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AUTOMOTIVE AIR CONDITIONING REPAIR

Question:

What are some of the tricks of servicing?

Answer:

The following tricks are not in any particular order.

After evacuating the system, if the service ports are both near the compressor, introduce refrigerant on the high side only. Watch the low side gauge and when it comes out of a vacuum, the system is open all the way around. This works on all expansion valve systems. Orifice tube systems rarely have the service ports near the compressor. If the low side doesn't come out of a vacuum, check the service connection to make sure they are open into the system. There are a couple ways to find a restriction. Start the engine and the unit; the system should pull into a vacuum. Look for signs of frosting on the pipes. Fittings can also be loosened to see where refrigerant leaks out. If there is a restriction in a hose, the frost line will be at the next nearest metal. Another way to test the system for restriction or hose connection is to start pulling vacuum on the high side only and see if the low side gauge indicates a vacuum. If so, then the vacuum can be pulled from both high and low sides.

One of the most important tricks is to never charge the system completely before checking for operation. A 70% charge should make the system work. If it doesn't, it is not the refrigerant causing the problem. Pressures should read normal at this point. Remember; never charge the system with any more refrigerant than the minimum amount needed to make it operate. The customers using environment is different than the working environment.

When charging a system that is a suspect for a restricted condenser, only install 50% of the charge. Start the engine and unit and read the pressures. Remember, 1500 RPM. If the high side is reading higher than normal, the condenser is restricted. An example would be if the ambient temperature were 100 degrees, a normal pressure would be 220 lb. If the pressure is reading near 200 lb at this charge, it's restricted.

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If wanted, try putting in a couple more ounces of refrigerant. If there is no restriction, the pressures will not change. Many vehicles are released from the shop with high side pressures reading 300 lb. or more. This is asking for a comeback. There will be excessive heat in the compressor and it will start leaking.

The newer recovery/service machines can install oil into a pressurized system. Using a manifold set, the four-ounce charge cans of oil can be used for small amounts. If no machine and the system requires a full charge of oil, the system must be empty. Before starting the evacuation, connect a hose to the discharge service port and the other end of the hose into a measured amount of oil. Connect the vacuum pump to the suction service port fitting, turn on the evacuation pump and the oil will be drawn into the system.

There are times that the pressures are textbook and the air delivery is not as cold as it should be. The first instinct is to add more refrigerant. This rarely will help. If the air delivery is sixty degrees or less, the problem is most likely outside interference. Hot water in the heater or an AC door is out of position. If the air is hotter than sixty, check to see where the high side service connection is located. If the connection is after the condenser, check for temperature drop across the condenser. The evaporator could be filling up with vapor instead of liquid refrigerant.

One way to test if the AC doors are in the correct position is to put the AC blower on high and hold your hand in front of the center vent. Feel the pressure and then start pulling your hand back toward your body. If you can't feel the pressure all the way back to your chest, there is a problem. Usually, the air will get so slight that it can't be felt after half way back to your chest. Check for vacuum leaks, cables out of whack, or doors stuck or damaged.

Systems today are operated through the computer in the car. Groundside switching is used to protect the computer. This means there is current to the compressor when the AC is turned on and the computer makes a check of the rest of the system to see if it is

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okay to run the AC. The computer forms a ground to the compressor and it is turned on. When troubleshooting a unit for operation, disconnect the blower motor or the compressor clutch wires from the cars wiring and using jumper wires, connect directly from the unit being tested to the battery and see if it operates. Most of the problems are bad grounds within the system.

If a system has just been serviced and there is every reason to believe it should work, but it doesn't, it may be contaminated refrigerant. If it was serviced with recycled refrigerant, pull the charge from the system and recharge the system with virgin refrigerant. If the system works then, the refrigerant was contaminated. If charging from a thirty- pound tank, check the scales in the machine to be sure the system is not being overcharged.

One thing to remember, even though it is assumed that machines don't make mistakes, they do. Scales get out of calibration if the machine is vibrated, or if the machine is not used correctly, can cause a system not to operate. If an identifier was not used, the tanks could have contaminated refrigerant in them. Know the equipment is correct before condemning the system.