

## Significant Emission Test Changes Coming In July 2008

The Wisconsin vehicle emissions testing program will undergo changes on July 1, 2008 that affect both motorists and the automotive repair industry. These changes stem from statutory changes contained in the recently adopted state budget.

The changes coming in July include:

- Eliminating mandatory testing for non-OBDII compliant vehicles.
- All vehicles that are model year 1995 and older will be exempted starting July 1. So will newer vehicles with gross vehicle weight rating (GVWR) over 8,500 pounds. ( Under current law, model year 1968 and newer vehicles weighing up to 10,000 lb. GVWR are subject to testing.) This change eliminates the use of IM240 testing in our program.
- Eliminating gas cap testing for OBDII compliant vehicles. Since a vehicle's OBDII system evaluates evaporative system performance, the gas cap check will no longer be necessary on 1996 and newer vehicles.

The program's statutory changes also will expand the population of vehicles subject to OBDII testing, effective January 1, 2010. Beginning on that date, all model year 2007 and later vehicles between 8,501 and 14,000 lb. GVWR will be tested – including diesel-powered vehicles.

While the above changes are significant, many aspects of the program will remain unchanged:

- Vehicles will still require emissions testing every two years as part of their registration renewal requirement. Generally, even-model year vehicles will be tested in odd calendar years and odd-model year vehicles in even calendar years.
- Model year 1996 and newer vehicles over five model years old will require testing upon change of ownership.
- Motorists will continue receiving required tests free of charge (until their third retest).
- The program area will remain the same: Kenosha, Milwaukee, Ozaukee, Racine, Sheboygan, Washington, and Waukesha counties.

With these program changes, Wisconsin will join the growing number of states operating OBDII-only vehicle emission inspection programs.

We will be mailing another Analyzer soon with further program change details, including a schedule of informational seminars. Meanwhile, we invite you to contact us with any questions. Contact us by phone at (414) 358-3900 x6117 or (608) 266-2267, or use the feedback form on the program website: [www.wivip.com](http://www.wivip.com).

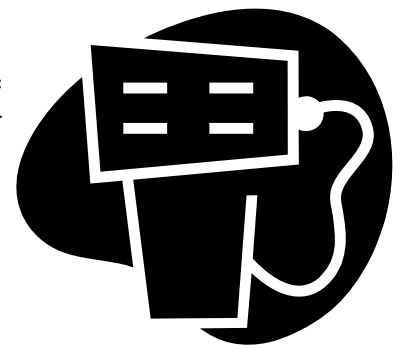
We look forward to continuing our valued partnership with you, members of Wisconsin's vehicle repair community.

## A Word of Caution: Use of E85 Fuel In Non-Flex Fuelled Vehicles Can Cause Problems

As the retail cost of gasoline increases, we are seeing more price differentials between regular gasoline and E85 gasoline at stations where it is available. E85 is a blend of 85 percent denatured ethanol and 15 percent gasoline. It should not be confused with another common mix called E10, which is a blend of 10 percent ethanol and 90 percent gasoline. E10 is available in many areas across the United States and can be used in any gasoline vehicle manufactured after 1980.

E85 cannot be used in a conventional, gasoline-only engine. Vehicles must be specially designed to run on it. The only vehicles currently available to U.S. drivers are known as flex fuel vehicles (FFVs), because they can run on E85, gasoline, or any blend of the two. Much like diesel fuel, E85 is available at specially-marked fueling pumps. Today, nearly 700 fueling stations offer it nationwide including a growing number of stations in southeastern Wisconsin.

Burning gasoline with greater than 10% ethanol in non-flex fuel designed vehicles can cause drivability issues, service engine soon indicators as well as increased fuel corrosion. Fueling non-Flex fuel designated vehicles with E-85, or with fuels where the concentration of ethanol exceeds the ASTM specification of 10%, may result in the following conditions:



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**Lean Drivability concerns such as hesitations and/or possible stalling**

Using E85 in a non-Flex Fuel vehicle will cause the air fuel mixture to be leaner than normal in carbureted or open loop fuel injection engines and cause closed loop fuel injection systems to adjust for the increase in oxygen content of the fuel mixture. The result will be drivability problems due to the lean mixture.

**MIL lights due to OBD codes, including Fuel Trim codes P0171 and or P0174, Misfire codes (P0300), Various O2 sensor codes, Catalytic Converter codes**

Using E85 in non-Flex Fuel vehicles can also cause a variety of DTCs causing the MIL to illuminate. This is caused by the vehicles computers responding to the change in fuel mixture in which it believes it can not maintain the closed-loop control of the internal combustion process due to the presence of more oxygen in E85 than gasoline. There can be stresses placed on various emission components of the vehicle due to E85 usage in standard engines.

