REPLACEMENT PARTS

Part No.	Description
TL000E-1	Power and Rubber Over-Molded Inductive Pickup Cable Assembly
TL-550MN	Instruction Manual
TL000E-2	Hard Carrying Case

FULL THREE (3) YEAR WARRANTY

MAC Tools Company, 4635 Hilton Corporate Drive, Columbus, Ohio 43232, USA warrants to the user that this unit, excluding lead sets, will be free of defects in materials and workmanship for a period of three (3) years from the date of original purchase. Any unit that fails within this period will be repaired without charge when returned to an authorized factory repair center. MAC Tools requests that a copy of the original, dated sales receipt be returned with the unit to determine if the warranty period is still in effect. This warranty does not apply to damages caused by accident, alterations or improper or unreasonable use. MAC TOOLS COMPANY DISCLAIMS ANY LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY WRITTEN WARRANTY ON THE UNIT. Some countries do not allow the disclaimer of liability for incidental or consequential damages, so the above disclaimer may not apply to you. This warranty gives you specific legal rights and you may also have rights which vary from state to state.

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MODEL TL550E

ADVANCE TIMING LIGHT

INSTRUCTIONS

The Advance Timing Light is a useful tool for timing engines. The inductive pickup makes hookups simple, and the ON button provides easy and comfortable operation.

With an adjustable advance knob and dial that reads in direct degrees, the Advance Timing Light provides the additional capability to check timing advance curves of vacuum, mechanical, and computer-controlled ignition systems.

The Advance Timing Light's shape is designed with a narrow barrel for use in tight spaces, and features a comfortable new pistol grip handle and compact size for easy use and storage. The inductive pickup and power cable is detachable.

The Advance Timing Light is designed for 12-volt DC operation. See the IMPORTANT NOTE ON HOOKUPS when testing other electrical systems. Before connecting the timing light, read BATTERY in the SAFETY GUIDELINES section of this manual.

SAFETY GUIDELINES

TO PREVENT ACCIDENTS THAT COULD RESULT IN SERIOUS INJURY AND/OR DAMAGE TO YOUR VEHICLE OR TEST EQUIPMENT, CAREFULLY FOLLOW THESE SAFETY RULES AND TEST PROCEDURES

SAFETY EQUIPMENT

Fire Extinguisher
Never work on your car without having a suitable fire extinguisher handy. A 5-lb or larger CO_2 or dry chemical unit specified for gasoline/chemical/electrical fires is recommended.

Fireproof Container
Rags and flammable liquids should be stored only in fireproof, closed metal containers. A gasoline-soaked rag should be allowed to dry thoroughly outdoors before being discarded.

Safety Goggles
We recommend wearing safety goggles when working on your car, to protect your eyes from battery acid, gasoline, and dust and dirt flying off moving engine parts.

NOTE: Never look directly into the carburetor throat while the engine is cranking or running, as sudden backfire can cause burns.

LOOSE CLOTHING AND LONG HAIR (MOVING PARTS)

Be very careful not to get your hands, hair or clothes near any moving parts such as fan blades, belts and pulleys or throttle and transmission linkages. Never wear neckties or loose clothing when working on your car.

JEWELRY

Never wear wrist watches, rings or other jewelry when working on your car. You'll avoid the possibility of catching on moving parts or causing an electrical short circuit which could shock or burn you.

VENTILATION

The carbon monoxide in exhaust gas is highly toxic. To avoid asphyxiation, always operate vehicle in a well-ventilated area. If vehicle is in an enclosed area, exhaust should be routed directly to the outside via leakproof exhaust hose.

SETTING THE BRAKE

Make sure that your car is in **Park** or **Neutral**, and that the **parking brake is firmly set.**

NOTE: Some vehicles have an automatic release on the parking brake when the gear shift lever is removed from the PARK position. This feature must be disabled when it is necessary (for testing) to have the parking brake engaged when in the DRIVE position. Refer to your vehicle service manual for more information.

HOT SURFACES

Avoid contact with hot surfaces such as exhaust manifolds and pipes, mufflers (catalytic converters), radiator and hoses. Never remove the radiator cap while the engine is hot, as escaping coolant under pressure may seriously burn you.

SMOKING AND OPEN FLAMES

Never smoke while working on your car. Gasoline vapor is highly flammable, and the gas formed in a charging battery is explosive.

BATTERY

Do not lay tools or equipment on the battery. Accidentally grounding the "HOT" battery terminal can shock or burn you and damage wiring, the battery or your tools and testers. Be careful of contact with battery acid. It can burn holes in your clothing and burn your skin or eyes.
When operating any test instrument from an auxiliary battery, connect a jumper wire between the negative terminal of the auxiliary battery and ground on the vehicle under test. When working in a garage or other enclosed area, auxiliary battery should be located at least 18 inches above the floor to minimize the possibility of igniting gasoline vapors.

