

BRAKE LIGHT FLASHER CIRCUIT

By Bob Walters

This circuit was devised after I was rear ended twice by drivers that did not notice that I was stopping, even though my brake lights were operational.

The circuit causes the automobile brake lights to flash at about 3 times per second for 1-1/2 to 2 seconds after the brake pedal is pressed. The brake lights then stay ON normally after this initial period. This rapid flashing should be noticeable to any driver following your car.

There are three variations of the circuit; from inexpensive and easy to install to a more complex and costly design.

- 1) This version is the easiest and least expensive to install, but it still gives a definitive brake light flashing signal to any tail-gating driver. The circuit uses two 555 timer chips. One chip (U2) operates in the multi-vibrator mode and oscillates at about 3 pulses per second; this drives a Power MOSFET switch in series with the brake light wiring. The length of the flashing period is set by the second 555 timer (U1) operating in a mono-stable mode, as a one shot. This chip disables the oscillations of the multi-vibrator chip after a period of 1-1/2 to 2 seconds. The flashing cycle is repeated each time the brake pedal is released and then pushed again. The circuit gets its power from the brake light wiring. It also can be neatly tucked into the trunk, out of the way, and requires no routing of wires from under the hood to the back of the car. (See the attached sheets for a schematic and parts list.)

SW1 is installed so that in the event of a circuit failure, the circuit can be bypassed with the flip of a switch; no need to disconnect the whole circuit board. Since it is impossible to see the brake lights while driving, LED1 was incorporated and is directly across the brake lights. This LED monitors circuit operation and should be mounted on the rear speaker deck where it is visible while driving.

- 2) The second version of this circuit uses a Motorola acceleration sensor. The sensor outputs a voltage proportional to the deceleration rate of the vehicle when in the braking mode. The sensor output drives the 555 timer chip and varies the flashing rate by using the control input to the chip located on pin 5. The acceleration sensor is cost about \$15, but is only available in a SMD "Surface Mount package". Soldering these devices requires specialized equipment or a very steady hand.
- 3) In this version, a Honeywell hydraulic pressure sensor, needs to be incorporated into the brake line by means of a "T" adaptor. The sensor

outputs a 0-6 volt signal proportional to the brake line pressure, i.e. the faster you stop, the higher the brake pressure in the hydraulic lines and the higher the output voltage. This voltage be used to set the pulse rate of a 555 timer chip which in turn triggers the power MOSFET. The harder one pushes on the brake pedal, the faster the lights flash. Although this is my preferred method, it is also the most expensive and requires the greatest expertise to incorporate. The sensor costs approximately \$275 because it is made out of stainless steel to withstand the caustic hydraulic fluid in the brake lines. It also requires tapping into the brake line. This should only be done by an experienced auto mechanic. You would also need to have a machine shop make the adaptor as I have not been able to find one commercially. Many auto manufacturers use different fitting sizes and thread configurations. The beauty of this approach however is that it allows you to flash the brake lights even while you are stopped a a light; as long as you push on the brake pedal. The circuit could be set to only flash with heavy foot pressure on the brake pedal.

PARTS LIST

Automatic Brake Light Flasher			
CIRCUIT	DESCRIPTION	QTY	ALLIED P/N
DESIGNATOR			
U1, U2	NE555 Timer	2	248-0294
C1	.001 UF	1	852-1145
C2	10 UF	1	852-5683
C3	1 UF	1	852-5677
R1, R2	221 K ohm	2	296-0024
R3, R4, R5	100 K ohm	3	296-0011
R6	100 Ohm	1	296-0007
R7	332 Ohm	1	296-0031
Q1	2N4401 (NPN)	1	431-0408
Q2	IRF5210	1	273-0279
SW1	SPST 15 Amp	1	642-1148
LED1	RED	1	749-0700

