

The Kildwick Rail Crash of 1875

Part 4 – Why was the crash so bad ?

Introduction

This is Part 4 of Farnhill and Kildwick Local History Group's investigation into the Kildwick rail crash of August 28th 1875. In the previous three parts we have looked at the causes of the crash, who might have been responsible, and the reports and investigations that were made into the events of that fateful evening.

Researching the crash, however, it has been surprising how the neither the coroner's inquests nor the two court cases against Harrison Palfreeman actually looked at the cause of the seven deaths – as opposed to the cause of the crash. A rail crash occurred, certainly, and Harrison Palfreeman was tried for his part in causing that crash; but the question that was not asked is: how did the crash come to cause seven deaths, as well as so many injuries ?

That is the focus for our investigation in this part.

How bad was the crash ?

William Wiggins, a guard on the mail train, is reported as saying¹:

He was half-standing, half-stooping at the time of the collision. He was expecting the collision but did not think it would so severe. He did not think there was anything for him to prepare for when he looked out and saw the brake van, or that there would be anything severe in the way of a collision.

One of the passengers, in the front carriage of the mail train said^{2,3}:

"... it was only for a moment ... [there] was a sharp shock, about eight or ten minutes after leaving Skipton. The shock was not severe, but enough to jerk most people off their seats ..."

Albany Renton, driver of the excursion, reported¹:

He was going forward at a speed of about four miles an hour when the collision occurred. He and his fireman remained on the engine. They did not feel any severe shock on the engine.

So, the collision did not seem to be a severe one – but how fast was it ?

What was the speed of impact ?

In a highly romanticised account of the crash, published some 30 years after the event, the approach of the mail train is described thus⁴:

It came thundering along and dashed into the rear of the first train with a great crash which Mr Mitchell and others heard in their homes at Farnhill.

However, Samuel Watson, who saw the approach of the mail train from the rear of Airedale Mill, described a more sedate sequence of events to the coroner's inquest^{5,6}:

The excursion train, when he saw it, was standing or nearly standing, opposite the distance signal, and he watched it being drawn forward until it passed under the bridge. A minute or two later he heard another train approaching. He saw a short train [the mail train] pass the signal post. The driver had shut off the steam but the train was still going at a good speed. The speed slowed as it approached the bridge and further still as it passed under it. He watch it until it ran into the other train.

So, the mail train was slowing from the distance signal to the point of impact 600 yards further on.

The best estimate of the speed of the mail train at the instance of the crash comes from Harrison Palfreeman, the driver, who thought that they were travelling at 10 to 15 mph¹. William Dobson, the fireman, appearing before Leeds assizes, gave his estimate as 10 to 12 mph¹². William Wiggins' suggestion that they were going at just 5 to 6 mph can probably be discounted, and there are no other recorded estimates of the actual speed. If the excursion was moving away at 4 to 5 mph (according to the driver, Albany Renton, see earlier), then we have an impact speed of around 10 mph.

So now the question posed at the start of this piece becomes: how was it that a 10 mph collision could cause seven deaths and around 50 serious injuries ?

Where were those who died seated ?

Intuitively, in a rear-end collision, you might expect the greatest amount of damage, and the greatest number of deaths and injuries, to occur in the vehicles at the end of the one train (the excursion, in this case) and the front of the other (the mail train).

In fact, we know that there was very little damage done to the mail train; nobody was hurt, and it was subsequently able to continue on its journey. All the injuries and deaths happened in the excursion train^{2,3}.

The most serious damage was sustained by the rear three vehicles of the excursion but not, perhaps, in the pattern that might be expected.

Rear brake van

The rear brake van, at the very back of the excursion, was built to a design similar to that of a goods truck, and was a substantial structure. It took the full force of the collision, and suffered significant damage. The superstructure was separated from the bogies and the roof completely removed. The van was thrown up on one end, onto the rear-most carriage.

Thomas Doidge, the guard, was badly thrown about and shaken by the impact, but was fit enough to go home later that night.

Composite carriage

The rear-most carriage was a composite, consisting of two first-class compartments, with third-class compartments to the front and rear.

The superstructure of the rear-most third-class compartment was completely destroyed. It was occupied by eight passengers; including Julia Redman who was killed. Also in the same compartment was Mr. Smith Ambler, who described the moments following the impact:

All of a sudden, and without any warning, there was an awful crash, and the excursion train was bounced forward, and before the passengers knew where they were the carriage went rocking from side to side, and the woodwork began to creak and crash, as if it were splitting up. ... The carriage floor seemed to open, and one after another the passengers fell through, the screaming and yelling becoming awful.

Third-class carriage

Next was a slightly-built third-class carriage. The couplings between this and the composite carriage were broken by the impact and the rear section was smashed in, with the roof touching the floor in places and the sides of the carriage burst out. The damage to this carriage was so great that the wreckage was to fuel fires lit to aid the rescue effort.

Six of the seven who died were travelling in this carriage.

The pattern of injuries

In part 1, we provided a list of the injured along with details of their injuries, where known. What is surprising about this list is the large number of injuries to the head and upper body.

The pattern of injuries sustained by the dead is similar: with six of the seven reported to have sustained head injuries⁷.

Conclusion – causes of death

So, there is a pattern to the deaths that occurred. They, and most of the serious injuries, happened in the third-class compartment of the composite carriage, and in the third-class carriage. Almost all were the result of injuries to the head or upper body – such as might have been caused by flying debris.

So, our initial question about why the crash was so bad becomes transformed. Now we must ask, what was about the third-class accommodation on the excursion train that made it so dangerous? Why did these structures fail so badly?

The development of third-class rail travel

At the very outset, passenger accommodation on the railways was designed to mirror that of travel by stage-coach. Those who could afford a higher fare were carried inside, while those on the outside, who were forced to brave the elements, paid a lower rate⁸. Indeed, the very earliest railway carriages even looked like stage-coaches⁹.



