

DATE: 2024-06-18

TECHNICIAN: Gabriel Robinson (Resident/Brother of homeowner)

DESCRIPTION OF PROBLEM:

Fan would run for about an hour then stall and hum from then on. The temperature differential between the evaporator and the condenser was greater than standard running specification. Since I don't have equipment to get verified numbers, I would say it was well below the dew point on the evaporator and burning to the touch hot on the condenser.

DESCRIPTION OF WORK: Replaced a Dual Run Capacitor

NOTES OF WORK DONE:

Figured out the dual run capacitor had gone bad and that the run capacitor was installed incorrectly. The FAN and HERM connections on run capacitor swapped with respect to COMMON.

Because of the swapped lines the fan and compressor should have an eye kept on them for the foreseeable future, as they may have been damaged by the miss match of their standard running conditions.

All of the measurements were made with a **FLUKE 115 True RMS Multimeter**.

The readings for the old dual run capacitor are as the following:

COMMON to FAN : $800\text{nF} \pm 50\text{nF}$ (It was very unstable)

COMMON to HERM : $34.1\mu\text{F}$

The readings for the new dual run capacitor are as the following:

COMMON to FAN : $5.16\mu\text{F}$ (within specifications)

COMMON to HERM : $35\mu\text{F}$ (dead-on for specifications)

The readings for the condenser fan are as the following:

BLACK to PURPLE : 57.4Ω

BLACK to BROWN : 60.1Ω

PURPLE to BROWN : 114.6Ω (so it is $\sim 2\%$ lower than calculated value)

$$57.4\Omega + 60.1\Omega = 117.5\Omega$$

$$114.6\Omega / 117.5\Omega = 0.9753$$

$$0.9753 - 1 = -0.0246$$

TOOLS USED:

- Zip ties
- FLUKE 115 True RMS Multimeter
- 5/16 Hex screw driver

WHAT I DID:

1. Removed the Thermostat from its holder, to remove it from the system.
 - Wanted to remove the possibility of the thermostat starting the system if something was installed wrong.
2. Opened the outside ac units power box and disconnected the power.
3. Checked for voltage going to the contactor relay to ensure it wasn't still live.
4. Removed the protective cover on the outdoor control box.
5. Disconnected all the wires going to the capacitor.
6. Set the multimeter to the correct setting to measure capacitance.
7. Measured COMMON to FAN and COMMON to HERM.
8. Figured out the capacitor was bad.
9. Removed it from its holder.
10. Did some wire management for the wiring.
 1. zip tied the motor wires together.
11. Installed a new capacitor.
 1. Slid it into the holder and tightened the holder around the Run Cap .
 2. Connected the PURPLE wire to COMMON on the Run Cap.
 3. Connected the RED wire to COMMON on the Run Cap.
 4. Connected the YELLOW wire to HERM on the Run Cap.
 5. Connected the BROWN wire to FAN on the Run Cap.
12. Put the protective cover back over the outdoor control box.
13. Reinstalled the power disconnect in the ON orientation.
14. Closed the outdoor power box.
15. Put the thermostat back into its holder.
16. Set the thermostat to cool.
17. Went outside to check the condenser
 1. Check to see if the fan is spinning the correct direction.
 - The fan was blowing air out through the top of the condenser, so that is running correct.
 - Two hours later, system seems to be functioning correctly.
 - The air was warmer than ambient, that is good.
 - The temperature differential on the coolant lines was not as great, that is good too.
18. Finished.
 - 1.

Old Capacitor Label Information:

TITAN PRO 370

Motor Run Capacitor

TRCD355

35+5MFD \pm 5%

370VAC 60/50HZ

Rated to 70°

Protected 10,000AFC

RoHS Compliant

NON PCB

C22.2 No.190

Made in China

c  us

New Capacitor Label Information:

TITAN HD

Motor Run Capacitor

PRCFD355A

35+5MFD \pm 5%

440/370VAC 60/50HZ

Rated to 70°

Protected 10,000AFC

RoHS Compliant

2340 No-PCB

C22.2 No.190

Made in USA

c  us