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عنوان مقاله:

Fluid Selection of Organic Rankine Cycle for Waste Heat Recovery from Engine Test Cell

محل انتشار:

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خلاصه مقاله:

In manufacturing an engine, it is needed to evaluate the engine performance. This is performed in test cell. During the test, a significant portion of fuel energy is wasted. In this work, an Organic Rankine Cycle (ORC) is used to produce electrical power from the waste heat of the engine test cell. To achieve the best results, different working fluids are examined in ORC and performance of the system is determined for each case from the energy and exergy viewpoints. Finally a parametric study is done to reveal the effects of some decision variables on the performance of the system. The results show that selection of different working fluids in ORC has considerable effect on energy and exergy performance of the system. It is concluded that, the system with R123 as a working fluid for the organic rankine cycle, has the highest work produced, among considered working fluids, whereas R11 results the highest energy and exergy efficiency for heat recovery process. Also, the results of parametric study reveal that, increasing evaporator temperature increases produced work and exergy efficiency while increasing condenser temperature, pinch point temperature difference in the evaporator and degree of superheat at ORC turbine inlet decreases produced work and exergy efficiency.

کلمات کلیدی:

energy, exergy, engine test cell, heat recovery, working fluid

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