

**Part 3.0**

**Outline of the U.S. EPA's  
Enhanced I/M  
Performance Standards**

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**U.S. EPA's ENHANCED I/M PERFORMANCE STANDARDS**

On September 18, 1995, EPA finalized its I/M Flexibility Amendments (40 CFR Part 51), which are designed to give states more options to meet the enhanced I/M program requirements under the Clean Air Act Amendments of 1990. EPA's original enhanced I/M regulations (57 FR 52950, November 5, 1992) included a single performance standard for enhanced I/M, which was based on EPA's model enhanced I/M program.

The Flexibility Amendments, on the other hand, do not require states to meet a specific performance standard for enhanced I/M. Rather, EPA offers a menu of options that states can choose to meet either a "high" or a "low" enhanced I/M performance standard. States determine which standard they want to meet based on how many emission reduction credits they need to complete their State Implementation Plans. States that have already implemented their enhanced I/M programs, as well as those that do not wish to alter their original plans for enhanced I/M, will not be affected by the Flexibility Amendments.

The outline below summarizes some of the options states can choose to meet the two performance standards. The outline also includes other noted changes made to EPA's enhanced I/M requirements. In addition, on the following pages are three tables from an EPA February 27th policy memo, which illustrate the levels of emission reductions states can claim for various enhanced I/M options, as well as a summary of the assumptions EPA used in modeling the options.

On November 28, 1995, President Clinton signed the National Highway System Designation Act of 1995. The legislation impacts I/M programs in two ways. First, EPA can no longer disapprove an I/M State Implementation Plan (SIP) based on the 1992 regulations providing for a default discount for test-and-repair I/M programs nor can the default discounts be applied to any plan. Second, EPA is required to approve, on an interim basis, SIPs that claim credits that reflect "good faith estimates." The statutory language, as well as EPA's guidance on interim approvals of I/M plans under the new legislation is included in this section.

**I. Program Design****A. High Enhanced I/M Performance Standard**

Can be centralized (run by contractor or state) or decentralized, test-only; or can be hybrid test-only/test-and-repair. Can have annual or biennial testing.

**B. Low Enhanced I/M Performance Standard**

In addition to high enhanced I/M options, can also be fully decentralized, test-and-repair. Can have annual or biennial testing.

**II. Test Procedures****A. High Enhanced**

1. A dynamometer test - currently, either IM240 or ASM, or possibly RG240.
2. Pressure and purge tests.

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3. Visual anti-tampering check of the catalyst and fuel inlet restrictor on at least 1984 and newer model year vehicles, a check of the PCV valve on at least 1968 and newer vehicles, and a check of the EGR valve on at least 1972 and newer vehicles.
4. Extra credit for a remote sensing program.

**B. Low Enhanced**

1. Can use an idle or two-speed idle test.
2. Visual inspection of PCV and EGR valves.
3. Extra credit for:
  - a) ASM or IM240 test
  - b) purge and pressure tests
  - c) remote sensing

**III. Vehicles Covered**

For both high and low enhanced I/M, states can get more or less emission reduction credit depending on the number of vehicle model years and weights they choose to include for tailpipe and evaporative emissions testing.

**IV. Implementation Dates**

Many states need emission reduction credits from an enhanced I/M program in order to meet the 15% VOC reduction requirement by 1996, as mandated by the Clean Air Act. To avoid sanctions, these states therefore need to implement a program as soon as possible. States that plan to use their enhanced I/M emission reduction credits for their full attainment plan generally have more time to implement a program.

**V. Administrative Elements****A. Waivers**

1. Cost waiver: Although the Clean Air Act requires implementation of a \$450 cost waiver, the Act does not specify an implementation deadline. In its proposed flexibility amendments, EPA has therefore proposed to extend the implementation deadline for a minimum \$450 (adjusted to Consumer Price Index) cost waiver until January 1, 1998.

The proposed amendments also would permit motorists to apply toward the cost waiver limit emissions-related repairs made within 60 days prior to the date of the vehicle's inspection. Also, the cost of non-technician emissions-related repairs (i.e. repairs completed by a non-professional or non-certified repair technician) can also be applied toward the cost waiver limit.

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EPA continues to maintain that waivers must be denied for warranted vehicles or for repairs related to tampering.

2.      Hardship extension: EPA proposes permitting qualified motorists to receive more than one economic hardship extension during a vehicle lifetime. The extension is not to exceed the inspection frequency (i.e. a maximum one-year extension to complete repairs within an annual testing program, and a maximum two-year extension in a biennial testing program).

#### **B.      Test Fee**

For a biennial IM240 test, EPA estimated in its original rule \$17/car/test.

#### **C.      Quality Control Measures**

1.      EPA recommends regular and covert quality assurance audits.
2.      EPA requires program effectiveness evaluations.

#### **D.      Repair Technician Training/Certification**

For both high and low enhanced I/M, states can receive extra credit for adding a technician training and certification program.

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### **U.S. EPA RULEMAKING**

The Clean Air Act Amendments of 1990 require EPA to issue guidance to the states regarding what program components are needed to constitute an acceptable basic and enhanced I/M program. In November 1992, EPA adopted a regulation setting I/M performance standards based on its high-tech program. In April 1995, EPA finalized revisions to the regulations designed to give the states more flexibility in choosing I/M programs.

#### **Time Table**

##### I/M Program Requirements

NPRM:            July 13, 1992 (57 F.R. 31058)  
Final:            November 5, 1992 (57 F.R. 52950)

##### I/M Flexibility Amendments

NPRM:            April 28, 1995 (60 F.R. 20934)  
Final:            September 18, 1995 (60 F.R. 48029)  
NPRM:            August 20, 1999 (64 F.R. 45491) (additional flexibility amendments to Final Rule)

##### I/M Flexibility Amendments for OTC

NPRM:            October 23, 1995 (60 F.R. 54321)  
Final:            July 25, 1996 (61 F.R. 39032)

##### On-Board Diagnostic Check

NPRM:            August 18, 1995 (60 F.R. 43092)  
Final:            August 6, 1996 (61 F.R. 40940)  
NPRM:            December 22, 1997 (62 F.R. 66841) (amendment to Final Rule)  
Final:            May 4, 1998 (63 F.R. 24429)

##### Minor Amendments to I/M Program Evaluation Requirements

NPRM:            September 19, 1997 (62 F.R. 49184)  
Final:            January 9, 1998 (63 F.R. 1362) (replaces mandatory tailpipe program evaluation using IM240 or equivalent METT with any approved alternative methodologies)

##### Performance Warranty Test Procedure Guidance

NPRM:            Anticipated May 2000  
Final:            Anticipated December 2000

##### Recall Identification

NPRM:            Anticipated August 2000  
Final:            Anticipated January 2001

#### **Rulemaking Summaries (listed chronologically)**

Additional Flexibility Amendments to I/M Program Requirements. On August 20, 1999 (64 FR 45491), the U.S. EPA proposed to amend its 1992 Motor Vehicle Inspection and Maintenance (I/M) rule to provide additional flexibility to state I/M programs. Specifically, EPA proposed to:

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- Amend the enhanced I/M performance standard to change the performance standard modeling evaluation date from 2000 to 2002.
- Officially delete the previously established decentralized, test-and-repair credit discount.
- Revise the definition of test-only to allow test-only stations to sell self-serve gasoline, pre-packaged oil, and any other items that are not directly related to automotive parts sales and/or service.
- Revise the test procedures and standards to clarify that tailpipe exhaust testing is not a universal requirement for all I/M programs, that alternatives to the IM240 drive cycle are allowed under the requirements for transient testing, and that the standard for an acceptable alternative test is comparability, not necessarily equivalence.
- Revise the test equipment requirements to make the definition of "computerized analyzer" less prescriptive and to relax the requirement for a real-time data link for those areas required to do I/M, but which do not need to claim I/M emission reductions to meet their other non-I/M CAAA requirements.
- Revise the data collection, analysis, and reporting requirements to clarify that the specific elements to be collected and reported are only required where applicable to the test type employed.
- Revise the requirements for consumer protection and limit the current requirement to provide diagnostic information to those programs and test types capable of producing such information reliably and practically.
- Expand the options for complying with the on-road testing requirement by removing language suggesting that such testing must be tailpipe-based and inserting language making the out-of-cycle repair requirement optional where on-road testing is used as a clean-screen approach.

The goal of these proposed amendments is to bring the I/M rule up-to-date with current policy decisions and statutory requirements, while also providing states the additional flexibility they need to tailor their I/M programs now to better meet their future needs. Among these future needs are:

- The need to maximize program efficiency and customer convenience by capitalizing on newer vehicle testing options, such as on-board diagnostic (OBD) system testing.
- The need to accommodate an in-use fleet turning over to newer, cleaner, and more durable vehicle technologies over time.
- The need to assess the role I/M should play in areas once they have attained the National Ambient Air Quality Standards.

Amendment to On-Board Diagnostic Check (Final Rule). On May 4, 1998 (63 FR 24429), EPA revised the federal I/M rule to delay the required implementation date for on-board diagnostic (OBD) checks in basic and enhanced I/M program areas in the Ozone Transport Region (OTR) and all other areas until January 1, 2001. (See proposed rule below for more information.)

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Minor Amendments to I/M Program Evaluation Requirements. On January 9, 1998 (63 FR 1362), EPA revised its I/M rule by replacing the requirement that the tailpipe portion of the mandatory program evaluation be performed using only an IM240 or equivalent mass-emission transient test (METT) with a requirement that states use a sound evaluation methodology capable of providing accurate information about the overall effectiveness of an I/M program. The goal of this action is to allow states additional flexibility to use other approved alternative technologies for their program evaluation.

Prior to this rulemaking, the I/M rule required states to test at least 0.1% of the vehicles subject to inspection in a given year using a state administered or monitored IM240 test or an EPA-approved equivalent METT evaluation methodology. However, many states were concerned that requiring a METT like IM240 for the purpose of evaluating a program posed practical implementation difficulties if the state was using a non-METT as its day-to-day test (e.g., ASM).

