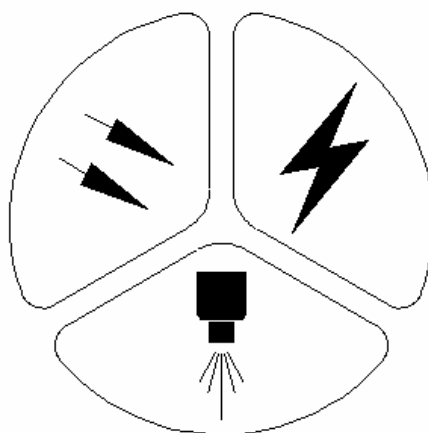


# Lumenition<sup>®</sup>

*Motorsport Products*



## EDM 010

### Engine Detonation Monitor Instruction Manual

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## EDM 010. Knock Monitor Instruction Manual.

### INTRODUCTION.

The Lumenition EDM 010 gives a visual indication of the amount of knock present coming from the engine. The monitor uses a standard piezo electric engine microphone to 'listen' to the vibrations from the engine. The unit is set for universal application and will be suited to most common engine types. The possibility of engine knock can be affected by a number of different factors and all of these must be taken into account in order to prevent engine damage.

Factor	Less likely	More likely
Octane	High Octane	Low / regular
Boost Pressure	Low	High
Engine Load	Low	High
Engine RPM	Decell	Accell
Compression Ratio	Low	High
Ign Timing	Retarded	Advanced
A/F Ratio	Rich	Lean
Air Temp	Low	High
Coolant Temp	Low	High
Engine Cooling	Good	Bad

The table above shows the major factors that influence the likelihood of engine knocking occurring. Some you may have some control over others not. Using the EDM 010 on a standard or mildly tuned engine can indicate whether the equipment that you have fitted can maintain effective control over the engine performance without premature failure. If you are using the monitor in association with a programmable engine management system it can help to ensure that your calibration is good for the engine.

### CONTENTS OF KIT

1	Monitor Display Unit
2	Piezo Knock Sensor
3	Audible Warning Device
4	Main Harness
5	Supply Harness
6	Wire Protection Conduit
7	Snap In Terminator
8	Cable Ties x 5
9	Self-Adhesive Pads

### INSTALLATION OF THE MONITOR.

The display unit can be mounted anywhere but direct sunlight should be avoided. The self-adhesive pads supplied can be used or any similar method. Screws should not be used into the case.

The audible warning device can be mounted using either the self-adhesive pads supplied or can be screwed to a surface using its mounting ears.

### INSTALLATION OF THE SENSOR.

For accurate operation of the monitor unit it is important that the sensor be mounted onto the engine in the best possible position to isolate the noise produced by engine knock. There are a number of factors that affect the best position for the knock sensor such as engine dimension, block / cylinder construction and likely sources of background noise. If your engine is already fitted with a knock sensor then it is best to replicate that position as closely as possible maybe on another cylinder or cylinder pair. It is possible that the engine was fitted with a knock sensor during original trials and the position is still showing in the block casing even though it is no longer used. In general the sensor should be sighted as close to the knock noise source as possible with a short transmission path, i.e. Close to the top of the block on the centre line of the bore or maybe equidistant between two cylinders (preferable alternate firing).

If you find that during use the monitor appears to be showing a high level of knock in normal operation it is possible that the sensor is reacting to other sources of engine noise such as piston slap or valve train. Moving the sensor to a different position may reduce or eliminate sensitivity to this other noise.

### **WIRING.**

For safety before carrying out any wiring alterations on the vehicle it is advisable to isolate the vehicle battery.

- 1) Power. The meter takes a 12v supply from the ignition switch circuit. For convenience the red wire (+12v) is supplied wired to a 10 Amp blade fuse. Simply replace one of the existing vehicle ignition switched fuses with this item. If your vehicle is not fitted with blade fuses then cut the fuse connector from the red wire and connect to a suitable supply circuit. The Black (Earth) wire should be connected to a local earthing point. Connect the two pin power connector to the main harness.
- 2) Warning device. The warning device is connected to the main harness using its own two pin connector. The connection will only fit one way round and can be released by depressing the small latch and pulling the housings apart.
- 3) Sensor. The sensor is connected to the main harness using its two-pin connector. A short length of cable conduit is supplied that can be used to protect the wire from abrasion within the engine compartment. The conduit is not heat resistant above 85°C. It is recommended that the wire be routed away from exhaust or similar high temperature areas.
- 4) Monitor. Attach the main connector of the harness to the rear of the monitor display unit.

### **OPERATION**

- 1) When the meter is first powered up a beep is heard from the warning device if fitted.
- 2) Following initial power up it will take approximately 2 – 3 minutes for the electrical circuits to settle before full sensitivity is attained.
- 3) The front panel indicator is divided into three coloured zones.
  - a) Green, Caution shows a potential for knocking from the engine. It is normal for the engine to show in this area briefly especially at idle or when pulling from low throttle.
  - b) Yellow, Danger means that the conditions within the engine are getting to the limits and knocking is starting to occur.
  - c) Red, Damage means that persistent and potentially damaging knocking is happening. The audible warning alarm if fitted will sound when this limit is reached. If the alarm continues action should be taken immediately to return the engine to a safe operating condition.
- 4) It is important to use the EDM 010 for a time on your engine to observe the signals that your engine is sending to the monitor during its normal working before you start to use the display for tuning. The sensor is designed to measure vibrations from the engine of which the knocking frequency and amplitude is just one. High lift cams, solid lifters and other engine modifications can contribute to a high level of background noise, which may show on the monitor predominantly in the Caution zone. A high level of background noise will disguise the early signs of knocking meaning that the transition into the Danger or Damage zone may happen very quickly.

### **IMPORTANT NOTES**

- 1) The product is intended for 12v operation only. Under no circumstances should a 24v system be used even for starting unless the normal vehicle battery circuits are fully protected.
- 2) When fitting electrical devices into the vehicle wiring it is recommended to isolate the vehicle battery and exercise care when making connections.
- 3) The outside surface of the monitor can be cleaned using a soft cloth. Do not use water, detergents or other cleaning solvents that may damage the external finish.
- 4) The monitor contains sensitive temperature correction circuitry that may be damaged if the unit is subjected to continuous direct sunlight. It is recommended that the device is fitted away from the windscreen area or protected from heat.
- 5) Excessive force or shock to the monitor case could damage the internal circuitry.
- 6) The monitor will only show correctly if the sensor connection is good and the sensor itself is not damaged. It is normal for the engine to show brief excursions into the Caution zone during normal running which can also be used as a guide to correct sensor operation.