INSTRUCTIONS FOR

TIMING LIGHTS

MODEL NO: **TL84 & TL85 (WITH ADVANCE)**

Thank you for purchasing a Sealey product. Manufactured to a high standard, this product will, if used according to these instructions, and properly maintained, give you years of trouble free performance.

IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS & CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. KEEP THESE INSTRUCTIONS SAFE FOR FUTURE USE.


Refer to instruction manual


Refer to instruction manual


Wear protective gloves

1. SAFETY

▲ ***DANGER! - BE AWARE, LEAD-ACID BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON IT IS VERY IMPORTANT TO READ AND FOLLOW THESE INSTRUCTIONS CAREFULLY, EACH TIME YOU USE THE TIMING LIGHT****. Follow these instructions and those published by the battery manufacturer and the maker of any equipment you intend to use in the vicinity of the battery. Remember to review warning marks on all products and on engines.*

1.1. **PERSONAL PRECAUTIONS**

- ✓ Ensure there is another person within hearing range of your voice and close enough to come to your aid should a problem arise when working near a lead-acid battery.
- ✓ Wear safety eye protection and protective clothing. Avoid touching eyes while working near battery.
- ✓ Have fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
- ✓ Wash immediately with soap and water if battery acid contacts skin or clothing. If acid enters eye, flush eye immediately with cool, clean running water for at least 15 minutes and seek immediate medical attention.
- ✓ Remove personal metallic items such as rings, bracelets, necklaces and watches. A lead-acid battery can produce a short-circuit current high enough to weld a ring or the like to metal and may cause severe burns.
- ✓ Ensure hands, clothing (especially belts) are clear of fan blades and other moving or hot parts of engine, remove ties and contain long hair.
- × **DO NOT** smoke or allow a spark, or flame, in the vicinity of battery or engine.
- ✓ Remember that a flashing timing light 'freezes' rotating components. **DO NOT** be tempted to touch an apparently stationary component which is, in fact, rotating.
- ❑ **WARNING! When ignition is on DO NOT touch any ignition components - very high voltages are present.**

1.2. **GENERAL SAFETY**

- ❑ **WARNING!** When running an engine in an enclosed space ensure adequate ventilation or ducted exhaust. Exhaust gases kill.
- ✓ Keep children and unauthorised persons away from the working area.
- ✓ Ensure vehicle transmission is in 'Neutral' (manual) or 'Park' (automatic) and the parking brake is applied.
- ✓ Ensure the ignition is switched off before attaching the power clamps to the battery.
- ✓ Keep tools and other items away from the engine and ensure that you can see the battery and working parts of engine clearly.
- ✓ If the battery terminals are corroded or dirty, clean them before attaching the timing light clamps.
- × **DO NOT** dis-assemble the timing light for any reason. The timing light must only be checked by qualified service personnel.
- ❑ **WARNING!** ***DO NOT*** *allow metal tools or equipment to accidentally touch battery terminals since this may produce sparks or a short circuit resulting in an explosion.*
- × **DO NOT** cross-connect leads from the timing light to the battery. Ensure positive (+) (RED) is to positive and negative (-) BLACK is to negative.
- ✓ If symbols cannot be distinguished, negative terminal is normally the one directly connected to the vehicle bodywork (check vehicle hand-book).
- × **DO NOT** allow inductive pick-up, or leads, to contact exhaust or other engine parts as the heat will cause damage.
- × **DO NOT** pull the cables or clamps from the battery terminals.
- × **DO NOT** use the timing light outdoors, or in damp, or wet locations, and **DO NOT** operate within the vicinity of flammable liquids or gases.
- × **DO NOT** use the timing light for a task for which it is not designed. When not in use, store the timing light in a safe, dry, childproof location.

2. INTRODUCTION

Composite cased Xenon timing light with inductive pulse pick up, 8000rpm maximum. TL85 measures timing advance range 0-60° BTDC. Supplied with 1.5mtr coiled 12V power lead, inductive coupler and instructions.

3. WHAT IS 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 the explosion must be timed so that maximum force is delivered to the engine's piston. This is "timing". Each engine manufacturer tells its factory the exact timing necessary for various engines so that every possible amount of power is obtained from each litre of fuel. As normal engine and ignition systems wear, the timing can change, thereby reducing both power and mileage. With the TL84 or TL85 Timing Light, you can reset the timing to the manufacturer's standard, regain lost power and increase mileage.

Timing is given in Degrees Before Top Dead Centre (BTDC) or After Top Dead Centre (ATDC). In order to completely burn the air/fuel mixture in the car's cylinders, most timing is such that the spark occurs at a point several degrees BTDC (for example 4° BTDC). This ensures that the full power of the explosions obtained (see fig 1).Two additional terms used when describing timing are 'Advanced' and 'Retarded'.

