METROPOLITAN NY CHAPTER

Refrigeration Service Engineers Society

Continuing Education for the HVAC/R Industry

"Better Service Through Knowledge"

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May 2016

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Read and Record

When a refrigeration system fails, many times the cause can easily be diagnosed. However, there are occasions when the cause cannot easily be determined—either the true cause of the problem is unclear or the technician is unsure of the problem. In either case, this can be a very frustrating experience.

How can a technician work through these jobs? One method used by some technicians is to "***read and record***". This means you measure and record **all** of the system's possible operating conditions. This includes all possible refrigerant pressures, such as the pressure at the compressor's inlet and outlet ports, the refrigerant pressure in the evaporator and condenser, and any other locations. Multiple pressure readings allow you to determine if any excessive pressure-drops exist throughout a system. Excessive pressure-drops can cause a technician to assume an inaccurate pressure reading, which can lead to misdiagnosing a problem.

For example: the refrigerant pressure at the outlet of the evaporator may not be the same at the inlet of the compressor. On a properly designed and installed system the pressure drop across the suction line should equal no more than a 2˚F change in the refrigerant's saturation temperature. But what if the system is not properly designed and installed? What if there is a significant pressure drop across the suction line? Now if you read the pressure at the inlet of the compressor and try to calculate the refrigerant superheat value at the outlet of the evaporator, will your calculations be accurate? No.

All of the system's temperatures need to be recorded, such as the refrigerant temperature at the outlet of the evaporator, outlet of the condenser, inlet of the compressor and outlet of the compressor. All air temperatures should be recorded such as the temperature entering and leaving the condenser and entering and leaving the evaporator, as well as any other necessary temperatures. The compressor's oil level and, if possible, the refrigerant level in the receiver should be included in these recordings. All of the system's electrical conditions should be recorded, such as the applied voltage and amperage draw of all motors, especially the compressor. Record as much information as possible. ***The more the better***.

This procedure helps a technician in several ways. First, it forces him to look at the entire picture and not miss vital information which can help lead him to finding the problem. Second, it allows him to review the problem with a fellow technician or technical advisor. When discussing the problem, a technician does not need to recall from memory any of the system parameters. Sometimes our memory fails us and we give the wrong information, which masks the true problem. It also eliminates "the superheat is good" or "the amperage draw is normal" statements. Numbers do not lie but your memory may fail you.

Reading and recording also has some benefits on functional systems. It allows the next technician to see how the system was operating previously, which can be a tremendous aid the next time the system fails. The next technician can compare the current operating parameters to the past parameters, and may be able to discover the current problem. These records can also be saved and trended over time to help predict possible future system issues or schedule any required maintenance and/or repairs.

Reading and recording does take extra time. A technician must determine when it makes sense for the job and the customer. It is not needed on every job or for every customer, but it should be considered and used when appropriate and/or necessary.

The Metro NY RSES Chapter Officers and Board members wish you all a Successful and Safe Spring & Summer Season.

We look forward to seeing you in September

SAFE & HEALTHY

for another informative series of Educational Programs

Liquid "Push-Pull" Recovery Method

There are several methods which can be used to recover refrigerant from a system. The most common is the vapor recovery method, where refrigerant in its vapor state is removed from a system, condensed into a liquid and then stored in a recovery cylinder. This method can be time-consuming, especially on systems with large amounts of refrigerant.

A faster method of recovering refrigerant is to remove the refrigerant in its liquid form. One method of recovering liquid refrigerant is the "push-pull" method. This method uses a recovery machine to pressurize the system and push liquid out and into the recovery tank. This method will speed up the recovery process, however it is a two step process, as it cannot be used to completely recover all the refrigerant from a system. When liquid refrigerant is no longer traveling from the system, the recovery process must then be switched over to the vapor recovery method for completion.

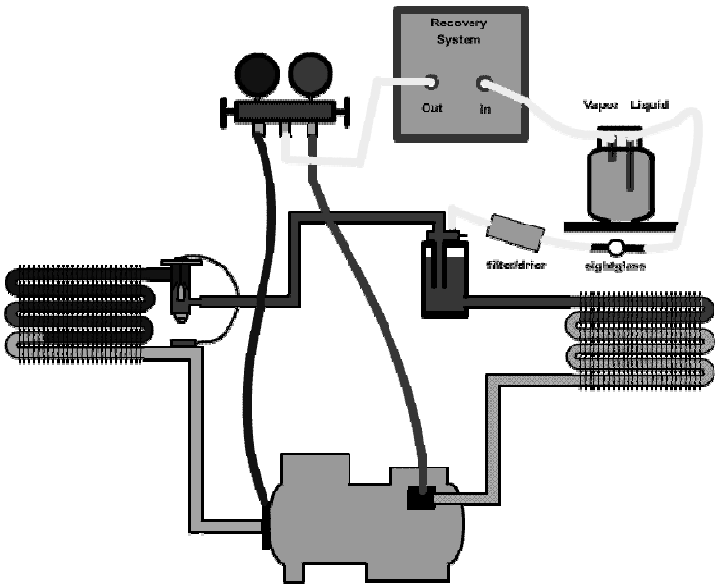
This method is not practical for all systems. If any of the following conditions are present, the liquid "push-pull" method should not be used:

- the equipment contains less than 10 lbs of refrigerant;
- the equipment is a heat pump or other system with refrigerant flow that would prevent a technician from isolating the liquid;
- the equipment has an accumulator between the service ports used in the liquid recovery process;
- liquid refrigerant migration has occurred and the location of the liquid is unknown;
- the refrigerant tubing design on the equipment does not allow for a solid column of liquid refrigerant to be formed.

