



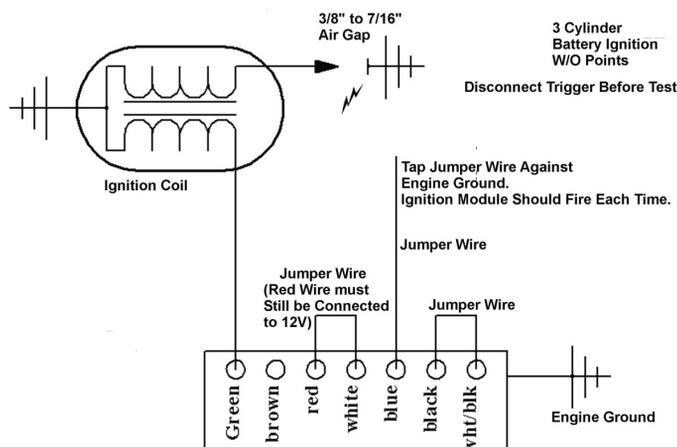
Mercury Battery CD Ignitions without Points

Three Cylinder Engines (With 114-4796/332-4796/393-4797 Switch Box)

(Note) A CD Tester by CDI Electronics (511-9701) or Merc-o-Tronics can be used to test the CD module, distributor cap, rotor button and spark plug wires on the engine while the Trigger Tester by CDI can be used to test the distributor trigger.

(SERVICE NOTE) Check the battery voltage at approximately 3500 RPM, MAXIMUM reading allowable is 16 volts and minimum is 12V. Running below 12V or over 16 volts will damage the ignition. Check for loose connections or a bad battery. **Maintenance free batteries are NOT recommended for this application.**

Engine Wiring Connection for Testing Ignition Module



GENERAL:

1. Clean all battery connections and engine grounds.
2. Disconnect the mercury tilt switch and retest. If the ignition works properly, replace or discard the mercury tilt switch.
3. Connect a spark gap tester to the spark plug wires and check for spark on *all cylinders*. If some cylinders spark and not others, the problem is likely in the distributor cap, rotor button or spark plug wires.
4. Perform a voltage drop test after the engine is repaired to see if there is a problem with the voltage going to the CD module. At cranking and while the engine is running, use a DC voltmeter and put the Black meter lead on the battery POS (+) *post* and the Red meter lead on the positive battery cable at the starter solenoid. Keep the Black lead on the battery post and shift the Red meter lead to the positive post of the rectifier, then to the Red and White terminals on the switch box. If you find a reading above 0.6V, there is a problem at the point where the voltage jumped up. For example, if the meter reads 0.4V until you get to the White terminal and then jumps to 2.3V on the White terminal – this indicates a problem in the key switch, or harness. Repeat the test for the negative battery post by putting the Black meter lead on the battery NEG (-) *post* and the Red meter lead on the negative battery cable terminal, then shifting to the engine block, rectifier base and case ground of the CD module.

NO SPARK ON ANY CYLINDER:

1. If a mercury tilt switch is connected to the switch box, disconnect it and retest. If you now have spark, replace or discard the mercury tilt switch.
2. Check DC voltage on the White and Red terminals (White wire on the 114-4796) (they must be connected to the switch box) to Engine Ground AT CRANKING. It MUST be at least 9.5 volts. If not, there is most likely a problem in the battery. Try a known-good non-maintenance-free cranking battery. If no change, check the key switch, starter and battery cables.
3. Perform the jumper wire test in the illustration above. Disconnect the trigger wires from the switch box and connect a jumper wire from the Black trigger terminal/wire of the switch box to the White/Black trigger terminal/wire of the switch box. Connect another jumper wire to the Blue trigger terminal/wire of the switch box. Turn the ignition switch to ON. Strike the jumper wire from the Blue trigger terminal/wire against Engine Ground – (DO NOT HOLD THE JUMPER AGAINST ENGINE GROUND). The ignition coil should spark each time the Blue wire is tapped to Engine Ground. If not, the switch box and/or ignition coil is faulty.
4. Connect a spark gap tester to the high-tension lead coming from the ignition coil and set it to approximately 7/16". When you crank the engine over, if it sparks while the spark gap tester is connected to the coil and does not spark through the spark plug wires – there is a problem in the distributor cap, rotor button or spark plug wires.
5. Check DC voltage on the White/Black trigger terminal/wire (it must be connected to the switch box) to Engine Ground AT CRANKING. It must be at least at least 9V DC. A low reading indicates a bad switch box.
6. Check DVA voltage between the Blue and Black trigger terminals/wires (they must be connected to the switch box) AT CRANKING. It must be at least 3V DVA. A low reading indicates a bad trigger.
7. Check DVA voltage on the Green wire going to the coil to Engine Ground AT CRANKING. It must be at least 100V DVA. A low reading indicates a bad switch box.



