عنوان مقاله:

Performance of Heat Recovery Cycle in order to Enhance Efficiency and its Mutual Effect on the Engine Performance with the Aid of Thermodynamic Simulation

نویسندگان:

H. Radaei - *Sea-Based Energy Research Group, Faculty of Mechanical Engineering, Babol Noshirvani University of Technology, Babol, Iran*

R. Shafaghat - *Sea-Based Energy Research Group, Faculty of Mechanical Engineering, Babol Noshirvani University of Technology, Babol, Iran*

S. Talesh Amiri - *Sea-Based Energy Research Group, Faculty of Mechanical Engineering, Babol Noshirvani University of Technology, Babol, Iran*

B. Alizadeh Kharkeshi - *Sea-Based Energy Research Group, Faculty of Mechanical Engineering, Babol Noshirvani University of Technology, Babol, Iran*

خلاصه مقاله:

Considering that the heat required for the Waste heat recovery (WHR) cycle of the engine is provided from two parts of the exhaust gas and the cooling system, the mutual influence of the WHR cycle on the engine performance is undeniable. Therefore, in this numerical study, an attempt has been made to thermodynamically evaluate the effect of the implementation of the WHR cycle on the engine efficiency. For this purpose, the ۱۶ cylinder MTU ۴۰۰۰ R۴۳L heavy diesel engine was simulated and a comparison was made between numerical and experimental results. Finally, the SRC heat recovery cycle was designed and applied in the simulated model according to the desired limits and the temperature range of the engine operation. At low speed with the application of the WHR cycle, the output net power did not drop much, but at the maximum speed and power, a power loss of about ۴% is observed. At ۱۱۳۰ rpm, the power did not increase much. At ۱۶۰۰ rpm, the power increase is reduced to about ۲.۳%. At ۱۸۰۰ rpm, due to the significant increase in exhaust gas temperature, the total power value increased by about ۴%.

کلمات کلیدی:

Heat Recovery, Internal combustion engine, parametric analysis, prime mover, Waste heat recovery