RAIB
Rail Accident Investigation Branch

# Rail Accident Report

## Derailment at Denbigh Hall South Junction, near Bletchley, Buckinghamshire
## 26 June 2025

Report 04/2026
April 2026

This investigation was carried out in accordance with:

- the Railway Safety Directive 2004/49/EC
- the Railways and Transport Safety Act 2003
- the Railways (Accident Investigation and Reporting) Regulations 2005.

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# Preface

The purpose of a Rail Accident Investigation Branch (RAIB) investigation is to improve railway safety by preventing future railway accidents or by mitigating their consequences. It is not the purpose of such an investigation to establish blame or liability. Accordingly, it is inappropriate that RAIB reports should be used to assign fault or blame, or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

RAIB's findings are based on its own evaluation of the evidence that was available at the time of the investigation and are intended to explain what happened, and why, in a fair and unbiased manner.

Where RAIB has described a factor as being linked to cause and the term is unqualified, this means that RAIB has satisfied itself that the evidence supports both the presence of the factor and its direct relevance to the causation of the accident or incident that is being investigated. However, where RAIB is less confident about the existence of a factor, or its role in the causation of the accident or incident, RAIB will qualify its findings by use of words such as 'probable' or 'possible', as appropriate. Where there is more than one potential explanation RAIB may describe one factor as being 'more' or 'less' likely than the other.

In some cases factors are described as 'underlying'. Such factors are also relevant to the causation of the accident or incident but are associated with the underlying management arrangements or organisational issues (such as working culture). Where necessary, words such as 'probable' or 'possible' can also be used to qualify 'underlying factor'.

Use of the word 'probable' means that, although it is considered highly likely that the factor applied, some small element of uncertainty remains. Use of the word 'possible' means that, although there is some evidence that supports this factor, there remains a more significant degree of uncertainty.

An 'observation' is a safety issue discovered as part of the investigation that is not considered to be causal or underlying to the accident or incident being investigated, but does deserve scrutiny because of a perceived potential for safety learning.

The above terms are intended to assist readers' interpretation of the report, and to provide suitable explanations where uncertainty remains. The report should therefore be interpreted as the view of RAIB, expressed with the sole purpose of improving railway safety.

Any information about casualties is based on figures provided to RAIB from various sources. Considerations of personal privacy may mean that not all of the actual effects of the event are recorded in the report. RAIB recognises that sudden unexpected events can have both short- and long-term consequences for the physical and/or mental health of people who were involved, both directly and indirectly, in what happened.

RAIB's investigation (including its scope, methods, conclusions and recommendations) is independent of any inquest or fatal accident inquiry, and all other investigations, including those carried out by the safety authority, police or railway industry.

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# Derailment at Denbigh Hall South Junction, near Bletchley, Buckinghamshire, 26 June 2025

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# Summary

At about 12:27 on 26 June 2025, an out-of-service passenger train travelling at 15 mph (24 km/h) derailed as it passed over Denbigh Hall South Junction, on the West Coast Main Line, between Bletchley and Milton Keynes Central stations. At the time of the derailment, soon after the start of its journey from Bletchley station to a depot at Northampton, the train was making a wrong-direction movement over the junction. There were no injuries to any of the four members of train crew on the train but damage was caused to the train and to railway infrastructure.

The train derailed on switch diamond points which were in an unsafe position for the direction that the train was travelling over them. It had been necessary for the train to make a wrong-direction movement due to a fault which had prevented the driver from moving the train from the cab at one end. Once the need for the wrong-direction movement was identified and agreed, signalling staff at Rugby Signalling Control Centre proposed and then implemented a path for the train which they did not realise was invalid. Subsequent checking activities by these signalling staff did not identify this. When the train then arrived at the junction, no one in the train's leading cab noticed that the switch diamond points were in an unsafe position for the train to pass over them.

A probable underlying factor to the accident was the staff involved had variable knowledge and understanding of what switch diamond points were and how trains operated over them. A possible underlying factor was that the training for signallers, when applying the Rule Book modules for authorising a train to pass a signal at danger (red) and for wrong-direction movements, did not sufficiently account for the information, strategies and knowledge used by experienced signallers.

As part of its investigation, RAIB also observed that the Rule Book did not cover the specific circumstances of this wrong-direction movement. This meant that the signaller was unintentionally not following the rules when they had authorised the driver to pass a signal at danger at the start of the movement.

RAIB has made four recommendations as a result of this investigation. The first is addressed to Network Rail to provide training to signallers on the tools and techniques that can be used when setting up and checking the proposed path for a train to take during an out-of-course event. The second and third, addressed to Network Rail and West Midlands Trains respectively, are to develop training for staff to give them the appropriate level of knowledge and understanding of switch diamond points to allow them to undertake their duties in accordance with the Rule Book. The fourth is addressed to the Rail Safety and Standards Board, in consultation with the rail industry, to consider whether the Rule Book needs to account for the scenario where a signal at danger is located at, or near to, the start of a planned wrong-direction movement.

RAIB also identified four learning points. They cover staff understanding the impact that personal issues can have on themselves; the importance of staff taking the time to stop and check again, or continuing to challenge if unsure; reminding signallers that they should ask a competent person, if present, to check the path that they have set up for the wrong-direction movement; and reminding drivers that during a wrong-direction movement, they can approach a junction at a speed slower than 15 mph (or 25 km/h) to give themselves more time to make sure, if possible, that any points, switch diamonds or swing-nose crossings are in the correct position.

# Introduction

## Definitions

1 Metric units are used in this report, except when it is normal railway practice to give speeds and locations in imperial units. Where appropriate the equivalent metric value is also given.

2 The report contains abbreviations and acronyms, which are explained in appendix A. Sources of evidence used in the investigation are listed in appendix B.

# The accident

## Summary of the accident

3 At about 12:27 on 26 June 2025, an out-of-service passenger train travelling at 15 mph (24 km/h) derailed as it passed over Denbigh Hall South Junction, on the West Coast Main Line (WCML), between Bletchley and Milton Keynes Central stations (figures 1 and 2).

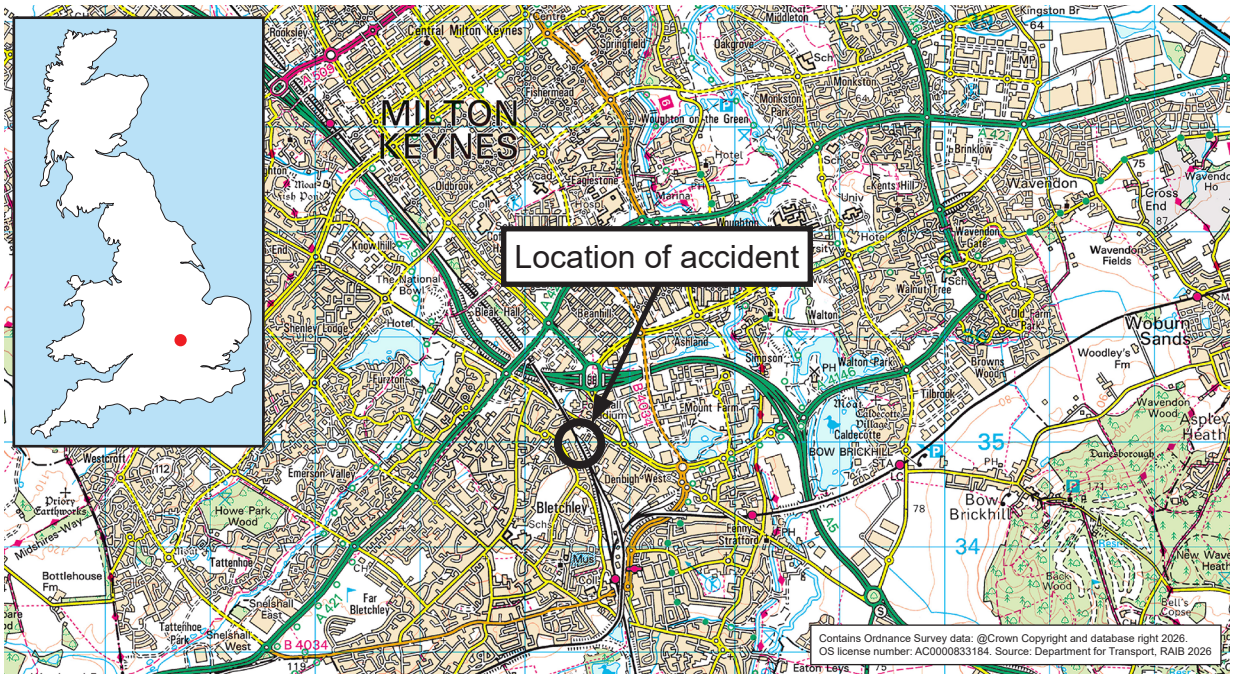



*Figure 1: Extract from Ordnance Survey map showing location of the accident at Denbigh Hall South Junction.*

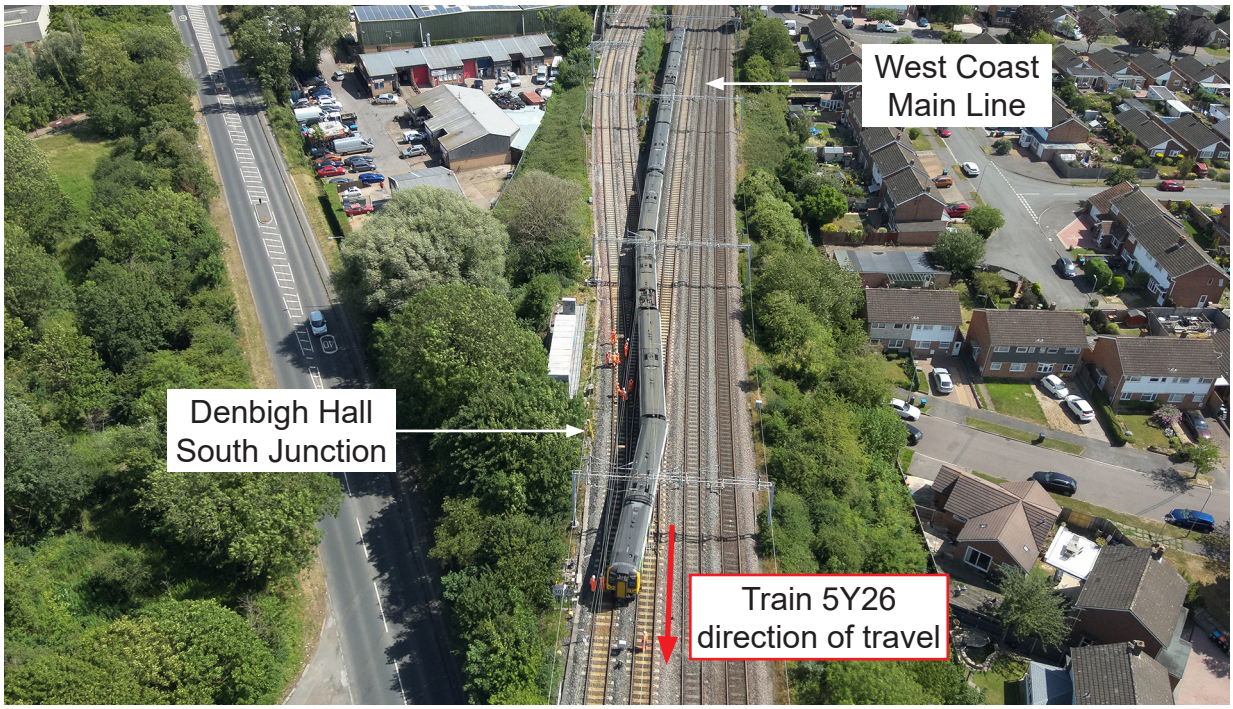



*Figure 2: The derailed train (courtesy of Network Rail with RAIB annotations).*

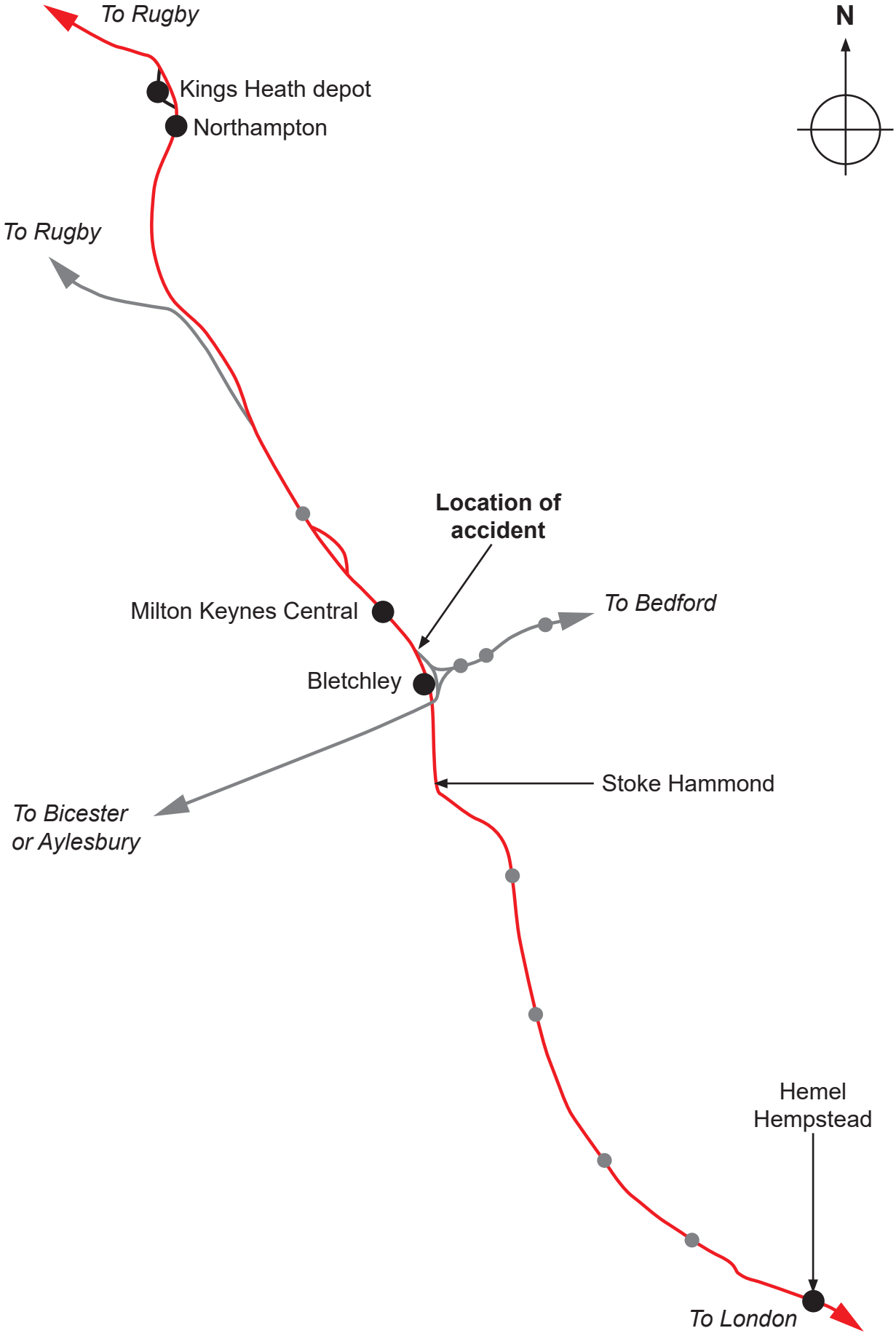



*Figure 3: Overview of locations.*

4 The train had failed earlier that day after it had arrived at Bletchley station. At the time of the derailment, the train was making a wrong-direction movement over the junction, soon after the start of its journey, to a train maintenance depot at Northampton (figure 3). There were no injuries to any of the four members of staff on the train (these were the driver, senior conductor and two driver managers).

5 The derailment caused damage to the train and to railway infrastructure. The adjacent fast lines on the WCML were initially closed but reopened about an hour later. The slow lines on which the derailment happened reopened at 16:05 on 29 June, after recovery of the derailed train and repairs to the railway infrastructure, albeit with some restrictions in place on some points. Normal working resumed at 03:05 on 7 July after all the affected points were restored to full operation.

## Context

### Location

6 Denbigh Hall South Junction is located at 47 miles 52 chains (a chain is 22 yards or around 20 metres) on the WCML, about 1 mile north of Bletchley station. At this location, the WCML is a four track railway, comprising the Up Fast, Down Fast, Up Slow and Down Slow lines, although both fast lines are not part of the junction. The junction is a double junction where the Up Bletchley and Down Bletchley lines join the Up Slow and Down Slow lines (figure 4).

7 The derailment happened on points where the Down Bletchley line crosses the Up Slow line to then join the Down Slow line. The train had approached on the Up Slow line, travelling in the opposite direction to the normal direction of traffic. Consequently, the train was required by the Rule Book, GERT8000, to travel over the points at the junction at a maximum speed of 15 mph (or 25 km/h) during the wrong-direction movement. In the normal direction of traffic, the permissible speed on the Up Slow line is 75 mph (121 km/h).

8 Signalling in the Denbigh Hall South Junction area is controlled from the Bletchley signaller workstation located at Rugby Signalling Control Centre (SCC). The railway at this location is electrified with 25,000 volt alternating current (25 kV AC) overhead line equipment.

### Organisations involved

9 Network Rail is the owner and maintainer of the infrastructure at Denbigh Hall South Junction. It is the employer of the signalling staff at Rugby SCC and control room staff based at Rugby ROC (Rail Operating Centre).

10 West Midlands Trains was the operator of the train, under the trading name London Northwestern Railway. It is the employer of the train crew and driver managers involved, plus the control room staff located at both Rugby ROC and in Birmingham. From the start of February 2026, West Midlands Trains transferred into public ownership and is managed by the Department for Transport (DfT) under its public corporation DfT Operator Ltd (DFTO). DFTO is the government's public sector owning group that will manage all train companies as they move into public ownership ahead of the creation of Great British Railways.

