

Lumenition Optronic^â and Performance Ignition System

Guidance on Fitting Kit Design

Introduction

Lumenition Ignition system fitting kits have been designed for a considerable number of distributors and are available for over 500 makes and models of vehicle. However, there are a number of less common distributor models for which Lumenition have not created fitting kits.

This guidance sheet has been created for people who wish to make their own fitting kit for distributors not covered by the Lumenition application list. It briefly describes the issues to be considered when creating a fitting kit using the optical switch from the Optronic ignition PMA50 kit or the Performance Ignition CEK150 kit.

Some basic engineering skills and facilities are normally necessary to produce a satisfactory solution.

Please note that Lumenition is part of Autocar Electrical Equipment Co. Ltd and that Autocar cannot provide any assistance in the creation of a fitting kit other than these guidance notes. Please also note that Autocar cannot accept any responsibility for any damage to customer's property or other problems that might arise from the application of these guidance notes.

Main Considerations

The three main areas that need to be considered are as follows:

- The "Chopper" materials and fitment over the distributor shaft
- The provision of an adaptor plate
- The fitment of the optical switch.

The Chopper

The "chopper" is the fan-like blade which fits over the distributor cam and breaks the optical switch's beam of light to fire the coil.

CHOPPER MATERIAL:

Chopper material must be opaque to infra red light, remain rigid to 150 C and be resistant to Ozone, Petrol, Oil, Brake Fluid etc.

CHOPPER BARREL:

The wall thickness of the barrel of the chopper (which fits over the distributor shaft) should be the maximum possible and give a clearance of at least 1 mm from optical switch.

BLADE TO CYLINDER RELATIONSHIP:

This is normally 1 blade per cylinder.

BLADE DIAMETER:

This should be long enough to completely obscure the beam of light from the optical switch BLADE HEIGHT.

BLADE LOCATION:

Wall thickness above cam shoulder should be maximum achievable without raising rotor arm. Chopper should be positively located, free from Radial or Axial movement and have a minimum clearance of 1 mm between the top and bottom of the blade and the optical switch lenses

Blades should pass perpendicular to, and through middle of, the optical switch lenses.
Note: Where excessive end float on a distributor shaft is evident, position the blade to give appropriate clearance of both top and bottom lenses.

THE RATIO OF BLADE TO GAP

This is generally 2/3rds gap to 1/3rd blade. This is not applicable to 1 or 2 cylinder engines where ratio is decided by coil duty cycle.

ANGULAR ACCURACY BETWEEN BLADES:

Variation should be no greater than 15 minutes (1/4 degree).

PHASING:

This is the position of the rotor arm with respect to the distributor cap pick up segment when coil switches off.

With Lumenition Optronic Systems the coil switches off when the leading edge of the chopper blade traveling in the direction of distributor rotation has obscured 2/3rds of the optical switch lenses. At this point the centre of the rotor tip should be pointing to the centre of a pick up segment on the distributor cap.

Phasing position can be adjusted by changing the radial position of the chopper blade relative to the rotor arm or changing the mounting position of the optical switch if adjustment of chopper blade is not possible. See the section "Adaptor or Mounting Plate" below.

Adaptor or Mounting Plate**PLATE ATTACHMENT**

The mounting plate should be positively located with two screws or one screw and one pin. Screw lengths should not obstruct vacuum advance plate movement or interfere with any other component in the distributor.

PLATE LOCATION

To minimise the possibility of the optical switch metal casing earthing the ignition spark, the plate position should allow the optical switch to be fitted between the H.T. segments on the distributor cap. The optical switch should only be mounted directly below an HT segment when absolutely necessary - in which case the maximum clearance must be obtained by using the thinnest possible mounting plate.

PLATE MATERIALS

Plate material ideally should be electro plated steel, plastic (to a similar specification as the chopper) or aluminium. The material used should be capable of being threaded to allow screw fixing of the optical switch.

To allow a secure optical switch fixing the plate thickness should be the maximum possible and should not be less than 2 complete threads of the optical switch fixing screw. Wherever possible fixing holes should be tapped to a standard thread. On most Lumenition fitting kits the optical switch is secured by a No. 2 British Association (2BA) screw.

To prevent distortion of the plate or the optical switch housing, the screws securing the optical switch to the adaptor plate should not protrude below the base of the plate. Lock washers should be used where possible.

Note: Where specified in instruction leaflets for particular items and applications, the mounting faces of the adaptor plate should be coated with heat sink compound.

Fitting the Optical Switch

Optical Switches should be positioned and mounted as stated in the adaptor plate section above and conform to the following instructions:

1. All wires should be routed clear of any moving or rotating parts.
2. To prevent fouling all wires should be held down by "P" Clips, cable ties or some similar method which will allow for movement of vacuum advance etc.
3. Wires must not be tightly bent back upon themselves or stretched during fitment or during vacuum advance movement in normal operation
4. Where the wires exit the distributor body a suitable grommet should be fitted to prevent the insulation from chafing.
Note: the silicone wire used on optical switches is operational to 270 C but has poor cut-through resistance.
5. The optical switch should not foul anything when stationary or throughout movement of the vacuum advance plate.

A BRITISH INVENTION

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