

Clarke®



INDUCTIVE XENON TIMING LIGHT

MODEL NO: CIXTL1

PART NO: 4003400

USER INSTRUCTIONS



ORIGINAL INSTRUCTIONS

GC1219 - ISS 1

INTRODUCTION

Thank you for purchasing this CLARKE Timing Light.

Before use, read the following information and we are sure that you will enjoy many years of service from your timing light and maintain the efficiency of your car's engine.

The xenon bulb used in this light will provide the bright flash needed to see engine timing marks under bright lighting conditions including normal daylight.

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BASICS OF PETROL ENGINE TIMING

In order for an automobile engine to function, three things are necessary: air, fuel and a spark, to ignite the air/fuel mixture and create an explosion. The precise instant of that explosion must be such that the maximum power is delivered to the engine piston. This is "Timing". Each engine manufacturer determines the exact timing necessary for various engines so that optimum power is obtained from the fuel used. Due to normal engine and ignition system wear, the accuracy of the timing can be lost, reducing both power and fuel mileage. With the timing light, the car owner can reset the timing to new car standards and regain lost power and fuel mileage.

Timing is given in degrees Before Top Dead Center (BTDC) or After Top Dead Center (ATDC) in the manufacturer's specifications.

In order to completely burn the air/fuel mixture in the engine cylinders, most timing is such that the spark occurs at a point several degrees before top dead center (for example, 4° BTDC) to assure that full power of the explosion is obtained. See Figure 1 on page 4.

Two additional terms the engine manufacturers use when describing timing are "Advanced" and "Retarded". As shown in Figure 1, when the timing is advanced the spark will occur before the piston reaches the top of the engine cylinder (BTDC). On some late model cars equipped with various emission control devices, the timing is retarded so that the spark occurs after the piston has started to move down in the cylinder (ATDC). Engine timing is changed by adjustment of the ignition distributor.

In order to allow setting and adjustment of the engine timing, special "timing marks" are provided on each engine during assembly. In most cases, these marks appear on the engine vibration damper or fan pulley at the lower front of the engine. See Figure 1 on page 4. On some early engines, this mark was shown at the rear of the engine on the flywheel.

WHEN TO CHECK TIMING

The instant of spark plug firing is determined by the opening of the contact breaker points and will change any time the points gap or dwell angle is changed. In addition, normal wear on the contact breaker point contact block will change the dwell and affect the timing. While cars equipped with modern breakerless electronic ignition systems will not normally change timing, since there are no contact breaker points, the timing light can still be used to note changes in timing caused by defects in the ignition system as well as for re-setting timing when components are changed.

