

## **ABSTRACT**

*Indonesia which in previous decades as an oil exporting country, so that Indonesia is incorporated in OPEC (Organization of the Petroleum Exporting Countries). And now it has turned into an oil importing country. Thus, the price of oil in Indonesia is determined by the world oil price. To anticipate the impact of the uncertainty of petroleum prices, as well as the depletion of petroleum reserves, it should seek the exploration of vegetable oil as an alternative fuel for environmentally friendly solar substitutes. This study aims to determine the performance of diesel engines when using mixed combustion fuel from castor oil and B5 and B10 oil, by knowing the generated power, specific fuel consumption (SFC), machine pans, and knowing the characteristics of fuel nozzle injection on diesel engines . In this test using diesel engine with brand Jiangdong R180N 4 steps with one cylinder and nozzle injection tool. In testing of diesel engine performance of mixed oil biodiesel fuel of castor oil and coconut oil B5 and B10, biodiesel which has the highest fuel consumption value (more economical) is fuel BJBK91 B10, while which has the lowest specific fuel consumption value (more wasteful) is BJBK64 B5. It is also possible to test the characteristic of the nozzle injection nozzle, the length of the constant nozzle spray, where the fuel having a low viscosity value of the fuel spray will be shorter, and vice versa if the viscosity value is higher then the spray from the nozzle will be longer.*