EXERGY ANALYSIS APPLIED TO INTERNAL COMBUSTION ENGINES

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ABSTRACT

During part load operation of internal combustion engines in automotive applications, a significant part of the working time is spent at part load conditions with reduced thermal efficiency. This reduction of the thermal efficiency should be evaluated with the second law of thermodynamics. A model for the calculation of the exergy of an internal combustion engine is presented. The objective is the calculation of the lost exergy (irreversibility) during the engine working cycle. A second law efficiency expression is proposed.

Due to the poor performance in terms of first law of thermodynamics of the Otto cycle when working under part load, the model was applied to an Otto cycle working under part load conditions.

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