Clean Air Notes

2003 Hyundai Tiburon

We have had a few 2003 Hyundai Tiburons that have failed the emission test for failure to communicate. After working with area technicians to find the solution, we found that the vehicle will not communicate in OBD generic mode because pin number 5 on the OBD connector is not grounded. There is a TSB out on the vehicle; the TSB number is 03-01-003-01. If you have any questions regarding this type of vehicle please contact our Diagnostic Technician at 219-661-5456 for assistance.

2003 Ford Focus

Some 2003 Ford Focuses are subject to TSB 06-7-5, which covers monitor completion issues. This does not affect all 2003 Ford Focuses, but if you have one that keeps rejecting, refer to the TSB to see if it applies.

Pilot Study

We are conducting a pilot study that will assist the motorist and/or technician in determining if vehicles failing for HC have hydrocarbon leaks. We will "sniff" the vehicle and pinpoint the source of the potential leak. Watch the September issue of Technically Speaking for more details.

Attention shop owners & service managers:

If you are not an Indiana Certified Emission Repair Facility but you employ a technician who has his/her Indiana Certified Emission Repair Technician certification you may be eligible to become a certified shop. Contact the Quality Assurance manager at 219-661-5455 if you would like more information.

Diagnostic Techniques for Enhanced EVAP Systems, Presented by John Thornton

One of the area's most respected automotive trainers will provide thorough instruction on diagnostic techniques for Enhanced EVAP systems in domestic and Asian imports.

Monday, September 17 - Domestic Enhanced EVAP System Training (GM, Ford and Chrysler)	Wednesday, September 19 - Asian Enhanced EVAP System Training (Nissan, Honda and Toyota)

Both classes are scheduled from 6 – 9:30 p.m. and will be held at the Envirotest Systems Training Center located at 1171 Breuckman Dr., Suite B, Crown Point.

Please call 1-888-240-1684 by September 13 to RSVP for one or both sessions.

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TECHNICALLY SPEAKING

CLEANAIR CARCHECK

AUGUST 2007

A MONTHLY PUBLICATION FOR THE PROFESSIONAL AUTOMOTIVE TECHNICIAN

Clinic teaches techs the inside story on converters

Clean Air Car Check hosted a full classroom of technicians during a presentation about catalytic converters by CATCO Airtek's national training manager Corey Smith on July 16th.

Smith shared valuable information about the history of catalytic converters and details about this component's inner workings. He also explained the role the converter plays in the emission control system and gave some useful tips about how to diagnose and repair converter problems.

Some of the information he provided is summarized here for your reference.

(Left) Corey Smith, National Training Manager for CATCO AirTek, provides additional resources to Kevin Burgess (center) and Howard Milam (right), repair technicians from Brown Tire in Valparaiso.

- When installing a converter on an OBD2 vehicle make sure to maintain the distance of the post-cat O2 to the back substrate of the converter. This distance is critical in keeping the post-cat O2 reading accurately. Altering this distance can cause false catalytic converter codes.
- After installing a new converter the vehicle must have at least 5 warm up cycles to "break in" the new catalyst. This break in period helps bond the substrate as well as the shell to the insulation material. This eliminates exhaust gases from passing around the substrate. This has recently been a topic on IATN with technicians installing new converters on OBD vehicles and having catalyst codes returning once or twice after repairs before the problem disappears. This "break in" process is the suspected cause.
- Do not always rely on converter temperature testing on later model vehicles; catalyst manufacturers have begun installing the NOx reduction substrate behind the oxidation substrate. This is a reversal from how they used to be manufactured. The NOx substrate needs heat to work properly and when temperature tested, the outlet of this style converter will be lower than the inlet temperature. Since you may not know how the beds are installed in the catalyst this could cause unnecessary replacement.

Fourth in a series...

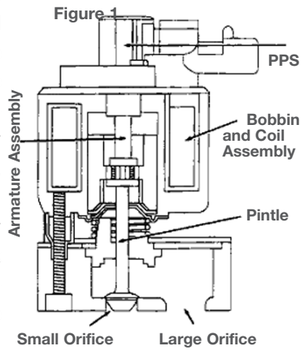
Diagnosing & Repairing EGR Systems: Spotlight on Linear EGR Valves

By Craig Cohen, Clean Air Car Check Diagnostic Technician

Linear EGR valves first appeared on many GM platforms and can now be found on many other manufacturers' vehicles as well. The popularity of this style valve is growing because of its ability to provide a wide range of exhaust gas reflow with very precise control.

This style valve uses an electromagnetic coil to lift the EGR pintle (See Figure 1). The vehicle PCM may use a variable pulse width or variable frequency control signal to raise and lower the pintle as needed. Inside the valve assembly is a potentiometer that provides feedback to the PCM so command and response can be accurately monitored. This direct mechanical feedback has many benefits. The PCM can learn the valve's closed position and be able to flag a valve that is stuck open or closed, it also offers improved EGR flow error detection, and simplifies vehicle construction as the EGR system now basically contains only one component.

