# Section 1 – Critical Readings

## Critical Readings - A/C & H/P Service Survey

The more information you give the more we can help you

Date:

| | |
|---|---|
| Distributor: | Contact Name and Phone#: |
| Dealer: | City & State: |

| | | | |
|---|---|---|---|
| *O.D. Unit Type (A/C H/P) and Make: | Model#: | | Serial#: |
| *I.D. Unit Type (Furnace A/H) and Make: | Model#: | | Serial#: |

| | | | |
|---|---|---|---|
| *Indoor Coil Type and Make: | Model#: | *Metering Device Type: | Size or Part Number#: |

Symptoms:

*Line Set Size and length #ft, rise or drop # ft / # of Elbows

| | |
|---|---|
| * Suction Pressure | |
| * Suction Line Temp | |
| (T&P) Suction Saturation | |
| Suction Superheat | |

| | |
|---|---|
| *Outdoor Dry Bulb | |

| | |
|---|---|
| * Total External Static | |

| | |
|---|---|
| * ID Entering Dry Bulb | |
| *ID Leaving Dry Bulb | |
| ID Delta T Dry Bulb | |

| | |
|---|---|
| *Indoor CFM | |
| *Supply Static Pressure | |
| *Return Static Pressure | |

| | |
|---|---|
| * Liquid Pressure | |
| (T&P) Liquid Saturation | |
| * Liquid Line Temp | |
| Liquid Subcooling | |

| | Indoor | Enthalpy (THC) |
|---|---|---|
| *Entering WB | | |
| *Leaving WB | | |
| | Delta THC | |

Capacity = Delta THC X 4.5 X cfm = Capacity

| | |
|---|---|
| Discharge Pressure | |
| *Discharge Line Temp | |
| Discharge Saturation | |
| Discharge Superheat | |

| Compressor | Rated on Plate | Actual |
|---|---|---|
| * Volts | | |
| *Amps | | |

*Blower Speed Tap

## Section 2 – Compressor Diagnostic Readings

1. Remove compressor wires from contactor and run capacitor. Check the resistance of the compressor windings with the ohms function on a multi-meter. DO NOT use continuity function.

| SINGLE PHASE | | THREE PHASE | |
|---|---|---|---|
| C-R | _____ Ohms | T1 – T2 | _____ Ohms |
| C-S | _____ Ohms | T2 – T3 | _____ Ohms |
| S-R | _____ Ohms | T1 – T3 | _____ Ohms |

Single Phase: S-R should be highest, C-R should be lowest, C-R + C-S should equal S-R reading.
Three Phase: All three readings should be the same.

2. Remove wire harness from compressor terminals and perform resistance check again at compressor terminals.

| SINGLE PHASE | | THREE PHASE | |
|---|---|---|---|
| C-R | _____ Ohms | T1 – T2 | _____ Ohms |
| C-S | _____ Ohms | T2 – T3 | _____ Ohms |
| S-R | _____ Ohms | T1 – T3 | _____ Ohms |

Both sets of ohm readings should be the same.

3. Verify wiring per diagram

C to T1 or T2

R to T2 or T1

S to run capacitor HERM terminal

Capacitor COMMON to T2 or T1

4. Check run capacitor COM to HERM _____ MFD

5. Voltage check – from LOAD side of compressor contactor:

| | | | | |
|---|---|---|---|---|
| NO LOAD | L1 – L2 _____ | L1 – L2 _____ | L1 – L3 _____ | L2 – L3 _____ |
| UNDER LOAD | L1 – L2 _____ | L1 – L2 _____ | L1 – L3 _____ | L2 – L3 _____ |

6. Current check – check while compressor is attempting to start.

C or T1 _____ AMPS

S or T2 _____ AMPS

R or T3 _____ AMPS

7. Line pressures:

LIQUID LINE _____ PSI

SUCTION LINE _____ PSI

Refrigerant charge in unit _____ LBS / OZ

Unit MOD: _____

Unit SER: _____

MAX FUSE SIZE listed on unit data plate: _____ AMPS

FUSE SIZE used in unit disconnect if applicable: _____ AMPS

Wire size feeding unit: _____

Length of wire run feeding unit: _____ FT

Voltage drop while start attempt should drop no more than 10%

If all previous steps check to be good, temporarily connect a start capacitor in parallel with the compressor run capacitor terminals COM and HERM.

Manually engage the compressor contactor for no more than 3 seconds. If compressor starts, remove power immediately and remove temporary start capacitor from circuit. Let pressures equalize and attempt to restart the compressor. If compressor does start and operate, take current readings and compare to unit data plate.

Attempt to restart equipment several times after pressures equalize. The equipment may require a permanent OEM hard start accessory.

If all previous steps check to be good and compressor will not start but is not drawing LRA that equals listing on unit data plate, the compressor wiring harness may be defective. Replace wire harness and attempt to operate compressor.