A typical springtime air-conditioning startup includes coil cleaning, checking refrigerant pressures and other inspections right out of the HVAC service textbooks. However, A/C textbooks rarely mention preventative-maintenance procedures and a host of the “little things” service techs can provide to go the extra mile.

The little things might include: removing rust and applying an anti-seize coating to a motor shaft; tightening electrical terminals; sealing small air-handler crevices where air can leak out; adding a few biocide tablets to a drain pan; or touching up a rusty filter-drier with a galvanizing spray. That extra service may not be immediately noticeable to the customers, but over the long term, their systems will run better and last longer.

There are also a host of things not to do, such as using toxic, corrosive coil cleaners on sensitive coils. Another tip a textbook does not reveal is the differences in insecticides. Ordinary household insecticides may conduct electricity and can electrically short out the run capacitor, compressor contactor or other components when spraying a hornets’ nest in a condenser.

These little things take time and a service tech’s first thought is how to get paid for the extra work. Invoices can be redesigned with a checklist itemizing preventive-maintenance safeguards. The checklist educates the customer and separates the service tech from the competition. For example, a service call invoice might offer a customer “good,” “better” and “best” preventive-maintenance programs that are charged according to services rendered. Would customers pay an extra $10 to $25 per service call knowing that the service techs did more preventative-maintenance procedures to preserve their air-conditioning systems long term? Numerous studies prove customers are willing to pay for better service.

**PM offerings**
The following list features some of the extra preventative-maintenance services and aftermarket products a service tech can offer a customer during A/C season startup.

**Electrical contacts**—Tightening electrical connections is one example of providing service that goes the extra mile. Most service techs routinely check connections at the compressor contactor, but probably not at the disconnect, breaker or all low-voltage contacts. It is especially appropriate to check aluminum-to-copper dissimilar metal connections as they tend to loosen. Likewise, wiring that is attached to components that vibrate or change temperature, such as compressor wires secured to suction lines, are also prone to...
loosen. A copper-based anti-seize product appropriate for electrical connections is another good preventive to minimize loose connections.

**Rusty shafts**—An often-overlooked area during the A/C startup season is a rusty condenser fan motor shaft. When a shaft gets a little rusty, the sharp abrasive rust particles can damage oil seals and very possibly cause premature motor failure. Rust can be removed with sandpaper and the shaft can be coated with the same aforementioned copper-based anti-seize product used for electrical connections. Furthermore, a fan blade is easier to remove for replacement if it was maintained previously with an anti-seize spray.

**Insecticide**—Spraying a hornets’ nest inside a condenser with a household insecticide can actually conduct electricity and affect the unit’s electrical performance. Most household insecticides can conduct electricity between terminals and can short out electrical components. Therefore, a specialty non-conductive (up to 47 kV) insecticide should be used. Most HVAC wholesale distributors carry non-conductive insecticides.

**Condensate debris**—Condensate drain lines have a propensity to clog, but adding a biocide to the drain pan could slow or eliminate debris buildup. Using some type of preventive tablets or pads in the primary drain pans is a great idea, however not all drain tablets are the same. Reviewing the label ingredients is important. For example, a tablet or treatment listed as a green or non-hazardous product is probably not biocidal and will not kill biological contaminants in the pan or drain. Instead, it is designed to actually dissolve into a very slick coating to prevent contaminants from sticking to drain pans and piping, which can be effective if the pads or tablets are used from the unit’s initial startup and replaced every 90 days. If not, a biocide treatment is needed. Location in the drain pan is important. Strong, harsh tablets are probably chlorine based, so it is important to keep them from touching evaporator coil fins. Mini-split evaporator coils are more sensitive to harsh chemicals. Therefore, their drain-pan treatments use safer EPA-listed mini-split chemicals that can double as treatments for unitary equipment too and save service truck space. Also, sensitive occupied areas, such as healthcare facilities and schools, may require an EPA-listed biocide for use in the air streams.

**Acid neutralizers** remove acid from a refrigeration system. It is a one-time use neutralizer that remains within the system without harming components. It is an additive that is OEM-approved for neutralizing acid after a burnout by several compressor manufacturers for OEM use. Photo credit: Natali Villanueva, RectorSeal, photographed at the ARS/Rescue Rooter’s Air Conditioning Service Technician Training Center, Houston, TX.

