

Model T



Installation and Operation Manual



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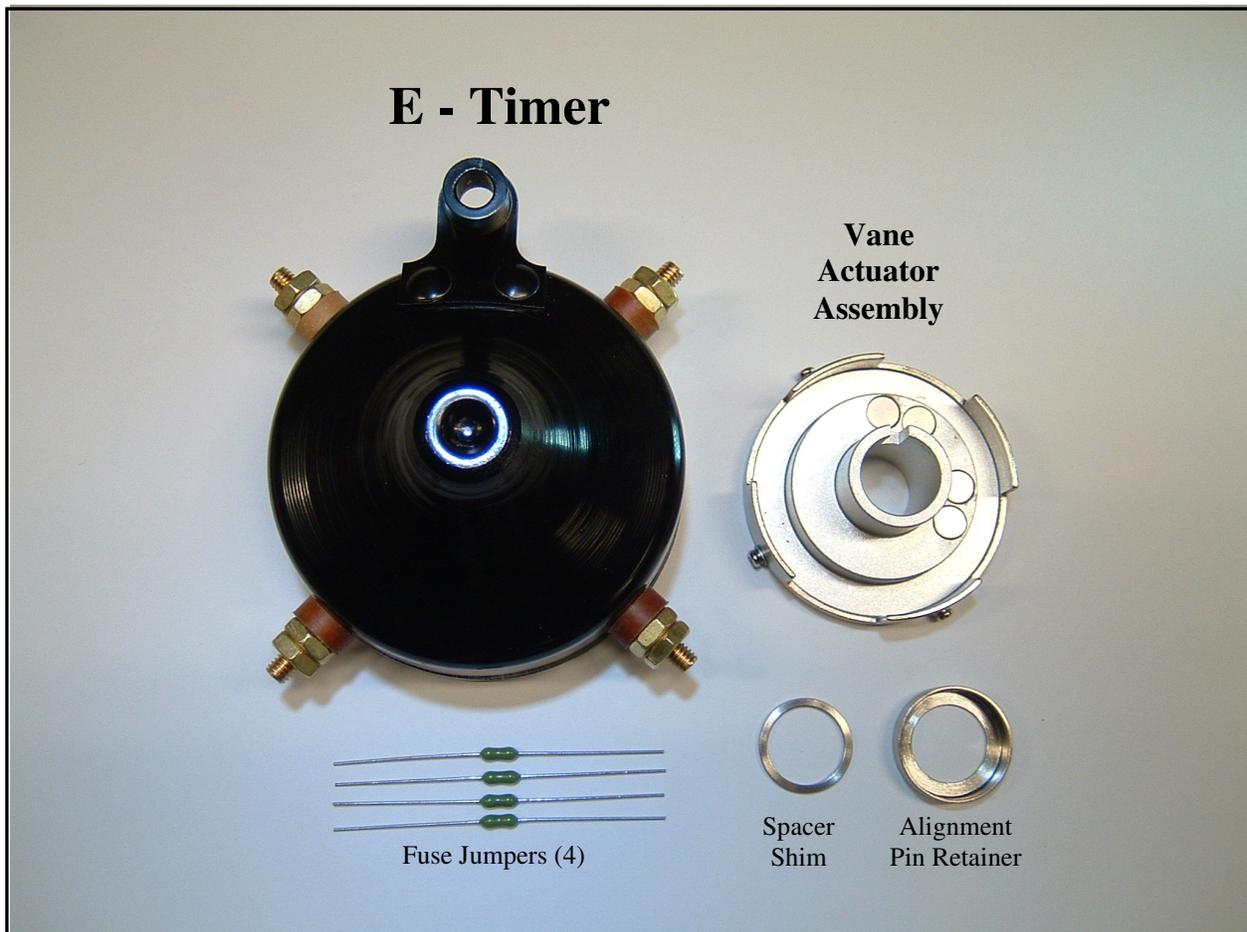
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E ⚡ Timer Conversion Kit Contents

The Electronic Timer conversion kit contains the following items:

Quantity	Description
1	Electronic Timer (E-timer)
1	Vane Actuator Assembly (Replaces Roller)
1	Alignment Pin Retainer ("brush cap")
4	Fuse jumpers used to bypass coil points
1	0.05" Spacer Shim (Not used in all installations)



E-Timer Conversion Kit

E-Timer Patented: 8,662,058

IMPORTANT! –It is the user’s responsibility to verify proper ignition timing and ensure proper timing lever position before attempting to hand crank Model T engine with any model Timer including the E-Timer. Failure to verify proper ignition timing may result in serious personal injury. User assumes all risks and liabilities.

