

The Analyzer

WISCONSIN VEHICLE INSPECTION PROGRAM

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Spring 2014

December Seminars Highlighted Evaporative Systems



As seminar attendees look on, Ken Dotzler demonstrates various smoke machines to diagnose evaporative emission failures.

Over 50 repair technicians attended two classes concentrating on evaporative emissions systems function, diagnosis, and repair. The seminars were split between the Opus office in New Berlin and Jerry's Automotive in Pewaukee.

Ken Dotzler, a WISETECH and automotive instructor from Gateway Technical College conducted the seminars that included a discussion on the common failures of evaporative systems. There were also equipment demonstrations and a review of successful diagnostic techniques that can be used to identify and repair evaporative failures.

Evaporative readiness monitors are one of the most difficult monitors to reset on a vehicle after repairs.

The June 2005 issue of MotorAge magazine listed examples of some common enabling criteria to run the EVAP monitor drive cycle is:

- The malfunction indicator lamp (MIL) must be off.
- Barometric pressure exceeds 75 Kpa.
- At start-up, IAT and ECT is between 45°F and 85°F.
- IAT is not more than 2°F greater than ECT.
- ECT is not more than 12°F greater than IAT.
- Fuel tank level is between 26 percent and 74 percent.
- The TPS is between 9 percent and 35 percent.
- The EVAP solenoid is at 50 percent pulse width PWM, within 65 seconds of engine run time.

There will be more seminars coming in 2014. Information on seminars will be included in future issues of the newsletter.

Recognized Repair Facility Certifications

There are many benefits to becoming a recognized repair facility. Recognized repair facilities closest to a testing station are printed and given to motorists at the time their vehicle fails. Only repairs performed at a recognized repair facility can be considered in issuing a cost waiver at Technical Assistance Centers (TAC).

If your repair facility employs at least one technician with either an ASE L1 certification, a WISETECH certification or is a new car dealership, your facility is one step away from becoming a recognized facility.

Included in this newsletter is an application for becoming a Recognized Repair

Facility. Just complete the information and send copies of your technicians' certifications to Opus Inspection. Once recognized, your inspection facility will appear on the wisconsinvip.org website as well as handouts to failed vehicle owners. Recognition status can be lost if you let your ASE certifications expire.

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Don't Risk It!

The use of electronic parts, tools and diagnostic equipment is critical for effectively repairing motor vehicles. However, the misuse of electronic equipment, such as scan tools, can lead to violations of the Federal Clean Air Act (CAA). The penalties for CAA violations include fines and jail time which can greatly impact a business.

Some of the more common abuses include defeat devices and emission control equipment tampering.

Defeat devices. It is a violation of the CAA to manufacture, sell, or install a part for a motor vehicle that bypasses, defeats, or renders inoperative any emission control device. For example, computer software that alters diesel fuel injection timing is a defeat device. Defeat devices, which are often sold to enhance engine performance, work by disabling a vehicle's emission controls, causing air pollution. New car warranties could also be voided if a defeat device has been used or a program been modified.

Tampering. The CAA prohibits anyone from tampering with an emission control device on a motor vehicle by removing it or making it inoperable prior to or after the sale or delivery to the buyer. A vehicle's emission control system is designed to limit emissions of harmful pollutants from vehicles or engines.

REGULATIONS AND FINES ASSOCIATED WITH TAMPERING

The regulatory language makes it clear that tampering with emission control devices is subject to monetary fines and other penalties.

There are four specific regulatory quotes which support this consideration: Section 86.090-25, paragraph (b)(6)(ii)(C) of the Code of Federal Regulations states:

“(C) A clearly displayed visible signal system approved by the Administrator is installed to alert the vehicle driver that maintenance is due. A signal bearing the message “maintenance needed” or “check engine,” or a similar message approved by the Administrator, shall be actuated at the appropriate mileage point or by component failure. This signal must be continuous while the engine is in operation, and not be easily eliminated without performance of the required maintenance. Resetting the signal shall be a required step in the maintenance operation...”

