
Load computation on the load-carrying system of a heavy dump truck

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At present time calculating research methods are becoming increasingly popular in automobile design and development. The proposed methods are distinctively characterized by incremental approach to computation of the load-carrying system. The first phase includes load computation in real-life environment; on the second phase the results obtained are used for the finite-element analysis of the system durability. The author developed mathematical automobile models and the program computing the given load when the automobile moves onto the rough surface and the dump truck is being unloaded. The program applies Newton iteration method in combination with the method of step-by-step changing the parameters. The study tested the responses from the guide suspension of different types on the car frame and suggested the ways of reducing the given load. The article gives the comparative analysis of the results of numerical and natural experiments. The methods enable multi-variant calculations of load-carrying system to be conducted on the early phase of design to find the best constructive decision.

Keywords: dump trucks, load-carrying system, mathematical models, load, finite-element analysis, numerical experiment.

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