

ELUMINATOR™ OPTIC 82

ADVANCE DIAL TIMING LIGHT

This Eluminator Optic xenon stroboscope features an extraordinarily brilliant flash and is built for high performance, heavy duty professional use. High efficiency power conversion lets the light run cooler for a long working life.

The back panel calibrated dial can be set so the light flashes at up to 60 degrees of ignition spark advance. Fingertip buttons on the handle control flash brightness.

Hookup is simple with the Inductive Spark Pickup. Dependable spark sensing is assured by electronics engineered for the broadest range of ignition types. The inductive pickup is plug-in replaceable for easy service.

The light is constructed of rugged, impact-resistant materials. It has a comfortable handle grip and a narrow barrel, which makes it easy to project light between engine belts and brackets. Quality engineered and made in the USA.

OPERATING SPECIFICATIONS

FLASH RATE	500 to 10,000 RPM
ADVANCE	0 to 60 degrees, $\pm 1.5^\circ$ acc., 1° grads.
POWER	10 to 16 Volts DC 12 volt battery
TEMPERATURE:	
Operating	0° to 122° F -18° to 50° C
Storage	-40° to 180° F -40° to 80° C
LEADS	5 feet 1.5 m
WEIGHT	1.5 pounds 650 gm
SIZE	12 inches tip to tip, 2.8 wide 30 x 7 cm

OPERATOR'S MANUAL

HOOKUP AND SETTINGS

POWER LEADS

The RED clip connects to the POS terminal on a 12 volt battery. The BLACK clip connects to the NEG battery terminal. The power should be at least 10 volts, and not over 16 volts, to assure reliable operation. Current draw is about 0.5 amp while flashing at 1800 RPM. Strobe flash intensity is regulated and is not affected by voltage. The light will not be harmed if the leads are connected incorrectly.

INDUCTIVE SPARK PICKUP

Latch the pickup around the reference spark plug wire (usually #1) so that spark current impulses are detected. The best pickup arrangement is next to the distributor with the label facing toward the spark plug end. This provides the cleanest signal and keeps the pickup away from the hot exhaust manifold.

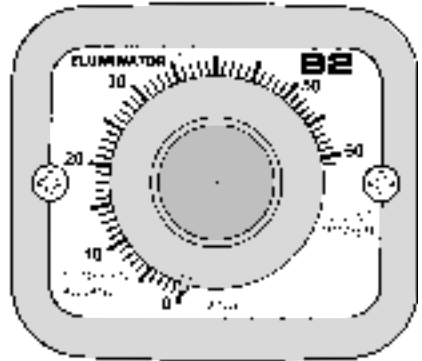
Leave the Pickup Latch Open when not in use.

The magnetic cores are made of ferrite ceramic and, when kept apart, they are less likely to break if the pickup is dropped.

If the light will not trigger on a spark plug wire, the wire may be broken. Try another for comparison. Ignition on a no-start engine may be checked by seeing if the timing light pickup will trigger from a plug wire while cranking the engine.

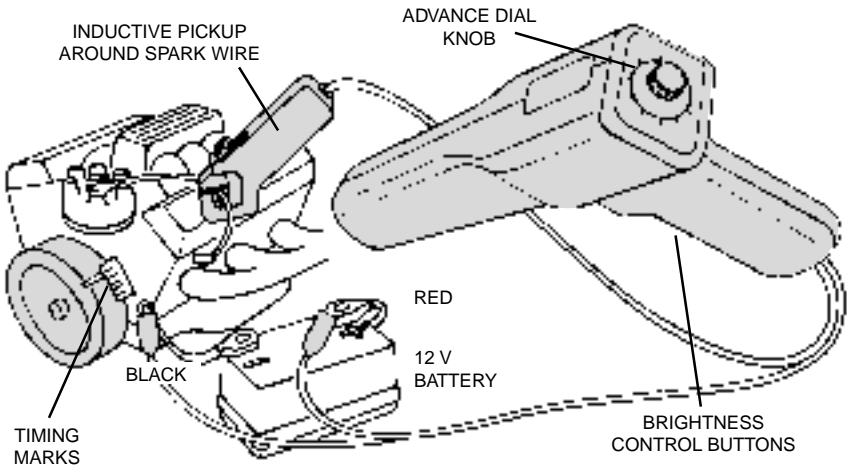
ADVANCE DIAL

The advance knob controls how long the flash is delayed after the spark. This lets the strobe image of the timing mark be moved a measured number of degrees by turning the knob. Setting the advance knob to TIMING (fully counter-clockwise) causes the light to flash within a fraction of a degree after the spark. Also note that for accurate readings, the engine should be held for a second at the reading RPM for the advance angle to settle.



FINGERTIP BRIGHTNESS CONTROL BUTTONS

Three levels of flash brightness are available by pressing the buttons on the handle. Press the lower button for standard brightness, press the upper button for higher brightness, or hold both buttons for maximum brightness.



TIMING-ADVANCE TEST PROCEDURE

This light measures advance by delaying the flash so that it appears to align the crank shaft TDC mark to its pointer, and then showing the degrees delayed on the calibrated dial. Note that on engines with ignition contact points, dwell affects timing and must be in calibration before timing is adjusted.

