

ANALYSIS OF THE EFFECT OF PILOT JET AND MAIN JET SIZE VARIATIONS ON THE POWER AND TORQUE OF A 116 CC BORE-UP YAMAHA F1ZR ENGINE

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ABSTRACT

The development of motorcycle modification, especially in two-stroke engines, has increased significantly, one of which is through increasing engine capacity by performing a bore up modification. Changes in engine capacity cause changes in fuel and air mixture requirements, so proper adjustment of the fuel system is needed to obtain optimal engine performance. One of the adjustment methods is by varying the size of the pilot jet and main jet in the carburetor system.

This study aims to determine the effect of variations in pilot jet and main jet sizes on the power and torque of a Yamaha F1ZR engine with a 116 cc bore up modification. The research method used was an experimental method by conducting engine performance tests using a dynamometer. The variations of pilot jet used were 35, 40, and 45, while the variations of main jet used were 120, 125, and 135. Each variation combination was tested three times with the observed parameters being engine power (HP) and torque (Nm).

The results showed that variations in pilot jet and main jet sizes affected the performance of the Yamaha F1ZR 116 cc bore up engine. The highest power was obtained using a combination of pilot jet 40 and main jet 135, producing a maximum power of 15.65 HP at 7,460 RPM. Meanwhile, the highest torque was obtained using a combination of pilot jet 45 and main jet 135, producing a maximum torque of 15.35 Nm at 7,020 RPM. Changes in jet size affect the amount of fuel and air mixture entering the combustion chamber, which influences the combustion process and engine performance.

Based on the results, it can be concluded that selecting the appropriate pilot jet and main jet sizes can improve the performance of the Yamaha F1ZR 116 cc bore up engine. The combination of pilot jet 40 and main jet 135 produced the best power performance, while the combination of pilot jet 45 and main jet 135 produced the best torque performance. This research is expected to be a reference for fuel system tuning on modified two-stroke engines.

Keywords: Yamaha F1ZR, 116 cc bore up, pilot jet, main jet, power, torque.