MINISTRY OF TRANSPORT

RAILWAY ACCIDENTS

REPORT ON THE COLLISION

which occurred on the

6th November, 1947, at

MOTSPUR PARK JUNCTION

on the

Southern Railway

LONDON: HIS MAJESTY'S STATIONERY OFFICE

1948

ONE SHILLING NET

SOUTHERN RAILWAY

(NOW SOUTHERN REGION, BRITISH RAILWAYS)

MINISTRY OF TRANSPORT,
Berkeley Square House,
London, W.1.

26th February, 1948.

Sir,

I have the honour to report for the information of the Minister of Transport, in accordance with the Order dated 7th November 1947, the result of my Inquiry into the collision which occurred in darkness and dense fog at about 5.50 p.m. on 6th November 1947 at Motspur Park Junction, where the Chessington branch connects with the double line of the Southern Railway from Raynes Park to Epsom, Leatherhead, and Dorking.

The 4.45 p.m. Up electric passenger train from Holmwood to Waterloo passed at Danger the Motspur Park Up Main (Leatherhead line) outer home signal, having received a clear hand signal from the fogsignalman stationed there. After travelling nearly 300 yards it collided sidelong with the 5.16 p.m. Down electric passenger train from Waterloo to Chessington, which was crossing its path under clear signals at the right handed double line junction.

Both the trains were well loaded and I regret to report that four passengers lost their lives, including one of the Company's servants, Motorman A. Martin, who was travelling on duty; all were in the leading motor coach of the Waterloo train. Motorman A. T. Drawbridge, who was driving this train, was fortunate to escape with his life as his cab was wrecked and he was detained in hospital with severe bruises and shock. Eight passengers were also detained in hospital, of whom four were discharged within a week, and 92 others complained of minor injuries or shock.

All lines at the junction were blocked by the collision and prompt action was taken to protect them by detonators; block communication between Motspur Park and Tolworth, the next signal box on the branch, was severed, and an Up train which had left Tolworth was stopped intermediately at Malden Manor station, to which the Motspur Park signalman had telephoned. The conductor rails were short circuited by the wreckage and the current was cut off instantly by the substation circuit breakers.

The two trains were similarly formed, each of two four-coach suburban sets. The tare weight of the Waterloo train was 209 tons and of the Chessington train 193 tons, and the length of each was the same, namely 172 yards. The leading motor coach of the Waterloo train struck the second coach of the Chessington train a few feet from its trailing end, but the full force of the impact was taken by the next coach in rear. This coach and the leading coach of the Waterloo train were overturned on their right hand sides away from each other, and the following coach of each train was partially overturned to the right.

Severe structural damage was confined to these four coaches and none of the remaining twelve was derailed: the two leading coaches of the Chessington train broke away from the remainder and ran forward for about 87 yards along the Down branch line, coming to rest as the brakes were applied by the parting of the hose coupling. At the moment of the collision, the two trains were travelling in nearly opposite directions at the diamond crossing and the nature and extent of the damage, including the severe distortion of several bogie frames, suggested that their combined speed was not less than 30 m.p.h.

Rescue work was taken in hand by uninjured passengers, local residents, and railway staff. Local doctors were quickly on the scene but owing to the fog, ambulances were unable to reach the site until 6.45 p.m. although they had been called promptly. There was no road directly alongside the line and stretchers had to be carried some distance to the ambulances, but all except one of the injured were on their way to hospital by 7.20 p.m.

Special attention should be drawn to the fortitude of the late Motorman Martin; regardless of himself, he spoke reassuringly to two slightly injured passengers in the wrecked and overturned compartment, and then helped them to climb out through the door above them which they could not otherwise have done. He made no mention of his own injuries to which he succumbed a little later.

Clearance of the wreckage presented no particular difficulty, though the work was slowed by the fog. There was not a great deal of damage to permanent way and signalling equipment, and normal working was resumed at 1.7 p.m. on 7th November, after an interval of 19 hours.

There had been fog all day, and the fog posts had been manned since 7.30 a.m. At Motspur Park, visibility at midday had extended to about 200 yards but it had been deteriorating all the afternoon, and at the time of the collision was restricted in the darkness to a few yards. It was not particularly cold.