IMPORTANT! – The E-Timer should only be installed on Negative Ground Model T engines in good mechanical condition that run normally. The E-Timer will not fix engine problems due to carburetor issues, bad coils, incorrect wiring or lose electrical connections.

1 Installation Instructions

The E-Timer has been designed for installation on negative ground Model T engines in good mechanical condition operating from properly fused 6 to 12V battery power only. The E-Timer will **not** operate on magneto. It is impossible to account for all possible mechanical alterations, mechanical wear or wiring changes that may have occurred over the years so these installation instructions include extra steps to verify proper mechanical fit and electrical performance to ensure trouble free installation and operation.

1. **Important!** Verify the ignition power is off. Verify negative ground electrical system; Negative battery terminal is connected to engine block. Verify ignition power positive battery wire is properly fused at the battery. A 4A fuse must be installed when using the E-Timer. Failure to follow these instructions can result in serious damage to the electrical system or car if an ignition wiring fault or other failure should occur.
2. Remove timer case spring that holds timer to front of motor then move the old timer out of the way. **Do NOT** remove any coil wires from the timer yet.
3. Remove roller/commutator nut, alignment pin retainer, alignment pin and old roller/brush from CAM shaft.
4. Inspect CAM shaft. Make sure it is clean and free from burrs around alignment pin hole. Inspect the timing cover where the timer rests. Make sure the contact area is clean and unpainted to provide good electrical contact to the E-timer.
5. Verify modern oil seal is properly installed in timing cover. Verify the seal is in good condition and not leaking oil into timer compartment. The E-Timer should **NOT** be installed on engines equipped with original felt oil seals. Oil leakage into timer compartment could cause E-Timer malfunction.
6. Verify the CAM is properly centered with respect to the timing cover. Proper CAM alignment requires a timing cover alignment tool (P/N: 3009) available from Model T parts suppliers.

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7. Install Vane Actuator Assembly on CAM. Verify the Vane Actuator Assembly rests on the CAM stop as illustrated in Figure 1 and not the timer cover.

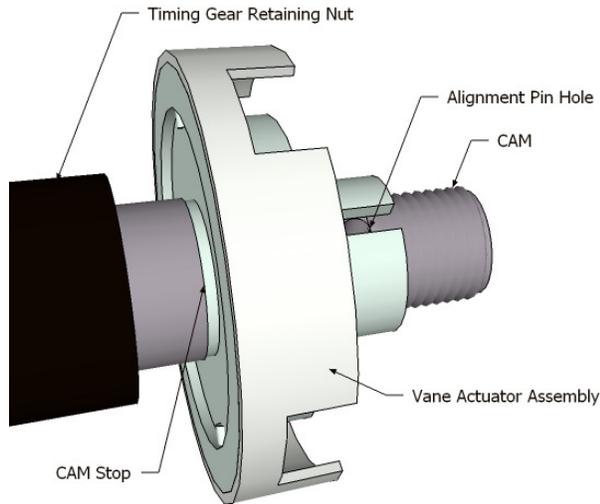


Figure 1. Vane Actuator Assembly Should Rest Against CAM Stop.

8. Turn the Vane Actuator Assembly back and forth while pushing it towards the engine to verify the Vane Assembly does not rub against the timing cover. **Important!** Install the 0.050" spacer shim if the Vane Actuator Assembly rubs against the timing gear cover, Figure 2. **Do NOT** install the spacer shim if the Vane Actuator Assembly does not contact timing cover!