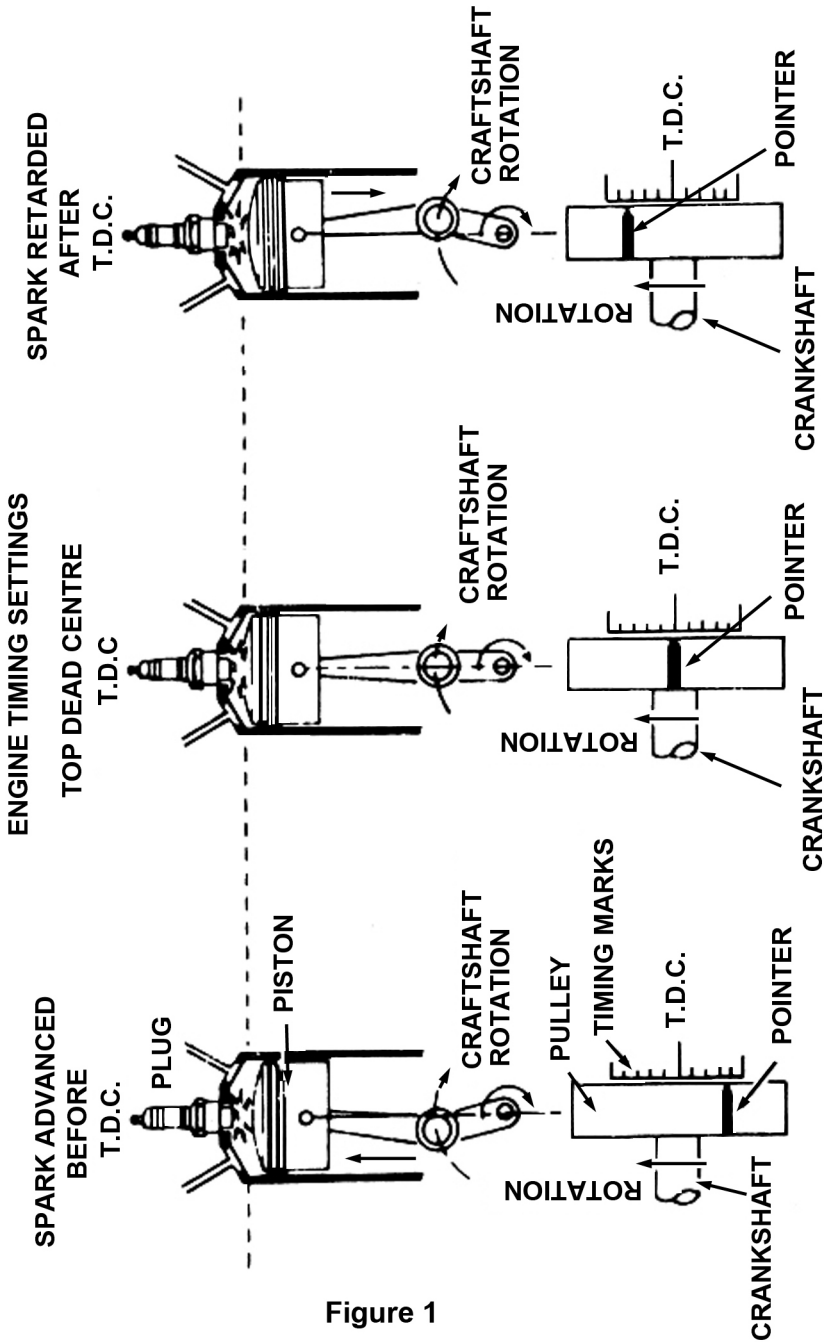


Figure 1

TIMING SPECIFICATIONS

Timing requirements vary from engine to engine and therefore the engine manufacturer's specifications should always be referred to before making any adjustments.

These specifications may be contained in the car owners manual, on the engine bay label (required on all cars manufactured since 1968), and in various printed publications. Many spark plug manufacturers such as "Champion" "Autolite" and others, also provide specifications.

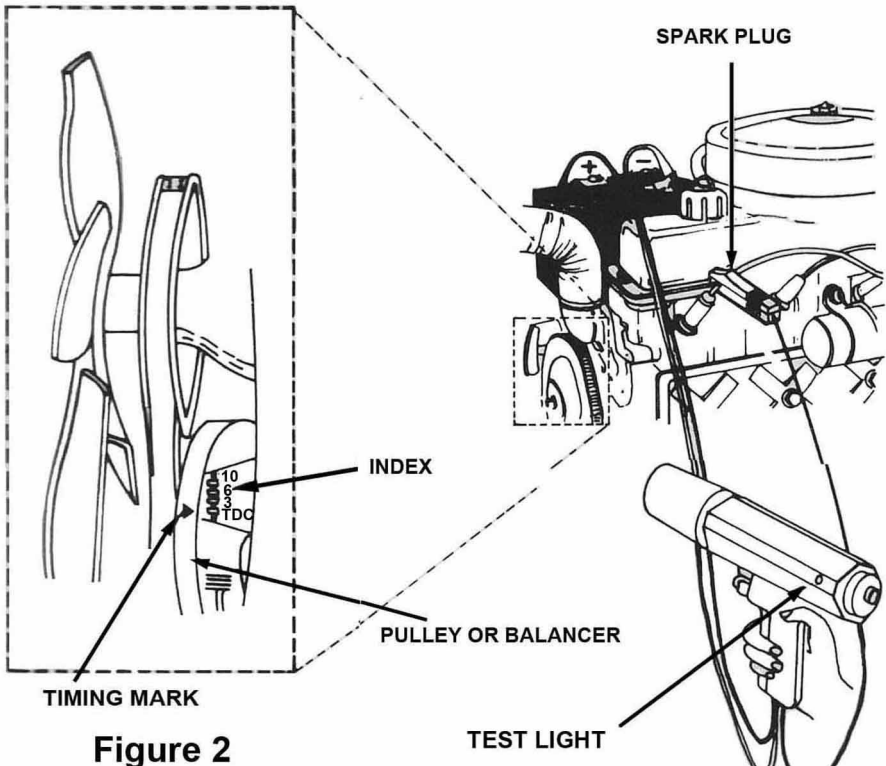


Figure 2

SAFETY PRECAUTIONS

1. DO NOT smoke, strike a match, or cause a spark in vicinity of the engine.
2. Remove all rings, bracelets, necklaces and watches while working with a running vehicle engine.
3. Take great care not to drop metal tools onto the battery or onto the moving parts of the engine.
4. Do not place the timing light on the hot engine surface and avoid the engine fan, fan belt and battery to prevent damage.

