# Clean Air Notes

Since April, Clean Air Car Check has been monitoring vehicle-specific wait times by using parking garage-style ticket gates at our facilities in an effort to ensure that our customers are being served in a timely manner. When you arrive at a station for a test, you will need to pull a time-stamped ticket at the gate that you will present to the lane inspector at the time of service.

Visit us online at www.cleanaircarcheck.com for information on the vehicle emission testing program. This new website was launched in February and it includes helpful information such as station hours and locations, waiver information, show car criteria and a list of Indiana Certified Emission Repair facilities.

We are updating our files. Current Indiana Certified Emission Repair Technicians must submit a copy of their current A-8 and L1 certifications to Clean Air Car Check by June 30th. Copies of these certifications can be faxed to 219-661-8409 or mailed to:

Envirotest Systems
1171 Breuckman Dr., Suite B
Crown Point, IN 46307

## Converter Clinic Tech Night

**Featuring Corey Smith, National Training Manager for CATCO AirTEK, Inc.**

Monday, July 16, 2007 6 – 9 p.m.
Envirotest Systems Headquarters
1171 Breuckman Dr., Suite B
Crown Point, IN 46307
**Limited Seating Capacity.**
**Call 1-888-240-1684 to reserve your seat.**

Topics that will be covered:

- History and evolution of automotive catalytic converters
- Converters don't commit suicide – HCs, CO and NOx
- Converters – The Inside Story
- Engine operating system changes
- Making your job easier by talking with the customer
- Why "OBD II by Design" is right and "Compliant" is not
- P0420 code and what it really means
- Converter testing
- The importance of the right converter

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# TECHNICALLY SPEAKING

# Converters are key, but there may be other problems

**By Corey Smith, National Training Manager for CATCO Catalytic Converters AirTEK, Inc.**

Asked recently, "Is it the converter that's turned on the light?" I answered, "Could be."

Although my answer seems non-committal, because it is, it was given that way because there is no way I or anyone else could correctly answer that question without doing proper emission-system diagnostics on the offending vehicle.

Here lies one of the biggest problems seen today in the vehicle emissions repair industry – uninformed technicians making assumptions without doing the work to find the real cause for a system failure.

These same individuals then try to "repair" a vehicle by swapping out parts. What they are really hoping is, "Let's sell the converter now, and see if it works." What they are really saying is "I don't have or know how to use the equipment" or "I'm bound to get it right pretty soon." Sometimes it even works – sometimes. Even so, this practice is a disservice first to the customer and second to the industry.

Just like hacking in "fits-all" mufflers, the practice of swapping out converters has seen its day. Today's vehicles require the correct muffler along with the correct converter to perform properly. OBD II emissions operating systems monitor, along with other components, the converter(s) to ensure it is present and working properly.

Although many studies find that failure of front O2 sensors is the leading cause of converter destruction, other studies show that carbon or soot contamination also results in the deactivation of catalytic converters. Either of these conditions will cause a P0420 code to present itself. Condemning a converter because you have read a P0420 code may mean you are only partially correct. This code very simply means that the converter cannot do its job – catalyzing exhaust gases – correctly.

Is the engine putting out too much HC or CO, and has it destroyed the converter, or too much NOx? Until you do know what has occurred and you repair the failed operating system and/or component failure, the light will come back on.

Installing a pre-OBD II converter design on top of not repairing the vehicle emissions system has perplexed many an individual and caused unneeded expense and many comebacks.

Fix the real problem(s), install the converter(s) specifically designed for the application where needed and continue to update your training.

Second in a series....

# Diagnosing and Repairing EGR Systems: Spotlight on GM

**By Craig Cohen, Clean Air Car Check Diagnostic Technician**

In this month's issue we will be taking a look at GM's negative and positive back pressure EGR valves. These valves started to show up in the early eighties and did their job quite well into the first years of OBD II- equipped vehicles.

As we all know the early EGR systems used a ported vacuum signal that was routed to the EGR through a thermo-vacuum valve or possibly a solenoid. These were used to block EGR operation during warm up and at wide open throttle. This setup worked well for many years but its main drawback was the inability to meter EGR flow in regards to engine load. This early setup was often the cause of many drivability issues and it was quite common to find the vacuum hoses to the valve disconnected or plugged off.

