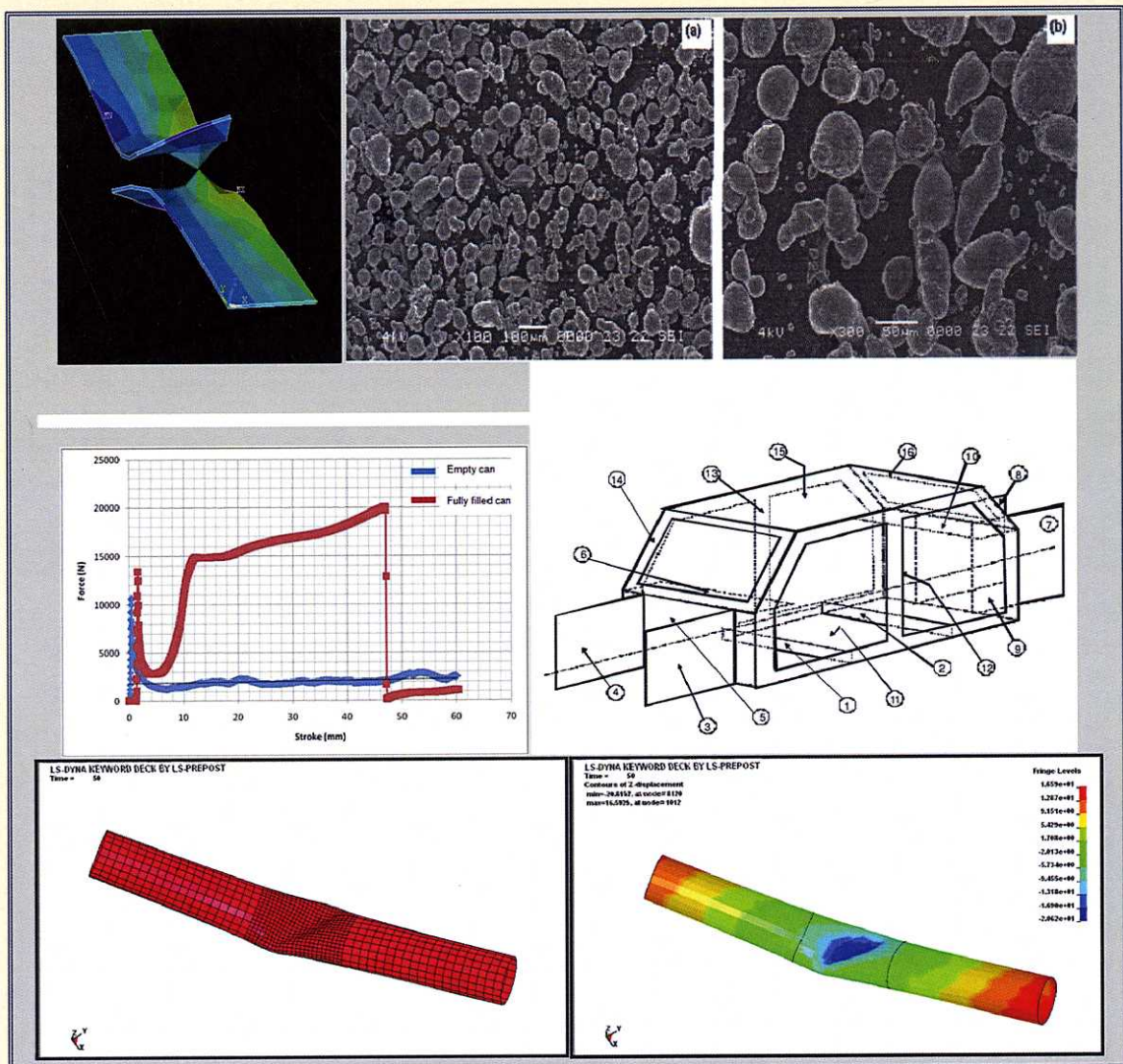


ADVANCED TOPICS IN MECHANICAL BEHAVIOR OF MATERIALS



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Meftah Hrairi



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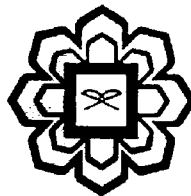
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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ENHANCING MAGNETIC PARTICLE TESTING OF AUTOMOTIVE PARTS

Meftah Hrairi, Salah Echrif

1. INTRODUCTION

The principle disadvantage in magnetic particle inspection, as generally practiced today, is the combination of variable human judgment and interpretation, and variations in the critical components' characteristics which are: magnetic particle liquid sensitivity, ultraviolet intensity variations, and magnetic field variations at the surface of the test piece. In high speed inspection systems, these variables can reduce the reliability of magnetic particle inspection flaw detection to only about 70% [1]. What is needed is an online, heavy duty, high speed parts inspection with online documentation and almost perfect flaw detect ability within calibrated equipment, if possible, by using modern electronic systems. Currently, the automated MT systems are still in their first stages and are developed on individual researchers' basis [2]. Also, the few current systems in the market which can automatically perform magnetic particle testing are extremely expensive. Hence, the need to provide a reasonable automated MT system with a comparable performance for inspecting surface defects in ferromagnetic materials automotive components.

In this system there are two subsystems, the software and the hardware. The hardware is the automation system that is responsible for controlling camera and the application of magnetic particles. All of these mechanisms are controlled in automatic sequences by the software. The software system consists of the image processing algorithm and the control software which controls all the hardware movements

2. SYSTEM HARDWARE AND SOFTWARE DESIGN

The drawing of the mechanical system of this project is shown in Figure 1. It integrates all of the selected components. Here, we will discuss the basic features of the design. First of all, the hardware