Optimalization of a Brake Unit in Terms of Control Range

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The paper deals with a study of actuator (brake cylinder) modification for generation of braking force in a brake unit. The original solution, carried out using the original brake cylinder in cooperation with the proportional pressure control valve, is sufficient in terms of correct function of the brake unit, but in terms of safety, the corresponding force sensor may be damaged in case of a control circuit proportional pressure valves defect. Another reason for the study is utilization of the total regulation range of the proportional pressure valve and improvement of the brake unit response time in case of braking force overload. Such overload results in tread or rotating rail surface damage. The article gives description of the currently implemented passive measures to increase safety against sensors damage, but also of proposed active measures to eliminate these defects by changing size and type of the brake cylinder.

Keywords: brake unit, brake cylinder, safety, control range, Finite Element Method.

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