

ASK THE INSPECTOR COLUMN FOR JUNE 1, 2016
HEADLINE: UNDERSTANDING YOUR AIR CONDITIONER

The sudden change in weather has brought a number of questions about air conditioners. It seems that some readers are using theirs already. It is no secret that the climate is changing and we are experiencing warmer days. Ten years ago, I might see an air conditioner installed in every 7th or 8th home that we inspected. Today, that has increased to more like every second or third home. With our changing climate, even with an average cost around \$3000 per installation, it has almost become a necessity for a good night's sleep!

Central air conditioners are actually a split system. The outdoor unit or condensing unit, as your HVAC tech will call it, and an indoor unit. The indoor unit is your furnace, which acts as the air handler, by way of the furnace fan. The evaporator coil or "A" coil, as it is sometimes called, is usually installed no less than four inches above the furnace and is contained inside the ductwork. Your compressor, housed inside the condensing unit, changes the refrigerant into a high temperature high-pressure gas. As this gas flows through the outdoor unit, it loses heat and, subsequently, condenses into a liquid. This liquid now travels into the house, through copper tubing, and on into the evaporator coil mounted on top of the furnace. After it absorbs the heat that is being circulated through the ductwork by the fan from the furnace, it becomes a gas. This cool air now flows through your home. The moisture, which condensates off of this coil, drains to a pan installed below the "A" coil and then discharges to a sink or to an external drain. This process is similar to what happens when moisture condensates on the outside of a glass of ice water on a hot humid day.

Sometimes it is necessary to pump this condensed water away and this is done by a small pump, often called a "Little Giant" pump, which is wired to operate with your system. The heat absorbed by the refrigerant is carried back outside through the copper tubing and is released into the outside air by the fan in the condensing unit. During a warm day in the mid 20's C., the air coming off your condensing unit can reach close to 60 C, while the gas inside the system may be in the 10 C range.

There has been considerable discussion about the refrigerant used in air conditioners. The older A/C units contained Freon or R-22 gas. Freon is actually the brand name that belongs to Dupont Chemicals. The real name is halogenated chlorofluorocarbon, CFC for short. It has long been known that this refrigerant is very harmful to the atmosphere. The replacement refrigerant is known as R-410A or Puron and is now the standard in Ontario, where Freon is no longer permitted. This gas is not harmful to the atmosphere. The US government mandated this refrigerant change in air conditioner manufacturing back in 2010 and Freon use is to be discontinued by 2030. Canada has followed suit and all new air conditioners must contain Puron gas. These units are slightly more expensive and the new gas is not interchangeable with Freon. These R-410A (Puron) refrigerant units operate under a higher pressure and this means that the compressors and tubing are heavier.

Air conditioners are energy rated by a system called Seasonal Energy Efficiency Ratio or SEER. The higher the SEER rating, the more energy efficient the unit is. A

minimum of fourteen is now the standard. I suggest checking your air conditioner to see how it is rated. If the unit is over twenty years old, there is a good chance its rating is less than ten. SEER ratings up to seventeen are not uncommon with the newer models. This suggests that a new unit could cut your air conditioning costs by a 1/3 to 1/2.

Not surprisingly, there are good and not so good service technicians. Your system should be serviced annually and should include, 1) checking for the correct amount of refrigerant; 2) Testing for leaks using a leak detector and ensuring that the system is balanced; 3) properly capturing any refrigerant that may be removed when repairs are needed and the refrigerant has to be drained out; 4) Measuring the airflow through the evaporator coils; 5) Verifying that the correct electrical sequence is operating and that the furnace and A/C cannot operate at the same time; 6) Checking the refrigerant lines for corrosion and any damage to insulation; 7) Checking all connections and cleaning/replacing as needed; 8) If your furnace fan is belt driven, ensuring it is tight to specifications and that the motor is oiled, if needed; 9) Cleaning and checking the "A" coil for dirt build-up and leaks; 10) Making sure that the condensation line is clear and, if there is a pump installed, confirming its operation.

As a homeowner, keep the compressor clear of shrubs and debris; at least 2-3 feet around the unit. The compressor should also be level. Remember to replace your furnace filter regularly. If you run your system regularly, change the filter every 6-8 weeks. Take a look at your exterior refrigerant lines and, if they look deteriorated, call your TSSA licensed A/C technician. Take the time to seal the joints in your ductwork. This can make a considerable difference in your air conditioner's efficiency. One study I have says that up to 25% of you're A/C and heated air escapes through the joints in your ducting. One last tip; if possible, close off your basement from the main floor. This will also help your operating costs.

Finally, install a programmable thermostat and regulate your system so that it is not cooling your home fully when you are away at work. Most new units can make a substantial comfort difference if they are regulated to kick in a half-hour before you arrive home. Your pocket book will appreciate this.

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