PROFESSIONAL TIMING LIGHT

- FOR MOST 12 VOLT GASOLINE ENGINES
- WORKS ON BOTH DOMESTIC AND IMPORT VEHICLES
- WORKS ON ADJUSTABLE AND NON-ADJUSTABLE TIMING SYSTEMS

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Safety Precautions

Always observe safety precautions whenever working on a vehicle.

DO NOT wear loose clothing, watches, rings or other jewelry when working on a vehicle.

Always wear safety eye protection.

Only work on a vehicle in a well-ventilated area.

Put transmission in “park” (for automatic) or “neutral” (for manual). Set parking brake. Put blocks on drive wheels.

Avoid moving fan blades or any potentially moving parts. **WHEN USING THE TIMING LIGHT, THESE PARTS MAY APPEAR TO BE STOPPED OR MOVING SLOWLY.**

Avoid hot engine parts.

The vehicle battery produces explosive gases. **DO NOT** smoke or allow spark or flame near the battery.

BE CAREFUL when working near high-voltage parts (spark plugs or coil terminals).

Turn off ignition before connecting (or disconnecting) any testing equipment.

ALWAYS READ THE VEHICLE'S SERVICE MANUAL BEFORE PERFORMING ANY PROCEDURE. OBSERVE ALL SAFETY PRECAUTIONS.

NOTE

EMI/RFI problems with Digital Timing Lights:

- If the Digital Timing Light readout becomes inoperative or locks up during use, disconnect and reconnect the timing light's positive battery clip from the battery to reset the unit.
- Some aftermarket ignition systems and/or specialty spark plug wires (solid core wires, racing wires, off-road wires) radiate above normal Electro-Magnetic Interference (EMI) and Radio Frequency Interference (RFI) which can cause improper operation of testing equipment. Please contact these manufacturers for instructions on how to use an inductive pickup with their systems.
- It may be necessary to replace the No. 1 spark plug wire with an O. E.-style plug wire during testing.

General Information

ABOUT THE TIMING LIGHT

This timing light is designed for use with all 12-volt negative-ground vehicles. The timing light may also be used on vehicles equipped with DIS (distributorless ignition systems).

Operating Controls and Indicators — General (see Figure 1)