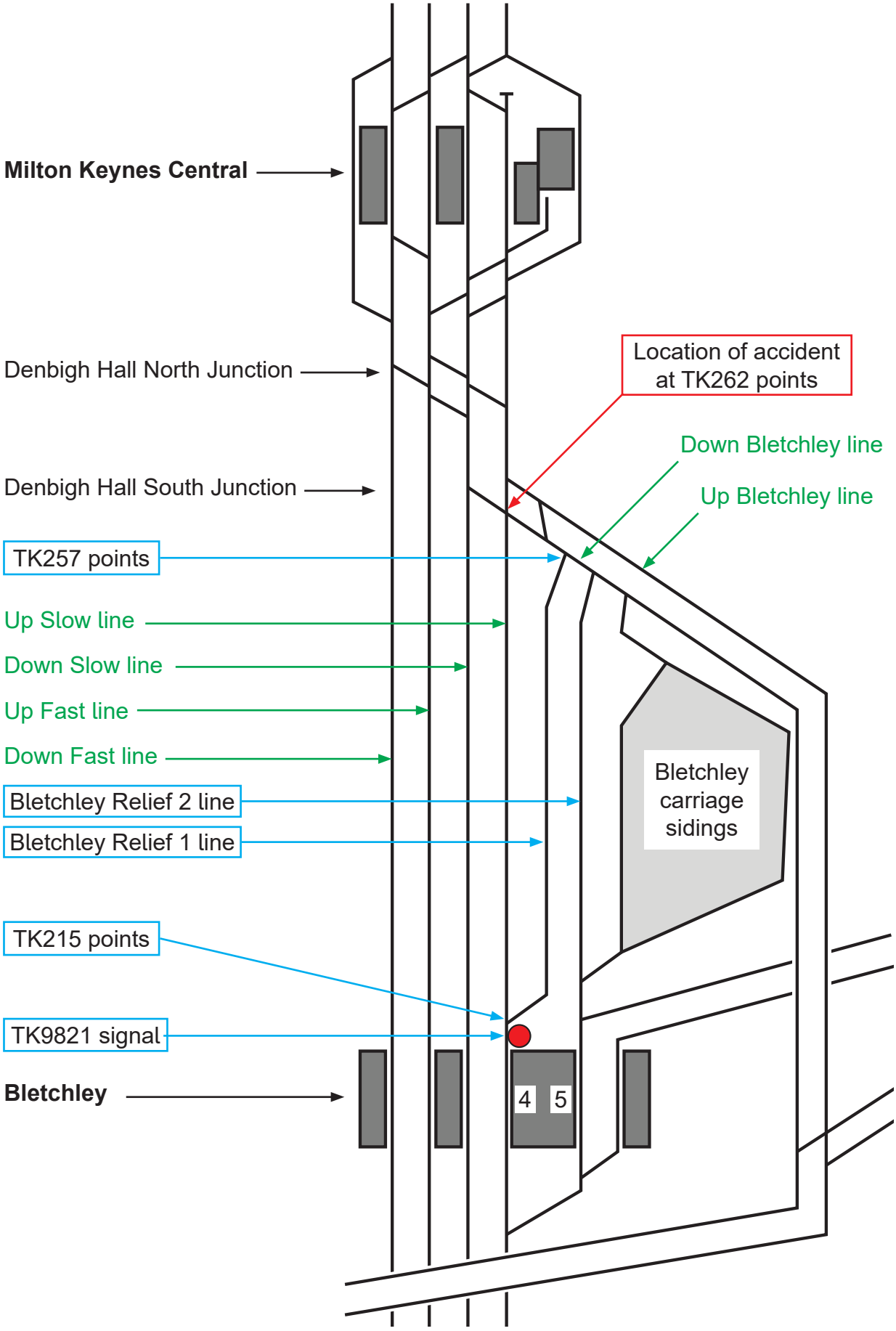



*Figure 4: Track layout at Denbigh Hall South Junction and surrounding locations.*

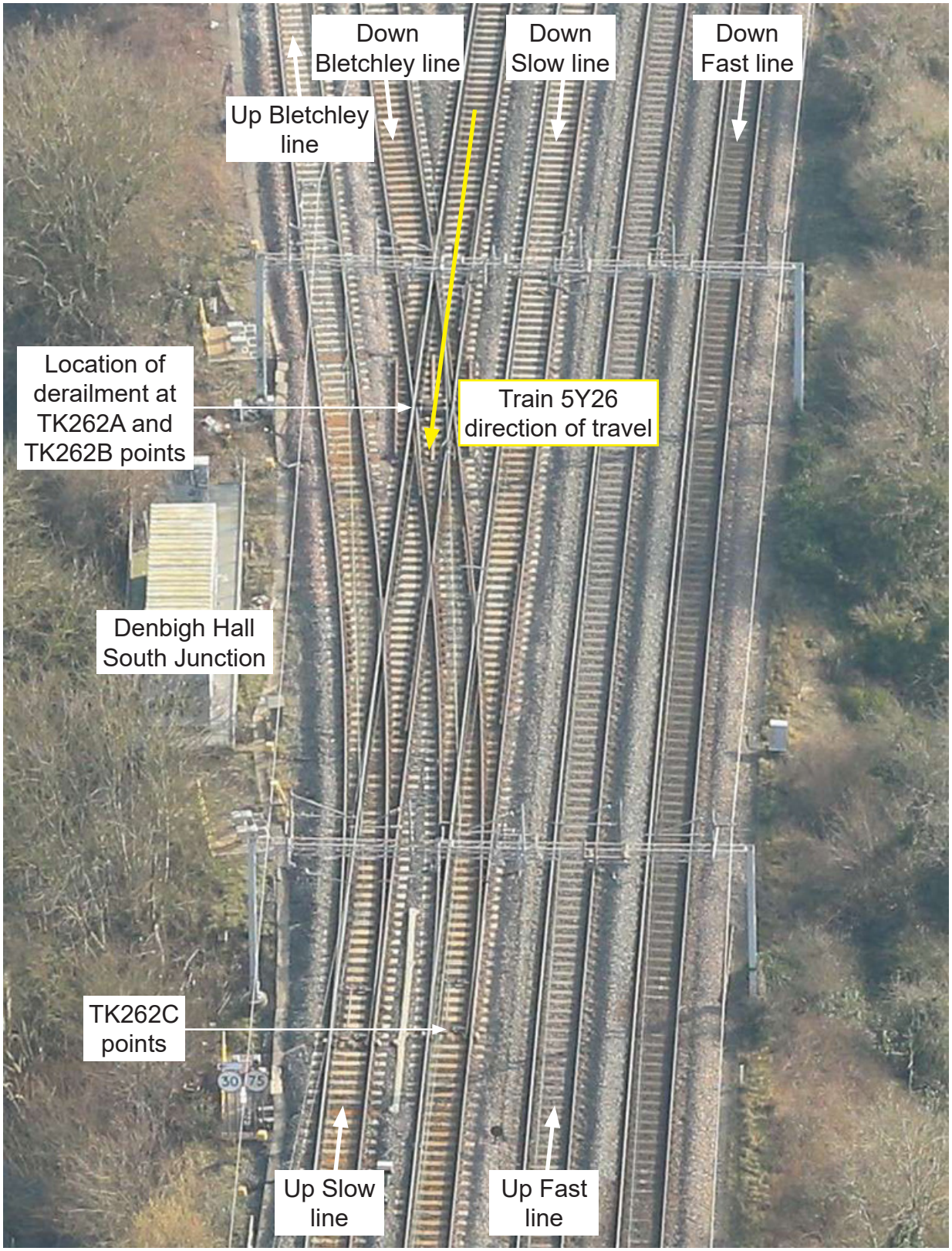



*Figure 5: Denbigh Hall South Junction viewed from above (courtesy of Network Rail with RAIB annotations).*

11 Siemens is the maintainer of the train and employer of the maintenance controller based at Kings Heath depot in Northampton (figure 3).

12 All the organisations involved freely co-operated with the investigation.

## Train involved

13 The train comprised two class 350 electric multiple units, numbers 350370 and 350247. These are 4-car 'Desiro' units that were built by Siemens in batches from 2004 to 2014. Angel Trains is the owner of unit 350370 and Porterbrook is the owner of unit 350247.

14 These units were previously in service as train reporting number 1Y26, the 09:06 from Birmingham New Street to London Euston. However, the train had failed at Bletchley station due to a fault in the leading cab of unit 350370, resulting in all the passengers leaving the train to catch other services. Train 1Y26 then became train 5Y26, an unplanned empty coaching stock movement from Bletchley station to Kings Heath depot (figure 3).

## Rail equipment/systems involved

15 The train derailed as it passed over a set of switch diamond points. Switch diamond points are found in places where one railway line crosses over another at a junction, such as at a double junction like Denbigh Hall South Junction (figure 5) where two lines join another two lines (paragraph 6).

16 In many places where one line crosses over another at a junction, the common solution is to use a fixed crossing (figure 6). A fixed crossing is a crossing without any movable parts. However, there are limitations on when a fixed crossing can be used, including when the angle that the two lines cross each other is shallower than 1 in 8. In the past, when the angle was too shallow for a fixed crossing to be used, switch diamond points were commonly used instead. However, they are no longer the preferred alternative to a fixed crossing due to known problems with their reliability. For example, switch diamond points can be prone to failures caused by longitudinal movement during hot weather. Network Rail's preferred layout for a double junction, when a fixed crossing cannot be used, is now to use a turnout followed by a crossover whenever possible (figure 6).

17 The switch diamond points at Denbigh Hall South Junction allow trains travelling on the Down Bletchley line to cross the Up Slow line and then join the Down Slow line (figure 5). Similarly, they allow trains travelling on the Up Slow line to cross the Down Bletchley line and continue on the Up Slow line. The points that facilitate these train movements are identified as TK262 points. The switch diamond points, located where the two lines cross, comprise two point ends which are identified as TK262A and TK262B. A third set of points, identified as TK262C, also form part of TK262 points and is located where the Down Bletchley line joins the Down Slow line (figure 5).

18 Network Rail company standard NR/L2/TRK/2102, 'Design and Construction of Track', issue 13 dated 1 March 2025, defines a switch diamond as consisting of two obtuse crossings in which the obtuse point rails are replaced by switch rails (figure 7). Consequently, the switch rails used for a switch diamond are different to the switch rails found at a standard set of points, being much shorter and less tapered. The two point ends are also located very close to each other. At Denbigh Hall South Junction they were separated by one sleeper bay, so were about 0.4 metres apart.

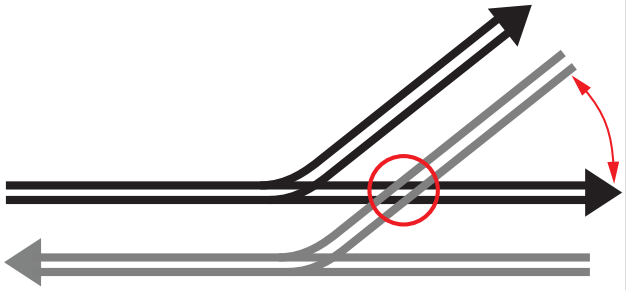
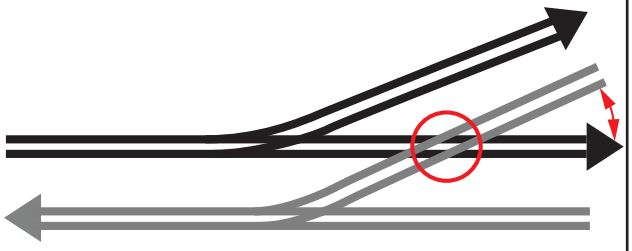
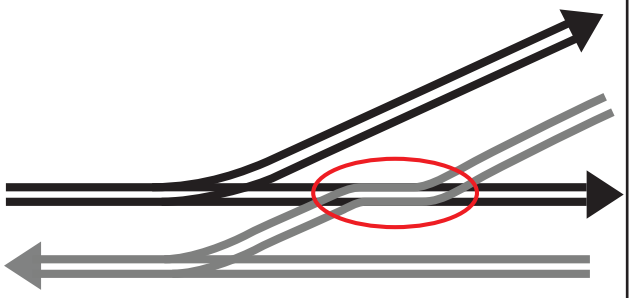
| | |
|---|---|
| Angle that lines cross over each other is steeper than 1 in 8 so a fixed crossing can be used. |  |
| Angle that lines cross over each other is shallower than 1 in 8, meaning a fixed crossing cannot be used, so switch diamond points are used instead. |  |
| Preferred layout is to use points configured to provide a turnout and a crossover, removing the need for one line to cross another (but only where there are no site constraints to prevent this layout from being used, such as it would prohibit the use of the parallel lines for simultaneous movements over the junction). |  |

*Figure 6: Options for double junction layouts.*

19 The two sets of point ends of a switch diamond should always be set in the opposite position to each other. This configuration means a train must stay on the same line throughout and can only cross over the other line. Switch diamond points are not designed to allow a train to go from one line to the other where they cross (figure 8).

## Staff involved

20 Three Network Rail staff at Rugby SCC had some involvement in deciding, setting up and checking the path for the train's wrong-direction movement. These were:

- The signalling shift manager (SSM) who had 27 years' experience as signaller and SSM. They were a signaller at Rugby SCC from when it first opened in 2004 and had been working as an SSM since 2010.
- Signaller 1 who started training to be a signaller in August 2023 and had passed out in August 2024 as competent to be a signaller on three out of the five signaller workstations at Rugby SCC. This included the Bletchley signaller workstation.
- Signaller 2 who had been a signaller for about 5 years. They had initially worked in smaller signal boxes in the East Midlands area before moving to Rugby SCC in February 2023. They too were competent to operate three out of the five signaller workstations, including the Bletchley signaller workstation.

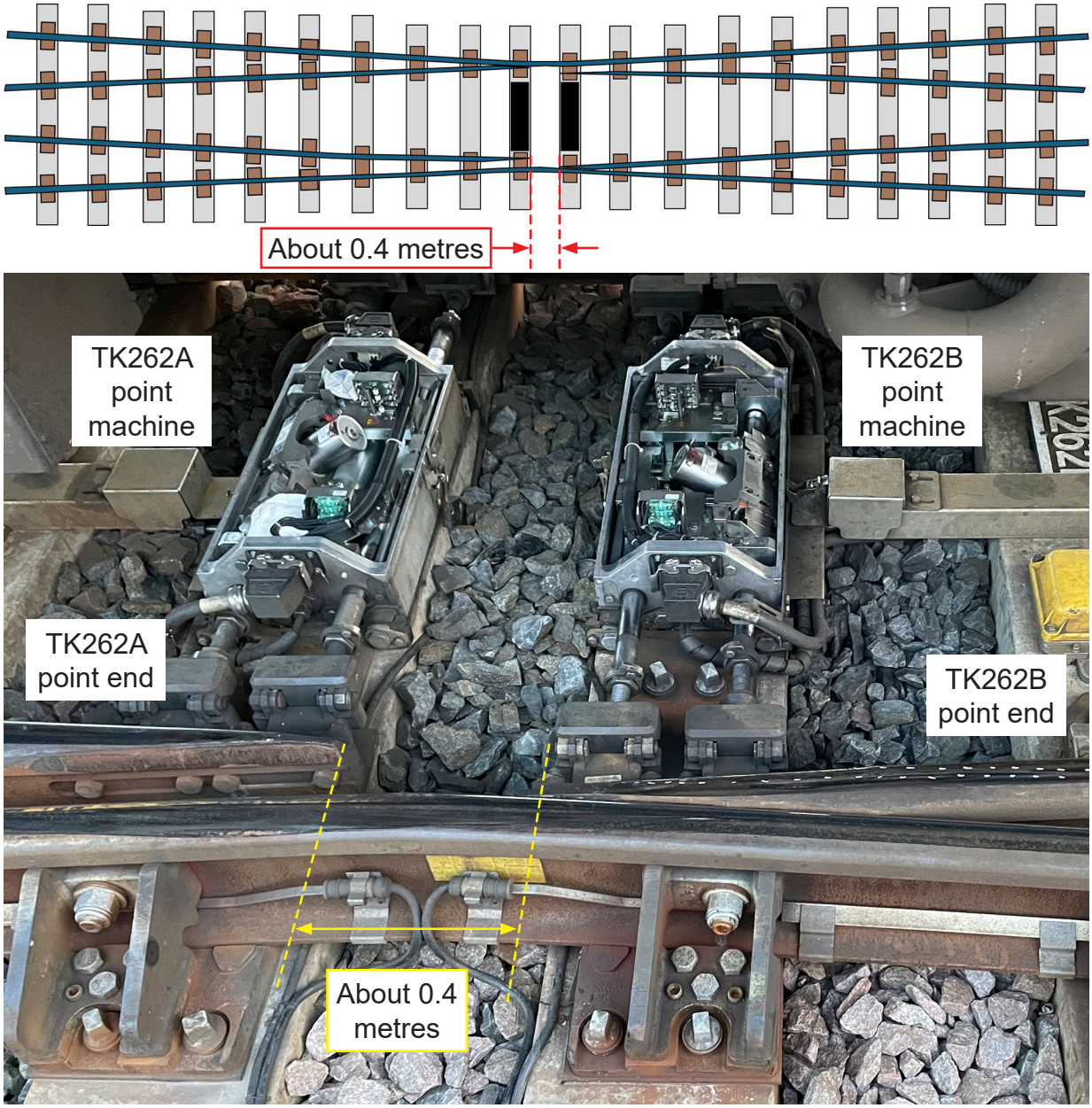



*Figure 7: Switch diamond point end arrangement.*

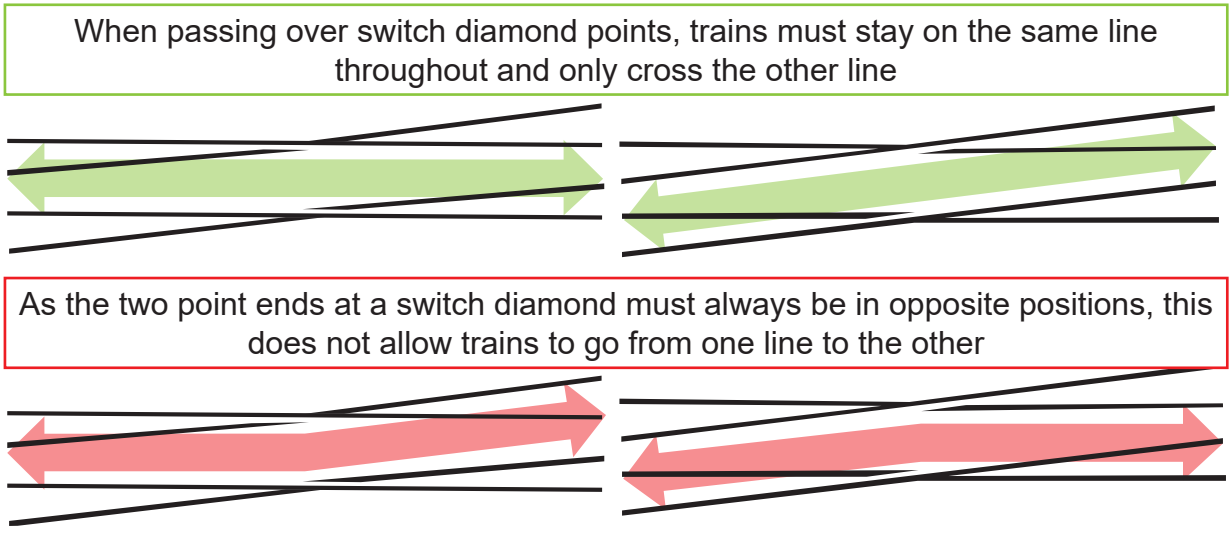



*Figure 8: Permitted movements over switch diamond points.*

21 The driver of train 5Y26 had started as a trainee driver with West Midlands Trains in 2019. They were based at the train crew depot at Bletchley. Their route and traction knowledge allowed them to drive class 350 units between London Euston and Northampton on the WCML.

