



The Analyzer

THE WISCONSIN VEHICLE INSPECTION PROGRAM

WIVIP HELP LINE
(866)623-8378

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Looking for All ASE L1 Certified Repair Technicians

Do you have a current ASE L1 Certification for Advanced Engine Performance Specialist? If so, we'd like to hear from you.

The Automobile - Advanced Engine Performance Specialist (L1) is an advanced level certification from ASE. It is geared toward technicians who diagnose and repair electronic drivetrain and emission control systems in modern automobiles and light trucks.

Having a current L1 certification will give your repair facility "Recognition" status. There are many advantages to being a recognized repair facility.

- **Increase business.** Accurate repairs yield satisfied customers and word-of-mouth referrals from family and friends.
- **Gain free advertising:** Only a list of recognized repair facilities are provided to motorists at the time of their vehicle's failure or reject. There is also a special section on the program website (www.wisconsinvip.org) that lists recognized repair facilities.
- **Increase your credibility:** As a recognized repair facility, you become one of a select group of repair facilities distinguished for having technicians with advanced emission repair training.
- **Stand out.** Only emission repair work performed at a recognized repair facility is eligible for waiver consideration.

To register with the Wisconsin Vehicle Inspection Program, please complete the Emission Repair Facility Profile, found on page 7 of this newsletter and return it Opus. If you have any questions, please call us at 262.641.5217.

What Vehicles Require Testing In 2018?

Registration Renewal Testing Requirement

Every other year, 1996 and newer vehicles (newest 3 models years are exempt) must be inspected before their license plates can be renewed. Because this is a biennial test, the following model years will be tested to fulfill registration renewal testing requirements:

Model Years Tested For Registration Renewals Expiring in 2018:

1997, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013, 2015

Testing Requirements for Change of Ownership Testing

Vehicles more than five model years old are required to be inspected upon change of ownership. Motorists receive notice of the emission-testing requirement after they have titled and registered the vehicle. Failure to complete the emission requirement within the allotted 45-day time period will result in the suspension of the newly purchased vehicle's registration.

Vehicles Purchased in 2018:

Model years 1996-2013 must be tested at the time a buyer titles the vehicle.

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The challenges of diagnosing and repairing EVAP System Diagnostic Trouble Codes (DTCs) is not unique to Wisconsin. "EVAP Monitor Operation" was covered in the February 2015 issue of the Rhode Island emission testing newsletter. The article reviewed the fundamentals of the EVAP monitor's operation and provided insight into addressing issues related to this emission control system. Special thanks to the Rhode Island program for sharing this article with the Wisconsin Vehicle Inspection Program.

EVAP Monitor Operation

By Mike Isabella

Assistant Professor, New England Institute of Technology

As part of the new government mandate of 1996, OBDII requires manufacturers to perform a vapor canister flow test as part of the OBDII monitor. To pass the test, a minimum flow rate of 1L/minute must be met.

How does the manufacturer actually measure this purge flow? If a mass air flow sensor (MAF) is used, the powertrain control module (PCM) will duty cycle the purge valve a specific amount and look for a corresponding drop in the MAF reading. Similarly, if a manifold absolute pressure sensor (MAP) is used, the PCM will look for a corresponding increase in the MAP reading. To ensure that the hoses are attached to the vapor canister and in good working order, the PCM also looks at the heated oxygen sensor (HO₂S) to switch rich.

This purging process mixes the hydrocarbon (HC) vapors from the canister with the existing air-fuel charge. Purging of the canister is desired under certain operating conditions. Normally, purge flow is wanted on a fully warmed engine during light load, cruise conditions. However, on many newer vehicles, the PCM will initiate purge flow shortly after initial start-up.

In 1998, in addition to the purge test, OBDII also required the manufacturer to perform a leak test of the entire EVAP system, with a maximum allowable leak of .040". In 2001, the maximum allowable leak for passenger vehicles was reduced to .020". Eventually, the maximum allowable leakage will be reduced to .000".

In model year 2000, some manufacturers started phasing in a *check fuel cap* message on the instrument cluster. A check for a *refueling event* is done at engine start and refuel flag is set if the fuel level is at least 20% greater at start-up.

To perform this quick check, the PCM closes the vent solenoid and will look for a slight increase in tank pressure due to fuel slosh. A diagnostic trouble code (DTC) P0457 is set if the fuel cap pressure is less than 7" H₂O within 30 seconds of refueling while the PCM monitors the fuel tank pressure (FTP). This is normally a two trip monitor.

A more complete leak test is performed once per drive cycle providing the enable criteria is met. Some of the enable criteria necessary to run the monitor include:

- ◆ Ambient temperature usually between 40°-100° F.
- ◆ Cold start
- ◆ Fuel level between 1/4—3/4 full
- ◆ Altitude less than 8,000 feet

Some manufacturers may also require a soak timer to time-out. This is generally an 8 hour period in which the vehicle is not running. This is to allow the vehicle to completely cool down to ambient or outside temperature.