EPA has currently identified four alternative program evaluation methodologies which will be investigated further by the Agency in the coming months. The methods to be reviewed are: 1) the V-MAS method, a low cost method for measuring exhaust flow for the purpose of converting concentration measurements into mass-emission measurements; 2) the California Analytical Bench method, a low cost analyzer bench that uses the same type of analyzers as the IM240; 3) the Sierra Research method, a method that relies on state I/M program data, modeling data, and correlation to a base I/M program with a known effectiveness level; and 4) the RSD method, which relies on remote sensing data.

EPA plans to release a guidance document on approved I/M program evaluation methodologies at the end of October 1998. State program evaluation testing shall begin no later than November 30, 1998.

Amendment to On-Board Diagnostic Check. On December 22, 1997 (62 FR 66841), EPA proposed to delay implementation of on-board diagnostic (OBD) checks until January 1, 2001 for all areas with basic and enhanced I/M programs. The current rule requires Ozone Transport Region (OTR) areas with low enhanced programs to implement OBD checks by January 1, 1999, and all other areas by January 1, 1998 (see below). The Agency believes that sufficient data must be generated on which to base an appropriate level of emission reduction credits for OBD and, therefore, it would be premature at this time to require states to perform OBD checks. EPA believes that the data needed must be generated by a separate study that compares OBD's emission reduction potential to the Federal Test Procedure.

The Agency is currently conducting such a study which began on October 1, 1997. This proposed rule does not change the date by which states must revise their State Implementation Plans to include the OBD check requirement. States must still adopt OBD rules by August 6, 1998. Only the date for start of testing is proposed for delay in this rule. Also, states which choose to add OBD checks before the new deadline and which choose to allow failure of OBD to result in failure of the I/M test, thereby requiring repair, may still do so. However, states cannot earn emission reduction credits for doing so unless they also perform the tailpipe and (where applicable) evaporative tests. Only after the Agency has accorded OBD a defined level of emission reduction credit can states potentially drop the tailpipe and evaporative tests and still earn emission reduction credits for performing OBD checks.

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On-Board Diagnostic Check. On August 6, 1996, EPA announced its final rule (40 CFR Parts 51 and 85) regarding On-Board Diagnostic (OBD) checks. The Clean Air Act Amendments of 1990 directs EPA to require OBD system checks as a component of I/M programs. In addition, the Act requires that states revise their I/M programs within two years after promulgation of regulations to meet the requirements of those regulations. The OBD rule establishes the test procedures and requirements for the OBD computer test portion of the I/M test.

OBD testing of 1996 and newer model year vehicles will be required in all I/M programs (basic and enhanced) beginning January 1, 1998 except that areas in the Northeast Ozone Transport Region (OTR) eligible to implement an OTR low enhanced I/M program must begin OBD testing by January 1, 1999. Failure of the OBD test will not result in mandatory repairs until January 1, 2000. During this two-year test period, EPA, in cooperation with states and motor vehicle manufacturers, hopes to gather data on the effectiveness of OBD.

I/M Flexibility Amendments for the OTR. On July 25, 1996 (61 FR 39032), EPA announced its final rule which revised its I/M requirements by adding a special low enhanced performance standard for qualified areas in the northeast Ozone Transport Region (OTR). The OTR consists of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and the District of Columbia.

The emission reduction targets for the program are less than both the low enhanced performance standard and the basic performance standard. There are two qualifications to be eligible for this new standard. First, the standard applies only in OTR attainment areas, marginal ozone nonattainment areas, and certain moderate ozone nonattainment areas with a population under 200,000. These areas would normally be exempt from all I/M requirements were it not for their location in the OTR. They are included in the OTR I/M requirements to help achieve overall attainment and maintenance goals in the region. Second, the OTR low enhanced program must be supplemented by other measures (e.g., imposing tighter gasoline requirements such as a reformulated gasoline standard) in order to achieve emission reductions equal to or greater than that which would have occurred had a regular low enhanced I/M program been implemented.

Twenty-five metropolitan areas, mainly in upstate New York and Pennsylvania, are eligible to implement the new performance standard. Other eligible areas include Portland, ME, Burlington, VT, and Hagerstown, MD. If an area chooses to use the OTR low enhanced performance standard, the program must be implemented no later than January 1, 1999.

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**U.S. EPA-RECOMMENDED STANDARDS AND PROCEDURES****Emission Standards**

In Part 4.0 (Section IV) of the report, emission standards are listed for each of the states. Some state summaries have the state's actual cutpoints listed; however, most state summaries just note whether or not the state's standards are the same as, more stringent than, or less stringent than EPA's. For this reason, we are listing below the current EPA standards for the various idle tests, ASM tests, and IM240 tests. HC and CO pass/fail standards are to apply to all vehicles and repairs are required for failure of any standard, regardless of the attainment status of the area. NOx pass/fail standards are to apply to vehicles subject to a transient test. (See attached tables.)

**Quality Assurance/Quality Control (QA/QC) Measures**

In Part 4.0 (Section VIII, Part C) of the report, quality control measures are listed for each of the states. Some state summaries have the state's actual measures listed; however, most state summaries just note whether or not the state is following EPA recommendations. The information below lists EPA's recommendations for Quality Assurance and Quality Control measures.

All I/M programs are subject to quality assurance (QA) checks through the use of both covert and overt audits. At least two overt audits per test lane must be conducted per year including equipment audits, checks of document security, record keeping, licensing and display information, and evaluation of the inspector's ability to properly perform an inspection. Screening or review of inspector and station records is required at least monthly to identify problems that may indicate potential fraud or incompetence and indicated the need for additional audits. The review is to include computerized analysis, with on-site review of non-covered records, to identify statistical inconsistencies, unusual patterns, and other discrepancies, and should provide for comprehensive accounting of forms that can be used to demonstrate compliance.

Covert audits using vehicles set to fail are required at least once per year per the number of inspectors. In test-and-repair networks, covert audits are to be conducted at least once per station per year, and are to include the purchase of repairs and retesting if the vehicle is properly failed. The program must use a sufficient number of covert vehicles and auditors to avoid detection; the vehicles should cover the range of vehicle technology groups (e.g., carbureted and fuel-injected). Auditors must be trained in program basics including the use of analyzers, air pollution control basics, emissions-related engine repair, emission control systems, evidence gathering, administrative procedures, applicable laws, and quality assurance practices. The auditors themselves are to be audited at least once annually.

The regulation includes minimum quality control (QC) requirements to be met by all I/M programs, as well as specific requirements for enhanced I/M programs. The measures addressed include periodic test equipment checks, calibration and maintenance requirements, accuracy specifications, QC record keeping requirements, frequency requirements for QC checks, process automation requirements, and document security requirements. Calibration gas specifications are also detailed. Alternatives or exceptions to the procedures or frequencies may be approved by the Administrator based on demonstration, including control chart analysis, of equivalent performance.

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**Table 1: Recommended Idle Emission Standards**

| <b>Pollutant</b> | <b>Emission Standard</b> |
|------------------|--------------------------|
| HC               | 220 ppm                  |
| CO               | 1.2%                     |

## Table 2: Recommended ASM Emission Standards

### (a) Emissions Standards

- (1) Start-up ASM Standards. Start-up standards should be used during the first cycle of the program. The exhaust emissions standards for the following model years and vehicle types are cross-referenced by the number in the column in §85.1(a)(3), as noted in the column headings:

#### (i) Light Duty Vehicles.

| <u>Model Years</u> | <u>Hydrocarbons</u><br>Table §85.1 (a)(3)(i) | <u>Carbon Monoxide</u><br>Table §85.1 (a)(3)(ii) | <u>Oxides of Nitrogen</u><br>Table §85.1 (a)(3)(iii) |
|--------------------|--|--|--|
| 1994+ Tier 1       | 1  | 21   | 41   |
| 1991-1995          | 2  | 22   | 42   |
| 1983-1990          | 4  | 23   | 43   |
| 1981-1982          | 4  | 26   | 43   |
| 1980               | 4  | 26   | 48   |
| 1977-1979          | 11   | 30   | 48   |
| 1975-1976          | 11   | 30   | 50   |
| 1973-1974          | 13   | 34   | 50   |
| 1968-1972          | 13   | 34   | 51   |

#### (ii) High-Altitude Light Duty Vehicles.

| <u>Model Years</u> | <u>Hydrocarbons</u><br>Table §85.1 (a)(3)(i) | <u>Carbon Monoxide</u><br>Table §85.1 (a)(3)(ii) | <u>Oxides of Nitrogen</u><br>Table §85.1 (a)(3)(iii) |
|--------------------|--|--|--|
| 1983-1984          | 4  | 26   | 43   |
| 1982               | 4  | 29   | 43   |

#### (iii) Light Duty Trucks 1 (less than 6000 pounds GVWR).

| <u>Model Years</u>     | <u>Hydrocarbons</u><br>Table §85.1 (a)(3)(i) | <u>Carbon Monoxide</u><br>Table §85.1 (a)(3)(ii) | <u>Oxides of Nitrogen</u><br>Table §85.1 (a)(3)(iii) |
|------------------------|--|--|--|
| 1994+ Tier 1 ≤3750 LVW | 1  | 21   | 41   |
| 1994+ Tier 1 >3750 LVW | 2  | 22   | 42   |
| 1991-1995              | 5  | 26   | 43   |
| 1988-1990              | 7  | 29   | 44   |
| 1984-1987              | 7  | 29   | 49   |
| 1979-1983              | 11   | 31   | 49   |
| 1975-1978              | 12   | 32   | 50   |
| 1973-1974              | 13   | 34   | 50   |
| 1968-1972              | 13   | 34   | 51   |

