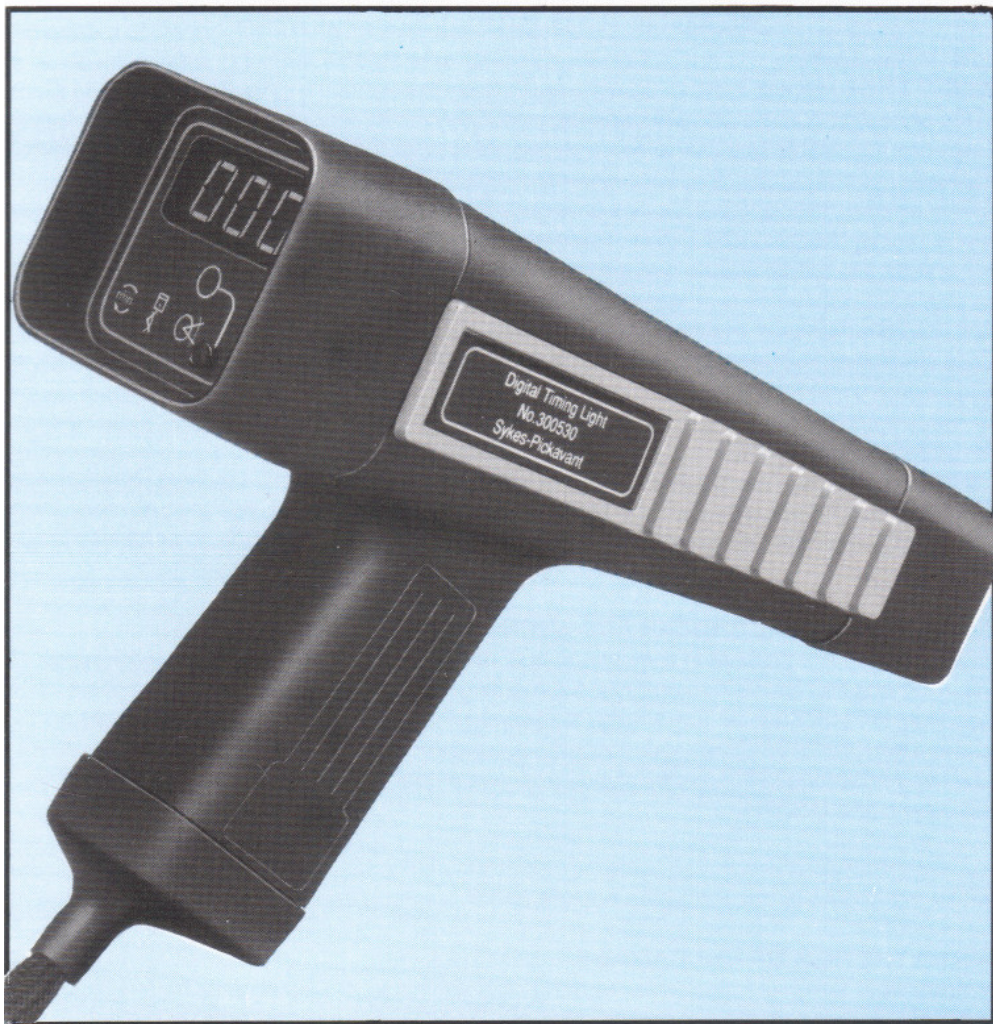


# Digital Timing Light



No 300530



**Sykes-Pickavant**

## **PLEASE NOTE:**

The methods outlined in these instructions are intended as a general guide only. Always follow the vehicle manufacturers recommendations for the particular vehicle or system under test. Danger and damage can result if correct procedures are not followed. In addition to manufacturers workshop manuals a useful source for specifications and data are the series of publications produced in the UK by Sykes-Pickavant Ltd.



