

## عنوان مقاله:

Advanced Exergy Scrutiny of a Dual-loop Organic Rankine Cycle for Waste Heat Recovery of a Heavy-duty Stationary Diesel Engine

## محل انتشار:

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## خلاصه مقاله:

In this paper, the normal exergy scrutiny (NES) and advanced exergy scrutiny (AES) of a waste heat recovery (WHR) system was performed. The proposed system contains a dual-loop organic Rankine cycle (DORC) which recovers the available waste heat of the intake air, exhaust gas, and coolant streams of a ۱۲-cylinder heavy-duty stationary diesel engine. A well-known method of the AES called the thermodynamic cycle approach is utilized to determine each component exergy destruction parts namely exogenous/endogenous, unavoidable/avoidable, etc. Results showed that ۵۹.۰۴ kW from the ۲۵۸.۶۹ kW total exergy destruction rate of the system could be eliminated (۲۲.۸۲% of the total exergy destruction rate). The total avoidable exergy destruction part of the low-temperature loop accounts for ۴۶.۶۲ kW, which indicates that it requires more attention than that of the high-temperature loop by ۱۲.۴۲ kW. Furthermore, it is revealed that to enhance the overall productivity of the system, there is a relatively significant difference in priority order regarding the improvement of system components. The AES has proposed this ranking for improvement priority of components: condenser, expander ۲, expander ۱, respectively. While the NES has specified the priority as the .evaporator ۱, condenser, expander ۲, respectively

## کلمات کلیدی:

Organic Rankine Cycle, Advanced Exergy Scrutiny, Heavy-duty Diesel Engine, Endogenous/exogenous, (Un) avoidable exergy destruction

## لینک ثابت مقاله در پایگاه سیویلیکا:

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