

# BRIGHT Spark

PART 02

In the second part of our technical feature on ignition systems, CKC's Technical Writer, John Dickens, joins Robin Hood owner, Steve Knaggs, to help him install his contactless electronic ignition system.

**THE FIRST COMMERCIAL** produced electronic ignition systems were launched around 1968 in the UK. They were initially produced by accessory companies like Boyer-Brandsen and Autocar (Lumenition). The major manufacturers quickly followed suit though, Lucas with its RITA system and Ford through its Motorola division. By 1980, mechanical contact breakers had been almost completely replaced by some form of electronic switching, either optical or Hall effect.

Optical triggers, used by Lumenition and Newtronic (Piranha), use a light detector and a light source with a slotted rotor interrupting the light falling on the sensor. Infra red light is usually preferred to visible.

Hall effect systems use a rotor with magnetic strips to produce voltage pulses in a semi-conductor sensor. Lumenition, Aldon and most OEM ignitions are based on this principle.

▼ Lumenition's Optronic ignition system offers easier starting, faster and smoother acceleration, reduced emissions and better fuel economy.

The advantages offered by electronic ignition are:

- ▶ Faster switching of the coil and a longer dwell time giving a stronger spark.
- ▶ With no mechanical contacts to erode and no moving parts to wear the spark timing is always accurate. Engine performance and emissions are constantly optimised.
- ▶ Almost no maintenance is required. This is particularly important in some kit car applications where distributor access can be considerably reduced compared to the standard engine installation.

The modern aftermarket conversions available are now very well developed and reliable. In this article I also hope to show that they are simple to fit.

Rather than simply convert a distributor on the workbench, I felt it



▲ Steve Knaggs with his tidy Robin Hood S7. Having been running a conventional points based system, he's decided to upgrade to a contactless electronic ignition.

would be more interesting to do the job on a genuine car needing conversion. Contacting some of the kit car clubs, they were only too happy to help me find a suitable car. Through the national clubs I was put in contact with local area representatives, Peter Dunn of the Locost Car Club and Steve Knaggs of the Robin Hood Owners' Club and Register. I went along to the area monthly meetings of both these clubs and would like to thank all the members involved for making me feel very welcome indeed.

As luck would have it, Steve had a Lumenition Optronic system ready to fit to his 2-litre Pinto engined Robin Hood S7, so his car was used for this feature.

The complete conversion was very straightforward and took about two hours with Steve working and me interrupting him to take photographs. Without interruptions, a typical installation would take the average person about one hour.

The Lumenition Magnetronic and the Aldon Ignitor systems are even simpler to fit as they have no separate power module. Instead, the whole system fits inside the distributor.

These two companies also market high power coils to match their systems, or alternatively you could use the Lucas Sports Coil, but you must use a coil designed for contact breaker systems, with a

resistance of 2.5 to 3ohms. Coils used with OEM electronic system have a low resistance (less than 1ohm) and the higher current dr will damage the power module.

I contacted Steve a few days later for his initial impressions of the system...

"Noticeably crisper performance was the biggest benefit," he commented, "along with better starting and of course less maintenance. I've not checked fuel consumption but I guess it must have improved."

"The kit was as easy to fit as a set of points and, as I bought it second hand from a fellow Robin Hood Club member, it was also cheap to buy."

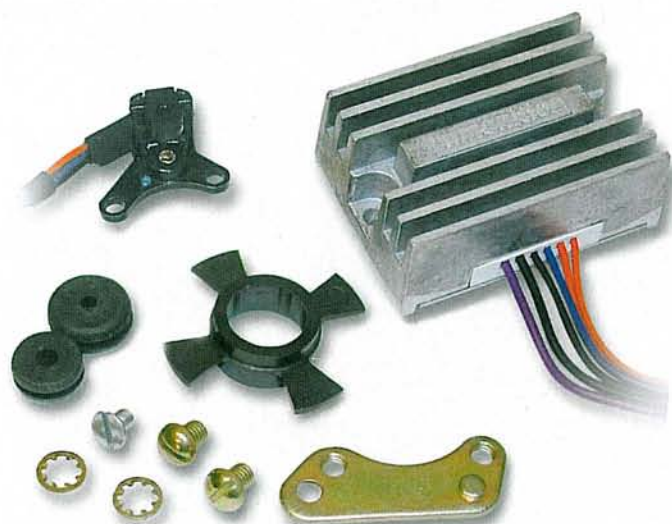
## USEFUL CONTACTS

### Conversion kits

[www.aldonauto.co.uk](http://www.aldonauto.co.uk)  
[www.lumenition.com/new/main.php/optron](http://www.lumenition.com/new/main.php/optron)  
[www.lumenition.com/new/main.php/magnet](http://www.lumenition.com/new/main.php/magnet)  
[www.lumenition.com/newtronic/system/index.html](http://www.lumenition.com/newtronic/system/index.html)  
[www.classicheads.com/Electronic\\_lgx.html](http://www.classicheads.com/Electronic_lgx.html)

