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The Drive to cleaner air

An Introduction to Enhanced Vehicle Emission Testing

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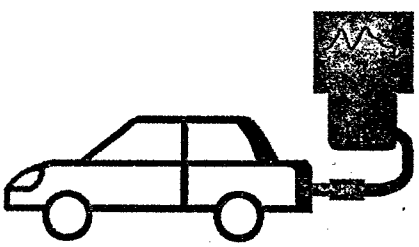
BACK COVER

About the Emission Testing Law

In 1990, Congress amended the Clean Air Act to require states to implement vehicle inspection and maintenance (I/M) programs. Highly populated areas that fail to meet air quality standards must implement either a "basic" or "enhanced" I/M program, depending on the level of pollution. The Act also requires additional controls on stationary sources (i.e., power plants) of air pollution, so everyone contributes to solving this important national problem.



Buying a car or truck is one of the biggest investments you make. To protect that investment, you must keep your vehicle in good working order. An important way to do that is to have your vehicle's exhaust emissions tested. Besides reducing air pollution, emission testing can help improve fuel economy and extend the life of your vehicle.

Emissions and Your Vehicle

High emission levels do more than pollute the air. They are symptoms of poor engine performance, which can cause decreased fuel efficiency and may signal possible engine troubles down the road.

You can extend the life of your vehicle by following the manufacturer's maintenance recommendations. Regular maintenance generally can help prevent many emission problems from developing.

If emission problems do occur, studies show that you can improve your vehicle's fuel efficiency by an average of 6% to 13% by having the problem repaired. This could mean a savings of $40 to $90 per vehicle every year.

In addition to lowering fuel costs and increasing your engine's efficiency, high-tech test-only emission testing is the most effective, least expensive way to identify polluting vehicles, which are the largest single source of air pollution in the United States.

Emissions and the Environment

By identifying vehicles that pollute, emission testing helps reduce risks to our health and the environment. It specifically works to reduce emissions of two major pollutants — carbon monoxide and ozone.

- **Carbon monoxide (CO)** is the deadliest component of air pollution. It is a colorless, odorless gas that results from incomplete combustion of fuel.

  CO goes directly from a vehicle's tailpipe into theair we breathe. It enters the bloodstream through the lungs and forms a compound that inhibits the blood's capacity to carry oxygen to the brain and tissues.

  This poisonous gas affects the elderly, infants, people with heart and respiratory disease, and even healthy individuals when they exercise. Acute exposure to CO can cause brain damage.

  Motor vehicles typically contribute 90% of the carbon monoxide pollution in urban areas.

- Another toxic component of air pollution is **ozone**, formed when hydrocarbons (HCs) and oxides of nitrogen (NOx) combine with sunlight. Both HCs and NOx are emitted from vehicles.

  In the upper atmosphere, ozone benefits life by filtering out ultraviolet radiation from the sun. At ground level, however, ozone can be damaging to plants, animals, and human tissue. Ozone is also a severe irritant that causes the choking, coughing, and stinging eyes associated with smog. High ozone concentrations can present serious problems for children, the elderly, and those with existing lung conditions.

  In typical urban areas, as much as one-half or more of these pollutants come from cars, trucks and buses.

How Do Emission Tests Work?

Emission tests check the gases your exhaust system releases and diagnose how well the entire system is working. They compare your actual emissions to the allowable standards for your vehicle model year and type.

There are two types of inspection and maintenance (I/M) testing programs — basic and enhanced. Which test is required for your vehicle depends on the level of air pollution in your area.

Basic I/M is used in areas with only moderate air pollution problems and consists of three types of tests:

- An **exhaust test** measures emissions through a hose hooked up to the tailpipe while your vehicle idles.
- An **on-board diagnostic (OBD) test.** Engine and emission control systems on today's vehicles are controlled by on-board computers. OBD computers monitor these systems and store codes when a problem is found so inspection or repair technicians can access these codes. The OBD test checks a log for any emission control problems recorded by the computer.
- A **visual check** of major emission control components.

Enhanced I/M refers to performance-based emission control initiatives selected by each state to meet enhanced performance standards in reducing air pollution locally.

There are several advanced technologies which can be used to evaluate overall engine performance. These high-tech, mass-based transient tests are currently used

in areas where pollution is more severe. The tests are very effective because they simulate actual driving conditions (including idling, acceleration, various speeds, and load levels) allowing emissions to be calculated more realistically. In addition, the sophistication of this technology reduces or eliminates false passes and false failures common in I/M testing.

A trained inspector, experienced in testing procedures and proper handling of vehicles, drives the vehicle onto a dynamometer (a vehicle treadmill) and performs some or all of the following tests:

- An **exhaust test** accurately measures, under real-world driving conditions, the amount of pollutants coming through a vehicle's tailpipe and compares that amount to the allowable standards. In general, tests take anywhere from 30 seconds to four minutes, or about two minutes.
- A **purge test** determines whether the gasoline vapors are properly captured from the fuel tank and charcoal canister and routed to the engine where they are burned as fuel. This is essential for pollution control and good fuel economy. This test is performed during the exhaust test.
- A **pressure test** checks the vehicle's evaporative emission control system for a proper seal.
- An **on-board diagnostic (OBD) test** (as described under the basic I/M test).
- A **visual check** of major emission control components.

The Future of Emission Testing

- Only by testing can we be sure that a vehicle's emission control system is working properly.

Today's tests are geared toward identifying emission control issues and having them repaired. Emission tests and other visual inspections rely on sophisticated computer technology both at the testing site to recognize if and how the car contributes to the pollution problem and at the repair facility where diagnostic equipment helps the technician isolate the cause so that it can be eliminated.

New technology, however, promises to make testing even easier. For instance, all new cars and trucks are equipped with OBD computers that monitor all the systems in a vehicle. OBD checks, if found to be effective, may replace other kinds of tests in the future.

Advanced technology in modern vehicles can greatly improve the quality of our air, but only if the engine is functioning properly. As vehicle owners take personal responsibility to maintain their vehicles and verify their engine performance through emission testing, America's #1 source of air pollution will be put in check.

A well-maintained car will last longer, cost less to operate, and be part of the solution to healthier, cleaner air.