Section 86.090-25, paragraph (b)(6)(iii) of the Code of Federal Regulations states:

“(iii) Visible signal systems used under paragraph (b)(6)(ii)(C) of this section are considered an element of design of the emission control system. Therefore, disabling, resetting, or otherwise rendering such signals inoperative without also performing the indicated maintenance procedure is a prohibited act under section 203(a)(3) of the Clean Air Act, as amended in August 1977 (42 U.S.C. 7522(a)(3))

Clean Air Act § 7522. (a) Enumerated prohibitions Air Act (CAA) states:

“(3) (A) for any person to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this subchapter prior to its sale and delivery to the ultimate purchaser, or for any person knowingly to remove or render inoperative any such device or element of design after such sale and delivery to the ultimate purchaser; or



INSTALLING
DEFEAT DEVICES
OR TAMPERING
WITH AN
EMISSION
CONTROL DEVICE
IS PUNISHABLE
WITH FINES AND
POTENTIAL JAIL
TIME.

CLEARING
MONITORS IS
CONSIDERED
TAMPERING.

(B) for any person to manufacture or sell, or offer to sell, or install, any part or component intended for use with, or as part of, any motor vehicle or motor vehicle engine, where a principal effect of the part or component is to bypass, defeat, or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this subchapter, and where the person knows or should know that such part or component is being offered for sale or installed for such use or put to such use;”

However, there are provisions to recognize that during the maintenance and repair of a motor vehicle, the emission components may be temporarily disabled during repair. The specific language addressing this states:

Clean Air Act §7522. (a) (5) No action with respect to any device or element of design referred to in paragraph (3) shall be treated as a prohibited act under that paragraph if

(i) the action is for the purpose of repair or replacement of the device or element, or is a necessary and temporary procedure to repair or replace any other item and the device or element is replaced upon completion of the procedure, and

(ii) such action thereafter results in the proper functioning of the device or element referred to in paragraph.

BOTTOM LINE: DON'T TAKE THE RISK

USEPA HAS INCREASED FINES FOR TAMPERING

EPA has increased most civil penalty amounts in accord with the provisions of the Debt Collection Improvement Act of 1996 (DCIA). The agency is required to review the civil monetary penalties under the statutes it administers every four years and to adjust the penalties as necessary for inflation according to a formula specified in the DCIA. Civil penalties were last adjusted in 2004. In a Federal Register notice, EPA states, “[T]he purpose of these adjustments is to maintain the deterrent effect of civil penalties and to further the policy goals of the underlying statutes.” Table 1 in the notice includes all past civil penalty amounts, statute by statute, and the pending adjusted amounts that can be imposed on violators. The maximum daily amount that can be recovered under section 113 (b) of the Clean Air Act has now increased from \$25,000 to \$37,500. [For further information: <http://www.epa.gov/fedrgstr/EPA-GENERAL/2008/December/Day-11/g29380.pdf>]

This final rule also applies to section 203(a)(3)(A) and (B) of the Clean Air Act. Manufacturer/new car dealer penalties for installing aftermarket components that in any way bypass or compromises the vehicle manufacturer’s emissions control system is \$37,500. The penalty for anyone else installing aftermarket components that in any way bypasses or compromises the vehicle manufacturer’s emissions control system is \$3,750. These penalties also apply to improper aftermarket catalytic converter replacements.

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Meet the Most “Popular” DTC: P0420

Test data from Wisconsin OBDII tests reveals that vehicles failing for the Diagnostic Trouble Code (DTC) P0420 Catalytic Efficiency Below Threshold (Bank 1) are not passing retests at a higher rate than other DTC codes. While failures for DTC P0430 Catalytic Efficiency Below Threshold (Bank 2) is less frequent, the diagnostic strategy for repairs for either DTC is similar. The most common reason for these vehicles failing retests is that technicians may be automatically replacing the catalytic converters rather than performing a complete diagnostics to find the root of the problem.