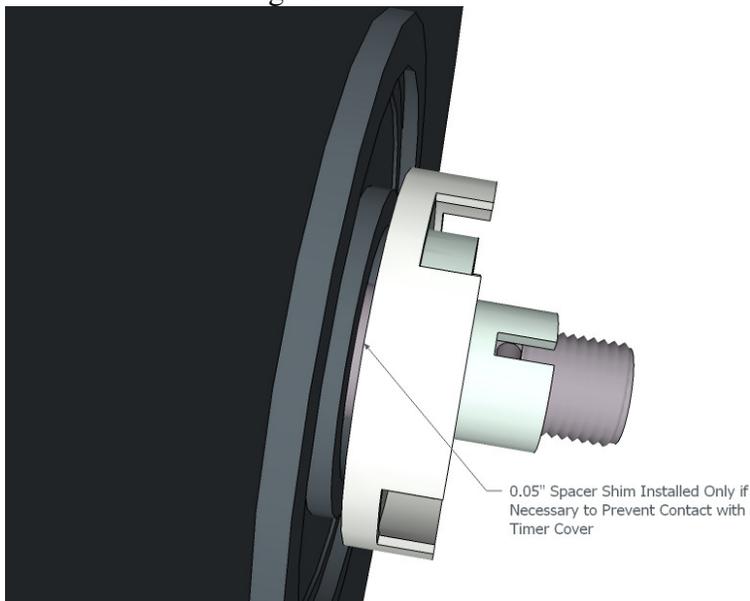


Figure 2. Only install shim if Vane Assembly contacts timing cover

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9. Install alignment pin, pin retainer and retaining nut on CAM. Tighten retaining nut to 15 ft/lbs. Measure the distance from the timer contact surface to the edge of the Vane Actuator Assembly as illustrated in Figure 3. Verify the distance does not exceed 0.7" Do NOT install or operate the E-Timer if the distance exceeds 0.7"

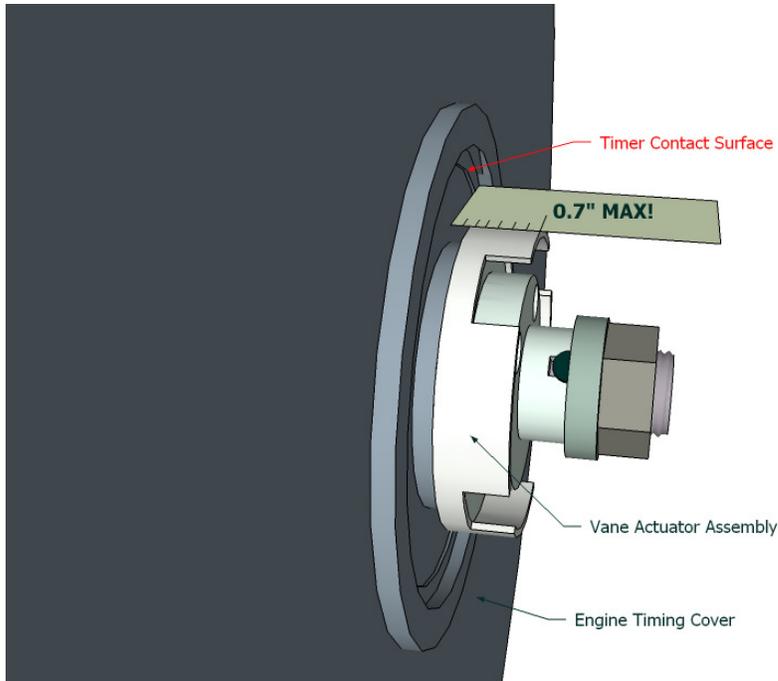


Figure 3. Maximum Distance From Timer Contact Surface to Edge of Vane is 0.7"

10. Transfer coil wires from original timer to the same terminals on the E-Timer one by one to avoid changing the firing order. Verify coil wires for cylinders 1, 2, 3 and 4 are properly connected to corresponding E-Timer coil terminals labeled on the E-Timer circuit board to ensure proper firing order. **IMPORTANT!** Inspect each coil wire as they are transferred to the E-Timer for loose or dirty connections. Replace solder-less crimp terminals with new ones if they are loose, broken or have frayed wires connecting to them. No timer will function properly with bad or intermittent electrical connections!
11. Position E-Timer on engine timing cover. Be careful when positioning E-Timer over Vane Actuator Assembly. Avoid excessive force on internal components of the E-Timer when positioning on engine. Install timer mounting spring and tighten mounting bolt. Turn the E-Timer gently clockwise and counter clockwise before connecting timer pull rod to verify it turns freely without contacting the Vane Actuator Assembly. **STOP** installation if there is any contact felt with the Vane Actuator Assembly and verify proper CAM centering with respect to the timing cover (Step 6) and that the Vane Actuator edge does not exceed 0.7" from the timer contact surface (Step 9).
12. Connect timer pull rod to the E-Timer. Insert new cotter pin (included) in pull rod to prevent disengagement of pull rod during operation.

