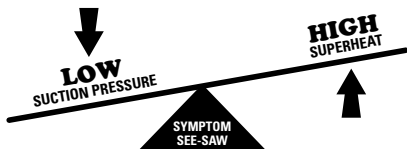


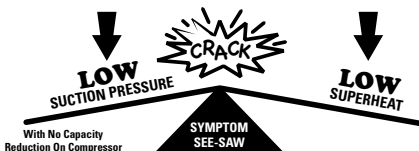
POSSIBLE CAUSES

- | | |
|-----------------------------|---|
| 1. Oversized Valve | 5. Wrong thermostatic charge |
| 2. TEV seat leak | 6. Bad Compressor-low capacity |
| 3. Low Superheat adjustment | 7. Moisture, dirt, wax |
| 4. Bulb installation | 8. Incorrectly located external equalizer |
| a. Poor thermal contact | |
| b. Warm location | |



POSSIBLE CAUSES

- | | |
|--|---|
| 1. Moisture, dirt, wax | 10. Low refrigerant charge |
| 2. Undersized valve | 11. Liquid line vapor |
| 3. High superheat adjustment | a. Vertical lift |
| 4. Gas charge condensation | b. High friction loss |
| 5. Dead thermostatic element charge | c. Long or small line |
| 6. Wrong thermostatic charge | d. Plugged drier or strainer |
| 7. Evaporator pressure drop —
no external equalizer | 12. Low pressure drop across valve |
| 8. External equalizer location | a. Same as #11 above |
| 9. Restricted or capped external
equalizer | b. Undersized distributor nozzle
or circuits |
| | c. Low condensing temperature |

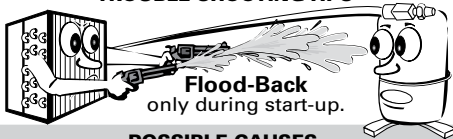


POSSIBLE CAUSES

- | | |
|----------------------|---|
| 1. Low load | 2. Poor air distribution |
| a. Not enough air | 3. Poor refrigerant distribution |
| b. Dirty air filters | 4. Improper compressor-evaporator balance |
| c. Air too cold | 5. Evaporator oil logged |
| d. Coil icing | 6. Flow from one TEV affecting another's bulb |

SHOOTIN' SERVICE

TROUBLE SHOOTING TIPS



POSSIBLE CAUSES

1. Oversized Valve
2. TEV seat leak (off cycle)
3. Low superheat adjustment
4. Wrong thermostatic charge
5. Bulb installation
 - a. Poor thermal contact
 - b. Warm location
6. Compressor discharge valve leak
7. Solenoid valve seat leak
8. Compressor in cold location
9. Suction line in cold location
10. Evaporator free draining to compressor
11. Interrupted pumpdown
12. Restricted or plugged external equalizer

APPROXIMATE PRESSURE CONTROL SETTINGS

Pressure - Pounds Per Square Inch Gauge

APPLICATION	TEMPERATURE RANGE (°F)	EVAPORATOR TD (°F)	REFRIGERANT							
			22		134a		404A		507	
			Out	In	Out	In	Out	In	Out	In
Beverage Cooler	35 to 38	15	41	66	17	33	53	82	56	86
Floral Cooler										
Produce Cooler										
Smoked Meat Cooler	32 to 35	15	38	62	15	30	49	77	52	81
Meat Reach Thru										
Service Deli										
Seafood										
Multi-Deck Fresh Meat	26 to 29	15	32	54	11	25	42	68	45	72
Frozen Glass Door	-10 to 0	10	9	24	-	-	15	33	16	35
Frozen Walk-In										
Frozen Ice Cream	-30 to -20	10	0	10	-	-	4	16	4	18
Frozen Food - Open Type										

Pressure control settings assume a suction line pressure loss equivalent to 2°F.

CARRYING CAPACITY OF REFRIGERATION LINES

Tons of Refrigeration - 200 Feet Equivalent Pipe Length

TYPE L COPPER TUBE O.D. Inches	REFRIGERANT						IRON PIPE SIZE Inches	SCHEDULE	REFRIGERANT 717 (Ammonia)	
	22		134a		404A / 507				Liquid Line	Suction Line
	Liquid Line	Suction Line	Liquid Line	Suction Line	Liquid Line	Suction Line				
	20°F Evap.		20°F Evap.		-20°F Evap.				20°F Evap.	
3/8	0.99	0.09	0.73	0.06	0.71	0.04	3/8	80	10.2	0.41
1/2	2.37	0.23	1.77	0.13	1.71	0.10	1/2	80	20.1	0.81
5/8	4.48	0.43	3.36	0.25	3.23	0.18	3/4	80	45.5	1.85
7/8	11.9	1.13	8.97	0.67	8.58	0.49	1	80	89.4	3.64
1-1/8	24.3	2.30	18.3	1.36	17.5	0.99	1-1/4	80	192	7.84
1-3/8	42.6	4.02	32.2	2.38	30.6	1.74	1-1/2	80	293	12.0
1-5/8	67.6	6.37	51.1	3.78	48.4	2.76	2	40	683	28.0
2-1/8	141	13.2	107	7.88	101	5.74	2-1/2	40	1090	44.7
2-5/8	250	23.4	190	14.0	179	10.2	3	40	1930	79.1
3-1/8	400	37.5	304	22.4	286	16.3	3-1/2	40	2820	116
3-5/8	595	55.7	453	33.3	425	24.2	4	40	3930	162
4-1/8	841	78.7	641	47.0	600	34.2	5	40	7100	292

Refrigerants 22, 134a, 404A, and 507 values are based on 100°F liquid temperature and the stated evaporator temperature. Refrigerant 717 (ammonia) values are based on 86°F liquid temperature and 20°F evaporator temperature. Both suction and liquid line values are based on a pressure drop equivalent to 1°F change in saturation temperature. Additional information on refrigerant line sizing, consult ASHRAE's Refrigeration Handbook.