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How to Troubleshoot Farm Duty Electric Motor Capacitors



By Josh Weber

eHow Contributing Writer

Contributor

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Induction Motor with Capacitor

Farm duty electrical motors most often consist of split-phase induction motors designed for heavy duty assignments. As split-phase motors use a separate starter winding, these require a capacitor in the starting circuit to provide increased starting power. Failure of split-phase induction motors is often corrected by troubleshooting the capacitor function as described.

Instructions

Difficulty: Moderately Easy

Diagnosing Capacitor Malfunction

1. Attempt to start the induction motor. In there is a malfunction, the motor hums but does not start.
2. Rule out malfunction of the centrifugal starter switch by spinning the rotor shaft by hand. If the shaft is frozen the problem is in the switch, and it must be replaced.
3. If the rotor shaft rotates freely by hand, attempt to start the motor. If it starts the switch is either defective or stuck in the closed position, and the motor will stop running. Use electrical contact cleaner to clean the switch. Replace the switch if cleaning fails to correct problem.
4. Rule out a malfunctioning centrifugal switch as above before assuming a failed capacitor function. Once the switch has been ruled out, a motor that continues to hum (has current) but is too weak or otherwise fails to start may be the result of a short or open circuit in the capacitor.

Things You'll Need:

- 1 Volt Ohmmeter
- 1 Phillips screwdriver
- 1 can of electrical contact aerosol cleaner

Troubleshooting the Capacitor



Motor mounted capacitor

Locate the capacitor, which is usually mounted on the side of the induction engine.

6. Remove electrical wires from the two male contacts on the front of the capacitor.



Capacitor terminals

Set the volt ohmmeter to the RX 100 scale and connect the positive and negative leads from the volt ohmmeter to the two contacts of the capacitor.

8. Observe the meter reading. If the needle jumps immediately to zero ohms and gradually drifts back to a high ohm reading, the capacitor is functional and is not the problem.



Volt-Ohm
Steady Ohms
Reading

A meter reading that registers steady zero ohms or steady high ohms indicates the capacitor is malfunctioning and should be replaced.

0. Double check meter results by reversing meter leads to the capacitor and re-checking the readings.

Tips & Warnings

- One indicator of an open circuit in a faulty capacitor is high frequency interference in nearby radios when the motor is use.

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