



## Safety recommendation no. 176

<b>Date of the publication</b>	13.12.2022
<b>Number of the final report</b>	2021030602
<b>Safety deficit</b>	<p>At around 09:50 on 6 March 2021, a driving pinion on a seven-car Adler rack-and-adhesion multiple unit of the Zentralbahn railway company broke on the line between Brünig-Hasliberg and Giswil.</p> <p>The coverage rate for the pitch circle of the toothed wheel/pitch line of the rack rail, which is defined as 62.5mm for the Zentralbahn network, is not met by the Adler and Fink multiple units. The normal codes of practice (D RTRs 29700, No 5.2.2, meshing of driving pinions) are therefore not being followed.</p> <p>Correct meshing conditions, including the meshing angle, height of the rack rail and coverage rate of the pitch circle of the toothed wheel/pitch line of the rack rail, are a safety requirement that ensures proper functioning and increased wear resistance as well as preventing the toothed wheel from climbing onto the rack teeth.</p>
<b>Safety recommendation</b>	The STSB recommends that the Federal Office of Transport (FOT) have the geometric proportions of the adjustable driving pinion system on Adler and Fink multiple units modified.
<b>Addressees</b>	Bundesamt für Verkehr
<b>Stage of the implementation</b>	Partially implemented. The FOT confirms that it has included the requirement of pitch circle/pitch line congruence after moderate wear as part of the 2024 IP-RailO revision. Adjusting the running gear of the affected fleets was deemed disproportionate because the manufacturer and the transport company were able to demonstrate through the measures taken that the cause of the breakage could be addressed by other means.
<b>Investigation report concerning the safety recommendation</b>	<a href="#">Schlussbericht</a> <a href="#">Vorbericht</a>