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SUPPLEMENT A
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SUPPLEMENT A

TO

COMPILATION OF AIR POLLUTANT EMISSION FACTORS

VOLUME II: MOBILE SOURCES

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL
INFORMATION SERVICE
SPRINGFIELD, VA 22161

This report has been reviewed by the Office Of Mobile Sources, U. S. Environmental Protection Agency, and has been approved for publication. Any mention of trade names or commercial products is not intended to constitute endorsement or recommendation for use.

AP-42
Volume II
Supplement A

Instructions for inserting SUPPLEMENT A
into AP-42, Volume II: Mobile Sources

Page	iv	replaces same.	Revised Table of Contents.
Pages	1 thru 70	replace pp. 2 thru 56.	Major revision.
Pages	A-1 thru A-10	replace pp. A-1 thru A-8.	Major revision.
Pages	B-1 thru B-3	replace pp. B-1 thru B-4.	Major revision.
Page	C-1	replaces same.	Minor revision.
Pages	D-1 thru D-5	replace pp. D-1 thru D-6.	Minor revision.
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Pages	G-1 thru G-6	replace same.	Major revision.
Pages	H-1 thru H-298	replace pp. H-1 thru H-190.	Major revision.
Pages	I-1 thru I-47	replace pp. I-1 thru I-38.	Major revision.
Pages	J-1 thru J-45	replace pp. J-1 thru J-37.	Major revision.
Pages	K-1 thru K-19	replace same.	Major revision.

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PREFACE TO SUPPLEMENT A TO

VOLUME II: MOBILE SOURCES

Compilation of Air Pollutant Emission Factors, AP-42, reports data on emissions of atmospheric pollutants for which sufficient information exists to establish realistic emission estimates. The highway source data presented in this supplement are based on MOBILE4, a computer program issued by the EPA in March 1989, which estimates fleet emission rates for hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) for any calendar year between 1960 and 2020. The emission factors for off-highway mobile sources are presented in Section II of the 4th edition of AP-42 (September 1985), and are not revised in this supplement. EPA will issue additional supplements to this volume, updating the emission factors for particulates, transit buses, and off-highway mobile sources, as new data are available.

Comments and suggestions regarding this document are appreciated and should be addressed to:

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Part I - HIGHWAY MOBILE SOURCES

INTRODUCTION

This document officially revises all previous emission factor (AP-42) documents for highway mobile sources. Also, this document will be periodically revised as the emissions and in-use vehicle operational characteristics vary from those presented.

A. PURPOSE

This document was generated to present more recent emission factor information for highway mobile sources. As such, the affected sections of the September 1985 Compilation of Air Pollutant Emission Factors: Highway Mobile Sources document (Introduction, Chapters 1-8, and Appendixes A-K) are outdated. Many of the emission rates contained in this document are found in EPA's mobile source emission model, MOBILE4.

B. MAJOR DIFFERENCES FROM 1985 COMPILATION DOCUMENT

The differences between the emission factors presented in this supplement and the September 1985 Compilation Document are listed below:

1. Calculation Methodologies

   a. Fuel volatility effects on hot soak, diurnal, and exhaust emissions are accounted for.

   b. Running loss emissions (evaporative emissions generated when a vehicle is operating) are added to the model. Emissions are expressed as functions of fuel volatility and ambient temperature.

   c. Refueling emissions are added.

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d. A set of trip- and emissions-weighted temperatures, based on the daily minimum and maximum ambient temperatures, are calculated in the model to be used for estimating exhaust, hot soak, and running loss emissions. The daily minimum and maximum ambient temperatures are used to calculate diurnal emissions.

e. Two sets of emission deterioration rates as a function of accumulated mileage (one applicable to the first 50,000 miles of vehicle operation, and a second applicable to mileage accumulation over 50,000 miles) are used for both HC and CO emissions of 1981 and later model year light-duty gasoline-powered vehicles.

f. Hot stabilized idle emissions are in units of grams per hour. For late model year gasoline-powered vehicle types, the idle emission rates are updated based on in-use data, as functions of hot FTP exhaust emission rates.

g. Trip characteristics (trip days, full diurnal, partial diurnal, multiple diurnal, and no diurnal days) are being accounted for in the calculation of evaporative emissions in grams per mile. Trips per day and miles per day parameters are expressed as functions of vehicle age.

h. Emission reduction credits from a motor vehicle inspection and maintenance program and/or an anti-tampering program are estimated depending on several user-specified parameters, such as waiver rate, compliance rate, type of program, etc.

2. Emission Data and Other Parameters

a. The hot soak and diurnal emission rates are based on test results using three levels of fuel volatility, with varying ambient temperatures.

b. More data for basic exhaust emissions are incorporated for all gasoline-powered vehicle types and heavy-duty diesel-powered vehicles, usually for the later model years and across wider mileage ranges.

c. More representative fleet characterization data (registration and mileage accumulation vs. age distributions) are used for each vehicle type.

d. New methane offsets are developed for the three light-duty gasoline-powered vehicle types based on more methane HC emissions data.

e. More temperature correction factor data, especially from fuel-injected technologies, have been incorporated for light-duty gasoline-powered vehicle types. For ambient temperatures higher than 75°F, a combined temperature and fuel volatility correction factor is used to adjust exhaust emissions.

f. More speed correction factor data, especially from tests over very low speed ($\leq$ 5 mph) cycles, have been incorporated for light-duty gasoline-powered vehicle types.

g. An additional category, "missing gas cap," is added for tampering rates and tampering offsets. More tampering data have been incorporated for light-duty gasoline-powered vehicle types.

3. Regulations

a. The emission rates for the 1988 and later model year trucks reflect the emission standards and regulations that have been promulgated at the time of this update (see Appendix A).

b. Emission reduction credits from a fuel volatility control program can be accounted for (see Section E below). Refueling emission impacts from either Stage II or onboard refueling vapor recovery system control programs can also be modeled (see sections F and G below).

[Note: Regulations and emission standards mandated by the Clean Air Act Amendments of 1990 are not accounted for in the emission factors presented in this supplement.]

In summary, all of the changes mentioned above have an impact on the calculated emission factors. To illustrate the differences, six figures are given. Each figure represents emissions at an average speed of 19.6 mph, temperature of 75°F, and operating mode VMT percentages of 20.6% for cold start, 52.1% for stabilized, and 27.3% for hot start, FTP ambient diurnal temperatures of 60° to 84°F. The six figures are grouped into two sets: low altitude and high altitude

emissions for January 1 of calendar years 1970 through 2000. The figures represent the emission levels for all eight vehicle types combined. Each set of graphs is composed of the three pollutants: nonmethane HC, CO, and NOx. The emissions predicted by the 1985 Compilation methodology were generated by the MOBILE3 computer model, using the default of 9.0 psi RVP certification fuel for exhaust emissions, and 11.5 psi fuel for evaporative emissions. The emissions predicted by the 1989 AP-42 methodology were generated by the MOBILE4 computer model, as corrected on May 19, 1989, using the in-use fuel volatility level of 11.5 psi RVP for all emissions.

Figure 1
NMHC Emissions, All Highway Vehicles
Low Altitude Region

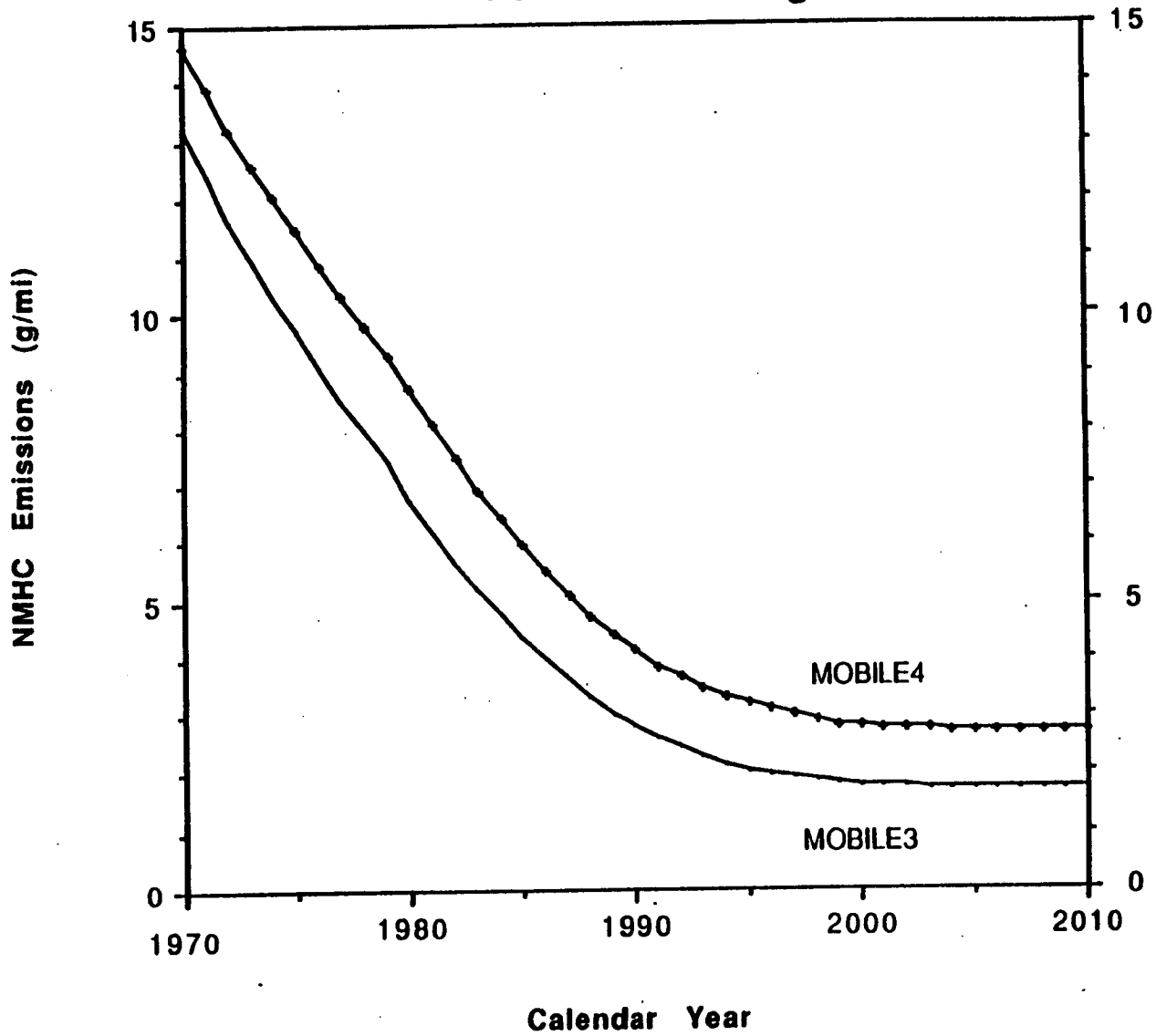

Figure 2
CO Emissions, All Highway Vehicles
Low Altitude Region

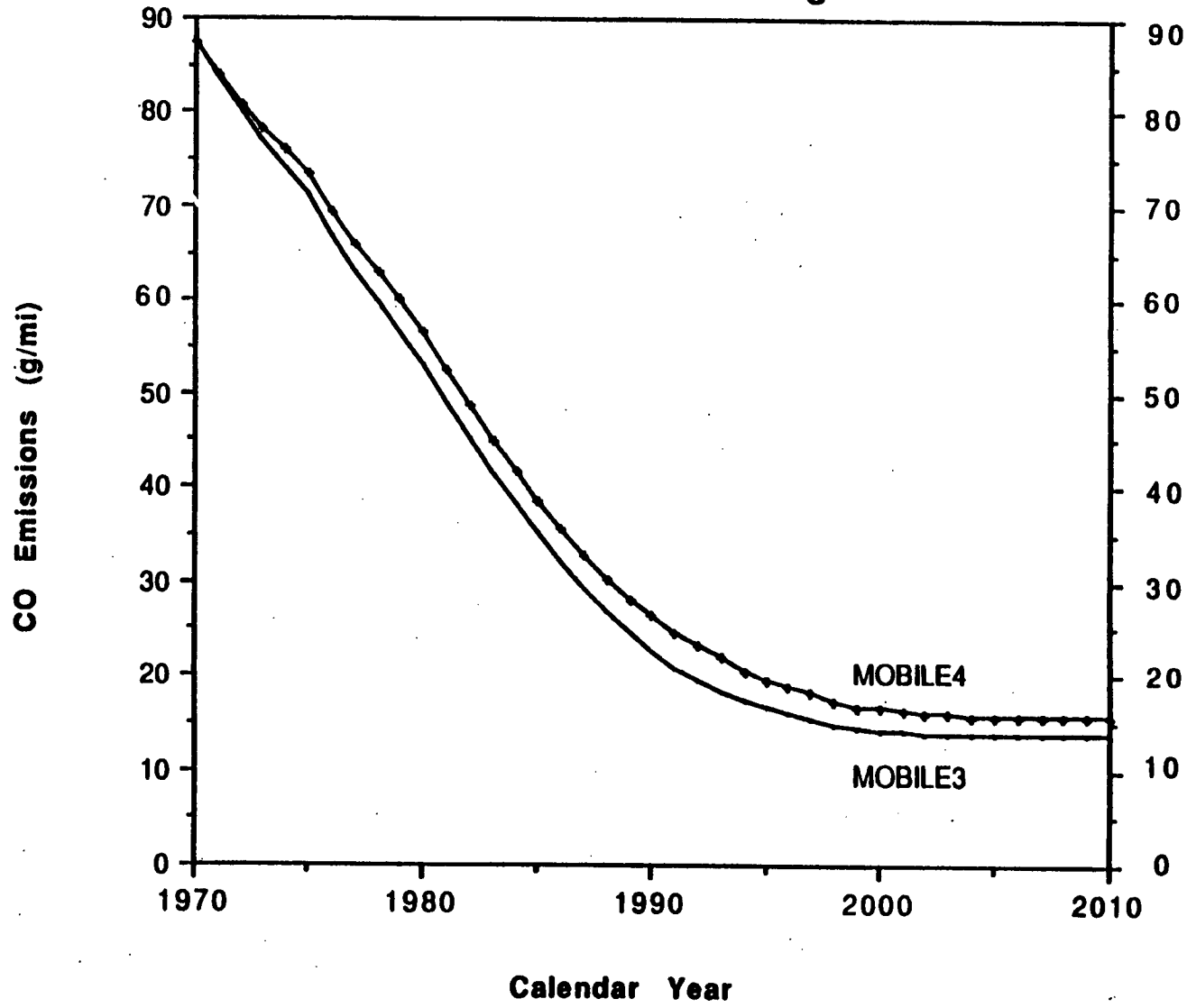

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Figure 3
NOx Emissions, All Highway Vehicles
Low Altitude Region

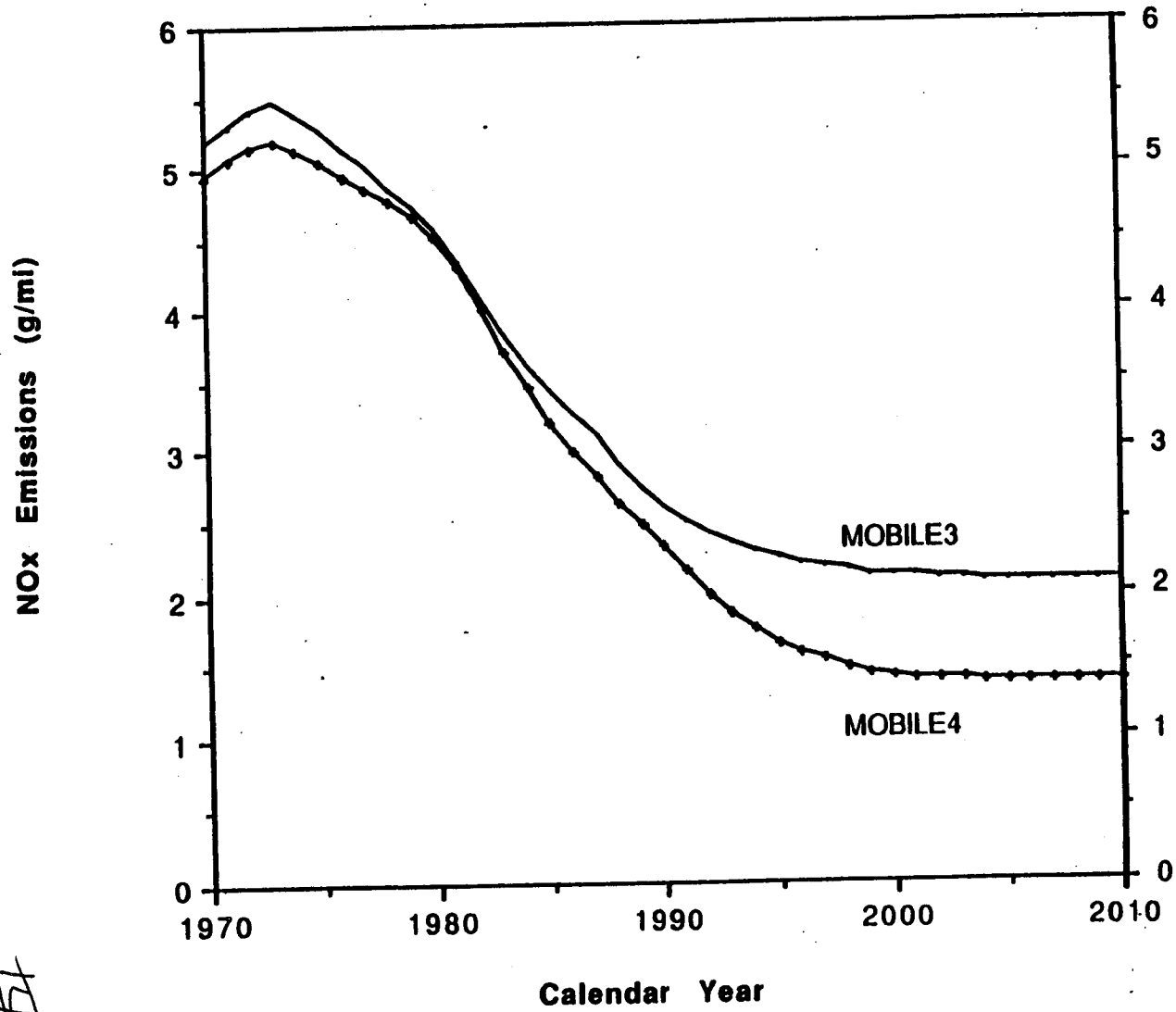


Figure 4
NMHC Emissions, All Highway Vehicles
High Altitude Region

#5

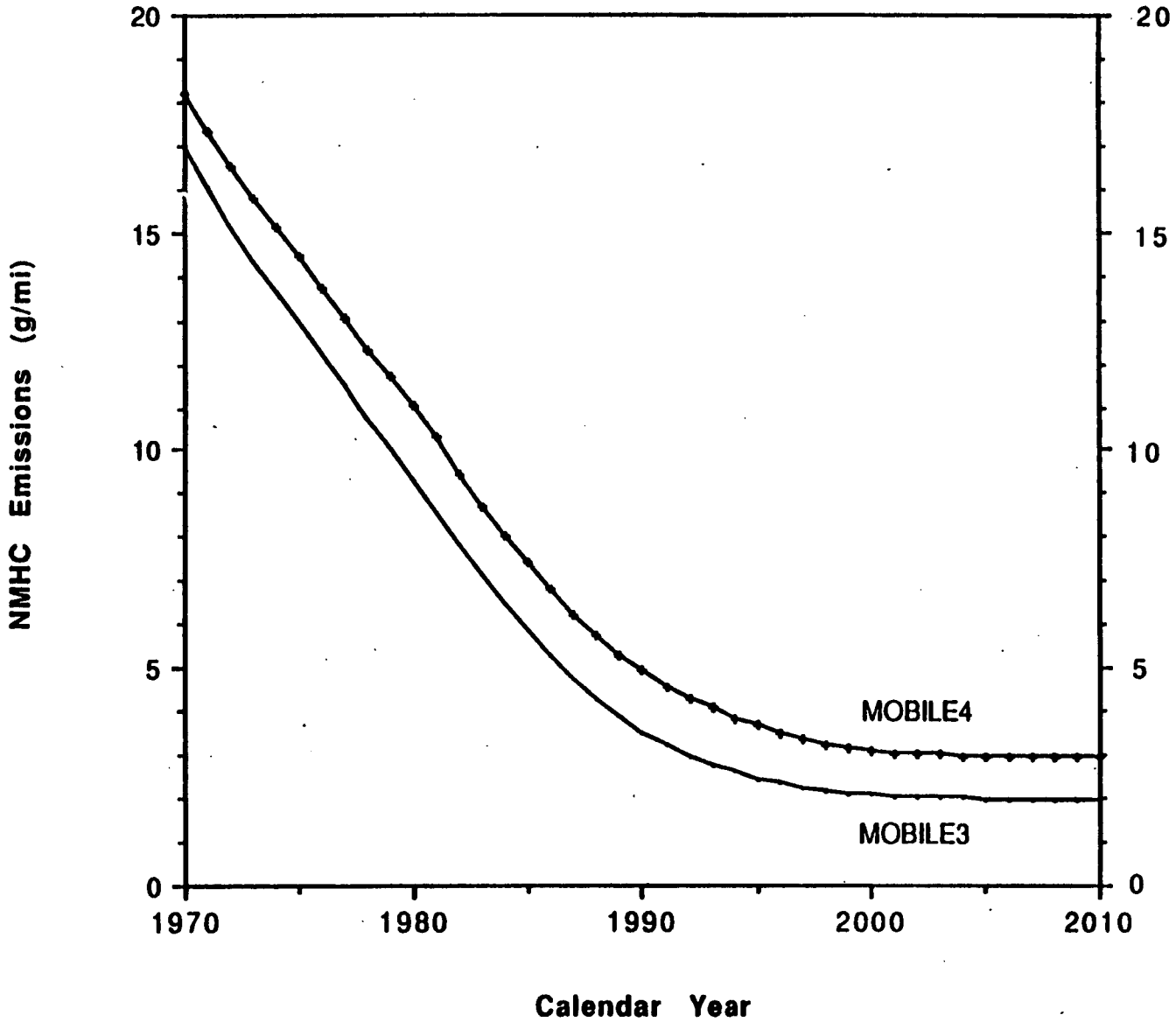


Figure 5
CO Emissions, All Highway Vehicles
High Altitude Region

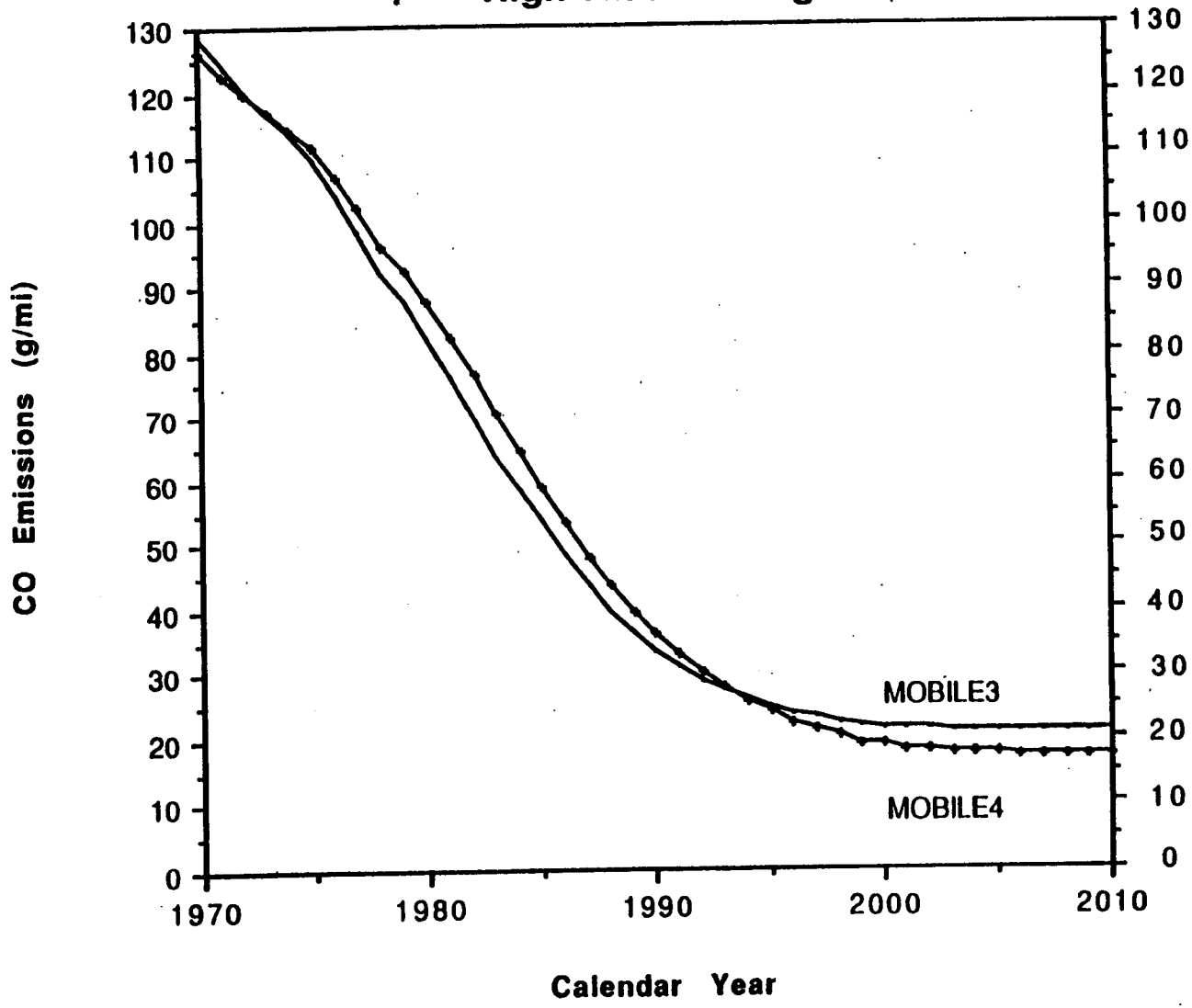
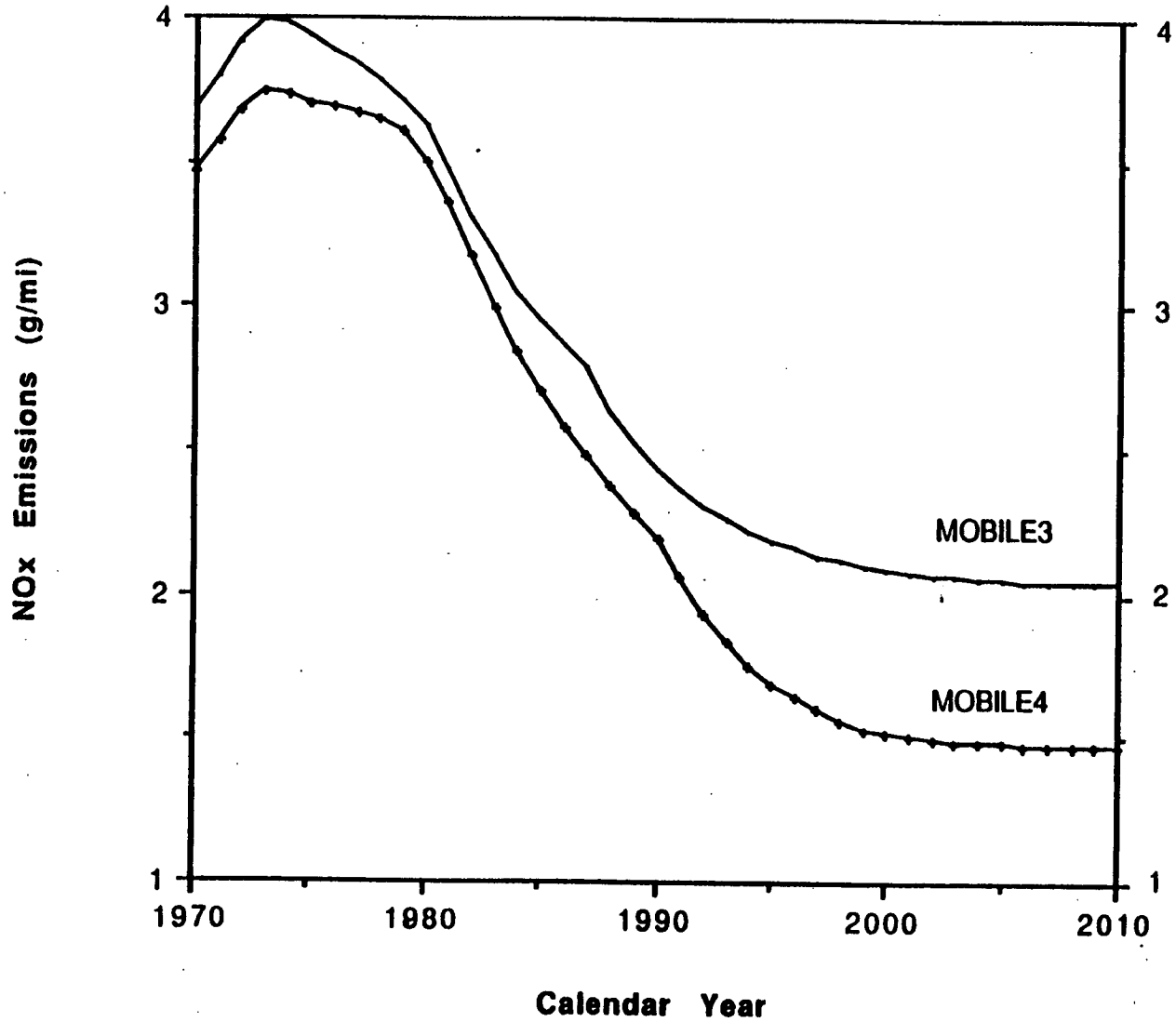


Figure 6
NOx Emissions, All Highway Vehicles
High Altitude Region



C. VEHICLE INSPECTION AND MAINTENANCE PROGRAMS

As in MOBILE3, if a motor vehicle inspection and maintenance (I/M) program is in effect in the area for which emission factors are being calculated, emission reduction credits can be taken.

The emission reduction credits attributable to an I/M program vary according to the type of program in effect. The MOBILE4 credits for an I/M program depend on the following nine factors:

1. The calendar year the I/M program is implemented.

2. The estimated failure rate (stringency factor) among the pre-1981 model year LDGVs or pre-1984 model year LDGTs.

3. The oldest and newest model years involved in the I/M program.

4. Percent waiver rate.

5. Percent compliance rate.

6. Frequency of I/M inspections: annual or biennial.

7. The four vehicle types potentially affected by the I/M program: LDGVs, LDGT1s, LDGT2s, and HDGVs.

8. One of the three test types: idle test, 2500 RPM idle test, or loaded idle test.

9. One of the three I/M program designs: centralized, decentralized and computerized, or decentralized and manual.

The I/M credits are not tabulated in this document but are built-in to the MOBILE4 computer program.

D. VEHICLE ANTI-TAMPERING PROGRAMS

As in MOBILE3, emission reduction credits can also be taken if an anti-tampering program (ATP) is in effect in the area for which emission factors are being calculated.

The emission reduction credits attributable to an ATP vary according to the program type. The MOBILE4 credits for an ATP depend on the following seven factors:

1. The calendar year in which the ATP is implemented.

2. The oldest and newest model years involved in the ATP.

3. The vehicle types affected by the ATP: LDGVs, LDGT1s, LDGT2s and HDGVs.

4. One of the two ATP designs: centralized or decentralized.

5. Frequency of the anti-tampering inspections: annual or biennial.

6. Percent compliance rate.

7. The extent of the inspections (i.e., types of components inspected). The eight components that may be included in an ATP are: air pump, catalyst, fuel inlet restrictor, tailpipe lead detection, EGR, evaporative control system (canister, purge lines, etc.), PCV, and fuel cap.

These ATP credits are not tabulated in this document, but are built-in to the MOBILE4 computer program.

E. FUEL VOLATILITY CONTROL PROGRAM

Emission reduction credits can be taken if a fuel volatility control program is in effect in the area for which emission factors are being calculated.

The emission reduction credits attributable to a fuel volatility control program vary according to the following three parameters:

1. The base (pre-control) fuel volatility level.

2. The controlled fuel volatility level.

3. The calendar year in which the fuel volatility control program is implemented.

F. STAGE II VAPOR RECOVERY SYSTEM CONTROL PROGRAM

Refueling emission reduction credits can be taken if a Stage II vapor recovery system control program is in effect in the area for which emission factors are being calculated.

The refueling emission reduction credits attributable to a Stage II vapor recovery system control program vary according to the following four parameters:

1. The calendar year in which the Stage II vapor recovery system control program is implemented.

2. Length of phase-in period (from one to three years) allowed for all stations to complete installation.

3. Percent efficiency for LDGVs and LDGTs.

4. Percent efficiency for HDGVs.

G. ONBOARD VAPOR RECOVERY SYSTEM CONTROL PROGRAM

Emission reduction credits can be taken if a nationwide onboard vapor recovery system control program is in effect.

The emission reduction credits attributable to a nationwide onboard vapor recovery system control program vary according to the following parameters:

1. The model year in which the onboard vapor recovery system control program is implemented.

2. The four vehicle types covered are: LDGVs, LDGT1s, LDGT2s, and HDGVs.

H. REACTIVE VERSUS NONREACTIVE HYDROCARBON EMISSIONS

Available scientific evidence indicates that methane and a few other nonreactive organic compounds do not contribute significantly to ozone formations. EPA's Volatile Organic Compound policy, published in the Federal Register on July 8, 1977, allows a limited number of compounds, including methane, to be excluded from control actions. States have been advised that they should exclude these compounds from baseline emission inventories that are to be used for control strategy development for ozone.

Although motor vehicles are regulated directly by the Clean Air Act on a total hydrocarbon basis (rather than on a "reactive" hydrocarbon basis), it is appropriate, when estimating ozone levels, to consider only those motor vehicle emissions which will react to form ozone. However, consideration must be given to the format of any associated stationary source emission inventory so that mobile source and stationary source emission inventories are consistent in their exclusion.

For MOBILE4, as in MOBILE3, nonmethane emissions are estimated by subtracting methane offsets from the total hydrocarbon (THC) emissions. These offsets are constant. While the MOBILE4 computer program can calculate either total or nonmethane hydrocarbon (NMHC) emissions, all HC emission factors presented in this document are nonmethane hydrocarbons.

EPA's Office of Air Quality Planning and Standards has determined that volatile organic compounds (VOCs), which consist of any organic compounds that participate in atmospheric photochemical reactions, include all organic compounds except for those listed below:

methane
ethane
methyl chloroform
methylene chloride
trifluoromethane (FC-23)
trichlorofluoromethane (CFC-11)
dichlorodifluoromethane (CFC-22)
trichlorotrifluoroethane (CFC-113)
dichlorotetrafluoroethane (CFC-114)
chloropentafluoroethane (CFC-115)
dichlorotrifluoroethane (HCFC-123)
tetrafluoroethane (HFC-134a)
dichlorofluoroethane (HCFC-141b)
chlorodifluoroethane (HCFC-142b)

Of these compounds, only methane and ethane are represented in highway mobile source exhaust and evaporative hydrocarbon emissions. The emission factors presented in this supplement, whether for "total" or "non-methane" hydrocarbons, do <u>not</u> exclude ethane. Formaldehyde, which is a VOC under the definition given above, is <u>not</u> included in either the total or non-methane hydrocarbon emission factors presented in this supplement. Future revisions to the mobile source emission factor model and the AP-42 emission factor compilation document will account for these differences (i.e., after future revisions, ethane emissions will be excluded from the "non-methane" hydrocarbon emission factors and aldehyde emissions will be included in the "total" and "non-methane" hydrocarbon emission factors).

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Chapter 1

LIGHT-DUTY GASOLINE-POWERED VEHICLES

1.A INTRODUCTION

Because of their widespread use, light-duty gasoline-powered vehicles (LDGVs), or automobiles, are responsible for a large share of air pollutant emissions in many areas of the United States. A LDGV is defined to be any gasoline-fueled vehicle designated primarily for transportation of persons and having a capacity of 12 or less persons. Substantial research effort has been expended to accurately characterize emissions from these vehicles. EPA's ongoing program to collect in-use vehicle emissions data was instituted a number of years ago in order to estimate their emission levels.

In addition to the methodologies presented for calculating the basic exhaust emission levels for HC, CO, and NOx, data are referenced in this chapter for crankcase emissions, evaporative hydrocarbon emissions from vehicles that are parked (hot soak and diurnal), from vehicles that are in operation (running loss), and from vehicles that are being refueled, and emissions in the idle mode. Information is also given regarding the emission correction factors and travel weighting fractions.

All tables referenced in Chapters 1-8 are found in Appendix H. The first half of Appendix H applies to the low altitude region, the latter half to the high altitude region.

1.A.1 Test Procedure

LDGV exhaust and evaporative emissions testing is performed according to procedures stipulated in the Federal Register (42 FR 32954, June 28, 1977) and the Code of Federal Regulations (40 CFR Part 86, Subpart B, July 1, 1989). The basic test conditions under which LDGVs are tested are as follows:

1. Ambient temperature range is between 68° and 86°F.

2. Absolute humidity is adjusted to 75 grains of water per pound of dry air.

3. Average speed is 19.6 mph, including 18% idle operation.

4. Average percent of vehicle-miles-traveled (VMT) is 20.6% in cold start operation, 27.3% in hot start operation, and 52.1% in stabilized operation.

5. Average trip length is 7.5 miles.

6. Fuel volatility is 9.0 psi RVP.

Additional elements regarding the test procedure that are reflected in the emission estimates are as follows:

1. Air conditioning is not in use.

2. Car contains driver and passenger, with no additional passengers, luggage, etc.

3. Car is not pulling a trailer.

The test sequence for LDGVs is summarized below:

1. Determine the weight of the vehicle.

2. Determine the road-load (assuming level road, no curves, no wind), which is a function of weight and frontal area.

3. Precondition the vehicle (i.e., vehicle is briefly driven).

4. Place the vehicle in an ambient temperature environment between 68° and 86°F, with the engine off for at least 12 hours.

5. The fuel tank is drained and refilled to 40% full with the specified test fuel.

6. Move the vehicle (with the engine shut off) into the evaporative emission enclosure. Close and seal enclosure doors. Start diurnal heat build for one hour so that the fuel temperatures rise from 60 to 84°F. This is the diurnal breathing loss test.

7. Push the vehicle onto a dynamometer. Start the engine and begin collecting exhaust emissions.

8. Emissions for the first 505 seconds are collected for test segment #1. The mileage driven is 3.59 miles with an average speed of 26 mph. This is the cold start portion of the test.

9. Test segment #2 collects emissions for the next 870 seconds. The engine is not turned off between Steps 8 and 9. The mileage driven is 3.91 miles and the average speed is 16 mph. This is the stabilized portion of the test.

10. The engine is turned off, and remains off for 10 minutes.

11. The car is re-started. The first 505 seconds are re-run and emissions are collected for test segment #3. This is the hot start portion of the test.

12. The grams of each pollutant are determined for each test segment. NOx emissions are adjusted for humidity. The exhaust emission levels, in grams per mile, are computed.

13. Place the vehicle inside the evaporative emission enclosure immediately after the test segment #3. Close and seal enclosure doors for 60 minutes. This is the hot soak test.

Running loss testing is performed by operating the vehicle over specified driving cycles on a dynamometer that is installed inside of an evaporative emissions enclosure. The test procedure, which has not been formally promulgated, is outlined below. Tests are conducted at different temperatures and using different RVP fuels to permit estimating running loss emission factors at different speeds and temperatures.

1. Drain and refill fuel tank to 40 percent full with Indolene test fuel (9.0 psi RVP).

2. Perform the following preconditioning sequence at 95°F: Drive one LA-4 cycle, one hour soak, drive another LA-4 cycle, one hour soak.

3. Drain vehicle fuel tank and refill to 40 percent full using the desired test fuel.

4. Operate the vehicle over another LA-4 driving cycle.

5. Vehicle soak for 12 to 30 hours at the desired test temperature.

6. Push the vehicle onto the dynamometer in the evaporative emission enclosure.

7. Drive the vehicle continuously for approximately one hour over the desired test cycle. (Test cycles used for running loss testing are the New York City Cycle and the LA-4. Running loss testing over the Highway Fuel Economy Test cycle was discontinued when it was observed that running loss emissions over that cycle are nearly nonexistent in almost all cases.) Six repetitions of the NYCC, or three repetitions of the LA-4, are required.

8. Repeat steps 3 thru 7 above as required to achieve a valid test at each desired combination of temperature and fuel volatility.

1.A.2 General Emissions Calculation Equations

The following generalized equations are used to calculate the LDGV emission factors (subscripts dropped from equations for clarity):

$$COMPHC = SUM \{TF * [(BEF * SALHCF * RVPCF) + REFUEL + RNGLOS + CCEVRT]\}$$

$$COMPCO = SUM [TF * (BEF * SALHCF * RVPCF)]$$

$$COMPNO = SUM [TF * (BEF * SALHCF)]$$

where:

$$BEF_{HC} = \{[(BER * OMTCF) - OFFMTH] * PCLEFT\} + OMTTAM$$

$$BEF_{CO} = (BER * OMTCF * PCLEFT) + OFFCO + OMTTAM$$

$$BEF_{NO} = (BER * OMTCF) + OMTTAM$$

$$SALHCF_{HC,CO} = SCF * ACCF * XLCF * TWCF$$

$$SALHCF_{NO} = SCF * ACCF * XLCF * TWCF * HHH$$

And also where:

COMPHCn = The composite HC emission factors in g/mile, on January 1 of calendar year n.

SUMi = The summation over twenty model years i, from n-19 to n, where n is the calendar year.

TFin = The fraction of the total miles driven, for model year i, on January 1 of calendar year n.

BEFin = The basic exhaust emission rates in g/mi, for model year i, in calendar year n.

SALHCFips = The composite speed, air conditioning, extra load, and trailer towing correction factor, for model year i, pollutant p, and speed s.

RVPCF = The fuel volatility (as measured by Reid vapor pressure (RVP)) correction factor for exhaust emissions, for HC and CO emissions from model year 1971-79 vehicles.

REFUELi = The refueling HC emission factors in g/mi, for model year i.

RNGLOSi = The running loss HC emission factors in g/mi, for model year i.

CCEVRTi = The crankcase and g/mi evaporative HC emission factors, for model year i.

COMPCOn = The exhaust CO emission factors in g/mile, on January 1 of calendar year n.

COMPNOn = The exhaust NOx emission factors in g/mile, on January 1 of calendar year n.

BERipn = The basic nontampered exhaust emission rates in g/mile, for model year i, pollutant p, on January 1 of calendar year n.

OMTCFipt = The composite operating mode and temperature (and fuel volatility, if temperature is > 40°F and model year is 1980 or later) correction factor, for model year i, pollutant p, at temperature t.

OFFMTHi = The methane offsets in g/mi, for model year i, if nonmethane HC emissions are being estimated.

PCLEFTipn = The exhaust emission benefit of an operating inspection and maintenance (I/M) program for model year i, pollutant p, in calendar year n.

OMTTAMipn = The emission offsets in g/mi corrected for temperature and operating mode, for model year i, pollutant p, in calendar year n, due to all types of tampering.

OFFCOit = The bag 1 CO offsets in g/mi corrected for operating mode, for model year i, at temperature t.

SCFips = The speed correction factor, for model year i, pollutant p, at speed s.

ACCFi = The air conditioning correction factor for model year i.

XLCFi = The extra load correction factor for model year i.

TWCFi = The trailer towing correction factor for model year i.

HHH = The humidity correction factor (for NOx emissions only).

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The general equations for estimating hot stabilized idle emissions are as follows:

IEF = SUM [TF * (IER - IDLMTH + TAMPIDL)]

where:

IEFpn = The idle emission factors in g/hour, for pollutant p, in calendar year n.

IERipn = The idle emission rates in g/hour, for model year i, pollutant p, in calendar year n.

IDLMTHi = The idle methane offsets in g/hour, for model year i, applicable only to HC emissions, if nonmethane HC emissions are being estimated.

TAMPIDLinp = The idle emission rates in g/hour, for model year i, pollutant p, in calendar year n, due to tampering.

Note that idle emissions are not corrected for temperature or operating mode.

1.B EMISSIONS

This section discusses the emission estimates for the LDGVs: basic exhaust emission rates, emission rates including tampering, crankcase emissions, other evaporative HC emission components, January 1 emission levels, and idle emission rates. The emission standards are given in Section A.1.1 of Appendix A. The emissions reflect vehicles which have received typical in-use maintenance. Further, the vehicles are not involved in an I/M or anti-tampering program.

1.B.1 Basic Exhaust Emission Rates

The basic exhaust emission rates for LDGVs were derived from data on in-use vehicles, tested with fuel volatility at the certification level (9.0 psi RVP), with no observed tampering. The assumption in the derivation of the basic exhaust emission rates is that emission levels change linearly as vehicles accumulate mileage. The emission rates are dependent upon three variables:

1. zero mile emission levels,

2. emission deterioration rates for vehicles with 50,000 miles or less accumulated mileage, and,

3. emission deterioration rates for vehicles with more than 50,000 accumulated miles.

The zero-mile emission levels are the average grams of pollutants emitted by the vehicles at zero miles. The two emission deterioration rates adjust the zero mile levels as vehicles accumulate mileage. Note that for pre-1981 model year HC and CO emissions and all model year NOx emissions, the same emission deterioration rates are used at all mileages.

The basic exhaust emission levels are calculated from a two-step linear function:

$$BERipn = ZMLip + DR1ip * Min \qquad \text{if } M \leq 50{,}000 \text{ miles}$$

$$= ZMLip + DR1ip * 5.0 + DR2ip * (Min - 5.0) \qquad \text{if } M > 50{,}000 \text{ miles}$$

where the lower case letters are subscripts and

BERipn = The nontampered basic exhaust emission levels in g/mile, for model year i and pollutant p, on January 1 of calendar year n.

ZMLip = The zero mile emission levels in g/mile, for model year i and pollutant p.

DR1ip = The emission deterioration rates for vehicles with less than or equal to 50,000 miles, in (g/mile)/10,000 miles, for model year i and pollutant p.

DR2ip = The emission deterioration rates for vehicles with more than 50,000 miles, in (g/mile)/10,000 miles, for model year i and pollutant p. Note that for pre-1981 model year HC and CO emissions, and all model year NOx emissions, DR2 equals DR1.

Min = The model year i cumulative mileage divided by 10,000 miles, on January 1 of calendar year n.

The basic nontampered exhaust emission rates are presented in Appendix H (Table 1.1.1A) for the different LDGV model year groups and pollutants.

1.B.2 Exhaust Emission Rates With Tampering

Tampering offsets in g/mi are added to the basic exhaust emission rates so that the overall fleet emissions reflect national average rates of tampering. (Locality-specific tampering rates can be provided as part of the input stream by the MOBILE4 user having such information.) The methodologies used to estimate the tampering rates and the emission offsets from various types of vehicle tampering are described in Appendix E.

Tampering effects are first estimated for each type of tampering and operating mode (cold start, stabilized, and hot start), as described in the following equation:

TAMPOFFipmn = TAMPipm * PEQUIPim * RATEimn

where:

TAMPOFFipmn = The emission offsets due to tampering in g/mi, for model year i, pollutant p, tampering type m, in calendar year n.

TAMPipm = The increase in emissions from tampered vehicles in g/mi, for model year i, pollutant p, and tampering type m.

PEQUIPim = The percent of the model year i vehicles that are equipped with item m that can be tampered with.

RATEimn = The percent of model year i vehicles with equipment m that has been tampered with in calendar year n.

The emission offsets of each type of tampering are then combined to form overall tampering offsets for cold start, stabilized, and hot start operating modes. They are then corrected for temperature, and combined by the following equation:

OMTTAMipn = (TAMPOFFipn1 * CS * TCF1) + (TAMPOFFipn2 * ST * TCF2) + (TAMPOFFipn3 * HS * TCF3)

where:

OMTTAMipn = The composite tampering offsets in g/mi, for model year i, pollutant p, in calendar year n.

TAMPOFFipn = The tampering offsets in g/mi, for model year i, pollutant p, in calendar year n, for each of the operating modes (cold start, stabilized, hot start).

CS = Percent of VMT accumulated in cold start mode.

ST = Percent of VMT accumulated in stabilized mode.

HS = Percent of VMT accumulated in hot start mode.

TCF = Temperature correction factor (or temperature and fuel volatility correction factor, depending on model year group) for each of the operating modes.

The exhaust emission rates including tampering in g/mi are presented in Appendix H, Table 1.1.1B, for the different LDGV model year groups and pollutants at different mileage intervals.

1.B.3 Crankcase and Evaporative HC Emission Levels

In addition to the basic exhaust HC emission levels and tampering offsets, five evaporative HC emission components are also calculated by MOBILE4:

1. Crankcase HC emissions are evaporative emissions coming from the crankcase when the engine is running.

2. Hot soak losses are produced as fuel evaporates from either the carburetor system (carbureted vehicles) or the fuel tank (fuel-injected vehicles) at the end of a trip.

3. Increases in ambient temperature result in expansion of the air-fuel mixture in a partially filled fuel tank and the generation of additional fuel vapor. As a result, diurnal emissions are expelled into the atmosphere.

4. Running loss emissions are evaporative emissions generated when the vehicle is operating.

5. Refueling emissions are evaporative emissions resulting from either displacement of gasoline vapor from the vehicle fuel tank or spillage of fuel when the vehicle is being refueled.

Note that the first three emission components (crankcase, hot soak, and diurnal) are sometimes called "crankcase and g/mi evaporative HC emissions," a terminology carried over from MOBILE2/MOBILE3. The last two emission components are new additions in MOBILE4.

The evaporative emissions are calculated according to the following three equations:

$$CCEVRT = [(HS + TAMPHS) * TPD + (DI + TAMPDI)] / MPD + (CC + TAMPCC)$$

$$RNGLOS = RULOSS + TAMPRL$$

$$REFUEL = (DISP + SPILL) / ROADFE$$

where:

CCEVRTi = The sum of crankcase and g/mi evaporative HC emission factors, for model year i.

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HStki	=	The hot soak emission rates in g/trip, corrected for temperature t and fuel of k psi RVP, for model year i.
TAMPHSkin	=	The hot soak excess emission rates in g/trip, corrected for k psi RVP fuel volatility, model year i, in calendar year n due to tampering.
TPDj	=	The trips per day values for age j vehicles.
DItki	=	The diurnal emission rates in grams, corrected for temperature t, k psi RVP fuel volatility, and model year i.
TAMPDItkin	=	The diurnal excess emission rates in grams, corrected for temperature t, k psi RVP fuel volatility, model year i, in calendar year n due to tampering.
MPDj	=	The miles per day values for age j vehicles.
CCi	=	Crankcase emissions in g/mi, for model year i.
TAMPCCin	=	The crankcase excess emissions in g/mi, for model year i, in calendar year n due to PCV tampering.
RNGLOSi	=	The running loss HC emission factors in g/mi, for model year i.
RULOSStki	=	The running loss emission rates in g/mi, corrected for temperature t, k psi RVP fuel volatility, and model year i.
TAMPRLtkin	=	The running loss excess emission rates in g/mi, corrected for temperature t, k psi RVP fuel volatility, model year i, in calendar year n due to tampering.
REFUELi	=	The refueling emission factors in g/mi, for model year i.
DISPk	=	The displacement refueling losses in g/gallon, corrected for k psi RVP fuel volatility.
SPILL	=	An average spillage rate in g/gallon.
ROADFEi	=	Road fuel economy, in gallons/mi, for model year i vehicles.

Except for the crankcase and refueling HC emissions, all other evaporative HC emission components are modeled as direct functions of ambient temperature and fuel volatility. (Refueling emissions are adjusted in MOBILE4 on the basis of the specified ASTM fuel volatility class, which serves as a surrogate variable for the effects of both ambient temperature and fuel volatility on these emissions.) In MOBILE4, it is assumed that there are no hot soak, diurnal, running loss, or refueling emissions when the temperature is less than or equal to 40°F. Further, except for crankcase and refueling emissions, these evaporative HC emissions, as can be seen from the above equations, are corrected for fuel volatility and temperature.

Under FTP conditions, the diurnal emissions are measured during a heat rise from 60° to 84°F over a one hour period. The hot soak emissions are measured immediately at the end of the hot start (test segment #3) portion of the exhaust emissions testing, with the ambient temperature about 82°F. The fuel tank level is at 40%, with fuel at the designated fuel volatility levels.

The LDGV crankcase, hot soak, and diurnal emissions at both 9.0 and 11.5 psi RVP fuels from nontampered vehicles tested under FTP conditions are summarized in Table 1.1.2A of Appendix H. The combined crankcase and g/mi evaporative HC emission tampering offsets at various mileage intervals are presented in Table 1.1.2B. The nontampered running loss emissions by model year group, fuel volatility level, and ambient temperature are summarized in Table 1.1.2C. The refueling emissions by model year are given in Table 1.1.2D.

1.B.4 January 1 Emission Levels

The emission levels for 20 model years on January 1 of the selected 24 calendar years are given in Tables 1.1.11A through 1.1.11C of Appendix H for HC, CO, and NOx, respectively. The HC emission levels reflect nonmethane HC emissions, and include crankcase and four other evaporative HC emission components (hot soak, diurnal, running loss, and refueling emissions). Also, all emission rates include tampering.

1.B.5 Hot Stabilized Idle Emission Rates

Estimates of emissions from the automotive fleet during a vehicle's idle operating mode have become more of a concern in transportation control plans, environmental impact statements, and state implementation plans. Examples of extended idle time are waits at shopping centers, airports, sport complexes, and with business drive-in window services. The emission estimates presented in this section reflect engines operating in a hot stabilized condition.

The idle emission rates are expressed in units of grams per hour, as opposed to the exhaust and other emission rates which are in units of grams per mile. For NOx emissions and pre-1977 model year HC and CO emissions, the LDGVs idle emission levels are calculated from the zero mile idle emission levels and idle emission deterioration rates. The HC and CO idle emission rates for 1977 and later model year LDGVs are calculated from the hot portions (hot stabilized and hot start) of the FTP exhaust emissions. The g/hr idle emission levels by model year and pollutant at three mileage points (zero, 50,000, and 100,000 miles), are given in Table 1.1.3 of Appendix H.

1.C TRAVEL WEIGHTING FRACTIONS

The LDGV travel weighting fractions are the individual model year proportions of the total LDGV VMT. To generate the travel weighting fractions, three distributions are required:

1. annual mileage accumulation rate distribution,
2. registration distribution, and,
3. diesel sales distribution.

The travel weighting fractions in this document reflect a January 1 evaluation date. For the LDGVs, the model year is assumed to begin sales on the October 1 preceding the corresponding calendar year. Further, it is assumed that the vehicles are sold and accumulate mileage according to a uniform distribution. These assumptions permit the estimation of the January 1 fleet mileage accumulation rate distribution and the January 1 registration distribution from July 1 information. An example of the travel weighting fraction calculation based on calendar year of 1988 is given in Appendix H (Table 1.1.5, using the information provided in Table 1.1.4A).

1.C.1 Annual Mileage Accumulation Rate Distribution

A given vehicle is assumed to travel according to the annual mileage accumulation distribution given in the third column of Table 1.1.4A. For example, at a uniform rate, the vehicle travels 13,118 miles in its first year, 12,408 miles in its second year, and 4,562 miles in its 20th year.

The January 1 mileage accumulation rate distribution is derived from the annual mileage accumulation rate distribution for individual vehicles. This derivation averages out the effects of purchase date. The derivation is described in Appendix D, and the resulting distribution is given in the fifth column of Table 1.1.4A.

1.C.2 Registration Distribution

The second column of Table 1.1.4A also presents the estimated LDGV registration distribution fractions. These fractions are the individual model year proportions of the entire LDV fleet (both gasoline and diesel powered vehicles combined). The registration distribution is based on July 1 information and is transformed to January 1 figures according to the procedure described in Appendix D. The January 1 LDGV fleet registration distribution is presented in the fourth column of Table 1.1.4A.

1.C.3 Diesel Sales Distribution

The diesel sales distribution is used in the travel weighting fractions to account for the influx of diesels. The diesel sales fractions for the light-duty vehicles (LDDVs) are given in Table 1.5.4B. For example, prior to 1978, diesels are considered to be an insignificant proportion of the LDV fleet (less than 0.5 percent). The distribution is anticipated to stabilize in model year 1995, with about 95 percent of the LDV sales being gasoline-powered vehicles.

1.C.4 Trips per Day and Miles per Day Estimates

Two other parameters related to vehicle travels are the trips per day and miles per day estimates. These estimates are used to calculate g/mi evaporative HC emissions from g/trip hot soak and grams diurnal emission rates. Both of these parameters are functions of vehicle age. The miles per day estimates are the January 1 mileage accumulation rates (column D of Table 1.1.5) divided by 365 days.

Trips per day and miles per day distributions by vehicle age are given in Table 1.1.4C.

1.D EMISSION CORRECTION FACTORS

The LDGV basic exhaust emission levels are based on test results under the standardized conditions defined in Section 1.A.1. However, the basic exhaust emission levels are affected by ambient and vehicle usage conditions which differ from the prescribed test procedure. The conditions under which emissions are known to vary are the average speed, fuel volatility level, ambient temperature, fraction of VMT in cold and hot start operating modes, use of air conditioning, carrying of an extra load, trailer towing, and humidity. Emission correction factors are available to compensate for variations in these conditions.

1.D.1 Speed Correction Factor

The test procedure used for collecting the basic exhaust emissions is a driving cycle with an average speed of 19.6 mph. For situations where the average speed of the vehicle deviates from this value, a speed correction factor is applied.

The speed correction factor is symbolized as SCFipsxw, where the lower case letters are subscripts and,

SCFipsxw = The speed correction factor for model year i, pollutant p, at average speed s. This is normalized to the speed associated with a cold start mode VMT fraction x and a hot start mode VMT fraction w.

The user is cautioned that this correction factor is only valid for speeds in the 2.5 through 55 mph range, since the regression equations were based on speed data in that range. Extrapolations to speeds beyond this range should not be made.

The coefficients for the speed correction factors, by model year and pollutant, are given in Tables 1.1.6A for pre-1977 model years, and 1.1.6B for 1977 and later model years.

1.D.2 Fuel Volatility Correction Factor

The volatility, as measured by Reid Vapor Pressure (RVP), of commercially available fuel for in-use vehicles had been increasing since 1970, from the level used for certification (9.0 psi) to about 11.5 psi in most of the country during the summer season in the mid to late 1980s. EPA's Emission Factor data collected at three fuel volatility levels (9.0, 10.4, and 11.5 psi RVP) showed that high volatility fuels produce higher evaporative and exhaust emissions. For evaporative HC emissions, fuel volatility is one of the parameters used in the model (as discussed in Section 1.B.3). For exhaust emissions at fuel volatility levels other than 9.0 psi RVP and when the ambient temperature is greater than 40°F, an RVP correction factor is used for 1971 and later model year vehicles.

There are three fuel volatility correction factor models used for exhaust emissions for temperatures above 40°F in MOBILE4:

1. For model years 1971-79, simple linear correction factors are used and are applied to exhaust HC and CO emissions only. The equations are:

   $RVPCF_{HC} = (0.56222 + 0.012512 * RVP) / 0.67483$

   $RVPCF_{CO} = (7.1656 + 0.33413 * RVP) / 10.17277$

where:

RVPCFk = The fuel volatility correction factor for k psi fuel.

RVP = The fuel volatility level in k psi RVP,

and the denominators are the value of the respective numerators evaluated at 9.0 psi RVP. These correction factors apply to the composite emission levels.

2. For 1980 and later model years and at temperatures greater than 75°F, the fuel volatility correction factor is combined with the high temperature correction factor, to be discussed in Section 1.D.4.

3. For 1980 and later model years at temperatures greater than 40°F but less than or equal to 75°F, two steps of correction are required. First, a RVP correction at 75°F ($RVPCF_{k,75}$) is determined from the combined fuel volatility and high temperature correction factor model (from Section 1.D.4). Then, the following equation is used:

$$RVPCFkt = 1.0 + \{(RVPCF_{k,75} - 1.0) * [(T - 40.0) / 35.0]\}$$

where:

RVPCFkt = The fuel volatility and high temperature correction factor, for k psi RVP fuel at temperature t (between 40 and 75°F).

$RVPCF_{k,75}$ = The fuel volatility and high temperature correction factor, for k psi RVP fuel at 75°F.

T = The ambient temperature in degrees Fahrenheit, which is between 40° and 75°F.

For 1980 and later model year vehicles, there are separate correction factors for fuel volatility for each test segment (bags 1, 2, 3). The fuel volatility correction factors for 1980 and later model year vehicles are also dependent on the fuel delivery system (carbureted, throttle-body fuel injection (TBI), or multi-point fuel injection (PFI)).

1.D.3 Low Temperature Correction Factor

The LDGV emission test procedure requires an ambient temperature between 68° and 86°F. A reference temperature of 75°F is used in MOBILE4. For temperatures lower than 75°F, a low temperature correction factor is needed. There are two low temperature correction factor models in MOBILE4:

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1. The multiplicative model is applicable to all pollutants and test segments, except for the 1980 and later model years bag 1 (cold start) CO emissions. The equational form is as follows:

$$TCFipbt = EXP\ [TCipb * (T - 75.0)]$$

where the lower case letters are subscripts and

TCFipbt = The low temperature correction factor for model year i, pollutant p, test segment b, at ambient temperature t (< 75°F).

EXP = The exponential function.

TCipb = The temperature correction factor coefficient for model year i, pollutant p, test segment b.

T = Ambient temperature in degrees Fahrenheit.

2. An additive (or offset) model is used for 1980 and later model years bag 1 CO emissions:

$$OFFCOit = TCi * (T - 75.0)$$

where:

OFFCOit = The bag 1 CO offset in g/mi, for model year i, at temperature t (< 75°F).

TCi = The bag 1 CO temperature correction factor coefficient for model year i.

The low temperature correction factor coefficients are presented in Table 1.1.7A.

1.D.4 High Temperature Correction Factor

For temperatures higher than 75°F, a correction factor is also needed to adjust the emission levels. A multiplicative model is used for each test segment and pollutant. There are two high temperature correction factor models used in MOBILE4:

1. For pre-1980 model years, the high temperature correction factor model is a function of temperature, similar to the low temperature correction factors described in the previous section.

2. For 1980 and later model years, a combined temperature and fuel volatility correction model is used:

$$TRCFipbkt = EXP\ [RCipb * (RVP - 9.0) + TCipb * (T - 75.0) + TRCipb * (RVP - 9.0) * (T - 75.0)]$$

where the lower case letters are subscripts and

TRCFipbkt	=	The combined high temperature and fuel volatility correction factor, for model year i, pollutant p, test segment b, k psi RVP fuel, at ambient temperature t.
EXP	=	The exponential function.
RCipb	=	The fuel volatility correction factor coefficient, for model year i, pollutant p, test segment b.
RVP	=	The fuel volatility level in k psi RVP.
TCipb	=	The high temperature correction factor coefficient, for model year i, pollutant p, test segment b.
T	=	Ambient temperature in degrees Fahrenheit.
TRCipb	=	The combined high temperature and fuel volatility correction factor coefficient, for model year i, pollutant p, test segment b.

The high temperature correction factor coefficients are presented in Appendix H, Table 1.1.7B.

1.D.5 Temperature/Operating-Mode Correction Factor

For all conditions except where the CO offset model is in effect, a single emission correction factor called OMTCF adjusts for temperature (and fuel volatility) and hot stabilized/cold start operating-mode conditions that differ from the basic test procedure. Vehicles usually emit more emissions in a cold start mode than in a stabilized or a hot start mode. Also, vehicles emit more emissions after an extended engine off period than vehicles that have not set long enough to be in the cold start mode. As a result, the operating mode is a necessary element of this correction factor.

An integral part of the operating mode portion of OMTCF are the normalized bag fractions. The normalized bag fractions adjust OMTCF for emissions attributable to each operating mode. These fractions for LDGVs are given in Table 1.1.7C.

The OMTCF correction factor is defined as follows:

$$OMTCFiptwxn = [(TERM1 + TERM2 + TERM3) / DENOM]$$

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where:

$$TERM1 = W * TCFip1t * (Bip1 + DR1ip1 * Min) \quad \text{if } M \leq 50{,}000 \text{ miles}$$

$$= W * TCFip1t * [Bip1 + DR1ip1 * 5.0 + DR2ip1 * (Min-5.0)] \quad \text{if } M > 50{,}000 \text{ miles}$$

$$TERM2 = (1.0-W-X) * TCFip2t * (Bip2 + DR1ip2 * Min) \quad \text{if } M \leq 50{,}000 \text{ miles}$$

$$= (1.0-W-X) * TCFip2t * [Bip2 + DR1ip2 * 5.0 + DR2ip2 * (Min-5.0)] \quad \text{if } M > 50{,}000 \text{ miles}$$

$$TERM3 = X * TCFip3t * (Bip3 + DR1ip3 * Min) \quad \text{if } M \leq 50{,}000 \text{ miles}$$

$$= X * TCFip3t * [Bip3 + DR1ip3 * 5.0 + DR2ip3 * (Min-5.0)] \quad \text{if } M > 50{,}000 \text{ miles}$$

$$DENOM = Bip0 + DR1ip0 * Min \quad \text{if } M \leq 50{,}000 \text{ miles}$$

$$= Bip0 + DR1ip0 * 5.0 + DR2ip0 * (Min-5.0) \quad \text{if } M > 50{,}000 \text{ miles}$$

And also where:

OMTCFiptwxn = The temperature operating-mode emission correction factor, for model year i, pollutant p, ambient temperature t, fraction of VMT in cold start operating mode w, and fraction of VMT in hot start operating mode x, on January 1 of calendar year n.

Bipb = The normalized bag fraction intercept coefficient, for model year i, pollutant p, and test segment b (test segment 0 is the entire basic test procedure).

DR1ipb = The normalized bag fraction slope coefficient, for model year i, pollutant p, and test segment b (test segment 0 is the entire basic test procedure), for vehicles with less than or equal to 50,000 miles.

DR2ipb = The normalized bag fraction slope coefficient, for model year i, pollutant p, and test segment b (test segment 0 is the entire basic test procedure), for vehicles with greater than 50,000 miles. Note that for pre-1981 model year HC and CO emissions, and all model year NOx emissions, DR2ipb equals DR1ipb.

Min = The fleet cumulative mileage divided by 10,000 miles, for model year i on January 1 of calendar year n.

W = The fraction of VMT traveled in the cold start mode.

X = The fraction of VMT traveled in the hot start mode.

TCFipbt = The emission temperature correction factor, for model year i, pollutant p, test segment b, and at ambient temperature t.

For 1980 and later model years, when the temperature is less than 75°F and when the percent cold start is greater than zero, TCFip1t is taken out of TERM1. Then OMTCF reflects the temperature and operating mode correction factors for the stabilized and hot start operating modes, but only the operating mode correction factor for the cold start mode. The emissions of the cold start mode are corrected for temperature with the CO offset discussed in Section 1.D.3. This offset is multiplied by the percent of VMT in the cold start (W), correct for fuel volatility if temperature is over 40°F, and added to the basic emission rate, as presented in Section 1.A.2.

1.D.6 Air Conditioning Correction Factor

The LDGV emissions can be affected by the use of air conditioning. The air conditioning correction factor coefficients are based on data from vehicles tested at several different temperatures with the air conditioner on. These correction factors are given in Table 1.1.8A. The general correction factor equation is as follows:

ACCFipt = U * Vi [Aip + Bip * (T - 75.0) - 1.0] + 1.0

U = (DI - DILO) / (DIHI - DILO)

DI = (DB + WB) * 0.4 + 15.0

where the lower case letters are subscripts and

ACCFipt = The air conditioning correction factor for model year i, pollutant p, at ambient temperature t.

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U	=	The fraction of air conditioner-equipped vehicles that have the air conditioner in use, $0.0 \leq U \leq 1.0$.
Vi	=	Fractions of the vehicles equipped with an air conditioner, for model year i. These fractions are given in Table 1.1.8B.
Aip	=	The air conditioning correction factor intercept coefficient, for model year i and pollutant p.
Bip	=	The air conditioning correction factor slope coefficient, for model year i and pollutant p.
T	=	Ambient temperature in degrees Fahrenheit.
DI	=	A discomfort index.
DILO	=	The highest discomfort index where no air conditioners are in use (set to 70°F in MOBILE4).
DIHI	=	The lowest discomfort index where all the air conditioners are in use (set to 80°F in MOBILE4).
DB	=	The dry bulb temperature in degrees Fahrenheit.
WB	=	The wet bulb temperature in degrees Fahrenheit.

1.D.7 Extra Load Correction Factor

The basic exhaust emission rates are based on the "typical" vehicle weight with a driver and passenger, vehicle fuel, and other liquids. There are, however, situations in which vehicles are carrying significant extra weight due to additional passengers, luggage, etc. In these events, emissions are known to change.

To apply the vehicle extra load correction factor found in Table 1.1.8C to a specific situation, it is necessary for a user to have an estimate of the percentage of LDGV VMT accumulated with an additional 500 pounds. The correction factor for extra load is computed according to the following equation:

$$XLCFip = (XLCip - 1.0) * U + 1.0$$

where the lower case letters are subscripts and

XLCFip	=	The extra load correction factor, for model year i and pollutant p.

XLCip = The extra load correction factor coefficient, for model year i and pollutant p.

U = The fraction of LDGV VMT accumulated with an extra load, $0.0 \leq U \leq 1.0$.

1.D.8 Trailer Towing Correction Factor

As with the extra load correction factor, the trailer towing correction factor will adjust LDGV emissions for usage conditions which differ from the basic test procedure. It has been determined that towing a trailer affects a vehicle's emissions. As such, a correction factor is available to adjust LDGV emissions when a trailer is being towed. The correction factor coefficients given in Table 1.1.8D are valid for a trailer weight of 1000 pounds. This correction factor is computed by the following equation:

$$TTCFip = (TTCip - 1.0) * U + 1.0$$

where the lower case letters are subscripts and

TTCFip = The trailer towing correction factor, for model year i and pollutant p.

TTCip = The trailer towing correction factor coefficient, for model year i and pollutant p.

U = The fraction of LDGV VMT accumulated while towing a trailer, $0.0 \leq U \leq 1.0$.

1.D.9 NOx Humidity Correction Factor

The NOx emission factors are normalized to 75 grains of water per pound of dry air. In order to adjust NOx emissions to different humidity conditions, a multiplicative correction factor is available. The formula for the correction factor is given below, and is applicable for all model years:

$$HCF = 1.0 - 0.0038 * (H - 75.0)$$

where:

HCF = The NOx humidity correction factor.

H = Humidity level in grains of water per pound of dry air, $20.0 \leq H \leq 140.0$.

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Chapter 2

LIGHT-DUTY GASOLINE-POWERED TRUCKS I

2.A INTRODUCTION

This chapter presents the emission factors for light-duty gasoline-powered trucks (LDGT1s) with a gross vehicle weight (GVW) rating of 6,000 pounds or less. Although LDGT1s have a load carrying capability that exceeds that of passenger cars, they are often used for personal transportation and light hauling.

2.A.1 Test Procedure

The test procedure used for determining the LDGT1 basic exhaust emissions is almost identical to the LDGV test procedure. The only difference between the two test procedures is the road-load horsepower setting. The summary of the LDGV test procedure in Chapter 1 is also applicable for LDGT1s.

2.A.2 General Emissions Calculation Equations

The equations for LDGV emission calculations presented in Chapter 1 are also valid for the LDGT1s, although the emissions, travel weighting fractions, and emission correction factors for LDGT1s are different.

2.B EMISSIONS

This section discusses the LDGT1 emission estimates: basic exhaust emission rates, emission rates including tampering, crankcase emissions, other evaporative HC emission components, January 1 emission levels, and idle emission rates. The emission standards are given in Section A.1.2 of Appendix A. The emissions reflect trucks which have received typical in-use maintenance. Further, the trucks are not involved in an I/M or anti-tampering program.

The discussions of the different LDGV emissions in Chapter 1 are also valid for the LDGT1s, with minor differences noted wherever applicable.

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2.B.1 Basic Exhaust Emission Rates

The basic nontampered exhaust emission rates for LDGT1s are calculated from two variables:

1. zero mile emission level, and,

2. emission deterioration rate at all mileages.

The LDGT1 basic exhaust emission rates by model year group and pollutant are given in Table 1.2.1A.

2.B.2 Exhaust Emission Rates With Tampering

Emission offsets in g/mi due to tampering are added to the basic exhaust emission rates so that the fleet emission rates reflect national average rates of tampering. The exhaust emission rates including tampering are presented in Table 1.2.1B for the different LDGT1 model year groups and pollutants at different mileage intervals.

2.B.3 Crankcase and Evaporative HC Emission Levels

The LDGT1 crankcase, hot soak and diurnal emissions at both 9.0 and 11.5 psi fuels from nontampered vehicles tested under FTP conditions are presented in Table 1.2.2A. The combined crankcase and g/mi evaporative HC emission tampering offsets at various mileage intervals are presented in Table 1.2.2B. The nontampered running loss emissions by model year group, fuel volatility level, and ambient temperature are summarized in Table 1.2.2C. The refueling emissions by model year are given in Table 1.2.2D.

2.B.4 January 1 Emission Levels

The emission levels for 20 model years on January 1 of the selected 24 calendar years are given in Tables 1.2.11A through 1.2.11C for HC, CO, and NOx, respectively. The HC emission levels reflect non-methane HC emissions, and include crankcase and four other evaporative HC emission components. All emission rates include tampering effects.

2.B.5 Hot Stabilized Idle Emission Rates

The LDGT1 hot stabilized g/hr idle emission rates are given in Table 1.2.3.

2.C TRAVEL WEIGHTING FRACTIONS

The LDGT1 travel weighting fractions are the individual model year proportions of the total LDGT1 VMT. To generate the travel weighting fractions, three distributions are required:

1. annual mileage accumulation rate distribution,

2. registration distribution, and,

3. diesel sales distribution.

The first and second distributions are given in Table 1.2.4, and the third distribution is given in Table 1.6.4B. More detailed information is available in Chapter 1 on these distributions.

The travel weighting fractions, as in LDGVs, reflect a January 1 evaluation date. For the LDGT1s, the model year is assumed to begin sales on the October 1 preceding the corresponding calendar year. Further, it is assumed that the trucks are sold and accumulate mileage according to a uniform distribution. These assumptions permit the estimation of the January 1 fleet mileage accumulation rate distribution and the January 1 registration distribution from July 1 information. An example of the travel weighting fraction calculation based on calendar year of 1988 is given in Table 1.2.5.

The trips per day and miles per day estimates for LDGT1s are given in Table 1.2.4C.

2.D EMISSION CORRECTION FACTORS

The LDGT1 basic exhaust emission levels are based on test results under the standardized conditions defined in Chapter 1. However, the basic exhaust emission levels are affected by ambient and truck usage conditions which differ from the prescribed test procedure. The conditions under which emissions are known to vary are the average speed, fuel volatility level, ambient temperature, fraction of VMT in cold and hot start operating modes, use of air conditioning, carrying of an extra load, trailer towing, and humidity level. Emission correction factors are available to compensate for variations in these conditions.

The LDGT1s correction factors are based on the LDGV information. Therefore, the LDGT1 correction factors are those from the LDGVs, and the LDGV discussions in Chapter 1 are valid for the LDGT1s.

2.D.1 Speed Correction Factor

The test procedure used for collecting the basic exhaust emissions is a driving cycle with an average speed of 19.6 mph. For those situations where the average speed of the truck deviates from this value, a speed correction factor is applied. The LDGT1 speed correction factors are given in Tables 1.2.6A for pre-1979 model years, and 1.2.6B for 1979 and later model years.

2.D.2 Fuel Volatility Correction Factor

For LDGT1 exhaust emissions at fuel volatility levels other than 9.0 psi RVP and at ambient temperatures greater than 40°F, an RVP correction factor is also used. The RVP correction factors for LDGT1s are the same as those used for LDGVs (described in Chapter 1, Section 1.D.2).

2.D.3 Low Temperature Correction Factor

For those situations where the ambient temperature is lower than 75°F, a low temperature correction factor is applied. Table 1.2.7A presents these correction factors for the LDGT1s. The bag 1 CO offset model is applied to 1984 and later model year LDGT1s.

2.D.4 High Temperature Correction Factor

For those situations where the ambient temperature is equal to or higher than 75°F, a high temperature correction factor is applied. Table 1.2.7B presents these correction factors for the LDGT1s.

2.D.5 Temperature/Operating-Mode Emission Correction Factor

As in LDGVs, a single emission correction factor called OMTCF adjusts for temperature and operating-mode conditions that differ from the basic test procedure. As described in Chapter 1, OMTCF depends on normalized bag fractions. The LDGT1 normalized bag fractions are given in Table 1.2.7C.

2.D.6 Air Conditioning Correction Factor

The LDGT1 emissions can be significantly affected by the use of air conditioning. These correction factors are given in Table 1.2.8A. The fractions of LDGT1s equipped with an air conditioner, by model year, are given in Table 1.2.8B.

2.D.7 Extra Load Correction Factor

The basic exhaust emission rates are based on the "typical" truck weight with a driver and passenger, fuel, and other liquids. There are, however, situations in which trucks are carrying significant extra weight due to additional passengers, luggage, etc. In these events, emissions are known to change.

To apply the truck extra load correction factor found in Table 1.2.8C to a specific situation, it is necessary for a user to have an estimate of the percentage of LDGT1 VMT accumulated with an additional 500 pounds.

2.D.8 Trailer Towing Correction Factor

As with the extra load correction factor, the trailer towing correction factor will adjust LDGT1 emissions for usage conditions which differ from the basic test procedure. The correction factor coefficients given in Table 1.2.8D are valid for a trailer weight of 1,000 pounds.

2.D.9 NOx Humidity Correction Factor

The LDGT1 NOx humidity correction factor equation is the same as the equation used for LDGVs.

Chapter 3

LIGHT-DUTY GASOLINE-POWERED TRUCKS II

3.A INTRODUCTION

This chapter presents the emission factors for light-duty gasoline-fueled trucks (LDGT2s) with a gross vehicle weight (GVW) rating between 6,001 and 8,500 pounds. This vehicle type is required since these trucks were classified as heavy-duty vehicles through the 1978 model year. Beginning with the 1979 model year, these trucks have been considered light-duty trucks.

In general, every LDGV section and subsection discussion in Chapter 1 is valid for this chapter.

3.A.1 Test Procedure

The test procedure used for determining the LDGT2 basic exhaust emissions is almost identical to the LDGV test procedure. The only difference between the two test procedures is the road-load horsepower setting. The LDGV test procedure summarized in Chapter 1 is also valid for the LDGT2s.

3.A.2 General Emissions Calculation Equations

The equations for LDGV emission calculations presented in Chapter 1 are also valid for the LDGT2s, although the emissions, travel weighting fractions, and emission correction factors for LDGT2s are different.

3.B EMISSIONS

This section presents the LDGT2 emission estimates: basic exhaust emission rates, emission rates including tampering, crankcase emissions, and other evaporative HC emission components, January 1 emission levels, and idle emission rates. The pre-1979 model year LDGT2s were considered heavy-duty vehicles; their emission standards are given in Section A.1.3 of Appendix A. The 1979 and later LDGT2 emission standards are given in Section A.1.2 of Appendix A. The emissions reflect trucks which have received typical in-use maintenance. Further, the trucks are not involved in an I/M or anti-tampering program.

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3.B.1 Basic Exhaust Emission Rates

The basic nontampered exhaust emission rates for LDGT2s are calculated from two variables:

1. zero mile emission levels, and,

2. emission deterioration rates for vehicles at all mileages.

The LDGT2 basic exhaust emission rates by model year group and pollutant are given in Table 1.3.1A.

3.B.2 Exhaust Emission Rates With Tampering

Emission offsets in g/mi due to tampering are added to basic exhaust emission rates so that the fleet emission rates reflect national average rates of tampering. The exhaust emission rates including tampering are presented in Table 1.3.1B for the different LDGT2 model year groups and pollutants at different mileage intervals.

3.B.3 Crankcase and Evaporative HC Emission Levels

The LDGT2 crankcase, hot soak and diurnal emissions at both 9.0 and 11.5 psi fuels from nontampered vehicles tested under FTP conditions are given in Table 1.3.2A. The combined crankcase and g/mi evaporative emission tampering offsets at various mileage intervals are shown in Table 1.3.2B. The nontampered running loss emissions by model year group, fuel volatility, and ambient temperature are summarized in Table 1.3.2C. The refueling emissions by model year are given in Table 1.3.2D.

3.B.4 January 1 Emission Levels

The emission levels for 20 model years on January 1 of the selected 24 calendar years are given in Tables 1.3.11A through 1.3.11C for HC, CO, and NOx, respectively. The HC emission levels reflect non-methane HC emissions, and include crankcase and four other evaporative HC emission components. All emission rates include tampering effects.

3.B.5 Hot Stabilized Idle Emission Rates

The LDGT2 hot stabilized g/hr idle emission rates are given in Table 1.3.3.

3.C TRAVEL WEIGHTING FRACTIONS

The LDGT2 travel weighting fractions are the individual model year proportions of the total LDGT2 VMT. To generate the travel weighting fractions, three distributions are required:

1. annual mileage accumulation rate distribution,

2. registration distribution, and,

3. diesels sales distribution.

The first and second distributions are given in Table 1.3.4A, and the third distribution is given in Table 1.6.4B. More detailed information is available in Chapter 1 on these three distributions.

The travel weighting fractions, as in LDGVs, reflect a January 1 evaluation date. For the LDGT2s, the model year is assumed to begin sales on the October 1 preceding the corresponding calendar year. Further, it is assumed that the trucks are sold and accumulate mileage according to a uniform distribution. These assumptions permit the estimation of the January 1 fleet mileage accumulation rate distribution and the January 1 registration distribution from July 1 information. An example of the travel weighting fraction calculation based on calendar year of 1988 is given in Table 1.3.5.

The trips per day and miles per day distributions by vehicle age are given in Table 1.3.4C.

3.D EMISSION CORRECTION FACTORS

The LDGT2 basic exhaust emission levels are based on test results under the standardized conditions defined in Chapter 1. However, the basic exhaust emission levels are affected by ambient and truck usage conditions which differ from the prescribed test procedure. The conditions under which emissions are known to vary are the average speed, fuel volatility level, ambient temperature, fraction of VMT in cold and hot start operating modes, use of air conditioning, carrying of an extra load, trailer towing, and humidity level. Emission correction factors are available to compensate for variations in these conditions.

The LDGT2 emission correction factors are based on the LDGV information. Therefore, the LDGT2 correction factors are those from the LDGVs, and the discussions in Chapter 1 are valid for the LDGT2s.

3.D.1 Speed Correction Factor

The test procedure used for collecting the basic exhaust emissions is a driving cycle with an average speed of 19.6 mph. For those situations where the average speed of the truck deviates from this value, a speed correction factor is applied. The LDGT2 average cycle speed emission correction factors are given in Tables 1.3.6A for pre-1979 model years, and 1.3.6B for 1979 and later model years.

3.D.2 Fuel Volatility Correction Factor

For LDGT2 exhaust emissions at fuel volatility levels other than 9.0 psi RVP and ambient temperatures greater than 40°F, an RVP correction factor is also used. The RVP correction factors for LDGT2s are the same as those used for LDGVs (described in Chapter 1, Section 1.D.2).

3.D.3 Low Temperature Correction Factor

For those situations where the ambient temperature is lower than 75°F, a low temperature correction factor is applied. Table 1.3.7A presents these correction factors for the LDGT2s. The bag 1 CO offset model is applied to 1984 and later model year LDGT2s.

3.D.4 High Temperature Correction Factor

For those situations where the ambient temperature is equal to or higher than 75°F, a high temperature correction factor is applied. Table 1.3.7B presents these correction factors for the LDGT2s.

3.D.5 Temperature/Operating-Mode Emission Correction Factor

As in LDGVs, a single emission correction factor called OMTCF adjusts for temperature and operating-mode conditions that differ from the basic test procedure. As described in Chapter 1, OMTCF depends on normalized bag fractions. The LDGT2 normalized bag fractions are given in Table 1.3.7C.

3.D.6 Air Conditioning Correction Factor

The LDGT2 emissions can be significantly affected by the use of air conditioning. These correction factors are given in Table 1.3.8A. The fractions of LDGT2s equipped with an air conditioner, by model year, are given in Table 1.3.8B.

3.D.7 Extra Load Correction Factor

The basic exhaust emission rates are based on the "typical" truck weight with a driver and passenger, fuel, and other liquids. There are, however, situations in which trucks are carrying significant extra weight due to additional passengers, luggage, etc. In these events, emissions are known to change.

To apply the truck extra load correction factor found in Table 1.3.8C to a specific situation, it is necessary for a user to have an estimate of the percentage of LDGT2 VMT accumulated with an additional 500 pounds.

3.D.8 Trailer Towing Correction Factor

As with the extra load correction factor, the trailer towing correction factor will adjust LDGT2 emissions for usage conditions which differ from the basic test procedure. The correction factor coefficients given in Table 1.3.8D are valid for a trailer weight of 1000 pounds.

3.D.9 NOx Humidity Correction Factor

The LDGT2 NOx humidity correction factor equation is the same equation used for LDGVs.

Chapter 4

HEAVY-DUTY GASOLINE-POWERED VEHICLES

4.A INTRODUCTION

This chapter presents the emission factors for the heavy-duty gasoline-powered vehicles (HDGVs). A HDGV is defined to be any gasoline-fueled motor vehicle designated primarily for the transportation of property and rated at more than 8,500 pounds gross vehicle weight (GVW), or designated primarily for transportation of persons and having a capacity of more than 12 persons.

