Mini Free Piston Stirling Engine Kit

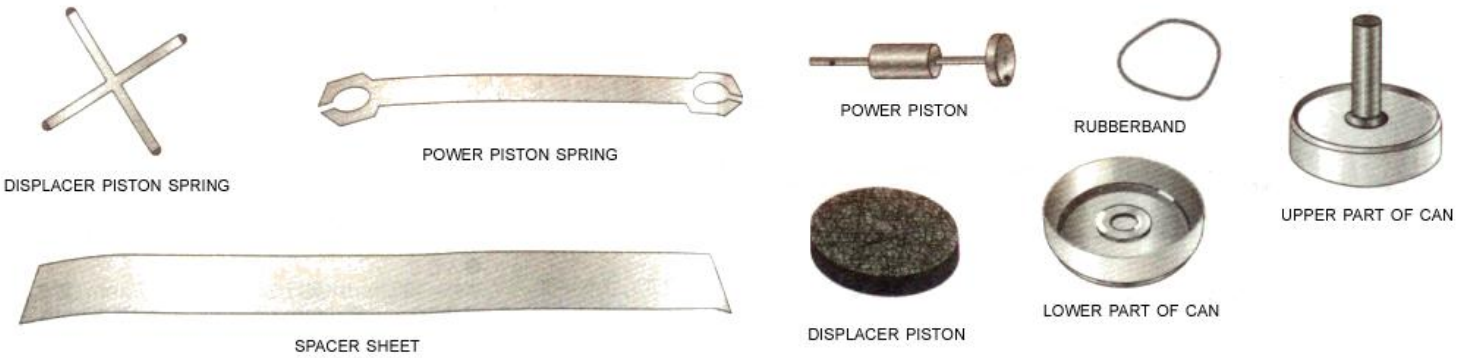
IMPORTANT NOTICE !

These low free piston Stirling engines require a difference in the bottom and top plates to operate. DO NOT place them on a high temperature heat source (e.g. oil/wood burning stove, candle, Arga stove). If you do, it will melt a number of parts on the Stirling engine. It can be placed on top of a recently boiled cup of water/tea/coffee but nothing hotter.

Starting your engine

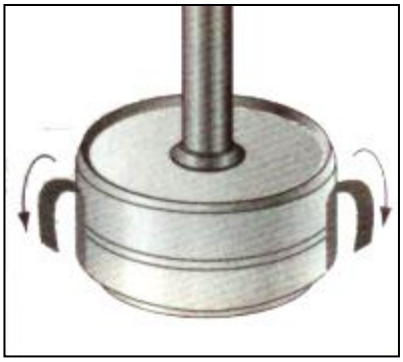
Once you have built your engine, place the engine on top of a recently boiled cup of water (as shown on picture on the left). Leave the engine for a minute in order for the cylinder base to warm up. Then simply tap the counter weight.

Parts included with the kit

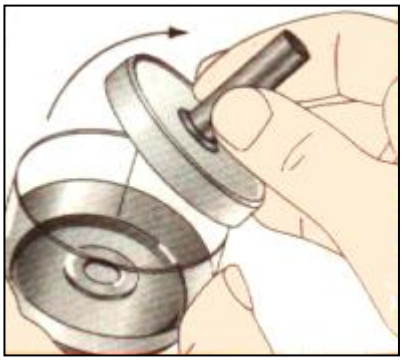


Displacer piston spring	x 2
Power piston spring	x 2
Spacer sheet	x 1
Power piston	x 1
Displacer piston	x 1
Lower part of can	x 1
Upper part of can	x 1
Rubberband	x 1

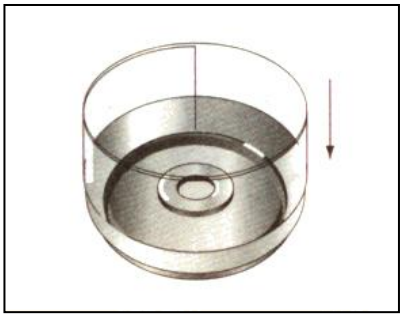
Assembling Your Stirling Engine



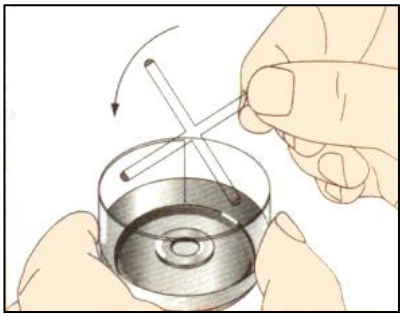
1. Open the can by removing the tape.