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13. Bypass each coil points with a fuse jumper included with conversion kit to protect coils and car wiring in the event of a car wiring failure. Use one of the methods illustrated in figures 4A through 4C on each of the 4 coil units.

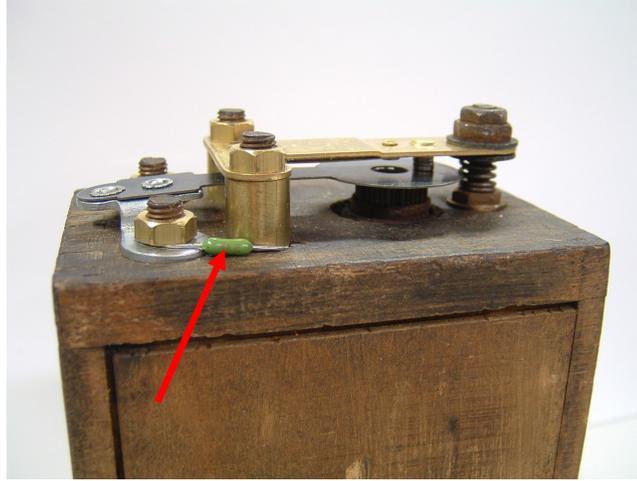


Figure 4A – Adjacent under point terminals
Loosen nuts and slip fuse jumper wires
Under point mounting posts.

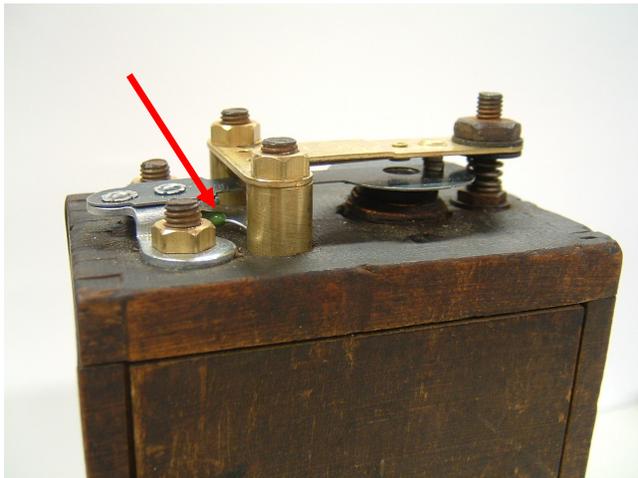


Figure 4B – Hidden under vibrator spring
Under silver and brass point terminal posts.



Figure 4C – Internal, clear tar and solder
Across point post terminals. Completely
Hidden from view for undetectable install.

Note: Coil point elements may need to be removed and cleaned if they are dirty or rusty to ensure good electrical contact with fuse jumper. Bypassed coil points are no longer used to operate the coil, however, they will continue to vibrate similar to normal operation. In some cases, the points may need to be adjusted to sound like they do in normal operation. This is only a “cosmetic” adjustment since bypassed coil points are no longer functional.

CAUTION: SHOCK HAZARD do NOT adjust coil points when ignition power is on or the engine is operating. High voltage is present on coil point contacts when ignition is on and operating. Turn off ignition before adjusting coil points.

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Note: Adjusting coil points to sound natural using the E-Timer is a completely different alignment than needed for the original ignition system. Coils may need to be re-adjusted if used with the original ignition system.

2 Timer Pull Rod Adjustment

IMPORTANT!: Proper engine ignition timing must be verified before attempting to operate a Model T engine with the E-Timer or any Timer. **Failure to verify proper ignition timing and sequence may result in serious personal injury, engine or starter damage.** User assumes all risks and liabilities.