22 The driver manager, who was in the leading cab when the train derailed, had started working in the rail industry in 1995, before moving to a driver role in 2000 with Silverlink Trains, which was the holder of the railway franchise before West Midlands Trains. They became a driver instructor in 2013, before becoming a driver manager in 2015. Their route and traction knowledge allowed them to drive class 350 units between London Euston and Birmingham New Street.

## External circumstances

23 It was daylight when the accident happened. Witness accounts, CCTV footage from the train, and data from a local weather station about 7 miles (11 km) away showed that it was dry and sunny with patchy cloud cover. It was warm, with a recorded air temperature of about 22°C. Visibility was good and glare due to the position of the sun was not a factor.

24 RAIB has not identified any external factors that may have influenced this accident.

# The sequence of events

## Events preceding the accident

### Overnight engineering work

25 At about 01:45 on 26 June, the night shift SSM at Rugby SCC reported to Network Rail control staff at Rugby ROC that a road-rail vehicle used for overhead line maintenance had derailed (figure 9) after running through and damaging TK257 points, located at the northern end of Bletchley Relief 1 line (figure 4). At the time, the road-rail vehicle was moving from the Down Bletchley line onto Bletchley Relief 1 line while working in a work site that was within an engineering possession. The possession was in place from Stoke Hammond at 42 miles 68 chains in the south to just north of Milton Keynes at 50 miles 10 chains (figure 3).

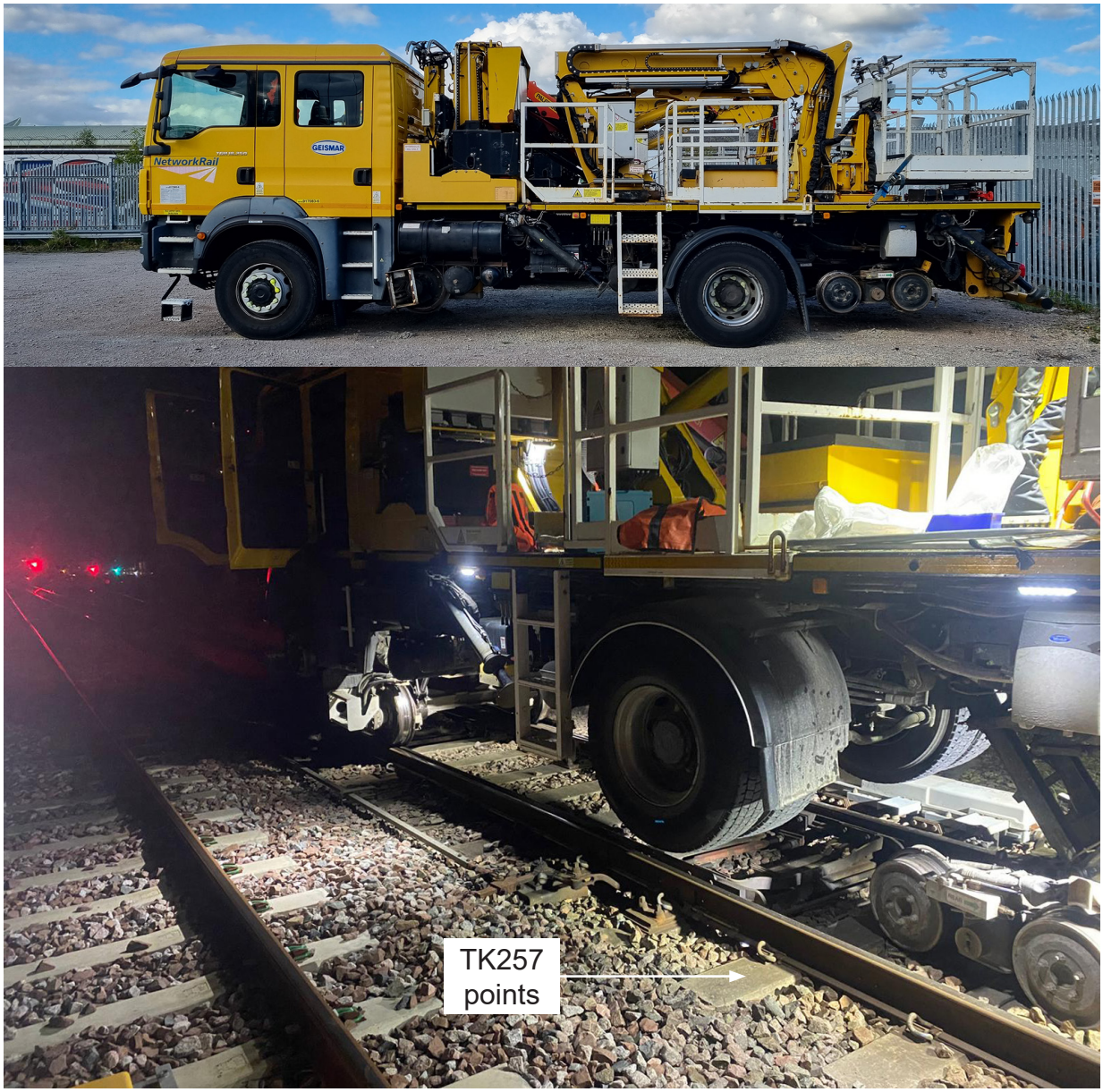



*Figure 9: The road-rail vehicle type that ran through TK257 points and derailed (lower image courtesy of Network Rail with RAIB annotations).*

26 After maintenance staff had attended and carried out an initial assessment of the derailed road-rail vehicle, the staff on site agreed to rerail it and move it back to a nearby road-rail access point to take it off the track. The road-rail vehicle was rerailed by 03:20 and began moving to the access point. Once the road-rail vehicle was moved clear of TK257 points, a Network Rail maintenance team that had been called to the site reported there was damage to the points that required some components to be replaced.

27 At 03:51, a mobile operations manager (often referred to as a MOM; these staff provide Network Rail's first-line response to incidents that affect the operation of the railway) who had been sent to the site reported that the road-rail vehicle was unable to get back to the access point. The derailment had damaged the vehicle and caused a hydraulic fluid leak, which was affecting its stability on the rails while moving. At this point, it was agreed by staff in control and at Rugby SCC that the road-rail vehicle would be left on Bletchley Relief 1 line. The MOM secured TK257 points in their normal position at the northern end of Bletchley Relief 1 line, while a second MOM went to the southern end of Bletchley Relief 1 line to secure TK215 points in their normal position (figure 4).

28 By 04:42, the MOMs had confirmed that the required points were secured, while the staff with the road-rail vehicle reported it had been left stabled on Bletchley Relief 1 line. These staff then handed back the possession at 05:54 so normal running could resume, albeit with Bletchley Relief 1 line now unavailable for any train movements over it from platform 4 at Bletchley station to Denbigh Hall South Junction.

29 When both signaller 1 and the SSM arrived at Rugby SCC ahead of the start of their shift at 06:00, they were informed that Bletchley Relief 1 line would be unavailable throughout the day and that it was likely that Network Rail maintenance staff would be asking for access to TK257 points to carry out repairs. Signaller 2 was made aware of this when they arrived at Rugby SCC at about 08:30. Signaller 2 had arrived later than the others as they had agreed at short notice to provide cover for staff sickness that day. Their role was to be the relief signaller, so that the other signallers could take their breaks.

## Train 1Y26 failure

30 At 09:08, train 1Y26, driven by another driver, departed from Birmingham New Street, running 2 minutes late. At about 10:20, the driver and driver manager met up at the booking-on point at the train crew offices at Bletchley station. The driver manager had arranged with the driver to carry out a planned formal driving assessment as part of their competence management. The assessment included driving train 1Y26 from Bletchley to London Euston. After completing the signing-on process, the driver and driver manager walked over to platform 4 and went to its southern end in readiness to meet the train.

31 At 10:39, train 1Y26 arrived at platform 4 at Bletchley station. The driver completed a handover from the incoming driver they were relieving and entered the cab with the driver manager. The driver then settled into the driver's seat and prepared to take the train forward. By 10:40:25, all the train doors were closed so the senior conductor gave a signal to the driver to depart. The driver released the train's brakes. This correctly left the train with just its holding brake applied, and 4 seconds later, the driver pulled the power and brake control lever back to demand traction. However, the holding brake did not automatically release because the traction equipment did not activate, and the train did not move.

32 After 10 seconds, the driver stopped demanding traction and soon after tried again, but the train's holding brake still did not release so the train did not move. The driver then made several more attempts to set off. Each time, the driver checked various indications in the cab and looked for fault messages on the train management system screen, but there was nothing shown to indicate what was wrong. The driver manager also could not see anything that would explain why the train was not moving.

33 After about 5 minutes of trying, at 10:45, the driver called signaller 1 to report that the train was unable to move. Just at the end of this call, signaller 1 and the driver agreed to cancel the route for the train, so the signal at the southern end of platform 4 changed to display a red (stop) aspect.

34 Next, the driver tried releasing and closing the doors again, but the train still did not move when the driver demanded traction. The driver then carried out a reset which involved opening the circuit breaker for the train's supply from the overhead line, dropping the pantograph and closing the cab desk. The driver then reopened the cab desk and re-energised the train, which in turn reset various train systems. After doing this, the driver made another two unsuccessful attempts to move.

35 By now, the driver had done all they could think of to try to overcome the fault and called the Siemens maintenance controller (SMC) to report the problem and obtain advice on what to do next. After the driver had explained the problem, the SMC talked the driver through checking various indications and carrying out fault-finding actions. The driver then made a further two unsuccessful attempts to move the train.

36 While the driver and SMC were trying to find the fault, signaller 1 was able to route trains around train 1Y26, using a route from Denbigh Hall South Junction via Bletchley Relief 2 line to platform 5 at Bletchley station. This meant there was no direct pressure on the driver or signaller 1 to move train 1Y26 straight away, although all the staff involved were aware that the train was blocking platform 4 and would need to be moved as soon as possible. The driver's fault-finding with the SMC was then interrupted by passengers wanting to get off train 1Y26 to catch other services from platform 5 heading towards London Euston. Due to the constant interruptions caused by passengers pulling alarm handles, and the need for the train doors to be opened to let passengers get off the train, the driver and SMC had to give up fault-finding.

37 By 11:03, the driver had managed to close the doors again as those passengers who had wanted to get off the train had now done so. The driver called the SMC to resume fault-finding and then made another unsuccessful attempt to move. However, the driver was soon interrupted again by further passenger alarm activations. The SMC asked the driver, when they were able, to undertake a reset which involved isolating and then reinstating the batteries on both units. The driver then left the cab at the leading end and began walking through the train with the senior conductor. They told passengers to leave the train now if they wanted to, explaining that the train had to be shut down completely, so the lights would go off, and the doors would need to remain closed while this was done.

38 By 11:14, the driver had reached the north end cab of unit 350247. While there, the driver called signaller 1 to ask for permission to see if they could move the train from that end. Signaller 1 gave their permission to do this but told the driver to go no further than TK9821 signal at the north end of platform 4. After closing the doors, the driver successfully moved the train a very short distance. The driver then left the north end cab and headed back to the south end cab.

39 At 11:22, once back at the south end cab, the driver called the SMC and advised they were now going to carry out the battery isolation reset as all the passengers had decided to get off the train. Between 11:25 and 11:34 the driver carried out the battery isolation reset on both units. During this time, another driver manager had arrived at Bletchley station and joined the others on the train. Being new to the role, they did this to gain experience and learn from what was happening. Once the driver had completed the battery isolation reset and restarted the systems on both units, they tried several more times to move the train from the south end cab but again without success.

40 The driver called the SMC and advised they had carried out the battery isolation reset, but was still unable to move the train from the leading cab. The driver, under instruction from the SMC, then isolated several safety systems in the south end cab, but was still unable to move the train. At 11:42, the SMC declared the train a failure and the driver called West Midlands Train's staff in control to report this.

## Train 5Y26 wrong-direction movement

41 While the driver had been attempting to rectify the fault with the SMC, staff in Network Rail control along with staff in West Midlands Trains control had looked at the options for recovering the train should it become necessary. At 11:50, the Network Rail train running controller called the SSM and gave two possible options for recovering the train. The first option was to find another unit and attach it to the front of the failed train to move it south. The second option was to drive the failed train from the north end cab to take it to Kings Heath depot in Northampton. The SSM and train running controller noted that the second option would initially involve the train making a wrong-direction movement along the Up Slow line before joining the Down Slow line due to the Bletchley Relief 1 line being unavailable.

42 The SSM chose the second option and decided the train should cross from the Up Slow to the Down Slow line at TK262 points. They then informed signaller 1 that they had agreed with control that the train would go north back to Kings Heath depot. Soon after, West Midlands Trains control staff spoke to the driver and asked if they would be willing to make a wrong-direction movement and then take the train to Kings Heath depot as train 5Y26. The driver agreed to do this, so headed back to the north end cab.

43 Once at the north end cab, the driver called signaller 1. They discussed the outline plan for the failed train, noting it included a short wrong-direction movement at the start of its journey back to the depot. Signaller 1 then authorised the driver to move the train north along platform 4 and to stop before TK9821 signal. They spoke again soon afterwards as the driver wanted to tell signaller 1 that the train would be stopping at Northampton station to drop the senior conductor off. Signaller 1 noted this and again told the driver to move the train northwards along the platform. Signaller 1 explained to the driver that they would find a gap in the southbound train service on the Up Slow line, to allow the wrong-direction movement to take place, once the train had moved up the platform.

44 When the driver went to move the train from the north end cab, they were unable to release the train's brakes. After speaking to the SMC, it was agreed that the driver manager could reset the isolated safety systems in the south end cab. Once this was done, the driver was able to release the train's brakes and at 12:18 the train moved along the platform, stopping before TK9821 signal. The driver and signaller 1 then spoke again, with signaller 1 advising that they would now set up the wrong-direction movement and call back with their instructions once ready.

45 Signaller 1 then set up the path for the train's wrong-direction movement, which included moving TK262 points to their reverse position and placing a reminder on the controls for them. The reminder provided a visual indication to signaller 1 that TK262 points should not be moved. The reminder also implemented a control in the signalling system that prevented TK262 points from being moved even if requested to move by the signaller. During this time, signaller 1 communicated with both the SSM and signaller 2 about the setting up and checking of the path. Signaller 1 also set three signalled routes for the train to continue along the Down Slow line at Denbigh Hall North Junction and beyond Milton Keynes Central station (figure 10).

46 At 12:21, signaller 1 called the driver and gave their instructions to the driver for the wrong-direction movement. After the driver had successfully repeated the instructions back, signaller 1 authorised the driver to pass TK9821 signal at danger (red) to start the movement. The train began moving at 12:24:57 and passed TK9821 signal at 12:25:11 to start the wrong-direction movement. When the train set off, the driver manager was in the leading cab with the driver. The other driver manager and senior conductor were in the passenger saloon area in the leading vehicle.

47 As the train proceeded along the Up Slow line in the wrong direction, the driver accelerated up to 36 mph (58 km/h) before they applied the train's brakes about 180 metres before Denbigh Hall South Junction. After braking for about 10 seconds, the train's speed had reduced to 15 mph (24 km/h) at 12:26:55. At this time, the front of the train was about 40 metres from TK262 points.

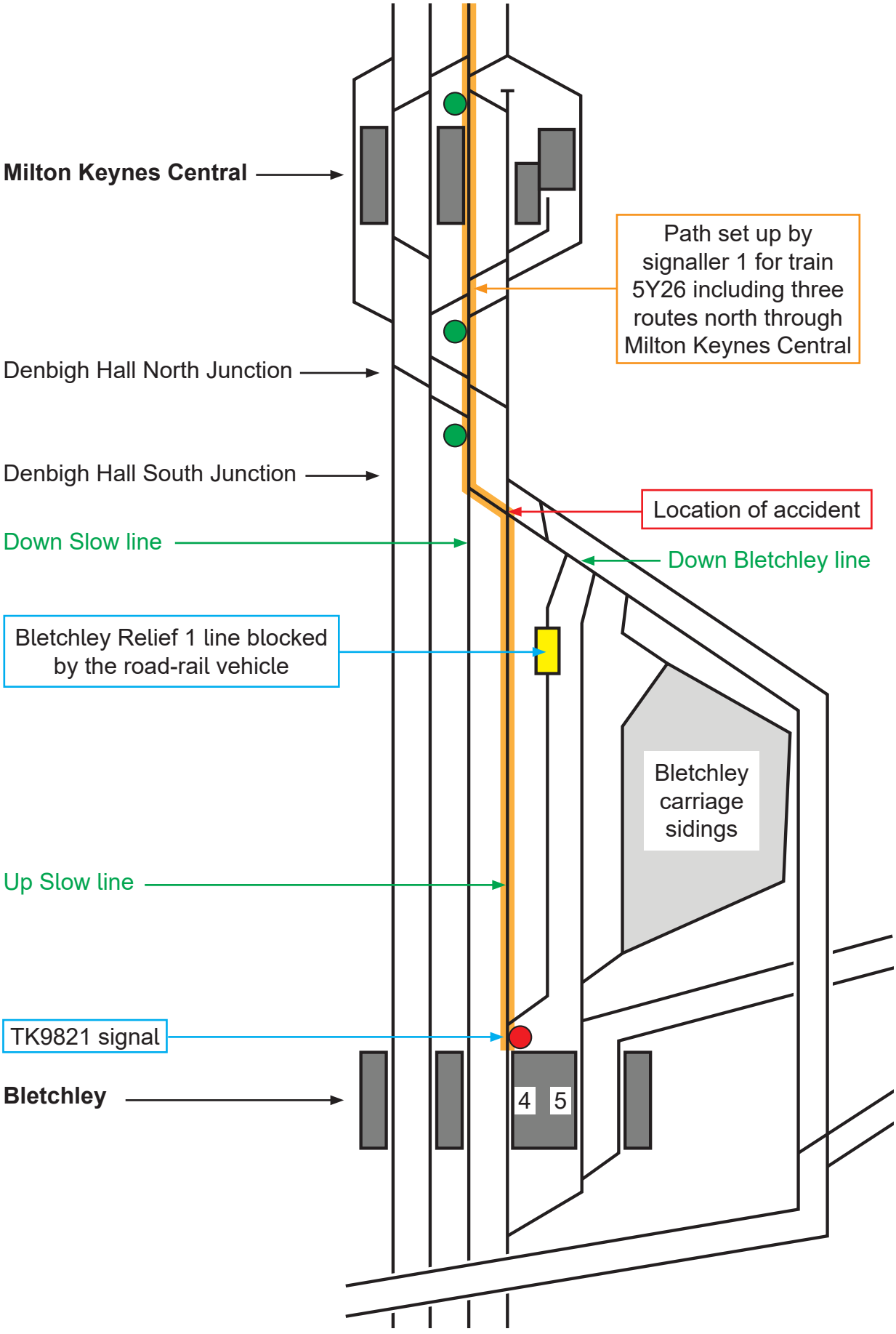



*Figure 10: The path set up by signaller 1 for train 5Y26.*

## Events during the accident

48 Train 5Y26 continued at about 15 mph (24 km/h) towards Denbigh Hall South Junction. At 12:27:01, the train arrived at TK262 points which were set in their reverse position (figure 11).