EVAP Monitor Operation

(continued from page 3)

The leak check portion of the monitor comes in two basic varieties: pressure based and the more popular vacuum based.

Some vacuum based systems will test by closing the vent solenoid to seal the system, then duty cycle the purge solenoid with the engine running to draw a slight vacuum on the system, typically between 7"-10" H₂O. If the system is incapable of reaching this target vacuum while the PCM monitors the FTP, a large leak DTC is set and the malfunction indicator lamp (MIL) is turned on.

If the target vacuum is met, the PCM will continue to monitor the FTP voltage for a change over a period of time, usually 20 seconds. If the rate of change exceeds a pre-set value over this time, then a small/medium leak DTC will be set.

The FTP may be located on the fuel tank itself or on the fuel pump module (GM) or the FTP may be mounted remotely (FoMoCo/Toyota) in the vapor line from the tank to the vapor canister.

A more recent type of vacuum based system is the engine off natural vacuum (EONV) system. This type of system works on the principle of the Gas Law, which states that the pressure in a sealed container will change if the temperature of the gas in the container changes.

The Small Leak Test is performed first after the vehicle shut-down by closing the vent solenoid to seal the system and allowing the fuel to cool down. When the fuel begins to cool, a natural vacuum will build within the tank that the PCM can monitor through the FTP or by closing a switch by a rise of the diaphragm on a natural leak detection (NVLD) pump.

A pressure based EVAP monitor is used by some manufacturers. The theory is basically the same with the exception that this system checks for leaks by pressuring and watching for a pressure loss.

The main component of this type of system is the leak detection pump (LDP). The pump is operated by engine vacuum controlled by the PCM and the vacuum solenoid on the LDP itself.

In most instances the vent valve is part of the LDP. The vent valve in the LDP is normally open, allowing fresh air to the canister.

When grounded by the PCM, the vacuum solenoid on the LDP allows vacuum to the upper chamber of the LDP. The vacuum will pull the diaphragm up against spring pressure (7.5" H₂O).

When the diaphragm is pulled up against spring pressure, the normally closed contacts of the LDP reed switch open. The PCM will now monitor the *rate of descent* of the LDP diaphragm by monitoring the reed switch contacts.

The time between the LDP solenoid off and LDP switch closed is called the *pump period*. This time period is inversely proportional to the size of the leak.

The LDP reed switch contacts can be monitored with a scan-tool.

I hope this article has given you a better understanding of the modern EVAP system and the confidence to diagnose those pesky EVAP DTCs.

Mike Isabella is an Assistant Professor in New England Institute of Technology's Automotive Technology Program. He is an ASE Certified Master Automotive Technician (CMAT) with L1 and F1 certifications. Mike is also a Rhode Island Certified Inspection Technician (CIT) and Certified Inspection Repair Technician (CIRT).

The Analyzer

Testing Tips



Here are a few reminders to perform the testing process properly:

- Perform the KOEO/KOER test prior to plugging into the vehicle's OBD port. The vehicle must be turned to the accessory position to perform the Key-On-Engine-Off (KOEO) test. The vehicle must be started to perform the Key-On-Engine-Running (KOER) test.
- Make sure the vehicle's engine is running prior to plugging into the vehicle's OBD port
- Verify the vehicle information entered into the analyzer matches the vehicle and paperwork. This includes the VIN, Make, Model, Model Year, Plate, Odometer and GVWR (if SUV, truck or van). If there are errors, abort the test prior to completing the process. If the test has been completed, immediately retest the vehicle.
- If you're looking at a SUV, truck or van and you weren't asked to input the GVWR, make sure that the vehicle type is not "Passenger Vehicle". If it is, change it to the appropriate vehicle type and enter the GVWR. The analyzer will tell you if it should be tested or issued a weight waiver.
- Provide the motorist with all the printed materials before they leave. For a reject, there should be 5 pages, for a failed test, there should be 7 pages handed to motorist.
- Offer the motorist a temporary plate or vehicle registration, if eligible, before they leave.
- Never team test. Only the inspector who fingerprinted in can perform all parts of the inspection.

Registration and Temporary Plate Reminders

Here are a few reminders:

- Always verify the registration renewal information with the dashboard VIN to ensure that you are registering the right vehicle.
- Never hand out a sticker unless you can print out the receipt and certificate of registration. If you are unable to print out these documents, call Opus at 262.641.5217.
- Issue Temporary Plates in sequential order. If you void one, do not throw it out. Write "VOID" on the plate and give to your manager. It will need to be given to Opus when one of the Field Service Technicians stops by for service.
- Never leave old registration renewal notices on the analyzer. They should be given to your manager, who will shred them if the customer does not return for them the next day.
- Secure the registration renewal stickers and temporary plates so they are not stolen. Keep them locked up at night. Treat them as cash!
- Temporary Plates cannot be issued unless the vehicle has a recent Fail or Reject test. Without a fail/reject test, the motorist is not eligible for a temporary plates.