To better understand the conditions that cause the trouble code to be present, it can be helpful to look at what the monitor is checking during vehicle operation. The vehicle’s OBDII system monitors a catalyst’s efficiency by comparing the switching activity of the upstream and downstream oxygen sensors in the exhaust. The upstream oxygen sensor in the exhaust manifold reflects the condition of exhaust gases as they exit the engine. The downstream oxygen sensor, in or behind the catalytic converter, reflects the condition of the exhaust as it passes through the converter. If the catalyst monitor finds too much switching activity in the downstream O2 sensor after the converter is hot while the vehicle is being driven, it may set a P0420 code and turn the check engine light on.

So does this mean that the catalytic converter is no longer functioning properly? Not always, but the challenge is to determine whether the cause is a bad catalytic converter or another reason that is causing this monitor to activate. Some possible reasons for activating this code are as follows:

- ◆ Damaged pre-cat exhaust manifold/catalytic converter/ pre-cat exhaust pipe including the flex pipe
- ◆ An oxygen sensor(s) not functioning properly
- ◆ High fuel pressure
- ◆ The engine coolant temperature sensor not working properly
- ◆ A cylinder misfiring

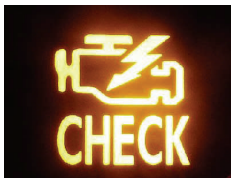
So where do you begin to narrow the cause of this code? BEFORE you replace the converter, look at the following:

Exhaust System: You should also inspect the exhaust system and converter for leaks. "False" air can enter the exhaust through leaks and upset the O2 sensor readings, causing them to read leaner than normal. Colorado State University developed an effective procedure for checking the efficiency of Catalytic Converters through the use of feed gases.

Verify that the vehicle’s exhaust system meets OEM requirements. If modifications have been made, they could activate the catalytic converter efficiency codes.

Inspect the vehicle’s exhaust system to verify that there are no pre-cat leaks. False air entering the exhaust through the pre-cat leaks can bias the O2 sensors.

In vehicles with multiple catalytic converters, some of the catalysts downstream are not monitored and would not have an impact on the emissions failure. It is important to identify what catalysts are being monitored and which are related to the DTC prior to repairs.



THE MOST
COMMON DTC
PRESENT WITH
MIL FAILURES IS
P0420—
CATALYST
SYSTEM
EFFICIENCY
BELOW
THRESHOLD
(BANK 1)

O2 Sensors: If the downstream O2 sensor is bad (heater circuit not working, loose or corroded wiring connector, contaminated sensor element, etc.), the OBD II system should detect the fault and set an oxygen sensor code. The same goes for a bad upstream O2 sensor. In either case, the presence of an O2 sensor code could prevent the catalyst monitor from running and setting a false P0420 code.

Verify the operation of each oxygen sensor(s) with a scan tool or software. If you see normal switching action in both sensors shortly after the engine is started, the O2 sensors are working properly. Look for the O2 sensor voltage switching back and forth between rich (>0.8 volts) and lean (< 0.3 volts.)

Fuel Pressure: High fuel pressure could be the cause of a DTC P0420 which causes the catalytic converter to load up with hydrocarbons. Check the fuel pressure at idle as well as under load to determine if the fuel pressure is within manufacturer specifications. Also check the fuel pressure regulator, injectors and O-rings for leaks.

Coolant Temperature: If there is a bad coolant temperature sensor, the vehicle could remain in open loop. This would cause the catalytic converter to overload with hydrocarbons.

Cylinder Misfiring: While you might expect a rich H02S in the case of an ignition-related misfire, there is also a large amount of unburned oxygen, since no combustion is taking place in the misfiring cylinder.