4.A.1 Test Procedure

The HDGV basic exhaust emission rates are based on the engine dynamometer transient test procedure stipulated in the Federal Register (48 FR 52170, November 16, 1983) and the Code of Federal Regulations (40 CFR, Part 86, Subpart N, July 1, 1989). The basic test conditions under which the HDGVs are tested are as follows:

1. Ambient temperature range is between 68° and 86°F.

2. Absolute humidity is adjusted to 75 grains of water per pound of dry air.

3. Average speed is 20.0 mph, including 27% idle operation.

4. Average percent VMT is 14.3% in cold operation, 86.7% in hot operation.

5. Average trip length is 6.5 miles.

The test procedure for HDGVs is summarized below:

1. Generate the maximum torque vs. speed curve of the engine.

2. Precondition the engine with practice cycle runs.

3. With the engine off, let it sit for at least 12 hours between 68° and 86°F. An optional procedure is the forced cool-down procedure, whereby cool water is circulated through the engine's water coolant system (and/or air is directed onto the engine) until the engine oil is between 68° and 75°F.

4. Conduct the cold test. The estimated mileage is 6.5 miles with an average speed of 20.0 mph.

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5. The engine is turned off, and remained off for 20 minutes.

6. Conduct the hot test, which is the same as the cold test.

7. Calculate the grams of pollutant and total brake horsepower-hour for each test cycle.

8. Correct NOx emissions to 75 grains of water per pound of dry air.

9. Calculate the basic exhaust emissions in grams per brake horsepower-hour (g/bhp-hr).

4.A.2 General Emissions Calculation Equations

To calculate the HDGV emission factors, the following generalized equations are used (subscripts dropped from equations for clarity):

COMPHC = SUM {TF * [REFUEL + RNGLOS + CCEVRT + SCF * (BEF - OFFMTH)]}

COMPCO = SUM (TF * SCF * BEF)

COMPNO = SUM (TF * SCF * BEF)

where:

BEF = OMTTAM * BER * TCF

And also where:

SCFps = The speed correction factor for HDGVs, for pollutant p, at speed s.

TCFpt = The temperature correction factor (not operating mode-dependent), for pollutant p, at temperature t.

All other variables have the same definitions as for LDGVs.

4.B EMISSIONS

This section discusses the emission estimates for the HDGVs: basic exhaust emission rates, emission rates including tampering, crankcase emissions and other evaporative HC emission components, January 1 emission levels, and idle emission rates. The emission standards are given in Section A.1.3 of Appendix A. The emissions reflect vehicles which have received typical in-use maintenance. Further, the vehicles are not involved in an I/M or anti-tampering program.

4.B.1 Basic Exhaust Emission Rates

The basic nontampered exhaust emission rates for HDGVs are calculated from two variables:

1. zero mile emission levels, and,

2. emission deterioration rates for vehicles at all mileages.

The HDGV basic exhaust emission rates by model year groups and pollutant are given in Table 1.4.1A.

The conversion factors which are used to convert the emissions in g/bhp-hr to emissions in g/mi are updated from the previous versions of mobile source emission factors. These conversion factors are dependent on projected sales in the different weight classes of the heavy-duty gasoline-powered vehicles and their respective fuel economies. The HDGV conversion factors by model year are given in Table 1.4.10B.

4.B.2 Exhaust Emission Rates With Tampering

Tampering offsets in g/mi are added to basic exhaust emission rates so that the fleet emission rates reflect national average rates of tampering. The exhaust emission rates including tampering are presented in Table 1.4.1B for the different HDGV model year groups and pollutants at different mileage intervals.

4.B.3 Crankcase and Evaporative HC Emission Levels

The HDGV crankcase, hot soak and diurnal emissions at both 9.0 and 11.5 psi RVP fuels from nontampered vehicles tested under FTP conditions are given in Table 1.4.2A. The combined crankcase and g/mi evaporative emission tampering offsets at various mileage intervals are shown in Table 1.4.2B. The nontampered running loss emissions by model year group, fuel volatility, and ambient temperature are summarized in Table 1.4.2C. The refueling emissions by model year are given in Table 1.4.2D.

4.B.4 January 1 Emission Levels

The emission levels for 20 model years on January 1 of the selected 24 calendar years are given in Tables 1.4.11A through 1.4.11C for HC, CO, and NOx, respectively. The HC emission levels reflect non-methane HC emissions, and include crankcase and four other evaporative HC emission components. All emission rates include tampering.

4.B.5 Hot Stabilized Idle Emission Rates

The HDGV hot stabilized g/hr idle emission rates are given in Table 1.4.3.

4.C TRAVEL WEIGHTING FRACTIONS

The HDGV travel weighting fractions are the individual model year proportions of the total HDGV VMT. To generate the HDGV travel weighting fractions, two distributions are required:

1. annual mileage accumulation rate distribution, and,

2. registration distribution.

These two distributions are given in Table 1.4.4. More detailed information is available in Chapter 1 on these distributions.

The travel weighting fractions in this document reflect a January 1 evaluation date. For the HDGVs, the model years are assumed to begin sales on January 1. Further, it is assumed that the vehicles are sold and accumulate mileage according to a uniform distribution. The travel weighting fractions based on calendar year 1988 are given in Table 1.4.5.

Average trips per day and miles per day estimates are used for HDGVs. These average values are given in Table 1.4.2A.

4.D EMISSION CORRECTION FACTORS

The HDGV basic exhaust emission levels are based on test results under the standard conditions defined in Section 4.A.1. However, the basic exhaust emission levels are affected by ambient and vehicle usage conditions which differ from the prescribed test procedure. The conditions under which HDGV emissions are known to vary are the average speed, fuel volatility level, and ambient temperature. Emission correction factors are available to compensate for variations in these conditions.

4.D.1 Speed Correction Factor

The test procedure used for collecting the basic exhaust emissions is a transient engine cycle with an estimated speed of 20.0 mph. For those situations where the average speed of the vehicle deviates from this

value, a speed correction factor is applied. Two speed correction factor models are used in MOBILE4:

1. $SCFps = EXP(Ap + Bp * s + Cp * s^2)$ for HC and CO

2. $SCFps = Ap + Bp * s + Cp * s^2$ for NOx

where:

SCFps = The speed correction factor, for pollutant p at average speed s.

EXP = The exponential function.

Ap = The speed correction factor intercept coefficient, for pollutant p.

Bp = The speed correction factor first order coefficient, for pollutant p.

Cp = The speed correction factor second order coefficient, for pollutant p.

The coefficients for the speed correction factor equations are given in Table 1.4.6. The speed correction factors are valid only for speeds in the 2.5 through 55 mph range.

4.D.2 Fuel Volatility Correction Factor

For HDGV exhaust emissions at fuel volatility levels other than 9.0 psi and at ambient temperatures greater than 40°F, an RVP correction factor is also used. The RVP correction factors for HDGVs are the same as those used for LDGVs (described in Chapter 1, Section 1.D.2).

4.D.3 Low Temperature Correction Factor

For situations where the ambient temperature is less than 75°F, an low temperature correction factor is applied. This low temperature correction factor differs slightly in form from the low temperature correction factor given in Chapter 1. The HDGV low temperature correction factor is for the entire transient test, as opposed to the LDGV low temperature correction factors for the individual test segments. The HDGV low temperature correction factor coefficients are given in Table 1.4.7A.

4.D.4 High Temperature Correction Factor

For those situations where the ambient temperature is equal to or higher than 75°F, a high temperature correction factor is applied. This high temperature correction factor also differs slightly in form from the high temperature correction factor given in Chapter 1. For pre-1985 model years, the high temperature correction factor model is a function of temperature, similar to the low temperature correction factors described in the previous section. For 1985 and later model years, a combined temperature and fuel volatility correction model is used. The HDGV high temperature correction factor is also applied to the entire transient test, as opposed to the LDGV high temperature correction factors for the individual test segments. Table 1.4.7B presents these correction factors for HDGVs.

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Chapter 5

LIGHT-DUTY DIESEL-POWERED VEHICLES

5.A INTRODUCTION

This chapter presents the emission factors for light-duty diesel-powered vehicles (LDDVs). A LDDV is defined to be any diesel-powered automobile designated primarily for transportation of persons and having a capacity of 12 or less persons.

5.A.1 Test Procedure

The test procedure used for determining the LDDV basic exhaust emissions is identical to the LDGV test procedure, outlined in Chapter 1.

5.A.2 General Emissions Calculation Equations

The same LDGV emission calculation equations are used for LDDVs, with the exception that the OMTCF parameter does not include the temperature correction factors, to be discussed in Sections 5.D.2 and 5.D.3.

5.B EMISSIONS

This section discusses the LDDV emission estimates: basic exhaust emission rates, January 1 emission levels, and idle emission rates. The emission standards are given in Section A.1.1 of Appendix A. The emissions reflect vehicles which have received typical in-use maintenance. Further, the vehicles are not involved in an I/M or anti-tampering program.

LDDVs are considered to have insignificant crankcase and all other evaporative HC emission components. Therefore, no evaporative emission factor estimates are given.

Also, diesel vehicles are not subject to the types of tampering that EPA gathers information on in its tampering surveys. Therefore, tampering offsets are not added to any diesel-powered vehicle emission factors.

With the exceptions listed above, the discussions of the different LDGV emissions in Chapter 1 are also valid for the LDDVs.

5.B.1 Basic Exhaust Emission Rates

The basic nontampered exhaust emission rates for LDDVs are calculated from two variables:

1. zero mile emission level, and,

2. emission deterioration rate at all mileages.

The LDDV basic exhaust emission rates by model year group and pollutant are given in Table 1.5.1.

5.B.2 January 1 Emission Levels

The emission levels for 20 model years on January 1 of the selected 24 calendar years are given in Tables 1.5.11A through 1.5.11C for HC, CO, and NOx, respectively. The HC emission levels reflect non-methane HC emissions.

5.B.3 Hot Stabilized Idle Emission Rates

The LDDV hot stabilized g/hr idle emission rates are given in Table 1.5.3.

5.C TRAVEL WEIGHTING FRACTIONS

The LDDV travel weighting fractions are individual model year proportions of the total LDDV VMT. To generate the travel weighting fractions, three distributions are required:

1. annual mileage accumulation rate distribution,

2. registration distribution, and,

3. diesel sales distribution.

The first and second distributions are given in Table 1.5.4A, and the third distribution is given in Table 1.5.4B. More detailed information is available in Chapter 1 on these distributions.

The travel weighting fraction in this document reflect a January 1 evaluation date. For LDDVs, model year sales are assumed to begin on October 1 of the preceding calendar year. Further, it is assumed that the vehicles are sold and accumulate mileage according to a uniform distribution. These assumptions permit the estimation of the January 1 fleet mileage accumulation rate distribution and the January 1

registration distribution from July 1 information. An example of the travel weighting fraction calculation based on calendar year of 1988 is given in Table 1.5.5.

Since it is assumed that there are no evaporative emissions from LDDVs, no trips per day or miles per day estimates are required for calculation of LDDV emission factors.

5.D EMISSION CORRECTION FACTORS

The LDDV basic exhaust emission levels are based on test results under the standardized conditions defined in Chapter 1. However, the basic exhaust emission levels are affected by ambient and vehicle usage conditions which differ from the prescribed test procedure. The conditions under which LDDV emissions are known to vary are the average speed and the fraction of VMT in cold and hot start operating modes. Emission correction factors are available to compensate for variations in these conditions.

Emissions from LDDVs may be somewhat dependent on temperature, but that dependence is thought to be relatively insignificant. Also, EPA has no data to quantify the effect of temperature on LDDV emissions. Therefore, no temperature correction factor is used for LDDVs.

The use of air conditioning, carrying of an extra load, trailer towing, humidity, and fuel volatility levels may affect LDDV emissions, but no information is available to estimate the effects.

5.D.1 Speed Correction Factor

The test procedure used for collecting the basic exhaust emissions is a driving cycle with an average speed of 19.6 mph. For those situations where the average speed of the vehicle differs from this value, a speed correction factor is applied.

The LDDV speed correction factor equation and coefficients are given in Table 1.5.6. The user is cautioned that the correction factor as given in Table 1.5.6 is only valid for speeds in the 2.5 through 55 mph range. Extrapolations to speeds beyond this range should not be made.

5.D.2 Speed/Operating-Mode Emission Correction Factor

A single emission correction factor called OMTCF adjusts for speed and operating-mode conditions that differ from the basic test procedure. As described in Chapter 1, OMTCF depends on normalized bag fractions. The LDDV normalized bag fractions are given in Table 1.5.7.

Chapter 6

LIGHT-DUTY DIESEL-POWERED TRUCKS

6.A INTRODUCTION

This chapter presents the emission factors for light-duty diesel-powered trucks (LDDTs). A LDDT is defined to be any diesel-powered motor vehicle designed primarily for transportation of property and rated at 8,500 pounds or less gross vehicle weight (GVW).

6.A.1 Test Procedure

The test procedure used for determining the LDDT basic exhaust emissions is almost identical to the LDGV test procedure. The only difference between the two test procedures is the road-load horsepower setting. The summary of the LDGV test procedure in Chapter 1 is also applicable for LDDTs.

6.A.2 General Emissions Calculation Equations

The same LDGV emission calculation equations are used for LDDTs, with the exception that the OMTCF parameter does not include the temperature correction factors, to be discussed in Sections 6.D.2 and 6.D.3.

6.B EMISSIONS

This section discusses the LDDT emission estimates: basic exhaust emission rates, January 1 emission levels, and idle emission rates. The emission standards are given in Section A.1.2 of Appendix A. Prior to the 1978 model year, the number of LDDTs are considered insignificant. As a result, no emissions are measured prior to January 1, 1978. The emissions also reflect trucks which have received typical in-use maintenance. Further, the trucks are not involved in an I/M or anti-tampering program.

LDDTs, like LDDVs, are considered to have insignificant crankcase and all other evaporative HC emission components. Therefore, no evaporative emission factor estimates are given.

Also, diesel trucks are not subject to the types of tampering that EPA gathers information on in its tampering surveys. Therefore, tampering offsets are not added to any diesel-powered truck emission factors.

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With the exceptions listed above, the discussions of the different LDGV emissions in Chapter 1 are also valid for the LDDTs.

6.B.1 Basic Exhaust Emission Rates

The basic nontampered exhaust emission rates for LDDTs are calculated from two variables:

1. zero mile emission level, and,

2. emission deterioration rate at all mileages.

The LDDT basic exhaust emission rates by model year group and pollutant are given in Table 1.6.1.

6.B.2 January 1 Emission Levels

The emission levels for 20 model years on January 1 of the selected 24 calendar years are given in Tables 1.6.11A through 1.6.11C for HC, CO, and NOx, respectively. The HC emission levels reflect non-methane HC emissions.

6.B.3 Hot Stabilized Idle Emission Rates

The LDDT hot stabilized g/hr idle emission rates are given in Table 1.6.3.

6.C TRAVEL WEIGHTING FRACTIONS

The LDDT travel weighting fractions are the individual model year proportion of the total LDDT VMT. To generate the travel weighting fractions, three distributions are required:

1. annual mileage accumulation rate distribution,

2. registration distribution, and,

3. fleet diesel sales distribution.

The first and second distributions are given in Table 1.6.4A, and the third distribution is given in Table 1.6.4B. More detailed information is available in Chapter 1 on these distributions.

The travel weighting fractions in this document reflect a January 1 evaluation date. For LDDTs, model year sales are assumed to begin on October 1 of the preceding calendar year. Further, it is assumed that the trucks are sold and accumulate mileage according to a uniform distribution. These assumptions permit the estimation of the January 1 fleet mileage accumulation rate distribution and the January 1 registration distribution from July 1 information. An example of the travel weighting fraction calculation based on calendar year of 1988 is given in Table 1.6.5.

Since it is assumed that there are no evaporative emissions from LDDTs, no trips per day or miles per day estimates are required for calculation of LDDT emission factors.

6.D EMISSION CORRECTION FACTORS

The LDDT basic exhaust emission levels are based on test results under the standardized conditions defined in Chapter 1. However, the basic exhaust emission levels are affected by ambient and truck usage conditions which differ from the prescribed test procedure. The conditions under which LDDT emissions are known to vary are the average speed and the fraction of VMT in cold and hot start operating modes. Emission correction factors are available to compensate for variations in these conditions.

Emissions from LDDTs may be somewhat dependent on temperature, but that dependence is thought to be relatively insignificant. Also, EPA has no data to quantify the effect of temperature on LDDT emissions. Therefore, no temperature correction factor is used for LDDTs.

The use of air conditioning, carrying of an extra load, trailer towing, humidity, and fuel volatility levels may affect LDDT emissions, but no information is available to estimate the effects.

6.D.1 Speed Correction Factor

The test procedure used for collecting the basic exhaust emissions is a driving cycle with an average speed of 19.6 mph. For those situations where the average speed of the truck differs from this value, a speed correction factor is applied.

The LDDT speed correction factor equation and coefficients are given in Table 1.6.6. The user is cautioned that this correction factor is only valid for speeds in the 2.5 through 55 mph range. Extrapolations to speeds beyond this range should not be made.

6.D.2 Temperature/Operating-Mode Emission Correction Factor

A single emission correction factor called OMTCF adjusts for speed and operating-mode conditions that differ from the basic test procedure. As described in Chapter 1, OMTCF depends on normalized bag fractions. The LDDT normalized bag fractions are given in Table 1.6.7.

Chapter 7

HEAVY-DUTY DIESEL-POWERED VEHICLES

7.A INTRODUCTION

This chapter presents the emission factors for heavy-duty diesel-powered vehicles (HDDVs). An HDDV is defined to be any diesel-powered motor vehicle designated primarily for the transportation of property and rated at more than 8,500 pounds of gross vehicle weight (GVW). Supplementary emission factors for diesel transit buses are found in Appendix N.

7.A.1 Test Procedure

The test procedure used for determining the HDDV basic exhaust emissions is almost identical to the HDGV test procedure. The only difference between the two test procedures is the test cycle. The specific differences are as follows:

1. The average speed is 20.0 mph, with 36% idle operation.

2. The average trip length is 6.4 miles.

3. NOx emissions are not corrected for humidity.

7.A.2 General Emissions Calculation Equations

The HDDV emission equations are:

COMPHC = SUM [TF * SCF * (BER - OFFMTH)]

COMPCO = SUM (TF * SCF * BER)

COMPNO = SUM (TF * SCF * BER)

where:

SCFps = The speed correction factor for HDDVs, for pollutant p, at speed s.

All other variables have the same definitions as for LDGVs.

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7.B EMISSIONS

This section discusses the emission estimates for HDDVs: basic exhaust emission rates, January 1 emission levels, and idle emission rates. The emission standards are given in Section A.1.4 of Appendix A. The emissions reflect vehicles which have received typical in-use maintenance. Further, the vehicles are not involved in an I/M or anti-tampering program.

HDDVs are considered to have insignificant crankcase and all other evaporative HC emission components. Therefore, no evaporative emission factor estimates are given.

Also, heavy-duty diesel vehicles are not subject to the types of tampering that EPA gathers information on in its tampering surveys. Therefore, tampering offsets are not added to any diesel-powered vehicle emission factors.

With the exceptions listed above, the discussions of the different LDGV emissions in Chapter 1 are also valid for the HDDVs.

7.B.1 Basic Exhaust Emission Rates

The basic nontampered exhaust emission rates for HDDVs are calculated from two variables:

1. zero mile emission level, and,

2. emission deterioration rate at all mileages.

The HDDV basic exhaust emission rates by model year group and pollutant are given in Table 1.7.1.

The conversion factors which are used to convert the emissions in g/bhp-hr to emissions in g/mi are updated from the previous versions of mobile source emission factors. These conversion factors are dependent on projected sales in the different weight classes of the heavy-duty diesel vehicles and their respective fuel economies. The HDDV conversion factors are given in Table 1.7.10B.

7.B.2 January 1 Emission Levels

The emission levels for 20 model years on January 1 of the selected 24 calendar years are given in Tables 1.7.11A through 1.7.11C for HC, CO, and NOx, respectively. The HC emission levels reflect non-methane HC emissions.

7.B.3 Hot Stabilized Idle Emission Rates

The HDDV hot stabilized g/hr idle emission rates are given in Table 1.7.3.

7.C TRAVEL WEIGHTING FRACTIONS

The HDDV travel weighting fractions are the individual model year proportions of the total HDDV VMT. To generate the HDDV travel weighting fractions, two distributions are required:

1. annual mileage accumulation rate distribution, and,

2. registration distribution.

These two distributions are given in Table 1.7.4. More detailed information is available in Chapter 1 on these distributions.

The travel weighting fractions in this document reflect a January 1 evaluation date. For the HDDVs, model year sales are assumed to begin on January 1 of that year. Further, it is assumed that the vehicles are sold and accumulate mileage according to a uniform distribution. The travel weighting fractions are given in Table 1.7.5.

Since it is assumed that there are no evaporative emissions from HDDVs, no trips per day or miles per day estimates are required for the calculation of HDDV emission factors.

7.D. EMISSION CORRECTION FACTORS

The HDDV basic exhaust emission levels are based on test results under the standard conditions defined in Section 4.A.1 of Chapter 4 and Section 7.A.1. However, the basic exhaust emission levels are affected by ambient and vehicle usage conditions which differ from the prescribed test procedure. The condition under which HDDV emissions are known to vary is the average speed. Emission correction factors are available to compensate for variations in these conditions.

Emissions from HDDVs emissions may be somewhat dependent on temperature, but that dependence is thought to be relatively insignificant. Also, EPA has no data to quantify the effect of temperature on HDDV emissions. Therefore, no temperature correction factor is used for HDDVs.

The use of air conditioning, carrying of an extra load, trailer towing, and humidity levels may affect HDDV emissions, but no information is available to estimate the effects.

7.D.1 Speed Correction Factor

The test procedure used for collecting the basic exhaust emissions is a transient engine cycle with an estimated speed of about 20 mph. For those situations where the average speed of the vehicle deviates from this value, a speed correction factor is applied.

The coefficients for the speed correction factor equations are given in Table 1.7.6. The speed correction factors are only valid for speeds in the 2.5 through 55 mph range.

Chapter 8

MOTORCYCLES

8.A INTRODUCTION

A motorcycle (MC) is defined as any motor vehicle designed to travel with no more than three wheels in contact with the ground, and with a curb weight less than 1,500 pounds.

The MC fleet is composed of six engine size-type combinations: small, medium, and large engine sizes, with two-stroke and four-stroke engine types for each of the engine sizes. Since 1978, the motorcycle market has been dominated by four-stroke engines. The market trend in recent years has been toward increasing shares of the larger engine size motorcycles.

8.A.1 Test Procedure

With the exception of pre-1978 model years, the MC basic exhaust emission test procedure is similar to the LDGV test procedure. Therefore, the summary of the LDGV test procedure in Chapter 1 is also applicable to MCs. Given below is a list of pre-1978 model year motorcycle test procedure summary statistics that differ from the LDGV test procedure:

1. Average speed is 17.8 mph.
2. Average percent VMT in cold start operation is 18.3%.
3. Average percent VMT in hot start operation is 24.2%.
4. Average percent VMT in the stabilized operation is 57.5%.
5. Average trip length is 6.8 miles.
6. Test segments 1 (cold start) and 3 (hot start) each have an average trip length of 2.89 miles and average speed of 20.6 mph.
7. Test segment 2 (stabilized) has an average trip length of 3.91 miles and average speed of 16.2 mph.

8.A.2 General Emission Calculation Equations

The MC generalized equations are almost identical to the LDGV equations. The differences are:

1. three emission correction factors (air conditioning, extra load, and trailer towing) are not applicable to motorcycles, and

2. the effects of tampering are not included for motorcycles.

8.B EMISSIONS

This section discusses the MC emission estimates: basic exhaust emission rates, crankcase emissions, other evaporative HC emission components, January 1 emission levels, and idle emission rates. The emission standards are given in Section A.1.5 of Appendix A. The emissions reflect motorcycles which have received typical in-use maintenance. Further, the motorcycles are not involved in an I/M or anti-tampering program.

Due to lack of data, it is assumed that there are no running loss or refueling emissions from motorcycles.

Also, MCs are not subject to the types of tampering that EPA gathers information on in its tampering surveys, therefore tampering offsets are not added to MC emission factors.

With the exceptions noted above, the discussions of the different emissions in Chapter 1 are also valid for MCs.

8.B.1 Basic Exhaust Emission Rates

The basic nontampered exhaust emission rates for MCs are calculated from two variables:

1. zero mile emission levels, and,

2. emission deterioration rates for vehicles at all mileages.

The MC basic exhaust emission rates by model year group and pollutant are given in Table 1.8.1.

8.B.2 Crankcase and Evaporative HC Emission Levels

The MC crankcase, hot soak, and diurnal emissions at both 9.0 and 11.5 psi RVP fuels, from nontampered vehicles tested under FTP conditions, are summarized in Table 1.8.2.

8.B.3 January 1 Emission Levels

The emission levels for 20 model years on January 1 of the selected 24 calendar years are given in Tables 1.8.11A through 1.8.11C for HC, CO, and NOx, respectively. The HC emission levels reflect non-methane HC emissions, and include crankcase and two other evaporative HC emission components (hot soak and diurnal emissions).

8.B.4 Hot Stabilized Idle Emission Rates

The MC hot stabilized g/hr idle emission rates are given in Table 1.8.3.

8.C TRAVEL WEIGHTING FRACTIONS

The MC travel weighting fractions are the individual model year proportions of the total MC VMT. To generate the MC travel weighting fractions, two distributions are required:

1. annual mileage accumulation rate distribution, and,

2. registration distribution.

These two distributions are given in Table 1.8.4. More detailed information is available in Chapter 1 on these distributions.

The travel weighting fractions in this document reflect a January 1 evaluation date. For MCs, model year sales are assumed to begin on January 1 of that year. Further, it is assumed that the motorcycles are sold and accumulate mileage according to a uniform distribution. These assumptions permit the estimation of the January 1 fleet mileage accumulation rate distribution and the January 1 registration distribution from July 1 information. The travel weighting fractions are given in Table 1.8.5.

Average trips per day and miles per day estimates are used for MCs. These values are given in Table 1.8.2.

8.D EMISSION CORRECTION FACTORS

The MC basic exhaust emission levels are typically based on test results under the standard conditions defined in Chapter 1. However, the basic exhaust emission levels are affected by ambient and usage conditions which differ from the prescribed test procedure. The conditions under which emissions are known to vary are the average speed, ambient temperature, fraction of VMT in cold and hot start operating conditions, and humidity level. Emission correction factors are available to compensate for variations in these conditions.

The MC emission correction factors are based on the LDGV information. The discussions in Chapter 1 are valid for MCs.

8.D.1 Speed Correction Factor

The test procedure used for collecting the basic exhaust emissions is typically a driving cycle with an average speed of 17.8 mph. For those situations where the average speed of the MC differs from this value, a speed correction factor is applied. The MC speed correction factor equation and coefficients are given in Table 1.8.6.

8.D.2 Low and High Temperature Correction Factors

The established motorcycle emissions test procedure requires an ambient test temperature between 68° and 86°F. For those situations where the ambient temperature is not 75°F, an emission temperature correction factor is applied. Table 1.8.7A presents the low temperature correction factors and Table 1.8.7B presents the high temperature correction factors for MCs.

8.D.3 Temperature/Operating-Mode Emission Correction Factor

As in LDGVs, a single emission correction factor called OMTCF adjusts for temperature, and operating-mode conditions that differ from the basic test procedure. As described in Chapter 1, OMTCF depends on normalized bag fractions. The MC normalized bag fractions are given in Table 1.8.7C.

8.D.4 NOx Humidity Correction Factor

The LDGV NOx humidity correction factor equation is also used for MCs.

Appendix A

NEW VEHICLE EMISSION STANDARDS

This appendix presents the emission standards assumed in this document. At the time of the MOBILE4 release, these standards represent promulgated current and future standards. However, it is possible that some of the assumed standards are now different due to changes in regulations, waivers, etc.

In addition, EPA has promulgated emission standards for methanol-fueled vehicles and engines (see 54 FR 14426, April 11, 1989). These standards are not presented here, as they represent vehicles and engines that are not yet used in significant numbers and are not modeled in MOBILE4.

A.1 LOW- AND HIGH-ALTITUDE NON-CALIFORNIA HIGHWAY VEHICLE EMISSION STANDARDS

This section presents the emission standards for the eight low- and high-altitude non-California vehicle types. The standards are presented in five subsections. The light-duty vehicle and light-duty truck fleets are comprised of both diesel and gasoline-fueled vehicle types. The pre-1979 model year gasoline-fueled light-duty trucks (LDGT2s, 6001-8500 lbs gross vehicle weight) are heavy-duty vehicles, while 1979 and later model year LDGT2s are light-duty trucks. Finally, high-altitude standards are included in this section since there are relatively few emission standards specific to high-altitude vehicles.

All hydrocarbon emission standards presented in this section are for total hydrocarbon emissions.

A.1.1 Light-Duty Vehicles (LDVs)

The following standards apply only to gasoline-fueled LDVs through 1974. Standards for 1975 and later apply to both gasoline-fueled and diesel LDVs.[1]

Year	Test Procedure[2]	Hydro-carbons	Carbon Monoxide	Oxides of Nitrogen	Partic-ulates[3]	Evaporative Hydrocarbons[4]
Prior to controls	7-mode	850 ppm	3.4 %	1000 ppm	-	-
	7-mode	11 gpm	80 gpm	4 gpm	-	-
	CVS-75	8.8 gpm	87.0 gpm	3.6 gpm	-	-
1968-69	7-mode					
	50-100 CID	410 ppm	2.3 %	-	-	-
	101-140 CID	350 ppm	2.0 %	-	-	-
	>140 CID	275 ppm	1.5 %	-	-	-
1970	7-mode	2.2 gpm	23 gpm	-	-	-
1971	7-mode	2.2 gpm	23 gpm	-	-	6.0 g/test[5]
1972	CVS-72	3.4 gpm	39 gpm	-	-	2.0 g/test
1973-74	CVS-72	3.4 gpm	39 gpm	3.0 gpm	-	2.0 g/test
1975-76	CVS-75	1.5 gpm	15 gpm	3.1 gpm	-	2.0 g/test
1977[6]	CVS-75	1.5 gpm	15 gpm	2.0 gpm	-	2.0 g/test
1978-79	CVS-75	1.5 gpm	15 gpm	2.0 gpm	-	6.0 g/test
1980	CVS-75	0.41 gpm	7.0 gpm	2.0 gpm	-	6.0 g/test
1981	CVS-75	0.41 gpm	3.4 gpm[7]	1.0 gpm[8,9]	-	2.0 g/test
1982[10]	CVS-75	0.41 gpm (0.57)	3.4 gpm[7] (7.8)[11]	1.0 gpm[8,9] (1.0)[8,9]	0.60 gpm (-)	2.0 g/test (2.6)
1983[10]	CVS-75	0.41 gpm (0.57)	3.4 gpm (7.8)	1.0 gpm[8] (1.0)[8]	0.60 gpm (0.60)	2.0 g/test (2.6)
1984-86[12]	CVS-75	0.41 gpm	3.4 gpm	1.0 gpm[8]	0.60 gpm	2.0 g/test
1987 & later[12]	CVS-75	0.41 gpm (0.41)	3.4 gpm (3.4)	1.0 gpm (1.0)	0.20 gpm[13] (0.20)[13]	2.0 g/test (2.0)

LIGHT-DUTY VEHICLES - Notes

1 Standards do not apply to LDVs with engines less than 50 CID from 1968 through 1974.

2 Different test procedures have been used since the early years of emission control which vary in stringency. The appearance that the standards were relaxed from 1971 to 1972 is incorrect; the 1972 standards are actually more stringent because of the 1972 test procedure.

3 Applies only to diesel LDVs.

4 Evaporative emissions determined by carbon trap method through 1977, SHED procedure beginning in 1978. Applies only to gasoline-fueled LDVs. No crankcase emissions permitted from LDGVs beginning with 1968 model year.

5 Evaporative standard does not apply to off-road utility LDVs for 1971.

6 LDVs sold in specified high-altitude counties are required to meet these standards at high altitude.

7 Carbon monoxide standard is waived to 7.0 gpm for 1981-82 for certain LDVs.

8 Oxides of nitrogen standard is waived (to levels of 1.2 to 1.5 gpm) for certain innovative technology or diesel LDVs (applies to 1981-84 only).

9 Oxides of nitrogen standard for 1981-82 is 2.0 gpm for American Motors Corporation LDVs.

10 Standards in parentheses apply to LDVs sold in specified high-altitude counties.

11 LDVs eligible for a carbon monoxide waiver to 7.0 gpm at low altitude are eligible for a waiver to 11 gpm at high altitude.

12 The same numerical standards apply to LDVs sold in high-altitude areas. Exemptions from compliance at high-altitude are provided for qualifying low-performance vehicles.

13 Emissions averaging may be used to meet this standard, provided that emissions from LDVs produced for sale in California or in designated high-altitude areas may be averaged only within each of those areas. May also be averaged with LDDT1s to meet "composite particulate emission standard" as defined in Section 86.087-2, Code of Federal Regulations.

CID - cubic inch displacement
CVS-72 - constant volume sample cold start test
CVS-75 - constant volume sample test including cold and hot starts
gpm - grams per mile
ppm - parts per million
7-mode - 137 second driving cycle test
SHED - sealed housing for evaporative determination

A.1.2 Light-Duty Trucks (LDTs)

The following standards apply only to gasoline-fueled LDTs through 1975. Standards for 1976 and later apply to both gasoline-fueled and diesel LDTs.[1]

Year	Test Procedure[2]		Hydro-carbons	Carbon Monoxide	Oxides of Nitrogen	Partic-ulates[3]	Evaporative Hydrocarbons[4]
Prior to controls	7-mode		850 ppm	3.4 %	1000 ppm	-	-
	7-mode		11 gpm	80 gpm	4 gpm	-	-
	CVS-75		6.5 gpm	76.0 gpm	3.6 gpm	-	-
1968-69	7-mode						
	50-100 CID		410 ppm	2.3 %	-	-	-
	101-140 CID		350 ppm	2.0 %	-	-	-
	>140 CID		275 ppm	1.5 %	-	-	-
1970	7-mode		2.2 gpm	23 gpm	-	-	-
1971	7-mode		2.2 gpm	23 gpm	-	-	6.0 g/test[5]
1972	CVS-72		3.4 gpm	39 gpm	-	-	2.0 g/test
1973-74	CVS-72		3.4 gpm	39 gpm	3.0 gpm	-	2.0 g/test
1975-77[6]	CVS-75		2.0 gpm	20 gpm	3.1 gpm	-	2.0 g/test
1978	CVS-75		2.0 gpm	20 gpm	3.1 gpm	-	6.0 g/test
1979-80[7]	CVS-75		1.7 gpm	18 gpm	2.3 gpm	-	6.0 g/test
1981	CVS-75		1.7 gpm	18 gpm	2.3 gpm	-	2.0 g/test
1982-83[8]	CVS-75		1.7 gpm (2.0)	18 gpm (26)	2.3 gpm (2.3)	0.60 gpm (-)	2.0 g/test (2.6)
1984-86	CVS-75		0.80 gpm (1.0)	10 gpm (14)	2.3 gpm (2.3)	0.60 gpm (-)	2.0 g/test (2.6)
1987[10]	CVS-75	(A)	0.80 gpm (1.0)	10 gpm (14)	2.3 gpm (2.3)	0.26 gpm[9] (-)	2.0 g/test (2.6)
		(B)	0.80 gpm (1.0)	10 gpm (14)	2.3 gpm (2.3)	0.50 gpm (-)	2.0 g/test (2.6)
1988-90[10]	CVS-75	(A)	0.80 gpm (1.0)	10 gpm (14)	1.2 gpm[9] (1.2)	0.26 gpm[9] (0.26)	2.0 g/test (2.6)
		(B)	0.80 gpm (1.0)	10 gpm (14)	*1.7 gpm[9] *(1.7)	0.45 gpm (-)	2.0 g/test (2.6)
1991 & later[10]	CVS-75	(A)	0.80 gpm (1.0)	10 gpm (14)	1.2 gpm[9] (1.2)	0.26 gpm[9] (0.26)	2.0 g/test (2.6)
		(B)	0.80 gpm (1.0)	10 gpm (14)	1.7 gpm[9] (1.7)	0.13 gpm[9] (0.13)	2.0 g/test (2.6)

* LDTs over 6,000 lbs GVW remain at 2.3 gpm NOx standard for 1988-89.

LIGHT-DUTY TRUCKS - Notes

1 Standards do not apply to LDTs with engines less than 50 CID from 1968 through 1974.

2 Different test procedures have been used since the early years of emission control which vary in stringency. The appearance that the standards were relaxed from 1971 to 1972 is incorrect; the 1972 standards are actually more stringent because of the 1972 test procedure.

3 Applies only to diesel LDTs.

4 Evaporative emissions determined by carbon trap method through 1977, SHED procedure beginning in 1978. Applies only to gasoline-fueled LDTs. No crankcase emissions permitted from LDGTs beginning with 1968 model year.

5 Evaporative standard does not apply to off-road utility LDTs for 1971.

6 LDTs sold in specified high-altitude counties required to meet standards at high altitude (1977 only).

7 Effective in 1979, the LDT classification was extended from 0-6,000 lbs GVWR to 0-8,500 lbs GVWR.

8 Standards in parentheses apply to LDTs sold in specified high-altitude counties. Manufacturers may choose to exempt up to 30 percent of their total LDT sales from demonstrating compliance with high-altitude standards (1982-84 only).

9 Emissions averaging may be used to meet this standard, provided that emissions from LDTs produced for sale in California or in designated high-altitude areas may be averaged only within each of those areas. NOx emissions from diesel and gasoline-fueled LDT engine families may not be averaged together. NOx emissions from LDTs over 6,000 lb GVW meeting 2.3 gpm NOx standard for 1988-89 may not be averaged with LDTs meeting 1.2 or 1.7 gpm standards. Particulate emissions from LDDT2s may not be averaged together with particulate emissions from LDDVs and LDDT1s under the 0.13 gpm standard.

10 Standards under (A) apply to LDTs up to and including 3,750 lbs loaded vehicle weight (LVW); those under (B) apply to LDTs over 3,750 lbs LVW.

CID - cubic inch displacement
CVS-72 - constant volume sample cold start test
CVS-75 - constant volume sample test which includes cold and hot starts
gpm - grams per mile
GVWR - gross vehicle weight rating
ppm - parts per million
7-mode - 137 second driving cycle test
SHED - sealed housing for evaporative determination

A.1.3 Heavy-Duty Gasoline-Fueled Engines and Vehicles

The following is a summary of gasoline-fueled heavy-duty engine and vehicle standards.[1]

Year		Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen	Hydrocarbons + Oxides of Nitrogen	Evaporative Hydrocarbons
Prior to Controls[2]		9.7 g/bhp-hr	121 g/bhp-hr	-	-	-
		12.7 g/bhp-hr	155 g/bhp-hr	6.86 g/bhp-hr	-	-
		10.9 g/bhp-hr	155 g/bhp-hr	6.71 g/bhp-hr	-	-
1970-73		275 ppm	1.5 %	-	-	-
1974-78		-	40 g/bhp-hr	-	16 g/bhp-hr	-
1979[3,4,5]		1.5 g/bhp-hr	25 g/bhp-hr	-	10 g/bhp-hr	-
		1.0 g/bhp-hr	25 g/bhp-hr	-	9.5 g/bhp-hr	-
		-	25 g/bhp-hr	-	5 g/bhp-hr	-
1980-83[3]		1.5 g/bhp-hr	25 g/bhp-hr	-	10 g/bhp-hr	-
		1.0 g/bhp-hr[6]	25 g/bhp-hr	-	9.5 g/bhp-hr[6]	-
		-	25 g/bhp-hr	-	5.0 g/bhp-hr	-
1984[7]	(A)	1.5 g/bhp-hr	25 g/bhp-hr	-	10 g/bhp-hr	-
		1.0 g/bhp-hr[6]	25 g/bhp-hr	-	9.5 g/bhp-hr[6]	-
		-	25 g/bhp-hr	-	5.0 g/bhp-hr	-
	(B)	1.3 g/bhp-hr	15.5 g/bhp-hr	10.7 g/bhp-hr[8]	-	-
1985-86[9]		1.9 g/bhp-hr	37.1 g/bhp-hr	10.6 g/bhp-hr	-	3.0 or 4.0 g/test
		2.5 g/bhp-hr	40.0 g/bhp-hr	10.7 g/bhp-hr	-	
1987-89[10]	(A)	1.1 g/bhp-hr	14.4 g/bhp-hr	10.6 g/bhp-hr	-	3.0 g/test
	(B)	1.9 g/bhp-hr	37.1 g/bhp-hr	10.6 g/bhp-hr	-	4.0 g/test
1990[10]	(A)	1.1 g/bhp-hr	14.4 g/bhp-hr	6.0 g/bhp-hr	-	3.0 g/test
	(B)	1.9 g/bhp-hr	37.1 g/bhp-hr	6.0 g/bhp-hr	-	4.0 g/test
1991 & later[10]	(A)	1.1 g/bhp-hr	14.4 g/bhp-hr	5.0 g/bhp-hr[11]	-	3.0 g/test
	(B)	1.9 g/bhp-hr	37.1 g/bhp-hr	5.0 g/bhp-hr[11]	-	4.0 g/test

HEAVY-DUTY GASOLINE-POWERED ENGINES AND VEHICLES - Notes

1 Test procedure for 1970-83 standards is the 9-mode. For 1984, either the steady-state or transient test may be used. For 1985-86, either the EPA or MVMA transient test may be used. For 1987 and later, the MVMA transient test is used. Standards are engine standards except for evaporative emissions standards, which apply to vehicles. No crankcase emissions permitted from HDGVs beginning with 1968 model year.

2 The first set of numbers represents uncontrolled emissions as measured on the 9-mode test; the second, as measured on the EPA transient test; the third, as measured on the MVMA transient test.

3 Manufacturers may choose among the sets of standards listed.

4 Standards of 1.0 HC, 25 CO, and 9.5 NOx may be used if NDIR HC measurement method is used.

5 Effective in 1979, the HDV classification was changed from ≥6,001 lbs GVWR to ≥8,501 lbs GVWR.

6 These standards are available as an option for low-volume manufacturers only.

7 At the manufacturers' option, the 1983 standards and test procedure may be used (option A), or the option B standards with the EPA transient test.

8 This standard was derived from the HC+NOx standard when the transient test was adopted. It does not represent any significant level of control, although control of HC emissions has exerted an upward influence on NOx emissions relative to baseline levels.

9 Standards of 1.9 HC, 37.1 CO, 10.6 NOx are used with the MVMA transient test; the EPA transient test is used with standards of 2.5 HC, 40.0 CO, 10.7 NOx. Evaporative standard is 3.0 g/test for HDVs 8,501-14,000 lbs GVWR, 4.0 g/test for those >14,000 lbs GVWR. (Evaporative standards do not apply to model year 1985 HDVs equipped with 1984 model year engines).

10 Standards under (A) apply to HDEs intended for use in HDVs ≤14,000 lbs GVWR; those under (B) apply to HDEs intended for use in HDVs >14,000 lbs GVWR. A manufacturer may certify up to 5 percent of HDEs intended for use in HDVs ≤14,000 lbs GVWR to the standards under (B) at its option. Test procedure is MVMA transient test.

11 Emissions averaging may be used to meet this standard; NOx emissions from gasoline-fueled HDEs may not be averaged together with those from diesel HDEs. Also, averaging is restricted regionally; the two regions are California and the other 49 states.

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g/bhp-hr	- grams per brake horsepower-hour
GVWR	- gross vehicle weight rating
HDE/HDV	- heavy-duty engine/heavy-duty vehicle
9-mode	- gasoline engine dynamometer test with 9 steady-state test points
NDIR	- nondispersive infrared
ppm	- parts per million
transient test	- engine dynamometer test procedure with starts, stops, and speed/load changes

A.1.4 Heavy-Duty Diesel-Powered Engines and Vehicles

The following is a summary of diesel-powered heavy-duty engine and vehicle standards.[1]

Year	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen	Hydrocarbons + Oxides of Nitrogen	Particulates	Smoke (opacity)
1970-73	-	-	-	-	-	ACCEL 40% LUG 20%
1974-78	-	40 g/bhp-hr	-	16 g/bhp-hr	-	ACCEL 20% LUG 15% PEAK 50%
1979-83[2,3]	1.5 g/bhp-hr -	25 g/bhp-hr 25 g/bhp-hr	- -	10 g/bhp-hr 5 g/bhp-hr	- -	ACCEL 20% LUG 15% PEAK 50%
1984[4] (A)	1.5 g/bhp-hr -	25 g/bhp-hr 25 g/bhp-hr	- -	5 g/bhp-hr 5 g/bhp-hr	- -	ACCEL 20% LUG 15% PEAK 50%
(B)	1.3 g/bhp-hr 0.5 g/bhp-hr	15.5 g/bhp-hr 15.5 g/bhp-hr	10.7 g/bhp-hr 9.0 g/bhp-hr	- -	- -	ACCEL 20% LUG 15% PEAK 50%
1985-87	1.3 g/bhp-hr	15.5 g/bhp-hr	10.7 g/bhp-hr	-	-	ACCEL 20% LUG 15% PEAK 50%
1988-89	1.3 g/bhp-hr	15.5 g/bhp-hr	10.7 g/bhp-hr	-	0.60 g/bhp-hr	ACCEL 20% LUG 15% PEAK 50%
1990	1.3 g/bhp-hr	15.5 g/bhp-hr	6.0 g/bhp-hr	-	0.60 g/bhp-hr	ACCEL 20% LUG 15% PEAK 50%
1991-93	1.3 g/bhp-hr	15.5 g/bhp-hr	5.0 g/bhp-hr[5]	-	0.25 g/bhp-hr[6] 0.10 g/bhp-hr[7]	ACCEL 20% LUG 15% PEAK 50%
1994 & later	1.3 g/bhp-hr	15.5 g/bhp-hr	5.0 g/bhp-hr[5]	-	0.10 g/bhp-hr[6]	ACCEL 20% LUG 15% PEAK 50%

HEAVY-DUTY DIESEL-POWERED ENGINES AND VEHICLES - Notes

1 Test procedure for 1970-1983 standards is the 13-mode. Test procedure for 1985 and later is the transient test. No crankcase emissions permitted from naturally aspirated HDDVs beginning with 1984 model year.

2 Effective in 1979, the HDV classification was changed from ≥6,001 lbs GVWR to ≥8,501 lbs GVWR.

3 Manufacturers may choose from the two sets of standards listed.

4 At the manufacturers' option, either the 1983 standards and test procedure may be used (option A), or standards of 1.3 HC, 15.5 CO, and 10.7 NOx with the transient test (option B). Also, standards of 0.5 HC, 15.5 CO, and 9.0 NOx are optional standards for 1984 diesel HDEs tested on the 13-mode test.

5 Emissions averaging may be used to meet this standard, but these emissions may not be averaged with gasoline-fueled HDE NOx emissions. Averaging is restricted to within useful life subclasses (light, medium, and heavy; see 40 CFR 86.085-2). Also, averaging is restricted regionally; the two regions are California and the other 49 states.

6 Emissions averaging may be used to meet this standard. However, averaging is restricted to within useful life subclasses. Also, averaging is restricted regionally; the two regions are California and the other 49 states. Emissions from engines used in urban buses may not be included in the averaging program.

7 For urban bus engines only, the standard is 0.10 g/bhp-hr for 1991-93. Particulate averaging is not allowed with this standard, but NOx emissions from these engines may be used in NOx averaging.

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g/bhp-hr - grams per brake horsepower-hour
ppm - parts per million
13-mode - diesel engine dynamometer test with 13 steady-state test points
transient test - engine dynamometer procedure with starts, stops, and speed/load changes

A.1.5 Motorcycles

The following is a summary of motorcycle standards.[1]

Year	Displacement [2]	Hydrocarbons	Carbon Monoxide
Prior to controls	All (average)	5.6 g/km	21.5 g/km
1978-79	50-169	5.0 g/km	17 g/km
	170-749	5.0 + 0.0155(D-170) g/km[3]	17 g/km
	750 & larger	14 g/km	17 g/km
1980 & later	All (50 cc & larger)	5.0 g/km	12 g/km

1 A motorcycle is any motor vehicle with a headlight, taillight, and stoplight, two or three wheels, and a curb mass of 680 kg (1500 lbs) or less. Motorcycles are exempt from these requirements if

(1) displacement is less than 50 cc (3.1 in^3), or,
(2) with an 80 kg (176 lb) driver it cannot
(a) start from a dead stop using only the engine, or,
(b) exceed a speed of 40 km/hr (25 mi/hr) on a level paved surface.

2 Engine displacement shown in cubic centimeters.

3 Formula for motorcycle hydrocarbon standards, where D = engine displacement in cubic centimeters. For example, for a motorcycle with a 300 cc engine, the hydrocarbon standard is: 5.0 + [(300-170) x .0155] = 7.0 g/km).

g/km - grams per kilometer
cc - cubic centimeters

Appendix B

CALCULATION OF THE VMT MIX

The proportion of the total vehicle-miles-traveled (VMT) driven by a given vehicle type depends on the following three parameters:

(a) number of vehicles,
(b) model year registration distribution, and,
(c) mileage accumulation rate distribution.

Also, as light-duty diesel-powered vehicles and trucks become a larger proportion of their respective fleets, their VMT proportions will increase. As the diesel-powered vehicle type VMT fractions increase, the corresponding gasoline-powered vehicle type VMT fractions will decrease.

The MOBILE4 computer program calculates the VMT mix, unless the user inputs locality-specific information. The calculation procedure is based on the estimated number of vehicles and the average annual miles driven for each vehicle type. The product of these two variables estimates the total miles driven on January 1 of a calendar year for each vehicle type. By performing this calculation for each vehicle type and summing up the results, the total miles driven on January 1 for the entire highway mobile source fleet are obtained. Finally, by normalizing the individual vehicle type total miles, the VMT fractions are estimated.

The MOBILE4 computer program performs the calculations in subprogram TFCALX with the following equations:

MILES(IV) = VCOUNT(IV) * GSFVCT(IV) * TFNORM(IV)

TOTVMT = SUMiv [MILES(IV)]

VMTMIX(IV) = MILES(IV) / TOTVMT

where:

MILES(IV) = The estimated miles driven by vehicle type IV.

IV = The vehicle type index (1 = LDGV, 2 = LDGT1, 3 = LDGT2, 4 = HDGV, 5 = LDDV, 6 = LDDT, 7 = HDDV, 8 = MC).

VCOUNT(IV) = The estimated vehicle count for vehicle type IV based on registrations. To use the dieselization rates, MOBILE4 assumes that VCOUNT(1) = VCOUNT(5) and VCOUNT(2) = VCOUNT(6). This means that the LDGVs and

LDDVs combined constitute the light-duty vehicle fleet. Similarly, LDGT1s, LDGT2s, and LDDTs combined constitute the light-duty truck fleet. Both the light-duty vehicle and truck fleets are adjusted by diesel sales fractions to separate diesel from gasoline-powered vehicles/trucks.

GSFVCT(IV) = Sales fractions of each total (both gasoline- and diesel-powered) vehicle counts that are either gasoline- or diesel-powered. For example, GSFVCT (1) = DAF(1) / [DAF(1) + DAF(5)], where DAF is the fleet sum of the product of the registration distribution and the diesel sales fractions by model year in a given calendar year. The DAF values change with calendar year. Examples of how the DAF values are estimated are shown in the tables with numbers ending in .5 in Appendix H. Also, the diesel sales fractions by model year are given in Tables x.5.4B for the LDVs and in Tables x.6.4B for the LDTs.

TFNORM(IV) = The registration-weighted average of annual miles driven by each vehicle of vehicle type IV. The derivation of these values is illustrated in each of the tables with numbers ending in .5 in Appendix H (denoted as TFNORM at the bottom of the C*D column).

TOTVMT = The total miles traveled by the entire highway mobile source fleet.

SUMiv = The summation over the eight vehicle types.

VMTMIX(IV) = The estimated VMT fraction for vehicle type IV.

An example of the VMT mix calculation follows. This example is based on the travel weighting factor calculation tables (Tables x.x.5 in Appendix H) and registration counts for the January 1, 1988 VMT mix estimates:

Step 1: Estimate GSFVCT values for each of the vehicle types.

IV	DAF	Adjustment	GSFVCT
1	0.944	0.944/(0.944 + 0.014)	0.985
2	0.929	0.929/(0.929 + 0.024)	0.975
3	0.929	0.929/0.929	1.0
4	0.935	0.935/0.935	1.0
5	0.014	0.014/(0.944 + 0.014)	0.015
6	0.024	0.024/(0.929 + 0.024)	0.025
7	0.918	0.918/0.918	1.0
8	0.904	0.904/0.904	1.0

Step 2: Calculate VMTMIX according to the equations given above.

IV	VCOUNT	GSFVCT	TFNORM	MILES	VMTMIX
1	117,268,000	0.985	9,253.6	10.69×10^{11}	0.708
2	18,634,000	0.975	10,604.2	1.93×10^{11}	0.128
3	11,518,000	1.0	11,243.4	1.26×10^{11}	0.086
4	1,854,000	1.0	12,397.5	0.23×10^{11}	0.015
5	117,268,000	0.015	11,382.8	0.20×10^{11}	0.013
6	18,634,000	0.025	11,566.7	0.09×10^{11}	0.004
7	1,301,000	1.0	41,840.1	0.54×10^{11}	0.036
8	4,179,000	1.0	3,657.4	0.15×10^{11}	0.010
			Total	15.09×10^{11}	

Appendix C

CALCULATION PROCEDURE TO COMBINE THE EMISSION RESULTS OF THE TWO LIGHT-DUTY GASOLINE-POWERED TRUCK CLASSES

Frequently air quality analyses require the use of one light-duty gasoline-powered truck vehicle type, as opposed to two. However, emission factors are presented for two truck types: LDGT1s and LDGT2s. As a result, a procedure based on VMT has been developed to combine the two truck types. This appendix describes this procedure.

The generalized formula is as follows:

$$\frac{VMT(LDGT1) \times EF(LDGT1) + VMT(LDGT2) \times EF(LDGT2)}{VMT(LDGT1) + VMT(LDGT2)}$$

To illustrate this, an example based on January 1, 1988 emission factor results is used. On January 1, 1988, the LDGT1 and LDGT2 calculated CO emission factors (based on standard FTP conditions and in-use 11.5 psi RVP fuels) are 39.37 and 41.27 grams/mile, respectively. Further, from Appendix B, the LDGT1 and LDGT2 proportions of the total fleet VMT are 12.8 percent and 8.6 percent, respectively. Finally, also from Appendix B, the entire fleet travels 15.09×10^{11} miles.

The combined truck types travel the following miles on January 1, 1988:

$$(15.09 \times 10^{11} \text{ miles}) * 0.128 + (15.09 \times 10^{11} \text{ miles}) * 0.086$$
$$= 1.93 \times 10^{11} \text{ miles} + 1.30 \times 10^{11} \text{ miles}$$

The total grams emitted by the combined truck types are:

$$(1.93 \times 10^{11} \text{ miles}) * 39.37 \text{ g/mi}$$
$$+ (1.30 \times 10^{11} \text{ miles}) * 41.27 \text{ g/mi}$$

As a result, the calculated CO gram/mile emission factor estimate for the combined truck type is, in total grams/total miles:

$$[(15.09 \times 10^{11} \text{ miles}) * 0.128 * 39.37 \text{ g/mi}$$
$$+ (15.09 \times 10^{11} \text{ miles}) * 0.086 * 41.27 \text{ g/mi}]$$
$$/ [(15.09 \times 10^{11} \text{ miles}) * 0.128 + (15.09 \times 10^{11} \text{ miles}) * 0.086]$$

or,

$$\frac{0.128 * 39.37 \text{ g/mi} + 0.086 * 41.27 \text{ g/mi}}{0.128 + 0.086} = 40.14 \text{ g/mi.}$$

Appendix D

METHODOLOGY FOR CALCULATING JANUARY 1 TRAVEL WEIGHTING INFORMATION AND FLEET AVERAGE MILEAGE ACCUMULATION

This appendix describes the derivation of January 1 registration distributions, the annual rate of mileage accrual for the fleet, and the fleet average mileage accumulation distributions. The January 1 registration and annual rate of mileage accrual distributions are used in the calculation of travel weighting fractions. The fleet average mileage accumulation distributions are used to estimate the January 1 emission levels by model year.

D.1 JANUARY 1 TRAVEL WEIGHTING INFORMATION

The travel weighting fractions for a given vehicle type are the individual model year proportions of the total VMT for the vehicle type. To generate the travel weighting fractions, three distributions are required:

(a) annual mileage accrual rate per vehicle by age distribution,
(b) registration distribution, and,
(c) diesel sales fraction distribution.

D.1.1 January 1 Registration Distribution Transformations

The first step of the January 1 travel fraction calculation procedure is to estimate the January 1 model year registration distribution for each vehicle type. The model year registration distribution, frequently referred to as the registration mix, begins with all model years combined for a given vehicle type and apportions them into their appropriate model year index (except for model year index 20, which represents all model years that were built 20 or more model years ago). At this phase of the registration mix development, the LDV and LDT model year registration distributions are composed of both the gasoline- and diesel-powered vehicle types.

For the MOBILE4 computer program, the initial model year registration distributions are assumed to be based on July 1 data. This July 1 information is then transformed into January 1 model year registration distributions. For vehicle types where sales begin on October 1 (such as light-duty vehicles and trucks), it is assumed that the original July 1 model year registration distribution accounts for approximately 75 percent of the current model year fleet. Using the assumption of uniform sales throughout the year, approximately 25 percent of the model year fleet would have been sold by January 1 (or one-third of the July 1 registration).

The older model year registration figures are six months older on July 1 than they are on January 1. However, no direct adjustment are made to these older model year registration values. Although the difference between January 1 and July 1 for the older model vehicles is primarily due to scrappage, the older model year registration values are to be adjusted later.

Denoting the July 1 registration fractions as R(1), R(2), R(3), . . ., R(20+), the January 1 adjustment equations can be generalized as follows:

FIRST MODEL YEAR INDEX: 1/3 * R(1)
SECOND AND LATER MODEL YEAR INDEX: R(i), i=2, 3, . . ., 20+

The second step of adjustment for the January 1 model year registration distributions is to account for the gasoline/diesel sales fractions: the separation of the model year sales into diesel- and gasoline-powered vehicle types. (The diesel sales fractions by model year are given in Tables x.5.4B for LDVs and x.6.4B for LDTs in Appendix H.) As a result, the January 1 model year registration distributions are adjusted according to the following formulae:

FIRST MODEL YEAR INDEX: 1/3 * R(1) * F(my)
SECOND AND LATER MODEL YEAR INDEX: R(i) * F(my-i+1)

where F(my) is the model year sales fractions which are gasoline-powered if calculating the LDGV or LDGT registration distributions, or the model year sales fractions which are diesel-powered if calculating the LDDV or LDDT registration distributions.

The last step of adjustment is to normalize the January 1 model year registration distribution so that the fractions from each model year index sum up to unity. To accomplish this adjustment, the following procedure is used:

DAF = SUMi [P(i) * R(i) * F(my-i+1)]

where:

P(1) = 1/3
P(i) = 1, for i = 2, 3, . . ., 20+
R(i) = July 1 registration values, i = 1, 2, 3, . . ., 20+
F(my-i+1) = sales fractions (either gasoline or diesel) for model year my-i+1
SUMi = summation over the 20 model years.

Then for each January 1 registration, the value of P(i)*R(i)*F(my-i+1) is divided by DAF to estimate the January 1 registration mix.

For vehicles whose sales begins on January 1 (such as heavy-duty vehicles and motorcycles), there are two changes to the above normalization procedure: P(1) is set to zero, and every F(my-i+1) term is set to 1.0.

D.1.2 January 1 Annual Rate of Mileage Accrual for the Fleet

The last aspect of calculating the travel weighting fractions is to determine the January 1 annual rate of mileage accrual. The following example illustrates the methodology used for calculating the average mileage accumulation rate for the 1988 model year (MY) LDGVs on January 1 of 1988, 1989, 1990, and later years.

First, the average annual mileage accumulation rate of the MY 1988 LDGVs on January 1, 1988, is calculated (i.e., the calendar year when the vehicle model year index is one). It is assumed that mileage accrual is uniform throughout the year and that 1988 LDGV model year sales begin on October 1, 1987.

Using these assumptions, it is obvious that by January 1, 1988, all 1988 MY vehicles are less than one year old and accumulate mileage at the first year rate of 13,118 miles. (The annual rates of mileage accural of LDGVs are presented in Table 1.1.4A of Appendix H.) By January 1, 1989, those vehicles that were sold by January 1, 1988 have been on the road for an additional year and accumulate mileage at the second year annual rate of 12,408 miles.

In addition to the MY 1988 vehicles sold before January 1, 1988, there are also those sold after January 1 and before October 1, 1988. Again by assuming uniform sales, approximately 75 percent of the MY 1988 vehicles are sold after January 1, 1988. Further, on January 1, 1989 these vehicles are still in their first year of mileage accumulation and are accumulating mileage at an annual rate of 13,118 miles.

Since the first group represents three months of sales and the second group represents nine months of sales, the average annual mileage accrual rate of MY 1988 vehicles on January 1, 1989 can be expressed as follows:

$$(0.25 * 12{,}408 \text{ miles}) + (0.75 * 13{,}118 \text{ miles})$$

By extension, the formula for the average mileage accumulation rate of the MY 1988 vehicles on January 1, 1990 is as follows:

$$(0.25 * 11{,}737 \text{ miles}) + (0.75 * 12{,}408 \text{ miles})$$

Denoting the average annual rate of mileage accrual during the first, second, and third year as M(1), M(2), and M(3), respectively, the generalized average annual mileage accumulation rate equations on January 1 are as follows:

FIRST MODEL YEAR INDEX:	M(1)
SECOND MODEL YEAR INDEX:	0.25 * M(2) + 0.75 * M(1)
THIRD MODEL YEAR INDEX:	0.25 * M(3) + 0.75 * M(2)
Ith MODEL YEAR INDEX:	0.25 * M(i) + 0.75 * M(i-1)

For the vehicle types whose sales begin on January 1 (such as heavy-duty vehicles and motorcycles), the generalized formulae are as follows:

FIRST MODEL YEAR INDEX:	0
Ith MODEL YEAR INDEX:	M(i-1)

D.2 JANUARY 1 FLEET AVERAGE MILEAGE ACCUMULATION

To estimate the emission levels on January 1 for each model year (as shown in Tables x.(IV).11A through x.(IV).11C of Appendix H for each vehicle type), the annual mileage accrual rate per vehicle by age is used to derive the fleet average mileage accumulation distribution.

The following example explains the methodology used for calculating the average January 1 fleet cumulative mileages for the 1988 model year (MY) LDGVs on January 1 of 1988, 1989, 1990, and later years.

First, the average fleet cumulative mileage of the MY 1988 vehicles on January 1, 1988 (i.e., the calendar year when the vehicle model year index is defined as "1") is calculated. As described in the previous section, MOBILE4 assumes that both the vehicle sales and the vehicle mileage accrual are uniformly distributed throughout the year, and for LDGVs the MY 1988 sales began on October 1, 1987. Then, by January 1, 1988 (25 percent of the way through the sales year), approximately 25 percent of the 1988 model year vehicles would have been sold. These vehicles range in age from 0 to 3 months. Assuming uniform sales, their average age is 1.5 months.

The average mileage accrual for these MY 1988 vehicles which were sold by January 1, 1988 is 1.5/12.0 (or 0.125) multiplied by the annual rate of mileage accumulation of 13,118 miles for the first year. (The annual mileage accrual rates for LDGVs are presented in Tables x.1.4A and x.1.5 of Appendix H.) By January 1, 1989, vehicles sold before January 1, 1988 have been on the road for an additional year. Therefore, they have accumulated mileage for 1.0+(1.5/12.0) years (or 1.125 years). Referring to Table 1.1.4A for the rates of annual mileage accrual, the average cumulative mileage of these vehicles are calculated as the sum of the first year's mileage of 13,118 miles plus 0.125 multiplied by the second year mileage rate of 12,408 miles.

In addition to the 1988 MY vehicles sold before January 1, 1988, there are also those sold between January 1, 1988 and September 30, 1988. Again by the uniform sales assumption, by January 1, 1989 these vehicles range in age from 3 to 12 months, with an average age of 7.5 months. Since these vehicles are still in their first year of use on January 1, 1989, their average mileage accumulation is 7.5/12.0 (or 0.625) multiplied by 13,118 miles.

The average cumulative mileage of all MY 1988 LDGVs on January 1, 1989 is the sales weighted average of the cumulative mileages for these two groups of vehicles (those sold before January 1 and those sold after January 1). Since the first group represents three months of sales and the second group represents nine months of sales, the weighted average cumulative mileage of MY 1988 vehicles on January 1, 1989 can be expressed as follows:

$$0.25 * (13118 \text{ miles} + 0.125 * 12408 \text{ miles}) + 0.75 * (0.625 * 13118 \text{ miles})$$

By extension, the formulae for the cumulative mileage of 1988 MY vehicles on January 1, 1990 is given by:

$$0.25 * (13118 \text{ miles} + 12408 \text{ miles} + 0.125 * 11737 \text{ miles}) + 0.75 * (13118 \text{ miles} + 0.625 * 12408 \text{ miles})$$

Denoting the average rate of mileage accumulation during the first, second, and third years as M(1), M(2), and M(3), we can generalize the equations for cumulative mileage on January 1 as follows:

FIRST YEAR:	$0.125 * M(1)$
SECOND YEAR:	$0.25 * [M(1) + 0.125 * M(2)] + 0.75 * [0.625 * M(1)]$
THIRD YEAR:	$M(1) + 0.25 * [M(2) + 0.125 * M(3)] + 0.75 * [0.625 * M(2)]$
Ith YEAR:	$M(1) + M(2) + \ldots + M(i-2) + 0.25 * [M(i-1) + 0.125 * M(i)] + 0.75 * [0.625 * M(i-1)]$

For vehicles whose sales year begins on January 1 (e.g., heavy-duty vehicles and motorcycles), the formulae are simplified as follows:

FIRST YEAR:	0
SECOND YEAR:	$0.5 * M(1)$
THIRD YEAR:	$M(1) + M(2) + \ldots + M(i-2) + 0.5 * M(i-1)$

Appendix E

METHOD FOR DETERMINING EMISSIONS DUE TO OR INCLUDING TAMPERING AND MISFUELING

E.1 BACKGROUND

Since 1978, EPA has been conducting surveys of in-use vehicles (passenger cars and trucks) nationwide, collecting data regarding emission component disablements and misfueling. Three of the latest available surveys, completed in 1984, 1985, and 1986, were chosen as the data base for MOBILE4 tampering and misfueling rates.

Tampering and misfueling rates are determined for four vehicle types (LDGVs, LDGT1s, LDGT2, and HDGVs) only. Due to lack of information on both rates and effects, no tampering and misfueling rates are assumed for other vehicle types. Separate tampering rates are used for non-I/M areas and areas with I/M programs, for nine different categories: air pump disablement, catalyst removal, EGR system disabled, filler neck damaged, fuel tank misfueled, total misfueled, PCV system disabled, canister disconnect, and both canister and fuel cap removal. Total misfueled is the sum of the filler neck damaged and fuel tank misfueled categories. For the light-duty vehicles and trucks, two separate groups are considered: pre-1981 model years, and 1981 and later model years.

As in MOBILE3, linear regression equations on mileage were fit to the three year survey data. In MOBILE4, each equation is defined by a zero mile rate, an increase in the rate for every 10,000 miles of fleet average mileage for the first 50,000 miles, and (depending on vehicle type and tampering category) either the same or a different increase in the rate for every 10,000 miles of fleet average mileage after 50,000 miles.

The regression coefficients are given in Tables x.(IV).9A in Appendix H. In these tables, some coefficients at the zero-mile level are negative. However, if a tampering or misfueling rate for a particular model year is calculated to be less than zero in the evaluation year, that rate is set to zero.

Also in Tables x.(IV).9A, the overlap among tampering types is ignored. One vehicle could contribute to several of the regression equations. The overall tampering rate at a given mileage is, therefore, less than the sum of these equations. However, when estimating the excess emissions due to tampering, it is necessary to explicitly account for vehicles with more than one form of tampering, since tampering effects on emissions are not always additive. The following sections describe the methodology with an illustrated example.

The method described below assumes that the user is interested in a situation in which vehicles are driven under standard conditions of temperature, speed, etc. All of the emission impacts shown in this document assume such a situation as well. It is possible to analyze other situations if correction factors for non-standard conditions are applied at an appropriate step in the calculation. MOBILE4 does this automatically.

E.2 Discussion of Methodology

The approach used begins with a single model year vehicle. The calculation is performed for each of the last 19 model years, resulting in a total emissions impact for each from all forms of tampering combined. These 19 model-year-specific impacts are then added using age-based vehicle-miles-traveled (VMT) fractions as weighting factors to arrive at the impact on the composite emissions of, for example, the LDGVs of all ages.

The discussion below is for low-altitude LDGVs. The same procedure is used for LDGT1s, LDGT2s, or HDGVs by substituting the appropriate tampering rates, emission impacts, etc. The calculation consists of the following steps for each model year.

Step 1:

Separate the model year into subgroups with distinct combinations of equipment, such that all vehicles in a subgroup are susceptible to the same types of tampering. Specifically, vehicles with catalyst and air pump must be separated from vehicles with air pump only, and from vehicles with catalyst only, since simultaneous air pump and catalyst tampering is possible for one subgroup but not the others. The sales fractions for each of these subgroups must also be known. (These fractions are given in Table 1.1.10C of Appendix H.)

In a single model year, vehicles either have or do not have PCV and evaporative controls. The fuel cap is considered as a part of the evaporative control system. The impacts of PCV and evaporative control system tampering are independent from the impacts of other types of tampering, such as misfueling, catalyst removal, and air pump disablement. For these reasons, there is no need to define subgroups based on PCV and evaporative equipment.

Step 2:

Identify all the unique combinations of tampering that could occur in each subgroup. These are as follows:

Air Pump/Catalyst	Catalyst Only	Air Pump Only
1. Air Pump/Catalyst		
2. Air Pump/Filler Neck Damaged		
3. Air Pump/Fuel Tank Misfueled		
4. Air Pump/Catalyst/Filler Neck Damaged		
5. Air Pump/Catalyst/Fuel Tank Misfueled		
6. Catalyst/Filler Neck Damaged	X	
7. Catalyst/Fuel Tank Misfueled	X	
8. Air Pump Only		X
9. Catalyst Only	X	
10. Filler Neck Damaged Only	X	
11. Fuel Tank Misfueled Only	X	

In the above list, "Filler Neck Damaged" designates habitual misfueling accompanied by tampering of the fuel inlet restrictor, "Fuel Tank Misfueled" designates habitual misfueling accomplished by other means, such as a small pump nozzle or a funnel.

Step 3:

Find the percentage of vehicles with each of the above unique combinations of tampering on the evaluation date, assuming no special program to reduce tampering and misfueling. These rates are described in Tables 1.1.9A, and are functions of the model year vehicle mileage on the evaluation date (January 1). (The mileage accumulation rate is given in Table 1.1.4A of Appendix H). Given an odometer value, the coefficients from Table 1.1.9A can be used to calculate the overall rates of tampering for air pump disablement (AIR), catalyst removal (CAT), misfueling via damaged filler neck (INLET), and fuel tank misfueled (OTHER).

These overall tampering rates are the sum of the rates for two or more of the above unique combinations of tampering. To calculate the individual rate for each unique combination, additional assumptions are necessary. EPA has assumed that the rate for a given overlap combination is always proportional to the overall rate of one or the other of the forms of tampering that make up the overlap combination. For example, the rate of simultaneous air pump and catalyst tampering affecting HC/CO emissions for 1981 and later model year LDGVs is 6.08 percent of the overall air pump tampering rate, regardless of any local variation in overall air pump tampering rate or overall catalyst tampering rate. This 6.08 percentage value, called the category size factor, was determined from the tampering survey data.

The category size factors used in MOBILE4 are defined by the pollutant affected (either HC/CO or NOx), and by the model year group (pre-1981 vs. 1981 and later model years):

Air Pump/Catalyst	HC/CO Emissions Pre-1981	HC/CO Emissions 1981+	NOx Emissions Pre-1981	NOx Emissions 1981+
1. Air Pump/Catalyst	0.2025	0.0608	0.1349	0.0786
2. Air Pump/Filler Neck Damaged	0.1942	0.1466	0.0353	0.0137
3. Air Pump/Fuel Tank Misfueled	0.0423	0.0363	0.0161	0.0149
4. Air Pump/Catalyst/Filler Neck Damaged	0.3454	0.2516	0.1392	0.0778
5. Air Pump/Catalyst/Fuel Tank Misfueled	0.0270	0.0283	0.0263	0.0
6. Catalyst/Filler Neck Damaged	0.2371	0.3750	0.1899	0.2780
7. Catalyst/Fuel Tank Misfueled	0.1176	0.0802	0.0526	0.0750

Necessary adjustments are made to prevent any logical contradiction. In the example given below, the rates of simultaneous filler neck damaged from vehicles with air pump only, from vehicles with catalyst only, and from vehicles equipped with catalyst and air pump are assumed to be equal to or less than the overall rate of filler neck damaged. Similar assumptions are made for other overlap combinations. The resultant tampering rates for each unique combination are used for calculating both the excess exhaust and the excess idle emissions. An example of the assumptions is as follows:

Air Pump/Catalyst	Rate
1. Air Pump/Catalyst	0.0608 x AIR
2. Air Pump/Filler Neck Damaged	0.1466 x AIR
3. Air Pump/Fuel Tank Misfueled	0.0363 x AIR
4. Air Pump/Catalyst/Filler Neck Damaged	0.2516 x CAT
5. Air Pump/Catalyst/Fuel Tank Misfueled	0.0283 x CAT
6. Catalyst/Filler Neck Damaged	0.3750 x CAT
7. Catalyst/Fuel Tank Misfueled	0.0802 x CAT
8. Air Pump Only	AIR - (1,2,3,4,5)
9. Catalyst Only	CAT - (1,4,5,6,7)
10. Filler Neck Damaged Only	INLET - (2,4,6)
11. Fuel Tank Misfueled Only	OTHER - (3,5,7)

PCV tampering rates come directly from the coefficients in Table 1.1.9A. Two sets of tampering rates are given for evaporative control system tampering: both canister and fuel cap disconnect, and canister disconnect. Therefore, the rate of fuel cap removal alone is to be calculated from the difference between the two rates.

Step 4:

Assign each unique combination of tampering an emissions impact (excess emissions or uncontrolled emissions) per vehicle. The impacts are taken from Table 1.1.9B for the exhaust and idle excess emissions, Table 1.1.9C for the uncontrolled evaporative crankcase, hot soak and diurnal emissions, and Table 1.1.9D for the uncontrolled evaporative running loss emissions. The following assumptions applied to cases of simultaneous tampering:

1) The impact of simultaneous catalyst removal and of misfueling and/or air pump tampering is the same as stated in Table 1.1.9B for catalyst removal alone.

2.) The impact of simultaneous misfueling and air pump tampering is the same as stated in Table 1.1.9B for misfueling alone.

Step 5:

Multiply the tampering rate by the emissions impact for each unique combination, then add the result for all combinations, taking into account the sales split between the air pump only subgroup, the catalyst only subgroup, and the air pump- and catalyst-equipped subgroup. The sum is the excess exhaust or idle emissions due to the tampering and misfueling.

Composite excess exhaust or idle emissions can be calculated by weighting each model year by its age-based VMT fraction (also known as the travel fraction).

Excess crankcase emissions due to PCV tampering are calculated from the PCV tampering rate, emissions impact, and fractions equipped with PCV.

Step 6:

Except for crankcase evaporative emissions, all other evaporative emissions (hot soak, diurnal, and running loss) including tampering are calculated from the following six components: nontampered emission rate, fraction of nontampered fleet, uncontrolled emissions due to canister disconnect, fractions of the fleet with canister disconnect, uncontrolled emissions due to fuel cap removal, and fractions of the fleet with fuel cap removal. Excess emissions are, therefore, calculated internally from uncontrolled and controlled evaporative emission levels.

E.3 Example Calculation

This example calculates the excess emissions due to tampering and misfueling for the 1982 model year LDGVs evaluated on January 1, 1988. It is assumed that the vehicles are located in a non-I/M area, with the national average tampering and misfueling rates described in Table 1.1.9A. The average 1982 model year vehicle is estimated to have accumulated 66,303 miles by January 1, 1988 (from Table 1.1.4A under model year index 7).

Table E-1

Example Calculation of Tampering and Misfueling Rates*

System	Zero-Mile Level(A)	Increase/ 10K miles(B) (< 50K mi)	Increase/ 10K miles(C) (> 50K mi)	Rate** at 66,303 mi = X
Air Pump Disablement	-0.0157	0.00961	0.03819	0.0946
Catalyst Removal	-0.0071	0.00574	0.01546	0.0468
Filler Neck Damaged	-0.0068	0.00496	0.00496	0.0261
Fuel Tank Misfueled	0.0140	0.00101	0.00101	0.0207
PCV System Disabled	-0.0059	0.00315	0.00315	0.0150
Canister Disconnect	-0.0206	0.01154	0.01154	0.0559
Both Canister & Cap	-0.0186	0.01301	0.01301	0.0677

* Non-I/M area LDGVs.
**Rate = A + B*5.0 + C*(X/10K - 5.0).

The overall rates are then used to estimate the size of the eleven overlap categories. These categories do not include PCV and evaporative control system tampering, which are to be addressed later in this section. (As mentioned in Section E.2, Step 1, the evaporative control system tampering also includes the fuel cap removal.) For HC and CO excess exhaust emissions, there are three technology types of interest: 1) air pump only, 2) catalyst only, and, 3) catalyst with air pump.

The category sizes for air pump only and catalyst only are calculated directly from the coefficients in Table 1.1.9A, as shown from Table E-1 to be 0.0946 and 0.0468, respectively. The category sizes for catalyst with air pump are shown below, using the equations and category size factors described in Section E.2, Step 3.

	Category Description*	Equation** from Section E.2, Step 3	Category Size at Evaluation
1.	AIR/CAT	0.0608 x AIR	0.00575
2.	AIR/INLET	0.1466 x AIR	0.01387
3.	AIR/OTHER	0.0363 x AIR	0.00347
4.	AIR/CAT/INLET	0.2516 x CAT	0.01178
5.	AIR/CAT/OTHER	0.0283 x CAT	0.00132
6.	CAT/INLET	0.3750 x CAT	0.01755
7.	CAT/OTHER	0.0802 x CAT	0.00375
8.	AIR	AIR - (1,2,3,4,5)	0.05841
9.	CAT	CAT - (1,4,5,6,7)	0.00665
10.	INLET	INLET - (2,4,6)	-.01710
11.	OTHER	OTHER - (3,5,7)	0.01216

Note that the category size of INLET from the above table is less than zero (-0.01710), as the overall INLET from Table E-1 is 0.0261, which is less than the sum of 0.0432 from the three subgroups (2, 4, and 6). An adjustment is made so that the sum of the three subgroups be equal to the overall rate of 0.0261, as shown below:

Category Description*	Category Size at Evaluation	Adjustment	Adjusted Category Size
2. AIR/INLET	0.01387	.01387/.0432*.0261	0.00833
4. AIR/CAT/INLET	0.01178	.01178/.0432*.0261	0.00712
6. CAT/INLET	0.01755	.01755/.0432*.0261	0.01060
Total:	0.04320		

* AIR = Air pump disablement, CAT = Catalyst removal, INLET = Misfueling by enlarging fuel filler neck, and OTHER = fuel tank misfueled.

** Rates for AIR, CAT, INLET, and OTHER from Table E-1.

With the adjustments, the revised overlap categories are shown in Table E-2.

Table E-2

Revised Overlap Categories

	Category Description*	Equation** from Section E.2, Step 3	Category Size at Evaluation
1.	AIR/CAT	0.0608 x AIR	0.00575
2.	AIR/INLET	0.1466 x AIR	0.00833
3.	AIR/OTHER	0.0363 x AIR	0.00347
4.	AIR/CAT/INLET	0.2516 x CAT	0.00712
5.	AIR/CAT/OTHER	0.0283 x CAT	0.00132
6.	CAT/INLET	0.3750 x CAT	0.01060
7.	CAT/OTHER	0.0802 x CAT	0.00375
8.	AIR	AIR - (1,2,3,4,5)	0.06861
9.	CAT	CAT - (1,4,5,6,7)	0.00665
10.	INLET	INLET - (2,4,6)	0.0
11.	OTHER	OTHER - (3,5,7)	0.01216

* AIR = Air pump disablement, CAT = Catalyst removal, INLET = Misfueling by enlarging fuel filler neck, and OTHER = fuel tank misfueled.

** Rates for AIR, CAT, INLET, and OTHER from Table E-1.

Next, the emission impacts of each of the categories must be determined. Since all of the 1982 model year vehicles are equipped with either an oxidation catalyst or a 3-way oxidation catalyst, the HC/CO emission impacts of air pump disablement, catalyst removal and misfueling can be taken directly from Table 1.1.9B in Appendix H.

For simplicity, only total HC emissions will be addressed in this example. Using the two assumptions stated in Section E.2, Step 4, the overlap categories 1, 4, 5, 6, 7, and 9, which all contain catalyst removal, are assumed to have the same emissions impact as from catalyst removal alone. Similarly, the overlap categories 2, 3, 10, and 11, which all contain misfueling, are assumed to have the same emissions impact as from misfueling alone. Category 8, which contains only air pump disablement, experiences the air pump disablement emissions impact.

The excess exhaust emissions due to tampering and misfueling are determined by multiplying the size of each emission impact group, and the appropriate excess emission estimate. The three technology types are then weighted by their fleet fractions from Table 1.1.10C and summed for the combined excess emissions from air pump, catalyst, and misfueling. This calculation is presented in Table E-3.

Table E-3

Example Calculation of Exhaust Emission Impact

Emission Impact Groups	Overlap Categories	(A) Emission Impact Group Size	(B) Excess Total HC Emissions (g/mi)	(C) Composite Technology Fleet Fraction	Emission Impact (A*B*C)
Catalyst with Air Pump					
Air Pump Disablement	8	0.06861	0.85	0.70	0.041
Catalyst Removal	1,4,5,6,7,9	0.03519	2.04	0.70	0.050
Misfueled	2,3,10,11	0.02396	1.44	0.70	0.024
Air Pump Only					
Air Pump Disablement	1-5,8	0.09460	0.85	0.00	0.0
Catalyst Only					
Catalyst Removal	1,4,5,6,7,9	0.04680	2.04	0.30	0.029
Misfueled	2,3,10,11	0.02396	1.44	0.30	0.010
		Total Emission Impact (g/mi):			0.154

The excess idle emissions due to tampering and misfueling are determined similarly, with the exception that excess idle emissions in g/hr are used in the calculation.

PCV and evaporative canister tampering effects are assumed not to overlap with any of the other tampering and misfueling effects discussed above. The excess crankcase emissions due to PCV tampering can be determined by simply multiplying together the evaluation date tampering rate of 0.0150 (from Table E-1), the excess emissions of 1.21 g/mi (from Table 1.1.9C), and technology type fleet fractions of 100.0 percent (from Table 1.1.10C). The calculated evaporative crankcase emissions impact due to PCV tampering is 0.018 g/mi for model year 1982 LDGVs on January 1, 1988.

The calculation of other evaporative HC emissions including tampering are more complicated. First, the two types of evaporative control system tampering to be considered are canister disconnect and fuel cap removal. The rate of canister disconnect is 0.0559 (from Table E-1). The rate of fuel cap removal is 0.0118, which is the rate differences between "both

canister and cap" and "canister disconnect" categories (i.e., 0.0677 - 0.0559 = 0.0118, from Table E-1). The fraction of the fleet exhibiting no evaporative control system tampering is 0.9323.

As mentioned in Section E.2 (Step 6), the evaporative emissions impact is estimated from the uncontrolled emission rates. As can be seen from Tables 1.1.9C and 1.1.9D in Appendix H, the uncontrolled hot soak, diurnal, and running loss emissions (like their nontampered counterparts) are dependent on fuel volatility level, ambient temperature, and fuel-metering technology. For simplicity, a certification RVP level of 9.0 psi is assumed. The diurnal emissions are derived from the FTP heat build of 60° to 84°F, the hot soak emissions are estimated at 82°F, and the running loss emissions are at an ambient temperature of 80°F. Further, to estimate hot soak and diurnal emissions, fleet fractions of fuel-metering systems (ported fuel-injected, throttle-body fuel-injected, and carbureted) are also needed. For model year 1982 LDGVs, the fleet fractions of these three technology groups are 0.063, 0.108, and 0.829, respectively (from Table 1.1.10D of Appendix H). The calculation of the uncontrolled evaporative emission rates (g/test for hot soak and diurnal, g/mi for running loss) is presented below.

Emission Type	Fuel Metering System	Uncontrolled Emissions	Fuel-Metering Technology Fractions	Combined Uncontrolled Emissions
Canister Disconnect				
Hot Soak	Carbureted	10.36	0.829	
	Fuel-injected	5.20	0.171	9.478
Diurnal	Carbureted	14.70	0.829	
	Fuel-injected	14.70	0.171	14.700
Running Loss	All	0.52	1.0	0.520
Fuel Cap Removal				
Hot Soak	Carbureted	0.0	0.829	
	Fuel-injected	5.20	0.171	0.889
Diurnal	Carbureted	14.70	0.829	
	Fuel-injected	14.70	0.171	14.700
Running Loss	All	1.23	1.0	1.230

The nontampered hot soak and diurnal emissions (g/test) are given in Table 1.1.2A of Appendix H. The nontampered g/mi running loss emissions are from Table 1.1.2C of Appendix H. Table E-4 shows the calculation of evaporative emissions including tampering.

