

# LONDON, MIDLAND AND SCOTTISH RAILWAY.

Ministry of Transport,

4, Whitehall Gardens,

London, S.W.1.

20th January, 1932.

SIR,

I have the honour to report, for the information of the Minister of Transport, in accordance with the Order of the 15th October, 1931, the result of my Inquiry into the accident which occurred at about 4.11 p.m. on the 12th October, at Preston, on the London, Midland and Scottish Railway.

As the 3.15 p.m. up passenger train from Blackpool (Central) to Leeds, running at about 12 miles an hour, was traversing a crossover junction from the up slow to the up East Lancashire line, at the north end of Preston station, near No. 4 signal box, the second and third coaches left the rails. Fourteen passengers were injured, or complained of shock, the majority of whom were travelling in the third coach, which partly overturned. In addition, complaints of shock were subsequently received from a further 8 passengers. One passenger was detained in the Preston Infirmary, the remainder being able to continue their journey.

There was no delay in rendering assistance to the passengers, as about 20 of the Company's servants trained in ambulance work, of whom there are approximately 90 at Preston, were on duty at the time of the accident, and a doctor arrived before the injured passengers reached the station. The passengers were able to leave the damaged coaches without difficulty, and the emergency tools carried on the train were not used.

The train consisted of eight 8-wheeled bogie coaches, electrically lit throughout, drawn by engine No. 13022, 2-6-0 type, with 6-wheeled tender, weighing in working order about 108 tons 4 cwt. The overall length of the train, with engine and tender, was about 536 ft. and its total weight approximately 321 tons. The engine and tender were fitted with a steam brake, acting on the coupled wheels and on those of the tender, working in conjunction with the automatic vacuum brake on the train, all wheels of which were braked. The effective braking power was approximately 85 per cent. of the weight of the train.

The weather at the time was fine and clear.

### *Description.*

The layout of the lines concerned, with the position of the train after derailment, and relevant distances from No. 4 signal box, is shown on the accompanying plan. There are ten platform lines through the station, numbered from west to east; numbers 8, 9 and 10, on the east side, are known as the East Lancashire lines. Connections between the six running lines north of the station and the platform lines are worked from No. 4 signal box, situated about 100 yards north of the platforms; other crossover junctions, north of the signal gantry shown on the plan, are worked from No. 5 signal box, 390 yards north of No. 4. The crossover junction concerned in this derailment has facing points (No. 107) in the up slow line, worked from No. 4 box, and joins a connection from the up fast line to the up East Lancashire line, leading to Nos. 9 and 10 platforms, by trailing points (No. 103).

*Permanent Way.*—The permanent way through the junction is laid with 95 lb. rails, old British Standard, on stone ballast, and is in very good condition. The facing connection at No. 107 points was originally laid in 1912, and the rails were renewed in 1924. The angle of the V-crossing is 1 in 9. The check rail clearance was correct.

*Signalling.*—Signals for all six running lines are carried on a large gantry spanning them immediately above No. 107 facing points. There are four posts applicable to, and over, the up slow line; each of these carries home and fixed distant arms, with a calling-on arm below. The home arms are worked from No. 4

signal box and slotted from No. 5, for which they serve as starting signals. The slot mechanism is of the usual type, in which two balance levers on a common pivot are worked from the respective signal boxes, and support a third counter-balance lever, working on the same pivot and connected to the down rod of the signal, in such a manner that it cannot move to lower the arm until both the first two levers have been raised, while the lowering of either of them raises the counter-balance lever and restores the arm to normal. The positions of the two balance levers of the slot mechanism are not electrically repeated in the signal boxes from which they are worked.

As seen on approaching them in the up direction, these four home signals, from left to right, read as follows, the numbers given being those of the levers in No. 4 signal box :—

- No. 139. Up slow to East Lancashire Line (Nos. 9 and 10 platforms).
- No. 141. Up slow to up fast (Nos. 6 and 7 platforms).
- No. 118. Up slow to up slow (Nos. 2 and 3 platforms).
- No. 129. Up slow to up through.

