



Clean Cars for Clean Air : Inspection and Maintenance Programs

What is Inspection and Maintenance?

Inspection and Maintenance (I/M) is a way to check whether the emission control system on a vehicle is working correctly. All new passenger cars and trucks sold in the United States today must meet stringent pollution standards, but they can only retain this low-pollution profile if the emission controls and engine are functioning properly. I/M is designed to ensure that vehicles stay clean in actual customer use. Through periodic vehicle checks and required repairs for vehicles that fail the test, I/M encourages proper vehicle maintenance and discourages tampering with emission control devices.

Why is I/M Needed?

Motor vehicle manufacturers have been required to meet increasingly stringent new vehicle pollution standards. But vehicles that are poorly maintained or that have malfunctioning emission controls often exceed those standards. Even minor malfunctions can increase emissions while major malfunctions can cause emissions to skyrocket. The average car on the road emits three to four times more pollution than standards allow for new cars.

The percentage of dirty vehicles increases with age. Roughly 30 percent of five-year-old cars emit excessive pollution. At seven years old, the average age of passenger cars in the United States, 55 percent of vehicles are high emitters. Overall, 10 to 30 percent of vehicles cause the bulk of the problem.

Unfortunately, it is not always obvious which vehicles fall into this category, as the emissions themselves may not be noticeable and emission control malfunctions do not necessarily affect vehicle driveability. Effective I/M programs can identify these problem vehicles and assure their repair.

I/M and Air Quality

Drivers may not think of their own vehicles as pollution sources, but cars and trucks collectively are the single greatest contributor in this country to carbon monoxide pollution and to ground-level ozone, the major component of smog. In typical polluted cities, vehicles contribute between 35 and 70 percent of ozone-forming emissions and 90 percent or more of carbon monoxide emissions.

Ambient concentrations of one or both of these pollutants exceed national air quality standards in virtually every major urban area of the country.

Substantial reductions in vehicle emissions are essential in cities struggling to achieve clean air. Depending on the sophistication of the program, I/M can reduce vehicle-related hydrocarbon and carbon monoxide emissions by 5 percent to more than 30 percent. A comprehensive I/M program can also yield reductions in nitrogen oxide emissions of up to 10 percent.

EPA oversees a number of programs designed to limit vehicle emissions, including requirements for cleaner vehicles, cleaner fuels, and cleaner transportation alternatives. Still, a well-designed I/M program remains the single most effective and cost-effective way to achieve major reductions in vehicle pollution.

What's Involved in an I/M Test?

States design and operate I/M programs in accordance with national policy set by EPA. In some states, inspections take place at government or privately-run inspection stations that do not perform vehicle repairs. Other states license service stations and repair shops to do inspections. Most states require annual checks.

Two basic types of tests are performed in I/M programs. The first is a test of emissions from the tailpipe (exhaust emissions). A probe is inserted into the tailpipe while the vehicle is idling or while the engine is being revved to 2500 rpm. Emissions analyzers then measure pollution levels in the exhaust. The second procedure involves a check to ensure that critical emission control components are present and operational. Cars that fail because of dirty exhaust or faulty emission controls must be repaired and re-inspected.

The cost to drivers for an I/M test varies from state to state and ranges from \$5 in Arizona to \$44 in California. The average test costs \$8 in states with inspection-only programs and \$18 in states where repair shops perform inspections.

Repair costs also vary considerably, depending upon the cause of failure. EPA estimates the average bill nationwide to be about \$50 to \$70 per vehicle that fails the test. The cost of some repairs is covered under emission performance or defect warranties required by the Clean Air Act or under other manufacturer warranties.

States consider vehicle design in setting the pass/fail cutoff for I/M tests. Older vehicles are not held to the same standard as newer models with more sophisti

cated emission controls. In addition, many states waive repair requirements if the cost exceeds a predetermined limit.

I/M: What's on the Horizon?

The 1990 Clean Air Act expands the scope of I/M as it currently exists. Many cities will need to start new I/M programs over the next several years and some cities that already require I/M testing will have to institute more comprehensive emission checks. Specifically, the new law calls for either basic or "enhanced" I/M programs in 154 areas, depending on the severity of pollution.

