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# ENVIRONMENTAL Fact Sheet

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## On-Board Diagnostics: A New Generation of Motor Vehicles

### What is On-Board Diagnostics? State-of-the-Art Technology

Beginning in the early 1980s, automobiles have been equipped with technology that helps technicians identify problems associated with computerized engine systems. This technology, known as on-board diagnostics or OBD, is made up of various sensors that communicate their findings to a technician by means of diagnostic trouble codes stored in the automobile's computer.

The federal Clean Air Act Amendments of 1990 required all 1996 and newer light duty vehicles to have more advanced OBD systems, known as OBD II. OBD II systems monitor vehicle conditions and components that are related to vehicle emissions, such as the catalyst in the catalytic converter, engine misfire, engine coolant temperature, and oxygen sensors. OBD II inspection programs ensure that the motor and emissions control equipment are operating correctly.

### What are the benefits of OBD?

Cars and trucks are responsible for approximately half of the air pollution that causes smog and acid rain and contribute to climate change. While it is true that modern cars emit less air pollution than older vehicles, they are only cleaner if their emission control systems are operating properly.

The OBD II system can often detect a vehicle malfunction before the driver becomes aware of the problem. Early detection and repair of malfunctions will result in fewer emissions and the early repair of minor problems may prevent more significant and more expensive engine problems that could develop if left unrepaired.

For example, a poorly performing spark plug can cause the engine to misfire, a condition sometimes unnoticed by the driver, but one that will be detected by the OBD II system. This engine misfire can, in turn, quickly degrade the performance of the catalytic converter and permanently damage the catalyst. By responding to the check engine light (turned on by the OBD II system) in a timely manner, the driver would be faced with a relatively inexpensive spark plug repair. However, without OBD II detection, the driver could be faced with an expensive catalytic converter repair in addition to the spark plug repair.

By storing the malfunction information in the computer's memory at the time it occurs, OBD II allows the service technician to more accurately identify the problem and make the proper repairs. This saves time for the repair technician, money for the consumer, and reduces air pollution.

### **How does the OBD II system work?**

The OBD II system monitors a variety of engine conditions and outputs while the car is being driven. When the OBD II system detects a problem with the emission control system, a dashboard light is illuminated indicating "Check Engine." A corresponding diagnostic trouble code is stored in the computer's memory documenting which emissions control component is experiencing the problem, and under what conditions. The repair technician will retrieve the diagnostic trouble code information from the computer using a computer scan tool. By using this information, a properly trained technician can more accurately find and fix the problem.



If the malfunction indicator light illuminates with a steady, continuous light, the vehicle operator should contact a repair technician and schedule a service visit. This is not an emergency situation, but the vehicle should be serviced soon. However, if the malfunction indicator light blinks or flashes, this indicates certain severe engine malfunctions. When this occurs, the vehicle operator should stop the car immediately and refer to the owner's manual to determine if the car can be driven or if it should be towed to a service station. Continued operation of the vehicle could result in damage to the engine or emissions control components, specifically the catalytic converter, a very costly component.

Sometimes the malfunction indicator light goes out by itself. This indicates that the problem that initially triggered the light no longer exists. This could happen if, for example, the gas cap was not on tight, but was then fixed. In this case, the light should reset itself and go out after several trips, eliminating the need for a service visit.

Some repairs may be covered under the vehicle's regular warranty or under a special warranty related to the OBD system and certain emission control components. Vehicle owners should check the warranty information and ask their technician what repairs are covered.

### **Who can service OBD II related problems?**

Only qualified, trained technicians using the correct equipment should perform OBD II related service. Vehicle owners should ask their repair facility if the technicians are certified to ASE A6, A8 and L1 standards, if they have the necessary diagnostic tools and especially if they will stand behind their work.

## **New Vehicle Safety Inspection Testing Requirements**

New Hampshire's annual enhanced vehicle safety inspection is now fully computerized and includes a test of the OBD II system on all model year 1997 and newer vehicles. The electronic



reporting and check of the OBD II system should add less than five minutes to the safety inspection time. Vehicles that pass the enhanced safety inspection and the OBD II test will be issued a New Hampshire vehicle inspection sticker. Vehicles that fail the safety portion of the inspection will not receive a sticker and must be repaired and re-inspected by the 10th of the month following the inspection month. If a vehicle fails the OBD portion of the test only, the vehicle operator is provided with a test report that specifies the reason for the failure. These vehicles must be repaired and retested within 60 days although the owner may apply for a 1-year-only hardship waiver from this requirement.

The OBD II system may tell the technician that certain components are not "ready" for testing and the vehicle owner may be asked to drive the vehicle for a few days to complete the "drive cycle," then return for testing. The "drive cycle" can generally be completed by operating the vehicle in a combination of in-town and highway driving. Essentially, a drive cycle puts a vehicle through enough different situations to allow the OBD II system to adequately evaluate the various components and will return the system to "ready" mode. A vehicle may not be ready for a number of reasons, including a recently disconnected battery or recent clearing of diagnostic codes using an OBD II scan tool.

### **For More Information**

New Hampshire Department of Safety Division of Motor Vehicles (603) 271-8800

New Hampshire Department of Environmental Services Air Resources Division (603) 271-1370