### Fitting hints

[www.lumenition.com/new/support/lumoptron/Optronic\\_Technical\\_Bulletins.pdf](http://www.lumenition.com/new/support/lumoptron/Optronic_Technical_Bulletins.pdf)  
[www.lumenition.com/PMA50ins.pdf](http://www.lumenition.com/PMA50ins.pdf)  
[www.denaploy.co.uk/autocar/tb05.htm](http://www.denaploy.co.uk/autocar/tb05.htm)



# ELECTRONIC IGNITION CONVERSION



▲ Check the distributor cap for cracks, pitted contacts, erosion or signs of tracking. Replace it if there is any doubt.



▲ Lift off the rotor arm. Check the contacts for wear and pitting. Once again, replace it if there is the slightest doubt. ▶ Check for side play on the distributor shaft. A small amount of wear is acceptable with contactless ignition, but too much means the distributor needs replacing. ▶▶ Undo the securing screw and remove the condenser.



▲ Undo the screw or screws holding the contact breaker points and remove them. ▼ Not essential, but a good time to check the mechanical advance mechanism in the distributor. Remove the screws and any circlips. Lift off the back plate.



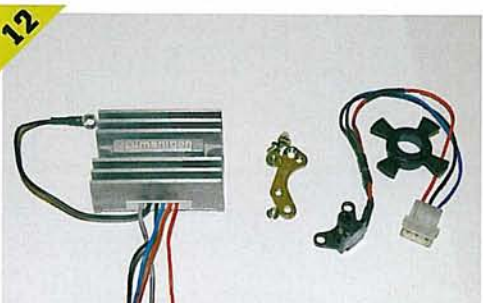
▲ Excellent access to the distributor in this car. In extreme cases it may be easier to remove the distributor from the car.



▲ Check the plug leads too. Silicone leads last a long time but do eventually need replacing. Mark the leads so that you don't mix them up if you disconnect them.



▲ Check that the bob weights move freely and put a drop of oil on the pivots and spring retaining posts. ▼ Left to right: The power module, the trigger fitting kit, the optical trigger and the 'chopper'.



▲ If you need to remove it, mark it and the engine block with Tipp-Ex so that it can be refitted without altering the timing.



▲ A typical points and condenser set up. In this distributor the wire exits through a special grommet. You have to lift the plate slightly to remove it.



▲ Feed the trigger wires through the grommet. Position them carefully in the back plate then re-fit it to the distributor block. Don't over tighten the screws. ▼ Check that the grommet is positioned correctly and that no wires are trapped or kinked.





▲ Using the screws supplied in the fitting kit, fit the adaptor plate to the distributor.



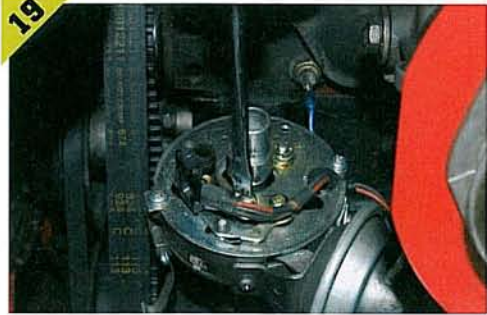
▲ Special countersunk screw. The trigger fits over it so it has to be flush.



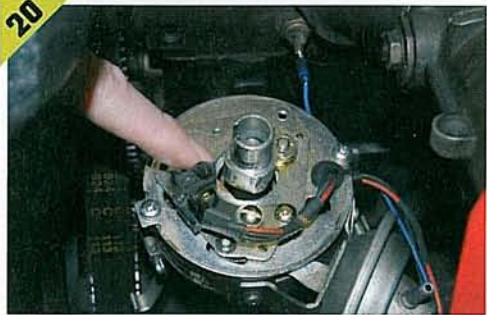
▲ This is the adaptor plate correctly fitted with the trigger ready to go on.



▲ The lenses can be seen here. One emits UV light. The other detects it. Avoid touching the lenses if possible.



▲ Using the screws and wave washers supplied, fit the trigger to the adaptor plate. Once again don't over tighten the screws.



▲ The chopper fits over the original cam and locates on the cam lobes. Check its alignment before you finally fit it.



▲ If necessary, turn the engine over so that the chopper blades clear the trigger unit when it slides into place. Push it fully on until it stops.



▲ This shows the chopper in position. The blades should pass approximately mid way between the two lenses.