1. **Important!** Verify the ignition power is off.
2. Move the timing lever through its range of operation and verify it moves freely and that the coil wires connecting to the E-Timer do not catch on anything; preventing movement. Correct any interference problems before continuing.
3. Set the timing lever to full RETARD (all the way up).
4. Label spark plug wires 1, 2, 3 and 4. Remove all spark plugs. Make sure the area around the spark plugs is clean to prevent debris from falling into the engine when spark plugs are removed. Verify all spark plugs are clean and properly gapped to 0.025". Clean or replace all dirty/fouled spark plugs. Replace any loose, broken or frayed spark plug wire connectors.
5. Re-connect spark plugs to coil wires and lay down on top of cylinder head. Do NOT reinstall spark plugs in engine yet.
6. Hand crank engine to position cylinder 1 (closest the radiator) is at Top Dead Center (TDC) position of its compression stroke.
7. Mark the cylinder 1 TDC position on top (outer diameter) of the front crank shaft pulley with a fixed point on the engine timing gear cover. A thin strip of white masking tape works well. See figure 5.



Use masking tape to mark reference line on timing cover

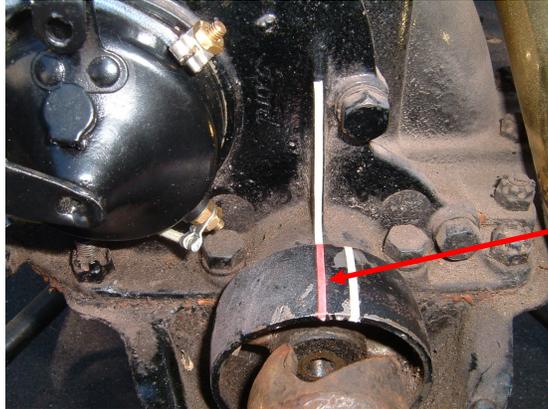
Mark crank pulley position of **cylinder 1** at TDC with tape that lines up with reference line

Note: Crank pin is horizontal (9 O'clock and 3 O'clock) when cylinders are at TDC of the compression stroke.

Figure 5. Mark position of cylinder 1 at TDC

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- Turn ignition power **ON**. Hand crank the engine slowly until cylinder 1 spark plug just fires. Do **NOT** crank engine past the firing point. **Important!** Repeat this step if you crank past the firing point. It is very important to stop cranking immediately when cylinder 1 spark plug fires to determine cylinder 1 firing position. See Figure 6. **Important!** Do **not** let spark plugs fire more than 30 seconds to avoid stressing the coils.



Mark crank pulley position when cylinder 1 just begins to fire with tape that lines up with reference mark on timing gear cover.

Figure 6. Mark position of crank pulley when cylinder 1 fires

- Verify cylinder 1 spark plug fires when crank shaft position is **AFTER** Top Dead Center. The timing mark indicating Top Dead Center (TDC) on the crank pulley should have turned **CLOCKWISE** of the TDC mark when cylinder 1 spark plug fires as viewed from the front of the engine. Firing must **not** occur before the cylinder reaches TDC!
- Measure the distance the crank pulley travels clockwise from the cylinder 1 TDC mark edge to cylinder 1 firing mark edge with a caliper or rule. See figure 7.



Figure 7. Measuring the crank travel between cylinder 1 TDC and cylinder 1 firing position.

- Cylinder 1 should fire 15 degrees **AFTER** TDC with the timing lever fully **RETARDED** (all the way up). The distance the pulley turns past TDC position will vary depending

