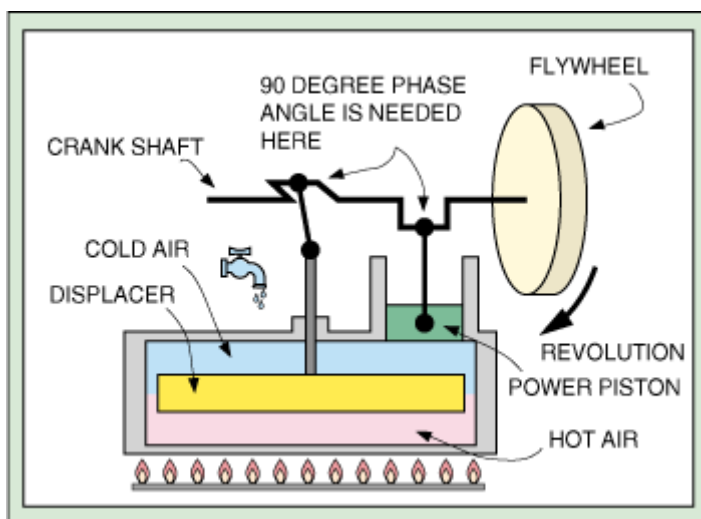


The Stirling engine (summary)

The Stirling engine is a device that converts heat energy into mechanical power by alternately compressing and expanding a fixed quantity of air or other gas at different temperatures.

The engine is designed so that the working gas is generally compressed in the colder portion of the engine and expanded in the hotter portion resulting in a net conversion of heat into work. An internal Regenerative heat exchanger increases the Stirling engine's thermal efficiency compared to simpler hot air engines lacking this feature.

This kind of engine has a sealed cylinder with one part hot and the other cold. The working gas inside the engine (which is often air, helium, or hydrogen) is moved by a mechanism from the hot side to the cold side. When the gas is on the hot side it expands and pushes up on the piston. When it moves back to the cold side it contracts. Properly designed Stirling engines have two power pulses per revolution, which can make them very smooth running. Two of the more common types are two piston Stirling engines and displacer-type Stirling engines. The two piston type Stirling engine has two power pistons. The displacer type Stirling engine has one power piston and a displacer piston.



They are used only in some very specialized applications, like in submarines or auxiliary power generators for yachts, where quiet operation is important. Although there hasn't been a successful mass-market application for the Stirling engine, some very high-power inventors are working on it.

Stirling engine can work as a heat pump or as a refrigerator. The use of the engine depends on the angle between of the pistons which are connected to the crank shaft. Mixture piston follows the power piston with the ninety degree shift. If we change the angle of the one of the piston for 180° the rotation of the Stirling engine would change the direction of turning the flywheel.