

# Ignition Run-On or Why Won't My Car's Engine Stop Running?

*By Allan Brown*

## **Background:**

Back in the mid 70's when the US introduced emission standards, MG made some modifications to the US models. One of these modifications was the Anti Run-On Valve another was the Ignition Relay.

The idea was that to turn off the engine, you removed the ignition by removing power from the Ignition Relay. This was applied to US '77 and '78 models.

In 1979, MG incorporated some of these modifications – but *not* the Anti Run-On Valve into the British cars. This is when they discovered the problem. The problem is known as a Sneak Circuit – an electrical circuit that is not always obvious when looking at the schematic. There is (was) a wiring design flaw in the US '77 model year.

It turns out that the engine was not being turned off by removing the power from the Ignition Relay, it was actually being starved of fuel by the Anti Run-On Valve. Since the British models did not have the Anti Run-On Valve, the engines would not stop, but instead kept on running even when the Ignition Key was removed.

What was happening? Depending on the ignition relay tolerances, the alternator, ignition lamp and a few other factors such as the phase of the Moon, weather, day of the week and so on, there may be enough current flowing back thru the charge indicator (ignition warning) lamp after the ignition is turned off to hold the relay on and therefore keep the engine running. Just by changing the relay to another of the same type may fix or partially fix the problem.

*Note:* There are several other reasons as to why the engine keeps on running after the ignition has been turned off. Some of these are wrong wattage of Ignition Warning lamp, defective or characteristic change in the Ignition Relay, poor ground in the lighting circuits. E.G. Someone reported “Along the same lines - my '74 would keep running with the ignition off after I installed an electric cooling fan. If the fan was on when the ign. was turned off, the fan would keep spinning from inertia and generate enough electricity to power the ignition. A diode in the power line to the fan solved the problem.”

*Another Note:* most of the older cars do not have this ignition relay. Also, this relay is sometimes referred to as the fan relay.

## **Today's Problem:**

Current problems associated with this are now due to age and owner modifications, Some Anti Run-On Valves are failing and are being removed. Also, some people are de-smogging their cars and removing the valve and other “plumbing”. This is introducing the condition to otherwise normally functioning cars.

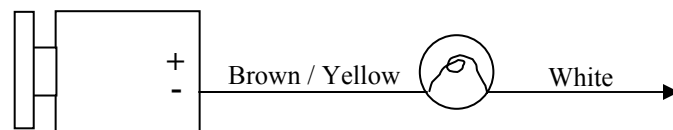
This was the case with my car – a 1978 US model. When I got the car, I discovered the PO had bypassed the ignition relay and removed the anti-run on valve system. When I re-installed the relay, the engine would not turn off.

## The Solution:

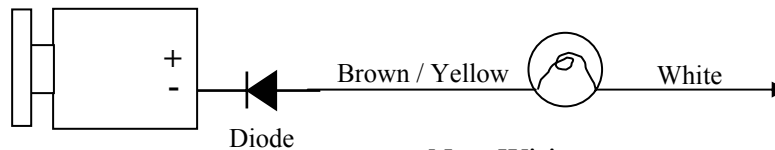
To solve the problem completely, you have to add a diode into the Ignition Relay's coil circuit. This is the wire that goes from the alternator negative terminal to the charge indicator (ignition warning) lamp located in the dash (Brown wire with Yellow stripe). You can do this either at the dash end or the alternator end – this being the easiest point to access the wire.

I chose a low voltage drop Schottky Barrier Rectifier (40V 3A) 1N5822 rather than a regular diode. You can get this diode from Active Components. This diode has a forward voltage drop of about 0.2 V as apposed to the 0.8V for the regular diode and helps to preserve the operation of the alternator sense line.

The diode has a band on one end. This corresponds to the Cathode. [See photos below](#). This end should go to the alternator side. If you put the diode in backwards, the lamp will not operate, but no harm will be done.



Original Wiring



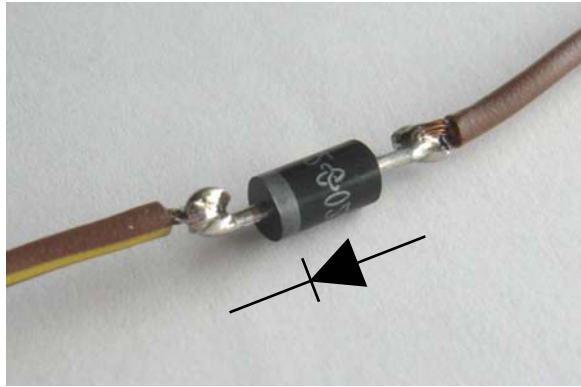
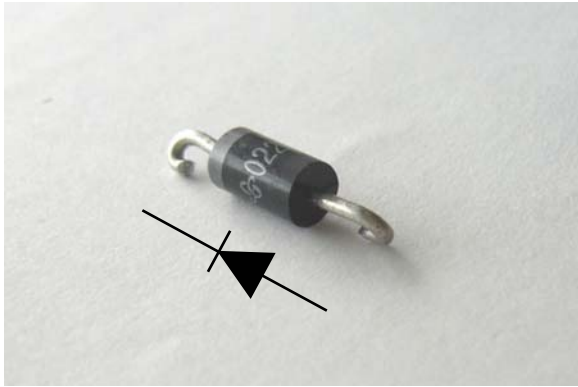
New Wiring

## How To:

To prepare the diode, I cut and shaped the leads as [shown below](#). I then soldered wires to each end. I happened to have the correct colour of wire from an old harness. Then I placed a piece of red heat-shrink tubing on the cathode end and covered the entire diode with blue heat-shrink, leaving a portion of the red showing. You can use any colour but try to use Teflon heat shrink rather than the PVC. It will stand up to the heat in the engine bay better. Yes, the wire has a PVC insulation but the heat-shrink is different.

You then need to un-wrap the wiring harness going from the alternator to the fender and find the Brown/Yellow wire. Cut this wire and solder in the diode assembly using more of the heat-shrink to cover the joints. Re-wrap the harness.

Your car's engine should now turn off when you turn off the ignition.



**Diode  
Assembly**

