Abstract Submitted
for the APR10 Meeting of
The American Physical Society

**Heat Engine with Finite Thermal Reservoirs and Nonideal Efficiency** CARL MUNGAN, U.S. Naval Academy — The performance of an irreversible heat engine operating between two thermal reservoirs with finite, temperature-independent heat capacity is analyzed. For this purpose, a dynamic second-law efficiency is introduced and assumed to be constant. As the first-law efficiency increases from zero up to the Carnot limit, the common final temperature of the reservoirs interpolates between the arithmetic and geometric mean of their initial temperatures. The total output work and entropy change of the reservoirs are computed and related to the static efficiencies. The dynamic and static efficiencies are shown to be approximately equal to each other when the temperature of the cold reservoir is at least 10% of the temperature of the hot reservoir. (Reference: LAJPE Vol. 3, pp. 239-242, May 2009.)

Carl Mungan
U.S. Naval Academy

Date submitted: 27 Aug 2009 Electronic form version 1.4