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Milestones in Auto Emissions Control

014 Air pollution and cars were first linked in the early 1950's by a California researcher who determined that traffic was to blame for the smoggy skies over Los Angeles. At the time, typical new cars were emitting nearly 13 grams per mile hydrocarbons (HC), 3.6 grams per mile nitrogen oxides (NOx), and 87 grams per mile carbon monoxide (CO).

Since then, the Federal Government has set standards to bring down levels of these pollutants, and the auto industry has responded by developing new emission control technologies. The current Federal certification standards for exhaust emissions from cars are 0.25 gram per mile HC, 0.4 gram per mile NOx, and 3.4 grams per mile CO. The standard for evaporative HC emissions is 2 grams per test. The improvements came about in a series of steps:

- 1964 California requires minimal emission control systems on 1966 model cars.
- 1966 Congress requires minimal emission controls on all 1968 and later cars.
- 1970 Congress adopts the first major Clean Air Act, establishes the U.S. Environmental Protection Agency (EPA), and gives the new Agency broad responsibility for regulating motor vehicle pollution. The clean air law calls for 90 percent reductions in automotive emissions. New cars must meet a 0.41 gram per mile HC standard and a 3.4 grams per mile CO standard by 1975; NOx emissions must be reduced to 0.4 gram per mile by 1976*. The law also directs EPA to set health-based "National Ambient Air Quality Standards" for six pollutants, all of which are present in auto emissions to some degree.
- 1971 New cars must meet evaporative emission standards for the first time; charcoal canisters to trap gasoline vapors appear.
- 1972 Exhaust gas recirculation (EGR) valves appear as automakers strive to meet NOx standards.
- 1974 Congress delays the HC and CO standards until 1978 and sets interim standards at the request of the auto industry. Congress adopts the Energy Policy Conservation Act, setting the first fuel economy goals. The Corporate Average Fuel Economy (CAFE) program establishes a phase-in of more stringent fuel economy standards beginning with 1975 models.

* The NOx standard was later revised (see 1977)

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- 1975 The first catalytic converters appear, and with them, unleaded gasoline, in response to HC and CO standards.
- 1977 Congress amends the Clean Air Act. At the request of automakers, the HC standard is delayed until 1980 and the CO standard until 1981. The NO_x standard is delayed until 1981 and is relaxed to 1 gram per mile.
- 1981 New cars meet the amended Clean Air Act standards for the first time. Sophisticated three-way catalysts with on-board computers and oxygen sensors appear in most new cars.
- 1983 Inspection and Maintenance (I/M) programs are established in 64 cities nationwide, requiring passenger vehicles to undergo periodic testing for malfunctioning emission control systems.
- 1985 EPA adopts stringent emission standards for diesel-powered trucks and buses, to take effect in 1991 and 1994.
- 1989 EPA for the first time sets fuel volatility limits aimed at reducing evaporative emissions.
- 1990 EPA imposes strict limits on diesel fuel sulfur content to help buses and trucks meet the 1985 emission standards (which become effective in the early 1990's).

Congress amends the Clean Air Act to require further reductions in HC, CO, NO_x, and particulate emissions. The amendments also introduce a comprehensive set of programs aimed at reducing pollution from motor vehicles. These include lower tailpipe standards; more stringent emission testing procedures; expanded I/M programs; new vehicle technologies and clean fuels programs; transportation management provisions; and possible regulation of emissions from nonroad vehicles.
- 1991 EPA promulgates lower tailpipe standards for HC and NO_x as required by the 1990 Clean Air Act. These standards take effect beginning with 1994 models.
- 1992 Standards setting emission limits for carbon monoxide at cold temperatures (20 °F) are established for the first time. Oxygenated gasoline is introduced in cities with high CO levels.
- 1993 Limits on sulfur content of diesel fuel take effect, enabling catalyst technology to reduce diesel particulate emissions.
- 1994 Phase-in begins for cleaner vehicle standards and technologies required by the 1990 Clean Air Act.

For Further Information

The EPA National Vehicle and Fuel Emissions Laboratory is the national center for research and policy related to air pollution from mobile sources. Write the laboratory at 2565 Plymouth Road, Ann Arbor MI 48105, or call 313-668-4333.