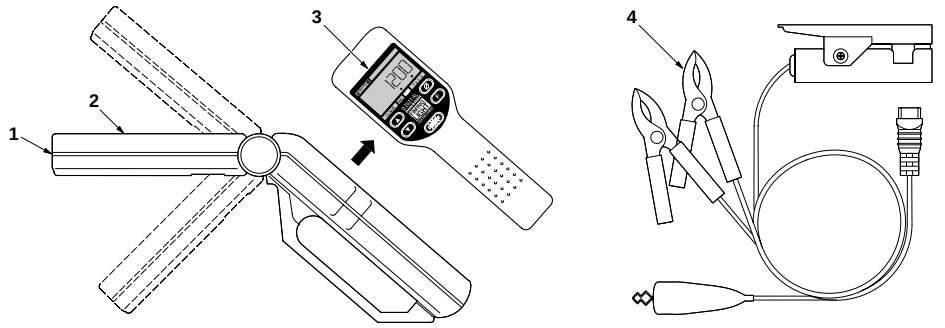
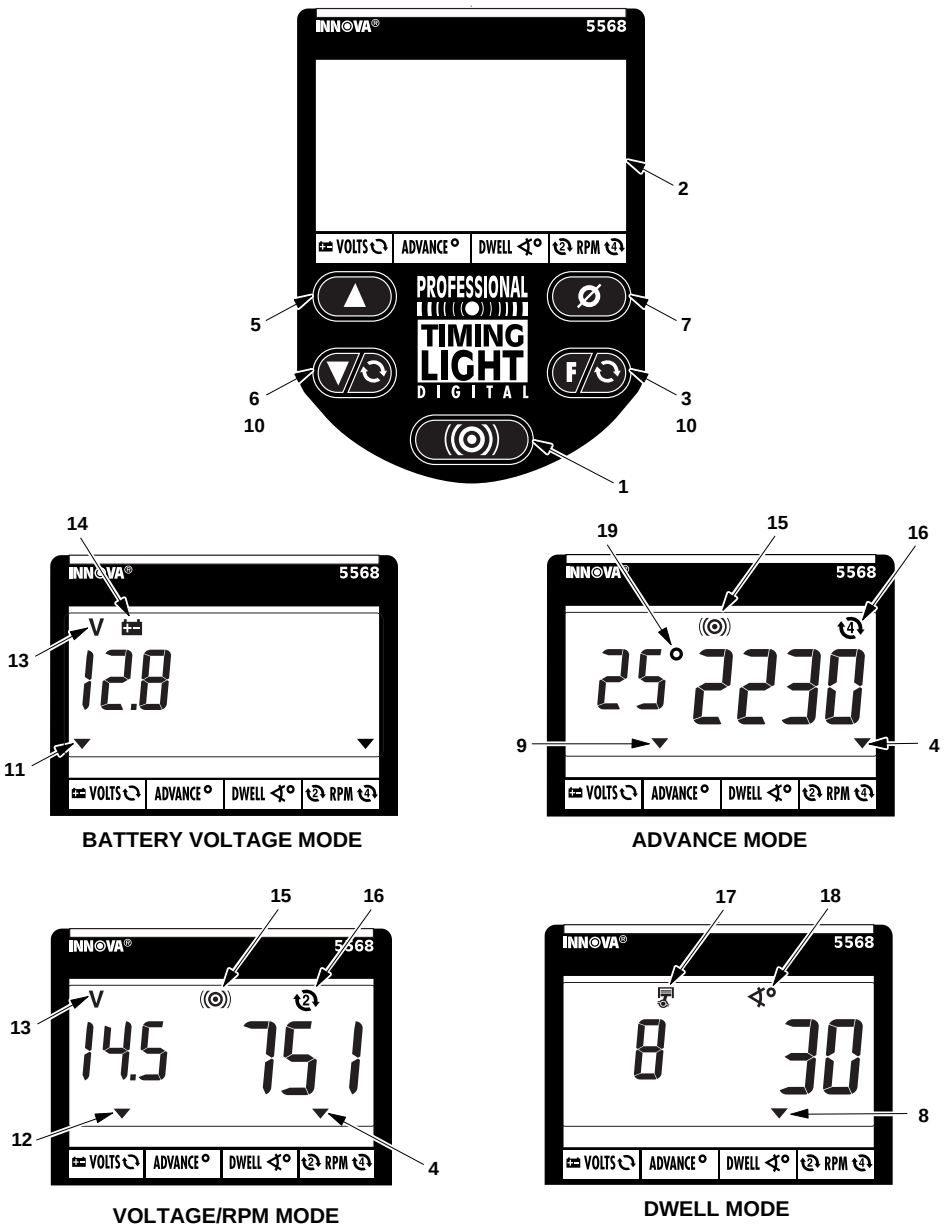


Figure 1. Operating Controls and Indicators

1. **Xenon Bulb** — Used to illuminate timing marks for checking timing.
2. **Swiveling Head** — Contains the xenon bulb. Rotates over approximately 90° to allow for easy illumination of timing marks in hard to reach locations.
3. **Control Panel** — Contains the controls and indicators necessary to operate the timing light.
4. **Inductive Pickup Leads** — Detachable leads assembly connects timing light to the battery and ignition system:
   - **Red Battery Clip** — Connects to battery positive (+) terminal.
   - **Black Battery Clip** — Connects to battery negative (-) terminal or bare metal chassis ground.
   - **Inductive Pickup Clip** — Clamps around No. 1 spark plug cable.
   - **Green DWELL Clip** — Connects to the negative (tach) side of the ignition coil.

Control Panel Controls and Indicators (see Figure 2)

1. **Flash Switch** — Push to turn strobe light on. Push again to turn strobe light off.
2. **LCD Display** — Provides a digital display of engine operating parameters including engine speed (rpm), advance (degrees), dwell angle (degrees), and battery and charging system voltage. Displayed information depends on operating mode selected. LCD display is backlit in soft blue light for easy viewing in low-light areas.