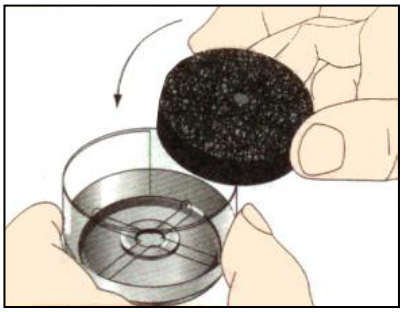
2. Take any parts out from the can



3. Insert the spacer sheet into the can as shown. Ensure it fits into the groove.

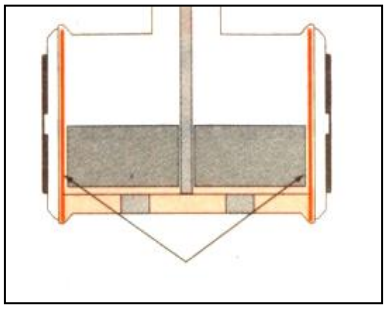


4. Insert the displacer piston spring and center it in the bottom of the lower part of the can.

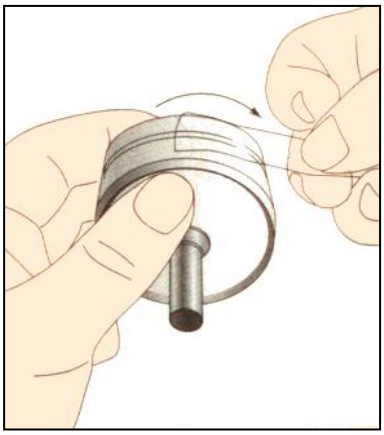


5. Take the displacer piston and place it into the can as shown.

6. Put the upper part of the can on top. Again ensure the spacer sheet fits into the groove.

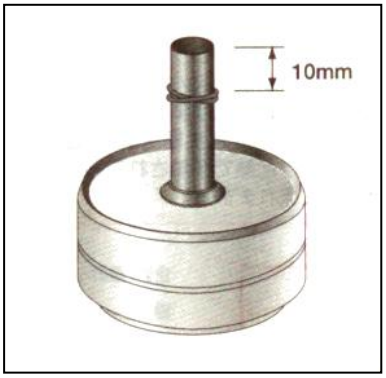


7. Spacer sheet should be as shown in diagram.



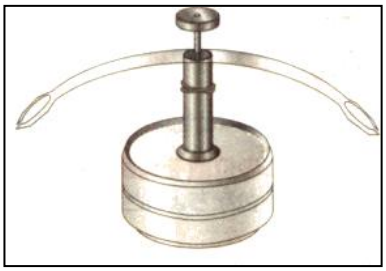
8. Tape the round the can as evenly as possible. Make sure it completely seals the can. It needs to be air tight.

Note: tape not provided.

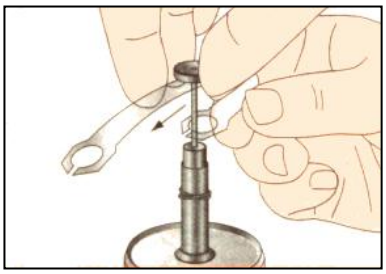


9. Place rubber band as shown. It should be about 10mm from the top.

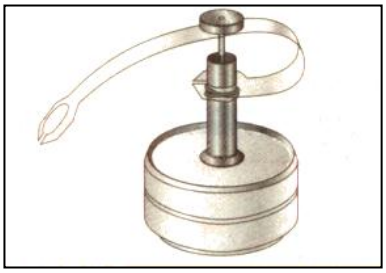
10. Insert the power piston.