To use the "push-pull" method always follow the instructions provided by the recovery system manufacturer. Below is an overview of the process. Again, follow the directions provided by the recovery system manufacturer as different systems operate differently.

Before setting up the recovery equipment make sure the equipment (recovery machine, refrigerant hoses and recovery cylinder) can handle the pressures associated with the refrigerant being recovered. Check the condition of the recovery equipment to make sure there are no obvious defects. Also make sure to wear the appropriate personal safety equipment for proper eye and hand protection.

Pictured is a sample of a setup using the push-pull method to recover liquid refrigerant from a system. In the picture below the manifold gage is connected similar to that of the vapor recovery method. The low side hose is connected to the low side of the system and the high side hose is connected to the high side of the system. This hook up may slightly differ depending on the service valves available and the type of system to be recovered. A refrigerant hose is connected from the liquid side of the system directly to the liquid side of the recovery tank. Connected into this line is a filter/direr and liquid line sightglass as shown in the picture. A refrigerant hose is connected from the vapor side of the recovery tank to the inlet of the recovery machine. The outlet of the recovery machine is connected to the transfer hose of the refrigerant manifold set. Make sure to place the recovery cylinder on a scale so its weight can be monitored during the recovery process. Do not fill any recovery cylinder to more than 80% of its total capacity.



Before beginning the recovery process make sure to open the necessary manifold and system valves and purge all the refrigerant hoses to prevent atmospheric air from contaminating the refrigerant being recovered. Once all the refrigerant hoses have been purged, open or close the appropriate manifold and system valves which will allow the liquid refrigerant to flow from the system directly into the liquid side of the recovery cylinder and the vapor from the recovery cylinder to flow into the recovery machine and then into the system to provide the necessary pressure to push the liquid refrigerant out of the system.

Start the recovery machine and monitor the weight of the recovery cylinder and condition of the refrigerant flow through the sightglass connected to the liquid side of the recovery cylinder. When the sightglass or the refrigerant scale show no signs of liquid refrigerant being transferred into the recovery cylinder, stop the process and switch to the vapor recovery method to complete the recovery of the refrigerant from the system.

COMING TOPICS

Leak Detection – New Innovations

COMPRESSORS – The Latest from Copeland

How To Finance Your Customers' Work

Scotsman Ice Machines

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If you have any suggestions or requests for Future programs, please let us know!

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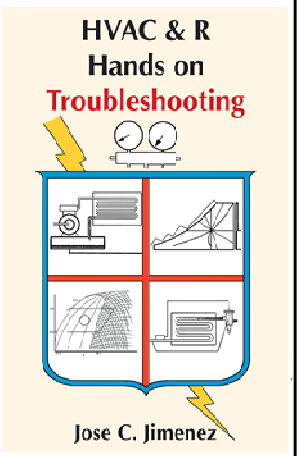
This Book May Help



(718) 994-3773
jocojial@gmail.com

METROPOLITAN NEW YORK CHAPTER, RSES

For Information Call: Stan Hollander, CMS (718) 232-6679

SPECIAL NOTICE TO LONG ISLAND CHAPTER MEMBERS: The LI Chapter has been merged into the Metro NY Chapter of RSES. Welcome to our chapter, we hope you will be able to attend our meetings. We are transitioning to meeting notices by email. If you did not also receive this notice by email then you must follow the directions below to insure that you receive meeting and seminar notices in the future.

THIS IS IT. THIS IS THE LAST NEWSLETTER WE WILL BE MAILING. IF YOU HAVE NOT RECEIVED YOUR NEWSLETTER BY EMAIL, THEN YOU MUST ACT NOW.

To insure you will receive future newsletters and seminar notices you must log in and update your profile on www.rses.org (there is no charge). If you have not established a log-in with RSES you will have to do so at this time. After you log in, check that your email address is correct. We will be using the RSES database of chapter members for our email list when transmitting meeting and seminar notices electronically.
This is the only way you can insure that you will receive our monthly meeting notices. This May meeting notice is the last one that will be sent by regular mail. ***ACT NOW.***

Wednesday May 11th, 2016 at 7:30pm

at

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"ZoomLock" Copper Tubing Connections WITHOUT BRAZING – See it Work

by

Kenny Balci—Sporlan Division

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EDUCATIONAL PROGRAM
Wednesday May 11th, 2016
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SEE DETAILS – THIS PAGE

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241 Halsey Street
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