Troubleshooting TXV’s
Troubleshooting TXV’s

3 forces shown that govern a TXV’s operation.

• P1, the pressure created by the remote bulb and power assembly
• P2, the evaporator or equalizer pressure
• P3, the equivalent spring pressure of the superheat spring.
• Valve will assume a stable position when forces are in equilibrium (P1=P2+P3).
Troubleshooting TXV’s

**Flooding**

- Undersized or inefficient compressor.
- Low superheat setting.
- Moisture.
- Dirt or debris.
- TXV seat leak.
- Oversized valve.
- Incorrect bulb position.
- Plugged equalizer tube.
Troubleshooting TXV’s

Hunting

• Valve oversized for application.
• Bulb location.
• Refrigerant distribution.
• Superheat adjustment.
• Moisture.
Troubleshooting TXV’s

**Starving**

- Moisture.
- Dirt or debris.
- Insufficient Delta P across valve.
- Undercharged system.
- Flash gas at inlet to TXV.
- Valve too small.
- Superheat adjusted too high.
- Power assembly failure or partial loss of charge.
Installing TXV’s

The bulb must be securely fastened with two straps to a clean straight section of the suction line. Application of the bulb to a horizontal run of line is preferred. If a vertical installation cannot be avoided, the bulb must be mounted so that the capillary tubing comes out at the top.
Expansion Valve

1/4' FLARE CONNECTION

BULB TO BE LOCATED AT 10 OR 2 O'CLOCK

EVAPORATOR COIL

REMOVE BEFORE INSTALLING EXPANSION VALVE

SEAL SUPPLIED W/ KIT

EXPANSION VALVE

SEAL SUPPLIED W/ KIT

SUCTION LINE

DISTRIBUTOR BODY

PISTON

SEAL

TAILPIECE

3/8" SWEAT

7/8" NUT
Expansion Valve

- Rotate bulb to keep tail at bottom
- Tail end up
- Vertical riser
Checking Expansion Valve Operation

1. Remove the remote bulb of the expansion valve from the suction line.

2. Start the system and cool the bulb in a container of ice water, closing the valve. As you cool the bulb, the **suction pressure should fall and the suction temperature will rise**.

3. Next warm the bulb in a container of warm tap water. As you warm the bulb, the **suction pressure should rise and the suction temperature will fall**.

4. If a temperature or pressure change is noticed, the expansion valve is operating. **No change is noticed, valve is restricted, the power element is faulty, or the equalizer tube is plugged**.

5. Recover the charge, replace the valve and drier, evacuate and recharge.
Checking Subcooling

EXAMPLE:

1. Liquid Line Pressure = 260 psi
2. Corresponding Temp. = 120°F
3. Thermometer on Liquid line = 109°F

To obtain the amount of subcooling subtract 109°F from 120°F. The difference is 11°F Subcooling.

Normal Subcooling Range:

7° to 9° Subcooling for straight cool and heat pumps units
Adjusting TXV’S Superheat

Adjustment Valve Stem Cap
Troubleshooting TXV’s

To measure superheat:

1. Determine suction pressure at the evaporator outlet;
2. Use a determine the saturation temperature corresponding to the pressure.
3. Measure the temperature of the suction line at the remote bulb location
4. Subtract the saturation temperature from the temperature measured at the remote bulb. The difference is the superheat.

NOTE: The expansion valves are factory adjusted to maintain 8 to 12 degrees superheat.
Troubleshooting TXV’s

Adjusting superheat for externally adjustable TXVs only:

Systems with TXV application should have a superheat of 7 ± 2ºF.
1. Remove the seal cap from the bottom of the valve, exposing the adjusting stem
2. Rotate the stem *clockwise* to increase the superheat—decreases flow of refrigerant
3. Rotate the stem *counterclockwise* to decrease the superheat— increases flow of refrigerant.
Expansion Valve

1/4' FLARE CONNECTION

55

SATURATED SUCTION PRESSURE TEMPERATURE CHART

<table>
<thead>
<tr>
<th>SUCTION PRESSURE</th>
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<tbody>
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EVAPORATOR COIL

REMOVE BEFORE INSTALLING EXPANSION VALVE

SEAL SUPPLIED W/ KIT

BULB

EXPANSION VALVE

SEAL SUPPLIED W/
Overfeeding

Overfeeding by the expansion valve results in high suction pressure, cold suction line, and possible liquid slugging of the compressor.

If these symptoms are observed:
1. Check for an overcharged unit by referring to the cooling performance charts in the servicing section.
2. Check the operation of the power element in the valve as explained in Checking Expansion Valve Valve Operation.
3. Check for restricted or plugged equalizer tube.
Underfeeding

Underfeeding by the expansion valve results in low system capacity and low suction pressures. If these symptoms are observed:

1. Check for a restricted liquid line or drier. A restriction will be indicated by a temperature drop across the drier.
2. Check the operation of the power element of the valve as described Checking Expansion Valve Operation.