

METROPOLITAN NY CHAPTER Refrigeration Service Engineers Society

Continued Education for the HVAC/R Industry

“Better Service Through Knowledge”

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What It Takes to be a HVAC/R Technician

Servicing and maintaining HVAC/R systems requires a technician with a unique set of skills. Not only must a technician be proficient in the refrigerant cycle and all of its components, he also must be knowledgeable in many other trades. A HVAC/R technician is also

- Part electrician;
- Part plumber;
- Part engineer;
- Sometimes, part welder or carpenter;
- And of course, let's not forget: Part salesman;
- Part customer service representative;
- And sometimes even, part outdoorsman.

Understanding an electrical system and its applications is most definitely a big part of a technician's job. While installing a system, a technician may be tasked to run an electrical service to the equipment. He needs to be knowledgeable in the sizing and installation of this wiring. When it comes to troubleshooting, a refrigeration technician must have a strong understanding of electrical theory since a major part of a technician's job is working with electrical devices.

Some HVAC/R systems require some type of drainage. When installing equipment, a technician must be able to properly run any drain lines. And while servicing equipment, he needs to be able to solve any problems associated with poor drainage.

A technician may not realize it, but sometimes he is part engineer. He may be tasked with modifying equipment in order to satisfy a customer's request or to enable a system to function properly. He will then need to change the system's design or re-engineer its modifications.

Welding and carpentry are also required skills in our industry. Installing and servicing a system may require some minor welding work such as putting together a frame to hold a condensing unit or repairing a bracket on a system. Occasionally a technician must also use his carpentry skills when installing an equipment.

For the most part HVAC/R technicians are the type of people who are not afraid to tackle a job and can fix just about

anything they set out to. They are not perfect but they will give it a good try and many times they will succeed. Besides the technical skills required, there is definitely a sales and customer service component to being a technician. HVAC/R technicians are always selling their service, equipment or parts to a customer and at times dealing with irate, frustrated or unpleasant customers. They must be adequate salesman and have outstanding customer service skills.

Occasionally a technician will have to deal with working on systems that are exposed to extreme weather conditions. Whether it is working outdoors on a condensing unit or inside a walk-in freezer, he needs to be prepared and capable of working under these conditions. A technician should know how to dress appropriately to be able to work efficiently under all weather conditions.

A good HVAC/R technician would be a good technician in any of the construction trades. He has a unique skill set that covers a wide spectrum of trades; he normally adapts well when working with different technologies and equipment. A good refrigeration technician is a jack of all trades and yes, a master of some.

The History of BX Cable

The use of armored cable did not become widespread until 1910, and it did not achieve major popularity until the late 1920's or the early 1930's. In 1959, "BX" was never an NEC or UL or ANSI designation. As of 1932, armored cable was officially called "Type AC," although BX (the trademark of cable made by G.E.'s Sprague Electric Division) was then and still is the common term.

Up to WWII, Washington, DC allowed no use of NM (Romex) type cable in any building construction, but they permitted the use of armored cable in basements as an experiment. This was done to determine the resistance of armored cable to rodents and nails. It is rumored that the name "BX" became a secret manufacturer's designation for "Cable, Basement Only, Experimental," hence the name BX.

It soon became the official manufacturing trademark after acceptance and testing by Underwriters Laboratory and the National Electric Code.

Shortcuts

Taking shortcuts on a job may save time but may cause a technician to work in an unsafe manner. This is not a wise trade off. Do not take any shortcuts that may cause you to work in an unsafe manner. It is simply not worth the few extra minutes you may have gained.

For example, sometimes the circuit breaker for an electrical circuit is not easily identified and a technician chooses to work on the circuit live rather than taking the time to find the circuit breaker. This is not a wise choice. Sometimes the ladder a technician is using is just a little too short for the location he is working on, and he decides to use the top step of the ladder and stretch to reach the required location. This is not a wise choice.

Other times a technician may not wear required protective gear, such as safety glasses, because they are in his truck and it is a good distance away and he does not want to take the time to go get them. This is not a wise choice.

There are many more examples of unwise choices technician may face while servicing and maintaining systems. Before taking a shortcut on a job, think first **"Is it a safe shortcut and a wise choice?"**



Disposal of Empty Non-Refillable Cylinders

Non-reusable non-refillable cylinders cannot be used for any other purpose once all of its contents has been removed. These cylinders must be properly discarded when emptied.

Before disposing of non-reusable non-refillable cylinders a technician must make sure all of its contents are removed using an approved refrigerant recovery device. Once emptied the cylinder's valve should be opened to allow air to enter, and the cylinder should be punctured with the valve still open (rendered useless). The used cylinders can be recycled with other scrap metal.



Never leave used cylinders with any residual refrigerant either outdoors or at a job site. The internal pressure of a cylinder with even a small amount of liquid refrigerant is exactly the same as a full cylinder. An abandoned cylinder will eventually deteriorate and can explode if the cylinder wall weakens.

Changing V-Belts

Changing fan belts is a common task for many RHVAC technicians. When working around any rotating machinery safety precautions should be taken to prevent injury. Below are some general safety tips to follow when changing V-belts:

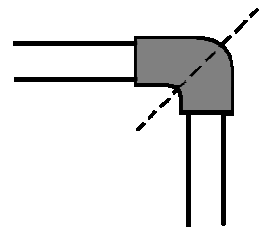
- Never try to stop a V-belt drive with your hands. Let it stop completely on its own before working on the fan assembly.
- Do not put your fingers under the V-belt. If the fan or drive moves, your fingers could become trapped between the V-belt and the drive and cause severe injury.
- Lock out the fan circuit to prevent the motor from starting while the belt is being changed.
- Block out the fan to prevent it from rotating while the belt is being changed.
- Replace fan guards, if equipped, before energizing the fan.
- Loosen motor mounts to remove V-belts, avoid stretching the belt over the either of the sheaves.
- Replace belt with motor mounts loosened and then tighten per manufacturer's recommendations.

Cutting Out a Copper Elbow

It is not uncommon for a HVAC/R technician to occasionally need to either install or repair some type of copper water lines which are soldered together. One of the problems when working on these lines is repairing leaks on the various fittings.

When encountered with a soldered fitting which is leaking, it is normally best to remove and replace the fitting rather than attempt to re-solder the joint. Re-soldering may work, but many times it will be a difficult procedure. Again it is best to simply "bite the bullet" and replace the fitting.

Occasionally when encountered with an elbow, there may not be sufficient room to easily heat the joint and remove the elbow. Sometimes it may be necessary to cut out the old elbow. An easy approach to cutting out this type of fitting is to cut the elbow on its diagonal (as pictured) with a good quality hacksaw blade. With the elbow cut into two pieces, each end can be heated and then easily removed. The ends can then be cleaned and a new elbow soldered in place. This procedure eliminates the need to use any additional fittings to reconnect the water lines.



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