



Palm Oil as an Engine Oil in Single Cylinder Tractor

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Abstract

Many industries have given lubrication a significant amount of consideration, especially those that deal with automotive lubricants. According to the research, 53% of the total lubricant use in the world in 2004 came from automobile lubricants. Lubricating oil is frequently produced using mineral-based base oils. The development of environmentally acceptable base oils for lubricating lubricants has emerged as a major research area due to the depletion of crude oil sources and environmental concerns. The development of vegetable oil-based lubricants as an alternative to mineral oil-based lubricants has raised significant concerns due to their inherent technical capabilities as a lubricant and their greater biodegradability. The aim of this research was to develop engine oil based on palm oil. The general lubricating properties of palm oil were measured and compared to a SAE15W40 standard mineral oil, including viscosity (at 40°C and 100°C), viscosity index, flash point, and density. Palm oil exhibited qualities similar to SAE15W40. The experiments were conducted to determine how utilizing palm oil as a mineral oil alternative (SAE 15W40) would affect the internal combustion engine's performance. When palm oil was substituted for SAE15W40, the temperature of the crankcase oil and coolant was lowered. However, the temperature of the exhaust gas increased substantially. By substituting mineral oil with palm oil as the engine lubricant, there was a decrease in brake-specific fuel consumption while the brake power thermal efficiency of the IC engine was increased. A wear tester was designed to measure the variation in material temperature and oil temperature during relative motive. Also, the wear mass between the value differences of the aluminium, block wear could be measured. Based on the results, although at lower load conditions, engine oil shows better wear stability than palm oil, at higher loads, palm oil shows comparable wear stability to engine oil.

Keywords: Bio Lubricant, Engine oil, Engine Performance, IC Engine, Palm Oil.

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