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IMPROVEMENT OF A NON ENERGY-CONSUMING SYSTEM: A GAMMA STIRLING ENGINE

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Abstract

In this paper, the classical adiabatic model was chosen. The assumption of perfect gas working fluid was replaced by that of a real gas working fluid. This last assumption was defined by the van der Waals state equation. A Gamma type Stirling engine functioning with a maximum filling pressure of 10 bars was used to carry out experiments. Both theoretical models: the Perfect Gas Adiabatic Model (PGAM) and the Real Gas Adiabatic Model (RGAM) were applied to the Gamma Stirling engine. The influence of the initial filling pressure on the engine performance was studied numerically and experimentally. The real gas adiabatic model presents results closer to the experimental ones, especially for high initial filling pressure.

Key words: adiabatic model, brake power, mechanical work, perfect gas, real gas, stirling engine

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