HIGH VOLTAGE

High voltage — 30,000 to 50,000 volts — is present in the ignition coil, distributor cap, ignition wires and spark plugs. When handling ignition wires while the engine is running, use insulated pliers to avoid a shock. While not lethal, a shock may cause you to jerk involuntarily and hurt yourself.

JACK

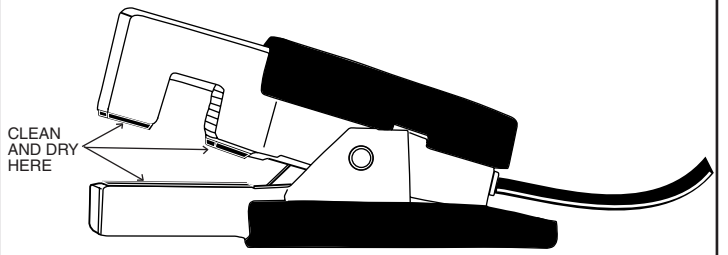
The jack supplied with the vehicle should be used only for changing wheels. Never crawl under car or run engine while vehicle is on a jack

TROUBLESHOOTING AND CARE

Problems with the ignition system may cause the timing light to flash erratically or multiple flash.

1. You may be able to steady the flash by sliding the inductive pickup along the Number One spark plug wire to a new location or turning it over as shown in Figure 3.
2. Solid copper ignition wires can interfere with the proper operation of the timing light. Temporarily replace the solid copper Number One ignition wire with a resistive type ignition wire for the duration of the test. Reinstall the original wire when done.
3. Erratic flashing of the timing light can also be caused by dirt or grease buildup on the mating surfaces of the inductive pickup. To maintain proper operation, clean the inside surfaces of the pickup with a soft cloth when necessary as shown in Figure 5.

Fig. 5 - Cleaning the Inductive Pickup Clamp



Do not allow the inductive pickup to touch the exhaust manifold or surrounding parts as these areas become extremely hot and may damage the inductive pickup. The inductive pickup is a sensitive device and can be damaged if abused or subjected to excessive shock. Do not drop the pickup or snap it shut. Always close the jaws slowly to prevent damage.

HOOKUP PROCEDURE

1. Figure 2 shows the typical hookup for the majority of spark-ignited gasoline engines.
2. Make sure the engine is OFF and the ignition key is OFF.
3. Clamp the inductive pickup around the Number One spark plug wire. See Figure 3. Do not allow the inductive pickup to touch the exhaust manifold or surrounding parts as these areas become extremely hot and may damage the inductive pickup.
4. Connect the RED clip to the positive (+) battery terminal.
5. Connect the BLACK clip to a secure engine ground such as the alternator bracket or engine block.

Fig. 2 - Master Hookup Diagram

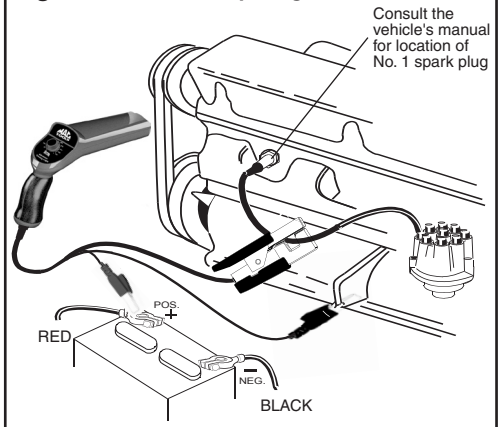
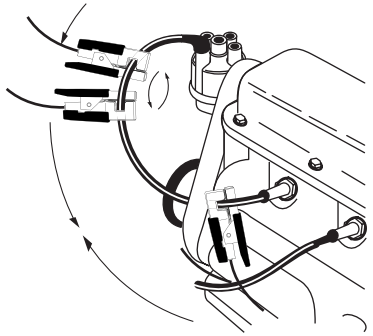


Fig. 3 - Positioning the Inductive Pickup for Reliable Readings



IMPORTANT NOTE ON HOOKUPS:

On 12-volt *Positive Ground* electrical systems, connect the BLACK clip to the negative (-) battery terminal and connect the RED clip to a secure engine ground. DO NOT USE the positive (+) battery terminal.

On 6-volt electrical systems, use an auxiliary 12-volt battery to power the timing light. Connect the BLACK clip to the negative (-) 12-volt battery terminal and connect the RED clip to the positive (+) 12-volt battery terminal. Use 18 AWG minimum wire to connect the negative (-) 12-volt battery terminal to a secure engine ground.

