

## Bittner Engineering, LLC

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### True-Fire Electronic Ignition System Installation

#### 6, 8 or 12 Volt Operation

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#### Introduction:

Congratulations on your purchase of the Bittner Engineering True-Fire Ignition System. This Ignition System is designed to operate on **any voltage between 6 and 12 VDC** and replaces the original commutator and coils on your Model T Ford.

It will give much more reliable ignition results than the original system (no moving parts). The best part is, your Model T will look and operate exactly like it did when Henry made it. Your timer and timer wiring harness remain the same and the spark plug wires remain the same - connected to your original coil box. Each True-Fire Ignition System is thoroughly tested and functioning properly prior to shipment.

*It should be noted that, although the True-Fire performance will be superior to the original system, it is not a cure-all for other problems that may cause poor engine performance such as a bad coil box, poor wiring, bad valves or a poorly functioning carburetor.*



Your True-Fire Electronic Ignition kit should include the following components:

- |                     |                       |                       |
|---------------------|-----------------------|-----------------------|
| 1 - Coil Box Module | 1 - Rotor             | 1 - Ground Wire       |
| 1 - Timer Module    | 1 - Split Lock Washer | 1 - Instruction Pages |

Tools required for the installation of your True-Fire Ignition System:

- |                       |                      |                          |
|-----------------------|----------------------|--------------------------|
| 9/16" Open End Wrench | 3/8" Open End Wrench | 300 - 600 Grit Sandpaper |
| 3/4" Open End Wrench  | Ohmmeter             |                          |

**Before you begin installing your new ignition system please read the entire installation procedure. Pay close attention to all precautions outlined.**

1. Disconnect your battery. Make sure your car has a negative ground system. A positive ground system will damage the True-Fire Electronic Ignition System. Model T's were made with a negative ground system but some owners have changed them through the years. Many people think they have a negative ground system until they check it.
2. Loosen the timer spring arm and remove the timer (commutator). Remove the timer control rod (only at timer side). Disconnect the wires from the timer.
3. Remove the nut from the end of the cam shaft, the retainer cup, pin, and roller. If your engine has a shield holding the felt in place, remove it. The new rotor will hold the felt in place. We suggest the installation of a modern camshaft seal which works much better than the original felt seal.
4. Clean the timing gear cover. If you are going to use your existing timer, clean your timer thoroughly, removing all oil, grease and grit. Be sure to clean deep behind the contacts on the timer. If you are using a new timer, you may want to clean your old timer and retain it as a backup.
5. After checking the camshaft for burrs, slip the plastic rotor onto the cam shaft aligning the slot on the rotor with the hole in the cam. If your cam has a hole on both sides, it makes no difference which one you use. Place the pin through the rotor slot and cam hole and install the retainer cup over the pin. Slide the supplied split lock washer over the end of the cam. Screw the cam nut on the cam just until the lock washer is compressed. Do not compress/distort the plastic rotor.



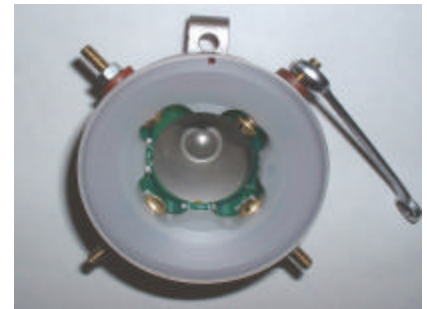
6. Loosen and remove the nuts and insulators on the four wire terminals located on the outside of the vintage timer. Carefully remove the four terminals by taping them toward the inside of the timer and place them aside. The insulator washers and nuts will be used in step #8. **Important: The small hole on the module should be at the top of the timer on 1909 - 1925 cars with coil boxes on the firewall and should be at the bottom of the timer on 1926 - 1927 cars whose coil box is mounted on the engine.**

(On right hand drive cars the small hole in the plastic module hole will still be at the top on early cars and at the bottom on '26-'27 cars, but the spark rod lever is on the bottom of the timer instead of the top.)



7. After determining the correct position of the plastic timer module, push the supplied 10-32 brass screws through each of the four holes in the module from the inside out, making sure they go through the wire loops on the circuit board.

8. Make sure the 10-32 brass screws do not contact the steel timer housing. Place the plastic insulators over the brass screws and screw the nuts down until they are snug. Carefully tighten the four nuts making sure the plastic timer module is centered on the timer. Do not over tighten the nuts. After driving the car about 100 miles, it may be necessary to retighten all the nuts because the plastic seems to "relax" slightly.



