

WEAR CHARACTERIZATION OF A DIESEL ENGINE USING FERROGRAPHIC TECHNIQUE

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"I declare that this thesis is the result of my own work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree"

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ABSTRACT

This study is about wear characterization using oil analysis for condition monitoring of a diesel engine of a bus. Keeping the engine in a good running condition is very important to avoid any major failures or a sudden breakdown, which will be costly. This can be avoided if the wear and tear of the engine can be monitored on a regular basis. This can be achieved using wear particle analysis which is a powerful technique for non-intrusive examination of the oil-wetted parts of a machine. The particles contained in the lubricating oil carry important information about the condition of the engine. This information are deduced from particle shape, composition, size distribution, and concentration of the particles. This method is cost saving because it reduces the costs on repair, overhaul, or replacement and loss of revenue during downtime. By using the data produced by Ferrographic technique, it is possible to pinpoint the presence of unusual concentrations of an element or particle in apparent wear so that the equipment can be repaired or removes from services before a major failure occurs to any oil wetted. This philosophy enhances the personnel safety at minimum cost, and guarantees decisive preventive maintenance, as worn parts can be replaced before they fail. Testing has been done to detect wear in the diesel engine. Based on the results, large cutting wear were found on the wear profile. Assumption was made that the cutting wear was likely due to abrasive contamination. This study has shown that engine monitoring condition by Ferrographic technique is powerful, reliable, non-intrusive, and effective.

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