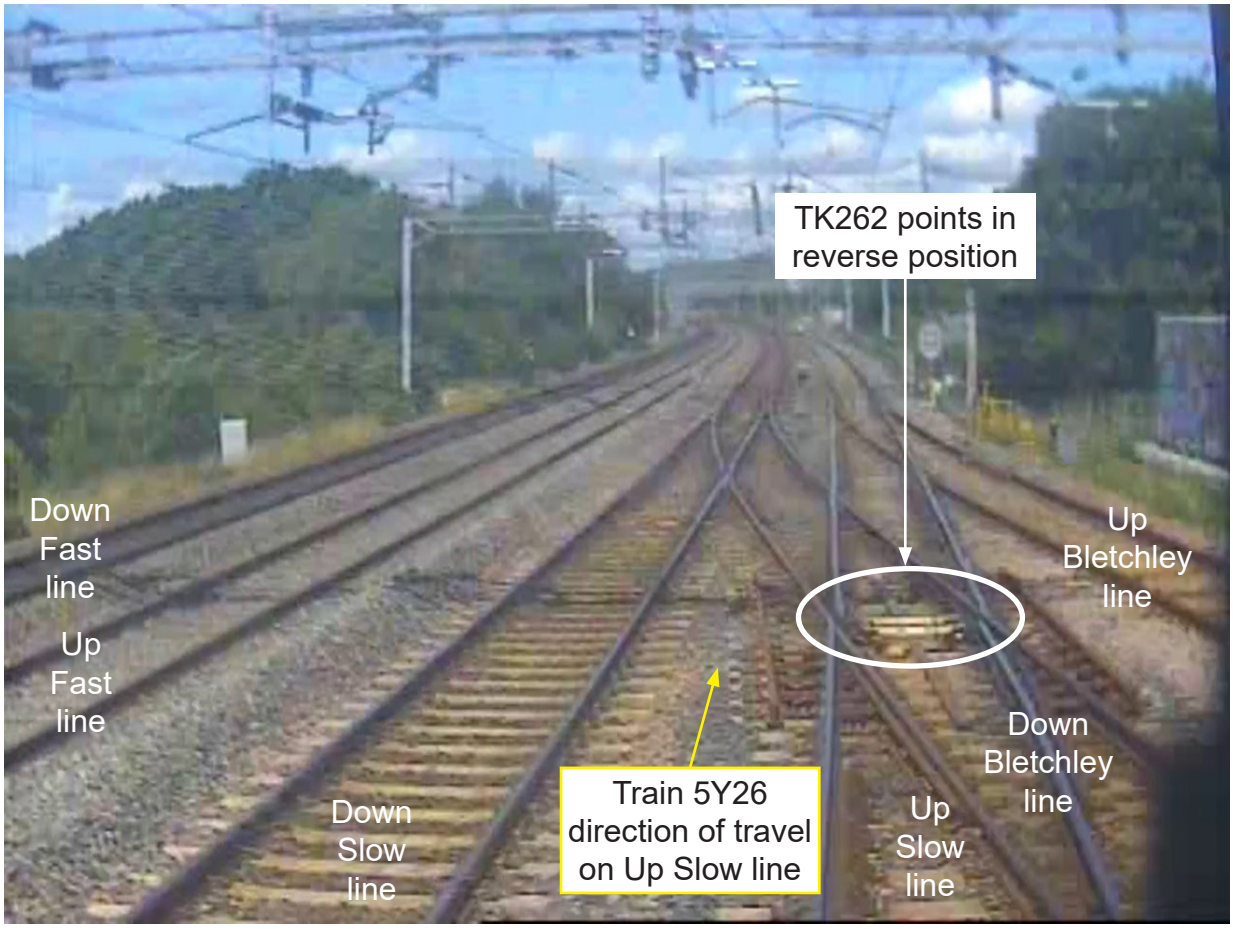



*Figure 11: Forward-facing CCTV image from train 5Y26 showing the position of TK262 points (courtesy of West Midlands Trains with RAIB annotations).*

49 The train's leading wheelset first ran through the trailing TK262A points. The left-hand wheel forced the closed switch rail open, while the right-hand wheel pushed the open switch rail towards its closed position (figure 12). This caused the signalling system to report a loss of reverse detection for TK262A points at 12:27:01. Immediately after, the leading right-hand wheel struck the closed switch rail of facing TK262B points (figure 12). This caused the signalling system to record a loss of reverse detection for TK262B points at the same time.

50 The leading right-hand wheel was unable to negotiate the sharp divergence to the left to travel along the right-hand switch rail. Instead, this wheel climbed over the switch rail and into derailment (figure 12). This initially lifted the front of the train before the leading wheelset then dropped down onto the ballast. At the same time, the leading left-hand wheel passed through the gap at the open switch rail on its side and into derailment on the ballast. The trailing wheelset of the leading bogie was then pulled into derailment as it followed the path of the derailed leading wheelset (figure 12).

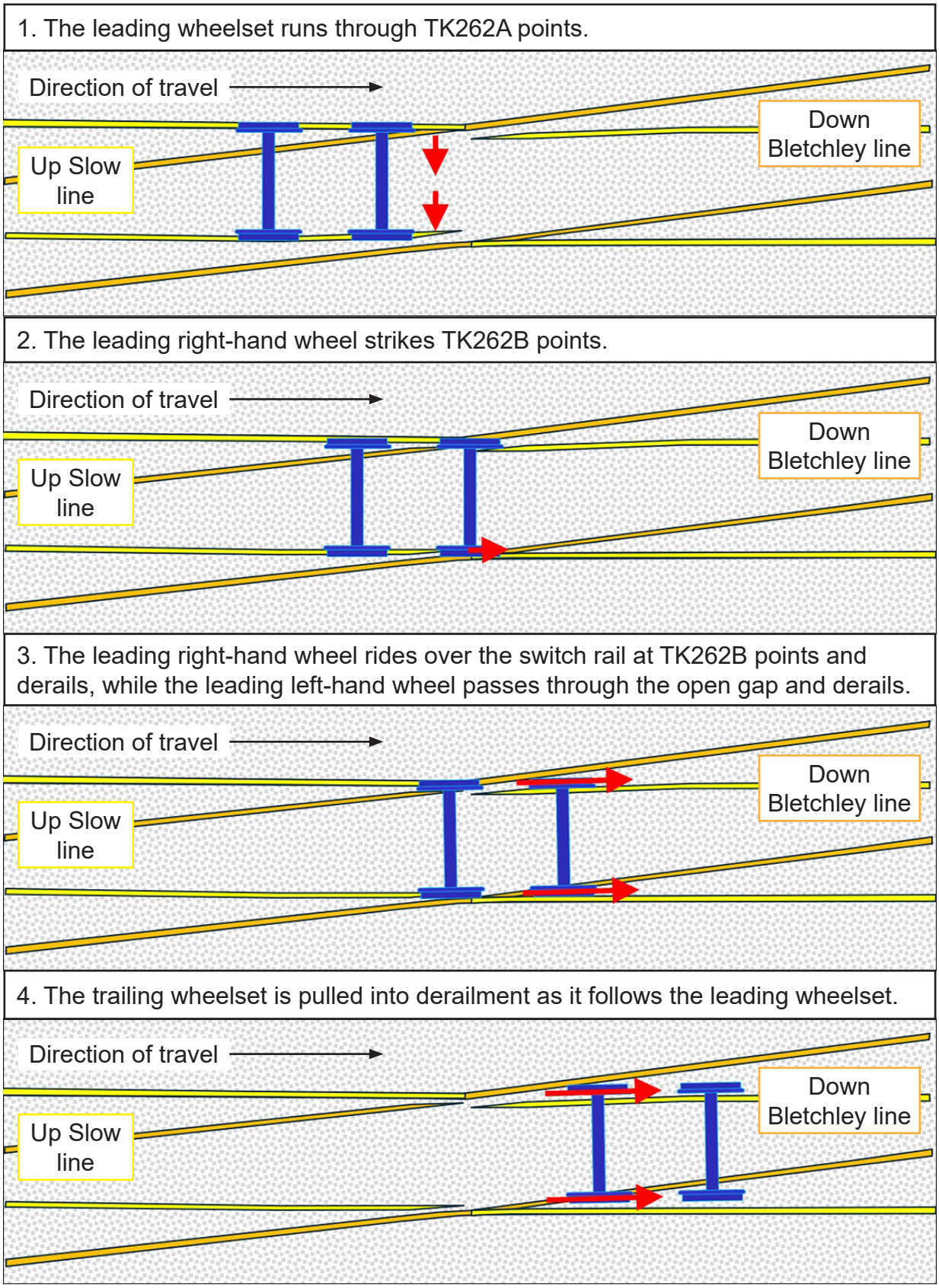



*Figure 12: The path of the train's wheels through TK262A and TK262B points.*

51 At 12:27:02, after feeling the front of the train lift and drop back down, the driver applied the train's brakes. As the train continued forward, the wheelsets of the rear bogie of the leading vehicle passed over TK262A and TK262B points. These wheelsets did not derail. Instead, they were able to negotiate the sharp turn to the left and were diverted from the Up Slow line onto the Down Bletchley line, and towards the Down Slow line (figure 13). Similarly, all the wheelsets for the second vehicle and the wheelsets of the leading bogie for the third vehicle did not derail as they passed over TK262A and TK262B points. They too were diverted onto the Down Bletchley line (figure 13).

52 At 12:27:11, train 5Y26 stopped before the wheelsets of the rear bogie of the third vehicle reached TK262A and TK262B points (figure 13). The train's derailed front bogie stopped about 50 metres beyond TK262A and TK262B points. The leading wheelset of the front bogie stopped within the space between the Up Slow and Down Slow lines. The left-hand wheel of the trailing wheelset also stopped in the space between the Up Slow and Down Slow lines, whereas its right-hand wheel stopped between the rails of the Up Slow line (figure 14).

## Events following the accident

53 Straight away, at 12:27:17, the driver made an emergency call to signaller 1 to report the derailment. Signaller 1 stopped all train movements in the area, including those on the fast lines. The two driver managers got off the train and placed safety devices on the Up Slow and Down Slow lines to protect the train.

54 West Midlands Trains control staff then began mobilising its staff to the site of the derailment to support its train crew and for recovery of the train. Similarly, Network Rail control staff mobilised its staff to site for the assessment and repair of the infrastructure.

55 A MOM soon arrived at the derailed train and confirmed to Network Rail control staff that the train was not foul of the adjacent fast lines. The signaller then authorised the driver of the first train on the adjacent Up Fast line to pass the derailed train at caution. Once this train had passed by, normal running resumed at 13:30 on both fast lines.

56 The following day, train 5Y26 was rerailed. The two units were then split, with southern end unit (350370) recovered to Bletchley carriage sidings. On 28 June, the unit that had derailed (350247) was recovered to Bletchley Relief 2 line. Overnight on 28 and 29 June, Network Rail carried out work on the slow lines to correct track alignment issues caused by the derailed train. After further work to repair several sets of points, the slow lines reopened at 16:09 on 29 June, albeit with some restrictions in place due to the damage to the points. Also on 29 June, unit 350247 was recovered from Bletchley Relief 2 line into Bletchley carriage sidings. Normal working over the slow lines resumed at 03:25 on 7 July after all the points at the junction were restored to normal operation.

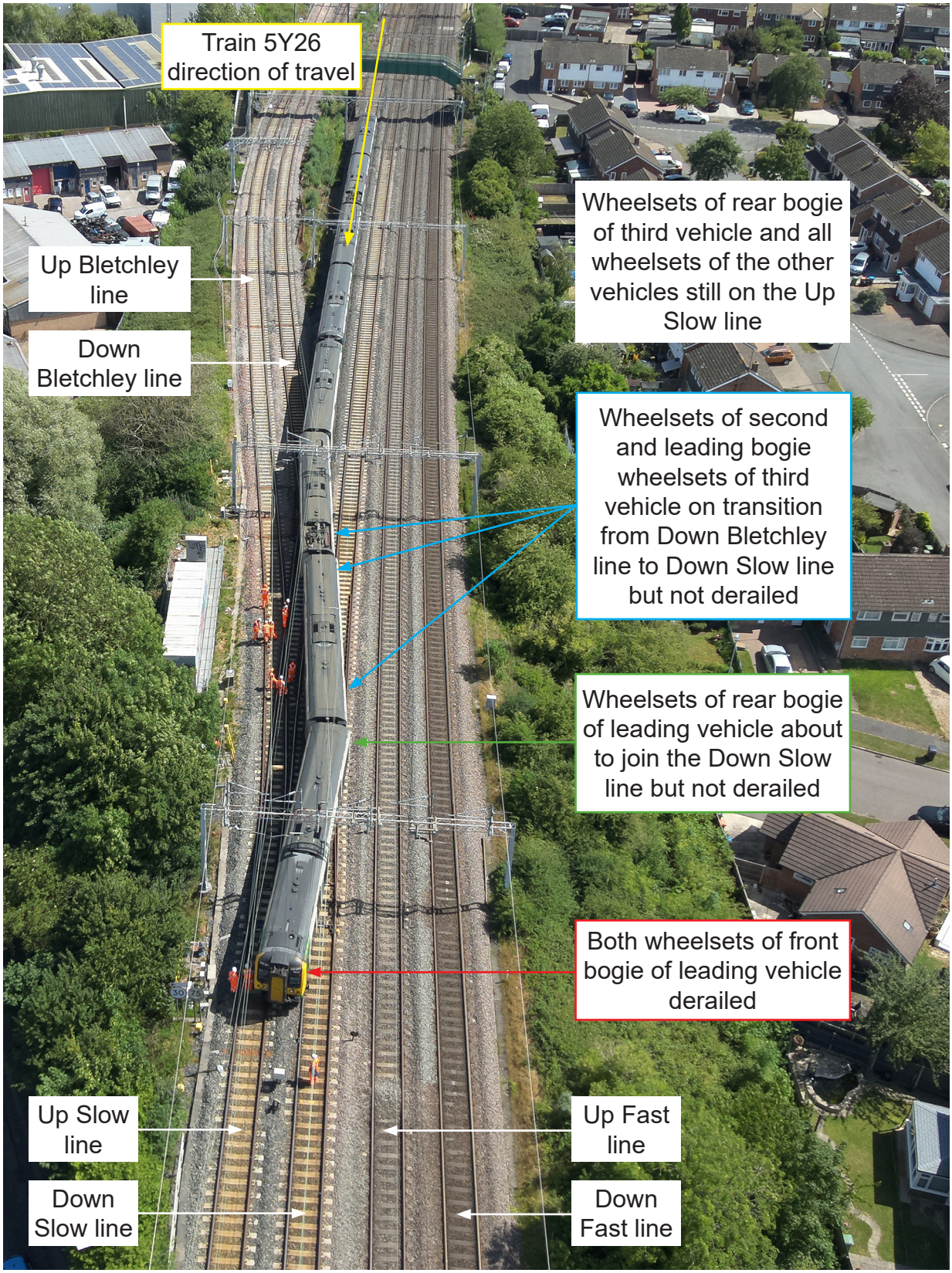



*Figure 13: Positions of the train's wheelsets after passing over TK262A and TK262B points (courtesy of Network Rail with RAIB annotations).*


*Figure 14: The front of the derailed train.*

# Analysis

## Identification of the immediate cause

**57 TK262A and TK262B switch diamond points were in an unsafe position for the direction that train 5Y26 was travelling over them.**

58 Train 5Y26 approached the junction on the Up Slow line. This meant the only valid way for the train to have travelled over TK262A and TK262B switch diamond points was for it to have continued along the Up Slow line (paragraph 17). This required these point ends to be in their normal position (figure 15).

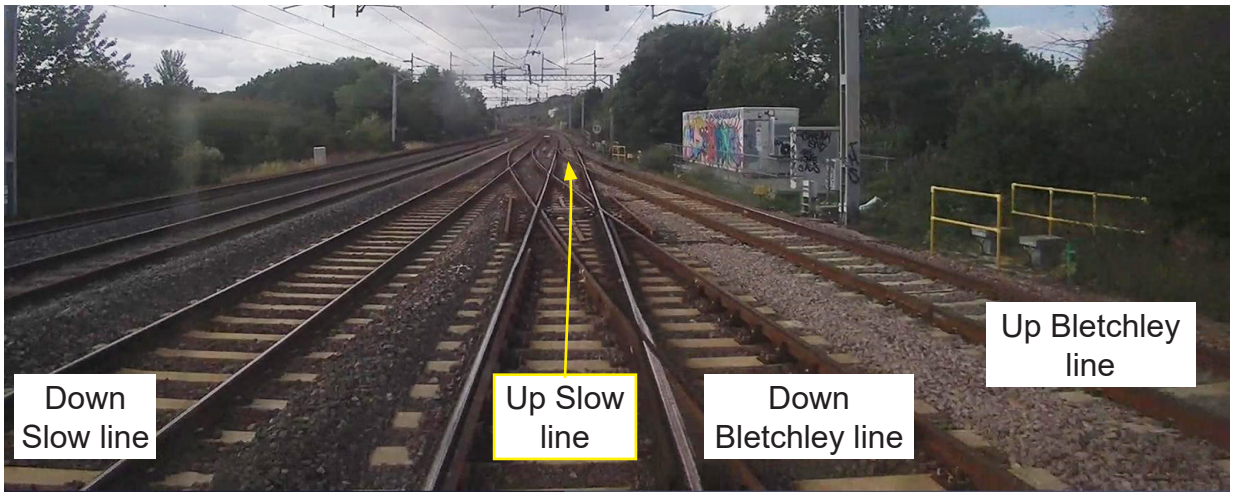



*Figure 15: Only valid path over TK262A and TK262B points when in their normal position (courtesy of Network Rail with RAIB annotations).*

59 However, the signalling system recorded that TK262A and TK262B point ends were in their reverse position (paragraph 48). These switch diamond points should be in this position when a train is travelling over the junction from the Down Bletchley line to the Down Slow line (figure 16). In their reverse position, the switch diamond points only allow trains making this movement to cross the Up Slow line.