9. After installing the plastic module in the timer, connect the wiring harness to the appropriate terminals on the timer. It is a good idea to check to make sure you have continuity between each of the corresponding timer connections and the appropriate terminals on the coil box (see reference illustration); **they should be wired according to the applicable original Model T diagram on the following page.** Reinstall the timer over the front of your camshaft and re-attach the timer control rod. The timer should rotate freely on the timing gear cover plate when using the spark lever on the steering column. If not, investigate and correct the cause of the problem.

**Important: Do not allow any of the screw terminals on the timer to touch any part of the engine. On 1909-1925 cars the #1 & 2 terminals trigger the coil. The #3 terminal is battery positive for the timer only and the #4 terminal is ground. If the #3 terminal touches ground you may damage the unit. Check to make sure the screw terminals clear all grounding sources through the full rotational motion as the spark lever is moved from full up to full down. On 1926-1927 cars the #3 & 4 terminals trigger the coil. The #2 terminal is battery positive for the timer only and the #1 terminal is ground. If the #2 terminal touches ground you may damage the unit. Check to make sure the screw terminals clear all grounding sources through the full rotational motion as the spark lever is moved from full up to full down.**

10. Remove all four of the vintage coils from the coil box. If your coil box has a metal brace across the center, remove the brace. Inspect to make sure that the coil box is in good condition. The wood should be clean and sealed with polyurethane or an equivalent treatment to make sure water and moisture will not penetrate it, consequently shorting out the system. The spring metal contacts should be very clean and not compressed. The spring contacts come in right-hand and left-hand sets; make sure they are facing the correct direction in your box. The bolts clamping the contacts and insulators should be solid brass, solid copper, or copper plated. Copper plated bolts that have been grit blasted or have damaged plating are poor conductors and could cause misfiring problems. All of the hardware should be tight and secure. After checking and adjusting the coil box, install the True-Fire "Super Coil" Module. It will seem to fit tighter than the vintage coils... this is normal and is expected because all of the contacts are engaging at the same time. It is important to use a coil box lid that has the springs necessary to hold the coils down securely. When you use four separate coils and one is loose, the three others will work. If the "Super Coil" is loose, it can affect all four cylinders.

11. Standing in front of the car, install the ground wire on the right-hand commutator wire post of the coil box. This is the commutator wire above the #4 spark plug wire on '09-'25 coil boxes in the firewall and the commutator wire above the #1 spark plug wire on the '26-'27 coil boxes on the engine. Attach the other end of the ground wire to one of the four bolts holding the steering column to the firewall of '09-'25 cars or to a good ground on the engine of '26-'27 cars. Grounding the "Super Coil" is very important and failure to do so will damage the unit. Double check with your volt meter or continuity tester to confirm that you have a good grounded circuit.

12. It should not be necessary to change the timing of your engine if it was running before installing the True-Fire Electronic Ignition System, but check it anyway. The timer module was designed with the same wiring scheme as the original timer. Check the condition of the plug wires. It is best if they are soldered. For best performance the spark plugs should be set at a .045" gap.

13. Reconnect the 6, 8 or 12 V battery. For safety reasons we recommend checking the position of the #1 piston when the #1 plug fires. If the unit was installed properly, you should hear the coil box buzz as the sensors trigger the coil. The #1 and #4 plugs are on the same coil so they fire at the same time. The #2 and #3 also fire at the same time (see diagram).

You have just completed the installation of the True-Fire Electronic Ignition System. Happy Motoring!

#### MAINTENANCE/TROUBLE SHOOTING

Your True-Fire Electronic Ignition System requires no maintenance. If for any reason, your engine starts running rough it would be a good idea to do the following:

- Check to make sure the coil box contacts are clean and making good contact with the coil module.
- Check to make sure your coil is securely held down in the coil box.
- Check the screws and nuts on the timer module and tighten slightly if required.
- Make sure all of the wires in the ignition system are clean and securely connected.
- Check spark plug condition & gap setting.

#### SERVICE

If any part of your True-Fire Ignition System is damaged, Bittner Engineering, LLC will fix or replace the damage at a minimal cost to the customer. It is our goal to make the Model T hobby safe and fun...

