AirSource®

SERVICE BULLETIN

AIR CONDITIONER SYSTEM CONTAMINATION

COMPRESSOR, CONDENSER & EVAPORATOR FAILURE DUE TO ACID IN SYSTEM

OVERVIEW

All air conditioners have a component that contains a chemical (desiccant) that absorbs moisture. If it is located on the high pressure side, (between the condenser and the evaporator) it is called a filter drier or receiver drier. If the component is located on the low pressure side, (between the evaporator and the compressor) it is called an accumulator. In either case it is simply a metal tank containing a moisture absorbing chemical. We have learned that air permeates (or goes through) the rubber hoses of the a/c system. Air also enters the system through loose fittings, deteriorated o-rings, and shrader ports. Even though the air conditioner has refrigerant in it, which means the pressure in the inside of the system is greater than the outside, air will still enter the system. We also know that air is mostly moisture (water). Filter driers/accumulators are designed to hold enough desiccant to absorb the amount of moisture that will enter a system in about a year's time. Of course, in the real world, with variations in humidity and other factors, the drier may become saturated with moisture in as little as only a few months or as long as several years. The important thing is that at some point, usually between one and three years of installation, the drier is no longer able to absorb the moisture. This moisture will mix and react with the refrigerant to form various acids. The acid will "eat" away at the metal surfaces and rubber hose, flaking off bits of material that will collect at the filter drier/accumulator screen, expansion valve, orifice tube, and the compressor. This debris will slow or stop the flow of oil from returning to the compressor and will cause compressor failure.

Evaporators, especially aluminum units, commonly fail because of leaks that develop at the bottom of the core. These leaks are caused by acids that collect at the bottom of the evaporator and "eat" through the very thin aluminum. Condensers, including those made of copper, steel or aluminum also develop leaks from acid eating through from the inside and winter road salt and/or salt water along the coasts causing deterioration from the outside.

Acid will cause small "pinhole" leaks to develop in the condenser coil and the evaporator coil. Flaked off debris and sludge will flow to the bottom tubes of the condenser causing both restrictions and a concentrated accumulation of acid to eat at the coil. Sludge and debris at the bottom of the evaporator coil will not normally cause a restriction but will eventually cause reduced cooling efficiency.

COMPRESSOR FAILURE AND SERVICE PROCEDURES ARE DISCUSSED IN BULLETIN #SB4-304AS

NOTE

ALWAYS VERIFY THE TYPE OF REFRIGERANT AND OIL IN THE SYSTEM YOU ARE SERVICING

DIAGNOSING

A. Only mechanics certified by an EPA-approved program may service mobile air conditioner systems.

B. Verify correct refrigerant and oil for system you are servicing. Take care not to contaminate your recycling equipment and refrigerant supply. Non-approved refrigerants containing flammable materials may ignite during servicing. Refrigerant identifiers are a must.

C. Each refrigerant (R12 and R134a) requires separate gauges, charging hoses and recycling equipment.

EVAPORATOR

1. Leak check, using an electric leak detector or fluorescent dye/"black light" if available, by removing insulation around inlet and outlet tubes of the evaporator case.
2. Feel with hand the bottom of the evaporator housing. A leaking coil may leave oil under the case.

CONDENSER

1. With system running, feel condenser surface with your hand. A sudden temperature drop indicates a restriction at that location.
2. Visually inspect condenser for signs of oil indicating leaks.
3. Using a leak detector, check under the oil spots and check connections, paying close attention to where the connections are soldered to distributor tubes.

COMPRESSOR

A locked compressor may be caused by a restriction at the expansion valve/orifice tube. See Bulletin 4S REV-4 for additional causes of compressor failure.

1. Discharge system* and check for contamination at expansion valve/orifice tube.

   *** Use of an approved refrigerant Recovery or Recovery/Recycling System is required by Section 609 of the Federal "Clean Air Act" of 1990.**

SERVICING **- GENERAL FLUSH INSTRUCTIONS**

1. Add refrigerant, if necessary and possible, to leak check and pressure test system for other problems.
2. Purge air conditioning system. Use a recovery system.
3. Remove and discard accumulator or filter-drier.
4. Disconnect discharge hose at compressor.
5. Disconnect suction hose at compressor.
6. Disconnect suction hose at evaporator. (If this is a filter-drier system)
7. If system has an orifice tube, remove and discard. (Orifice tube normally is located inside inlet end of evaporator) (See #19 for installation)
8. Consult MSDS sheet and label of flush solvent for precautionary measures. Pour 1 to 2 pints of flush solvent through top of flush gun. Re-attach top nut with your quick disconnect.

NOTE

DO NOT USE FLUSHES CONTAINING OZONE DEPLETING CFCs SUCH AS R-11, 12, 113 OR 115. IT IS ILLEGAL TO VENT THESE REFRIGERANTS PER SECTION 609 OF THE FEDERAL CLEAN AIR ACT. ALSO, MAKE CERTAIN THAT THE FLUSH SOLVENT USED IS COMPATIBLE WITH THE TYPE OF REFRIGERANT YOU ARE SERVICING. ALTHOUGH NO CURRENT EPA GUIDELINES EXIST REGARDING THE TYPE OF SOLVENT USED, IT IS RECOMMENDED THAT A FLUSH SOLVENT WITH LOW FLAMMABILITY AND LOW VOLATILITY BE USED.

