

Abstract

The task of lifetime monitoring applies to certain machine elements and mechanical components working under dynamic loading. Both the recent progress of measurement technology and the rapid development of information technology allow a new approach to this issue.

In this work lifetime monitoring of components, which undergo dynamic loading, is investigated, and the application in condition monitoring of mobile systems is discussed. In the main focus are applications in motor vehicles and rolling stock.

In the modern vehicles dynamically loaded critical components are usually not monitored. Thus, the actual stress and the current damage condition of these components are not known. This may lead to fatigue failure. The solution can be a lifetime observer, a device that monitors the dynamic loading and estimates the remaining lifetime. Especially, the mechatronic concept of the lifetime observer is in the centre of interest, with the involved data processing and management. The system to be developed is regarded thereby from a new point of view - the function-oriented design. A concept for the system structure is discussed and, based on the current state of the art, recommendations regarding the system architecture and exemplary implementation are suggested. Finally, the possible field of application in vehicles is presented.