GENERAL OPERATING PROCEDURES



CAUTION: TAKE CARE WHEN WORKING AROUND A MOVING ENGINE. KEEP HANDS, TOOLS AND THE TIMING LIGHT CLEAR OF THE MOVING FAN, BELTS OR OTHER MOVING PARTS.

1. Locate the engine timing mark (see figure 1) and use a rag to clean all grease and dirt from the mark and the pointer. It may help to use chalk or white paint on the marks to make them more easily seen.
2. Check the manufacturers specifications for correct timing for the engine being serviced.
3. Start and run the engine until the normal operating temperature is reached. (Approximately 15 minutes.) Stop the engine.
4. If the specifications require, locate the vacuum tube going to the ignition distributor vacuum advance and disconnect/ block the tube. A golf tee or small pencil may be used to seal the tube.
5. Connect the timing light as shown in figure 3 on page 7.
6. Start the engine and operate at normal idle speed. Aim the timing light at the timing mark.
7. Trigger the timing light and observe the reading from the timing mark.
8. Compare the reading obtained in step 7 with manufacturer's specifications. If the timing is not as specified, re-adjust as described in the following procedure.
9. Stop the engine.

ADJUSTING TIMING TO SPECIFICATIONS

1. Loosen the distributor hold-down locking bolt(s) located at base of the distributor enough so that the distributor may be rotated back and forth. Do not over-loosen or remove the bolt(s) but leave tight enough to prevent the distributor from turning by itself.
2. Start and run the engine.
3. Direct the timing light flash at the timing marks and slowly rotate the distributor right or left until the timing marks are aligned with the pointer. See Figure 4 on page 7. Stop the engine.
4. Tighten the distributor hold-down bolt(s) taking care not to change the position of the distributor.
5. Start the engine and re-check the timing.

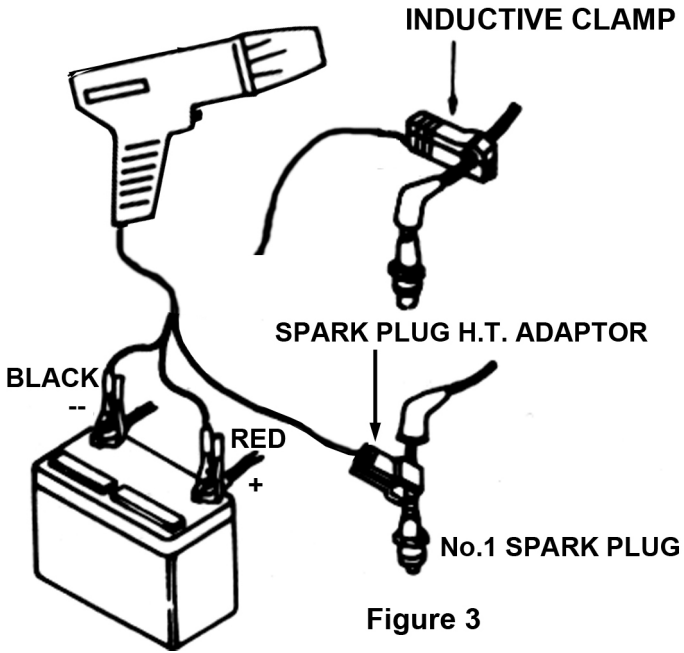
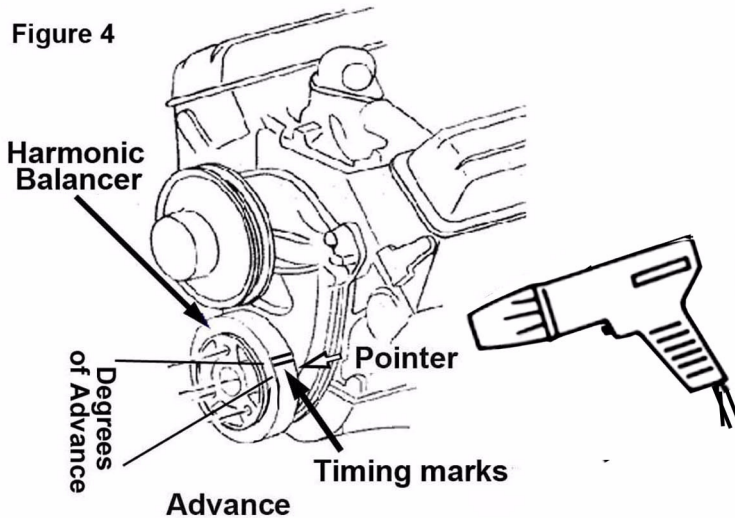


