

METROPOLITAN NY CHAPTER Refrigeration Service Engineers Society

Continued Education for the HVAC/R Industry
"Better Service Through Knowledge"

October 2009

WWW.METRONYRSES.ORG



WORKING ON SMALL CAPACITY REFRIGERATION SYSTEMS

While troubleshooting small capacity refrigeration systems, a technician should not be too quick to attach refrigerant gauges to a system. Small systems normally hold relatively small amounts of refrigerant. The process of attaching and removing a set of refrigeration gauges will release a small amount of refrigerant from the system. This loss could affect the operation of the system, especially if lengthy 6-foot hoses are used, or if a gauge manifold set is placed on and off several times.

Although at times it may be necessary to measure the system's pressures to discover the true cause of a problem, a technician should first attempt to analyze the system without the use of manifold gauges. This will help to eliminate the release of any refrigerant from the system and perhaps be the cause of an additional system problem.

There are several items a technician can check that will allow him to begin analyzing the system without the initial use of manifold gauges. First he can check to see if all of the system's motors are operating such as the compressor, the condenser and evaporator fan motors. If any of these motors are not in operation, then *perhaps* the problem is electrical in nature and reading of the system pressures is not necessary.

A technician can also check the condition of the both the evaporator and condenser coils. Are they dirty? Is the airflow restricted in any way through them? In the case of the evaporator, does it have an excess of ice or frost on its coils?

Another initial observation a technician can make is to measure the system's discharge line temperature. On an operating system; it should be well above room ambient temperature. If the system's compressor is running and the discharge line temperature is at or only slightly above room temperature, then there is a problem with the flow of refrigerant throughout the system. At this point it would be justified to attach a set of pressure gauges to further investigate the cause of the problem.

When it is necessary to actually measure the system's operational pressures, it is best to use a short gauge setup. This will diminish the amount of refrigerant released while reading the system's pressures. Although this setup does not allow refrigerant to be added or removed from

a system, it does allow a technician to troubleshoot the system effectively without the loss of an excessive amount of refrigerant.

Some of these smaller refrigeration systems will not have access valves. Some type of saddle valve will need to be added to the system in order to check the pressures. When adding a saddle valve, be sure to use a quality valve and make sure the tubing surface is relatively clean before attaching the valve. If installed improperly, these valves can leak refrigerant over a period of time. If during the repair process the refrigerant will need to be recovered from the system, it is normally best to remove the saddle valve and install a more permanent access valve, such as a Schrader valve. These types of valve seem to lead to less future repair concerns. <<

TROUBLESHOOTING BRAZED JOINTS

Brazing refrigerant lines is a common task for RHVAC technicians. Although the brazing process is relatively simple, problems due occur and sometimes the joint fails to be leak free. Below are some suggestions to help resolve some of the common problems encountered while brazing:

Brazing alloy does not flow into the joint, even though it melts and forms a fillet. The outside of the joint is hot; however the inside of the joint is not up to temperature. Remember to heat the tube first, applying heat at the point just adjacent to the fitting. Then work the flame around both the tube and the fitting until both reach the brazing temperature. When both have reached the brazing temperature feed the alloy into the joint, momentarily directing the flame to the tip of the filler metal to begin the melting process. Then sweep the flame over both the tube and the fitting to keep the metals at the brazing temperature while feeding the filler metal into the joint.

continued on page 2.

**COMING SOON: ALL DAY SEMINAR – 2 SESSIONS (morning & afternoon)
VFD (Variable Frequency Drive) Motors plus Scroll Compressor Technology**

Patience is a Virtue *When it Comes to Refrigeration*

One attribute all refrigeration technicians must possess is patience. Patience is vital for all aspects of a technician's job. It is required while maintaining, repairing and installing equipment, and even while troubleshooting systems.

Having patience is definitely a plus while troubleshooting systems. It is easy for a technician to rush to early conclusions, leading him to incorrectly diagnose a system problem. Many times a system must be thoroughly inspected before determining the root cause of the system problem. This may include measuring the system's suction and discharge pressures, evaporator and system superheat values, the amount of subcooling at the outlet of the condenser and perhaps some other system conditions. At times measuring these values takes time and it should not be skipped or, even worse, their values must not be assumed. When measuring a system's pressures and temperatures, a technician may need to let the system run for a period of time to allow the pressures and temperatures to stabilize. It is generally recommended to let the system run at least 10 to 15 minutes after a shut down or after any adjustments are made before relying on the measured values.

Patience is also required while maintaining systems. For example, a typical maintenance inspection on a system with an air-cooled condenser may require cleaning the condenser coil. Properly cleaning the condenser coil takes time and patience. It is important that a technician cleans both the outer and inner surfaces of the coil. Only cleaning the outer surface of the coil is not completing the task. Also, while cleaning the coil a technician must take care not to damage the fins of the condenser. This can easily happen if too much water pressure is used while rinsing the coil.

There are many times when patience is required while repairing systems. A typical example of this is the simple process of working with flare nuts. It is quite easy to cross thread a flare nut if care is not taken while assembling a flared connection. If the threads are not properly mated and a technician applies pressure with a wrench to tighten the flare nut, it is easy for the threads to cross and become

damaged. It is generally a good practice to always hand tighten a flare nut a few turns before applying pressure with a wrench. If the flare nut cannot be tightened by hand, find out why before taking a wrench to it.