ONLY HAS SPARK AS LONG AS THE STARTER IS ENGAGED:

This symptom usually indicates a bad trigger or low battery voltage.

NO SPARK OR INTERMITTENT SPARK ON ONE CYLINDER:

1. Connect a spark gap tester to the high-tension leads coming from the distributor cap and set the gap to approximately 7/16". Use of a CD Tester is highly recommended.
2. Align the rotor with #1 spark plug wire. Disconnect the trigger wires from the switch box and connect a jumper wire from the Black trigger terminal/wire of the switch box to the White/Black trigger terminal/wire of the switch box.
3. Connect another jumper wire to the Blue trigger terminal/wire of the switch box. Turn the ignition switch to ON. Strike the jumper wire from the Blue trigger terminal/wire against Engine Ground – (DO NOT HOLD THE JUMPER AGAINST ENGINE GROUND). Only the #1 spark plug wire should spark. If any other spark plug wire has spark, there is a problem in the distributor cap.
4. Repeat the test for the other cylinders.

MISS AT ANY RPM:

1. Check the battery voltage on the Red and White terminals (White wire on the 114-4796) (they must be connected to the switch box) to Engine Ground throughout the RPM range. The voltage should be between 12V and 16V DC. A reading outside this range will damage the CD module. If the readings are abnormal, perform the voltage drop test described above.
2. Perform a high-speed shutdown and read the spark plugs. Check for water. A crack in the block can cause a high miss at high speed when the water pressure gets high, but a normal shutdown will mask the problem.

TRIES TO RUN BACKWARDS:

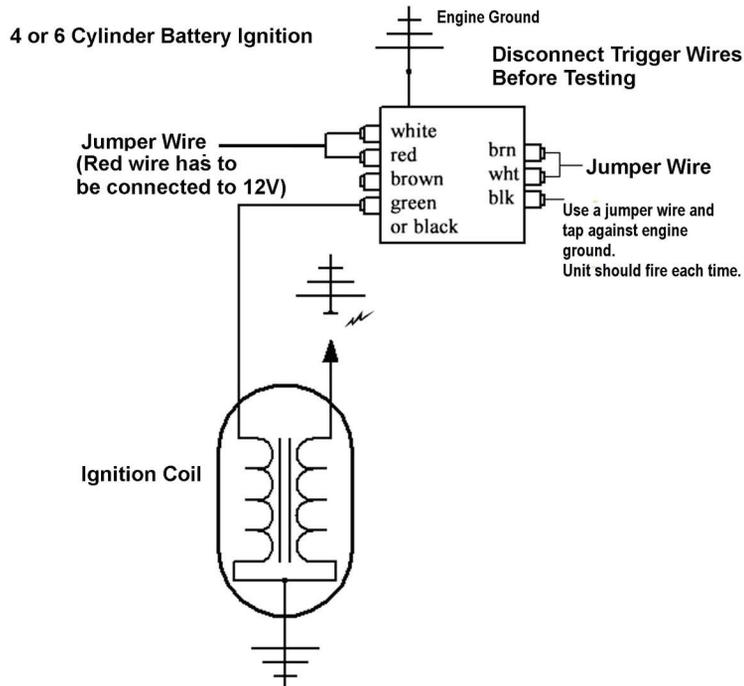
Check timing and timing belt.

Four and Six Cylinder Engines (With 114-2986/332-2986/393-3736 Switch Box)

(Note) A CD Tester like the one by CDI Electronics or Merc-o-Tronics can be used to test the CD module, distributor cap, rotor button and spark plug wires on the engine while the Trigger Tester by CDI can be used to test the distributor trigger.

