

Finding Tough A/C Leaks with Bullseye

It's summer time and the A/C season is upon us! A/C season can be a short window of opportunity for some since not every one of us lives in a warm climate all year long. For us who braved this cold winter weather, it feels good to finally get some hot weather. That being said, most motorists expect their A/C system to keep them cold and comfortable when it's hot outside. So when their A/C system does not function, we get the job of diagnosing the problem. This is one repair that price does not seem to matter as much since the owner just wants to be cool. As you know from working on A/C systems, there can be numerous problems causing no cold air from the ducts. Low refrigerant, defective expansion valves or orifice tubes, defective compressors, leaks, contaminated refrigerant or sealant problems are just a few. Most of the time, if you have a good game plan on how to check and diagnosis the system you can stay out of trouble. The first thing to do is use a sealant detector so you can make sure that your refrigerant identifier and AC machine do not get contaminated. With that very real possibility out of the way, next check the refrigerant itself with an identifier for the same reasons.

How about A/C leaks? There are many methods for identifying system leaks with all of us familiar with the refrigerant leak detector, fluorescent dyes, ultrasound equipment and nitrogen testing. Even with these methods, finding the really small leaks is always a challenge. And considering how little refrigerant modern systems hold, finding the small leaks is very important for proper cooling. Making sure the system is leak free ensures that the customer stays comfortable and satisfied.

The best solution available for A/C leaks is from Automotive Test Solutions (ATS). The BullsEye tester that ATS offers can find the smallest leak in the A/C system by detecting CO₂ leakage using their electronic detector. To confirm the exact area of the leak all that has to be done is spray the special form in the area that will pin point the exact area. The tester can also be used to test for leaks in nearly any system on the vehicle from EVAP systems to tires.

Here's a great real world example on a 2008 Acura RDX 2.3L Turbo I had in recently, with a complaint of poor cooling from the air condition system. The vehicle was brought to the dealer before coming to us because of a recall that matched the owner's complaint. The dealer recall (12-039) is for an A/C compressor extended warranty that addresses poor cooling caused by compressor performance. The vehicle owner was told that the compressor was replaced and fluorescent dye and refrigerant were added. After the repair, the system was performing well for about a month before it went back to blowing warm air. The vehicle was returned to the dealer and rechecked for leaks but none were located. The system was recharged and returned to the customer. After another month, the owner experienced the same problem but this time they brought the vehicle to us. We checked the refrigerant system for purity finding it 100% R134A and free of sealant. Since the system was free from refrigerant problems, we connected our A/C

machine checking both the low and high side gauges. The gauge readings were both equally at 50 psi, @ 81 degrees ambient temperature. The findings confirmed that the expansion block was working properly and that there were no clogs in the system. The rule of thumb for gauge pressure is 1 psi equals about 1 degree ambient temperature. Our next step was to check the system using a new SAE J2791 leak detection sniffer able to detect leak rates of under ¼ ounce per year but had no luck locating the leak. We tried checking for signs of the dye the dealer had installed using a black light that works on all dye spectrums but still could not locate the leak.



We recovered and evacuated the system and used the ATS BullsEye system, pressuring the A/C system with CO₂. The CO₂ molecule is smaller and more easily passes through small holes, making it easier to detect. Using the special leak detector that comes with the kit, we located the area of the leak in the vehicle's condenser (Figure 1). To confirm the small leak, we sprayed the BullsEye foam on the area where the BullsEye detector had triggered.



As you can see (Figure 2), the pink foam (area of no leak) reacts with the CO₂ and turns yellow, confirming the leak. A new condenser and receiver drier (one complete unit) later, and this customer's problem was solved!

The example is a 1996 Land Rover Range SE 4.0L Leaking AC System that was a breeze to find with the ATS BullsEye A/C detection system. Since this came from another shop that had already looked for a leaks we did not waste any time looking for a leak with dye or any other system except BullsEye. As you can see by the picture (Fig. 3) I took a picture of Jimmy locating the area of the leak and when the ATS detector located the area I sprayed the magic form. There was no question on where the leak was coming from. Take a look at (Fig. 4 & 5) were the leak was coming from the area turned yellow. Returned the vehicle to the shop where the replaced the condenser, receiver drier and charged the system now the vehicle was now fixed. Air conditioning leaks can be very frustrating, however with new techniques and the right equipment these problems can be solved quickly and easily.



Fig. 3



Fig. 4



Fig. 5



Article written by:
"G" Jerry Truglia
Founder & President
Technicians Service Training
www.tstseminars.org