METROPOLITAN NY CHAPTER

Refrigeration Service Engineers Society

Continuing Education for the HVAC/R Industry

"Better Service Through Knowledge"

****

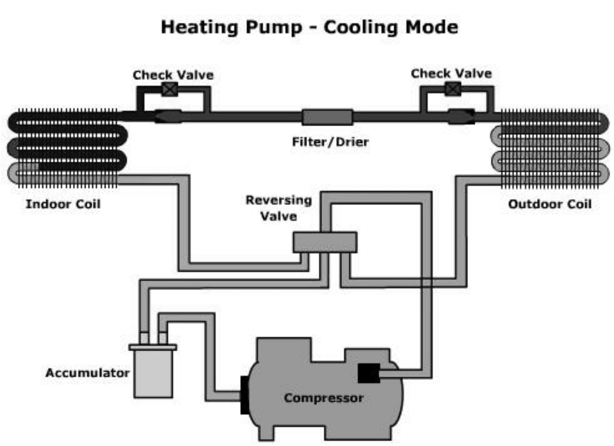
May 2015

WWW.METRONYRSES.ORG

Heat Pumps

Freeing a Stuck Check Valve

Heat pump systems need to use some type of check valve to either bypass refrigerant flow around a coil's metering device or force it through the coil's metering device. For example, when in the cooling mode, the check valve for an outdoor coil's metering device will allow the refrigerant to bypass around the metering device, and the check valve for the indoor coil will force the refrigerant to flow through its metering device. In the heating mode, the check valve for indoor coil's metering device will allow the refrigerant to bypass around the metering device, and the check valve for the outdoor coil will force the refrigerant to flow through its metering device.



Generally these check valves will be made with a brass body and an internal steel ball or disc. Sometimes a check valve will stick in one position, causing the system to malfunction. When this occurs a large magnet can be used to be try to free the valve's ball or disc. Simply place the magnet on the valve body and move it back and forth. Sometimes this will free up the check valve.

If this does free up the check valve it may not be a permanent fix. The check valve may stick again. If the valve sticks again, it should be replaced.

Striking Reversing Valves

A heat pump system that does not switch from the heating mode to the cooling mode, or from the cooling mode to the heating mode, could be traced to a problem with the reversing valve.

A reversing valve that does not switch the flow of refrigerant could be the result of several different causes, some of which are: a low system charge, a defective compressor, no voltage applied to its coil, or an internal problem within the valve such as a clog or a leak.

Many times a technician may attempt to hit the reversing valve with a hammer or a similar tool to break free an internal clog. This should be avoided. The body of the reversing valve is usually made from a rather thin outer skin of copper or brass.

Striking the body will likely cause damage to the valve. If the original cause of the problem was not a defective reversing valve, it is likely that you will not only need to repair the original problem, but also replace the reversing valve.

Electrical Safety

When replacing or repairing any electrical components, always verify that the voltage source is ***truly*** disconnected from the circuit. Test the circuit for the presence of voltage with some type of voltmeter or voltage indicator-**NOTE: always test this meter on another known voltage source first.** Do not solely rely on the electrical disconnect to ensure the voltage is disengaged.

Always verify this yourself.

It is possible that the disconnect may be defective or may have been bypassed by others. It is also possible that there may be another voltage source supplying the circuit not controlled by the disconnect shut down.

Ask Why

The main job of a refrigeration service technician is to fix problems. A system is not working so a customer calls the technician out to discover the cause and repair it. The customer relies on him/her to fix the problem effectively, efficiently, and with the assurance that the system will continue to work reliably. The customer hopes forever, but understands that is not practical and is satisfied with a system that performs reliably for a period of time, the longer the better.

So, a technician should not only fix the problem but—to the best of his ability–ensure the system operates reliably again, the longer the better. This means once a technician identifies the system problem, he should try to discover why the failure occurred and what can be done to prevent it from happening again. A good technician is like a good detective; once he finds the root cause of the problem he tries to discover why or how it happened. Sometimes the "why" is easily discovered, other times it's not so easy, and sometimes it's very difficult or even impossible to discover.

