the exact location of the accident. The full emergency arrangements were asked for by the Station Master, Mr. Staley, who arrived at the station very soon after he had been advised of the accident and who telephoned to the local police officer after endeavouring to locate the accident. At that time Mr. Staley had only Signaller Sutton's account of what had occurred and did not realise that the accident was serious. All the emergency services responded extremely promptly to the call.

REMARKS AND RECOMMENDATIONS

62. This accident occurred on a section of the line on which the most modern signalling and the Automatic Warning System of Train Control have been provided. These have been designed to prevent as far as possible accidents occurring from human errors but they could not have prevented an accident occurring from the type of errors made in this case by the driver of the Mid-day Scot. The accident was the direct result of this driver failing to obey a Rule which is framed to cover the exact circumstances that arose when the signal telephones on the Up lines failed. Such telephone failures are, I am glad to say, extremely rare. The Rule specifies firstly the circumstances in which a driver may pass a signal which remains at red when he cannot communicate with the signaller; and, secondly, the manner in which he must drive his train after passing such a signal. The accident would not have occurred if the driver had properly applied either part of the Rule.

63. Taking the second part of the Rule first, a driver having passed a signal at red without having been able to communicate with the signaller, is required to proceed with the greatest caution, having regard to the fact that there may be a train ahead, an obstruction or a failure of equipment, such as a broken rail, and also having regard to the local conditions. As mentioned in paragraph 55, the judging of speed, particularly at night, of a train drawn by a powerful main line diesel locomotive is not easy, and the only certain way of ensuring slow speed is to refer frequently to the speedometer. All diesel and electric locomotives are equipped with a speedometer in each driving compartment and this piece of equipment has now been fitted to a great many steam locomotives. I think, however, that on the whole drivers do not make sufficient use of it and I consider that some steps should be taken to ensure that they do so, particularly on main line diesel locomotives and electric locomotives. Colonel Reed referred to this point in his report on the accident that occurred at Lincoln on 3rd June 1962. He also wrote in his report on the collision near Watford on 16th October 1962, the following:—"So long as 'stop and proceed' is to continue I consider that every driver under training should be given a demonstration on the line under service conditions of this operation so as to bring its meaning home to him." That recommendation was directed particularly to the training of drivers in the special "stop and proceed" system on the electrified Watford lines. I consider, however, that it could with advantage also be applied to the training of main line drivers on diesel and electric locomotives and that such training should include the driving of a train really slowly, as is required when applying Rule 55 (g) (ii), both by day and by night. As I mentioned in my report on the collision near Victoria in December last, I am sure that recently developed equipment for simulating running conditions would help in such training. I refer to the markings on the speedometer later.

64. Reverting to the first part of the Rule, i.e. the circumstances in which a driver may pass a signal which remains at red when he cannot communicate with the signaller, it seems that the words "can see or ascertain that the line is clear to the next stop signal" are open to misinterpretation by some persons, though in my opinion they should be taken to mean exactly what they say. A driver cannot see that the line is clear at night, or in fog, or even by day in some circumstances; if he cannot see, he can ascertain that the line is clear only, generally speaking, by sending his fireman or the guard, or by going himself towards the next signal. I think that the Rule should be expanded and should explain the procedure.

65. This is certainly a delaying procedure and it is unfortunate that in modern times it should be necessary but I am sure that it is the only safe procedure so long as the rear end protection of trains by night consists only of an oil tail lamp. This protection is, generally speaking, the last line of defence in preventing an accident, and in the circumstances that arose in this case, it was virtually the only defence. It has not been developed, although the intensity of signal lights and of the general lighting of streets and towns, and the power and acceleration of locomotives, etc., have been developed greatly. It has in fact changed little during the last century. The oil tail lamp that forms the protection can give a good light but it is certainly not a conspicuous or an arresting light, and it is one that is overpowered by the intense light of the modern colour light signal.

