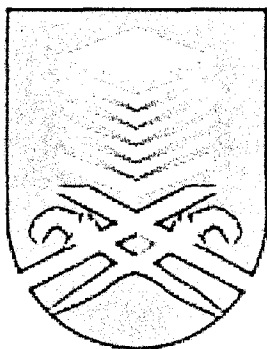


**SIMULATIONS OF AC DRIVES MODEL FOR  
MINE WINDER**

**This project thesis is presented in partial fulfillment for the award of the  
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## **ABSTRACT**

This paper discusses about a development of simulation model for investigation the performance characteristics of AC drives applying to mine winder. Mine winders are designed to fit out the mine hoisting facilities that are installed in the vertical and sloping mine shafts that are used to transfer the load such as mineral resources and rocks. The driving source for this developed simulated model is by using synchronous motor and is developed using MATLAB/Simulink software. The obtained results of the simulation are analyzed and evaluate in order to be able to obtain the necessary information to predict precisely its operational performance characteristics.

The understanding of these performance characteristics behaviors, particularly its dynamic characteristics are significantly important for design analysis. It provides vital information for selecting of precise design specifications and accurate prediction of performance characteristics of the developed drives system when operating over wide variation of load and speed characteristics. This subsequently will lead to the better understanding of operating the drives system at high optimum operating efficiency.

Understanding the dynamic characteristics of its various parameters such as torque, current and speed is essential particularly during design process will ease the determination process of peak values of the various parameters and subsequently enable accurate prediction and selection of the design specifications of the system to be possible.

Furthermore, the analysis performed from the obtained simulated results enables operational behavior characteristics of each parameter to be determined. From the reliability of the developed model enhance to perform other similar simulations involving AC drives and motor.

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# CHAPTER 1

## 1.0 INTRODUCTION

### 1.1 Introduction

Mine winders are designed to fit out the mine hoisting facilities installed in the vertical and sloping mine shafts that are used to transfer the load hoisting vessels upon hoisting mineral resources and rocks, descending or lifting the men, materials and equipment, checking up and inspecting the shaft and handing up or changing the hoist and balancing ropes. It may be either gear-driven off the one or two high-speed motors or gearless, i.e. driven off the low-speed by motor.

Its electrical control equipment provides the necessary require modes of operation i.e. automatic, semi-automatic and manual. The mechanical part of these machines covers all the necessary parts and assemblies, inbuilt electric, pneumatic and lubrication facilities, anchor parts, tools, spares and erection pieces. The schematic diagram of the mine winder is shown in Figure 1.1.

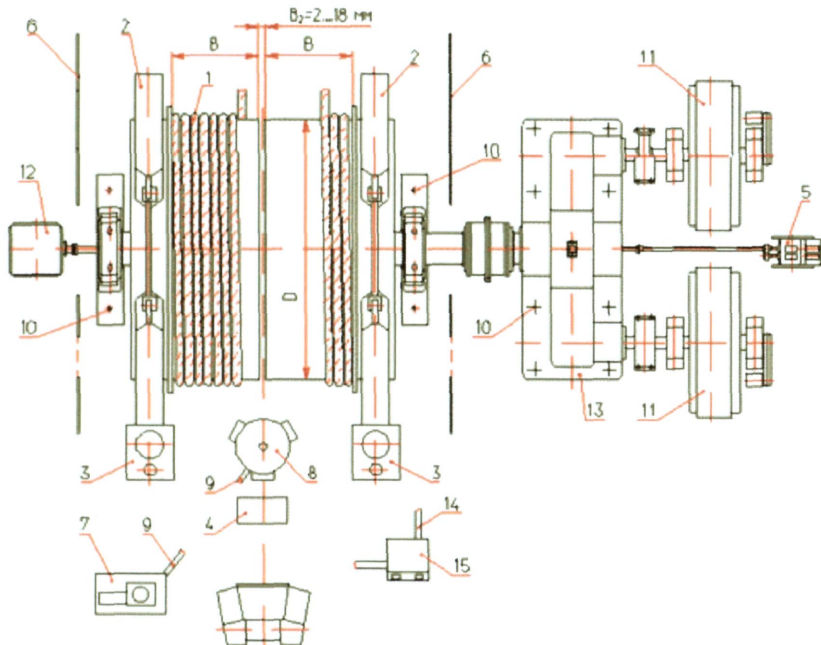


Figure 1.1: Schematic Diagram of Mine Winder

Nowadays, better driving mode with converter supply is implemented on the mine winders design. This is to ensure a greater performance characteristics involving