Improvement of Overall Equipment Effectiveness (OEE) through Implementation of Autonomous Maintenance in Crankcase Line

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ABSTRACT

The increase of industrial activities and motor vehicles globally causes rise demands in fossil fuel as energy sources. Since fossil fuel is non-renewable energy, many researches have been conducted to reduce the reliance to this fossil fuel. In conjunction, the number of waste plastic and tires around the world is increasing as a result of modern application and increasing number of motor vehicle. This type of waste is hard to decays and commonly dumped onto open landfills. Utilization of waste tires and plastics can produce alternative fuel that potentially can be used in diesel engine. In this paper, the combustion characteristics of two waste source fuels known as waste plastic disposal fuel (WPDF) and tire disposal fuel (TDF) are discussed. The combustion characteristics of both fuels are compared to diesel fuel. WPDF and TDF used in this experiment are pure concentrated and not blended with diesel fuel. The experiment is conducted using single cylinder YANMAR TF120M diesel engine. The engine is operated at constant load at 20 Nm and variable speed ranged from 1200 rpm to 2400 rpm. The combustion characteristics that discussed in this paper are ignition delay and peak pressure. Both characteristic are measured at two engine speed region which is low speed (1200 rpm) and high speed (2100 rpm). From the results obtained, it can be observed that WPDF has comparable ignition delay compared to diesel fuel while TDF has longest ignition delay compared to WPDF and diesel fuel. TDF also produce highest peak pressure compared to other tested fuels. Moreover, TDF is not suitable for high speed application since it cause backfire when engine speed reach 2200 rpm.

KEYWORDS: Alternative Fuel; Diesel Engine; Tire Derived Fuel; Waste Plastic Disposal Fuel

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