#### (iv) High-Altitude Light Duty Trucks 1 (less than 6000 pounds GVWR).

| <u>Model Years</u> | <u>Hydrocarbons</u><br>Table §85.1 (a)(3)(i) | <u>Carbon Monoxide</u><br>Table §85.1 (a)(3)(ii) | <u>Oxides of Nitrogen</u><br>Table §85.1 (a)(3)(iii) |
|--------------------|--|--|--|
|--------------------|--|--|--|

|           |    |    |    |
|-----------|----|----|----|
| 1991+     | 6  | 28 | 43 |
| 1988-1990 | 9  | 30 | 44 |
| 1984-1987 | 9  | 30 | 49 |
| 1982-1983 | 12 | 33 | 49 |

(v) Light Duty Trucks 2 (greater than 6000 pounds GVWR).

| <u>Model Years</u>     | <u>Hydrocarbons</u><br>Table §85.1 (a)(3)(i) | <u>Carbon Monoxide</u><br>Table §85.1 (a)(3)(ii) | <u>Oxides of Nitrogen</u><br>Table §85.1 (a)(3)(iii) |
|------------------------|--|--|--|
| 1994+ Tier 1 ≤5750 LVW | 2  | 22   | 42   |
| 1994+ Tier 1 >5750 LVW | 5  | 26   | 45   |
| 1991-1995              | 5  | 26   | 46   |
| 1988-1990              | 7  | 29   | 47   |
| 1984-1987              | 7  | 29   | 49   |
| 1979-1983              | 11   | 31   | 49   |
| 1975-1978              | 12   | 32   | 50   |
| 1973-1974              | 13   | 34   | 50   |
| 1968-1972              | 13   | 34   | 51   |

(vi) High-Altitude Light Duty Trucks 2 (greater than 6000 pounds GVWR).

| <u>Model Years</u> | <u>Hydrocarbons</u><br>Table §85.1 (a)(3)(i) | <u>Carbon Monoxide</u><br>Table §85.1 (a)(3)(ii) | <u>Oxides of Nitrogen</u><br>Table §85.1 (a)(3)(iii) |
|--------------------|--|--|--|
| 1991+              | 6  | 28   | 46   |
| 1988-1990          | 9  | 30   | 47   |
| 1984-1987          | 9  | 30   | 49   |
| 1982-1983          | 12   | 33   | 49   |

- (2) Final ASM Standards. The following exhaust emissions standards are designed to achieve the emission reduction credits issued by EPA. They should only be used after at least one cycle of operation using the start-up standards in §85.1(a)(1). The exhaust emissions standards for the following model years and vehicle types are cross-referenced by the number in the column in §85.1(a)(3), as noted in the column headings:

(i) Light Duty Vehicles.

| <u>Model Years</u> | <u>Hydrocarbons</u><br>Table §85.1 (a)(3)(i) | <u>Carbon Monoxide</u><br>Table §85.1 (a)(3)(ii) | <u>Oxides of Nitrogen</u><br>Table §85.1 (a)(3)(iii) |
|--------------------|--|--|--|
| 1994+ Tier 1       | 1  | 21   | 41   |
| 1983-1995          | 1  | 21   | 41   |
| 1981-1982          | 1  | 23   | 41   |
| 1980               | 1  | 23   | 45   |
| 1977-1979          | 6  | 27   | 45   |
| 1975-1976          | 6  | 27   | 48   |
| 1973-1974          | 10   | 32   | 48   |
| 1968-1972          | 10   | 32   | 49   |

(ii) High-Altitude Light Duty Vehicles.

| <u>Model Years</u> | <u>Hydrocarbons</u><br>Table §85.1 (a)(3)(i) | <u>Carbon Monoxide</u><br>Table §85.1 (a)(3)(ii) | <u>Oxides of Nitrogen</u><br>Table §85.1 (a)(3)(iii) |
|--------------------|--|--|--|
| 1983-1984          | 2  | 23   | 41   |
| 1982               | 2  | 23   | 41   |

(iii) Light Duty Trucks 1 (less than 6000 pounds GVWR).

| <u>Model Years</u> | <u>Hydrocarbons</u><br>Table §85.1 (a)(3)(i) | <u>Carbon Monoxide</u><br>Table §85.1 (a)(3)(ii) | <u>Oxides of Nitrogen</u><br>Table §85.1 (a)(3)(iii) |
|--------------------|--|--|--|
| 1994+ Tier 1       | 1  | 21   | 41   |
| 1988-1995          | 3  | 24   | 42   |
| 1984-1987          | 3  | 24   | 46   |
| 1979-1983          | 8  | 28   | 46   |
| 1975-1978          | 9  | 29   | 48   |
| 1973-1974          | 10   | 32   | 48   |
| 1968-1972          | 10   | 32   | 49   |

(iv) High-Altitude Light Duty Trucks 1 (less than 6000 pounds GVWR).

| <u>Model Years</u> | <u>Hydrocarbons</u><br>Table §85.1 (a)(3)(i) | <u>Carbon Monoxide</u><br>Table §85.1 (a)(3)(ii) | <u>Oxides of Nitrogen</u><br>Table §85.1 (a)(3)(iii) |
|--------------------|--|--|--|
| 1988+              | 4  | 26   | 42   |
| 1984-1987          | 4  | 26   | 46   |
| 1982-1983          | 9  | 30   | 46   |

(v) Light Duty Trucks 2 (greater than 6000 pounds GVWR).

| <u>Model Years</u> | <u>Hydrocarbons</u><br>Table §85.1 (a)(3)(i) | <u>Carbon Monoxide</u><br>Table §85.1 (a)(3)(ii) | <u>Oxides of Nitrogen</u><br>Table §85.1 (a)(3)(iii) |
|--------------------|--|--|--|
| 1994+ Tier 1       | 1  | 21   | 41   |
| 1988-1995          | 3  | 24   | 44   |
| 1984-1987          | 3  | 24   | 46   |
| 1979-1983          | 8  | 28   | 46   |
| 1975-1978          | 9  | 29   | 48   |
| 1973-1974          | 10   | 32   | 48   |
| 1968-1972          | 10   | 32   | 49   |

(vi) High-Altitude Light Duty Trucks 2 (greater than 6000 pounds GVWR).

| <u>Model Years</u> | <u>Hydrocarbons</u><br>Table §85.1 (a)(3)(i) | <u>Carbon Monoxide</u><br>Table §85.1 (a)(3)(ii) | <u>Oxides of Nitrogen</u><br>Table §85.1 (a)(3)(iii) |
|--------------------|--|--|--|
| 1988+              | 4  | 26   | 44   |
| 1984-1987          | 4  | 26   | 46   |
| 1982-1983          | 9  | 30   | 46   |

