

TECH TIP

Evaporator Leak Tests

Diagnosing a refrigerant leak at the evaporator can be difficult. Visual inspection cannot be performed since the evaporator is mounted inside a case. With R&R time for some evaporators exceeding 8 hours, being certain of the diagnosis will help avoid costly mistakes and comebacks.

Leaking refrigerant (which is heavier than air) falls to the bottom of the evaporator case. A common location to check for a leak is the evaporator case drain tube. The following tests are methods to help find evaporator leaks.

- **Electronic Leak Detector** – System must have a minimum of 50 PSI for testing. Hold the leak detector probe at the evaporator drain tube. Be careful not to allow water from the drain tube to contact the probe as this can short out the leak detector. On some vehicles, a blower motor resistor block mounts on the evaporator case and can be removed for probe access. Never use the dash vents and blower motor to attempt leak detection. Many leak detector probes react to airflow and produce a false signal.
- **Fluorescent Dye** – System must be fully charged with both refrigerant and oil. Since oil leaks out with the refrigerant, injecting fluorescent dye (1/4-oz) into the system, which mixes with the oil, can make leaks more obvious. Shining an ultra violet light at the drain tube will cause any dye that has leaked out to glow. To make it easier, take a clean rag (preferably white), wipe the drain tube and hold the rag up to the ultra violet light. However, if dye has just been injected into the system, it may take several days for the oil and dye to reach the drain.
- **Vacuum** – System must be discharged and the accumulator and refrigerant lines disconnected. To verify if a leak exists, before removing the evaporator, a vacuum test can be performed. Using appropriate flush adapters on the evaporator fittings, pull a vacuum of 28” to 30” Hg. The evaporator should hold vacuum for 30 minutes. If there is a loss of vacuum, verify that the adapters and gauges are not the cause. This test can also be performed on a new evaporator before installation.
Note: Refrigerant out-gassing, from oil in the evaporator, can effect test readings. Flush the evaporator prior to testing,

Keep in mind, that on several vehicles a thermostatic expansion valve (TXV) is also mounted inside the evaporator case. A leak that is detected can be from the evaporator, TXV or the fitting connection between the two components. Once the case has been opened a visual inspection for oil residue will determine the location of the leak. On difficult repairs, it may be wise to replace both components.