Figure 4



TESTING THE CENTRIFUGAL ADVANCE

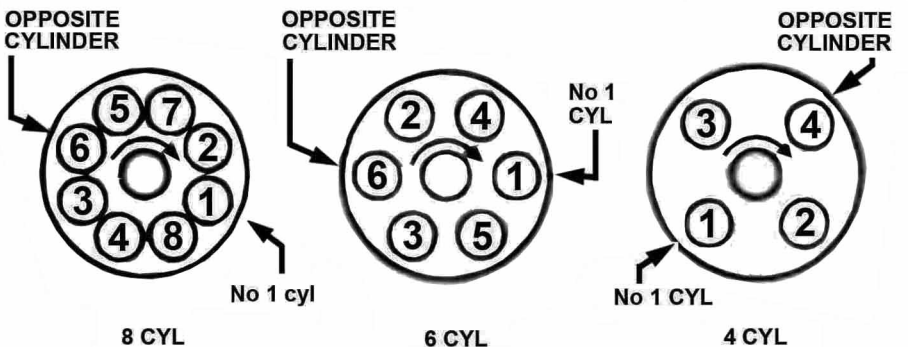
With the timing light still connected and with the vacuum line disconnected:

1. Speed the engine up slowly to the manufacturers specified speed and watch the timing mark.
2. The timing mark should remain stationary until the engine reaches the manufacturer's specified speed. The timing mark should then move steadily. (See figure 4 on page 7)
3. If the mark does not move or moves erratically, the centrifugal (automatic) advance should be serviced as necessary.
4. To check the maximum advance, it is necessary to mark the harmonic balancer with the maximum degree per the manufacturer's specifications and follow the manufacturer's procedures.

TESTING THE VACUUM ADVANCE

1. The vacuum tube to the distributor must be connected to make this test.
2. Set the engine speed to 800 R.P.M. or any speed necessary to apply vacuum to the distributor.
3. Aim the timing light and note the position of the timing mark.
4. Disconnect the vacuum tube.
5. If the timing mark does not move, the fault could be a plugged line, a leaky diaphragm or a seized distributor plate and the distributor should be serviced as required.

Figure 5



THE OPPOSITE CYLINDER IS ALWAYS OPPOSITE NO 1 CYLINDER ON THE DISTRIBUTOR CAP

CHECKING DISTRIBUTOR CAM WEAR

1. This check is done after the timing has been set and the timing mark lines up with the reference pointer for No 1 cylinder.
2. Connect the timing light to the lead directly opposite (180°) No 1 cylinder on the distributor cap. (See figure 5 on page 8)
3. Start the engine and aim the timing light towards the timing mark. The reading should be the same as when connected to No 1 cylinder.
4. If the reading is not the same, the probable cause is a worn out distributor cam or a bent distributor shaft. Repair as required.

SMALL ENGINES

The DC power timing light can be used on any combustion engine with impulse ignition or magneto ignition, such as motorcycles, lawn mowers, outboard motors, or anywhere there is a high voltage spark used for ignition.

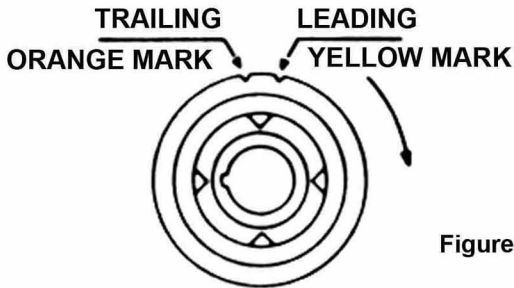
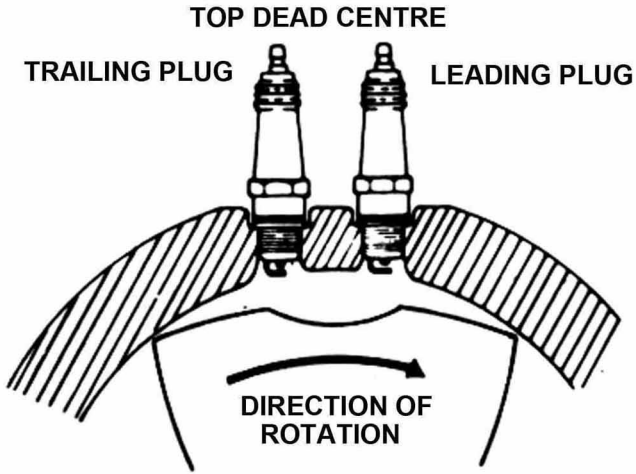
When 12 Volt DC voltage is not available from the engine being tested, an external battery of 12V must be used. Connect a ground from the negative post of the external battery to the engine. Connect the red clip to the (+) positive terminal and the black clip to the (-) negative terminal of the battery. Connect the adaptor lead of the timing light to the correct spark plug.