(3) ASM 2525 and 5015 Concentration Tables

(i) ASM2525 and ASM5015 Hydrocarbon (ppm C6) Table

| Column # | 1    | 1    | 2    | 2    | 3    | 3    | 4    | 4    | 5    | 5    | 6    | 6    | 7    | 7    | 8    | 8    | 9    | 9    | 10   | 10   | 11   | 11   | 12   | 12   | 13   | 13   |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|          | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 |
| ETW      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1750     | 142  | 136  | 224  | 216  | 257  | 249  | 291  | 282  | 324  | 315  | 374  | 364  | 390  | 381  | 407  | 397  | 457  | 447  | 706  | 694  | 774  | 761  | 843  | 828  | 1118 | 1098 |
| 1875     | 134  | 129  | 212  | 205  | 243  | 236  | 275  | 266  | 306  | 297  | 353  | 344  | 368  | 359  | 384  | 375  | 431  | 421  | 665  | 653  | 729  | 717  | 794  | 780  | 1052 | 1034 |
| 2000     | 127  | 123  | 201  | 194  | 230  | 223  | 260  | 252  | 289  | 281  | 333  | 325  | 348  | 339  | 363  | 354  | 407  | 398  | 627  | 616  | 688  | 676  | 749  | 736  | 992  | 975  |
| 2125     | 121  | 116  | 191  | 184  | 219  | 212  | 246  | 239  | 274  | 267  | 316  | 308  | 329  | 321  | 343  | 335  | 385  | 376  | 592  | 582  | 650  | 638  | 707  | 695  | 938  | 921  |
| 2250     | 115  | 111  | 182  | 175  | 208  | 201  | 234  | 227  | 260  | 253  | 299  | 292  | 312  | 305  | 325  | 318  | 365  | 357  | 560  | 551  | 615  | 604  | 669  | 658  | 887  | 872  |
| 2375     | 109  | 106  | 173  | 167  | 198  | 192  | 223  | 216  | 247  | 241  | 284  | 277  | 297  | 290  | 309  | 302  | 346  | 339  | 531  | 522  | 583  | 573  | 635  | 624  | 841  | 827  |
| 2500     | 105  | 101  | 166  | 160  | 189  | 183  | 212  | 206  | 236  | 230  | 271  | 264  | 283  | 276  | 294  | 288  | 329  | 322  | 505  | 496  | 554  | 544  | 603  | 593  | 800  | 786  |
| 2625     | 100  | 97   | 159  | 153  | 181  | 175  | 203  | 197  | 225  | 219  | 259  | 252  | 270  | 263  | 281  | 274  | 314  | 307  | 481  | 472  | 528  | 518  | 574  | 564  | 761  | 748  |
| 2750     | 96   | 93   | 152  | 147  | 173  | 168  | 194  | 189  | 216  | 210  | 247  | 241  | 258  | 252  | 269  | 262  | 300  | 294  | 459  | 451  | 503  | 495  | 548  | 539  | 726  | 714  |
| 2875     | 92   | 89   | 146  | 141  | 167  | 161  | 187  | 181  | 207  | 201  | 237  | 231  | 247  | 241  | 257  | 251  | 287  | 281  | 439  | 431  | 481  | 473  | 524  | 515  | 695  | 683  |
| 3000     | 89   | 86   | 141  | 136  | 160  | 155  | 180  | 174  | 199  | 194  | 228  | 222  | 237  | 232  | 247  | 241  | 276  | 270  | 420  | 413  | 461  | 453  | 502  | 493  | 666  | 654  |
| 3125     | 86   | 83   | 136  | 132  | 155  | 150  | 173  | 168  | 191  | 186  | 219  | 214  | 228  | 223  | 238  | 232  | 265  | 260  | 404  | 397  | 443  | 435  | 482  | 474  | 639  | 628  |
| 3250     | 83   | 80   | 132  | 127  | 149  | 145  | 167  | 162  | 185  | 180  | 211  | 206  | 220  | 215  | 229  | 224  | 256  | 250  | 388  | 382  | 426  | 419  | 464  | 456  | 615  | 604  |
| 3375     | 81   | 78   | 128  | 123  | 145  | 140  | 162  | 157  | 179  | 174  | 204  | 199  | 213  | 208  | 221  | 216  | 247  | 241  | 374  | 368  | 411  | 404  | 447  | 440  | 595  | 583  |
| 3500     | 78   | 76   | 124  | 120  | 140  | 136  | 157  | 152  | 173  | 169  | 198  | 193  | 206  | 201  | 214  | 209  | 239  | 234  | 362  | 355  | 397  | 390  | 432  | 424  | 573  | 563  |
| 3625     | 76   | 74   | 120  | 117  | 136  | 132  | 152  | 148  | 168  | 164  | 192  | 187  | 200  | 195  | 207  | 203  | 231  | 226  | 350  | 344  | 384  | 377  | 418  | 411  | 554  | 544  |
| 3750     | 74   | 72   | 117  | 114  | 133  | 129  | 148  | 144  | 163  | 159  | 186  | 182  | 194  | 189  | 201  | 197  | 224  | 220  | 339  | 333  | 372  | 365  | 405  | 398  | 537  | 527  |
| 3875     | 72   | 70   | 114  | 111  | 129  | 125  | 144  | 140  | 159  | 155  | 181  | 177  | 188  | 184  | 196  | 191  | 218  | 213  | 329  | 323  | 361  | 355  | 393  | 386  | 521  | 512  |
| 4000     | 71   | 68   | 112  | 108  | 126  | 122  | 140  | 137  | 155  | 151  | 176  | 172  | 183  | 179  | 191  | 186  | 212  | 208  | 320  | 314  | 351  | 345  | 382  | 375  | 506  | 497  |
| 4125     | 69   | 67   | 109  | 106  | 123  | 119  | 137  | 133  | 151  | 147  | 172  | 168  | 179  | 175  | 186  | 181  | 206  | 202  | 311  | 305  | 341  | 335  | 371  | 365  | 492  | 484  |
| 4250     | 67   | 65   | 107  | 103  | 120  | 117  | 134  | 130  | 147  | 143  | 167  | 164  | 174  | 170  | 181  | 177  | 201  | 197  | 303  | 297  | 332  | 326  | 361  | 355  | 479  | 471  |
| 4375     | 66   | 64   | 104  | 101  | 118  | 114  | 131  | 127  | 144  | 140  | 164  | 160  | 170  | 166  | 177  | 173  | 196  | 192  | 295  | 290  | 323  | 318  | 352  | 346  | 467  | 459  |
| 4500     | 65   | 63   | 102  | 99   | 115  | 112  | 128  | 124  | 141  | 137  | 160  | 156  | 166  | 162  | 172  | 169  | 192  | 188  | 287  | 282  | 315  | 310  | 343  | 337  | 455  | 447  |
| 4625     | 63   | 61   | 100  | 97   | 113  | 109  | 125  | 122  | 137  | 134  | 156  | 152  | 162  | 159  | 169  | 165  | 187  | 183  | 280  | 275  | 308  | 302  | 335  | 329  | 444  | 436  |
| 4750     | 62   | 60   | 98   | 95   | 110  | 107  | 122  | 119  | 134  | 131  | 153  | 149  | 159  | 155  | 165  | 161  | 183  | 179  | 273  | 269  | 300  | 295  | 327  | 321  | 433  | 425  |
| 4875     | 61   | 59   | 96   | 93   | 108  | 105  | 120  | 117  | 132  | 128  | 149  | 146  | 155  | 152  | 161  | 157  | 179  | 175  | 267  | 262  | 293  | 288  | 319  | 313  | 423  | 415  |
| 5000     | 60   | 58   | 94   | 92   | 106  | 103  | 117  | 114  | 129  | 126  | 146  | 143  | 152  | 148  | 157  | 154  | 175  | 171  | 260  | 256  | 286  | 281  | 311  | 305  | 412  | 405  |
| 5125     | 58   | 57   | 93   | 90   | 104  | 101  | 115  | 112  | 126  | 123  | 143  | 139  | 148  | 145  | 154  | 150  | 171  | 167  | 254  | 250  | 279  | 274  | 304  | 298  | 402  | 395  |
| 5250     | 57   | 56   | 91   | 88   | 102  | 99   | 112  | 110  | 123  | 120  | 140  | 136  | 145  | 142  | 150  | 147  | 167  | 163  | 248  | 244  | 272  | 267  | 296  | 291  | 393  | 386  |
| 5375     | 56   | 55   | 89   | 86   | 100  | 97   | 110  | 107  | 121  | 118  | 137  | 133  | 142  | 139  | 147  | 144  | 163  | 159  | 242  | 238  | 266  | 261  | 289  | 284  | 383  | 376  |
| 5500     | 55   | 54   | 87   | 85   | 98   | 95   | 108  | 105  | 118  | 115  | 134  | 130  | 139  | 136  | 144  | 141  | 159  | 156  | 236  | 232  | 259  | 255  | 282  | 277  | 374  | 367  |
| 5625     | 54   | 53   | 86   | 83   | 96   | 93   | 106  | 103  | 116  | 113  | 131  | 128  | 136  | 133  | 141  | 138  | 156  | 152  | 231  | 226  | 253  | 248  | 276  | 271  | 365  | 359  |
| 5750     | 53   | 52   | 84   | 82   | 94   | 91   | 104  | 101  | 113  | 111  | 128  | 125  | 133  | 130  | 138  | 135  | 152  | 149  | 225  | 221  | 247  | 243  | 269  | 264  | 357  | 350  |
| 5875     | 52   | 51   | 83   | 80   | 92   | 90   | 102  | 99   | 111  | 108  | 125  | 122  | 130  | 127  | 135  | 132  | 149  | 146  | 220  | 216  | 241  | 237  | 263  | 258  | 348  | 342  |
| 6000     | 51   | 50   | 81   | 79   | 90   | 88   | 100  | 97   | 109  | 106  | 123  | 120  | 127  | 124  | 132  | 129  | 146  | 143  | 215  | 211  | 236  | 232  | 257  | 252  | 341  | 334  |
| 6125     | 50   | 49   | 80   | 78   | 89   | 86   | 98   | 95   | 107  | 104  | 120  | 118  | 125  | 122  | 129  | 126  | 143  | 140  | 210  | 206  | 231  | 227  | 251  | 247  | 333  | 327  |
| 6250     | 50   | 48   | 79   | 76   | 87   | 85   | 96   | 94   | 105  | 102  | 118  | 115  | 123  | 120  | 127  | 124  | 140  | 137  | 206  | 202  | 226  | 222  | 246  | 242  | 326  | 320  |
| 6375     | 49   | 48   | 77   | 75   | 86   | 84   | 95   | 92   | 103  | 101  | 116  | 113  | 120  | 118  | 125  | 122  | 138  | 135  | 202  | 198  | 222  | 218  | 242  | 237  | 320  | 314  |
| 6500     | 48   | 47   | 76   | 74   | 85   | 83   | 93   | 91   | 102  | 99   | 114  | 112  | 119  | 116  | 123  | 120  | 136  | 133  | 199  | 195  | 218  | 214  | 238  | 233  | 315  | 309  |
| 6625     | 48   | 46   | 76   | 74   | 84   | 82   | 92   | 90   | 101  | 98   | 113  | 110  | 117  | 114  | 121  | 119  | 134  | 131  | 196  | 192  | 215  | 211  | 234  | 230  | 310  | 304  |
| 6750     | 47   | 46   | 75   | 73   | 83   | 81   | 91   | 89   | 100  | 97   | 112  | 109  | 116  | 113  | 120  | 117  | 132  | 129  | 194  | 190  | 213  | 209  | 232  | 227  | 307  | 301  |
| 6875     | 47   | 46   | 75   | 73   | 83   | 81   | 91   | 89   | 99   | 97   | 111  | 109  | 115  | 113  | 119  | 117  | 132  | 129  | 193  | 189  | 211  | 207  | 230  | 225  | 305  | 299  |
| 7000     | 47   | 46   | 74   | 72   | 83   | 80   | 91   | 88   | 99   | 96   | 111  | 108  | 115  | 112  | 119  | 116  | 131  | 128  | 192  | 188  | 211  | 207  | 229  | 225  | 304  | 298  |
| 7125     | 47   | 46   | 74   | 72   | 82   | 80   | 90   | 88   | 98   | 96   | 111  | 108  | 115  | 112  | 119  | 116  | 131  | 128  | 192  | 188  | 211  | 206  | 229  | 225  | 304  | 298  |
| 7250     | 47   | 46   | 74   | 72   | 82   | 80   | 90   | 88   | 98   | 96   | 111  | 108  | 115  | 112  | 119  | 116  | 131  | 128  | 192  | 188  | 211  | 206  | 229  | 225  | 304  | 298  |
| 7375     | 47   | 46   | 74   | 72   | 82   | 80   | 90   | 88   | 98   | 96   | 111  | 108  | 115  | 112  | 119  | 116  | 131  | 128  | 192  | 188  | 211  | 206  | 229  | 225  | 304  | 298  |
| 7500     | 47   | 46   | 74   | 72   | 82   | 80   | 90   | 88   | 98   | 96   | 111  | 108  | 115  | 112  | 119  | 116  | 131  | 128  | 192  | 188  | 211  | 206  | 229  | 225  | 304  | 298  |

