METROPOLITAN NY CHAPTER
Refrigeration Service Engineers Society

Continued Education for the HVAC/R Industry

"Better Service Through Knowledge"

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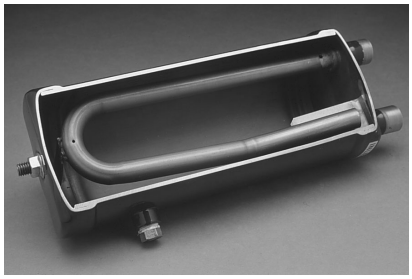
EMPIRE KEYSTONE ASSOCIATION — BETTER SERVICE THROUGH KNOWLEDGE

Suction-Line Accumulators

A suction-line accumulator is a safety device used mainly on a refrigeration system to prevent liquid refrigerant from returning to the compressor. Liquid refrigerant returning to a compressor can lead to several problems. One of these problems is bearing washout. The liquid refrigerant returning to the compressor mixes with the oil and this mixture is then used to lubricate the bearings within the compressor. This mixture is a very poor lubricant and will lead to premature bearing failure.

The basic design of a suction-line accumulator used on commercial refrigeration systems is a U-shaped tube enclosed in a large volume vessel. One end of the U-shaped tube is connected to the suction line leading back to the compressor, and the other end is open to the tank.

The suction line from the evaporator is then connected to the top of the shell of the tank. If any liquid refrigerant enters the accumulator it will be exposed to a large volume of the tank, causing it to evaporate and return only refrigerant vapor to the compressor. There are also two small holes drilled in this U-shaped tube. One hole is drilled at the bottom bend which allows a small amount of oil and possibly some liquid refrigerant which collects on the bottom of the tank to be safely metered back to the compressor.



There is also a small hole drilled at the top end of this tube, referred to as a *pressure equalization orifice*. When the system shuts down, it is possible for liquid refrigerant to collect in the bottom of the accumulator and because of the small hole drilled in the bottom bend of this tube liquid refrigerant will also collect here. On start-up liquid refrigerant could then be sucked out of the tube and return to the compressor. To prevent this from occurring, a small hole is drilled at the top end of the tube. This small hole equalizes the pressure on both sides of the liquid in the tube and prevents the liquid refrigerant from being sucked out on start-up.

Some accumulators will have a section of the liquid line run through the bottom section of the accumulator. This warm liquid refrigerant helps to evaporate any liquid refrigerant which collects at the bottom of the accumulator. This is also another benefit to this design: the liquid refrigerant in the liquid line will gain additional subcooling thus increasing the net refrigeration effect of the system.

Since accumulators are typically made of steel and may operate at temperatures below the dew point temperature of the surrounding air, the development of rust leading to a refrigerant leak is a common problem. Although manufacturers do coat the surface of their accumulators with a rust-preventive paint, if the steel surface is exposed rust can develop. This can happen during the installation process of the accumulator. If care is not taken, the paint near the line connections can be burned away exposing the steel surface of the accumulator. If this does occur, the surface should be recoated with silicon or some other coating to protect the steel surface from rusting.

Accumulators are only a safety gap for liquid refrigerant returning to the compressor. They should be not used to solve a system problem which is causing liquid refrigerant to regularly return to a compressor. If liquid refrigerant is found continuously returning to a compressor, the root cause should be identified and repaired.

