

# ***THE EFFECT OF USING AFTERMARKET AND STANDARD COILS ON ENGINE PERFORMANCE AND EXHAUST EMISSIONS ON CONVENTIONAL 125 CC MOTORCYCLES***

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## **ABSTRACT**

*This study aimed to determine the effect of using aftermarket and standard coils on engine performance and exhaust emissions in a conventional 125cc motorcycle. The research object was a 2005 Honda Supra X 125cc motorcycle with a carburetor fuel system. The coil variations tested included the standard factory coil, the KTC aftermarket coil, and the Blue Thunder aftermarket coil. Testing was conducted using a chassis dynamometer to determine torque and power values, and a gas analyzer to measure exhaust emissions of carbon monoxide (CO), hydrocarbons (HC), and nitrogen oxides (NOx). Engine performance testing was conducted at 3,000 to 8,000 rpm, while emissions testing was conducted at idle.*

*The results showed that using aftermarket coils improved engine performance compared to standard coils. The KTC aftermarket coil produced the best performance, with an average torque of 10.62 Nm at 5,000 rpm and a maximum power of 8.64 hp at 7,000 rpm. The Blue Thunder aftermarket coil performed better than the standard coil, with an average maximum torque of 10.61 Nm at 5,000 rpm and a maximum power of 8.46 hp at 7,000 rpm, but still below the KTC aftermarket coil. Meanwhile, the standard coil produced the lowest performance of the two aftermarket coils at 5,000 rpm, with an average maximum torque of 10.4 Nm and a maximum power of 8.26 hp at 7,000 rpm.*

*In exhaust emissions testing, the aftermarket coil also performed better than the standard coil. The KTC aftermarket coil produced CO emissions of 0.25% and HC emissions of 1,626 ppm, while the Blue Thunder aftermarket coil produced CO emissions of 0.36% and HC emissions of 1,926 ppm. The standard coil produced the highest emissions, with CO emissions of 0.38% and HC emissions of 3,292 ppm. NOx values for all coil variants were 0 mg/m<sup>3</sup> at idle. Based on the research results, it can be concluded that the use of aftermarket coils, particularly KTC coils, can improve the quality of the ignition system, resulting in more complete combustion. This results in increased engine torque and power, as well as reduced exhaust emissions.*

**Keywords:** *Aftermarket coil, standard coil, engine performance, torque, power, exhaust emissions.*