Introducing the Repair Book

Fast, Easy and Good For Business

It is now easier for your facility to receive credit for repair activity of vehicles that failed their emissions inspection. Once registered, repair technicians can access the Repair Book reporting website and log emission-related repairs. Your success rate in repairing vehicles will be posted on the www.wisconsinvip.org website. It is a great way to inform past, current and future customers about your success in performing emission-related repairs.

STEP 1: IS YOUR BUSINESS ALREADY REGISTERED WITH THE WISCONSIN VEHICLE INSPECTION PROGRAM?

- a) Verify if your business is already registered with the program. The easiest way to check is to look at the Inspection Facility, Recognized Repair Facility or Non-Recognized Repair Facility listings on the program website at www.wisconsinvip.org.
- b) If your facility is already registered, go to step 2.
- c) If your facility has not registered with the program, complete the profile form found on the program website in the "Recognized Repair Facilities" section.
- d) Once registered, your facility's repair activity can be reported on www.wisconsinvip.org, which is the official program website. The more effective you are at repairing vehicles that had failed the emission test, the better your repair score!

Repair Grade: 100%

Sample listing:

Facility Name	Address	City	Phone	Zip Code	REI	Web Site
YOUR GARAGE NAME	123 MAIN ST	ANYTOWN	(XXX) XXX-XXXX	53XXX	100.0	url hyperlink

STEP 2: TECHNICIAN REGISTRATION FOR THE REPAIR BOOK?

- a) At the sign-in screen, select register.
- b) Choose the station you are currently employed and select continue.

NOTE: If you change locations, please complete an updated Emission Repair Facility profile and submit it to Opus.

- c) Complete the registration information.



Wisconsin Repair Book

Tuesday, Dec 30, 2014



First Name

Job Title

User ID

Middle Name

Email

Password

Last Name

Verify Email

Re-enter Password

Do you own an ASE L1 (or Higher) or WISETECH certification?

Password must be between 6 and 10 characters

Password must be between 6 and 10 characters

Introducing the Repair Book

STEP 3: DATA ENTRY PROCESS FOR EMISSION RELATED REPAIRS

Certified Repair Info			
Owner Repair?	Yes <input type="radio"/> No <input type="radio"/>	Total Parts Cost	Total Labor Cost
For three dollars and thirty cents enter 3.30. For three hundred and thirty dollars enter 330			
The following should be completed only if NOT repaired by owner:			
Work Order #	Facility of Person Performing Repair	Apply to REI? <input type="checkbox"/>	
Phone#			
City	State	Zip	
Repair Date			

- Complete the information requested.
- Select whether it is an owner repair.
- Enter parts and labor cost. (Example: For three dollars and thirty cents, enter 3.30. For three hundred and thirty dollars, enter 330.)
- If not the owner, complete the section requesting more information on repairs.
- Indicate whether you want the repair record applied to your Repair Book (REI) Score.
- Select the repairs performed on the vehicle.

Vehicle Repair Data							
For reinspection or waiver qualification, the person performing the repairs must complete this form. Please place one "X" per item in the box to indicate which component has been (A) repaired, (B) replaced, or (C) repairs were recommended but not performed.							
1. Air Filter Element	A <input type="radio"/>	B <input type="radio"/>	C <input type="radio"/>	None <input type="radio"/>	15. Air Injection System	A <input type="radio"/>	B <input type="radio"/>
2. Thermostatic Air Cleaner System	A <input type="radio"/>	B <input type="radio"/>	C <input type="radio"/>	None <input type="radio"/>	16. Positive Crankcase Ventilation System	A <input type="radio"/>	B <input type="radio"/>
	C <input type="radio"/>	None <input type="radio"/>				C <input type="radio"/>	None <input type="radio"/>

- Once the data is entered, select continue.
- If you see the screen below, you have successfully entered the data.

Success
Congratulations! The repair data has been saved! This data may be used in the determination of your facilities REI. Continue

QUESTIONS? 262-641-5217



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:	<i>(First Name)</i>			<i>(Last Name)</i>		

Certifications: <small>Circle & Indicate Expiration Date</small>	ASE L1	<small>Expiration Date</small> _____	ASE L2	<small>Expiration Date</small> _____	WISETECH	<small>Date Graduated</small> _____

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:	<i>(First Name)</i>			<i>(Last Name)</i>		

Certifications: <small>Circle & Indicate Expiration Date</small>	ASE L1	<small>Expiration Date</small> _____	ASE L2	<small>Expiration Date</small> _____	WISETECH	<small>Date Graduated</small> _____

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.

_____	Date												
Repair Facility Owner/Manager													
OFFICIAL USE ONLY:													
Recognized: YES NO	Registration Number: <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> <td style="width: 20px; height: 20px;"> </td> </tr> </table>												