

Static and dynamic testing of a bogie

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Abstract:

The development process of railway bogie frames consists of three stages. The first stage involves stress calculations, the second stage comprises static and fatigue tests and the third one is focused on validating fatigue life data by stress monitoring during test runs on an actual track. The aim of this research is static and dynamic testing of a functional bogie model by hydraulic cylinders and subsequent evaluation of measured values. The load is determined according to the requirements specified in CSN EN 13749, Railway applications – Wheelsets and bogies – Method of specifying the structural requirements of bogie frames. In the fatigue test, the loads are composed of the static load, the quasi-static load, and the dynamic load. The bogie frame is a weldment made of S355 steel sheets, which has two transoms and two side rails ending with suspension brackets. It should be noted that the fatigue strength of a welded frame under dynamic loading is limited by the resilience of the welded joints. Attention is therefore paid to analyzing these joints. The development experience derived from this new bogie can be used to optimize the production of rolling stock. In the present experiments, the frame was examined using NDT to detect possible defects.

Key words:

Fatigue, durability, testing, bogie frame, strain gauge, NDT