BATTERY VOLTAGE MODE

ADVANCE MODE

VOLTAGE/RPM MODE

DWELL MODE

Figure 2. Control Panel Controls and Indicators

3. **Function (F) Switch** — Selects timing light operating mode (voltage/rpm, advance or dwell).
4. **RPM Indicator** — Displays when 2-cycle (DIS) or 4-cycle rpm mode is selected.
5. **Cylinder/Advance Increment Switch**
   - **Dwell Mode** — Increments through available cylinder settings for dwell check. Enabled when dwell mode is selected.
   - **Advance Mode** — Increments through degrees of advance. Enabled when advance mode is selected.
6. **Cylinder/Advance Decrement Switch**
   - **Dwell Mode** — Decrements through available cylinder settings for dwell check. Enabled when dwell mode is selected.
   - **Advance Mode** — Decrements through degrees of advance. Enabled when advance mode is selected.
7. **Zeroing Switch** — Returns LCD advance degrees to zero. Enabled when advance mode is selected.
8. **DWELL Indicator** — Displays when dwell mode is selected. LCD display shows dwell angle and number of cylinders.
9. **ADVANCE Indicator** — Displays when advance mode is selected. LCD display shows degrees advance and engine rpm.
10. **Ignition System Selection** — Selects the timing light operating mode (either 2-cycle (DIS) or 4-cycle) by pressing **BOTH** the Function (**F**) switch and the Cylinder/Advance Decrement switch simultaneously.
11. **Battery VOLTS Indicator** — Displays when battery voltage mode is selected. LCD display shows battery voltage.
12. **Charging System Battery VOLTS Indicator** — Displays when voltage/rpm mode is selected. LCD display shows charging system battery voltage and engine rpm.
13. **Volt Symbol** — Displays when voltage modes are selected.
14. **Battery Symbol** — Displays when battery voltage mode is selected.
15. **Flash Symbol** — Blinks when strobe light is operating.
16. **Ignition Mode Symbol** — Displays ignition system selected.
17. **Cylinder Symbol** — Displays when dwell mode is selected.
18. **Dwell Angle Symbol** — Displays when dwell mode is selected.
19. **Advance Degree Symbol** — Displays when advance mode is selected.

General Information

OPERATING SPECIFICATIONS

- **Power Requirements:** 10 to 16 volts DC
- **Operating Temperature:** 32 to 122°F (0 to 50°C)
- **Tachometer Range:** 240 to 9,990 RPM
- **Timing Advance Range:** 0 to +90°

Operation

APPLICATIONS

This timing light is designed for use on most late model import or domestic vehicles equipped with conventional or electronic ignition systems, or with DIS (distributorless ignition systems).

TIMING LIGHT CONNECTION

WARNING: ***Always keep hands, timing light, lead wires and clips away from moving engine parts and hot surfaces. DO NOT SMOKE.***

a. Turn ignition off. **DO NOT CONNECT TIMING LIGHT WITH IGNITION ON OR ENGINE RUNNING.**

b. Clamp inductive pickup clip around No. 1 spark plug wire (arrow points toward spark plug).

c. Connect the green DWELL clip to the negative (tach) side of the ignition coil (if applicable).

d. Connect battery clips to battery:

- Connect RED clip to battery positive (+) terminal.
- Connect BLACK clip to battery negative (-) terminal or chassis ground.

e. Attach pickup leads into bottom of timing light handle.

VOLTMETER OPERATION

- Make sure timing light is properly connected as described in TIMING LIGHT CONNECTION.
- **ALWAYS** check battery and charging system voltage before performing timing check to ensure reliable results.

a. With timing light connected and engine off, timing light is in battery voltage mode; the Battery VOLTS indicator, Volts symbol and Battery symbol will display. The LCD display will show battery voltage.

b. When the engine is started, the timing light enters the voltage/rpm mode; the Charging System Battery VOLTS indicator, Volts symbol and Ignition Mode symbol (either 2-cycle (DIS) or 4-cycle) will display. The LCD display will show charging system voltage and engine rpm.

CHECKING DWELL ANGLE

Dwell angle check is performed for vehicles equipped with conventional or electronic ignition systems.

- Make sure timing light is properly connected as described in TIMING LIGHT CONNECTION.

a. Start and run engine until it reaches normal operating temperature.

b. Press Function (**F**) switch as needed to select dwell mode. The DWELL Indicator, Cylinder Symbol, and Dwell Angle Symbol will display when dwell mode is selected.