As shown in figure 1, when the timing is advanced the spark will occur BTDC. On some late model cars equipped with various emission control devices, the timing is retarded so that the spark occurs ATDC. Timing is changed by adjustment of the ignition distributor.

In order to allow setting and adjustment of the engine timing, 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 (figure 1). On some early engines, this mark was shown at the rear of the engine on the flywheel.

3.1. **WHEN TO CHECK TIMING**

The instant of the spark plug firing is determined by the closing of the distributor ignition breaker points and will change any time the points gap or dwell angle is changed. In addition, normal wear on the breaker point rubbing block will change the dwell and affect the timing. Cars equipped with the new "breakerless electronic ignition system" will not normally change timing since there are no breaker points. For these vehicles, the Timing Light can still be used to note changes in timing caused by troubles in the ignition system as well as for resetting timing when components are changed.

3.2. **TIMING SPECIFICATIONS**

As noted earlier, timing requirements vary from engine to engine. The engine manufacturer's specifications should always be referred to before making any adjustment. These specifications can be found in the cars owner manual, on the under bonnet decal required on all cars manufactured since 1968 and in various automotive publications.

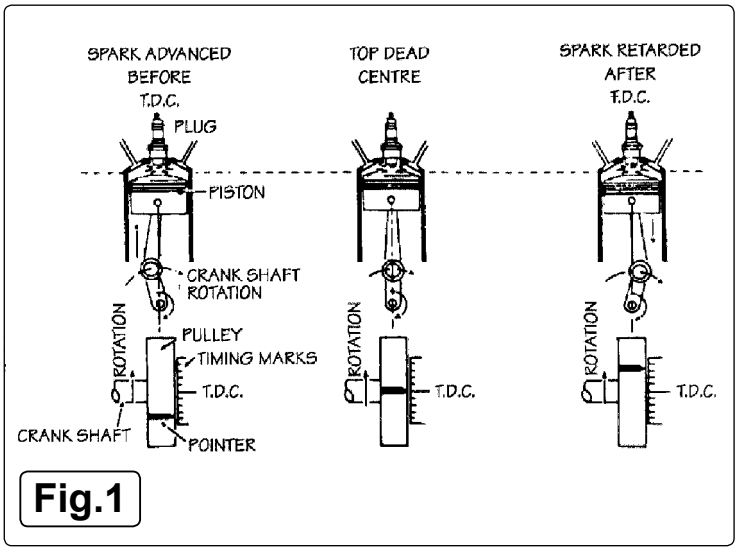


Fig.1

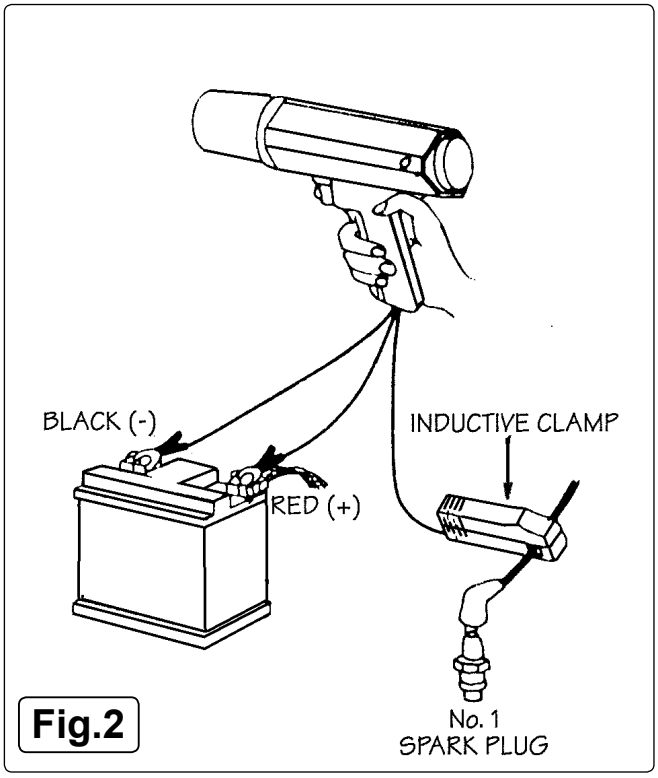


Fig.2

4. OPERATION - NORMAL ENGINES

4.1. Locate 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 visible.

4.2. Check manufacturer's specifications for correct timing of the engine being serviced.

4.3. Start and run the engine until normal operating temperature is reached .

4.4. Stop the engine.

4.5. If specifications require, locate the vacuum line going to the ignition distributor vacuum advance, disconnect it and plug the line. A bolt or pencil may be used to seal the line.