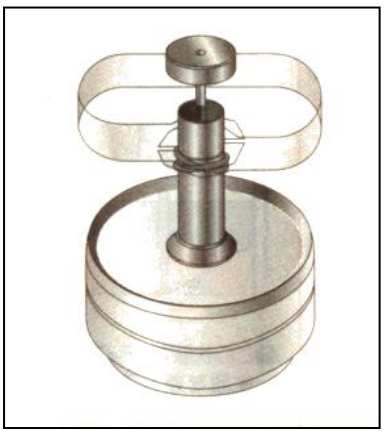
11. Attach the spring as shown.



12. Fold the spring as shown and clip over the tube.

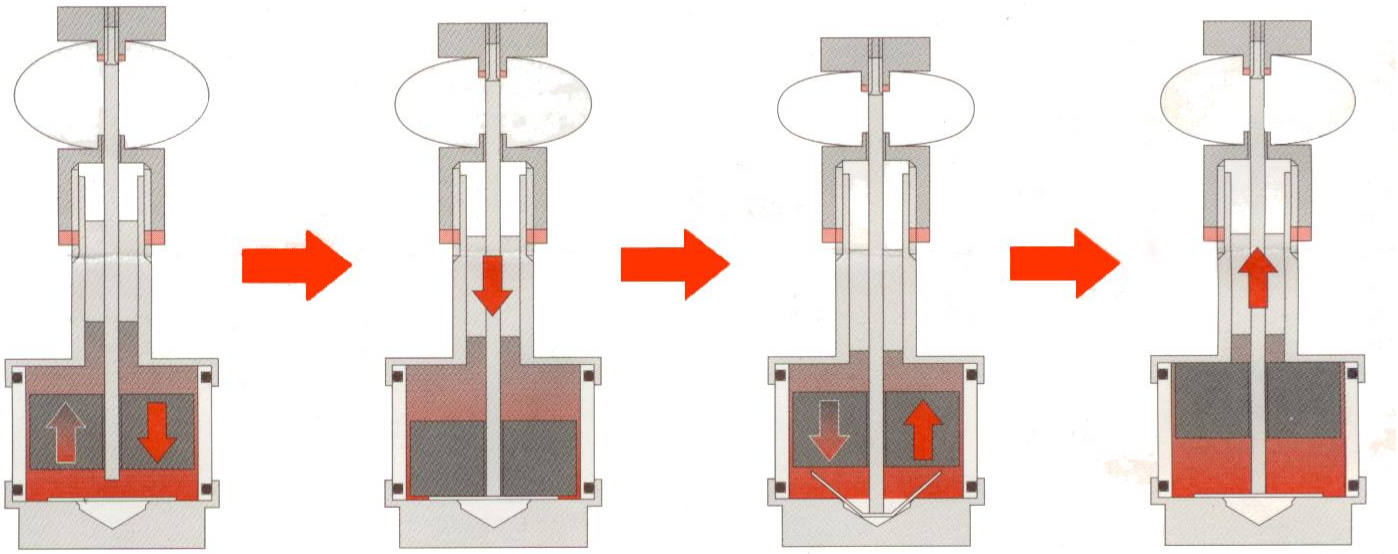


13. Allow the spring to rest on the rubber band. Do the same to the other side of the spring.



14. Place on top of a hot cup of water and tap the top with your finger to start. If the engine fails to start ensure the water has just boiled and try adding a second displacer spring.

How the Stirling Engine Works



Cooling Phase (Far left) – The displacer piston (large piston) is begins to drop. The air in the Stirling engine is beginning to cool ready for the contraction phase.

Contraction Phase (Second from left) – The Cooling phase has just finished. The overall temperature of the air inside the Stirling engine has dropped and hence the internal air pressure is dropping. The power piston (small piston) is being pulled down by this pressure drop. The displacer piston (large piston) is now at the bottom and the cooling has reached its peek.

Heating Phase (Second from right) – The displacer piston (large piston) is has been pushed up by the spring. The air under the displacer piston begins to heat up.

Expansion Phase (Far right) – The overall temperature of the air inside the Stirling engine has increased and so has the air pressure. The air is expanding and the power piston is being pushed up. The displacer piston (large piston) is now at the top, heating is at its peek. The cycle will repeat until the difference in temperature between the top and bottom plates are too small.