66. The existing procedure will have to be applied only when there is a combination of a signal telephone failure and of a signal remaining at red, on account of some other failure or of a train standing ahead. As I have mentioned, the signal telephone equipment is reliable and failures are rare. The combination of two such sets of circumstances will therefore be still more rare. The incidence could be reduced further on sections of line where there are more than two tracks, by installing the telephones on each of the lines with the same direction of movement on a separate circuit.

67. If however the rear end protection of trains were to be improved to meet modern conditions, then some relaxation of this part of the above mentioned Rule would certainly be justified. I have discussed this matter with the Officers of the British Railways Board and they tell me that they are now experimenting with a new form of tail lamp which is electrically operated and gives a flashing red light. I have seen prototypes of tail lamps of this kind. The flashing light would certainly improve the rear end protection of trains, and it is an arresting danger signal which the driver of a following train could hardly fail to notice, even against the light of a colour light signal. I recommend that the development of a flashing tail lamp should be pursued. I recommend also that the possibility of extending the use of other equipment, such as the electrically lighted red screen which is used in addition to an oil tail lamp on some electric multiple-unit trains on the Southern Region, should also be considered.

68. I have mentioned that the driver of the Mid-day Scot may have misread the speedometer on his locomotive, which has no figure against the 10 m.p.h. mark. I think that this makes possible the mis-reading of the speedometer at low speeds and I suggest that the figure "10" should be placed against the 10 m.p.h. mark on speedometers of this type.

69. A suggestion has been made that in order to prevent accidents of this kind locomotives should be equipped with powerful headlights to illuminate an obstruction ahead. Such headlights certainly might prevent some accidents and indeed they might have prevented this one. But in order to illuminate an obstruction at a sufficient distance to prevent an accident, such lights would need to have a powerful narrow beam which would, on a curve, always be thrown on the tangent. As there is so much curvature on British Railways it would therefore not necessarily illuminate an obstruction. Furthermore the intensity of traffic on British Railways is much greater than on other railways where such headlights are used, and even with dimming arrangements they could affect the sighting of signals by drivers on adjacent lines. I consider it more important that trains should be provided with better protection at the rear end to enable them to be clearly seen from an adequate distance.

70. A suggestion has also been made that locomotives should be equipped with a wireless telephone to enable the driver to keep in constant touch with signalboxes so that, in a case like this, he can obtain instructions when a signal remains at red and, when an accident occurs, can summon assistance without delay. This subject has been considered on many occasions and it has been discussed at length at meetings of the International Railway Congress Association. Apart from the technical difficulty involved, such as that of securing suitable short wave bands and of reception through tunnels, wireless telephony is not, in practically any country, considered a suitable means for regulating the movement of trains on running lines, on account of the large number of trains and signalboxes involved and of the consequent difficulty of ensuring that a message is received and understood by the right person. It is of course used extensively on British and Foreign Railways in marshalling yards, etc.

71. So far as calling for assistance is concerned, telephones are provided at all signals in modern installations and, as I have mentioned, the equipment is satisfactory. It was not the failure of the telephone equipment that was the cause of the delay in calling for assistance in this case, but the failure of the signaller who received the telephone message to act on it properly. The provision of a wireless telephone network between trains and signalboxes for this purpose would be extremely expensive, and I do not consider that it would be justified.

72. Again, a suggestion has been made that station masters should be provided with a telephone in their residences so that they can be called without delay in an emergency of this sort. If the station master at Winsford Station had had a telephone, he would probably have been one of the first persons to be advised of the accident by the signaller, and much time might then have been saved. Station masters of important stations are of course already provided with telephones. I think that, so far as station masters on important trunk lines are concerned, this is a good suggestion, and I recommend it for adoption. In view of the proposed closure of many stations the number of telephones required would probably not be large and, where there is a railway telephone exchange, as at Crewe, the telephone could be on that system.

