

# RAIB Bulletin 05/2009

## Collision between a passenger train and the door of an open wagon

### Description of accident

- 1 An engineer's train conveying OCA type wagons was travelling from within an engineering possession<sup>1</sup> on a four track railway. During this journey the door of an open wagon fell open, fouled the adjacent line and was struck by a High Speed Train (HST).
- 2 The HST suffered a significant amount of damage. This was reported by the train operator as being:
  - leading power - car step and body side damage.
  - 2<sup>nd</sup> carriage - gash in air conditioning unit.
  - 3<sup>rd</sup> carriage - saloon window smashed.
  - 4<sup>th</sup> carriage - two saloon windows smashed and running board missing.
  - 5<sup>th</sup> carriage - both running boards damaged.
  - 6<sup>th</sup> carriage - saloon window smashed.
- 3 The wagon suffered relatively minor damage to the open door. The extent of this damage is shown in Figures 1 and 2.



Figure 1: Damaged wagon



Figure 2: Incident door (held closed by straps) showing damage

<sup>1</sup> A period of time during which one or more tracks are blocked to service trains to permit work to be safely carried out on or near the line (also known as a T3 possession)

- 4 When the track and the wagon were inspected a short length of chain, with a door securing pin attached, was found on the track with another detached length of chain found resting on the wagon underframe. These may have come from the damaged door of the wagon.
- 5 The cause of the accident was that the leading left hand side door of the wagon was not latched on departure of the train from the engineering possession, or had become unlatched on the journey. This unlatched condition would have allowed the door to rotate to its open position. The normal open position is horizontal from the wagon body (Figure 3).



Figure 3 - Door orientation

### Findings of the RAIB

- 6 This type of wagon has six drop down doors: three on each side. The doors are hinged on their bottom edge and held closed in traffic by a spigot and securing pin arrangement located at the corner of each door (Figure 4). When released, the normal position for this door is drop to the horizontal position. This is due to a design feature incorporated to slow the door down when opening and reduce the effort required to close and secure it, effectively making it a one person operation. The door has to be pushed down from the horizontal position to its vertical open position held down by a spring system. When all six doors are vertically open, the four central pillars can be removed to give unrestricted access to the wagon flat bed.
- 7 Damage to the incident wagon was restricted to the leading end, left hand side, door. The top edge of the door had been deformed downwards towards the hinges with both pins and chains missing.
- 8 The door damage was a consequence of the impact with the HST and the detached chain and pin that was found on the ballast is likely to have come from the trailing end of the damaged door.
- 9 Refitting the pin into the trailing end spigot of the incident door showed that it was bent and that it could not easily be inserted fully into the pin hole. There was evidence of previous head damage caused by multiple impacts. The pattern of damage was consistent with the pin being hammered into position.

- 10 Had the incident door pins been inserted correctly and fully, it is unlikely that the door would have become unlatched in traffic.
- 11 Tests on the incident door showed that when unlatched and allowed to fall, the door came to rest horizontally from the wagon body (as designed).
- 12 Six randomly selected OCA wagons, were inspected in order to determine if the general condition of the incident wagon differed from other stock in service.
- 13 The overall condition of the incident wagon's doors were similar to those on the other six wagons that were inspected. With the exception of the incident door, all pins on all seven wagons were present and were capable of being inserted into the spigots, although one-third of the pins required tools for insertion and extraction.



*Figure 4 - Typical example of the type of securing pin*

#### Actions taken by the train operator

- 14 The operator of the engineer's train has undertaken a number of actions, on similar drop down door wagons, to reduce the likelihood that a door will drop down in traffic. These are:
  - detailed examination of the drop down doors and component parts, including locking pins and the chain assembly;
  - painting the locking pins and chain assemblies yellow;
  - replacing damaged pins and chain assemblies with yellow painted longer pins and chain assemblies; and
  - if doors are to be removed, the hinge pin holes, bell crank and connecting links are to be checked for wear.

## Learning points

- 15 The RAIB has decided not to conduct a full investigation as it does not believe that it would lead to the identification of any further significant lessons that would improve the safety of the railways or prevent further accidents or incidents. However, the RAIB believes that there are some learning points to be disseminated to owners and operators of similar wagons. These are:
- Some of the securing pins and door frames had been distorted such that the full insertion and extraction of the pin would have to be done using a tool or hammer. In addition, some of the locking rings were significantly distorted, thus preventing them from effectively locking the securing pin in place. It is therefore important that freight operators ensure that staff responsible for inserting pins are provided with suitable tools, and that these are correctly used to avoid damage to the securing pin system.
  - The position of the door securing pin mechanism could make it difficult for staff, standing on the adjacent ballast, to insert fully or extract a securing pin. Freight operators should be aware of this fact and review the methods used by their staff when securing doors on wagons of this type.
  - The general rustiness of the door attachment mechanism could make it difficult for a train preparer to see if pins were fully engaged. This problem can be mitigated if pins are more conspicuous (e.g. brightly coloured and/or longer in length).
  - The design of the spring assisted door creates a risk of contacting structures and rolling stock in traffic. Therefore there is a need within maintenance and inspection regimes to assess the condition of pins and door latching components on wagons with drop down doors of this type.

**The events described above took place west of Maidenhead station on 15 November 2008.**

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