(ii) ASM2525 and ASM5015 Carbon Monoxide (%CO) Table

| Column # | 21   |      | 22   |      | 23   |      | 24   |      | 25   |      | 26   |      | 27   |      | 28   |      | 29   |      | 30   |      | 31   |      | 32   |      | 33   |      | 34   |      |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|          | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 | 5015 | 2525 |
| ETW      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1750     | 0.80 | 0.77 | 1.26 | 1.22 | 1.64 | 1.83 | 2.02 | 2.43 | 2.21 | 2.73 | 2.78 | 3.64 | 2.97 | 3.94 | 3.16 | 4.24 | 3.54 | 4.85 | 3.92 | 5.45 | 4.31 | 6.06 | 5.07 | 7.26 | 5.26 | 7.44 | 8.02 | 9.90 |
| 1875     | 0.75 | 0.73 | 1.19 | 1.16 | 1.55 | 1.72 | 1.91 | 2.29 | 2.09 | 2.58 | 2.63 | 3.43 | 2.81 | 3.71 | 2.98 | 4.00 | 3.34 | 4.57 | 3.70 | 5.14 | 4.06 | 5.70 | 4.78 | 6.84 | 4.96 | 7.05 | 7.56 | 9.90 |
| 2000     | 0.71 | 0.69 | 1.13 | 1.09 | 1.47 | 1.63 | 1.81 | 2.17 | 1.97 | 2.43 | 2.48 | 3.24 | 2.65 | 3.51 | 2.82 | 3.77 | 3.16 | 4.31 | 3.49 | 4.85 | 3.83 | 5.38 | 4.51 | 6.45 | 4.68 | 6.68 | 7.14 | 9.90 |
| 2125     | 0.68 | 0.66 | 1.07 | 1.04 | 1.39 | 1.54 | 1.71 | 2.05 | 1.87 | 2.30 | 2.35 | 3.06 | 2.51 | 3.32 | 2.67 | 3.57 | 2.99 | 4.08 | 3.31 | 4.58 | 3.63 | 5.09 | 4.26 | 6.10 | 4.43 | 6.34 | 6.75 | 9.66 |
| 2250     | 0.64 | 0.62 | 1.02 | 0.99 | 1.32 | 1.47 | 1.62 | 1.94 | 1.77 | 2.18 | 2.23 | 2.90 | 2.38 | 3.14 | 2.53 | 3.38 | 2.83 | 3.86 | 3.13 | 4.34 | 3.44 | 4.82 | 4.04 | 5.78 | 4.20 | 6.00 | 6.40 | 9.14 |
| 2375     | 0.61 | 0.59 | 0.97 | 0.94 | 1.26 | 1.39 | 1.54 | 1.85 | 1.69 | 2.07 | 2.12 | 2.76 | 2.26 | 2.98 | 2.40 | 3.21 | 2.69 | 3.66 | 2.98 | 4.12 | 3.26 | 4.57 | 3.83 | 5.48 | 3.98 | 5.69 | 6.07 | 8.67 |
| 2500     | 0.59 | 0.57 | 0.93 | 0.90 | 1.20 | 1.33 | 1.47 | 1.76 | 1.61 | 1.97 | 2.02 | 2.62 | 2.15 | 2.84 | 2.29 | 3.05 | 2.56 | 3.48 | 2.83 | 3.91 | 3.10 | 4.35 | 3.65 | 5.21 | 3.79 | 5.41 | 5.78 | 8.25 |
| 2625     | 0.56 | 0.54 | 0.89 | 0.86 | 1.15 | 1.27 | 1.41 | 1.68 | 1.53 | 1.88 | 1.92 | 2.50 | 2.05 | 2.70 | 2.18 | 2.91 | 2.44 | 3.32 | 2.70 | 3.73 | 2.96 | 4.14 | 3.48 | 4.96 | 3.61 | 5.15 | 5.51 | 7.85 |
| 2750     | 0.54 | 0.52 | 0.85 | 0.82 | 1.10 | 1.21 | 1.34 | 1.60 | 1.47 | 1.80 | 1.84 | 2.39 | 1.96 | 2.58 | 2.09 | 2.78 | 2.33 | 3.17 | 2.58 | 3.56 | 2.83 | 3.95 | 3.32 | 4.73 | 3.45 | 4.92 | 5.26 | 7.50 |
| 2875     | 0.52 | 0.50 | 0.82 | 0.79 | 1.05 | 1.16 | 1.29 | 1.54 | 1.41 | 1.72 | 1.76 | 2.29 | 1.88 | 2.47 | 2.00 | 2.66 | 2.23 | 3.03 | 2.47 | 3.41 | 2.71 | 3.78 | 3.18 | 4.53 | 3.30 | 4.70 | 5.03 | 7.17 |
| 3000     | 0.50 | 0.48 | 0.79 | 0.76 | 1.01 | 1.12 | 1.24 | 1.48 | 1.35 | 1.66 | 1.69 | 2.19 | 1.80 | 2.37 | 1.92 | 2.55 | 2.14 | 2.91 | 2.37 | 3.27 | 2.60 | 3.62 | 3.05 | 4.34 | 3.17 | 4.51 | 4.83 | 6.87 |
| 3125     | 0.48 | 0.46 | 0.76 | 0.73 | 0.98 | 1.08 | 1.19 | 1.42 | 1.30 | 1.59 | 1.63 | 2.11 | 1.74 | 2.28 | 1.84 | 2.45 | 2.06 | 2.79 | 2.28 | 3.14 | 2.50 | 3.48 | 2.93 | 4.17 | 3.04 | 4.33 | 4.64 | 6.60 |
| 3250     | 0.46 | 0.45 | 0.73 | 0.71 | 0.94 | 1.04 | 1.15 | 1.37 | 1.26 | 1.53 | 1.57 | 2.03 | 1.67 | 2.20 | 1.78 | 2.36 | 1.99 | 2.69 | 2.20 | 3.02 | 2.40 | 3.35 | 2.82 | 4.01 | 2.93 | 4.17 | 4.47 | 6.35 |
| 3375     | 0.45 | 0.43 | 0.71 | 0.69 | 0.91 | 1.00 | 1.11 | 1.32 | 1.21 | 1.48 | 1.52 | 1.96 | 1.62 | 2.12 | 1.72 | 2.28 | 1.92 | 2.60 | 2.12 | 2.91 | 2.32 | 3.23 | 2.72 | 3.87 | 2.83 | 4.02 | 4.31 | 6.13 |
| 3500     | 0.44 | 0.42 | 0.69 | 0.67 | 0.88 | 0.97 | 1.08 | 1.28 | 1.17 | 1.43 | 1.47 | 1.89 | 1.56 | 2.05 | 1.66 | 2.20 | 1.86 | 2.51 | 2.05 | 2.82 | 2.24 | 3.12 | 2.63 | 3.74 | 2.73 | 3.88 | 4.17 | 5.92 |
| 3625     | 0.42 | 0.41 | 0.67 | 0.65 | 0.86 | 0.94 | 1.05 | 1.24 | 1.14 | 1.39 | 1.42 | 1.84 | 1.52 | 1.98 | 1.61 | 2.13 | 1.80 | 2.43 | 1.99 | 2.73 | 2.17 | 3.02 | 2.55 | 3.62 | 2.65 | 3.76 | 4.04 | 5.73 |
| 3750     | 0.41 | 0.40 | 0.65 | 0.63 | 0.83 | 0.92 | 1.02 | 1.20 | 1.11 | 1.35 | 1.38 | 1.78 | 1.47 | 1.92 | 1.56 | 2.07 | 1.74 | 2.36 | 1.93 | 2.64 | 2.11 | 2.93 | 2.47 | 3.51 | 2.57 | 3.64 | 3.91 | 5.55 |
| 3875     | 0.40 | 0.39 | 0.63 | 0.61 | 0.81 | 0.89 | 0.99 | 1.17 | 1.08 | 1.31 | 1.34 | 1.73 | 1.43 | 1.87 | 1.52 | 2.01 | 1.69 | 2.29 | 1.87 | 2.57 | 2.05 | 2.85 | 2.40 | 3.40 | 2.49 | 3.54 | 3.80 | 5.39 |
| 4000     | 0.39 | 0.38 | 0.62 | 0.60 | 0.79 | 0.87 | 0.96 | 1.14 | 1.05 | 1.28 | 1.31 | 1.68 | 1.39 | 1.82 | 1.48 | 1.95 | 1.65 | 2.22 | 1.82 | 2.49 | 1.99 | 2.77 | 2.33 | 3.31 | 2.43 | 3.44 | 3.70 | 5.24 |
| 4125     | 0.38 | 0.37 | 0.60 | 0.58 | 0.77 | 0.85 | 0.94 | 1.11 | 1.02 | 1.24 | 1.27 | 1.64 | 1.36 | 1.77 | 1.44 | 1.90 | 1.61 | 2.16 | 1.77 | 2.43 | 1.94 | 2.69 | 2.27 | 3.22 | 2.36 | 3.34 | 3.60 | 5.09 |
| 4250     | 0.37 | 0.36 | 0.59 | 0.57 | 0.75 | 0.83 | 0.92 | 1.08 | 1.00 | 1.21 | 1.24 | 1.60 | 1.32 | 1.72 | 1.40 | 1.85 | 1.56 | 2.11 | 1.73 | 2.36 | 1.89 | 2.62 | 2.21 | 3.13 | 2.30 | 3.25 | 3.51 | 4.96 |