## **HEALTH AND SAFETY**

### **AVOID THE RISK OF FIRE:**

Keep a fire extinguisher close to hand. (Foam, CO<sub>2</sub>, Powder and/or Halon (BCF) are suitable). Rags and flammable liquids should be stored only in fireproof, closed metal containers. Petrol soaked rags should be allowed to dry thoroughly before being discarded. Do not smoke or allow naked flames or sparks. Fuel vapour is highly inflammable and the gas formed when charging a battery is explosive. Take care when working on the fuel system that HT sparks are not accidentally emitted; disconnect the coil if necessary.

### **AVOID THE RISK OF FUME INHALATION**

Fuel and exhaust fumes are harmful; always work in a well ventilated area. Never run an engine in a closed garage.

### **AVOID MOVING PARTS**

Be careful not to get hands, hair or clothing near fan blades and belts, pulleys, transmission and throttle linkages etc. Do not wear ties, loose clothing, jewelry, watches or other loose articles when working on a vehicle; they can get caught on moving parts and can also cause short circuits.

### **AVOID ELECTRICAL SHOCKS AND BURNS**

High voltages are present in the ignition coil, distributor cap, HT leads and spark plugs. A violent shock can cause involuntary movements resulting in injury. Use insulated pliers when handling HT leads whilst the engine is running. Take care not to lay or drop tools on the battery; accidental earthing, or direct contact between the terminals can shock and burn you, and cause damage to the electrical systems. Avoid contact with battery acid; it can burn your skin, eyes and clothing.

Avoid contact with hot exhaust systems, radiators, and hoses. Never remove the radiator cap whilst the engine is hot. Escaping coolant under pressure could scald you.

### **AVOID THE RISK OF EYE DAMAGE**

Always wear eye protection when working on a vehicle to protect against battery acid, fuel, dirt and dust flying off moving engine parts etc. Do NOT look into the throat of the carburettor while the engine is cranking as a backfire can cause burns.

WHEN WORKING ON A VEHICLE ALWAYS ENSURE IT IS SECURELY PARKED WITH THE BRAKE ON AND GEAR IN NEUTRAL. IF THE VEHICLE IS JACKED, USE SUITABLE EQUIPMENT (NOT THE WHEEL CHANGE JACK SUPPLIED WITH THE VEHICLE) AND DOUBLE CHECK THAT IT CANNOT SLIP.

## IGNITION SYSTEM TIMING

Two methods of checking timing are available, either static or dynamic. Static tests, with the engine off, involve the use of a simple test lamp or multimeter which is used to verify that the points are closed at the correct position (relative to TDC) as measured by the fixed and moving timing marks on the engine.

However, dynamic testing is now considered to be a far more accurate method, and as the vehicle engine is running, timing can be tested and set at different RPM levels, if required by the manufacturer.

Dynamic tests are conducted using a Timing Light or Strobe which is used to "freeze" the movement of the moving timing mark so that its position relative to the fixed mark is seen. This is achieved by the inductive pick-up lead being connected to the HT lead of the reference spark plug and cylinder. This pick-up senses the high voltage in the plug lead when it is about to fire, causing the Strobe to flash for a very short period. When the Strobe is pointed at the moving mark these flashes make it appear stationary. With a very basic Timing Light which includes no special features, the actual timing must be gauged by the difference between the moving and static marks. Sometimes this can be done by reference to additional markings on the engine, but not always. On more sophisticated Timing Lights, including those in the Sykes-Pickavant range, an "Advance" feature is built in which allows the actual flash of the Strobe to be adjusted. In this way the flash can occur at the time of ignition, or it can be delayed by a specific number of degrees of advance, so that the two timing marks are aligned when the required advance is achieved. This feature allows for much faster timing checks and adjustments to be made.

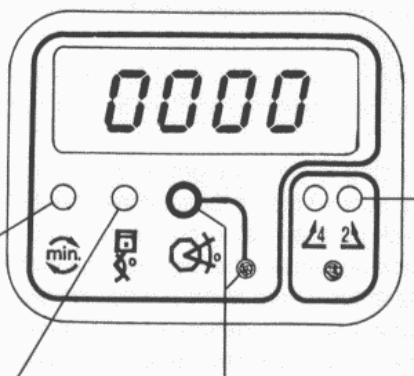
Vehicle manufacturers all have their own methods and preferences in their approach to ignition timing and some caution is recommended before using a Timing Light. Note that the method of producing the fixed and moving timing marks can vary (and some manufacturers choose to mark the ignition point itself, rather than TDC), also variations between car models can occur (eg high and low compression engines, differences in distributors fitted) and some vehicles may be fitted with vacuum units whilst others are not.