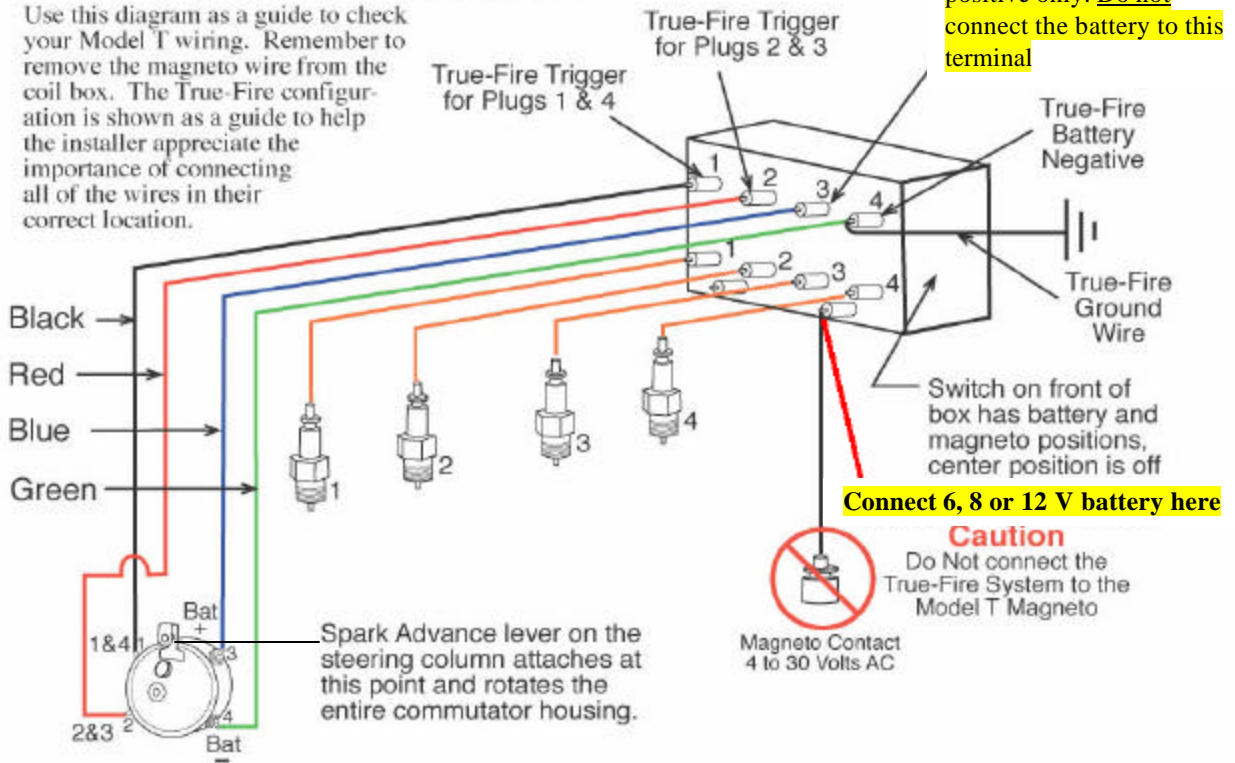
#### PRECAUTIONS:

- Every ignition system is thoroughly tested and properly functioning properly prior to shipment. Improper installation can result in damage to the electronics and Bittner Engineering will not be responsible for such damage. Repair service is available at a reasonable cost if you do damage the system, so don't get frantic, we can fix it.
- **The True-Fire Ignition System will be damaged by the high AC voltage that is produced by the Model T magneto. You must disconnect your magneto unless you purchased a Magneto Voltage Regulator manufactured by Bittner Engineering.**
- Always turn the ignition key to the "OFF" position before removing the commutator. If the wire terminals are grounded out you will short the system and quite likely, damage the electronics in the commutator and coil module.
- Make sure that the commutator wires do not come in contact with or in close proximity to the high voltage spark plug wires.
- Check all preexisting wires and electrical components for loose connections, corrosion and dirt.
- The True-Fire Electronic Ignition is designed to operate based on the original Model T wiring diagram. Be absolutely sure that your car is wired correctly.

# 1909-1925

## True-Fire Ignition Wiring Diagram

Use this diagram as a guide to check your Model T wiring. Remember to remove the magneto wire from the coil box. The True-Fire configuration is shown as a guide to help the installer appreciate the importance of connecting all of the wires in their correct location.



# 1926-1927

## True-Fire Ignition Wiring Diagram

Use this diagram as a guide to check your Model T wiring. Remember to remove the magneto wire from the Mag Post. The True-Fire configuration is shown as a guide to help the installer appreciate the importance of connecting all of the wires in their correct location.

