

49 - 51 Tiverton Street
London SE1 6NZ
United Kingdom
Tel: (44) 20 7403 4334
Fax: (44) 20 7368 1270
Sales@Autocar-electrical.com
www.autocar-electrical.com

OPTRONIC^ã & PERFORMANCE IGNITION SYSTEMS



Product Guide and System Component Description

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Please check for product bulletins and updated information relating to Lumenition Optronic Ignition systems at the end of this document.

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Lumenition Ignition System Description

Lumenition optically-switched contact breaker replacement ignition systems consist of two basic models, the **Optronic** ignition system and the **Performance Ignition** system.

The installation of both systems is straight forward and easily reversible, involves no specialist tools and is normally completed in less than an hour.

Both systems replace the distributor contact breakers with an optical switch (using a separate, distributor-specific fitting kit) and an external power module. The same distributor-specific fitting kit is used for both models and the optical switches differ only in the connectors used with the different power modules (see below)

The system works by creating a beam of light inside the distributor which is broken by a fan-like part (called a chopper) fitted over the distributor cam. As the distributor cam rotates, the chopper breaks the beam of light and the optical switch and external power module fires the coil. The spark is distributed to the plugs through the distributor cap and rotor arm as usual.

The Optronic System.

This is the Premier replacement system for contact breakers and original fitment electronic ignitions with over 500,000 being sold worldwide and 30 years of product development. The advantages of the **Optronic** system are:

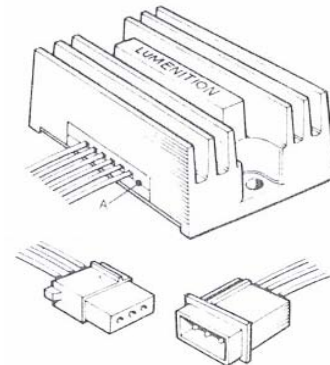
- No maintenance or re-timing needed and no loss of performance over time.
- Contactless, optical switching giving smoother engine running and improved idling
- Significant improvement in cold starting.
- Improved fuel economy

Identification of an Optronic system.

The **Optronic** Ignition system has a polished alloy external power module (see figure). The product code for this unit is **PMAZ**.

The connector used in the **Optronic** system is a 3 pin, in-line connector (See figure),

The **Optronic** system has a fixed dwell angle and can be used with most existing ignition coils. The ignition coil resistance (including ballast resistor if one is fitted) should be about 3 ohms and **no lower than 2.5 ohms**. The Lumenition product range includes a coil specifically designed for **Optronic** ignitions. The **MS4 coil** is a 1.5 ohm coil complete with a 1.5 ohm ballast resistor and is ideal for this system.



The current **Optronic** system has two models in the range, these being the PMA50 and the PMA60. For details of the difference between these models please see **Optical Switches** below.

Identification of older, Mk16 Optronic systems.

The Optronic system has been in production for over 35 years and many older systems are still in operation. Around 1983 the current Mk17 design was introduced. However the Mk16 design it superseded was very similar in appearance and is most easily identified by the user as follows:

If the plastic clamp which hold the wires in place as they exit the power module (marked "A" in the figure) is coloured **white** the power module is of the current design (MK17) and replacement modules and optical switches can be ordered,

However, if the plastic clamp is coloured red or black, the power module is a Mk16 model, is over 20 years old and no spare parts are available. The Mk 16 unit is also not compatible with the current optical switch.

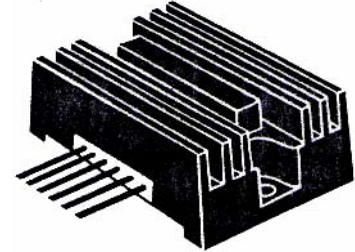
The Performance Ignition System

The **Lumenition Performance Ignition System** is very similar to the **Optronic** system but has the following additional features:

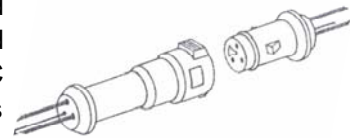
- Utilises a low resistance, high energy ignition coil electronically matched to power module (provided with CEK150 and CEK160 variants).
- Variable dwell angle and advanced coil current control optimises spark energy and prevents coil over-heating at low speed.
- “Automatic switch off on engine stop” prevents coil damage if the ignition is left on when the engine is not running.

Identification of a Performance Ignition System.

The Performance Ignition system has a black powder-coated alloy external power module (see figure). Product code **CEM**



The connector used in the **Performance Ignition** system is a 3 pin euro-connector with an O-ring seal and grommet wire-entry seals which provides a superior water-resistant connection. (see figure)



Standard automotive 12 volt coils with resistance of 1.5 ohms and above should **not** be used with this system. The CEK150 and CEK160 **Performance Ignition** products are supplied with a CEC constant energy coil which has a resistance of about 0.7 ohms and is similar to the coils used on electronic engine management systems.