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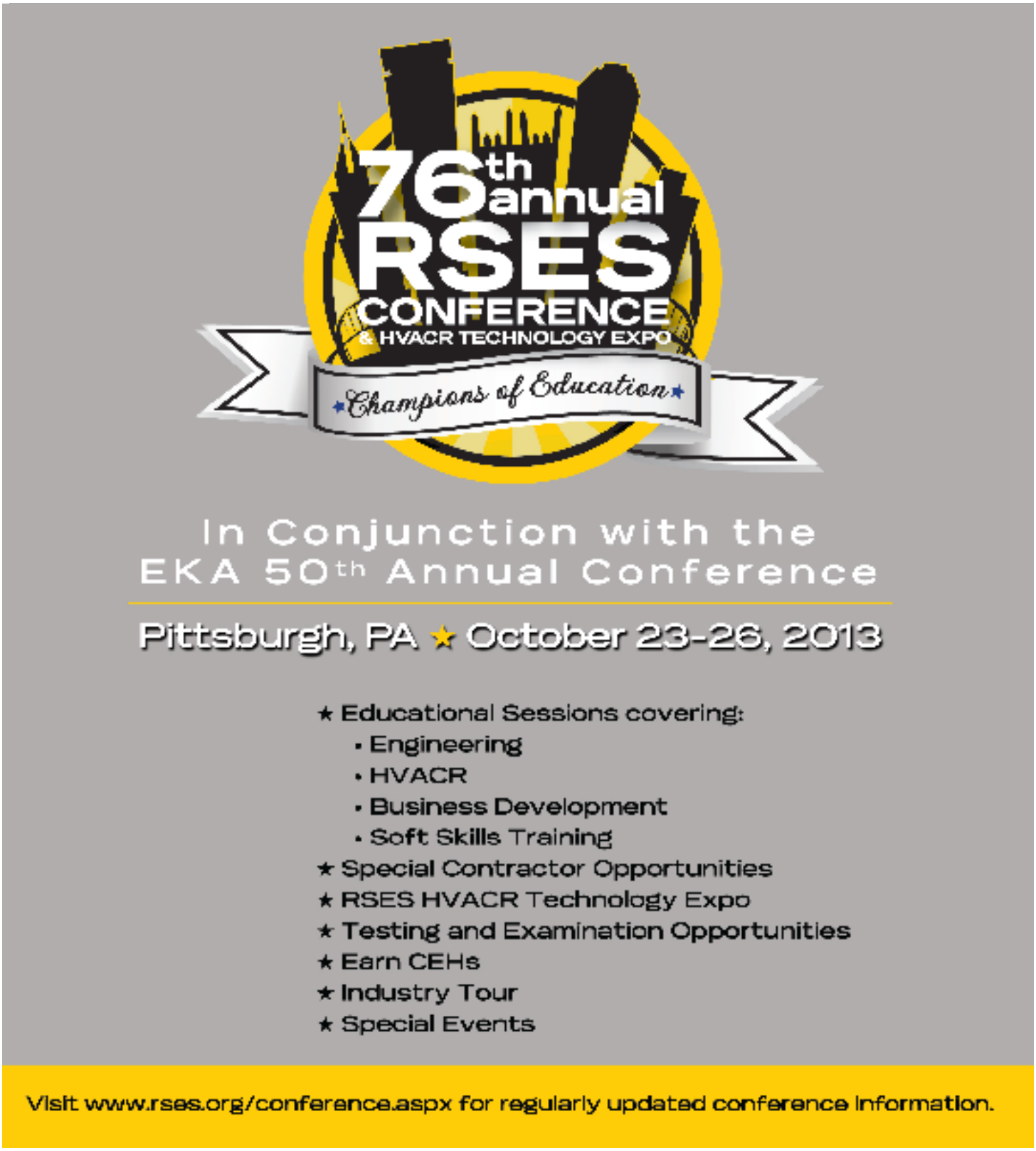
Brazed/Soldered Components

When replacing system components that are brazed or soldered in a system, it is normally safer to cut out the original component rather than unbraze or unsolder it from the system.

The reason for this recommendation is that oil may be present inside the joint of the component that is being removed. Heating the joint can cause the oil to ignite, and potentially cause injury.

When cutting the component out of the system, do so at an easily accessible location. Once the component is removed from the system, transfer the remaining stubs from the old component to the new component and then braze or solder the complete assembly back into the system.



The Electrical Training Center is looking for donations for any HVAC/R equipment available. Broken, used and new equipment are all greatly appreciated.

Is your company currently looking for helpers? Please let us know. We have classes graduating in the HVAC/R and Electrical fields. Please contact justin@electricaltrainingcenterli.com or call 631-226-8021. Thank you,

Justin Ralph—Student Services/Marketing Coordinator

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METROPOLITAN NEW YORK CHAPTER, RSES

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

Your Chapter Officers and Board members wish you all a successful and safe summer season.

We look forward to seeing you in September

SAFE & HEALTHY

for another informative series of Educational Programs.

Wednesday May 8th, 2013 at 7:30pm

at

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By Scott Aveni—Copeland Division, Emerson Electric

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EDUCATIONAL PROGRAM
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