

## Overview

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The continuing quest for efficient mechanical and structural designs has caused a steady rise in operating stresses as a proportion of design stresses and has placed long life requirements on the articles. Therefore, the cyclic stresses resulting from normal loading have become an important consideration in the design, analysis, and testing process. Similarly, there is ample evidence that loading variables such as amplitude, frequency, sequence, and phasing have a significant effect on fatigue crack initiation and propagation.

In order to review the latest developments in the analytical treatment of fatigue loads, a one-day symposium was held in Cincinnati, Ohio, on 29 April 1987. The symposium was jointly sponsored by ASTM Committee E-9 on Fatigue and the Society of Automotive Engineers (SAE) Fatigue Design and Evaluation Committee to review the state of art in characterizing and standardizing cyclic loads that are experienced by structures in service. This symposium is a sequel to the ASTM sponsored symposia on the Effect of Load Spectrum Variables on Fatigue Crack Initiation and Propagation (STP 714) held on 21 May 1979 in San Francisco, California, and Service Fatigue Loads Monitoring, Simulation, and Analysis (STP 671) presented in Atlanta, Georgia, 14–15 November 1977.

The authors addressed two broad areas of interest; (1) characterization of measured loads and (2) development of analytical and test load spectra from condensed data. The information in this volume should be useful to engineers responsible for collection and evaluation of service loads and to those involved in analyzing and testing structures subjected to repeating loads.

A large number of people contributed their time and energy to make the symposium a success. The editors would like to thank the authors for their contributions and the reviewers for their diligent editing of the manuscripts. We are also indebted to K. H. Donaldson and M. R. Mitchell, from the SAE-Fatigue Design and Evaluation Committee who served on the symposium planning committee and arranged reviewer support. The editors would like to thank symposium session chairmen A. L. Conle and J. W. Fash for their efforts.

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