
DEVELOPMENT AND STATIC STRENGTH ANALYSIS OF THE MODIFIED MILITARY SEMI-TRAILER BEARING STRUCTURE

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Abstract

The development of a new semi-trailer presents a great challenge for designers, as well as the investment of a significant amount of money and time. Army vehicles have specific characteristics and allow certain flexibility in measure dimensions which can be defined according to the specific needs of customers. This paper presents the reconstruction and modification of an old semi-trailer with the aim to reduce manufacturing costs. The base for modification was a semi-trailer, 30 tones load bearing, which spent approximately 30 years in exploitation. According to the assessment of the state of the current bearing structure and materials, the vehicle owner decided, to retain half construction, reconstruct and develop another half to the specific purchaser's requests. The first step was to remove one-half of the construction which must be reconstructed by cutting. Furthermore, a 3D and numerical model of the bearing structure was formed. Static strength analysis of the modified vehicle structure was performed using an adequate software package and finite element method. Analysis was done for the different load cases and defined by valid standards and purchaser requests. Obtained results showed that modified vehicle structures can withstand defined loads without any permanent deformation. After producing 2D documentation, production of prototype semi-trailer was launched, and a vehicle was delivered and involved in exploitation. After a year of exploitation test, the modified bearing structure satisfied all required criteria and serial production can be started.

Keywords

Semi-trailer, Modification, Prototype, Static strength analysis

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