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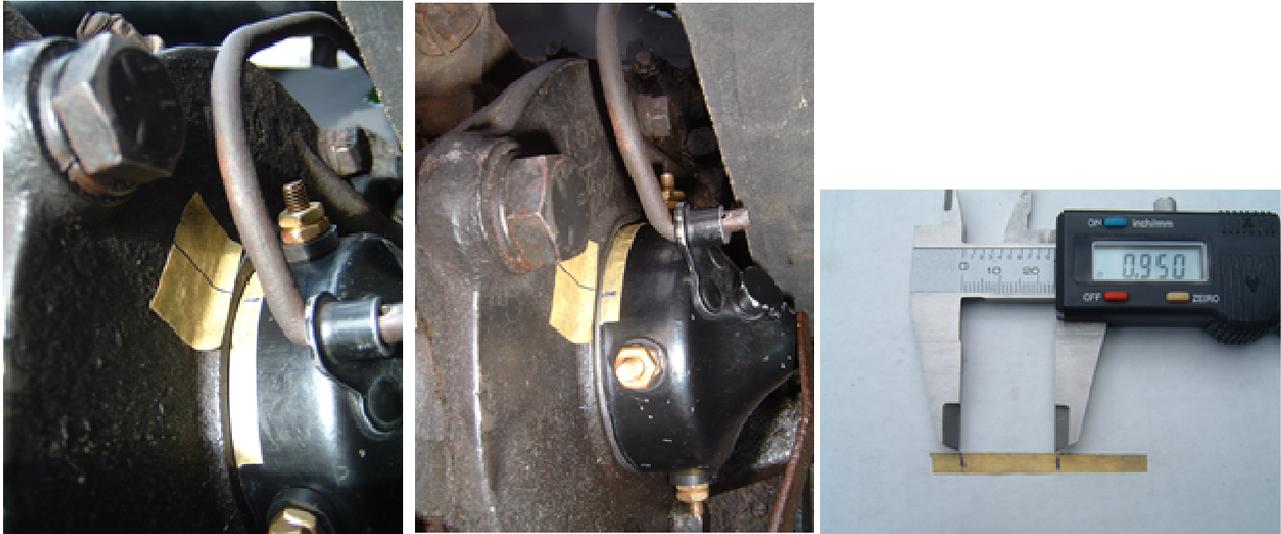
upon its outside diameter of the crank pulley. Table 1 lists approximate travel distances past TDC for various pulley diameters. Adjust the timer pull rod so that cylinder 1 fires the specified distance past TDC for the front pulley outside diameter on your car.

Pulley Diameter	Distance Past TDC
3.00"	0.390"
3.25"	0.425"
3.50"	0.460"
3.75"	0.490"
4.00"	0.525"

Table 1. Pulley Travel Past TDC for Cylinder 1 Firing

12. Crank engine to verify firing order: Cylinder 1, 2, 4 and 3. This is also a good time to verify each coil is working properly providing the same spark quality and to adjust the coil points if necessary so they buzz and sound natural. Be sure to turn off the ignition power when adjusting the coil points to avoid shock hazard. **Important!** Do not let any spark plug fire more than 30 seconds to avoid stressing the coils. Replace coils that produce a weak, intermittent spark. Check the following if a coil produces no spark: coil box contacts, fuse jumpers across points, wiring from coil box to E-timer. Replace defective coils.
13. Turn ignition power **OFF**. Re-install all spark plugs in engine. Re-connect spark plug wires. Verify proper firing order of each spark plug matches the cylinder labels put on in step 4.
14. Verify timer housing adjustment range. Set the timing lever to the fully retarded position (all the way up). Affixing a 1 1/4" inch strip of masking tape to the timer housing in a convenient location between the terminals. Make a mark on the engine cover and masking tape near the upper edge of the tape. Set the timing lever to the full advance position (all the way down) and make another mark on the masking tape that corresponds to the index mark on the engine. Remove the masking tape and lay flat. Measure the distance between the two marks. The distance should be 0.910" minimum to insure at least 70 degrees of timing adjustment range: 15 degrees After TDC fully retarded to 55 degrees Before TDC fully advanced. Adjust the timer pull rod as necessary if the distance measured is less than 0.910". See Figure 8.

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A. Spark Lever Fully Retarded B. Spark Lever Fully Advanced C. Measure Rotational Travel

Figure 8. Verifying Timer Housing Adjustment Range

IMPORTANT! Insufficient timer housing adjustment range can be caused by excessive play in timing lever or pull rod linkage. Worn parts may require replacement to obtain the necessary adjustment range. Operating the E-Timer with less than 0.910” of timer adjustment range may result in poor acceleration in Automatic Timing Advance mode due to insufficient timing advance setting with the timing lever fully advanced.

This completes E-Timer Installation.

Please refer to the next section for E-Timer operating instructions

3 E-Timer Operating Instructions

IMPORTANT! – It is the user’s responsibility to verify proper ignition timing and ensure proper timing lever position before attempting to hand crank Model T engine with any model Timer including the E-Timer. Failure to verify proper ignition timing may result in serious personal injury, engine damage. User assumes all risks and liabilities.

