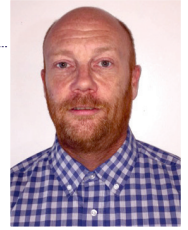


# Last Word

## Common Myths in Residential Air Conditioning

BY BRUCE WELLS



Shortly after starting in this trade, a gentleman named Sam Hewitt Sr. (a close friend and early mentor) told me, “This trade is forever evolving. Study, research, and learn to evolve with it. If you do, you will always be in high demand.” Those words have always stuck with me.

While I have always strived to do just that, I don’t think I ever grasped how true those words were up until recent years. Through working in nearly every aspect of HVACR over the last three decades, I’ve run across many practices that are either dated, inefficient, or simply improper. In residential HVAC, it seems there are many practices that follow myths rather than the laws and principles of refrigeration. Below are what I feel to be the top three myths in residential A/C.

**MYTH 1:** *Line sets need to be flushed using a chemical solvent when switching from R-22 to R-410a.*

Early during the phase out of HCFC refrigerants and the transition to HFC refrigerants, there was concern that mineral oil and POE oil would not mix and possibly cause adverse chemical reactions within the system. Upon further research, mainly with commissioned systems in the field, it was found that solvent flushing does more harm than good. Not only is it ineffective and removing the old mineral oil 100%, no matter how well you follow up with nitrogen and evacuation, trace deposits of solvent will remain in the lines.

These trace deposits continue to break down the oil in the new system, which can and will ultimately lead to premature failure of the compressor. It was also learned that mixing of mineral oil and POE oil actually poses no threat at all. In fact, many HFC blends that do not contain a hydrocarbon additive call for a mix of mineral oil and POE oil to ensure proper oil return. Many manufacturers, including Trane/AS, Rheem/Ruud, and Emerson/Copeland started sending out bulletins 10 years ago warning against the use of flushing agents, yet the practice of doing so remains to be more common than not.

**MYTH 2:** *Oil traps are needed in suction risers when the condenser is mounted above the evaporator.*

While this one does bear some truth, the fact is they have not been needed for quite some time. Not on HFC systems anyways. When HCFC systems that use mineral oil were common, traps played a very significant role in return oiling. With HCFC refrigerants and mineral oil being only partially miscible, the refrigerant basically has to “push” the oil throughout the system. On a suction riser in these systems, much of the oil is lost as the refrigerant is pulled through the circulating oil. Traps serve as both a collection point for this lost oil and a pick up point to continue lifting the oil back to the compressor.

Now on HFC systems that use POE oil, both the refrigerant and oil are completely miscible. What this means is the refrigerant basically “carries” the oil and they move as one throughout the system. Have you ever noticed the excessive amount of oil lost when removing your hoses on a R-410a system in comparison to a R-22 system? This is why.

For this reason, traps are not needed on HFC systems. In fact, they actually hinder oil return through velocity loss and will pull oil from the refrigerant as it passes through from the added friction. Only in cases of extreme lift would the friction of the riser warrant the use of a trap. For most manufacturers, this height is over 80-ft. In many instances, this will exceed the vertical lifting capabilities of the compressor.

**MYTH 3:** *Refrigerant circuit restrictions reveal themselves as low suction and high head pressure.*

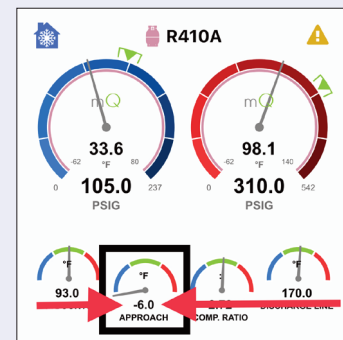
The fact on this one is that a restriction actually lowers both suction and head pressure. In a properly charged system, when a line becomes restricted, it essentially cuts off the feed to the compressor. It also reduces flow through the evaporator, which means less heat is absorbed to later be rejected in the condenser. Both

of these things in turn result in lower head pressure. I have seen this trick even the most seasoned of techs. I can only assume that’s because we can get caught up in the daily grind and sometimes overlook the basics. The only time you’ll see elevated head pressure with a restriction is if a previous tech misdiagnosed and excessively charged the system in attempts to raise suction pressure.

*Bruce Wells is a Journeyman HVACR technician and a master sheet metal fabricator with 30 years of experience in service, maintenance, and installation of residential, commercial, and industrial equipment.*

### ▶ TROUBLESHOOTING ANSWER

If you said to look for a restricted filter/drier inside the condensing unit then you would be on the right track. The telltale indicator in this diagnosis is the liquid line temperature measured just outside of the condensing is BELOW the outdoor temperature by 6°F which is called a -6°F approach. In a normally operating system with a dry coil, it is impossible for the liquid line to be colder than the outdoor temperature because the outdoor air is the medium to which the heat was just rejected.



The exceptions to this would be a restriction prior to the measurement point resulting in a liquid pressure drop and flashing, a wet condenser coil or a case where the refrigerant is something other than what you thought it was.

Some system manufacturers install a line drier inside the cabinet of the condensing unit so the next logical step would be to look for a temperature drop of more than 3°F across the factory installed liquid line filter/drier.