

Doug Rye *says ...*



Improperly installed systems can't keep you cool

Boy, it is hot outside, again. When you receive this copy of *Rural Arkansas* magazine, which should be in early August, it could very well be the day of my wedding anniversary. Several years ago in early August, I was on my way to a Baptist church in Jacksonville, Arkansas. I was driving a blue 1963 Volkswagen Beetle with a 40-horsepower motor and no air conditioner. I was going to marry one of the prettiest and sweetest girls in Jacksonville. I thought, "It can't get any better than this." But was it ever hot.

There was a large group of folks in the church. It appeared there were many who wanted to see the lady who would marry a nut like me. The reception was held in the Willie Wiredhand room at the First Electric Co-op where my new father-in-law worked and later retired as a lineman. Did I mention that it was hot? The cooling systems at both locations struggled and simply could not keep up with the demand.

Well, that is now history and God has certainly blessed our marriage. Just after our wedding, I began to be involved in heating, cooling and energy efficiency and I am still doing that today. Each August, along with my anniversary, I can count on receiving many calls about cooling systems that can't keep up. Two months ago, in this column, I discussed some of the reasons why some systems have such problems. The response to that column was quite impressive and by that I mean I received a lot of calls. Many had questions about whether or not they could enlarge the size of the return air system. A few had more technical questions. But the one that really got my attention was from a lady who had recently had a new system installed. It was not cooling her house, she said, and she was ready to whip someone. Our phone conversation went something like this:

Me: Hello, this is Doug Rye.

Caller: Well, hi, this is Sarah. Am I speaking to Mr. Rye?

Me: You certainly are. How may I help you?

Caller: We live in an older house and a few months ago we had a local company install two new package units.

Me: Yes, m'am. And what is the size of your house?

Caller: It is a two-story house with about 1,000 square feet upstairs and 1,600 square feet downstairs. They installed two 3.5-ton systems. Does that sound about right?

Me: Well, I haven't seen your house so I do not know

what it needs for heating and cooling. But 7 tons is probably plenty of capacity to say the least.

Caller: Well, I just finished reading your column, "Thou shalt provide adequate air." If I understood correctly, you said each unit needs 7 square feet of return air.

Me: No m'am. Each unit needs about 3.5 square feet of return air. However, the return air filter grille does need to be 7 square feet.

Caller: Oh my gosh, oh my gosh. No wonder my house isn't cool. My upstairs return air filter is 11 by 16 inches.

Me: Oh my gosh, oh my gosh. How about the downstairs?

Caller: That filter is 20 by 24 inches. And I removed the grille from the wall and there was no ductwork at all. All you see is a 2- by 4-inch wall with a hole about 3 by 14 inches chiseled out for the air to go through.

Me: Oh my lands, Sarah. You have 3.5 tons of cooling equipment, which means you need 504 square inches of return air but it only has 42 square inches available. You are probably getting only a ton of cooling from the 3.5 ton unit.

Folks, I have written this conversation exactly as I remember except for her name, which I changed. I'm not sure that I want to know what happened next but I am worried about her house. As I have thought about her situation, I came up with this demonstration to help illustrate it. Raise your hand and touch your thumb to your first finger. That should form an O with a diameter of about 1.5 inches. Now, blow one breath of air through the O. Now, make the O smaller and blow another breath into it. Do this several times until the O is about the size of a pea. You will notice that every time the hole gets smaller, it takes more energy and more time to move the air. The air sound also gets noisier. The cooling system with an undersized return air works the same way. The system has to work harder, longer and is noisier, none of which is beneficial to the equipment or the one paying the energy bill. In fact, if her system has a variable speed fan, it might be pure havoc. The solution is to get a reputable and knowledgeable heating and air company to check your system for ductwork leaks, proper sizing of the return air, etc. Also, many local electric cooperatives will do free energy audits of your home as well.

See you next month when it will still be hot during the day, but cool at night.

P.S. My wife is member of First Electric Co-op and she will be getting this magazine, too. So, happy anniversary, sweetheart!