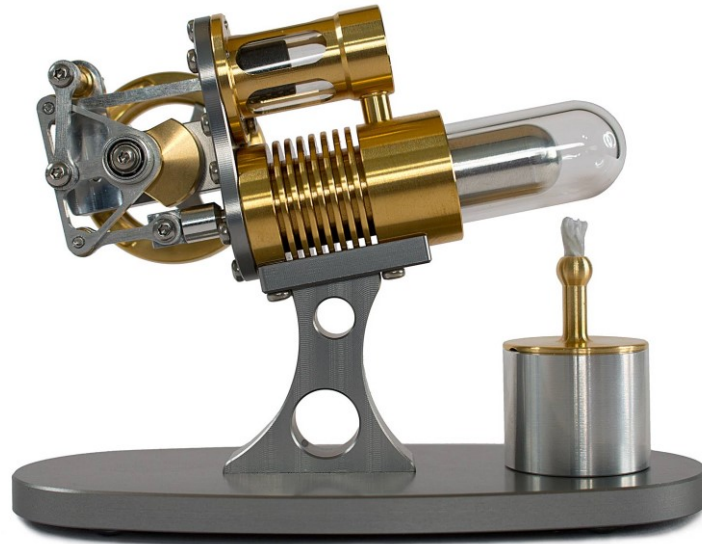


# Nano Cannon Manual

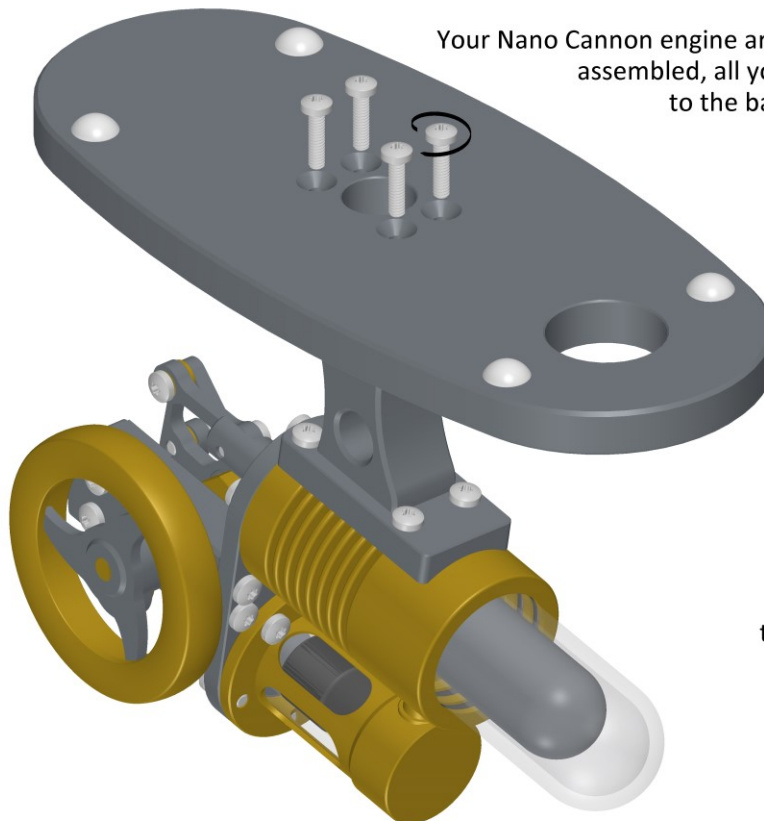


## WARNING:

**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.

## Unboxing and Assembly



Your Nano Cannon engine arrives fully tested and almost fully assembled, all you need to do is attach the engine to the base plate using the supplied 4 torx screws and torx screwdriver.

Carefully remove all the parts from the box and place on a desk.

Align the base plate and engine as shown in the diagram. The rubber feet on the base will be facing upward and the hole for the burner will be close to the glass on the engine.

Screw all 4 screws in loosely. Once they are all in loosely, tighten with the torx screwdriver.

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## **The Wick**

Now push the wick through 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.

## **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.

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## 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.

