INTISARI

Intake runner merupakan komponen pada *air intake system* untuk menyalurkan aliran udara masuk ke mesin. Mobil Formula Bimasakti UGM sebagai mobil yang mengikuti kompetisi *Formula Student* (FSAE) memerlukan komponen yang memiliki performa tinggi termasuk komponen *intake runner*. Pada kompetisi FSAE terdapat peraturan yang mengharuskan penggunaan restrictor sebesar 20 mm pada *intake system* mobil. Penelitian ini bertujuan untuk mendapatkan desain intake runner yang dapat mengoptimalkan daya dan torsi mesin KTM 450 SX-F tetapi sesuai dengan peraturan kompetisi *Student Formula SAE* untuk diaplikasikan pada mobil Bimasakti.

Penulis melakukan analisa pengaruh panjang intake runner terhadap performa mesin dari mobil Bimasakti generasi 7. Dalam penelitian ini dilakukan simulasi pada 9 variasi desain intake runner dan 1 desain awal menggunakan *software Ricardo WAVE*, software simulasi mesin dan dinamika gas 1 dimensi.

Dari penelitian ini, didapatkan bahwa variasi desain 9 mampu meningkatkan daya sebesar 24.36% dan torsi maksimum sebesar 20,96% dari mobil Bimasakti generasi 7. Dibandingkan dengan variasi desain yang lain, desain tersebut menghasilkan performa mesin yang paling optimal. Diketahui juga dari hasil simulasi bahwa semakin panjang *intake runner* maka nilai puncak daya dan torsi akan semakin naik.

Kata kunci: panjang *intake runner*, *Air Intake System, Ricardo WAVE*

ABSTRACT

Intake runner is one of the components in the air intake system to distribute air flow in to the engine. Bimasakti UGM Formula Car as one of the participating teams in the Formula Student (FSAE) competition need a component with high performance including intake runner. In the competition, the rule states that a restrictor with a dimension of 20 mm must be available in the intake system. This study aims to obtain an intake runner design with the ability to optimize the power and torque produced by KTM 450 SX-F engine without violating the competition's rule so that it shall be applied to Bimasakti.

The author conducted an analysis upon the effect of the length of the intake runner against the engine's performance of 7th generation of Bimasakti car. In this study, a simulation has been carried out with 9 intake runner design variations and 1 existing design using *Ricardo WAVE* software, an engine and one dimension gas dynamics simulation software.

From the study conducted, it is known that the design no. 9 is capable to increase 24.36% of the power and 20.96% of maximum torque of 7th generation of Bimasakti car. Compared to the other design variations, this design generates the most optimum engine performance. It is also known form the simulation that the longer the intake runner, the bigger the peak power and torque generated.

Keywords: Intake Runner Length, Air Intake System, *Ricardo WAVE*