Mars Tech Leak Detection Basics

LEAK DETECTION BASICS

Refrigerant leaks are typically very small and require sensitive detecting devices to be located. Commonly used methods of leak detection are bubble solutions, fluorescent dyes, refrigerant dyes, halide torch and electronic detection. Late model electronic devices may be used on R-134a, R123 and other new alternative refrigerants.

Bubble Solutions

A mixture of water and soap is a commonly used bubble solution. The solution is brushed over the suspected area of leaking. Gas coming through the solution will create bubbles which are visible to the technician. There are patented solutions which provide a stronger, longer lasting bubble film than the soap solution. The bubble solution should be wiped off the tubing or fitting after detecting the leak.

Advantages of using the bubble method are low cost and ease of application. A disadvantage is that larger leaks will blow through the solution and no bubbles will appear.

Halide Torch Detection

Alcohol, propane, acetylene, and most other torches burn with an almost colorless flame. A flame will continue to be almost colorless if a copper strip is placed in it. However, when and if the tiniest amount of a halogen refrigerant comes into contact with the heated copper, the flame will change to a light green color. Halogen refrigerants include R-12, R-22, R-11, R-500, R-502, etc.)

Refrigerant Dye and Fluorescent Leak Detecting

Refrigerant dye, when added to a system, will produce a bright red color at the point of leakage. Most leaks show up in a short time, however, some leaks may take up to 24 hours to show. In most systems, the entire refrigerant charge must be replaced with refrigerant containing the dye to achieve maximum leak detection.

In using the ultraviolet fluorescent method, a fluorescent additive is circulated through the system. The leak is found by scanning the system with an ultraviolet light.

Electronic Detection

The electronic leak detector is probably the most sensitive of any of the leak detecting methods. In operation, the electronic leak detector is turned on and adjusted in a normal atmosphere. The leak detecting probe is then passed over surfaces suspected of leaking. If there is even a tiny leak, the refrigerant is drawn into the probe tip. The new vapor changes the resistance in the circuit which will cause the instrument to emit a piercing sound, or a light will flash or both.

When using an electronic leak detector, all drafts should be minimized. Fans and other devices that may cause air movement should be turned off. The probe tip should be positioned below the suspected leak.

Since refrigerant is heavier than air, it will drift downward. The probe tip should be moved at a rate of about an inch per second. A tip, if adjusted in ambient air will only buzz. The instrument will squeal when the tip sniffs refrigerant. The probe tip should be cleaned after each use and contact with dirt, lint and water should be avoided.

Ultrasonic leak detectors have become widely used in our industry. These units use headphones and a portable, hand-held detector. Ultrasonic frequencies are sound waves that are beyond the range of human hearing. Ultrasonic leak detectors detect the sound that a vapor makes as it is escaping from a pressurized system.

MARS No.
25301

H-10 Pro Refrigerant Leak Detector