Reliability Analysis of Loading System of Hydraulic Excavator

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Abstract

Hydraulic excavators are widely used in mining and construction. They have an important role in mine loading cycle. These machines have three major parts: work equipment, upper structure and lower structure. The work equipment that is for digging and loading includes boom, arm and bucket. Because of the operation of the work equipment, it has got more failures in comparison with other parts. In this paper reliability modeling of work equipment according to the method of analytic solution of the proposed model has been made. After estimating of model parameters, system failure rate has been calculated and failure behavior is assessed. The reliability of work equipment system reduces to 80% after 30 hours of operation and it reach zero after about 360 hours. The failure rate increases at a decreasing rate and after 360 hours it will be at a rate of 0.021.

KEYWORDS: Hydraulic excavator, Reliability, Failure rate