(SERVICE NOTE) Check the battery voltage at approximately 3500 RPM, MAXIMUM reading allowable is 16 volts and minimum is 12V. Running below 12V or over 16 volts will damage the ignition. Check for loose connections or a bad battery. **Maintenance free batteries are NOT recommended for this application.**

Engine Wiring Connection for Testing Ignition Module



GENERAL:

1. Clean all battery connections and engine grounds.
2. Disconnect the mercury tilt switch and retest. If the ignition works properly, replace or discard the mercury tilt switch.
3. Connect a spark gap tester to the spark plug wires and check for spark on *all cylinders*. If some cylinders spark and not others, the problem is likely in the distributor cap, rotor button or spark plug wires.
4. Perform a voltage drop test after the engine is repaired to see if there is a problem with the voltage going to the CD module. At



cranking and while the engine is running, use a DC voltmeter and put the Black meter lead on the battery POS (+) *post* and the Red meter lead on the positive battery cable at the starter solenoid. Keep the Black lead on the battery post and shift the Red meter lead to the positive post of the rectifier, then to the Red and White terminals on the switch box. If you find a reading above 0.6V, there is a problem at the point where the voltage jumped up. For example, if the meter reads 0.4V until you get to the White terminal and then jumps to 2.3V on the White terminal – this indicates a problem in the key switch, or harness. Repeat the test for the negative battery post by putting the Black meter lead on the battery NEG (-) *post* and the Red meter lead on the negative battery cable terminal, then shifting to the engine block, rectifier base and case ground of the CD module.

NO SPARK ON ANY CYLINDER:

1. If a mercury tilt switch is connected to the switch box, disconnect it and retest. If you now have spark, replace or discard the mercury tilt switch.
2. Check DC voltage on the White and Red terminals (White/Red wire on the 114-2986) (they must be connected to the switch box) to Engine Ground AT CRANKING. It MUST be at least 9.5 volts. If not, there is most likely a problem in the battery. Try a known-good non-maintenance-free cranking battery. If no change, check the key switch, starter and battery cables.
3. Perform the jumper wire test in the illustration above. Disconnect the trigger wires from the switch box and connect a jumper wire from the Brown trigger terminal/wire of the switch box to the White trigger terminal/wire of the switch box. Connect another jumper wire to the Black trigger terminal/wire of the switch box. Turn the ignition switch to ON. Strike the jumper wire from the Black trigger terminal/wire against Engine Ground – (DO NOT HOLD THE JUMPER AGAINST ENGINE GROUND). The ignition coil should spark each time the Black wire is tapped to Engine Ground. If not, the switch box and/or ignition coil is faulty.
4. Connect a spark gap tester to the high-tension lead coming from the ignition coil and set it to approximately 7/16". When you crank the engine over, if it sparks while the spark gap tester is connected to the coil and does not spark through the spark plug wires – there is a problem in the distributor cap, rotor button or spark plug wires.
5. Check DC voltage on the Brown trigger terminal/wire (it must be connected to the switch box) to Engine Ground AT CRANKING. It must be at least at least 9V DC. A low reading indicates a bad switch box.
6. Check DVA voltage between the White and Black trigger terminals/wires (they must be connected to the switch box) AT CRANKING. It must be at least 3V DVA. A low reading indicates a bad trigger.
7. Check DVA voltage on the Green wire going to the coil to Engine Ground AT CRANKING. It must be at least 100V DVA. A low reading indicates a bad switch box.

ONLY HAS SPARK AS LONG AS THE STARTER IS ENGAGED:

This symptom usually indicates a bad trigger or low battery voltage.

NO SPARK OR INTERMITTENT SPARK ON ONE CYLINDER:

1. Connect a spark gap tester to the high-tension leads coming from the distributor cap and set the gap to approximately 7/16". (Use of a CD Tester is recommended).
2. Align the rotor with #1 spark plug wire. Disconnect the trigger wires from the switch box and connect a jumper wire from the Brown trigger terminal/wire of the switch box to the White trigger terminal/wire of the switch box.
3. Connect another jumper wire to the Black trigger terminal/wire of the switch box. Turn the ignition switch to ON. Strike the jumper wire from the Black trigger terminal/wire against Engine Ground – (DO NOT HOLD THE JUMPER AGAINST ENGINE GROUND). Only the #1 spark plug wire should spark. If any other spark plug wire has spark, there is a problem in the distributor cap.
4. Repeat the test for the other cylinders.

MISS AT ANY RPM:

1. Check the battery voltage on the Red and White terminals (White/Red wire on the 114-2986) (they must be connected to the switch box) to Engine Ground throughout the RPM range. The voltage should be between 12V and 16V DC. A reading outside this range will damage the CD module. If the readings are abnormal, perform the voltage drop test described above.
2. Perform a high-speed shutdown and read the spark plugs. Check for water. A crack in the block can cause a high miss at high speed when the water pressure gets high, but a normal shutdown will mask the problem.

TRIES TO RUN BACKWARDS:

Check timing and timing belt.