Standard inductive automotive coils should not be used on the Performance system.

The operation of the power module on the **Performance Ignition System** can be disrupted by electro-magnetic interference and consequently fully suppressed ignition leads must used on this system. Using unsuppressed leads may lead to permanent power module damage.

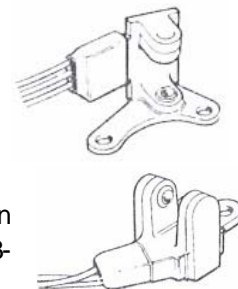
The Performance Ignition system has two models in the range, these are the CEK150 and the CEK160. For details of the difference between these models please see **Optical Switches** below.

Optical Switches for the Optronic & Performance Ignition Systems

The patented **Lumenition Optical switch** fits into the distributor in place of the contact breakers. An infra-red beam of light is interrupted by a fan-like “chopper” fitted over the distributor cam. The Optical switch is unaffected by heat, dirt or dampness and requires no maintenance.

To be as near universal in application as possible the whole range of vehicles and both models of ignition systems are served by just two styles of optical switch. These are::

- The Vertical-beam **OS50** used in the PMA50 (with a male, 3-pin in-line connector) or **CET150** used in the CEK150 (with a male 3-pin Euro-connector)
- The Horizontal-beam **OS60** used in the PMA60 (with a male, 3-pin in-line connector) or **CET160** used in the CEK160 (with a male 3-pin Euro-connector)



These two switch styles can fit a huge range of distributors by using the different choppers and adaptor plates included in the distributor-specific fitting kits.

The majority of conventional distributors with advance mechanism below the rotor arm will use a power module and optical switch assembly type PMA50 (for the **Optronic System**) or CEK150 (for the **Performance Ignition** system). Distributors with advance mechanism above the rotor arm (e.g. A.C. Delco, Magneti-Marelli, Femsa, Lada etc.) usually use the PMA60 or CEK160. The optical switch style used in a particular application is identified in the **Optronic Ignition System Vehicle Application List**

Marine Ignition Systems

A Marine version of the Optronic Ignition and Performance Ignition Systems are available for petrol marine engines. These include water-resistant connectors and epoxy coated power module to minimise corrosion. The Optronic system will suit most marine engines with the Performance Ignition System being ideal for high speed performance boats with 6 or more cylinders. Features of the two versions are similar to the Optronic and Performance Ignition systems.

The Fitting Kit.

These kits include the chopper and all other parts needed to fit an optical switch in a specific distributor. The installation usually requires no specialist tools or permanent modifications and can be completed in minutes..

Over 2000 vehicle makes and models are covered by the range of available fitting kits and most makes of distributor including Lucas, Bosch, Ford, Ducellier, Mitsubishi, Motorcraft, Mallory, Nippon Denso, Hitachi, LADA, SEV, A.C. Delco, Magneti Marelli etc.

The components for fitting the optical switch in each distributor are contained in the identified fitting kit (part numbers prefixed FKxxx). These kits are 'tailor-made' for the make and model of distributor and are identified in the **Optronic Ignition System Vehicle Application List**

To identify the correct kit for each distributor some or all of the following information may be necessary.

- Vehicle or engine make, model/capacity and year.
- The Number of cylinders.
- Distributor make, model and rotation of rotor as seen from above.
- Does the distributor have a vacuum advance unit?
- Does it have a bearing plate above the contact breaker assembly ?
- Is electronic ignition already fitted ?

There are notes in the text and in footers at the bottom of the pages of the application list where particular attention needs to be given to the above issues. The following notes give some general guidance on these issues

Rotation of Distributor

The direction of the rotation of the distributor shaft (identified clockwise 'C' or anticlockwise 'A' in the application list) must be checked when looking down at the rotor from above and not when looking up from the drive end of the distributor.

Bosch Distributors

There are two types of contact breakers on Bosch distributor. One has a Left Hand Pivot Pin contact breaker and the other a Right Hand Pivot Pin contact breaker (please see diagrams below). It is essential that the correct kit be selected.

There are a large number of Bosch distributor variants (particularly on Volvo cars) and Bosch model numbers may be required for full identification of the fitting kit required.



L.H. Pivot Pin



R.H. Pivot Pin

Disclaimer

Please note that manufacturers of ignition distributors may, without prior notification, change the design of a model in current production. Should this change result in our recommended conversion kit being no longer suitable we cannot accept liability for any damage or failure which may occur if a conversion is attempted.

Note: Lumenition equipment is designed for automotive, industrial and marine applications only. It is not approved for and should not be used on aircraft of any kind.