

ANALYSIS OF WHEEL CONTACT SURFACE DAMAGE AND BRAKE BLOCKS BREAKING

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Abstract

The paper presents an analysis of possible causes of damage to the tread of wheels and cracking of brake blocks of heavy-duty motor tower car VMT 980 C-GR. In order to determine the possible causes, a series of tests were done to check all the influences that led to the occurrence of these damages. The analysis included checking the regularity of the brake operation, non-destructive testing of the tread damage, and visual inspection of the brake blocks. The correctness of the brake operation was checked by stationary brake tests. The examination of the damage to the tread of the wheels was performed by non-destructive methods, using means for detecting microcracks and measuring the hardness. The results of the conducted tests indicate that the characteristics of the brake system are within the designed limits and are not the cause of damage to the wheels and the brake blocks. The measured values of hardness on the side and on the tread are higher than the minimum required for test samples according to EN 12362. The wheels are made of ER7 steel, which is used as a standard for railway wheels, with a chemical composition within the prescribed limits. Further analysis showed that significant surface damage to the brake blocks is a consequence of previous damage to the tread surface of the wheels. Visual inspection of the wheels showed flaking and cracking, indicating contact fatigue and the presence of thermal stresses as the most likely causes of brake blocks and wheel damage.

Keywords

Contact fatigue, thermal stresses, non-destructive testing, brake characteristics, heavy duty motor tower car

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