**Condensate overflow shutoff switches**—Installing a condensate overflow shutoff switch should be offered to every customer as an option for protecting property from drain-pan overflow. Furthermore, it is a profitable aftermarket add-on. Instead of installing a 3/4-in. cleanout tee inline, a better solution is a condensate overflow shutoff switch, many of which have inline bodies that can double as cleanout ports once the float switch is removed. They protect the customer’s property and eliminate the laborious drain-line cutting to get access to a blockage. There are now bi-directional cleanout tools that fit a few manufacturers’ safety switch cleanout ports (if there is one). The tools are inserted into the top of switch body or the bull of a 3/4-in. tee and create a tight seal inside the drain line, while the opposite end provides a connection for shop vacuum hoses or pressure pumps. Proactively installing an inline condensate shutoff switch that also includes a cleanout access port will eliminate cutting the drain line on each service call and put the drain line into compliance with the new Drain Line Maintenance requirements of the International Mechanical Code (IMC-Section 307.2.5) and the International Residential Code (IRC-Section M1411.3.3). If a condensate overflow shutoff switch is already installed, water should be
The only coil cleaning needed in most service calls is spraying the outdoor condenser coil with water from the inside to the outside. If a chemical cleaner is needed, investigate what chemical will clean and not prematurely corrode the coil’s copper tubing or fins. Past use of water in the drain pan to test its operation (see pg. 16 of the April 2015 issue of RSES Journal for a full review on condensate overflow switches).

Duct and unit sealing—After closing the air handler/coil cabinet, it should be sealed to prevent wasted energy through air leakage and prevent infiltrated dirty unconditioned air to bypass the filter. Putty is the best solution, but not all putties are alike. Non-hardening putty, which most HVAC distributors carry, will not dry out and crack over time, nor will it stain hands during application. Darker colored putty will stay clean looking longer.

Coil cleaning—Assuming filters were changed regularly and the evaporator coil is clean, the only coil cleaning needed in most service calls is spraying the outdoor condenser coil with water from the inside to the outside. For simple light cleaning, no chemical is the best choice. But when a chemical cleaner is needed, investigate what chemical will clean and not prematurely corrode the coil’s copper tubing or fins. Choosing the wrong coil cleaner can defeat the purposes of preventive maintenance and system longevity. An indoor coil cleaner choice is even more critical, as fumes from poorly rinsed chemicals can infiltrate the building’s occupied breathing space. Mini-split coil cleaners, which have very-low toxicity formulas but strong cleaning abilities, might also serve as an A-coil cleaner in unitary equipment (see pg. 22 of the May 2014 issue of RSES Journal for a complete story on coil cleaning).

Rusty filter-drier—A rusty filter-drier exterior can affect performance by rusting inside-out and leaking, and it is probably one of the obvious things a customer can see looking at their condenser, besides clean coils. It only takes a second to wire brush the rust off and spray the filter-drier with a fresh coat of cold galvanizing spray to give it a hot-dipped galvanized appearance. Most distributors carry a cold galvanizing spray.

Leak sealing—Using leak sealants to repair refrigeration leaks is probably one of today’s most controversial subjects in the HVACR industry. Refrigeration purists want only refrigerant and oil in a system and they believe leaks must be repaired conventionally regardless of cost to the customer. Meanwhile, there is another generation of service techs that use leak sealants after conventional leak repairs prove inaccessible, impractical or they want to avoid passing the cost of a new coil onto a customer. Some contractors are even using leak sealants as a proactive approach against future leaks and sometimes apply them in spring startups regardless if the system leaks or not. When the system does eventually leak, the residual sealant in the system immediately repairs it unbeknownst to the contractor or the customer. Like many products there are different types of leak sealants and a thorough investigation can reveal which sealant is safest for the equipment and easiest to apply.

Acid neutralizer—Acid in refrigeration systems is a hidden compressor killer. A system might run fine on spring startup, but then halfway through the cooling season system moisture converts into acid and eventually burns out the compressor motor. A 4-oz. dose of acid neutralizer, which is available for mineral or polyelester oil systems, can be insurance against acid...
development throughout the lifetime of the unit. It stays active in the system, is not an acid scavenger, and does not clog valves, filter-driers or linesets.

**Hard-start device**—A great preventive maintenance aftermarket product is the hard-start device, because it extends the life of compressors by bringing them up to full speed more quickly and efficiently. They assist compressors when starting under adverse conditions, such as low voltage or high head pressures. There are many brands to choose from, however, some are easier than others to install, and not all models are approved by compressor manufacturers. Hard-start devices can be profitable add-ons that a customer can appreciate because it will help curtail light flickering during compressor startup.

**Conclusion**

A service tech going the extra mile on these small hidden procedures may go unnoticed by most customers, but an itemized checklist of services rendered will be appreciated by customers. When compared to the competition with no checklist and barebones fundamental services and even that enticing $3999 annual checkup advertisement, putting a value on going the extra mile will put the service tech ahead of the competition and attract customers that care about their systems.

James Bowman is the National Technical Manager–HVACR of Rectorseal® Corp., Houston, which offers dozens of accessories, tools and products described in this story that can be seen in detail online or in RectorSeal’s free HVAC catalog available at 800-231-3345. Bowman is a former service tech that is EPA-certified, NATE-certified, holds a Class A contractor license in Texas, and was the RSES “Speaker of the Year” in 2015. Bowman can be reached at james.bowman@rectorseal.com. For more information, visit www.rectorseal.com.