Table E-4

Example Calculation of Evaporative HC Emissions Including Tampering

Emission Type	Non-tampered Emissions	Non-tampered Fleet Fraction	Canister Disconnect Combined Emission Rate	Canister Disconnect Tampered Fleet Fraction	Fuel Cap Removal Combined Emission Rate	Fuel Cap Removal Tampered Fleet Fraction	Composite Emissions
Hot Soak	1.80	0.9323	9.478	0.0559	0.889	0.0118	2.218
Diurnal	2.29	0.9323	14.700	0.0559	14.700	0.0118	3.130
Running Loss	0.24	0.9323	0.520	0.0559	1.230	0.0118	0.268

Appendix F

CALCULATION PROCEDURE FOR VMT VS. AGE DISTRIBUTIONS FOR HEAVY-DUTY DIESEL-POWERED VEHICLES

In MOBILE4, the VMT distribution for heavy-duty diesel-powered vehicles (HDDVs) in any given calendar year is calculated from the VMT vs. age distributions of four distinct HDDV weight classes. The four weight classes of diesel-powered trucks are:

Class	Gross Vehicle Weight (Lbs)
2B	8,500 - 10,000
Light (3-5)	10,001 - 19,500
Medium (6-8A)	19,501 - 50,000
Heavy (8B)	> 50,000

The annual mileage accumulation distributions by age for each weight class, given in Table F-1, are weighted together by their registration fractions in each weight class to derive an overall heavy-duty diesel mileage distribution (under "weighted average" in Table F-1) for each calendar year. The registration fractions are shown at the bottom of Table F-1 for calendar year 1988. These fractions are calculated from the estimated number of vehicles in each weight class for each calendar year (for example, 1988), as shown in Table F-2.

Table F-1

Calendar Year 1988 HDDV VMT Example

Age	Annual Mileage Accumulation Rates: Class 2B	Light (3-5)	Medium (6-8A)	Heavy (8B)	Weighted Average
1	17,608	23,611	43,946	86,375	56,990
2	16,217	20,947	40,504	79,434	52,418
3	14,937	18,583	37,332	73,051	48,214
4	13,758	16,486	34,408	67,181	44,348
5	12,671	14,625	31,713	61,782	40,792
6	11,671	12,975	29,229	56,817	37,522
7	10,749	11,511	26,939	52,252	34,514
8	9,901	10,212	24,829	48,053	31,749
9	9,119	9,059	22,885	44,191	29,205
10	8,399	8,037	21,092	40,640	26,865
11	7,736	7,130	19,440	37,374	24,713
12	7,125	6,325	17,918	34,371	22,735
13	6,562	5,612	16,514	31,609	20,914
14	6,044	4,978	15,221	29,069	19,240
15	5,567	4,416	14,029	26,733	17,700
16	5,127	3,918	12,930	24,585	16,283
17	4,723	3,476	11,917	22,609	14,980
18	4,350	3,084	10,984	20,792	13,781
19	4,006	2,736	10,123	19,121	12,678
20+	3,690	2,427	9,931	17,585	11,665

Registration fractions for each weight class of HDDVs in 1988* are:

0.2113	0.0321	0.3026	0.4540

* The registration fractions for the four HDDV weight classes are calculated from the total registrations by class (Table F-2) divided by the overall HDDV registrations (last column of Table F-2).

Table F-2

Total HDDV Registrations by Class
for 1980 through 2000

Calendar Year	Total Registrations (in Millions) Class 2B	Light (3-5)	Medium (6-8A)	Heavy (8B)	Overall
1980	0.001	0.003	0.536	0.990	1.530
1981	0.001	0.004	0.570	1.033	1.608
1982	0.047	0.009	0.590	1.049	1.695
1983	0.119	0.015	0.609	1.067	1.810
1984	0.200	0.024	0.648	1.129	2.001
1985	0.309	0.041	0.711	1.189	2.250
1986	0.397	0.057	0.761	1.228	2.443
1987	0.495	0.074	0.811	1.260	2.640
1988	0.599	0.091	0.858	1.287	2.835
1989	0.710	0.107	0.902	1.308	3.027
1990	0.831	0.122	0.944	1.324	3.221
1991	0.956	0.136	0.988	1.340	3.420
1992	1.086	0.150	1.033	1.356	3.625
1993	1.214	0.164	1.079	1.372	3.829
1994	1.341	0.176	1.127	1.387	4.031
1995	1.464	0.188	1.175	1.406	4.233
1996	1.585	0.200	1.225	1.425	4.435
1997	1.702	0.211	1.277	1.447	4.637
1998	1.816	0.221	1.328	1.470	4.835
1999	1.925	0.232	1.379	1.495	5.031
2000	2.030	0.241	1.430	1.522	5.223

Appendix G

SAMPLE CALCULATION OF MOTOR VEHICLE EMISSIONS

This appendix presents the procedure for calculating emission factors in a step-by-step manner. Although most users of motor vehicle emission factors should rely on computerized calculations (such as MOBILE4), this sample calculation may prove useful to those becoming familiar with the methodologies presented in this document.

For this sample calculation, the light-duty gasoline-powered vehicle (LDGV) hydrocarbon (HC) emissions for January 1, 1988 are computed. It is designed to give the user an understanding of the logical sequence of calculations. An inventory of motor vehicle sources of hydrocarbon emissions should include emissions from the eight vehicle types. For each vehicle type, the exhaust emission factors should be calculated with the equations presented in the corresponding chapter. The resultant exhaust emission factors, are first multiplied by the fraction of vehicles-miles-traveled (VMT) for the respective vehicle types, then are summed up to obtain average grams per mile exhaust emission levels from the entire highway mobile source fleet. For hydrocarbon emission estimates, the crankcase and four other evaporative HC emissions (hot soak and diurnal evaporative, running loss, and refueling emissions) are also calculated. They are then added to the exhaust HC emission estimates.

G.1 DATA REQUIREMENTS

Before determining what data are required, the user should review the conditions under which vehicles are tested in order to ascertain whether these conditions differ from the locality-specific ambient temperature, average speeds, and vehicle operating modes (see Section .A.1 in each chapter).

The user should determine the following locality specific data:

1. Daily minimum and maximum ambient temperatures in degrees Fahrenheit.

2. Fractions of January 1 travel, by model year, for each vehicle type (obtained from model year registration distributions and fleet annual mileage accumulation rates).

3. The VMT mix (fractions of total VMT accumulated by each vehicle type).

4. Percent of VMT in cold start and hot start operating modes for light-duty vehicles, light-duty trucks, and motorcycles.

5. The calendar year of evaluation (January 1 of that year).

6. The level of in-use fuel volatility.

7. Any other data required to utilize additional (optional) correction factors.

G.2 DATA USED TO CALCULATE HC EMISSIONS

For this sample calculation, the following conditions are assumed:

1. Daily minimum and maximum ambient temperatures are 60° and 84°F, respectively.

2. National statistics on average fleet annual mileage accumulation rates and vehicle registration by model year are used.

3. The total hydrocarbon emissions (as opposed to nonmethane HC) are calculated for the average speed of 30 mph.

4. The percentages of VMT in the cold start, stabilized, and hot start operating modes are assumed to be 40%, 30%, and 30% respectively, for light-duty vehicles (both catalyst and non-catalyst).

5. The calendar year of evaluation is 1988.

6. No I/M or anti-tampering programs.

7. A certification fuel volatility level of 9.0 psi is assumed.

8. All other conditions are assumed to match the vehicle testing conditions.

G.3 CALCULATION OF EXHAUST EMISSION FACTORS

The equations to calculate the exhaust hydrocarbon emission factor for LDGVs are discussed in Chapter 1.

Since the air conditioning usage (ACCFipt), extra load (XLCFip), trailer towing (TWCFip), and humidity level for NOx (HCF) are assumed to match the basic test conditions, they are all set equal to 1.0 (i.e., they have no effect on the calculations).

G.3.1 Basic Exhaust Emission Levels (BER)

The basic exhaust emission levels for LDGVs are the emission levels in grams per mile, assuming the basic test conditions. The HC exhaust emission levels on January 1, 1988 are listed in Table G-1. Model year specific emission factors for selected calendar years between 1985 and 2020 are presented in Appendix H, Tables R.VT.11A, 11B, and 11C, where R = region (1 = low altitude, 2 = high altitude) and VT = vehicle type.

G.3.2 Operating-Mode/Temperature Correction Factor (OMTCF)

The operating-mode/temperature correction factor can be calculated manually using the generalized equations in Chapter 1. The OMTCF values listed in Table G-1 are calculated in MOBILE4 for a cold start/stablilized/hot start mix of 40%/30%/30%, and an ambient temperature of 78°F (representing a trip- and emission-weighted average temperature for a day with 60°F minimum and 84°F maximum temperatures).

G.3.3 Tampering Offset (OMTTAM)

The effects of tampering (rate of each type of tampering and the associated emission impact) on each model year's emission rate are estimated and corrected for temperature and operating mode, listed also in Table G-1.

G.3.4 Speed Correction Factor (SALCHF)

The average speed used in this example is 30 mph. The speed correction factors, used to correct emissions from 19.6 mph to 30 mph, are shown in the column marked "SALHCF" in Table G-1. If any of the additional correction factors (AC use, trailer towing, extra load) were used in this example, this is the point at which they would be applied.

G.3.5 Travel Weighting Fractions (TF)

In order to calculate the fraction of annual travel by model year, the fraction of in-use vehicles by model year are weighted on the basis of annual rate of mileage accumulation. In many cases, locality specific data on automobile use and registration are readily available. Whenever possible, local data should be used. However, for purposes of this sample calculation, the national average fraction of annual travel are used. (These national average values are presented in Appendix H, Tables R.VT.5, where R = region and VT = vehicle type.) These TF values, also listed in Table G-1, are used to weight the individual model year emission factors together to form a fleet number.

G.3.6 Calculated Exhaust Emission Factors

The final step in the calculation of the exhaust HC emission factor for LDGVs is to multiply the basic emission level (BER) by the operating mode/temperature correction factor (OMTCF), add the tampering offset (OMTTAM), and then multiply this sum by the speed correction factor (SALCHF) and travel fraction (TF). This procedure is shown in Table G-1. The emission factor is expressed in units of grams per vehicle mile traveled.

If the pollutant were CO or NOx, no further calculations would be needed to estimate the total exhaust emission factor. However, for HC emission estimates, additional calculations discussed in Sections G.3.7 to G.3.9 also need to be performed.

G.3.7 Crankcase and Evaporative HC Emission Levels (CCEVERT)

To calculate the crankcase and evaporative HC emission level, the model year crankcase emissions (CC), plus the tampering offsets, and hot soak (HS), diurnal (DI), including tampering are required. The estimated evaporative and crankcase emissions are shown in Table G-2. Further, the fractions of annual travel by model year (TF) are also required (the same as in Section G.3.5).

G.3.8 Refueling and Running Loss HC Emission Levels

The estimated refueling and running loss emissions are shown in Table G-2. The fractions of annual travel by model year (TF) are also required (the same as in Section G.3.5).

G.3.9 Total HC Emission Factors

Summing the emission factors from Sections G.3.6 to G.3.8 gives the total HC emission factor. For this example the total HC emission factor is 3.14 grams/mile (1.788 + 0.654 + 0.300 + 0.397).

Table G-1

CALCULATION OF EXHAUST HYDROCARBON EMISSION
FACTOR FOR LIGHT DUTY GASOLINE POWERED VEHICLES

Ambient Temperature 78°F, Avg. Route Speed 30 mph,
40% Cold Start/30% Hot Start,
January 1, 1988

Model Year(i)	BER	OMTCF	OMTTAM	SALHCF	TF	BEF = (BER*OMTCF+OMTTAM) *SALHCF*TF
1988	0.277	1.453	0.012	0.730	0.0307	0.009
1987	0.323	1.403	0.019	0.730	0.1209	0.042
1986	0.399	1.349	0.039	0.730	0.1102	0.046
1985	0.470	1.327	0.064	0.730	0.0985	0.049
1984	0.547	1.319	0.087	0.730	0.0879	0.052
1983	0.620	1.299	0.133	0.730	0.0783	0.054
1982	0.840	1.268	0.192	0.730	0.0679	0.062
1981	0.982	1.255	0.248	0.730	0.0598	0.065
1980	1.209	1.384	0.835	0.730	0.0537	0.098
1979	3.675	1.111	0.858	0.730	0.0481	0.174
1978	3.901	1.109	0.927	0.730	0.0427	0.164
1977	4.114	1.106	0.955	0.730	0.0381	0.153
1976	4.316	1.104	1.042	0.717	0.0328	0.137
1975	4.508	1.102	1.075	0.717	0.0280	0.121
1974	5.453	1.037	0.190	0.706	0.0237	0.098
1973	5.551	1.035	0.200	0.706	0.0197	0.083
1972	5.644	1.034	0.070	0.795	0.0167	0.078
1971	8.437	1.073	0.036	0.798	0.0134	0.097
1970	8.629	1.073	0.037	0.811	0.0104	0.078
1969	8.355	1.060	0.0	0.781	0.0185	0.128
			Exhaust HC (g/mi) =			1.788

Table G-2

CALCULATION OF TOTAL HYDROCARBON EMISSION FACTOR
FOR LIGHT DUTY GASOLINE POWERED VEHICLES

Hot Soak 80°F, Diurnal 60 to 84°F, Running Loss 81°F,
Certification fuel volatility level of 9.0 psi,
Calendar Year 1988

Model Year	BEF	CCEVERT	Refuel	Running	TF	BEF+TF*(CCEVERT+ Refueling+Running)
1988	0.009	0.147	0.243	0.254	0.0307	0.029
1987	0.042	0.155	0.244	0.254	0.1209	0.121
1986	0.046	0.177	0.248	0.264	0.1102	0.122
1985	0.049	0.215	0.255	0.275	0.0985	0.123
1984	0.052	0.258	0.262	0.285	0.0879	0.123
1983	0.054	0.300	0.266	0.294	0.0783	0.121
1982	0.062	0.345	0.263	0.303	0.0679	0.124
1981	0.065	0.390	0.272	0.311	0.0598	0.123
1980	0.098	0.576	0.291	0.551	0.0537	0.174
1979	0.174	0.620	0.335	0.559	0.0481	0.246
1978	0.164	0.665	0.339	0.566	0.0427	0.231
1977	0.153	1.515	0.370	0.650	0.0381	0.250
1976	0.137	1.593	0.387	0.656	0.0328	0.223
1975	0.121	1.674	0.427	0.662	0.0280	0.199
1974	0.098	1.759	0.473	0.668	0.0237	0.166
1973	0.083	1.846	0.473	0.673	0.0197	0.142
1972	0.078	1.937	0.465	0.679	0.0167	0.130
1971	0.097	2.726	0.469	0.683	0.0134	0.149
1970	0.078	3.556	0.451	0.715	0.0104	0.127
1969	0.128	3.660	0.454	0.684	0.0185	0.217
HC Emissions (g/mi):						
	1.788	0.654	0.300	0.397		3.139

Appendix H

HIGHWAY MOBILE SOURCE EMISSION FACTOR TABLES

All of the emission factor tables for each region and vehicle type are given within this appendix. Each emission factor table has a three digit identification table number. The table numbers have the following format:

R.VT.#

where:

R indicates the region code,
1 = Low altitude non-California region, and,
2 = High altitude non-California region.

VT indicates the vehicle type
1 = LDGV, 2 = LDGT1, 3 = LDGT2, 4 = HDGV,
5 = LDDV, 6 = LDDT, 7 = HDDV, and,
8 = MC.

# indicates which of the 16 types of table are referenced.

In addition to this coding scheme for the table numbers, the table titles include the information to avoid confusion. Table H-1 gives a summary of every table and table number for each region. There is a total of 150 tables for each of the two regions presented in this appendix.

Table H-1

SUMMARY OF THE EMISSION FACTOR TABLE NUMBERS
FOR EACH REGION BY VEHICLE TYPE AND TABLE TYPE

Note: All table numbers are of the form R.IV.#, where R = Region (1 = low altitude, 2 = high-altitude), IV = Vehicle type code, and # = the table number within each region and vehicle type set of tables.

	Vehicle Type Code "IV"							
Table Code "#" Description	.1 LDGV	.2 LDGT1	.3 LDGT2	.4 HDGV	.5 LDDV	.6 LDDT	.7 HDDV	.8 MC
Nontampered Basic Exhaust Emissions	.1A	.1A	.1A	.1A	.1	.1	.1	.1A
Exhaust Emissions at Various Mileage Intervals	.1B	.1B	.1B	.1B	-	-	-	-
Nontampered Crankcase & Evap. HC Emissions	.2A	.2A	.2A	.2A	-	-	-	.2
Tampering Offsets of Evap HC at Various Mileages	.2B	.2B	.2B	.2B	-	-	-	-
Nontampered Running Loss Emissions	.2C	.2C	.2C	.2C	-	-	-	-
Refueling Emissions	.2D	.2D	.2D	.2D	-	-	-	-
Idle Emissions	.3	.3	.3	.3	.3	.3	.3	.3
Registration and Mileage Accumulation Rates	.4A	.4A	.4A	.4	.4A	.4A	.4	.4
Diesel Sales Fractions	-	-	-	-	.4B	.4B	-	-
Trips per Day and Miles per Day	.4C	.4C	.4C	-	-	-	-	-
Example Travel Weighting Fractions	.5	.5	.5	.5	.5	.5	.5	.5
Speed Correction Factor Coefficients	.6A	.6A	.6A	.6	.6	.6	.6	.6
	.6B	.6B	.6B	-	-	-	-	-
Low Temperature Correction Factor Coefficients	.7A	.7A	.7A	.7A	-	-	-	.7A
High Temperature Correction Factor Coefficients	.7B	.7B	.7B	.7B	-	-	-	.7B
Normalized Bag Fractions	.7C	.7C	.7C	-	.7	.7	-	.7C
Air Conditioning Correction Factor Coefficients	.8A	.8A	.8A	-	-	-	-	-
Air Conditioning Fleet Sizes	.8B	.8B	.8B	-	-	-	-	-
Extra Load Correction Factors	.8C	.8C	.8C	-	-	-	-	-
Trailer Towing Correction Factors	.8D	.8D	.8D	-	-	-	-	-
Tampering and Misfueling Rates	.9A	.9A	.9A	.9A	-	-	-	-
Excess Exhaust and Idle Emissions	.9B	.9B	.9B	.9B	-	-	-	-
Excess Crankcase & Uncontrolled Evap. Emissions	.9C	.9C	.9C	.9C	-	-	-	-
Uncontrolled Running Loss Emissions	.9D	.9D	.9D	.9D	-	-	-	-
Methane Offsets	.10A	.10A	.10A	.10A	.10A	.10A	.10A	.10A
Conversion Factors for Heavy-Duty Vehicles	-	-	-	.10B	-	-	.10B	-
Emission Control System Technology Distributions	.10C	.10C	.10C	.10C	-	-	-	-
Fuel-Metering System Technology Distributions	.10D	.10D	.10D		-	-	-	-
By Model Year Nonmethane HC Emission Levels	.11A	.11A	.11A	.11A	.11A	.11A	.11A	.11A
By Model Year CO Emission Levels	.11B	.11B	.11B	.11B	.11B	.11B	.11B	.11B
By Model Year NOx Emission Levels	.11C	.11C	.11C	.11C	.11C	.11C	.11C	.11C

TABLE 1.1.1A

NONTAMPERED EXHAUST EMISSION RATES FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* BER = ZML + (DR1 * M), for M ≤ 50K Miles.
= ZML + DR1*5.0 + DR2*(M - 5.0), for M > 50K Miles

Pol	Model Years	Zero Mile Emission Level	Det. Rate 1	Det. Rate 2	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1968	7.250	0.180	0.180	8.150	9.050
	1968-1969	4.430	0.250	0.250	5.680	6.930
	1970-1971	3.000	0.370	0.370	4.850	6.700
	1972-1974	3.380	0.160	0.160	4.180	4.980
	1975-1979	1.060	0.280	0.280	2.460	3.860
	1980	0.360	0.100	0.100	0.860	1.360
	1981	0.308	0.079	0.108	0.703	1.243
	1982	0.305	0.074	0.101	0.675	1.180
	1983	0.257	0.062	0.085	0.567	0.992
	1984	0.242	0.067	0.088	0.577	1.017
	1985	0.254	0.063	0.084	0.569	0.989
	1986	0.265	0.060	0.081	0.565	0.970
	1987	0.264	0.060	0.081	0.564	0.969
	1988	0.267	0.059	0.080	0.562	0.962
	1989	0.269	0.059	0.079	0.564	0.959
	1990	0.271	0.058	0.078	0.561	0.951
	1991	0.275	0.057	0.077	0.560	0.945
	1992+	0.278	0.056	0.076	0.558	0.938
CO	Pre-1968	78.270	2.250	2.250	89.520	100.770
	1968-1969	56.340	2.550	2.550	69.090	81.840
	1970-1971	42.170	3.130	3.130	57.820	73.470
	1972-1974	40.940	2.350	2.350	52.690	64.440
	1975-1979	17.720	2.460	2.460	30.020	42.320
	1980	6.090	0.730	0.730	9.740	13.390
	1981	3.378	1.147	1.765	9.113	17.938
	1982	3.376	1.079	1.616	8.771	16.851
	1983	2.731	0.760	1.013	6.531	11.596
	1984	2.432	0.840	1.052	6.632	11.892
	1985	2.611	0.803	1.014	6.626	11.696
	1986	2.764	0.771	0.982	6.619	11.529
	1987	2.720	0.786	0.983	6.650	11.565
	1988	2.757	0.780	0.973	6.657	11.522
	1989	2.785	0.774	0.967	6.655	11.490
	1990	2.813	0.769	0.961	6.658	11.463
	1991	2.870	0.757	0.949	6.655	11.400
	1992+	2.915	0.748	0.939	6.655	11.350
NOx	Pre-1968	3.440	0.0	0.0	3.440	3.440
	1968-1972	4.350	0.0	0.0	4.350	4.350
	1973-1974	2.860	0.050	0.050	3.110	3.360
	1975-1976	2.440	0.040	0.040	2.640	2.840
	1977-1979	1.790	0.110	0.110	2.340	2.890
	1980	1.500	0.070	0.070	1.850	2.200
	1981	0.651	0.067	0.067	0.986	1.321
	1982	0.633	0.071	0.071	0.988	1.343
	1983	0.632	0.039	0.039	0.827	1.022
	1984	0.663	0.035	0.035	0.838	1.013
	1985	0.651	0.035	0.035	0.826	1.001
	1986	0.641	0.035	0.035	0.816	0.991
	1987	0.647	0.034	0.034	0.817	0.987
	1988	0.646	0.034	0.034	0.816	0.986
	1989	0.644	0.034	0.034	0.814	0.984
	1990	0.642	0.034	0.034	0.812	0.982
	1991	0.638	0.034	0.034	0.808	0.978
	1992+	0.635	0.034	0.034	0.805	0.975

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile.
ZML = Zero mile level in grams/mile.
DR1 = Deterioration rate for ≤ 50K miles, in grams/mile/10K miles.
DR2 = Deterioration rate for > 50K miles, in grams/mile/10K miles.
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 1.1.1B

EXHAUST EMISSION RATES FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
AT VARIOUS MILEAGE LEVELS
(RATES INCLUDE TAMPERING)

Pol	Model Years	Emission Rate (Grams/Mile) 0K	25K	50K	75K	100K	125K	150K
HC	Pre-1968	7.250	7.700	8.150	8.600	9.050	9.500	9.950
	1968-1969	4.430	5.058	5.689	6.321	6.952	7.584	8.215
	1970-1971	3.000	3.928	4.859	5.791	6.722	7.654	8.585
	1972	3.380	3.785	4.199	4.612	5.025	5.438	5.851
	1973-1974	3.380	3.796	4.236	4.675	5.115	5.554	5.994
	1975	1.166	2.044	2.957	3.876	4.798	5.721	6.644
	1976	1.172	2.058	2.975	3.899	4.825	5.752	6.679
	1977	1.172	2.058	2.970	3.886	4.803	5.722	6.641
	1978-1979	1.179	2.073	2.991	3.915	4.840	5.768	6.695
	1980	0.477	0.915	1.393	1.885	2.382	2.878	3.375
	1981	0.320	0.557	0.813	1.218	1.623	2.029	2.438
	1982	0.317	0.541	0.783	1.167	1.550	1.935	2.322
	1983	0.268	0.462	0.672	1.008	1.344	1.681	2.021
	1984	0.253	0.456	0.675	1.011	1.347	1.684	2.023
	1985	0.265	0.458	0.667	0.993	1.319	1.646	1.975
	1986	0.276	0.460	0.659	0.965	1.272	1.579	1.887
	1987	0.275	0.459	0.656	0.956	1.257	1.557	1.859
	1988	0.278	0.459	0.654	0.952	1.250	1.548	1.847
	1989	0.280	0.461	0.656	0.951	1.247	1.542	1.839
	1990	0.282	0.461	0.653	0.946	1.239	1.532	1.826
	1991	0.286	0.462	0.652	0.942	1.233	1.523	1.815
	1992+	0.289	0.463	0.650	0.938	1.226	1.514	1.803
CO	Pre-1968	78.270	83.895	89.520	95.145	100.770	106.395	112.020
	1968-1969	56.340	62.776	69.298	75.820	82.342	88.863	95.385
	1970-1971	42.170	50.059	58.037	66.015	73.993	81.971	89.949
	1972	40.940	46.943	53.126	59.309	65.491	71.674	77.857
	1973-1974	40.940	47.200	53.998	60.796	67.594	74.392	81.190
	1975	18.700	26.575	35.140	43.817	52.521	61.236	69.957
	1976	18.761	26.664	35.167	43.781	52.423	61.077	69.737
	1977	18.761	26.664	35.047	43.504	51.979	60.468	68.964
	1978-1979	18.823	26.754	35.134	43.607	52.103	60.613	69.130
	1980	7.164	10.667	14.946	19.451	24.011	28.578	33.150
	1981	3.443	6.636	10.124	16.415	22.705	29.008	35.332
	1982	3.440	6.454	9.746	15.571	21.395	27.231	33.086
	1983	2.793	4.990	7.437	11.572	15.706	19.850	24.009
	1984	2.481	4.840	7.433	11.546	15.660	19.781	23.916
	1985	2.660	4.927	7.427	11.445	15.464	19.490	23.530
	1986	2.813	4.975	7.321	10.947	14.574	18.205	21.846
	1987	2.769	4.957	7.302	10.775	14.248	17.725	21.209
	1988	2.806	4.979	7.309	10.757	14.205	17.657	21.116
	1989	2.834	4.992	7.307	10.740	14.173	17.610	21.054
	1990	2.862	5.007	7.310	10.728	14.146	17.568	20.997
	1991	2.919	5.034	7.307	10.695	14.083	17.475	20.874
	1992+	2.964	5.057	7.307	10.670	14.033	17.400	20.774
NOx	Pre-1968	3.440	3.440	3.440	3.440	3.440	3.440	3.440
	1968-1972	4.350	4.350	4.350	4.350	4.350	4.350	4.350
	1973	2.922	3.083	3.244	3.405	3.565	3.726	3.887
	1974	2.930	3.095	3.260	3.426	3.591	3.756	3.922
	1975-1976	2.635	2.848	3.061	3.273	3.486	3.699	3.911
	1977-1979	1.987	2.376	2.765	3.154	3.542	3.931	4.320
	1980	1.726	2.031	2.337	2.642	2.948	3.253	3.559
	1981	0.654	0.848	1.055	1.312	1.569	1.826	2.083
	1982	0.636	0.840	1.058	1.326	1.594	1.861	2.129
	1983	0.635	0.760	0.899	1.089	1.279	1.470	1.660
	1984	0.667	0.787	0.922	1.116	1.310	1.504	1.698
	1985	0.655	0.775	0.910	1.104	1.298	1.492	1.686
	1986	0.645	0.765	0.900	1.094	1.288	1.482	1.676
	1987	0.651	0.768	0.900	1.090	1.279	1.469	1.659
	1988	0.650	0.767	0.899	1.089	1.278	1.468	1.658
	1989	0.648	0.765	0.897	1.087	1.276	1.466	1.656
	1990	0.646	0.763	0.895	1.085	1.274	1.464	1.654
	1991	0.642	0.759	0.891	1.081	1.270	1.460	1.650
	1992+	0.639	0.756	0.888	1.078	1.267	1.457	1.647

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TABLE 1.1.2A

NONTAMPERED
CRANKCASE AND EVAPORATIVE HYDROCARBON EMISSIONS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
Pre-1963	4.10	14.67	26.08	22.45	47.99
1963-1967	0.80	14.67	26.08	22.45	47.99
1968-1970	0.0	14.67	26.08	22.45	47.99
1971	0.0	10.91	16.28	16.15	38.58
1972-1977	0.0	8.27	8.98	12.32	23.53
1978-1980	0.0	2.46	5.16	4.30	14.47
1981	0.0	1.90	2.31	3.69	8.86
1982	0.0	1.80	2.29	3.51	8.77
1983	0.0	1.67	2.25	3.30	8.63
1984	0.0	1.54	2.22	3.08	8.50
1985	0.0	1.38	2.12	2.98	8.12
1986	0.0	1.25	2.05	2.85	7.85
1987	0.0	1.16	2.00	2.80	7.65
1988	0.0	1.10	1.95	2.78	7.46
1989	0.0	1.07	1.93	2.75	7.41
1990	0.0	1.04	1.91	2.77	7.31
1991	0.0	0.99	1.86	2.77	7.14
1992+	0.0	0.95	1.84	2.74	7.04

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

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TABLE 1.1.2B

TAMPERING OFFSETS FOR TOTAL
CRANKCASE AND EVAPORATIVE HC EMISSIONS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
AT VARIOUS MILEAGE INTERVALS

Fuel RVP	Model Years	Tampering Offset (Grams/Mile)** 0K	25K	50K	75K	100K	125K	150K
9.0	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1969	0.0	0.00	0.01	0.02	0.03	0.04	0.05
	1970	0.0	0.01	0.04	0.06	0.09	0.12	0.15
	1971-1973	0.0	0.01	0.05	0.09	0.13	0.17	0.21
	1974-1976	0.0	0.01	0.05	0.09	0.13	0.17	0.21
	1977-1978	0.0	0.02	0.07	0.13	0.18	0.24	0.29
	1979	0.0	0.02	0.07	0.13	0.18	0.24	0.29
	1980	0.0	0.01	0.06	0.11	0.15	0.20	0.25
	1981	0.0	0.01	0.06	0.11	0.15	0.20	0.24
	1982	0.0	0.01	0.06	0.10	0.15	0.19	0.23
	1983	0.0	0.01	0.06	0.10	0.14	0.18	0.23
	1984	0.0	0.01	0.05	0.09	0.13	0.17	0.21
	1985	0.0	0.01	0.05	0.09	0.13	0.17	0.20
	1986	0.0	0.01	0.05	0.09	0.12	0.16	0.20
	1987	0.0	0.01	0.05	0.09	0.12	0.16	0.19
	1988	0.0	0.01	0.05	0.08	0.12	0.16	0.19
	1989	0.0	0.01	0.05	0.08	0.12	0.15	0.19
	1990	0.0	0.01	0.05	0.08	0.12	0.15	0.19
	1991+	0.0	0.01	0.05	0.08	0.11	0.15	0.18
11.5	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1969	0.0	0.00	0.01	0.02	0.03	0.04	0.05
	1970	0.0	0.01	0.05	0.09	0.13	0.17	0.21
	1971-1973	0.0	0.02	0.07	0.13	0.19	0.24	0.30
	1974-1976	0.0	0.02	0.07	0.13	0.19	0.24	0.30
	1977-1978	0.0	0.02	0.09	0.17	0.24	0.31	0.38
	1979	0.0	0.02	0.09	0.17	0.24	0.31	0.38
	1980	0.0	0.02	0.09	0.16	0.23	0.30	0.37
	1981	0.0	0.02	0.09	0.16	0.23	0.29	0.36
	1982	0.0	0.02	0.09	0.15	0.22	0.28	0.35
	1983	0.0	0.02	0.08	0.15	0.21	0.27	0.34
	1984	0.0	0.02	0.08	0.14	0.20	0.26	0.31
	1985	0.0	0.02	0.08	0.13	0.19	0.24	0.30
	1986	0.0	0.02	0.07	0.13	0.18	0.23	0.29
	1987	0.0	0.02	0.07	0.12	0.17	0.23	0.28
	1988	0.0	0.02	0.07	0.12	0.17	0.22	0.27
	1989	0.0	0.02	0.07	0.12	0.17	0.22	0.27
	1990	0.0	0.02	0.07	0.12	0.16	0.21	0.26
	1991+	0.0	0.02	0.07	0.11	0.16	0.21	0.26

* Based on calculated hot soak temperature of 82.0F,
Diurnal temperature rise from 60.0 to 84.0F,
Fuel RVPs of 9.0 and 11.5 psi with no weathering, tank level of 40.0%.

** Based on averages of 4.21 trips per day and 25.35 miles per day.

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TABLE 1.1.2C

NONTAMPERED
RUNNING LOSS EMISSIONS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Pre-1971	7.0	0.36	0.52	1.13	2.16
	9.0	0.58	1.50	2.62	4.81
	10.4	1.06	2.70	4.00	5.63
	11.7	2.88	3.85	8.20	13.64
1971-1977	7.0	0.30	0.49	1.04	1.60
	9.0	0.49	1.15	2.37	3.60
	10.4	0.85	2.04	2.96	4.10
	11.7	2.15	2.85	5.97	9.87
1978-1980	7.0	0.24	0.42	0.97	1.39
	9.0	0.39	1.20	2.21	2.88
	10.4	0.68	1.70	2.38	3.23
	11.7	1.72	2.30	4.79	7.90
1981+	7.0	0.15	0.20	0.30	0.65
	9.0	0.24	0.40	0.70	2.05
	10.4	0.42	0.97	1.66	2.52
	11.7	1.16	1.60	3.40	5.65

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TABLE 1.1.2D

REFUELING EMISSIONS* FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Fuel Economy (miles/gal)	Uncontrolled (grams/mile)	With Volatility Control** (grams/mile)	With Onboard** (grams/mile)	With both Volatility and Onboard** (grams/mile)
Pre-1970	12.7	0.45	0.45	0.45	0.45
1970	12.8	0.45	0.45	0.45	0.45
1971	12.3	0.47	0.47	0.47	0.47
1972	12.4	0.47	0.47	0.47	0.47
1973-1974	12.2	0.47	0.47	0.47	0.47
1975	13.5	0.43	0.43	0.43	0.43
1976	14.9	0.39	0.39	0.39	0.39
1977	15.6	0.37	0.37	0.37	0.37
1978	17.0	0.34	0.34	0.34	0.34
1979	17.2	0.34	0.34	0.34	0.34
1980	19.8	0.29	0.29	0.29	0.29
1981	21.2	0.27	0.27	0.27	0.27
1982	21.9	0.26	0.26	0.26	0.26
1983	21.7	0.27	0.27	0.27	0.27
1984	22.0	0.26	0.26	0.26	0.26
1985	22.6	0.26	0.26	0.26	0.26
1986	23.3	0.25	0.25	0.25	0.25
1987	23.6	0.24	0.24	0.24	0.24
1988	23.7	0.24	0.24	0.24	0.24
1989-1991	23.6	0.24	0.24	0.24	0.24
1992	23.6	0.24	0.19	0.24	0.02
1993-1996	23.5	0.25	0.20	0.02	0.02
1997-1999	23.4	0.25	0.20	0.02	0.02
2000+	23.3	0.25	0.20	0.02	0.02

* Refueling Emissions (g/mi) = [Displacement (g/gal) + Spillage (g/gal)] / Fuel Economy (mi/gal).

** Volatility control assumed to start in 1992, with 7.0/7.8/9.0 RVP fuels for ASTM class A/B/C cities. Onboard assumed to start in 1993, and apply to LDGVs, LDGTs, and HDGVs.

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TABLE 1.1.3

HOT STABILIZED IDLE EMISSIONS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Pol	Model Years	Emission Rate (Grams/Hour) Nontampered Zero Mile	Nontampered 50,000 Mile	Nontampered 100,000 Mile	In-use Level* 50,000 Mile	In-use Level* 100,000 Mile
HC	Pre-1968	79.20	88.20	97.20	89.55	102.80
	1968-1969	64.20	82.20	100.20	83.55	105.80
	1970-1971	32.40	53.40	74.40	54.75	80.00
	1972-1974	43.20	64.20	85.20	65.55	90.80
	1975-1976	18.00	39.00	60.00	40.35	65.60
	1977-1979	15.92	40.90	65.89	42.25	71.49
	1980	5.19	10.81	16.42	12.16	22.02
	1981	4.05	10.12	18.50	11.47	24.11
	1982	4.02	9.73	17.63	11.08	23.24
	1983	4.91	9.72	16.04	11.07	21.64
	1984	4.54	9.59	15.91	10.94	21.51
	1985	4.31	9.21	15.59	10.56	21.20
	1986	3.62	8.42	14.89	9.77	20.49
	1987	3.44	8.25	14.75	9.60	20.35
	1988	3.37	8.15	14.67	9.50	20.28
	1989	3.35	8.15	14.66	9.50	20.26
	1990	3.34	8.09	14.58	9.44	20.19
	1991	3.32	8.04	14.58	9.39	20.18
	1992+	3.29	7.97	14.52	9.32	20.12
CO	Pre-1968	825.60	945.60	1065.60	951.66	1099.83
	1968-1969	839.40	1028.40	1217.40	1034.46	1251.63
	1970-1971	710.40	974.40	1238.40	980.46	1272.63
	1972-1974	759.60	987.60	1215.60	993.66	1249.83
	1975-1976	360.00	615.00	870.00	621.06	904.23
	1977-1979	303.37	524.48	745.58	530.53	779.81
	1980	56.71	101.26	145.79	107.32	180.02
	1981	22.56	112.38	260.77	118.44	295.01
	1982	25.63	109.15	244.31	115.20	278.54
	1983	35.17	98.22	185.98	104.28	220.22
	1984	30.36	97.92	187.24	103.98	221.47
	1985	31.77	86.00	171.31	92.06	205.55
	1986	26.23	57.20	139.14	63.26	173.37
	1987	25.08	53.05	134.31	59.10	168.55
	1988	24.07	49.74	129.72	55.79	163.95
	1989	23.71	48.41	127.74	54.47	161.97
	1990	23.24	47.11	125.79	53.16	160.03
	1991	22.38	44.39	121.75	50.45	155.99
	1992+	21.78	42.33	118.63	48.38	152.86
NOx	Pre-1968	5.40	5.40	5.40	5.43	5.55
	1968-1972	10.20	10.20	10.20	10.23	10.35
	1973-1974	8.40	8.40	8.40	8.43	8.55
	1975-1976	15.60	15.60	15.60	15.63	15.75
	1977-1979	3.98	3.98	3.98	4.01	4.13
	1980	7.23	7.23	7.23	7.26	7.38
	1981	6.85	6.85	6.85	6.88	7.00
	1982	6.41	6.41	6.41	6.44	6.56
	1983	2.07	2.07	2.07	2.10	2.22
	1984	2.00	2.00	2.00	2.03	2.15
	1985	1.93	1.93	1.93	1.96	2.08
	1986	1.78	1.78	1.78	1.81	1.93
	1987	1.72	1.72	1.72	1.75	1.87
	1988	1.66	1.66	1.66	1.69	1.81
	1989	1.64	1.64	1.64	1.67	1.79
	1990	1.62	1.62	1.62	1.65	1.77
	1991	1.57	1.57	1.57	1.60	1.72
	1992+	1.54	1.54	1.54	1.57	1.69

* In-use emission level includes tampering.

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TABLE 1.1.4A

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per vehicle*)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.062	13118.	0.021	13118.	1640.
2	0.082	12408.	0.082	12940.	9816.
3	0.079	11737.	0.079	12240.	22403.
4	0.075	11103.	0.075	11578.	34309.
5	0.071	10503.	0.071	10953.	45571.
6	0.067	9935.	0.067	10361.	56225.
7	0.063	9398.	0.063	9801.	66303.
8	0.060	8889.	0.060	9271.	75837.
9	0.056	8409.	0.056	8769.	84854.
10	0.052	7954.	0.052	8295.	93383.
11	0.048	7524.	0.048	7846.	101452.
12	0.045	7117.	0.045	7422.	109084.
13	0.041	6733.	0.041	7021.	116303.
14	0.037	6369.	0.037	6642.	123133.
15	0.033	6024.	0.033	6283.	129593.
16	0.029	5698.	0.029	5943.	135704.
17	0.026	5390.	0.026	5621.	141484.
18	0.022	5099.	0.022	5317.	146951.
19	0.018	4823.	0.018	5030.	152124.
20+	0.034	4562.	0.034	4758.	157016.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1, where: JMAR(1) = MAR(1) and,
JMAR(MYI) = .25*MAR(MYI) + .75*MAR(MYI-1), MYI = 2,...,20+.

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TABLE 1.1.4C

TRIPS PER DAY AND MILES PER DAY FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Year Index*	Trips per Day	Miles per Day
1	4.66	35.94
2	4.60	35.45
3	4.54	33.53
4	4.48	31.72
5	4.43	30.01
6	4.37	28.39
7	4.31	26.85
8	4.25	25.40
9	4.19	24.02
10	4.13	22.73
11	4.08	21.50
12	4.02	20.33
13	3.96	19.24
14	3.90	18.20
15	3.84	17.21
16	3.78	16.28
17	3.72	15.40
18	3.67	14.57
19	3.61	13.78
20+	3.55	13.03

* The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

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TABLE 1.1.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
JANUARY 1, 1988

Model Years	(A) LDV Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) LDGV Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.021	0.990	0.020	0.022	13118.	284.2	0.031
1987	0.082	0.996	0.082	0.086	12940.	1119.1	0.121
1986	0.079	0.996	0.079	0.083	12240.	1019.8	0.110
1985	0.075	0.991	0.074	0.079	11578.	911.2	0.098
1984	0.071	0.988	0.070	0.074	10953.	813.6	0.088
1983	0.067	0.986	0.066	0.070	10361.	724.8	0.078
1982	0.063	0.961	0.061	0.064	9801.	628.3	0.068
1981	0.060	0.940	0.056	0.060	9271.	553.7	0.060
1980	0.056	0.955	0.053	0.057	8769.	496.6	0.054
1979	0.052	0.974	0.051	0.054	8295.	444.9	0.048
1978	0.048	0.991	0.048	0.050	7846.	395.2	0.043
1977	0.045	0.997	0.045	0.048	7422.	352.6	0.038
1976	0.041	0.997	0.041	0.043	7021.	303.9	0.033
1975	0.037	0.997	0.037	0.039	6642.	259.4	0.028
1974	0.033	0.997	0.033	0.035	6283.	218.9	0.024
1973	0.029	0.998	0.029	0.031	5943.	182.1	0.020
1972	0.026	0.998	0.026	0.027	5621.	154.4	0.017
1971	0.022	0.999	0.022	0.023	5317.	123.7	0.013
1970	0.018	1.000	0.018	0.019	5030.	95.9	0.010
1969-	0.034	1.000	0.034	0.036	4758.	171.3	0.019
		DAF:	0.944		TFNORM:	9253.6	

WHERE :

A = January 1 registration mix from Table 1.1.4A,
B = Gasoline fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 1.1.4A.

NOTE : In general, the travel weighting fractions will change for every calendar year since the sales fraction (column B) changes for almost every model year.

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TABLE 1.1.6A

SPEED CORRECTION FACTOR COEFFICIENTS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = EXP(A + B*s + C*s**2+ D*S**3+ E*s**4+ F*s**5), HC & CO
= A + B*s + C*s**2+ D*s**3+ E*s**4 + F*s**5, NOx

Pollutant and Model Years	A	B	C	D	E	F
HC						
Pre-1968	0.231026E+01	-0.289572E+00	0.152990E-01	-0.446689E-03	0.648183E-05	-0.363456E-07
1968	0.239726E+01	-0.299985E+00	0.161351E-01	-0.487491E-03	0.729093E-05	-0.419769E-07
1969	0.240873E+01	-0.308187E+00	0.168168E-01	-0.506843E-03	0.753855E-05	-0.431596E-07
1970	0.223217E+01	-0.284985E+00	0.153833E-01	-0.456738E-03	0.673486E-05	-0.383798E-07
1971	0.225223E+01	-0.287778E+00	0.156820E-01	-0.473179E-03	0.707954E-05	-0.408456E-07
1972	0.234948E+01	-0.304959E+00	0.168416E-01	-0.509623E-03	0.759516E-05	-0.434963E-07
1973-1974	0.268382E+01	-0.344633E+00	0.195417E-01	-0.625720E-03	0.978442E-05	-0.583369E-07
1975-1976	0.239540E+01	-0.335781E+00	0.211609E-01	-0.731550E-03	0.120715E-04	-0.748567E-07
CO						
Pre-1968	0.233989E+01	-0.296978E+00	0.160071E-01	-0.477396E-03	0.706752E-05	-0.403978E-07
1968	0.246551E+01	-0.305023E+00	0.160497E-01	-0.473969E-03	0.699075E-05	-0.399758E-07
1969	0.277804E+01	-0.319130E+00	0.153183E-01	-0.422327E-03	0.584948E-05	-0.314969E-07
1970	0.278899E+01	-0.327107E+00	0.162943E-01	-0.467573E-03	0.671906E-05	-0.374401E-07
1971	0.270743E+01	-0.331038E+00	0.176179E-01	-0.538583E-03	0.817402E-05	-0.477803E-07
1972	0.268454E+01	-0.332817E+00	0.176277E-01	-0.524123E-03	0.772221E-05	-0.437025E-07
1973-1974	0.283929E+01	-0.368756E+00	0.210782E-01	-0.676438E-03	0.106267E-04	-0.636405E-07
1975-1976	0.248747E+01	-0.391562E+00	0.270721E-01	-0.976178E-03	0.165270E-04	-0.104317E-06
NOx						
Pre-1968	0.168635E+01	-0.118303E+00	0.654975E-02	-0.137139E-03	0.100849E-05	0.0
1968	0.122677E+01	-0.444978E-01	0.262476E-02	-0.567150E-04	0.434293E-06	0.0
1969	0.101743E+01	-0.118958E-01	0.914365E-03	-0.215740E-04	0.182300E-06	0.0
1970	0.987600E+00	-0.195674E-01	0.169645E-02	-0.404000E-04	0.328001E-06	0.0
1971	0.115917E+01	-0.444536E-01	0.296425E-02	-0.668990E-04	0.522365E-06	0.0
1972	0.128169E+01	-0.804874E-01	0.535735E-02	-0.118891E-03	0.901060E-06	0.0
1973-1974	0.783838E+00	0.328549E-03	0.106029E-02	-0.319350E-04	0.290389E-06	0.0
1975-1976	0.942131E+00	-0.423240E-01	0.386253E-02	-0.939853E-04	0.753883E-06	0.0

* WHERE : s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16].

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TABLE 1.1.6B

SPEED CORRECTION FACTOR COEFFICIENTS FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = A/s + B, HC & CO
= EXP(A + B*s + C*s**2), NOx

Pollutant	Speed	Model Years	Coefficient A	B	C
HC	Low	1977-1979	37.95604	0.0	
		1980	10.60380	0.0	
		1981	10.82023	0.0	
		1982	10.88869	0.0	
		1983	8.74266	-0.07927	
		1984	8.92062	-0.08068	
		1985	7.76209	-0.06197	
		1986	5.23198	-0.02100	
		1987	4.98885	-0.01610	
		1988	4.78677	-0.01203	
		1989	4.70467	-0.01037	
		1990	4.62258	-0.00872	
		1991	4.45523	-0.00535	
		1992+	4.32577	-0.00274	
	High	1977+	8.10000	0.0	
CO	Low	1977-1979	490.98633	-1.97820	
		1980	107.24390	0.96562	
		1981	113.27760	0.86151	
		1982	117.23621	0.75511	
		1983	87.77820	-0.14450	
		1984	91.78729	-0.10426	
		1985	73.35860	0.60021	
		1986	33.19730	2.14936	
		1987	30.11700	2.39638	
		1988	27.55679	2.60169	
		1989	26.51669	2.68510	
		1990	25.47659	2.76850	
		1991	23.35629	2.93853	
		1992+	21.71620	3.07006	
	High	1977+	60.00000	0.0	
NOx	All	1977-1979	1.04330	-0.026082	0.00042835
		1980	0.18957	-0.033673	0.00047036
		1981	0.20906	-0.033673	0.00047036
		1982	0.22795	-0.033673	0.00047036
		1983	-0.02994	-0.023254	0.00017100
		1984	-0.03852	-0.022703	0.00016500
		1985	-0.04694	-0.023881	0.00017700
		1986	-0.06606	-0.026426	0.00020485
		1987	-0.07443	-0.026426	0.00020485
		1988	-0.08138	-0.026426	0.00020485
		1989	-0.08420	-0.026426	0.00020485
		1990	-0.08703	-0.026426	0.00020485
		1991	-0.09279	-0.026426	0.00020485
		1992+	-0.09724	-0.026426	0.00020485

* WHERE: s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16],
Low = average speed ≤ 19.6 mph,
High = average speed > 19.6 mph.

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TABLE 1.1.7A

LOW (< 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* TCF(1) = TC(1)*(T - 75.0), 1980+ CO,
TCF(b) = EXP [TC(b)*(T - 75.0)], all others

Pol	Model Years	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1968	-0.20623E-01	-0.24032E-02	-0.10081E-02
	1968-1969	-0.24462E-01	-0.32017E-02	-0.86884E-03
	1970-1971	-0.21255E-01	-0.52755E-03	0.93659E-03
	1972-1974	-0.21427E-01	-0.39442E-03	0.49731E-02
	1975-1979	-0.23517E-01	-0.88057E-02	-0.16222E-02
	1980	-0.26820E-01	-0.75815E-02	-0.51660E-02
	1981	-0.32775E-01	-0.83176E-02	-0.90264E-02
	1982	-0.32082E-01	-0.85130E-02	-0.90264E-02
	1983	-0.36438E-01	-0.75058E-02	-0.60426E-02
	1984	-0.35578E-01	-0.81946E-02	-0.66347E-02
	1985	-0.32581E-01	-0.81979E-02	-0.66579E-02
	1986	-0.30518E-01	-0.84082E-02	-0.68510E-02
	1987	-0.28966E-01	-0.83924E-02	-0.68481E-02
	1988	-0.27479E-01	-0.82775E-02	-0.67604E-02
	1989	-0.27110E-01	-0.83525E-02	-0.68268E-02
	1990	-0.26217E-01	-0.81568E-02	-0.66662E-02
	1991	-0.24879E-01	-0.80063E-02	-0.65473E-02
	1992+	-0.24123E-01	-0.80347E-02	-0.65766E-02
CO	Pre-1968	-0.13487E-01	0.15784E-02	0.11097E-02
	1968-1969	-0.21126E-01	-0.15289E-02	0.15749E-02
	1970-1971	-0.20843E-01	-0.59951E-02	0.18253E-02
	1972-1974	-0.19091E-01	-0.42373E-03	0.57982E-02
	1975-1979	-0.24835E-01	-0.88336E-02	-0.11553E-02
	1980	-0.12448E+01	-0.12478E-01	-0.74106E-02
	1981	-0.13095E+01	-0.14584E-01	-0.11371E-01
	1982	-0.12840E+01	-0.14584E-01	-0.11371E-01
	1983	-0.11767E+01	-0.13677E-01	-0.90777E-02
	1984	-0.11670E+01	-0.14721E-01	-0.90777E-02
	1985	-0.10669E+01	-0.14836E-01	-0.90777E-02
	1986	-0.10037E+01	-0.15221E-01	-0.90777E-02
	1987	-0.95141E+00	-0.15255E-01	-0.90777E-02
	1988	-0.89850E+00	-0.15140E-01	-0.90777E-02
	1989	-0.88826E+00	-0.15264E-01	-0.90777E-02
	1990	-0.85298E+00	-0.15010E-01	-0.90777E-02
	1991	-0.80405E+00	-0.14838E-01	-0.90777E-02
	1992+	-0.77959E+00	-0.14907E-01	-0.90777E-02
NOx	Pre-1968	-0.16897E-03	-0.89245E-02	-0.72580E-02
	1968-1972	-0.25074E-03	-0.59791E-02	-0.62690E-02
	1973-1974	0.38855E-02	-0.24156E-02	-0.21188E-02
	1975-1976	-0.45504E-04	-0.12575E-02	-0.53153E-03
	1977-1979	-0.76044E-02	-0.68045E-02	-0.54198E-02
	1980	-0.19000E-02	-0.61656E-02	-0.49643E-02
	1981	-0.45479E-02	-0.74823E-02	-0.90882E-02
	1982	-0.47657E-02	-0.69890E-02	-0.90882E-02
	1983	-0.43258E-02	-0.97304E-02	-0.10136E-01
	1984	-0.43258E-02	-0.94139E-02	-0.10063E-01
	1985	-0.43258E-02	-0.85291E-02	-0.92968E-02
	1986	-0.43258E-02	-0.79012E-02	-0.88139E-02
	1987	-0.43258E-02	-0.74446E-02	-0.84137E-02
	1988	-0.43258E-02	-0.70163E-02	-0.80091E-02
	1989	-0.43258E-02	-0.69007E-02	-0.79307E-02
	1990	-0.43258E-02	-0.66551E-02	-0.76610E-02
	1991	-0.43258E-02	-0.62738E-02	-0.72869E-02
	1992+	-0.43258E-02	-0.60484E-02	-0.70998E-02

* WHERE :

TCF(b) = Low temperature correction factor for appropriate pollutant, ambient temperature (< 75F), and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = Low temperature correction factor coefficient for appropriate pollutant, reference temperature, and model year, for test segment b

NOTE : The low temperature correction factor is used in conjunction with the correction factor given in Table 1.1.7C.

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TABLE 1.1.7B

HIGH (> 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
AND FUEL RVP CORRECTION FACTORS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* TCF(b) = EXP [TC(b)*(T - 75.0)], Pre-1980
TRCF(b) = EXP [RC(b)*(RVP - 9.0) + TC(b)*(T - 75.0)
+ TRC(b)*(RVP - 9.0)*(T - 75.0)], 1980+

Pol	Model Years	Parameter	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1968	TC	-0.14381E-01	0.13219E-02	0.34799E-02
	1968-1969		-0.12552E-01	0.42667E-02	0.75843E-02
	1970-1971		-0.10888E-01	-0.47925E-03	0.76666E-02
	1972-1974		-0.66107E-02	0.26288E-02	0.12320E-01
	1975-1979		-0.14095E-01	0.26179E-01	0.24297E-01
	1980-1982	RC	0.91402E-01	0.42060E-01	0.93179E-01
		TC	0.44270E-02	0.48358E-02	0.74688E-02
		TRC	0.29466E-02	0.0	0.47276E-02
	1983+	RC	0.23202E-01	0.15373E+00	0.13263E+00
		TC	0.0	0.86550E-02	0.83730E-02
		TRC	0.0	0.0	0.56009E-02
CO	Pre-1968	TC	-0.14691E-01	0.37462E-02	0.11014E-01
	1968-1969		-0.38767E-01	0.84685E-02	0.25179E-01
	1970-1971		-0.21165E-01	0.23603E-01	0.28483E-01
	1972-1974		-0.13146E-01	0.24717E-01	0.25848E-01
	1975-1979		-0.19612E-01	0.48537E-01	0.31439E-01
	1980-1982	RC	0.91345E-01	0.13968E+00	0.16322E+00
		TC	0.62182E-02	0.14943E-01	0.14923E-01
		TRC	0.0	0.0	0.0
	1983+	RC	0.40748E-01	0.26214E+00	0.23218E+00
		TC	0.35170E-02	0.14966E-01	0.20695E-01
		TRC	0.0	0.56416E-02	0.82344E-02
NOx	Pre-1968	TC	0.38841E-02	-0.87325E-02	-0.10839E-01
	1968-1972		-0.10389E-02	-0.92466E-02	-0.10108E-01
	1973-1974		-0.18301E-01	-0.10925E-01	-0.18042E-01
	1975-1976		-0.71420E-02	-0.87910E-02	-0.75470E-02
	1977-1979		-0.26153E-01	-0.18603E-01	-0.20878E-01
	1980-1982	RC	0.0	-0.40024E-01	0.0
		TC	0.0	0.0	0.0
		TRC	0.0	0.0	0.0
	1983+	RC	0.14219E-01	0.27491E-01	0.0
		TC	0.0	0.37789E-02	0.0
		TRC	0.0	0.0	0.0

* WHERE :

TCF(b) = High temperature correction factor for appropriate pollutant, ambient temperature, and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = High temperature correction factor coefficient for appropriate pollutant, temperature, and model year, for test segment b.
TRCF(b)= High temperature and fuel RVP correction factor for appropriate pollutant, ambient temperature, fuel RVP, and model year, for test segment b.
RC(b) = Fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, and model year, for test segment b.
RVP = Fuel volatility in psi.
TRC(b) = Combined temperature and fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, ambient temperature, and model year, for test segment b.

NOTE : The temperature correction factor is used in conjunction with the correction factor given in Table 1.1.7C.

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TABLE 1.1.7C

NORMALIZED BAG FRACTIONS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Pol	Model Years	Test Segment 1 B1	D11	D12	Test Segment 2 B2	D21	D22	Test Segment 3 B3	D31	D32	Total Test B0	D01	D02
		Normalized Fractions											
HC	Pre-1968	1.2820	0.0250		0.9730	0.0280		0.8390	0.0190		1.0000	0.0249	
	1968-1969	1.3450	0.0740		0.9460	0.0540		0.8420	0.0480		1.0000	0.0565	
	1970-1971	1.3450	0.1780		0.9190	0.1180		0.8940	0.0930		1.0000	0.1235	
	1972-1974	1.3890	0.0440		0.9030	0.0560		0.8910	0.0360		1.0000	0.0481	
	1975-1979	1.9360	0.3240		0.7340	0.2670		0.8010	0.2100		1.0000	0.2632	
	1980	2.2000	0.7140		0.5710	0.1710		0.9140	0.1430		1.0000	0.2752	
	1981	2.4510	0.4547	0.5919	0.5012	0.2152	0.3136	0.8571	0.1856	0.2381	1.0000	0.2565	0.3503
	1982	2.4402	0.4320	0.5629	0.5081	0.2027	0.2936	0.8520	0.1801	0.2363	1.0000	0.2438	0.3334
	1983	2.4754	0.4360	0.6417	0.4941	0.1874	0.2214	0.8521	0.1928	0.2673	1.0000	0.2401	0.3205
	1984	2.6207	0.5239	0.7405	0.4657	0.2158	0.2389	0.7967	0.2117	0.2815	1.0000	0.2782	0.3538
	1985	2.6438	0.4458	0.6159	0.4548	0.2088	0.2536	0.8001	0.1909	0.2583	1.0000	0.2528	0.3295
	1986	2.6599	0.3854	0.5201	0.4467	0.2032	0.2645	0.8034	0.1749	0.2406	1.0000	0.2330	0.3106
	1987	2.7111	0.3905	0.5154	0.4349	0.2100	0.2741	0.7873	0.1748	0.2384	1.0000	0.2376	0.3140
	1988	2.7307	0.3728	0.4838	0.4290	0.2101	0.2802	0.7837	0.1698	0.2322	1.0000	0.2326	0.3091
	1989	2.7345	0.3621	0.4665	0.4274	0.2092	0.2824	0.7840	0.1669	0.2290	1.0000	0.2292	0.3057
	1990	2.7383	0.3515	0.4494	0.4257	0.2084	0.2845	0.7843	0.1640	0.2258	1.0000	0.2257	0.3024
	1991	2.7457	0.3303	0.4153	0.4225	0.2066	0.2887	0.7849	0.1584	0.2194	1.0000	0.2189	0.2959
	1992+	2.7513	0.3143	0.3897	0.4200	0.2053	0.2919	0.7854	0.1541	0.2146	1.0000	0.2138	0.2909
CO	Pre-1968	1.2770	0.0330		1.0170	0.0290		0.7580	0.0250		1.0000	0.0287	
	1968-1969	1.4420	0.0710		0.9960	0.0420		0.6740	0.0330		1.0000	0.0455	
	1970-1971	1.5530	0.1090		0.9330	0.0790		0.7110	0.0380		1.0000	0.0740	
	1972-1974	1.4020	0.0540		0.9860	0.0690		0.7230	0.0370		1.0000	0.0572	
	1975-1979	1.8100	0.1490		0.8610	0.1590		0.6540	0.0930		1.0000	0.1389	
	1980	2.3970	0.2770		0.6470	0.0610		0.6190	0.0760		1.0000	0.1096	
	1981	2.8171	0.6155	0.8042	0.3577	0.2966	0.5154	0.8546	0.2652	0.4212	1.0000	0.3537	0.5492
	1982	2.7447	0.6031	0.7700	0.3853	0.2732	0.4642	0.8566	0.2545	0.4018	1.0000	0.3360	0.5102
	1983	2.8699	0.4792	0.5760	0.2877	0.2286	0.3036	0.9484	0.2591	0.3650	1.0000	0.2885	0.3765
	1984	2.8689	0.6010	0.6754	0.3140	0.2715	0.3372	0.8990	0.2988	0.4027	1.0000	0.3469	0.4247
	1985	2.7500	0.5075	0.6091	0.3558	0.2602	0.3241	0.9089	0.2619	0.3433	1.0000	0.3116	0.3880
	1986	2.6623	0.4372	0.5592	0.3863	0.2514	0.3140	0.9168	0.2344	0.2992	1.0000	0.2850	0.3605
	1987	2.6277	0.4480	0.5709	0.4065	0.2614	0.3206	0.9044	0.2360	0.2937	1.0000	0.2929	0.3648
	1988	2.5906	0.4291	0.5586	0.4217	0.2614	0.3193	0.9034	0.2279	0.2784	1.0000	0.2868	0.3574
	1989	2.5747	0.4169	0.5500	0.4274	0.2600	0.3176	0.9046	0.2231	0.2706	1.0000	0.2822	0.3526
	1990	2.5591	0.4049	0.5415	0.4329	0.2586	0.3160	0.9058	0.2183	0.2629	1.0000	0.2778	0.3479
	1991	2.5280	0.3811	0.5247	0.4440	0.2559	0.3127	0.9081	0.2089	0.2476	1.0000	0.2689	0.3386
	1992+	2.5048	0.3633	0.5122	0.4522	0.2538	0.3103	0.9099	0.2019	0.2362	1.0000	0.2622	0.3316
NOx	Pre-1968	1.1210	0.0090		0.7850	0.0010		1.3190	-0.0090		1.0000	-0.0001	
	1968-1972	1.1610	0.0		0.7960	0.0		1.2670	0.0		1.0000	0.0	
	1973-1974	1.2470	0.0240		0.7790	0.0070		1.2360	0.0280		1.0000	0.0162	
	1975-1976	1.2950	0.0250		0.7850	0.0080		1.1880	0.0330		1.0000	0.0183	
	1977-1979	1.3770	0.0500		0.7580	0.0610		1.1770	0.0780		1.0000	0.0634	
	1980	1.3130	0.0470		0.8110	0.0340		1.1250	0.0540		1.0000	0.0421	
	1981	1.7037	0.0896	0.0896	0.7445	0.1011	0.1011	0.9565	0.1301	0.1301	1.0000	0.1066	0.1066
	1982	1.6886	0.1007	0.1007	0.7519	0.1084	0.1084	0.9539	0.1402	0.1402	1.0000	0.1155	0.1155
	1983	1.5084	0.0673	0.0673	0.7760	0.0507	0.0507	1.0438	0.0717	0.0717	1.0000	0.0599	0.0599
	1984	1.5590	0.0545	0.0545	0.7542	0.0410	0.0410	1.0472	0.0671	0.0671	1.0000	0.0509	0.0509
	1985	1.5619	0.0584	0.0584	0.7594	0.0397	0.0397	1.0352	0.0709	0.0709	1.0000	0.0521	0.0521
	1986	1.5638	0.0619	0.0619	0.7641	0.0387	0.0387	1.0248	0.0743	0.0743	1.0000	0.0532	0.0532
	1987	1.5800	0.0590	0.0590	0.7588	0.0354	0.0354	1.0227	0.0739	0.0739	1.0000	0.0508	0.0508
	1988	1.5856	0.0593	0.0593	0.7587	0.0341	0.0341	1.0186	0.0749	0.0749	1.0000	0.0504	0.0504
	1989	1.5865	0.0599	0.0599	0.7595	0.0338	0.0338	1.0165	0.0755	0.0755	1.0000	0.0505	0.0505
	1990	1.5874	0.0605	0.0605	0.7602	0.0335	0.0335	1.0144	0.0761	0.0761	1.0000	0.0507	0.0507
	1991	1.5892	0.0617	0.0617	0.7618	0.0328	0.0328	1.0101	0.0775	0.0775	1.0000	0.0510	0.0510
	1992+	1.5906	0.0627	0.0627	0.7630	0.0324	0.0324	1.0067	0.0785	0.0785	1.0000	0.0512	0.0512

NOTE : The fractions given in this table are used in the calculation of the operating-mode/ temperature correction factor (OMTCF).

WHERE :

OMTCF = [(TERM1 + TERM2 + TERM3)/DENOM].
TERM1 = W *TCF(1)*(B1+D11*M), or *[B1+D11*5.0+D12*(M-5.0)].
TERM2 = (1-W-X)*TCF(2)*(B2+D21*M), or *[B2+D21*5.0+D22*(M-5.0)].
TERM3 = X *TCF(3)*(B3+D31*M), or *[B3+D31*5.0+D32*(M-5.0)].
DENOM = B0+D01*M, or = B0+D01*5.0+D02*(M-5.0).
W = Fraction of VMT in the cold start mode.
X = Fraction of VMT in the hot start mode.
TCF(b) = Temperature correction factor for pollutant/model year/test segment b.
M = Cumulative mileage / 10,000 miles.

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TABLE 1.1.8A

AIR CONDITIONING CORRECTION FACTOR COEFFICIENTS FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* ACCF= U*V*(A + B*(T-75) -1) + 1

Model Years	HC		CO		NOx	
	A	B	A	B	A	B
Pre-1975	0.1023E+01	0.3344E-02	0.1202E+01	0.1808E-02	0.1299E+01	0.5643E-04
1975+	0.1000E+01	0.3512E-02	0.1130E+01	0.1528E-02	0.1221E+01	0.4262E-03

* WHERE :

ACCF = Air Conditioning Correction Factor,
V = Fraction of vehicles equipped with AC given in Table 1.1.8B,
U = Fraction of vehicles with AC that are using it = (DI-DILO)/(DIHI-DI), 0<=U<=1,
DI = Discomfort index = (DB+WB)*.4+15,
DILO = The highest discomfort index where no AC is used,
DIHI = The lowest discomfort index where all vehicles with AC use it,
DB = Dry bulb temperature (Fahrenheit),
WB = Wet bulb temperature (Fahrenheit),
T = Ambient temperature (Fahrenheit).

TABLE 1.1.8B

ESTIMATED FRACTION OF
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
EQUIPPED WITH AIR CONDITIONING

Model Years	Fraction Equipped With Air Conditioning
Pre-1962	0.07
1962-1964	0.14
1965-1966	0.24
1967-1968	0.37
1969-1971	0.51
1972-1976	0.61
1977+	0.72

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TABLE 1.1.8C

EXTRA LOAD CORRECTION FACTOR COEFFICIENTS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* XLCF = (XLC-1)*U + 1

Model Years	Coefficients (XLC) HC	CO	NOx
Pre-1968	1.0786	1.2765	0.9535
1968-1969	1.0495	1.1384	1.0313
1970-1971	1.0852	1.2478	1.0313
1972	1.0556	1.1347	1.0313
1973-1974	1.0556	1.1347	1.0753
1975+	1.0455	1.3058	1.0719

* WHERE :

XLCF = Extra load correction factor,
U = Fraction of VMT with an extra load,
XLC = Correction factor coefficient.

TABLE 1.1.8D

TRAILER TOWING CORRECTION FACTOR COEFFICIENTS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* TTCF = (TTC-1)*U + 1

Model Years	Coefficients (TTC) HC	CO	NOx
Pre-1968	1.2614	1.9327	1.1184
1968-1969	1.2762	1.8940	1.1384
1970-1971	1.4598	2.4753	1.1384
1972	1.7288	2.1414	1.1384
1973-1974	1.7288	2.1414	1.2170
1975+	1.5909	3.9722	1.3875

* WHERE :

TTCF = Trailer towing correction factor,
U = Fraction of VMT towing a trailer,
TTC = Correction factor coefficient.

TABLE 1.1.9A

TAMPERING AND MISFUELING RATES
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Area	Model Years	System	Zero Mile Level	Det. Rate 1	Det. Rate 2	50,000 Mile Level	100,000 Mile Level
Non-I/M	Pre-1981	Air Pump Disablement	-0.0556	0.03819	0.03819	0.135	0.326
		Catalyst Removal	0.0362	0.01546	0.01546	0.113	0.191
		EGR System Disabled	0.0673	0.01552	0.01552	0.145	0.222
		Filler Neck Damaged	0.0183	0.02393	0.02393	0.138	0.258
		Fuel Tank Misfueled	0.0109	0.00171	0.00171	0.019	0.028
		Total Misfueled	0.0292	0.02564	0.02564	0.157	0.286
		PCV System Disabled	-0.0059	0.00315	0.00315	0.010	0.026
		Cannister Disconnect	-0.0206	0.01154	0.01154	0.037	0.095
		Both Cannister & Cap	-0.0186	0.01301	0.01301	0.046	0.111
	1981+	Air Pump Disablement	-0.0157	0.00961	0.03819	0.032	0.223
		Catalyst Removal	-0.0071	0.00574	0.01546	0.022	0.099
		EGR System Disabled	-0.0054	0.00674	0.01552	0.028	0.106
		Filler Neck Damaged	-0.0068	0.00496	0.00496	0.018	0.043
		Fuel Tank Misfueled	0.0140	0.00101	0.00101	0.019	0.024
		Total Misfueled	0.0072	0.00597	0.00597	0.037	0.067
		PCV System Disabled	-0.0059	0.00315	0.00315	0.010	0.026
		Cannister Disconnect	-0.0206	0.01154	0.01154	0.037	0.095
		Both Cannister & Cap	-0.0186	0.01301	0.01301	0.046	0.111
With I/M	Pre-1981	Air Pump Disablement	-0.0473	0.02914	0.02914	0.098	0.244
		Catalyst Removal	-0.0062	0.00960	0.00960	0.042	0.090
		EGR System Disabled	0.0206	0.01449	0.01449	0.093	0.165
		Filler Neck Damaged	0.0163	0.01188	0.01188	0.076	0.135
		Fuel Tank Misfueled	0.0434	-0.00216	-0.00216	0.033	0.022
		Total Misfueled	0.0597	0.00972	0.00972	0.108	0.157
		PCV System Disabled	-0.0024	0.00180	0.00180	0.007	0.016
		Cannister Disconnect	-0.0063	0.00601	0.00601	0.024	0.054
		Both Cannister & Cap	-0.0077	0.00752	0.00752	0.030	0.067
	1981+	Air Pump Disablement	-0.0106	0.00744	0.02914	0.027	0.172
		Catalyst Removal	-0.0058	0.00338	0.00960	0.011	0.059
		EGR System Disabled	0.0002	0.00286	0.01449	0.014	0.087
		Filler Neck Damaged	-0.0002	0.00059	0.00059	0.003	0.006
		Fuel Tank Misfueled	0.0115	0.00009	0.00009	0.012	0.012
		Total Misfueled	0.0113	0.00068	0.00068	0.015	0.018
		PCV System Disabled	-0.0024	0.00180	0.00180	0.007	0.016
		Cannister Disconnect	-0.0063	0.00601	0.00601	0.024	0.054
		Both Cannister & Cap	-0.0077	0.00752	0.00752	0.030	0.067

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TABLE 1.1.9B

EXCESS EMISSIONS
DUE TO TAMPERING AND/OR MISFUELING
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Type of Tampering	Emission Control System	Pollutant	Excess Emissions (g/mi) FTP	Bag 1	Bag 2	Bag 3	Idle (g/hr)
Air Pump Disablement	Oxidation	HC	1.37	1.80	1.37	1.04	27.38
		CO	30.61	34.67	33.90	21.28	506.08
	3way/Oxidation 3way	HC	0.85	1.36	0.76	0.61	
		Pre-1985					8.97
		1985+					11.71
		CO	21.02	31.80	18.21	18.25	
		Pre-1985					177.43
		1985+					215.29
Catalyst Removal	Oxidation	HC	3.05	2.31	3.40	2.95	42.83
		CO	28.01	41.40	28.97	16.06	124.82
	3way/Oxidation 3way	HC	2.04	1.80	2.25	1.81	42.83
		CO	13.74	16.32	14.11	11.07	124.82
		NOx	1.52	1.49	1.36	1.83	2.31
,otal Misfueled	Oxidation	HC	2.47	2.30	2.57	2.40	9.70
		CO	20.96	46.50	13.13	16.62	14.18
	3way/Oxidation 3way	HC	1.44	1.42	1.56	1.21	9.70
		CO	6.57	8.08	6.60	5.37	14.18
		NOx	0.57	0.64	0.45	0.74	0.13
EGR System Disabled		NOx					
		Pre-1975	1.21	1.40	0.96	1.54	
		1975-1976	3.31	3.82	2.63	4.21	
		1977-1980	3.48	4.11	2.68	4.53	
		1981+	1.23	1.36	1.19	1.21	
EGR System Disabled	and Catalyst Removal	NOx	3.39	3.02	3.46	3.55	
EGR System Disabled	and Total Misfueled	NOx	1.99	2.12	1.85	2.16	

DATE : MAY 19, 1989

TABLE 1.1.9C

EXCESS CRANKCASE EMISSIONS
AND UNCONTROLLED
EVAPORATIVE HYDROCARBON EMISSIONS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Excess Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
PCV System Disabled					
1964-1970	1.28				
1971-1974	1.27				
1975-1977	1.26				
1978-1979	1.24				
1980	1.22				
1981+	1.21				
Cannister Disconnect					
Pre-1971		14.67	24.90	22.45	48.76
1971		14.67	24.90	22.45	48.76
1972-1977		14.67	18.78	22.45	36.77
1978-1980		13.29	14.90	18.50	29.18
1981+ CARB		10.36	14.70	17.47	28.78
1981+ FINJ		5.20	14.70	9.00	28.78
Missing Fuel Cap					
Pre-1971		14.67	24.90	22.45	48.76
1971		14.67	24.90	22.45	48.76
1972-1977		14.67	18.78	22.45	36.77
1978-1980		13.29	14.90	18.50	29.18
1981+ CARB		0.0	14.70	0.0	28.78
1981+ FINJ		5.20	14.70	9.00	28.78

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

DATE : MAY 19, 1989

TABLE 1.1.9D

UNCONTROLLED
RUNNING LOSS EMISSIONS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Cannister Disconnect				
7.0	0.33	0.42	0.90	1.85
9.0	0.52	1.30	2.04	4.29
10.4	0.95	2.36	3.52	4.97
11.7	2.54	3.37	7.19	11.97
Missing Fuel Cap				
7.0	0.60	0.84	1.28	2.44
9.0	1.23	1.85	3.31	15.58
10.4	2.09	3.43	15.30	28.51
11.7	3.62	17.28	44.93	44.93

* Uncontrolled emissions applicable to 1971+ model year vehicles.

DATE : MAY 19, 1989

TABLE 1.1.10A

METHANE OFFSETS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Methane Offsets (g/mi) FTP	Bag 1	Bag 2	Bag 3
Pre-1975	0.311	0.420	0.310	0.230
1975-1976	0.168	0.250	0.160	0.120
1977	0.168	0.250	0.160	0.120
1978-1979	0.168	0.250	0.160	0.120
1980	0.098	0.140	0.090	0.080
1981-1982	0.108	0.155	0.101	0.085
1983	0.080	0.111	0.075	0.067
1984	0.075	0.105	0.070	0.063
1985	0.067	0.093	0.062	0.056
1986	0.064	0.088	0.059	0.054
1987	0.057	0.079	0.053	0.049
1988	0.055	0.075	0.051	0.046
1989	0.053	0.073	0.049	0.046
1990	0.052	0.071	0.048	0.044
1991	0.049	0.067	0.046	0.042
1992+	0.048	0.065	0.044	0.041

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

DATE : MAY 19, 1989

TABLE 1.1.10C

PERCENT TECHNOLOGY DISTRIBUTIONS
(EXHAUST AND EVAPORATIVE EMISSION SYSTEMS)
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Air Pump Only	Oxidation Catalyst	3Way Catalyst	EGR System	Air Pump & Oxidation or 3Way Catalyst	EGR System & 3Way Catalyst
Pre-1968	0.0	0.0	0.0	0.0	0.0	0.0
1968-1971	5.0	0.0	0.0	0.0	0.0	0.0
1972	10.0	0.0	0.0	0.0	0.0	0.0
1973	30.0	0.0	0.0	80.0	0.0	0.0
1974	30.0	0.0	0.0	90.0	0.0	0.0
1975	15.0	80.0	0.0	90.0	30.0	0.0
1976	10.0	85.0	0.0	90.0	30.0	0.0
1977	10.0	85.0	0.0	90.0	20.0	0.0
1978-1979	5.0	90.0	0.0	90.0	25.0	0.0
1980	0.0	88.0	7.0	97.0	65.0	7.0
1981	0.0	15.0	85.0	90.0	75.0	85.0
1982	0.0	14.0	86.0	90.0	70.0	85.0
1983	0.0	12.0	88.0	90.0	60.0	85.0
1984-1985	0.0	0.0	100.0	93.0	60.0	93.0
1986	0.0	0.0	100.0	93.0	40.0	93.0
1987+	0.0	0.0	100.0	90.0	30.0	90.0

Model Years	Evaporative Canister	PCV System
Pre-1963	0.0	0.0
1963-1967	0.0	0.0
1968-1970	0.0	100.0
1971+	100.0	100.0

DATE : MAY 19, 1989

TABLE 1.1.10D

PERCENT TECHNOLOGY DISTRIBUTIONS
(FUEL DELIVERY SYSTEMS)
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Carbureted	Ported Fuel-Injected	Throttle-Body Fuel-Injected
1981	91.5	5.7	2.8
1982	82.9	6.3	10.8
1983	71.8	8.7	19.5
1984	60.7	10.4	28.9
1985	45.5	28.0	26.5
1986	33.0	39.1	27.9
1987	25.3	48.3	26.4
1988	18.9	57.6	23.5
1989	16.3	59.4	24.3
1990	13.7	65.6	20.7
1991	8.4	74.2	17.4
1992+	4.3	78.5	17.2

DATE : MAY 19, 1989

TABLE 1.1.11A

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	14.6	1967	14.6	1968	12.1	1969	12.1	1970	12.5	1971	11.8	1972	8.2	1973	8.2	1974	8.2	1975	7.7	1976	7.7	1977	7.7
1967	14.5	1968	11.9	1969	11.9	1970	12.3	1971	11.6	1972	8.1	1973	8.1	1974	8.1	1975	7.6	1976	7.6	1977	7.6	1978	6.6
1968	11.8	1969	11.8	1970	12.1	1971	11.4	1972	8.0	1973	8.0	1974	8.0	1975	7.5	1976	7.5	1977	7.5	1978	6.5	1979	6.5
1969	11.7	1970	11.9	1971	11.2	1972	7.9	1973	7.9	1974	8.0	1975	7.3	1976	7.3	1977	7.3	1978	6.4	1979	6.3	1980	3.1
1970	11.7	1971	11.0	1972	7.9	1973	7.9	1974	7.8	1975	7.2	1976	7.2	1977	7.2	1978	6.3	1979	6.2	1980	3.0	1981	2.6
1971	10.8	1972	7.8	1973	7.8	1974	7.8	1975	7.0	1976	7.0	1977	7.0	1978	6.1	1979	6.1	1980	3.0	1981	2.6	1982	2.5
1972	7.7	1973	7.7	1974	7.7	1975	6.8	1976	6.8	1977	6.8	1978	5.9	1979	5.9	1980	3.0	1981	2.5	1982	2.4	1983	2.2
1973	7.5	1974	7.5	1975	6.6	1976	6.6	1977	6.6	1978	5.7	1979	5.7	1980	2.9	1981	2.5	1982	2.4	1983	2.1	1984	2.1
1974	7.4	1975	6.4	1976	6.4	1977	6.4	1978	5.5	1979	5.5	1980	2.8	1981	2.4	1982	2.4	1983	2.1	1984	2.1	1985	2.0
1975	6.2	1976	6.2	1977	6.2	1978	5.3	1979	5.3	1980	2.8	1981	2.3	1982	2.3	1983	2.1	1984	2.0	1985	2.0	1986	1.9
1976	6.0	1977	6.0	1978	5.1	1979	5.1	1980	2.7	1981	2.3	1982	2.2	1983	2.0	1984	2.0	1985	1.9	1986	1.9	1987	1.8
1977	5.7	1978	4.8	1979	4.8	1980	2.6	1981	2.2	1982	2.1	1983	1.9	1984	1.9	1985	1.9	1986	1.8	1987	1.8	1988	1.8
1978	4.6	1979	4.6	1980	2.5	1981	2.1	1982	2.0	1983	1.8	1984	1.8	1985	1.8	1986	1.8	1987	1.7	1988	1.7	1989	1.7
1979	4.3	1980	2.4	1981	2.0	1982	1.9	1983	1.7	1984	1.8	1985	1.7	1986	1.7	1987	1.7	1988	1.7	1989	1.6	1990	1.6
1980	2.3	1981	1.8	1982	1.8	1983	1.7	1984	1.7	1985	1.7	1986	1.6	1987	1.6	1988	1.6	1989	1.6	1990	1.5	1991	1.5
1981	1.7	1982	1.7	1983	1.6	1984	1.6	1985	1.6	1986	1.6	1987	1.6	1988	1.6	1989	1.6	1990	1.5	1991	1.5	1992	1.4
1982	1.6	1983	1.5	1984	1.5	1985	1.5	1986	1.5	1987	1.5	1988	1.5	1989	1.5	1990	1.5	1991	1.4	1992	1.4	1993	1.4
1983	1.4	1984	1.4	1985	1.4	1986	1.4	1987	1.4	1988	1.4	1989	1.4	1990	1.4	1991	1.4	1992	1.4	1993	1.3	1994	1.3
1984	1.3	1985	1.3	1986	1.3	1987	1.3	1988	1.3	1989	1.3	1990	1.3	1991	1.3	1992	1.3	1993	1.3	1994	1.3	1995	1.2
1985	1.3	1986	1.3	1987	1.3	1988	1.3	1989	1.3	1990	1.3	1991	1.3	1992	1.3	1993	1.3	1994	1.3	1995	1.2	1996	1.2

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	6.7	1979	6.7	1980	3.2	1981	2.8	1984	2.4	1986	2.2	1989	2.2	1991	2.2	1993	2.2	1996	2.2	1999	2.2	2001	2.2
1979	6.6	1980	3.1	1981	2.7	1982	2.6	1985	2.3	1987	2.2	1990	2.1	1992	2.1	1994	2.1	1997	2.1	2000	2.1	2002	2.1
1980	3.1	1981	2.7	1982	2.6	1983	2.3	1986	2.2	1988	2.1	1991	2.1	1993	2.1	1995	2.1	1998	2.1	2001	2.1	2003	2.1
1981	2.7	1982	2.5	1983	2.2	1984	2.2	1987	2.1	1989	2.1	1992	2.0	1994	2.0	1996	2.0	1999	2.0	2002	2.0	2004	2.0
1982	2.5	1983	2.2	1984	2.2	1985	2.1	1988	2.1	1990	2.0	1993	2.0	1995	2.0	1997	2.0	2000	2.0	2003	2.0	2005	2.0
1983	2.2	1984	2.2	1985	2.1	1986	2.0	1989	2.0	1991	2.0	1994	1.9	1996	1.9	1998	1.9	2001	1.9	2004	1.9	2006	1.9
1984	2.1	1985	2.1	1986	2.0	1987	2.0	1990	1.9	1992	1.9	1995	1.9	1997	1.9	1999	1.9	2002	1.9	2005	1.9	2007	1.9
1985	2.0	1986	2.0	1987	1.9	1988	1.9	1991	1.9	1993	1.8	1996	1.8	1998	1.8	2000	1.8	2003	1.8	2006	1.8	2008	1.8
1986	1.9	1987	1.9	1988	1.9	1989	1.8	1992	1.8	1994	1.8	1997	1.8	1999	1.8	2001	1.8	2004	1.8	2007	1.8	2009	1.8
1987	1.9	1988	1.9	1989	1.8	1990	1.8	1993	1.7	1995	1.7	1998	1.7	2000	1.7	2002	1.7	2005	1.7	2008	1.7	2010	1.7
1988	1.8	1989	1.8	1990	1.7	1991	1.7	1994	1.7	1996	1.7	1999	1.7	2001	1.7	2003	1.7	2006	1.7	2009	1.7	2011	1.7
1989	1.7	1990	1.7	1991	1.7	1992	1.6	1995	1.6	1997	1.6	2000	1.6	2002	1.6	2004	1.6	2007	1.6	2010	1.6	2012	1.6
1990	1.6	1991	1.6	1992	1.6	1993	1.6	1996	1.6	1998	1.5	2001	1.5	2003	1.5	2005	1.5	2008	1.5	2011	1.5	2013	1.5
1991	1.6	1992	1.6	1993	1.5	1994	1.5	1997	1.5	1999	1.5	2002	1.5	2004	1.5	2006	1.5	2009	1.5	2012	1.5	2014	1.5
1992	1.5	1993	1.5	1994	1.4	1995	1.4	1998	1.4	2000	1.4	2003	1.4	2005	1.4	2007	1.4	2010	1.4	2013	1.4	2015	1.4
1993	1.4	1994	1.4	1995	1.4	1996	1.3	1999	1.3	2001	1.3	2004	1.3	2006	1.3	2008	1.3	2011	1.3	2014	1.3	2016	1.3
1994	1.3	1995	1.3	1996	1.3	1997	1.3	2000	1.3	2002	1.3	2005	1.3	2007	1.3	2009	1.3	2012	1.3	2015	1.3	2017	1.3
1995	1.3	1996	1.3	1997	1.2	1998	1.2	2001	1.2	2003	1.2	2006	1.2	2008	1.2	2010	1.2	2013	1.2	2016	1.2	2018	1.2
1996	1.2	1997	1.2	1998	1.2	1999	1.1	2002	1.1	2004	1.1	2007	1.1	2009	1.1	2011	1.1	2014	1.1	2017	1.1	2019	1.1
1997	1.2	1998	1.2	1999	1.1	2000	1.1	2003	1.1	2005	1.1	2008	1.1	2010	1.1	2012	1.1	2015	1.1	2018	1.1	2020	1.1

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start, 60 TO 84F diurnal, 75F for hot soak and running loss emissions, 9.0 psi fuel RVP, 54.57% average in-use fuel tank level, including refueling emissions. Emissions are based on the January 1 mileage accumulation figures given in Table 1.1.4A.