DESCRIPTION OF SITE AND SIGNALLING

1. With reference to the attached sketch diagram, the electrified double line to Epsom, Leatherhead and Dorking, and thence to Horsham via Holmwood, branches off in a southerly direction from the Western Section four-track main line at Raynes Park, 8¾ miles from Waterloo. Motspur Park and Worcester Park stations are one and two miles respectively south of Raynes Park, and the short Chessington double line branch diverges to the West at a right handed junction, approximately midway between them. The line is straight for the whole of the distance between Motspur Park and Worcester Park and the gradient falls at 1 in 180 in the Up direction. There is little or no cut or fill between Motspur Park and the junction, whence there is shallow cutting to Worcester Park.

2. The train service between Raynes Park, Epsom and Chessington is of suburban character, and all passenger trains are electric. With the normal peak service there is a maximum of 10 trains per hour in each direction at Motspur Park, and 7 at Worcester Park, south of the junction; the majority are booked to stop at both stations. When a fog service is in operation, as on the evening of the accident, there are 6 trains per hour in each direction at Motspur Park and 3 at Worcester Park.

3. The junction is controlled, with electrical operation of the points, by Motspur Park signal box, in which the necessary track circuiting is indicated by a normally dark illuminated diagram. The signals on the Leatherhead and Chessington lines south of Raynes Park are oil-lit semaphores, and manual block working is in force from Motspur Park to Raynes Crossing in the London direction, to Worcester Park in the Leatherhead direction, and to Tolworth on the branch.

4. The diagram shows the layout in the neighbourhood of Motspur Park Junction, also the signal aspects which were displayed to the two trains concerned. There are outer homes, Nos. 13 and 8 respectively, for the converging Up Main and Branch lines, but there are no inner homes in rear of the junction. By the special instructions at Motspur Park box, the signalman there is authorised to accept Up trains *which are booked to stop at Worcester Park* at full Line Clear when the junction is occupied, notwithstanding the modified clearance of 285 yards from No. 13 outer home signal to the fouling point. Such acceptance is permitted in fog when there are fogsignalmen at No. 13 and at the Up Main distants No. 17. As noted on the diagram this was the case at the time of the accident; the fog posts at the Up Branch distant and outer home signals were also manned, as well as those at the Up inner home and the Worcester Park Down distant. There are electrical repeaters on the ground at Signal No. 12, whose arms at one time were carried high on the post though they have since been lowered. None of the other signals concerned are so repeated.

5. Signal No. 13, which was passed at Danger by the Waterloo train, has an upper quadrant arm of standard design, 25 ft. above rail level on a lattice post, and is repeated in the box. In accordance with the Company's practice, the balance weight bar is on the upper half of the post, and an iron ladder of the usual type leads to the top of the post on its north side. The fogman's hut is 30 yards in rear of the signal, and there is a gap in the cess side conductor rail opposite to the hut to enable detonators to be placed.

Evidence

6. At the time of the collision, the Down Chessington train was running 12 minutes late and the Up Waterloo train 23 minutes late. Signalman G. S. Davis who was on duty at Motspur Park box, stated that his clock, which kept very good time, had been checked by the time signal that morning. He accepted the Chessington train from Raynes Crossing at 5.39 p.m. and immediately afterwards accepted the Waterloo train from Worcester Park, also recording the time as 5.39 p.m., but he did not offer it forward to Raynes Crossing until 5.46 p.m. (see later).

He received Train Entering Section from Raynes Crossing for the Chessington train at 5.41 p.m., and in view of the short section from that box, judged that there would be time for the train to clear the junction on to the Down Branch line before the Waterloo train arrived at the Up Main outer home signal. He therefore obtained acceptance from Tolworth for the Chessington train, recording the time as 5.41 p.m., which was consistent with the time recorded in the Tolworth train register after making allowance for the fast clock at that box. Davis was sure that on receiving the acceptance from Tolworth, he set the junction at once for the Down Branch and lowered signals Nos. 2, 4 and 7; the Down distant No. 1 was held at Caution by the interlocking with the junction set for the branch. The lever of signal No. 13 was also locked normal, and its arm was proved in the "On" position, through the block controls, by the acceptance of the Waterloo train. The interlocking and controls were tested within two hours of the collision and were found in order.

Owing to cautious running in the fog from Raynes Crossing, the Chessington train did not leave Motspur Park station until 5.47 p.m. and in the meantime Davis had received Train Entering Section at 5.46 p.m. from Worcester Park for the Waterloo train which had stopped there as booked. He then got it accepted (5.46 p.m.) by Raynes Crossing, intending it to go forward directly the Chessington train had cleared the junction, in advance of the Up Branch train, already mentioned, which he had accepted from Tolworth.