| 4375     | 0.36 | 0.35 | 0.58 | 0.56 | 0.74 | 0.81 | 0.89 | 1.06 | 0.97 | 1.18 | 1.21 | 1.56 | 1.29 | 1.68 | 1.37 | 1.81 | 1.53 | 2.06 | 1.68 | 2.31 | 1.84 | 2.55 | 2.16 | 3.05 | 2.24 | 3.17 | 3.42 | 4.83 |
| 4500     | 0.36 | 0.35 | 0.57 | 0.55 | 0.72 | 0.79 | 0.87 | 1.03 | 0.95 | 1.16 | 1.18 | 1.52 | 1.26 | 1.64 | 1.34 | 1.76 | 1.49 | 2.01 | 1.64 | 2.25 | 1.80 | 2.49 | 2.11 | 2.98 | 2.19 | 3.09 | 3.34 | 4.71 |
| 4625     | 0.35 | 0.34 | 0.55 | 0.54 | 0.70 | 0.77 | 0.85 | 1.01 | 0.93 | 1.13 | 1.15 | 1.48 | 1.23 | 1.60 | 1.30 | 1.72 | 1.46 | 1.96 | 1.61 | 2.19 | 1.76 | 2.43 | 2.06 | 2.90 | 2.14 | 3.02 | 3.26 | 4.60 |
| 4750     | 0.34 | 0.33 | 0.54 | 0.53 | 0.69 | 0.76 | 0.84 | 0.99 | 0.91 | 1.10 | 1.13 | 1.45 | 1.20 | 1.57 | 1.28 | 1.68 | 1.42 | 1.91 | 1.57 | 2.14 | 1.72 | 2.37 | 2.01 | 2.83 | 2.09 | 2.95 | 3.18 | 4.49 |
| 4875     | 0.34 | 0.33 | 0.53 | 0.52 | 0.67 | 0.74 | 0.82 | 0.97 | 0.89 | 1.08 | 1.10 | 1.42 | 1.17 | 1.53 | 1.25 | 1.64 | 1.39 | 1.87 | 1.53 | 2.09 | 1.68 | 2.32 | 1.96 | 2.77 | 2.04 | 2.87 | 3.11 | 4.38 |
| 5000     | 0.33 | 0.32 | 0.52 | 0.51 | 0.66 | 0.73 | 0.80 | 0.95 | 0.87 | 1.05 | 1.08 | 1.38 | 1.15 | 1.49 | 1.22 | 1.60 | 1.36 | 1.82 | 1.50 | 2.04 | 1.64 | 2.26 | 1.92 | 2.70 | 1.99 | 2.81 | 3.03 | 4.28 |
| 5125     | 0.32 | 0.31 | 0.51 | 0.50 | 0.65 | 0.71 | 0.78 | 0.92 | 0.85 | 1.03 | 1.05 | 1.35 | 1.12 | 1.46 | 1.19 | 1.57 | 1.33 | 1.78 | 1.46 | 2.00 | 1.60 | 2.21 | 1.87 | 2.64 | 1.95 | 2.74 | 2.97 | 4.18 |
| 5250     | 0.32 | 0.31 | 0.50 | 0.49 | 0.63 | 0.70 | 0.77 | 0.90 | 0.83 | 1.01 | 1.03 | 1.32 | 1.10 | 1.43 | 1.16 | 1.53 | 1.30 | 1.74 | 1.43 | 1.95 | 1.56 | 2.16 | 1.83 | 2.58 | 1.90 | 2.68 | 2.90 | 4.08 |
| 5375     | 0.31 | 0.30 | 0.49 | 0.48 | 0.62 | 0.68 | 0.75 | 0.89 | 0.81 | 0.99 | 1.01 | 1.29 | 1.07 | 1.39 | 1.14 | 1.50 | 1.27 | 1.70 | 1.40 | 1.90 | 1.53 | 2.11 | 1.79 | 2.51 | 1.86 | 2.61 | 2.83 | 3.98 |
| 5500     | 0.30 | 0.30 | 0.48 | 0.47 | 0.61 | 0.67 | 0.73 | 0.87 | 0.80 | 0.97 | 0.99 | 1.26 | 1.05 | 1.35 | 1.11 | 1.46 | 1.24 | 1.66 | 1.37 | 1.86 | 1.49 | 2.06 | 1.75 | 2.46 | 1.82 | 2.55 | 2.77 | 3.89 |
| 5625     | 0.30 | 0.29 | 0.47 | 0.46 | 0.59 | 0.65 | 0.72 | 0.85 | 0.78 | 0.94 | 0.97 | 1.24 | 1.03 | 1.33 | 1.09 | 1.43 | 1.21 | 1.62 | 1.34 | 1.82 | 1.46 | 2.01 | 1.71 | 2.40 | 1.77 | 2.49 | 2.70 | 3.80 |
| 5750     | 0.29 | 0.29 | 0.46 | 0.45 | 0.58 | 0.64 | 0.70 | 0.83 | 0.76 | 0.92 | 0.94 | 1.21 | 1.01 | 1.30 | 1.07 | 1.40 | 1.19 | 1.59 | 1.31 | 1.78 | 1.43 | 1.96 | 1.67 | 2.34 | 1.74 | 2.43 | 2.64 | 3.71 |
| 5875     | 0.29 | 0.28 | 0.45 | 0.44 | 0.57 | 0.63 | 0.69 | 0.81 | 0.75 | 0.91 | 0.92 | 1.18 | 0.98 | 1.27 | 1.04 | 1.37 | 1.16 | 1.55 | 1.28 | 1.74 | 1.40 | 1.92 | 1.63 | 2.29 | 1.70 | 2.38 | 2.59 | 3.62 |
| 6000     | 0.28 | 0.28 | 0.44 | 0.44 | 0.56 | 0.62 | 0.67 | 0.80 | 0.73 | 0.89 | 0.91 | 1.16 | 0.96 | 1.25 | 1.02 | 1.34 | 1.14 | 1.52 | 1.25 | 1.70 | 1.37 | 1.88 | 1.60 | 2.24 | 1.66 | 2.33 | 2.53 | 3.54 |
| 6125     | 0.28 | 0.27 | 0.44 | 0.43 | 0.55 | 0.61 | 0.66 | 0.78 | 0.72 | 0.87 | 0.89 | 1.13 | 0.94 | 1.22 | 1.00 | 1.31 | 1.11 | 1.49 | 1.23 | 1.66 | 1.34 | 1.84 | 1.57 | 2.19 | 1.63 | 2.28 | 2.48 | 3.47 |
| 6250     | 0.27 | 0.27 | 0.43 | 0.42 | 0.54 | 0.60 | 0.65 | 0.77 | 0.71 | 0.85 | 0.87 | 1.11 | 0.93 | 1.20 | 0.98 | 1.28 | 1.09 | 1.46 | 1.20 | 1.63 | 1.31 | 1.80 | 1.54 | 2.15 | 1.60 | 2.23 | 2.43 | 3.40 |
| 6375     | 0.27 | 0.26 | 0.42 | 0.42 | 0.53 | 0.59 | 0.64 | 0.76 | 0.69 | 0.84 | 0.86 | 1.09 | 0.91 | 1.18 | 0.96 | 1.26 | 1.07 | 1.43 | 1.18 | 1.60 | 1.29 | 1.77 | 1.51 | 2.11 | 1.57 | 2.19 | 2.39 | 3.34 |
| 6500     | 0.26 | 0.26 | 0.42 | 0.41 | 0.52 | 0.58 | 0.63 | 0.74 | 0.68 | 0.83 | 0.84 | 1.08 | 0.90 | 1.16 | 0.95 | 1.24 | 1.06 | 1.41 | 1.16 | 1.57 | 1.27 | 1.74 | 1.48 | 2.07 | 1.54 | 2.15 | 2.35 | 3.28 |
| 6625     | 0.26 | 0.26 | 0.41 | 0.41 | 0.52 | 0.57 | 0.62 | 0.73 | 0.67 | 0.82 | 0.83 | 1.06 | 0.88 | 1.14 | 0.94 | 1.23 | 1.04 | 1.39 | 1.15 | 1.55 | 1.25 | 1.72 | 1.46 | 2.04 | 1.52 | 2.12 | 2.32 | 3.23 |
| 6750     | 0.26 | 0.26 | 0.41 | 0.41 | 0.51 | 0.57 | 0.61 | 0.73 | 0.67 | 0.81 | 0.82 | 1.05 | 0.88 | 1.13 | 0.93 | 1.21 | 1.03 | 1.37 | 1.14 | 1.54 | 1.24 | 1.70 | 1.45 | 2.02 | 1.50 | 2.10 | 2.29 | 3.20 |
| 6875     | 0.26 | 0.25 | 0.40 | 0.40 | 0.51 | 0.56 | 0.61 | 0.72 | 0.66 | 0.80 | 0.82 | 1.04 | 0.87 | 1.12 | 0.92 | 1.20 | 1.02 | 1.36 | 1.13 | 1.52 | 1.23 | 1.68 | 1.44 | 2.00 | 1.49 | 2.08 | 2.28 | 3.17 |
| 7000     | 0.25 | 0.25 | 0.40 | 0.40 | 0.51 | 0.56 | 0.61 | 0.72 | 0.66 | 0.80 | 0.82 | 1.04 | 0.87 | 1.12 | 0.92 | 1.20 | 1.02 | 1.36 | 1.12 | 1.52 | 1.23 | 1.68 | 1.43 | 2.00 | 1.49 | 2.08 | 2.27 | 3.17 |
| 7125     | 0.25 | 0.25 | 0.40 | 0.40 | 0.51 | 0.56 | 0.61 | 0.72 | 0.66 | 0.80 | 0.81 | 1.04 | 0.87 | 1.12 | 0.92 | 1.20 | 1.02 | 1.36 | 1.12 | 1.52 | 1.22 | 1.68 | 1.43 | 2.00 | 1.49 | 2.08 | 2.27 | 3.17 |
|          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

