G25802 - High Voltage Spark Ignition Coil by Spark Industries Inc

https://www.goldmine-elec-products.com/prodinfo.asp?number=G25802

Hi guys, no questions today but maybe some helpful info. I know how this spark ignitor thing works. I got a few of them from what was then Jerryco like 20+ years ago. This is clearly the exact same product, with a slightly different case but the same form factor.

The trick is that you need to charge a 1 uF capacitor to 70-200 volts and then discharge it through the coil primary, which is the two terminals on either side of the one offset terminal. The spark comes between the offset center terminal, which is ground, and the pointy end of the case which is the other side of the secondary coil.

Back in the day I designed a little circuit to run it based on a cheap disposable camera flash unit and a SCR. It will generate up to about 10 pulses per second and they are safe for human contact, similar to machines used by chiropractors to loosen up stiff muscles. They will also throw sparks a couple of cm and obviously ignite flammable gases, as they were designed to do.

-Roger

Instructions for Making a High-Voltage "Sparker"

This device will create brief 10-20 kilovolt pulses which will shoot visible sparks up to 2cm, at any rate up to 10-20 pulses per second. These pulses are low-current and safe for a healthy human to contact.

Parts List:
1 "Spark Ignitor" Am Sci & Surp P/N 23122
1 Cheapest possible camera strobe flash unit
1 Capacitor 1uF, 200V (or more)
1 SCR 400 volt, 6 amp (or more)
1 resistor 100K-? (or potentiometer)
Optional: 1 extra neon bulb

Instructions:

Open the flash unit and inspect it to make sure the photo-flash capacitor and strobe lamp are wired in parallel. This is very important. If they are not wired together, then you need to get a cheaper flash. Most very cheap flashes are built this way.

If the wires are not color-coded, make note of the one connected to the positive (+) side of the photo-flash capacitor. Remove the strobe lamp and capacitor, leaving the capacitor wires connected to the PC board. The strobe lamp will have a third "trigger" wire connected to the trigger transformer; trace it back and remove the trigger transformer. Remove the "ready" neon lamp and save it. Remove any wires that connected the flash to the camera.

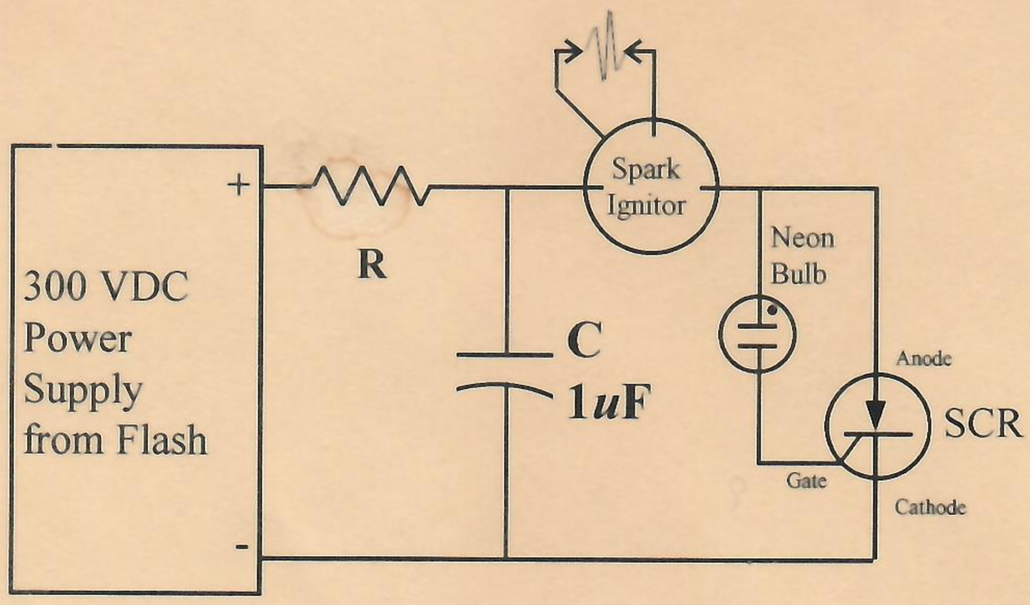
You now have a 300-400 VDC power supply available through the wires which once fed the photo-flash capacitor. The remaining circuitry on the board is concerned with generating a trigger pulse to fire the strobe, and will not interfere with our project. If you are familiar enough with electronics to identify which components are actually used to generate the high voltage, you can remove the others, but this is not necessary.

Caution: Although the final output of the spark ignitor is safe, the high voltage from the flash is dangerous, particularly if it has been used to charge a capacitor. Use caution and seal the final project so this voltage is not accessible!

Now observe the basic schematic. You can wire it as shown, or make the following modifications:

1. You can replace R with a potentiometer. If you do this, you should wire a fixed resistor in series with the pot so that the flash rate cannot go too high.

2. If you have a second neon bulb, you can wire it in series with the one salvaged from the flash. This will double the trigger voltage, making a stronger spark. If you do this, you can also wire a switch across one of the neon bulbs to short it out, for "dual-power" operation.



How It Works:

The 1-uF capacitor C charges through R until it reaches about 75 volts. At this point the neon bulb comes on, triggering the SCR, which discharges the capacitor through the spark ignitor. The SCR turns off when the capacitor is drained and the process starts again.

If a second neon bulb is wired in series with the salvaged one, the pair will trigger the SCR at about 150 volts instead of 75 volts, giving a stronger pulse but taking longer to charge the capacitor each time.

Maximum Pulse Rate:

The maximum pulse rate is determined by the the rate at which the flash can keep the capacitor recharged. A guess can be made by observing how long it takes the flash unit to charge for a flash before taking it apart. Call this period T and the original photo-flash capacitor C uF. The maximum rate will be about 4C/T pulses per second. Halve this if you are using two neon bulbs for more powerful pulses.

DO NOT use a larger capacitor — ESPECIALLY not the photo-flash capacitor! This will fry the SCR and is very dangerous. Also, do not substitute a smaller SCR. A heavy-duty model is needed to absorb the huge pulse of current which occurs when it shorts out the capacitor through the spark ignitor.