## SPECIFICATION

RANGES:	RPM 0-9990 (10rpm resolution)
	ADVANCE 0-99.9 degrees (0.1 resolution)
	DWELL ANGLE 0-99.9 degrees (0.1 resolution)
POWER:	DC 12V
DISPLAY:	15 mm Digital
READINGS AND MEASUREMENTS	Initial advance
	Intermediate advance
	Final advance
	Dwell
	Engine speed

## MANUAL CONTROLS AND ADJUSTMENTS

Strobe on/off. Advance switch. Sensitivity switch on inductive pick-up. On/off button for dwell test  
Selector for 2 or 4 stroke engines



RPM  
INDICATOR  
LIGHT

ADVANCE  
INDICATOR  
LIGHT

DWELL SELECTOR  
AND INDICATOR  
LIGHT

SELECTOR AND INDICATOR LIGHTS  
FOR 2/4 STROKE

## FEATURES AND BENEFITS

FEATURE	BENEFIT
0-99 deg Advance	Use for initial, intermediate and final advance; for centrifugal, mechanical or electronic advance.
RPM measurement	Quick set up of engine speed, without need of rev counter or other test equipment.
Dwell measurement	Instant check on dwell without need of other test equipment. Automatic selection of number of engine cylinders.
Sensitivity switch	Interference from other areas of the ignition system can be screened out; eg humidity in plug leads, HT lead screening faulty, plus many other causes.
Coil suppressor	A further aid to screening out interference from other parts of the HT circuit.
Xenon lamp	Strong bright white light; good in all lighting conditions, and "freezes" the moving mark without blurring.
Robust housing and circuit design	Shock proof and designed for the garage environment.

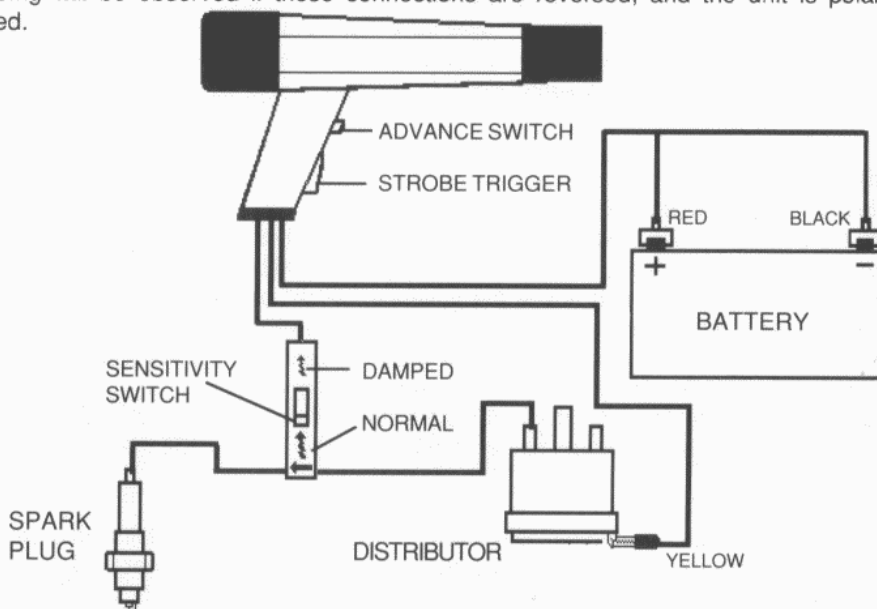
The Sykes-Pickavant model 300530 is an advanced computerised Timing Light with all the features necessary for a thoroughly professional approach to vehicle timing checks and adjustments.

