

Chapter 19 Problem 14 †

Given

$$T_{sun} = 5600 \text{ K}$$

$$T_{space} = 2.7 \text{ K}$$

Solution

Find the efficiency of this engine.

Using the reversible process Carnot cycle, the efficiency of this process would be

$$e = 1 - \frac{T_C}{T_H} = 1 - \frac{2.7K}{5600K}$$

$$e = 0.9995$$

$$e = 99.95\% \text{ efficient}$$

†Problem from Essential University Physics, Wolfson