

## Shaking Force Balancing of Mechanisms: An Overview

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**Abstract :** The balancing of mechanisms is a well-known problem in the field of mechanical engineering because the variable dynamic loads cause vibrations, as well as noise, wear and fatigue of the machines. A mechanical system with unbalance shaking force and shaking moment transmits substantial vibration to the frame. Therefore, the objective of the balancing is to cancel or reduce the variable dynamic reactions transmitted to the frame. The resolution of this problem consists in the balancing of the shaking force and shaking moment. It can be fully or partially, by internal mass redistribution via adding counterweights or by modification of the mechanism's architecture via adding auxiliary structures. The balancing problems are of continue interest to researchers. Several laboratories around the world are very active in this area and new results are published regularly. However, despite its ancient history, mechanism balancing theory continues to be developed and new approaches and solutions are constantly being reported. Various surveys have been published that disclose particularities of balancing methods. The author believes that this is an appropriate moment to present a state of the art of the shaking force balancing studies completed by new research results. This paper presents an overview of methods devoted to the shaking force balancing of mechanisms, as well as the historical aspects of the origins and the evolution of the balancing theory of mechanisms.

**Keywords :** inertial forces, shaking forces, balancing, dynamics, mechanism design

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