To assist ease of use a memory will hold values for 10 seconds, and a blinking display indicates an incorrect connection.



## OPERATING INSTRUCTIONS

Connect the red clip to the positive battery terminal, and the black clip to the negative one. No reading will be observed if these connections are reversed, and the unit is polarity protected.



Connect the inductive pick-up to the plug lead of the reference cylinder; usually No1. The arrow on the pick-up should be pointing towards the plug. (On some electronic ignitions with reversed polarity this may need to be reversed.) Do not place the pick-up too close to the plug, especially if the insulation is suspect, as high voltage discharges may cause damage. Connect the yellow clamp, for checking dwell to the CB terminal on either the distributor or coil. During testing if interferences from the ignition system cause the readings to be unstable the sensitivity switch on the pick-up can be adjusted from its normal setting to the damped setting. This is indicated on the switch by the symbols as shown in the diagram above.

Where a great deal of disturbance is present a suppressor is supplied which can be fitted into the coil centre tower. The HT lead is removed, the suppressor fitted, and the HT lead plugged into the suppressor.

### Dwell

Press the 2/4 stroke selector button to suit the engine being tested. Start the engine and set the required RPM as recommended by the manufacturer. RPM will be indicated on the display when the Dwell selector light is off, and when the strobe trigger is not being depressed. Press the Dwell selector and the Dwell angle will be displayed. There is no need to select the number of cylinders in the engine.

Dwell variation at raised engine speed can be checked by increasing RPM to about 1500, and if a variation of more than 3 degrees is noted suspect wear in the distributor- shaft, point base plate etc.

Dwell variation between cylinders can also be checked by moving the position of the inductive pick-up. On an engine with the firing order 1-3-4-2, the dwell reading will be as follows;

clamp on 1	read dwell for 3
clamp on 3	read dwell for 4
clamp on 4	read dwell for 2
clamp on 2	read dwell for 1

### Initial Advance

Select 2/4 stroke as appropriate.

With the engine running at idle disconnect the vacuum advance pipe; where the vehicle is fitted with a vacuum advance/retard unit both pipes should be disconnected.

Press the strobe trigger and adjust the advance switch\* until the setting specified by the manufacturer registers on the scale, point the light towards the fixed and moving timing marks. The marks should coincide if the Initial Advance is correctly set, but if not the distributor should be rotated until they are correctly aligned.

Note that if the manufacturers timing marks are set up to indicate the ignition point rather than TDC the advance control should be set to zero, and alignment of the marks checked at this setting.

\*The advance switch will automatically show 10 degrees of advance at first, in order to make it quicker to set the manufacturers figure. When held constantly, to either the left or right, the switch will rapidly change the degree values. For small adjustments the switch can be pressed and released to change the value by 0.1 increments.

When the strobe trigger is not depressed engine RPM will automatically be displayed.

### Intermediate and/or Final Advance (Automatic Advance)

Run the engine to the RPM specified by the manufacturer, and again point the light toward the timing marks. Use the advance switch to set the automatic advance value. The timing marks should be aligned if the centrifugal automatic advance is functioning correctly.

Note that the automatic advance reading includes the number of degrees of initial timing, so, if the manufacturer specifies say, 15 degrees of centrifugal advance at 3000rpm, and the initial timing was 5 degrees BTDC, then the total advance to be set would be 5+15=20 degrees.

The above example applies to vehicles where the timing marks relate to TDC, but if they are related to the firing point then the advance setting would relate to the auto advance degrees only. (In this situation remember the timing light was set to zero for the initial timing.)

It is possible to check the centrifugal advance right through the speed range up to the highest safe rpm, and by pressing and releasing the strobe trigger simultaneous readings of the actual advance and rpm can be obtained. When the trigger is released the advance value will be memorised for 10 seconds to allow it to be noted.

### Vacuum Advance

Having established the number of degrees of Automatic advance it is possible to take the test a stage further; a vacuum gauge can be useful to verify that sufficient draw is being created by the carburettor at the speed of test to fully operate the vacuum advance.

