Investigation of Intake Flow Rate and Swirl Motion of Sl Engine

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ABSTRACT

In the process of producing an optimized air intake system design, detailed understanding of the airflow motion is required. To reach such understanding, this paper aims to investigate the flow rate and swirl motion of an engines inlet system at different pressures and different conditions. Using a commercial steady flow bench and a swirl meter, the different parameters, the flow rate and swirl coefficient, is obtained at different valve lifts. The inlet system will then be tested in different pressures and at different engine configurations. Since the tested inlet system has two valves in its intake port, both valves are tested separately as well as tested together. It is found that the flow rate pattern mirrors the swirl pattern where the value increases as the valve lift increases but decreases and levels after a certain valve lift. Increase in pressure from 5kPa to 10kPa exhibits a 43% increase in flow rate and 90% increase in swirl coefficient and by removing the manifold, the flow rate only increase by 4% but the swirl coefficient changes by 30%. Theses findings show the main factors that affects the intake process and the results will be used as a baseline to improve the intake system.

KEYWORDS: Airflow, Intake System, Intake Turbulence, Naturally Aspirated Engine

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