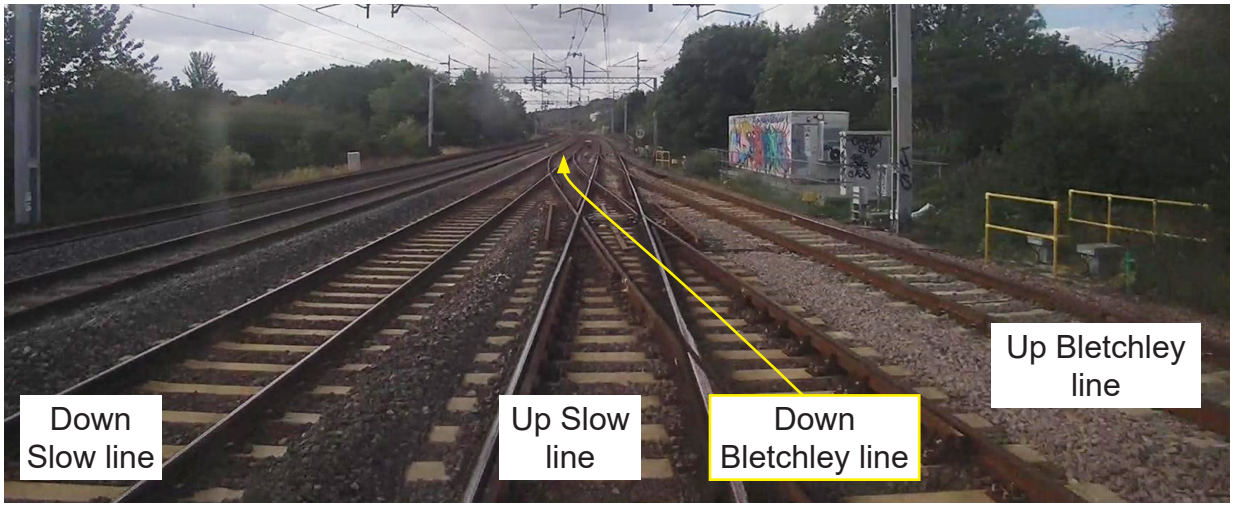



*Figure 16: Only valid path over TK262A and TK262B points when in their reverse position (courtesy of Network Rail with RAIB annotations).*

60 When the train approached on the Up Slow line, it was unsafe for the switch diamond points to be in their reverse position. It meant that the trailing TK262A points were run through by the train's leading wheels and the facing TK262B points were set to divert the train's leading wheels sharply to the left onto the Down Bletchley line (figure 17). The switch diamond points were never designed to allow this (figure 8).

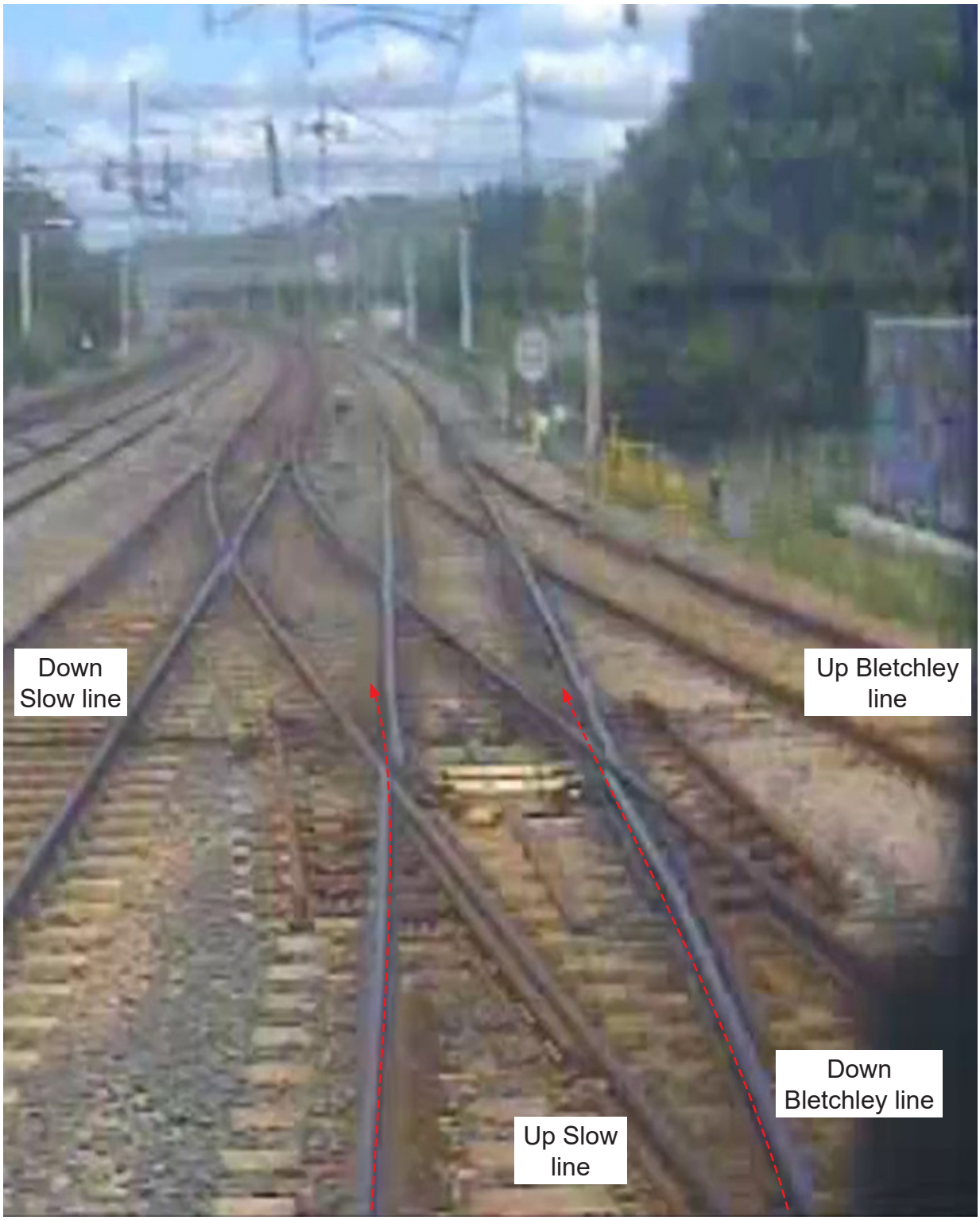



*Figure 17: Path taken by the leading wheelset of train 5Y26 after approaching on the Up Slow line and then travelling through TK262A points and over TK262B points in their reverse position (courtesy of West Midlands Trains with RAIB annotations).*

61 Instead of diverting to the left, all the wheels of the leading bogie derailed (paragraph 50). The path these wheels took is shown in figure 17. The right-hand wheels of the leading bogie derailed due a combination of the train's speed and the angle of the right-hand switch blade being too acute for these wheels to be directed onto the Down Bletchley line. The following wheels were able to negotiate the sharp turn to the left due to a combination of the train slowing down and its leading end moving over to the left as it ran derailed between the two slow lines (figure 17).

## Identification of causal factors

62 The accident occurred due to a combination of the following causal factors:

a. Train 5Y26 was making a wrong-direction movement but the path that the train was authorised to take was invalid as it involved passing over points in an unsafe condition (paragraph 63).

b. No one in the train's leading cab noticed that the switch diamond point ends were in an unsafe position for the train to pass over them (paragraph 112).

Each of these factors is now considered in turn.

### Unsafe path for train 5Y26

**63 Train 5Y26 was making a wrong-direction movement but the path that the train was authorised to take was invalid as it involved passing over points in an unsafe condition**.

64 After the train was declared a failure (paragraph 40), from the options available, the SSM chose to carry out a wrong-direction movement (paragraph 42). A wrong-direction movement was necessary as the only signalled route from TK9821 signal at the north end of platform 4 was unavailable, because the Bletchley Relief 1 line was blocked by a stabled road-rail vehicle (paragraphs 27 and 28). Consequently, the only way the train could move north out of platform 4 was to go in the wrong direction along the Up Slow line.

65 Rule Book Module TW7, GERT8000-TW7, 'Wrong-direction movements', issue 10 dated December 2024, defines the circumstances when a wrong-direction movement can take place. One of the listed circumstances when a signaller is permitted to authorise a wrong-direction movement is when a train cannot continue forward and has to return because it has failed, or it cannot be driven from the cab at the leading end. The failed train met this criterion.

66 Signalling staff at Rugby SCC then decided, set up and checked the train's path for the wrong-direction movement. The chosen path aimed to cross train 5Y26 from the Up Slow to the Down Slow line at Denbigh Hall South Junction. Being a wrong-direction movement, it was over a section of track for which no signalled route was provided in that direction. Consequently, there were no controls or checks provided by the signalling system for this movement. This meant the movement relied on the signalling staff correctly setting up the path to be used by the train.

67 However, the path set up for the train to take was not valid and led to the train derailing on the switch diamond points at Denbigh Hall South Junction. This causal factor arose due to a combination of the following:

a. A fault with the train meant the driver was unable to obtain traction from the cab at the train's southern end necessitating the wrong-direction movement (paragraph 68).

b. The SSM proposed, and signaller 1 then implemented, an invalid path for the train to travel (paragraph 84).

c. The checking activities by two signallers and the SSM did not identify that the path set up for the train's wrong-direction movement was invalid (paragraph 94).

Each of these factors is now considered in turn.

*Fault with train 1Y26*

**68 A fault with the train meant the driver was unable to obtain traction from the cab at the train's southern end necessitating the wrong-direction movement.**

69 Following the accident, Siemens maintenance staff investigated the fault with unit 350370 which had prevented the driver from moving the train using its cab at the southern end (paragraphs 31 to 40). The Siemens maintenance staff established that one of the two contacts in the driver's reminder appliance (DRA) switch had failed open circuit.

70 The purpose of the DRA switch is to prevent a driver from setting off before they have checked the aspect of the signal ahead of the train. It does this by stopping traction power from being taken while the switch is in its on position. Typically, a driver might put the DRA to its on position when stopped in a platform and the signal ahead is displaying a red aspect. The switch is illuminated when on, to act as a visual reminder to the driver to check the signal ahead (figure 18). Once the driver has seen that the signal is displaying a proceed aspect, they can move the DRA switch back to its off position, which extinguishes the light and enables traction. Traction is inhibited or enabled by a contact in the DRA switch which is wired into the train's control circuits. When the DRA switch is in the on position this contact is open and inhibits traction. On a class 350 unit this in turn prevents the release of the holding brake.

71 When leaving the cab for a driver change, as part of the handover process, Rule Book Module TW1, GERT8000-TW1, 'Preparation and movement of trains', issue 20 dated December 2024, required the driver leaving the train to set the DRA switch in its on position. By doing this when a driver change takes place, it reminds the incoming driver to check the signal ahead before setting off. The driver who brought train 1Y26 into Bletchley station moved the DRA switch to its on position soon after the train had stopped in the platform. After the handover between the drivers was complete, the next driver sat down in the cab and prepared to set off. As part of their preparation, the driver had already noted that the signal ahead was displaying a green (proceed) aspect so moved the DRA switch to its off position. The switch light went off as expected.


*Figure 18: The DRA switch in the cab of a class 350 unit.*

72 After the senior conductor gave a signal to the driver that the train could depart, the driver moved the power brake controller back to first release the train brakes and then further back to demand traction. The train brakes released to a holding brake, which should automatically release when traction is achieved. However, the holding brake did not release, and the train did not move.

73 The on-train data recorder (OTDR) fitted to the leading end of unit 350370 recorded that the DRA switch had been moved to its off position, that the driver had released the brakes and demanded traction, but that traction was not enabled. This indicated that something was preventing the train from taking traction and explained why the holding brake was not releasing.

74 When fault-finding with the SMC, the driver had explained in their first conversation that the brakes were releasing to the holding brake. This was also mentioned twice more in subsequent conversations. During that initial conversation, the SMC had asked the driver if the DRA switch was in its off position, and the driver had confirmed that it was. While fault-finding, the driver carried out various actions which included moving the DRA switch between its off and on positions several times. However, after carrying out these actions, all attempts to take traction from the leading cab on unit 350370 were unsuccessful.

75 Although the driver had moved the DRA switch to its off position, the failed open circuit switch contact meant an input to the traction control unit was not energised. This was despite all other conditions for allowing traction being met, such as the leading cab being occupied, all the doors being detected as closed, and there being no emergency brake application due to a safety system. As far as the driver and driver manager could tell, there was nothing in the cab that indicated to them what the problem with the train was.

76 The DRA switch module was removed for inspection and testing (figure 19). When the DRA switch contact was first tested while in situ within the DRA module, it remained open circuit. However, when the switch unit was disturbed to remove it from the DRA module, the switch contact began working correctly (figure 19). The switch unit was then taken apart. Under close examination, this showed there was some pitting on the contact faces and a very small amount of black residue. It is likely that these issues had caused the switch contact to fail open circuit, but it began conducting again when it was disturbed.

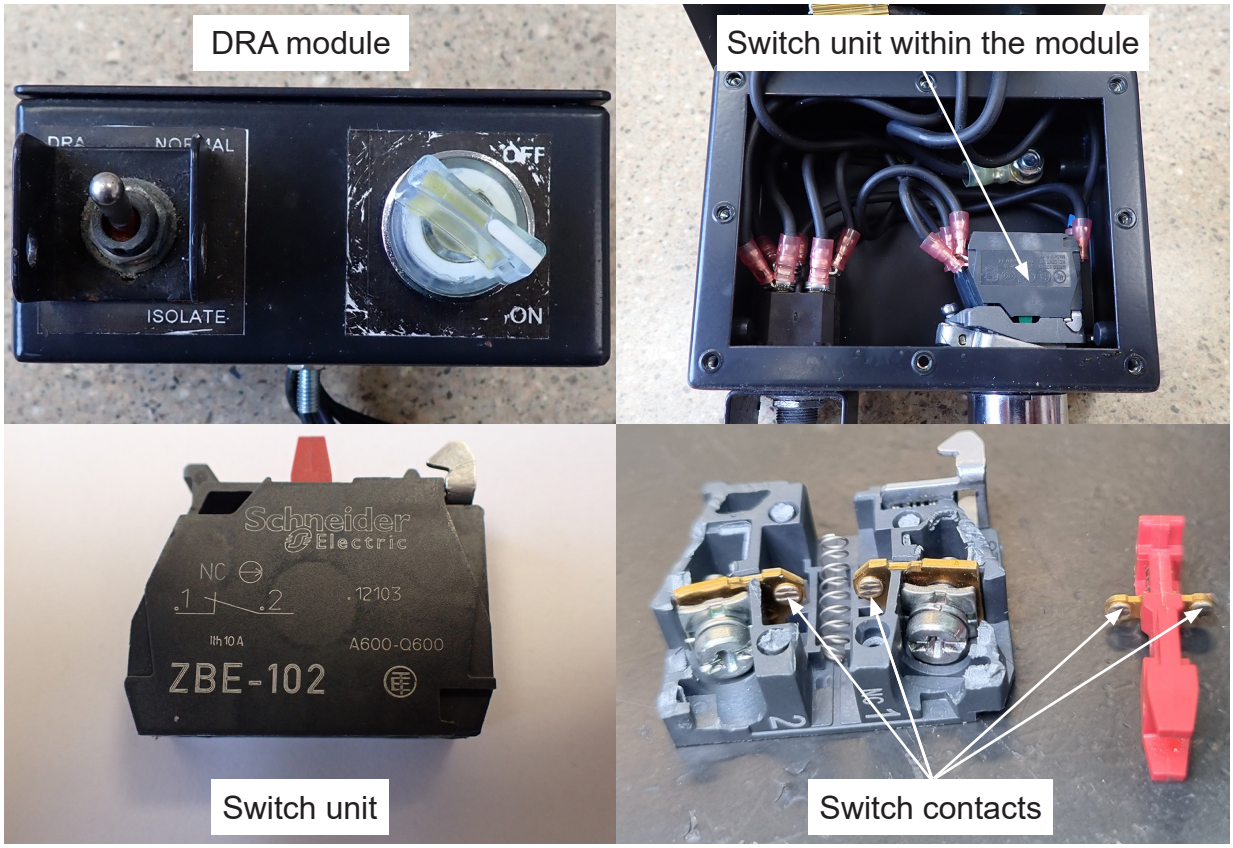



*Figure 19: The DRA module, switch unit and switch contacts.*

77 This DRA module had been installed into this cab of unit 350370 in 2018. It was to be replaced as part of a campaign change due to issues with the DRA switch failing on some class 350 units (the class 350/3 and 350/4 variants). However, Siemens reported no previous history of contact failures within DRA switches on class 350 units that had prevented traction from being taken by drivers.

78 The fault-finding actions carried out by the driver, under instruction from the SMC, had included moving the DRA switch several times. However, no one had thought to break the isolation switch seal and use this switch to isolate the DRA (figure 18). While there was no evidence of any reluctance by anyone to isolate the DRA, there were no prompts to isolate the DRA in the documents used by the SMC when fault-finding. Testing showed that if the isolation switch had been used, the driver would have been able to gain traction from the cab at the southern end. The consequence of isolating the DRA in a leading cab, in accordance with the West Midlands Trains instructions for defective on train equipment, is that the unit must be taken out of service at the first suitable station. It must then go with no passengers onboard to a repair location. This is in effect what happened to the train anyway, when it was declared a failure in the platform at Bletchley station.

79 RAIB reviewed the data from the unit's OTDR and identified that this DRA switch contact had failed in this way previously. It had happened once on 20 June 2025, once on 25 June and again on the day of the accident, when train 1Y26 attempted to set off from Birmingham New Street at 09:06. However, each time the switch contact had begun working again after the DRA switch was moved to the on position and then back to off.

