DYNAMIC BEHAVIOR OF A PLANAR FLEXIBLE SLIDER CRANK MECHANISM WITH DIFFERENCE LENGTHS

by

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APPROVAL AND DECLARATION SHEET

This project report titled Dynamic Behavior Of A Planar Flexible Slider Crank mechanism with difference length was prepared and submitted by Nurain binti alias (Matrix Number: 061110873) and has been found satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the Bachelor of Engineering (Mechanical Engineering) in Universiti Malaysia Perlis (UniMAP).

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DINAMIK KETELENTURAN SATAH MEKANISMA GELANGSAR ENGKOL

ABSTRAK

Projek ini adalah untuk mengkaji dan memahami kelemahan dinamik kelenturan satah mekanisma gelangsar engkol merujuk kepada perbezaan panjang engkol. Kaedah simulasi digunakan mengkaji kelenturan engkol. Bagi ujian simulasi, model engkol dilukis mengunakan perisian ADAMs dan SOLIDWORKs. Untuk melengkapkan model engkol ini, penghubung yang digunakan adalah model berdasarkan kepada fungsi hentakan. Ciri-ciri gerakan satah mekanisma gelangsar engkol adalah berdasarkan kepada tiga fasa iaitu gerakan bebas, penghubung gerakan berterusan dan gerakan hentakan. Dalam laporan ini, masalah bagi satah mekanisma gelangsar engkol iaitu dengan kakuan penghubung dan masalah kelenturan kakuan telah dikenalpasti dan dikaji. Daripada analisis yang dibuat didapati apabila ukuran panjang mekanisma gelangsar engkol bertambah maka kelajuan dan pecutan engkol adalah berkurang.

DYNAMIC BEHAVIOR OF A PLANAR FLEXIBLE SLID CRANK MECHANISM

ABSTRACT

This project is the study and understand of the dynamic behavior of a planar flexible slider–crank mechanism with different lengths. The simulation to used in study of the planar flexible slider–crank mechanism. For the simulation tests, we have built the model under the software ADAMS and Solidworks. We used a contact model based on the so called Impact-function. The motion is characterized by the occurrence of three phases: a free motion, a continuous contact motion and an impact motion. In this paper, the problem of the mechanism with rigid link and the case with flexible link were is detected and study studied. It is shown that when the slider crank lengths increase the velocity and acceleration is decrease.

TABLE OF CONTENT

LIST OF TABLE

LIST OF FIGURE

LIST OF SYMBOLS, ABBREVIATIONS OR NOMENCLATURE

F	the mutual gravitational force exerted , one on the other.
m	The mass of bodies .
a	The acceleration of a particle .
σ	Uniaxial stress
ω_n	The natural frequency
τ	The time period of the system, τ_d
K	The stiffness coefficient