The Waterloo train restarted from Worcester Park at about 5.47 p.m. with the Up starter at Clear and the Motspur Park inner distant at Caution, passed No. 13 signal at Danger under a clear hand signal, and collided with the Chessington train at the junction at about 5.50 p.m., as already described. Signalman Davis first knew that anything was wrong when the junction track circuit indication lights flickered and then remained alight; two or three minutes later, he was advised of the collision by a telephone call from Subganger Burtenshaw, who was acting as relief fogsignalman at Nos. 3 and 4 signals.

7. The Down Chessington train was driven by Motorman F. C. Austin. He stated that on starting from Motspur Park he accelerated in series for a short distance, and then coasted slowly to the directing signals. He had "practically stopped" when he received a green hand signal from the fogsignalman there (Burtenshaw), and he also saw the green light of No. 4 signal, so he moved the controller to the series position to carry him over the junction. He thought that all six contactors had operated to full series when he shut off, just before the collision, to coast forward to the advanced starting signal (No.7). Having regard to the distance and the accelerating characteristics of the equipment, the speed of the Chessington train at the moment of the collision was probably about 15 m.p.h.

8. Motorman A. T. Drawbridge, who was driving the Waterloo train, has 22 years experience as steam driver and motorman; he has been stationed at Leatherhead depot for a considerable time and has a thorough knowledge of the route. Owing to his injuries, he was not fit to be interviewed until 31st December, seven weeks after the accident, but he appeared to have a clear recollection of the journey.

According to his account, the weather was clear until he emerged from Mickleham Tunnel, midway between Dorking and Leatherhead. He was stopped at the Leatherhead outer home, and thenceforward the fog became very thick, but he managed to see all the signals at close range by cautious running between station stops. He had clear signals from Leatherhead onwards until he reached the Worcester Park home signal; a detonator was exploded there with the home signal at Clear and the Motspur outer distant on the same post at Caution, and he ran into the station and stopped at the platform, drawing right up to the starting signal at the foot of the ramp. As he stood there, he saw the starter at Clear and the Motspur Park inner distant arm below it at Caution, and stated that the fogman so informed him and showed him a yellow light; he told the fogman that he was particularly concerned to locate the next signal No. 13 as he knew there was a junction ahead of it, and was assured in reply that the signal was "fogged"

He therefore started very cautiously on the shunting notch to feel his way to the signal, and as he had been told that it was fogged, he looked out for a hand signal from the ground rather than for the signal light "up in the air." He had not attained more than about 10 m.p.h., switching on and off as far as the shunting notch, when he saw the fogsignalman displaying a green hand signal from the cess, close to the hut and the lighted brazier, but he did not see the light of the fixed signal. No detonator was exploded and he continued forward cautiously towards signal No. 12; the collision took him by surprise, and he never saw the lights of the Chessington train in his path.

9. Sub-ganger O. J. Williams was the fogsignalman at No. 13 signal. He is 35 years of age, with 11 years service on the permanent way staff, interrupted by 4½ years military service with Railway Construction Units during the war; he has acted regularly as fogsignalman since November 1946, but this was the first occasion in 1947 on which he had been on fog duty all day. Williams did not deny that he had shown a green light to the Waterloo train, having, as he thought, *heard* the signal arm move to Clear. He admitted that he did not otherwise verify that the signal was in the clear position, and did not hesitate to accept responsibility for the collision, but his account of his actions was difficult to follow, and was not borne out by other witnesses.

Williams booked on duty at 7.30 a.m. and went straight to his fog post. He was relieved for a meal from 11.30 a.m. to 12 noon by Sub-ganger Burtenshaw, who was acting as relief fogsignalman for several posts in the neighbourhood, and Burtenshaw relieved him again for tea at approximately 4.30 p.m. Williams stated that he took over again from Burtenshaw at about 5.0 p.m., just after an engine and brake van had passed on the Up Leatherhead line, and he maintained a detonator on the line, with his lamp at red; the next Up train was the 4.38 p.m. from Effingham and he "distinctly heard" the signal being cleared for it, so he removed the detonator and showed a green light, afterwards "hearing the arm drop" as the signal was restored to Danger, on which he replaced the detonator on the line and turned his lamp to red.

The next Up train was the Waterloo train concerned in the accident, and Williams stated that some time after the train from Effingham had passed he was "distinctly under the impression" that he heard the signal move again to Clear, so he walked up to the signal post but the fog was so dense that he could not see what indication was displayed. In spite of that he went back and removed the detonator from the rails and showed a green light as the Waterloo train approached and passed.