When approaching the diagnostics on a vehicle that has a P0420 code, narrowing down the causes is an important first step. Check to see if the vehicle has any Technical Service Bulletins related to this code. In some cases, a "re-flash" of the engine computer may be required if the vehicle has a history of being overly sensitive with the catalyst monitor.

Top 10 DTCs

| DTC | Description | Percent |
|-------|----------------------------------------------------------------|---------|
| P0420 | Catalyst System Efficiency Below Threshold (Bank 1) | 5.53 |
| P0300 | Random/Multiple Cylinder Misfire Detected | 4.22 |
| P0171 | System Too Lean (Bank 1) | 4.17 |
| P0442 | Evaporative Emission Control System Leak Detected (Small Leak) | 3.7 |
| P0455 | Evaporative Emission Control System Leak Detected (Gross Leak) | 3.15 |
| P0174 | System Too Lean (Bank 2) | 2.31 |
| P0401 | Exhaust Gas Recirculation Flow Insufficient Detected | 2.17 |
| P0141 | O2 Sensor Heater Circuit Malfunction (Bank 1 Sensor 2) | 2.03 |
| P0440 | Evaporative Emission Control System Malfunction | 2.02 |
| P0301 | Cylinder 1 Misfire Detected | 1.87 |

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Preparing Your Customer For A Cost Waiver Review

The Wisconsin Vehicle Inspection Program has incorporated the services of five Technical Assistance Centers to issue cost waivers. Before a customer would qualify for a cost waiver, the following criteria must be met:

1. *Vehicle has failed at least two inspections*
2. *Repair work has been performed at a recognized repair facility.*

In the case of a vehicle failing the inspections, there has been an initial inspection and repairs performed at a recognized repair facility to address those Diagnostic Trouble Codes on the previous inspection.

The motorist received a list of recognized repair facilities at the time of the vehicle inspection. A complete list of recognized repair facilities can also be found on the program [website](#).

3. *Repair invoices need to be in compliance with the [Chapter ATCP 132](#), Wisconsin Administrative Code.*

The invoice must also contain the phrase: "Motor vehicle repair practices are regulated by chapter ATCP 132, Wis. Adm. Code, administered by the Bureau of Consumer Protection, Wisconsin Dept. of Agriculture, Trade and Consumer Protection, P.O. Box 8911, Madison, Wisconsin"

4. *The repair invoices must be marked paid for the repairs and diagnostics.*

The repair invoice should provide specific information about what repairs or diagnostics were performed to address the problems on the previous vehicle inspection that caused the vehicle to fail (DTCs) or reject (readiness monitors not completed). Each part must also be listed and include the unit price.

Estimates for repairs alone do not qualify a motorist for free Technical Assistance Center services. REMINDER: Without an initial inspection, repairs and re-inspection, the vehicle would not qualify for a cost waiver review at a Technical Assistance Center.

If the above criteria has been met, your customer may qualify for a cost waiver review. TACs also provide additional diagnostics for motorists after the vehicle/motorist meets specific repair and test criteria.

Please ask the motorist to call 866-OBD-TEST (866-623-8378) for more information about how to schedule a TAC appointment.

Note: The repair cost limit for all model year vehicles subject to testing will increase from \$840 to \$855 on July 1, 2014. This figure is adjusted annually by the DNR per NR485.045.

HELP YOUR
CUSTOMERS
PREPARE FOR A
COST WAIVER
REVIEW.



WISCONSIN VEHICLE INSPECTION PROGRAM

Federal Emissions Warranties

Section 207 (l) of the Clean Air Act specifies that the defect and performance warranty period for light-duty trucks and vehicles and engines manufactured. Emissions repairs for either defect or the performance warranties on the chart below are the responsibility of the manufacturer. During the warranty period, only an authorized repair facility from the manufacturer has the ability to receive reimbursement and approval for the repairs.