(iii) ASM2525 and ASM5015 Nitric Oxide (% NO) Table

| Column # | 41<br>5015 | 41<br>2525 | 42<br>5015 | 42<br>2525 | 43<br>5015 | 43<br>2525 | 44<br>5015 | 44<br>2525 | 45<br>5015 | 45<br>2525 | 46<br>5015 | 46<br>2525 | 47<br>5015 | 47<br>2525 | 48<br>5015 | 48<br>2525 | 49<br>5015 | 49<br>2525 | 50<br>5015 | 50<br>2525 | 51<br>5015 | 51<br>2525 |
|----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| ETW      |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |            |
| 1750     | 1212       | 1095       | 1819       | 1642       | 2272       | 2114       | 2725       | 2587       | 3178       | 3060       | 3631       | 3532       | 4084       | 4005       | 4990       | 4950       | 4990       | 4960       | 4990       | 4980       | 4990       | 4990       |
| 1875     | 1142       | 1031       | 1713       | 1547       | 2181       | 1991       | 2649       | 2435       | 3117       | 2879       | 3586       | 3323       | 4054       | 3767       | 4990       | 4655       | 4990       | 4738       | 4990       | 4906       | 4990       | 4990       |
| 2000     | 1077       | 973        | 1616       | 1460       | 2058       | 1877       | 2499       | 2295       | 2941       | 2713       | 3383       | 3131       | 3824       | 3548       | 4707       | 4384       | 4778       | 4535       | 4919       | 4838       | 4990       | 4990       |
| 2125     | 1018       | 920        | 1527       | 1380       | 1944       | 1774       | 2360       | 2167       | 2776       | 2561       | 3192       | 2955       | 3609       | 3348       | 4441       | 4136       | 4578       | 4349       | 4853       | 4776       | 4990       | 4990       |
| 2250     | 964        | 871        | 1446       | 1307       | 1839       | 1678       | 2232       | 2050       | 2625       | 2422       | 3018       | 2794       | 3411       | 3165       | 4197       | 3909       | 4395       | 4179       | 4792       | 4720       | 4990       | 4990       |
| 2375     | 915        | 827        | 1372       | 1240       | 1744       | 1592       | 2115       | 1943       | 2487       | 2295       | 2859       | 2646       | 3231       | 2998       | 3974       | 3701       | 4228       | 4024       | 4736       | 4668       | 4990       | 4990       |
| 2500     | 869        | 786        | 1304       | 1179       | 1657       | 1512       | 2009       | 1845       | 2361       | 2179       | 2714       | 2512       | 3066       | 2845       | 3771       | 3512       | 4076       | 3881       | 4685       | 4620       | 4990       | 4990       |
| 2625     | 828        | 749        | 1242       | 1123       | 1577       | 1440       | 1912       | 1756       | 2246       | 2073       | 2581       | 2389       | 2916       | 2706       | 3585       | 3339       | 3936       | 3752       | 4639       | 4577       | 4990       | 4990       |
| 2750     | 791        | 715        | 1186       | 1072       | 1504       | 1374       | 1823       | 1675       | 2142       | 1976       | 2460       | 2277       | 2779       | 2579       | 3416       | 3181       | 3809       | 3579       | 4596       | 4374       | 4990       | 4772       |
| 2875     | 756        | 684        | 1134       | 1026       | 1438       | 1313       | 1742       | 1601       | 2046       | 1888       | 2350       | 2175       | 2654       | 2463       | 3261       | 3037       | 3669       | 3417       | 4484       | 4176       | 4892       | 4556       |
| 3000     | 725        | 656        | 1088       | 984        | 1378       | 1258       | 1668       | 1533       | 1959       | 1808       | 2249       | 2082       | 2539       | 2357       | 3120       | 2906       | 3510       | 3270       | 4290       | 3996       | 4680       | 4359       |
| 3125     | 696        | 630        | 1045       | 945        | 1323       | 1208       | 1601       | 1471       | 1879       | 1734       | 2157       | 1997       | 2435       | 2260       | 2992       | 2787       | 3366       | 3135       | 4114       | 3832       | 4488       | 4180       |
| 3250     | 670        | 607        | 1006       | 910        | 1273       | 1163       | 1539       | 1415       | 1806       | 1667       | 2073       | 1920       | 2340       | 2172       | 2874       | 2677       | 3234       | 3012       | 3952       | 3681       | 4311       | 4016       |
| 3375     | 647        | 585        | 970        | 878        | 1227       | 1121       | 1483       | 1363       | 1740       | 1606       | 1997       | 1849       | 2253       | 2092       | 2767       | 2577       | 3113       | 2899       | 3804       | 3544       | 4150       | 3866       |
| 3500     | 625        | 566        | 937        | 848        | 1184       | 1082       | 1432       | 1316       | 1679       | 1550       | 1926       | 1784       | 2174       | 2018       | 2668       | 2486       | 3002       | 2796       | 3669       | 3418       | 4002       | 3728       |
| 3625     | 605        | 547        | 907        | 821        | 1146       | 1047       | 1384       | 1273       | 1623       | 1498       | 1862       | 1724       | 2100       | 1950       | 2578       | 2401       | 2900       | 2701       | 3544       | 3302       | 3867       | 3602       |
| 3750     | 586        | 531        | 879        | 796        | 1110       | 1014       | 1340       | 1233       | 1571       | 1451       | 1802       | 1669       | 2033       | 1887       | 2494       | 2323       | 2806       | 2614       | 3429       | 3195       | 3741       | 3485       |
| 3875     | 569        | 515        | 853        | 773        | 1077       | 984        | 1300       | 1195       | 1523       | 1407       | 1747       | 1618       | 1970       | 1829       | 2417       | 2251       | 2719       | 2533       | 3323       | 3096       | 3625       | 3377       |
| 4000     | 553        | 501        | 829        | 751        | 1046       | 956        | 1262       | 1161       | 1479       | 1365       | 1695       | 1570       | 1912       | 1775       | 2345       | 2184       | 2638       | 2457       | 3224       | 3003       | 3517       | 3276       |
| 4125     | 538        | 487        | 807        | 731        | 1017       | 930        | 1227       | 1128       | 1437       | 1327       | 1647       | 1526       | 1857       | 1724       | 2277       | 2122       | 2562       | 2387       | 3131       | 2917       | 3416       | 3182       |
| 4250     | 524        | 475        | 786        | 712        | 990        | 905        | 1194       | 1098       | 1398       | 1291       | 1602       | 1484       | 1806       | 1677       | 2214       | 2063       | 2490       | 2320       | 3044       | 2836       | 3321       | 3094       |
| 4375     | 510        | 463        | 766        | 694        | 964        | 882        | 1162       | 1069       | 1360       | 1257       | 1559       | 1444       | 1757       | 1632       | 2154       | 2007       | 2423       | 2258       | 2961       | 2759       | 3230       | 3010       |
| 4500     | 498        | 451        | 747        | 677        | 939        | 859        | 1132       | 1042       | 1325       | 1224       | 1518       | 1406       | 1711       | 1589       | 2096       | 1953       | 2359       | 2198       | 2883       | 2686       | 3145       | 2930       |
| 4625     | 486        | 440        | 728        | 661        | 916        | 838        | 1104       | 1015       | 1291       | 1193       | 1479       | 1370       | 1666       | 1548       | 2042       | 1903       | 2297       | 2140       | 2807       | 2616       | 3063       | 2854       |
| 4750     | 474        | 430        | 711        | 645        | 893        | 818        | 1076       | 990        | 1259       | 1163       | 1441       | 1336       | 1624       | 1508       | 1989       | 1854       | 2238       | 2085       | 2735       | 2549       | 2983       | 2780       |
| 4875     | 463        | 420        | 694        | 630        | 872        | 798        | 1049       | 966        | 1227       | 1134       | 1405       | 1302       | 1583       | 1470       | 1938       | 1806       | 2180       | 2032       | 2665       | 2483       | 2907       | 2709       |
| 5000     | 452        | 410        | 677        | 615        | 850        | 778        | 1023       | 942        | 1196       | 1106       | 1369       | 1269       | 1542       | 1433       | 1889       | 1760       | 2125       | 1980       | 2597       | 2420       | 2833       | 2640       |
| 5125     | 441        | 400        | 661        | 600        | 830        | 760        | 998        | 919        | 1167       | 1078       | 1335       | 1237       | 1503       | 1397       | 1840       | 1715       | 2070       | 1930       | 2530       | 2359       | 2760       | 2573       |
| 5250     | 431        | 391        | 646        | 586        | 810        | 741        | 974        | 896        | 1138       | 1051       | 1301       | 1206       | 1465       | 1362       | 1793       | 1672       | 2017       | 1881       | 2466       | 2298       | 2690       | 2507       |
| 5375     | 420        | 382        | 631        | 573        | 790        | 723        | 950        | 874        | 1109       | 1025       | 1269       | 1176       | 1428       | 1327       | 1747       | 1629       | 1966       | 1833       | 2403       | 2240       | 2621       | 2443       |
| 5500     | 410        | 373        | 616        | 559        | 771        | 706        | 926        | 853        | 1082       | 1000       | 1237       | 1147       | 1392       | 1294       | 1703       | 1587       | 1916       | 1786       | 2341       | 2183       | 2554       | 2381       |
| 5625     | 401        | 364        | 601        | 546        | 752        | 689        | 904        | 832        | 1055       | 975        | 1206       | 1118       | 1357       | 1261       | 1659       | 1547       | 1867       | 1740       | 2282       | 2127       | 2489       | 2321       |
| 5750     | 391        | 356        | 587        | 534        | 734        | 673        | 882        | 812        | 1029       | 951        | 1176       | 1090       | 1323       | 1230       | 1617       | 1508       | 1820       | 1697       | 2224       | 2074       | 2426       | 2262       |
| 5875     | 383        | 348        | 574        | 522        | 717        | 657        | 860        | 793        | 1004       | 928        | 1147       | 1064       | 1290       | 1199       | 1577       | 1471       | 1774       | 1654       | 2168       | 2022       | 2366       | 2206       |
| 6000     | 374        | 340        | 561        | 510        | 701        | 642        | 840        | 774        | 980        | 906        | 1120       | 1039       | 1259       | 1171       | 1539       | 1435       | 1731       | 1614       | 2116       | 1973       | 2308       | 2152       |
| 6125     | 366        | 333        | 549        | 499        | 685        | 628        | 822        | 757        | 958        | 886        | 1094       | 1015       | 1230       | 1144       | 1503       | 1401       | 1690       | 1577       | 2066       | 1927       | 2254       | 2102       |
| 6250     | 359        | 326        | 538        | 489        | 671        | 615        | 804        | 741        | 937        | 867        | 1070       | 993        | 1203       | 1119       | 1469       | 1371       | 1653       | 1542       | 2020       | 1884       | 2204       | 2056       |
| 6375     | 352        | 320        | 528        | 480        | 658        | 604        | 788        | 727        | 919        | 850        | 1049       | 973        | 1179       | 1096       | 1439       | 1343       | 1619       | 1510       | 1979       | 1846       | 2159       | 2014       |
| 6500     | 346        | 315        | 519        | 473        | 647        | 593        | 775        | 714        | 902        | 835        | 1030       | 956        | 1158       | 1077       | 1413       | 1318       | 1590       | 1483       | 1943       | 1813       | 2119       | 1977       |
| 6625     | 341        | 311        | 512        | 466        | 638        | 585        | 763        | 704        | 889        | 823        | 1014       | 941        | 1140       | 1060       | 1391       | 1298       | 1565       | 1460       | 1913       | 1785       | 2087       | 1947       |
| 6750     | 338        | 307        | 507        | 461        | 631        | 578        | 755        | 696        | 879        | 813        | 1003       | 931        | 1127       | 1048       | 1374       | 1283       | 1546       | 1443       | 1890       | 1764       | 2062       | 1924       |
| 6875     | 335        | 305        | 503        | 458        | 626        | 574        | 749        | 691        | 872        | 807        | 995        | 924        | 1118       | 1040       | 1364       | 1273       | 1534       | 1432       | 1875       | 1750       | 2046       | 1909       |
| 7000     | 335        | 305        | 502        | 457        | 624        | 573        | 747        | 689        | 870        | 805        | 992        | 921        | 1115       | 1037       | 1360       | 1269       | 1530       | 1428       | 1870       | 1745       | 2040       | 1904       |
| 7125     | 335        | 305        | 502        | 457        | 625        | 573        | 747        | 689        | 870        | 805        | 992        | 921        | 1115       | 1037       | 1360       | 1269       | 1531       | 1428       | 1874       | 1745       | 2045       | 1904       |
| 7250     | 335        | 305        | 502        | 457        | 625        | 573        | 747        | 689        | 870        | 805        | 992        | 921        | 1115       | 1037       | 1360       | 1269       | 1531       | 1428       | 1874       | 1745       | 2045       | 1904       |
| 7375     | 335        | 305        | 502        | 457        | 625        | 573        | 747        | 689        | 870        | 805        | 992        | 921        | 1115       | 1037       | 1360       | 1269       | 1531       | 1428       | 1874       | 1745       | 2045       | 1904       |
| 7500     | 335        | 305        | 502        | 457        | 625        | 573        | 747        | 689        | 870        | 805        | 992        | 921        | 1115       | 1037       | 1360       | 1269       | 1531       | 1428       | 1874       | 1745       | 2045       | 1904       |

