

Timing Light As Stroboscope

Q I have a timing light which operates off a car battery and a connection to a spark plug wire. Is there some way to modify the light for use as a stroboscope? — M. M., Elko, Nev.

A A timing light is a special kind of stroboscope that flashes whenever a particular spark plug fires, enabling you to see what position the engine is in at that moment. What you need is a way to trigger it

through a spark plug wire.

Timing lights that connect directly to a spark plug aren't so easy to fool; they are triggered by the high voltage from the ignition coil, which isn't easy to simulate safely.

Bear in mind that the maximum frequency of a timing light is about 20 Hz. Above that frequency, timing lights tend to skip pulses. You might be able to speed up a timing light by reducing the value of the high-voltage capacitor across the flashtube; the light will then be dimmer, but the capacitor will

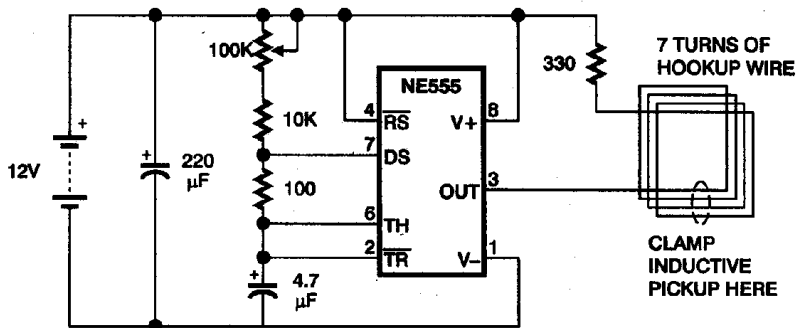


FIG. 1—THIS OSCILLATOR will trigger a timing light for non-automotive use as a stroboscope.

without using an automobile engine.

There are two ways a timing light might attach to the wiring of the engine: by direct connection or through an inductive pickup. If your timing light has an inductive pickup, you're in luck — you can use the circuit in Figure 1 to trigger it. The NE555 produces brief pulses of current in the wire, which is wound into a loop to increase the amount of induction; we used seven turns, but one or two turns may suffice. To the timing light, these pulses look like the pulses that flow

charge up more quickly for the next flash.

Xenon Flashtube Theory

Q I'm interested in building a battery-operated flasher circuit using a xenon strobe tube. I understand that the xenon tube operates in the kilovolt range. Any ideas? — D. B. S., Saylorsburg, Pa.

A The actual operating voltage across a xenon flashtube is about 300 volts, stored in a capacitor as shown in Fig. 2. To make the tube

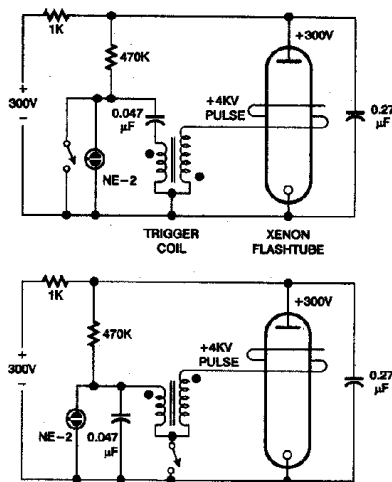


FIG. 2—BASIC CIRCUITS FOR FLASHING a xenon tube. Choose the circuit that fits the polarity of the trigger coil.

flash, a step-up transformer called a *trigger coil* provides a momentary pulse of several kilovolts to a wire wrapped around the middle of the tube. This is coupled capacitively to the gas inside the tube and makes it start to ionize. As soon as the gas becomes conductive, the capacitor discharges through the flashtube and there is a bright flash of light; then the capacitor has to charge up again for the next flash.

The trigger pulse, in turn, comes from a smaller capacitor which is charged up to about 70 volts and then suddenly discharged through the primary of the trigger coil. As Figure 2 shows, the exact circuit depends on the polarity of the trigger coil, indicated by dots in the diagram; if in doubt, simply try it both ways.

The NE-2 lamp serves as a voltage regulator and "ready" light. The switch can be replaced by an SCR.

Now all you need is a battery-operated 300-volt power supply. The easiest way to get one is to use

a junked photographic flash unit, which will also contain the xenon tube and trigger coil. For complete instructions on converting a camera flash into a stroboscope, see our sister publication, *Popular Electronics*, November 1995, pp. 77-78 (available from our reprint bookstore). And remember, *strobe circuits are dangerous*; the capacitor in a camera flash can deliver a painful or even lethal shock. Always be sure to discharge every high-voltage capacitor through a 1-kilohm resistor before touching any of the components.

Bein Alarm