9. Due to environmental concerns, closed-loop flushing is now recommended. Flushing machines are currently available to accomplish this procedure. In addition, flush adapter fittings are available for most vehicle a/c components. These screw-on adapters enable the flush solvent to be contained within the system, eliminating the accidental sprayings and mess associated with probe type attachments.
10. If a probe type attachment is used, make sure probe is attached securely to flush gun hose. Make sure flush gun hose is attached securely to flush gun.
11. To avoid spraying of oil, flush solvent, and other debris, use #8808 flush capturing unit (hose) or attach a piece of hose to end of component being flushed. Place opposite end of venting hose in large can and fill with rags or other absorbent material.

NOTE

FLUSH GUN SHOULD BE HUNG OR HELD IN UPRIGHT POSITION
ALWAYS WEAR SAFETY GLASSES OF GOGGLES AND GLOVES WHEN FLUSHING

12. Attach your compressed air hose to quick disconnect. Flushing will work efficiently from air pressure of 90 PSI to 175 PSI.

    If probe type attachment is used, push probe end into end of component and release the liquid flush solvent under pressure. Follow the manufacturer's recommended flushing procedures when using a closed-loop machine.

13. First flush from end of discharge hose at compressor, through hose, condenser and liquid line to point where either the filter drier was discarded or where liquid line was disconnected at evaporator.
14. Flush remaining liquid line hose if system has filter drier between condenser and evaporator.
15. Flush suction hose between evaporator or accumulator and compressor.

NOTE

WHEN DIRTY LIQUID AND DEBRIS COMING FROM FLUSHED COMPONENT CHANGES TO A CLEAR LIQUID, THAT COMPONENT IS CLEAN AND YOU CAN GO TO NEXT COMPONENT

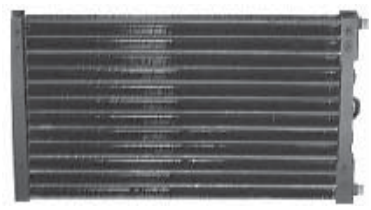
16. If system has an expansion valve, remove and clean. Reinstall or replace. Do not flush through valves.
17. Flush evaporator.
18. If compressor is not being replaced, the oil should be drained and replaced with clean refrigeration oil. If a replacement is being installed, check for correct amount of oil already in compressor. See Service Bulletin 4S REV-4 for procedures to replace oil.
19. Install new orifice tube if necessary (See #7).
20. Wait approximately 20 minutes for flush solvent to evaporate. Evaporation rate of solvent is dependent upon the type and brand of flush solvent used and the ambient temperature. Slow evaporating solvents may be "blown out" of system using dry, clean compressed air.
21. Reassemble system. Replace all "O" Rings, gaskets, garter springs, etc. Make sure correct type of material o-rings and seals are used. Add oil to system as follows:
    a. See step 18 above.
    b. Add an additional 2-3 ounces of oil if all of system except the evaporator is flushed.
    c. Add 4 ounces **<u>total</u>** if evaporator is also flushed or replaced.

REMEMBER TO CHECK FOR BOTH PROPER OIL TYPE AND AMOUNT OF OIL IN REPLACEMENT COMPRESSOR

REMEMBER TO DRAIN AND REPLACE OIL IN THE ORIGINAL COMPRESSOR BEING LEFT ON SYSTEM

22. If possible, install an in-line filter in the liquid line between the filter-drier and the expansion valve.
23. New filter-drier or accumulator should be last item installed.
24. Evacuate for 45 minutes with a good working vacuum pump using clean oil.
25. Add refrigerant-leak check-FOLLOW STEPS 15 THROUGH 21 OF SERVICE BULLETIN #SB4-304AS

Insert probe (or flush adapter fitting) to inlet (larger hose size) of condenser.



Attach #8808 capturing hose or piece of hose to outlet and vent to safe area.

ATTENTION: If probe end is spring loaded, lubricate with refrigerant oil to prevent drying and sticking.

REVIEW

1. Flushing the system removes the contamination, acid and dirty oil.
2. Replace the filter drier/accumulator to insure fresh moisture absorbing capacity and to remove the contamination and acid that is in the old component.
3. Install fresh oil in the system including the compressor.
4. Install an in-line filter to prevent restrictions in the TXV/orifice tube.
5. By doing the complete job properly, you have insured yourself against a comeback and have done a first class, professional job.

Think of the air conditioner in terms of the whole system. Determine not only what part or parts are defective, but what may have caused those parts to fail. Then make the necessary repairs.

PLEASE NOTE THAT OUR COMPRESSOR WARRANTY REQUIRES THE FLUSHING OF THE SYSTEM, THE REPLACEMENT OF THE DRIER/ACCUMULATOR AND THE CLEANING OF THE EXPANSION VALVE OR REPLACEMENT OF THE ORIFICE TUBE.