**Table 3: Recommended IM240 Emission Standards**

**Phase-in IM240 Standards**

Phase-in emission standards are recommended for at least calendar years 1995 and 1996, and may also be used in 1997, depending upon when full implementation occurs. The following standards are recommended for low-altitude areas and will yield a failure rate of about 20-30%.

**Light Duty Vehicle IM240 Phase-in Standards**

| <u>Model Years</u> | <u>Hydrocarbons</u><br>grams per mile | <u>Carbon Monoxide</u><br>grams per mile | <u>Oxides of Nitrogen</u><br>grams per mile |
|--------------------|---------------------------------------|--|---|
| 1994+ Tier 1       | 0.80                                  | 15.0                                     | 2.0   |
| 1991-1995          | 1.20                                  | 20.0                                     | 2.5   |
| 1983-1990          | 2.00                                  | 30.0                                     | 3.0   |
| 1981-1982          | 2.00                                  | 60.0                                     | 3.0   |
| 1980               | 2.00                                  | 60.0                                     | 6.0   |
| 1977-1979          | 7.50                                  | 90.0                                     | 6.0   |
| 1975-1976          | 7.50                                  | 90.0                                     | 9.0   |
| 1973-1974          | 10.0                                  | 150                                      | 9.0   |
| 1968-1972          | 10.0                                  | 150                                      | 10.0  |

**Light Duty Truck 1 IM240 Phase-in Standards**

*Less than 6001 pounds Gross Vehicle Weight Rating*

| <u>Model Years</u>     | <u>Hydrocarbons</u><br>grams per mile | <u>Carbon Monoxide</u><br>grams per mile | <u>Oxides of Nitrogen</u><br>grams per mile |
|------------------------|---------------------------------------|--|---|
| 1994+ Tier 1 <3750 LVW | 0.80                                  | 15.0                                     | 2.0   |
| 1994+ Tier 1 >3750 LVW | 1.00                                  | 20.0                                     | 2.5   |
| 1991-1995              | 2.40                                  | 60.0                                     | 3.0   |
| 1988-1990              | 3.20                                  | 80.0                                     | 3.5   |
| 1984-1987              | 3.20                                  | 80.0                                     | 7.0   |
| 1979-1983              | 7.50                                  | 100                                      | 7.0   |
| 1975-1978              | 8.00                                  | 120                                      | 9.0   |
| 1973-1974              | 10.0                                  | 150                                      | 9.0   |
| 1968-1972              | 10.0                                  | 150                                      | 10.0  |

**Light Duty Truck 2 IM240 Phase-in Standards**

*Greater than 6000 pounds Gross Vehicle Weight Rating*

| <u>Model Years</u>       | <u>Hydrocarbons</u><br>grams per mile | <u>Carbon Monoxide</u><br>grams per mile | <u>Oxides of Nitrogen</u><br>grams per mile |
|--------------------------|---------------------------------------|--|---|
| 1994+ Tier 1 (<5750 LVW) | 1.00                                  | 20.0                                     | 2.5   |
| 1994+ Tier 1 (>5750 LVW) | 2.40                                  | 60.0                                     | 4.0   |
| 1991-1995                | 2.40                                  | 60.0                                     | 4.5   |
| 1988-1990                | 3.20                                  | 80.0                                     | 5.0   |
| 1984-1987                | 3.20                                  | 80.0                                     | 7.0   |
| 1979-1983                | 7.50                                  | 100                                      | 7.0   |
| 1975-1978                | 8.00                                  | 120                                      | 9.0   |
| 1973-1974                | 10.0                                  | 150                                      | 9.0   |
| 1968-1972                | 10.0                                  | 150                                      | 10.0  |

**Part 3.0 Outline of the U.S. EPA's Enhanced I/M Performance Standards**

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**Final IM240 Standards**

Final standards are recommended for use after at least one full test cycle has been completed using the phase-in standards. The following standards are recommended for low-altitude areas and will yield a failure rate of about 20-30% (after a full cycle of the phase-in standards).

**Light Duty Vehicle IM240 Final Standards**

| <u>Model Years</u> | <u>Hydrocarbons</u><br>grams per mile | <u>Carbon Monoxide</u><br>grams per mile | <u>Oxides of Nitrogen</u><br>grams per mile |
|--------------------|---------------------------------------|--|---|
| 1994+ Tier 1       | 0.60                                  | 10.0                                     | 1.5   |
| 1983-1995          | 0.80                                  | 15.0                                     | 2.0   |
| 1981-1982          | 0.80                                  | 30.0                                     | 2.0   |
| 1980               | 0.80                                  | 30.0                                     | 4.0   |
| 1977-1979          | 3.00                                  | 65.0                                     | 4.0   |
| 1975-1976          | 3.00                                  | 65.0                                     | 6.0   |
| 1973-1974          | 7.00                                  | 120                                      | 6.0   |
| 1968-1972          | 7.00                                  | 120                                      | 7.0   |

**Light Duty Truck 1 IM240 Final Standards**

*Less than 6001 pounds Gross Vehicle Weight Rating*

| <u>Model Years</u>     | <u>Hydrocarbons</u><br>grams per mile | <u>Carbon Monoxide</u><br>grams per mile | <u>Oxides of Nitrogen</u><br>grams per mile |
|------------------------|---------------------------------------|--|---|
| 1994+ Tier 1 <3750 LVW | 0.60                                  | 10.0                                     | 1.5   |
| 1994+ Tier 1 >3750 LVW | 0.80                                  | 13.0                                     | 1.8   |
| 1988-1995              | 1.60                                  | 40.0                                     | 2.5   |
| 1984-1987              | 1.60                                  | 40.0                                     | 4.5   |
| 1979-1983              | 3.40                                  | 70.0                                     | 4.5   |
| 1975-1978              | 4.00                                  | 80.0                                     | 6.0   |
| 1973-1974              | 7.00                                  | 120                                      | 6.0   |
| 1968-1972              | 7.00                                  | 120                                      | 7.0   |

**Light Duty Truck 2 IM240 Phase-in Standards**

*Greater than 6000 pounds Gross Vehicle Weight Rating*

| <u>Model Years</u>     | <u>Hydrocarbons</u><br>grams per mile | <u>Carbon Monoxide</u><br>grams per mile | <u>Oxides of Nitrogen</u><br>grams per mile |
|------------------------|---------------------------------------|--|---|
| 1994+ Tier 1 <5750 LVW | 0.80                                  | 13.0                                     | 1.8   |
| 1994+ Tier 1 >5750 LVW | 0.80                                  | 15.0                                     | 2.0   |
| 1988-1995              | 1.60                                  | 40.0                                     | 3.5   |
| 1984-1987              | 1.60                                  | 40.0                                     | 4.5   |
| 1979-1983              | 3.40                                  | 70.0                                     | 4.5   |
| 1975-1978              | 4.00                                  | 80.0                                     | 6.0   |
| 1973-1974              | 7.00                                  | 120                                      | 6.0   |
| 1968-1972              | 7.00                                  | 120                                      | 7.0   |