



**DESIGN AND ANALYSIS OF SLIDING WEAR MECHNISM IN ELECTRIC
TRAIN APPLICATION**

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ABSTRACT

Wear has been known as one of the major factors limiting the life and performance of engineering component and engineering system. Wear control has become the most need for the advanced and reliable technology of the future. Investigating wear rate in sliding wear mechanism to solve a wear problem is a challenging task because its involve deformation of material on surface contact. There are an issues of sliding wear that happen in electric train mechanism that occur between current collector and conductor rail. However, until now there no available literature that study on sliding wear by using different configuration of material (current collector) acting on rail at electric train application. Besides, the experimental setup does not accurately mimic the real operating condition of train mechanism (rotation movement instead of linear movement). This study involved in designing the experimental setup and analysis in detail design before fabrication stage. The project methodology for designing requires several engineering tools to achieve goals and meet specific requirement. The tools that being used is Benchmarking and Systematic Design Step (SDS). Functional Analysis System Technique (FAST) was used to clarify problem before convert into functional requirement. To choose the best design that fulfil the criteria the decision matrix has been produce before proceed to detail design stage. From the method that being used, a working drawing, a manufacturing process planning and assembly steps has been produces as a result for the design project. In addition, the tolerance analysis has been carried out to determine the face clearance needed between the critical part of conducting rail and wheel of train.

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CHAPTER 1

INTRODUCTION

First chapter is written and arranged in six sections as to provide general information about the final project that have been conducted. In the first section of the first chapter, the theoretical background of this work is presented and elaboration on the design process of the project and that includes performance requirements to design and analyze the sliding wear mechanism. The necessity of having a study on this wear mechanism because, there is no literature study on the linear type movement are stated in the problem statement. Then next section, is the establishment of research objectives. An overview of the structure of the thesis is given in the final section.

1.1 Background

This study is to design and analyze a sliding wear mechanism in electric train system. Electric train is a railway vehicle that move along rails by using electric power. Electric power supply to the train usually drawn from an external source. Electric locomotives are important public transport nowadays, its saving cost and eco-friendly features became the people's choice. According to the latest development in electric train sector, a numerous research has been conducted worldwide. The study on main component for electric train on third rail system show the resulted of wear forming