Basic programs will likely resemble those in place today with a simple emissions test and check of emission control devices. "Enhanced" programs will involve more comprehensive and sophisticated emission testing and functional checks. For example, in addition to exhaust from the tailpipe, these programs will address evaporative emissions, an increasingly important aspect of the hydrocarbon pollution problem. The enhanced I/M provisions prohibit stations that conduct I/M tests from performing vehicle repairs and also allows states to take steps such as tightening enforcement procedures to increase the overall effectiveness of their program.

Will New Technologies Eliminate the Need for I/M?

No, but emerging technologies may someday complement I/M programs:

- On-board diagnostic (OBD) systems will use vehicle computers to monitor emission controls. The computer triggers a dashboard indicator light when the controls malfunction. This, in turn, alerts the driver to seek maintenance for the vehicle. Diagnostic systems will be required on vehicles beginning with 1994 models. Future I/M inspections will include OBD checks, but because the OBD system itself could malfunction, be tampered with, or simply be ignored, OBD will not be able to replace I/M.
- Remote sensing technologies are being refined that offer the potential for a fast and convenient way to identify high-emitting vehicles. These technologies take a "snapshot" of a vehicle's emissions as it passes by a sensor located on the side of the road. Like OBD, remote sensing could provide a useful addition to I/M programs. The accuracy of remote sensing is still limited, however, and remote sensing devices cannot measure evaporative emissions. Thus, an I/M structure will still be necessary to ensure comprehensive and fair monitoring and repair of all vehicles in a given area.

- Cleaner vehicle and fuel technologies required under the 1990 Clean Air Act will help reduce emissions of tailpipe exhaust and evaporating gasoline. But cars must be properly maintained and emission control systems must remain functional if these reductions are to be fully realized. I/M serves as a continuing incentive for motorists to have their vehicles serviced regularly.

For More Information:

The Office of Mobile Sources is the national center for research and policy on air pollution from highway and off-highway motor vehicles and equipment. You can write to us at the EPA National Vehicle and Fuel Emissions Laboratory, 2565 Plymouth Road, Ann Arbor, MI 48105. Our phone number is (313) 668-4333.

For Further Information:

To learn more about I/M programs in your area, contact your EPA regional office (addresses listed below), or the motor vehicle or environmental agency in your state.

Region 1 CT, MA, ME, NH, RI, VT
U.S. Environmental Protection Agency
John F. Kennedy Federal Building
Boston, MA 02203
617/565-3225

Region 2 NJ, NY
U.S. Environmental Protection Agency
Air Programs Branch
26 Federal Plaza, Room 1034A
New York, NY 10278
212/264-2517

Region 3 DE, DC, MD, PA, VA, WV
U.S. Environmental Protection Agency
841 Chestnut Building
Philadelphia, PA 19107
215/597-4554

Region 4 AL, FL, GA, KY, MS, NC, SC, TN
U.S. Environmental Protection Agency
345 Courtland Street, N. E.
Atlanta, GA 30365
404/347-3043

Region 5 IL, IN, MI, MN, OH, WI
U.S. Environmental Protection Agency
Air and Radiation Division (5AD26)
Metcalf Federal Building
77 West Jackson
Chicago, Illinois 60604
312/886-7857

Region 6 AR, LA, NM, OK, TX
U.S. Environmental Protection Agency
First Interstate Bank Tower at Fountain Place
1445 Ross Avenue, Suite # 1200
Dallas, TX 75202-2733
214/655-7214

Region 7 IA, KS, MO, NE
U.S. Environmental Protection Agency
726 Minnesota Avenue
Kansas City, KS 66101
913/551-7494

Region 8 CO, MT, ND, SD, UT, WY
U.S. Environmental Protection Agency
999 18th Street
Denver, CO 80202
303/293-1754

Region 9 AZ, CA, HI, NV
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105
415/744-1177

Region 10 AK, ID, OR, WA
U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101
206/553-1066

Direct questions about I/M policy to the Emission Planning and Strategies Division of the EPA National Vehicle and Fuel Emissions Laboratory, 2565 Plymouth Road, Ann Arbor, MI 48105.

Direct questions about warranty coverage of emission control components to the Office of Mobile Sources Field Operations and Support Division, US EPA (6406J), 401 M St. SW, Washington, DC 20460, or call 202-260-2633.