Lever No. 111 in No. 5 signal box works the slots on Nos. 139, 141 and 118 signals, and lever No. 106 in No. 5 signal box works the slot on No. 129 and on the calling-on arm below it. Movements controlled by Nos. 139, 141 and 118 signals run over No. 107 facing points, while No. 129 signal refers to movements over a crossover junction served by facing points a little further to the north, worked from No. 5 box.

No. 107 facing points lie for the right hand road when the lever working them is normal. As there is no room for a locking bar between the points and the signals already mentioned, a 40-foot bar has been provided on each switch rail. There are two facing point bolt locks in the stretcher of the points, one working with each of the locking bars, but not operated by means of it. No. 108 lever in No. 4 signal box, when drawn, bolts the facing points for the right hand road and operates the left hand locking bar, releasing signals Nos. 118 and 141, and the calling-on arms beneath them, while No. 109 lever bolts the points for the left hand road, operates the right hand locking bar, and releases signal No. 139, and the corresponding calling-on arm.

I tested the locking of these signals, bars, and points in No. 4 signal box, and found it correct; it had not been altered since the accident. The wires to the signals named do not pass through detectors at the points, the two facing point bolts acting to some extent as rod worked detectors of the position of the switch rails.

#### *Report.*

The train concerned is not booked to stop at Preston and was running to time; it approached No. 4 signal box on the up slow line. It was preceded on that line, about 7 minutes earlier, by the 3.10 p.m. train from Blackpool, which had gone ahead into No. 2 platform, to which it was admitted by No. 117 calling-on arm below No. 118 home signal, leading over facing points No. 107 in their normal position.

Drivers of trains from Blackpool to Yorkshire are instructed in the weekly notices to be prepared to work through Preston station either via the East Lancashire line (Nos. 9 and 10 platforms) or via Nos. 6 and 7 platforms; thus they may take either the left or the right hand road at No. 107 facing points. In normal circumstances the 3.15 p.m. train travels by the former path, and it was the intention that it should do so on the day of the accident.

When the train came to a stand it was found that the engine and leading coach were on the rails, the second coach (No. 11571) was derailed and standing upright, the third coach (No. 12508) was derailed and leaning to the left at an angle of about 45 degrees, both bogies having been wrenched from below it and the body displaced. The remaining five coaches were not derailed.

The engine, the first, and the last five coaches of the train were standing on the connection from the up slow line to the East Lancashire line, that is to say, on the route which the train was intended to follow. The second vehicle, or at

any rate its leading bogie, had also apparently followed this route before derailment took place, while the marks on the track indicated that the leading bogie of the third vehicle (and possibly the trailing one of the second also) had taken the right hand road at facing points No. 107. The second and third coaches came to rest at an angle of some 30 degrees with their intended path, as shown approximately on the plan.

Some damage was done to the trailing end of the first coach and to the leading end of the fourth, in addition to that sustained by the second and third vehicles. This is set forth in detail in the Appendix to this report.

The first marks of derailment were on the check rails of both the diverging lines at the V-crossing ahead of No. 107 facing points. Both of these were marked heavily on their working edges, and bore wheel marks on their top faces. Ahead of this the sleepers of both lines were marked, and some 65 chairs were broken. The facing points themselves were undamaged, and required no repair or adjustment after the accident.

As will be seen from the evidence, No. 141 signal was "off" when the train passed it, although its lever in No. 4 signal box was normal. I examined the slot mechanism, which had not been altered since the accident, and found it in good order. The counterbalance lever was not unduly weighted, only producing in the down rod of the signal an upward thrust some 18 lbs. in excess of that required to move the arm. Also, the balance levers were adequately loaded, that worked from No. 4 box being capable of exercising a pull of about 113 lbs. on the signal wire in addition to raising the counterbalance lever, with the other balance lever connected with No. 5 box in the "off" position. Although there are many wires running along the gantry, which carries in all 28 working signals, of which 20 are slotted, there appeared to be no obstacle there to the free working of the wire concerned, nor could I detect any sign of obstruction or jamming in the run of this wire between the foot of the gantry and the tail of No. 141 lever in the signal box, such as might have prevented the balance lever responding when the signalman restored his lever to the normal position.