Fig 1: The “Experiment”, the first passenger railway carriage, came into service on the Darlington-Stockton line just a fortnight after the first passenger rail journey, in October 1825.

By the late-1830s a three-class system had become the norm for all new and existing railway companies, even though third-class carriages were not necessarily attached to each train. First-class passengers always had the best accommodation, their compartments containing soft furnishings and window glazing. Initially, second-class carriages had roofs and padded seats, but were usually still open to the elements on either side; however, this latter feature did become less common up to the 1860s. Lastly, third-class passengers travelled in little more than open trucks with wooden seats.

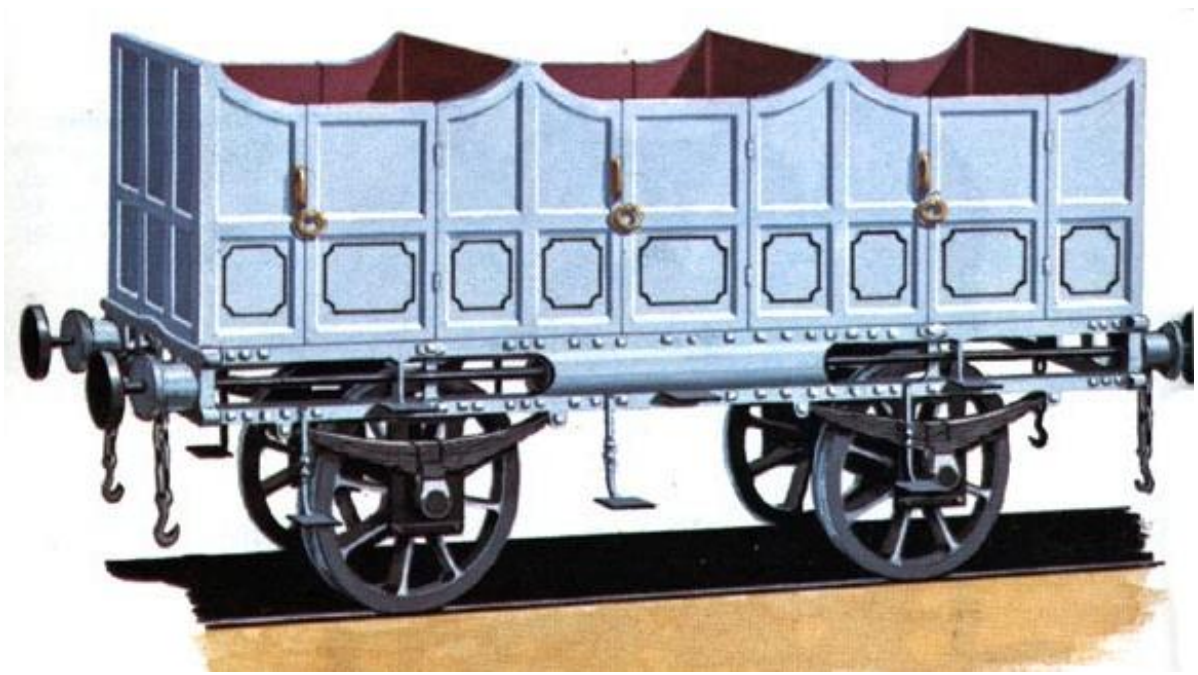


Fig 2: No, this isn't a freight truck, it's a third-class carriage from the Liverpool-Manchester railway c.1830.

Some improvement in the quality of third-class rail travel came about in the wake of the 1841 Sonning Cutting rail crash, in which nine passengers died after being thrown out of an open carriage following a derailment¹⁰. The 1844 Railways Act required each company to run one passenger train a day along the length of their line at the cheap rate of one penny a mile. The carriages on this train had to be provided with seats and protected from the weather¹¹.

On January 1st 1875, after adding third class accommodation to every train in 1872, the Midland Railway abolished second class travel, and lowered the price of third. In addition, a new design of third-class carriages were created for use on the Airedale line, in which the open-sides were panelled. These carriages were twice as long as contemporary designs, and had improved ride comfort due to the use of swivelling bogies. The company also created the first composite coaches, which combined first and third class compartments.

The impetus for this improvement was purely financial. Eliminating second-class accommodation reduced the cost of carriage construction and vehicle marshalling for the Midland. The improved third class accommodation was an enticement to customers who would otherwise use the Midland's competitors.

However, although third-class travellers on the Midland in 1875 might have thought they were travelling in style, this was an illusion. The build quality of the new carriages had not improved. As we have seen, in the event of even a low-speed collision, the poor quality of the third-class carriage construction could have fatal consequences. The newspaper reports of the time clearly attest to this. So³:

The sides of the composite carriage were broken in, and the roof had been crumpled up like a piece of cardboard, one end coming down nearly to where the floor ought to have been. The third-class carriage, being of still slighter make, was smashed into "matchwood". ... The composite carriage had nothing but the bottom remaining; the seats, doors, sides, ends, cushions, and broken glass of the windows were mixed together ... in [an] indistinguishable mash. The third-class carriage was also a complete wreck and, with the exception of one compartment and the framework, split almost into pieces. The roof fell onto the floor and the sides were burst out ...

And²:

The sound of the crash, described by some of the passengers as like nothing so much as the crushing of a lot of match-boxes on a large scale, was succeeded by piercing shrieks and cries from the injured ...

So we have: the "crushing of match-boxes", "smashed into matchwood", and "crumpled up like cardboard". Could it possibly have been that the third-class accommodation on the fateful excursion wasn't built to withstand even a 10 mph collision? Perhaps this answers our question: why was the Kildwick rail crash so bad?

References

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