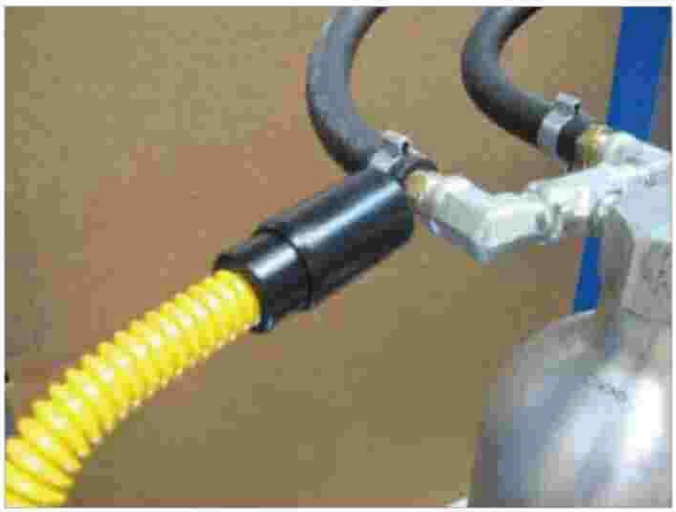
BULLSEYE CO_2 Leak Detector

Step 1. Remove electronic leak detector from kit and turn on unit, allow unit to warm up the CO2 sensor tip. When unit is ready the red light will shut off and the green ready light will turn on, this will take about 90 seconds. For best results the leak detector CO2 sensor should be allowed to fully warm up for about 5 minutes.

Step 2. Now adjust the CO2 leak detector sensitivity by turning the knob until a light steady humming noise is made (this is just below the beeping tone). This sensitivity adjustment may need to be adjusted several times during testing. This will allow for the most sensitive adjustment possible.

***Note:* This light humming noise should always be present during testing.**



Step 3. Using the electronic leak detector go around the system to identify the leak site area. While moving the CO2 probe tip around the system it is best to keep the CO2 sensor face perpendicular to the surface being tested. ***Note: If tip is bumped against the surface being tested the detector may momentarily go off, this false alert will go off right away. If the leak detector senses CO2 gas the alert will stay on for 10 to 40 seconds.***

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Step 4. When CO2 gas is detected the yellow alert lamp is activated along with the audio alert (loud beeping noise). Once the detector has sensed CO2 the alerts will continue for about 10 to 40 seconds; ***Note:* DO NOT CHANGE THE SENSITIVITY ADJUSTMENT. Remove sensor from leak site area and let the unit stop beeping on its own.** Once the detector has stopped beeping you can now retest the leak site area with the CO2 detector.

WARNING!: Do not allow coolant or coolant vapor to get on CO2 sensor at end of yellow flex tube! This will damage CO2 sensor and will require the CO2 sensor to be replaced. Do not hold probe over radiator neck or coolant neck bottle while engine is running. This will allow coolant vapor to get on CO2 sensing probe.
***Note:* Never directly hit or drop the leak detector on the CO2 sensor tip, this will cause the sensor to become damaged!**

Finding Tough A/C Leaks BULLSEYE Style

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 that we are all familiar with; refrigerant leak detectors, fluorescent dyes, ultrasound equipment and nitrogen testing. Even with these methods, finding the really small leaks is always a challenge. 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 Leak Detector 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 location of the leak all that has to be done is spray the special foam in the area that will then pin point the exact site. The tester can also be used to test for leaks in nearly any system on the vehicle from EVAP systems to tires.

2008 Acura RDX 2.3L Turbo

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!

Figure 1


Figure 2

1996 Land Rover Range SE 4.0L

This Land Rover had a leaking AC System that was a breeze to find with the BullsEye Leak Detector. Since this vehicle came from another shop that had already looked for a leak we did not waste any time leak testing with dye or any other system except for the BullsEye. As you can see in the picture (Fig. 3) Jimmy is locating the area of the leak with the BullsEye CO2 detector. When the detector located the area I sprayed on the foam. There was no question where the leak was coming from. Take a look at (Fig. 4 & 5) the foam at the area of the leak turned pink. We returned the vehicle to the shop where they replaced the condenser, receiver drier and charged the system which fixed the vehicle.

Figure 3

Figure 4

Figure 5

Written by **G. Jerry Truglia**
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"G" has been involved in the auto repair Business for a long time as a tech, shop Owner and nationally recognized trainer/author. He founded TST to bring affordable training to his fellow techs and shop owners.