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A newsletter for Ohio's Automotive Technicians

TECH talk

Ohio E✓Check
Vehicle Emissions Testing Program

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New Certification Standard for MVAC Machines

The U.S. Environmental Protection Agency (U.S. EPA) is updating its certification standard for motor vehicle air-conditioning (MVAC) service equipment. This new standard applies to all MVAC recovery/recycle and recovery/recycle/recharging equipment for HFC R – 134a refrigerant. All MVAC refrigerant service equipment manufactured or imported after December 31, 2007, must meet this new standard.

U.S. EPA is taking this action to avoid any confusion with its MVAC equipment certification standards. The old U.S. EPA MVAC certification standard required MVAC equipment to meet the SAE J2210 standard. This old SAE standard may have left as much as 30 percent of old refrigerant in a MVAC system. This could happen even when the J2210 certified equipment indicated a zero charge in the MVAC system. SAE has since updated the MVAC refrigerant equipment standard to the more stringent J2788 standard. This new SAE standard requires a recharge accuracy standard of 0.5 ounces coupled with a refrigerant recovery efficiency of 95 percent.

The new rule does not require the immediate replacement of any previously certified MVAC recovery/recycle and recovery/recycling/recharging equipment which a shop may own or lease. Any equipment manufactured or imported after December 31, 2007 must meet the new SAE J2788 standard.

The EPA also is changing the system for submitting MVAC equipment certification paperwork. Under the old system the paperwork would be sent to the U.S. EPA's Headquarters in Washington, D.C., and then transferred to the appropriate U.S. EPA regional offices. Under the new system the paperwork will be mailed directly to the regional office responsible for maintaining the paperwork. The new address for shops with addresses in Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin is:

CAA Section 609 Enforcement Contact
EPA Region V (AE17)
77 W Jackson Blvd.
Chicago, IL 60604-3507

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http://www.mde.state.md.us

Finding & Fixing EVAP System Faults

The following is an excerpt from the article: Vapor Trails: Finding & Fixing Evaporative System Faults by Bob Pattengale. This article was published in the February 2006 issue of MOTOR Magazine. For the complete article please see www.motor.com.

The evaporative system, or EVAP, is a vehicle emission control that captures and stores hydrocarbon vapors for later use in the engine. The EVAP system reduces evaporative losses related to gas tank venting, vehicle running, and refueling. Hydrocarbon control is important because it is one of the precursor pollutants for the formation of ozone. Depending on the model year and type of vehicle, an EVAP system fails a self-test if leaks greater than 0.040 and 0.020 of an inch are found. All vehicles produced in 2002 and later must adhere to the standard of 0.020 in. EVAP codes are one of the top 5 codes found in vehicles undergoing an On Board Diagnostic Vehicle Emission Inspection.

The first rule in diagnosing any evaporative emissions problem is: Don't touch anything! Do not fall into the trap of tightening the gas cap and then beginning your testing. What if the gas cap was the problem and you run an in-bay evaporative system leak test or perform a leak test with a smoke machine and no leaks are found? At this point, you won't know if the leak is intermittent or if it was actually the cap.

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Finding & Fixing EVAP System Faults *(Continued from page 1)*

In the early stages of your diagnosis, perform as many nonintrusive tests as possible. After retrieving and recording any DTCs, look up the exact description and recommendations for your specific code. Don't forget to check and record the freeze frame data. The key freeze frame data parameters (PIDs) to check are engine coolant temperature (ECT) and vehicle speed sensor (VSS). The ECT will let you know if the engine was cold or warm when the DTC was set. The VSS might help you decide if vehicle vibration might be a contributing factor in the case of an intermittent leak.

The next step in the diagnostic process is research – specifically, checking for technical service bulletins (TSBs), recalls or powertrain control module (PCM) reflashes. If you want to save time and money, spend a few minutes researching the problem; you might find a solution prior to testing. Checking for PCM software calibration updates or reflashes can correct issues that cannot be fixed any other way. Don't overlook checking www.iatn.net for good suggestions. Other techs may have already reached successful diagnostic conclusions under similar or identical conditions.

Evaporative emissions problems fall into three basic categories: component and circuit DTCs, purge flow DTCs and leak detection DTCs. The type of code present will determine the diagnostic path. Component and circuit DTCs normally point to opens, shorts and component failures.