The wire can be adjusted by taking up links of a chain in the basement of the signal box; access to this is difficult. I was informed that adjustment, which is rarely needed, is carried out by the lineman, not by the signalman, and that none had been made since the accident, or for several weeks previous to it.

#### *Evidence.*

The engine of the 3.15 p.m. train was driven by W. Fearby. He said that he was checked by signals approaching No. 5 box, and immediately afterwards saw that signal No. 141 on the gantry, applicable to the line on which he was running, was "off". He was certain that the arm was not merely drooping, but at an angle of about 45 degrees with the post. He passed below the gantry slowly, at about 10 or 12 miles an hour, as he could not pick out the next signals, some 250 yards ahead, from his side of the footplate. He did not immediately realise that his engine was not following the route to which No. 141 signal leads, and learning from his fireman that the signals ahead were against him, was crossing the footplate to verify this when he heard shouts from the ground and applied the brake fully, bringing his train to a standstill in about an engine length, and only then finding that the derailment had taken place.

Fearby's statement as to his speed and the indication of the signals was confirmed by his fireman, T. Fricker, who first noticed that No. 141 signal was "off" when the engine was 40 or 50 yards from it, and by the guard of the train, A. Bottomley. The latter, after seeing that the signals at No. 5 box and No. 141 signal were clear, returned to his seat and was unaware that the derailment had occurred until the train came to a stand. Fricker went to No. 4 signal box immediately after the accident but did not notice whether No. 141 signal was still "off".

Further corroboration was given by driver J. Alsop, whose engine, with one coach attached, was standing on the down fast line—immediately adjacent to the up slow—about 40 or 50 yards north of the signal gantry when the 3.15 p.m. train passed. He said his engine had been in that position for about a minute.

and that he was waiting to shunt the coach into the East Lancashire side of the station. He particularly noticed that No. 141 signal was "off", and concluding from that that the 3.15 p.m. train was being sent into No. 6 or No. 7 platform, wondered why his shunting movement into No. 9 or No. 10 was not allowed to continue. His estimate of the speed of the 3.15 p.m. train agreed with that given by Fearby.

Chief signal lineman F. Beer, who was working near Fishergate overbridge at about 4 p.m., happened to notice that signal No. 141 was "off" at the same time as calling-on arm No. 117 on the adjacent post was lowered to admit a train to No. 2 platform. He realised that there was something amiss and went to get tools to remedy it. His attention was also called to the defect by signalman Walsh, as he was passing No. 4 signal box. When Beer reached the gantry he had to wait for a down goods train to pass before he could get to the ladder. He saw the 3.15 p.m. train from Blackpool approaching as he was climbing the ladder, but could not then see whether No. 141 signal was still "off"; he added that by the time he had reached the signal it was at danger and both balance levers were normal.

Beer and his assistant then examined all the connections between the signal and No. 111 lever in No. 5 signal box, and tested the working of the lever, finding everything in order. He then examined all the connections between No. 4 box and the signal, and found they worked freely; he could find no obstruction, such as material stacked near the wire, which might have prevented the balance lever from obeying the movement of the lever in the box. He was unable to test the working of No. 141 lever at the time, as damage caused to other connections by the derailment prevented the levers leading No. 141 from being operated. He tested the working of the slot later, and found it responded correctly to the position of the signal lever.

Beer also stated that he had had no previous trouble with the working of this signal, or of others on the same gantry, during the seven years he has been chief lineman at Preston, and said the only possible cause of the incorrect indication given was some temporary interference with the wire from No. 4 box.