TABLE 1.1.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	113.6	1967	113.6	1968	96.4	1969	96.4	1970	91.3	1971	91.3	1972	77.8	1973	77.8	1974	77.8	1975	56.4	1976	56.4	1977	56.4
1967	112.5	1968	95.1	1969	95.1	1970	89.8	1971	89.8	1972	76.7	1973	76.7	1974	76.7	1975	55.1	1976	55.1	1977	55.1	1978	55.1
1968	93.8	1969	93.8	1970	88.2	1971	88.2	1972	75.5	1973	75.5	1974	75.5	1975	53.9	1976	53.9	1977	53.9	1978	53.9	1979	53.9
1969	92.4	1970	86.5	1971	86.5	1972	74.2	1973	74.2	1974	74.2	1975	52.5	1976	52.5	1977	52.5	1978	52.5	1979	52.5	1980	16.4
1970	84.7	1971	84.7	1972	72.8	1973	72.8	1974	72.8	1975	51.1	1976	51.1	1977	51.1	1978	51.1	1979	51.1	1980	16.0	1981	24.2
1971	82.7	1972	71.4	1973	71.4	1974	71.4	1975	49.6	1976	49.6	1977	49.6	1978	49.6	1979	49.6	1980	15.6	1981	23.2	1982	21.6
1972	69.9	1973	69.9	1974	69.9	1975	48.0	1976	48.0	1977	48.0	1978	48.0	1979	48.0	1980	15.1	1981	22.0	1982	20.6	1983	13.9
1973	68.3	1974	68.3	1975	46.3	1976	46.3	1977	46.3	1978	46.3	1979	46.3	1980	14.6	1981	20.8	1982	19.5	1983	13.2	1984	13.6
1974	66.6	1975	44.6	1976	44.6	1977	44.6	1978	44.6	1979	44.6	1980	14.1	1981	19.5	1982	18.3	1983	12.5	1984	12.8	1985	12.6
1975	42.7	1976	42.7	1977	42.7	1978	42.7	1979	42.7	1980	13.5	1981	18.2	1982	17.1	1983	11.7	1984	12.0	1985	11.8	1986	11.7
1976	40.7	1977	40.7	1978	40.7	1979	40.7	1980	12.9	1981	16.8	1982	15.8	1983	10.9	1984	11.2	1985	11.0	1986	10.9	1987	10.9
1977	38.6	1978	38.6	1979	38.6	1980	12.3	1981	15.3	1982	14.4	1983	10.1	1984	10.3	1985	10.2	1986	10.0	1987	10.1	1988	10.0
1978	36.4	1979	36.4	1980	11.6	1981	13.7	1982	12.9	1983	9.1	1984	9.4	1985	9.2	1986	9.2	1987	9.2	1988	9.2	1989	9.2
1979	34.0	1980	10.9	1981	12.0	1982	11.4	1983	8.2	1984	8.3	1985	8.3	1986	8.2	1987	8.3	1988	8.2	1989	8.2	1990	8.2
1980	10.2	1981	10.2	1982	9.8	1983	7.2	1984	7.3	1985	7.3	1986	7.2	1987	7.3	1988	7.3	1989	7.3	1990	7.3	1991	7.2
1981	8.6	1982	8.3	1983	6.2	1984	6.3	1985	6.3	1986	6.3	1987	6.3	1988	6.3	1989	6.3	1990	6.3	1991	6.3	1992	6.3
1982	7.1	1983	5.3	1984	5.3	1985	5.4	1986	5.4	1987	5.4	1988	5.4	1989	5.4	1990	5.5	1991	5.5	1992	5.5	1993	5.5
1983	4.4	1984	4.3	1985	4.4	1986	4.5	1987	4.5	1988	4.5	1989	4.5	1990	4.5	1991	4.6	1992	4.6	1993	4.6	1994	4.6
1984	3.3	1985	3.4	1986	3.5	1987	3.5	1988	3.5	1989	3.5	1990	3.6	1991	3.6	1992	3.6	1993	3.6	1994	3.6	1995	3.6
1985	2.7	1986	2.9	1987	2.8	1988	2.9	1989	2.9	1990	2.9	1991	3.0	1992	3.0	1993	3.0	1994	3.0	1995	3.0	1996	3.0

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	56.4	1979	56.4	1980	17.6	1981	28.0	1984	17.9	1986	17.1	1989	17.0	1991	16.8	1993	16.7	1996	16.7	1999	16.7	2001	16.7
1979	55.1	1980	17.2	1981	27.1	1982	25.3	1985	17.0	1987	16.7	1990	16.5	1992	16.2	1994	16.2	1997	16.2	2000	16.2	2002	16.2
1980	16.8	1981	26.2	1982	24.4	1983	16.4	1986	16.1	1988	16.1	1991	15.9	1993	15.8	1995	15.8	1998	15.8	2001	15.8	2003	15.8
1981	25.3	1982	23.6	1983	15.8	1984	16.3	1987	15.6	1989	15.5	1992	15.2	1994	15.2	1996	15.2	1999	15.2	2002	15.2	2004	15.2
1982	22.6	1983	15.2	1984	15.7	1985	15.3	1988	15.0	1990	14.9	1993	14.7	1995	14.7	1997	14.7	2000	14.7	2003	14.7	2005	14.7
1983	14.6	1984	15.0	1985	14.7	1986	14.4	1989	14.4	1991	14.2	1994	14.1	1996	14.1	1998	14.1	2001	14.1	2004	14.1	2006	14.1
1984	14.3	1985	14.0	1986	13.8	1987	13.8	1990	13.7	1992	13.5	1995	13.5	1997	13.5	1999	13.5	2002	13.5	2005	13.5	2007	13.5
1985	13.4	1986	13.1	1987	13.2	1988	13.1	1991	12.9	1993	12.9	1996	12.9	1998	12.9	2000	12.9	2003	12.9	2006	12.9	2008	12.9
1986	12.4	1987	12.5	1988	12.4	1989	12.4	1992	12.2	1994	12.2	1997	12.2	1999	12.2	2001	12.2	2004	12.2	2007	12.2	2009	12.2
1987	11.7	1988	11.7	1989	11.6	1990	11.6	1993	11.5	1995	11.5	1998	11.5	2000	11.5	2002	11.5	2005	11.5	2008	11.5	2010	11.5
1988	10.9	1989	10.9	1990	10.8	1991	10.8	1994	10.7	1996	10.7	1999	10.7	2001	10.7	2003	10.7	2006	10.7	2009	10.7	2011	10.7
1989	10.0	1990	10.0	1991	10.0	1992	9.9	1995	9.9	1997	9.9	2000	9.9	2002	9.9	2004	9.9	2007	9.9	2010	9.9	2012	9.9
1990	9.1	1991	9.1	1992	9.1	1993	9.1	1996	9.1	1998	9.1	2001	9.1	2003	9.1	2005	9.1	2008	9.1	2011	9.1	2013	9.1
1991	8.2	1992	8.2	1993	8.2	1994	8.2	1997	8.2	1999	8.2	2002	8.2	2004	8.2	2006	8.2	2009	8.2	2012	8.2	2014	8.2
1992	7.2	1993	7.2	1994	7.2	1995	7.2	1998	7.2	2000	7.2	2003	7.2	2005	7.2	2007	7.2	2010	7.2	2013	7.2	2015	7.2
1993	6.3	1994	6.3	1995	6.3	1996	6.3	1999	6.3	2001	6.3	2004	6.3	2006	6.3	2008	6.3	2011	6.3	2014	6.3	2016	6.3
1994	5.5	1995	5.5	1996	5.5	1997	5.5	2000	5.5	2002	5.5	2005	5.5	2007	5.5	2009	5.5	2012	5.5	2015	5.5	2017	5.5
1995	4.6	1996	4.6	1997	4.6	1998	4.6	2001	4.6	2003	4.6	2006	4.6	2008	4.6	2010	4.6	2013	4.6	2016	4.6	2018	4.6
1996	3.6	1997	3.6	1998	3.6	1999	3.6	2002	3.6	2004	3.6	2007	3.6	2009	3.6	2011	3.6	2014	3.6	2017	3.6	2019	3.6
1997	3.0	1998	3.0	1999	3.0	2000	3.0	2003	3.0	2005	3.0	2008	3.0	2010	3.0	2012	3.0	2015	3.0	2018	3.0	2020	3.0

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in Table 1.1.4A.

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TABLE 1.1.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	3.4	1967	3.4	1968	4.3	1969	4.3	1970	4.3	1971	4.3	1972	4.3	1973	3.6	1974	3.6	1975	3.1	1976	3.1	1977	3.5
1967	3.4	1968	4.3	1969	4.3	1970	4.3	1971	4.3	1972	4.3	1973	3.6	1974	3.6	1975	3.0	1976	3.0	1977	3.5	1978	3.5
1968	4.3	1969	4.3	1970	4.3	1971	4.3	1972	4.3	1973	3.6	1974	3.6	1975	3.0	1976	3.0	1977	3.4	1978	3.4	1979	3.4
1969	4.3	1970	4.3	1971	4.3	1972	4.3	1973	3.6	1974	3.6	1975	3.0	1976	3.0	1977	3.3	1978	3.3	1979	3.3	1980	2.5
1970	4.3	1971	4.3	1972	4.3	1973	3.5	1974	3.5	1975	3.0	1976	3.0	1977	3.3	1978	3.3	1979	3.3	1980	2.4	1981	1.6
1971	4.3	1972	4.3	1973	3.5	1974	3.5	1975	3.0	1976	3.0	1977	3.2	1978	3.2	1979	3.2	1980	2.4	1981	1.5	1982	1.6
1972	4.3	1973	3.5	1974	3.5	1975	2.9	1976	2.9	1977	3.1	1978	3.1	1979	3.1	1980	2.4	1981	1.5	1982	1.5	1983	1.1
1973	3.4	1974	3.4	1975	2.9	1976	2.9	1977	3.1	1978	3.1	1979	3.1	1980	2.3	1981	1.4	1982	1.5	1983	1.1	1984	1.1
1974	3.4	1975	2.9	1976	2.9	1977	3.0	1978	3.0	1979	3.0	1980	2.3	1981	1.4	1982	1.4	1983	1.1	1984	1.0	1985	1.0
1975	2.8	1976	2.8	1977	2.9	1978	2.9	1979	2.9	1980	2.2	1981	1.3	1982	1.4	1983	1.0	1984	1.0	1985	1.0	1986	1.0
1976	2.8	1977	2.8	1978	2.8	1979	2.8	1980	2.2	1981	1.3	1982	1.3	1983	1.0	1984	1.0	1985	1.0	1986	1.0	1987	1.0
1977	2.7	1978	2.7	1979	2.7	1980	2.1	1981	1.2	1982	1.2	1983	1.0	1984	1.0	1985	0.9	1986	0.9	1987	0.9	1988	0.9
1978	2.6	1979	2.6	1980	2.0	1981	1.2	1982	1.2	1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9
1979	2.5	1980	2.0	1981	1.1	1982	1.1	1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9
1980	1.9	1981	1.0	1982	1.0	1983	0.9	1984	0.9	1985	0.8	1986	0.8	1987	0.8	1988	0.8	1989	0.8	1990	0.8	1991	0.8
1981	1.0	1982	1.0	1983	0.8	1984	0.8	1985	0.8	1986	0.8	1987	0.8	1988	0.8	1989	0.8	1990	0.8	1991	0.8	1992	0.8
1982	0.9	1983	0.8	1984	0.8	1985	0.8	1986	0.8	1987	0.8	1988	0.8	1989	0.8	1990	0.8	1991	0.8	1992	0.8	1993	0.8
1983	0.7	1984	0.7	1985	0.7	1986	0.7	1987	0.7	1988	0.7	1989	0.7	1990	0.7	1991	0.7	1992	0.7	1993	0.7	1994	0.7
1984	0.7	1985	0.7	1986	0.7	1987	0.7	1988	0.7	1989	0.7	1990	0.7	1991	0.7	1992	0.7	1993	0.7	1994	0.7	1995	0.7
1985	0.7	1986	0.6	1987	0.7	1988	0.7	1989	0.6	1990	0.6	1991	0.6	1992	0.6	1993	0.6	1994	0.6	1995	0.6	1996	0.6

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	3.5	1979	3.5	1980	2.6	1981	1.7	1984	1.2	1986	1.2	1989	1.2	1991	1.2	1993	1.2	1996	1.2	1999	1.2	2001	1.2
1979	3.5	1980	2.6	1981	1.7	1982	1.7	1985	1.2	1987	1.2	1990	1.2	1992	1.2	1994	1.2	1997	1.2	2000	1.2	2002	1.2
1980	2.5	1981	1.6	1982	1.7	1983	1.2	1986	1.2	1988	1.1	1991	1.1	1993	1.1	1995	1.1	1998	1.1	2001	1.1	2003	1.1
1981	1.6	1982	1.6	1983	1.2	1984	1.2	1987	1.1	1989	1.1	1992	1.1	1994	1.1	1996	1.1	1999	1.1	2002	1.1	2004	1.1
1982	1.6	1983	1.2	1984	1.1	1985	1.1	1988	1.1	1990	1.1	1993	1.1	1995	1.1	1997	1.1	2000	1.1	2003	1.1	2005	1.1
1983	1.1	1984	1.1	1985	1.1	1986	1.1	1989	1.1	1991	1.1	1994	1.1	1996	1.1	1998	1.1	2001	1.1	2004	1.1	2006	1.1
1984	1.1	1985	1.1	1986	1.1	1987	1.1	1990	1.1	1992	1.1	1995	1.1	1997	1.1	1999	1.1	2002	1.1	2005	1.1	2007	1.1
1985	1.1	1986	1.0	1987	1.0	1988	1.0	1991	1.0	1993	1.0	1996	1.0	1998	1.0	2000	1.0	2003	1.0	2006	1.0	2008	1.0
1986	1.0	1987	1.0	1988	1.0	1989	1.0	1992	1.0	1994	1.0	1997	1.0	1999	1.0	2001	1.0	2004	1.0	2007	1.0	2009	1.0
1987	1.0	1988	1.0	1989	1.0	1990	1.0	1993	1.0	1995	1.0	1998	1.0	2000	1.0	2002	1.0	2005	1.0	2008	1.0	2010	1.0
1988	1.0	1989	1.0	1990	1.0	1991	1.0	1994	1.0	1996	1.0	1999	1.0	2001	1.0	2003	1.0	2006	1.0	2009	1.0	2011	1.0
1989	0.9	1990	0.9	1991	0.9	1992	0.9	1995	0.9	1997	0.9	2000	0.9	2002	0.9	2004	0.9	2007	0.9	2010	0.9	2012	0.9
1990	0.9	1991	0.9	1992	0.9	1993	0.9	1996	0.9	1998	0.9	2001	0.9	2003	0.9	2005	0.9	2008	0.9	2011	0.9	2013	0.9
1991	0.9	1992	0.9	1993	0.9	1994	0.9	1997	0.9	1999	0.9	2002	0.9	2004	0.9	2006	0.9	2009	0.9	2012	0.9	2014	0.9
1992	0.8	1993	0.8	1994	0.8	1995	0.8	1998	0.8	2000	0.8	2003	0.8	2005	0.8	2007	0.8	2010	0.8	2013	0.8	2015	0.8
1993	0.8	1994	0.8	1995	0.8	1996	0.8	1999	0.8	2001	0.8	2004	0.8	2006	0.8	2008	0.8	2011	0.8	2014	0.8	2016	0.8
1994	0.8	1995	0.8	1996	0.8	1997	0.8	2000	0.8	2002	0.8	2005	0.8	2007	0.8	2009	0.8	2012	0.8	2015	0.8	2017	0.8
1995	0.7	1996	0.7	1997	0.7	1998	0.7	2001	0.7	2003	0.7	2006	0.7	2008	0.7	2010	0.7	2013	0.7	2016	0.7	2018	0.7
1996	0.7	1997	0.7	1998	0.7	1999	0.7	2002	0.7	2004	0.7	2007	0.7	2009	0.7	2011	0.7	2014	0.7	2017	0.7	2019	0.7
1997	0.6	1998	0.6	1999	0.6	2000	0.6	2003	0.6	2005	0.6	2008	0.6	2010	0.6	2012	0.6	2015	0.6	2018	0.6	2020	0.6

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in Table 1.1.4A.

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TABLE 1.2.1A

NONTAMPERED EXHAUST EMISSION RATES FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1968	7.250	0.180	8.150	9.050
	1968-1969	4.430	0.250	5.680	6.930
	1970-1971	3.000	0.370	4.850	6.700
	1972-1974	3.360	0.170	4.210	5.060
	1975-1978	1.800	0.270	3.150	4.500
	1979-1980	0.870	0.280	2.270	3.670
	1981-1983	0.820	0.150	1.570	2.320
	1984	0.700	0.150	1.450	2.200
	1985	0.410	0.080	0.810	1.210
	1986	0.360	0.080	0.760	1.160
	1987	0.310	0.080	0.710	1.110
	1988	0.370	0.080	0.770	1.170
	1989	0.370	0.080	0.770	1.170
	1990	0.370	0.080	0.770	1.170
	1991	0.370	0.080	0.770	1.170
	1992+	0.360	0.080	0.760	1.160
CO	Pre-1968	78.270	2.250	89.520	100.770
	1968-1969	56.340	2.550	69.090	81.840
	1970-1971	42.170	3.130	57.820	73.470
	1972-1974	40.780	2.440	52.980	65.180
	1975-1978	24.550	2.590	37.500	50.450
	1979-1980	12.280	2.430	24.430	36.580
	1981-1983	12.580	1.460	19.880	27.180
	1984	9.430	1.460	16.730	24.030
	1985	7.030	0.730	10.680	14.330
	1986	5.760	0.730	9.410	13.060
	1987	4.420	0.730	8.070	11.720
	1988	5.290	0.730	8.940	12.590
	1989	5.260	0.730	8.910	12.560
	1990	5.220	0.730	8.870	12.520
	1991	5.210	0 730	8.860	12.510
	1992+	5.070	0.730	8.720	12.370
NOx	Pre-1968	3.440	0.0	3.440	3.440
	1968-1972	4.350	0.0	4.350	4.350
	1973-1974	2.870	0.040	3.070	3.270
	1975-1978	2.700	0.030	2.850	3.000
	1979-1980	1.770	0.060	2.070	2.370
	1981-1983	1.640	0.030	1.790	1.940
	1984	1.120	0.070	1.470	1.820
	1985	1.240	0.040	1.440	1.640
	1986	1.080	0.040	1.280	1.480
	1987	0.910	0.040	1.110	1.310
	1988	0.820	0.040	1.020	1.220
	1989	0.820	0.040	1.020	1.220
	1990	0.810	0.040	1.010	1.210
	1991	0.810	0.040	1.010	1.210
	1992+	0.780	0.040	0.980	1.180

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile.
ZML = Zero mile level in grams/mile.
DR = Deterioration rate in grams/mile/10K miles.
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 1.2.1B

EXHAUST EMISSION RATES FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I
AT VARIOUS MILEAGE LEVELS
(RATES INCLUDE TAMPERING)

Pol	Model Years	Emission Rate (Grams/Mile) 0K	25K	50K	75K	100K	125K	150K
HC	Pre-1968	7.250	7.700	8.150	8.600	9.050	9.500	9.950
	1968-1969	4.445	5.074	5.704	6.333	6.963	7.592	8.222
	1970-1971	3.015	3.944	4.874	5.803	6.733	7.662	8.592
	1972	3.390	3.824	4.258	4.692	5.126	5.560	5.994
	1973-1974	3.449	3.901	4.353	4.806	5.258	5.710	6.162
	1975	2.393	3.291	4.250	5.181	6.111	7.042	7.952
	1976	2.466	3.398	4.395	5.359	6.324	7.289	8.235
	1977-1978	2.414	3.335	4.310	5.255	6.199	7.144	8.081
	1979-1980	1.552	2.502	3.527	4.520	5.513	6.505	7.467
	1981	0.898	1.419	1.975	2.554	3.143	3.724	4.300
	1982	0.896	1.418	1.977	2.559	3.150	3.733	4.312
	1983	0.893	1.410	1.962	2.536	3.120	3.696	4.268
	1984	0.770	1.286	1.840	2.416	3.000	3.576	4.150
	1985	0.476	0.812	1.184	1.577	1.978	2.372	2.763
	1986	0.423	0.749	1.105	1.480	1.864	2.241	2.615
	1987	0.358	0.661	0.988	1.331	1.680	2.025	2.366
	1988-1991	0.418	0.719	1.045	1.386	1.733	2.075	2.415
	1992+	0.408	0.709	1.035	1.376	1.723	2.065	2.405
CO	Pre-1968	78.270	83.895	89.520	95.145	100.770	106.395	112.020
	1968-1969	56.671	63.147	69.623	76.100	82.576	89.052	95.528
	1970-1971	42.515	50.446	58.376	66.306	74.236	82.167	90.097
	1972	41.474	47.786	54.098	60.410	66.722	73.034	79.345
	1973-1974	42.863	49.598	56.334	63.070	69.805	76.541	83.276
	1975	30.891	39.527	48.767	57.746	66.725	75.704	84.262
	1976	31.580	40.514	50.091	59.372	68.653	77.933	86.814
	1977-1978	30.972	39.805	49.152	58.225	67.298	76.371	85.221
	1979-1980	19.574	28.060	37.298	46.236	55.174	64.111	72.460
	1981	13.246	18.476	24.228	30.197	36.258	42.245	48.191
	1982	13.222	18.489	24.332	30.390	36.536	42.609	48.641
	1983	13.175	18.364	24.108	30.055	36.084	42.044	47.967
	1984	9.978	15.194	21.032	27.068	33.177	39.221	45.230
	1985	7.531	10.840	14.748	18.841	23.000	27.100	31.167
	1986	6.214	9.314	12.879	16.607	20.400	24.139	27.849
	1987	4.661	7.419	10.549	13.787	17.062	20.306	23.532
	1988	5.531	8.262	11.342	14.529	17.752	20.945	24.121
	1989	5.501	8.232	11.312	14.499	17.722	20.915	24.091
	1990	5.461	8.192	11.272	14.459	17.682	20.875	24.051
	1991	5.451	8.182	11.262	14.449	17.672	20.865	24.041
	1992+	5.311	8.042	11.122	14.309	17.532	20.725	23.901
NOx	Pre-1968	3.440	3.440	3.440	3.440	3.440	3.440	3.440
	1968-1972	4.350	4.350	4.350	4.350	4.350	4.350	4.350
	1973	2.966	3.116	3.266	3.416	3.566	3.717	3.867
	1974	2.978	3.134	3.291	3.447	3.603	3.760	3.916
	1975-1978	3.001	3.234	3.467	3.700	3.933	4.165	4.398
	1979-1980	2.108	2.435	2.762	3.089	3.416	3.744	4.071
	1981	1.640	1.786	1.981	2.245	2.509	2.774	3.038
	1982	1.640	1.787	1.982	2.246	2.511	2.776	3.041
	1983	1.641	1.789	1.986	2.252	2.519	2.786	3.053
	1984	1.122	1.372	1.672	2.042	2.413	2.783	3.153
	1985	1.243	1.422	1.652	1.951	2.252	2.552	2.852
	1986	1.085	1.269	1.505	1.812	2.120	2.428	2.735
	1987	0.926	1.147	1.425	1.777	2.134	2.488	2.840
	1988-1989	0.836	1.023	1.239	1.489	1.742	1.992	2.242
	1990-1991	0.826	1.013	1.229	1.479	1.732	1.982	2.232
	1992+	0.796	0.983	1.199	1.449	1.702	1.952	2.202

DATE : MAY 19, 1989

TABLE 1.2.2A

NONTAMPERED
CRANKCASE AND EVAPORATIVE HYDROCARBON EMISSIONS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Years	Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
Pre-1963	4.10	14.67	26.08	22.45	47.99
1963-1967	0.80	14.67	26.08	22.45	47.99
1968-1970	0.0	14.67	26.08	22.45	47.99
1971	0.0	10.91	16.28	16.15	38.58
1972-1977	0.0	8.27	8.98	12.32	23.53
1978-1980	0.0	2.46	5.16	4.30	14.47
1981	0.0	1.35	2.98	3.05	11.44
1982	0.0	1.35	2.99	3.06	11.46
1983	0.0	1.35	2.99	3.06	11.47
1984	0.0	1.35	2.97	3.05	11.38
1985	0.0	1.30	2.87	2.98	11.00
1986	0.0	1.15	2.54	2.77	9.74
1987	0.0	1.00	2.19	2.56	8.38
1988	0.0	0.96	2.12	2.47	8.12
1989	0.0	0.96	2.10	2.48	8.07
1990	0.0	0.96	2.07	2.54	7.94
1991	0.0	0.96	2.07	2.56	7.93
1992+	0.0	0.94	2.02	2.53	7.75

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

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TABLE 1.2.2B

TAMPERING OFFSETS FOR TOTAL
CRANKCASE AND EVAPORATIVE HC EMISSIONS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I
AT VARIOUS MILEAGE INTERVALS

Fuel RVP	Model Years	Tampering Offset (Grams/Mile)** 0K	25K	50K	75K	100K	125K	150K
9.0	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1969	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1970	0.0	0.03	0.06	0.10	0.14	0.17	0.21
	1971-1976	0.0	0.03	0.09	0.14	0.19	0.24	0.29
	1977-1978	0.0	0.05	0.12	0.20	0.27	0.34	0.42
	1979	0.0	0.05	0.12	0.20	0.27	0.34	0.42
	1980	0.0	0.03	0.08	0.13	0.17	0.22	0.27
	1981	0.0	0.03	0.08	0.13	0.17	0.22	0.27
	1982	0.0	0.03	0.08	0.13	0.17	0.22	0.27
	1983	0.0	0.03	0.08	0.13	0.17	0.22	0.27
	1984	0.0	0.03	0.08	0.12	0.17	0.22	0.26
	1985	0.0	0.03	0.08	0.12	0.17	0.21	0.26
	1986	0.0	0.03	0.08	0.12	0.16	0.21	0.25
	1987	0.0	0.03	0.08	0.12	0.16	0.20	0.25
	1988	0.0	0.03	0.07	0.12	0.16	0.20	0.25
	1989	0.0	0.03	0.07	0.12	0.16	0.20	0.25
	1990	0.0	0.03	0.07	0.12	0.16	0.20	0.25
	1991+	0.0	0.03	0.07	0.12	0.16	0.20	0.25
11.5	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1969	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1970	0.0	0.04	0.09	0.14	0.20	0.25	0.30
	1971-1976	0.0	0.05	0.12	0.20	0.27	0.35	0.43
	1977-1978	0.0	0.06	0.16	0.25	0.35	0.45	0.54
	1979	0.0	0.06	0.16	0.25	0.35	0.44	0.54
	1980	0.0	0.05	0.13	0.21	0.29	0.37	0.45
	1981	0.0	0.05	0.13	0.21	0.29	0.37	0.45
	1982	0.0	0.05	0.13	0.21	0.29	0.37	0.45
	1983	0.0	0.05	0.13	0.21	0.29	0.37	0.44
	1984	0.0	0.05	0.13	0.20	0.28	0.36	0.44
	1985	0.0	0.05	0.12	0.19	0.26	0.33	0.40
	1986	0.0	0.05	0.11	0.18	0.24	0.31	0.37
	1987	0.0	0.05	0.11	0.17	0.24	0.30	0.36
	1988	0.0	0.05	0.11	0.17	0.24	0.30	0.36
	1989	0.0	0.05	0.11	0.17	0.23	0.30	0.36
	1990	0.0	0.05	0.11	0.17	0.23	0.30	0.36
	1991+	0.0	0.05	0.11	0.17	0.23	0.29	0.36

* Based on calculated hot soak temperature of 82.0F,
Diurnal temperature rise from 60.0 to 84.0F,
Fuel RVPs of 9.0 and 11.5 psi with no weathering, tank level of 40.0%.

** Based on averages of 4.24 trips per day and 29.05 miles per day.

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TABLE 1.2.2C

NONTAMPERED
RUNNING LOSS EMISSIONS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS 1

Model Years	Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Pre-1971	7.0	0.36	0.52	1.13	2.16
	9.0	0.58	1.50	2.62	4.81
	10.4	1.06	2.70	4.00	5.63
	11.7	2.88	3.85	8.20	13.64
1971-1977	7.0	0.30	0.49	1.04	1.60
	9.0	0.49	1.15	2.37	3.60
	10.4	0.85	2.04	2.96	4.10
	11.7	2.15	2.85	5.97	9.87
1978-1980	7.0	0.24	0.42	0.97	1.39
	9.0	0.39	1.20	2.21	2.88
	10.4	0.68	1.70	2.38	3.23
	11.7	1.72	2.30	4.79	7.90
1981+	7.0	0.05	0.06	0.18	0.20
	9.0	0.07	0.13	0.42	0.62
	10.4	0.13	0.30	0.50	0.75
	11.7	0.36	0.47	1.03	1.73

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TABLE 1.2.2D

REFUELING EMISSIONS* FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS

Model Years	Fuel Economy (miles/gal)	Uncontrolled (grams/mile)	With Volatility Control** (grams/mile)	With Onboard** (grams/mile)	With both Volatility and Onboard** (grams/mile)
Pre-1971	11.1	0.52	0.52	0.52	0.52
1971	10.7	0.54	0.54	0.54	0.54
1972	10.8	0.53	0.53	0.53	0.53
1973-1974	10.6	0.54	0.54	0.54	0.54
1975	11.9	0.48	0.48	0.48	0.48
1976	12.3	0.47	0.47	0.47	0.47
1977	13.3	0.43	0.43	0.43	0.43
1978	13.0	0.44	0.44	0.44	0.44
1979	12.6	0.46	0.46	0.46	0.46
1980	15.7	0.37	0.37	0.37	0.37
1981	17.0	0.34	0.34	0.34	0.34
1982	17.3	0.33	0.33	0.33	0.33
1983	17.6	0.33	0.33	0.33	0.33
1984	17.2	0.34	0.34	0.34	0.34
1985	17.3	0.33	0.33	0.33	0.33
1986-1987	18.0	0.32	0.32	0.32	0.32
1988	17.7	0.33	0.33	0.33	0.33
1989-1991	17.8	0.32	0.32	0.32	0.32
1992	17.8	0.32	0.26	0.32	0.03
1993-1997	17.7	0.33	0.26	0.04	0.03
1998+	17.6	0.33	0.26	0.04	0.03

* Refueling Emissions (g/mi) = [Displacement (g/gal) + Spillage (g/gal)] / Fuel Economy (mi/gal).

** Volatility control assumed to start in 1992, with 7.0/7.8/9.0 RVP fuels for ASTM class A/B/C cities. Onboard assumed to start in 1993, and apply to LDGVs, LDGTs, and HDGVs.

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TABLE 1.2.3

HOT STABILIZED IDLE EMISSIONS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Pol	Model Years	Emission Rate (Grams/Hour) Nontampered Zero Mile	Nontampered 50,000 Mile	Nontampered 100,000 Mile	In-use Level* 50,000 Mile	In-use Level* 100,000 Mile
HC	Pre-1968	79.20	88.20	97.20	93.47	108.66
	1968-1969	64.20	82.20	100.20	87.47	111.66
	1970-1971	32.40	53.40	74.40	58.67	85.86
	1972-1974	43.20	55.20	67.20	60.47	78.66
	1975-1978	12.12	30.12	48.12	35.39	59.58
	1979-1980	12.53	37.88	63.30	43.15	74.76
	1981-1983	9.16	23.54	37.85	28.82	49.31
	1984	6.34	21.46	35.96	26.74	47.42
	1985	3.94	11.23	18.57	16.51	30.03
	1986	4.24	11.46	18.79	16.74	30.25
	1987	3.33	10.53	17.85	15.81	29.31
	1988	5.31	12.73	20.12	18.01	31.58
	1989	5.30	12.72	20.11	18.00	31.57
	1990	5.29	12.71	20.10	17.99	31.56
	1991	5.28	12.70	20.09	17.98	31.55
	1992+	4.97	12.39	19.77	17.66	31.23
CO	Pre-1968	825.60	945.60	1065.60	975.88	1134.27
	1968-1969	839.40	1028.40	1217.40	1058.68	1286.07
	1970-1971	710.40	974.40	1238.40	1004.68	1307.07
	1972-1974	759.60	987.60	1215.60	1017.88	1284.27
	1975-1978	376.20	592.20	808.20	622.48	876.87
	1979-1980	242.33	440.18	638.01	470.46	706.68
	1981	138.85	267.69	396.51	297.97	465.18
	1982	137.24	266.08	394.90	296.36	463.57
	1983	138.29	267.13	395.95	297.41	464.62
	1984	110.50	239.31	368.08	269.58	436.75
	1985	42.85	107.52	172.13	137.79	240.81
	1986	29.68	94.35	158.98	124.63	227.65
	1987	25.35	90.01	154.62	120.28	223.29
	1988	39.07	103.65	168.23	133.93	236.91
	1989	38.12	102.72	167.32	133.00	235.99
	1990	36.97	101.57	166.17	131.85	234.85
	1991	36.76	101.34	165.92	131.62	234.59
	1992+	32.63	97.19	161.76	127.47	230.44
NOx	Pre-1968	5.40	5.40	5.40	5.41	5.42
	1968-1972	10.20	10.20	10.20	10.21	10.22
	1973-1974	8.40	8.40	8.40	8.41	8.42
	1975-1978	3.60	3.60	3.60	3.61	3.62
	1979-1980	3.98	3.98	3.98	3.99	4.00
	1981	7.34	7.34	7.34	7.35	7.36
	1982	7.31	7.31	7.31	7.32	7.33
	1983	7.37	7.37	7.37	7.38	7.39
	1984	7.62	7.62	7.62	7.63	7.64
	1985	6.96	6.96	6.96	6.97	6.98
	1986	2.00	2.00	2.00	2.01	2.02
	1987	1.73	1.73	1.73	1.74	1.75
	1988-1989	1.66	1.66	1.66	1.67	1.68
	1990-1991	1.65	1.65	1.65	1.66	1.67
	1992+	1.61	1.61	1.61	1.62	1.63

* In-use emission level includes tampering.

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TABLE 1.2.4A

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per truck *)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.070	15640.	0.023	15640.	1955.
2	0.092	14590.	0.092	15377.	11697.
3	0.088	13610.	0.088	14345.	26552.
4	0.083	12696.	0.083	13381.	40409.
5	0.077	11843.	0.077	12483.	53335.
6	0.072	11048.	0.072	11644.	65393.
7	0.067	10306.	0.067	10862.	76642.
8	0.062	9614.	0.062	10133.	87135.
9	0.057	8968.	0.057	9452.	96923.
10	0.051	8366.	0.051	8817.	106054.
11	0.047	7804.	0.047	8225.	114572.
12	0.041	7280.	0.041	7673.	122517.
13	0.036	6791.	0.036	7158.	129929.
14	0.031	6335.	0.031	6677.	136843.
15	0.026	5909.	0.026	6229.	143293.
16	0.021	5512.	0.021	5810.	149310.
17	0.016	5142.	0.016	5419.	154922.
18	0.011	4797.	0.011	5056.	160157.
19	0.007	4475.	0.007	4716.	165041.
20+	0.044	4174.	0.044	4400.	169597.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1, where: JMAR(1) = MAR(1) and,
JMAR(MYI) = .25*MAR(MYI) + .75*MAR(MYI-1), MYI = 2,...,20+.

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TABLE 1.2.4C

TRIPS PER DAY AND MILES PER DAY FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Year Index*	Trips per Day	Miles per Day
1	4.66	42.85
2	4.60	42.13
3	4.54	39.30
4	4.48	36.66
5	4.43	34.20
6	4.37	31.90
7	4.31	29.76
8	4.25	27.76
9	4.19	25.90
10	4.13	24.16
11	4.08	22.54
12	4.02	21.02
13	3.96	19.61
14	3.90	18.29
15	3.84	17.06
16	3.78	15.92
17	3.72	14.85
18	3.67	13.85
19	3.61	12.92
20+	3.55	12.05

* The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

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TABLE 1.2.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I
JANUARY 1, 1988

Model Years	(A) LDT1 Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) LDGT1 Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.023	0.973	0.023	0.024	15640.	382.6	0.036
1987	0.092	0.991	0.091	0.098	15377.	1510.8	0.142
1986	0.088	0.980	0.086	0.093	14345.	1333.2	0.126
1985	0.083	0.989	0.082	0.088	13381.	1183.7	0.112
1984	0.077	0.974	0.075	0.081	12483.	1008.9	0.095
1983	0.072	0.958	0.069	0.074	11644.	865.5	0.082
1982	0.067	0.908	0.061	0.066	10862.	712.1	0.067
1981	0.062	0.918	0.057	0.061	10133.	621.5	0.059
1980	0.057	0.952	0.054	0.058	9452.	552.8	0.052
1979	0.051	0.985	0.050	0.054	8817.	477.3	0.045
1978	0.047	0.990	0.047	0.050	8225.	412.4	0.039
1977	0.041	1.000	0.041	0.044	7673.	339.0	0.032
1976	0.036	1.000	0.036	0.039	7158.	277.7	0.026
1975	0.031	1.000	0.031	0.033	6677.	223.1	0.021
1974	0.026	1.000	0.026	0.028	6229.	174.5	0.016
1973	0.021	1.000	0.021	0.023	5810.	131.5	0.012
1972	0.016	1.000	0.016	0.017	5419.	93.4	0.009
1971	0.011	1.000	0.011	0.012	5056.	59.9	0.006
1970	0.007	1.000	0.007	0.008	4716.	35.6	0.003
1969-	0.044	1.000	0.044	0.047	4400.	208.6	0.020
		DAF:	0.929		TFNORM:	10604.2	

WHERE :

A = January 1 registration mix from Table 1.2.4A,
B = Gasoline fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 1.2.4A.

NOTE : In general, the travel weighting fractions will change for every calendar year since the sales fraction (column B) changes for almost every model year.

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TABLE 1.2.6A

SPEED CORRECTION FACTOR COEFFICIENTS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = EXP(A + B*s + C*s**2+ D*S**3+ E*s**4+ F*s**5), HC & CO
= A + B*s + C*s**2+ D*s**3+ E*s**4 + F*s**5, NOx

Pollutant and Model Years	A	B	C	D	E	F
HC						
Pre-1968	0.231026E+01	-0.289572E+00	0.152990E-01	-0.446689E-03	0.648183E-05	-0.363456E-07
1968	0.239726E+01	-0.299985E+00	0.161351E-01	-0.487491E-03	0.729093E-05	-0.419769E-07
1969	0.240873E+01	-0.308187E+00	0.168168E-01	-0.506843E-03	0.753855E-05	-0.431596E-07
1970	0.223217E+01	-0.284985E+00	0.153833E-01	-0.456738E-03	0.673486E-05	-0.383798E-07
1971	0.225223E+01	-0.287778E+00	0.156820E-01	-0.473179E-03	0.707954E-05	-0.408456E-07
1972	0.234948E+01	-0.304959E+00	0.168416E-01	-0.509623E-03	0.759516E-05	-0.434963E-07
1973-1974	0.268382E+01	-0.344633E+00	0.195417E-01	-0.625720E-03	0.978442E-05	-0.583369E-07
1975-1978	0.239540E+01	-0.335781E+00	0.211609E-01	-0.731550E-03	0.120715E-04	-0.748567E-07
CO						
Pre-1968	0.233989E+01	-0.296978E+00	0.160071E-01	-0.477396E-03	0.706752E-05	-0.403978E-07
1968	0.246551E+01	-0.305023E+00	0.160497E-01	-0.473969E-03	0.699075E-05	-0.399758E-07
1969	0.277804E+01	-0.319130E+00	0.153183E-01	-0.422327E-03	0.584948E-05	-0.314969E-07
1970	0.278899E+01	-0.327107E+00	0.162943E-01	-0.467573E-03	0.671906E-05	-0.374401E-07
1971	0.270743E+01	-0.331038E+00	0.176179E-01	-0.538583E-03	0.817402E-05	-0.477803E-07
1972	0.268454E+01	-0.332817E+00	0.176277E-01	-0.524123E-03	0.772221E-05	-0.437025E-07
1973-1974	0.283929E+01	-0.368756E+00	0.210782E-01	-0.676438E-03	0.106267E-04	-0.636405E-07
1975-1978	0.248747E+01	-0.391562E+00	0.270721E-01	-0.976178E-03	0.165270E-04	-0.104317E-06
NOx						
Pre-1968	0.168635E+01	-0.118303E+00	0.654975E-02	-0.137139E-03	0.100849E-05	0.0
1968	0.122677E+01	-0.444978E-01	0.262476E-02	-0.567150E-04	0.434293E-06	0.0
1969	0.101743E+01	-0.118958E-01	0.914365E-03	-0.215740E-04	0.182300E-06	0.0
1970	0.987600E+00	-0.195674E-01	0.169645E-02	-0.404000E-04	0.328001E-06	0.0
1971	0.115917E+01	-0.444536E-01	0.296425E-02	-0.668990E-04	0.522365E-06	0.0
1972	0.128169E+01	-0.804874E-01	0.535735E-02	-0.118891E-03	0.901060E-06	0.0
1973-1974	0.783838E+00	0.328549E-03	0.106029E-02	-0.319350E-04	0.290389E-06	0.0
1975-1978	0.942131E+00	-0.423240E-01	0.386253E-02	-0.939853E-04	0.753883E-06	0.0

* WHERE : s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16].

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TABLE 1.2.6B

SPEED CORRECTION FACTOR COEFFICIENTS FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = A/s + B, HC & CO
= EXP(A + B*s + C*s**2), NOx

Pollutant	Speed	Model Years	Coefficient A	B	C
HC	Low	1979-1980	41.27921	0.0	
		1981	14.50530	0.0	
		1982	13.13510	0.0	
		1983	13.72850	0.0	
		1984	12.87590	0.0	
		1985	12.29910	0.0	
		1986	6.03710	-0.03723	
		1987	5.02670	-0.01687	
		1988	4.79940	-0.01228	
		1989	4.76780	-0.01165	
		1990	4.73310	-0.01095	
		1991	4.72990	-0.01088	
		1992+	4.59730	-0.00821	
	High	1979+	8.10000	0.0	
CO	Low	1979-1980	563.51440	-3.44034	
		1981	168.89410	0.72193	
		1982	147.47639	0.80430	
		1983	158.07001	0.75053	
		1984	145.32240	0.77799	
		1985	137.36800	0.76426	
		1986	43.39830	1.33132	
		1987	30.59711	2.35788	
		1988	27.71680	2.58886	
		1989	27.31670	2.62094	
		1990	26.87669	2.65622	
		1991	26.83670	2.65943	
		1992+	25.15649	2.79417	
	High	1979+	60.00000	0.0	
NOx	All	1979-1980	1.04330	-0.026082	0.00042835
		1981	0.24736	-0.033673	0.00047036
		1982	0.22790	-0.033673	0.00047036
		1983	0.24101	-0.033673	0.00047036
		1984	0.23298	-0.033673	0.00047036
		1985	0.23289	-0.033673	0.00047036
		1986	-0.03836	-0.026426	0.00020485
		1987	-0.07312	-0.026426	0.00020485
		1988	-0.08094	-0.026426	0.00020485
		1989	-0.08203	-0.026426	0.00020485
		1990	-0.08323	-0.026426	0.00020485
		1991	-0.08333	-0.026426	0.00020485
		1992+	-0.08790	-0.026426	0.00020485

* WHERE: s = average speed (mph).
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w. [1/sadj = (w+x)/26 + (1-w-x)/16].
Low = average speed ≤ 19.6 mph.
High = average speed > 19.6 mph.

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TABLE 1.2.7A

LOW (< 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* TCF(1) = TC(1)*(T - 75.0), 1981+ CO,
TCF(b) = EXP [TC(b)*(T - 75.0)], all others

Pol	Model Years	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1968	-0.20623E-01	-0.24032E-02	-0.10081E-02
	1968-1969	-0.24462E-01	-0.32017E-02	-0.86884E-03
	1970-1971	-0.21255E-01	-0.52755E-03	0.93659E-03
	1972-1974	-0.21427E-01	-0.39442E-03	0.49731E-02
	1975-1980	-0.23517E-01	-0.88057E-02	-0.16222E-02
	1981-1983	-0.26820E-01	-0.75815E-02	-0.51660E-02
	1984	-0.32775E-01	-0.83176E-02	-0.90264E-02
	1985	-0.32082E-01	-0.85130E-02	-0.90264E-02
	1986	-0.33863E-01	-0.75333E-02	-0.60835E-02
	1987	-0.29645E-01	-0.86205E-02	-0.70376E-02
	1988	-0.29076E-01	-0.90614E-02	-0.74167E-02
	1989	-0.28850E-01	-0.90467E-02	-0.74058E-02
	1990	-0.28022E-01	-0.87314E-02	-0.71430E-02
	1991	-0.27909E-01	-0.86831E-02	-0.71027E-02
	1992+	-0.27350E-01	-0.88233E-02	-0.72259E-02
CO	Pre-1968	-0.13487E-01	0.15784E-02	0.11097E-02
	1968-1969	-0.21126E-01	-0.15289E-02	0.15749E-02
	1970-1971	-0.20843E-01	-0.59951E-02	0.18253E-02
	1972-1974	-0.19091E-01	-0.42373E-03	0.57982E-02
	1975-1980	-0.24835E-01	-0.88336E-02	-0.11553E-02
	1981-1983	-0.12448E+01	-0.12478E-01	-0.74106E-02
	1984	-0.13095E+01	-0.14584E-01	-0.11371E-01
	1985	-0.12840E+01	-0.14584E-01	-0.11371E-01
	1986	-0.10914E+01	-0.13812E-01	-0.90777E-02
	1987	-0.98042E+00	-0.15565E-01	-0.90777E-02
	1988	-0.97360E+00	-0.16234E-01	-0.90777E-02
	1989	-0.96563E+00	-0.16220E-01	-0.90777E-02
	1990	-0.92922E+00	-0.15787E-01	-0.90777E-02
	1991	-0.92410E+00	-0.15721E-01	-0.90777E-02
	1992+	-0.90931E+00	-0.15947E-01	-0.90777E-02
NOx	Pre-1968	-0.16897E-03	-0.89245E-02	-0.72580E-02
	1968-1972	-0.25074E-03	-0.59791E-02	-0.62690E-02
	1973-1974	0.38855E-02	-0.24156E-02	-0.21188E-02
	1975-1978	-0.45504E-04	-0.12575E-02	-0.53153E-03
	1979-1980	-0.76044E-02	-0.68045E-02	-0.54198E-02
	1981-1983	-0.19000E-02	-0.61656E-02	-0.49643E-02
	1984	-0.45479E-02	-0.74823E-02	-0.90882E-02
	1985	-0.47657E-02	-0.69890E-02	-0.90882E-02
	1986	-0.43258E-02	-0.89681E-02	-0.94839E-02
	1987	-0.43258E-02	-0.76241E-02	-0.86355E-02
	1988	-0.43258E-02	-0.74160E-02	-0.85833E-02
	1989	-0.43258E-02	-0.73506E-02	-0.85224E-02
	1990	-0.43258E-02	-0.71351E-02	-0.82440E-02
	1991	-0.43258E-02	-0.71061E-02	-0.82048E-02
	1992+	-0.43258E-02	-0.69285E-02	-0.80917E-02

* WHERE :

TCF(b) = Low temperature correction factor for appropriate pollutant, ambient temperature (< 75F), and model year, for test segment b.
T = Ambient temperature (Fahrenheit),
TC(b) = Low temperature correction factor coefficient for appropriate pollutant, reference temperature, and model year, for test segment b.

NOTE : The low temperature correction factor is used in conjunction with the correction factor given in Table 1.2.7C.

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TABLE 1.2.7B

HIGH (> 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
AND FUEL RVP CORRECTION FACTORS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* TCF(b) = EXP [TC(b)*(T - 75.0)], Pre-1981
TRCF(b) = EXP [RC(b)*(RVP - 9.0) + TC(b)*(T - 75.0)
+ TRC(b)*(RVP - 9.0)*(T - 75.0)], 1981+

Pol	Model Years	Parameter	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1968	TC	-0.14381E-01	0.13219E-02	0.34799E-02
	1968-1969		-0.12552E-01	0.42667E-02	0.75843E-02
	1970-1971		-0.10888E-01	-0.47925E-03	0.76666E-02
	1972-1974		-0.66107E-02	0.26288E-02	0.12320E-01
	1975-1980		-0.14095E-01	0.26179E-01	0.24297E-01
	1981-1985	RC	0.91402E-01	0.42060E-01	0.93179E-01
		TC	0.44270E-02	0.48358E-02	0.74688E-02
		TRC	0.29466E-02	0.0	0.47276E-02
	1986+	RC	0.23202E-01	0.15373E+00	0.13263E+00
		TC	0.0	0.86550E-02	0.83730E-02
		TRC	0.0	0.0	0.56009E-02
CO	Pre-1968	TC	-0.14691E-01	0.37462E-02	0.11014E-01
	1968-1969		-0.38767E-01	0.84685E-02	0.25179E-01
	1970-1971		-0.21165E-01	0.23603E-01	0.28483E-01
	1972-1974		-0.13146E-01	0.24717E-01	0.25848E-01
	1975-1980		-0.19612E-01	0.48537E-01	0.31439E-01
	1981-1985	RC	0.91345E-01	0.13968E+00	0.16322E+00
		TC	0.62182E-02	0.14943E-01	0.14923E-01
		TRC	0.0	0.0	0.0
	1986+	RC	0.40748E-01	0.26214E+00	0.23218E+00
		TC	0.35170E-02	0.14966E-01	0.20695E-01
		TRC	0.0	0.56416E-02	0.82344E-02
NOx	Pre-1968	TC	0.38841E-02	-0.87325E-02	-0.10839E-01
	1968-1972		-0.10389E-02	-0.92466E-02	-0.10108E-01
	1973-1974		-0.18301E-01	-0.10925E-01	-0.18042E-01
	1975-1978		-0.71420E-02	-0.87910E-02	-0.75470E-02
	1979-1980		-0.26153E-01	-0.18603E-01	-0.20878E-01
	1981-1985	RC	0.0	-0.40024E-01	0.0
		TC	0.0	0.0	0.0
		TRC	0.0	0.0	0.0
	1986+	RC	0.14219E-01	0.27491E-01	0.0
		TC	0.0	0.37789E-02	0.0
		TRC	0.0	0.0	0.0

* WHERE :

TCF(b) = High temperature correction factor for appropriate pollutant, ambient temperature, and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = High temperature correction factor coefficient for appropriate pollutant, temperature, and model year, for test segment b.
TRCF(b)= High temperature and fuel RVP correction factor for appropriate pollutant, ambient temperature, fuel RVP, and model year, for test segment b.
RC(b) = Fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, and model year, for test segment b.
RVP = Fuel volatility in psi.
TRC(b) = Combined temperature and fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, ambient temperature, and model year, for test segment b.

NOTE : The temperature correction factor is used in conjunction with the correction factor given in Table 1.2.7C.

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TABLE 1.2.7C

NORMALIZED BAG FRACTIONS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Pol	Model Years	Normalized Fractions: Test Segment 1 B1	Test Segment 1 D1	Test Segment 2 B2	Test Segment 2 D2	Test Segment 3 B3	Test Segment 3 D3	Total Test BO	Total Test DO
HC	Pre-1968	1.2820	0.0250	0.9730	0.0280	0.8390	0.0190	1.0000	0.0249
	1968-1969	1.3450	0.0740	0.9460	0.0540	0.8420	0.0480	1.0000	0.0565
	1970-1971	1.3450	0.1780	0.9190	0.1180	0.8940	0.0930	1.0000	0.1235
	1972-1974	1.3980	0.0600	0.8850	0.0550	0.9190	0.0360	1.0000	0.0508
	1975-1978	1.8560	0.3450	0.7650	0.2340	0.8030	0.1960	1.0000	0.2465
	1979-1980	2.0914	0.4073	0.6714	0.2752	0.8035	0.2972	1.0000	0.3082
	1981-1983	2.7957	0.1898	0.4428	0.2024	0.7084	0.1645	1.0000	0.1898
	1984	2.8662	0.2721	0.6530	0.2902	0.2540	0.2358	1.0000	0.2721
	1985	3.2436	0.2100	0.2334	0.1867	0.7701	0.1633	1.0000	0.1867
	1986	3.2304	0.2289	0.2289	0.2035	0.7885	0.1781	1.0000	0.2035
	1987	3.2688	0.2603	0.2025	0.2314	0.8100	0.2025	1.0000	0.2314
	1988	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1989	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1990	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1991	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1992+	2.3023	0.2623	0.6120	0.2331	0.7577	0.2040	1.0000	0.2331
CO	Pre-1968	1.2770	0.0330	1.0170	0.0290	0.7580	0.0250	1.0000	0.0287
	1968-1969	1.4420	0.0710	0.9960	0.0420	0.6740	0.0330	1.0000	0.0455
	1970-1971	1.5530	0.1090	0.9330	0.0790	0.7110	0.0380	1.0000	0.0740
	1972-1974	1.5730	0.0540	0.9020	0.0790	0.7550	0.0290	1.0000	0.0602
	1975-1978	1.9020	0.1700	0.8500	0.1510	0.6060	0.1050	1.0000	0.1423
	1979-1980	2.0939	0.3129	0.6895	0.1805	0.7671	0.1479	1.0000	0.1985
	1981-1983	2.6454	0.1633	0.4526	0.1020	0.8032	0.1076	1.0000	0.1163
	1984	2.5738	0.2181	0.3799	0.1362	0.9959	0.1436	1.0000	0.1553
	1985	3.4554	0.1471	0.2186	0.0914	0.6385	0.0971	1.0000	0.1043
	1986	3.2307	0.1795	0.3032	0.1115	0.6465	0.1185	1.0000	0.1272
	1987	2.8508	0.2342	0.4456	0.1455	0.6615	0.1546	1.0000	0.1660
	1988	1.5788	0.1945	0.8083	0.1209	0.9291	0.1284	1.0000	0.1379
	1989	1.5680	0.1958	0.8134	0.1216	0.9275	0.1292	1.0000	0.1387
	1990	1.5572	0.1973	0.8179	0.1226	0.9271	0.1302	1.0000	0.1398
	1991	1.5559	0.1974	0.8182	0.1226	0.9274	0.1303	1.0000	0.1399
	1992+	1.5064	0.2028	0.8408	0.1260	0.9216	0.1339	1.0000	0.1438
NOx	Pre-1968	1.1210	0.0090	0.7850	0.0010	1.3190	-0.0090	1.0000	-0.0001
	1968-1972	1.1990	-0.0040	0.7930	-0.0020	1.2450	0.0060	1.0000	-0.0002
	1973-1974	1.2620	0.0220	0.7700	0.0040	1.2420	0.0270	1.0000	0.0140
	1975-1978	1.2960	0.0120	0.7810	0.0040	1.1950	0.0160	1.0000	0.0089
	1979-1980	1.3666	0.0444	0.7444	0.0278	1.2111	0.0333	1.0000	0.0333
	1981-1983	1.3033	0.0061	0.8077	0.0184	1.1381	0.0245	1.0000	0.0184
	1984	1.0029	0.1343	0.9223	0.0358	1.1461	0.0537	1.0000	0.0627
	1985	1.1665	0.0724	0.8849	0.0161	1.0941	0.0322	1.0000	0.0322
	1986	1.2408	0.0833	0.8611	0.0185	1.0834	0.0370	1.0000	0.0370
	1987	1.3532	0.0990	0.8251	0.0220	1.0672	0.0440	1.0000	0.0440
	1988	1.3974	0.1094	0.8384	0.0243	1.0085	0.0486	1.0000	0.0486
	1989	1.3976	0.1103	0.8336	0.0245	1.0175	0.0490	1.0000	0.0490
	1990	1.4113	0.1114	0.8294	0.0248	1.0151	0.0495	1.0000	0.0495
	1991	1.4113	0.1114	0.8294	0.0248	1.0151	0.0495	1.0000	0.0495
	1992+	1.4452	0.1151	0.8185	0.0256	1.0104	0.0512	1.0000	0.0512

NOTE : The fractions given in this table are used in the calculation of the operating-mode/temperature correction factor (OMTCF).

WHERE :
- OMTCF = [(TERM1 + TERM2 + TERM3)/DENOM],
- TERM1 = W *TCF(1)*(B1+D1*M),
- TERM2 = (1-W-X)*TCF(2)*(B2+D2*M),
- TERM3 = X *TCF(3)*(B3+D3*M),
- DENOM = BO + DO*M,
- W = Fraction of VMT in the cold start mode,
- X = Fraction of VMT in the hot start mode,
- TCF(b) = Temperature correction factor for pollutant, model year, for test segment b,
- M = Cumulative mileage / 10,000 miles.

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TABLE 1.2.8A

AIR CONDITIONING CORRECTION FACTOR COEFFICIENTS FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* ACCF= U*V*(A + B*(T-75) -1) + 1

Model Years	HC A	HC B	CO A	CO B	NOx A	NOx B
Pre-1975	0.1023E+01	0.3344E-02	0.1202E+01	0.1808E-02	0.1299E+01	0.5643E-04
1975+	0.1000E+01	0.3512E-02	0.1130E+01	0.1528E-02	0.1221E+01	0.4262E-03

* WHERE :

ACCF = Air Conditioning Correction Factor,
V = Fraction of vehicles equipped with AC given in Table 1.2.8B,
U = Fraction of vehicles with AC that are using it = (DI-DILO)/(DIHI-DI), 0<=U<=1,
DI = Discomfort index = (DB+WB)*.4+15,
DILO = The highest discomfort index where no AC is used,
DIHI = The lowest discomfort index where all vehicles with AC use it,
DB = Dry bulb temperature (Fahrenheit),
WB = Wet bulb temperature (Fahrenheit),
T = Ambient temperature (Fahrenheit).

TABLE 1.2.8B

ESTIMATED FRACTION OF
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I
EQUIPPED WITH AIR CONDITIONING

Model Years	Fraction Equipped With Air Conditioning
Pre-1977	0.32
1977	0.52
1978+	0.39

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TABLE 1.2.8C

EXTRA LOAD CORRECTION FACTOR COEFFICIENTS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* XLCF = (XLC-1)*U + 1

Model Years	Coefficients (XLC) HC	CO	NOx
Pre-1968	1.0786	1.2765	0.9535
1968-1969	1.0495	1.1384	1.0313
1970-1971	1.0852	1.2478	1.0313
1972	1.0556	1.1347	1.0313
1973-1974	1.0556	1.1347	1.0753
1975+	1.0455	1.3058	1.0719

* WHERE :

XLCF = Extra load correction factor,
U = Fraction of VMT with an extra load,
XLC = Correction factor coefficient.

TABLE 1.2.8D

TRAILER TOWING CORRECTION FACTOR COEFFICIENTS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* TTCF = (TTC-1)*U + 1

Model Years	Coefficients (TTC) HC	CO	NOx
Pre-1968	1.2614	1.9327	1.1184
1968-1969	1.2762	1.8940	1.1384
1970-1971	1.4598	2.4753	1.1384
1972	1.7288	2.1414	1.1384
1973-1974	1.7288	2.1414	1.2170
1975+	1.5909	3.9722	1.3875

* WHERE :

TTCF = Trailer towing correction factor,
U = Fraction of VMT towing a trailer,
TTC = Correction factor coefficient.

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TABLE 1.2.9A

TAMPERING AND MISFUELING RATES
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Area	Model Years	System	Zero Mile Level	Det. Rate 1	Det. Rate 2	50,000 Mile Level	100,000 Mile Level
Non-I/M	Pre-1981	Air Pump Disablement	0.2155	0.02630	0.02630	0.347	0.478
		Catalyst Removal	0.2267	0.02260	0.02260	0.340	0.453
		EGR System Disabled	0.1037	0.02175	0.02175	0.212	0.321
		Filler Neck Damaged	0.1462	0.03684	0.03684	0.330	0.515
		Fuel Tank Misfueled	-0.0375	0.00857	0.00857	0.005	0.048
		Total Misfueled	0.1087	0.04541	0.04541	0.336	0.563
		PCV System Disabled	-0.0022	0.00419	0.00419	0.019	0.040
		Cannister Disconnect	-0.0185	0.01801	0.01801	0.072	0.162
		Both Cannister & Cap	-0.0121	0.01832	0.01832	0.079	0.171
	1981+	Air Pump Disablement	-0.0274	0.02619	0.02630	0.104	0.235
		Catalyst Removal	-0.0100	0.02074	0.02260	0.094	0.207
		EGR System Disabled	-0.0139	0.01374	0.02175	0.055	0.164
		Filler Neck Damaged	0.0087	0.00926	0.00926	0.055	0.101
		Fuel Tank Misfueled	0.0231	-0.00212	-0.00212	0.013	0.002
		Total Misfueled	0.0318	0.00714	0.00714	0.067	0.103
		PCV System Disabled	-0.0022	0.00419	0.00419	0.019	0.040
		Cannister Disconnect	-0.0185	0.01801	0.01801	0.072	0.162
		Both Cannister & Cap	-0.0121	0.01832	0.01832	0.079	0.171
With I/M	Pre-1981	Air Pump Disablement	0.2015	0.01561	0.01561	0.280	0.358
		Catalyst Removal	-0.0081	0.03342	0.03342	0.159	0.326
		EGR System Disabled	0.0880	0.01078	0.01078	0.142	0.196
		Filler Neck Damaged	0.0437	0.02806	0.02806	0.184	0.324
		Fuel Tank Misfueled	-0.0705	0.01076	0.01076	0.0	0.037
		Total Misfueled	-0.0268	0.03882	0.03882	0.167	0.361
		PCV System Disabled	-0.0068	0.00315	0.00315	0.009	0.025
		Cannister Disconnect	-0.0186	0.01349	0.01349	0.049	0.116
		Both Cannister & Cap	-0.0213	0.01484	0.01484	0.053	0.127
	1981+	Air Pump Disablement	-0.0044	0.00874	0.01561	0.039	0.117
		Catalyst Removal	0.0085	0.00618	0.03342	0.039	0.206
		EGR System Disabled	0.0068	0.00370	0.01078	0.025	0.079
		Filler Neck Damaged	0.0059	0.00380	0.00380	0.025	0.044
		Fuel Tank Misfueled	0.0097	0.00554	0.00554	0.037	0.065
		Total Misfueled	0.0156	0.00934	0.00934	0.062	0.109
		PCV System Disabled	-0.0068	0.00315	0.00315	0.009	0.025
		Cannister Disconnect	-0.0186	0.01349	0.01349	0.049	0.116
		Both Cannister & Cap	-0.0213	0.01484	0.01484	0.053	0.127

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TABLE 1.2.9B

EXCESS EMISSIONS
DUE TO TAMPERING AND/OR MISFUELING
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS

Type of Tampering	Emission Control System	Pollutant	Excess Emissions (g/mi) FTP	Bag 1	Bag 2	Bag 3	Idle (g/hr)
Air Pump Disablement	Oxidation	HC	1.37	1.80	1.37	1.04	27.38
		CO	30.61	34.67	33.90	21.28	506.08
	3way/Oxidation 3way	HC	0.85	1.36	0.76	0.61	
		Pre-1985					8.97
		1985+					11.71
		CO	21.02	31.80	18.21	18.25	
		Pre-1985					177.43
		1985+					215.29
Catalyst Removal	Oxidation	HC	3.05	2.31	3.40	2.95	42.83
		CO	28.01	41.40	28.97	16.06	124.82
	3way/Oxidation 3way	HC	2.04	1.80	2.25	1.81	42.83
		CO	13.74	16.32	14.11	11.07	124.82
		NOx	1.52	1.49	1.36	1.83	2.31
Total Misfueled	Oxidation	HC	2.47	2.30	2.57	2.40	9.70
		CO	20.96	46.50	13.13	16.62	14.18
	3way/Oxidation 3way	HC	1.44	1.42	1.56	1.21	9.70
		CO	6.57	8.08	6.60	5.37	14.18
		NOx	0.57	0.64	0.45	0.74	0.13
EGR System Disabled		NOx					
		Pre-1975	1.21	1.40	0.96	1.54	
		1975-1978	3.31	3.82	2.63	4.21	
		1979-1987	3.48	4.11	2.68	4.53	
		1988+	1.23	1.36	1.19	1.21	
EGR System Disabled	and Catalyst Removal	NOx	3.39	3.02	3.46	3.55	
EGR System Disabled	and Total Misfueled	NOx	1.99	2.12	1.85	2.16	

DATE : MAY 19, 1989

TABLE 1.2.9C

EXCESS CRANKCASE EMISSIONS
AND UNCONTROLLED
EVAPORATIVE HYDROCARBON EMISSIONS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Years	Excess Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
PCV System Disabled					
1964-1977	1.28				
1978-1979	1.27				
1980	1.24				
1981+	1.23				
Cannister Disconnect					
Pre-1971		14.67	24.90	22.45	48.76
1971		14.67	24.90	22.45	48.76
1972-1977		14.67	18.78	22.45	36.77
1978-1980		13.29	14.90	18.50	29.18
1981+ CARB		6.50	13.68	13.85	26.78
1981+ FINJ		5.20	14.70	9.00	28.78
Missing Fuel Cap					
Pre-1971		14.67	24.90	22.45	48.76
1971		14.67	24.90	22.45	48.76
1972-1977		14.67	18.78	22.45	36.77
1978-1980		13.29	14.90	18.50	29.18
1981+ CARB		0.0	13.68	0.0	26.78
1981+ FINJ		5.20	14.70	9.00	28.78

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

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TABLE 1.2.9D

UNCONTROLLED
RUNNING LOSS EMISSIONS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS

Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Cannister Disconnect				
7.0	0.33	0.42	0.90	1.85
9.0	0.52	1.30	2.04	4.29
10.4	0.95	2.36	3.52	4.97
11.7	2.54	3.37	7.19	11.97
Missing Fuel Cap				
7.0	0.60	0.84	1.28	2.44
9.0	1.23	1.85	3.31	15.58
10.4	2.09	3.43	15.30	28.51
11.7	3.62	17.28	44.93	44.93

* Uncontrolled emissions applicable to 1971+ model year vehicles.

DATE : MAY 19, 1989

~~H-51~~

TABLE 1.2.10A

METHANE OFFSETS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Years	Methane Offsets (g/mi) FTP	Bag 1	Bag 2	Bag 3
Pre-1975	0.311	0.420	0.310	0.230
1975-1978	0.197	0.290	0.190	0.140
1979-1980	0.172	0.260	0.160	0.130
1981-1983	0.144	0.237	0.125	0.110
1984	0.122	0.181	0.111	0.097
1985	0.112	0.166	0.102	0.090
1986	0.094	0.139	0.085	0.076
1987	0.079	0.119	0.071	0.065
1988	0.072	0.109	0.064	0.059
1989	0.072	0.108	0.064	0.059
1990	0.071	0.108	0.064	0.058
1991	0.071	0.108	0.064	0.058
1992+	0.069	0.105	0.062	0.057

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

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TABLE 1.2.10C

PERCENT TECHNOLOGY DISTRIBUTIONS
(EXHAUST AND EVAPORATIVE EMISSION SYSTEMS)
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Years	Air Pump Only	Oxidation Catalyst	3Way Catalyst	EGR System	Air Pump & Oxidation or 3Way Catalyst	EGR System & 3Way Catalyst
Pre-1968	0.0	0.0	0.0	0.0	0.0	0.0
1968-1971	5.0	0.0	0.0	0.0	0.0	0.0
1972	10.0	0.0	0.0	0.0	0.0	0.0
1973	30.0	0.0	0.0	80.0	0.0	0.0
1974	30.0	0.0	0.0	90.0	0.0	0.0
1975	10.0	70.0	0.0	90.0	30.0	0.0
1976	10.0	80.0	0.0	90.0	30.0	0.0
1977-1978	10.0	75.0	0.0	90.0	20.0	0.0
1979-1980	10.0	80.0	0.0	100.0	40.0	0.0
1981	0.0	95.0	5.0	100.0	50.0	5.0
1982	0.0	90.0	10.0	100.0	60.0	10.0
1983	0.0	80.0	20.0	100.0	60.0	20.0
1984	0.0	70.0	30.0	100.0	75.0	30.0
1985	0.0	60.0	40.0	100.0	75.0	40.0
1986	0.0	50.0	50.0	100.0	55.0	50.0
1987	0.0	5.0	95.0	100.0	55.0	95.0
1988+	0.0	5.0	95.0	100.0	50.0	95.0

Model Years	Evaporative Canister	PCV System
Pre-1963	0.0	0.0
1963-1967	0.0	0.0
1968-1970	0.0	100.0
1971+	100.0	100.0

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TABLE 1.2.10D

PERCENT TECHNOLOGY DISTRIBUTIONS
(FUEL DELIVERY SYSTEMS)
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Years	Carbureted	Ported Fuel-Injected	Throttle-Body Fuel-Injected
1981	99.1	0.9	0.0
1982	99.5	0.5	0.0
1983	99.8	0.2	0.0
1984	97.8	2.2	0.0
1985	88.6	6.8	4.6
1986	58.5	23.7	17.8
1987	26.5	43.2	30.3
1988	19.3	44.4	36.3
1989	18.3	45.8	35.9
1990	17.2	52.2	30.6
1991	17.1	53.1	29.8
1992+	12.9	55.7	31.4

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TABLE 1.2.11A

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS 1
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	16.3	1967	16.3	1968	13.9	1969	13.9	1970	14.5	1971	13.4	1972	9.4	1973	9.4	1974	9.4	1975	9.5	1976	9.5	1977	9.5
1967	16.2	1968	13.8	1969	13.8	1970	14.3	1971	13.2	1972	9.4	1973	9.4	1974	9.4	1975	9.5	1976	9.4	1977	9.4	1978	7.9
1968	13.7	1969	13.7	1970	14.1	1971	13.1	1972	9.3	1973	9.3	1974	9.3	1975	9.3	1976	9.3	1977	9.3	1978	7.8	1979	7.0
1969	13.5	1970	14.0	1971	12.9	1972	9.2	1973	9.2	1974	9.2	1975	9.2	1976	9.2	1977	9.2	1978	7.7	1979	6.9	1980	6.8
1970	13.7	1971	12.7	1972	9.1	1973	9.1	1974	9.1	1975	9.0	1976	9.0	1977	9.0	1978	7.6	1979	6.7	1980	6.7	1981	4.0
1971	12.4	1972	9.0	1973	9.0	1974	9.0	1975	8.8	1976	8.9	1977	8.9	1978	7.4	1979	6.6	1980	6.6	1981	4.0	1982	4.0
1972	8.9	1973	8.9	1974	8.9	1975	8.7	1976	8.7	1977	8.7	1978	7.2	1979	6.4	1980	6.4	1981	3.9	1982	3.9	1983	3.9
1973	8.7	1974	8.7	1975	8.5	1976	8.5	1977	8.5	1978	7.0	1979	6.2	1980	6.2	1981	3.9	1982	3.8	1983	3.8	1984	3.6
1974	8.6	1975	8.3	1976	8.3	1977	8.3	1978	6.8	1979	6.0	1980	6.0	1981	3.8	1982	3.8	1983	3.7	1984	3.6	1985	2.4
1975	8.1	1976	8.1	1977	8.1	1978	6.6	1979	5.8	1980	5.8	1981	3.6	1982	3.6	1983	3.6	1984	3.5	1985	2.3	1986	2.2
1976	7.8	1977	7.8	1978	6.4	1979	5.5	1980	5.5	1981	3.5	1982	3.5	1983	3.5	1984	3.4	1985	2.3	1986	2.2	1987	2.0
1977	7.6	1978	6.1	1979	5.3	1980	5.3	1981	3.3	1982	3.4	1983	3.4	1984	3.2	1985	2.3	1986	2.1	1987	2.0	1988	2.0
1978	5.9	1979	5.0	1980	5.0	1981	3.2	1982	3.2	1983	3.2	1984	3.1	1985	2.2	1986	2.1	1987	1.9	1988	2.0	1989	1.9
1979	4.7	1980	4.7	1981	3.0	1982	3.0	1983	3.0	1984	2.9	1985	2.1	1986	2.0	1987	1.9	1988	1.9	1989	1.9	1990	1.8
1980	4.4	1981	2.9	1982	2.9	1983	2.9	1984	2.7	1985	2.0	1986	1.9	1987	1.8	1988	1.9	1989	1.8	1990	1.8	1991	1.8
1981	2.7	1982	2.7	1983	2.7	1984	2.6	1985	1.9	1986	1.8	1987	1.7	1988	1.8	1989	1.8	1990	1.7	1991	1.7	1992	1.6
1982	2.5	1983	2.5	1984	2.4	1985	1.8	1986	1.7	1987	1.6	1988	1.6	1989	1.7	1990	1.7	1991	1.6	1992	1.6	1993	1.5
1983	2.3	1984	2.2	1985	1.7	1986	1.6	1987	1.5	1988	1.5	1989	1.5	1990	1.5	1991	1.6	1992	1.5	1993	1.5	1994	1.4
1984	1.9	1985	1.6	1986	1.5	1987	1.4	1988	1.4	1989	1.4	1990	1.4	1991	1.4	1992	1.4	1993	1.4	1994	1.3	1995	1.3
1985	1.5	1986	1.4	1987	1.3	1988	1.3	1989	1.3	1990	1.3	1991	1.3	1992	1.3	1993	1.3	1994	1.3	1995	1.3	1996	1.2

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	8.0	1979	7.3	1980	7.2	1981	4.3	1984	4.1	1986	2.5	1989	2.5	1991	2.5	1993	2.5	1996	2.5	1999	2.5	2001	2.5
1979	7.1	1980	7.1	1981	4.2	1982	4.2	1985	2.6	1987	2.4	1990	2.4	1992	2.4	1994	2.4	1997	2.4	2000	2.4	2002	2.4
1980	7.0	1981	4.2	1982	4.1	1983	4.1	1986	2.5	1988	2.4	1991	2.4	1993	2.4	1995	2.4	1998	2.4	2001	2.4	2003	2.4
1981	4.1	1982	4.2	1983	4.1	1984	3.9	1987	2.3	1989	2.4	1992	2.3	1994	2.3	1996	2.3	1999	2.3	2002	2.3	2004	2.3
1982	4.1	1983	4.1	1984	3.9	1985	2.5	1988	2.3	1990	2.3	1993	2.3	1995	2.3	1997	2.3	2000	2.3	2003	2.3	2005	2.3
1983	4.0	1984	3.9	1985	2.5	1986	2.3	1989	2.3	1991	2.3	1994	2.2	1996	2.2	1998	2.2	2001	2.2	2004	2.3	2006	2.3
1984	3.7	1985	2.5	1986	2.3	1987	2.2	1990	2.2	1992	2.2	1995	2.2	1997	2.2	1999	2.2	2002	2.2	2005	2.2	2007	2.2
1985	2.4	1986	2.3	1987	2.2	1988	2.2	1991	2.2	1993	2.1	1996	2.1	1998	2.1	2000	2.1	2003	2.1	2006	2.1	2008	2.1
1986	2.3	1987	2.2	1988	2.1	1989	2.1	1992	2.1	1994	2.1	1997	2.1	1999	2.1	2001	2.1	2004	2.1	2007	2.1	2009	2.1
1987	2.1	1988	2.2	1989	2.1	1990	2.0	1993	2.0	1995	2.0	1998	2.0	2000	2.0	2002	2.0	2005	2.0	2008	2.0	2010	2.0
1988	2.1	1989	2.1	1990	2.0	1991	2.0	1994	2.0	1996	1.9	1999	1.9	2001	1.9	2003	2.0	2006	2.0	2009	2.0	2011	2.0
1989	2.0	1990	2.0	1991	1.9	1992	1.9	1995	1.9	1997	1.9	2000	1.9	2002	1.9	2004	1.9	2007	1.9	2010	1.9	2012	1.9
1990	1.9	1991	1.9	1992	1.8	1993	1.8	1996	1.8	1998	1.8	2001	1.8	2003	1.8	2005	1.8	2008	1.8	2011	1.8	2013	1.8
1991	1.9	1992	1.8	1993	1.8	1994	1.7	1997	1.7	1999	1.7	2002	1.7	2004	1.7	2006	1.7	2009	1.7	2012	1.7	2014	1.7
1992	1.7	1993	1.8	1994	1.7	1995	1.6	1998	1.6	2000	1.6	2003	1.6	2005	1.6	2007	1.6	2010	1.6	2013	1.6	2015	1.6
1993	1.6	1994	1.7	1995	1.6	1996	1.5	1999	1.5	2001	1.5	2004	1.5	2006	1.5	2008	1.5	2011	1.5	2014	1.5	2016	1.5
1994	1.5	1995	1.6	1996	1.5	1997	1.4	2000	1.4	2002	1.4	2005	1.4	2007	1.4	2009	1.4	2012	1.4	2015	1.4	2017	1.4
1995	1.4	1996	1.4	1997	1.4	1998	1.3	2001	1.3	2003	1.3	2006	1.3	2008	1.3	2010	1.3	2013	1.3	2016	1.3	2018	1.3
1996	1.3	1997	1.3	1998	1.2	1999	1.2	2002	1.2	2004	1.2	2007	1.2	2009	1.2	2011	1.2	2014	1.2	2017	1.2	2019	1.2
1997	1.2	1998	1.3	1999	1.2	2000	1.1	2003	1.1	2005	1.1	2008	1.1	2010	1.1	2012	1.1	2015	1.1	2018	1.1	2020	1.1

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start, 60 TO 84F diurnal, 75F for hot soak and running loss emissions, 9.0 psi fuel RVP, 54.57% average in-use fuel tank level, including refueling emissions. Emissions are based on the January 1 mileage accumulation figures given in Table 1.2.4A

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TABLE 1.2.11B.

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	116.4	1967	116.4	1968	99.6	1969	99.6	1970	95.3	1971	95.3	1972	82.2	1973	82.2	1974	82.2	1975	68.5	1976	68.5	1977	68.5
1967	115.4	1968	98.4	1969	98.4	1970	93.8	1971	93.8	1972	81.1	1973	81.1	1974	81.1	1975	67.3	1976	67.3	1977	67.3	1978	67.3
1968	97.2	1969	97.2	1970	92.3	1971	92.3	1972	79.9	1973	79.9	1974	79.9	1975	66.0	1976	66.0	1977	66.0	1978	66.0	1979	51.2
1969	95.9	1970	90.7	1971	90.7	1972	78.6	1973	78.6	1974	78.6	1975	64.7	1976	64.7	1977	64.7	1978	64.7	1979	49.9	1980	49.9
1970	88.9	1971	88.9	1972	77.2	1973	77.2	1974	77.2	1975	63.2	1976	63.2	1977	63.2	1978	63.2	1979	48.6	1980	48.6	1981	34.4
1971	87.0	1972	75.8	1973	75.8	1974	75.8	1975	61.7	1976	61.7	1977	61.7	1978	61.7	1979	47.1	1980	47.1	1981	33.5	1982	33.5
1972	74.2	1973	74.2	1974	74.2	1975	60.0	1976	60.0	1977	60.0	1978	60.0	1979	45.5	1980	45.5	1981	32.6	1982	32.6	1983	32.6
1973	72.5	1974	72.5	1975	58.2	1976	58.2	1977	58.2	1978	58.2	1979	43.9	1980	43.9	1981	31.6	1982	31.6	1983	31.6	1984	28.4
1974	70.7	1975	56.3	1976	56.3	1977	56.3	1978	56.3	1979	42.1	1980	42.1	1981	30.5	1982	30.5	1983	30.5	1984	27.3	1985	16.0
1975	54.2	1976	54.2	1977	54.2	1978	54.2	1979	40.1	1980	40.1	1981	29.3	1982	29.3	1983	29.3	1984	26.2	1985	15.4	1986	14.1
1976	52.0	1977	52.0	1978	52.0	1979	38.1	1980	38.1	1981	28.1	1982	28.1	1983	28.1	1984	24.9	1985	14.8	1986	13.5	1987	12.2
1977	49.7	1978	49.7	1979	35.8	1980	35.8	1981	26.7	1982	26.7	1983	26.7	1984	23.6	1985	14.1	1986	12.8	1987	11.5	1988	12.4
1978	47.1	1979	33.5	1980	33.5	1981	25.3	1982	25.3	1983	25.3	1984	22.2	1985	13.4	1986	12.1	1987	10.8	1988	11.7	1989	11.6
1979	30.9	1980	30.9	1981	23.8	1982	23.8	1983	23.8	1984	20.6	1985	12.6	1986	11.4	1987	10.0	1988	10.9	1989	10.9	1990	10.8
1980	28.2	1981	22.1	1982	22.1	1983	22.1	1984	19.0	1985	11.8	1986	10.5	1987	9.2	1988	10.1	1989	10.0	1990	10.0	1991	10.0
1981	20.4	1982	20.4	1983	20.4	1984	17.2	1985	10.9	1986	9.7	1987	8.3	1988	9.2	1989	9.2	1990	9.1	1991	9.1	1992	9.0
1982	18.5	1983	18.5	1984	15.3	1985	10.0	1986	8.7	1987	7.4	1988	8.2	1989	8.2	1990	8.2	1991	8.2	1992	8.0	1993	8.0
1983	16.5	1984	13.3	1985	9.0	1986	7.7	1987	6.4	1988	7.2	1989	7.2	1990	7.2	1991	7.1	1992	7.0	1993	7.0	1994	7.0
1984	11.1	1985	7.9	1986	6.6	1987	5.3	1988	6.1	1989	6.1	1990	6.1	1991	6.1	1992	5.9	1993	5.9	1994	5.9	1995	5.9
1985	7.2	1986	5.9	1987	4.6	1988	5.4	1989	5.4	1990	5.4	1991	5.4	1992	5.2	1993	5.2	1994	5.2	1995	5.2	1996	5.2

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	68.5	1979	53.5	1980	53.5	1981	37.3	1984	34.2	1986	18.1	1989	17.6	1991	17.6	1993	17.5	1996	17.5	1999	17.5	2001	17.5
1979	52.4	1980	52.4	1981	36.7	1982	36.7	1985	19.1	1987	16.5	1990	17.3	1992	17.1	1994	17.1	1997	17.1	2000	17.1	2002	17.1
1980	51.2	1981	36.0	1982	36.0	1983	36.0	1986	17.5	1988	17.0	1991	16.9	1993	16.8	1995	16.8	1998	16.8	2001	16.8	2003	16.8
1981	35.2	1982	35.2	1983	35.2	1984	32.1	1987	15.7	1989	16.6	1992	16.4	1994	16.4	1996	16.4	1999	16.4	2002	16.4	2004	16.4
1982	34.4	1983	34.4	1984	31.2	1985	17.9	1988	16.2	1990	16.1	1993	16.0	1995	16.0	1997	16.0	2000	16.0	2003	16.0	2005	16.0
1983	33.5	1984	30.4	1985	17.5	1986	16.2	1989	15.7	1991	15.7	1994	15.5	1996	15.5	1998	15.5	2001	15.5	2004	15.5	2006	15.5
1984	29.4	1985	17.0	1986	15.8	1987	14.4	1990	15.2	1992	15.1	1995	15.1	1997	15.1	1999	15.1	2002	15.1	2005	15.1	2007	15.1
1985	16.5	1986	15.2	1987	13.9	1988	14.8	1991	14.7	1993	14.6	1996	14.6	1998	14.6	2000	14.6	2003	14.6	2006	14.6	2008	14.6
1986	14.7	1987	13.4	1988	14.2	1989	14.2	1992	14.0	1994	14.0	1997	14.0	1999	14.0	2001	14.0	2004	14.0	2007	14.0	2009	14.0
1987	12.8	1988	13.7	1989	13.6	1990	13.6	1993	13.4	1995	13.4	1998	13.4	2000	13.4	2002	13.4	2005	13.4	2008	13.4	2010	13.4
1988	13.0	1989	13.0	1990	13.0	1991	13.0	1994	12.8	1996	12.8	1999	12.8	2001	12.8	2003	12.8	2006	12.8	2009	12.8	2011	12.8
1989	12.3	1990	12.3	1991	12.3	1992	12.1	1995	12.1	1997	12.1	2000	12.1	2002	12.1	2004	12.1	2007	12.1	2010	12.1	2012	12.1
1990	11.6	1991	11.6	1992	11.4	1993	11.4	1996	11.4	1998	11.4	2001	11.4	2003	11.4	2005	11.4	2008	11.4	2011	11.4	2013	11.4
1991	10.8	1992	10.7	1993	10.7	1994	10.7	1997	10.7	1999	10.7	2002	10.7	2004	10.7	2006	10.7	2009	10.7	2012	10.7	2014	10.7
1992	9.8	1993	9.8	1994	9.8	1995	9.8	1998	9.8	2000	9.8	2003	9.8	2005	9.8	2007	9.8	2010	9.8	2013	9.8	2015	9.8
1993	9.0	1994	9.0	1995	9.0	1996	9.0	1999	9.0	2001	9.0	2004	9.0	2006	9.0	2008	9.0	2011	9.0	2014	9.0	2016	9.0
1994	8.0	1995	8.0	1996	8.0	1997	8.0	2000	8.0	2002	8.0	2005	8.0	2007	8.0	2009	8.0	2012	8.0	2015	8.0	2017	8.0
1995	7.0	1996	7.0	1997	7.0	1998	7.0	2001	7.0	2003	7.0	2006	7.0	2008	7.0	2010	7.0	2013	7.0	2016	7.0	2018	7.0
1996	5.9	1997	5.9	1998	5.9	1999	5.9	2002	5.9	2004	5.9	2007	5.9	2009	5.9	2011	5.9	2014	5.9	2017	5.9	2019	5.9
1997	5.2	1998	5.2	1999	5.2	2000	5.2	2003	5.2	2005	5.2	2008	5.2	2010	5.2	2012	5.2	2015	5.2	2018	5.2	2020	5.2

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in Table 1.2.4A.