- Press Cylinder/Advance Increment and Decrement switches as needed to select appropriate number of cylinders for vehicle under test. The LCD display will show the number of cylinders selected and the dwell angle.

c. Note dwell angle and compare to manufacturer's specifications.

d. Refer to the vehicle's service manual for procedures to adjust dwell angle.

e. Turn ignition off and disconnect timing light from engine.

INITIAL TIMING CHECK (USING NO. 1 CYLINDER)

- **ALWAYS** refer to the manufacturer's test procedures and specifications when performing timing check. Timing procedures vary from vehicle to vehicle. Refer to the Vehicle Emission Control Label or service manual for the vehicle under test.

  NOTE: *Some vehicles equipped with computerized engine control systems may be designated as "NON-ADJUSTABLE".*

- Make sure timing light is properly connected as described in TIMING LIGHT CONNECTION.
- **MAKE SURE** the proper operating mode is selected (2- cycle (DIS) or 4-cycle).
- If vehicle is equipped with distributor points, check dwell as described in CHECKING DWELL ANGLE, and adjust if necessary **BEFORE** performing timing check.

a. Start and run engine until it reaches normal operating temperature.

- The Flash Indicator will blink to indicate the timing light is operating.
- Press both ignition system selection switches **SIMULTANEOUSLY** to select either 2-cycle (DIS) or 4-cycle mode. The Ignition Mode Symbol will display the selected mode.

- Press Function (**F**) switch as needed to select voltage/rpm mode. The RPM Indicator will display when voltage/rpm mode is selected. The LCD display will show engine rpm. Adjust engine rpm as necessary.

b. Adjust timing light barrel, as needed, to ensure proper illumination of timing marks.

c. Refer to the vehicle's service manual to check and adjust timing. **OBSERVE ALL SAFETY PRECAUTIONS.**

d. Press Flash switch. Timing light will stop flashing.

e. Turn ignition off and disconnect timing light from engine.

f. If disconnected, reconnect vacuum line to distributor.

ADVANCE/RETARD TIMING CONTROL CHECKS

Advance and retard timing controls ensure that ignition occurs at the proper time during the compres-sion stroke. These controls include mechanical advance, vacuum advance, vacuum retard, electronic advance, electronic retard, and electronic advance/retard. Depending on make and model, a vehicle may be equipped with a single timing control device, or two or more devices may be used in combination.

NOTE: *Advance and retard timing test procedures vary widely from vehicle to vehicle. The following paragraphs provide* ***general*** *test procedures for checking mechanical advance, mechanical/vacuum advance, and vacuum retard.* ***ALWAYS*** *make sure initial timing and dwell are correct before checking advance/retard timing.* ***ALWAYS*** *refer to the service manual for the vehicle under test to obtain the proper timing procedures and specifications.* ***OBSERVE ALL SAFETY PRECAUTIONS.***

Centrifugal/Mechanical Advance

- Make sure timing light is properly connected as described in TIMING LIGHT CONNECTION.
- Make sure initial timing is correct. If necessary, prepare engine for advance timing check as directed by manufacturer's instructions.

a. With timing light directed at timing marks, note position of rotating timing mark in relation to reference pointer. Reading should indicate initial timing in accordance with manufacturer's specifications.

b. Adjust engine speed to the specified RPM for advance test.

c. Press Function (**F**) switch as needed to select advance mode. The ADVANCE indicator and Advance Degree symbol will display when advance mode is selected. The LCD display will show "0" degrees advance and engine rpm.

d. With timing light directed at timing marks, press Cylinder/Advance Increment switch as needed to realign timing marks to initial timing or as instructed by manufacturer's specifications. Note degrees advance on LCD display and compare with manufacturer's specifications.

e. Turn off ignition and disconnect timing light from engine.

Vacuum Advance

- Make sure timing light is properly connected as described in TIMING LIGHT CONNECTION.
- Make sure initial timing is correct. If necessary, prepare engine for advance timing check as directed by manufacturer's instructions.