IMPORTANT! – Follow E-Timer installation instructions **BEFORE** attempting to operate E-Timer.

Automatic Timing Advance (ATA) Mode Operation

The E-Timer comes pre-programmed from the factory to operate in Automatic Timing Advance (ATA) mode. This mode of operation frees the driver from timing lever adjustment while enjoying optimal engine performance regardless of engine speed.

ATA Operation:

1. Verify ignition is **OFF**
2. Always set the timing lever position to **full retard position (all the way up)** whenever starting engine as per standard Model T starting procedure.
3. Prime engine as per standard Model T starting procedure.
4. Turn ignition power **ON**. **Caution:** Engine may start on compression as soon as ignition power is turned on.
5. Crank engine, applying carburetor choke as necessary as per standard Model T starting procedure. Engage electric starter on starter equipped cars.
6. **AFTER the engine starts**, advance the timing lever to approximately 45 degrees Before Top Dead Center within 15 seconds. Note: 45 Degrees timing advance is near full advance. Automatic Timing Advance engages after 250 engine revolutions (about 15 seconds at 500RPM) and may stall engine if timing is not advanced prior.
7. Drive the car as usual with the exception of adjusting the timing lever. Only minor adjustment of the timing lever may be necessary to find the best performing operating position. Once set, no further adjustment of the timing lever should be necessary to enjoy optimal performance while driving regardless of engine speed.

Manual Timing (MT) Mode Programming

The E-Timer can easily be programmed to operate in Manual Timing (MT) mode which mimics the original Model T operation. The driver must properly adjust the timing lever for optimal engine performance depending upon engine speed. Manual Timing (MT) mode is programmed by following these instructions.

1. Remove all coils from the coil box **EXCEPT Coil 2. (Coil that fires cylinder 2).**
2. Turn ignition power ON for 5 seconds.
3. Turn ignition power OFF.
4. Re-install all coils in the coil box and close coil box.
5. E-Timer will now operate in Manual Timing (MT) mode unless timing mode is changed again to ATA mode.

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Manual Timing (MT) Mode Operation

1. Verify ignition is **OFF**
2. Always set the timing lever position to **full retard position (all the way up)** whenever starting engine as per standard Model T starting procedure.
3. Prime engine as per standard Model T starting procedure.
4. Turn ignition power **ON**. **Caution:** Engine may start on compression as soon as ignition power is turned on.
5. Crank engine, applying carburetor choke as necessary as per standard Model T starting procedure. Engage electric starter on starter equipped cars.
6. Drive the car as usual adjusting timing lever as necessary to achieve optimal engine performance.

Automatic Timing Advance (ATA) Mode Programming

The E-Timer can easily be programmed to operate in Automatic Timing Advance (ATA) mode by following these instructions.

1. Remove all coils from the coil box **EXCEPT Coil 1. (Coil that fires cylinder 1)**.
2. Turn ignition power ON for 5 seconds.
3. Turn ignition power OFF.
4. Re-install all coils in the coil box and close coil box.
5. E-Timer will now operate in Automatic Timing Adjustment (ATA) mode unless timing mode is changed again to MT mode.

IMPORTANT! – **Do NOT** electrically connect points of different coils while the engine is running or damage can occur. This can happen when opening or closing the coil box with a metal cover. Avoid opening or closing metal coil box cover when the engine is running.

4 Maintenance

The E-Timer does not require any maintenance. **Do NOT** oil or grease the E-Timer!

5 Warranty

The E-Timer is warranted against defectives due to faulty workmanship or materials for a period of one year from the date of purchase. Units found to be defective during the warranty period will be repaired or replaced, at the discretion of the manufacturer, without charge. Proof of purchase and a Return Authorization are required.

6 Safety Warning

The E-Timer has been designed to be installed on Model T engines in good mechanical condition and in functional operation. It is the user's responsibility to verify proper ignition timing and ensure proper timing lever position before attempting to hand crank Model T engine with any model timer including the E-Timer. Failure to verify proper ignition timing may result in serious personal injury, engine or starter damage. User assumes all risks and liabilities.