73. The London Midland Region Instruction that modifies Rule 55 (h) (i) (see paragraph 16), lays down that if the telephones at signals on the line on which a train is standing or on an adjacent line on which trains travel in the same direction are out of order, the train crew should use the telephone at a signal on an opposing line. I have already said that if the driver of the Mid-day Scot had complied with the instruction on this occasion, the accident would probably not have occurred. I think however that in other circumstances the instruction could create a new risk because the signaller receiving the message might not know the situation on the line on which the train was standing. He would therefore have to telephone to the signaller at the other end of the section, obtain his instructions and relay them to the driver. Such a procedure is liable to result in misunderstandings, and I am glad to know that the instruction is to be withdrawn.

74. I have mentioned that there was an electrification telephone on an overhead structure near the scene of the accident, but that no member of the train crews made use of it. These telephones are clearly marked and they are intended primarily for use by the electric traction staff. I would suggest that the running staff should be reminded of the existence of these telephones, and that they should be instructed to use them also in an emergency.

75. I have also mentioned that the Buckeye coupling between the 7th and 8th coaches of the Birmingham train fractured, with the result that the 8th coach telescoped into the coach ahead. The pins of two Buckeye couplings on coaches on the Mid-day Scot also fractured. This type of coupling is designed to prevent telescoping, and it has generally been most successful in achieving this objective. The fact that the steel in the pivot pin at the front end of the 8th coach was not up to specification had no bearing on the fact that telescoping took place, because the pivot pin at the rear end of the 7th coach, the steel of which was of the correct grade, also fractured and allowed the whole coupling to be driven through the headstock and into that coach. I have no doubt that the failure of the couplings was entirely due to the severity of the impact blow. Steps have been taken to withdraw from service all the pivot pins which are of the incorrect grade of steel.

76. Finally, I would draw attention to the difficulty that arose in this case in locating the site of the accident. The distance between the signalboxes concerned is four miles and although the signalman knew the number of the signal from which the message about the accident was telephoned, he had no means of knowing the location of that signal. With the modern concept of signalling, boxes will frequently be spaced at distances of 20 miles or more. I think therefore that, when boxes are spaced far apart, some steps should be taken to enable a signalman to know the location of the signals on the lines approaching his box, which will be indicated on the illuminated diagram in his box, or alternatively that arrangements should be made for the positions and numbers of all the signals to be recorded on the large scale maps that are maintained in the control centres of the Emergency Services.

