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JUSTIFICATION OF THE FRONT SUSPENSION OF THE AUTONOMOUS MINING DUMP TRUCK, WITH A HIGHT LOAD CAPACITY

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ABSTRACT

The study justifies the use of the front suspension in autonomous mining dump trucks with a load capacity of 240 tons. The relevance of creating autonomous mining dump trucks with a load capacity of 240 tons is explicated. The paper considers the types of front suspension used in the existing mining dump trucks with a load capacity of 218-255 tons. Analysis of front suspensions by performance characteristics is conducted with the method of multicriteria analysis – TOPSIS. Initial data for selecting the type of front suspension by the TOPSIS method is a decision matrix including evaluations of the alternatives according to the criteria, as well as the weights of the criteria. Alternatives in this case are the types of front suspension and the criteria are their performance characteristics. The TOPSIS method helps to determine the coefficients of each option's proximity to the ideal, which are presented graphically in a histogram. The analysis suggests that the independent single-lever transverse (McPherson) front suspension is the best match in terms of performance. McPherson suspension will provide the 240-ton autonomous mining truck with relatively high characteristics of smooth running, stability, and controllability in combination with the simplicity of design.

Keywords: autonomous mining dump truck, mining, mining dump truck, front suspension.