The purge control circuit can be checked with a basic voltmeter or scan tool. The scan tool would be my first choice, if bidirectional controls are available for this component or circuit. For example, to quickly check the function and operation of the purge solenoid, use the scan tool to activate the solenoid and listen for a clicking sound. This checks the PCM, wiring and component all at one time. If the solenoid clicks, the circuit is currently working, and you might be dealing with an intermittent problem. At this point, perform a wiggle test on the related wiring and connection points and repeat the test. If the solenoid did not click, the problem may be with the wiring, the purge solenoid or even the PCM. The next step is to use a voltmeter to check power and ground wires and to repair as needed. If the circuit checks good, then the problem is most likely with the purge solenoid, which can be checked with an ohmmeter or manually tested with a set of jumper wires.

The next area of the evap system is purge flow diagnostics. Possible DTCs for this problem include P0441 (Insufficient or Excessive Flow Detected During EVAP Operation), P1447 (Evaporative Control Purge Flow Monitoring) and other codes. Honda vehicles have a manufacturer specific DTC P1457 (Evaporative Control System Leak Detected - EVAP Canister System) that could create some confusion. The code description might have you looking for a leak in the system when the problem is actually a restricted or clogged evap system.

There are a variety of methods employed by vehicle manufacturers to detect purge flow. A widely used option is to monitor oxygen sensor or fuel trim values when the purge solenoid is activated. The PCM expects to see a change in either of these values when the purge solenoid is opened.

If you plan on using this method to verify purge operation, keep in mind that when the purge solenoid is commanded on, the values may go rich or lean. In most cases, the O_2 sensor will read rich and short-term fuel trim (STFT) will go negative, due to the buildup of fuel vapors in the evap system. However, there are times when the content of the evap system is mostly air. In this case, the O_2 sensor will read lean and STFT will go positive. Another option available to vehicle manufacturers is to monitor changes in the fuel tank pressure (FTP) sensor when the purge solenoid is activated. In most cases, the PCM will command the vent solenoid closed and the purge solenoid open, purging the vapors in the evap system and drawing the system into a slight vacuum condition. The PCM expects the FTP sensor reading to decrease.

Restrictions in the evap system can be caused by pinched or kinked hoses, dirt, mud or material from the charcoal canister blocking purge lines, or other situations. In some Nissan vehicles, the charcoal canister may leak charcoal into the evap system. Nissan TSB NTB00-085 covers this issue. The last diagnostic topic we'll discuss is looking for leaks in the evap system. The first step is to verify that a leak currently exists in the evap system. Most leaks are pretty easy to find, but some intermittent leaks are difficult to locate. Intermittent leaks can vary with changes in temperature, vehicle vibration and sticking vent or purge solenoids.

If you're unable to locate the leak with smoke, there are a few more options that might help. Move the gas analyzer probe slowly around the evap system. Hydrocarbons (HCs) are lighter than air, so be sure to check the areas above the evap system fittings and hoses to find a leak. If you're still having trouble locating the leak, another option is to break the evap system into smaller test sections. This should be considered an option of last resort, because you may change something in the process by disturbing the evap system, and the leak may temporarily disappear.

Keep in mind that most leak-detection methods use pressure, but most evap systems are tested with vacuum under OBD II.

INDUSTRY QUESTIONS & ANSWERS

Q: Can repair technicians take their customer's vehicles to an E-Check station after repairs?

A: Absolutely! Anyone may take a vehicle in for an emission test at any E-Check station within 365 days of the vehicle's registration renewal date if the vehicle needs to be tested that year. If the vehicle may be eligible for a waiver, receipts will only be accepted for work that has already been paid for before the test.

Q: My shop does not have access to online resources to look up all manufaturer specific DTCs. What additional resources are available to me?

A: Ohio EPA keeps a listing of valuable resources on the Ohio E-Check Technician Resource Center Web site (http://www.epa.state.oh.us/dapc/echeck/other_programs/repair_tech_ctr.html). As always if you have suggestions for other Web sites that may be valuable, please let us know. However, if you are still having difficulties, contact Ohio EPA directly at (614) 644-3059 and we will look up the DTC for you!

REMEMBER.....

Blue smoke can indicate engine oil being burned in the combustion chamber.

Black smoke can indicate an overly rich fuel mixture.

