

Review of failure analysis of coupling systems on freight trains

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Abstract

This paper presents a review of screw coupling and draw gear failure analysis on freight trains in Europe and other countries where screw coupling systems are still in use. Analyses of failures show different characteristics and applications of root cause analyses and can group them into several categories that repeat on considered railways. A variety of failure types indicates that more than one factor causes breaks in the coupling system, and they didn't always equally present. Most studies of failure investigate fatigue of screw coupling and draw gear elements because of initial crack or corrosion. Some fractured elements haven't had signs of fatigue so other causes must be considered in the analysis, like overload, impact, inadequate material, or certain deficiencies in heat treatments of fractured elements. Investigations were performed via a series of experimental tests and numerical analyses using the finite element method.

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