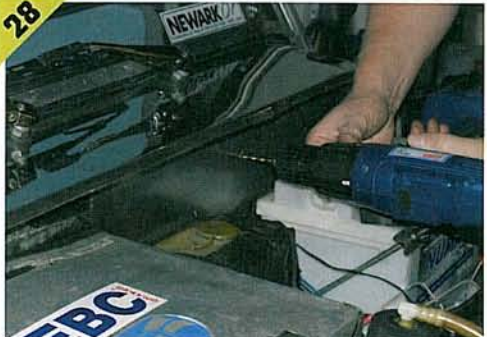
▲ Replace the rotor arm. Locate it correctly on its keyway. It sits on top of the chopper unit.



▲ The completed assembly should look similar to this (depending on the distributor being converted). ▼ Check that the wiring clears all the rotating parts. Check this with the vacuum advance unit in both the advanced and retarded positions.



▲ Choose a suitable position for the power module, within reach of the distributor but away from sources of heat. The inner wings or bulkhead are usually suitable. ▼ Hold the module in the chosen position. Mark the positions for the fixing screws.

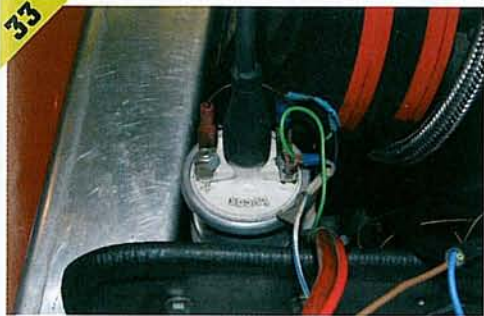


▲ Drill the holes for the fixing screws. Steve recommends titanium coated drills for stainless steel (bought in bulk). ▼ The unit needs a secure earthing point. The stainless body here is perfect, but a GRP body needs a separate earth wire.





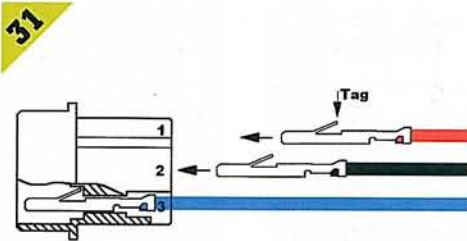
▲ Now we're into the wiring. You may prefer to disconnect the battery at this point.



▲ Start the engine. Connect one lead of your meter to a good earth. Measure the voltage at the positive battery terminal then at the positive or SW terminal of the coil. If the two readings are the same or very close then you have a non-ballasted system and you can use the positive coil terminal as your power source. If the voltage at the coil is 4-5 volts lower than the battery voltage then you have a ballast resistor in the system and you would be safer using the ignition switch or fuse box as your 12v live source.



▲ If the bulb lights, turn the distributor body in the same direction as the rotor arm rotation until the bulb goes out. Turn it a few degrees more to take up backlash. If the bulb doesn't light move to the next stage. ▼ Turn the distributor body slowly in the opposite direction to the rotor arm rotation until the bulb just lights. Tighten the distributor clamp bolt carefully. ▼ If your ignition timing is carried out using a timing light then the procedure is exactly the same as it was with the original ignition system fitted.



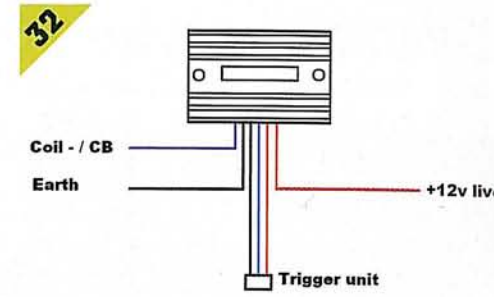
▲ Fit the 3-way connector onto the trigger wires. It is not factory fitted in case the wires have to be fed through small holes or grommets during installation.



▲ Use silicone grease or petroleum jelly to stop water entering and corroding the electrical connectors.



◀ Turn the engine over in its normal direction of rotation until the timing marks line up and the rotor arm is pointing to number one plug lead in the distributor cap. Note the direction of rotation of the rotor arm. ▲ Slacken the distributor clamp bolt. ▶ Connect a test lamp between the negative coil terminal and a good earth. Switch on the ignition.



▲ The power module wiring is: RED – 12v ignition live. LILAC (Brown on early units) – Coil negative (or CB) terminal. BLACK – Earth.

TRIGGER LEADS – trigger unit 3-way connector. The red wire needs to be connected to a source which gives the full 12v when the ignition is on *and* also when the starter motor is turning. The most convenient point is the positive or SW terminal of the ignition coil provided that it is *not* a ballast resistor ignition system. If you have access to a voltmeter or multi-meter you can easily check this for yourself.



▲ Some electronic ignition systems can only be timed stroboscopically with the engine running but the Optronic system also allows for static ignition timing using a test light or bulb. Highlight the timing marks with Tipp-Ex or white paint. It makes them far easier to see.



**John Dickens' technical series will return with the February issue**  
**DON'T MISS IT!**