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TABLE 1.2.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	3.4	1967	3.4	1968	4.3	1969	4.3	1970	4.3	1971	4.3	1972	4.3	1973	3.5	1974	3.5	1975	3.2	1976	3.2	1977	3.2
1967	3.4	1968	4.3	1969	4.3	1970	4.3	1971	4.3	1972	4.3	1973	3.5	1974	3.5	1975	3.2	1976	3.2	1977	3.2	1978	3.2
1968	4.3	1969	4.3	1970	4.3	1971	4.3	1972	4.3	1973	3.5	1974	3.5	1975	3.2	1976	3.2	1977	3.2	1978	3.2	1979	2.7
1969	4.3	1970	4.3	1971	4.3	1972	4.3	1973	3.5	1974	3.5	1975	3.2	1976	3.2	1977	3.2	1978	3.2	1979	2.7	1980	2.7
1970	4.3	1971	4.3	1972	4.3	1973	3.5	1974	3.5	1975	3.1	1976	3.1	1977	3.1	1978	3.1	1979	2.7	1980	2.7	1981	2.1
1971	4.3	1972	4.3	1973	3.4	1974	3.4	1975	3.1	1976	3.1	1977	3.1	1978	3.1	1979	2.6	1980	2.6	1981	2.1	1982	2.1
1972	4.3	1973	3.4	1974	3.4	1975	3.1	1976	3.1	1977	3.1	1978	3.1	1979	2.6	1980	2.6	1981	2.0	1982	2.0	1983	2.0
1973	3.4	1974	3.4	1975	3.1	1976	3.1	1977	3.1	1978	3.1	1979	2.5	1980	2.5	1981	2.0	1982	2.0	1983	2.0	1984	2.0
1974	3.4	1975	3.1	1976	3.1	1977	3.1	1978	3.1	1979	2.5	1980	2.5	1981	2.0	1982	2.0	1983	2.0	1984	2.0	1985	1.7
1975	3.0	1976	3.0	1977	3.0	1978	3.0	1979	2.5	1980	2.5	1981	2.0	1982	2.0	1983	2.0	1984	1.9	1985	1.7	1986	1.5
1976	3.0	1977	3.0	1978	3.0	1979	2.4	1980	2.4	1981	2.0	1982	2.0	1983	2.0	1984	1.9	1985	1.7	1986	1.5	1987	1.3
1977	3.0	1978	3.0	1979	2.4	1980	2.4	1981	1.9	1982	1.9	1983	1.9	1984	1.8	1985	1.6	1986	1.5	1987	1.3	1988	1.2
1978	3.0	1979	2.3	1980	2.3	1981	1.9	1982	1.9	1983	1.9	1984	1.7	1985	1.6	1986	1.4	1987	1.3	1988	1.2	1989	1.2
1979	2.2	1980	2.2	1981	1.9	1982	1.9	1983	1.9	1984	1.7	1985	1.5	1986	1.4	1987	1.2	1988	1.1	1989	1.1	1990	1.1
1980	2.2	1981	1.8	1982	1.8	1983	1.8	1984	1.6	1985	1.5	1986	1.3	1987	1.2	1988	1.1	1989	1.1	1990	1.1	1991	1.1
1981	1.8	1982	1.8	1983	1.8	1984	1.5	1985	1.5	1986	1.3	1987	1.1	1988	1.0	1989	1.0	1990	1.0	1991	1.0	1992	1.0
1982	1.8	1983	1.8	1984	1.4	1985	1.4	1986	1.2	1987	1.1	1988	1.0	1989	1.0	1990	1.0	1991	1.0	1992	0.9	1993	0.9
1983	1.7	1984	1.3	1985	1.3	1986	1.2	1987	1.0	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9	1994	0.9
1984	1.2	1985	1.3	1986	1.1	1987	1.0	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.8	1993	0.8	1994	0.8	1995	0.8
1985	1.2	1986	1.1	1987	0.9	1988	0.8	1989	0.8	1990	0.8	1991	0.8	1992	0.8	1993	0.8	1994	0.8	1995	0.8	1996	0.8

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	3.2	1979	2.8	1980	2.8	1981	2.1	1984	2.3	1986	1.8	1989	1.5	1991	1.5	1993	1.5	1996	1.5	1999	1.5	2001	1.5
1979	2.8	1980	2.8	1981	2.1	1982	2.1	1985	1.9	1987	1.6	1990	1.5	1992	1.4	1994	1.4	1997	1.4	2000	1.4	2002	1.4
1980	2.7	1981	2.1	1982	2.1	1983	2.1	1986	1.7	1988	1.5	1991	1.4	1993	1.4	1995	1.4	1998	1.4	2001	1.4	2003	1.4
1981	2.1	1982	2.1	1983	2.1	1984	2.2	1987	1.5	1989	1.4	1992	1.4	1994	1.4	1996	1.4	1999	1.4	2002	1.4	2004	1.4
1982	2.1	1983	2.1	1984	2.2	1985	1.8	1988	1.4	1990	1.4	1993	1.4	1995	1.4	1997	1.4	2000	1.4	2003	1.4	2005	1.4
1983	2.1	1984	2.1	1985	1.8	1986	1.7	1989	1.4	1991	1.4	1994	1.4	1996	1.4	1998	1.4	2001	1.4	2004	1.4	2006	1.4
1984	2.1	1985	1.8	1986	1.6	1987	1.5	1990	1.4	1992	1.3	1995	1.3	1997	1.3	1999	1.3	2002	1.3	2005	1.3	2007	1.3
1985	1.8	1986	1.6	1987	1.4	1988	1.3	1991	1.3	1993	1.3	1996	1.3	1998	1.3	2000	1.3	2003	1.3	2006	1.3	2008	1.3
1986	1.6	1987	1.4	1988	1.3	1989	1.3	1992	1.3	1994	1.3	1997	1.3	1999	1.3	2001	1.3	2004	1.3	2007	1.3	2009	1.3
1987	1.4	1988	1.3	1989	1.3	1990	1.3	1993	1.2	1995	1.2	1998	1.2	2000	1.2	2002	1.2	2005	1.2	2008	1.2	2010	1.2
1988	1.2	1989	1.2	1990	1.2	1991	1.2	1994	1.2	1996	1.2	1999	1.2	2001	1.2	2003	1.2	2006	1.2	2009	1.2	2011	1.2
1989	1.2	1990	1.2	1991	1.2	1992	1.2	1995	1.2	1997	1.2	2000	1.2	2002	1.2	2004	1.2	2007	1.2	2010	1.2	2012	1.2
1990	1.2	1991	1.2	1992	1.1	1993	1.1	1996	1.1	1998	1.1	2001	1.1	2003	1.1	2005	1.1	2008	1.1	2011	1.1	2013	1.1
1991	1.1	1992	1.1	1993	1.1	1994	1.1	1997	1.1	1999	1.1	2002	1.1	2004	1.1	2006	1.1	2009	1.1	2012	1.1	2014	1.1
1992	1.0	1993	1.0	1994	1.0	1995	1.0	1998	1.0	2000	1.0	2003	1.0	2005	1.0	2007	1.0	2010	1.0	2013	1.0	2015	1.0
1993	1.0	1994	1.0	1995	1.0	1996	1.0	1999	1.0	2001	1.0	2004	1.0	2006	1.0	2008	1.0	2011	1.0	2014	1.0	2016	1.0
1994	0.9	1995	0.9	1996	0.9	1997	0.9	2000	0.9	2002	0.9	2005	0.9	2007	0.9	2009	0.9	2012	0.9	2015	0.9	2017	0.9
1995	0.9	1996	0.9	1997	0.9	1998	0.9	2001	0.9	2003	0.9	2006	0.9	2008	0.9	2010	0.9	2013	0.9	2016	0.9	2018	0.9
1996	0.8	1997	0.8	1998	0.8	1999	0.8	2002	0.8	2004	0.8	2007	0.8	2009	0.8	2011	0.8	2014	0.8	2017	0.8	2019	0.8
1997	0.8	1998	0.8	1999	0.8	2000	0.8	2003	0.8	2005	0.8	2008	0.8	2010	0.8	2012	0.8	2015	0.8	2018	0.8	2020	0.8

*MY Indicates the model year

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in table 1.2.4A.

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TABLE 1.3.1A

NONTAMPERED EXHAUST EMISSION RATES FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1970	9.570	0.180	10.470	11.370
	1970-1973	6.280	0.250	7.530	8.780
	1974-1978	6.280	0.170	7.130	7.980
	1979-1980	0.870	0.280	2.270	3.670
	1981-1983	0.820	0.150	1.570	2.320
	1984	0.700	0.150	1.450	2.200
	1985	0.410	0.080	0.810	1.210
	1986	0.360	0.080	0.760	1.160
	1987	0.310	0.080	0.710	1.110
	1988	0.370	0.080	0.770	1.170
	1989	0.370	0.080	0.770	1.170
	1990	0.370	0.080	0.770	1.170
	1991	0.370	0.080	0.770	1.170
	1992+	0.360	0.080	0.760	1.160
CO	Pre-1970	93.980	2.250	105.230	116.480
	1970-1973	60.080	2.550	72.830	85.580
	1974-1978	60.080	2.440	72.280	84.480
	1979-1980	12.280	2.430	24.430	36.580
	1981-1983	12.580	1.460	19.880	27.180
	1984	9.430	1.460	16.730	24.030
	1985	7.030	0.730	10.680	14.330
	1986	5.760	0.730	9.410	13.060
	1987	4.420	0.730	8.070	11.720
	1988	5.290	0.730	8.940	12.590
	1989	5.260	0.730	8.910	12.560
	1990	5.220	0.730	8.870	12.520
	1991	5.210	0.730	8.860	12.510
	1992+	5.070	0.730	8.720	12.370
NOx	Pre-1970	5.440	0.0	5.440	5.440
	1970-1973	6.450	0.0	6.450	6.450
	1974-1978	4.610	0.040	4.810	5.010
	1979-1980	1.770	0.060	2.070	2.370
	1981-1983	1.640	0.030	1.790	1.940
	1984	1.120	0.070	1.470	1.820
	1985	1.240	0.040	1.440	1.640
	1986	1.080	0.040	1.280	1.480
	1987	0.910	0.040	1.110	1.310
	1988	0.820	0.040	1.020	1.220
	1989	0.820	0.040	1.020	1.220
	1990	0.810	0.040	1.010	1.210
	1991	0.810	0.040	1.010	1.210
	1992+	0.780	0.040	0.980	1.180

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile.
ZML = Zero mile level in grams/mile.
DR = Deterioration rate in grams/mile/10K miles.
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 1.3.1B

EXHAUST EMISSION RATES FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
AT VARIOUS MILEAGE LEVELS
(RATES INCLUDE TAMPERING)

Pol	Model Years	Emission Rate (Grams/Mile) 0K	25K	50K	75K	100K	125K	150K
HC	Pre-1970	9.570	10.020	10.470	10.920	11.370	11.820	12.270
	1970-1973	6.280	6.905	7.530	8.155	8.780	9.405	10.030
	1974-1978	6.280	6.705	7.130	7.555	7.980	8.405	8.830
	1979-1980	1.684	2.685	3.779	4.833	5.887	6.942	7.957
	1981	0.900	1.423	1.982	2.565	3.157	3.742	4.322
	1982	0.900	1.427	1.992	2.581	3.180	3.771	4.357
	1983	0.896	1.418	1.977	2.559	3.150	3.733	4.312
	1984	0.770	1.286	1.840	2.416	3.000	3.576	4.150
	1985	0.476	0.812	1.184	1.577	1.978	2.372	2.763
	1986	0.423	0.749	1.105	1.480	1.864	2.241	2.615
	1987	0.362	0.669	1.003	1.353	1.710	2.062	2.410
	1988-1991	0.422	0.728	1.060	1.408	1.762	2.112	2.458
	1992+	0.412	0.718	1.050	1.398	1.752	2.102	2.448
CO	Pre-1970	93.980	99.605	105.230	110.855	116.480	122.105	127.730
	1970-1973	60.080	66.455	72.830	79.205	85.580	91.955	98.330
	1974-1978	60.080	66.180	72.280	78.380	84.480	90.580	96.680
	1979-1980	20.491	29.303	39.056	48.433	57.809	67.185	75.826
	1981	13.270	18.537	24.336	30.358	36.476	42.517	48.515
	1982	13.270	18.614	24.555	30.725	36.988	43.174	49.316
	1983	13.222	18.489	24.332	30.390	36.536	42.609	48.641
	1984	9.978	15.194	21.032	27.068	33.177	39.221	45.230
	1985	7.531	10.840	14.748	18.841	23.000	27.100	31.167
	1986	6.214	9.314	12.879	16.607	20.400	24.139	27.849
	1987	4.709	7.542	10.769	14.116	17.506	20.860	24.194
	1988	5.579	8.384	11.559	14.852	18.188	21.489	24.770
	1989	5.549	8.354	11.529	14.822	18.158	21.459	24.740
	1990	5.509	8.314	11.489	14.782	18.118	21.419	24.700
	1991	5.499	8.304	11.479	14.772	18.108	21.409	24.690
	1992+	5.359	8.164	11.339	14.632	17.968	21.269	24.550
NOx	Pre-1970	5.440	5.440	5.440	5.440	5.440	5.440	5.440
	1970-1972	6.450	6.450	6.450	6.450	6.450	6.450	6.450
	1973	6.487	6.506	6.525	6.545	6.564	6.583	6.602
	1974-1978	4.646	4.765	4.884	5.002	5.121	5.240	5.359
	1979-1980	2.108	2.435	2.762	3.089	3.416	3.744	4.071
	1981-1982	1.640	1.786	1.981	2.245	2.509	2.773	3.038
	1983	1.640	1.787	1.982	2.246	2.511	2.776	3.041
	1984	1.122	1.372	1.672	2.042	2.413	2.783	3.153
	1985	1.243	1.422	1.652	1.951	2.252	2.552	2.852
	1986	1.065	1.269	1.505	1.812	2.120	2.428	2.735
	1987	0.923	1.134	1.400	1.740	2.083	2.424	2.764
	1988-1989	0.833	1.008	1.211	1.447	1.684	1.920	2.155
	1990-1991	0.823	0.998	1.201	1.437	1.674	1.910	2.145
	1992+	0.783	0.968	1.171	1.407	1.644	1.880	2.115

DATE : MAY 19, 1989

TABLE 1.3.2A

NONTAMPERED
CRANKCASE AND EVAPORATIVE HYDROCARBON EMISSIONS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
Pre-1968	5.70	18.08	42.33	27.66	77.89
1968-1978	0.0	18.08	42.33	27.66	77.89
1979-1980	0.0	2.46	5.16	4.30	14.47
1981	0.0	1.35	2.98	3.05	11.44
1982	0.0	1.35	2.99	3.06	11.46
1983	0.0	1.35	2.99	3.06	11.47
1984	0.0	1.35	2.97	3.05	11.38
1985	0.0	1.30	2.87	2.98	11.00
1986	0.0	1.15	2.54	2.77	9.74
1987	0.0	1.00	2.19	2.56	8.38
1988	0.0	0.96	2.12	2.47	8.12
1989	0.0	0.96	2.10	2.48	8.07
1990	0.0	0.96	2.07	2.54	7.94
1991	0.0	0.96	2.07	2.56	7.93
1992+	0.0	0.94	2.02	2.53	7.75

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

DATE : MAY 19, 1989

TABLE 1.3.2B

TAMPERING OFFSETS FOR TOTAL
CRANKCASE AND EVAPORATIVE HC EMISSIONS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
AT VARIOUS MILEAGE INTERVALS

Fuel RVP	Model Years	Tampering Offset (Grams/Mile)**						
		0K	25K	50K	75K	100K	125K	150K
9.0	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1976	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1977	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1978	0.0	0.05	0.12	0.19	0.26	0.33	0.40
	1979	0.0	0.05	0.12	0.19	0.26	0.33	0.40
	1980	0.0	0.03	0.08	0.12	0.17	0.21	0.26
	1981	0.0	0.03	0.08	0.12	0.17	0.21	0.26
	1982	0.0	0.03	0.08	0.12	0.17	0.21	0.26
	1983	0.0	0.03	0.08	0.12	0.17	0.21	0.26
	1984	0.0	0.03	0.08	0.12	0.17	0.21	0.26
	1985	0.0	0.03	0.07	0.12	0.16	0.21	0.25
	1986	0.0	0.03	0.07	0.11	0.16	0.20	0.24
	1987	0.0	0.03	0.07	0.11	0.16	0.20	0.24
	1988	0.0	0.03	0.07	0.11	0.16	0.20	0.24
	1989	0.0	0.03	0.07	0.11	0.16	0.20	0.24
	1990	0.0	0.03	0.07	0.11	0.16	0.20	0.24
	1991+	0.0	0.03	0.07	0.11	0.15	0.20	0.24
11.5	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1969	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1970-1976	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1977	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1978	0.0	0.06	0.15	0.24	0.33	0.42	0.52
	1979	0.0	0.06	0.15	0.24	0.33	0.42	0.51
	1980	0.0	0.05	0.13	0.20	0.28	0.36	0.43
	1981	0.0	0.05	0.13	0.20	0.28	0.36	0.43
	1982	0.0	0.05	0.13	0.20	0.28	0.36	0.43
	1983	0.0	0.05	0.13	0.20	0.28	0.36	0.43
	1984	0.0	0.05	0.12	0.20	0.27	0.35	0.42
	1985	0.0	0.05	0.12	0.18	0.25	0.32	0.39
	1986	0.0	0.04	0.11	0.17	0.23	0.29	0.36
	1987	0.0	0.04	0.11	0.17	0.23	0.29	0.35
	1988	0.0	0.04	0.10	0.17	0.23	0.29	0.35
	1989	0.0	0.04	0.10	0.16	0.22	0.29	0.35
	1990	0.0	0.04	0.10	0.16	0.22	0.28	0.35
	1991+	0.0	0.04	0.10	0.16	0.22	0.28	0.34

* Based on calculated hot soak temperature of 82.0F,
Diurnal temperature rise from 60.0 to 84.0F,
Fuel RVPs of 9.0 and 11.5 psi with no weathering, tank level of 40.0%.

** Based on averages of 4.24 trips per day and 30.80 miles per day.

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TABLE 1.3.2C

NONTAMPERED
RUNNING LOSS EMISSIONS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Pre-1979	7.0	0.36	0.52	1.13	2.16
	9.0	0.58	1.50	2.62	4.81
	10.4	1.06	2.70	4.00	5.63
	11.7	2.88	3.85	8.20	13.64
1979-1980	7.0	0.24	0.42	0.97	1.39
	9.0	0.39	1.20	2.21	2.88
	10.4	0.68	1.70	2.38	3.23
	11.7	1.72	2.30	4.79	7.90
1981+	7.0	0.05	0.06	0.18	0.20
	9.0	0.07	0.13	0.42	0.62
	10.4	0.13	0.30	0.50	0.75
	11.7	0.36	0.47	1.03	1.73

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TABLE 1.3.2D

REFUELING EMISSIONS* FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Fuel Economy (miles/gal)	Uncontrolled (grams/mile)	With Volatility Control** (grams/mile)	With Onboard** (grams/mile)	With both Volatility and Onboard** (grams/mile)
Pre-1971	11.1	0.52	0.52	0.52	0.52
1971	10.7	0.54	0.54	0.54	0.54
1972	10.8	0.53	0.53	0.53	0.53
1973-1974	10.6	0.54	0.54	0.54	0.54
1975	11.9	0.48	0.48	0.48	0.48
1976	12.3	0.47	0.47	0.47	0.47
1977	13.3	0.43	0.43	0.43	0.43
1978	13.0	0.44	0.44	0.44	0.44
1979	12.6	0.46	0.46	0.46	0.46
1980	15.7	0.37	0.37	0.37	0.37
1981	17.0	0.34	0.34	0.34	0.34
1982	17.3	0.33	0.33	0.33	0.33
1983	17.6	0.33	0.33	0.33	0.33
1984	17.2	0.34	0.34	0.34	0.34
1985	17.3	0.33	0.33	0.33	0.33
1986-1987	18.0	0.32	0.32	0.32	0.32
1988	17.7	0.33	0.33	0.33	0.33
1989-1991	17.8	0.32	0.32	0.32	0.32
1992	17.8	0.32	0.26	0.32	0.03
1993-1997	17.7	0.33	0.26	0.04	0.03
1998+	17.6	0.33	0.26	0.04	0.03

* Refueling Emissions (g/mi) = [Displacement (g/gal) + Spillage (g/gal)] / Fuel Economy (mi/gal).

** Volatility control assumed to start in 1992, with 7.0/7.8/9.0 RVP fuels for ASTM class A/B/C cities. Onboard assumed to start in 1993, and apply to LDGVs, LDGTs, and HDGVs.

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TABLE 1.3.3

HOT STABILIZED IDLE EMISSIONS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

		Emission Rate (Grams/Hour)				
		Nontampered			In-use Level*	
Pol	Model Years	Zero Mile	50,000 Mile	100,000 Mile	50,000 Mile	100,000 Mile
HC	Pre-1970	100.20	109.20	118.20	114.55	129.84
	1970-1973	63.60	75.60	87.60	80.95	99.24
	1974-1978	12.12	30.12	48.12	35.47	59.76
	1979-1980	12.53	37.88	63.30	43.23	74.94
	1981-1983	9.16	23.54	37.85	28.90	49.49
	1984	6.34	21.46	35.96	26.81	47.60
	1985	3.94	11.23	18.57	16.58	30.21
	1986	4.24	11.46	18.79	16.81	30.42
	1987	3.33	10.53	17.85	15.88	29.49
	1988	5.31	12.73	20.12	18.08	31.76
	1989	5.30	12.72	20.11	18.07	31.75
	1990	5.29	12.71	20.10	18.06	31.74
	1991	5.28	12.70	20.09	18.05	31.73
	1992+	4.97	12.39	19.77	17.74	31.41
CO	Pre-1970	1138.80	1273.80	1408.80	1305.43	1480.64
	1970-1973	691.80	847.80	1003.80	879.43	1075.64
	1974-1978	691.80	838.80	985.80	870.43	1057.64
	1979-1980	242.33	440.18	638.01	471.81	709.84
	1981	138.85	267.69	396.51	299.33	468.35
	1982	137.24	266.08	394.90	297.72	466.74
	1983	138.29	267.13	395.95	298.77	467.79
	1984	110.50	239.31	368.08	270.94	439.92
	1985	42.85	107.52	172.13	139.15	243.97
	1986	29.68	94.35	158.98	125.98	230.82
	1987	25.35	90.01	154.62	121.64	226.46
	1988	39.07	103.65	168.23	135.28	240.07
	1989	38.12	102.72	167.32	134.35	239.16
	1990	36.97	101.57	166.17	133.20	238.01
	1991	36.76	101.34	165.92	132.97	237.76
	1992+	32.63	97.19	161.76	128.82	233.60
NOx	Pre-1970	4.80	4.80	4.80	4.80	4.80
	1970-1973	6.00	6.00	6.00	6.00	6.00
	1974-1978	4.20	4.20	4.20	4.20	4.20
	1979-1980	3.98	3.98	3.98	3.98	3.98
	1981	7.34	7.34	7.34	7.34	7.34
	1982	7.31	7.31	7.31	7.31	7.31
	1983	7.37	7.37	7.37	7.37	7.37
	1984	7.62	7.62	7.62	7.62	7.62
	1985	6.96	6.96	6.96	6.96	6.96
	1986	2.00	2.00	2.00	2.00	2.00
	1987	1.73	1.73	1.73	1.73	1.73
	1988-1989	1.66	1.66	1.66	1.66	1.66
	1990-1991	1.65	1.65	1.65	1.65	1.65
	1992+	1.61	1.61	1.61	1.61	1.61

* In-use emission level includes tampering.

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TABLE 1.3.4A

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per truck *)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.070	17608.	0.023	17608.	2201.
2	0.092	16217.	0.092	17260.	13163.
3	0.088	14937.	0.088	15897.	29731.
4	0.083	13758.	0.083	14642.	44991.
5	0.077	12671.	0.077	13486.	59047.
6	0.072	11671.	0.072	12421.	71992.
7	0.067	10749.	0.067	11440.	83915.
8	0.062	9901.	0.062	10537.	94897.
9	0.057	9119.	0.057	9705.	105012.
10	0.051	8399.	0.051	8939.	114329.
11	0.047	7736.	0.047	8233.	122909.
12	0.041	7125.	0.041	7583.	130812.
13	0.036	6562.	0.036	6984.	138092.
14	0.031	6044.	0.031	6432.	144796.
15	0.026	5567.	0.026	5925.	150970.
16	0.021	5127.	0.021	5457.	156658.
17	0.016	4723.	0.016	5026.	161896.
18	0.011	4350.	0.011	4630.	166721.
19	0.007	4006.	0.007	4264.	171165.
20+	0.044	3690.	0.044	3927.	175257.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1, where: JMAR(1) = MAR(1) and,
JMAR(MYI) = .25*MAR(MYI) + .75*MAR(MYI-1), MYI = 2,...,20+.

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TABLE 1.3.4C

TRIPS PER DAY AND MILES PER DAY FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Year Index*	Trips per Day	Miles per Day
1	4.66	48.24
2	4.60	47.29
3	4.54	43.55
4	4.48	40.12
5	4.43	36.95
6	4.37	34.03
7	4.31	31.34
8	4.25	28.87
9	4.19	26.59
10	4.13	24.49
11	4.08	22.56
12	4.02	20.78
13	3.96	19.13
14	3.90	17.62
15	3.84	16.23
16	3.78	14.95
17	3.72	13.77
18	3.67	12.68
19	3.61	11.68
20+	3.55	10.76

* The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

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TABLE 1.3.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
JANUARY 1, 1988

Model Years	(A) LDT2 Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) LDGT2 Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.023	0.973	0.023	0.024	17608.	430.8	0.038
1987	0.092	0.991	0.091	0.098	17260.	1695.8	0.151
1986	0.088	0.980	0.086	0.093	15897.	1477.4	0.131
1985	0.083	0.989	0.082	0.088	14642.	1295.3	0.115
1984	0.077	0.974	0.075	0.081	13486.	1090.0	0.097
1983	0.072	0.958	0.069	0.074	12421.	923.3	0.082
1982	0.067	0.908	0.061	0.066	11440.	750.0	0.067
1981	0.062	0.918	0.057	0.061	10537.	646.3	0.057
1980	0.057	0.952	0.054	0.058	9705.	567.5	0.050
1979	0.051	0.985	0.050	0.054	8939.	483.9	0.043
1978	0.047	0.990	0.047	0.050	8233.	412.8	0.037
1977	0.041	1.000	0.041	0.044	7583.	335.1	0.030
1976	0.036	1.000	0.036	0.039	6984.	271.0	0.024
1975	0.031	1.000	0.031	0.033	6432.	214.9	0.019
1974	0.026	1.000	0.026	0.028	5925.	166.0	0.015
1973	0.021	1.000	0.021	0.023	5457.	123.5	0.011
1972	0.016	1.000	0.016	0.017	5026.	86.7	0.008
1971	0.011	1.000	0.011	0.012	4630.	54.9	0.005
1970	0.007	1.000	0.007	0.008	4264.	32.2	0.003
1969-	0.044	1.000	0.044	0.047	3927.	186.2	0.017
		DAF:	0.929		TFNORM:	11243.4	

WHERE :

A = January 1 registration mix from Table 1.3.4A,
B = Gasoline fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 1.3.4A.

NOTE : In general, the travel weighting fractions will change for every calendar year since the sales fraction (column B) changes for almost every model year.

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TABLE 1.3.6A

SPEED CORRECTION FACTOR COEFFICIENTS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = EXP(A + B*s + C*s**2+ D*S**3+ E*s**4+ F*s**5), HC & CO
= A + B*s + C*s**2+ D*s**3+ E*s**4 + F*s**5, NOx

Pollutant and Model Years	A	B	C	D	E	F
HC						
Pre-1970	0.231026E+01	-0.289572E+00	0.152990E-01	-0.446689E-03	0.648183E-05	-0.363456E-07
1970-1973	0.240873E+01	-0.308187E+00	0.168168E-01	-0.506843E-03	0.753855E-05	-0.431596E-07
1974-1978	0.268382E+01	-0.344633E+00	0.195417E-01	-0.625720E-03	0.978442E-05	-0.583369E-07
CO						
Pre-1970	0.233989E+01	-0.296978E+00	0.160071E-01	-0.477396E-03	0.706752E-05	-0.403978E-07
1970-1973	0.277804E+01	-0.319130E+00	0.153183E-01	-0.422327E-03	0.584948E-05	-0.314969E-07
1974-1978	0.283929E+01	-0.368756E+00	0.210782E-01	-0.676438E-03	0.106267E-04	-0.636405E-07
NOx						
Pre-1970	0.168635E+01	-0.118303E+00	0.654975E-02	-0.137139E-03	0.100849E-05	0.0
1970-1973	0.101743E+01	-0.118958E-01	0.914365E-03	-0.215740E-04	0.182300E-06	0.0
1974-1978	0.783838E+00	0.328549E-03	0.106029E-02	-0.319350E-04	0.290389E-06	0.0

* WHERE : s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16].

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TABLE 1.3.6B

SPEED CORRECTION FACTOR COEFFICIENTS FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = A/s + B. HC & CO
= EXP(A + B*s + C*s**2). NOx

Pollutant	Speed	Model Years	Coefficient A	B	C
HC	Low	1979-1980	41.27921	0.0	
		1981	14.50530	0.0	
		1982	13.13510	0.0	
		1983	13.72850	0.0	
		1984	12.87590	0.0	
		1985	12.29910	0.0	
		1986	6.03710	-0.03723	
		1987	5.02670	-0.01687	
		1988	4.79940	-0.01228	
		1989	4.76780	-0.01165	
		1990	4.73310	-0.01095	
		1991	4.72990	-0.01088	
		1992+	4.59730	-0.00821	
	High	1979+	8.10000	0.0	
CO	Low	1979-1980	563.51440	-3.44034	
		1981	168.89410	0.72193	
		1982	147.47639	0.80430	
		1983	158.07001	0.75053	
		1984	145.32240	0.77799	
		1985	137.36800	0.76426	
		1986	43.39830	1.33132	
		1987	30.59711	2.35788	
		1988	27.71680	2.58886	
		1989	27.31670	2.62094	
		1990	26.87669	2.65622	
		1991	26.83670	2.65943	
		1992+	25.15649	2.79417	
	High	1979+	60.00000	0.0	
NOx	All	1979-1980	1.04330	-0.026082	0.00042835
		1981	0.24736	-0.033673	0.00047036
		1982	0.22790	-0.033673	0.00047036
		1983	0.24101	-0.033673	0.00047036
		1984	0.23298	-0.033673	0.00047036
		1985	0.23289	-0.033673	0.00047036
		1986	-0.03836	-0.026426	0.00020485
		1987	-0.07312	-0.026426	0.00020485
		1988	-0.08094	-0.026426	0.00020485
		1989	-0.08203	-0.026426	0.00020485
		1990	-0.08323	-0.026426	0.00020485
		1991	-0.08333	-0.026426	0.00020485
		1992+	-0.08790	-0.026426	0.00020485

* WHERE: s = average speed (mph).
sadj = basic test procedure speed: adjusted for fraction of cold start operation x and fraction of hot start operation w. [1/sadj = (w+x)/26 + (1-w-x)/16].
Low = average speed ≤ 19.6 mph.
High = average speed > 19.6 mph.

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TABLE 1.3.7A

LOW (< 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* TCF(1) = TC(1)*(T - 75.0), 1981+ CO.
TCF(b) = EXP [TC(b)*(T - 75.0)], all others

Pol	Model Years	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1970	-0.20623E-01	-0.24032E-02	-0.10081E-02
	1970-1973	-0.24462E-01	-0.32017E-02	-0.86884E-03
	1974-1978	-0.21255E-01	-0.52755E-03	0.93659E-03
	1979-1980	-0.23517E-01	-0.88057E-02	-0.16222E-02
	1981-1983	-0.26820E-01	-0.75815E-02	-0.51660E-02
	1984	-0.32775E-01	-0.83176E-02	-0.90264E-02
	1985	-0.32082E-01	-0.85130E-02	-0.90264E-02
	1986	-0.33863E-01	-0.75333E-02	-0.60835E-02
	1987	-0.29645E-01	-0.86205E-02	-0.70376E-02
	1988	-0.29076E-01	-0.90614E-02	-0.74167E-02
	1989	-0.28850E-01	-0.90467E-02	-0.74058E-02
	1990	-0.28022E-01	-0.87314E-02	-0.71430E-02
	1991	-0.27909E-01	-0.86831E-02	-0.71027E-02
	1992+	-0.27350E-01	-0.88233E-02	-0.72259E-02
CO	Pre-1970	-0.13487E-01	0.15784E-02	0.11097E-02
	1970-1973	-0.21126E-01	-0.15289E-02	0.15749E-02
	1974-1978	-0.20843E-01	-0.59951E-02	0.18253E-02
	1979-1980	-0.24835E-01	-0.88336E-02	-0.11553E-02
	1981-1983	-0.12448E+01	-0.12478E-01	-0.74106E-02
	1984	-0.13095E+01	-0.14584E-01	-0.11371E-01
	1985	-0.12840E+01	-0.14584E-01	-0.11371E-01
	1986	-0.10914E+01	-0.13812E-01	-0.90777E-02
	1987	-0.98042E+00	-0.15565E-01	-0.90777E-02
	1988	-0.97360E+00	-0.16234E-01	-0.90777E-02
	1989	-0.96563E+00	-0.16220E-01	-0.90777E-02
	1990	-0.92922E+00	-0.15787E-01	-0.90777E-02
	1991	-0.92410E+00	-0.15721E-01	-0.90777E-02
	1992+	-0.90931E+00	-0.15947E-01	-0.90777E-02
NOx	Pre-1970	-0.16897E-03	-0.89245E-02	-0.72580E-02
	1970-1973	-0.25074E-03	-0.59791E-02	-0.62690E-02
	1974-1978	0.38855E-02	-0.24156E-02	-0.21188E-02
	1979-1980	-0.76044E-02	-0.68045E-02	-0.54198E-02
	1981-1983	-0.19000E-02	-0.61656E-02	-0.49643E-02
	1984	-0.45479E-02	-0.74823E-02	-0.90882E-02
	1985	-0.47657E-02	-0.69890E-02	-0.90882E-02
	1986	-0.43258E-02	-0.89681E-02	-0.94839E-02
	1987	-0.43258E-02	-0.76241E-02	-0.86355E-02
	1988	-0.43258E-02	-0.74160E-02	-0.85833E-02
	1989	-0.43258E-02	-0.73506E-02	-0.85224E-02
	1990	-0.43258E-02	-0.71351E-02	-0.82440E-02
	1991	-0.43258E-02	-0.71061E-02	-0.82048E-02
	1992+	-0.43258E-02	-0.69285E-02	-0.80917E-02

* WHERE :

TCF(b) = Low temperature correction factor for appropriate pollutant, ambient temperature (< 75F), and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = Low temperature correction factor coefficient for appropriate pollutant, reference temperature, and model year, for test segment b.

NOTE : The low temperature correction factor is used in conjunction with the correction factor given in Table 1.3.7C.

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TABLE 1.3.7B

HIGH (> 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
AND FUEL RVP CORRECTION FACTORS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* TCF(b) = EXP [TC(b)*(T - 75.0)], Pre-1981
TRCF(b) = EXP [RC(b)*(RVP - 9.0) + TC(b)*(T - 75.0)
+ TRC(b)*(RVP - 9.0)*(T - 75.0)], 1981+

Pol	Model Years	Parameter	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1970	TC	-0.14381E-01	0.13219E-02	0.34799E-02
	1970-1973		-0.12552E-01	0.42667E-02	0.75843E-02
	1974-1978		-0.10888E-01	-0.47925E-03	0.76666E-02
	1979-1980		-0.14095E-01	0.26179E-01	0.24297E-01
	1981-1985	RC	0.91402E-01	0.42060E-01	0.93179E-01
		TC	0.44270E-02	0.48358E-02	0.74688E-02
		TRC	0.29466E-02	0.0	0.47276E-02
	1986+	RC	0.23202E-01	0.15373E+00	0.13263E+00
		TC	0.0	0.86550E-02	0.83730E-02
		TRC	0.0	0.0	0.56009E-02
CO	Pre-1970	TC	-0.14691E-01	0.37462E-02	0.11014E-01
	1970-1973		-0.38767E-01	0.84685E-02	0.25179E-01
	1974-1978		-0.21165E-01	0.23603E-01	0.28483E-01
	1979-1980		-0.19612E-01	0.48537E-01	0.31439E-01
	1981-1985	RC	0.91345E-01	0.13968E+00	0.16322E+00
		TC	0.62182E-02	0.14943E-01	0.14923E-01
		TRC	0.0	0.0	0.0
	1986+	RC	0.40748E-01	0.26214E+00	0.23218E+00
		TC	0.35170E-02	0.14966E-01	0.20695E-01
		TRC	0.0	0.56416E-02	0.82344E-02
NOx	Pre-1970	TC	0.38841E-02	-0.87325E-02	-0.10839E-01
	1970-1973		-0.10389E-02	-0.92466E-02	-0.10108E-01
	1974-1978		-0.18301E-01	-0.10925E-01	-0.18042E-01
	1979-1980		-0.26153E-01	-0.18603E-01	-0.20878E-01
	1981-1985	RC	0.0	-0.40024E-01	0.0
		TC	0.0	0.0	0.0
		TRC	0.0	0.0	0.0
	1986+	RC	0.14219E-01	0.27491E-01	0.0
		TC	0.0	0.37789E-02	0.0
		TRC	0.0	0.0	0.0

* WHERE :

TCF(b) = High temperature correction factor for appropriate pollutant, ambient temperature, and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = High temperature correction factor coefficient for appropriate pollutant, temperature, and model year, for test segment b.
TRCF(b)= High temperature and fuel RVP correction factor for appropriate pollutant, ambient temperature, fuel RVP, and model year, for test segment b.
RC(b) = Fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, and model year, for test segment b.
RVP = Fuel volatility in psi.
TRC(b) = Combined temperature and fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, ambient temperature, and model year, for test segment b.

NOTE : The temperature correction factor is used in conjunction with the correction factor given in Table 1.3.7C.

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TABLE 1.3.7C

NORMALIZED BAG FRACTIONS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

		Normalized Fractions							
	Model	Test Segment 1		Test Segment 2		Test Segment 3		Total Test	
Pol	Years	B1	D1	B2	D2	B3	D3	BO	DO
HC	Pre-1970	1.2820	0.0250	0.9730	0.0280	0.8390	0.0190	1.0000	0.0249
	1970-1973	1.3450	0.0740	0.9460	0.0540	0.8420	0.0480	1.0000	0.0565
	1974-1978	1.3980	0.0600	0.8850	0.0550	0.9190	0.0360	1.0000	0.0508
	1979-1980	2.0914	0.4073	0.6714	0.2752	0.8035	0.2972	1.0000	0.3082
	1981-1983	2.7957	0.1898	0.4428	0.2024	0.7084	0.1645	1.0000	0.1898
	1984	2.8662	0.2721	0.6530	0.2902	0.2540	0.2358	1.0000	0.2721
	1985	3.2436	0.2100	0.2334	0.1867	0.7701	0.1633	1.0000	0.1867
	1986	3.2304	0.2289	0.2289	0.2035	0.7885	0.1781	1.0000	0.2035
	1987	3.2688	0.2603	0.2025	0.2314	0.8100	0.2025	1.0000	0.2314
	1988	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1989	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1990	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1991	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1992+	2.3023	0.2623	0.6120	0.2331	0.7577	0.2040	1.0000	0.2331
CO	Pre-1970	1.2770	0.0330	1.0170	0.0290	0.7580	0.0250	1.0000	0.0287
	1970-1973	1.4420	0.0710	0.9960	0.0420	0.6740	0.0330	1.0000	0.0455
	1974-1978	1.5730	0.0540	0.9020	0.0790	0.7550	0.0290	1.0000	0.0602
	1979-1980	2.0939	0.3129	0.6895	0.1805	0.7671	0.1479	1.0000	0.1985
	1981-1983	2.6454	0.1633	0.4526	0.1020	0.8032	0.1076	1.0000	0.1163
	1984	2.5738	0.2181	0.3799	0.1362	0.9959	0.1436	1.0000	0.1553
	1985	3.4554	0.1471	0.2186	0.0914	0.6385	0.0971	1.0000	0.1043
	1986	3.2307	0.1795	0.3032	0.1115	0.6465	0.1185	1.0000	0.1272
	1987	2.8508	0.2342	0.4456	0.1455	0.6615	0.1546	1.0000	0.1660
	1988	1.5788	0.1945	0.8083	0.1209	0.9291	0.1284	1.0000	0.1379
	1989	1.5680	0.1958	0.8134	0.1216	0.9275	0.1292	1.0000	0.1387
	1990	1.5572	0.1973	0.8179	0.1226	0.9271	0.1302	1.0000	0.1398
	1991	1.5559	0.1974	0.8182	0.1226	0.9274	0.1303	1.0000	0.1399
	1992+	1.5064	0.2028	0.8408	0.1260	0.9216	0.1339	1.0000	0.1438
NOx	Pre-1970	1.1210	0.0090	0.7850	0.0010	1.3190	-0.0090	1.0000	-0.0001
	1970-1973	1.1990	-0.0040	0.7930	-0.0020	1.2450	0.0060	1.0000	-0.0002
	1974-1978	1.2620	0.0220	0.7700	0.0040	1.2420	0.0270	1.0000	0.0140
	1979-1980	1.3666	0.0444	0.7444	0.0278	1.2111	0.0333	1.0000	0.0333
	1981-1983	1.3033	0.0061	0.8077	0.0184	1.1381	0.0245	1.0000	0.0184
	1984	1.0029	0.1343	0.9223	0.0358	1.1461	0.0537	1.0000	0.0627
	1985	1.1665	0.0724	0.8849	0.0161	1.0941	0.0322	1.0000	0.0322
	1986	1.2408	0.0833	0.8611	0.0185	1.0834	0.0370	1.0000	0.0370
	1987	1.3532	0.0990	0.8251	0.0220	1.0672	0.0440	1.0000	0.0440
	1988	1.3974	0.1094	0.8384	0.0243	1.0085	0.0486	1.0000	0.0486
	1989	1.3976	0.1103	0.8336	0.0245	1.0175	0.0490	1.0000	0.0490
	1990	1.4113	0.1114	0.8294	0.0248	1.0151	0.0495	1.0000	0.0495
	1991	1.4113	0.1114	0.8294	0.0248	1.0151	0.0495	1.0000	0.0495
	1992+	1.4452	0.1151	0.8185	0.0256	1.0104	0.0512	1.0000	0.0512

NOTE : The fractions given in this table are used in the calculation of the operating-mode/temperature correction factor (OMTCF).

WHERE :

OMTCF = [(TERM1 + TERM2 + TERM3)/DENOM].
TERM1 = W *TCF(1)*(B1+D1*M).
TERM2 = (1-W-X)*TCF(2)*(B2+D2*M).
TERM3 = X *TCF(3)*(B3+D3*M).
DENOM = BO + DO*M.
W = Fraction of VMT in the cold start mode.
X = Fraction of VMT in the hot start mode.
TCF(b) = Temperature correction factor for pollutant, model year, for test segment b.
M = Cumulative mileage / 10,000 miles.

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TABLE 1.3.8A

AIR CONDITIONING CORRECTION FACTOR COEFFICIENTS FOR
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* ACCF= U*V*(A + B*(T-75) -1) + 1

Model Years	HC A	HC B	CO A	CO B	NOx A	NOx B
Pre-1979	0.1023E+01	0.3344E-02	0.1202E+01	0.1808E-02	0.1299E+01	0.5643E-04
1979+	0.1000E+01	0.3512E-02	0.1130E+01	0.1528E-02	0.1221E+01	0.4262E-03

* WHERE :

ACCF = Air Conditioning Correction Factor,
V = Fraction of vehicles equipped with AC given in Table 1.3.8B,
U = Fraction of vehicles with AC that are using it = (DI-DILO)/(DIHI-DI), 0<=U<=1,
DI = Discomfort index = (DB+WB)*.4+15,
DILO = The highest discomfort index where no AC is used,
DIHI = The lowest discomfort index where all vehicles with AC use it,
DB = Dry bulb temperature (Fahrenheit),
WB = Wet bulb temperature (Fahrenheit),
T = Ambient temperature (Fahrenheit).

TABLE 1.3.8B

ESTIMATED FRACTION OF
LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
EQUIPPED WITH AIR CONDITIONING

Model Years	Fraction Equipped With Air Conditioning
Pre-1977	0.32
1977	0.52
1978+	0.39

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TABLE 1.3.8C

EXTRA LOAD CORRECTION FACTOR COEFFICIENTS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* XLCF = (XLC-1)*U + 1

Model Years	Coefficients (XLC) HC	CO	NOx
Pre-1970	1.0786	1.2765	0.9535
1970-1973	1.0495	1.1384	1.0313
1974-1978	1.0556	1.1347	1.0753
1979+	1.0455	1.3058	1.0719

* WHERE :

XLCF = Extra load correction factor,
U = Fraction of VMT with an extra load,
XLC = Correction factor coefficient.

TABLE 1.3.8D

TRAILER TOWING CORRECTION FACTOR COEFFICIENTS
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* TTCF = (TTC-1)*U + 1

Model Years	Coefficients (TTC) HC	CO	NOx
Pre-1970	1.2614	1.9327	1.1184
1970-1973	1.2762	1.8940	1.1384
1974-1978	1.7288	2.1414	1.2170
1979+	1.5909	3.9722	1.3875

* WHERE :

TTCF = Trailer towing correction factor,
U = Fraction of VMT towing a trailer,
TTC = Correction factor coefficient.

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TABLE 1.3.9A

TAMPERING AND MISFUELING RATES
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Area	Model Years	System	Zero Mile Level	Det. Rate 1	Det. Rate 2	50,000 Mile Level	100,000 Mile Level
Non-I/M	Pre-1981	Air Pump Disablement	0.2155	0.02630	0.02630	0.347	0.478
		Catalyst Removal	0.2267	0.02260	0.02260	0.340	0.453
		EGR System Disabled	0.1037	0.02175	0.02175	0.212	0.321
		Filler Neck Damaged	0.1462	0.03684	0.03684	0.330	0.515
		Fuel Tank Misfueled	-0.0375	0.00857	0.00857	0.005	0.048
		Total Misfueled	0.1087	0.04541	0.04541	0.336	0.563
		PCV System Disabled	-0.0022	0.00419	0.00419	0.019	0.040
		Cannister Disconnect	-0.0185	0.01801	0.01801	0.072	0.162
		Both Cannister & Cap	-0.0121	0.01832	0.01832	0.079	0.171
	1981+	Air Pump Disablement	-0.0274	0.02619	0.02630	0.104	0.235
		Catalyst Removal	-0.0100	0.02074	0.02260	0.094	0.207
		EGR System Disabled	-0.0139	0.01374	0.02175	0.055	0.164
		Filler Neck Damaged	0.0087	0.00926	0.00926	0.055	0.101
		Fuel Tank Misfueled	0.0231	-0.00212	-0.00212	0.013	0.002
		Total Misfueled	0.0318	0.00714	0.00714	0.067	0.103
		PCV System Disabled	-0.0022	0.00419	0.00419	0.019	0.040
		Cannister Disconnect	-0.0185	0.01801	0.01801	0.072	0.162
		Both Cannister & Cap	-0.0121	0.01832	0.01832	0.079	0.171
With I/M	Pre-1981	Air Pump Disablement	0.2015	0.01561	0.01561	0.280	0.358
		Catalyst Removal	-0.0081	0.03342	0.03342	0.159	0.326
		EGR System Disabled	0.0880	0.01078	0.01078	0.142	0.196
		Filler Neck Damaged	0.0437	0.02806	0.02806	0.184	0.324
		Fuel Tank Misfueled	-0.0705	0.01076	0.01076	0.0	0.037
		Total Misfueled	-0.0268	0.03882	0.03882	0.167	0.361
		PCV System Disabled	-0.0068	0.00315	0.00315	0.009	0.025
		Cannister Disconnect	-0.0186	0.01349	0.01349	0.049	0.116
		Both Cannister & Cap	-0.0213	0.01484	0.01484	0.053	0.127
	1981+	Air Pump Disablement	-0.0044	0.00874	0.01561	0.039	0.117
		Catalyst Removal	0.0085	0.00618	0.03342	0.039	0.206
		EGR System Disabled	0.0068	0.00370	0.01078	0.025	0.079
		Filler Neck Damaged	0.0059	0.00380	0.00380	0.025	0.044
		Fuel Tank Misfueled	0.0097	0.00554	0.00554	0.037	0.065
		Total Misfueled	0.0156	0.00934	0.00934	0.062	0.109
		PCV System Disabled	-0.0068	0.00315	0.00315	0.009	0.025
		Cannister Disconnect	-0.0186	0.01349	0.01349	0.049	0.116
		Both Cannister & Cap	-0.0213	0.01484	0.01484	0.053	0.127

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TABLE 1.3.9B

EXCESS EMISSIONS
DUE TO TAMPERING AND/OR MISFUELING
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Type of Tampering	Emission Control System	Pollutant	Excess Emissions (g/mi) FTP	Bag 1	Bag 2	Bag 3	Idle (g/hr)
Air Pump Disablement	Oxidation	HC	1.37	1.80	1.37	1.04	27.38
		CO	30.61	34.67	33.90	21.28	506.08
	3way/Oxidation 3way	HC	0.85	1.36	0.76	0.61	
		Pre-1985					8.97
		1985+					11.71
		CO	21.02	31.80	18.21	18.25	
		Pre-1985					177.43
		1985+					215.29
Catalyst Removal	Oxidation	HC	3.05	2.31	3.40	2.95	42.83
		CO	28.01	41.40	28.97	16.06	124.82
	3way/Oxidation 3way	HC	2.04	1.80	2.25	1.81	42.83
		CO	13.74	16.32	14.11	11.07	124.82
		NOx	1.52	1.49	1.36	1.83	2.31
Total Misfueled	Oxidation	HC	2.47	2.30	2.57	2.40	9.70
		CO	20.96	46.50	13.13	16.62	14.18
	3way/Oxidation 3way	HC	1.44	1.42	1.56	1.21	9.70
		CO	6.57	8.08	6.60	5.37	14.18
		NOx	0.57	0.64	0.45	0.74	0.13
EGR System Disabled		NOx					
		Pre-1979	1.21	1.40	0.96	1.54	
		1979-1978	3.31	3.82	2.63	4.21	
		1979-1987	3.48	4.11	2.68	4.53	
		1988+	1.23	1.36	1.19	1.21	
EGR System Disabled	and Catalyst Removal	NOx	3.39	3.02	3.46	3.55	
EGR System Disabled	and Total Misfueled	NOx	1.99	2.12	1.85	2.16	

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TABLE 1.3.9C

EXCESS CRANKCASE EMISSIONS
AND UNCONTROLLED
EVAPORATIVE HYDROCARBON EMISSIONS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Excess Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
PCV System Disabled					
1964-1977	1.28				
1978-1979	1.27				
1980	1.24				
1981+	1.23				
Cannister Disconnect					
Pre-1979		18.08	40.21	27.99	78.74
1979-1980		13.29	14.90	18.50	29.18
1981+ CARB		6.50	14.70	13.85	28.78
1981+ FINJ		5.20	14.70	9.00	28.78
Missing Fuel Cap					
Pre-1979		18.08	40.21	27.99	78.74
1979-1980		13.29	14.90	18.50	29.18
1981+ CARB		0.0	14.70	0.0	28.78
1981+ FINJ		5.20	14.70	9.00	28.78

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

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TABLE 1.3.9D

UNCONTROLLED
RUNNING LOSS EMISSIONS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Cannister Disconnect				
7.0	0.33	0.42	0.90	1.85
9.0	0.52	1.30	2.04	4.29
10.4	0.95	2.36	3.52	4.97
11.7	2.54	3.37	7.19	11.97
Missing Fuel Cap				
7.0	0.60	0.84	1.28	2.44
9.0	1.23	1.85	3.31	15.58
10.4	2.09	3.43	15.30	28.51
11.7	3.62	17.28	44.93	44.93

* Uncontrolled emissions applicable to 1979+ model year vehicles.

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TABLE 1.3.10A

METHANE OFFSETS*
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Methane Offsets (g/mi) FTP	Bag 1	Bag 2	Bag 3
Pre-1974	0.311	0.420	0.310	0.230
1974-1978	0.311	0.420	0.310	0.230
1979-1980	0.172	0.260	0.160	0.130
1981-1983	0.144	0.237	0.125	0.110
1984	0.122	0.181	0.111	0.097
1985	0.112	0.166	0.102	0.090
1986	0.094	0.139	0.085	0.076
1987	0.079	0.119	0.071	0.065
1988	0.072	0.109	0.064	0.059
1989	0.072	0.108	0.064	0.059
1990	0.071	0.108	0.064	0.058
1991	0.071	0.108	0.064	0.058
1992+	0.069	0.105	0.062	0.057

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

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TABLE 1.3.10C

PERCENT TECHNOLOGY DISTRIBUTIONS
(EXHAUST AND EVAPORATIVE EMISSION SYSTEMS)
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Air Pump Only	Oxidation Catalyst	3Way Catalyst	EGR System	Air Pump & Oxidation or 3Way Catalyst	EGR System & 3Way Catalyst
Pre-1973	0.0	0.0	0.0	0.0	0.0	0.0
1973-1978	0.0	0.0	0.0	30.0	0.0	0.0
1979-1981	0.0	100.0	0.0	100.0	50.0	0.0
1982	0.0	100.0	0.0	100.0	60.0	0.0
1983	0.0	90.0	10.0	100.0	60.0	10.0
1984	0.0	70.0	30.0	100.0	75.0	30.0
1985	0.0	60.0	40.0	100.0	75.0	40.0
1986	0.0	50.0	50.0	100.0	55.0	50.0
1987	0.0	15.0	85.0	100.0	55.0	85.0
1988+	0.0	15.0	85.0	100.0	50.0	85.0

Model Years	Evaporative Canister	PCV System
Pre-1968	0.0	0.0
1968-1970	0.0	100.0
1971-1978	5.0	100.0
1979+	100.0	100.0

DATE : MAY 19, 1989

TABLE 1.3.10D

PERCENT TECHNOLOGY DISTRIBUTIONS
(FUEL DELIVERY SYSTEMS)
FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Carbureted	Ported Fuel-Injected	Throttle-Body Fuel-Injected
1981	99.1	0.9	0.0
1982	99.5	0.5	0.0
1983	99.8	0.2	0.0
1984	97.8	2.2	0.0
1985	88.6	6.8	4.6
1986	58.5	23.7	17.8
1987	26.5	43.2	30.3
1988	19.3	44.4	36.3
1989	18.3	45.8	35.9
1990	17.2	52.2	30.6
1991	17.1	53.1	29.8
1992+	12.9	55.7	31.4

DATE : MAY 19, 1989

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TABLE 1.3.11A

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	25.8	1967	25.8	1968	20.1	1969	20.1	1970	18.0	1971	18.0	1972	18.0	1973	18.1	1974	16.6	1975	16.6	1976	16.6	1977	16.5
1967	25.7	1968	20.0	1969	20.0	1970	17.9	1971	17.9	1972	17.9	1973	17.9	1974	16.6	1975	16.6	1976	16.5	1977	16.5	1978	16.5
1968	19.9	1969	19.9	1970	17.8	1971	17.8	1972	17.8	1973	17.8	1974	16.5	1975	16.5	1976	16.5	1977	16.4	1978	16.4	1979	7.3
1969	19.8	1970	17.7	1971	17.7	1972	17.7	1973	17.7	1974	16.4	1975	16.4	1976	16.4	1977	16.4	1978	16.4	1979	7.2	1980	7.1
1970	17.6	1971	17.6	1972	17.6	1973	17.6	1974	16.3	1975	16.3	1976	16.3	1977	16.3	1978	16.3	1979	7.0	1980	7.0	1981	4.2
1971	17.4	1972	17.4	1973	17.4	1974	16.2	1975	16.2	1976	16.2	1977	16.2	1978	16.2	1979	6.9	1980	6.9	1981	4.2	1982	4.1
1972	17.3	1973	17.3	1974	16.1	1975	16.1	1976	16.1	1977	16.1	1978	16.1	1979	6.8	1980	6.8	1981	4.1	1982	4.1	1983	4.0
1973	17.1	1974	16.0	1975	16.0	1976	16.0	1977	16.0	1978	16.0	1979	6.6	1980	6.6	1981	4.1	1982	4.0	1983	4.0	1984	3.8
1974	15.9	1975	15.9	1976	15.9	1977	15.9	1978	15.9	1979	6.4	1980	6.4	1981	3.9	1982	3.9	1983	3.9	1984	3.8	1985	2.5
1975	15.7	1976	15.7	1977	15.7	1978	15.7	1979	6.1	1980	6.1	1981	3.8	1982	3.8	1983	3.8	1984	3.6	1985	2.5	1986	2.3
1976	15.6	1977	15.6	1978	15.6	1979	5.9	1980	5.9	1981	3.7	1982	3.7	1983	3.7	1984	3.6	1985	2.4	1986	2.3	1987	2.1
1977	15.4	1978	15.4	1979	5.6	1980	5.6	1981	3.5	1982	3.6	1983	3.6	1984	3.4	1985	2.4	1986	2.2	1987	2.1	1988	2.1
1978	15.3	1979	5.3	1980	5.3	1981	3.4	1982	3.4	1983	3.4	1984	3.3	1985	2.3	1986	2.2	1987	2.0	1988	2.1	1989	2.0
1979	5.0	1980	5.0	1981	3.2	1982	3.2	1983	3.2	1984	3.1	1985	2.2	1986	2.1	1987	2.0	1988	2.0	1989	2.0	1990	1.9
1980	4.7	1981	3.0	1982	3.0	1983	3.0	1984	2.9	1985	2.1	1986	2.0	1987	1.9	1988	2.0	1989	1.9	1990	1.9	1991	1.8
1981	2.8	1982	2.8	1983	2.8	1984	2.7	1985	2.0	1986	1.9	1987	1.8	1988	1.9	1989	1.9	1990	1.8	1991	1.8	1992	1.7
1982	2.6	1983	2.6	1984	2.5	1985	1.9	1986	1.8	1987	1.7	1988	1.7	1989	1.7	1990	1.7	1991	1.7	1992	1.7	1993	1.6
1983	2.4	1984	2.3	1985	1.8	1986	1.7	1987	1.6	1988	1.6	1989	1.6	1990	1.6	1991	1.6	1992	1.5	1993	1.5	1994	1.5
1984	2.0	1985	1.6	1986	1.5	1987	1.4	1988	1.5	1989	1.5	1990	1.5	1991	1.5	1992	1.5	1993	1.4	1994	1.4	1995	1.4
1985	1.5	1986	1.4	1987	1.3	1988	1.4	1989	1.4	1990	1.4	1991	1.4	1992	1.4	1993	1.4	1994	1.3	1995	1.3	1996	1.3

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	16.5	1979	7.5	1980	7.4	1981	4.4	1984	4.3	1986	2.6	1989	2.6	1991	2.6	1993	2.6	1996	2.6	1999	2.6	2001	2.6
1979	7.4	1980	7.4	1981	4.4	1982	4.4	1985	2.7	1987	2.5	1990	2.5	1992	2.5	1994	2.5	1997	2.5	2000	2.5	2002	2.5
1980	7.3	1981	4.4	1982	4.3	1983	4.3	1986	2.6	1988	2.5	1991	2.5	1993	2.5	1995	2.5	1998	2.5	2001	2.5	2003	2.5
1981	4.3	1982	4.3	1983	4.2	1984	4.1	1987	2.4	1989	2.5	1992	2.4	1994	2.4	1996	2.4	1999	2.4	2002	2.4	2004	2.4
1982	4.2	1983	4.3	1984	4.0	1985	2.6	1988	2.4	1990	2.4	1993	2.4	1995	2.4	1997	2.4	2000	2.4	2003	2.4	2005	2.4
1983	4.2	1984	4.0	1985	2.6	1986	2.5	1989	2.4	1991	2.4	1994	2.4	1996	2.4	1998	2.4	2001	2.4	2004	2.4	2006	2.4
1984	3.9	1985	2.6	1986	2.4	1987	2.3	1990	2.3	1992	2.3	1995	2.3	1997	2.3	1999	2.3	2002	2.3	2005	2.3	2007	2.3
1985	2.6	1986	2.5	1987	2.3	1988	2.3	1991	2.3	1993	2.2	1996	2.3	1998	2.3	2000	2.3	2003	2.3	2006	2.3	2008	2.3
1986	2.4	1987	2.3	1988	2.3	1989	2.2	1992	2.2	1994	2.2	1997	2.2	1999	2.2	2001	2.2	2004	2.2	2007	2.2	2009	2.2
1987	2.2	1988	2.3	1989	2.2	1990	2.2	1993	2.1	1995	2.1	1998	2.1	2000	2.1	2002	2.1	2005	2.1	2008	2.1	2010	2.1
1988	2.2	1989	2.2	1990	2.1	1991	2.1	1994	2.1	1996	2.1	1999	2.1	2001	2.1	2003	2.1	2006	2.1	2009	2.1	2011	2.1
1989	2.1	1990	2.1	1991	2.0	1992	2.0	1995	2.0	1997	2.0	2000	2.0	2002	2.0	2004	2.0	2007	2.0	2010	2.0	2012	2.0
1990	2.0	1991	2.1	1992	1.9	1993	1.9	1996	1.9	1998	1.9	2001	1.9	2003	1.9	2005	1.9	2008	1.9	2011	1.9	2013	1.9
1991	2.0	1992	2.0	1993	1.9	1994	1.8	1997	1.8	1999	1.8	2002	1.8	2004	1.8	2006	1.8	2009	1.8	2012	1.8	2014	1.8
1992	1.8	1993	1.9	1994	1.8	1995	1.7	1998	1.7	2000	1.7	2003	1.7	2005	1.7	2007	1.7	2010	1.7	2013	1.7	2015	1.7
1993	1.7	1994	1.8	1995	1.7	1996	1.6	1999	1.6	2001	1.6	2004	1.6	2006	1.6	2008	1.6	2011	1.6	2014	1.6	2016	1.6
1994	1.6	1995	1.6	1996	1.5	1997	1.5	2000	1.5	2002	1.5	2005	1.5	2007	1.5	2009	1.5	2012	1.5	2015	1.5	2017	1.5
1995	1.5	1996	1.5	1997	1.4	1998	1.4	2001	1.4	2003	1.4	2006	1.4	2008	1.4	2010	1.4	2013	1.4	2016	1.4	2018	1.4
1996	1.4	1997	1.4	1998	1.3	1999	1.3	2002	1.3	2004	1.2	2007	1.3	2009	1.3	2011	1.3	2014	1.3	2017	1.3	2019	1.3
1997	1.3	1998	1.3	1999	1.2	2000	1.2	2003	1.2	2005	1.2	2008	1.2	2010	1.2	2012	1.2	2015	1.2	2018	1.2	2020	1.2

*MY - Indicates the model year.
**E - Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start, 60 TO 84F diurnal, 75F for hot soak and running loss emissions, 9.0 psi fuel RVP, 54.57% average in-use fuel tank level, including refueling emissions. Emissions are based on the January 1 mileage accumulation figures given in Table 1.3.4A

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TABLE 1.3.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	133.4	1967	133.4	1968	133.4	1969	133.4	1970	104.8	1971	104.8	1972	104.8	1973	104.8	1974	102.9	1975	102.9	1976	102.9	1977	102.9
1967	132.5	1968	132.5	1969	132.5	1970	103.8	1971	103.8	1972	103.8	1973	103.8	1974	101.9	1975	101.9	1976	101.9	1977	101.9	1978	101.9
1968	131.5	1969	131.5	1970	102.6	1971	102.6	1972	102.6	1973	102.6	1974	100.8	1975	100.8	1976	100.8	1977	100.8	1978	100.8	1979	52.8
1969	130.4	1970	101.4	1971	101.4	1972	101.4	1973	101.4	1974	99.6	1975	99.6	1976	99.6	1977	99.6	1978	99.6	1979	51.6	1980	51.6
1970	100.1	1971	100.1	1972	100.1	1973	100.1	1974	98.3	1975	98.3	1976	98.3	1977	98.3	1978	98.3	1979	50.4	1980	50.4	1981	35.5
1971	98.6	1972	98.6	1973	98.6	1974	96.9	1975	96.9	1976	96.9	1977	96.9	1978	96.9	1979	49.0	1980	49.0	1981	34.6	1982	34.6
1972	97.0	1973	97.0	1974	95.4	1975	95.4	1976	95.4	1977	95.4	1978	95.4	1979	47.5	1980	47.5	1981	33.7	1982	33.7	1983	33.7
1973	95.3	1974	93.8	1975	93.8	1976	93.8	1977	93.8	1978	93.8	1979	45.8	1980	45.8	1981	32.8	1982	32.8	1983	32.8	1984	29.6
1974	92.0	1975	92.0	1976	92.0	1977	92.0	1978	92.0	1979	44.1	1980	44.1	1981	31.7	1982	31.7	1983	31.7	1984	28.5	1985	16.6
1975	90.1	1976	90.1	1977	90.1	1978	90.1	1979	42.2	1980	42.2	1981	30.5	1982	30.5	1983	30.5	1984	27.4	1985	16.0	1986	14.7
1976	88.0	1977	88.0	1978	88.0	1979	40.1	1980	40.1	1981	29.3	1982	29.3	1983	29.3	1984	26.1	1985	15.4	1986	14.1	1987	12.8
1977	85.7	1978	85.7	1979	37.8	1980	37.8	1981	27.9	1982	27.9	1983	27.9	1984	24.8	1985	14.7	1986	13.4	1987	12.1	1988	13.0
1978	83.3	1979	35.3	1980	35.3	1981	26.4	1982	26.4	1983	26.4	1984	23.3	1985	14.0	1986	12.7	1987	11.4	1988	12.2	1989	12.2
1979	32.7	1980	32.7	1981	24.8	1982	24.8	1983	24.8	1984	21.7	1985	13.2	1986	11.9	1987	10.5	1988	11.4	1989	11.4	1990	11.3
1980	29.8	1981	23.1	1982	23.1	1983	23.1	1984	19.9	1985	12.3	1986	11.0	1987	9.7	1988	10.5	1989	10.5	1990	10.5	1991	10.5
1981	21.2	1982	21.2	1983	21.2	1984	18.1	1985	11.3	1986	10.1	1987	8.7	1988	9.6	1989	9.6	1990	9.5	1991	9.5	1992	9.4
1982	19.2	1983	19.2	1984	16.0	1985	10.3	1986	9.0	1987	7.7	1988	8.6	1989	8.5	1990	8.5	1991	8.5	1992	8.4	1993	8.4
1983	16.9	1984	13.8	1985	9.2	1986	7.9	1987	6.6	1988	7.5	1989	7.4	1990	7.4	1991	7.4	1992	7.2	1993	7.2	1994	7.2
1984	11.4	1985	8.0	1986	6.7	1987	5.4	1988	6.3	1989	6.2	1990	6.2	1991	6.2	1992	6.0	1993	6.0	1994	6.0	1995	6.0
1985	7.2	1986	5.9	1987	4.6	1988	5.5	1989	5.4	1990	5.4	1991	5.4	1992	5.2	1993	5.2	1994	5.2	1995	5.2	1996	5.2

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	102.9	1979	54.9	1980	54.9	1981	38.2	1984	35.0	1986	18.6	1989	18.1	1991	18.0	1993	17.9	1996	17.9	1999	17.9	2001	17.9
1979	53.9	1980	53.9	1981	37.6	1982	37.6	1985	19.5	1987	16.9	1990	17.7	1992	17.6	1994	17.6	1997	17.6	2000	17.6	2002	17.6
1980	52.8	1981	36.9	1982	36.9	1983	36.9	1986	17.9	1988	17.5	1991	17.4	1993	17.2	1995	17.2	1998	17.2	2001	17.2	2003	17.2
1981	36.2	1982	36.2	1983	36.2	1984	33.1	1987	16.2	1989	17.1	1992	16.9	1994	16.9	1996	16.9	1999	16.9	2002	16.9	2004	16.9
1982	35.5	1983	35.5	1984	32.3	1985	18.5	1988	16.7	1990	16.7	1993	16.5	1995	16.5	1997	16.5	2000	16.5	2003	16.5	2005	16.5
1983	34.6	1984	31.5	1985	18.1	1986	16.8	1989	16.3	1991	16.2	1994	16.1	1996	16.1	1998	16.1	2001	16.1	2004	16.1	2006	16.1
1984	30.6	1985	17.6	1986	16.3	1987	15.0	1990	15.8	1992	15.6	1995	15.6	1997	15.6	1999	15.6	2002	15.6	2005	15.6	2007	15.6
1985	17.1	1986	15.8	1987	14.5	1988	15.4	1991	15.3	1993	15.2	1996	15.2	1998	15.2	2000	15.2	2003	15.2	2006	15.2	2008	15.2
1986	15.3	1987	14.0	1988	14.8	1989	14.8	1992	14.6	1994	14.6	1997	14.6	1999	14.6	2001	14.6	2004	14.6	2007	14.6	2009	14.6
1987	13.4	1988	14.3	1989	14.2	1990	14.2	1993	14.0	1995	14.0	1998	14.0	2000	14.0	2002	14.0	2005	14.0	2008	14.0	2010	14.0
1988	13.6	1989	13.6	1990	13.6	1991	13.6	1994	13.4	1996	13.4	1999	13.4	2001	13.4	2003	13.4	2006	13.4	2009	13.4	2011	13.4
1989	12.9	1990	12.9	1991	12.9	1992	12.7	1995	12.7	1997	12.7	2000	12.7	2002	12.7	2004	12.7	2007	12.7	2010	12.7	2012	12.7
1990	12.2	1991	12.1	1992	12.0	1993	12.0	1996	12.0	1998	12.0	2001	12.0	2003	12.0	2005	12.0	2008	12.0	2011	12.0	2013	12.0
1991	11.3	1992	11.2	1993	11.2	1994	11.2	1997	11.2	1999	11.2	2002	11.2	2004	11.2	2006	11.2	2009	11.2	2012	11.2	2014	11.2
1992	10.3	1993	10.3	1994	10.3	1995	10.3	1998	10.3	2000	10.3	2003	10.3	2005	10.3	2007	10.3	2010	10.3	2013	10.3	2015	10.3
1993	9.4	1994	9.4	1995	9.4	1996	9.4	1999	9.4	2001	9.4	2004	9.4	2006	9.4	2008	9.4	2011	9.4	2014	9.4	2016	9.4
1994	8.4	1995	8.4	1996	8.4	1997	8.4	2000	8.4	2002	8.4	2005	8.4	2007	8.4	2009	8.4	2012	8.4	2015	8.4	2017	8.4
1995	7.2	1996	7.2	1997	7.2	1998	7.2	2001	7.2	2003	7.2	2006	7.2	2008	7.2	2010	7.2	2013	7.2	2016	7.2	2018	7.2
1996	6.0	1997	6.0	1998	6.0	1999	6.0	2002	6.0	2004	6.0	2007	6.0	2009	6.0	2011	6.0	2014	6.0	2017	6.0	2019	6.0
1997	5.2	1998	5.2	1999	5.2	2000	5.2	2003	5.2	2005	5.2	2008	5.2	2010	5.2	2012	5.2	2015	5.2	2018	5.2	2020	5.2

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in Table 1.3.4A.

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TABLE 1.3.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	5.4	1967	5.4	1968	5.4	1969	5.4	1970	6.5	1971	6.5	1972	6.5	1973	6.5	1974	5.3	1975	5.3	1976	5.3	1977	5.3
1967	5.4	1968	5.4	1969	5.4	1970	6.5	1971	6.5	1972	6.5	1973	6.5	1974	5.3	1975	5.3	1976	5.3	1977	5.3	1978	5.3
1968	5.4	1969	5.4	1970	6.5	1971	6.5	1972	6.5	1973	6.5	1974	5.3	1975	5.3	1976	5.3	1977	5.3	1978	5.3	1979	2.8
1969	5.4	1970	6.5	1971	6.5	1972	6.5	1973	6.5	1974	5.3	1975	5.3	1976	5.3	1977	5.3	1978	5.3	1979	2.7	1980	2.7
1970	6.5	1971	6.5	1972	6.5	1973	6.5	1974	5.2	1975	5.2	1976	5.2	1977	5.2	1978	5.2	1979	2.7	1980	2.7	1981	2.1
1971	6.5	1972	6.5	1973	6.5	1974	5.2	1975	5.2	1976	5.2	1977	5.2	1978	5.2	1979	2.7	1980	2.7	1981	2.1	1982	2.1
1972	6.5	1973	6.5	1974	5.2	1975	5.2	1976	5.2	1977	5.2	1978	5.2	1979	2.6	1980	2.6	1981	2.1	1982	2.1	1983	2.1
1973	6.5	1974	5.2	1975	5.2	1976	5.2	1977	5.2	1978	5.2	1979	2.6	1980	2.6	1981	2.1	1982	2.1	1983	2.1	1984	2.1
1974	5.1	1975	5.1	1976	5.1	1977	5.1	1978	5.1	1979	2.6	1980	2.6	1981	2.0	1982	2.0	1983	2.0	1984	2.0	1985	1.8
1975	5.1	1976	5.1	1977	5.1	1978	5.1	1979	2.5	1980	2.5	1981	2.0	1982	2.0	1983	2.0	1984	2.0	1985	1.7	1986	1.6
1976	5.1	1977	5.1	1978	5.1	1979	2.5	1980	2.5	1981	2.0	1982	2.0	1983	2.0	1984	1.9	1985	1.7	1986	1.5	1987	1.4
1977	5.0	1978	5.0	1979	2.4	1980	2.4	1981	2.0	1982	2.0	1983	2.0	1984	1.9	1985	1.7	1986	1.5	1987	1.3	1988	1.2
1978	5.0	1979	2.3	1980	2.3	1981	1.9	1982	1.9	1983	1.9	1984	1.8	1985	1.6	1986	1.5	1987	1.3	1988	1.2	1989	1.2
1979	2.3	1980	2.3	1981	1.9	1982	1.9	1983	1.9	1984	1.7	1985	1.6	1986	1.4	1987	1.2	1988	1.2	1989	1.2	1990	1.1
1980	2.2	1981	1.9	1982	1.9	1983	1.9	1984	1.6	1985	1.5	1986	1.4	1987	1.2	1988	1.1	1989	1.1	1990	1.1	1991	1.1
1981	1.8	1982	1.8	1983	1.8	1984	1.5	1985	1.5	1986	1.3	1987	1.1	1988	1.1	1989	1.1	1990	1.0	1991	1.0	1992	1.0
1982	1.8	1983	1.8	1984	1.4	1985	1.4	1986	1.3	1987	1.1	1988	1.0	1989	1.0	1990	1.0	1991	1.0	1992	1.0	1993	1.0
1983	1.7	1984	1.3	1985	1.4	1986	1.2	1987	1.0	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9	1994	0.9
1984	1.2	1985	1.3	1986	1.1	1987	1.0	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.8	1993	0.8	1994	0.8	1995	0.8
1985	1.2	1986	1.1	1987	0.9	1988	0.8	1989	0.8	1990	0.8	1991	0.8	1992	0.8	1993	0.8	1994	0.8	1995	0.8	1996	0.8

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	5.3	1979	2.8	1980	2.8	1981	2.2	1984	2.3	1986	1.8	1989	1.5	1991	1.5	1993	1.5	1996	1.5	1999	1.5	2001	1.5
1979	2.8	1980	2.8	1981	2.2	1982	2.2	1985	1.9	1987	1.6	1990	1.5	1992	1.5	1994	1.5	1997	1.5	2000	1.5	2002	1.5
1980	2.8	1981	2.1	1982	2.1	1983	2.1	1986	1.7	1988	1.5	1991	1.5	1993	1.4	1995	1.4	1998	1.4	2001	1.4	2003	1.4
1981	2.1	1982	2.1	1983	2.1	1984	2.3	1987	1.6	1989	1.5	1992	1.4	1994	1.4	1996	1.4	1999	1.4	2002	1.4	2004	1.4
1982	2.1	1983	2.1	1984	2.2	1985	1.9	1988	1.4	1990	1.4	1993	1.4	1995	1.4	1997	1.4	2000	1.4	2003	1.4	2005	1.4
1983	2.1	1984	2.2	1985	1.8	1986	1.7	1989	1.4	1991	1.4	1994	1.4	1996	1.4	1998	1.4	2001	1.4	2004	1.4	2006	1.4
1984	2.1	1985	1.8	1986	1.7	1987	1.5	1990	1.4	1992	1.4	1995	1.4	1997	1.4	1999	1.4	2002	1.4	2005	1.4	2007	1.4
1985	1.8	1986	1.6	1987	1.5	1988	1.4	1991	1.4	1993	1.3	1996	1.3	1998	1.3	2000	1.3	2003	1.3	2006	1.3	2008	1.3
1986	1.6	1987	1.4	1988	1.3	1989	1.3	1992	1.3	1994	1.3	1997	1.3	1999	1.3	2001	1.3	2004	1.3	2007	1.3	2009	1.3
1987	1.4	1988	1.3	1989	1.3	1990	1.3	1993	1.3	1995	1.3	1998	1.3	2000	1.3	2002	1.3	2005	1.3	2008	1.3	2010	1.3
1988	1.3	1989	1.3	1990	1.3	1991	1.3	1994	1.2	1996	1.2	1999	1.2	2001	1.2	2003	1.2	2006	1.2	2009	1.2	2011	1.2
1989	1.2	1990	1.2	1991	1.2	1992	1.2	1995	1.2	1997	1.2	2000	1.2	2002	1.2	2004	1.2	2007	1.2	2010	1.2	2012	1.2
1990	1.2	1991	1.2	1992	1.2	1993	1.2	1996	1.2	1998	1.2	2001	1.2	2003	1.2	2005	1.2	2008	1.2	2011	1.2	2013	1.2
1991	1.1	1992	1.1	1993	1.1	1994	1.1	1997	1.1	1999	1.1	2002	1.1	2004	1.1	2006	1.1	2009	1.1	2012	1.1	2014	1.1
1992	1.1	1993	1.1	1994	1.1	1995	1.1	1998	1.1	2000	1.1	2003	1.1	2005	1.1	2007	1.1	2010	1.1	2013	1.1	2015	1.1
1993	1.0	1994	1.0	1995	1.0	1996	1.0	1999	1.0	2001	1.0	2004	1.0	2006	1.0	2008	1.0	2011	1.0	2014	1.0	2016	1.0
1994	1.0	1995	1.0	1996	1.0	1997	1.0	2000	1.0	2002	1.0	2005	1.0	2007	1.0	2009	1.0	2012	1.0	2015	1.0	2017	1.0
1995	0.9	1996	0.9	1997	0.9	1998	0.9	2001	0.9	2003	0.9	2006	0.9	2008	0.9	2010	0.9	2013	0.9	2016	0.9	2018	0.9
1996	0.8	1997	0.8	1998	0.8	1999	0.8	2002	0.8	2004	0.8	2007	0.8	2009	0.8	2011	0.8	2014	0.8	2017	0.8	2019	0.8
1997	0.8	1998	0.8	1999	0.8	2000	0.8	2003	0.8	2005	0.8	2008	0.8	2010	0.8	2012	0.8	2015	0.8	2018	0.8	2020	0.8

*MY Indicates the model year.
**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in Table 1.3.4A.

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TABLE 1.4.1A

NONTAMPERED EXHAUST EMISSION RATES FOR
LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1963	19.720	0.370	21.570	23.420
	1963-1969	19.310	0.360	21.110	22.910
	1970-1973	9.730	0.390	11.680	13.630
	1974	9.610	0.260	10.910	12.210
	1975	8.880	0.240	10.080	11.280
	1976	8.410	0.220	9.510	10.610
	1977-1978	7.200	0.190	8.150	9.100
	1979	3.670	0.180	4.570	5.470
	1980	3.450	0.170	4.300	5.150
	1981-1983	3.270	0.160	4.070	4.870
	1984	3.260	0.160	4.060	4.860
	1985	2.280	0.050	2.530	2.780
	1986	2.000	0.050	2.250	2.500
	1987-1989	0.820	0.090	1.270	1.720
	1990	0.820	0.090	1.270	1.720
	1991-2000	0.820	0.090	1.270	1.720
	2001+	0.810	0.090	1.260	1.710
CO	Pre-1963	240.220	5.760	269.020	297.820
	1963-1969	235.250	5.640	263.450	291.650
	1970-1973	166.260	7.050	201.510	236.760
	1974	164.300	6.670	197.650	231.000
	1975	151.700	6.160	182.500	213.300
	1976	143.730	5.830	172.880	202.030
	1977-1978	123.050	4.990	148.000	172.950
	1979	57.180	4.790	81.130	105.080
	1980	53.770	4.510	76.320	98.870
	1981-1983	50.910	4.270	72.260	93.610
	1984	50.750	4.250	72.000	93.250
	1985	35.790	0.860	40.090	44.390
	1986	28.210	0.860	32.510	36.810
	1987-1989	11.170	0 640	14.370	17.570
	1990	11.140	0.640	14.340	17.540
	1991-2000	11.080	0.640	14.280	17.480
	2001+	11.030	0.640	14.230	17.430
NOx	Pre-1963	9.410	0.0	9.410	9.410
	1963-1969	9.220	0.0	9.220	9.220
	1970-1973	9.870	0.0	9.870	9.870
	1974	7.110	0.090	7.560	8.010
	1975	6.560	0.080	6.960	7.360
	1976	6.220	0.070	6.570	6.920
	1977-1978	5.320	0.060	5.620	5.920
	1979	5.950	0.060	6.250	6.550
	1980	5.580	0.060	5.880	6.180
	1981-1983	5.300	0.050	5.550	5.800
	1984	5.280	0.050	5.530	5.780
	1985	5.210	0.030	5.360	5.510
	1986	5.200	0.030	5.350	5.500
	1987-1989	5.210	0.030	5.360	5.510
	1990	4.270	0.040	4.470	4.670
	1991-2000	3.540	0.040	3.740	3.940
	2001+	3.530	0.040	3.730	3.930

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile.
ZML = Zero mile level in grams/mile.
DR = Deterioration rate in grams/mile/10K miles.
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

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TABLE 1.4.1B

EXHAUST EMISSION RATES FOR
LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES
AT VARIOUS MILEAGE LEVELS
(RATES INCLUDE TAMPERING)

Pol	Model Years	Emission Rate (Grams/Mile) 0K	25K	50K	75K	100K	125K	150K
HC	Pre-1970	19.310	20.210	21.110	22.010	22.910	23.810	24.710
	1970-1973	9.730	10.705	11.680	12.655	13.630	14.605	15.580
	1974	9.610	10.260	10.910	11.560	12.210	12.860	13.510
	1975	8.880	9.480	10.080	10.680	11.280	11.880	12.480
	1976	8.410	8.960	9.510	10.060	10.610	11.160	11.710
	1977-1978	7.200	7.675	8.150	8.625	9.100	9.575	10.050
	1979	3.670	4.120	4.570	5.020	5.470	5.920	6.370
	1980	3.450	3.875	4.300	4.725	5.150	5.575	6.000
	1981	3.270	3.670	4.070	4.470	4.870	5.270	5.670
	1982-1983	3.310	3.731	4.151	4.570	4.989	5.410	5.827
	1984	3.301	3.723	4.144	4.563	4.983	5.404	5.822
	1985	2.319	2.465	2.610	2.753	2.898	3.043	3.184
	1986	2.039	2.185	2.330	2.473	2.618	2.763	2.904
	1987	1.085	1.431	1.775	2.110	2.425	2.729	3.027
	1988-1989	1.166	1.555	1.940	2.312	2.665	3.008	3.337
	1990+	1.256	1.690	2.119	2.531	2.928	3.317	3.684
CO	Pre-1970	235.250	249.350	263.450	277.550	291.650	305.750	319.850
	1970-1973	166.260	183.885	201.510	219.135	236.760	254.385	272.010
	1974	164.300	180.975	197.650	214.325	231.000	247.675	264.350
	1975	151.700	167.100	182.500	197.900	213.300	228.700	244.100
	1976	143.730	158.305	172.880	187.455	202.030	216.605	231.180
	1977-1978	123.050	135.525	148.000	160.475	172.950	185.425	197.900
	1979	57.180	69.155	81.130	93.105	105.080	117.055	129.030
	1980	53.770	65.045	76.320	87.595	98.870	110.145	121.420
	1981	50.910	61.585	72.260	82.935	93.610	104.285	114.960
	1982-1983	51.288	62.154	73.015	83.857	94.713	105.574	116.403
	1984	51.134	61.953	72.766	83.561	94.370	105.184	115.966
	1985	36.160	38.497	40.828	43.142	45.469	47.801	50.102
	1986	28.580	30.917	33.248	35.562	37.889	40.221	42.522
	1987	14.434	17.329	20.198	22.987	25.497	27.857	30.120
	1988-1989	15.227	18.514	21.762	24.895	27.750	30.452	33.002
	1990	15.883	19.492	23.054	26.471	29.650	32.692	35.525
	1991+	15.823	19.432	22.994	26.411	29.590	32.632	35.465
NOx	Pre-1970	9.220	9.220	9.220	9.220	9.220	9.220	9.220
	1970-1973	9.870	9.870	9.870	9.870	9.870	9.870	9.870
	1974	7.110	7.335	7.560	7.785	8.010	8.235	8.460
	1975	6.560	6.760	6.960	7.160	7.360	7.560	7.760
	1976	6.220	6.395	6.570	6.745	6.920	7.095	7.270
	1977-1978	5.320	5.470	5.620	5.770	5.920	6.070	6.220
	1979	5.950	6.100	6.250	6.400	6.550	6.700	6.850
	1980	5.590	5.740	5.890	6.040	6.190	6.340	6.490
	1981-1983	5.300	5.425	5.550	5.675	5.800	5.925	6.050
	1984	5.280	5.405	5.530	5.655	5.780	5.905	6.030
	1985	5.329	5.467	5.604	5.741	5.879	6.016	6.154
	1986	5.325	5.466	5.607	5.748	5.888	6.029	6.170
	1987	5.368	5.521	5.674	5.826	5.979	6.134	6.288
	1988-1989	5.362	5.513	5.663	5.814	5.965	6.118	6.271
	1990	4.649	4.943	5.237	5.528	5.819	6.107	6.393
	1991+	3.919	4.213	4.507	4.798	5.089	5.377	5.663

DATE : MAY 19, 1989

TABLE 1.4.2A

NONTAMPERED
CRANKCASE AND EVAPORATIVE HYDROCARBON EMISSIONS*
FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
Pre-1968	5.70	18.08	42.33	27.66	77.89
1968-1984	0.0	18.08	42.33	27.66	77.89
1985+	0.0	2.12	4.68	4.77	17.94

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

Based on averages of 6.88 trips per day and 33.97 miles per day.