10. Motorman Hedges, however, of the 4.38 p.m. train from Effingham was quite sure that he was stopped by a detonator and red light at No. 13 signal, and he had remarked to the fogman there that it was a very bad night. Burtenshaw well recollected stopping this train, also the brief conversation with Hedges, whom he knew, and it thus became clear that Burtenshaw was still at this fog post when Hedges' train passed at about 5.18 p.m. Burtenshaw also said that it was not quite dark at that time and he was just able to see the signal arm. It appeared, therefore, that Williams' statement that he signalled this train was incorrect, and he must have arrived back at his post after 5.18 p.m., considerably later than he stated. Also the Waterloo train was the first to pass his post after he returned to it, and so was the first train which he had signalled after it became dark.

11. The Company's printed fogsignalling Instructions, dated 1st November 1945, are issued to all fogsignalmen. They are definite that reliance must not be placed on the sound of the signal arm moving, and the following is the relevant extract:

> "Fogsignalmen must be careful not to remove the detonator from the rail until they have made quite sure that the signal is in the clear position and not allow themselves to be guided by the sound of an arm moving, or the movement of a balance weight."

Rule 92(c) also reads:

> "When the fixed signal for which he is fogsignalling cannot be seen by the Fogsignalman, he must, unless he can satisfy himself to the contrary, assume that it is at Danger, or Caution in the case of a distant signal."

Sub-ganger Williams was examined and passed in the fogsignalling Instructions and Rules in September 1946 and in May 1947 by Area Inspector H. S. Tanner and Permanent Way Inspector H. B. Pamplin.

Although it is not laid down in writing that a fogsigaalman may have to climb the ladder to satisfy himself as to the position of the arm in very dense fog, Mr. Tanner stated that it always was the practice to lay stress on this point during the course of the examination, by the method of question and answer, and he had done so when Williams was examined. He added that this would be the only way in which a fogsignalman, in the absence of a repeater, could make quite sure, in accordance with the Instructions, that the signal was in the Clear position if he could not see its arm or light from the ground.

With regard to his examination in May 1947, Williams confirmed that, so far as he could recollect, Mr. Tanner had explained to him that if he could not see the arm from the ground that he should "get up the post and see." He stated, however, that it did not occur to him to do so on this occasion, and that he was

relying on the sound. He referred to the awkwardness of climbing a signal ladder in the dark, but Ganger W. R. Slaughter, who was the fogsignalman at the Motspur Park Up Main outer distant and is 63 years of age, seemed to think little of it and recognised it to be his duty if he could not otherwise see the position of the signal.

Conclusion

12. The exceptional density of the fog, which was widespread in the London area that evening, was a material factor, but with the fogsignalmen at their posts at the Up Distant and Outer Home signals, Signalman G. S. Davis was in order in allowing the Waterloo train to approach the latter at Danger with the junction occupied. Nor have I any reason to disbelieve his account of his sequence of operations at Motspur Park box during the few minutes before the collision ; they were such as might have been expected in the circumstances, and I am satisfied that there was no last minute change of mind on his part as to the priority of the two trains at the junction, which might have led to the lowering and replacement of signal No. 13 before the Waterloo train arrived.

Thus Davis is free from responsibility, as also are the two motormen concerned ; F. C. Austin of the Chessington train was running under clear signals, and A. T. Drawbridge of the Waterloo train had the misfortune to be misled by the absence of a detonator and by a clear hand signal, which he was entitled to accept. No criticism arises in respect of the modified clearance for acceptance purposes of 285 yards between No. 13 signal and the junction as it is applicable only to trains booked to stop at Worcester Park, 465 yards in rear of the signal.

13. I conclude therefore that signal No. 13 was not lowered at any time for the Waterloo train, and that the collision was brought about by a mistake on the part of Sub-ganger O. J. Williams, which resulted from his disregard of the fogsignalling Instructions and the Rules, as indeed he admitted. It is immaterial what sound he mistook for the movement of the signal arm, as reliance on sound, which is notoriously misleading in fog, is prohibited by the Instructions ; it was his duty to *make quite sure* that the signal was Clear before removing the detonator and displaying a green light, and the only way in which he could do so under the prevailing conditions was to go up the ladder and see, as he had been instructed verbally during the course of his examination, and appeared to have understood.

It is to his credit that he made no attempt to deny or excuse his failure, but it was none the less of a serious nature, arising, it seems, from an undeveloped sense of responsibility which is unusual in a railwayman of his age and experience. Indeed it is difficult to suggest any reason other than laziness for his casual attention to his simple though important duties, as he was not working under any pressure of traffic, and this was the first train he had signalled after dark on his return to his post ; though it was more than 10 hours since he had booked on duty at 7.30 a.m., I do not consider that the time was excessive in view of the adequate arrangements for periodical relief. Williams' record shows him to have been a keen and hard worker with his gang, but he was stated to be forgetful.

