

## Replacing IGN warning lamp with an LED

This note is aimed at classic cars with alternators from the late 60's – 80's that use a 2- or 3-watt filament bulb as the IGN warning indicator. Your car may be different so check with a qualified alternator shop, auto electric shop or manufacturer if you are considering changing the bulb to an LED.

### Issue

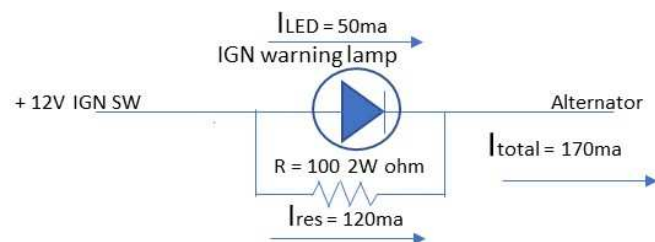
Many cars used a 2- or 3-watt filament bulb for the IGN warning indicator. If you are considering replacing this bulb with an LED in the warning lamp circuit, you should note that the LED will likely NOT provide the necessary current to pre-energize the field winding when starting your car. Litezupp dash LEDs typically draw 45-50ma and the filament bulb you are replacing draws approx. 180ma. Our experience shows the field winding needs more current than the LED allows to excite the winding/start the charging process upon engine startup. Symptoms if LED is fitted: the IGN light stays on and the result is the alternator is not producing a voltage/current to charge the battery. Or you have to do excessive revving to get the IGN warning LED to extinguish.

### Litezupp advises the following solution:

While Litezupp provides LEDs that can be used in the IGN circuit as part of the dash kits, **we recommend that you continue to use the exiting filament bulb in the IGN warning lamp circuit.**

Also, there are some additional troubleshooting capabilities when using filament bulbs that you won't get with using an LED for the IGN warning. Filament bulbs are voltage based and bidirectional so current will flow (and light) in either direction if there is an imbalance in voltage on either side of the lamp. LEDs, on the other hand, are unidirectional current devices, e.g., current only flows in one direction so that imbalance has to be on the alternator side.

If you feel there is a need for an LED, we suggest you place a 100-ohm 2-watt resistor across the IGN warning socket to enable additional current to flow to excite the alternator. Depending on type of alternator, a current of 150-200ma will be needed to excite the field winding. Litezupp dash LEDs will run at 50ma. So a shunt resistor will provide the additional current needed.



### Typical Operation

The IGN warning lamp is part of the alternator charging circuit that provides a current flow to the field winding of the alternator via the IND terminal on the alternator. When the ignition switch is turned on, current flows from the battery through the IGN warning circuit and pre energizes (excites) the alternator field winding, that is, sets up a magnetic flux in the alternator. Since there is an imbalance between the battery and the field coil voltage, the IGN lamp will be on. Once the car is started and the alternator comes up to speed, this magnetic flux spinning inside the stator will produce electricity. The regulator portion of the alternator will regulate the charging current and voltage to the battery. At this point the voltage across the warning lamp will be equalized and the IGN lamp will go off, assuming your alternator is self-exciting. If an imbalance were to happen between the alternator voltage and the battery the warning lamp would light.