**Fuel system and/or engine mechanical component degradation**

Use of E85 gasoline in non-Flex fuel vehicles can cause damage to metal and rubber parts in older engines designed primarily for gasoline. In addition to corrosion, there is a risk of increased engine wear for non-Flex fuel vehicles that are not specifically designed for operation on high levels (>10%) of ethanol. The risk primarily comes from a rare occurrence where the E85 becomes contaminated with water.

**Measures To Take If You Suspect E85 Has Been used in Non-Flex Fuel Vehicle**

If you suspect that a non-Flex fuelled designated vehicle has been fueled with E85, the fuel in the vehicle's tank should be checked for alcohol content. Check with the manufacturer to determine their methods of checking alcohol content in the fuel. If the alcohol content exceeds 10%, the fuel should be drained and the vehicle refilled with gasoline. Unfortunately, if E85 fuel has been used in a non-Flex Fuel vehicle, the repairs are not covered under the terms of the New Vehicle warranty.

**Converting Conventional Vehicles To Run E85**

While it is technically possible to convert a conventional gasoline vehicle to run on E85; such conversions would likely be illegal unless they are certified by the U.S. Environmental Protection Agency (EPA). To date, EPA has not certified any E85 conversions. In addition, converting a conventional vehicle to E85 may violate the terms of the vehicle warranty. For more information on the vehicle conversion process, please visit EPA's Web site at: [www.epa.gov/otaq/cert/dearmfr/cisd0602.pdf](http://www.epa.gov/otaq/cert/dearmfr/cisd0602.pdf)

**Benefits of Using E85 Gasoline in FFV's**

While we've discussed the dangers of using E85 in non-FFV's, what are the advantages in using it in vehicles designed to burn E85? According to the USEPA web site, E85 provides important reductions in greenhouse gas (GHG) emissions. When made from corn, E85 reduces life-cycle GHG emissions (which include the energy required to grow and process corn into ethanol) by 15-20% as compared to gasoline. E85 made from cellulose can reduce emissions by around 70 percent as compared to gasoline.

EPA's stringent Tier II vehicle emission standards require that FFVs achieve the same low emissions level regardless of whether E85 or gasoline is used. However, E85 can further reduce emissions of certain pollutants as compared to conventional gasoline or lower volume ethanol blends. For example, E85 is less volatile than gasoline or low volume ethanol blends, which results in fewer evaporative emissions. Using E85 also reduces carbon monoxide emissions and provides significant reductions in emissions of many harmful toxics, including benzene, a known human carcinogen. However, E85 also increases emissions of acetaldehyde--a toxic pollutant. EPA is conducting additional analysis to expand our understanding of the emissions impacts of E85.

Lastly, much of the increased interest in ethanol as a vehicle fuel is due to its ability to replace gasoline from imported oil. The United States is currently the world's largest ethanol producer, and most of the ethanol we use is produced domestically from corn grown by American farmers. In Wisconsin, crops used for ethanol production has increased dramatically in the last few years and has become an important industry in Wisconsin.

Source: EPA420-F-06-047, October 2006

**WISETECH PATCHES AVAILABLE**

*Technicians who have successfully completed a WISETECH class are eligible to receive two program patches free of charge. To request your patches, contact us at (414) 358-3900 x6117 or via the WVIP website feedback form: [www.wvip.com](http://www.wvip.com).*





## A Little Detective Work May Be Needed To Find Causes of DTC Catalytic Efficiency Code – 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. 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 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
- ◆ 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.
- ◆ 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 an 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 "reflash" of the engine computer may be required if the vehicle has a history of being overly sensitive with the catalyst monitor. You can always call the Technical Assistance Centers too to discuss the vehicle. Their phone numbers are 414-768-9135 or 800-335-5088.

## Training Classes

As an ongoing service to the repair industry, The WIVIP Analyzer will publish a list of private and public training centers that offer courses in automotive repair technology. The following is just a sampling of training courses available to you. **The WIVIP Analyzer is not recommending any specific course and would encourage you to contact us at 414-358-3905 if you are aware of other training opportunities.**



Steve Hirshfeld  
WisDOT  
608-266-2267

### Other Training

Tim Houghtaling  
Automotive Seminars Inc.  
800/450-0402

Wells Technical Services  
Wells Manufacturing Corporation  
920/929-6258  
Technician Hotline (Free)  
1-800-558-9770 Press 3

## AUTOMOTIVE RELATED WEB SITES

WWW.CCAR-GREENLINK.ORG  
WWW.I-ATN.COM  
WWW.AUTO-TALK.COM  
WWW.STS.SAE.ORG  
WWW.ASTTRAINING.COM

## Wisconsin Technical Assistance Hotline

**414-358-3905**  
**800-335-5088**

## WISETECH PROVIDERS

Margie Zamorski  
Milwaukee Area Technical College  
5555 West Highland Road  
Mequon, WI 53092  
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Ken Dotzler  
Gateway Technical College  
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