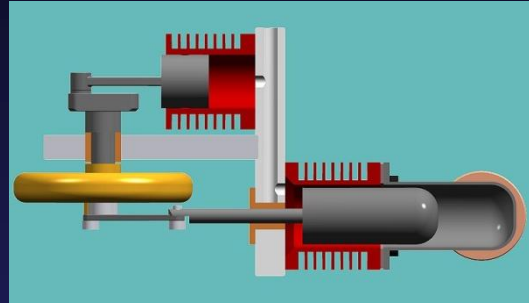


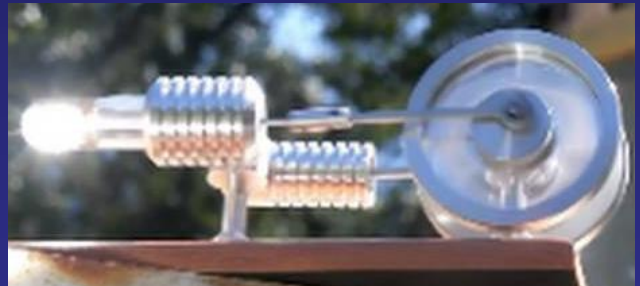
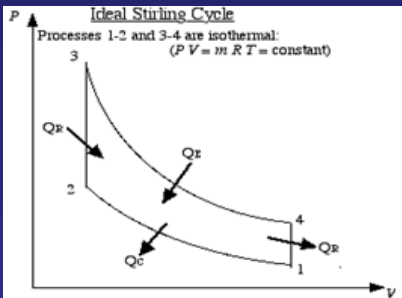
STIRLING ENGINE

What to do

1. Fill the reservoir with ethanol and ignite
 2. Use a large Fresnel lens as a source of heat.
- CAUTION: HEAT and FLAMMABLE LIQUID**



A Stirling engine is a heat engine that operates through the cyclic compression and expansion of air or other gases. An external heat source applied to one portion of the engine results in an expansion of the contained gas, which flows into the colder portion where it compresses. Key components of the engine are the heat source, the heat sink and one or more heat exchangers. The *regenerator* is an internal heat exchanger and temporary heat store placed in between the cold and hot compartments. Its function is to retain heat within the system that might otherwise be lost from intermediate temperature stages to the surroundings: this is what enables Stirling engines to approach the limiting Carnot efficiency.



The ideal Stirling cycle shown can be analysed as follows:

Process 1-2 is an isothermal (constant temperature) compression process, during which the piston in the hot cylinder compresses the working fluid, which loses heat to the cooling medium or environment as it compresses. Work W_C is done on the system (a force is applied in the direction of compression), while an equal amount of heat Q_C is lost by the system, thus maintaining a constant temperature T_C .

Process 2-3 is a heat exchange process in which the pressure of the gas increases due to heat Q_R being absorbed by the gas without a change in the gas's volume.

Process 3-4 is an isothermal expansion process, during which an amount of heat Q_E is added to the system by the heater and the system does an equal amount of work W_E , thus maintaining a constant temperature T_E . The piston in the cold cylinder is pushed out in this part of the cycle.

Process 4-1 is a constant volume process in which heat Q_R is removed from the working gas by the cooling medium.

Brought to you by Corridor Physics