Figure 1



As we discussed last month, digital EGR valve flow detection is fairly straight forward. The PCM uses decel manifold vacuum changes, fuel trims and RPM changes to verify flow. The difference is now it has proof that the valve is or is not working and an EGR flow code can be more accurately determined.

When facing a P0401 on a linear EGR valve-equipped vehicle that has no pintle position error or EGR circuit codes, the passage would be a good place to start. If the passage proves clear we should be looking at how the PCM verifies flow and checking those sensors or systems. One example of this issue crops up frequently on GM's late model 3.8L engines. If during PCV valve replacement the lower PCV o-ring is forgotten or damaged, the MAP sensor located on the PCV cover cannot verify vacuum drop in the intake during decel conditions leading to erroneous flow codes.

One of the most common issues with this type of EGR valve is the occurrence of pintle position error codes. These can often be diagnosed with a scan tool that has graphing capabilities. In Figure 2 you can see the pintle position graph quickly going vertical and then ramping smoothly after that point. This is caused by a dragging pintle and was causing a repeatable P1406 pintle position error code. Most of my experiences with these valves were regarding intermittent or pending codes. This prompted me to find a way to evaluate pintle drag outside of scan data. I developed and have used this test often. To try this for yourself you will need a low current probe, a two channel lab scope and a way to ground the EGR solenoid to lift the pintle (a power probe works great for this).

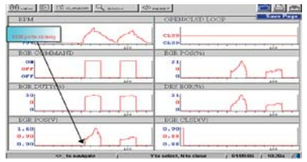


Figure 2

Place your current probe around the EGR 12 volt feed and set your scope up to see the current pattern as well as the pintle position sensor pattern. Use your preferred grounding method to open the EGR and capture the current and pintle position voltage patterns. In Figures 3 and 4 the top trace is current and the bottom is position feedback. In Figure 3 it is easy to see current ramping up and 10 mS delay before the pintle pops open with an almost vertical rise. Compare this to Figure 4, which is a new valve. Again current begins to flow and in under 2 mS the pintle ramps up smoothly. As you might suspect Figure 3 was causing an intermittent pending code. It is important to use a current probe for this procedure as it shows the magnetic coil becoming energized and lifting the pintle. A voltage pattern would not provide a reference point for the actual working of the valve.

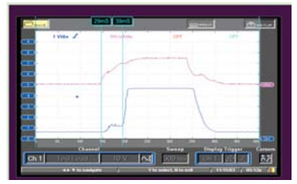


Figure 3

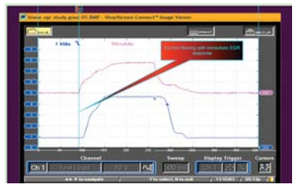


Figure 4

Case Study: Some repairs are more than meets the eye

Guest Columnist, Jeff Reeder, Owner Reeder's Auto Service Center

There are times in our industry that the root cause of a problem is elusive to say the least, and at times I would be tempted to label it as demonic. Then there are times that the problem is a total unexpected surprise. Such is the case with a 1994 Chevy Camaro Z28 brought in to our shop for an emission failure.

Phil, a senior emission certified technician, was assigned to this vehicle. He received the vehicle after the customer's husband tried valiantly to repair his wife's car. Phil diagnosed a weak catalytic converter with the inability to store oxygen.

The customer needed the car as soon as the catalytic converter was installed and she would retest the car herself.

A week later the customer returned to our shop with failure papers. I assured the customer that I would personally oversee the reevaluation of the car and contact her shortly.

I retested the car and the tail pipe readings were excellent, ignition scope test, computer scan and fuel delivery system's performance good. Upon review of the drive trace it was obvious that raw fuel fumes were tainting the tail pipe gases. I retested the vehicle and picked up HC readings from the fuel system. I had to have the car running with the lines fully pressured by the fuel pump and gently bounce the car in the rear. The leak was somewhere from the top of the fuel tank, a 4.5 – 5.0 hour job with fastening bolts and an exhaust system that has not been touched for a decade.

I confronted Phil on how he could have misread a drive trace like this. He insisted that this drive trace was totally different from what he saw a week earlier. Knowing Phil, I believed this was accurate.

The next conversation with the customer started out less than warm. I explained that fuel vapor was leaking from the top of the fuel tank around the fuel pump area. She stated that my information was unlikely because her husband had just installed a new fuel pump. I'm sure that by the silence on my end of the phone, she could sense my state of shock.

Jeff Reeder

I collected myself and asked to speak with her husband. I asked him if I understood his wife properly about the fuel pump replacement, and he acknowledged that he had just replaced the fuel pump. I asked how he accomplished the task. He told me to pull back the carpet in the hatch area to find where he used a saw to cut through the flooring. He then bent and duct taped the metal flap he had created to seal the job when done. When I reopened his incision I found the return line with a slight crack created by flexing a brittle hose during the pump replacement. We replaced the hose and the car flew through the test. The lesson learned is that it's not always what meets the eye.