I have the honour to be,

Sir,

Your obedient Servant,

D. McMULLEN,

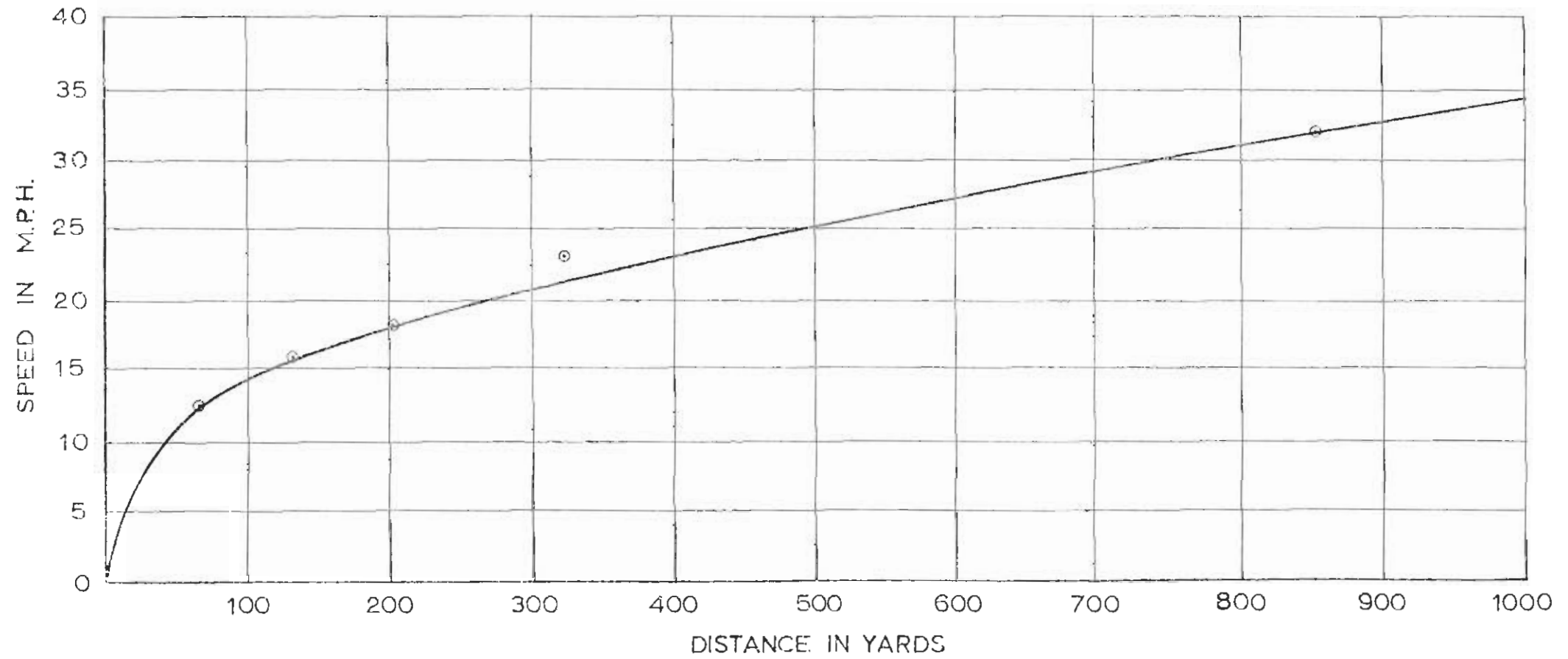
Colonel.

The Secretary.

Ministry of Transport.