Reconnect the vacuum advance pipe and increase the advance setting on the Timing Light to include the additional degrees of advance.

Re-check that the timing marks are still correctly aligned.

Note: Certain 4 stroke engines are fitted with double cycle ignition systems in which ignition also occurs during the exhaust stroke, eg Citroen 2CV types, AMI and VISA, plus the Fiat Panda. In this situation the RPM readings must be divided by 2.

## **SPARES**

Your Sykes-Pickavant Timing Light should require little in service maintenance, and no parts are replaceable by the user. If you suspect your unit requires service please refer to the Guarantee section which explains the procedure in detail. Under no circumstances should the unit be opened by an unauthorised person.

## **S.P. DIAGNOSTICS GUARANTEE**

Sykes-Pickavant guarantee to the original purchaser that this product will be free of defects in material and workmanship for a period of 12 months from the date of purchase, providing it has not been damaged by accident, negligence, alteration, improper installation maintenance or repair.

Any product which fails during the guarantee period will be repaired or replaced, without charge, providing it has been carefully packed to avoid transit damage, and that proof of purchase is supplied with the returned goods. Consumable items such as batteries, fuses, bulbs etc are excluded from the scope of this guarantee.

A written description of the problem should be sent to the Company as soon as reasonably practicable after a defect is noticed, and no further use should be made of the product before the Company is given the opportunity of inspecting it.

Products from the S-P Diagnostics range are also subject to the general Conditions of Sale published by Sykes-Pickavant in both the Company's Price List and Catalogue.

## **SERVICE PROCEDURE**

### **A) Guarantee Registration**

Please return the postage paid Guarantee Card within one week of purchase. This will enable our Service Department to quickly process any guarantee claim that may be necessary, and will also ensure that you are kept up to date with new products introduced by Sykes-Pickavant.

#### B)Guarantee Claims

Return the unit direct to your supplier,with a written description of the problem, and proof of purchase (eg. original invoice).Your supplier will contact Sykes-Pickavant and ensure the product is packed and returned safely.

#### C)Out of Guarantee service

You can either return the unit to the Sykes-Pickavant Service Department directly ,or through your normal supplier. Products within the S-P Diagnostics range can be repaired for a fixed charge,which includes a thorough condition check,and service. During this service all faults are repaired and excessively worn components replaced. After servicing, products are fully guaranteed against faulty materials and workmanship for 6 months, unless otherwise stated.

If you return your product through your normal supplier,they will undertake to return the goods safely and will advise the Service Charge payable to them.

If you wish to return goods directly to Sykes-Pickavant you should telephone or write to the Service Department who will advise the Service Charge and carriage payable.Your cheque, made payable to Sykes-Pickavant Ltd, should accompany the goods. Please note that if you are returning goods directly you must ensure they are correctly packed as Sykes-Pickavant cannot be held responsible for damage in transit.

#### D)Service outside the U.K.

As servicing arrangements may vary from one overseas market to another you should check with your local supplier for full details of both "In" and "Out" of Guarantee servicing.

#### E)Transit Packaging

If possible you should retain the packaging in which the product was first supplied as it can often prove difficult to find suitable material when it is necessary to return a product for service.

#### F)Service Return Number

Before returning any product,both distributors and users are requested to telephone,fax or write to the address below to obtain a Service Return Number. This will help us to ensure your returns are dealt with in a speedy and efficient manner.

SYKES-PICKAVANT LTD  
SERVICE DEPARTMENT  
KILNHOUSE LANE  
LYTHAM ST ANNES  
LANCASHIRE FY8 3DU  
ENGLAND  
TEL.0253 721291  
FAX.0253 713076



## NOTES

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# Sykes-Pickavant Ltd.

Kilnhouse Lane, Lytham St. Annes, Lancs, FY8 3DU England  
Telephone: 0253 721291 Telex: 67157 Fax: 0253 713076  
A member of the Sykes-Pickavant Group plc