80 None of these issues had been reported by any of the drivers who experienced them. The driver who took train 1Y26 from Birmingham New Street to Northampton later remembered having this problem when trying to set off from Birmingham New Street station. As they did not know what was wrong with the train, they went through their usual restart routine. This involved putting all the controls back to their starting position and trying again. After a third unsuccessful attempt to depart from Birmingham, the driver added turning the DRA switch to on and back to off to their routine. After doing that, they were able to successfully gain traction and set off.

81 When this driver left the train at Northampton station, they could not remember seeing the next driver who was due to take over. However, train 1Y26 is timetabled to dwell for about 10 minutes at Northampton, so this was not unusual. Therefore, it is unlikely that the next driver who took the train from Northampton was told about the earlier issue with the train at Birmingham New Street. By the time train 1Y26 was handed over to the driver at Bletchley, who was driving the train when it derailed, another driver change had taken place at Milton Keynes Central, so this was the third driver change of the journey. Witness evidence is that, when the handover between the third and fourth drivers took place at Bletchley, nothing was mentioned about any problems with the train.

82 Drivers are required to record faults with class 350 units within fault logbooks kept in each cab. Each fault report written by a driver into the logbook is recorded on triplicate sheets. The driver is then required to take one of these sheets out of the logbook and hand it in at the end of their shift. There was no evidence that any of these intermittent faults with taking traction on unit 350370 were reported.

83 West Midlands Trains stated that they did not regard this as unexpected. This is because it is not certain how the requirement placed on drivers to record faults applies when the train has started working again as expected. Witness evidence indicates that if a fault only happens once during a journey and appears to have corrected itself, a driver will tend not to record it in the logbook. However, if the same fault happens again, then a driver will report it.

*Invalid path proposed and set up*

**84 The SSM proposed, and signaller 1 then implemented, an invalid path for the train to travel.**

85 When the SSM spoke to the train running controller in Network Rail control and chose the option to make a wrong-direction movement (paragraph 41), the SSM immediately decided the train should cross from the Up Slow to the Down Slow line at TK262 points. However, this was not possible. It was not a valid path because it involved crossing these points in an unsafe state. The SSM then told signaller 1 what the plan was for train 5Y26 and advised signaller 1 to cross the train over at Denbigh Hall South Junction back onto the Down Slow line. Signaller 1 queried this, but the SSM confirmed that this should be the path used for the movement. Their rationale for using TK262 points was to get the train crossed over from the Up Slow line to the Down Slow line at the first opportunity, to limit the distance travelled in the wrong direction.

86 At 12:11:57, the signalling system recorded that signaller 1 commanded TK262 points to their normal position and then placed a reminder on TK262A points' control. RAIB has been unable to establish why this was done. This was about the time the driver had a problem releasing the brakes from the northern end cab (paragraph 44).

87 At 12:18, just as the driver moved train 5Y26 up platform 4 in Bletchley station (paragraph 44), signaller 1 removed the reminder from TK262A points and put the individual point control for TK262 points back to its centre position. This meant the points were free to be moved by the interlocking should the signaller set a route over them.

88 After signaller 1 told the driver they would set up the wrong-direction movement and call back with instructions (paragraph 44), the signalling system recorded that signaller 1 commanded TK262 points to their reverse position. Signaller 1 again placed a reminder on TK262A points' control. Immediately, signaller 1 then set a further three signalled routes for the train to take it north through Milton Keynes Central (figure 10). Signaller 1 reported that, after setting up the path for the train, it did not look quite right to them. However, the instruction for setting up this path had come from the SSM, who was seen as a very experienced person at Rugby SCC (paragraph 20). Signaller 2, on the adjacent Tring signaller workstation, had overheard the exchange between the SSM and signaller 1 and gained the impression that this particular wrong-direction movement had been done before.

89 Both signaller 1 and signaller 2 trusted the SSM's judgement about this being the correct path for the train's wrong-direction movement. However, very soon after the derailment, the SSM realised that they had asked signaller 1 to set up an invalid path for the train. They could not understand why they had done this as they knew it was not possible to cross from the Up Slow line to the Down Slow line at TK262 points.

90 The SSM was working while dealing with significant personal issues, both long-term and more recent. Witness evidence indicates the SSM did not realise the impact this was having on them and how it was affecting their concentration and decision-making at work. No one at Rugby SCC, including signaller 1 and signaller 2, had noticed any issues with the SSM's performance or behaviour, nor had anyone asked them how they were. Witness evidence suggests that, if the SSM had declared their personal issues to their manager, they would have been taken off duty on compassionate grounds. Had their manager been made aware, Network Rail could also have reviewed the SSM's personal circumstances and taken action, such as providing additional monitoring and support. However, the SSM thought at the time that they were coping, so they did not say anything to anyone.

91 Human performance can be affected by emotions. Generally, negative emotions can impair cognitive performance. They can affect cognition in different ways (such as memory and perception) and can specifically affect decision-making. Much of the research into this area shows that when people are distracted or under stress they are not as effective at making appropriate decisions.

92 Stress can affect decision-making negatively. People under stress can make 'unsystematic and hurried decisions' and may not fully consider all the available options.[1] It may also cause attentional narrowing where people pay more attention to positive information and discount negative information.

93 Research on road users found that internal emotions such as worrying about something can be particularly potent in capturing attention and therefore pose a higher risk of driver distraction.[2] Other research has found that when an individual experiences an emotional reaction (such as anxiety or worry) they are less efficient in processing incoming sensory information and need to work harder to maintain performance levels.[3] Generally, what is thought to happen is that emotions may take up resources, including some working memory. These emotions due to life stresses can have a cumulative effect and stress in one domain of life can spill into others. The difficulty can be in identifying this in individuals. People are often blind to their own emotional states, and this may impact their cognition and behaviour without them being aware of it.

[1] Gok K and Atsan N, 'Decision-Making under Stress and Its Implications for Managerial Decision-Making: A Review of Literature', International Journal of Business and Social Research, 6, pages 38 to 47 (2016).

[2] Cunningham ML and Regan MA, 'The impact of emotion, life stress and mental health issues on driving performance and safety', Road and Transport research 25(3), pages 40 to 50 (2016).

[3] Eysenck MW and Calvo MG, 'Anxiety and Performance: The Processing Efficiency Theory', Cognition and Emotion, 6(6), pages 409 to 434 (1992).

*Invalid path not found by checks*

**94 The checking activities by two signallers and the SSM did not identify that the path set up for the train's wrong-direction movement was invalid.**

95 Once the path for the wrong-direction movement was set up, Rule Book module TW7 required signaller 1 to then make sure the line was safe. This included making sure that all points were in the required position for the train's path and locked by facing point locks (where these were provided). Rule Book module TW7 also required signaller 1 to ask a competent person, if present, to check the path. As signaller 1 was working in the SCC, they expected that the SSM would act as the competent person to check the path for the wrong-direction movement. The SSM would normally do these checks, so this was not unusual.

96 At about this time, signaller 2 on the adjacent Tring signaller workstation went over to the Bletchley signaller workstation. They had overheard the ongoing conversation between signaller 1 and the SSM about the path that was being used for the wrong-direction movement. To learn from what was happening, as they were also competent to operate the Bletchley workstation, signaller 2 went to see what had been done (paragraph 20). While standing next to signaller 1, signaller 2 looked at the proposed path and confirmed to signaller 1 that they thought it looked correct. Signaller 1 still thought it did not look quite right, but as they now believed that two other people had checked it and said it was correct, they felt unable to challenge the proposed path any further.

97 Signaller 1 had not used a route card to set up or check the path for the wrong-direction movement. Similarly, no route cards were used for any of the checks by the others. Route cards are provided for signallers to use, usually when authorising a train to pass a signal displaying a red aspect, in accordance with Rule Book Module S5, GERT8000-S5, 'Passing a signal at danger or an end of authority (EoA) without a movement authority (MA)', issue 12 dated December 2024.

98 Route cards are available on the signaller workstations at Rugby SCC in paper format and detail the path that a train must take from a signal for a specific route. The route card shows information for that specific route, including what position any points within the route must be in. Therefore, the route card acts as a checklist for a signaller to make sure the path is correctly set up. Signallers are first taught to use route cards as part of their initial signaller training. This course, which has varied in length between 10 to 12 weeks over time, is focused on learning and implementing the relevant requirements of the Rule Book by carrying out tasks. Route cards are introduced when the training covers Rule Book module S5. The use of route cards is then covered again during local training when a signaller starts working at a signal box or signalling centre.

99 As there was no signalled route from TK9821 signal along the Up Slow line, no one involved thought there would be a relevant route card, so they did not think to use one. However, the train had used a signalled route to get to where it was at platform 4 at Bletchley station and the route card for that route could have been used in reverse for the wrong-direction movement back along the Up Slow line.

100 Using a route card in reverse for wrong-direction movements is a technique commonly used by experienced signallers. Signallers at Rugby SCC are not trained to do this as part of their initial signaller training. Instead, trainee signallers at Rugby SCC tend to find out about doing this when being mentored by an experienced signaller, during the time spent learning how to operate the signaller workstations. There are risks associated with using a route card in reverse, and specific arrangements might be required to be put in place for some assets along the route, such as level crossings. On the day, neither the SSM nor the two signallers thought to use a route card in reverse for the movement.

101 As the signalling staff involved had not used a route card, they checked the path for the wrong-direction movement by carrying out what is known as a finger check, or finger trace. This involves using a finger to follow the line of the proposed path for the train on the signaller workstation, which might need to go across multiple display screens (figure 20). When following the line, the signaller should check that the points along the line are in the right position and that reminders are applied to those points.

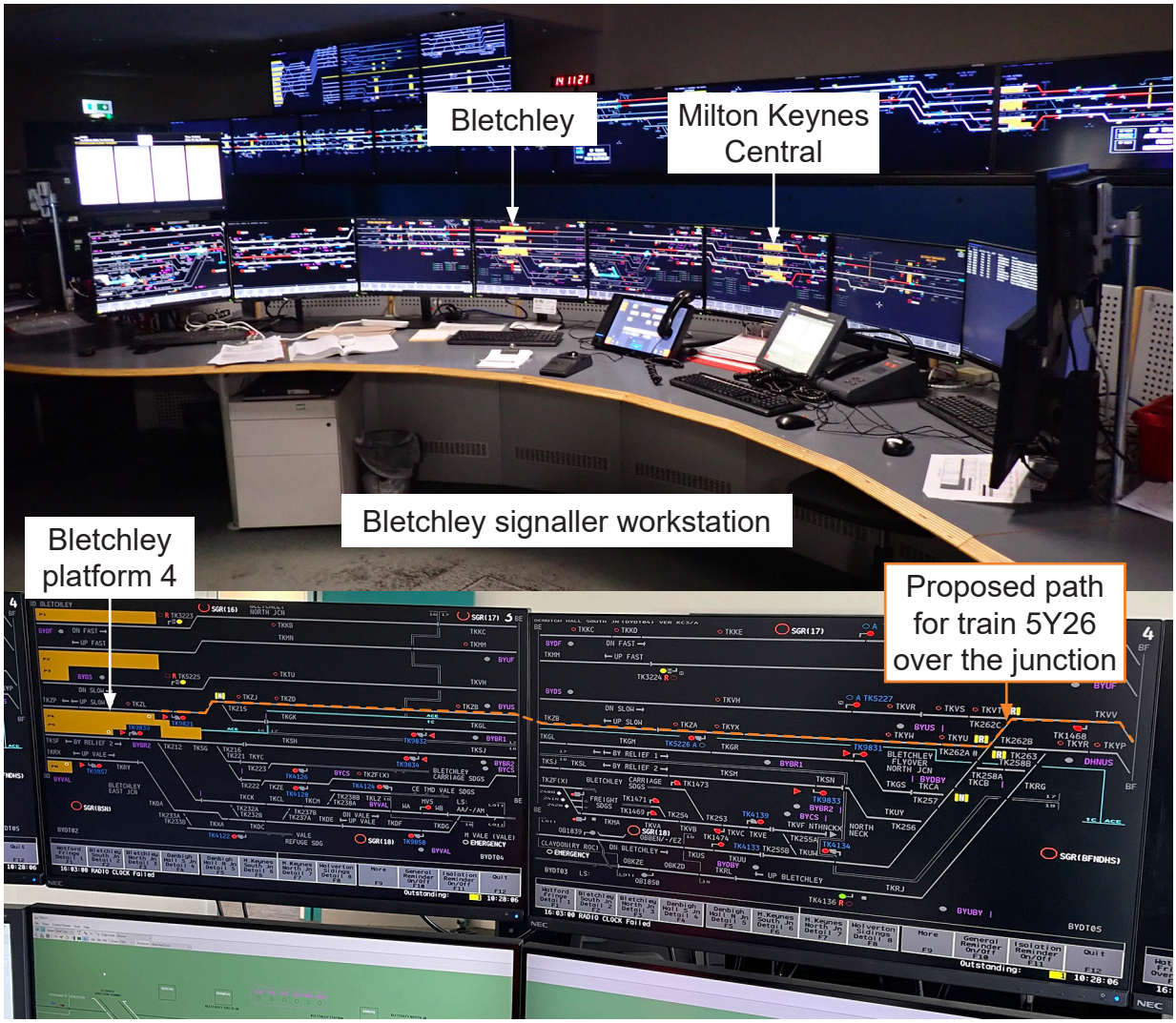



*Figure 20: The Bletchley signaller workstation and finger check for the train's path across multiple display screens.*

102 Signallers should also look for any gaps in the line along the train's proposed path when carrying out this check. A continuous line through all the points along the proposed path for a train indicates that the path has been set up correctly for the safe passage of the train. Conversely, a gap in the line at a set of points shows that the path is not set up correctly at those points. However, none of the checks by anyone on the day of the accident identified that there was a gap in the line at TK262A and TK262B points (figure 21).

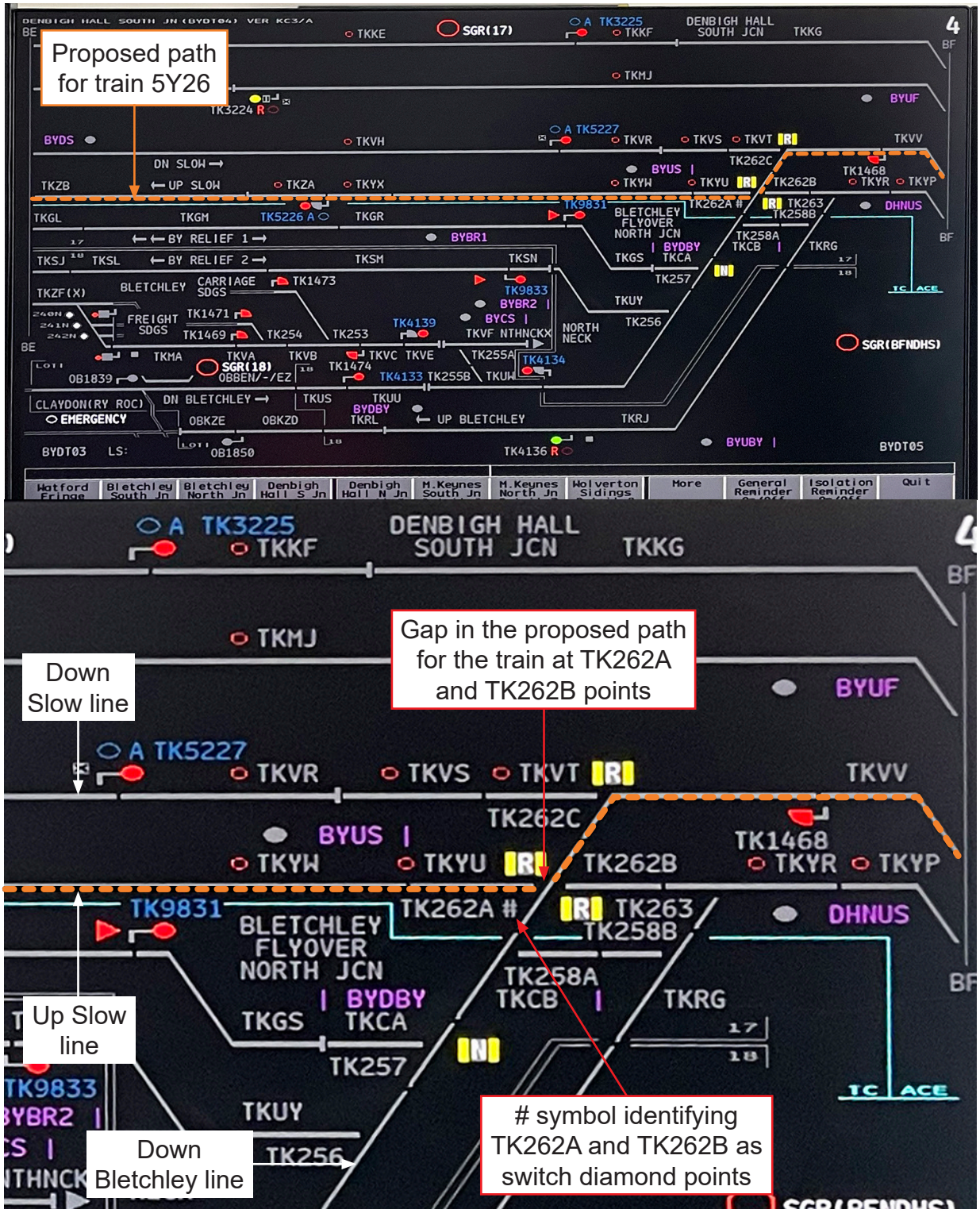



*Figure 21: The gap at TK262A and TK262B points in the train's proposed path and # symbol identifying these points as switch diamond points.*

103 Network Rail stated that it expected that the techniques for managing out-of-course situations, plus the associated non-technical skills that new signallers will need, would be a requirement of the local training plan for each new signaller at Rugby SCC. RAIB, however, found that this check was not taught as part of the formal 4-week training course attended by signallers who are new to Rugby SCC. This is known as systems training and is focused on teaching signallers who are new to the SCC about how to operate a signaller workstation and how to apply the skills they have learned during their initial training on this type of signalling technology.

104 RAIB established that signaller 1 was instead taught how to do the finger check by other signallers at Rugby SCC while being mentored as part of learning how to operate the workstations. While this mentoring formed part of the planned local training for signaller 1, it was much less structured than the systems training.

105 When doing the finger check, signaller 1 focused on checking that the points were in the correct position and that reminders were applied to them. They did not check for gaps in the proposed path. The SSM was aware that it was good practice to trace the proposed path set up for a train with a finger even when a route card has been used. However, they could not remember doing such a check that day.