There were three signalmen and a booking lad on duty in No. 4 signal box. Signalman J. Walsh, who has been employed in that box for 18 years, was in charge of the north end of the frame, which contains 183 working levers. He said that he admitted the 3.10 p.m. train from Blackpool, which arrived on the up slow line at 4.5 p.m., to No. 2 platform by lowering the calling-on arm (No. 117) below No. 118 signal. For this movement facing points No. 107 were normal, and locking bar No. 108 "over." After reversing this signal he noticed that No. 141 arm was "off," though its lever was normal; the last occasion on which it had been drawn was at 3.21 p.m. He spoke to signalman Whittle, at No. 5 box, asking him to advise the lineman that No. 141 signal was out of order, and then saw chief lineman Beer passing No. 4 box on his way to the gantry and told him what had happened. Walsh then accepted a goods train on the up fast line from No. 5 box, and routed it through No. 10 platform. This train passed his box at 4.10 p.m., and as it was doing so he was offered the 3.15 p.m. train from Blackpool on the up slow line by No. 5 box. He did not accept it immediately, as he intended to send it forward via the East Lancashire Line and No. 9 platform, and by regulation passenger trains may not be accepted unless the line is clear to Fishergate Bridge; the goods train was then passing over No. 103 trailing points. Though he had a clear over-run for the 3.15 p.m. train on the slow line, as No. 107 facing points were then normal, Walsh thought this might be obstructed by a down train under the control of one of the other men in the box; accordingly he did not accept the 3.15 p.m. train until the goods train was well clear of points No. 103. He then reversed these points and facing points No. 107. He said that he endeavoured to pull lever No. 109, to bolt the last-named points, but was unable to do so; on looking out of the box he saw that the train was passing the signal gantry, and that part of it was derailed.

Walsh stated that he saw No. 141 signal return to danger, after he telephoned to No. 5 box, but that he did not notice its position when he accepted the 3.15 p.m. train; he said that the arm was drooping immediately after the accident. He was

certain that he did not touch the facing point lever (No. 107) after his failure to pull No. 109, the lever working the locking bar and bolt. He was unable to recall any instance of the signals on the gantry sticking " off " in the past.

No. 5 signal box, which has 126 levers, was manned by two men and two boys at the time of the accident. The message from Walsh regarding the false indication of No. 141 signal was received at 4.7 p.m. by signalman J. Whittle, who has been employed in this box for nine years. While he was enquiring for the signal lineman, he learnt from another of the men in No. 4 box that Beer was on his way to attend to the matter. Whittle stated that when he received the first message the 3.10 p.m. train from Blackpool had just passed, and he had not restored No. 111 lever, working the slot on No. 141 signal, which he had pulled for that train. When he restored No. 111, he saw the signal arm return to danger.

The 3.15 p.m. from Blackpool was originally offered to No. 4 box by Whittle at 4.6 p.m., but was not accepted till offered a second time at 4.10 p.m. According to his register, the train passed his box at 4.11 p.m. When it was accepted, he pulled off No. 111 lever, but did not look to see if any of the three signals controlled by it (Nos. 118, 139, and 141) responded. He said that if he had seen that the arm of No. 141 signal was lowered immediately he pulled No. 111 lever he would have suspected that it was still faulty, as it would be unusual for the 3.15 p.m. train to run through platforms 6 or 7, and also because the signalman at No. 4 box would not, in normal circumstances, have obtained acceptance for the train from the next box ahead so speedily, and so would not have pulled off his portion of the slot mechanism.

The road at No. 107 facing points had been examined a few hours before the accident by ganger Preston, who stated that he found it in good order, and that it had never given any trouble in maintenance. Both Preston and permanent-way inspector Thompson examined the lead of No. 107 points after the accident; the latter stated that it was correct to gauge, that there was no sign of any obstruction in the points or at the crossing, and that the switch rails showed no sign of having been struck. Both men said that no one was working at the time near the gangers' store of materials on the down side of the line, close to which the signal wires run. Preston, however, had a gang of 6 or 7 men at work renewing the rails of a set of hand-worked points, in the carriage siding on the down side of the line, immediately below the signal gantry, close to the spot where the wire from No. 4 signal box to No. 141 signal crosses under the tracks. This wire is partly protected by planks fastened to the sleepers and Preston assured me that these planks had not been removed; he did not think that the work in progress could have obstructed the free movement of the wire.