1. Connect the power leads: RED - positive, BLACK - negative. Place the Inductive Pickup around the #1 spark plug wire. Keep leads away from the fan, belts, and exhaust manifold.
2. Prepare the engine for timing tests according to the manufacturer's instructions. Specifications are often printed on the emissions control label in the engine compartment.
3. Point the light at the degree marks on the engine damper wheel or flywheel, press the fingertip brightness control button(s), and turn the advance knob to move the mark to the TDC position. Then, read the advance angle from the timing light calibrated dial.
4. Compare the measurement with the specification. Timing adjustments are made by turning the distributor slightly or by moving the ignition timing sensor.
5. Restore all engine parts to their normal arrangement.

NOTE: Align your eye squarely with the timing marks when viewing, to avoid parallax error. The strobe light may be aimed from the side, but marks must be viewed squarely.

TYPICAL MEASUREMENTS

INITIAL TIMING

This is usually the engine timing specification. Follow the engine service manual procedure or the emission control label in the engine compartment. Not all engines can be adjusted. For engines with fixed timing, this is a diagnostic measurement.

VACUUM ADVANCE OR RETARD

Vacuum actuators connected to the distributor or intake manifold sensors have specified amounts of timing change for an amount of applied vacuum. To measure, disconnect and plug the input hoses, and then couple the input to a hand pump with gauge. Run the engine at idle to see the timing change with and without applied vacuum.

CENTRIFUGAL ADVANCE

Mechanical ignition controls usually have a set of spinning weights in the distributor which advance the spark timing a certain number of degrees as RPM goes from idle to driving range. To see the centrifugal advance alone, vacuum actuators must be disabled. Besides the amount of change, it is important to see that the advance changes smoothly with slowly increasing RPM. Sticky weight pivots, rust, and bad retracting springs are the usual problems.

TOTAL ADVANCE

This is the advance at a specified RPM with the engine timing controls intact.

COIL WIRE TIMING

Use only when required by engine specifications. Be sure to set the advance knob to TIMING, because the advance reading will be divided by the number of cylinders sensed by the pickup.

STOPPED MOTION VIEWING

Valve lifter motion and throttle body injector spray can be watched in stopped motion with the light. The advance knob changes the viewed time in the engine cycle. Triggering can be from a spark plug wire, coil primary, or injector drive. Multiple flashes per revolution are likely with unconventional hookups. Some experimentation may be necessary to find a trigger coordinated with the action. The 2 stroke scale provides the widest adjustment range.

MEASUREMENT TECHNIQUE

This measurement technique, which is used by all makes of strobe lights, operates with the assumption that RPM is constant throughout the crankshaft revolution. In fact, the shaft slows down for each cylinder during its compression stroke and speeds up on the power stroke. This variation is not significant at RPM levels where advance is normally measured, but at idle speed there may not be enough flywheel inertia. In this case, compression slowing could make the delay noticeably longer than the average time to turn a complete crankshaft revolution, thus making the reading higher than actual. If you are concerned about this possible error, confirm advance measurements by comparing the dial advance reading to the nearest engine timing scale mark with the light set to TIMING.

TIMING LIGHT MAINTENANCE & REPAIR

When cleaning the timing light, use a cloth dampened with waterless hand cleaner. DO NOT use solvents such as acetone and benzene, which can be absorbed by and damage plastics. Promptly remove penetrating oils, gasoline, and battery acid.

For repair service, contact your tool dealer or check the other sheets packed with this light for a telephone number to call. The Inductive Spark Pickup is a plug-in replaceable lead, part number X008-01. It can be repaired or replaced if damaged. There are no user serviceable parts inside the light.

SAFETY PRECAUTIONS

- Do not look into the light beam. Internal eye burns may be the result. The pain usually starts in a day or two.
- Do not touch rotating engine parts that appear stopped or slowed under the strobe light flashes.
- Always wear an eye shield when testing vehicles. Be extra careful near batteries and moving parts.
- Battery gas is highly explosive.
 - a. If a battery explodes, flush the acid away from person's skin with generous amounts of water. Follow up with a neutralizing solution of baking soda and then more water. Medical treatment for acid burns may be necessary.

Treat clothing, vehicle parts, and equipment similarly. Any acid traces inside equipment must be removed by generous rinsing. Dry off equipment afterwards and place in a warm 50° C (120° F) oven until thoroughly dry.

- b. Never use a wrench on the ungrounded battery terminal until the grounded one has been disconnected. Contact between the vehicle body metal and the "hot" terminal can cause sparks to ignite gas or even weld tools into a battery short circuit.
 - c. Keep the space around a battery well ventilated.
 - d. Do not make sparks or allow flames near batteries.
- Before working on a vehicle, set the brakes and block the wheels. Beware of automatic parking brake releases.
- Keep your work area well ventilated and free of exhaust. Engine exhaust contains deadly poisons.
- Avoid electrical shocks caused by getting too close to live ignition wires or touching the coil TACH terminal. A person's reaction near a running engine can be more damaging than the shock.
- Keep spark producing devices at least 0.5m (18") above the floor to reduce the hazard of igniting gasoline vapor.
- Do not let test leads wind up in a fan or pulley. Route leads away.
- Remove finger rings and metal wristbands. They can short terminals and become very hot from electric current.