DATE : MAY 19, 1989

TABLE 1.4.2B

TAMPERING OFFSETS FOR TOTAL
CRANKCASE AND EVAPORATIVE HC EMISSIONS*
FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES
AT VARIOUS MILEAGE INTERVALS

Fuel RVP	Model Years	Tampering Offset (Grams/Mile)**						
		0K	25K	50K	75K	100K	125K	150K
9.0	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1979	0.0	0.01	0.03	0.04	0.05	0.07	0.08
	1980-1983	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1984+	0.0	0.09	0.22	0.36	0.50	0.64	0.78
11.5	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1979	0.0	0.01	0.03	0.04	0.05	0.07	0.08
	1980-1983	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1984+	0.0	0.12	0.32	0.52	0.71	0.91	1.11

* Based on calculated hot soak temperature of 82.0F,
Diurnal temperature rise from 60.0 to 84.0F,
Fuel RVPs of 9.0 and 11.5 psi with no weathering, tank level of 40.0%.

** Based on averages of 6.88 trips per day and 33.97 miles per day.

DATE : MAY 19, 1989

TABLE 1.4.2C

NONTAMPERED
RUNNING LOSS EMISSIONS
FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Pre-1985	7.0	0.36	0.52	1.13	2.16
	9.0	0.58	1.50	2.62	4.81
	10.4	1.06	2.70	4.00	5.63
	11.7	2.88	3.85	8.20	13.64
1985+	7.0	0.24	0.42	0.97	1.39
	9.0	0.39	1.20	2.21	2.88
	10.4	0.68	1.70	2.38	3.23
	11.7	1.72	2.30	4.79	7.90

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TABLE 1.4.2D

REFUELING EMISSIONS* FOR
LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Fuel Economy (miles/gal)	Uncontrolled (grams/mile)	With Volatility Control** (grams/mile)	With Onboard** (grams/mile)	With both Volatility and Onboard** (grams/mile)
Pre-1971	6.4	0.89	0.89	0.89	0.89
1971	6.1	0.95	0.95	0.95	0.95
1972	5.7	1.01	1.01	1.01	1.01
1973	6.1	0.95	0.95	0.95	0.95
1974	6.5	0.89	0.89	0.89	0.89
1975	6.9	0.83	0.83	0.83	0.83
1976	6.8	0.85	0.85	0.85	0.85
1977	7.2	0.81	0.81	0.81	0.81
1978	7.7	0.75	0.75	0.75	0.75
1979	8.1	0.71	0.71	0.71	0.71
1980	8.8	0.66	0.66	0.66	0.66
1981	9.1	0.63	0.63	0.63	0.63
1982	9.4	0.61	0.61	0.61	0.61
1983	9.9	0.58	0.58	0.58	0.58
1984-1985	10.0	0.58	0.58	0.58	0.58
1986	10.0	0.58	0.58	0.58	0.58
1987	10.1	0.57	0.57	0.57	0.57
1988	10.1	0.57	0.57	0.57	0.57
1989	10.2	0.57	0.57	0.57	0.57
1990	10.3	0.56	0.56	0.56	0.56
1991	10.3	0.56	0.56	0.56	0.56
1992	10.4	0.55	0.44	0.55	0.05
1993	10.6	0.54	0.43	0.06	0.05
1994	10.7	0.54	0.43	0.06	0.05
1995	10.8	0.53	0.42	0.06	0.05
1996	10.9	0.53	0.42	0.06	0.05
1997	10.9	0.53	0.42	0.06	0.05
1998	10.9	0.53	0.42	0.06	0.05
1999	11.0	0.52	0.42	0.06	0.05
2000+	11.1	0.52	0.41	0.06	0.05

* Refueling Emissions (g/mi) = [Displacement (g/gal) + Spillage (g/gal)] / Fuel Economy (mi/gal).

** Volatility control assumed to start in 1992, with 7.0/7.8/9.0 RVP fuels for ASTM class A/B/C cities. Onboard assumed to start in 1993, and apply to LDGVs, LDGTs, and HDGVs.

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TABLE 1.4.3

HOT STABILIZED IDLE EMISSIONS FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

		Emission Rate (Grams/Hour)				
	Model	Nontampered			In-use Level*	
Pol	Years	Zero Mile	50,000 Mile	100,000 Mile	50,000 Mile	100,000 Mile
HC	Pre-1970	137.40	149.40	161.40	150.23	162.55
	1970-1973	51.00	63.00	75.00	63.83	76.15
	1974-1978	51.00	57.00	63.00	57.83	64.15
	1979-1983	25.80	34.80	43.80	35.63	44.95
	1984	6.47	21.90	36.70	22.73	37.85
	1985	4.02	11.46	18.95	12.29	20.11
	1986	4.86	12.23	19.70	13.07	20.86
	1987	4.34	11.69	19.16	12.52	20.31
	1988-1990	6.45	14.03	21.57	14.86	22.72
	1991+	6.19	13.76	21.29	14.59	22.45
CO	Pre-1970	1330.80	1489.80	1648.80	1492.07	1651.89
	1970-1973	369.00	453.00	537.00	455.27	540.09
	1974-1978	369.00	450.00	531.00	452.27	534.09
	1979-1983	385.20	469.20	553.20	471.47	556.29
	1984	104.42	235.85	367.25	238.13	370.34
	1985	36.13	102.12	168.05	104.39	171.14
	1986	53.87	119.86	185.80	122.13	188.90
	1987	48.53	114.51	180.44	116.78	183.53
	1988	91.64	157.54	223.44	159.82	226.54
	1989	91.32	157.23	223.15	159.51	226.24
	1990	90.85	156.77	222.69	159.04	225.78
	1991	90.71	156.60	222.50	158.88	225.59
	1992+	89.18	155.07	220.95	157.34	224.04
NOx	Pre-1970	2.40	2.40	2.40	2.40	2.40
	1970-1973	3.00	3.00	3.00	3.00	3.00
	1974-1983	3.60	3.60	3.60	3.60	3.60
	1984-1985	7.11	7.11	7.11	7.11	7.11
	1986+	2.35	2.35	2.35	2.35	2.35

* In-use emission level includes tampering.

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TABLE 1.4.4

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per vehicle*)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.065	18211.	0.0	0.	0.
2	0.131	16767.	0.131	18211.	9105.
3	0.113	15437.	0.113	16767.	26595.
4	0.097	14213.	0.097	15437.	42696.
5	0.084	13086.	0.084	14213.	57522.
6	0.072	12048.	0.072	13086.	71171.
7	0.062	11093.	0.062	12048.	83738.
8	0.054	10213.	0.054	11093.	95308.
9	0.046	9403.	0.046	10213.	105961.
10	0.040	8657.	0.040	9403.	115769.
11	0.034	7971.	0.034	8657.	124799.
12	0.030	7339.	0.030	7971.	133113.
13	0.026	6757.	0.026	7339.	140768.
14	0.022	6221.	0.022	6757.	147816.
15	0.019	5728.	0.019	6221.	154305.
16	0.016	5273.	0.016	5728.	160279.
17	0.014	4855.	0.014	5273.	165780.
18	0.012	4470.	0.012	4855.	170844.
19	0.010	4116.	0.010	4470.	175506.
20+	0.052	3789.	0.052	4116.	179799.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1, where: JMAR(1) = 0 and,
JMAR(MYI) = MAR(MYI-1), MYI = 2,...,20+.

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TABLE 1.4.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES
JANUARY 1, 1988

Model Years	(A) HDGV Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) HDGV Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.0	1.000	0.0	0.0	0.	0.0	0.0
1987	0.131	1.000	0.131	0.140	18211.	2554.2	0.206
1986	0.113	1.000	0.113	0.121	16767.	2028.6	0.164
1985	0.097	1.000	0.097	0.104	15437.	1603.2	0.129
1984	0.084	1.000	0.084	0.090	14213.	1278.3	0.103
1983	0.072	1.000	0.072	0.077	13086.	1008.8	0.081
1982	0.062	1.000	0.062	0.066	12048.	799.8	0.065
1981	0.054	1.000	0.054	0.058	11093.	641.4	0.052
1980	0.046	1.000	0.046	0.049	10213.	503.0	0.041
1979	0.040	1.000	0.040	0.043	9403.	402.7	0.032
1978	0.034	1.000	0.034	0.036	8657.	315.1	0.025
1977	0.030	1.000	0.030	0.032	7971.	256.0	0.021
1976	0.026	1.000	0.026	0.028	7339.	204.3	0.016
1975	0.022	1.000	0.022	0.024	6757.	159.2	0.013
1974	0.019	1.000	0.019	0.020	6221.	126.6	0.010
1973	0.016	1.000	0.016	0.017	5728.	98.1	0.008
1972	0.014	1.000	0.014	0.015	5273.	79.0	0.006
1971	0.012	1.000	0.012	0.013	4855.	62.4	0.005
1970	0.010	1.000	0.010	0.011	4470.	47.9	0.004
1969-	0.052	1.000	0.052	0.056	4116.	229.2	0.018
		DAF:	0.935		TFNORM:	12397.5	

WHERE :

A = January 1 registration mix from Table 1.4.4,
B = Gasoline fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 1.4.4.

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TABLE 1.4.6

SPEED CORRECTION FACTOR COEFFICIENTS FOR
LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

* SCF(s) = EXP(A + B*s + C*s**2), HC & CO
= A + B*s + C*s**2, NOx

Pol	Model Years	Coefficients A	B	C
HC	All	1.60800	-0.09700	0.00083
CO	All	1.52000	-0.09800	0.00110
NOx	All	0.82400	0.00880	0.0

* WHERE: s = average speed (mph).

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TABLE 1.4.7A

LOW (< 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

* TCF = EXP [TC*(T - 75.0)]

Pollutant	Model Years	TC
HC	Pre-1970	-0.58903E-02
	1970-1973	-0.73870E-02
	1974-1978	-0.49759E-02
	1979-1983	-0.28549E-02
	1984	-0.74107E-02
	1985+	-0.92859E-02
CO	Pre-1970	-0.20576E-02
	1970-1973	-0.45541E-02
	1974-1978	-0.42899E-02
	1979-1983	-0.13085E-02
	1984	-0.77117E-02
	1985+	-0.60195E-02
NOx	Pre-1970	-0.64315E-02
	1970-1973	-0.55456E-02
	1974-1978	-0.13969E-02
	1979-1983	-0.46352E-03
	1984	-0.57524E-02
	1985+	-0.19733E-02

* WHERE :

TCF = Low temperature correction factor for appropriate pollutant, ambient temperature (< 75F), and model year,
T = Ambient temperature (Fahrenheit),
TC = Low temperature correction factor coefficient for appropriate pollutant, and model year.

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TABLE 1.4.7B

HIGH (> 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
AND FUEL RVP CORRECTION FACTORS
FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

* TCF = EXP [TC*(T - 75.0)], Pre-1985
TRCF = EXP [RC*(RVP - 9.0) + TC*(T - 75.0)
+ TRC*(RVP - 9.0)*(T - 75.0)], 1985+

Pol	Model Years	Parameter	Coefficient
HC	Pre-1970	TC	0.13458E-02
	1970-1973		0.52317E-02
	1974-1978		0.54651E-02
	1979-1983		0.10082E-01
	1984		0.20546E-01
	1985+	RC	0.42060E-01
		TC	0.48358E-02
		TRC	0.0
CO	Pre-1970	TC	0.81720E-02
	1970-1973		0.20268E-01
	1974-1978		0.24127E-01
	1979-1983		0.22061E-01
	1984		0.27019E-01
	1985+	RC	0.13968E+00
		TC	0.14943E-01
		TRC	0.0
NOx	Pre-1970	TC	-0.83986E-02
	1970-1973		-0.86880E-02
	1974-1978		-0.18079E-01
	1979-1983		-0.74889E-02
	1984		-0.21593E-01
	1985+	RC	-0.40024E-01
		TC	0.0
		TRC	0.0

* WHERE :

TCF = High temperature correction factor for appropriate pollutant, ambient temperature, and model year.
T = Ambient temperature (Fahrenheit).
TC = High temperature correction factor coefficient for appropriate pollutant, temperature, and model year.
TRCF = High temperature and fuel RVP correction factor for appropriate pollutant, ambient temperature, fuel RVP, and model year.
RC = Fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, and model year.
RVP = Fuel volatility in psi.
TRC = Combined temperature and fuel RVP correction factor coefficient for appropriate pollutant, ambient temperature, fuel RVP, and model year.

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TABLE 1.4.9A

TAMPERING AND MISFUELING RATES
FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Area	Model Years	System	Zero Mile Level	Det. Rate 1	Det. Rate 2	50,000 Mile Level	100,000 Mile Level
Non-I/M	All	Air Pump Disablement	0.2155	0.02630	0.02630	0.347	0.478
		Catalyst Removal	0.2267	0.02260	0.02260	0.340	0.453
		EGR System Disabled	0.1037	0.02175	0.02175	0.212	0.321
		Filler Neck Damaged	0.1462	0.03684	0.03684	0.330	0.515
		Fuel Tank Misfueled	-0.0375	0.00857	0.00857	0.005	0.048
		Total Misfueled	0.1087	0.04541	0.04541	0.336	0.563
		PCV System Disabled	-0.0022	0.00419	0.00419	0.019	0.040
		Cannister Disconnect	-0.0185	0.01801	0.01801	0.072	0.162
		Both Cannister & Cap	-0.0121	0.01832	0.01832	0.079	0.171
With I/M	All	Air Pump Disablement	0.2015	0.01561	0.01561	0.280	0.358
		Catalyst Removal	-0.0081	0.03342	0.03342	0.159	0.326
		EGR System Disabled	0.0880	0.01078	0.01078	0.142	0.196
		Filler Neck Damaged	0.0437	0.02806	0.02806	0.184	0.324
		Fuel Tank Misfueled	-0.0705	0.01076	0.01076	0.0	0.037
		Total Misfueled	-0.0268	0.03882	0.03882	0.167	0.361
		PCV System Disabled	-0.0068	0.00315	0.00315	0.009	0.025
		Cannister Disconnect	-0.0186	0.01349	0.01349	0.049	0.116
		Both Cannister & Cap	-0.0213	0.01484	0.01484	0.053	0.127

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TABLE 1.4.9B

EXCESS EMISSIONS
DUE TO TAMPERING AND/OR MISFUELING
FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Type of Tampering	Emission Control System	Pollutant	Excess Emissions (g/mi) FTP	Bag 1	Bag 2	Bag 3	Idle (g/hr)
Air Pump Disablement	Oxidation	HC	1.37	1.80	1.37	1.04	27.38
		CO	30.61	34.67	33.90	21.28	506.08
	3way/Oxidation 3way	HC	0.85	1.36	0.76	0.61	
		Pre-1985					8.97
		1985+					11.71
		CO	21.02	31.80	18.21	18.25	
		Pre-1985					177.43
		1985+					215.29
Catalyst Removal	Oxidation	HC	3.05	2.31	3.40	2.95	42.83
		CO	28.01	41.40	28.97	16.06	124.82
	3way/Oxidation 3way	HC	2.04	1.80	2.25	1.81	42.83
		CO	13.74	16.32	14.11	11.07	124.82
		NOx	1.52	1.49	1.36	1.83	2.31
Total Misfueled	Oxidation	HC	2.47	2.30	2.57	2.40	9.70
		CO	20.96	46.50	13.13	16.62	14.18
	3way/Oxidation 3way	HC	1.44	1.42	1.56	1.21	9.70
		CO	6.57	8.08	6.60	5.37	14.18
		NOx	0.57	0.64	0.45	0.74	0.13
EGR System Disabled		NOx					
		Pre-1990	1.21	1.40	0.96	1.54	
		1990+	3.31	3.82	2.63	4.21	
EGR System Disabled	and Catalyst Removal	NOx	3.39	3.02	3.46	3.55	
EGR System Disabled	and Total Misfueled	NOx	1.99	2.12	1.85	2.16	

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TABLE 1.4.9C

EXCESS CRANKCASE EMISSIONS
AND UNCONTROLLED
EVAPORATIVE HYDROCARBON EMISSIONS*
FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Excess Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
PCV System Disabled					
1964-1980	1.34				
1981+	1.29				
Cannister Disconnect					
Pre-1985		18.08	40.21	27.66	78.74
1985+		14.67	21.43	23.31	41.97
Missing Fuel Cap					
Pre-1985		18.08	40.21	27.66	78.74
1985+		14.67	21.43	23.31	41.97

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

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TABLE 1.4.9D

UNCONTROLLED
RUNNING LOSS EMISSIONS*
FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Cannister Disconnect				
7.0	0.33	0.42	0.90	1.85
9.0	0.52	1.30	2.04	4.29
10.4	0.95	2.36	3.52	4.97
11.7	2.54	3.37	7.19	11.97
Missing Fuel Cap				
7.0	0.60	0.84	1.28	2.44
9.0	1.23	1.85	3.31	15.58
10.4	2.09	3.43	15.30	28.51
11.7	3.62	17.28	44.93	44.93

* Uncontrolled emissions applicable to 1985+ model year vehicles.

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TABLE 1.4.10A

METHANE OFFSETS*
FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Methane Offsets (Grams/Mile)
Pre-1979	0.670
1979-1986	0.310
1987+	0.180

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

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TABLE 1.4.10B

CONVERSION FACTORS
FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Conversion Factors*
Pre-1962	1.548
1962	1.536
1963	1.536
1964	1.527
1965	1.516
1966	1.518
1967	1.497
1968	1.479
1969	1.449
1970	1.449
1971	1.437
1972	1.419
1973	1.422
1974	1.313
1975	1.244
1976	1.073
1977	1.057
1978	1.022
1979	0.961
1980	0.935
1981	0.912
1982	0.884
1983	0.907
1984	0.896
1985	0.894
1986	0.897
1987	0.895
1988	0.894
1989	0.893
1990	0.893
1991	0.892
1992	0.891
1993	0.890
1994	0.889
1995	0.887
1996	0.886
1997+	0.885

* Convert from grams/brake-hoursepower/hour to grams/mile units.

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TABLE 1.4.10C

PERCENT TECHNOLOGY DISTRIBUTIONS
(EXHAUST AND EVAPORATIVE EMISSION SYSTEMS)
FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Air Pump Only	Oxidation Catalyst	3Way Catalyst	EGR System	Air Pump & Oxidation or 3Way Catalyst	EGR System & 3Way Catalyst
Pre-1982	0.0	0.0	0.0	0.0	0.0	0.0
1982-1984	0.0	5.0	0.0	0.0	0.0	0.0
1985	0.0	5.0	0.0	95.0	0.0	0.0
1986	0.0	5.0	0.0	100.0	0.0	0.0
1987	7.0	15.0	15.0	100.0	30.0	15.0
1988-1989	7.0	25.0	15.0	100.0	30.0	15.0
1990+	7.0	30.0	25.0	100.0	30.0	25.0

Model Years	Evaporative Canister	PCV System
Pre-1968	0.0	0.0
1968-1984	0.0	100.0
1985+	100.0	100.0

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TABLE 1.4.11A

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BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	36.9	1967	36.9	1968	31.2	1969	31.2	1970	22.2	1971	22.2	1972	22.3	1973	22.2	1974	19.7	1975	18.6	1976	17.7	1977	15.9
1967	36.7	1968	31.0	1969	31.0	1970	22.0	1971	22.0	1972	22.0	1973	22.1	1974	19.6	1975	18.5	1976	17.6	1977	15.9	1978	15.9
1968	30.9	1969	30.9	1970	21.8	1971	21.8	1972	21.8	1973	21.9	1974	19.6	1975	18.5	1976	17.6	1977	15.8	1978	15.8	1979	12.1
1969	30.7	1970	21.6	1971	21.6	1972	21.6	1973	21.6	1974	19.4	1975	18.4	1976	17.5	1977	15.8	1978	15.7	1979	12.0	1980	11.6
1970	21.4	1971	21.4	1972	21.4	1973	21.4	1974	19.2	1975	18.2	1976	17.5	1977	15.7	1978	15.7	1979	11.9	1980	11.5	1981	11.2
1971	21.2	1972	21.2	1973	21.2	1974	19.0	1975	18.0	1976	17.3	1977	15.7	1978	15.6	1979	11.9	1980	11.4	1981	11.1	1982	11.1
1972	20.9	1973	20.9	1974	18.9	1975	17.8	1976	17.1	1977	15.5	1978	15.5	1979	11.8	1980	11.4	1981	11.0	1982	11.0	1983	11.0
1973	20.6	1974	18.7	1975	17.7	1976	16.9	1977	15.3	1978	15.3	1979	11.7	1980	11.3	1981	10.9	1982	10.9	1983	10.9	1984	10.8
1974	18.5	1975	17.5	1976	16.8	1977	15.1	1978	15.1	1979	11.5	1980	11.3	1981	10.9	1982	10.8	1983	10.8	1984	10.8	1985	4.6
1975	17.3	1976	16.6	1977	15.0	1978	15.0	1979	11.3	1980	11.0	1981	10.8	1982	10.7	1983	10.7	1984	10.6	1985	4.6	1986	4.3
1976	16.4	1977	14.8	1978	14.8	1979	11.2	1980	10.8	1981	10.6	1982	10.7	1983	10.6	1984	10.5	1985	4.6	1986	4.3	1987	3.5
1977	14.6	1978	14.6	1979	11.0	1980	10.7	1981	10.4	1982	10.4	1983	10.5	1984	10.4	1985	4.6	1986	4.2	1987	3.5	1988	3.5
1978	14.4	1979	10.8	1980	10.5	1981	10.2	1982	10.2	1983	10.3	1984	10.3	1985	4.6	1986	4.2	1987	3.4	1988	3.4	1989	3.4
1979	10.6	1980	10.3	1981	10.0	1982	10.0	1983	10.0	1984	10.1	1985	4.6	1986	4.2	1987	3.3	1988	3.3	1989	3.3	1990	3.3
1980	10.1	1981	9.8	1982	9.8	1983	9.8	1984	9.8	1985	4.5	1986	4.2	1987	3.3	1988	3.2	1989	3.2	1990	3.2	1991	3.1
1981	9.6	1982	9.6	1983	9.6	1984	9.6	1985	4.3	1986	4.1	1987	3.2	1988	3.2	1989	3.1	1990	3.0	1991	3.1	1992	3.0
1982	9.4	1983	9.4	1984	9.4	1985	4.3	1986	4.0	1987	3.0	1988	3.1	1989	3.0	1990	3.0	1991	2.9	1992	2.9	1993	2.9
1983	9.1	1984	9.1	1985	4.2	1986	3.9	1987	2.8	1988	2.9	1989	2.9	1990	2.9	1991	2.8	1992	2.8	1993	2.8	1994	2.7
1984	8.8	1985	4.1	1986	3.8	1987	2.7	1988	2.7	1989	2.7	1990	2.8	1991	2.7	1992	2.7	1993	2.6	1994	2.6	1995	2.6
1985	4.0	1986	3.8	1987	2.6	1988	2.6	1989	2.6	1990	2.6	1991	2.7	1992	2.6	1993	2.6	1994	2.5	1995	2.5	1996	2.5

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	15.9	1979	12.1	1980	11.7	1981	11.3	1984	11.2	1986	4.3	1989	3.9	1991	3.9	1993	3.9	1996	3.8	1999	3.8	2001	3.8
1979	12.1	1980	11.7	1981	11.3	1982	11.2	1985	4.6	1987	3.8	1990	3.8	1992	3.8	1994	3.8	1997	3.8	2000	3.8	2002	3.8
1980	11.6	1981	11.2	1982	11.2	1983	11.2	1986	4.3	1988	3.8	1991	3.8	1993	3.8	1995	3.8	1998	3.8	2001	3.7	2003	3.7
1981	11.2	1982	11.2	1983	11.1	1984	11.1	1987	3.8	1989	3.8	1992	3.8	1994	3.7	1996	3.7	1999	3.7	2002	3.7	2004	3.7
1982	11.1	1983	11.1	1984	11.0	1985	4.6	1988	3.7	1990	3.7	1993	3.7	1995	3.7	1997	3.7	2000	3.7	2003	3.7	2005	3.6
1983	11.0	1984	11.0	1985	4.6	1986	4.3	1989	3.7	1991	3.7	1994	3.6	1996	3.6	1998	3.6	2001	3.6	2004	3.6	2006	3.6
1984	10.9	1985	4.6	1986	4.3	1987	3.7	1990	3.6	1992	3.6	1995	3.6	1997	3.6	1999	3.6	2002	3.5	2005	3.5	2007	3.5
1985	4.6	1986	4.3	1987	3.6	1988	3.6	1991	3.5	1993	3.5	1996	3.5	1998	3.5	2000	3.5	2003	3.5	2006	3.5	2008	3.5
1986	4.3	1987	3.6	1988	3.6	1989	3.5	1992	3.5	1994	3.5	1997	3.5	1999	3.5	2001	3.4	2004	3.4	2007	3.4	2009	3.4
1987	3.6	1988	3.5	1989	3.5	1990	3.5	1993	3.4	1995	3.4	1998	3.4	2000	3.4	2002	3.4	2005	3.3	2008	3.3	2010	3.3
1988	3.5	1989	3.5	1990	3.4	1991	3.4	1994	3.3	1996	3.3	1999	3.3	2001	3.3	2003	3.3	2006	3.3	2009	3.3	2011	3.2
1989	3.4	1990	3.4	1991	3.3	1992	3.3	1995	3.2	1997	3.2	2000	3.2	2002	3.2	2004	3.2	2007	3.2	2010	3.2	2012	3.2
1990	3.3	1991	3.3	1992	3.2	1993	3.2	1996	3.1	1998	3.1	2001	3.1	2003	3.1	2005	3.1	2008	3.1	2011	3.1	2013	3.1
1991	3.2	1992	3.2	1993	3.1	1994	3.1	1997	3.0	1999	3.0	2002	3.0	2004	3.0	2006	3.0	2009	3.0	2012	3.0	2014	3.0
1992	3.1	1993	3.0	1994	3.0	1995	3.0	1998	2.9	2000	2.9	2003	2.9	2005	2.9	2007	2.9	2010	2.9	2013	2.8	2015	2.8
1993	3.0	1994	2.9	1995	2.9	1996	2.8	1999	2.8	2001	2.8	2004	2.8	2006	2.8	2008	2.7	2011	2.7	2014	2.7	2016	2.7
1994	2.8	1995	2.8	1996	2.7	1997	2.7	2000	2.7	2002	2.6	2005	2.6	2007	2.6	2009	2.6	2012	2.6	2015	2.6	2017	2.6
1995	2.7	1996	2.6	1997	2.6	1998	2.6	2001	2.5	2003	2.5	2006	2.5	2008	2.5	2010	2.5	2013	2.5	2016	2.4	2018	2.4
1996	2.5	1997	2.5	1998	2.4	1999	2.4	2002	2.3	2004	2.3	2007	2.3	2009	2.3	2011	2.3	2014	2.3	2017	2.3	2019	2.3
1997	2.4	1998	2.4	1999	2.4	2000	2.3	2003	2.3	2005	2.3	2008	2.3	2010	2.2	2012	2.2	2015	2.2	2018	2.2	2020	2.2

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 60 TO 84F diurnal, 75F for hot soak and running loss emissions, 9.0 psi fuel RVP, 54.57% average in-use fuel tank level, including refueling emissions
Emissions are based on the January 1 mileage accumulation figures given in Table 1.4.4

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TABLE 1.4.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	336.7	1967	336.7	1968	336.7	1969	336.7	1970	293.0	1971	293.0	1972	293.0	1973	293.0	1974	284.2	1975	262.5	1976	248.6	1977	212.8
1967	334.2	1968	334.2	1969	334.2	1970	290.0	1971	290.0	1972	290.0	1973	290.0	1974	281.4	1975	259.8	1976	246.0	1977	210.6	1978	210.6
1968	331.6	1969	331.6	1970	286.7	1971	286.7	1972	286.7	1973	286.7	1974	278.3	1975	256.9	1976	243.3	1977	208.3	1978	208.3	1979	139.0
1969	328.7	1970	283.1	1971	283.1	1972	283.1	1973	283.1	1974	274.9	1975	253.8	1976	240.4	1977	205.8	1978	205.8	1979	136.6	1980	128.5
1970	279.3	1971	279.3	1972	279.3	1973	279.3	1974	271.2	1975	250.4	1976	237.2	1977	203.0	1978	203.0	1979	134.0	1980	126.1	1981	119.3
1971	275.0	1972	275.0	1973	275.0	1974	267.2	1975	246.8	1976	233.7	1977	200.0	1978	200.0	1979	131.1	1980	123.4	1981	116.8	1982	116.8
1972	270.5	1973	270.5	1974	262.9	1975	242.8	1976	229.9	1977	196.8	1978	196.8	1979	128.0	1980	120.4	1981	114.0	1982	114.0	1983	114.0
1973	265.5	1974	258.2	1975	238.4	1976	225.8	1977	193.3	1978	193.3	1979	124.6	1980	117.3	1981	111.0	1982	111.0	1983	111.0	1984	110.6
1974	253.1	1975	233.7	1976	221.3	1977	189.5	1978	189.5	1979	120.9	1980	113.8	1981	107.7	1982	107.7	1983	107.7	1984	107.3	1985	47.2
1975	228.6	1976	216.5	1977	185.3	1978	185.3	1979	117.0	1980	110.1	1981	104.2	1982	104.2	1983	104.2	1984	103.8	1985	46.5	1986	38.9
1976	211.2	1977	180.8	1978	180.8	1979	112.6	1980	106.0	1981	100.3	1982	100.3	1983	100.3	1984	100.0	1985	45.7	1986	38.2	1987	18.6
1977	175.9	1978	175.9	1979	107.9	1980	101.6	1981	96.2	1982	96.2	1983	96.2	1984	95.8	1985	44.9	1986	37.3	1987	18.0	1988	18.0
1978	170.6	1979	102.8	1980	96.8	1981	91.6	1982	91.6	1983	91.6	1984	91.3	1985	44.0	1986	36.4	1987	17.3	1988	17.3	1989	17.3
1979	97.3	1980	91.5	1981	86.7	1982	86.7	1983	86.7	1984	86.3	1985	43.0	1986	35.4	1987	16.5	1988	16.5	1989	16.5	1990	16.5
1980	85.9	1981	81.3	1982	81.3	1983	81.3	1984	81.0	1985	41.9	1986	34.3	1987	15.7	1988	15.7	1989	15.7	1990	15.7	1991	15.6
1981	75.5	1982	75.5	1983	75.5	1984	75.2	1985	40.7	1986	33.2	1987	14.9	1988	14.9	1989	14.9	1990	14.8	1991	14.8	1992	14.8
1982	69.1	1983	69.1	1984	68.9	1985	39.5	1986	31.9	1987	13.9	1988	13.9	1989	13.9	1990	13.9	1991	13.8	1992	13.8	1993	13.8
1983	62.3	1984	62.1	1985	38.1	1986	30.5	1987	12.9	1988	12.9	1989	12.9	1990	12.8	1991	12.8	1992	12.8	1993	12.8	1994	12.8
1984	54.6	1985	36.6	1986	29.0	1987	11.8	1988	11.8	1989	11.8	1990	11.7	1991	11.7	1992	11.7	1993	11.7	1994	11.7	1995	11.7
1985	35.8	1986	28.2	1987	11.2	1988	11.2	1989	11.2	1990	11.1	1991	11.1	1992	11.1	1993	11.1	1994	11.1	1995	11.1	1996	11.1

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	212.8	1979	143.3	1980	134.9	1981	127.7	1984	127.2	1986	43.7	1989	22.7	1991	22.6	1993	22.6	1996	22.6	1999	22.6	2001	22.5
1979	141.2	1980	132.9	1981	125.9	1982	125.9	1985	50.9	1987	22.4	1990	22.4	1992	22.3	1994	22.3	1997	22.3	2000	22.3	2002	22.3
1980	130.8	1981	123.9	1982	123.9	1983	123.9	1986	42.9	1988	22.1	1991	22.0	1993	22.0	1995	22.0	1998	22.0	2001	22.0	2003	22.0
1981	121.7	1982	121.7	1983	121.7	1984	121.2	1987	21.8	1989	21.8	1992	21.7	1994	21.7	1996	21.7	1999	21.7	2002	21.6	2004	21.6
1982	119.3	1983	119.3	1984	118.9	1985	49.6	1988	21.4	1990	21.4	1993	21.3	1995	21.3	1997	21.3	2000	21.3	2003	21.3	2005	21.3
1983	116.8	1984	116.3	1985	49.1	1986	41.5	1989	21.0	1991	21.0	1994	21.0	1996	21.0	1998	21.0	2001	20.9	2004	20.9	2006	20.9
1984	113.6	1985	48.5	1986	40.9	1987	20.6	1990	20.6	1992	20.5	1995	20.5	1997	20.5	1999	20.5	2002	20.5	2005	20.5	2007	20.5
1985	47.9	1986	40.3	1987	20.2	1988	20.2	1991	20.1	1993	20.1	1996	20.1	1998	20.1	2000	20.1	2003	20.0	2006	20.0	2008	20.0
1986	39.7	1987	19.7	1988	19.7	1989	19.7	1992	19.6	1994	19.6	1997	19.6	1999	19.6	2001	19.5	2004	19.5	2007	19.5	2009	19.5
1987	19.2	1988	19.2	1989	19.2	1990	19.1	1993	19.1	1995	19.1	1998	19.1	2000	19.1	2002	19.0	2005	19.0	2008	19.0	2010	19.0
1988	18.6	1989	18.6	1990	18.5	1991	18.5	1994	18.5	1996	18.5	1999	18.5	2001	18.4	2003	18.4	2006	18.4	2009	18.4	2011	18.4
1989	18.0	1990	17.9	1991	17.9	1992	17.9	1995	17.9	1997	17.9	2000	17.9	2002	17.8	2004	17.8	2007	17.8	2010	17.8	2012	17.8
1990	17.2	1991	17.2	1992	17.2	1993	17.2	1996	17.2	1998	17.2	2001	17.1	2003	17.1	2005	17.1	2008	17.1	2011	17.1	2013	17.1
1991	16.4	1992	16.4	1993	16.4	1994	16.4	1997	16.4	1999	16.4	2002	16.4	2004	16.4	2006	16.4	2009	16.4	2012	16.4	2014	16.4
1992	15.6	1993	15.6	1994	15.6	1995	15.6	1998	15.6	2000	15.6	2003	15.6	2005	15.6	2007	15.6	2010	15.6	2013	15.6	2015	15.6
1993	14.8	1994	14.8	1995	14.8	1996	14.8	1999	14.8	2001	14.7	2004	14.7	2006	14.7	2008	14.7	2011	14.7	2014	14.7	2016	14.7
1994	13.8	1995	13.8	1996	13.8	1997	13.8	2000	13.8	2002	13.8	2005	13.8	2007	13.8	2009	13.8	2012	13.8	2015	13.8	2017	13.8
1995	12.8	1996	12.8	1997	12.8	1998	12.8	2001	12.7	2003	12.7	2006	12.7	2008	12.7	2010	12.7	2013	12.7	2016	12.7	2018	12.7
1996	11.7	1997	11.7	1998	11.7	1999	11.7	2002	11.6	2004	11.6	2007	11.6	2009	11.6	2011	11.6	2014	11.6	2017	11.6	2019	11.6
1997	11.1	1998	11.1	1999	11.1	2000	11.1	2003	11.0	2005	11.0	2008	11.0	2010	11.0	2012	11.0	2015	11.0	2018	11.0	2020	11.0

*MY Indicates the model year.

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F. Emissions are based on the January 1 mileage accumulation figures given in Table 1.4.4.

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TABLE 1.4.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	9.2	1967	9.2	1968	9.2	1969	9.2	1970	9.9	1971	9.9	1972	9.9	1973	9.9	1974	8.7	1975	8.0	1976	7.5	1977	6.4
1967	9.2	1968	9.2	1969	9.2	1970	9.9	1971	9.9	1972	9.9	1973	9.9	1974	8.7	1975	8.0	1976	7.4	1977	6.4	1978	6.4
1968	9.2	1969	9.2	1970	9.9	1971	9.9	1972	9.9	1973	9.9	1974	8.6	1975	7.9	1976	7.4	1977	6.3	1978	6.3	1979	7.0
1969	9.2	1970	9.9	1971	9.9	1972	9.9	1973	9.9	1974	8.6	1975	7.9	1976	7.4	1977	6.3	1978	6.3	1979	6.9	1980	6.6
1970	9.9	1971	9.9	1972	9.9	1973	9.9	1974	8.6	1975	7.8	1976	7.3	1977	6.3	1978	6.3	1979	6.9	1980	6.6	1981	6.1
1971	9.9	1972	9.9	1973	9.9	1974	8.5	1975	7.8	1976	7.3	1977	6.2	1978	6.2	1979	6.9	1980	6.5	1981	6.1	1982	6.1
1972	9.9	1973	9.9	1974	8.4	1975	7.7	1976	7.3	1977	6.2	1978	6.2	1979	6.8	1980	6.5	1981	6.0	1982	6.0	1983	6.0
1973	9.9	1974	8.4	1975	7.7	1976	7.2	1977	6.2	1978	6.2	1979	6.8	1980	6.4	1981	6.0	1982	6.0	1983	6.0	1984	6.0
1974	8.3	1975	7.6	1976	7.2	1977	6.1	1978	6.1	1979	6.7	1980	6.4	1981	6.0	1982	6.0	1983	6.0	1984	5.9	1985	5.6
1975	7.6	1976	7.1	1977	6.1	1978	6.1	1979	6.7	1980	6.3	1981	5.9	1982	5.9	1983	5.9	1984	5.9	1985	5.6	1986	5.6
1976	7.0	1977	6.0	1978	6.0	1979	6.6	1980	6.3	1981	5.9	1982	5.9	1983	5.9	1984	5.9	1985	5.6	1986	5.5	1987	5.6
1977	6.0	1978	6.0	1979	6.6	1980	6.2	1981	5.8	1982	5.8	1983	5.8	1984	5.8	1985	5.5	1986	5.5	1987	5.5	1988	5.5
1978	5.9	1979	6.5	1980	6.2	1981	5.8	1982	5.8	1983	5.8	1984	5.8	1985	5.5	1986	5.5	1987	5.5	1988	5.5	1989	5.5
1979	6.5	1980	6.1	1981	5.7	1982	5.7	1983	5.7	1984	5.7	1985	5.5	1986	5.5	1987	5.5	1988	5.5	1989	5.5	1990	4.6
1980	6.0	1981	5.7	1982	5.7	1983	5.7	1984	5.6	1985	5.4	1986	5.4	1987	5.4	1988	5.4	1989	5.4	1990	4.6	1991	3.8
1981	5.6	1982	5.6	1983	5.6	1984	5.6	1985	5.4	1986	5.4	1987	5.4	1988	5.4	1989	5.4	1990	4.5	1991	3.8	1992	3.8
1982	5.5	1983	5.5	1984	5.5	1985	5.3	1986	5.3	1987	5.3	1988	5.3	1989	5.3	1990	4.4	1991	3.7	1992	3.7	1993	3.7
1983	5.4	1984	5.4	1985	5.3	1986	5.3	1987	5.3	1988	5.3	1989	5.3	1990	4.4	1991	3.6	1992	3.6	1993	3.6	1994	3.6
1984	5.3	1985	5.2	1986	5.2	1987	5.2	1988	5.2	1989	5.2	1990	4.3	1991	3.6	1992	3.6	1993	3.6	1994	3.6	1995	3.6
1985	5.2	1986	5.2	1987	5.2	1988	5.2	1989	5.2	1990	4.3	1991	3.5	1992	3.5	1993	3.5	1994	3.5	1995	3.5	1996	3.5

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	6.4	1979	7.0	1980	6.7	1981	6.2	1984	6.2	1986	5.7	1989	5.7	1991	4.3	1993	4.3	1996	4.3	1999	4.3	2001	4.2
1979	7.0	1980	6.6	1981	6.2	1982	6.2	1985	5.7	1987	5.7	1990	5.0	1992	4.2	1994	4.2	1997	4.2	2000	4.2	2002	4.2
1980	6.6	1981	6.2	1982	6.2	1983	6.2	1986	5.7	1988	5.7	1991	4.2	1993	4.2	1995	4.2	1998	4.2	2001	4.2	2003	4.2
1981	6.1	1982	6.1	1983	6.1	1984	6.1	1987	5.7	1989	5.7	1992	4.2	1994	4.2	1996	4.2	1999	4.2	2002	4.2	2004	4.2
1982	6.1	1983	6.1	1984	6.1	1985	5.7	1988	5.7	1990	4.9	1993	4.2	1995	4.2	1997	4.2	2000	4.2	2003	4.2	2005	4.2
1983	6.1	1984	6.1	1985	5.7	1986	5.7	1989	5.7	1991	4.2	1994	4.2	1996	4.2	1998	4.2	2001	4.1	2004	4.1	2006	4.1
1984	6.0	1985	5.7	1986	5.6	1987	5.7	1990	4.9	1992	4.1	1995	4.1	1997	4.1	1999	4.1	2002	4.1	2005	4.1	2007	4.1
1985	5.6	1986	5.6	1987	5.6	1988	5.6	1991	4.1	1993	4.1	1996	4.1	1998	4.1	2000	4.1	2003	4.1	2006	4.1	2008	4.1
1986	5.6	1987	5.6	1988	5.6	1989	5.6	1992	4.1	1994	4.1	1997	4.1	1999	4.1	2001	4.1	2004	4.1	2007	4.1	2009	4.1
1987	5.6	1988	5.6	1989	5.6	1990	4.8	1993	4.0	1995	4.0	1998	4.0	2000	4.0	2002	4.0	2005	4.0	2008	4.0	2010	4.0
1988	5.6	1989	5.6	1990	4.7	1991	4.0	1994	4.0	1996	4.0	1999	4.0	2001	4.0	2003	4.0	2006	4.0	2009	4.0	2011	4.0
1989	5.5	1990	4.7	1991	4.0	1992	4.0	1995	4.0	1997	4.0	2000	4.0	2002	4.0	2004	4.0	2007	4.0	2010	4.0	2012	4.0
1990	4.7	1991	3.9	1992	3.9	1993	3.9	1996	3.9	1998	3.9	2001	3.9	2003	3.9	2005	3.9	2008	3.9	2011	3.9	2013	3.9
1991	3.9	1992	3.9	1993	3.9	1994	3.9	1997	3.9	1999	3.9	2002	3.9	2004	3.9	2006	3.9	2009	3.9	2012	3.9	2014	3.9
1992	3.8	1993	3.8	1994	3.8	1995	3.8	1998	3.8	2000	3.8	2003	3.8	2005	3.8	2007	3.8	2010	3.8	2013	3.8	2015	3.8
1993	3.8	1994	3.8	1995	3.8	1996	3.8	1999	3.8	2001	3.8	2004	3.8	2006	3.8	2008	3.8	2011	3.8	2014	3.8	2016	3.8
1994	3.7	1995	3.7	1996	3.7	1997	3.7	2000	3.7	2002	3.7	2005	3.7	2007	3.7	2009	3.7	2012	3.7	2015	3.7	2017	3.7
1995	3.6	1996	3.6	1997	3.6	1998	3.6	2001	3.6	2003	3.6	2006	3.6	2008	3.6	2010	3.6	2013	3.6	2016	3.6	2018	3.6
1996	3.6	1997	3.6	1998	3.6	1999	3.6	2002	3.6	2004	3.6	2007	3.6	2009	3.6	2011	3.6	2014	3.6	2017	3.6	2019	3.6
1997	3.5	1998	3.5	1999	3.5	2000	3.5	2003	3.5	2005	3.5	2008	3.5	2010	3.5	2012	3.5	2015	3.5	2018	3.5	2020	3.5

*MY Indicates the model year.

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F. Emissions are based on the January 1 mileage accumulation figures given in table 1.4.4.

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TABLE 1.5.1

NONTAMPERED EXHAUST EMISSION RATES FOR
LOW ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1975	1.310	0.080	1.710	2.110
	1975-1976	0.420	0.070	0.770	1.120
	1977	0.420	0.070	0.770	1.120
	1978	0.420	0.070	0.770	1.120
	1979	0.420	0.070	0.770	1.120
	1980+	0.290	0.030	0.440	0.590
CO	Pre-1975	2.710	0.130	3.360	4.010
	1975-1976	1.170	0.090	1.620	2.070
	1977	1.170	0.090	1.620	2.070
	1978	1.170	0.090	1.620	2.070
	1979	1.170	0.090	1.620	2.070
	1980+	1.150	0.040	1.350	1.550
NOx	Pre-1975	1.460	0.040	1.660	1.860
	1975-1976	1.400	0.040	1.600	1.800
	1977	1.400	0.040	1.600	1.800
	1978	1.400	0.040	1.600	1.800
	1979	1.400	0.040	1.600	1.800
	1980	1.400	0.040	1.600	1.800
	1981-1984	1.310	0.030	1.460	1.610
	1985+	0.870	0.030	1.020	1.170

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile,
ZML = Zero mile level in grams/mile,
DR = Deterioration rate in grams/mile/10K miles,
M = Cumulative mileage / 10,000 miles.

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TABLE 1.5.3

NONTAMPERED HOT STABILIZED IDLE EMISSIONS
FOR LOW ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

* IER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate
HC	Pre-1975	8.40	0.60
	1975-1976	1.80	0.0
	1977	2.40	0.0
	1978	3.60	0.0
	1979	3.00	0.0
	1980+	1.80	0.0
CO	Pre-1975	13.80	0.60
	1975-1976	8.40	0.60
	1977	9.60	0.60
	1978	10.20	0.60
	1979	10.80	0.60
	1980+	9.00	0.60
NOx	Pre-1975	7.80	0.0
	1975-1976	13.20	0.0
	1977	10.20	0.60
	1978	12.00	0.60
	1979	10.80	0.60
	1980	11.40	0.60
	1981-1984	8.40	0.60
	1985+	5.40	0.60

* WHERE : IER = Nontampered idle emissions in grams/hour,
ZML = Zero mile level in grams/hour
DR = Deterioration rate in grams/hour/10K miles,
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 1.5.4A

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
LOW ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per vehicle*)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.062	17825.	0.021	17825.	2228.
2	0.082	16478.	0.082	17488.	13327.
3	0.079	15233.	0.079	16167.	30145.
4	0.075	14081.	0.075	14945.	45692.
5	0.071	13017.	0.071	13815.	60063.
6	0.067	12033.	0.067	12771.	73349.
7	0.063	11124.	0.063	11806.	85630.
8	0.060	10283.	0.060	10914.	96984.
9	0.056	9506.	0.056	10089.	107479.
10	0.052	8788.	0.052	9326.	117181.
11	0.048	8123.	0.048	8622.	126150.
12	0.045	7509.	0.045	7969.	134440.
13	0.041	6942.	0.041	7367.	142104.
14	0.037	6417.	0.037	6811.	149189.
15	0.033	5932.	0.033	6296.	155739.
16	0.029	5484.	0.029	5820.	161793.
17	0.026	5069.	0.026	5380.	167390.
18	0.022	4686.	0.022	4973.	172564.
19	0.018	4332.	0.018	4597.	177346.
20+	0.034	4005.	0.034	4250.	181768.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1, where: JMAR(1) = MAR(1) and,
JMAR(MYI) = .25*MAR(MYI) + .75*MAR(MYI-1), MYI = 2,...,20+.

DATE : MAY 19, 1989

TABLE 1.5.4B

DIESEL SALES FRACTION FOR
LOW ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

Model Years	Diesel Sales Fraction
Pre-1971	0.0
1971	0.001
1972-1973	0.002
1974-1977	0.003
1978	0.009
1979	0.026
1980	0.045
1981	0.060
1982	0.039
1983	0.014
1984	0.012
1985	0.009
1986	0.004
1987	0.004
1988	0.010
1989	0.016
1990	0.021
1991	0.027
1992	0.033
1993	0.039
1994	0.045
1995+	0.050

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TABLE 1.5.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
LOW ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES
JANUARY 1, 1988

Model Years	(A) LDV Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) LDDV Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.021	0.010	0.000	0.014	17825.	258.0	0.023
1987	0.082	0.004	0.000	0.023	17488.	401.8	0.035
1986	0.079	0.004	0.000	0.022	16167.	357.8	0.031
1985	0.075	0.009	0.001	0.047	14945.	706.6	0.062
1984	0.071	0.012	0.001	0.060	13815.	824.4	0.072
1983	0.067	0.014	0.001	0.066	12771.	839.1	0.074
1982	0.063	0.039	0.002	0.172	11806.	2031.8	0.178
1981	0.060	0.060	0.004	0.252	10914.	2752.0	0.242
1980	0.056	0.045	0.003	0.177	10089.	1780.8	0.156
1979	0.052	0.026	0.001	0.095	9326.	883.2	0.078
1978	0.048	0.009	0.000	0.030	8622.	260.9	0.023
1977	0.045	0.003	0.000	0.009	7969.	75.4	0.007
1976	0.041	0.003	0.000	0.009	7367.	63.5	0.006
1975	0.037	0.003	0.000	0.008	6811.	53.0	0.005
1974	0.033	0.003	0.000	0.007	6296.	43.7	0.004
1973	0.029	0.002	0.000	0.004	5820.	23.6	0.002
1972	0.026	0.002	0.000	0.004	5380.	19.6	0.002
1971	0.022	0.001	0.000	0.002	4973.	7.7	0.001
1970	0.018	0.0	0.0	0.0	4597.	0.0	0.0
1969-	0.034	0.0	0.0	0.0	4250.	0.0	0.0
		DAF:	0.014		TFNORM:	11382.8	

WHERE :

A = January 1 registration mix from Table 1.5.4A,
B = Diesel fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 1.5.4A.

NOTE : In general, the travel weighting fractions will change for every calendar year since the sales fraction (column B) changes for almost every model year.

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TABLE 1.5.6

SPEED CORRECTION FACTOR COEFFICIENTS FOR
LOW ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s)= EXP(A + B*s + C*s**2)

Pol	Model Years	Coefficients A	B	C
HC	All	0.90900	-0.05500	0.00044
CO	All	1.37520	-0.08800	0.00091
NOx	All	0.66800	-0.04800	0.00071

* WHERE :

s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16].

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TABLE 1.5.7

NORMALIZED BAG FRACTIONS FOR LOW ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

Pol	Model Years	Normalized Fractions: Test Segment 1 B1	Test Segment 1 D1	Test Segment 2 B2	Test Segment 2 D2	Test Segment 3 B3	Test Segment 3 D3	Total Test BO	Total Test DO
HC	Pre-1975	1.2090	0.0710	1.0730	0.0560	0.7030	0.0640	1.0000	0.0613
	1975-1976	1.2090	0.1050	1.0730	0.0840	0.7030	0.0880	1.0000	0.0894
	1977	1.2090	0.1050	1.0730	0.0840	0.7030	0.0880	1.0000	0.0894
	1978	1.2090	0.1050	1.0730	0.0840	0.7030	0.0880	1.0000	0.0894
	1979	1.2090	0.1050	1.0730	0.0840	0.7030	0.0880	1.0000	0.0894
	1980+	1.3490	0.1030	0.9690	0.1380	0.7960	0.1030	1.0000	0.1212
CO	Pre-1975	1.1990	0.0600	0.9350	0.0420	0.9740	0.0510	1.0000	0.0482
	1975-1976	1.1990	0.0670	0.9350	0.0480	0.9740	0.0570	1.0000	0.0544
	1977	1.1990	0.0670	0.9350	0.0480	0.9740	0.0570	1.0000	0.0544
	1978	1.1990	0.0670	0.9350	0.0480	0.9740	0.0570	1.0000	0.0544
	1979	1.1990	0.0670	0.9350	0.0480	0.9740	0.0570	1.0000	0.0544
	1980+	1.1500	0.0610	0.9940	0.0260	0.8990	0.0350	1.0000	0.0357
NOx	Pre-1975	1.0680	0.0260	0.9810	0.0290	0.9850	0.0260	1.0000	0.0276
	1975-1976	1.0680	0.0310	0.9810	0.0330	0.9850	0.0300	1.0000	0.0318
	1977	1.0680	0.0310	0.9810	0.0330	0.9850	0.0300	1.0000	0.0318
	1978	1.0680	0.0310	0.9810	0.0330	0.9850	0.0300	1.0000	0.0318
	1979	1.0680	0.0310	0.9810	0.0330	0.9850	0.0300	1.0000	0.0318
	1980	0.9690	0.0310	1.0620	0.0470	0.9060	0.0310	1.0000	0.0393
	1981-1982	0.9690	0.0310	1.0620	0.0470	0.9060	0.0310	1.0000	0.0393
	1983+	0.9690	0.0310	1.0620	0.0470	0.9060	0.0310	1.0000	0.0393

NOTE : The fractions given in this table are used in the calculation of the operating-mode/temperature correction factor (OMTCF).

WHERE :

OMTCF = [(TERM1 + TERM2 + TERM3)/DENOM],
TERM1 = W *TCF(1)*(B1+D1*M),
TERM2 = (1-W-X)*TCF(2)*(B2+D2*M),
TERM3 = X *TCF(3)*(B3+D3*M),
DENOM = BO + DO*M,
W = Fraction of VMT in the cold start mode,
X = Fraction of VMT in the hot start mode,
TCF(b) = Temperature correction factor for pollutant, model year, for test segment b,
M = Cumulative mileage / 10,000 miles.

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TABLE 1.5.10A

METHANE OFFSETS*
FOR LOW ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

Model Years	Methane Offsets (Grams/Mile)
Pre-1975	0.043
1975-1979	0.011
1980+	0.011

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

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TABLE 1.5.11A

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	2.8	1967	2.8	1968	2.8	1969	2.8	1970	2.8	1971	2.8	1972	2.8	1973	2.8	1974	2.8	1975	1.7	1976	1.7	1977	1.7
1967	2.7	1968	2.7	1969	2.7	1970	2.7	1971	2.7	1972	2.7	1973	2.7	1974	2.7	1975	1.7	1976	1.7	1977	1.7	1978	1.7
1968	2.7	1969	2.7	1970	2.7	1971	2.7	1972	2.7	1973	2.7	1974	2.7	1975	1.6	1976	1.6	1977	1.6	1978	1.6	1979	1.6
1969	2.6	1970	2.6	1971	2.6	1972	2.6	1973	2.6	1974	2.6	1975	1.6	1976	1.6	1977	1.6	1978	1.6	1979	1.6	1980	0.8
1970	2.6	1971	2.6	1972	2.6	1973	2.6	1974	2.6	1975	1.6	1976	1.6	1977	1.6	1978	1.6	1979	1.6	1980	0.8	1981	0.8
1971	2.6	1972	2.6	1973	2.6	1974	2.6	1975	1.5	1976	1.5	1977	1.5	1978	1.5	1979	1.5	1980	0.8	1981	0.8	1982	0.8
1972	2.5	1973	2.5	1974	2.5	1975	1.5	1976	1.5	1977	1.5	1978	1.5	1979	1.5	1980	0.7	1981	0.7	1982	0.7	1983	0.7
1973	2.4	1974	2.4	1975	1.4	1976	1.4	1977	1.4	1978	1.4	1979	1.4	1980	0.7	1981	0.7	1982	0.7	1983	0.7	1984	0.7
1974	2.4	1975	1.4	1976	1.4	1977	1.4	1978	1.4	1979	1.4	1980	0.7	1981	0.7	1982	0.7	1983	0.7	1984	0.7	1985	0.7
1975	1.3	1976	1.3	1977	1.3	1978	1.3	1979	1.3	1980	0.7	1981	0.7	1982	0.7	1983	0.7	1984	0.7	1985	0.7	1986	0.7
1976	1.2	1977	1.2	1978	1.2	1979	1.2	1980	0.6	1981	0.6	1982	0.6	1983	0.6	1984	0.6	1985	0.6	1986	0.6	1987	0.6
1977	1.2	1978	1.2	1979	1.2	1980	0.6	1981	0.6	1982	0.6	1983	0.6	1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6
1978	1.1	1979	1.1	1980	0.6	1981	0.6	1982	0.6	1983	0.6	1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6	1989	0.6
1979	1.0	1980	0.5	1981	0.5	1982	0.5	1983	0.5	1984	0.5	1985	0.5	1986	0.5	1987	0.5	1988	0.5	1989	0.5	1990	0.5
1980	0.5	1981	0.5	1982	0.5	1983	0.5	1984	0.5	1985	0.5	1986	0.5	1987	0.5	1988	0.5	1989	0.5	1990	0.5	1991	0.5
1981	0.5	1982	0.5	1983	0.5	1984	0.5	1985	0.5	1986	0.5	1987	0.5	1988	0.5	1989	0.5	1990	0.5	1991	0.5	1992	0.5
1982	0.4	1983	0.4	1984	0.4	1985	0.4	1986	0.4	1987	0.4	1988	0.4	1989	0.4	1990	0.4	1991	0.4	1992	0.4	1993	0.4
1983	0.4	1984	0.4	1985	0.4	1986	0.4	1987	0.4	1988	0.4	1989	0.4	1990	0.4	1991	0.4	1992	0.4	1993	0.4	1994	0.4
1984	0.3	1985	0.3	1986	0.3	1987	0.3	1988	0.3	1989	0.3	1990	0.3	1991	0.3	1992	0.3	1993	0.3	1994	0.3	1995	0.3
1985	0.3	1986	0.3	1987	0.3	1988	0.3	1989	0.3	1990	0.3	1991	0.3	1992	0.3	1993	0.3	1994	0.3	1995	0.3	1996	0.3

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	1.7	1979	1.7	1980	0.8	1981	0.8	1984	0.8	1986	0.8	1989	0.8	1991	0.8	1993	0.8	1996	0.8	1999	0.8	2001	0.8
1979	1.7	1980	0.8	1981	0.8	1982	0.8	1985	0.8	1987	0.8	1990	0.8	1992	0.8	1994	0.8	1997	0.8	2000	0.8	2002	0.8
1980	0.8	1981	0.8	1982	0.8	1983	0.8	1986	0.8	1988	0.8	1991	0.8	1993	0.8	1995	0.8	1998	0.8	2001	0.8	2003	0.8
1981	0.8	1982	0.8	1983	0.8	1984	0.8	1987	0.8	1989	0.8	1992	0.8	1994	0.8	1996	0.8	1999	0.8	2002	0.8	2004	0.8
1982	0.8	1983	0.8	1984	0.8	1985	0.8	1988	0.8	1990	0.8	1993	0.8	1995	0.8	1997	0.8	2000	0.8	2003	0.8	2005	0.8
1983	0.8	1984	0.8	1985	0.8	1986	0.8	1989	0.8	1991	0.8	1994	0.8	1996	0.8	1998	0.8	2001	0.8	2004	0.8	2006	0.8
1984	0.7	1985	0.7	1986	0.7	1987	0.7	1990	0.7	1992	0.7	1995	0.7	1997	0.7	1999	0.7	2002	0.7	2005	0.7	2007	0.7
1985	0.7	1986	0.7	1987	0.7	1988	0.7	1991	0.7	1993	0.7	1996	0.7	1998	0.7	2000	0.7	2003	0.7	2006	0.7	2008	0.7
1986	0.7	1987	0.7	1988	0.7	1989	0.7	1992	0.7	1994	0.7	1997	0.7	1999	0.7	2001	0.7	2004	0.7	2007	0.7	2009	0.7
1987	0.7	1988	0.7	1989	0.7	1990	0.7	1993	0.7	1995	0.7	1998	0.7	2000	0.7	2002	0.7	2005	0.7	2008	0.7	2010	0.7
1988	0.6	1989	0.6	1990	0.6	1991	0.6	1994	0.6	1996	0.6	1999	0.6	2001	0.6	2003	0.6	2006	0.6	2009	0.6	2011	0.6
1989	0.6	1990	0.6	1991	0.6	1992	0.6	1995	0.6	1997	0.6	2000	0.6	2002	0.6	2004	0.6	2007	0.6	2010	0.6	2012	0.6
1990	0.6	1991	0.6	1992	0.6	1993	0.6	1996	0.6	1998	0.6	2001	0.6	2003	0.6	2005	0.6	2008	0.6	2011	0.6	2013	0.6
1991	0.5	1992	0.5	1993	0.5	1994	0.5	1997	0.5	1999	0.5	2002	0.5	2004	0.5	2006	0.5	2009	0.5	2012	0.5	2014	0.5
1992	0.5	1993	0.5	1994	0.5	1995	0.5	1998	0.5	2000	0.5	2003	0.5	2005	0.5	2007	0.5	2010	0.5	2013	0.5	2015	0.5
1993	0.5	1994	0.5	1995	0.5	1996	0.5	1999	0.5	2001	0.5	2004	0.5	2006	0.5	2008	0.5	2011	0.5	2014	0.5	2016	0.5
1994	0.4	1995	0.4	1996	0.4	1997	0.4	2000	0.4	2002	0.4	2005	0.4	2007	0.4	2009	0.4	2012	0.4	2015	0.4	2017	0.4
1995	0.4	1996	0.4	1997	0.4	1998	0.4	2001	0.4	2003	0.4	2006	0.4	2008	0.4	2010	0.4	2013	0.4	2016	0.4	2018	0.4
1996	0.3	1997	0.3	1998	0.3	1999	0.3	2002	0.3	2004	0.3	2007	0.3	2009	0.3	2011	0.3	2014	0.3	2017	0.3	2019	0.3
1997	0.3	1998	0.3	1999	0.3	2000	0.3	2003	0.3	2005	0.3	2008	0.3	2010	0.3	2012	0.3	2015	0.3	2018	0.3	2020	0.3

*MY Indicates the model year.

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on January 1 mileage accumulation figures given in Table 1.5.4A

TABLE 1.5.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	5.1	1967	5.1	1968	5.1	1969	5.1	1970	5.1	1971	5.1	1972	5.1	1973	5.1	1974	5.1	1975	2.8	1976	2.8	1977	2.8
1967	5.0	1968	5.0	1969	5.0	1970	5.0	1971	5.0	1972	5.0	1973	5.0	1974	5.0	1975	2.8	1976	2.8	1977	2.8	1978	2.8
1968	5.0	1969	5.0	1970	5.0	1971	5.0	1972	5.0	1973	5.0	1974	5.0	1975	2.7	1976	2.7	1977	2.7	1978	2.7	1979	2.7
1969	4.9	1970	4.9	1971	4.9	1972	4.9	1973	4.9	1974	4.9	1975	2.7	1976	2.7	1977	2.7	1978	2.7	1979	2.7	1980	1.8
1970	4.8	1971	4.8	1972	4.8	1973	4.8	1974	4.8	1975	2.6	1976	2.6	1977	2.6	1978	2.6	1979	2.6	1980	1.8	1981	1.8
1971	4.7	1972	4.7	1973	4.7	1974	4.7	1975	2.6	1976	2.6	1977	2.6	1978	2.6	1979	2.6	1980	1.8	1981	1.8	1982	1.8
1972	4.6	1973	4.6	1974	4.6	1975	2.5	1976	2.5	1977	2.5	1978	2.5	1979	2.5	1980	1.7	1981	1.7	1982	1.7	1983	1.7
1973	4.6	1974	4.6	1975	2.4	1976	2.4	1977	2.4	1978	2.4	1979	2.4	1980	1.7	1981	1.7	1982	1.7	1983	1.7	1984	1.7
1974	4.5	1975	2.4	1976	2.4	1977	2.4	1978	2.4	1979	2.4	1980	1.7	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.7
1975	2.3	1976	2.3	1977	2.3	1978	2.3	1979	2.3	1980	1.7	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.7	1986	1.7
1976	2.2	1977	2.2	1978	2.2	1979	2.2	1980	1.6	1981	1.6	1982	1.6	1983	1.6	1984	1.6	1985	1.6	1986	1.6	1987	1.6
1977	2.1	1978	2.1	1979	2.1	1980	1.6	1981	1.6	1982	1.6	1983	1.6	1984	1.6	1985	1.6	1986	1.6	1987	1.6	1988	1.6
1978	2.0	1979	2.0	1980	1.5	1981	1.5	1982	1.5	1983	1.5	1984	1.5	1985	1.5	1986	1.5	1987	1.5	1988	1.5	1989	1.5
1979	1.9	1980	1.5	1981	1.5	1982	1.5	1983	1.5	1984	1.5	1985	1.5	1986	1.5	1987	1.5	1988	1.5	1989	1.5	1990	1.5
1980	1.4	1981	1.4	1982	1.4	1983	1.4	1984	1.4	1985	1.4	1986	1.4	1987	1.4	1988	1.4	1989	1.4	1990	1.4	1991	1.4
1981	1.4	1982	1.4	1983	1.4	1984	1.4	1985	1.4	1986	1.4	1987	1.4	1988	1.4	1989	1.4	1990	1.4	1991	1.4	1992	1.4
1982	1.3	1983	1.3	1984	1.3	1985	1.3	1986	1.3	1987	1.3	1988	1.3	1989	1.3	1990	1.3	1991	1.3	1992	1.3	1993	1.3
1983	1.3	1984	1.3	1985	1.3	1986	1.3	1987	1.3	1988	1.3	1989	1.3	1990	1.3	1991	1.3	1992	1.3	1993	1.3	1994	1.3
1984	1.2	1985	1.2	1986	1.2	1987	1.2	1988	1.2	1989	1.2	1990	1.2	1991	1.2	1992	1.2	1993	1.2	1994	1.2	1995	1.2
1985	1.2	1986	1.2	1987	1.2	1988	1.2	1989	1.2	1990	1.2	1991	1.2	1992	1.2	1993	1.2	1994	1.2	1995	1.2	1996	1.2

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	2.8	1979	2.8	1980	1.9	1981	1.9	1984	1.9	1986	1.9	1989	1.9	1991	1.9	1993	1.9	1996	1.9	1999	1.9	2001	1.9
1979	2.8	1980	1.9	1981	1.9	1982	1.9	1985	1.9	1987	1.9	1990	1.9	1992	1.9	1994	1.9	1997	1.9	2000	1.9	2002	1.9
1980	1.8	1981	1.8	1982	1.8	1983	1.8	1986	1.8	1988	1.8	1991	1.8	1993	1.8	1995	1.8	1998	1.8	2001	1.8	2003	1.8
1981	1.8	1982	1.8	1983	1.8	1984	1.8	1987	1.8	1989	1.8	1992	1.8	1994	1.8	1996	1.8	1999	1.8	2002	1.8	2004	1.8
1982	1.8	1983	1.8	1984	1.8	1985	1.8	1988	1.8	1990	1.8	1993	1.8	1995	1.8	1997	1.8	2000	1.8	2003	1.8	2005	1.8
1983	1.8	1984	1.8	1985	1.8	1986	1.8	1989	1.8	1991	1.8	1994	1.8	1996	1.8	1998	1.8	2001	1.8	2004	1.8	2006	1.8
1984	1.7	1985	1.7	1986	1.7	1987	1.7	1990	1.7	1992	1.7	1995	1.7	1997	1.7	1999	1.7	2002	1.7	2005	1.7	2007	1.7
1985	1.7	1986	1.7	1987	1.7	1988	1.7	1991	1.7	1993	1.7	1996	1.7	1998	1.7	2000	1.7	2003	1.7	2006	1.7	2008	1.7
1986	1.7	1987	1.7	1988	1.7	1989	1.7	1992	1.7	1994	1.7	1997	1.7	1999	1.7	2001	1.7	2004	1.7	2007	1.7	2009	1.7
1987	1.7	1988	1.7	1989	1.7	1990	1.7	1993	1.7	1995	1.7	1998	1.7	2000	1.7	2002	1.7	2005	1.7	2008	1.7	2010	1.7
1988	1.6	1989	1.6	1990	1.6	1991	1.6	1994	1.6	1996	1.6	1999	1.6	2001	1.6	2003	1.6	2006	1.6	2009	1.6	2011	1.6
1989	1.6	1990	1.6	1991	1.6	1992	1.6	1995	1.6	1997	1.6	2000	1.6	2002	1.6	2004	1.6	2007	1.6	2010	1.6	2012	1.6
1990	1.5	1991	1.5	1992	1.5	1993	1.5	1996	1.5	1998	1.5	2001	1.5	2003	1.5	2005	1.5	2008	1.5	2011	1.5	2013	1.5
1991	1.5	1992	1.5	1993	1.5	1994	1.5	1997	1.5	1999	1.5	2002	1.5	2004	1.5	2006	1.5	2009	1.5	2012	1.5	2014	1.5
1992	1.4	1993	1.4	1994	1.4	1995	1.4	1998	1.4	2000	1.4	2003	1.4	2005	1.4	2007	1.4	2010	1.4	2013	1.4	2015	1.4
1993	1.4	1994	1.4	1995	1.4	1996	1.4	1999	1.4	2001	1.4	2004	1.4	2006	1.4	2008	1.4	2011	1.4	2014	1.4	2016	1.4
1994	1.3	1995	1.3	1996	1.3	1997	1.3	2000	1.3	2002	1.3	2005	1.3	2007	1.3	2009	1.3	2012	1.3	2015	1.3	2017	1.3
1995	1.3	1996	1.3	1997	1.3	1998	1.3	2001	1.3	2003	1.3	2006	1.3	2008	1.3	2010	1.3	2013	1.3	2016	1.3	2018	1.3
1996	1.2	1997	1.2	1998	1.2	1999	1.2	2002	1.2	2004	1.2	2007	1.2	2009	1.2	2011	1.2	2014	1.2	2017	1.2	2019	1.2
1997	1.2	1998	1.2	1999	1.2	2000	1.2	2003	1.2	2005	1.2	2008	1.2	2010	1.2	2012	1.2	2015	1.2	2018	1.2	2020	1.2

*MY -- Indicates the model year.

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on January 1 mileage accumulation figures given in Table 1.5.4A.

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TABLE 1.5.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	2.2	1967	2.2	1968	2.2	1969	2.2	1970	2.2	1971	2.2	1972	2.2	1973	2.2	1974	2.2	1975	2.1	1976	2.1	1977	2.1
1967	2.2	1968	2.2	1969	2.2	1970	2.2	1971	2.2	1972	2.2	1973	2.2	1974	2.2	1975	2.1	1976	2.1	1977	2.1	1978	2.1
1968	2.1	1969	2.1	1970	2.1	1971	2.1	1972	2.1	1973	2.1	1974	2.1	1975	2.1	1976	2.1	1977	2.1	1978	2.1	1979	2.1
1969	2.1	1970	2.1	1971	2.1	1972	2.1	1973	2.1	1974	2.1	1975	2.1	1976	2.1	1977	2.1	1978	2.1	1979	2.1	1980	2.1
1970	2.1	1971	2.1	1972	2.1	1973	2.1	1974	2.1	1975	2.0	1976	2.0	1977	2.0	1978	2.0	1979	2.0	1980	2.0	1981	1.8
1971	2.1	1972	2.1	1973	2.1	1974	2.1	1975	2.0	1976	2.0	1977	2.0	1978	2.0	1979	2.0	1980	2.0	1981	1.8	1982	1.8
1972	2.1	1973	2.1	1974	2.1	1975	2.0	1976	2.0	1977	2.0	1978	2.0	1979	2.0	1980	2.0	1981	1.8	1982	1.8	1983	1.8
1973	2.0	1974	2.0	1975	2.0	1976	2.0	1977	2.0	1978	2.0	1979	2.0	1980	2.0	1981	1.7	1982	1.7	1983	1.7	1984	1.7
1974	2.0	1975	1.9	1976	1.9	1977	1.9	1978	1.9	1979	1.9	1980	1.9	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.3
1975	1.9	1976	1.9	1977	1.9	1978	1.9	1979	1.9	1980	1.9	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.2	1986	1.2
1976	1.9	1977	1.9	1978	1.9	1979	1.9	1980	1.9	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.2	1986	1.2	1987	1.2
1977	1.8	1978	1.8	1979	1.8	1980	1.8	1981	1.6	1982	1.6	1983	1.6	1984	1.6	1985	1.2	1986	1.2	1987	1.2	1988	1.2
1978	1.8	1979	1.8	1980	1.8	1981	1.6	1982	1.6	1983	1.6	1984	1.6	1985	1.2	1986	1.2	1987	1.2	1988	1.2	1989	1.2
1979	1.7	1980	1.7	1981	1.6	1982	1.6	1983	1.6	1984	1.6	1985	1.1	1986	1.1	1987	1.1	1988	1.1	1989	1.1	1990	1.1
1980	1.7	1981	1.5	1982	1.5	1983	1.5	1984	1.5	1985	1.1	1986	1.1	1987	1.1	1988	1.1	1989	1.1	1990	1.1	1991	1.1
1981	1.5	1982	1.5	1983	1.5	1984	1.5	1985	1.0	1986	1.0	1987	1.0	1988	1.0	1989	1.0	1990	1.0	1991	1.0	1992	1.0
1982	1.4	1983	1.4	1984	1.4	1985	1.0	1986	1.0	1987	1.0	1988	1.0	1989	1.0	1990	1.0	1991	1.0	1992	1.0	1993	1.0
1983	1.4	1984	1.4	1985	1.0	1986	1.0	1987	1.0	1988	1.0	1989	1.0	1990	1.0	1991	1.0	1992	1.0	1993	1.0	1994	1.0
1984	1.3	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9	1994	0.9	1995	0.9
1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9	1994	0.9	1995	0.9	1996	0.9

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	2.1	1979	2.1	1980	2.1	1981	1.9	1984	1.9	1986	1.4	1989	1.4	1991	1.4	1993	1.4	1996	1.4	1999	1.4	2001	1.4
1979	2.1	1980	2.1	1981	1.8	1982	1.8	1985	1.4	1987	1.4	1990	1.4	1992	1.4	1994	1.4	1997	1.4	2000	1.4	2002	1.4
1980	2.1	1981	1.8	1982	1.8	1983	1.8	1986	1.4	1988	1.4	1991	1.4	1993	1.4	1995	1.4	1998	1.4	2001	1.4	2003	1.4
1981	1.8	1982	1.8	1983	1.8	1984	1.8	1987	1.4	1989	1.4	1992	1.4	1994	1.4	1996	1.4	1999	1.4	2002	1.4	2004	1.4
1982	1.8	1983	1.8	1984	1.8	1985	1.4	1988	1.4	1990	1.4	1993	1.4	1995	1.4	1997	1.4	2000	1.4	2003	1.4	2005	1.4
1983	1.8	1984	1.8	1985	1.3	1986	1.3	1989	1.3	1991	1.3	1994	1.3	1996	1.3	1998	1.3	2001	1.3	2004	1.3	2006	1.3
1984	1.8	1985	1.3	1986	1.3	1987	1.3	1990	1.3	1992	1.3	1995	1.3	1997	1.3	1999	1.3	2002	1.3	2005	1.3	2007	1.3
1985	1.3	1986	1.3	1987	1.3	1988	1.3	1991	1.3	1993	1.3	1996	1.3	1998	1.3	2000	1.3	2003	1.3	2006	1.3	2008	1.3
1986	1.3	1987	1.3	1988	1.3	1989	1.3	1992	1.3	1994	1.3	1997	1.3	1999	1.3	2001	1.3	2004	1.3	2007	1.3	2009	1.3
1987	1.2	1988	1.2	1989	1.2	1990	1.2	1993	1.2	1995	1.2	1998	1.2	2000	1.2	2002	1.2	2005	1.2	2008	1.2	2010	1.2
1988	1.2	1989	1.2	1990	1.2	1991	1.2	1994	1.2	1996	1.2	1999	1.2	2001	1.2	2003	1.2	2006	1.2	2009	1.2	2011	1.2
1989	1.2	1990	1.2	1991	1.2	1992	1.2	1995	1.2	1997	1.2	2000	1.2	2002	1.2	2004	1.2	2007	1.2	2010	1.2	2012	1.2
1990	1.2	1991	1.2	1992	1.2	1993	1.2	1996	1.2	1998	1.2	2001	1.2	2003	1.2	2005	1.2	2008	1.2	2011	1.2	2013	1.2
1991	1.1	1992	1.1	1993	1.1	1994	1.1	1997	1.1	1999	1.1	2002	1.1	2004	1.1	2006	1.1	2009	1.1	2012	1.1	2014	1.1
1992	1.1	1993	1.1	1994	1.1	1995	1.1	1998	1.1	2000	1.1	2003	1.1	2005	1.1	2007	1.1	2010	1.1	2013	1.1	2015	1.1
1993	1.0	1994	1.0	1995	1.0	1996	1.0	1999	1.0	2001	1.0	2004	1.0	2006	1.0	2008	1.0	2011	1.0	2014	1.0	2016	1.0
1994	1.0	1995	1.0	1996	1.0	1997	1.0	2000	1.0	2002	1.0	2005	1.0	2007	1.0	2009	1.0	2012	1.0	2015	1.0	2017	1.0
1995	1.0	1996	1.0	1997	1.0	1998	1.0	2001	1.0	2003	1.0	2006	1.0	2008	1.0	2010	1.0	2013	1.0	2016	1.0	2018	1.0
1996	0.9	1997	0.9	1998	0.9	1999	0.9	2002	0.9	2004	0.9	2007	0.9	2009	0.9	2011	0.9	2014	0.9	2017	0.9	2019	0.9
1997	0.9	1998	0.9	1999	0.9	2000	0.9	2003	0.9	2005	0.9	2008	0.9	2010	0.9	2012	0.9	2015	0.9	2018	0.9	2020	0.9

*MY Indicates the model year.

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on January 1 mileage accumulation figures given in Table 1.5.4A

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TABLE 1.6.1

NONTAMPERED EXHAUST EMISSION RATES FOR
LOW ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1978	0.860	0.080	1.260	1.660
	1978-1980	0.860	0.080	1.260	1.660
	1981+	0.430	0.040	0.630	0.830
CO	Pre-1978	1.970	0.100	2.470	2.970
	1978-1980	1.970	0.100	2.470	2.970
	1981+	1.330	0.040	1.530	1.730
NOx	Pre-1978	1.830	0.080	2.230	2.630
	1978-1980	1.830	0.080	2.230	2.630
	1981-1987	1.480	0.030	1.630	1.780
	1988-1989	1.070	0.030	1.220	1.370
	1990+	1.030	0.030	1.180	1.330

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile,
ZML = Zero mile level in grams/mile,
DR = Deterioration rate in grams/mile/10K miles,
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 1.6.3

NONTAMPERED HOT STABILIZED IDLE EMISSIONS
FOR LOW ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

* IER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate
HC	Pre-1978	4.80	0.60
	1978-1980	6.00	0.60
	1981+	4.20	0.60
CO	Pre-1978	18.00	1.20
	1978-1980	18.60	0.60
	1981+	18.60	0.60
NOx	Pre-1978	11.40	0.60
	1978-1980	19.20	0.60
	1981-1986	20.40	0.60
	1987+	7.80	0.60

* WHERE : IER = Nontampered idle emissions in grams/hour,
ZML = Zero mile level in grams/hour
DR = Deterioration rate in grams/hour/10K miles,
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 1.6.4A

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
LOW ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per truck *)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.070	20140.	0.023	20140.	2517.
2	0.092	17572.	0.092	19498.	15025.
3	0.088	15432.	0.088	17037.	33252.
4	0.083	13639.	0.083	14984.	49230.
5	0.077	12133.	0.077	13262.	63326.
6	0.072	10863.	0.072	11816.	75843.
7	0.067	9788.	0.067	10594.	87030.
8	0.062	8877.	0.062	9560.	97091.
9	0.057	8103.	0.057	8683.	106200.
10	0.051	7444.	0.051	7938.	114500.
11	0.047	6883.	0.047	7304.	122112.
12	0.041	6405.	0.041	6763.	129138.
13	0.036	5999.	0.036	6304.	135665.
14	0.031	5655.	0.031	5913.	141767.
15	0.026	5365.	0.026	5582.	147510.
16	0.021	5123.	0.021	5304.	152948.
17	0.016	4924.	0.016	5073.	158133.
18	0.011	4763.	0.011	4884.	163108.
19	0.007	4637.	0.007	4731.	167912.
20+	0.044	4543.	0.044	4613.	172582.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1, where: JMAR(1) = MAR(1) and,
JMAR(MYI) = .25*MAR(MYI) + .75*MAR(MYI-1), MYI = 2,...,20+.

DATE : MAY 19, 1989

TABLE 1.6.4B

DIESEL SALES FRACTION FOR
LOW ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

Model Years	Diesel Sales Fraction
Pre-1978	0.0
1978	0.010
1979	0.015
1980	0.048
1981	0.082
1982	0.092
1983	0.042
1984	0.026
1985	0.011
1986	0.020
1987	0.009
1988	0.027
1989	0.044
1990	0.062
1991	0.080
1992	0.097
1993	0.115
1994	0.132
1995+	0.150

DATE : MAY 19, 1989

TABLE 1.6.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
LOW ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS
JANUARY 1, 1988

Model Years	(A) LDT1 Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) LDDT Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.023	0.027	0.001	0.026	20140.	520.5	0.045
1987	0.092	0.009	0.001	0.034	19498.	662.3	0.057
1986	0.088	0.020	0.002	0.072	17037.	1230.1	0.106
1985	0.083	0.011	0.001	0.037	14984.	561.2	0.049
1984	0.077	0.026	0.002	0.082	13262.	1089.2	0.094
1983	0.072	0.042	0.003	0.124	11816.	1465.8	0.127
1982	0.067	0.092	0.006	0.253	10594.	2679.0	0.232
1981	0.062	0.082	0.005	0.209	9560.	1993.9	0.172
1980	0.057	0.048	0.003	0.112	8683.	974.6	0.084
1979	0.051	0.015	0.001	0.031	7938.	249.1	0.022
1978	0.047	0.010	0.000	0.019	7304.	140.8	0.012
1977	0.041	0.0	0.0	0.0	6763.	0.0	0.0
1976	0.036	0.0	0.0	0.0	6304.	0.0	0.0
1975	0.031	0.0	0.0	0.0	5913.	0.0	0.0
1974	0.026	0.0	0.0	0.0	5582.	0.0	0.0
1973	0.021	0.0	0.0	0.0	5304.	0.0	0.0
1972	0.016	0.0	0.0	0.0	5073.	0.0	0.0
1971	0.011	0.0	0.0	0.0	4884.	0.0	0.0
1970	0.007	0.0	0.0	0.0	4731.	0.0	0.0
1969-	0.044	0.0	0.0	0.0	4613.	0.0	0.0
		DAF:	0.024		TFNORM:	11566.7	

WHERE :

A = January 1 registration mix from Table 1.6.4A,
B = Diesel fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 1.6.4A.

NOTE : In general, the travel weighting fractions will change for every calendar year since the sales fraction (column B) changes for almost every model year.

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TABLE 1.6.6

SPEED CORRECTION FACTOR COEFFICIENTS FOR
LOW ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s)= EXP(A + B*s + C*s**2)

Pol	Model Years	Coefficients A	B	C
HC	All	0.90900	-0.05500	0.00044
CO	All	1.37520	-0.08800	0.00091
NOx	All	0.66800	-0.04800	0.00071

* WHERE :

s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16].

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TABLE 1.6.7

NORMALIZED BAG FRACTIONS FOR LOW ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

		Normalized Fractions							
	Model	Test Segment 1		Test Segment 2		Test Segment 3		Total Test	
Pol	Years	B1	D1	B2	D2	B3	D3	BO	DO
HC	Pre-1979	1.2090	0.1120	1.0730	0.0910	0.7030	0.0930	1.0000	0.0959
	1979	1.2090	0.1100	1.0730	0.0890	0.7030	0.0920	1.0000	0.0941
	1980-1982	1.2090	0.1100	1.0730	0.0890	0.7030	0.0920	1.0000	0.0941
	1983+	1.2090	0.1150	1.0730	0.0930	0.7030	0.0950	1.0000	0.0981
CO	Pre-1979	1.1990	0.0620	0.9350	0.0440	0.9740	0.0530	1.0000	0.0502
	1979	1.1990	0.0600	0.9350	0.0430	0.9740	0.0510	1.0000	0.0487
	1980-1982	1.1990	0.0570	0.9350	0.0400	0.9740	0.0480	1.0000	0.0457
	1983+	1.1990	0.0570	0.9350	0.0400	0.9740	0.0480	1.0000	0.0457
NOx	Pre-1979	1.0680	0.0330	0.9810	0.0360	0.9850	0.0320	1.0000	0.0343
	1979	1.0680	0.0330	0.9810	0.0350	0.9850	0.0320	1.0000	0.0338
	1980-1984	1.0680	0.0360	0.9810	0.0380	0.9850	0.0350	1.0000	0.0368
	1985+	1.0680	0.0710	0.9810	0.0720	0.9850	0.0680	1.0000	0.0707

NOTE : The fractions given in this table are used in the calculation of the operating-mode/temperature correction factor (OMTCF).

