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Current Measurement of Engine Oils under Various Voltage Application

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Abstract. This paper presents the conduction current measurement of engine oil of a vehicle during engine oil usage. A motorcycle and car engine oil is the sample in this study. For motorcycle engine oil, sample was taken between 0km to 1500km while for car engine oil, it was taken between 0km and 9000km. The electrode was printed to PCB board and the oil was placed between electrode with 1mm gap. The current was measured by a microammeter under voltage applied from 0.2 to 1.0kV. From the result it is understood that the current decreases with the increase in travelling distance of each vehicle. Motorcycle engine oil shows a higher current decreasing rate as compares to car engine oil.

Keywords: Engine oil, Current, High voltage.

1 Introduction

Generally, condition monitoring increases the performance of an engine and its life-time, lowers the operating costs, reduces the downtime cost and prevents failures [1]. This play an important role in engine-based technologies and maximizes engine reliability and maintainability. An engine's performance can be seen from three points of view; the condition of the lubricant, the presence of contaminants and engine wear and tear [2].

Engine oil is very important since its function is to reduce the wear and tear of engine. Primary function of the oil is to lubricate the moving parts and also to clean, prevent rust formation, improve the sealing and cooling the aggregate by transportation of heat from engine [3]. It is known that the engine part is moving against each other thus resulting to the friction and power loss through conversion into heat. Besides that, the process of oil degradation due to the high temperature in the engine will continue and consequently leads to a system malfunctions. So, engine oil needs to be changed regularly as a precaution [4].