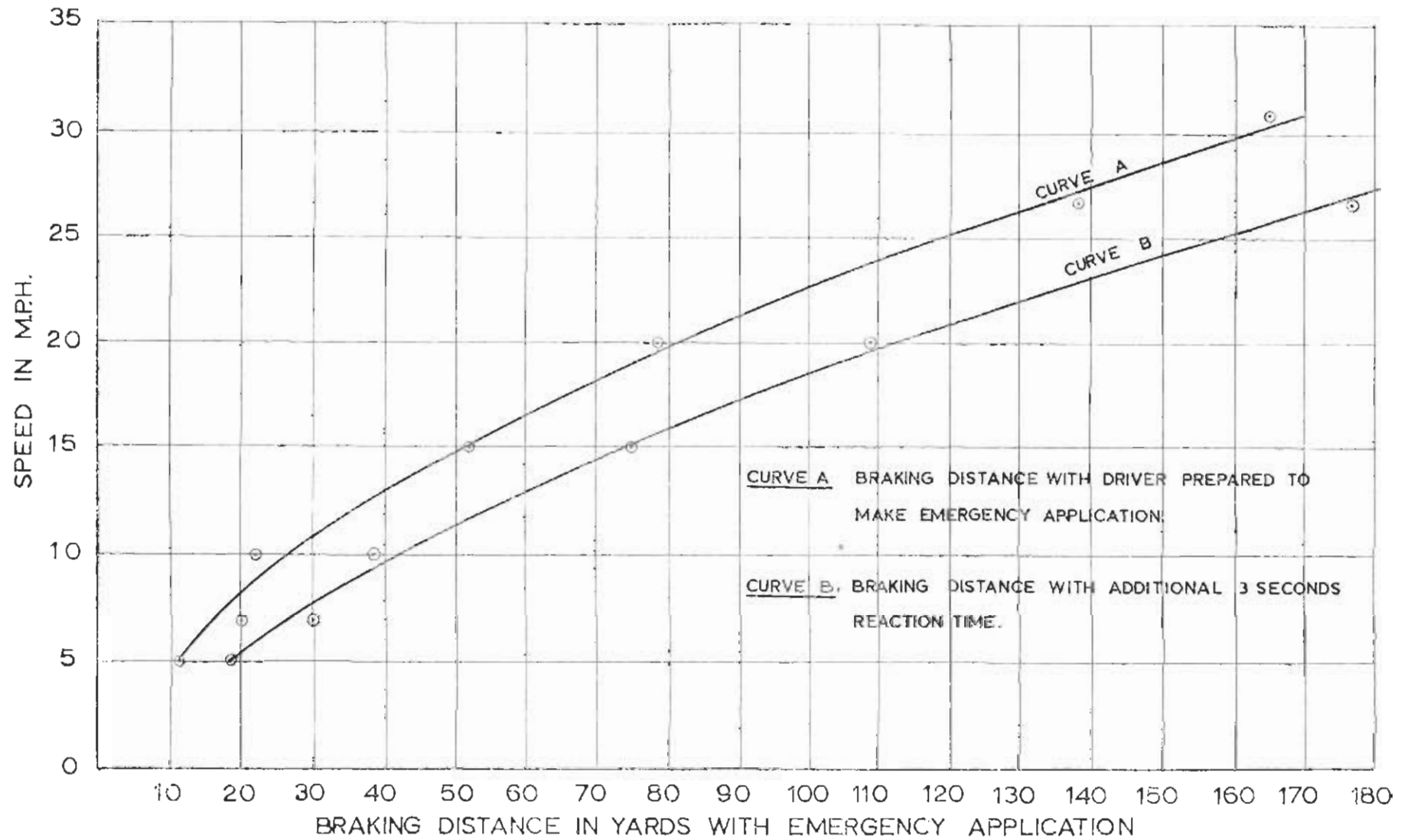
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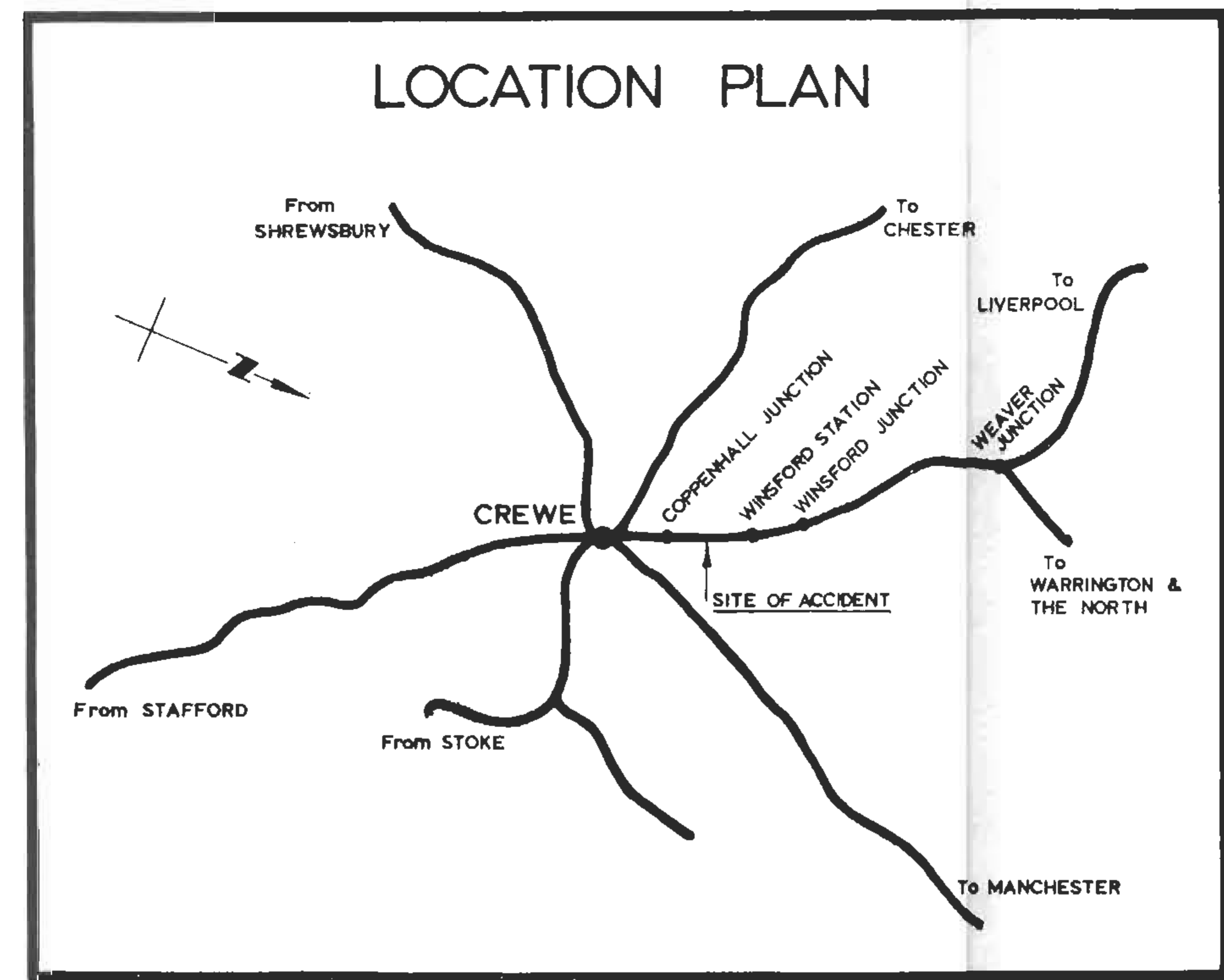
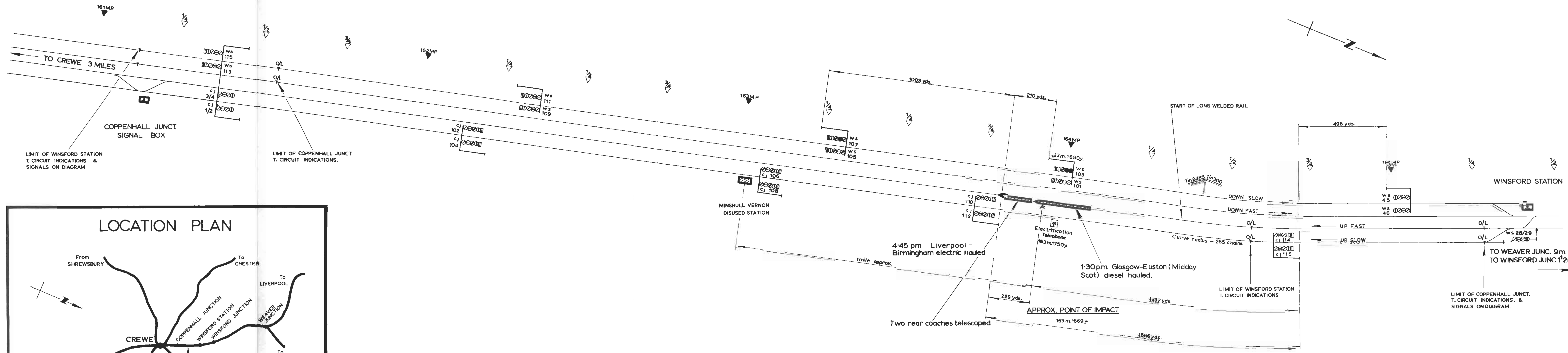
APPENDIX A



BRAKING TESTS

APPENDIX B





- NOTES:
1. LONGITUDINAL SCALE: 10 CHAINS TO 1 INCH.
 2. [Symbol] INDICATES SIGNAL WORKS AUTOMATICALLY.
 3. SIGNAL ASPECTS SHOWN ARE NORMAL ASPECTS.

COLLISION NEAR WINSFORD 26th December 1962

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