Dynamic Force Analysis

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1 Introduction

Mechanical systems involving the interaction of various components play a crucial role in understanding and optimizing the performance of machines. In this lab report, a dynamic force analysis will be conducted for an opposed two-cylinder crank/connecting rod/slider arrangement.

1.1 Objectives

The primary objective of this analysis is to delve into the kinematic and kinetic aspects of the system. Through numerical and symbolic calculations, we aim to determine key parameters, including angular velocities, angular accelerations, transmitted forces, input torque for constant angular velocity, and out-of-balance forces. These parameters will be crucial in comprehending the system's behavior and optimizing its design.

The investigation encompasses a time-dependent analysis covering two complete revolutions of the crank, and the obtained results will be graphically illustrated.

1.2 Approach

The analysis will be carried out utilizing computational software, namely MATLAB, and analytical methods. The analytical equations developed in class will be employed to conduct a comprehensive analysis of the system, particularly in determining the out-of-balance forces. The MATLAB software will be used to numerically solve the system's equations of motion.

This dual approach, combining computational tools and analytical methods, ensures a robust and comprehensive understanding of the mechanical system under consideration.

2 Literature Review

Lorem ipsum dolor sit amet, qui minim labore adipisicing minim sint cillum sint consectetur cupidatat. Here is a citation[1] and another[2].

[1] rover2012
[2] koyarem2011

3 Methodology

4 Analysis

Assumptions made in the analysis include treating each linkage as a slender rod, neglecting the effects of gravity and friction, and confining all motion to a common plane. It is imperative to document and articulate any additional assumptions deemed necessary for the analysis.

5 Discussion

6 Conclusions

7 References

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4. Cheng-ge, H. (2010). Discussion on Frame Dynamic Force Analysis of Power Capacitor. Power Capacitor & Reactive Power Compensation.

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