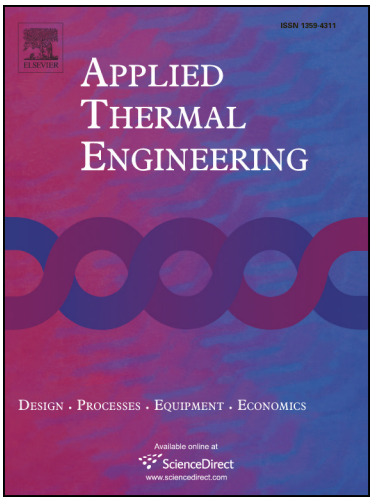

Research Paper

Performance enhancement of a baffle-cut heat exchanger of exhaust gas recirculation

E. Jiaqiang, Dandan Han, Yuanwang Deng, Wei Zuo, Cheng Qian, Gang Wu, Qingguo Peng, Zhiqing Zhang

PII: S1359-4311(17)37240-X
DOI: https://doi.org/10.1016/j.applthermaleng.2018.01.109
Reference: ATE 11763

To appear in: *Applied Thermal Engineering*

Received Date: 12 November 2017
Revised Date: 25 January 2018
Accepted Date: 28 January 2018

Please cite this article as: E. Jiaqiang, D. Han, Y. Deng, W. Zuo, C. Qian, G. Wu, Q. Peng, Z. Zhang, Performance enhancement of a baffle-cut heat exchanger of exhaust gas recirculation, *Applied Thermal Engineering* (2018), doi: https://doi.org/10.1016/j.applthermaleng.2018.01.109

Performance enhancement of a baffle-cut heat exchanger of exhaust gas recirculation

Jiaqiang E [a, b, e], Dandan Han[a, b], Yuanwang Deng[a, b, e, *], Wei Zuo[a, b], Cheng Qian[c], Gang Wu[d], Qingguo Peng[a, b], Zhiqing Zhang[a, b]

a. State Key Laboratory of Advanced Design and Manufacturing for Vehicle Body, Hunan University, Changsha,410082, China;

b. College of Mechanical and Vehicle Engineering, Hunan University, Changsha, 410082, China;

c. Mechanical and Electrical Engineering College,Jiaxing University, Zhejiang Jiaxing,31400 1, China;

d. College of Automotive and Mechanical Engineering, Changsha University of Science and Technology, 410114, Changsha City, Hunan, China;

e. Institute of New Energy and Energy-Saving & Emission-Reduction Technology, Hunan University, Changsha,410082, China

*dengyuanwang@hnu.edu.cn

Abstract: In present investigation, a 3D numerical simulation of a baffle-cut heat exchanger of exhaust gas recirculation (EGR) in diesel engine is used to investigate its flow field and heat transfer characteristics at three different part loads. Firstly, an original shell-and-tube heat exchanger with different EGR rates is simulated as reference for latter comparisons. Then, some baffle-cut heat exchanger models with differently adjacent baffles cut in every model but same overall baffle cuts are made. Afterwards, these new ones are simulated with same conditions of original one to facilitate comparisons. The Nu/P_p is the ratio of Nu to pump power. It's taken as one evaluation criterion to indicate comprehensive performance enhancement of new models which is increased with the increase of EGR rates and higher than original one.

Key words: Baffle-cut heat exchanger; Baffle cuts; Baffle arrangements; Heat transfer