NOTE: *A vacuum pump equipped with a vacuum gauge is needed to check vacuum advance.*

a. With engine off, disconnect vacuum hose from distributor's vacuum advance port; plug vacuum hose.

b. Connect vacuum pump to distributor's vacuum advance port.

c. Start and run engine until it reaches normal operating temperature.

d. Press Function (**F**) switch as needed to select advance mode. The ADVANCE indicator and Advance Degree symbol will display when advance mode is selected. The LCD display will show "0" degrees advance and engine rpm.

e. With timing light directed at timing marks, note position of rotating timing mark in relation to reference pointer. Reading should indicate initial timing in accordance with manufacturer's specifications.

f. Using vacuum pump, apply specified amount of vacuum to distributor's vacuum port.

g. With timing light directed at timing marks, press Cylinder/Advance Increment switch as needed to realign timing marks to initial timing. Note degrees advance on LCD display and compare with manufacturer's specifications.

h. Turn off ignition and disconnect timing light from engine. Unplug and reconnect vacuum hose to distributor's vacuum port.

Electronic Advance/Retard

Refer to manufacturer's instructions for procedures to check electronic advance/retard. For some systems, it may be necessary to set the timing light's advance display to "0" and to read timing from the vehicle's timing marks.

Operation

TIMING ADJUSTMENT

Refer to the vehicle's service manual for procedures to adjust timing. **DO NOT ATTEMPT TO ADJUST TIMING WITHOUT MANUFACTURER'S SPECIFICATIONS.**

TROUBLESHOOTING

NOTE: *If the timing light readout becomes inoperative or locks up during use, disconnect and reconnect the timing light's positive battery clamp from the battery to reset the unit.*

If the timing light fails to operate, make the following checks:

a. Make sure the battery clips are firmly connected to the battery terminals.

b. Make sure the battery clip polarity is correct (red clip to positive terminal, black clip to negative terminal).

c. Make sure the upper and lower ferrite cores of the inductive pickup clip are clean. Clean the inductive pickup clip if necessary (refer to Chapter 3).

d. Make sure the inductive pickup clip is properly connected to the No. 1 spark plug cable.

e. Make sure the No. 1 spark plug is working properly:

- Connect the inductive pickup clip to another spark plug cable.
- If the timing light flashes, service the No. 1 spark plug before continuing.

Maintenance

CLEANING THE INDUCTIVE PICKUP CLIP

Dirt or grease on the inside surfaces of the inductive pickup clip can result in erratic flashing or poor operation of the timing light. Periodically clean the contact surfaces inside the inductive pickup clip by wiping with a soft cloth.

REPLACING THE INDUCTIVE PICKUP LEADS

The timing light is equipped with detachable leads which can be disconnected from the timing light for easy storage after use. If the test leads or clips become damaged, a replacement set can be obtained from your dealer or directly from the service center.

Warranty and Service

LIMITED ONE YEAR WARRANTY

The Manufacturer warrants to the original purchaser that this unit is free of defects in materials and workmanship under normal use and maintenance for a period of one (1) year from the date of original purchase. If the unit fails within the one (1) year period, it will be repaired or replaced, at the Manufacturer's option, at no charge, when returned prepaid to the Service Center with Proof of Purchase. The sales receipt may be used for this purpose. All replacement parts, whether new or re-manufactured, assume as their warranty period only the remaining time of this warranty. This warranty does not apply to damage caused by improper use, accident, abuse, improper voltage, service, fire, flood, lightning, or other acts of God, or if the product was altered or repaired by anyone other than the Manufacturer's Service. The Manufacturer, under no circumstances shall be liable for any consequential damages for breach of any written warranty of this unit. This warranty gives you specific legal rights, and you may also have rights which vary from state to state. This manual is copyrighted with all rights reserved. No portion of this document may be copied or reproduced by any means without the express written permission of the Manufacturer. THIS WARRANTY IS NOT TRANSFERABLE. For service, send via U.P.S. (if possible) prepaid to Manufacturer. Allow 3-4 weeks for service/repair.

SERVICE PROCEDURES

If you have any questions, please contact your local store, distributor or the Service Center.

USA & Canada:

(800) 544-4124 (9:00-4:00, Monday-Friday PST)

All others:

(714) 241-6802 (9:00-4:00, Monday-Friday PST)

FAX:

(714) 432-7910 (24 hr.)

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