4-26-2007

A Comprehensive Study of a Servo-Hydraulic Engine Mount Test Machine

Jeremy Crist
Indiana University - Purdue University Fort Wayne

A Comprehensive Study of a Servo-Hydraulic Engine Mount Test Machine

Jeremy Crist
IPFW Student
Senior Design Project

Final Project Report
April 26th, 2007

Professor Paul Lin, P.E.
Professor of ECET 491, Senior Design
College of Engineering, Technology and Computer Science

and

Dr. Karen Griggs
Professor of ENG421, Technical Communications
College of Arts and Sciences

Indiana University-Purdue University Fort Wayne
Fort Wayne, Indiana

ABSTRACT

The hydraulic test machine is the heart of product testing. Through the study of one test frame at Cooper Standard Automotive in Auburn, Indiana, this report provides detailed information on three key areas of the anatomy of the modern test machine. The first area of discussion details the physical hardware needed for testing, such as the hydraulic actuator, the servovalve, the force transducer, and the displacement transducer. The second area of discussion focuses on the Digital Signal Processor and the main function of Proportional-Integral-Derivative closed loop control. The third area of discussion focuses on the role of data acquisition in the testing world, including the electronic focused topic of analog-to-digital conversion and data storage options.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

Figure Page

Table Page

Equation Page