| Vehicle Model Year | Defect Warranty | Performance Warranty |
|-----------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 1996 & Newer (For Tier 0 and Tier 1) | All emissions related components for 2 years/24,000 miles | All components and parameter adjustments for 2 years/24,000 miles. Certain specified components. (Catalyst and ECU) for 8 years/80,000 |

Understanding OBD II Results

| | |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PASS | <ul style="list-style-type: none"> ◆ MIL Not Commanded On for Any DTC ◆ Readiness Status OK |
| FAIL | <ul style="list-style-type: none"> ◆ MIL Commanded On For Any DTC ◆ DLC missing, damaged or inoperable ◆ Check Engine Light Does Not Illuminate During Key On Engine Off (KOEO) ◆ Check Engine Light illuminates continuously or flashes during Key On Engine Running (KOER) |
| Readiness/Reject | <p>Monitors</p> <ul style="list-style-type: none"> ◆ 1996-2000: Three or more non-continuous monitors are not set to ready ◆ 2001 and newer: Two or more non-continuous monitors are not set to ready <p>Communications</p> <ul style="list-style-type: none"> ◆ Vehicle is unable to communicate with analyzer after three attempts and protocol check |

NOTE: A deliberate or unintentional attempt of clearing codes prior to the OBD test will cause the readiness monitors to reset to NOT READY and may cause a readiness reject.

Only a pass or waiver result will enable the motorist to renew their vehicle registration. Please refer motorists with multiple failures or rejects to 866-OBD-TEST or www.wisconsinvip.org.



5470 South Westridge Dr
 New Berlin, WI 53151
 262-641-5217 (voice)
 262-641-5095 (fax)

**EMISSION REPAIR FACILITY
 PROFILE**

(please circle one)

UPDATE **NEWLY REGISTERED**

If you wish to register your repair facility with the vehicle inspection program or need to update your business record, please provide the following information for your repair facility. Mail the completed form with technician certifications to address above, or fax it to 262-641-5095, or scan to sue.krueger@opusinspection.com. A recognized repair facility is one that employs at least one technician with ASE L1 certification, WISETECH training, or other equivalent training. Please attach copies of documentation for each technician's training or certifications.

FACILITY INFORMATION:

Facility Name: _____

Street Address: _____

City: _____ State: _____ ZIP: _____

Main Business Phone #: () _____ E-Mail: _____

Owner or Manager: _____ County: _____

TECHNICIAN INFORMATION

Name: _____ (First Name) _____ (Last Name)

Certifications:

| Circle & Indicate Expiration Date | ASE | Expiration Date | ASE | Expiration Date | WISETECH | Date Graduated | School |
|-----------------------------------|-----|-----------------|-----|-----------------|----------|----------------|--------|
| L1 | | _____ | L2 | _____ | | _____ | _____ |

Other: (Explain) _____

DIESEL CERTIFICATIONS: Please indicate if you have diesel certification for a specific make (Honda, Ford, ..) of vehicle(s) you are certified to work on. List all that apply and attach Diesel certification documentation to this application:

TECHNICIAN INFORMATION

Name: _____ (First Name) _____ (Last Name)

Certifications:

| Circle & Indicate Expiration Date | ASE | Expiration Date | ASE | Expiration Date | WISETECH | Date Graduated | School |
|-----------------------------------|-----|-----------------|-----|-----------------|----------|----------------|--------|
| L1 | | _____ | L2 | _____ | | _____ | _____ |

Other: (Explain) _____

DIESEL CERTIFICATIONS: Please indicate if you have diesel certification for a specific make (Honda, Ford) of vehicle(s) you are certified to work on. List all that apply and attach Diesel certification documentation to this application:

VERIFICATION

As owner/manager of this repair facility, I verify that my facility is actively engaged in the automotive repair business and that information provided is accurate. I understand that it is my responsibility to notify the Wisconsin Vehicle Inspection Program if my profile information changes.

_____ Repair Facility Owner/Manager _____ Date

OFFICIAL USE ONLY:

Recognized: YES NO Registration Number: _____