4.6. Connect the timing light as shown in figure 2.

4.7. Start the engine and operate at normal idle speed. Aim the timing light at the timing mark as shown in figure 3

4.8. Trigger the timing light and observe the reading from the timing mark.

▲ **Caution: Use care when working around a moving engine. Keep hands, tools and timing light clear of moving fan, belts or other moving parts.**

4.9. Compare reading obtained in step 4.8 with the manufacturer's specifications. If timing is not as specified, readjust as described below.

4.10. CHECK THE IDLE (TL85 only)

4.10.1. Set the knob to the '0' position as in figure 4.

4.10.2. Follow steps 4.1 - 4.9.

4.11. CHECKING THE CENTRIFUGAL ADVANCE AND VACUUM ADVANCE (TL85 only)

4.11.1. Follow steps 4.1 - 4.7 under 'Operating Procedures' but increase the engine speed to 2000 rpm. Trigger the timing light and rotate the knob clockwise slowly and stop when the timing mark moves to TDC or'0°'.

4.11.2. Observe the reading from the advance scale as shown in figure 5

4.11.3. Compare the reading with the manufacturer's specification.

4.12. ADJUSTING THE TIMING TO SPECIFICATIONS

4.12.1. Loosen distributor locking bolt located at the base of distributor enough so that the distributor may be rotated back and forth. **DO NOT** over loosen or remove bolt, but leave it tight enough to prevent distributor turning by itself.

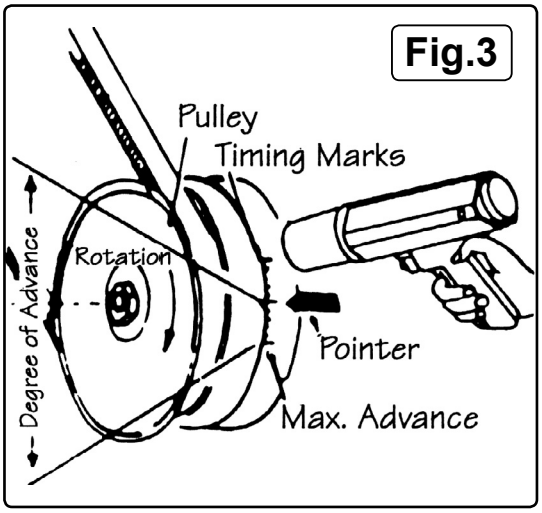


Fig.3

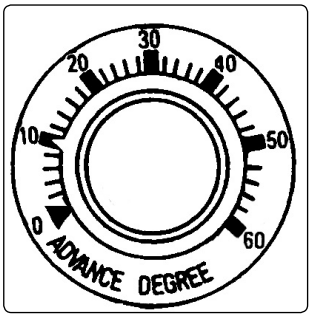


Fig.4

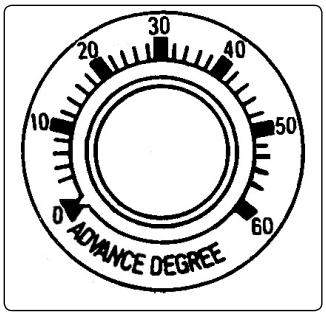


Fig.5

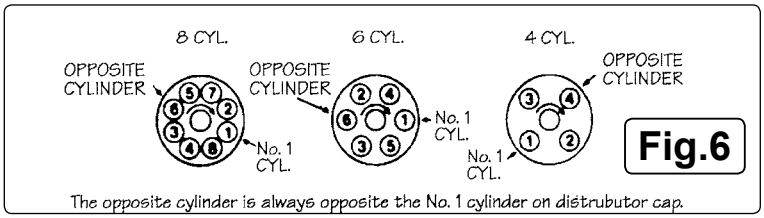


Fig.6

4.12.2. Start and run the engine.
4.12.3. Direct the timing light flash at timing marks and slowly rotate distributor right and left until the marks are aligned with the pointer (see figure 3).
4.12.4. Stop the engine.
4.12.5. Tighten distributor locking bolt taking care not to alter the position of the distributor.
4.12.6. Start the engine and recheck the timing.

4.13. TESTING THE CENTRIFUGAL ADVANCE

4.13.1. With the timing light still connected and with the vacuum line disconnected, speed the engine up slowly and watch the timing mark. It should remain stationary until the engine reaches the manufacturer's specified speed. The timing should then move steadily and without jerking (see figure 3). If the mark does not move, or moves erratically, the centrifugal (automatic) advance should be serviced as necessary.

4.13.2. To check the maximum advance, it is necessary to mark the harmonic balancer with the maximum degree per manufacturer's specifications and follow manufacturer's procedures.