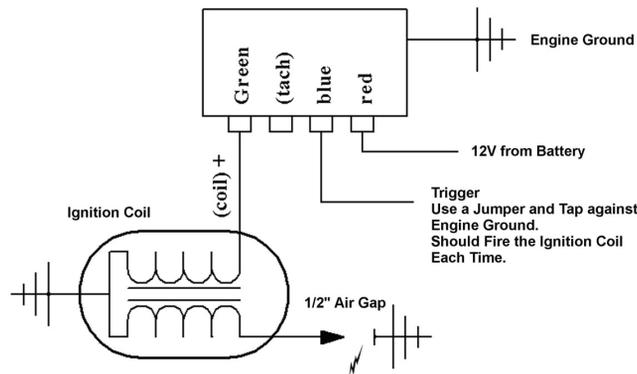
Four Cylinder Engines 1970-1971 Engines (With 337-4406/337-4411 Switch Box)

WARNING: Check the battery voltage at approximately 3500 RPM, MAXIMUM allowable reading is 16 volts and minimum is 12V. Running below 12V or over 16 volts will damage the ignition. Check for loose connections or a bad battery. Maintenance free batteries are NOT recommended for this application.

(SERVICE NOTE) Due to problems associated with this system, it is recommended that the system be converted over to a 332-2986/393-3736 type system. (CDI Electronics offers a conversion kit, P/N – 114-2986K1)

Engine Wiring Connection for Testing Ignition 337-4411 Module

4 Cylinder Battery Ignition



GENERAL:

1. Clean all battery connections and engine grounds.
2. Disconnect the mercury tilt switch and retest. If the ignition works properly, replace or discard the mercury tilt switch.
3. Connect a spark gap tester to the spark plug wires and check for spark on *all cylinders*. If some cylinders spark and not others, the problem is likely in the distributor cap, rotor button or spark plug wires.
4. Perform a voltage drop test after the engine is repaired to see if there is a problem with the voltage going to the CD module. At cranking and while the engine is running, use a DC voltmeter and put the Black meter lead on the battery POS (+) *post* and the Red meter lead on the positive battery cable at the starter solenoid. Keep the Black lead on the battery post and shift the Red meter lead to the positive post of the rectifier, then to the Red and White terminals on the switch box. If you find a reading above 0.6V, there is a problem at the point where the voltage jumped up. For instance, if the meter reads 0.4V until you get to the White terminal and then jumps to 2.3V on the White terminal – this indicates a problem in the key switch, or harness. Repeat the test for the negative battery post by putting the Black meter lead on the battery NEG (-) *post* and the Red meter lead on the negative battery cable terminal, then shifting to the engine block, rectifier base and case ground of the CD module.

NO SPARK ON ANY CYLINDER:

1. If a mercury tilt switch is connected to the switch box, disconnect it and retest. If you now have spark, replace or discard the mercury tilt switch.
2. Connect a spark gap tester to the high-tension lead coming from the ignition coil and set it to approximately 7/16". When you crank the engine over, if it sparks while the spark gap tester is connected to the coil and does not spark through the spark plug wires – there is a problem in the distributor cap, rotor button or spark plug wires.
3. Check the DC voltage present on the White trigger wire and the Red terminal of the switch box while cranking. It MUST be at least 9.5 volts. If not, there is a problem in the harness, key switch, starter, battery cables or battery.
4. Check DVA voltage between the Blue terminal and engine ground while cranking (The trigger wire must be connected to the switch box). You should read at least 9V. A low reading indicates a bad switch box.
5. Disconnect the wire from the Blue terminal of the switch box and connect a jumper wire to the terminal. Strike the other end of the jumper wire against engine ground. The switch box should spark each time. Failure to spark usually indicates a bad CD module.
6. Check DVA voltage on the Green wire going to the coil, it should be over 100 volts at cranking.

NO SPARK OR INTERMITTENT SPARK ON ONE CYLINDER:

1. Connect a spark gap tester to the spark plug wires coming from the distributor cap and set the air gap to approximately 7/16".
2. Align the rotor with #1 spark plug wire. Disconnect the wire from the Blue terminal of the switch box and connect a jumper wire to the terminal. Strike the other end of the jumper wire against engine ground. Only the #1 spark plug wire should spark. If any other spark plug wire has spark, there is a problem in the distributor cap.
3. Repeat the test for the other cylinders.

NOTICE: The 4 cylinder engines using the 332-3213 ignition module and belt driven ignition driver DO NOT USE BATTERY VOLTAGE. Connecting 12V to the Red terminal will destroy the module.