106 Signaller 2 had been taught about the finger check during their training when learning to work at single manned signal boxes in the East Midlands area. When they started working at Rugby SCC, it was something they were already used to doing. However, they could not remember being specifically told to look for a continuous path along the proposed route for a train when doing the finger check on a signaller workstation.

107 Witness evidence shows that a clear understanding was not reached over who acted as the competent person and checked the proposed path for the train as required by Rule Book module TW7. Signaller 1 thought that the SSM had checked the path, with signaller 2 then carrying out a second check to confirm it was set up correctly. The SSM was unsure if they had carried out any checks and believed that signaller 2 had done the formal check as the competent person. Signaller 2 thought the path had already been formally checked by someone else, such as the SSM, so had just looked at it to see if the points were in the right position with reminders applied to them. On this basis, RAIB has concluded that it is unlikely that anyone formally checked the path for the wrong-direction movement in accordance with Rule Book module TW7.

108 Staff responsible for the training of signallers at Rugby SCC acknowledged that the finger check was not part of the initial signaller training or systems training. However, they were clear that signallers were required to know how to perform this check and that it should include checking that the line along the train's path is unbroken throughout on the display, not just that points are in the correct position and that reminders are applied.

109 Carrying out the finger check when no route is set means all the lines on the display are thin and grey. This possibly makes it easier to miss or overlook any gaps in the proposed path for a train. When a route is set, the lines are white and thicker, and probably easier to follow.

110 Whatever checks did take place, no one identified the unsafe points in the proposed path for the train. The signalling logs show that signaller 1 completed setting up the proposed path for the train at 12:20:46, before going on straight away to set the three onward routes for the train from 12:20:55 to 12:21:14. Signaller 1 then began a call to the driver at 12:21:26, just 12 seconds later, to give their instructions for making the wrong-direction movement. Therefore, the amount of time for any meaningful check between the path being set up and the driver being given their instructions for the movement was very short.

111 Wrong-direction movements are carried out by signallers infrequently. Signaller 1 had carried them out less than five times since starting at Rugby SCC and signaller 2 had carried them out about four times in the previous 2 years. The relative inexperience of signaller 1 meant they did not realise the significance of there being switch diamond points in the path set up for the movement. It is possible that a more experienced signaller might have told the SSM that the movement over TK262 points could not be done that way. The training of signallers is discussed further in paragraph 122.

## Unsafe points not noticed

**112 No one in the train's leading cab noticed that the switch diamond point ends were in an unsafe position for the train to pass over them.**

113 Signaller 1 gave instructions for the wrong-direction movement to the driver, explaining that the train would pass over TK262 points to go from the Up Slow to the Down Slow line. Signaller 1 also told the driver to proceed at caution and to check the points as they go. Section 4.1 of Rule Book module TW7, which covers points and crossings, states that, during a wrong-direction movement, drivers must approach any points, switch diamonds or swing-nose crossings at caution. Rule Book module TW7 also states that drivers must make sure, if possible, that the points are in the correct position. This section requires a driver not to pass over any points or crossings at more than 15 mph (or 25 km/h) during such movements.

114 The Rail Safety and Standards Board (RSSB)[4] advised that the rule which requires trains to pass over points at no more than 15 mph (or 25 km/h) during a wrong-direction movement was introduced during revisions to the Rule Book in 1988. Initially it only applied to movements over facing points after a driver was authorised to pass a signal at danger, or when a driver was making a wrong-direction movement. When Rule Book module TW7 was further updated in 2012, this requirement was changed to apply to all wrong-direction movements over points (so in both the facing and trailing directions).

115 Between 2004 and 2014, changes were considered by the rail industry to Rule Book Module P1, GERT8000-P1, 'Single line working' to increase the maximum speed allowed during single line working. Each time a change was considered, the associated work identified that the 15 mph (or 25 km/h) limit mitigated hazards due to points not being correctly set.

[4] The Rail Safety and Standards Board (RSSB) is a not-for-profit company owned by major industry stakeholders. It is the independent safety, standards and research body for Great Britain's rail network.

116 In 2004, the only identified consequence due to points not being correctly set was derailment. By 2014, this had changed to additionally include consequences such as points being run through or damaged, or a train travelling at excessive speed over the points (which results in increased lateral forces on people and objects on the train). While the speed for single line working was increased in 2014, the rules still required the first train through to approach any points at caution, check the position of those points if possible and proceed over the points at no more than 15 mph (or 25 km/h).

117 By approaching the points at caution, it gives a driver the opportunity to check the position of the points. The requirement to go over points at no more than 15 mph (or 25 km/h) would also influence the speed which drivers regarded as being appropriate for a movement at caution when approaching any points in these circumstances. The limit is also a mitigation against the consequences of a driver not being able to see, or misreading, the position of any points.

118 The driver knew the requirement to proceed over points at no more than 15 mph (or 25 km/h) when making a wrong-direction movement. While the train had reached a speed of 36 mph (58 km/h) during the movement, the driver had applied the train's brakes and slowed down to 15 mph (24 km/h) when about 40 metres from the switch diamond point ends (paragraph 47). Analysis by RAIB suggests that this probably gave the driver and driver manager about 6 seconds to check their position and stop the train if they saw a problem.

119 When the front of the train was lifted and then derailed (paragraph 50), the driver and driver manager could not initially understand what had happened. Witness evidence indicated that both agreed that the points were set at the junction for the train to cross to the Down Slow line, which matched what the driver had been told by signaller 1. Witness evidence also indicated that both saw the position of the further away TK262B point ends, which were facing. These were set in the reverse position to divert the train towards the Down Slow line. However, neither identified the position of the nearer TK262A point ends, which were trailing. Being in the reverse position meant the train would incorrectly run through them.

120 The design and position of the switch rails for a switch diamond (paragraph 18) make it much more difficult for a driver to see the position of both point ends from their cab. The driver and driver manager had about 6 seconds to view and determine the position of the point ends once the train was travelling at 15 mph (24 km/h). However, at the start of this time, both point ends would have been about 40 metres away from them, and difficult to see. As the train got closer, the positions of the point ends would have become easier to see, but the period remaining to observe them and draw a conclusion as to their position would have been shorter. This would also have left the driver without much time to act should they have become aware of a problem.

121 Approaching more slowly than 15 mph (24 km/h) would have increased the amount of time that the driver and driver manager had to view the point ends positions, draw conclusions, and take any necessary action. It would also have given the driver more time to view the point ends when closer to them, when it would have been easier to determine their position. However, the driver and driver manager may still have focused on the facing part of the switch diamond, which was easier to see, and made an assumption from the position of the facing point ends alone that the switch diamond as a whole was in the correct position. The training of drivers on switch diamond points is discussed further in the next section.

## Identification of underlying factors

### Staff knowledge of switch diamond points

**122 The Network Rail signalling staff and West Midlands Trains driving staff involved in this accident had variable knowledge and understanding of what switch diamond points were and how trains operated over them. This is a probable underlying factor.**

#### *Network Rail signallers*

123 Switch diamond points meant very little to signaller 1 before the derailment. Signaller 1 knew that TK262A and TK262B point ends were switch diamond points as they were identified on the signalling display by a # symbol (figure 21). However, signaller 1 only used this information for applying the required rules for when these points failed.

124 Rule Book Module TS11, GERT8000-TS11, 'Failure of, or work on, signalling equipment - signallers' regulations', issue 7 dated December 2024, defines what signallers are required to do to manage a power operated points failure. These rules state that all failures which affect switch diamonds or swing-nose crossings should be managed as a complex failure, where additional requirements must be followed. While signaller 1 knew what was required to be done when the switch diamond points failed, they did not know that trains could only go in certain directions over them (figure 8). Signaller 1 had also never seen switch diamond points out on the track.

125 Signaller 2 was more familiar with switch diamond points and knew what a # symbol on a signaller workstation screen meant. However, they had not noticed it when they looked at the proposed path for the wrong-direction movement.

126 Signaller training on switch diamond points is limited and the knowledge each signaller had about them tended to be related to the amount of experience they had gained while working as a signaller. The initial signaller training course includes some basic information on points, but the focus is on explaining what trailing points and facing points are, in relation to setting routes. There is a picture of switch diamond points shown in the training material, within a short section that provides an overview of track infrastructure. However, this was one presentation slide in a 10 to 12-week course (paragraph 98).

127 Network Rail stated that it expected new signallers to learn about switch diamond points as part of their local training if this type of infrastructure was present in the geographical control area covered by the signal box or signalling centre they were working at. RAIB found that the systems training at Rugby SCC did not include any specific training material about switch diamond points and that neither signaller 1, nor signaller 2, had received any specific training about switch diamond points during their local training.

*West Midlands Trains drivers*

128 The Rule Book gives three specific circumstances when drivers must, if possible, make sure that any points, switch diamonds or swing-nose crossings are in the correct position for their train. These are contained in modules P1 (when single line working is implemented), S5 (when authorised to pass a signal at danger), and TW7 (when making a wrong-direction movement). Each of these Rule Book modules state '*approach all points, switch diamonds and swing-nose crossings at caution*' and so refer to switch diamond points separately to other types of points.

129 These activities are all carried out infrequently by individual drivers. As switch diamond points are uncommon pieces of railway infrastructure, it would be even rarer for a driver to be required to check the position of their point ends during an out-of-course movement.

130 The West Midlands Trains training material for new drivers, which covered points in a section about track infrastructure, was focused on understanding basic information about points such as what facing and trailing means. It also covered the different types of points a driver might encounter such as powered points, hand operated points and trap points. The training material aligned with the driver's experience from the training they had received on the types of points. The driver had no recollection of being told in any depth about switch diamond points during their training.

131 The driver training material also included learning the requirements in Rule Book modules S5, P1 and TW7 to approach points at caution and not pass over any points (both facing and trailing) at more than 15 mph (or 25 km/h). It also stated that, where practical, drivers must make sure the points are in the correct position for their train. There was no specific mention of switch diamond points in this part of the training on the rules.

132 RAIB found a previous relevant derailment on switch diamond points which highlighted how a driver going slower than 15 mph (24 km/h) while looking out for the position of points in daylight can still miss seeing that the switch diamond point ends were in an unsafe position. This derailment happened in 2003 at Hemel Hempstead South Junction (figure 3) after the driver had been authorised to pass a signal at danger. As the driver had been involved in a previous incident after being authorised to pass a signal at danger, they proceeded very cautiously. They were travelling at 10 mph (16 km/h) and were specifically looking out for the position of all the points in their path during the movement. However, that driver still did not manage to see that the switch diamond point ends were in the wrong position for the movement they were making before their train derailed (figure 22).

133 The industry report for this derailment included a recommendation to the train operating company to ensure that the driver was trained to identify the correct position of switch diamond points and to consider extending this training to other drivers and future trainee drivers. The train operating company was a previous holder of the franchise that is now held by West Midlands Trains.

134 The current training provided to new drivers at West Midlands Trains does not include any specific information about switch diamond points. West Midlands Trains stated to RAIB that it believed that information about switch diamond points had been added to the training after the Hemel Hempstead derailment, but it had since been taken out when the training materials were updated.


*Figure 22: Derailed train on switch diamond points at Hemel Hempstead South Junction (courtesy of Network Rail).*

135 Following initial training, the knowledge of different types of points and what drivers should look out for is not covered by any part of the ongoing driver competence management process. The formal assessments of drivers carried out by driver managers are primarily focused on the driver's train handling, performance and behaviours when driving. Out-of-course events are covered during these assessments, but usually as discussions, with the driver manager asking the driver what they would do for a particular out-of-course event to check the driver's understanding of the relevant rules or procedures for that scenario. As part of their competence management regime, drivers are subject to a summary assessment every 2 years. This assessment is focused on the driver's knowledge of the rules. It includes checking a driver's knowledge of Rule Book modules S5, P1 and TW7 but there are no specific questions about the types of points a driver might encounter, or what to look for when they do.

136 Rail Industry Standard RIS-3702-TOM, 'Management of Route Knowledge', issue 3 dated March 2020, explains how drivers need a complete understanding of the route features that are essential to complete driving tasks safely. This includes a requirement for train operators, such as West Midlands Trains, to undertake route risk assessments. The purpose of a route risk assessment is to identify the information that staff need to know to operate safely and effectively over a specific route. This then forms the basis of any training requirements or route knowledge needed by a driver to drive trains over that route. West Midlands Trains' route risk assessment does not include any entries for switch diamond points.

137 The switch diamond points at Denbigh Hall South Junction are not in the route risk assessment that included this location. This may explain why there was no consequent identified need for drivers to be trained to know anything about such points, including where they are located. As a result, the assessment does not take account of the potentially increased risks associated with a driver making an out-of-course movement over switch diamond points, such as the driver not being able to make sure the point ends are in the correct position.

### *Checking staff competence*

138 Rule Book modules S5, P1, TW7 and TS11, and the references to switch diamonds within them, relate to out-of-course events that involve both drivers and signallers. The references in Rule Book module TS11 date back to at least 1984 (within Section E which covered the failure of signalling equipment). RSSB identified that specific references to drivers checking the position of switch diamond points were included in Rule Books going back much further, as far as 1933. These old Rule Book references solely related to a train being authorised to pass a defective stop signal at danger, requiring the signaller to make sure the switch diamond points were in the proper position and the driver making sure the same before passing over them.

139 As part of managing their competence, all the staff involved in this accident were subject to assessments that checked their knowledge, understanding and application of the rules. However, the questions in these assessments only ever referred to points in a generic way. None made specific reference to switch diamond points, even though these items could be considered as being higher-risk infrastructure during out-of-course events. This is because, as this accident shows, they have the potential to make setting paths more complicated for signallers and are also more difficult for a driver to determine their position during a movement over them.

140 Other signaller and driver competence management activities are largely based on managers observing staff while they are performing their normal duties. Managers very rarely see how staff respond to an out-of-course event (such as a wrong-direction movement) during an assessment. Given the scarcity of out-of-course events, managers would have even less chance of observing one involving switch diamond points.

141 Another way of checking and managing staff competence, particularly for out-of-course and/or unusual tasks, is by using simulators. Drivers at West Midlands Trains were not subject to any simulator-based assessments as part of their competence management regime. West Midlands Trains is considering changes to its driver competence management regime to make use of the simulators it has for new trains that it has recently introduced, which are replacing the class 350 units. It is unknown if any of the routes covered on the new simulators will include a junction with switch diamond points.

142 The signallers at Rugby SCC are subject to a simulator-based assessment every year. These assessments make use of a signaller workstation simulator at the SCC which is also used for the systems training undertaken by new signallers. Different out-of-course event scenarios, including one for wrong-direction movements, are covered in a 3-year cycle. However, there is no evidence that any of the simulator-based activities checked signaller knowledge or understanding of switch diamond points.

## Signaller training for out-of-course movements

**143 Network Rail's local training for signallers, when applying Rule Book modules S5 and TW7, did not sufficiently account for the information, strategies and knowledge used by experienced signallers. This is a possible underlying factor.**

144 After completing initial signaller training and systems training, trainee signallers at Rugby SCC learned how to become a signaller on specific signaller workstations through mentoring with an experienced signaller. This included the experienced signallers telling the newer signallers about some of the informal tools and ways of working that they used to manage certain situations. As an example, this mentoring period is when signaller 1 was told about using the finger check.

145 However, RAIB's investigation found there were inconsistent ways of working between signallers. There were also differences in the practices that managers expected would be adopted, and those that were followed by the signalling staff on the day of the derailment. There was, for example, an inconsistent approach to using route cards for a wrong-direction movement. No one involved considered using a route card in reverse on the day of the accident, whereas those responsible for signaller training and management had expected, from their experience, that the signalling staff involved would have known to do this (paragraph 100). In addition, when undertaking finger checks, some signallers were focused on point positions and reminders being applied and did not look for gaps in the proposed path for a train. However, those responsible for signaller training and management had expected the signallers to know that they needed to look for gaps when carrying out this check (paragraphs 102 to 106).

146 Since it became operational in 2005, RAIB has investigated numerous incidents in which signaller decision-making has been pivotal. During these incidents, the safety of the railway system was heavily dependent on the decisions being made by signallers, particularly as they happened when there were no, or limited, engineered safeguards available.

147 In May 2020, RAIB published a class investigation into factors affecting safety-critical human performance in signalling operations on the mainline railway network (RAIB report 03/2020). This work focused on data for incidents over a 5-year period which highlighted the vulnerable nature of such decision-making by signallers. It considered what factors affected signaller decision-making and identified that one of the most significant components was experiential knowledge. This comprised both local and geographical knowledge of their area, as well as a less tangible representation of the overall task itself (such as train service patterns, the types of infrastructure and equipment, or relationships with people in other roles).

148 The class investigation noted that signallers' decisions are based not only on an understanding of railway rules, but also their extended experience of local conditions and dealing with different operational scenarios. The investigation identified that knowledge from these experiences has a profound effect on the strategies that signallers use and the decisions that they make. It also noted a link between the number of operational irregularities and the inexperience of signallers and found numerous examples of local ways of working that experienced signallers were aware of, but inexperienced signallers were not.

149 Research by Network Rail had suggested that only about half of this type of local knowledge was imparted through documentation (such as instructions and procedures), with the rest derived informally through experience. Despite the clear importance of this experiential knowledge, it was not formalised in signaller training (although experience, by definition, is gained over time).

150 The class investigation reported that further research into the psychology of expert decision-making has shown that some types of training (such as simulation or operational exercises) can accelerate the gaining of experiential knowledge. Signallers at Rugby SCC have some opportunities to do this for out-of-course events (paragraph 142). Some strategies are also shared between signallers to increase experiential knowledge typically through mentoring or, in larger signalling centres like Rugby SCC, through ad hoc support from working alongside others.

151 The class investigation identified that relying on the informal development of experiential knowledge to close gaps in training or procedures may introduce vulnerabilities for tasks that are performed infrequently. It also identified that this could lead to inconsistencies in ways of working between different signallers. This investigation has found similar issues with how experiential knowledge was being passed to new signallers at Rugby SCC.

152 The class investigation made a recommendation to Network Rail to carry out research to better understand what constituted experiential knowledge of experienced signallers and how such knowledge contributed to safe and efficient performance. It then called for Network Rail to incorporate its findings into the training and development of all signallers. Network Rail's response to this recommendation is discussed in paragraphs 167 to 171.