Patience is always required during system installations. Technicians need to take time their time while laying out piping to ensure the system is properly piped together. Once the piping is installed the system needs to be properly evacuated. Most systems should be evacuated to a 500 micron level to ensure it is completely degassed and dehydrated. Sometimes this process is time-consuming and requires a technician to be patient and not shortcut the process.

Patience is definitely a virtue when it comes to troubleshooting, maintaining, repairing and installing refrigeration systems. It is a must for all technicians. Without it a technician's job can become quite frustrating. <<

TROUBLESHOOTING BRAZED JOINTS

continued from page 1...

If flux is used, this problem could also be caused by a breakdown of the flux due to excessive heat. If overheated, the flux can become saturated with oxides and the filler metal will not flow. Try using a softer flame or apply a heavier coating of flux.

Brazing alloy does not wet surfaces but balls up instead of running into the joint. This can be the result of several different problems: either the tubing and the fitting are not reaching the brazing temperature and the filler metal is being melted by the flame rather than the base metal, or the joint has been overheated and the flux is no longer active. Another potential cause of this problem could be that the tube and the fitting have not been properly cleaned.

Brazing alloy flows away from, instead of into, the joint. Be sure the fitting is at the brazing temperature and the flame is directed toward the fitting.

Joint leaks in service The majority of joints with leaks are the result of incorrect brazing techniques. Either the joint was unevenly heated (the entire joint did not reach the brazing temperature) or the joint was overheated causing volatilization of the elements. <<

JOHNSTONE [®] **Supplies Equipment**
JOHNSTONE [®] **Supplies Equipment**
 27-01 BROOKLYN QUEENS EXPRESSWAY WEST WOODSIDE, NY 11377
 FAX (718) 274-4972
 Large Local Stock Free Catalogue
718-545-4896
 WHOLESALE ONLY

Supco

SEALED UNIT PARTS CO., INC.
 P.O. BOX 21
 2230 LANDMARK PLACE
 ALLENWOOD, NJ 08720 USA
 (732) 223-6644
 FAX: (732) 223-1617

CSI
Support Services for the HVAC Contractor

 HVAC Water Treatment

 Specialty Cleaning Pipe • Duct • Coil

 HVAC Antifreeze

 Lab Services

 Indoor Air Quality

718-361-6666
 www.csiontheweb.com

UR TM
UNITED REFRIGERATION INC.
 Refrigeration, Air Conditioning, Heating, Supplies, Equipment & Parts
Jim Herlinger
 Branch Manager
 51-05 59th Place
 Woodside, NY 11377-7408
 Tel: 718 476-2600
 Fax: 718 476-2648
 Branchv2@uri.com

HALSEY ^{SUPPLY CO. INC.}
 FOR ALL YOUR
 AIR CONDITIONING REFRIGERATION
 EQUIPMENT PARTS SUPPLIES
 EPA-CERTIFICATION TESTING
 241 HALSEY STREET
 BROOKLYN, NY 11216
(718) 574-4774
 FAX (718) 574-4778

COMING EVENTS

Variable Frequency Drives
 Scroll Compressors
 Back to the Basics
 Refrigeration Piping Problems
 Troubleshooting Electric Motor
 Electrical Safety

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

SEE US 1st

Sid Harvey's
 WHOLESALE DISTRIBUTORS
 Refrigeration/AC/Heating
 BROOKLYN (718) 257-4039
 99-03 Foster Ave.
 JAMAICA (718) 526-0330
 139-29 Queens Blvd.
 MT. VERNON (914) 668-3631
 551 S. Columbus Ave.


Fire Ice Mechanical Inc.
 HVAC/R Service Contractors
KURT J. EGGERT
 Vogt Tube-Ice Authorized Dealer/
 Sales & Factory Certified Technicians
 Goldenrod Distributor;
 The Newest in Water Treatment Technology
 Air Conditioning & Refrigeration
 Tel (718) 631-1503
 Fax (718) 279-4686

ThermatiX Supply
 Plumbing, Heating, and Air Conditioning Supplies
 "We keep you supplied"

 73 Broadway, Hicksville, NY 11801
 toll free: (877) 390-9421
 tel: (516) 513-0985 / 0986
 fax: (516) 620-5942
 email: sales@thermatixsupply.com


 49-70 31st STREET
 L.I.C., NY 11101
 Phone: 718-937-9000
 Fax: 718-392-1296
 1-800-937-9000


Riccardo's by the bridge

WEDDINGS
OUR SPECIALTY
 Special Attention Given To
 Dinner Dances • Company Parties
 Cocktail Parties • Business Meetings
 Fund Raisers • Fashion Shows
 Engagement Parties • Christenings
 Special Discounts Given to Senior Citizens
Riccardo's by the bridge
 21-01 24th Avenue, Astoria, NY 11102
 718 721-7777
 ANTHONY M. CORBISIERO
 RICHARD F. CORBISIERO

METROPOLITAN NEW YORK CHAPTER, RSES

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

Wednesday October 14th, 2009 at 7:30pm

at

RICCARDO'S

21-01 24th Avenue, Astoria NY 11102

**Leak Detection:
From Bubbles to Light –
and Everything in Between**

By

Chip Clark— Gimper IV

PLACE LABEL HERE

EDUCATIONAL PROGRAM
Wednesday Oct. 14th, 2009
at 7:30pm
SEE DETAILS — THIS PAGE