A technician should always make the extra effort and try to discover the "why". This means he may need to spend a little extra time on the job to inspect the system and the failed component(s). How much extra time should be spent looking into the system further depends on the system and the customer. Repairing refrigeration systems is a business and, like all businesses, common sense must prevail in how a system is repaired. A technician must judge how much extra effort is justified for the repair he/she is performing.

What can a technician do to try and discover the "why"?

One way is to open up the failed component to see what is defective inside. This may help to discover the "why". Another way is to re-inspect the system after the repair has been made and see if there are other issues with it. A technician can call for help and get advice from other technicians; maybe they have seen the problem before and know the reason "why" it occurred. If needed, a technician can call the system manufacturer or the local distributor for help.

Here is an example of how a technician can give a little extra effort and find the "why". A compressor fails. Normally this is quite easy for a technician to discover. But why did it fail? Many times a system problem is the cause of a compressor failure. After replacing the compressor a technician takes some extra time to examine the system. He/she discovers the thermostatic expansion valve is defective, causing liquid refrigerant to return to the compressor. The technician replaces the expansion valve and saves the replacement compressor from certain failure.

On another service call a technician discovers a frozen evaporator which was caused by a defective defrost timer. The technician replaces the timer and, after examining the system, also discovers the defrost termination switch is defective and has been disconnected. The system had been terminating defrost based on time and not temperature, as originally designed. The technician replaces the defrost termination switch and prevents the system from possibly over defrosting.

Become a better technician and ask the "why". Your customers will appreciate the extra effort and rave about you and your company.

Types of Plastic Tubing

There are many different types of plastic tubing used in our industry. Technicians should be familiar with their uses and limitations. Below is information on some of the popular plastic tubing used on RHVAC systems:

PVC: Polyvinyl Chloride. This pipe is strong, rigid and resistant to a variety of acids and bases. Some solvents and chlorinated hydrocarbons may damage the pipe. Maximum useable temperature is 140°F and pressure ratings start at a minimum of 125 to 200 psi (check for specific rating on the pipe). Can be used with water, gas and drainage systems but not with hot water systems.

ABS: Acrylonitrile Butadiene Styrene. This pipe is strong and rigid and resistant to a variety of acids and bases. Some solvents and chlorinated hydrocarbons may damage the pipe. Maximum useable temperature is 160°F at low pressures.

CPVC: Chlorinated Polyvinyl Chloride. Similar to PVC but designed specially for piping water up to 180°F (can actually withstand 200°F for a limited time). Pressure rating is 100 psi.

PE: Polyethylene. A flexible pipe for pressurized water systems, but not for hot water.

PEX: Cross-linked Polyethylene . A flexible pipe for pressurized water systems. Cross-linked refers to its molecular structure.

PB: Polybutylene. A flexible pipe for pressurized water systems both hot and cold. Only compression and banded type joints can be used with this tubing.

COMING TOPICS

High Velocity Air Conditioning

Solid State System & Safety Controls

New Scotsman Ice Machines – Technology, Servicing & Troubleshooting

Unbelievable Customer Relation Stories and other Tales from the Trenches—From a Prior Owner who has Seen it All

Eliminate Connecting Manifolds and Hoses Forever

Low Temperature Radiant Heating

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

METROPOLITAN NEW YORK CHAPTER, RSES

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

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

Wednesday May 13th, 2015 at 7:30pm

at

RICCARDO'S

21-01 24th Avenue, Astoria NY 11102

High Velocity Air Conditioning: Alternate Air Conditioning Solutions

By

Rob Morrison—Unico

PLACE LABEL HERE

EDUCATIONAL PROGRAM

Wednesday May 13th, 2015

at 7:30

SEE DETAILS—THIS PAGE

RSES®
The HVACR Training Authority
Metropolitan New York Chapter
Refrigeration Service Engineers Society
241 Halsey Street
Brooklyn, NY 11216