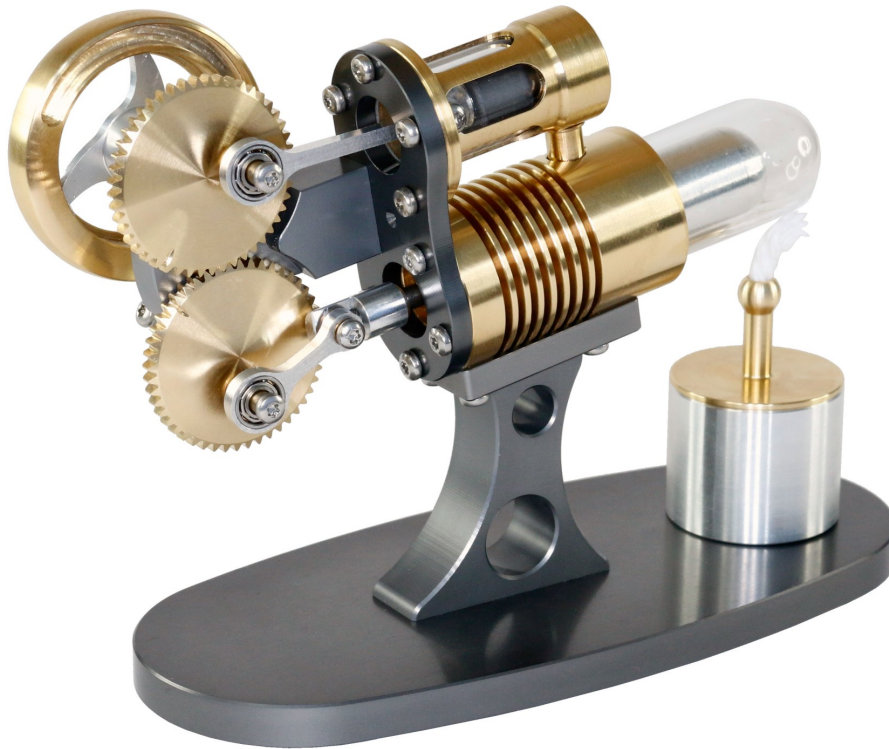


Nano Gear Manual



SAFETY WARNING:

Parts of the engine will be very hot while in operation and will take time to cool down. Make sure children are fully supervised. Ensure burner is extinguished after use. Do not leave engine running unattended. When in use or when the engine is cooling, keep away from flammable materials and fuel.

Because of its high rpm the engine may 'walk' across a table/desk due to vibration. Read the instructions to find out why this happens how to prevent this.

WARNING ABOUT FUEL:

Please note **WE DO NOT** supply fuel with any of our engines. However all the nano range of engines are supplied with a small bottle of oil.



THE BOTTLE CONTAINS OIL. DO NOT USE AS FUEL.

Nano Gear Manual

The Wick

The wick needs to be pushed to the brass part of the burner. The wick only needs to protrude 4mm from the end. The rest of the wick can remain curled up in the base of the burner. The wick is a tight fit and sometimes can be tricky to feed through the hole.

Adding fuel

Fill the burner with methylated spirits (Denatured alcohol). No more than $\frac{3}{4}$ full. Half full will last a long time running the engine. Put the lid of the burner on and place the burner into the base. It will fit snugly.

Starting

Light the wick using a cigarette lighter, match or piezo electric starter. The flame may not be obviously visible at first due to the small size. Let the engine warm up. It won't be able to start for 30 seconds to 1 minute. Once it has warmed up flick the flywheel. It will only run one way. If the burner is to the right and the flywheel to the left, the flywheel needs to rotate clockwise. You may need to flick the flywheel a few times for it to start.

Stopping

You can either let the burner run out of fuel or extinguish the flame. It is recommended the flame is blown out before running out of fuel. This saves the wick from smouldering, which will reduce its length over time. Ensure the flame is out and let the engine cool down before putting away. The engine can still be over 200C even if the flame is out.

Failing to Start, running slow or vibrating across the table/desk

If the engine fails to start or runs slower than usually it needs oiling. Equally if the engine starts to rev higher than normal this induces vibration. A higher revving engine tends vibrate more and walk across the desk/table. In testing we concluded that under normal operation the engine wouldn't walk across the desk/table but as the oil dissipated the RPM increased, then as the oil dissipated further the engine would slow or stop. So oil your engine if the speed increases to the point where vibrates.

As a guide the engine needs oiling about every 1 hour of running time.

The second key factor in controlling the speed is the length of the wick. There should be about 4mm sticking out. Too little and the engine will fail to run. Too much and the engine may go so fast that it starts to vibrate.

Looking after your engine and keeping it clean

Keep your engine free from dust and grime as this will degrade performance or stop it from running. Don't oil the graphite piston it is self-lubricating. Do not oil it. Getting oil on that will damage the engine. Only oil the parts we suggest.

Nano Gear Manual

Oiling

From time to time the engine will need oiling. The engine will fail to start without enough oil. Each engine is supplied with an oiler that has a needle end. This enables you to precisely place a single drop of oil on the key components. Never use wd40, motor oil or a general oil; It needs to be an extremely light oil. You will have plenty of supplied oil with the engine, if you do happen to run out in future years we only recommend a good quality sewing machine oil. See diagram for the 7 oiling points.

Your engine has been pre-oiled and factory tested.
About every 1 hour running apply oil on the follow joints.

