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PREVENTIVE MAINTENANCE OF RAIL VEHICLE CHASSIS BY OPTIMIZATION OF DIMENSIONING PARAMETERS

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ABSTRACT

Among the complex metal structures, we find the chassis locomotive frame receiving various static and dynamic actions are often the seat of constraints that may cause local ruptures in the elements of the frame The detection of the much requested zones of the frame is an important operation which makes it possible to envisage the possible reinforcements necessary for the consolidation of the frame. Also, the determination of the exact position of the reinforcing cross requires a judicious calculation. Often ruggedness tests are performed on the chassis prototypes at specialized testing centers to certify compliance of the chassis. Nevertheless, the recourse to these tests is expensive and takes much time. Thus, the use of the numerical methods leads to a better appreciation of the fast and reliable solutions. The objective of our work is to develop a numerical method based on a computer code to check the pre-dimensioning of the frame of the railway vehicles in order to prevent the preventive maintenance. The simulation includes the thickness variation and the positions of the principal elements of reinforcement of the chassis. The results of numerical calculation are compared with those obtained by experimental tests of tension and compression. The validity of our model allows building a tool for the decision on the replacement of elements who have suffered failures during operation instead of reforming the entire chassis.

KEYWORDS: Locomotive, Châssis, Optimisation MEF