

RAIB Bulletin 06/2010

Runaway and collision on the Welshpool and Llanfair Light Railway, 3 March 2010

Description of the accident

1. At 11:10 hrs on Wednesday 3 March a diesel personnel carrier, known as “the Wasp” (figure 1), pulling a match wagon ran away from near to the top of Sylfaen Summit on the Welshpool and Llanfair Light Railway. It ran away on a continuous gradient for approximately 2.1 miles, reaching an estimated maximum speed of 30 mph and passing over two open level crossings. At approximately 11:20 hrs it arrived at Welshpool Raven Square station and collided with five wagons stabled in the platform, causing the Wasp, its match wagon and three of the stabled wagons to derail (figure 2), the latter suffering major structural deformation. Two of the three people on the Wasp received minor injuries.



Figure 1: The Wasp



Figure 2: Aftermath of the collision

2. The railway was not open to the public and the Wasp and match wagon were being used to take workers and equipment to a track relaying worksite between Sylfaen and Sylfaen Summit (figure 3). It had travelled from Welshpool to Sylfaen and back to just over the summit without any problems. The driver was in the process of changing driving end to the Llanfair end when the Wasp began to run away. All attempts to stop it from the Llanfair end were unsuccessful, and the handbrake was not effective in this respect.

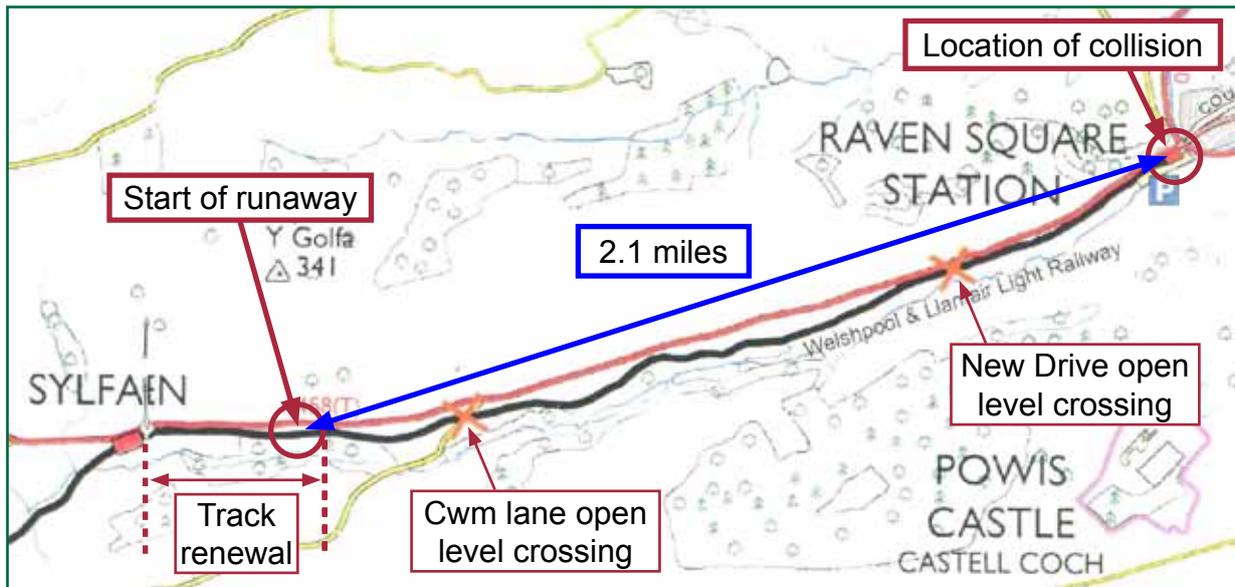


Figure 3: Location of the accident

3. The Wasp was built for MoD by Baguley-Drewry in 1976 and was converted to “2ft 6in” gauge shortly before being purchased by the Welshpool and Llanfair Light Railway in 2008. It has two separate brake systems. An “air brake” that applies air pressure causing brake shoes to act on the treads of each of the four rail wheels; this is used for service braking and is controlled by a brake controller on each of the two desks, one at each end of the vehicle. A “parking brake” utilises a drum brake on the transfer box of the drive system; this is mechanically applied by a hand-lever near each desk. No brakes were in use on the match wagon.
4. The Wasp has one brake handle and one desk key. When changing driving desks, the brake handle and desk key have to be removed for use in the other desk. The brake controller in the desk needs to be left in the “on” position for the brake controller at the other end to be able to apply the air brake. A mechanical interlock arrangement is fitted with the aim of ensuring this. Figure 4 shows the warning label on the brake controller reminding drivers of this. Figure 5 shows the brake controller and interlock features. The brake handle is fitted with a collar so that it can only be withdrawn through the hole at the “on” position. When the desk key is removed an interlock pin is raised pneumatically, this is designed to hold the controller in the “on” position.



