TROUBLESHOOTING GUIDE

The following guide will help the installer determine if a problem exists in the system that would cause a malfunction. **If you are experiencing problems in the physical operation of the unit (blower speeds, door operation, etc.), we encourage you to refer to the *wiring diagram* located in the instruction manual**. Using a continuity or light tester you can solve many of the simple problems by tracing all connections and testing them individually. However, if the unit is functioning correctly, but it is not cooling, you can refer to the following guide that will outline the most common problems encountered by installers.

I. TEST CONDITIONS USED TO DETERMINE SYSTEM OPERATION

A. PLACE TEMPERATURE PROBE (THERMOMETER) INTO CENTER OUTLET.
B. CONNECT GAUGES OR SERVICE EQUIPMENT TO HIGH/LOW CHARGING PORTS
C. PLACE BLOWER FAN SWITCH ON MEDIUM.
D. CLOSE ALL DOORS AND WINDOWS ON VEHICLE.
E. PLACE SHOP FAN OR HEAVY DUTY SQUIRREL-CAGE BLOWER DIRECTLY IN FRONT OF CONDENSER.
F. RUN ENGINE IDLE UP TO 1500 RPM.

(THESE TEST CONDITIONS WILL SIMULATE THE AFFECT OF DRIVING THE VEHICLE AND GIVE THE TECHNICIAN THE THREE CRITICAL READINGS THAT THEY WILL NEED TO DIAGNOSE ANY POTENTIAL PROBLEMS)

II. ACCEPTABLE OPERATING PRESSURE RANGES FOR VINTAGE AIR SYSTEMS

A. **R134A TYPE**

1. **HIGH-SIDE PRESSURES** (160-250 PSI) * Note- general rule of thumb is two times the ambient (daytime) temperature, plus 15-20%.
2. **LOW-SIDE PRESSURES** (06-18 PSI in a steady state)
3. **CENTER DUCT TEMPERATURE** (36-46 DEGREES F.)

B. **R12 TYPE**

1. **HIGH-SIDE PRESSURES** (140-230 PSI) * Note- general rule of thumb is two times the ambient (daytime) temperature, plus 15%.
2. **LOW-SIDE PRESSURES** (12-15 PSI in a steady state)
3. **CENTER DUCT TEMPERATURE** (36-46 DEGREES F.)

Charge as follows: R134A = 1.8 lbs R12= 2.0 lbs
No additional oil is necessary in new compressors

III. TYPICAL PROBLEMS ENCOUNTERED IN CHARGING SYSTEMS

A. NOISY COMPRESSOR

1. A noisy compressor is generally caused by overcharging the system or introducing outside air into the system.

a. If the system is overcharged both gauges will read abnormally high readings. This is causing a feedback pressure on the compressor causing it to rattle or shake from the increased cylinder head pressures. System must be evacuated and re-charged to exact weight specifications.

b. If air is introduced into the system during charging it will introduce moisture that will cause ice to form in the refrigerant flow and will cause the compressor to rattle or growl under acceleration. System must be evacuated and re-charged to exact weight specifications making sure to bleed any air from lines when introducing the refrigerant.

B. SYSTEM NOT COOLING

1. There are numerous factors that can cause the cooling to be less than optimal.

a. **Improper charge in system-** Improper charging is the number one cause of system failure. The pressure readings should be taken before any determination can be made. High or low readings in direct proportion to the normal pressures(see sect. II) will tell you if the charge is too high or low. Excessive system pressure can also cause vibrations and whistling noises from the expansion valve and refrigerant lines.

b. **Heater control valve installation**- Installing the heater control valve in the incorrect hose will allow water to collect in the unit. **The heater control is a directional valve; make sure the water flow is with the direction of the arrow**. As the engine heats up that water transfers the heat to the coil, thus overpowering the a/c coil. A leaking or faulty valve will have a more pronounced affect on the unit's cooling ability. Installing the valve improperly (such as having the flow reversed) will also allow water to flow through, thus inhibiting cooling. Check for heat transfer by disconnecting hoses from the system completely. By running down the road with the hoses looped backed through the motor, you eliminate the possibility of heat transfer to the unit. Move or replace the valve if necessary

c. **Evaporator freezing**- Freezing can occur both externally and internally on an evaporator core. ***External freeze up*** occurs when the coil cannot effectively displace the condensation on the outside fins and the water forms ice (the evaporator core resembles a block of solid ice), it restricts the flow of air that can pass through it, which gives the illusion of the air not functioning. The common cause of external freezing is the setting of the thermostat and the presence of high humidity in the passenger compartment. All door and window seals should be checked in the event of constant freeze-up. A thermostat is provided with all units to control the cycling of the compressor. The gas-filled probe will often come coiled up and must be installed into the coil through the access hole located in the top of each unit.

The rotary-type thermostat should be set all of the way clockwise and turned back counterclockwise an eighth of a turn. The lever-type thermostat should be backed away from the cold position slightly.

Internal freeze up occurs when there is too much moisture inside the system. The symptoms of internal freeze up often surface after extended highway driving. The volume of air stays constant, but the temperature of the air gradually rises. When this freezing occurs the low side pressure will drop, eventually going into a vacuum. At this point, the system should be checked by a professional who will evacuate the system and change the drier.

d. **Inadequate airflow to condenser**- The condenser works best in front of the radiator with a large supply of fresh air. Abnormally high pressures will result from improper airflow. Check the airflow requirements by placing a large capacity fan in front of the condenser and running cool water over the surface. If the pressures drop significantly, this will indicate the need for better airflow.

e. **Incorrect or inadequate condenser capacity**- Incorrect condenser capacity will cause abnormally high head pressures. Vintage Air recommends at least 300 cubic inches of fin area on a double-pass (two rows of tubes) condenser. (This can be measured by multiplying the height times the width times the thickness) This rule only applies to the tube and fin style, the efficiency of the superflow design allows the use of a smaller area. A quick test that can be performed is to run cool water over the condenser while the system is operating, if the pressures decrease significantly, it is likely a airflow or capacity problem.

f. **Expansion valve failure**- An expansion valve failure is generally caused by dirt or debris entering the system during assembly. If an expansion valve fails it will be indicated by abnormal gauge readings. A valve that is blocked will be indicated by high side that is unusually high, while the low side will be unusually low or may even go into a vacuum. A valve that is stuck open will be indicated by both the high and low pressures rising to unusually high readings, seeming to move toward equal readings on the gauges.

g. **Restrictions in system-** A restriction in the cooling system will cause abnormal readings on the gauges. A high-side restriction (between the compressor and the drier inlet) will be indicated by the discharge gauges reading excessively high.

These simple tests can be performed by a local shop and can help determine the extent of the systems problem. **If further assistance is needed, our tech line is (210) 654-7171**. If you have performed the initial tests, please document the results and readings before calling our technical line, it will help us solve the problem faster.