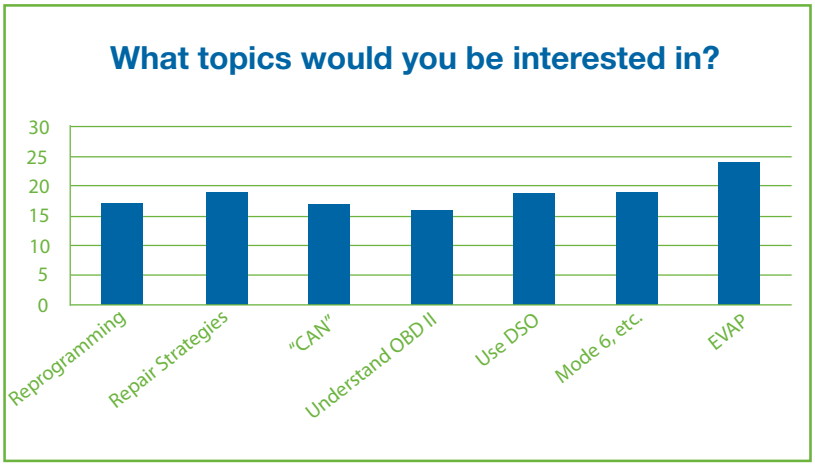
Repair Industry Survey Results!

You talked, we listened! You and your colleagues said that more training in emission-related repairs would be very useful and that Ohio EPA needed to be more vocal in disseminating class information. Technicians agreed continued training and 3-hour, one-time classes are important. Therefore, Ohio EPA will begin working with members of the Training Repair Industry Advisory Group (TRIAG) to develop new courses to best serve you all.

Overall, technicians agreed that additional courses across a wide range of topics will better assist them in making efficient and effective repairs on vehicles that are failing emissions tests. Figure 1 shows the breakdown of the responses from the survey.

In an effort to notify you regarding upcoming training session dates and times, technicians may now subscribe to a listserv that will send out periodic e-mails with training class information. To enroll in the listserv, please visit the Ohio E-Check Web site and click on the "NEW! Listser enrollment" link under "For Repair Shops." The information obtained will not be used to send unsolicited e-mail to any member of the group.

Stay tuned for more information as you all help us serve you better!



Ohio Program Fail Rates:
January - August 2008

ASM	OBD II
ASM fail rate: 20.37% *(of 133,139 total ASM tests)*	OBD II fail rate: 6.44% *(of 425,630 total OBD II tests)*
ASM fail rate: 4.75% *(of 571,422 total tests)*	OBD II fail rate: 4.8% *(of 571,422 total tests)*
Total Tests:	**571,422**
Total Fail Tests:	**55,771**
Overall Fail Rate:	**9.76%**

OH Program Top Ten OBD Diagnostic Trouble Codes
January - August 2008

DTC	Total #	Description
P0420	3393	Catalyst system efficiency below threshold (Bank 1)
P0401	2923	Exhaust gas recirculation flow insufficient detected
P0300	2917	Random/multiple cylinder misfire detected
P0442	2747	Evaporative emission control system leak detected (small leak)
P0171	2721	System too lean (Bank 1)
P0325	2017	Knock sensor 1 circuit malfunction (Bank 1 or single sensor)
P0141	1570	O_2 Sensor heater circuit malfunction (Bank 1, Sensor 2)
P0440	1401	Evaporative emission control system malfunction
P0174	1379	System too lean (Bank 2)
P0133	1367	O_2 Sensor circuit slow response (Bank 1, Sensor 1)

Gas Cap Replacement Program Launched

On September 15, 2008, Ohio E-Check stations started replacing faulty or missing gas caps, free of charge, at the 23 stations in northeast Ohio.

"By providing free gas caps at E-Check stations, we can remedy most gas cap issues on the spot, saving motorists a return trip and immediately improving air quality" said Bob Hodanbosi, Ohio EPA Division of Air Pollution Control Chief.

In 2007, 25,349 vehicles failed the gas cap portion of E-Check. The new gas cap replacement program is a motorist convenience that will reap immediate benefits in terms of emissions reductions by shortening the time that vapors can escape from a gas tank. Caps distributed at E-Check stations will fit approximately 90 percent of all cars tested at the stations. If a vehicle has a unique gas cap that is not stocked at the station, the motorist will receive a $5 gas gift card – the approximate cost of a replacement gas cap.

ATTENTION: Ohio EPA is looking for technicians interested in becoming certified to teach Ohio E-Check repair programs. If you are interested and have obtained your ASE L1 certification, please contact Ohio EPA's Mobile Sources Section at (614) 644-3059.

Ohio E✓Check
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Columbus, OH 43216-1049