Remarks

14. This collision was due to failure of the human element in circumstances which admitted of no excuse, as Williams' task as fogsignalman required nothing more than conscientious observance of clear and simple instructions. The question, however, arises, whether an electrical or mechanical repeater should be provided at signal No. 13 for the guidance of the fogsignalmen, as was recommended by the Jury at the Coroner's Inquest. I have also received several letters from members of the public on this point, and so, I understand, have the Company.

In general, it is their practice to install fog post repeaters where signal arms are more than 25 ft. above rail level, and repeaters are also provided on the merits of individual cases—for instance where there is a more or less complicated group of signals on one post or gantry, or where the fogman would have to cross a line of rails to get a close view of the signal, or again where a repeater has been specially asked for by the men concerned. Traffic density is also considered.

There were no such special features to support the provision of a repeater in this particular case, and the fog, which obsured the view of the arm or light from the ground after dark, was of exceptional density such as may occur only a few times a year. The fact remains, however, that in all probability the accident would not have occurred if the arm of No. 13 signal had been repeated on the ground, and in view of its importance as the signal immediately protecting the junction, I think that the matter should receive consideration, also more generally, whether the limit of 25 ft. for the provision of repeaters might with advantage be lowered.

15. Automatic Train Control at the Stop signal would have prevented the collision, also, probably, a co-acting detonator placer, as Motorman Drawbridge knew exactly where he was and was approaching the signal with due caution. This line is not one which would rank high in priority for the installation of colour-light signalling.

I have the honour to be, Sir,

Your obedient Servant,

G. R. S. WILSON
Lieut.-Colonel.

The Secretary,
Ministry of Transport.

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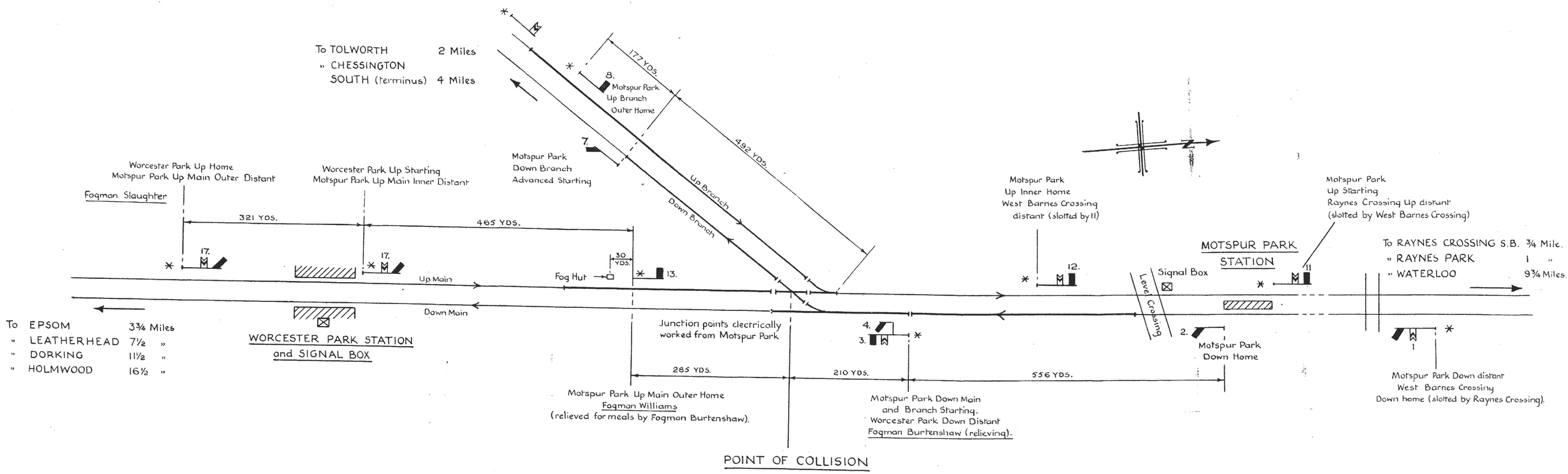

GENERAL DIAGRAM

NOT TO SCALE

* Fogposts manned.

SOUTHERN RAILWAY
COLLISION AT MOTSPUR PARK.
6th NOVEMBER 1947.