NOTE: For engines equipped with breaker point ignition systems, it will be necessary to set point dwell before adjusting timing.

IMPORTANT

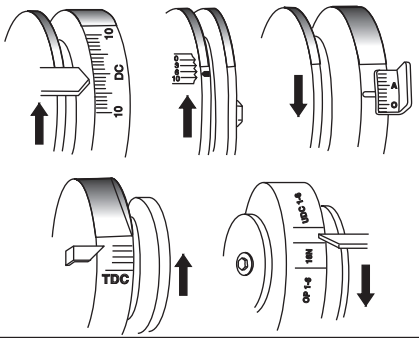
ALWAYS FOLLOW THE MANUFACTURER'S SPECIFICATIONS AND TEST PROCEDURES FOR ADJUSTING DWELL ANGLE AND IDLE SPEED.

TIMING MEASUREMENTS

MEASURING INITIAL TIMING

1. Follow the necessary engine preparation steps listed on the vehicle emission control label or in the vehicle service manual for checking timing.
2. Start the engine and allow it to warm to operating temperature.
3. Aim the timing light at the crankshaft damper (pulley) or transmission bell housing – depending on the location of the timing marks on the engine being tested. See Figure 4.
4. Press and hold down the ON button.
5. While viewing the timing marks, increase or decrease advance using the advance knob until the moving mark is aligned with the stationary "0" degree timing mark (TDC).
6. Read initial timing on the degrees advance dial.

Fig. 4 - Various Timing Mark Configurations



ALTERNATE METHOD OF MEASURING TIMING

Turn the advance knob to zero advance. With the engine running, aim the timing light at the timing mark and read the advance, counting the timing marks on the engine. See Figure 4.

SETTING INITIAL TIMING

To set initial timing, Turn the advance knob to the desired initial advance and then, following vehicle manufacturer's instructions, loosen and turn the distributor until the moving mark is at "0" degrees (TDC). When done, tighten the distributor hold-down bolt securely.

TIMING ADVANCE

The following advance system checks are general and may be used on most pre-emission controlled vehicles. However, many vehicles have ignition and emission control systems which may permit timing advance only under certain operating conditions. It is important on these vehicles to check your vehicle service manual for specific instructions on how to perform advance system checks.

CHECKING CENTRIFUGAL ADVANCE OPERATION

1. Set the advance knob to "0" on the dial. With the distributor vacuum line disconnected and plugged and the engine at idle RPM, aim the timing light at the timing marks and note the position of the timing mark.
2. Gradually increase engine RPM to 2500 RPM (or other engine speed specified by the manufacturer) while observing the timing mark position.
3. As the engine RPM increases, the timing mark should appear to move smoothly in the opposite direction of engine rotation (the “spark advance” direction). As engine RPM is decreased, the timing mark should appear to move smoothly back to the initial timing mark position noted in Step 1.

MEASURING CENTRIFUGAL ADVANCE

1. With the distributor vacuum line disconnected and plugged, and engine at idle RPM, turn the advance knob until the moving timing mark is aligned with the stationary "0" degree timing mark. Read the idle advance on the dial.
2. Increase engine speed to 2500 RPM (or other engine speed specified by the manufacturer). Turn the advance knob until the moving timing mark is aligned with the stationary "0" degree timing mark. Read the advance at 2500 RPM on the dial.
3. Subtract the idle advance from the 2500 RPM advance to find the contribution of the centrifugal advance. After completing the test, unplug and reconnect the vacuum line to the distributor.

MEASURING VACUUM ADVANCE

Accurately checking the calibration of the vacuum advance system requires not only the timing light but also a vacuum pump with gauge.

1. Disconnect the vacuum line from the distributor and plug the line.
2. Connect the hand vacuum pump to the distributor port where the vacuum line was disconnected.
3. Operate the engine at the RPM specified by the vehicle manufacturer for the vacuum advance check. Turn the advance knob until the moving timing mark is aligned with the stationary "0" degree timing mark. Read the advance on the dial at specified RPM.
4. Using the pump, apply vacuum specified by the vehicle manufacturer. Turn the advance knob until the moving timing mark is aligned with the stationary "0" degree timing mark. Read the advance on the dial with vacuum applied.
5. Subtract the advance without vacuum applied from the advance with vacuum applied to find the contribution of the vacuum advance system. After completing the test, unplug and reconnect the vacuum line to the distributor.

ADVANCE TIMING LIGHT CONTROLS

Fig. 1 - Advance Timing Light Controls