WHERE :

OMTCF = [(TERM1 + TERM2 + TERM3)/DENOM].
TERM1 = W *TCF(1)*(B1+D1*M).
TERM2 = (1-W-X)*TCF(2)*(B2+D2*M).
TERM3 = X *TCF(3)*(B3+D3*M).
DENOM = BO + DO*M.
W = Fraction of VMT in the cold start mode.
X = Fraction of VMT in the hot start mode.
TCF(b) = Temperature correction factor for pollutant, model year, for test segment b.
M = Cumulative mileage / 10,000 miles.

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TABLE 1.6.10A

METHANE OFFSETS*
FOR LOW ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

Model Years	Methane Offsets (Grams/Mile)
Pre-1978	0.034
1978-1980	0.034
1981+	0.017

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

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TABLE 1.6.11A

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	2.2	1967	2.2	1968	2.2	1969	2.2	1970	2.2	1971	2.2	1972	2.2	1973	2.2	1974	2.2	1975	2.2	1976	2.2	1977	2.2
1967	2.2	1968	2.2	1969	2.2	1970	2.2	1971	2.2	1972	2.2	1973	2.2	1974	2.2	1975	2.2	1976	2.2	1977	2.2	1978	2.2
1968	2.2	1969	2.2	1970	2.2	1971	2.2	1972	2.2	1973	2.2	1974	2.2	1975	2.2	1976	2.2	1977	2.2	1978	2.2	1979	2.2
1969	2.1	1970	2.1	1971	2.1	1972	2.1	1973	2.1	1974	2.1	1975	2.1	1976	2.1	1977	2.1	1978	2.1	1979	2.1	1980	2.1
1970	2.1	1971	2.1	1972	2.1	1973	2.1	1974	2.1	1975	2.1	1976	2.1	1977	2.1	1978	2.1	1979	2.1	1980	2.1	1981	1.0
1971	2.0	1972	2.0	1973	2.0	1974	2.0	1975	2.0	1976	2.0	1977	2.0	1978	2.0	1979	2.0	1980	2.0	1981	1.0	1982	1.0
1972	2.0	1973	2.0	1974	2.0	1975	2.0	1976	2.0	1977	2.0	1978	2.0	1979	2.0	1980	2.0	1981	1.0	1982	1.0	1983	1.0
1973	1.9	1974	1.9	1975	1.9	1976	1.9	1977	1.9	1978	1.9	1979	1.9	1980	1.9	1981	1.0	1982	1.0	1983	1.0	1984	1.0
1974	1.9	1975	1.9	1976	1.9	1977	1.9	1978	1.9	1979	1.9	1980	1.9	1981	0.9	1982	0.9	1983	0.9	1984	0.9	1985	0.9
1975	1.8	1976	1.8	1977	1.8	1978	1.8	1979	1.8	1980	1.8	1981	0.9	1982	0.9	1983	0.9	1984	0.9	1985	0.9	1986	0.9
1976	1.8	1977	1.8	1978	1.8	1979	1.8	1980	1.8	1981	0.9	1982	0.9	1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9
1977	1.7	1978	1.7	1979	1.7	1980	1.7	1981	0.9	1982	0.9	1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9
1978	1.6	1979	1.6	1980	1.6	1981	0.8	1982	0.8	1983	0.8	1984	0.8	1985	0.8	1986	0.8	1987	0.8	1988	0.8	1989	0.8
1979	1.6	1980	1.6	1981	0.8	1982	0.8	1983	0.8	1984	0.8	1985	0.8	1986	0.8	1987	0.8	1988	0.8	1989	0.8	1990	0.8
1980	1.5	1981	0.7	1982	0.7	1983	0.7	1984	0.7	1985	0.7	1986	0.7	1987	0.7	1988	0.7	1989	0.7	1990	0.7	1991	0.7
1981	0.7	1982	0.7	1983	0.7	1984	0.7	1985	0.7	1986	0.7	1987	0.7	1988	0.7	1989	0.7	1990	0.7	1991	0.7	1992	0.7
1982	0.6	1983	0.6	1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6	1989	0.6	1990	0.6	1991	0.6	1992	0.6	1993	0.6
1983	0.6	1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6	1989	0.6	1990	0.6	1991	0.6	1992	0.6	1993	0.6	1994	0.6
1984	0.5	1985	0.5	1986	0.5	1987	0.5	1988	0.5	1989	0.5	1990	0.5	1991	0.5	1992	0.5	1993	0.5	1994	0.5	1995	0.5
1985	0.4	1986	0.4	1987	0.4	1988	0.4	1989	0.4	1990	0.4	1991	0.4	1992	0.4	1993	0.4	1994	0.4	1995	0.4	1996	0.4

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	2.2	1979	2.2	1980	2.2	1981	1.1	1984	1.1	1986	1.1	1989	1.1	1991	1.1	1993	1.1	1996	1.1	1999	1.1	2001	1.1
1979	2.2	1980	2.2	1981	1.1	1982	1.1	1985	1.1	1987	1.1	1990	1.1	1992	1.1	1994	1.1	1997	1.1	2000	1.1	2002	1.1
1980	2.2	1981	1.1	1982	1.1	1983	1.1	1986	1.1	1988	1.1	1991	1.1	1993	1.1	1995	1.1	1998	1.1	2001	1.1	2003	1.1
1981	1.1	1982	1.1	1983	1.1	1984	1.1	1987	1.1	1989	1.1	1992	1.1	1994	1.1	1996	1.1	1999	1.1	2002	1.1	2004	1.1
1982	1.0	1983	1.0	1984	1.0	1985	1.0	1988	1.0	1990	1.0	1993	1.0	1995	1.0	1997	1.0	2000	1.0	2003	1.0	2005	1.0
1983	1.0	1984	1.0	1985	1.0	1986	1.0	1989	1.0	1991	1.0	1994	1.0	1996	1.0	1998	1.0	2001	1.0	2004	1.0	2006	1.0
1984	1.0	1985	1.0	1986	1.0	1987	1.0	1990	1.0	1992	1.0	1995	1.0	1997	1.0	1999	1.0	2002	1.0	2005	1.0	2007	1.0
1985	1.0	1986	1.0	1987	1.0	1988	1.0	1991	1.0	1993	1.0	1996	1.0	1998	1.0	2000	1.0	2003	1.0	2006	1.0	2008	1.0
1986	0.9	1987	0.9	1988	0.9	1989	0.9	1992	0.9	1994	0.9	1997	0.9	1999	0.9	2001	0.9	2004	0.9	2007	0.9	2009	0.9
1987	0.9	1988	0.9	1989	0.9	1990	0.9	1993	0.9	1995	0.9	1998	0.9	2000	0.9	2002	0.9	2005	0.9	2008	0.9	2010	0.9
1988	0.9	1989	0.9	1990	0.9	1991	0.9	1994	0.9	1996	0.9	1999	0.9	2001	0.9	2003	0.9	2006	0.9	2009	0.9	2011	0.9
1989	0.9	1990	0.9	1991	0.9	1992	0.9	1995	0.9	1997	0.9	2000	0.9	2002	0.9	2004	0.9	2007	0.9	2010	0.9	2012	0.9
1990	0.8	1991	0.8	1992	0.8	1993	0.8	1996	0.8	1998	0.8	2001	0.8	2003	0.8	2005	0.8	2008	0.8	2011	0.8	2013	0.8
1991	0.8	1992	0.8	1993	0.8	1994	0.8	1997	0.8	1999	0.8	2002	0.8	2004	0.8	2006	0.8	2009	0.8	2012	0.8	2014	0.8
1992	0.7	1993	0.7	1994	0.7	1995	0.7	1998	0.7	2000	0.7	2003	0.7	2005	0.7	2007	0.7	2010	0.7	2013	0.7	2015	0.7
1993	0.7	1994	0.7	1995	0.7	1996	0.7	1999	0.7	2001	0.7	2004	0.7	2006	0.7	2008	0.7	2011	0.7	2014	0.7	2016	0.7
1994	0.6	1995	0.6	1996	0.6	1997	0.6	2000	0.6	2002	0.6	2005	0.6	2007	0.6	2009	0.6	2012	0.6	2015	0.6	2017	0.6
1995	0.6	1996	0.6	1997	0.6	1998	0.6	2001	0.6	2003	0.6	2006	0.6	2008	0.6	2010	0.6	2013	0.6	2016	0.6	2018	0.6
1996	0.5	1997	0.5	1998	0.5	1999	0.5	2002	0.5	2004	0.5	2007	0.5	2009	0.5	2011	0.5	2014	0.5	2017	0.5	2019	0.5
1997	0.4	1998	0.4	1999	0.4	2000	0.4	2003	0.4	2005	0.4	2008	0.4	2010	0.4	2012	0.4	2015	0.4	2018	0.4	2020	0.4

*MY Indicates the model year.

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on January 1 mileage accumulation figures given in Table 1.6.4A

TABLE 1.6.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	3.7	1967	3.7	1968	3.7	1969	3.7	1970	3.7	1971	3.7	1972	3.7	1973	3.7	1974	3.7	1975	3.7	1976	3.7	1977	3.7
1967	3.6	1968	3.6	1969	3.6	1970	3.6	1971	3.6	1972	3.6	1973	3.6	1974	3.6	1975	3.6	1976	3.6	1977	3.6	1978	3.6
1968	3.6	1969	3.6	1970	3.6	1971	3.6	1972	3.6	1973	3.6	1974	3.6	1975	3.6	1976	3.6	1977	3.6	1978	3.6	1979	3.6
1969	3.6	1970	3.6	1971	3.6	1972	3.6	1973	3.6	1974	3.6	1975	3.6	1976	3.6	1977	3.6	1978	3.6	1979	3.6	1980	3.6
1970	3.5	1971	3.5	1972	3.5	1973	3.5	1974	3.5	1975	3.5	1976	3.5	1977	3.5	1978	3.5	1979	3.5	1980	3.5	1981	1.9
1971	3.4	1972	3.4	1973	3.4	1974	3.4	1975	3.4	1976	3.4	1977	3.4	1978	3.4	1979	3.4	1980	3.4	1981	1.9	1982	1.9
1972	3.4	1973	3.4	1974	3.4	1975	3.4	1976	3.4	1977	3.4	1978	3.4	1979	3.4	1980	3.4	1981	1.9	1982	1.9	1983	1.9
1973	3.3	1974	3.3	1975	3.3	1976	3.3	1977	3.3	1978	3.3	1979	3.3	1980	3.3	1981	1.9	1982	1.9	1983	1.9	1984	1.9
1974	3.3	1975	3.3	1976	3.3	1977	3.3	1978	3.3	1979	3.3	1980	3.3	1981	1.8	1982	1.8	1983	1.8	1984	1.8	1985	1.8
1975	3.2	1976	3.2	1977	3.2	1978	3.2	1979	3.2	1980	3.2	1981	1.8	1982	1.8	1983	1.8	1984	1.8	1985	1.8	1986	1.8
1976	3.1	1977	3.1	1978	3.1	1979	3.1	1980	3.1	1981	1.8	1982	1.8	1983	1.8	1984	1.8	1985	1.8	1986	1.8	1987	1.8
1977	3.0	1978	3.0	1979	3.0	1980	3.0	1981	1.8	1982	1.8	1983	1.8	1984	1.8	1985	1.8	1986	1.8	1987	1.8	1988	1.8
1978	2.9	1979	2.9	1980	2.9	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.7	1986	1.7	1987	1.7	1988	1.7	1989	1.7
1979	2.8	1980	2.8	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.7	1986	1.7	1987	1.7	1988	1.7	1989	1.7	1990	1.7
1980	2.7	1981	1.6	1982	1.6	1983	1.6	1984	1.6	1985	1.6	1986	1.6	1987	1.6	1988	1.6	1989	1.6	1990	1.6	1991	1.6
1981	1.6	1982	1.6	1983	1.6	1984	1.6	1985	1.6	1986	1.6	1987	1.6	1988	1.6	1989	1.6	1990	1.6	1991	1.6	1992	1.6
1982	1.5	1983	1.5	1984	1.5	1985	1.5	1986	1.5	1987	1.5	1988	1.5	1989	1.5	1990	1.5	1991	1.5	1992	1.5	1993	1.5
1983	1.5	1984	1.5	1985	1.5	1986	1.5	1987	1.5	1988	1.5	1989	1.5	1990	1.5	1991	1.5	1992	1.5	1993	1.5	1994	1.5
1984	1.4	1985	1.4	1986	1.4	1987	1.4	1988	1.4	1989	1.4	1990	1.4	1991	1.4	1992	1.4	1993	1.4	1994	1.4	1995	1.4
1985	1.3	1986	1.3	1987	1.3	1988	1.3	1989	1.3	1990	1.3	1991	1.3	1992	1.3	1993	1.3	1994	1.3	1995	1.3	1996	1.3

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	3.7	1979	3.7	1980	3.7	1981	2.0	1984	2.0	1986	2.0	1989	2.0	1991	2.0	1993	2.0	1996	2.0	1999	2.0	2001	2.0
1979	3.6	1980	3.6	1981	2.0	1982	2.0	1985	2.0	1987	2.0	1990	2.0	1992	2.0	1994	2.0	1997	2.0	2000	2.0	2002	2.0
1980	3.6	1981	2.0	1982	2.0	1983	2.0	1986	2.0	1988	2.0	1991	2.0	1993	2.0	1995	2.0	1998	2.0	2001	2.0	2003	2.0
1981	2.0	1982	2.0	1983	2.0	1984	2.0	1987	2.0	1989	2.0	1992	2.0	1994	2.0	1996	2.0	1999	2.0	2002	2.0	2004	2.0
1982	1.9	1983	1.9	1984	1.9	1985	1.9	1988	1.9	1990	1.9	1993	1.9	1995	1.9	1997	1.9	2000	1.9	2003	1.9	2005	1.9
1983	1.9	1984	1.9	1985	1.9	1986	1.9	1989	1.9	1991	1.9	1994	1.9	1996	1.9	1998	1.9	2001	1.9	2004	1.9	2006	1.9
1984	1.9	1985	1.9	1986	1.9	1987	1.9	1990	1.9	1992	1.9	1995	1.9	1997	1.9	1999	1.9	2002	1.9	2005	1.9	2007	1.9
1985	1.9	1986	1.9	1987	1.9	1988	1.9	1991	1.9	1993	1.9	1996	1.9	1998	1.9	2000	1.9	2003	1.9	2006	1.9	2008	1.9
1986	1.8	1987	1.8	1988	1.8	1989	1.8	1992	1.8	1994	1.8	1997	1.8	1999	1.8	2001	1.8	2004	1.8	2007	1.8	2009	1.8
1987	1.8	1988	1.8	1989	1.8	1990	1.8	1993	1.8	1995	1.8	1998	1.8	2000	1.8	2002	1.8	2005	1.8	2008	1.8	2010	1.8
1988	1.8	1989	1.8	1990	1.8	1991	1.8	1994	1.8	1996	1.8	1999	1.8	2001	1.8	2003	1.8	2006	1.8	2009	1.8	2011	1.8
1989	1.8	1990	1.8	1991	1.8	1992	1.8	1995	1.8	1997	1.8	2000	1.8	2002	1.8	2004	1.8	2007	1.8	2010	1.8	2012	1.8
1990	1.7	1991	1.7	1992	1.7	1993	1.7	1996	1.7	1998	1.7	2001	1.7	2003	1.7	2005	1.7	2008	1.7	2011	1.7	2013	1.7
1991	1.7	1992	1.7	1993	1.7	1994	1.7	1997	1.7	1999	1.7	2002	1.7	2004	1.7	2006	1.7	2009	1.7	2012	1.7	2014	1.7
1992	1.6	1993	1.6	1994	1.6	1995	1.6	1998	1.6	2000	1.6	2003	1.6	2005	1.6	2007	1.6	2010	1.6	2013	1.6	2015	1.6
1993	1.6	1994	1.6	1995	1.6	1996	1.6	1999	1.6	2001	1.6	2004	1.6	2006	1.6	2008	1.6	2011	1.6	2014	1.6	2016	1.6
1994	1.5	1995	1.5	1996	1.5	1997	1.5	2000	1.5	2002	1.5	2005	1.5	2007	1.5	2009	1.5	2012	1.5	2015	1.5	2017	1.5
1995	1.5	1996	1.5	1997	1.5	1998	1.5	2001	1.5	2003	1.5	2006	1.5	2008	1.5	2010	1.5	2013	1.5	2016	1.5	2018	1.5
1996	1.4	1997	1.4	1998	1.4	1999	1.4	2002	1.4	2004	1.4	2007	1.4	2009	1.4	2011	1.4	2014	1.4	2017	1.4	2019	1.4
1997	1.3	1998	1.3	1999	1.3	2000	1.3	2003	1.3	2005	1.3	2008	1.3	2010	1.3	2012	1.3	2015	1.3	2018	1.3	2020	1.3

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on January 1 mileage accumulation figures given in Table 1.6.4A.

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TABLE 1.6.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	3.2	1967	3.2	1968	3.2	1969	3.2	1970	3.2	1971	3.2	1972	3.2	1973	3.2	1974	3.2	1975	3.2	1976	3.2	1977	3.2
1967	3.2	1968	3.2	1969	3.2	1970	3.2	1971	3.2	1972	3.2	1973	3.2	1974	3.2	1975	3.2	1976	3.2	1977	3.2	1978	3.2
1968	3.1	1969	3.1	1970	3.1	1971	3.1	1972	3.1	1973	3.1	1974	3.1	1975	3.1	1976	3.1	1977	3.1	1978	3.1	1979	3.1
1969	3.1	1970	3.1	1971	3.1	1972	3.1	1973	3.1	1974	3.1	1975	3.1	1976	3.1	1977	3.1	1978	3.1	1979	3.1	1980	3.1
1970	3.1	1971	3.1	1972	3.1	1973	3.1	1974	3.1	1975	3.1	1976	3.1	1977	3.1	1978	3.1	1979	3.1	1980	3.1	1981	1.9
1971	3.0	1972	3.0	1973	3.0	1974	3.0	1975	3.0	1976	3.0	1977	3.0	1978	3.0	1979	3.0	1980	3.0	1981	1.9	1982	1.9
1972	3.0	1973	3.0	1974	3.0	1975	3.0	1976	3.0	1977	3.0	1978	3.0	1979	3.0	1980	3.0	1981	1.9	1982	1.9	1983	1.9
1973	2.9	1974	2.9	1975	2.9	1976	2.9	1977	2.9	1978	2.9	1979	2.9	1980	2.9	1981	1.9	1982	1.9	1983	1.9	1984	1.9
1974	2.9	1975	2.9	1976	2.9	1977	2.9	1978	2.9	1979	2.9	1980	2.9	1981	1.9	1982	1.9	1983	1.9	1984	1.9	1985	1.9
1975	2.8	1976	2.8	1977	2.8	1978	2.8	1979	2.8	1980	2.8	1981	1.8	1982	1.8	1983	1.8	1984	1.8	1985	1.8	1986	1.8
1976	2.7	1977	2.7	1978	2.7	1979	2.7	1980	2.7	1981	1.8	1982	1.8	1983	1.8	1984	1.8	1985	1.8	1986	1.8	1987	1.8
1977	2.7	1978	2.7	1979	2.7	1980	2.7	1981	1.8	1982	1.8	1983	1.8	1984	1.8	1985	1.8	1986	1.8	1987	1.8	1988	1.4
1978	2.6	1979	2.6	1980	2.6	1981	1.8	1982	1.8	1983	1.8	1984	1.8	1985	1.8	1986	1.8	1987	1.8	1988	1.4	1989	1.4
1979	2.5	1980	2.5	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.7	1986	1.7	1987	1.7	1988	1.3	1989	1.3	1990	1.3
1980	2.4	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.7	1986	1.7	1987	1.7	1988	1.3	1989	1.3	1990	1.3	1991	1.3
1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.7	1986	1.7	1987	1.7	1988	1.3	1989	1.3	1990	1.2	1991	1.2	1992	1.2
1982	1.6	1983	1.6	1984	1.6	1985	1.6	1986	1.6	1987	1.6	1988	1.2	1989	1.2	1990	1.2	1991	1.2	1992	1.2	1993	1.2
1983	1.6	1984	1.6	1985	1.6	1986	1.6	1987	1.6	1988	1.2	1989	1.2	1990	1.1	1991	1.1	1992	1.1	1993	1.1	1994	1.1
1984	1.5	1985	1.5	1986	1.5	1987	1.5	1988	1.1	1989	1.1	1990	1.1	1991	1.1	1992	1.1	1993	1.1	1994	1.1	1995	1.1
1985	1.5	1986	1.5	1987	1.5	1988	1.1	1989	1.1	1990	1.0	1991	1.0	1992	1.0	1993	1.0	1994	1.0	1995	1.0	1996	1.0

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	3.2	1979	3.2	1980	3.2	1981	2.0	1984	2.0	1986	2.0	1989	1.6	1991	1.5	1993	1.5	1996	1.5	1999	1.5	2001	1.5
1979	3.2	1980	3.2	1981	2.0	1982	2.0	1985	2.0	1987	2.0	1990	1.5	1992	1.5	1994	1.5	1997	1.5	2000	1.5	2002	1.5
1980	3.1	1981	2.0	1982	2.0	1983	2.0	1986	2.0	1988	1.6	1991	1.5	1993	1.5	1995	1.5	1998	1.5	2001	1.5	2003	1.5
1981	2.0	1982	2.0	1983	2.0	1984	2.0	1987	2.0	1989	1.5	1992	1.5	1994	1.5	1996	1.5	1999	1.5	2002	1.5	2004	1.5
1982	1.9	1983	1.9	1984	1.9	1985	1.9	1988	1.5	1990	1.5	1993	1.5	1995	1.5	1997	1.5	2000	1.5	2003	1.5	2005	1.5
1983	1.9	1984	1.9	1985	1.9	1986	1.9	1989	1.5	1991	1.5	1994	1.5	1996	1.5	1998	1.5	2001	1.5	2004	1.5	2006	1.5
1984	1.9	1985	1.9	1986	1.9	1987	1.9	1990	1.5	1992	1.5	1995	1.5	1997	1.5	1999	1.5	2002	1.5	2005	1.5	2007	1.5
1985	1.9	1986	1.9	1987	1.9	1988	1.5	1991	1.4	1993	1.4	1996	1.4	1998	1.4	2000	1.4	2003	1.4	2006	1.4	2008	1.4
1986	1.9	1987	1.9	1988	1.5	1989	1.5	1992	1.4	1994	1.4	1997	1.4	1999	1.4	2001	1.4	2004	1.4	2007	1.4	2009	1.4
1987	1.8	1988	1.4	1989	1.4	1990	1.4	1993	1.4	1995	1.4	1998	1.4	2000	1.4	2002	1.4	2005	1.4	2008	1.4	2010	1.4
1988	1.4	1989	1.4	1990	1.4	1991	1.4	1994	1.4	1996	1.4	1999	1.4	2001	1.4	2003	1.4	2006	1.4	2009	1.4	2011	1.4
1989	1.4	1990	1.3	1991	1.3	1992	1.3	1995	1.3	1997	1.3	2000	1.3	2002	1.3	2004	1.3	2007	1.3	2010	1.3	2012	1.3
1990	1.3	1991	1.3	1992	1.3	1993	1.3	1996	1.3	1998	1.3	2001	1.3	2003	1.3	2005	1.3	2008	1.3	2011	1.3	2013	1.3
1991	1.3	1992	1.3	1993	1.3	1994	1.3	1997	1.3	1999	1.3	2002	1.3	2004	1.3	2006	1.3	2009	1.3	2012	1.3	2014	1.3
1992	1.3	1993	1.3	1994	1.3	1995	1.3	1998	1.3	2000	1.3	2003	1.3	2005	1.3	2007	1.3	2010	1.3	2013	1.3	2015	1.3
1993	1.2	1994	1.2	1995	1.2	1996	1.2	1999	1.2	2001	1.2	2004	1.2	2006	1.2	2008	1.2	2011	1.2	2014	1.2	2016	1.2
1994	1.2	1995	1.2	1996	1.2	1997	1.2	2000	1.2	2002	1.2	2005	1.2	2007	1.2	2009	1.2	2012	1.2	2015	1.2	2017	1.2
1995	1.1	1996	1.1	1997	1.1	1998	1.1	2001	1.1	2003	1.1	2006	1.1	2008	1.1	2010	1.1	2013	1.1	2016	1.1	2018	1.1
1996	1.1	1997	1.1	1998	1.1	1999	1.1	2002	1.1	2004	1.1	2007	1.1	2009	1.1	2011	1.1	2014	1.1	2017	1.1	2019	1.1
1997	1.0	1998	1.0	1999	1.0	2000	1.0	2003	1.0	2005	1.0	2008	1.0	2010	1.0	2012	1.0	2015	1.0	2018	1.0	2020	1.0

*MY Indicates the model year.

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on January 1 mileage accumulation figures given in Table 1.6.4A.

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TABLE 1.7.1

NONTAMPERED EXHAUST EMISSION RATES FOR
LOW ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1967	3.540	0.060	3.840	4.140
	1967-1968	3.660	0.060	3.960	4.260
	1969	3.780	0.060	4.080	4.380
	1970	3.810	0.060	4.110	4.410
	1971-1973	3.910	0.060	4.210	4.510
	1974-1976	3.910	0.060	4.210	4.510
	1977	3.990	0.060	4.290	4.590
	1978	3.920	0.060	4.220	4.520
	1979	3.510	0.0	3.510	3.510
	1980-1981	3.170	0.0	3.170	3.170
	1982	2.780	0.0	2.780	2.780
	1983	2.660	0.0	2.660	2.660
	1984	2.820	0.0	2.820	2.820
	1985	2.590	0.0	2.590	2.590
	1986	2.280	0.0	2.280	2.280
	1987	2.230	0.0	2.230	2.230
	1988-1989	2.180	0.0	2.180	2.180
	1990	2.130	0.0	2.130	2.130
	1991-2000	2.100	0.0	2.100	2.100
	2001+	2.100	0.0	2.100	2.100
CO	Pre-1967	10.320	0.140	11.020	11.720
	1967-1968	10.690	0.150	11.440	12.190
	1969	11.040	0.150	11.790	12.540
	1970	11.130	0.150	11.880	12.630
	1971-1973	11.420	0.160	12.220	13.020
	1974-1976	11.420	0.160	12.220	13.020
	1977	11.650	0.160	12.450	13.250
	1978	11.440	0.160	12.240	13.040
	1979	14.040	0.120	14.640	15.240
	1980-1981	12.670	0.110	13.220	13.770
	1982	11.120	0.100	11.620	12.120
	1983	10.660	0.090	11.110	11.560
	1984	11.260	0.100	11.760	12.260
	1985	10.350	0.090	10.800	11.250
	1986	10.360	0.090	10.810	11.260
	1987	10.140	0.090	10.590	11.040
	1988-1989	9.900	0.080	10.300	10.700
	1990	9.670	0.080	10.070	10.470
	1991-2000	9.530	0.080	9.930	10.330
	2001+	9.520	0.080	9.920	10.320
NOx	Pre-1967	22.990	0.170	23.840	24.690
	1967-1968	23.830	0.180	24.730	25.630
	1969	24.590	0.180	25.490	26.390
	1970	24.800	0.190	25.750	26.700
	1971-1973	25.460	0.190	26.410	27.360
	1974-1976	25.440	0.190	26.390	27.340
	1977	25.970	0.190	26.920	27.870
	1978	25.500	0.190	26.450	27.400
	1979	23.780	0.0	23.780	23.780
	1980-1981	21.470	0.0	21.470	21.470
	1982	18.840	0.0	18.840	18.840
	1983	18.060	0.0	18.060	18.060
	1984	19.080	0.0	19.080	19.080
	1985	17.530	0.0	17.530	17.530
	1986	17.560	0.0	17.560	17.560
	1987	17.180	0.0	17.180	17.180
	1988-1989	16.770	0.0	16.770	16.770
	1990	9.790	0.0	9.790	9.790
	1991-2000	8.010	0.0	8.010	8.010
	2001+	7.990	0.0	7.990	7.990

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile.
ZML = Zero mile level in grams/mile.
DR = Deterioration rate in grams/mile/10K miles.
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 1.7.3

NONTAMPERED HOT STABILIZED IDLE EMISSIONS
FOR LOW ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES

* IER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate
HC	Pre-1985	21.60	0.0
	1985+	16.20	0.0
CO	All	40.20	0.60
NOx	Pre-1985	55.20	0.0
	1985+	13.20	0.0

* WHERE : IER = Nontampered idle emissions in grams/hour,
ZML = Zero mile level in grams/hour
DR = Deterioration rate in grams/hour/10K miles,
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 1.7.4

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
LOW ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per vehicle*)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.082	56990.	0.0	0.	0.
2	0.165	52418.	0.165	56990.	28495.
3	0.135	48214.	0.135	52418.	83199.
4	0.111	44348.	0.111	48214.	133514.
5	0.091	40792.	0.091	44348.	179795.
6	0.075	37522.	0.075	40792.	222364.
7	0.061	34514.	0.061	37522.	261521.
8	0.050	31749.	0.050	34514.	297538.
9	0.041	29205.	0.041	31749.	330670.
10	0.034	26865.	0.034	29205.	361147.
11	0.028	24713.	0.028	26865.	389182.
12	0.023	22735.	0.023	24713.	414971.
13	0.019	20914.	0.019	22735.	438695.
14	0.015	19240.	0.015	20914.	460519.
15	0.013	17700.	0.013	19240.	480596.
16	0.010	16283.	0.010	17700.	499065.
17	0.009	14980.	0.009	16283.	516057.
18	0.007	13781.	0.007	14980.	531688.
19	0.006	12678.	0.006	13781.	546069.
20+	0.024	11665.	0.024	12678.	559298.

* Default information that may be altered by the MOBILE4 user with information about the local area. This mileage distribution is applicable to calendar year 1988 only.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1,
where: JMAR(1) = 0 and,
JMAR(MYI) = MAR(MYI-1), MYI = 2,...,20+.

DATE : MAY 19, 1989

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TABLE 1.7.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
LOW ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES
JANUARY 1, 1988

Model Years	(A) HDDV Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) HDDV Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.0	1.000	0.0	0.0	0.	0.0	0.0
1987	0.165	1.000	0.165	0.180	56990.	10254.4	0.245
1986	0.135	1.000	0.135	0.147	52418.	7716.9	0.184
1985	0.111	1.000	0.111	0.121	48214.	5836.1	0.139
1984	0.091	1.000	0.091	0.099	44348.	4400.9	0.105
1983	0.075	1.000	0.075	0.082	40792.	3336.3	0.080
1982	0.061	1.000	0.061	0.067	37522.	2496.0	0.060
1981	0.050	1.000	0.050	0.055	34514.	1881.9	0.045
1980	0.041	1.000	0.041	0.045	31749.	1419.5	0.034
1979	0.034	1.000	0.034	0.037	29205.	1082.8	0.026
1978	0.028	1.000	0.028	0.031	26865.	820.3	0.020
1977	0.023	1.000	0.023	0.025	24713.	619.9	0.015
1976	0.019	1.000	0.019	0.021	22735.	471.1	0.011
1975	0.015	1.000	0.015	0.016	20914.	342.1	0.008
1974	0.013	1.000	0.013	0.014	19240.	272.8	0.007
1973	0.010	1.000	0.010	0.011	17700.	193.0	0.005
1972	0.009	1.000	0.009	0.010	16283.	159.8	0.004
1971	0.007	1.000	0.007	0.008	14980.	114.4	0.003
1970	0.006	1.000	0.006	0.007	13781.	90.2	0.002
1969-	0.024	1.000	0.024	0.026	12678.	331.8	0.008
		DAF:	0.918		TFNORM:	41840.1	

WHERE :

A = January 1 registration mix from Table 1.7.4.
B = Diesel fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 1.7.4.

DATE : MAY 19, 1989

TABLE 1.7.6

SPEED CORRECTION FACTOR COEFFICIENTS FOR
LOW ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES

* SCF(s) = EXP(A + B*s + C*s**2)

Pol	Model Years	Coefficients A	B	C
HC	All	0.92400	-0.05500	0.00044
CO	All	1.39600	-0.08800	0.00091
NOx	All	0.67600	-0.04800	0.00071

* WHERE: s = average speed (mph).

DATE : MAY 19, 1989

TABLE 1.7.10A

METHANE OFFSETS*
FOR LOW ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES

Model Years	Methane Offsets (Grams/Mile)
Pre-1978	0.145
1978-1981	0.145
1982-1987	0.118
1988+	0.100

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

DATE : MAY 19, 1989

TABLE 1.7.10B

CONVERSION FACTORS
FOR LOW ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES

Model Years	Conversion Factors*
Pre-1962	2.850
1962	2.858
1963	2.874
1964	2.890
1965	2.900
1966	2.964
1967	2.995
1968	3.074
1969	3.100
1970	3.161
1971	3.197
1972	3.188
1973	3.213
1974	3.146
1975	3.179
1976	3.246
1977	3.187
1978	2.999
1979	2.716
1980	2.698
1981	2.376
1982	2.277
1983	2.406
1984	2.211
1985	2.214
1986	2.167
1987	2.132
1988	2.099
1989	2.066
1990	2.050
1991	2.033
1992	2.033
1993	2.033
1994	2.039
1995	2.039
1996	2.037
1997+	2.036

* Convert from grams/brake-hoursepower/hour to grams/mile units.

DATE : MAY 19, 1989

TABLE 1.7.11A

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	6.9	1967	7.0	1968	7.0	1969	7.1	1970	7.2	1971	7.3	1972	7.3	1973	7.3	1974	7.3	1975	7.3	1976	7.3	1977	7.3
1967	6.9	1968	6.9	1969	7.1	1970	7.1	1971	7.2	1972	7.2	1973	7.2	1974	7.2	1975	7.2	1976	7.2	1977	7.3	1978	7.2
1968	6.9	1969	7.0	1970	7.0	1971	7.1	1972	7.1	1973	7.1	1974	7.1	1975	7.1	1976	7.1	1977	7.2	1978	7.1	1979	3.5
1969	6.9	1970	6.9	1971	7.0	1972	7.0	1973	7.0	1974	7.0	1975	7.0	1976	7.0	1977	7.1	1978	7.0	1979	3.5	1980	3.2
1970	6.8	1971	6.9	1972	6.9	1973	6.9	1974	6.9	1975	6.9	1976	6.9	1977	7.0	1978	6.9	1979	3.5	1980	3.2	1981	3.2
1971	6.8	1972	6.8	1973	6.8	1974	6.8	1975	6.8	1976	6.8	1977	6.9	1978	6.8	1979	3.5	1980	3.2	1981	3.2	1982	2.8
1972	6.7	1973	6.7	1974	6.7	1975	6.7	1976	6.7	1977	6.8	1978	6.7	1979	3.5	1980	3.2	1981	3.2	1982	2.8	1983	2.7
1973	6.5	1974	6.5	1975	6.5	1976	6.5	1977	6.6	1978	6.6	1979	3.5	1980	3.2	1981	3.2	1982	2.8	1983	2.7	1984	2.8
1974	6.4	1975	6.4	1976	6.4	1977	6.5	1978	6.4	1979	3.5	1980	3.2	1981	3.2	1982	2.8	1983	2.7	1984	2.8	1985	2.6
1975	6.2	1976	6.2	1977	6.3	1978	6.3	1979	3.5	1980	3.2	1981	3.2	1982	2.8	1983	2.7	1984	2.8	1985	2.6	1986	2.3
1976	6.1	1977	6.2	1978	6.1	1979	3.5	1980	3.2	1981	3.2	1982	2.8	1983	2.7	1984	2.8	1985	2.6	1986	2.3	1987	2.2
1977	6.0	1978	5.9	1979	3.5	1980	3.2	1981	3.2	1982	2.8	1983	2.7	1984	2.8	1985	2.6	1986	2.3	1987	2.2	1988	2.2
1978	5.7	1979	3.5	1980	3.2	1981	3.2	1982	2.8	1983	2.7	1984	2.8	1985	2.6	1986	2.3	1987	2.2	1988	2.2	1989	2.2
1979	3.5	1980	3.2	1981	3.2	1982	2.8	1983	2.7	1984	2.8	1985	2.6	1986	2.3	1987	2.2	1988	2.2	1989	2.2	1990	2.1
1980	3.2	1981	3.2	1982	2.8	1983	2.7	1984	2.8	1985	2.6	1986	2.3	1987	2.2	1988	2.2	1989	2.2	1990	2.1	1991	2.1
1981	3.2	1982	2.8	1983	2.7	1984	2.8	1985	2.6	1986	2.3	1987	2.2	1988	2.2	1989	2.2	1990	2.1	1991	2.1	1992	2.1
1982	2.8	1983	2.7	1984	2.8	1985	2.6	1986	2.3	1987	2.2	1988	2.2	1989	2.2	1990	2.1	1991	2.1	1992	2.1	1993	2.1
1983	2.7	1984	2.8	1985	2.6	1986	2.3	1987	2.2	1988	2.2	1989	2.2	1990	2.1	1991	2.1	1992	2.1	1993	2.1	1994	2.1
1984	2.8	1985	2.6	1986	2.3	1987	2.2	1988	2.2	1989	2.2	1990	2.1	1991	2.1	1992	2.1	1993	2.1	1994	2.1	1995	2.1
1985	2.6	1986	2.3	1987	2.2	1988	2.2	1989	2.2	1990	2.1	1991	2.1	1992	2.1	1993	2.1	1994	2.1	1995	2.1	1996	2.1

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	7.3	1979	3.5	1980	3.2	1981	3.2	1984	2.8	1986	2.3	1989	2.2	1991	2.1	1993	2.1	1996	2.1	1999	2.1	2001	2.1
1979	3.5	1980	3.2	1981	3.2	1982	2.8	1985	2.6	1987	2.2	1990	2.1	1992	2.1	1994	2.1	1997	2.1	2000	2.1	2002	2.1
1980	3.2	1981	3.2	1982	2.8	1983	2.7	1986	2.3	1988	2.2	1991	2.1	1993	2.1	1995	2.1	1998	2.1	2001	2.1	2003	2.1
1981	3.2	1982	2.8	1983	2.7	1984	2.8	1987	2.2	1989	2.2	1992	2.1	1994	2.1	1996	2.1	1999	2.1	2002	2.1	2004	2.1
1982	2.8	1983	2.7	1984	2.8	1985	2.6	1988	2.2	1990	2.1	1993	2.1	1995	2.1	1997	2.1	2000	2.1	2003	2.1	2005	2.1
1983	2.7	1984	2.8	1985	2.6	1986	2.3	1989	2.2	1991	2.1	1994	2.1	1996	2.1	1998	2.1	2001	2.1	2004	2.1	2006	2.1
1984	2.8	1985	2.6	1986	2.3	1987	2.2	1990	2.1	1992	2.1	1995	2.1	1997	2.1	1999	2.1	2002	2.1	2005	2.1	2007	2.1
1985	2.6	1986	2.3	1987	2.2	1988	2.2	1991	2.1	1993	2.1	1996	2.1	1998	2.1	2000	2.1	2003	2.1	2006	2.1	2008	2.1
1986	2.3	1987	2.2	1988	2.2	1989	2.2	1992	2.1	1994	2.1	1997	2.1	1999	2.1	2001	2.1	2004	2.1	2007	2.1	2009	2.1
1987	2.2	1988	2.2	1989	2.2	1990	2.1	1993	2.1	1995	2.1	1998	2.1	2000	2.1	2002	2.1	2005	2.1	2008	2.1	2010	2.1
1988	2.2	1989	2.2	1990	2.1	1991	2.1	1994	2.1	1996	2.1	1999	2.1	2001	2.1	2003	2.1	2006	2.1	2009	2.1	2011	2.1
1989	2.2	1990	2.1	1991	2.1	1992	2.1	1995	2.1	1997	2.1	2000	2.1	2002	2.1	2004	2.1	2007	2.1	2010	2.1	2012	2.1
1990	2.1	1991	2.1	1992	2.1	1993	2.1	1996	2.1	1998	2.1	2001	2.1	2003	2.1	2005	2.1	2008	2.1	2011	2.1	2013	2.1
1991	2.1	1992	2.1	1993	2.1	1994	2.1	1997	2.1	1999	2.1	2002	2.1	2004	2.1	2006	2.1	2009	2.1	2012	2.1	2014	2.1
1992	2.1	1993	2.1	1994	2.1	1995	2.1	1998	2.1	2000	2.1	2003	2.1	2005	2.1	2007	2.1	2010	2.1	2013	2.1	2015	2.1
1993	2.1	1994	2.1	1995	2.1	1996	2.1	1999	2.1	2001	2.1	2004	2.1	2006	2.1	2008	2.1	2011	2.1	2014	2.1	2016	2.1
1994	2.1	1995	2.1	1996	2.1	1997	2.1	2000	2.1	2002	2.1	2005	2.1	2007	2.1	2009	2.1	2012	2.1	2015	2.1	2017	2.1
1995	2.1	1996	2.1	1997	2.1	1998	2.1	2001	2.1	2003	2.1	2006	2.1	2008	2.1	2010	2.1	2013	2.1	2016	2.1	2018	2.1
1996	2.1	1997	2.1	1998	2.1	1999	2.1	2002	2.1	2004	2.1	2007	2.1	2009	2.1	2011	2.1	2014	2.1	2017	2.1	2019	2.1
1997	2.1	1998	2.1	1999	2.1	2000	2.1	2003	2.1	2005	2.1	2008	2.1	2010	2.1	2012	2.1	2015	2.1	2018	2.1	2020	2.1

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F. Emissions are based on the January 1 mileage accumulation figures given in Table 1.7.4.

TABLE 1.7.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	18.2	1967	19.1	1968	19.1	1969	19.4	1970	19.5	1971	20.4	1972	20.4	1973	20.4	1974	20.4	1975	20.4	1976	20.4	1977	20.6
1967	18.9	1968	18.9	1969	19.2	1970	19.3	1971	20.2	1972	20.2	1973	20.2	1974	20.2	1975	20.2	1976	20.2	1977	20.4	1978	20.2
1968	18.7	1969	19.0	1970	19.1	1971	19.9	1972	19.9	1973	19.9	1974	19.9	1975	19.9	1976	19.9	1977	20.2	1978	19.9	1979	20.4
1969	18.8	1970	18.9	1971	19.7	1972	19.7	1973	19.7	1974	19.7	1975	19.7	1976	19.7	1977	19.9	1978	19.7	1979	20.2	1980	18.3
1970	18.6	1971	19.4	1972	19.4	1973	19.4	1974	19.4	1975	19.4	1976	19.4	1977	19.6	1978	19.4	1979	20.0	1980	18.2	1981	18.2
1971	19.1	1972	19.1	1973	19.1	1974	19.1	1975	19.1	1976	19.1	1977	19.3	1978	19.1	1979	19.8	1980	18.0	1981	18.0	1982	15.9
1972	18.8	1973	18.8	1974	18.8	1975	18.8	1976	18.8	1977	19.0	1978	18.8	1979	19.6	1980	17.7	1981	17.7	1982	15.7	1983	14.8
1973	18.4	1974	18.4	1975	18.4	1976	18.4	1977	18.7	1978	18.5	1979	19.3	1980	17.5	1981	17.5	1982	15.5	1983	14.6	1984	15.6
1974	18.1	1975	18.1	1976	18.1	1977	18.3	1978	18.1	1979	19.0	1980	17.2	1981	17.2	1982	15.3	1983	14.4	1984	15.4	1985	14.1
1975	17.6	1976	17.6	1977	17.9	1978	17.7	1979	18.7	1980	17.0	1981	17.0	1982	15.0	1983	14.2	1984	15.2	1985	13.9	1986	13.9
1976	17.2	1977	17.4	1978	17.2	1979	18.4	1980	16.6	1981	16.6	1982	14.7	1983	13.9	1984	14.9	1985	13.6	1986	13.6	1987	13.4
1977	16.9	1978	16.7	1979	18.0	1980	16.3	1981	16.3	1982	14.4	1983	13.6	1984	14.6	1985	13.3	1986	13.3	1987	13.1	1988	12.5
1978	16.2	1979	17.6	1980	15.9	1981	15.9	1982	14.1	1983	13.3	1984	14.2	1985	13.0	1986	13.0	1987	12.8	1988	12.3	1989	12.3
1979	17.2	1980	15.5	1981	15.5	1982	13.7	1983	13.0	1984	13.9	1985	12.7	1986	12.7	1987	12.5	1988	12.0	1989	12.0	1990	11.8
1980	15.1	1981	15.1	1982	13.3	1983	12.7	1984	13.5	1985	12.4	1986	12.4	1987	12.1	1988	11.7	1989	11.7	1990	11.4	1991	11.3
1981	14.6	1982	12.9	1983	12.3	1984	13.1	1985	12.0	1986	12.0	1987	11.8	1988	11.3	1989	11.3	1990	11.1	1991	11.0	1992	11.0
1982	12.5	1983	11.9	1984	12.6	1985	11.6	1986	11.6	1987	11.3	1988	11.0	1989	11.0	1990	10.7	1991	10.6	1992	10.6	1993	10.6
1983	11.4	1984	12.1	1985	11.1	1986	11.1	1987	10.9	1988	10.6	1989	10.6	1990	10.3	1991	10.2	1992	10.2	1993	10.2	1994	10.2
1984	11.5	1985	10.6	1986	10.6	1987	10.4	1988	10.1	1989	10.1	1990	9.9	1991	9.8	1992	9.8	1993	9.8	1994	9.8	1995	9.8
1985	10.4	1986	10.4	1987	10.1	1988	9.9	1989	9.9	1990	9.7	1991	9.5	1992	9.5	1993	9.5	1994	9.5	1995	9.5	1996	9.5

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	20.4	1979	20.8	1980	18.8	1981	18.8	1984	16.9	1986	15.4	1989	14.4	1991	14.0	1993	14.0	1996	14.0	1999	14.0	2001	14.0
1979	20.6	1980	18.7	1981	18.7	1982	16.6	1985	15.3	1987	15.1	1990	14.0	1992	13.9	1994	13.9	1997	13.9	2000	13.9	2002	13.9
1980	18.5	1981	18.5	1982	16.4	1983	15.4	1986	15.1	1988	14.2	1991	13.8	1993	13.8	1995	13.8	1998	13.8	2001	13.8	2003	13.8
1981	18.3	1982	16.3	1983	15.3	1984	16.4	1987	14.8	1989	14.0	1992	13.7	1994	13.7	1996	13.7	1999	13.7	2002	13.6	2004	13.6
1982	16.1	1983	15.2	1984	16.3	1985	14.8	1988	13.9	1990	13.7	1993	13.5	1995	13.5	1997	13.5	2000	13.5	2003	13.5	2005	13.5
1983	15.0	1984	16.1	1985	14.7	1986	14.7	1989	13.7	1991	13.4	1994	13.4	1996	13.4	1998	13.4	2001	13.4	2004	13.4	2006	13.4
1984	15.9	1985	14.5	1986	14.5	1987	14.3	1990	13.4	1992	13.2	1995	13.2	1997	13.2	1999	13.2	2002	13.2	2005	13.2	2007	13.2
1985	14.3	1986	14.3	1987	14.1	1988	13.4	1991	13.0	1993	13.0	1996	13.0	1998	13.0	2000	13.0	2003	13.0	2006	13.0	2008	13.0
1986	14.1	1987	13.9	1988	13.2	1989	13.2	1992	12.8	1994	12.8	1997	12.8	1999	12.8	2001	12.8	2004	12.8	2007	12.8	2009	12.8
1987	13.6	1988	13.0	1989	13.0	1990	12.8	1993	12.6	1995	12.6	1998	12.6	2000	12.6	2002	12.6	2005	12.6	2008	12.6	2010	12.6
1988	12.8	1989	12.8	1990	12.6	1991	12.4	1994	12.4	1996	12.4	1999	12.4	2001	12.4	2003	12.4	2006	12.4	2009	12.4	2011	12.4
1989	12.5	1990	12.3	1991	12.2	1992	12.2	1995	12.2	1997	12.2	2000	12.2	2002	12.2	2004	12.2	2007	12.2	2010	12.2	2012	12.2
1990	12.1	1991	11.9	1992	11.9	1993	11.9	1996	11.9	1998	11.9	2001	11.9	2003	11.9	2005	11.9	2008	11.9	2011	11.9	2013	11.9
1991	11.6	1992	11.6	1993	11.6	1994	11.6	1997	11.6	1999	11.6	2002	11.6	2004	11.6	2006	11.6	2009	11.6	2012	11.6	2014	11.6
1992	11.3	1993	11.3	1994	11.3	1995	11.3	1998	11.3	2000	11.3	2003	11.3	2005	11.3	2007	11.3	2010	11.3	2013	11.3	2015	11.3
1993	11.0	1994	11.0	1995	11.0	1996	11.0	1999	11.0	2001	11.0	2004	11.0	2006	11.0	2008	11.0	2011	11.0	2014	11.0	2016	11.0
1994	10.6	1995	10.6	1996	10.6	1997	10.6	2000	10.6	2002	10.6	2005	10.6	2007	10.6	2009	10.6	2012	10.6	2015	10.6	2017	10.6
1995	10.2	1996	10.2	1997	10.2	1998	10.2	2001	10.2	2003	10.2	2006	10.2	2008	10.2	2010	10.2	2013	10.2	2016	10.2	2018	10.2
1996	9.8	1997	9.8	1998	9.8	1999	9.8	2002	9.7	2004	9.7	2007	9.7	2009	9.7	2011	9.7	2014	9.7	2017	9.7	2019	9.7
1997	9.5	1998	9.5	1999	9.5	2000	9.5	2003	9.5	2005	9.5	2008	9.5	2010	9.5	2012	9.5	2015	9.5	2018	9.5	2020	9.5

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F. Emissions are based on the January 1 mileage accumulation figures given in Table 1.7.4.

TABLE 1.7.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	32.5	1967	33.9	1968	33.9	1969	34.7	1970	35.4	1971	36.1	1972	36.1	1973	36.1	1974	36.1	1975	36.1	1976	36.1	1977	36.6
1967	33.7	1968	33.7	1969	34.4	1970	35.2	1971	35.8	1972	35.8	1973	35.8	1974	35.8	1975	35.8	1976	35.8	1977	36.3	1978	35.9
1968	33.4	1969	34.2	1970	34.9	1971	35.6	1972	35.6	1973	35.6	1974	35.5	1975	35.5	1976	35.5	1977	36.1	1978	35.6	1979	23.8
1969	33.9	1970	34.6	1971	35.3	1972	35.3	1973	35.3	1974	35.2	1975	35.2	1976	35.2	1977	35.8	1978	35.3	1979	23.8	1980	21.5
1970	34.3	1971	34.9	1972	34.9	1973	34.9	1974	34.9	1975	34.9	1976	34.9	1977	35.5	1978	35.0	1979	23.8	1980	21.5	1981	21.5
1971	34.6	1972	34.6	1973	34.6	1974	34.6	1975	34.6	1976	34.6	1977	35.1	1978	34.6	1979	23.8	1980	21.5	1981	21.5	1982	18.8
1972	34.2	1973	34.2	1974	34.2	1975	34.2	1976	34.2	1977	34.7	1978	34.2	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1
1973	33.8	1974	33.8	1975	33.8	1976	33.8	1977	34.3	1978	33.8	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1
1974	33.3	1975	33.3	1976	33.3	1977	33.9	1978	33.4	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5
1975	32.8	1976	32.8	1977	33.4	1978	32.8	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6
1976	32.3	1977	32.8	1978	32.4	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2
1977	32.3	1978	31.8	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8
1978	31.2	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8
1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8
1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8	1991	8.0
1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8	1991	8.0	1992	8.0
1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8	1991	8.0	1992	8.0	1993	8.0
1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8	1991	8.0	1992	8.0	1993	8.0	1994	8.0
1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8	1991	8.0	1992	8.0	1993	8.0	1994	8.0	1995	8.0
1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8	1991	8.0	1992	8.0	1993	8.0	1994	8.0	1995	8.0	1996	8.0

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	36.1	1979	23.8	1980	21.5	1981	21.5	1984	19.1	1986	17.6	1989	16.8	1991	8.0	1993	8.0	1996	8.0	1999	8.0	2001	8.0
1979	23.8	1980	21.5	1981	21.5	1982	18.8	1985	17.5	1987	17.2	1990	9.8	1992	8.0	1994	8.0	1997	8.0	2000	8.0	2002	8.0
1980	21.5	1981	21.5	1982	18.8	1983	18.1	1986	17.6	1988	16.8	1991	8.0	1993	8.0	1995	8.0	1998	8.0	2001	8.0	2003	8.0
1981	21.5	1982	18.8	1983	18.1	1984	19.1	1987	17.2	1989	16.8	1992	8.0	1994	8.0	1996	8.0	1999	8.0	2002	8.0	2004	8.0
1982	18.8	1983	18.1	1984	19.1	1985	17.5	1988	16.8	1990	9.8	1993	8.0	1995	8.0	1997	8.0	2000	8.0	2003	8.0	2005	8.0
1983	18.1	1984	19.1	1985	17.5	1986	17.6	1989	16.8	1991	8.0	1994	8.0	1996	8.0	1998	8.0	2001	8.0	2004	8.0	2006	8.0
1984	19.1	1985	17.5	1986	17.6	1987	17.2	1990	9.8	1992	8.0	1995	8.0	1997	8.0	1999	8.0	2002	8.0	2005	8.0	2007	8.0
1985	17.5	1986	17.6	1987	17.2	1988	16.8	1991	8.0	1993	8.0	1996	8.0	1998	8.0	2000	8.0	2003	8.0	2006	8.0	2008	8.0
1986	17.6	1987	17.2	1988	16.8	1989	16.8	1992	8.0	1994	8.0	1997	8.0	1999	8.0	2001	8.0	2004	8.0	2007	8.0	2009	8.0
1987	17.2	1988	16.8	1989	16.8	1990	9.8	1993	8.0	1995	8.0	1998	8.0	2000	8.0	2002	8.0	2005	8.0	2008	8.0	2010	8.0
1988	16.8	1989	16.8	1990	9.8	1991	8.0	1994	8.0	1996	8.0	1999	8.0	2001	8.0	2003	8.0	2006	8.0	2009	8.0	2011	8.0
1989	16.8	1990	9.8	1991	8.0	1992	8.0	1995	8.0	1997	8.0	2000	8.0	2002	8.0	2004	8.0	2007	8.0	2010	8.0	2012	8.0
1990	9.8	1991	8.0	1992	8.0	1993	8.0	1996	8.0	1998	8.0	2001	8.0	2003	8.0	2005	8.0	2008	8.0	2011	8.0	2013	8.0
1991	8.0	1992	8.0	1993	8.0	1994	8.0	1997	8.0	1999	8.0	2002	8.0	2004	8.0	2006	8.0	2009	8.0	2012	8.0	2014	8.0
1992	8.0	1993	8.0	1994	8.0	1995	8.0	1998	8.0	2000	8.0	2003	8.0	2005	8.0	2007	8.0	2010	8.0	2013	8.0	2015	8.0
1993	8.0	1994	8.0	1995	8.0	1996	8.0	1999	8.0	2001	8.0	2004	8.0	2006	8.0	2008	8.0	2011	8.0	2014	8.0	2016	8.0
1994	8.0	1995	8.0	1996	8.0	1997	8.0	2000	8.0	2002	8.0	2005	8.0	2007	8.0	2009	8.0	2012	8.0	2015	8.0	2017	8.0
1995	8.0	1996	8.0	1997	8.0	1998	8.0	2001	8.0	2003	8.0	2006	8.0	2008	8.0	2010	8.0	2013	8.0	2016	8.0	2018	8.0
1996	8.0	1997	8.0	1998	8.0	1999	8.0	2002	8.0	2004	8.0	2007	8.0	2009	8.0	2011	8.0	2014	8.0	2017	8.0	2019	8.0
1997	8.0	1998	8.0	1999	8.0	2000	8.0	2003	8.0	2005	8.0	2008	8.0	2010	8.0	2012	8.0	2015	8.0	2018	8.0	2020	8.0

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F. Emissions are based on the January 1 mileage accumulation figures given in Table 1.7.4.

TABLE 1.8.1

NONTAMPERED EXHAUST EMISSION RATES FOR
LOW ALTITUDE
MOTORCYCLES

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	12,000 Mile Emission Level	24,000 Mile Emission Level
HC	Pre-1978	8.780	0.750	9.680	10.580
	1978-1979	2.400	1.440	4.128	5.856
	1980-1981	1.930	1.150	3.310	4.690
	1982-1984	1.650	0.950	2.790	3.930
	1985-1987	1.310	0.750	2.210	3.110
	1988+	1.200	0.700	2.040	2.880
CO	Pre-1978	33.420	3.220	37.284	41.148
	1978-1979	24.390	3.560	28.662	32.934
	1980-1981	17.510	2.530	20.546	23.582
	1982+	17.400	2.460	20.352	23.304
NOx	Pre-1978	0.250	0.030	0.286	0.322
	1978-1979	0.680	0.0	0.680	0.680
	1980+	0.850	0.0	0.850	0.850

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile,
ZML = Zero mile level in grams/mile,
DR = Deterioration rate in grams/mile/10K miles,
M = Cumulative mileage / 10,000 miles.

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TABLE 1.8.2

NONTAMPERED
CRANKCASE AND EVAPORATIVE HYDROCARBON EMISSIONS*
FOR LOW ALTITUDE
MOTORCYCLES

Model Years	Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
Pre-1978	0.31	4.01	6.53	6.14	12.02
1978-1979	0.0	9.01	8.79	13.79	16.17
1980-1981	0.0	9.64	9.13	14.75	16.80
1982-1984	0.0	9.95	9.24	15.22	17.00
1985+	0.0	9.90	9.35	15.15	17.20

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

Based on averages of 1.35 trips per day and 10.02 miles per day.

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TABLE 1.8.3

NONTAMPERED HOT STABILIZED IDLE EMISSIONS
FOR LOW ALTITUDE
MOTORCYCLES

* IER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate
HC	Pre-1978	117.00	25.20
	1978-1979	44.40	21.60
	1980+	35.40	22.80
CO	Pre-1978	259.80	13.80
	1978-1979	175.20	30.00
	1980+	140.40	15.60
NOx	Pre-1978	0.60	0.0
	1978-1979	1.80	0.0
	1980+	2.40	0.0

* WHERE : IER = Nontampered idle emissions in grams/hour,
ZML = Zero mile level in grams/hour
DR = Deterioration rate in grams/hour/10K miles,
M = Cumulative mileage / 10,000 miles.

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TABLE 1.8.4

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
LOW ALTITUDE
MOTORCYCLES

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per vehicle*)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.144	4786.	0.048	0.	0.
2	0.168	4475.	0.168	4786.	2393.
3	0.135	4164.	0.135	4475.	7023.
4	0.109	3853.	0.109	4164.	11343.
5	0.088	3543.	0.088	3853.	15351.
6	0.070	3232.	0.070	3543.	19049.
7	0.056	2921.	0.056	3232.	22437.
8	0.045	2611.	0.045	2921.	25513.
9	0.036	2300.	0.036	2611.	28279.
10	0.029	1989.	0.029	2300.	30735.
11	0.023	1678.	0.023	1989.	32879.
12	0.097	1368.	0.097	1678.	34713.
13	0.0	0.	0.0	1368.	36236.
14	0.0	0.	0.0	0.	36920.
15	0.0	0.	0.0	0.	36920.
16	0.0	0.	0.0	0.	36920.
17	0.0	0.	0.0	0.	36920.
18	0.0	0.	0.0	0.	36920.
19	0.0	0.	0.0	0.	36920.
20+	0.0	0.	0.0	0.	36920.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1, where: JMAR(1) = 0 and,
JMAR(MYI) = MAR(MYI-1), MYI = 2,...,20+.

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TABLE 1.8.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
LOW ALTITUDE
MOTORCYCLES
JANUARY 1, 1988

Model Years	(A) MC Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) MC Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.048	1.000	0.048	0.0	0.	0.0	0.0
1987	0.168	1.000	0.168	0.196	4786.	939.3	0.257
1986	0.135	1.000	0.135	0.158	4475.	705.8	0.193
1985	0.109	1.000	0.109	0.127	4164.	530.2	0.145
1984	0.088	1.000	0.088	0.103	3853.	396.1	0.108
1983	0.070	1.000	0.070	0.082	3543.	289.7	0.079
1982	0.056	1.000	0.056	0.065	3232.	211.4	0.058
1981	0.045	1.000	0.045	0.053	2921.	153.6	0.042
1980	0.036	1.000	0.036	0.042	2611.	109.8	0.030
1979	0.029	1.000	0.029	0.034	2300.	77.9	0.021
1978	0.023	1.000	0.023	0.027	1989.	53.4	0.015
1977	0.097	1.000	0.097	0.113	1678.	190.1	0.052
1976	0.0	1.000	0.0	0.0	1368.	0.0	0.0
1975	0.0	1.000	0.0	0.0	0.	0.0	0.0
1974	0.0	1.000	0.0	0.0	0.	0.0	0.0
1973	0.0	1.000	0.0	0.0	0.	0.0	0.0
1972	0.0	1.000	0.0	0.0	0.	0.0	0.0
1971	0.0	1.000	0.0	0.0	0.	0.0	0.0
1970	0.0	1.000	0.0	0.0	0.	0.0	0.0
1969-	0.0	1.000	0.0	0.0	0.	0.0	0.0
		DAF:	0.904		TFNORM:	3657.4	

WHERE :

A = January 1 registration mix from Table 1.8.4,
B = Gasoline fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 1.8.4.

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TABLE 1.8.6

SPEED CORRECTION FACTOR COEFFICIENTS FOR LOW ALTITUDE MOTORCYCLES

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = EXP(A + B*s + C*s**2+ D*S**3+ E*s**4+ F*s**5), HC & CO
= A + B*s + C*s**2+ D*s**3+ E*s**4 + F*s**5, NOx

Pollutant and Model Years	A	B	C	D	E	F
HC						
Pre-1978	0.231026E+01	-0.289572E+00	0.152990E-01	-0.446689E-03	0.648183E-05	-0.363456E-07
1978-1979	0.240873E+01	-0.308187E+00	0.168168E-01	-0.506843E-03	0.753855E-05	-0.431596E-07
1980+	0.225223E+01	-0.287778E+00	0.156820E-01	-0.473179E-03	0.707954E-05	-0.408456E-07
CO						
Pre-1978	0.233989E+01	-0.296978E+00	0.160071E-01	-0.477396E-03	0.706752E-05	-0.403978E-07
1978-1979	0.277804E+01	-0.319130E+00	0.153183E-01	-0.422327E-03	0.584948E-05	-0.314969E-07
1980+	0.270743E+01	-0.331038E+00	0.176179E-01	-0.538583E-03	0.817402E-05	-0.477803E-07
NOx						
Pre-1978	0.168635E+01	-0.118303E+00	0.654975E-02	-0.137139E-03	0.100849E-05	0.0
1978+	0.128169E+01	-0.804874E-01	0.535735E-02	-0.118891E-03	0.901060E-06	0.0

* WHERE : s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16].

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TABLE 1.8.7A

LOW (< 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
FOR LOW ALTITUDE
MOTORCYCLES

* TCF(b) = EXP [TC(b)*(T - 75.0)]

Pol	Model Years	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1978	-0.20623E-01	-0.24032E-02	-0.10081E-02
	1978-1979	-0.24462E-01	-0.32017E-02	-0.86884E-03
	1980+	-0.21255E-01	-0.52755E-03	0.93659E-03
CO	Pre-1978	-0.13487E-01	0.15784E-02	0.11097E-02
	1978-1979	-0.21126E-01	-0.15289E-02	0.15749E-02
	1980+	-0.20843E-01	-0.59951E-02	0.18253E-02
NOx	Pre-1978	-0.16897E-03	-0.89245E-02	-0.72580E-02
	1978+	-0.25074E-03	-0.59791E-02	-0.62690E-02

* WHERE :

TCF(b) = Low temperature correction factor for appropriate pollutant, ambient temperature (< 75F), and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = Low temperature correction factor coefficient for appropriate pollutant, reference temperature, and model year, for test segment b.

NOTE : The low temperature correction factor is used in conjunction with the correction factor given in Table 1.8.7C.

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TABLE 1.8.7B

HIGH (> 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
FOR LOW ALTITUDE
MOTORCYCLES

* TCF(b) = EXP [TC(b)*(T - 75.0)]

Pol	Model Years	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1978	-0.14381E-01	0.13219E-02	0.34799E-02
	1978-1979	-0.12552E-01	0.42667E-02	0.75843E-02
	1980+	-0.10888E-01	-0.47925E-03	0.76666E-02
CO	Pre-1978	-0.14691E-01	0.37462E-02	0.11014E-01
	1978-1979	-0.38767E-01	0.84685E-02	0.25179E-01
	1980+	-0.21165E-01	0.23603E-01	0.28483E-01
NOx	Pre-1978	0.38841E-02	-0.87325E-02	-0.10839E-01
	1978+	-0.10389E-02	-0.92466E-02	-0.10108E-01

* WHERE :

TCF(b) = High temperature correction factor for appropriate pollutant, ambient temperature, and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = High temperature correction factor coefficient for appropriate pollutant, temperature, and model year, for test segment b.

NOTE : The temperature correction factor is used in conjunction with the correction factor given in Table 1.8.7C.

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TABLE 1.8.7C

NORMALIZED BAG FRACTIONS FOR LOW ALTITUDE MOTORCYCLES

		Normalized Fractions							
	Model	Test Segment 1		Test Segment 2		Test Segment 3		Total Test	
Pol	Years	B1	D1	B2	D2	B3	D3	BO	DO
HC	Pre-1978	1.2823	0.1059	0.9726	0.0774	0.8393	0.0843	1.0000	0.0854
	1978-1979	1.2818	0.7474	0.9728	0.5470	0.8392	0.5929	1.0000	0.6012
	1980+	1.2829	0.7427	0.9713	0.5454	0.8414	0.5869	1.0000	0.5973
CO	Pre-1978	1.2772	0.1523	1.0172	0.0877	0.7580	0.0712	1.0000	0.0964
	1978-1979	1.2774	0.2308	1.0171	0.1324	0.7580	0.1078	1.0000	0.1459
	1980+	1.2776	0.2284	1.0171	0.1314	0.7579	0.1068	1.0000	0.1445
NOx	Pre-1978	1.1112	0.1984	0.7937	0.1191	1.3097	0.1191	1.0000	0.1191
	1978+	1.1118	0.0	0.7899	0.0	1.3166	0.0	1.0000	0.0

NOTE : The fractions given in this table are used in the calculation of the operating-mode/temperature correction factor (OMTCF).

WHERE :

OMTCF = [(TERM1 + TERM2 + TERM3)/DENOM],
TERM1 = W *TCF(1)*(B1+D1*M),
TERM2 = (1-W-X)*TCF(2)*(B2+D2*M),
TERM3 = X *TCF(3)*(B3+D3*M),
DENOM = BO + DO*M,
W = Fraction of VMT in the cold start mode,
X = Fraction of VMT in the hot start mode,
TCF(b) = Temperature correction factor for pollutant, model year, for test segment b,
M = Cumulative mileage / 10,000 miles.

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TABLE 1.8.10A

METHANE OFFSETS*
FOR LOW ALTITUDE
MOTORCYCLES

Model Years	Methane Offsets (Grams/Mile)
Pre-1978	0.530
1978-1979	0.270
1980+	0.240

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

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TABLE 1.8.11A

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BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
MOTORCYCLES
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	12.7	1967	12.7	1968	12.7	1969	12.7	1970	12.7	1971	12.7	1972	12.7	1973	12.7	1974	12.7	1975	12.7	1976	12.7	1977	12.7
1967	12.7	1968	12.7	1969	12.7	1970	12.7	1971	12.7	1972	12.7	1973	12.7	1974	12.7	1975	12.7	1976	12.7	1977	12.7	1978	9.1
1968	12.7	1969	12.7	1970	12.7	1971	12.7	1972	12.7	1973	12.7	1974	12.7	1975	12.7	1976	12.7	1977	12.7	1978	9.1	1979	9.1
1969	12.7	1970	12.7	1971	12.7	1972	12.7	1973	12.7	1974	12.7	1975	12.7	1976	12.7	1977	12.7	1978	9.1	1979	9.1	1980	7.6
1970	12.7	1971	12.7	1972	12.7	1973	12.7	1974	12.7	1975	12.7	1976	12.7	1977	12.7	1978	9.1	1979	9.1	1980	7.6	1981	7.6
1971	12.7	1972	12.7	1973	12.7	1974	12.7	1975	12.7	1976	12.7	1977	12.7	1978	9.1	1979	9.1	1980	7.6	1981	7.6	1982	6.6
1972	12.7	1973	12.7	1974	12.7	1975	12.7	1976	12.7	1977	12.7	1978	9.1	1979	9.1	1980	7.6	1981	7.6	1982	6.6	1983	6.6
1973	12.6	1974	12.6	1975	12.6	1976	12.6	1977	12.6	1978	9.0	1979	9.0	1980	7.5	1981	7.5	1982	6.6	1983	6.6	1984	6.6
1974	12.5	1975	12.5	1976	12.5	1977	12.5	1978	8.8	1979	8.8	1980	7.4	1981	7.4	1982	6.4	1983	6.4	1984	6.4	1985	5.4
1975	12.4	1976	12.4	1977	12.4	1978	8.5	1979	8.5	1980	7.1	1981	7.1	1982	6.2	1983	6.2	1984	6.2	1985	5.3	1986	5.3
1976	12.2	1977	12.2	1978	8.2	1979	8.2	1980	6.9	1981	6.9	1982	6.0	1983	6.0	1984	6.0	1985	5.1	1986	5.1	1987	5.1
1977	12.0	1978	7.8	1979	7.8	1980	6.6	1981	6.6	1982	5.8	1983	5.8	1984	5.8	1985	4.9	1986	4.9	1987	4.9	1988	4.7
1978	7.4	1979	7.4	1980	6.3	1981	6.3	1982	5.5	1983	5.5	1984	5.5	1985	4.7	1986	4.7	1987	4.7	1988	4.5	1989	4.5
1979	7.0	1980	5.9	1981	5.9	1982	5.3	1983	5.3	1984	5.3	1985	4.5	1986	4.5	1987	4.5	1988	4.2	1989	4.2	1990	4.2
1980	5.6	1981	5.6	1982	4.9	1983	4.9	1984	4.9	1985	4.2	1986	4.2	1987	4.2	1988	4.0	1989	4.0	1990	4.0	1991	4.0
1981	5.1	1982	4.6	1983	4.6	1984	4.6	1985	3.9	1986	3.9	1987	3.9	1988	3.7	1989	3.7	1990	3.7	1991	3.7	1992	3.7
1982	4.2	1983	4.2	1984	4.2	1985	3.6	1986	3.6	1987	3.6	1988	3.5	1989	3.5	1990	3.5	1991	3.5	1992	3.5	1993	3.5
1983	3.8	1984	3.8	1985	3.3	1986	3.3	1987	3.3	1988	3.2	1989	3.2	1990	3.2	1991	3.2	1992	3.2	1993	3.2	1994	3.2
1984	3.3	1985	3.0	1986	3.0	1987	3.0	1988	2.8	1989	2.8	1990	2.8	1991	2.8	1992	2.8	1993	2.8	1994	2.8	1995	2.8
1985	2.8	1986	2.8	1987	2.8	1988	2.7	1989	2.7	1990	2.7	1991	2.7	1992	2.7	1993	2.7	1994	2.7	1995	2.7	1996	2.7

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	9.1	1979	9.1	1980	7.6	1981	7.6	1984	6.6	1986	5.6	1989	5.3	1991	5.3	1993	5.3	1996	5.3	1999	5.3	2001	5.3
1979	9.1	1980	7.6	1981	7.6	1982	6.6	1985	5.6	1987	5.6	1990	5.3	1992	5.3	1994	5.3	1997	5.3	2000	5.3	2002	5.3
1980	7.6	1981	7.6	1982	6.6	1983	6.6	1986	5.6	1988	5.3	1991	5.3	1993	5.3	1995	5.3	1998	5.3	2001	5.3	2003	5.3
1981	7.6	1982	6.6	1983	6.6	1984	6.6	1987	5.6	1989	5.3	1992	5.3	1994	5.3	1996	5.3	1999	5.3	2002	5.3	2004	5.3
1982	6.6	1983	6.6	1984	6.6	1985	5.6	1988	5.3	1990	5.3	1993	5.3	1995	5.3	1997	5.3	2000	5.3	2003	5.3	2005	5.3
1983	6.6	1984	6.6	1985	5.6	1986	5.6	1989	5.3	1991	5.3	1994	5.3	1996	5.3	1998	5.3	2001	5.3	2004	5.3	2006	5.3
1984	6.6	1985	5.6	1986	5.6	1987	5.6	1990	5.3	1992	5.3	1995	5.3	1997	5.3	1999	5.3	2002	5.3	2005	5.3	2007	5.3
1985	5.5	1986	5.5	1987	5.5	1988	5.2	1991	5.2	1993	5.2	1996	5.2	1998	5.2	2000	5.2	2003	5.2	2006	5.2	2008	5.2
1986	5.4	1987	5.4	1988	5.1	1989	5.1	1992	5.1	1994	5.1	1997	5.1	1999	5.1	2001	5.1	2004	5.1	2007	5.1	2009	5.1
1987	5.3	1988	5.0	1989	5.0	1990	5.0	1993	5.0	1995	5.0	1998	5.0	2000	5.0	2002	5.0	2005	5.0	2008	5.0	2010	5.0
1988	4.8	1989	4.8	1990	4.8	1991	4.8	1994	4.8	1996	4.8	1999	4.8	2001	4.8	2003	4.8	2006	4.8	2009	4.8	2011	4.8
1989	4.7	1990	4.7	1991	4.7	1992	4.7	1995	4.7	1997	4.7	2000	4.7	2002	4.7	2004	4.7	2007	4.7	2010	4.7	2012	4.7
1990	4.5	1991	4.5	1992	4.5	1993	4.5	1996	4.5	1998	4.5	2001	4.5	2003	4.5	2005	4.5	2008	4.5	2011	4.5	2013	4.5
1991	4.2	1992	4.2	1993	4.2	1994	4.2	1997	4.2	1999	4.2	2002	4.2	2004	4.2	2006	4.2	2009	4.2	2012	4.2	2014	4.2
1992	4.0	1993	4.0	1994	4.0	1995	4.0	1998	4.0	2000	4.0	2003	4.0	2005	4.0	2007	4.0	2010	4.0	2013	4.0	2015	4.0
1993	3.7	1994	3.7	1995	3.7	1996	3.7	1999	3.7	2001	3.7	2004	3.7	2006	3.7	2008	3.7	2011	3.7	2014	3.7	2016	3.7
1994	3.5	1995	3.5	1996	3.5	1997	3.5	2000	3.5	2002	3.5	2005	3.5	2007	3.5	2009	3.5	2012	3.5	2015	3.5	2017	3.5
1995	3.2	1996	3.2	1997	3.2	1998	3.2	2001	3.2	2003	3.2	2006	3.2	2008	3.2	2010	3.2	2013	3.2	2016	3.2	2018	3.2
1996	2.8	1997	2.8	1998	2.8	1999	2.8	2002	2.8	2004	2.8	2007	2.8	2009	2.8	2011	2.8	2014	2.8	2017	2.8	2019	2.8
1997	2.7	1998	2.7	1999	2.7	2000	2.7	2003	2.7	2005	2.7	2008	2.7	2010	2.7	2012	2.7	2015	2.7	2018	2.7	2020	2.7

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start, 60 TO 84F diurnal, 75F for hot soak 9.0 psi fuel RVP, 54.57% average in-use fuel tank level. Emissions are based on January 1 mileage accumulation figures given in Table 1.8.4.

TABLE 1.8.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
MOTORCYCLES
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	45.3	1967	45.3	1968	45.3	1969	45.3	1970	45.3	1971	45.3	1972	45.3	1973	45.3	1974	45.3	1975	45.3	1976	45.3	1977	45.3
1967	45.3	1968	45.3	1969	45.3	1970	45.3	1971	45.3	1972	45.3	1973	45.3	1974	45.3	1975	45.3	1976	45.3	1977	45.3	1978	37.5
1968	45.3	1969	45.3	1970	45.3	1971	45.3	1972	45.3	1973	45.3	1974	45.3	1975	45.3	1976	45.3	1977	45.3	1978	37.5	1979	37.5
1969	45.3	1970	45.3	1971	45.3	1972	45.3	1973	45.3	1974	45.3	1975	45.3	1976	45.3	1977	45.3	1978	37.5	1979	37.5	1980	26.9
1970	45.3	1971	45.3	1972	45.3	1973	45.3	1974	45.3	1975	45.3	1976	45.3	1977	45.3	1978	37.5	1979	37.5	1980	26.9	1981	26.9
1971	45.3	1972	45.3	1973	45.3	1974	45.3	1975	45.3	1976	45.3	1977	45.3	1978	37.5	1979	37.5	1980	26.9	1981	26.9	1982	26.5
1972	45.3	1973	45.3	1974	45.3	1975	45.3	1976	45.3	1977	45.3	1978	37.5	1979	37.5	1980	26.9	1981	26.9	1982	26.5	1983	26.5
1973	45.1	1974	45.1	1975	45.1	1976	45.1	1977	45.1	1978	37.3	1979	37.3	1980	26.7	1981	26.7	1982	26.3	1983	26.3	1984	26.3
1974	44.6	1975	44.6	1976	44.6	1977	44.6	1978	36.8	1979	36.8	1980	26.3	1981	26.3	1982	25.9	1983	25.9	1984	25.9	1985	25.9
1975	44.0	1976	44.0	1977	44.0	1978	36.1	1979	36.1	1980	25.8	1981	25.8	1982	25.5	1983	25.5	1984	25.5	1985	25.5	1986	25.5
1976	43.3	1977	43.3	1978	35.3	1979	35.3	1980	25.3	1981	25.3	1982	25.0	1983	25.0	1984	25.0	1985	25.0	1986	25.0	1987	25.0
1977	42.5	1978	34.5	1979	34.5	1980	24.7	1981	24.7	1982	24.4	1983	24.4	1984	24.4	1985	24.4	1986	24.4	1987	24.4	1988	24.4
1978	33.5	1979	33.5	1980	24.0	1981	24.0	1982	23.7	1983	23.7	1984	23.7	1985	23.7	1986	23.7	1987	23.7	1988	23.7	1989	23.7
1979	32.4	1980	23.2	1981	23.2	1982	22.9	1983	22.9	1984	22.9	1985	22.9	1986	22.9	1987	22.9	1988	22.9	1989	22.9	1990	22.9
1980	22.3	1981	22.3	1982	22.1	1983	22.1	1984	22.1	1985	22.1	1986	22.1	1987	22.1	1988	22.1	1989	22.1	1990	22.1	1991	22.1
1981	21.4	1982	21.2	1983	21.2	1984	21.2	1985	21.2	1986	21.2	1987	21.2	1988	21.2	1989	21.2	1990	21.2	1991	21.2	1992	21.2
1982	20.2	1983	20.2	1984	20.2	1985	20.2	1986	20.2	1987	20.2	1988	20.2	1989	20.2	1990	20.2	1991	20.2	1992	20.2	1993	20.2
1983	19.1	1984	19.1	1985	19.1	1986	19.1	1987	19.1	1988	19.1	1989	19.1	1990	19.1	1991	19.1	1992	19.1	1993	19.1	1994	19.1
1984	18.0	1985	18.0	1986	18.0	1987	18.0	1988	18.0	1989	18.0	1990	18.0	1991	18.0	1992	18.0	1993	18.0	1994	18.0	1995	18.0
1985	17.4	1986	17.4	1987	17.4	1988	17.4	1989	17.4	1990	17.4	1991	17.4	1992	17.4	1993	17.4	1994	17.4	1995	17.4	1996	17.4

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	37.5	1979	37.5	1980	26.9	1981	26.9	1984	26.5	1986	26.5	1989	26.5	1991	26.5	1993	26.5	1996	26.5	1999	26.5	2001	26.5
1979	37.5	1980	26.9	1981	26.9	1982	26.5	1985	26.5	1987	26.5	1990	26.5	1992	26.5	1994	26.5	1997	26.5	2000	26.5	2002	26.5
1980	26.9	1981	26.9	1982	26.5	1983	26.5	1986	26.5	1988	26.5	1991	26.5	1993	26.5	1995	26.5	1998	26.5	2001	26.5	2003	26.5
1981	26.9	1982	26.5	1983	26.5	1984	26.5	1987	26.5	1989	26.5	1992	26.5	1994	26.5	1996	26.5	1999	26.5	2002	26.5	2004	26.5
1982	26.5	1983	26.5	1984	26.5	1985	26.5	1988	26.5	1990	26.5	1993	26.5	1995	26.5	1997	26.5	2000	26.5	2003	26.5	2005	26.5
1983	26.5	1984	26.5	1985	26.5	1986	26.5	1989	26.5	1991	26.5	1994	26.5	1996	26.5	1998	26.5	2001	26.5	2004	26.5	2006	26.5
1984	26.5	1985	26.5	1986	26.5	1987	26.5	1990	26.5	1992	26.5	1995	26.5	1997	26.5	1999	26.5	2002	26.5	2005	26.5	2007	26.5
1985	26.3	1986	26.3	1987	26.3	1988	26.3	1991	26.3	1993	26.3	1996	26.3	1998	26.3	2000	26.3	2003	26.3	2006	26.3	2008	26.3
1986	25.9	1987	25.9	1988	25.9	1989	25.9	1992	25.9	1994	25.9	1997	25.9	1999	25.9	2001	25.9	2004	25.9	2007	25.9	2009	25.9
1987	25.5	1988	25.5	1989	25.5	1990	25.5	1993	25.5	1995	25.5	1998	25.5	2000	25.5	2002	25.5	2005	25.5	2008	25.5	2010	25.5
1988	25.0	1989	25.0	1990	25.0	1991	25.0	1994	25.0	1996	25.0	1999	25.0	2001	25.0	2003	25.0	2006	25.0	2009	25.0	2011	25.0
1989	24.4	1990	24.4	1991	24.4	1992	24.4	1995	24.4	1997	24.4	2000	24.4	2002	24.4	2004	24.4	2007	24.4	2010	24.4	2012	24.4
1990	23.7	1991	23.7	1992	23.7	1993	23.7	1996	23.7	1998	23.7	2001	23.7	2003	23.7	2005	23.7	2008	23.7	2011	23.7	2013	23.7
1991	22.9	1992	22.9	1993	22.9	1994	22.9	1997	22.9	1999	22.9	2002	22.9	2004	22.9	2006	22.9	2009	22.9	2012	22.9	2014	22.9
1992	22.1	1993	22.1	1994	22.1	1995	22.1	1998	22.1	2000	22.1	2003	22.1	2005	22.1	2007	22.1	2010	22.1	2013	22.1	2015	22.1
1993	21.2	1994	21.2	1995	21.2	1996	21.2	1999	21.2	2001	21.2	2004	21.2	2006	21.2	2008	21.2	2011	21.2	2014	21.2	2016	21.2
1994	20.2	1995	20.2	1996	20.2	1997	20.2	2000	20.2	2002	20.2	2005	20.2	2007	20.2	2009	20.2	2012	20.2	2015	20.2	2017	20.2
1995	19.1	1996	19.1	1997	19.1	1998	19.1	2001	19.1	2003	19.1	2006	19.1	2008	19.1	2010	19.1	2013	19.1	2016	19.1	2018	19.1
1996	18.0	1997	18.0	1998	18.0	1999	18.0	2002	18.0	2004	18.0	2007	18.0	2009	18.0	2011	18.0	2014	18.0	2017	18.0	2019	18.0
1997	17.4	1998	17.4	1999	17.4	2000	17.4	2003	17.4	2005	17.4	2008	17.4	2010	17.4	2012	17.4	2015	17.4	2018	17.4	2020	17.4

*MY -- Indicates the model year.

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in table 1.8.4.