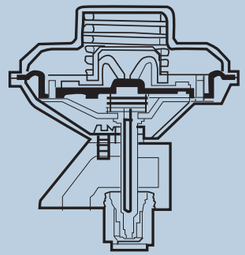
The solution to these problems came in the form of the backpressure style valves. They look just like the old valves they replaced, so to be sure which type of valve you are dealing with simply check the numbers on the top of the valve. A "P" is a positive backpressure and an "N" is a negative backpressure. If there is no letter it is a standard non-pressure regulated valve.

In Figure 1 we see that these style valves have a hollow pintle stem. The stem contains a valve assembly that helps modify the EGR vacuum control signal. The internal valve mechanism bleeds vacuum out of the EGR diaphragm. This vacuum bleed off causes the valve to "dither" its position.

This means that these types of valves should never just pull all the way open when they receive a vacuum signal. The valve diaphragm should lift and flutter as exhaust system pressure pulsations control the vacuum bleed off rate.

The testing of a backpressure EGR valve is pretty straightforward. After we have verified that we have the needed vacuum control signal to the valve you should identify which style valve you are dealing with. If the valve has the letter "P" for positive, place a vacuum pump on the EGR vacuum port, then pull vacuum on the valve. It should open and stay open with no vacuum loss. If the vacuum drops off the valve is faulty.

If vacuum holds keep the pump attached, and find a way to restrict the vehicle's exhaust system.



▲ FIGURE 1

Many techs use a half-inch socket inserted drive side into the tailpipe clamped with a pair of locking pliers to accomplish this. Start the vehicle and watch the EGR valve as you raise the engine RPM. The valve should fall fairly quickly. If the valve drops slow, sticks as it falls or refuses to drop with induced back pressure the valve will need replacement.

On a negative pressure valve marked with an "N" the procedure starts the same as before. Pull a vacuum on the valve and it should raise up and hold vacuum without dropping. A valve that won't pull open or drops down is faulty and needs replacement. If the valve opens and holds vacuum, have an assistant start the vehicle. As

"Spotlight" continued on page 3



# Case Study: High Hydrocarbons from an Unusual Source

**Guest Columnist Joe Kubiak, Owner of Kubiak Service & Towing, St. John**

A 1994 Chevy Caprice came into my shop because it had failed the emissions test for high hydrocarbons.

The car had been to a non-certified shop for initial repairs. The shop had performed a complete tune up with distributor cap, rotor, spark plug wires, pcv valve, air filter and an oxygen sensor. After the repairs the owner took the car to get tested, but it failed for high hydrocarbons again.


Once the car made it to my shop, I did a tailpipe test and the readings coming from the tailpipe were extremely low. I then racked the car up so I could inspect it from underneath. I checked the gas tank and lines for any leaks, but could not find any. I then took my emissions wand and started checking the rear of the car by the tailpipe. I started


picking up hydrocarbon readings under the rear bumper.

I lowered the car and opened the trunk. The trunk was full of all sorts of stuff including a half full one gallon gas can that was buried under a pile of clothes. I removed the gas can and the car was retested and fast passed on the dyno.

The owner of the car had completely forgotten the gas can was in the trunk. Though he was impressed with the "repairs," he wasn't too happy with all of the money he spent on unnecessary repairs elsewhere. My bit of advice, "Always check the trunk for junk."

"Spotlight" continued from page 2

the vehicle cranks and starts, the negative pressure waves in the exhaust should cause the valve to drop closed. Again if the valve remains open or sticks as it falls it will need replacement.

As you can see this was pretty straightforward; now we need to consider a few other areas to keep this style EGR system working as designed. First, if we are lacking a vacuum signal be aware some vehicles need to see the vehicle in drive before allowing vacuum to the valve. If we have a park/neutral switch error we may not be getting a vacuum signal as needed. Also be aware some vehicles need to see VSS input before the EGR will be allowed to operate.

Second, vehicles with this style of EGR system often use the O2 sensor for EGR operation verification, so a lazy operating O2 sensor can prevent the PCM from accurately determining an EGR fault.

Third, as always the EGR passages need to be clean, if we are dealing with a NOx failure this is very important, the best EGR passage inspection will always be a visual one.

Lastly, as these EGR valves rely on the exhaust system's high and low pressure pulses keep in mind that performance exhaust systems as well as exhaust system alterations can interfere with the valve's metering ability. This often results in a reduction of EGR flow and may contribute to an emission failure.