#### *Conclusion.*

Movement of No. 107 facing points while the train was passing over them was undoubtedly the cause of this accident. It is evident that when Walsh first reversed them for the train, the engine must have been close to them, that they were then restored to normal between two pairs of wheels, and subsequently reversed again in the interval between two later pairs. Though he had no recollection of restoring and again pulling No. 107 lever, it is clear that Walsh must have done so; when he found he could not pull No. 109 lever to bolt the points it would be a natural action for him to work the point lever again to make sure that the points were properly home. As he was under the impression that the signals governing movement over the points were at danger, no blame can be attached to him for this, as the Company's regulations do not prohibit the movement of facing points in such circumstances after a train has been accepted.

While it is impossible to state with certainty which wheels of the train took the right-hand road, I think it probable that both pairs of the leading bogie of the third coach, which would take about a second to pass over the points at the speed at which the train was running, were so diverted, and possibly one or both pairs of the trailing bogie of the second coach in addition.

Notwithstanding the discrepancy in the evidence of Walsh and of Beer as to the indication of signal No. 141 immediately after the derailment, there is ample evidence that it was " off " when driver Fearby passed it; several of the

witnesses were positive that the arm was lowered sufficiently to constitute an unmistakable signal to proceed. Consequently Fearby cannot be criticised for obeying the "false clear" indication, nor, in my opinion, for failing to notice immediately that his train was not following the route to which the signal applies.

Unfortunately, it has not been possible to ascertain what caused this misleading indication, which was the most important factor contributing to this accident. As the signal arm responded correctly to the replacement of No. 111 lever in No. 5 signal box, it is evident that the portion of the slot mechanism worked from No. 4 box was temporarily at fault, that is to say, the positions of the balance lever at the signal and of the lever in the signal box did not correspond. A possible explanation for this is that at some point in its run the wire became temporarily entangled with another running alongside it, so that the balance lever was actuated by the pulling of some signal lever other than its own. But neither on the gantry itself, where the wire in question has a fairly direct run from the bottom of the post carrying No. 141 signal down an adjacent support to the ground, nor between the foot of this support and No. 4 signal box, could any trace of such entanglement be found.

Alternatively, the balance lever might have been prevented from responding when No. 141 lever in the signal box was restored to normal, some 50 minutes before the accident, by the wire jamming in one of the pulleys or wheels over which it runs, or on account of the free movement of the wire being impeded by some heavy object accidentally placed upon it by the permanent-way men working in the carriage siding. No trace of the wire having jammed could be found and the latter explanation therefore seems the only likely one.

Since accidental interference with the wire would only nullify the control of the signal from No. 4 signal box, the arm continuing to respond to the movements of the lever in No. 5 box, it is, perhaps, not surprising that the fact that the signal was faulty escaped notice for some time.

But it is, I think, regrettable that the two signalmen concerned, Walsh and Whittle, did not keep a closer watch on the movements of the signal after it had been noticed to be drooping; each seems to have assumed that this was due to the control from the other signal box being faulty. Greater alertness in this respect, until the signal and its connections had been examined and adjusted by Beer, would probably have prevented the accident. In my opinion, therefore, some measure of responsibility for the accident must be borne by Walsh and by Whittle, both of whom, I understand, have good records.

#### *Remarks.*

As mentioned earlier, the equipment of No. 107 facing points does not include detectors in the run of the signal wires, to prove the position of the points and of the plunger of the facing-point lock, in accordance with modern practice. It is true that the existing separate facing-point bolt locks, one for each direction, partly take the place of detectors, in that the locking in the signal box prevents the signal levers from being drawn unless the appropriate facing-point lock lever is reversed; this safeguard is, however, dependent on the rodding between the box and the points being intact. Also, the locking bars carried on the points are worked by a connection from the rodding actuating the facing-point locks, instead of themselves serving to transmit the motion of the rodding to the lock plungers; there is thus a possibility of the points being unbolted without the locking bar moving, if the connection by which the latter is worked is faulty.