ROTARY ENGINES

The timing light can be used on rotary engines.

Follow the manufacturer's specific instructions and specifications. Figure 6 on page 10 shows a typical procedure for the Mazda twin rotor engine.

1. Connect the Red (+) and Black (-) power leads clamps to the battery. Connect the lead with the spark plug adaptor to the leading spark plug on the front rotor housing.
2. Start the engine and run at idle speed.
3. Aim the timing light at the timing indicator pin on the front cover.
4. Loosen the distributor locking nuts and rotate the leading side distributor body until the timing mark on the eccentric shaft pulley are in line with the timing indicator pin.
5. Tighten the locking nuts and recheck the timing.
6. Repeat the above steps for setting the trailing side distributor timing with the timing light connected to the trailing spark plug.



CARE AND MAINTENANCE

XENON LAMP REPLACEMENT

The lamp may have a black spot around the anode, this is perfectly normal. However, if the lamp is completely black it has reached its end of life and should be replaced. For a replacement xenon lamp, please contact your CLARKE dealer.

TROUBLESHOOTING

Symptom	Probable Cause	Solution
No flash	Trigger in OFF position	Set trigger to ON position
	Battery clips connected in reverse	Reverse the battery clip connections
	Poor connection of clips	Make sure the clips are connected to a clean battery terminal
	Wrong direction of inductive clamp	Point the arrow on the clamp towards the spark plug
	Weak ignition or spark plug. Plug gap is too small.	Connect to other plugs or spark plug leads. If lamp flashes, then repair the bad plug or correct the gap.
	Faulty lamp	Get lamp replaced
Light flashes intermittently	Timing light high-tension lead lying on or too close to the other spark plug leads.	Place the high tension lead so that it is routed away from the other plug leads.

All timing lights are tested before they are shipped from the factory and improper operation is usually caused by incorrect connection. Please observe the above troubleshooting procedure if the timing light fails to perform satisfactorily.

ENVIRONMENTAL RECYCLING POLICY



Through purchase of this product, the customer is taking on the obligation to deal with the WEEE in accordance with the WEEE regulations in relation to the treatment, recycling & recovery and environmentally sound disposal of the WEEE.

In effect, this means that this product must not be disposed of with general household waste. It must be disposed of according to the laws governing Waste Electrical and Electronic Equipment (WEEE) at a recognised disposal facility.

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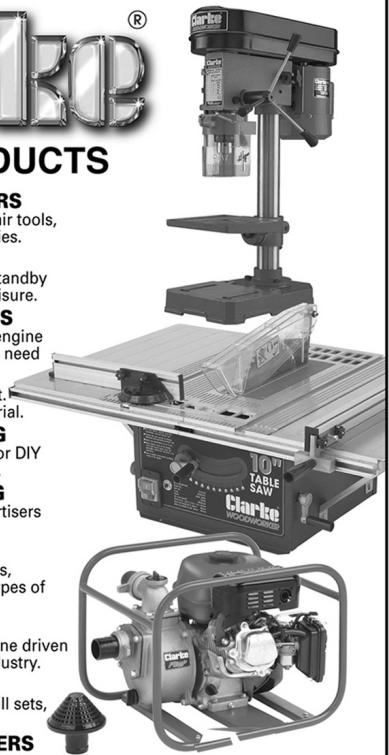
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Guarantee

This product is guaranteed against faulty manufacture for a period of 12 months from the date of purchase. Please keep your receipt which will be required as proof of purchase.

This guarantee is invalid if the product is found to have been abused or tampered with in any way, or not used for the purpose for which it was intended. Faulty goods should be returned to their place of purchase, no product can be returned without prior permission.

This guarantee does not affect you statutory rights.

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