4.14. TESTING VACUUM ADVANCE

4.14.1. The vacuum line to the distributor must be connected to make this test.
4.14.2. Set the engine speed to 800rpm or at the speed necessary to apply vacuum to the distributor.
4.14.3. Aim the timing light and note the position of the timing mark.
4.14.4. Disconnect the vacuum line. If the timing mark does not move, the trouble could be a plugged line, a leaky diaphragm or a frozen distributor plate. If so, the distributor should be serviced as required.

4.15. CHECKING DISTRIBUTOR CAM WEAR

4.15.1. This check is done after the timing has been set and the timing mark lines up with the reference pointer for 1 cylinder.
4.15.2. Connect the timing light to the wire directly opposite (180º) 1 cylinder on the distributor cap (see figure 6).
4.15.3. Start engine and aim the timing light towards the timing mark. The reading should be the same as when connected to 1 cylinder. If not, the probable cause is a worn out distributor shaft. Repair as required.

5. OPERATION - SMALL ENGINES

The timing light can be used on any combustion engine with impulse ignition, magneto ignition (motorcycles, lawn mowers, outboard motors etc) or any time there is a high voltage spark used for ignition. When 12V DC is not available from the engine being tested, an external 12V battery must be used.

5.1. Connect a ground from the negative (-) post of the external battery to the engine.
5.2. Connect the red clip to the positive (+) terminal and the black clip to the negative (-) terminal of the battery.
5.3. Connect the adaptor lead of the timing light to the proper spark plug.

6. TROUBLESHOOTING

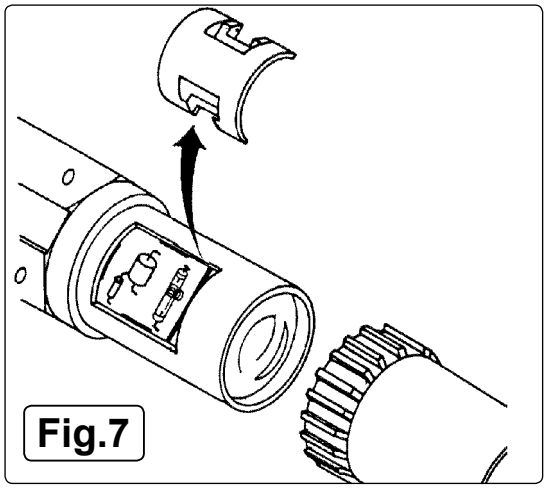
SYMPTOM	PROBABLE CAUSE	SOLUTION
NO FLASH	Switch in 'OFF' position.	Move switch to 'ON' position.
	Battery clips connected backwards.	Reverse the battery clip connections.
	Poor connection of clips.	Make sure the clips are connected to a clean battery post.
NO FLASH BUT DOUBLE CHECK INDICATOR IS "ON"	Wrong direction of inductive lamp.	Toward the arrow on clamp to # 1 plug.
	Weak ignition or spark plug. The gap is to close.	Connect to other plugs or spark plug wires. If flashes then repair the plug or gap.
	Faulty lamp	Replace it
LIGHT FLASHES INTERMIT-TENTLY	Timing light high tension wire lying on or to close to the other spark plug wires.	Place the high tension wire in good order so it is routed away from the other spark plug wires.

6.1. All timing lights are 100% tested before they are shipped from the factory and improper operation is usually caused by incorrect hook up. Please observe the troubleshooting procedure to perform satisfactorily.

7. LAMP REPLACEMENT

7.1. If procedures outlined in Trouble Shooting do not correct the failure, the most probable cause is a defective Xenon lamp.

7.2. The lamp may have a black spot around the anode, this is perfectly normal. However, if the lamp is completely black it has reached the end of its life and should be replaced. (see figure 7)



ENVIRONMENT PROTECTION

Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycling centre and disposed of in a manner which is compatible with the environment. When the product becomes completely unserviceable and requires disposal, drain any fluids (if applicable) into approved containers and dispose of the product and fluids according to local regulations.

WEEE REGULATIONS

Dispose of this product at the end of its working life in compliance with the EU Directive on Waste Electrical and Electronic Equipment (WEEE). When the product is no longer required, it must be disposed of in an environmentally protective way. Contact your local solid waste authority for recycling information.

Note: It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice.

Important: No Liability is accepted for incorrect use of this product.

Warranty: Guarantee is 12 months from purchase date, proof of which is required for any claim.

Sealey Group, Kempson Way, Suffolk Business Park, Bury St Edmunds, Suffolk. IP32 7AR

01284 757500 **01284 703534** **sales@sealey.co.uk** **www.sealey.co.uk**