Figure 4: Warning label on brake controller

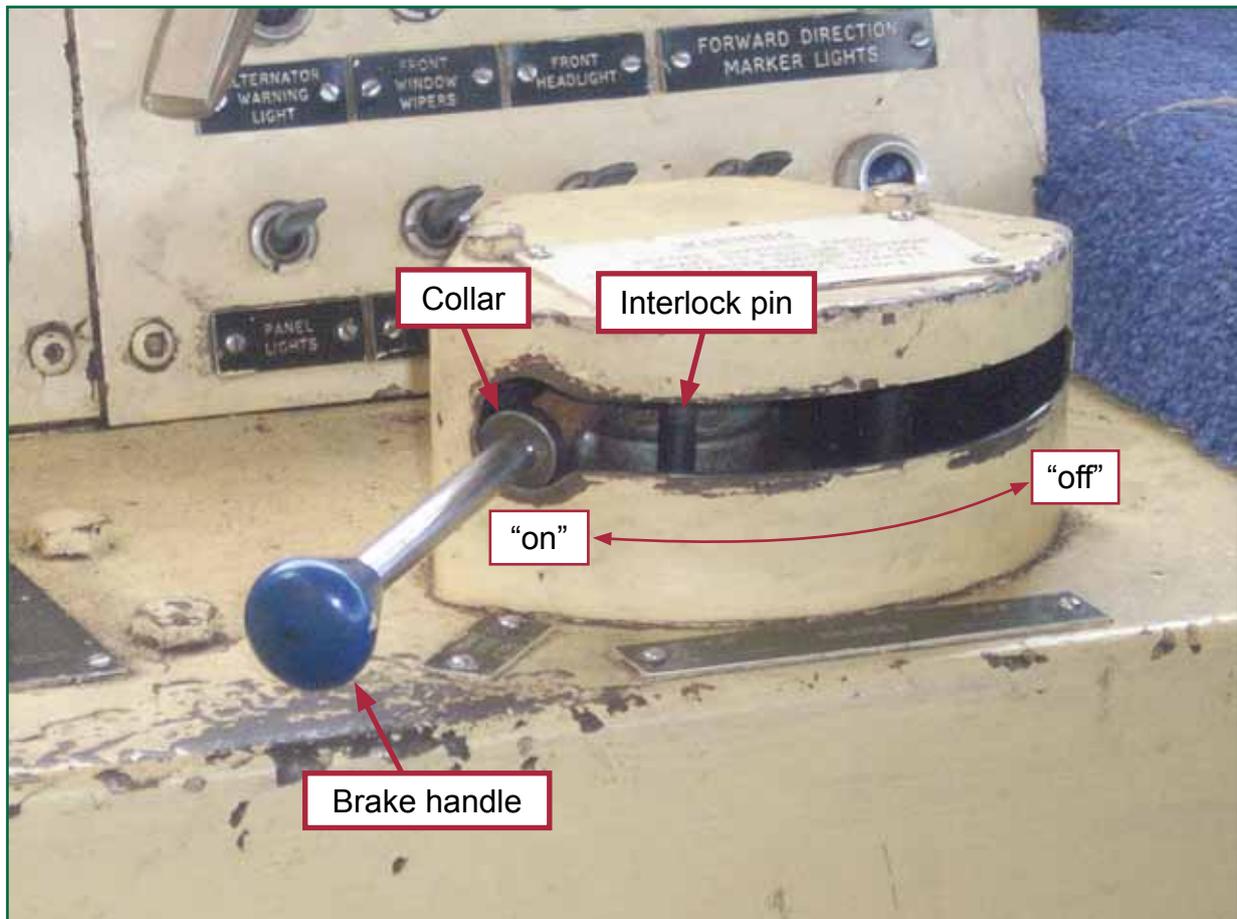


Figure 5: Brake controller and interlock features

Findings of the RAIB

5. The RAIB found that the Welshpool end brake controller had not been left in the “on” position and had been locked in the “off” position. Furthermore, it found that the design of the interlock arrangement was such that it could be bypassed relatively easily. The brake controller could be moved to the “off” position with the brake handle partially withdrawn. The handle could then be fully removed, and, when the desk key is withdrawn, the interlock pin would lock the brake controller in the “off” position. In this condition there was no means of applying the air brake to stop the Wasp using the brake controller at the Llanfair end.
6. The driver reported that he had received training on the Wasp from the company responsible for rebuilding it and converting it to narrow gauge and had gained additional knowledge through reading the manual and testing.
7. The braking system on the Wasp is significantly different to that of other vehicles operating on the Welshpool and Llanfair Light Railway and witness evidence was that the possibility of the interlock being accidentally bypassed had not been recognised. Whilst a number of modifications were made as a result of testing and assessment, the underlying cause of this accident was that no formal documented risk assessment was undertaken for the operation of this vehicle on the railway prior to its introduction into service, and as such possible failure mechanisms and hazards specific to the railway were not identified or considered.

Learning point

8. The RAIB has identified the following learning point for heritage and other industrial railways:
 - A failure to fully understand the design of, and potential hazards from, braking systems and associated controls on vehicles and on-track plant (including the ways in which the actions of an operator could lead to him inadvertently overriding safety interlock systems) can result in single point failures going unrecognised and therefore not being protected against.

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