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CONTROL OF STATUS OF WELDED JOINTS OF STRUCTURAL MEMBERS OF TRANSPORT MACHINES

The work objective is to create the tools method for controlling a technical status of the mechanical members of the vehicle parts of railway locomotives using a criterion for fatigue cracking through their welded joints. The on-board measuring complex for dynamic and structural running tests of the structural member of the DS3 electric locomotive, the computer simulation of a stressed-strained state of a welded joint, the strain-measuring null-indicator method of detection of fatigue cracks have been employed.

The paper presents the results of dynamic and structural running tests of a welded joint of a damper plate for a suspension axle box stage and a side-frame of the DS3 electric locomotive bogie obtained by an on-board strain- measuring complex. It is found that fatigue cracking through the welded joint results from the defect of a leg at the site of initiation of maximal tensile stresses, a supernumerary work of a hydraulic damper of the suspension axle box stage. Using the computer simulation of a stressed-strained state of the welded crack-free joint with the fatigue crack of a semi-elliptic form, the capability of its detection prior to critical dimensions at the inaccessible site of the structural member with our strain-measuring null indicator method is demonstrated.

Conclusions about the verification of the quality of repair of welded joints of the mechanical members for the vehicle parts of railway locomotives under real operational conditions without fatigue cracking are made.

Keywords: *welded joint, fatigue crack, repair, causes of failure, computer simulation, control of initiation of crack.*

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