Apart from this, however, if the signal wires from No. 4 box had been run through detectors at the points, this accident would, in all probability, have been prevented. For if some obstruction to the free movement of the wire had prevented the balance lever of the slot of No. 141 signal returning to normal when the lever in No. 4 signal box was restored, the signal slide of the detector would have remained in engagement with the point and bolt slides, and thus would have held the points in their normal position, also preventing them from being unbolted. Conversely, if the wire had been accidentally pulled or tightened after the points had been set for the left-hand road, or indeed

while they were lying for the right-hand road but unbolted, the point and bolt slides of the detector would have prevented the signal slide from moving and the balance lever of the slot would have remained normal. Thus in either case the "false clear" indication of the signal would not have been given.

In view of this, and having regard to the volume of traffic passing through Preston, the installation of modern equipment seems desirable, and I recommend that this point should not be overlooked when either the signalling or permanent way there becomes due for renewal.

I have the honour to be,

Sir,

Your obedient Servant,

E. WOODHOUSE,

*Lieut.-Colonel.*

The Secretary,  
Ministry of Transport.

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## APPENDIX.

## DAMAGE TO ROLLING STOCK, IN ORDER OF MARSHALLING FROM FRONT TO REAR.

*First Vehicle.*

No. 12170. Bogie Third Brake.

One buffer rod bent, rear right. Two buffer casting bolts broken, and buffer casting displaced.

*Second Vehicle.*

No. 11571. Lavatory Bogie Compo.

Both bogies derailed all wheels, wheels correct to gauge, tyres and flanges cut and bruised (profile of wheels good). Both bogie frames badly buckled. Six axle boxes broken (four on rear bogie and two on leading bogie). All brake work bent and twisted. Left side steel sole bar buckled over the rear bogie. Right side ditto. Automatic vacuum main pipes, and steam main pipes, branch pipes and pull rods bent and displaced. Rear coupling top "D" link strained. Rear drawbar bent slightly. Rear left buffer rod bent. Rear left buffer casting displaced. Two long step boards broken. Four quarter-lights broken left side. Two bogie check chains broken (through links). Two intermediate draw bars bent. One steel diagonal and one steel longitudinal bent. One top centre casting broken. Wheel journals cut and damaged, corner of body damaged (beading and panels).

*Third Vehicle.*

No. 12508. Lavatory Bogie Third Brake.

Derailed all wheels, body partly turned over towards its left side, both bogies displaced. Rear bogie, leading axle bent and out of gauge  $1\frac{1}{2}$  inches. Other wheels correct to gauge (tyre profile of all wheels good). Both bogies badly buckled and all brake work fittings on same displaced, bent and broken. Seven axle boxes broken. Journals and tyres cut and bruised. Both steel sole bars bent. One steel diagonal bent. All under frame ironwork bent, twisted or broken. Body, rear end completely smashed in (brake compartment). Leading end stove in slightly (metal plated). Two quarter lights and one door light broken. Left side badly grazed. Ambulance material intact, emergency tools displaced in cupboard, cupboard door burst open, and fastener displaced by impact. Snow Fire extinguisher discharged also by the impact.

*Fourth Vehicle.*

No. 18033. Vestibule Bogie Third.

Leading end damaged. Eight end boards broken. One bottom side panel broken. One waist panel broken. One top panel broken. One corner pillar broken. Roof at same end damaged. Three end step irons, one end lamp bracket, one end hand rail and one inter-communication disc rod bent. One flexible steam pipe torn off.

No. 849. Bogie Third Saloon.

No. 15644. Bogie Third Brake.

No. 10987. Lavatory Third Compo.

No. 15985. Lav. Bogie Third Brake.

} Not damaged.

# DERAILMENT AT PRESTON (L.M.S.R.) 12-10-1931