## Observations

**153 Because this was a wrong-direction movement, Rule Book module S5 did not allow the signaller to authorise the driver to pass TK9821 signal at danger.**

154 Before the wrong-direction movement took place, as part of their instructions to the driver, signaller 1 authorised the driver to pass TK9821 signal at danger (paragraph 46). However, Rule Book module S5 did not permit the signaller to do this. There are 17 circumstances listed in Rule Book module S5 for when a signaller can authorise a driver to pass a signal displaying a red aspect, but none of these circumstances applied to this scenario.

155 RSSB advised that, as a wrong-direction movement was taking place in accordance with Rule Book module TW7, the train was taking an unsignalled path. This meant TK9821 signal, despite being a red signal situated in front of the train, was not applicable to the movement that was being made. Consequently, RSSB's view was that Rule Book module S5 did not apply in this scenario, meaning there was no requirement for signaller 1 to authorise the driver to pass the red signal.

156 Those responsible for the training and management of the signalling staff at Rugby SCC appreciated the view held by RSSB but thought it unlikely that any driver would set off without one of their signallers first authorising that driver to pass a red signal in front of their train. Similarly, staff responsible for the drivers at West Midlands Trains expected that none of their drivers would ever pass a signal displaying a red aspect unless authorised to do so by a signaller. This was confirmed by several drivers and driver managers who were asked about this scenario.

## Previous occurrences of a similar character

157 As part of this investigation, RAIB obtained the industry report for the derailment at Hemel Hempstead in February 2003 (paragraphs 132 and 133). For this investigation, RAIB also collated data from a rail industry safety reporting system for incidents relating to wrong-direction movements recorded in the period from 1 January 2015 to 30 June 2025. RAIB identified 32 events in the data that were relevant to wrong-direction movements. The most common issues were related to signallers not setting up the path for the wrong-direction movement correctly (13 events) and drivers moving their train when not yet authorised to do so (8 events). None of the 32 events led to a derailment.

158 RAIB identified one further incident in the data which involved switch diamond points. It happened at Bushbury Junction on 16 July 2019. A freight train was diverted onto the wrong line via switch diamond points after only one of the point ends was secured in the correct position (figure 23). At the time, a trainee signaller was managing a points failure which required the freight train to be authorised to pass a signal at danger in accordance with Rule Book module S5.

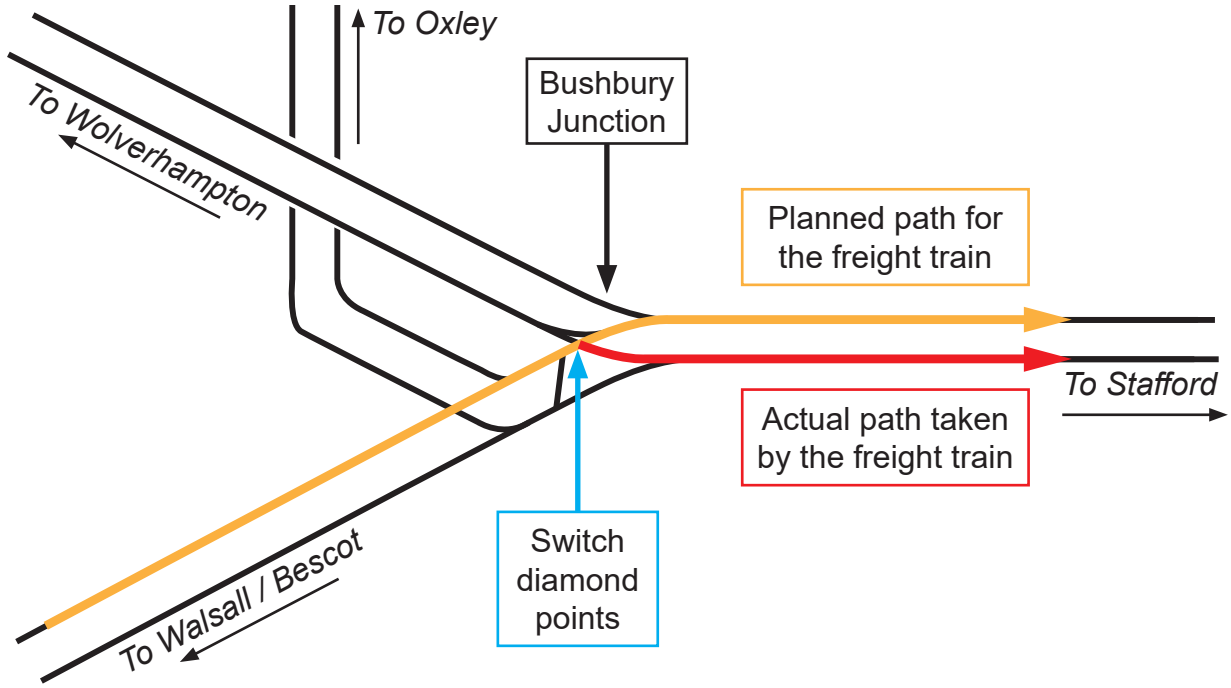



*Figure 23: Intended and actual paths taken by the freight train at Bushbury Junction.*

159 A MOM, who was at the junction and acting as a route setting agent, was told by the trainee signaller to secure only one of the switch diamond point ends. A route setting agent is a competent person appointed to co-ordinate the manual operation of points during a complex points failure (paragraph 124). The trainee signaller then authorised the driver to move after giving their instructions. The train set off and passed over the switch diamond points which were in an unsafe position. However, the train did not derail and instead was diverted onto the adjacent line, going in the wrong direction. It then continued along the adjacent line towards a stationary passenger train. The freight train stopped about 0.25 miles (0.4 km) from the passenger train when the driver realised that they were on the wrong line. As the incident happened at night, the driver did not see that the switch diamond points were in the wrong position for the movement.

160 The industry investigation found that the trainee signaller and duty signaller had not followed Rule Book module S5; the route card was used incorrectly, and no checks were carried out by a competent person, as both signallers were involved in setting up the train's path. There were other similar factors to those found during this investigation, with staff not following rules correctly, staff working while affected by significant personal issues, and staff not understanding how switch diamond points work, and how trains should operate over them.

# Summary of conclusions

## Immediate cause

161 TK262A and TK262B switch diamond points were in an unsafe position for the direction that train 5Y26 was travelling over them (paragraph 57).

## Causal factors

162 The causal factors were:

a. Train 5Y26 was making a wrong-direction movement but the path that the train was authorised to take was invalid as it involved passing over points in an unsafe condition (paragraph 63). This causal factor arose due to a combination of the following:

i. A fault with the train meant the driver was unable to obtain traction from the cab at the train's southern end necessitating the wrong-direction movement (paragraph 68), action already taken (see paragraph 172).

ii. The SSM proposed, and signaller 1 then implemented, an invalid path for the train to travel (paragraph 84), **Recommendation 1**, **Learning points 1 and 2**.

iii. The checking activities by two signallers and the SSM did not identify that the path set up for the train's wrong-direction movement was invalid (paragraph 94), **Recommendation 1**, **Learning point 3**.

b. No one in the train's leading cab noticed that the switch diamond point ends were in an unsafe position for the train to pass over them (paragraph 112), **Recommendation 3**, **Learning point 4**.

## Underlying factors

163 The underlying factors were:

a. The Network Rail signalling staff and West Midlands Trains driving staff involved in this accident had variable knowledge and understanding of what switch diamond points were and how trains operated over them. This is a probable underlying factor (paragraph 122), **Recommendations 2 and 3**.

b. Network Rail's local training for signallers, when applying Rule Book modules S5 and TW7, did not sufficiently account for the information, strategies and knowledge used by experienced signallers. This is a possible underlying factor (paragraph 143), **Recommendation 1**.

## Observations

164 Although not linked to the accident on 26 June 2025, RAIB observes that:

a. Because this was a wrong-direction movement, Rule Book module S5 did not allow the signaller to authorise the driver to pass TK9821 signal at danger (paragraph 153), **Recommendation 4**.

# Previous RAIB recommendations relevant to this investigation

165 The following recommendation, which was made by RAIB as a result of a previous investigation, has relevance to this investigation.

Class investigation into factors affecting safety-critical human performance in signalling operations on the national network, RAIB report 03/2020, Recommendation 4

166 This recommendation reads as follows:

> *Recommendation 4*
>
> *The intent of this recommendation is to improve the capabilities of all signallers through training that better understands the information, strategies and knowledge used by experienced signallers.*
>
> *Network Rail should carry out research with the objective of better understanding what constitutes experiential knowledge of experienced signallers (both in general and specific to a location), how such knowledge contributes to safe and efficient performance, and then incorporating the findings into the training and development of all signallers. This may include, but not be limited to, training at signalling school and/or local initiatives, such as structured mentoring, simulated scenarios or operational exercises for both initial and refresher training.*

167 In June 2025, the Office of Rail and Road (ORR, the safety authority for railways in Great Britain) reported that this recommendation had been implemented by Network Rail. In addressing the recommendation, Network Rail reported it had commissioned two research projects aimed at improving its understanding of what constituted experiential knowledge of experienced signallers and identifying how this could be used to improve the training and development of signallers. Network Rail reported that the research findings were then incorporated into its signaller training. Using the output from the research, Network Rail had updated its company standard NR/L3/OPS/045/2.17, 'National Operating Procedure 2.17 – Signaller Selection and Training', issue 01 dated 2 September 2017.

168 Issue 02 of NR/L3/OPS/045/2.17 describes new signaller training in two stages. Stage 1 is initial signaller training (paragraph 98). Stage 2 is local training and covers additional subject areas according to the infrastructure and work practices for the location where the signaller will be working. It covers areas such as the geography of the control area, the types of signals and equipment, level crossings, yards and sidings, routing and regulation of trains, stations and train operations.

169 At the end of the stage 2 training, the signaller's competence is assessed ahead of them being passed out to work unsupervised at that location. Appendix B in issue 02 of NR/L3/OPS/045/2.17 provides a detailed framework for local training plans to achieve the stage 2 training, which is much more detailed than in issue 01. In both issues, the local training framework required signallers to be trained to know the types of points in their control area. However, this investigation found the signallers involved had variable levels of knowledge about the points under their control.

170 The information given to signallers 1 and 2 during their local training, primarily by experienced signallers through mentoring, about the informal tools and techniques that they could use was variable and incomplete. The need for new signallers to shadow experienced colleagues during local training was mentioned in issue 01 of NR/L3/OPS/045/2.17, but the stage 2 training framework in issue 02 now provides much more detail about the supervision of trainee signallers. The issue 02 framework also includes a section about learning tips used by experienced signallers to avoid operating irregularities under a new section about incidents and lessons learned.

171 Issue 02 was not published until 6 September 2025, after this accident had happened. Network Rail stated that this issue was available to preview as an upcoming revised standard before the accident occurred and that it had started plans and actions to adopt the requirements in issue 02. These included briefing out the changes being introduced, and taking steps to ensure that training facilities could be suitably equipped with a simulator and the resources needed to operate them.

# Actions reported as already taken or in progress relevant to this report

## Actions reported that address factors which otherwise would have resulted in an RAIB recommendation

172 Siemens has updated the fault-finding guidance for its maintenance controllers so that potential problems with the DRA switch are now considered when fault-finding. The guidance includes using the DRA isolation switch, which might then allow the train to be driven from the leading cab. Although this would still require the train to be taken out of service at the first suitable location (paragraph 78), it would potentially avoid the need for a wrong-direction movement.

## Other reported actions

173 Network Rail issued a safety bulletin soon after the accident took place. This gave an overview of what had happened and raised discussion points for staff to consider. These included understanding the capabilities of the infrastructure, and staff taking time to assure themselves that the chosen route is valid and correct decision-making.

174 Network Rail revised its systems training course for new signallers at Rugby SCC to include specific references to switch diamond points. The changes made included general information about switch diamond points in week 1 and specific information about managing failures and out-of-course events involving switch diamond points in week 4. In parallel, Network Rail updated the local signaller training plan to include information specific to TK262 points. These changes explain how TK262 points operate and what routes are valid over these switch diamond points. Also, when learning to operate the Bletchley workstation, the local signaller training now includes practical scenarios for out-of-course events which involve TK262 switch diamond points.

# Recommendations and learning points

## Recommendations

175 The following recommendations are made:[5]

1 *The intent of this recommendation is to reduce the risk of signallers setting up an unsafe path for a train during an out-of-course event when the protection normally provided by the signalling system may be wholly or partly absent.*

Network Rail should develop structured training for its signallers on the tools and techniques it intends its signallers to use when setting up and checking the proposed path for a train during an out-of-course event or during degraded operations, such as when a train is required to make a wrong-direction movement, or is authorised to pass a signal at danger.

A timebound plan should then be implemented to deliver this training to signallers who need to use these tools and techniques, to ensure a consistent approach is adopted to these tasks. This training should also be included as part of the training framework for new signallers who need to use these tools and techniques (paragraphs 162a.ii, 162a.iii and 163b).

2 *The intent of this recommendation is to reduce the risk of an unsafe movement taking place over a switch diamond or swing-nose crossing.*

Network Rail should develop training for its signallers to give them the appropriate level of knowledge and understanding of switch diamond points and swing-nose crossings to allow them to be able to undertake their duties, in accordance with the Rule Book, primarily when responding to and managing an out-of-course event.

[5] Those identified in the recommendations have a general and ongoing obligation to comply with health and safety legislation, and need to take these recommendations into account in ensuring the safety of their employees and others.

Additionally, for the purposes of regulation 12(1) of the Railways (Accident Investigation and Reporting) Regulations 2005, these recommendations are addressed to the Office of Rail and Road to enable it to carry out its duties under regulation 12(2) to:

(a) ensure that recommendations are duly considered and where appropriate acted upon; and

(b) report back to RAIB details of any implementation measures, or the reasons why no implementation measures are being taken.

Copies of both the regulations and the accompanying guidance notes (paragraphs 200 to 203) can be found on RAIB's website www.gov.uk/raib.

A timebound plan should then be implemented to deliver this training to all signallers whose geographical area of control includes switch diamond points and/or swing-nose crossings, so that these staff have a consistent level of knowledge and understanding about these items of railway infrastructure. This training should also be included as part of the training framework for newly recruited signallers and those signallers moving to a new location and potentially encountering switch diamond points and swing-nose crossings in their geographical area of control for the first time.

This recommendation may apply to Network Rail staff who are competent to act as route setting agents (paragraph 163a).

3 *The intent of this recommendation is to reduce the risk of an unsafe movement taking place over a switch diamond or swing-nose crossing.*

West Midlands Trains should include switch diamond points and swing-nose crossings within the training needs analysis and route risk assessments that form the basis for its driver training and route knowledge requirements. It should then develop training for its drivers and driver managers to give them the appropriate level of knowledge and understanding to undertake their duties, in accordance with the Rule Book, when making a train movement over switch diamond points or a swing-nose crossing during an out-of-course event.

A timebound plan should then be implemented to deliver this training to drivers and driver managers who drive over routes where these items of railway infrastructure are present. This training should also be included as part of the training framework for new drivers.

This recommendation may apply to other transport undertakings (paragraphs 162b and 163a).

4 *The intent of this recommendation is to address the risk of signallers or drivers unintentionally not following rules due to how conflicting parts of the Rule Book should be applied.*

The Rail Safety and Standards Board, in consultation with the rail industry, and involving recognised industry processes, should review GERT8000 Rule Book modules S5 ‘Passing a signal at danger or an end of authority without a movement authority’ and TW7 ‘Wrong-direction movements’. It should consider whether these modules need to account for the scenario where a signal at danger is located at, or near to, the start location of the path for a planned wrong-direction movement, but the intended path for the train when making the wrong-direction movement is in a direction that is not a signalled route from that signal.

The output of the review should then be used to propose any required changes to GERT8000 Rule Book (paragraph 164a).

## Learning points

176 RAIB has identified the following important learning points:[6]

1 This accident demonstrates the impact that personal issues may have on staff working in a safety-critical role without them necessarily realising the effect it is having on their decision-making. It highlights the importance of staff in such roles both understanding the effect personal issues might be having on them, and considering informing their employer so they can be supported and managed appropriately (paragraph 162a.ii).

2 This accident highlights the importance of anyone who is unsure about the correctness of an instruction taking the time to stop and check again, or continuing to challenge until their concerns are fully addressed (paragraph 162a.ii).

3 This accident highlights the importance of signallers carrying out all the actions for a wrong-direction movement as required by section 2 of GERT8000 Rule Book module TW7 'Wrong-direction movements'. Signallers are reminded that on a route-setting panel or signaller workstation, they must ask a competent person, if present, to check and confirm the path that they have set up for the wrong-direction movement (paragraph 162a.iii).

4 Drivers are reminded that the requirement in section 4.1 of GERT8000 Rule Book module TW7 'Wrong-direction movements' to make movements over points at no more than 15 mph (or 25 km/h) is defining an upper limit, and that a slower speed may be more appropriate. A slower speed will give a driver more time to meet the requirement in the rules to approach any points, switch diamonds or swing-nose crossings at caution and to make sure, if possible, that they are in the correct position. It will also allow a driver proceeding at caution to stop before reaching any points which they determine are not in the correct position (paragraph 162b).

[6] 'Learning points' are intended to disseminate safety learning that is not covered by a recommendation. They are included in a report when RAIB wishes to reinforce the importance of compliance with existing safety arrangements (where RAIB has not identified management issues that justify a recommendation) and the consequences of failing to do so. They also record good practice and actions already taken by industry bodies that may have a wider application.

# Appendices

## Appendix A - Glossary of abbreviations and acronyms

| Acronym / abbreviation | Term in full |
|---|---|
| DfT | Department for Transport |
| DFTO | DfT Operator Ltd |
| DRA | Driver's reminder appliance |
| MOM | Mobile operations manager |
| ORR | Office of Rail and Road |
| OTDR | On-train data recorder |
| RAIB | Rail Accident Investigation Branch |
| ROC | Route operating centre |
| RSSB | Rail Safety and Standards Board |
| SCC | Signalling control centre |
| SMC | Siemens maintenance controller |
| SSM | Signalling shift manager |
| WCML | West Coast Main Line |

## Appendix B - Investigation details

RAIB used the following sources of evidence in this investigation:

- information provided by witnesses
- site photographs and measurements
- forward-facing CCTV footage taken from the train
- information taken from the OTDR on each unit
- information from the signalling system
- voice communication recordings
- staff training and competence management records
- rosters and records of the hours worked by the staff involved
- Rule Book modules and railway industry standards
- Network Rail company standards and West Midlands Trains procedures
- train timetable and running data from rail industry systems
- rail industry control logs
- weather reports and observations at the site
- rail industry records for previous similar accidents and incidents
- a review of previous RAIB investigations that had relevance to this accident.

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