# Service Notes SHP-036
# GENERAL INFORMATION

**September 15, 2010**

**Subject:** Replacing R-22 Systems with R-410A Systems.

**Units involved**: All R-410A Split Systems, AC and Heat Pumps.

**Date codes involved:** All R-410A Split Systems

## Details:

Over the past several years, and primarily since the changes in the law requiring the phase out of HFC and HCFC refrigerants, the use R-410A refrigerant and minimum efficiency levels, the industry has found some unprecedented issues come to light.

Installers often ask if they must replace the line-set when installing a new R-410A system in place of an existing R-22 system. Clearly, this is the most reliable practice and is preferred in all cases. The existing R-22 line-set may be used if the installer follows the guidelines below.

1. Is the current line-set the proper size for the new equipment selected? If not, the line set must be replaced regardless of how clean the line-set is.
2. What were the operating conditions of the previous system? If it was burnt out or ran low on refrigerant several times, it is likely the system has acid or other contamination in the line-set.
   The new mixture of R410A and POE oil will act as a solvent and clean the lines which will ultimately re-deposit the substance in metering devices if not captured by a filter drier.

Rheem/Ruud has not tested, and therefore does not recommend flushing agents as a viable means of cleaning a line set to remove residue from the inner walls of a refrigerant line. While a proper flushing practice may be effective in clearing some residual oil, it will not offer the same level of cleanliness a new line-set has to offer. Additionally, any flushing agent or loosened residue that may be left in the system can be more problematic.

It should be considered best practice to install a filter-drier on all R-410A systems, and every unit is shipped with one. Keep in mind these factory supplied filter-driers are intended for use on a clean system with a new line-set. If the installer is using an existing line-set, it may be wise to install a larger capacity clean-up filter-drier rather than the one shipped with the system.

Regarding cooling only systems, the filter-drier should be installed near the indoor coil. This will be the best way to ensure there is no residue getting into the metering device.

On heat pump systems, the drier should be installed nearest the metering device being used first in commissioning. In applications where an existing line set is used, even after

flushing, it is recommended that a filter drier be installed at both the indoor coil and at the outdoor unit. This may seem to conflict with “old-school” wisdom, however, the move to HFC’s and POE oils have changed the rules.

Sampled and dissected metering devices and reversing valves returned indicate a considerably higher failure rate on systems where the existing line-set has been used. Many of these metering devices have been found to have a sticky substance which appears to be made up from residue from the existing line-set.

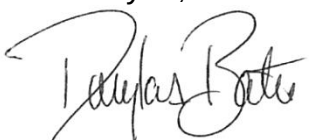
It should be clarified, vacuum pumps do not “suck” moisture out of a system, simply stated, they reduce the atmospheric pressure and boil moisture changing liquid to vapor. The vapor then crystallizes. Because the pump does not suck, the crystals are left in place. Triple evacuation is the best method to removing moisture, and is crucial, but soot, acid and oil are not removed by evacuation.

Technicians who are ill-informed may believe acid neutralizing products (using a base to offset the acid) will solve an acid problem. This is simply not the case. Keep in mind, neutralization reaction follows the fundamental laws of chemistry. Acid and base react to form the basic elements of salt and water. The salt that forms is a corrosive metallic salt sludge, which remains in the system to corrode components and potentially clog small passageways (such as TXV’s). As we know, every acid neutralization reaction leaves a residue. Water will speed the acid formation creating a snowball effect. Acid must be removed, not neutralized. An acid removing drier must be used to collect the acid, then disposed and replaced with a clean filter-drier.

The air conditioning professional installing the equipment is aware that the best way to prevent a potential failure is to follow best practices during the installation.
Some Additional Tips to consider.

- Never un-sweat a filter drier out of a system.  Cut it out using a tubing cutter.
- Never use a saw to cut refrigerant lines.
- Suction Line Filter-Driers are to be removed after a few hours when used.
- Anytime a system is opened, the liquid line filter-drier should be replaced.
- During service, measure temperature drop across the filter-drier. Limit delta to 2 degrees.
- Evacuate all systems to 500 microns.
- Use a nitrogen purge when brazing to prevent oxidation and scaling (soot) inside the tubing.
- Use a wet rag or heat block when brazing near TXV’s, Reversing Valves or Service Valves.
- Promote and attend training events whenever possible.

Thank you,



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