

Extract from the investigation report RJ 2010:04 on an accident, derailment of train on 04/06/2008

Summary

On Wednesday, 4 June 2008 at 08:53, the first axle of the forward locomotive on passenger train 814 derailed on the open line between Rotebro and Upplands Väsby. The trainset consisted of 10 carriages with a locomotive at both the front and rear.

The trainset had travelled several times that day on the route between Stockholm and Uppsala, and the previous driver had noted the sound and the feeling of flat wheel on the locomotive. The driver inspected the wheels, both in Uppsala and Stockholm, and found no defects. The driver had also reported the matter to operational management.

When the driver of train 814 was driving from Stockholm to Uppsala, he noticed vibrations and knocking noises from the locomotive. The driver performed a deceleration test in Solna, and the knocking sound then changed to that of a 'normal' flat wheel. As the train passed Rotebro, the locomotive began to shake and heavily vibrate, the driver then heard a loud bang under the locomotive, and a few seconds later the driver heard another loud bang. The driver applied the emergency brakes and the train stopped after about 1 109 metres.

The immediate cause of the accident was that the wheel flange on the first axle's left wheel burst due to fatigue and split off, which caused the locomotive to derail. SHK (Swedish Accident Investigation Board) has not been able to establish what initiated the fatigue fracture.

The underlying cause of the wheel flange splitting off was that the device to keep the flange in place, in the case of bursting, was not intended for that function.

Another underlying cause of the wheel flange burst was a lack of experience-feedback from previous incidents of broken wheel flanges. Had experience-feedback been more systematic and led to the analysis of underlying causes, measures could have been taken in the form of more exhaustive flat wheel inspections. This could have reduced the likelihood of wheel flanges being allowed to run with fractures that grew unchecked.

Another underlying cause of the derailment was that operations support did not have sufficient instructions and procedures on how they should respond to reports of serious flat wheel.

Recommendations

It is recommended that the Swedish Transport Agency:

- explore the possibility of ensuring the implementation of a comprehensive study on the risks of material fatigue on wheel flanges caused by long runs or high speeds (see sections 2.4.4.10 and 2.4.4.11). (*RJ 2010:04 R1*).
- ensure that the rail undertakings, during periodic or need-driven maintenance, have procedures to ensure that wheels are adequately inspected so that wheels with incipient fractures are prevented from leaving the workshop without being attended to (see sections 2.4.4.11, 3-1 and 3.2.2). (*RJ 2010:04 R2*).
- ensure that railway undertakings have procedures that help staff to take proper action when reporting faults which may have serious safety implications (see sections 3.1 and 3.2.2). (*RJ 2010:04 R3*).