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TABLE 1.8.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR LOW ALTITUDE
MOTORCYCLES
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	0.4	1967	0.4	1968	0.4	1969	0.4	1970	0.4	1971	0.4	1972	0.4	1973	0.4	1974	0.4	1975	0.4	1976	0.4	1977	0.4
1967	0.4	1968	0.4	1969	0.4	1970	0.4	1971	0.4	1972	0.4	1973	0.4	1974	0.4	1975	0.4	1976	0.4	1977	0.4	1978	0.7
1968	0.4	1969	0.4	1970	0.4	1971	0.4	1972	0.4	1973	0.4	1974	0.4	1975	0.4	1976	0.4	1977	0.4	1978	0.7	1979	0.7
1969	0.4	1970	0.4	1971	0.4	1972	0.4	1973	0.4	1974	0.4	1975	0.4	1976	0.4	1977	0.4	1978	0.7	1979	0.7	1980	0.9
1970	0.4	1971	0.4	1972	0.4	1973	0.4	1974	0.4	1975	0.4	1976	0.4	1977	0.4	1978	0.7	1979	0.7	1980	0.9	1981	0.9
1971	0.4	1972	0.4	1973	0.4	1974	0.4	1975	0.4	1976	0.4	1977	0.4	1978	0.7	1979	0.7	1980	0.9	1981	0.9	1982	0.9
1972	0.4	1973	0.4	1974	0.4	1975	0.4	1976	0.4	1977	0.4	1978	0.7	1979	0.7	1980	0.9	1981	0.9	1982	0.9	1983	0.9
1973	0.4	1974	0.4	1975	0.4	1976	0.4	1977	0.4	1978	0.7	1979	0.7	1980	0.9	1981	0.9	1982	0.9	1983	0.9	1984	0.9
1974	0.4	1975	0.4	1976	0.4	1977	0.4	1978	0.7	1979	0.7	1980	0.9	1981	0.9	1982	0.9	1983	0.9	1984	0.9	1985	0.9
1975	0.4	1976	0.4	1977	0.4	1978	0.7	1979	0.7	1980	0.9	1981	0.9	1982	0.9	1983	0.9	1984	0.9	1985	0.9	1986	0.9
1976	0.4	1977	0.4	1978	0.7	1979	0.7	1980	0.9	1981	0.9	1982	0.9	1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9
1977	0.3	1978	0.7	1979	0.7	1980	0.9	1981	0.9	1982	0.9	1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9
1978	0.7	1979	0.7	1980	0.9	1981	0.9	1982	0.9	1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9
1979	0.7	1980	0.9	1981	0.9	1982	0.9	1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9
1980	0.9	1981	0.9	1982	0.9	1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9	1991	0.9
1981	0.9	1982	0.9	1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9
1982	0.9	1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9
1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9	1994	0.9
1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9	1994	0.9	1995	0.9
1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9	1994	0.9	1995	0.9	1996	0.9

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	0.7	1979	0.7	1980	0.9	1981	0.9	1984	0.9	1986	0.9	1989	0.9	1991	0.9	1993	0.9	1996	0.9	1999	0.9	2001	0.9
1979	0.7	1980	0.9	1981	0.9	1982	0.9	1985	0.9	1987	0.9	1990	0.9	1992	0.9	1994	0.9	1997	0.9	2000	0.9	2002	0.9
1980	0.9	1981	0.9	1982	0.9	1983	0.9	1986	0.9	1988	0.9	1991	0.9	1993	0.9	1995	0.9	1998	0.9	2001	0.9	2003	0.9
1981	0.9	1982	0.9	1983	0.9	1984	0.9	1987	0.9	1989	0.9	1992	0.9	1994	0.9	1996	0.9	1999	0.9	2002	0.9	2004	0.9
1982	0.9	1983	0.9	1984	0.9	1985	0.9	1988	0.9	1990	0.9	1993	0.9	1995	0.9	1997	0.9	2000	0.9	2003	0.9	2005	0.9
1983	0.9	1984	0.9	1985	0.9	1986	0.9	1989	0.9	1991	0.9	1994	0.9	1996	0.9	1998	0.9	2001	0.9	2004	0.9	2006	0.9
1984	0.9	1985	0.9	1986	0.9	1987	0.9	1990	0.9	1992	0.9	1995	0.9	1997	0.9	1999	0.9	2002	0.9	2005	0.9	2007	0.9
1985	0.9	1986	0.9	1987	0.9	1988	0.9	1991	0.9	1993	0.9	1996	0.9	1998	0.9	2000	0.9	2003	0.9	2006	0.9	2008	0.9
1986	0.9	1987	0.9	1988	0.9	1989	0.9	1992	0.9	1994	0.9	1997	0.9	1999	0.9	2001	0.9	2004	0.9	2007	0.9	2009	0.9
1987	0.9	1988	0.9	1989	0.9	1990	0.9	1993	0.9	1995	0.9	1998	0.9	2000	0.9	2002	0.9	2005	0.9	2008	0.9	2010	0.9
1988	0.9	1989	0.9	1990	0.9	1991	0.9	1994	0.9	1996	0.9	1999	0.9	2001	0.9	2003	0.9	2006	0.9	2009	0.9	2011	0.9
1989	0.9	1990	0.9	1991	0.9	1992	0.9	1995	0.9	1997	0.9	2000	0.9	2002	0.9	2004	0.9	2007	0.9	2010	0.9	2012	0.9
1990	0.9	1991	0.9	1992	0.9	1993	0.9	1996	0.9	1998	0.9	2001	0.9	2003	0.9	2005	0.9	2008	0.9	2011	0.9	2013	0.9
1991	0.9	1992	0.9	1993	0.9	1994	0.9	1997	0.9	1999	0.9	2002	0.9	2004	0.9	2006	0.9	2009	0.9	2012	0.9	2014	0.9
1992	0.9	1993	0.9	1994	0.9	1995	0.9	1998	0.9	2000	0.9	2003	0.9	2005	0.9	2007	0.9	2010	0.9	2013	0.9	2015	0.9
1993	0.9	1994	0.9	1995	0.9	1996	0.9	1999	0.9	2001	0.9	2004	0.9	2006	0.9	2008	0.9	2011	0.9	2014	0.9	2016	0.9
1994	0.9	1995	0.9	1996	0.9	1997	0.9	2000	0.9	2002	0.9	2005	0.9	2007	0.9	2009	0.9	2012	0.9	2015	0.9	2017	0.9
1995	0.9	1996	0.9	1997	0.9	1998	0.9	2001	0.9	2003	0.9	2006	0.9	2008	0.9	2010	0.9	2013	0.9	2016	0.9	2018	0.9
1996	0.9	1997	0.9	1998	0.9	1999	0.9	2002	0.9	2004	0.9	2007	0.9	2009	0.9	2011	0.9	2014	0.9	2017	0.9	2019	0.9
1997	0.9	1998	0.9	1999	0.9	2000	0.9	2003	0.9	2005	0.9	2008	0.9	2010	0.9	2012	0.9	2015	0.9	2018	0.9	2020	0.9

*MY Indicates the model year.

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in table 1.8.4.

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TABLE 2.1.1A

NONTAMPERED EXHAUST EMISSION RATES FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* BER = ZML + (DR1 * M), for M ≤ 50K Miles.
= ZML + DR1*5.0 + DR2*(M - 5.0), for M > 50K Miles

Pol	Model Years	Zero Mile Emission Level	Det. Rate 1	Det. Rate 2	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1968	9.350	0.180	0.180	10.250	11.150
	1968-1969	5.600	0.250	0.250	6.850	8.100
	1970-1971	4.580	0.370	0.370	6.430	8.280
	1972-1974	4.620	0.160	0.160	5.420	6.220
	1975-1976	2.000	0.280	0.280	3.400	4.800
	1977	0.930	0.280	0.280	2.330	3.730
	1978-1979	2.080	0.280	0.280	3.480	4.880
	1980	0.780	0.100	0.100	1.280	1.780
	1981	0.565	0.079	0.108	0.960	1.500
	1982	0.446	0.074	0.101	0.816	1.321
	1983	0.269	0.062	0.085	0.579	1.004
	1984	0.242	0.067	0.088	0.577	1.017
	1985	0.254	0.063	0.084	0.569	0.989
	1986	0.265	0.060	0.081	0.565	0.970
	1987	0.264	0.060	0.081	0.564	0.969
	1988	0.267	0.059	0.080	0.562	0.962
	1989	0.269	0.059	0.079	0.564	0.959
	1990	0.271	0.058	0.078	0.561	0.951
	1991	0.275	0.057	0.077	0.560	0.945
	1992+	0.278	0.056	0.076	0.558	0.938
CO	Pre-1968	117.700	2.250	2.250	128.950	140.200
	1968-1969	85.540	2.550	2.550	98.290	111.040
	1970-1971	79.640	3.130	3.130	95.290	110.940
	1972-1974	75.680	2.350	2.350	87.430	99.180
	1975-1976	47.030	2.460	2.460	59.330	71.630
	1977	19.630	2.460	2.460	31.930	44.230
	1978-1979	41.830	2.460	2.460	54.130	66.430
	1980	22.800	0.730	0.730	26.450	30.100
	1981	12.532	1.147	1.765	18.267	27.092
	1982	9.742	1.079	1.616	15.137	23.217
	1983	3.280	0.760	1.013	7.080	12.145
	1984	3.162	0.840	1.052	7.362	12.622
	1985	3.217	0.803	1.014	7.232	12.302
	1986	3.264	0.771	0.982	7.119	12.029
	1987	3.242	0.786	0.983	7.172	12.087
	1988	3.251	0.780	0.973	7.151	12.016
	1989	3.259	0.774	0.967	7.129	11.964
	1990	3.267	0.769	0.961	7.112	11.917
	1991	3.284	0.757	0.949	7.069	11.814
	1992+	3.298	0.748	0.939	7.038	11.733
NOx	Pre-1968	1.960	0.0	0.0	1.960	1.960
	1968-1972	2.910	0.0	0.0	2.910	2.910
	1973-1974	1.920	0.050	0.050	2.170	2.420
	1975-1976	1.700	0.040	0.040	1.900	2.100
	1977	1.370	0.110	0.110	1.920	2.470
	1978-1979	0.970	0.110	0.110	1.520	2.070
	1980	0.820	0.070	0.070	1.170	1.520
	1981	0.505	0.067	0.067	0.840	1.175
	1982	0.627	0.071	0.071	0.982	1.337
	1983	0.784	0.039	0.039	0.979	1.174
	1984	0.789	0.035	0.035	0.964	1.139
	1985	0.789	0.035	0.035	0.964	1.139
	1986	0.789	0.035	0.035	0.964	1.139
	1987	0.791	0.034	0.034	0.961	1.131
	1988	0.791	0.034	0.034	0.961	1.131
	1989	0.791	0.034	0.034	0.961	1.131
	1990	0.791	0.034	0.034	0.961	1.131
	1991	0.791	0.034	0.034	0.961	1.131
	1992+	0.791	0.034	0.034	0.961	1.131

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile.
ZML = Zero mile level in grams/mile.
DR1 = Deterioration rate for ≤ 50K miles, in grams/mile/10K miles.
DR2 = Deterioration rate for > 50K miles, in grams/mile/10K miles.
M = Cumulative mileage / 10,000 miles.

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TABLE 2.1.1B

EXHAUST EMISSION RATES FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
AT VARIOUS MILEAGE LEVELS
(RATES INCLUDE TAMPERING)

Pol	Model Years	Emission Rate (Grams/Mile) 0K	25K	50K	75K	100K	125K	150K
HC	Pre-1968	9.350	9.800	10.250	10.700	11.150	11.600	12.050
	1968-1969	5.600	6.228	6.859	7.491	8.122	8.754	9.385
	1970-1971	4.580	5.508	6.439	7.371	8.302	9.234	10.165
	1972	4.620	5.025	5.439	5.852	6.265	6.678	7.091
	1973-1974	4.620	5.036	5.476	5.915	6.355	6.794	7.234
	1975	2.106	2.984	3.897	4.816	5.738	6.661	7.584
	1976	2.112	2.998	3.915	4.839	5.765	6.692	7.619
	1977	1.042	1.928	2.840	3.756	4.673	5.592	6.511
	1978-1979	2.199	3.093	4.011	4.935	5.860	6.788	7.715
	1980	0.897	1.335	1.813	2.305	2.802	3.298	3.795
	1981	0.577	0.814	1.070	1.475	1.880	2.286	2.695
	1982	0.458	0.682	0.924	1.308	1.691	2.076	2.463
	1983	0.280	0.474	0.684	1.020	1.356	1.693	2.033
	1984	0.253	0.456	0.675	1.011	1.347	1.684	2.023
	1985	0.265	0.458	0.667	0.993	1.319	1.646	1.975
	1986	0.276	0.460	0.659	0.965	1.272	1.579	1.887
	1987	0.275	0.459	0.656	0.956	1.257	1.557	1.859
	1988	0.278	0.459	0.654	0.952	1.250	1.548	1.847
	1989	0.280	0.461	0.656	0.951	1.247	1.542	1.839
	1990	0.282	0.461	0.653	0.946	1.239	1.532	1.826
	1991	0.286	0.462	0.652	0.942	1.233	1.523	1.815
	1992+	0.289	0.463	0.650	0.938	1.226	1.514	1.803
CO	Pre-1968	117.700	123.325	128.950	134.575	140.200	145.825	151.450
	1968-1969	85.540	91.976	98.498	105.020	111.542	118.063	124.585
	1970-1971	79.640	87.529	95.507	103.485	111.463	119.441	127.419
	1972	75.680	81.683	87.866	94.049	100.231	106.414	112.597
	1973-1974	75.680	81.940	88.738	95.536	102.334	109.132	115.930
	1975	48.010	55.885	64.450	73.127	81.831	90.546	99.267
	1976	48.071	55.974	64.477	73.091	81.733	90.387	99.047
	1977	20.671	28.574	36.957	45.414	53.889	62.378	70.874
	1978-1979	42.933	50.864	59.244	67.717	76.213	84.723	93.240
	1980	23.874	27.377	31.656	36.161	40.721	45.288	49.860
	1981	12.597	15.790	19.278	25.568	31.859	38.162	44.486
	1982	9.806	12.820	16.112	21.937	27.761	33.597	39.452
	1983	3.342	5.539	7.986	12.121	16.255	20.399	24.558
	1984	3.211	5.570	8.163	12.276	16.390	20.511	24.646
	1985	3.266	5.533	8.033	12.051	16.070	20.096	24.136
	1986	3.313	5.475	7.821	11.447	15.074	18.705	22.346
	1987	3.291	5.479	7.824	11.297	14.770	18.247	21.731
	1988	3.300	5.473	7.803	11.251	14.699	18.151	21.610
	1989	3.308	5.466	7.781	11.214	14.647	18.084	21.528
	1990	3.316	5.461	7.764	11.182	14.600	18.022	21.451
	1991	3.333	5.448	7.721	11.109	14.497	17.889	21.288
	1992+	3.347	5.440	7.690	11.053	14.416	17.783	21.157
NOx	Pre-1968	1.960	1.960	1.960	1.960	1.960	1.960	1.960
	1968-1972	2.910	2.910	2.910	2.910	2.910	2.910	2.910
	1973	1.982	2.143	2.304	2.465	2.625	2.786	2.947
	1974	1.990	2.155	2.320	2.486	2.651	2.816	2.982
	1975-1976	1.895	2.108	2.321	2.533	2.746	2.959	3.171
	1977	1.567	1.956	2.345	2.734	3.122	3.511	3.900
	1978-1979	1.167	1.556	1.945	2.334	2.722	3.111	3.500
	1980	1.046	1.351	1.657	1.962	2.268	2.573	2.879
	1981	0.508	0.702	0.909	1.166	1.423	1.680	1.937
	1982	0.630	0.834	1.052	1.320	1.588	1.855	2.123
	1983	0.787	0.912	1.051	1.241	1.431	1.622	1.812
	1984-1986	0.793	0.913	1.048	1.242	1.436	1.630	1.824
	1987+	0.795	0.912	1.044	1.234	1.423	1.613	1.803

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TABLE 2.1.2A

NONTAMPERED
CRANKCASE AND EVAPORATIVE HYDROCARBON EMISSIONS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
Pre-1963	5.29	19.07	33.90	29.18	62.39
1963-1967	1.03	19.07	33.90	29.18	62.39
1968-1970	0.0	19.07	33.90	29.18	62.39
1971	0.0	14.18	21.16	20.99	50.15
1972-1976	0.0	14.07	17.15	20.96	44.93
1977	0.0	8.27	8.98	12.32	23.53
1978-1980	0.0	6.37	13.36	11.15	36.85
1981	0.0	4.93	5.98	9.57	29.19
1982	0.0	2.34	2.97	4.57	14.50
1983	0.0	2.18	2.93	4.29	14.27
1984	0.0	1.54	2.22	3.08	10.81
1985	0.0	1.38	2.12	2.98	10.33
1986	0.0	1.25	2.05	2.85	9.99
1987	0.0	1.16	2.00	2.80	9.73
1988	0.0	1.10	1.95	2.78	9.50
1989	0.0	1.07	1.93	2.75	9.43
1990	0.0	1.04	1.91	2.77	9.30
1991	0.0	0.99	1.86	2.77	9.08
1992+	0.0	0.95	1.84	2.74	8.96

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

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TABLE 2.1.2B

TAMPERING OFFSETS FOR TOTAL
CRANKCASE AND EVAPORATIVE HC EMISSIONS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
AT VARIOUS MILEAGE INTERVALS

Fuel RVP	Model Years	Tampering Offset (Grams/Mile)** 0K	25K	50K	75K	100K	125K	150K
9.0	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1969	0.0	0.00	0.01	0.02	0.03	0.04	0.05
	1970	0.0	0.01	0.05	0.09	0.13	0.16	0.20
	1971-1973	0.0	0.01	0.05	0.09	0.13	0.17	0.21
	1974-1975	0.0	0.01	0.05	0.09	0.13	0.17	0.21
	1976	0.0	0.01	0.05	0.10	0.14	0.18	0.22
	1977-1978	0.0	0.02	0.07	0.13	0.18	0.24	0.29
	1979	0.0	0.02	0.07	0.13	0.18	0.24	0.29
	1980	0.0	0.02	0.07	0.12	0.17	0.22	0.27
	1981	0.0	0.02	0.08	0.14	0.20	0.26	0.32
	1982	0.0	0.02	0.08	0.13	0.19	0.25	0.31
	1983	0.0	0.01	0.06	0.11	0.15	0.20	0.24
	1984	0.0	0.01	0.06	0.10	0.14	0.19	0.23
	1985	0.0	0.01	0.06	0.10	0.14	0.18	0.22
	1986	0.0	0.01	0.05	0.09	0.13	0.17	0.21
	1987	0.0	0.01	0.05	0.09	0.13	0.17	0.21
	1988	0.0	0.01	0.05	0.09	0.13	0.17	0.21
	1989	0.0	0.01	0.05	0.09	0.13	0.17	0.20
	1990	0.0	0.01	0.05	0.09	0.13	0.16	0.20
	1991+	0.0	0.01	0.05	0.09	0.12	0.16	0.20
11.5	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1969	0.0	0.00	0.01	0.02	0.03	0.04	0.05
	1970	0.0	0.02	0.09	0.16	0.22	0.29	0.36
	1971-1973	0.0	0.02	0.08	0.14	0.19	0.25	0.31
	1974-1975	0.0	0.02	0.08	0.14	0.19	0.25	0.31
	1976	0.0	0.02	0.09	0.15	0.22	0.29	0.36
	1977-1978	0.0	0.02	0.09	0.16	0.23	0.30	0.37
	1979	0.0	0.02	0.09	0.16	0.23	0.30	0.37
	1980	0.0	0.02	0.09	0.16	0.24	0.31	0.38
	1981	0.0	0.03	0.13	0.22	0.32	0.41	0.51
	1982	0.0	0.03	0.12	0.21	0.31	0.40	0.49
	1983	0.0	0.02	0.09	0.16	0.23	0.30	0.37
	1984	0.0	0.02	0.09	0.16	0.22	0.29	0.35
	1985	0.0	0.02	0.09	0.15	0.21	0.27	0.34
	1986	0.0	0.02	0.08	0.14	0.21	0.27	0.33
	1987	0.0	0.02	0.08	0.14	0.20	0.26	0.32
	1988	0.0	0.02	0.08	0.14	0.20	0.26	0.31
	1989	0.0	0.02	0.08	0.14	0.19	0.25	0.31
	1990	0.0	0.02	0.08	0.13	0.19	0.25	0.30
	1991+	0.0	0.02	0.08	0.13	0.19	0.24	0.30

* Based on calculated hot soak temperature of 82.0F,
Diurnal temperature rise from 60.0 to 84.0F,
Fuel RVPs of 9.0 and 11.5 psi with no weathering, tank level of 40.0%.

** Based on averages of 4.21 trips per day and 25.35 miles per day.

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TABLE 2.1.2C

NONTAMPERED
RUNNING LOSS EMISSIONS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Pre-1971	7.0	0.36	0.52	1.13	2.16
	9.0	0.58	1.50	2.62	4.81
	10.4	1.06	2.70	4.00	5.63
	11.7	2.88	3.85	8.20	13.64
1971-1977	7.0	0.30	0.49	1.04	1.60
	9.0	0.49	1.15	2.37	3.60
	10.4	0.85	2.04	2.96	4.10
	11.7	2.15	2.85	5.97	9.87
1978-1980	7.0	0.24	0.42	0.97	1.39
	9.0	0.39	1.20	2.21	2.88
	10.4	0.68	1.70	2.38	3.23
	11.7	1.72	2.30	4.79	7.90
1981+	7.0	0.15	0.20	0.30	0.65
	9.0	0.24	0.40	0.70	2.05
	10.4	0.42	0.97	1.66	2.52
	11.7	1.16	1.60	3.40	5.65

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TABLE 2.1.2D

REFUELING EMISSIONS* FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Fuel Economy (miles/gal)	Uncontrolled (grams/mile)	With Volatility Control** (grams/mile)	With Onboard** (grams/mile)	With both Volatility and Onboard** (grams/mile)
Pre-1970	12.7	0.45	0.45	0.45	0.45
1970	12.8	0.45	0.45	0.45	0.45
1971	12.3	0.47	0.47	0.47	0.47
1972	12.4	0.47	0.47	0.47	0.47
1973-1974	12.2	0.47	0.47	0.47	0.47
1975	13.5	0.43	0.43	0.43	0.43
1976	14.9	0.39	0.39	0.39	0.39
1977	15.6	0.37	0.37	0.37	0.37
1978	17.0	0.34	0.34	0.34	0.34
1979	17.2	0.34	0.34	0.34	0.34
1980	19.8	0.29	0.29	0.29	0.29
1981	21.2	0.27	0.27	0.27	0.27
1982	21.9	0.26	0.26	0.26	0.26
1983	21.7	0.27	0.27	0.27	0.27
1984	22.0	0.26	0.26	0.26	0.26
1985	22.6	0.26	0.26	0.26	0.26
1986	23.3	0.25	0.25	0.25	0.25
1987	23.6	0.24	0.24	0.24	0.24
1988	23.7	0.24	0.24	0.24	0.24
1989-1991	23.6	0.24	0.24	0.24	0.24
1992	23.6	0.24	0.19	0.24	0.02
1993-1996	23.5	0.25	0.20	0.02	0.02
1997-1999	23.4	0.25	0.20	0.02	0.02
2000+	23.3	0.25	0.20	0.02	0.02

* Refueling Emissions (g/mi) = [Displacement (g/gal) + Spillage (g/gal)] / Fuel Economy (mi/gal).

** Volatility control assumed to start in 1992, with 7.0/7.8/9.0 RVP fuels for ASTM class A/B/C cities. Onboard assumed to start in 1993, and apply to LDGVs, LDGTs, and HDGVs.

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TABLE 2.1.3

HOT STABILIZED IDLE EMISSIONS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Pol	Model Years	Emission Rate (Grams/Hour) Nontampered Zero Mile	Nontampered 50,000 Mile	Nontampered 100,000 Mile	In-use Level* 50,000 Mile	In-use Level* 100,000 Mile
HC	Pre-1968	97.80	106.80	115.80	108.15	121.40
	1968-1969	45.60	63.60	81.60	64.95	87.20
	1970-1971	42.60	63.60	84.60	64.95	90.20
	1972-1974	44.40	56.40	68.40	57.75	74.00
	1975-1976	16.20	37.20	58.20	38.55	63.80
	1977	13.96	38.74	63.67	40.09	69.27
	1978-1979	31.23	57.86	83.30	59.21	88.90
	1980	11.24	16.08	21.49	17.44	27.09
	1981	7.44	13.82	22.33	15.17	27.93
	1982	5.88	11.76	19.74	13.12	25.34
	1983	5.07	9.89	16.22	11.24	21.82
	1984	4.54	9.59	15.91	10.94	21.51
	1985	4.31	9.21	15.59	10.56	21.20
	1986	3.62	8.42	14.89	9.77	20.49
	1987	3.44	8.25	14.75	9.60	20.35
	1988	3.37	8.15	14.67	9.50	20.28
	1989	3.35	8.15	14.66	9.50	20.26
	1990	3.34	8.09	14.58	9.44	20.19
	1991	3.32	8.04	14.58	9.39	20.18
	1992+	3.29	7.97	14.52	9.32	20.12
CO	Pre-1968	958.80	1078.80	1198.80	1084.86	1233.03
	1968-1969	674.40	863.40	1052.40	869.46	1086.63
	1970-1971	775.80	1039.80	1303.80	1045.86	1338.03
	1972-1974	839.40	1067.40	1295.40	1073.46	1329.63
	1975-1976	445.20	700.20	955.20	706.26	989.43
	1977	354.94	555.38	777.48	561.43	811.71
	1978-1979	663.38	914.56	1148.25	920.62	1182.48
	1980	264.22	307.44	351.34	313.50	385.57
	1981	129.44	242.22	402.46	248.28	436.70
	1982	101.88	199.11	342.20	205.16	376.43
	1983	41.67	106.24	194.65	112.30	228.89
	1984	38.87	108.48	198.61	114.54	232.84
	1985	37.17	94.95	180.80	101.00	215.03
	1986	30.69	64.70	147.00	70.76	181.23
	1987	29.34	60.90	142.50	66.96	176.73
	1988	28.16	57.21	137.46	63.27	171.70
	1989	27.74	55.61	135.18	61.66	169.42
	1990	27.19	54.02	132.92	60.08	167.16
	1991	26.18	50.74	128.26	56.80	162.50
	1992+	25.48	48.23	124.66	54.28	158.89
NOx	Pre-1968	6.60	6.60	6.60	6.63	6.75
	1968-1972	5.40	5.40	5.40	5.43	5.55
	1973-1976	4.20	4.20	4.20	4.23	4.35
	1977-1979	3.98	3.98	3.98	4.01	4.13
	1980	7.23	7.23	7.23	7.26	7.38
	1981	6.85	6.85	6.85	6.88	7.00
	1982	6.41	6.41	6.41	6.44	6.56
	1983	2.07	2.07	2.07	2.10	2.22
	1984	2.00	2.00	2.00	2.03	2.15
	1985	1.93	1.93	1.93	1.96	2.08
	1986	1.78	1.78	1.78	1.81	1.93
	1987	1.72	1.72	1.72	1.75	1.87
	1988	1.66	1.66	1.66	1.69	1.81
	1989	1.64	1.64	1.64	1.67	1.79
	1990	1.62	1.62	1.62	1.65	1.77
	1991	1.57	1.57	1.57	1.60	1.72
	1992+	1.54	1.54	1.54	1.57	1.69

* In-use emission level includes tampering.

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TABLE 2.1.4A

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per vehicle*)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.062	13118.	0.021	13118.	1640.
2	0.082	12408.	0.082	12940.	9816.
3	0.079	11737.	0.079	12240.	22403.
4	0.075	11103.	0.075	11578.	34309.
5	0.071	10503.	0.071	10953.	45571.
6	0.067	9935.	0.067	10361.	56225.
7	0.063	9398.	0.063	9801.	66303.
8	0.060	8889.	0.060	9271.	75837.
9	0.056	8409.	0.056	8769.	84854.
10	0.052	7954.	0.052	8295.	93383.
11	0.048	7524.	0.048	7846.	101452.
12	0.045	7117.	0.045	7422.	109084.
13	0.041	6733.	0.041	7021.	116303.
14	0.037	6369.	0.037	6642.	123133.
15	0.033	6024.	0.033	6283.	129593.
16	0.029	5698.	0.029	5943.	135704.
17	0.026	5390.	0.026	5621.	141484.
18	0.022	5099.	0.022	5317.	146951.
19	0.018	4823.	0.018	5030.	152124.
20+	0.034	4562.	0.034	4758.	157016.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1, where: JMAR(1) = MAR(1) and,
JMAR(MYI) = .25*MAR(MYI) + .75*MAR(MYI-1), MYI = 2,...,20+.

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TABLE 2.1.4C

TRIPS PER DAY AND MILES PER DAY FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Year Index*	Trips per Day	Miles per Day
1	4.66	35.94
2	4.60	35.45
3	4.54	33.53
4	4.48	31.72
5	4.43	30.01
6	4.37	28.39
7	4.31	26.85
8	4.25	25.40
9	4.19	24.02
10	4.13	22.73
11	4.08	21.50
12	4.02	20.33
13	3.96	19.24
14	3.90	18.20
15	3.84	17.21
16	3.78	16.28
17	3.72	15.40
18	3.67	14.57
19	3.61	13.78
20+	3.55	13.03

* The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

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TABLE 2.1.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
JANUARY 1, 1988

Model Years	(A) LDV Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) LDGV Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.021	0.990	0.020	0.022	13118.	284.2	0.031
1987	0.082	0.996	0.082	0.086	12940.	1119.1	0.121
1986	0.079	0.996	0.079	0.083	12240.	1019.8	0.110
1985	0.075	0.991	0.074	0.079	11578.	911.2	0.098
1984	0.071	0.988	0.070	0.074	10953.	813.6	0.088
1983	0.067	0.986	0.066	0.070	10361.	724.8	0.078
1982	0.063	0.961	0.061	0.064	9801.	628.3	0.068
1981	0.060	0.940	0.056	0.060	9271.	553.7	0.060
1980	0.056	0.955	0.053	0.057	8769.	496.6	0.054
1979	0.052	0.974	0.051	0.054	8295.	444.9	0.048
1978	0.048	0.991	0.048	0.050	7846.	395.2	0.043
1977	0.045	0.997	0.045	0.048	7422.	352.6	0.038
1976	0.041	0.997	0.041	0.043	7021.	303.9	0.033
1975	0.037	0.997	0.037	0.039	6642.	259.4	0.028
1974	0.033	0.997	0.033	0.035	6283.	218.9	0.024
1973	0.029	0.998	0.029	0.031	5943.	182.1	0.020
1972	0.026	0.998	0.026	0.027	5621.	154.4	0.017
1971	0.022	0.999	0.022	0.023	5317.	123.7	0.013
1970	0.018	1.000	0.018	0.019	5030.	95.9	0.010
1969-	0.034	1.000	0.034	0.036	4758.	171.3	0.019
		DAF:	0.944		TFNORM:	9253.6	

WHERE :

A = January 1 registration mix from Table 2.1.4A,
B = Gasoline fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 2.1.4A.

NOTE : In general, the travel weighting fractions will change for every calendar year since the sales fraction (column B) changes for almost every model year.

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TABLE 2.1.6A

SPEED CORRECTION FACTOR COEFFICIENTS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = EXP(A + B*s + C*s**2+ D*S**3+ E*s**4+ F*s**5), HC & CO
= A + B*s + C*s**2+ D*s**3+ E*s**4 + F*s**5, NOx

Pollutant and Model Years	A	B	C	D	E	F
HC						
Pre-1968	0.224612E+01	-0.290973E+00	0.158890E-01	-0.472494E-03	0.694077E-05	-0.392798E-07
1968	0.202779E+01	-0.273049E+00	0.153577E-01	-0.460304E-03	0.678527E-05	-0.384880E-07
1969	0.215056E+01	-0.283620E+00	0.153836E-01	-0.442136E-03	0.628732E-05	-0.346311E-07
1970	0.223021E+01	-0.293648E+00	0.162356E-01	-0.484148E-03	0.711591E-05	-0.402861E-07
1971	0.212230E+01	-0.291072E+00	0.169089E-01	-0.526148E-03	0.802705E-05	-0.470117E-07
1972	0.215361E+01	-0.283451E+00	0.156948E-01	-0.469759E-03	0.693832E-05	-0.394707E-07
1973-1974	0.211340E+01	-0.285676E+00	0.163180E-01	-0.500793E-03	0.755067E-05	-0.437187E-07
1975-1976	0.239540E+01	-0.335781E+00	0.211609E-01	-0.731550E-03	0.120715E-04	-0.748567E-07
CO						
Pre-1968	0.181978E+01	-0.254663E+00	0.152347E-01	-0.487397E-03	0.758207E-05	-0.449514E-07
1968	0.186919E+01	-0.276679E+00	0.172335E-01	-0.558279E-03	0.871678E-05	-0.516980E-07
1969	0.182133E+01	-0.272054E+00	0.170304E-01	-0.552021E-03	0.862543E-05	-0.511440E-07
1970	0.201421E+01	-0.295188E+00	0.186353E-01	-0.621606E-03	0.993657E-05	-0.599779E-07
1971	0.204533E+01	-0.310618E+00	0.204852E-01	-0.708527E-03	0.116215E-04	-0.715690E-07
1972	0.231868E+01	-0.341147E+00	0.209446E-01	-0.665891E-03	0.102225E-04	-0.598265E-07
1973-1974	0.215487E+01	-0.329116E+00	0.210112E-01	-0.689057E-03	0.108390E-04	-0.647125E-07
1975-1976	0.248747E+01	-0.391562E+00	0.270721E-01	-0.976178E-03	0.165270E-04	-0.104317E-06
NOx						
Pre-1968	0.244424E+01	-0.250107E+00	0.138293E-01	-0.287025E-03	0.207585E-05	0.0
1968	0.188656E+01	-0.161289E+00	0.904995E-02	-0.185609E-03	0.132555E-05	0.0
1969	0.155777E+01	-0.113032E+00	0.671832E-02	-0.143409E-03	0.106079E-05	0.0
1970	0.204516E+01	-0.194014E+00	0.110736E-01	-0.231754E-03	0.168372E-05	0.0
1971	0.163262E+01	-0.121861E+00	0.703020E-02	-0.146293E-03	0.106141E-05	0.0
1972	0.144825E+01	-0.122444E+00	0.795024E-02	-0.171078E-03	0.125777E-05	0.0
1973-1974	0.153447E+01	-0.125671E+00	0.785919E-02	-0.169428E-03	0.125494E-05	0.0
1975-1976	0.942131E+00	-0.423240E-01	0.386253E-02	-0.939853E-04	0.753883E-06	0.0

* WHERE : s = average speed (mph).
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w. [1/sadj = (w+x)/26 + (1-w-x)/16].

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TABLE 2.1.6B

SPEED CORRECTION FACTOR COEFFICIENTS FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = A/s + B, HC & CO
= EXP(A + B*s + C*s**2), NOx

Pollutant	Speed	Model Years	Coefficient A	B	C
HC	Low	1977-1979	37.95604	0.0	
		1980	10.60380	0.0	
		1981	10.82023	0.0	
		1982	10.88869	0.0	
		1983	8.74266	-0.07927	
		1984	8.92062	-0.08068	
		1985	7.76209	-0.06197	
		1986	5.23198	-0.02100	
		1987	4.98885	-0.01610	
		1988	4.78677	-0.01203	
		1989	4.70467	-0.01037	
		1990	4.62258	-0.00872	
		1991	4.45523	-0.00535	
		1992+	4.32577	-0.00274	
	High	1977+	8.10000	0.0	
CO	Low	1977-1979	490.98633	-1.97820	
		1980	107.24390	0.96562	
		1981	113.27760	0.86151	
		1982	117.23621	0.75511	
		1983	87.77820	-0.14450	
		1984	91.78729	-0.10426	
		1985	73.35860	0.60021	
		1986	33.19730	2.14936	
		1987	30.11700	2.39638	
		1988	27.55679	2.60169	
		1989	26.51669	2.68510	
		1990	25.47659	2.76850	
		1991	23.35629	2.93853	
		1992+	21.71620	3.07006	
	High	1977+	60.00000	0.0	
NOx	All	1977-1979	1.04330	-0.026082	0.00042835
		1980	0.18957	-0.033673	0.00047036
		1981	0.20906	-0.033673	0.00047036
		1982	0.22795	-0.033673	0.00047036
		1983	-0.02994	-0.023254	0.00017100
		1984	-0.03852	-0.022703	0.00016500
		1985	-0.04694	-0.023881	0.00017700
		1986	-0.06606	-0.026426	0.00020485
		1987	-0.07443	-0.026426	0.00020485
		1988	-0.08138	-0.026426	0.00020485
		1989	-0.08420	-0.026426	0.00020485
		1990	-0.08703	-0.026426	0.00020485
		1991	-0.09279	-0.026426	0.00020485
		1992+	-0.09724	-0.026426	0.00020485

* WHERE: s = average speed (mph).
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w. [1/sadj = (w+x)/26 + (1-w-x)/16].
Low = average speed ≤ 19.6 mph.
High = average speed > 19.6 mph.

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TABLE 2.1.7A

LOW (< 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* TCF(1) = TC(1)*(T - 75.0), 1980+ CO,
TCF(b) = EXP [TC(b)*(T - 75.0)], all others

Pol	Model Years	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1968	-0.20623E-01	-0.24032E-02	-0.10081E-02
	1968-1969	-0.24462E-01	-0.32017E-02	-0.86884E-03
	1970-1971	-0.21255E-01	-0.52755E-03	0.93659E-03
	1972-1974	-0.21427E-01	-0.39442E-03	0.49731E-02
	1975-1979	-0.23517E-01	-0.88057E-02	-0.16222E-02
	1980	-0.26820E-01	-0.75815E-02	-0.51660E-02
	1981	-0.32775E-01	-0.83176E-02	-0.90264E-02
	1982	-0.32082E-01	-0.85130E-02	-0.90264E-02
	1983	-0.36438E-01	-0.75058E-02	-0.60426E-02
	1984	-0.35578E-01	-0.81946E-02	-0.66347E-02
	1985	-0.32581E-01	-0.81979E-02	-0.66579E-02
	1986	-0.30518E-01	-0.84082E-02	-0.68510E-02
	1987	-0.28966E-01	-0.83924E-02	-0.68481E-02
	1988	-0.27479E-01	-0.82775E-02	-0.67604E-02
	1989	-0.27110E-01	-0.83525E-02	-0.68268E-02
	1990	-0.26217E-01	-0.81568E-02	-0.66662E-02
	1991	-0.24879E-01	-0.80063E-02	-0.65473E-02
	1992+	-0.24123E-01	-0.80347E-02	-0.65766E-02
CO	Pre-1968	-0.13487E-01	0.15784E-02	0.11097E-02
	1968-1969	-0.21126E-01	-0.15289E-02	0.15749E-02
	1970-1971	-0.20843E-01	-0.59951E-02	0.18253E-02
	1972-1974	-0.19091E-01	-0.42373E-03	0.57982E-02
	1975-1979	-0.24835E-01	-0.88336E-02	-0.11553E-02
	1980	-0.12448E+01	-0.12478E-01	-0.74106E-02
	1981	-0.13095E+01	-0.14584E-01	-0.11371E-01
	1982	-0.12840E+01	-0.14584E-01	-0.11371E-01
	1983	-0.11767E+01	-0.13677E-01	-0.90777E-02
	1984	-0.11670E+01	-0.14721E-01	-0.90777E-02
	1985	-0.10669E+01	-0.14836E-01	-0.90777E-02
	1986	-0.10037E+01	-0.15221E-01	-0.90777E-02
	1987	-0.95141E+00	-0.15255E-01	-0.90777E-02
	1988	-0.89850E+00	-0.15140E-01	-0.90777E-02
	1989	-0.88826E+00	-0.15264E-01	-0.90777E-02
	1990	-0.85298E+00	-0.15010E-01	-0.90777E-02
	1991	-0.80405E+00	-0.14838E-01	-0.90777E-02
	1992+	-0.77959E+00	-0.14907E-01	-0.90777E-02
NOx	Pre-1968	-0.16897E-03	-0.89245E-02	-0.72580E-02
	1968-1972	-0.25074E-03	-0.59791E-02	-0.62690E-02
	1973-1974	0.38855E-02	-0.24156E-02	-0.21188E-02
	1975-1976	-0.45504E-04	-0.12575E-02	-0.53153E-03
	1977-1979	-0.76044E-02	-0.68045E-02	-0.54198E-02
	1980	-0.19000E-02	-0.61656E-02	-0.49643E-02
	1981	-0.45479E-02	-0.74823E-02	-0.90882E-02
	1982	-0.47657E-02	-0.69890E-02	-0.90882E-02
	1983	-0.43258E-02	-0.97304E-02	-0.10136E-01
	1984	-0.43258E-02	-0.94139E-02	-0.10063E-01
	1985	-0.43258E-02	-0.85291E-02	-0.92968E-02
	1986	-0.43258E-02	-0.79012E-02	-0.88139E-02
	1987	-0.43258E-02	-0.74446E-02	-0.84137E-02
	1988	-0.43258E-02	-0.70163E-02	-0.80091E-02
	1989	-0.43258E-02	-0.69007E-02	-0.79307E-02
	1990	-0.43258E-02	-0.66551E-02	-0.76610E-02
	1991	-0.43258E-02	-0.62738E-02	-0.72869E-02
	1992+	-0.43258E-02	-0.60484E-02	-0.70998E-02

* WHERE :

TCF(b) = Low temperature correction factor for appropriate pollutant, ambient temperature (< 75F), and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = Low temperature correction factor coefficient for appropriate pollutant, reference temperature, and model year, for test segment b

NOTE : The low temperature correction factor is used in conjunction with the correction factor given in Table 2.1.7C.

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TABLE 2.1.7B

HIGH (> 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
AND FUEL RVP CORRECTION FACTORS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* TCF(b) = EXP [TC(b)*(T - 75.0)], Pre-1980
TRCF(b) = EXP [RC(b)*(RVP - 9.0) + TC(b)*(T - 75.0)
+ TRC(b)*(RVP - 9.0)*(T - 75.0)], 1980+

Pol	Model Years	Parameter	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1968	TC	-0.14381E-01	0.13219E-02	0.34799E-02
	1968-1969		-0.12552E-01	0.42667E-02	0.75843E-02
	1970-1971		-0.10888E-01	-0.47925E-03	0.76666E-02
	1972-1974		-0.66107E-02	0.26288E-02	0.12320E-01
	1975-1979		-0.14095E-01	0.26179E-01	0.24297E-01
	1980-1982	RC	0.91402E-01	0.42060E-01	0.93179E-01
		TC	0.44270E-02	0.48358E-02	0.74688E-02
		TRC	0.29466E-02	0.0	0.47276E-02
	1983+	RC	0.23202E-01	0.15373E+00	0.13263E+00
		TC	0.0	0.86550E-02	0.83730E-02
		TRC	0.0	0.0	0.56009E-02
CO	Pre-1968	TC	-0.14691E-01	0.37462E-02	0.11014E-01
	1968-1969		-0.38767E-01	0.84685E-02	0.25179E-01
	1970-1971		-0.21165E-01	0.23603E-01	0.28483E-01
	1972-1974		-0.13146E-01	0.24717E-01	0.25848E-01
	1975-1979		-0.19612E-01	0.48537E-01	0.31439E-01
	1980-1982	RC	0.91345E-01	0.13968E+00	0.16322E+00
		TC	0.62182E-02	0.14943E-01	0.14923E-01
		TRC	0.0	0.0	0.0
	1983+	RC	0.40748E-01	0.26214E+00	0.23218E+00
		TC	0.35170E-02	0.14966E-01	0.20695E-01
		TRC	0.0	0.56416E-02	0.82344E-02
NOx	Pre-1968	TC	0.38841E-02	-0.87325E-02	-0.10839E-01
	1968-1972		-0.10389E-02	-0.92466E-02	-0.10108E-01
	1973-1974		-0.18301E-01	-0.10825E-01	-0.18042E-01
	1975-1976		-0.71420E-02	-0.87910E-02	-0.75470E-02
	1977-1979		-0.26153E-01	-0.18603E-01	-0.20878E-01
	1980-1982	RC	0.0	-0.40024E-01	0.0
		TC	0.0	0.0	0.0
		TRC	0.0	0.0	0.0
	1983+	RC	0.14219E-01	0.27491E-01	0.0
		TC	0.0	0.37789E-02	0.0
		TRC	0.0	0.0	0.0

* WHERE :

TCF(b) = High temperature correction factor for appropriate pollutant, ambient temperature, and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = High temperature correction factor coefficient for appropriate pollutant, temperature, and model year, for test segment b.
TRCF(b)= High temperature and fuel RVP correction factor for appropriate pollutant, ambient temperature, fuel RVP, and model year, for test segment b.
RC(b) = Fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, and model year, for test segment b.
RVP = Fuel volatility in psi.
TRC(b) = Combined temperature and fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, ambient temperature, and model year, for test segment b.

NOTE : The temperature correction factor is used in conjunction with the correction factor given in Table 2.1.7C.

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TABLE 2.1.7C

NORMALIZED BAG FRACTIONS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

		Normalized Fractions											
	Model	Test Segment 1			Test Segment 2			Test Segment 3			Total Test		
Pol	Years	B1	D11	D12	B2	D21	D22	B3	D31	D32	BO	DO1	DO2
HC	Pre-1968	1.2820	0.0250		0.9730	0.0280		0.8390	0.0190		1.0000	0.0249	
	1968-1969	1.3450	0.0740		0.9460	0.0540		0.8420	0.0480		1.0000	0.0565	
	1970-1971	1.3450	0.1780		0.9190	0.1180		0.8940	0.0930		1.0000	0.1235	
	1972-1974	1.3890	0.0440		0.9030	0.0560		0.8910	0.0360		1.0000	0.0481	
	1975-1979	1.9360	0.3240		0.7340	0.2670		0.8010	0.2100		1.0000	0.2632	
	1980	2.2000	0.7140		0.5710	0.1710		0.9140	0.1430		1.0000	0.2752	
	1981	2.4510	0.4547	0.5919	0.5012	0.2152	0.3136	0.8571	0.1856	0.2381	1.0000	0.2565	0.3503
	1982	2.4402	0.4320	0.5629	0.5081	0.2027	0.2936	0.8520	0.1801	0.2363	1.0000	0.2438	0.3334
	1983	2.4754	0.4360	0.6417	0.4941	0.1874	0.2214	0.8521	0.1928	0.2673	1.0000	0.2401	0.3205
	1984	2.6207	0.5239	0.7405	0.4657	0.2158	0.2389	0.7967	0.2117	0.2815	1.0000	0.2782	0.3538
	1985	2.6438	0.4458	0.6159	0.4548	0.2088	0.2536	0.8001	0.1909	0.2583	1.0000	0.2528	0.3295
	1986	2.6599	0.3854	0.5201	0.4467	0.2032	0.2645	0.8034	0.1749	0.2406	1.0000	0.2330	0.3106
	1987	2.7111	0.3905	0.5154	0.4349	0.2100	0.2741	0.7873	0.1748	0.2384	1.0000	0.2376	0.3140
	1988	2.7307	0.3728	0.4838	0.4290	0.2101	0.2802	0.7837	0.1698	0.2322	1.0000	0.2326	0.3091
	1989	2.7345	0.3621	0.4665	0.4274	0.2092	0.2824	0.7840	0.1669	0.2290	1.0000	0.2292	0.3057
	1990	2.7383	0.3515	0.4494	0.4257	0.2084	0.2845	0.7843	0.1640	0.2258	1.0000	0.2257	0.3024
	1991	2.7457	0.3303	0.4153	0.4225	0.2066	0.2887	0.7849	0.1584	0.2194	1.0000	0.2189	0.2959
	1992+	2.7513	0.3143	0.3897	0.4200	0.2053	0.2919	0.7854	0.1541	0.2146	1.0000	0.2138	0.2909
CO	Pre-1968	1.2770	0.0330		1.0170	0.0290		0.7580	0.0250		1.0000	0.0287	
	1968-1969	1.4420	0.0710		0.9960	0.0420		0.6740	0.0330		1.0000	0.0455	
	1970-1971	1.5530	0.1090		0.9330	0.0790		0.7110	0.0380		1.0000	0.0740	
	1972-1974	1.4020	0.0540		0.9860	0.0690		0.7230	0.0370		1.0000	0.0572	
	1975-1979	1.8100	0.1490		0.8610	0.1590		0.6540	0.0930		1.0000	0.1389	
	1980	2.3970	0.2770		0.6470	0.0610		0.6190	0.0760		1.0000	0.1096	
	1981	2.8171	0.6155	0.8042	0.3577	0.2966	0.5154	0.8546	0.2652	0.4212	1.0000	0.3537	0.5492
	1982	2.7447	0.6031	0.7700	0.3853	0.2732	0.4642	0.8566	0.2545	0.4018	1.0000	0.3360	0.5102
	1983	2.8699	0.4792	0.5760	0.2877	0.2286	0.3036	0.9484	0.2591	0.3650	1.0000	0.2885	0.3765
	1984	2.8689	0.6010	0.6754	0.3140	0.2715	0.3372	0.8990	0.2988	0.4027	1.0000	0.3469	0.4247
	1985	2.7500	0.5075	0.6091	0.3558	0.2602	0.3241	0.9089	0.2619	0.3433	1.0000	0.3116	0.3880
	1986	2.6623	0.4372	0.5592	0.3863	0.2514	0.3140	0.9168	0.2344	0.2992	1.0000	0.2850	0.3605
	1987	2.6277	0.4480	0.5709	0.4065	0.2614	0.3206	0.9044	0.2360	0.2937	1.0000	0.2929	0.3648
	1988	2.5906	0.4291	0.5586	0.4217	0.2614	0.3193	0.9034	0.2279	0.2784	1.0000	0.2868	0.3574
	1989	2.5747	0.4169	0.5500	0.4274	0.2600	0.3176	0.9046	0.2231	0.2706	1.0000	0.2822	0.3526
	1990	2.5591	0.4049	0.5415	0.4329	0.2586	0.3160	0.9058	0.2183	0.2629	1.0000	0.2778	0.3479
	1991	2.5280	0.3811	0.5247	0.4440	0.2559	0.3127	0.9081	0.2089	0.2476	1.0000	0.2689	0.3386
	1992+	2.5048	0.3633	0.5122	0.4522	0.2538	0.3103	0.9099	0.2019	0.2362	1.0000	0.2622	0.3316
NOx	Pre-1968	1.1210	0.0090		0.7850	0.0010		1.3190	-0.0090		1.0000	-0.0001	
	1968-1972	1.1610	0.0		0.7960	0.0		1.2670	0.0		1.0000	0.0	
	1973-1974	1.2470	0.0240		0.7790	0.0070		1.2360	0.0280		1.0000	0.0162	
	1975-1976	1.2950	0.0250		0.7850	0.0080		1.1880	0.0330		1.0000	0.0183	
	1977-1979	1.3770	0.0500		0.7580	0.0610		1.1770	0.0780		1.0000	0.0634	
	1980	1.3130	0.0470		0.8110	0.0340		1.1250	0.0540		1.0000	0.0421	
	1981	1.7037	0.0896	0.0896	0.7445	0.1011	0.1011	0.9565	0.1301	0.1301	1.0000	0.1066	0.1066
	1982	1.6886	0.1007	0.1007	0.7519	0.1084	0.1084	0.9539	0.1402	0.1402	1.0000	0.1155	0.1155
	1983	1.5084	0.0673	0.0673	0.7760	0.0507	0.0507	1.0438	0.0717	0.0717	1.0000	0.0599	0.0599
	1984	1.5590	0.0545	0.0545	0.7542	0.0410	0.0410	1.0472	0.0671	0.0671	1.0000	0.0509	0.0509
	1985	1.5619	0.0584	0.0584	0.7594	0.0397	0.0397	1.0352	0.0709	0.0709	1.0000	0.0521	0.0521
	1986	1.5638	0.0619	0.0619	0.7641	0.0387	0.0387	1.0248	0.0743	0.0743	1.0000	0.0532	0.0532
	1987	1.5800	0.0590	0.0590	0.7588	0.0354	0.0354	1.0227	0.0739	0.0739	1.0000	0.0508	0.0508
	1988	1.5856	0.0593	0.0593	0.7587	0.0341	0.0341	1.0186	0.0749	0.0749	1.0000	0.0504	0.0504
	1989	1.5865	0.0599	0.0599	0.7595	0.0338	0.0338	1.0165	0.0755	0.0755	1.0000	0.0505	0.0505
	1990	1.5874	0.0605	0.0605	0.7602	0.0335	0.0335	1.0144	0.0761	0.0761	1.0000	0.0507	0.0507
	1991	1.5892	0.0617	0.0617	0.7618	0.0328	0.0328	1.0101	0.0775	0.0775	1.0000	0.0510	0.0510
	1992+	1.5906	0.0627	0.0627	0.7630	0.0324	0.0324	1.0067	0.0785	0.0785	1.0000	0.0512	0.0512

NOTE : The fractions given in this table are used in the calculation of the operating-mode/ temperature correction factor (OMTCF).

WHERE :

OMTCF = [(TERM1 + TERM2 + TERM3)/DENOM].
TERM1 = W *TCF(1)*(B1+D11*M), or *[B1+D11*5.0+D12*(M-5.0)].
TERM2 = (1-W-X)*TCF(2)*(B2+D21*M), or *[B2+D21*5.0+D22*(M-5.0)].
TERM3 = X *TCF(3)*(B3+D31*M), or *[B3+D31*5.0+D32*(M-5.0)].
DENOM = BO+DO1*M, or = BO+DO1*5.0+DO2*(M-5.0).
W = Fraction of VMT in the cold start mode.
X = Fraction of VMT in the hot start mode.
TCF(b) = Temperature correction factor for pollutant/model year/test segment b.
M = Cumulative mileage / 10,000 miles.

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TABLE 2.1.8A

AIR CONDITIONING CORRECTION FACTOR COEFFICIENTS FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* ACCF= U*V*(A + B*(T-75) -1) + 1

Model Years	HC A	HC B	CO A	CO B	NOx A	NOx B
Pre-1975	0.1023E+01	0.3344E-02	0.1202E+01	0.1808E-02	0.1299E+01	0.5643E-04
1975+	0.1000E+01	0.3512E-02	0.1130E+01	0.1528E-02	0.1221E+01	0.4262E-03

* WHERE :

ACCF = Air Conditioning Correction Factor,
V = Fraction of vehicles equipped with AC given in Table 2.1.8B,
U = Fraction of vehicles with AC that are using it = (DI-DILO)/(DIHI-DI), 0<=U<=1,
DI = Discomfort index = (DB+WB)*.4+15,
DILO = The highest discomfort index where no AC is used,
DIHI = The lowest discomfort index where all vehicles with AC use it,
DB = Dry bulb temperature (Fahrenheit),
WB = Wet bulb temperature (Fahrenheit),
T = Ambient temperature (Fahrenheit).

TABLE 2.1.8B

ESTIMATED FRACTION OF
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
EQUIPPED WITH AIR CONDITIONING

Model Years	Fraction Equipped With Air Conditioning
Pre-1962	0.07
1962-1964	0.14
1965-1966	0.24
1967-1968	0.37
1969-1971	0.51
1972-1976	0.61
1977+	0.72

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TABLE 2.1.8C

EXTRA LOAD CORRECTION FACTOR COEFFICIENTS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* XLCF = (XLC-1)*U + 1

Model Years	Coefficients (XLC) HC	CO	NOx
Pre-1968	1.0786	1.2765	0.9535
1968-1969	1.0495	1.1384	1.0313
1970-1971	1.0852	1.2478	1.0313
1972	1.0556	1.1347	1.0313
1973-1974	1.0556	1.1347	1.0753
1975+	1.0455	1.3058	1.0719

* WHERE :

XLCF = Extra load correction factor,
U = Fraction of VMT with an extra load,
XLC = Correction factor coefficient.

TABLE 2.1.8D

TRAILER TOWING CORRECTION FACTOR COEFFICIENTS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

* TTCF = (TTC-1)*U + 1

Model Years	Coefficients (TTC) HC	CO	NOx
Pre-1968	1.2614	1.9327	1.1184
1968-1969	1.2762	1.8940	1.1384
1970-1971	1.4598	2.4753	1.1384
1972	1.7288	2.1414	1.1384
1973-1974	1.7288	2.1414	1.2170
1975+	1.5909	3.9722	1.3875

* WHERE :

TTCF = Trailer towing correction factor,
U = Fraction of VMT towing a trailer,
TTC = Correction factor coefficient.

TABLE 2.1.9A

TAMPERING AND MISFUELING RATES
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Area	Model Years	System	Zero Mile Level	Det. Rate 1	Det. Rate 2	50,000 Mile Level	100,000 Mile Level
Non-I/M	Pre-1981	Air Pump Disablement	-0.0556	0.03819	0.03819	0.135	0.326
		Catalyst Removal	0.0362	0.01546	0.01546	0.113	0.191
		EGR System Disabled	0.0673	0.01552	0.01552	0.145	0.222
		Filler Neck Damaged	0.0183	0.02393	0.02393	0.138	0.258
		Fuel Tank Misfueled	0.0109	0.00171	0.00171	0.019	0.028
		Total Misfueled	0.0292	0.02564	0.02564	0.157	0.286
		PCV System Disabled	-0.0059	0.00315	0.00315	0.010	0.026
		Cannister Disconnect	-0.0206	0.01154	0.01154	0.037	0.095
		Both Cannister & Cap	-0.0186	0.01301	0.01301	0.046	0.111
	1981+	Air Pump Disablement	-0.0157	0.00961	0.03819	0.032	0.223
		Catalyst Removal	-0.0071	0.00574	0.01546	0.022	0.099
		EGR System Disabled	-0.0054	0.00674	0.01552	0.028	0.106
		Filler Neck Damaged	-0.0068	0.00496	0.00496	0.018	0.043
		Fuel Tank Misfueled	0.0140	0.00101	0.00101	0.019	0.024
		Total Misfueled	0.0072	0.00597	0.00597	0.037	0.067
		PCV System Disabled	-0.0059	0.00315	0.00315	0.010	0.026
		Cannister Disconnect	-0.0206	0.01154	0.01154	0.037	0.095
		Both Cannister & Cap	-0.0186	0.01301	0.01301	0.046	0.111
With I/M	Pre-1981	Air Pump Disablement	-0.0473	0.02914	0.02914	0.098	0.244
		Catalyst Removal	-0.0062	0.00960	0.00960	0.042	0.090
		EGR System Disabled	0.0206	0.01449	0.01449	0.093	0.165
		Filler Neck Damaged	0.0163	0.01188	0.01188	0.076	0.135
		Fuel Tank Misfueled	0.0434	-0.00216	-0.00216	0.033	0.022
		Total Misfueled	0.0597	0.00972	0.00972	0.108	0.157
		PCV System Disabled	-0.0024	0.00180	0.00180	0.007	0.016
		Cannister Disconnect	-0.0063	0.00601	0.00601	0.024	0.054
		Both Cannister & Cap	-0.0077	0.00752	0.00752	0.030	0.067
	1981+	Air Pump Disablement	-0.0106	0.00744	0.02914	0.027	0.172
		Catalyst Removal	-0.0058	0.00338	0.00960	0.011	0.059
		EGR System Disabled	0.0002	0.00286	0.01449	0.014	0.087
		Filler Neck Damaged	-0.0002	0.00059	0.00059	0.003	0.006
		Fuel Tank Misfueled	0.0115	0.00009	0.00009	0.012	0.012
		Total Misfueled	0.0113	0.00068	0.00068	0.015	0.018
		PCV System Disabled	-0.0024	0.00180	0.00180	0.007	0.016
		Cannister Disconnect	-0.0063	0.00601	0.00601	0.024	0.054
		Both Cannister & Cap	-0.0077	0.00752	0.00752	0.030	0.067

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TABLE 2.1.9B

EXCESS EMISSIONS
DUE TO TAMPERING AND/OR MISFUELING
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Type of Tampering	Emission Control System	Pollutant	Excess Emissions (g/mi) FTP	Bag 1	Bag 2	Bag 3	Idle (g/hr)
Air Pump Disablement	Oxidation	HC	1.37	1.80	1.37	1.04	27.38
		CO	30.61	34.67	33.90	21.28	506.08
	3way/Oxidation 3way	HC	0.85	1.36	0.76	0.61	
		Pre-1985					8.97
		1985+					11.71
		CO	21.02	31.80	18.21	18.25	
		Pre-1985					177.43
		1985+					215.29
Catalyst Removal	Oxidation	HC	3.05	2.31	3.40	2.95	42.83
		CO	28.01	41.40	28.97	16.06	124.82
	3way/Oxidation 3way	HC	2.04	1.80	2.25	1.81	42.83
		CO	13.74	16.32	14.11	11.07	124.82
		NOx	1.52	1.49	1.36	1.83	2.31
otal Misfueled	Oxidation	HC	2.47	2.30	2.57	2.40	9.70
		CO	20.96	46.50	13.13	16.62	14.18
	3way/Oxidation 3way	HC	1.44	1.42	1.56	1.21	9.70
		CO	6.57	8.08	6.60	5.37	14.18
		NOx	0.57	0.64	0.45	0.74	0.13
EGR System Disabled		NOx					
		Pre-1975	1.21	1.40	0.96	1.54	
		1975-1976	3.31	3.82	2.63	4.21	
		1977-1980	3.48	4.11	2.68	4.53	
		1981+	1.23	1.36	1.19	1.21	
EGR System Disabled	and Catalyst Removal	NOx	3.39	3.02	3.46	3.55	
EGR System Disabled	and Total Misfueled	NOx	1.99	2.12	1.85	2.16	

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TABLE 2.1.9C

EXCESS CRANKCASE EMISSIONS
AND UNCONTROLLED
EVAPORATIVE HYDROCARBON EMISSIONS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Excess Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
PCV System Disabled					
1964-1970	1.28				
1971-1974	1.27				
1975-1977	1.26				
1978-1979	1.24				
1980	1.22				
1981+	1.21				
Cannister Disconnect					
Pre-1971		19.07	42.15	29.18	93.10
1971		19.07	42.15	29.18	93.10
1972-1976		19.07	31.79	29.18	70.20
1977		14.67	24.45	22.45	54.00
1978-1980		17.28	25.22	24.05	55.71
1981-1983 CARB		13.47	24.88	22.71	54.94
1984+ CARB		10.36	19.14	17.47	42.26
1981-1983 FINJ		6.76	24.88	11.70	54.94
1984+ FINJ		5.20	19.14	9.00	42.26
Missing Fuel Cap					
Pre-1971		19.07	42.15	29.18	93.10
1971		19.07	42.15	29.18	93.10
1972-1976		19.07	31.79	29.18	70.20
1977		14.67	24.45	22.45	54.00
1978-1980		17.28	25.22	24.05	55.71
1981-1983 CARB		0.0	24.88	0.0	54.94
1984+ CARB		0.0	19.14	0.0	42.26
1981-1983 FINJ		6.76	24.88	11.70	54.94
1984+ FINJ		5.20	19.14	9.00	42.26

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

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TABLE 2.1.9D

UNCONTROLLED
RUNNING LOSS EMISSIONS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Cannister Disconnect				
7.0	0.33	0.42	0.90	1.85
9.0	0.52	1.30	2.04	4.29
10.4	0.95	2.36	3.52	4.97
11.7	2.54	3.37	7.19	11.97
Missing Fuel Cap				
7.0	0.60	0.84	1.28	2.44
9.0	1.23	1.85	3.31	15.58
10.4	2.09	3.43	15.30	28.51
11.7	3.62	17.28	44.93	44.93

* Uncontrolled emissions applicable to 1971+ model year vehicles.

DATE : MAY 19, 1989

TABLE 2.1.10A

METHANE OFFSETS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Methane Offsets (g/mi) FTP	Bag 1	Bag 2	Bag 3
Pre-1975	0.421	0.570	0.420	0.310
1975-1976	0.316	0.470	0.300	0.230
1977	0.148	0.220	0.140	0.110
1978-1979	0.328	0.490	0.310	0.240
1980	0.212	0.300	0.200	0.170
1981-1982	0.178	0.258	0.167	0.140
1983	0.080	0.111	0.075	0.067
1984	0.075	0.105	0.070	0.063
1985	0.067	0.093	0.062	0.056
1986	0.064	0.088	0.059	0.054
1987	0.057	0.079	0.053	0.049
1988	0.055	0.075	0.051	0.046
1989	0.053	0.073	0.049	0.046
1990	0.052	0.071	0.048	0.044
1991	0.049	0.067	0.046	0.042
1992+	0.048	0.065	0.044	0.041

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

DATE : MAY 19, 1989

TABLE 2.1.10C

PERCENT TECHNOLOGY DISTRIBUTIONS
(EXHAUST AND EVAPORATIVE EMISSION SYSTEMS)
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Air Pump Only	Oxidation Catalyst	3Way Catalyst	EGR System	Air Pump & Oxidation or 3Way Catalyst	EGR System & 3Way Catalyst
Pre-1968	0.0	0.0	0.0	0.0	0.0	0.0
1968-1971	5.0	0.0	0.0	0.0	0.0	0.0
1972	10.0	0.0	0.0	0.0	0.0	0.0
1973	30.0	0.0	0.0	80.0	0.0	0.0
1974	30.0	0.0	0.0	90.0	0.0	0.0
1975	15.0	80.0	0.0	90.0	30.0	0.0
1976	10.0	85.0	0.0	90.0	30.0	0.0
1977	10.0	85.0	0.0	90.0	20.0	0.0
1978-1979	5.0	90.0	0.0	90.0	25.0	0.0
1980	0.0	88.0	7.0	97.0	65.0	7.0
1981	0.0	15.0	85.0	90.0	75.0	85.0
1982	0.0	14.0	86.0	90.0	70.0	85.0
1983	0.0	12.0	88.0	90.0	60.0	85.0
1984-1985	0.0	0.0	100.0	93.0	60.0	93.0
1986	0.0	0.0	100.0	93.0	40.0	93.0
1987+	0.0	0.0	100.0	90.0	30.0	90.0

Model Years	Evaporative Canister	PCV System
Pre-1963	0.0	0.0
1963-1967	0.0	0.0
1968-1970	0.0	100.0
1971+	100.0	100.0

DATE : MAY 19, 1989

TABLE 2.1.10D

PERCENT TECHNOLOGY DISTRIBUTIONS
(FUEL DELIVERY SYSTEMS)
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES

Model Years	Carbureted	Ported Fuel-Injected	Throttle-Body Fuel-Injected
1981	91.5	5.7	2.8
1982	82.9	6.3	10.8
1983	71.8	8.7	19.5
1984	60.7	10.4	28.9
1985	45.5	28.0	26.5
1986	33.0	39.1	27.9
1987	25.3	48.3	26.4
1988	18.9	57.6	23.5
1989	16.3	59.4	24.3
1990	13.7	65.6	20.7
1991	8.4	74.2	17.4
1992+	4.3	78.5	17.2

DATE : MAY 19, 1989

TABLE 2.1.11A

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	18.0	1967	18.0	1968	14.3	1969	14.3	1970	15.2	1971	14.2	1972	10.2	1973	10.2	1974	10.2	1975	9.5	1976	9.4	1977	7.7
1967	17.9	1968	14.2	1969	14.2	1970	15.0	1971	14.0	1972	10.2	1973	10.2	1974	10.2	1975	9.4	1976	9.3	1977	7.5	1978	8.5
1968	14.1	1969	14.1	1970	14.8	1971	13.8	1972	10.1	1973	10.1	1974	10.1	1975	9.2	1976	9.2	1977	7.4	1978	8.4	1979	8.4
1969	13.9	1970	14.6	1971	13.6	1972	10.0	1973	10.0	1974	10.0	1975	9.1	1976	9.1	1977	7.3	1978	8.3	1979	8.3	1980	4.4
1970	14.4	1971	13.4	1972	9.9	1973	9.9	1974	9.9	1975	8.9	1976	8.9	1977	7.2	1978	8.2	1979	8.1	1980	4.4	1981	3.4
1971	13.2	1972	9.8	1973	9.8	1974	9.8	1975	8.7	1976	8.7	1977	7.0	1978	8.0	1979	8.0	1980	4.3	1981	3.4	1982	2.8
1972	9.7	1973	9.7	1974	9.7	1975	8.5	1976	8.5	1977	6.8	1978	7.8	1979	7.8	1980	4.3	1981	3.3	1982	2.7	1983	2.3
1973	9.6	1974	9.6	1975	8.4	1976	8.4	1977	6.6	1978	7.6	1979	7.6	1980	4.3	1981	3.3	1982	2.7	1983	2.3	1984	2.2
1974	9.5	1975	8.1	1976	8.1	1977	6.4	1978	7.4	1979	7.4	1980	4.2	1981	3.2	1982	2.7	1983	2.3	1984	2.1	1985	2.0
1975	7.9	1976	7.9	1977	6.2	1978	7.2	1979	7.2	1980	4.1	1981	3.1	1982	2.6	1983	2.3	1984	2.1	1985	2.0	1986	1.9
1976	7.7	1977	6.0	1978	7.0	1979	7.0	1980	4.0	1981	3.0	1982	2.5	1983	2.2	1984	2.1	1985	2.0	1986	1.9	1987	1.9
1977	5.7	1978	6.7	1979	6.7	1980	3.9	1981	2.9	1982	2.4	1983	2.1	1984	2.0	1985	1.9	1986	1.9	1987	1.8	1988	1.8
1978	6.5	1979	6.5	1980	3.8	1981	2.8	1982	2.3	1983	2.0	1984	1.9	1985	1.9	1986	1.8	1987	1.8	1988	1.7	1989	1.7
1979	6.2	1980	3.7	1981	2.7	1982	2.2	1983	1.9	1984	1.8	1985	1.8	1986	1.8	1987	1.8	1988	1.7	1989	1.7	1990	1.6
1980	3.6	1981	2.6	1982	2.1	1983	1.9	1984	1.7	1985	1.7	1986	1.7	1987	1.7	1988	1.7	1989	1.6	1990	1.6	1991	1.6
1981	2.5	1982	2.0	1983	1.8	1984	1.6	1985	1.6	1986	1.6	1987	1.6	1988	1.6	1989	1.6	1990	1.5	1991	1.5	1992	1.5
1982	1.9	1983	1.7	1984	1.5	1985	1.5	1986	1.5	1987	1.5	1988	1.5	1989	1.5	1990	1.5	1991	1.5	1992	1.4	1993	1.4
1983	1.6	1984	1.5	1985	1.5	1986	1.5	1987	1.4	1988	1.5	1989	1.5	1990	1.5	1991	1.5	1992	1.4	1993	1.4	1994	1.4
1984	1.4	1985	1.4	1986	1.4	1987	1.4	1988	1.4	1989	1.4	1990	1.4	1991	1.4	1992	1.4	1993	1.3	1994	1.3	1995	1.3
1985	1.3	1986	1.3	1987	1.3	1988	1.3	1989	1.3	1990	1.3	1991	1.3	1992	1.3	1993	1.3	1994	1.3	1995	1.3	1996	1.2

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	8.7	1979	8.6	1980	4.5	1981	3.5	1984	2.4	1986	2.3	1989	2.2	1991	2.2	1993	2.2	1996	2.2	1999	2.2	2001	2.2
1979	8.5	1980	4.5	1981	3.5	1982	2.9	1985	2.3	1987	2.2	1990	2.2	1992	2.2	1994	2.2	1997	2.2	2000	2.2	2002	2.2
1980	4.4	1981	3.5	1982	2.9	1983	2.4	1986	2.2	1988	2.2	1991	2.1	1993	2.1	1995	2.1	1998	2.1	2001	2.1	2003	2.1
1981	3.4	1982	2.9	1983	2.4	1984	2.3	1987	2.2	1989	2.1	1992	2.1	1994	2.1	1996	2.1	1999	2.1	2002	2.1	2004	2.1
1982	2.8	1983	2.4	1984	2.2	1985	2.2	1988	2.1	1990	2.1	1993	2.0	1995	2.0	1997	2.0	2000	2.0	2003	2.0	2005	2.0
1983	2.4	1984	2.2	1985	2.1	1986	2.1	1989	2.0	1991	2.0	1994	2.0	1996	2.0	1998	2.0	2001	2.0	2004	2.0	2006	2.0
1984	2.2	1985	2.1	1986	2.0	1987	2.0	1990	2.0	1992	1.9	1995	1.9	1997	1.9	1999	1.9	2002	1.9	2005	1.9	2007	1.9
1985	2.1	1986	2.0	1987	2.0	1988	2.0	1991	1.9	1993	1.9	1996	1.9	1998	1.9	2000	1.9	2003	1.9	2006	1.9	2008	1.9
1986	2.0	1987	2.0	1988	1.9	1989	1.9	1992	1.8	1994	1.8	1997	1.8	1999	1.8	2001	1.8	2004	1.8	2007	1.8	2009	1.8
1987	1.9	1988	1.9	1989	1.8	1990	1.8	1993	1.8	1995	1.8	1998	1.8	2000	1.8	2002	1.8	2005	1.8	2008	1.8	2010	1.8
1988	1.8	1989	1.8	1990	1.8	1991	1.7	1994	1.7	1996	1.7	1999	1.7	2001	1.7	2003	1.7	2006	1.7	2009	1.7	2011	1.7
1989	1.8	1990	1.8	1991	1.7	1992	1.7	1995	1.7	1997	1.6	2000	1.6	2002	1.6	2004	1.6	2007	1.6	2010	1.6	2012	1.6
1990	1.7	1991	1.7	1992	1.6	1993	1.6	1996	1.6	1998	1.6	2001	1.6	2003	1.6	2005	1.6	2008	1.6	2011	1.6	2013	1.6
1991	1.6	1992	1.6	1993	1.6	1994	1.5	1997	1.5	1999	1.5	2002	1.5	2004	1.5	2006	1.5	2009	1.5	2012	1.5	2014	1.5
1992	1.5	1993	1.5	1994	1.5	1995	1.5	1998	1.4	2000	1.4	2003	1.4	2005	1.4	2007	1.4	2010	1.4	2013	1.4	2015	1.4
1993	1.5	1994	1.4	1995	1.4	1996	1.4	1999	1.4	2001	1.4	2004	1.4	2006	1.4	2008	1.4	2011	1.4	2014	1.4	2016	1.4
1994	1.4	1995	1.4	1996	1.3	1997	1.3	2000	1.3	2002	1.3	2005	1.3	2007	1.3	2009	1.3	2012	1.3	2015	1.3	2017	1.3
1995	1.3	1996	1.3	1997	1.3	1998	1.3	2001	1.2	2003	1.2	2006	1.2	2008	1.2	2010	1.2	2013	1.2	2016	1.2	2018	1.2
1996	1.3	1997	1.2	1998	1.2	1999	1.2	2002	1.2	2004	1.2	2007	1.2	2009	1.2	2011	1.2	2014	1.2	2017	1.2	2019	1.2
1997	1.2	1998	1.2	1999	1.2	2000	1.1	2003	1.1	2005	1.1	2008	1.1	2010	1.1	2012	1.1	2015	1.1	2018	1.1	2020	1.1

*MY -- Indicates the model year.

**E - Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start, 60 TO 84F diurnal, 75F for hot soak and running loss emissions, 9.0 psi fuel RVP, 54.57% average in-use fuel tank level, including refueling emissions. Emissions are based on the January 1 mileage accumulation figures given in Table 2.1.4A.

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TABLE 2.1.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	153.0	1967	153.0	1968	125.6	1969	125.6	1970	128.8	1971	128.8	1972	112.6	1973	112.6	1974	112.6	1975	85.7	1976	85.7	1977	58.3
1967	151.9	1968	124.3	1969	124.3	1970	127.3	1971	127.3	1972	111.4	1973	111.4	1974	111.4	1975	84.5	1976	84.5	1977	57.1	1978	79.3
1968	123.0	1969	123.0	1970	125.7	1971	125.7	1972	110.2	1973	110.2	1974	110.2	1975	83.2	1976	83.2	1977	55.8	1978	78.0	1979	78.0
1969	121.6	1970	123.9	1971	123.9	1972	108.9	1973	108.9	1974	108.9	1975	81.8	1976	81.8	1977	54.4	1978	76.6	1979	76.6	1980	33.1
1970	122.1	1971	122.1	1972	107.6	1973	107.6	1974	107.6	1975	80.4	1976	80.4	1977	53.0	1978	75.2	1979	75.2	1980	32.7	1981	33.4
1971	120.2	1972	106.1	1973	106.1	1974	106.1	1975	78.9	1976	78.9	1977	51.5	1978	73.7	1979	73.7	1980	32.3	1981	32.3	1982	28.0
1972	104.6	1973	104.6	1974	104.6	1975	77.3	1976	77.3	1977	49.9	1978	72.1	1979	72.1	1980	31.8	1981	31.2	1982	27.0	1983	14.5
1973	103.0	1974	103.0	1975	75.7	1976	75.7	1977	48.2	1978	70.5	1979	70.5	1980	31.3	1981	30.0	1982	25.9	1983	13.8	1984	14.3
1974	101.3	1975	73.9	1976	73.9	1977	46.5	1978	68.7	1979	68.7	1980	30.8	1981	28.7	1982	24.7	1983	13.1	1984	13.6	1985	13.2
1975	72.0	1976	72.0	1977	44.6	1978	66.8	1979	66.8	1980	30.2	1981	27.4	1982	23.5	1983	12.3	1984	12.8	1985	12.5	1986	12.2
1976	70.0	1977	42.6	1978	64.8	1979	64.8	1980	29.6	1981	25.9	1982	22.2	1983	11.5	1984	11.9	1985	11.6	1986	11.4	1987	11.4
1977	40.5	1978	62.7	1979	62.7	1980	29.0	1981	24.4	1982	20.8	1983	10.6	1984	11.0	1985	10.8	1986	10.5	1987	10.6	1988	10.5
1978	60.5	1979	60.5	1980	28.3	1981	22.8	1982	19.3	1983	9.7	1984	10.1	1985	9.9	1986	9.7	1987	9.7	1988	9.7	1989	9.6
1979	58.1	1980	27.6	1981	21.1	1982	17.8	1983	8.7	1984	9.1	1985	8.9	1986	8.7	1987	8.8	1988	8.7	1989	8.7	1990	8.7
1980	26.9	1981	19.4	1982	16.1	1983	7.7	1984	8.0	1985	7.9	1986	7.7	1987	7.8	1988	7.8	1989	7.7	1990	7.7	1991	7.7
1981	17.8	1982	14.7	1983	6.7	1984	7.0	1985	6.9	1986	6.8	1987	6.8	1988	6.8	1989	6.8	1990	6.8	1991	6.7	1992	6.7
1982	13.4	1983	5.9	1984	6.0	1985	6.0	1986	5.9	1987	5.9	1988	5.9	1989	5.9	1990	5.9	1991	5.9	1992	5.9	1993	5.9
1983	5.0	1984	5.0	1985	5.0	1986	5.0	1987	5.0	1988	5.0	1989	5.0	1990	5.0	1991	5.0	1992	5.0	1993	5.0	1994	5.0
1984	4.0	1985	4.0	1986	4.0	1987	4.0	1988	4.0	1989	4.0	1990	4.0	1991	4.0	1992	4.0	1993	4.0	1994	4.0	1995	4.0
1985	3.3	1986	3.4	1987	3.4	1988	3.4	1989	3.4	1990	3.4	1991	3.4	1992	3.4	1993	3.4	1994	3.4	1995	3.4	1996	3.4

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	80.5	1979	80.5	1980	34.3	1981	37.2	1984	18.6	1986	17.6	1989	17.5	1991	17.2	1993	17.1	1996	17.1	1999	17.1	2001	17.1
1979	79.3	1980	33.9	1981	36.3	1982	31.6	1985	17.6	1987	17.2	1990	16.9	1992	16.6	1994	16.6	1997	16.6	2000	16.6	2002	16.6
1980	33.5	1981	35.4	1982	30.8	1983	16.9	1986	16.6	1988	16.6	1991	16.3	1993	16.1	1995	16.1	1998	16.1	2001	16.1	2003	16.1
1981	34.4	1982	29.9	1983	16.3	1984	17.0	1987	16.2	1989	16.0	1992	15.6	1994	15.6	1996	15.6	1999	15.6	2002	15.6	2004	15.6
1982	29.0	1983	15.8	1984	16.4	1985	15.9	1988	15.5	1990	15.4	1993	15.1	1995	15.1	1997	15.1	2000	15.1	2003	15.1	2005	15.1
1983	15.1	1984	15.7	1985	15.3	1986	14.9	1989	14.8	1991	14.6	1994	14.5	1996	14.5	1998	14.5	2001	14.5	2004	14.5	2006	14.5
1984	15.1	1985	14.6	1986	14.3	1987	14.4	1990	14.1	1992	13.9	1995	13.9	1997	13.9	1999	13.9	2002	13.9	2005	13.9	2007	13.9
1985	14.0	1986	13.6	1987	13.7	1988	13.6	1991	13.4	1993	13.3	1996	13.3	1998	13.3	2000	13.3	2003	13.3	2006	13.3	2008	13.3
1986	12.9	1987	13.0	1988	12.9	1989	12.8	1992	12.6	1994	12.6	1997	12.6	1999	12.6	2001	12.6	2004	12.6	2007	12.6	2009	12.6
1987	12.2	1988	12.2	1989	12.1	1990	12.1	1993	11.9	1995	11.9	1998	11.9	2000	11.9	2002	11.9	2005	11.9	2008	11.9	2010	11.9
1988	11.4	1989	11.3	1990	11.3	1991	11.2	1994	11.1	1996	11.1	1999	11.1	2001	11.1	2003	11.1	2006	11.1	2009	11.1	2011	11.1
1989	10.5	1990	10.5	1991	10.4	1992	10.3	1995	10.3	1997	10.3	2000	10.3	2002	10.3	2004	10.3	2007	10.3	2010	10.3	2012	10.3
1990	9.6	1991	9.5	1992	9.5	1993	9.5	1996	9.5	1998	9.5	2001	9.5	2003	9.5	2005	9.5	2008	9.5	2011	9.5	2013	9.5
1991	8.6	1992	8.6	1993	8.6	1994	8.6	1997	8.6	1999	8.6	2002	8.6	2004	8.6	2006	8.6	2009	8.6	2012	8.6	2014	8.6
1992	7.6	1993	7.6	1994	7.6	1995	7.6	1998	7.6	2000	7.6	2003	7.6	2005	7.6	2007	7.6	2010	7.6	2013	7.6	2015	7.6
1993	6.7	1994	6.7	1995	6.7	1996	6.7	1999	6.7	2001	6.7	2004	6.7	2006	6.7	2008	6.7	2011	6.7	2014	6.7	2016	6.7
1994	5.9	1995	5.9	1996	5.9	1997	5.9	2000	5.9	2002	5.9	2005	5.9	2007	5.9	2009	5.9	2012	5.9	2015	5.9	2017	5.9
1995	5.0	1996	5.0	1997	5.0	1998	5.0	2001	5.0	2003	5.0	2006	5.0	2008	5.0	2010	5.0	2013	5.0	2016	5.0	2018	5.0
1996	4.0	1997	4.0	1998	4.0	1999	4.0	2002	4.0	2004	4.0	2007	4.0	2009	4.0	2011	4.0	2014	4.0	2017	4.0	2019	4.0
1997	3.4	1998	3.4	1999	3.4	2000	3.4	2003	3.4	2005	3.4	2008	3.4	2010	3.4	2012	3.4	2015	3.4	2018	3.4	2020	3.4

*MY Indicates the model year.

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in Table 2.1.4A.

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TABLE 2.1.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED VEHICLES
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	2.0	1967	2.0	1968	2.9	1969	2.9	1970	2.9	1971	2.9	1972	2.9	1973	2.7	1974	2.7	1975	2.3	1976	2.3	1977	3.1
1967	2.0	1968	2.9	1969	2.9	1970	2.9	1971	2.9	1972	2.9	1973	2.7	1974	2.7	1975	2.3	1976	2.3	1977	3.0	1978	2.6
1968	2.9	1969	2.9	1970	2.9	1971	2.9	1972	2.9	1973	2.7	1974	2.7	1975	2.3	1976	2.3	1977	3.0	1978	2.6	1979	2.6
1969	2.9	1970	2.9	1971	2.9	1972	2.9	1973	2.6	1974	2.6	1975	2.3	1976	2.3	1977	2.9	1978	2.5	1979	2.5	1980	1.8
1970	2.9	1971	2.9	1972	2.9	1973	2.6	1974	2.6	1975	2.2	1976	2.2	1977	2.9	1978	2.5	1979	2.5	1980	1.8	1981	1.4
1971	2.9	1972	2.9	1973	2.6	1974	2.6	1975	2.2	1976	2.2	1977	2.8	1978	2.4	1979	2.4	1980	1.7	1981	1.4	1982	1.5
1972	2.9	1973	2.5	1974	2.5	1975	2.2	1976	2.2	1977	2.7	1978	2.3	1979	2.3	1980	1.7	1981	1.3	1982	1.5	1983	1.3
1973	2.5	1974	2.5	1975	2.2	1976	2.2	1977	2.6	1978	2.2	1979	2.2	1980	1.6	1981	1.3	1982	1.5	1983	1.2	1984	1.2
1974	2.5	1975	2.1	1976	2.1	1977	2.6	1978	2.2	1979	2.2	1980	1.6	1981	1.2	1982	1.4	1983	1.2	1984	1.2	1985	1.2
1975	2.1	1976	2.1	1977	2.5	1978	2.1	1979	2.1	1980	1.5	1981	1.2	1982	1.3	1983	1.2	1984	1.1	1985	1.1	1986	1.1
1976	2.1	1977	2.4	1978	2.0	1979	2.0	1980	1.5	1981	1.1	1982	1.3	1983	1.1	1984	1.1	1985	1.1	1986	1.1	1987	1.1
1977	2.3	1978	1.9	1979	1.9	1980	1.4	1981	1.1	1982	1.2	1983	1.1	1984	1.1	1985	1.1	1986	1.1	1987	1.1	1988	1.1
1978	1.8	1979	1.8	1980	1.4	1981	1.0	1982	1.2	1983	1.1	1984	1.1	1985	1.1	1986	1.1	1987	1.0	1988	1.0	1989	1.0
1979	1.7	1980	1.3	1981	0.9	1982	1.1	1983	1.0	1984	1.0	1985	1.0	1986	1.0	1987	1.0	1988	1.0	1989	1.0	1990	1.0
1980	1.2	1981	0.9	1982	1.0	1983	1.0	1984	1.0	1985	1.0	1986	1.0	1987	1.0	1988	1.0	1989	1.0	1990	1.0	1991	1.0
1981	0.8	1982	1.0	1983	1.0	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9
1982	0.9	1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9
1983	0.9	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9	1994	0.9
1984	0.8	1985	0.8	1986	0.8	1987	0.8	1988	0.8	1989	0.8	1990	0.8	1991	0.8	1992	0.8	1993	0.8	1994	0.8	1995	0.8
1985	0.8	1986	0.8	1987	0.8	1988	0.8	1989	0.8	1990	0.8	1991	0.8	1992	0.8	1993	0.8	1994	0.8	1995	0.8	1996	0.8

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	2.7	1979	2.7	1980	1.9	1981	1.6	1984	1.3	1986	1.3	1989	1.3	1991	1.3	1993	1.3	1996	1.3	1999	1.3	2001	1.3
1979	2.6	1980	1.9	1981	1.5	1982	1.7	1985	1.3	1987	1.3	1990	1.3	1992	1.3	1994	1.3	1997	1.3	2000	1.3	2002	1.3
1980	1.8	1981	1.5	1982	1.7	1983	1.4	1986	1.3	1988	1.3	1991	1.3	1993	1.3	1995	1.3	1998	1.3	2001	1.3	2003	1.3
1981	1.5	1982	1.6	1983	1.3	1984	1.3	1987	1.3	1989	1.3	1992	1.3	1994	1.3	1996	1.3	1999	1.3	2002	1.3	2004	1.3
1982	1.6	1983	1.3	1984	1.3	1985	1.3	1988	1.3	1990	1.3	1993	1.3	1995	1.3	1997	1.3	2000	1.3	2003	1.3	2005	1.3
1983	1.3	1984	1.2	1985	1.2	1986	1.2	1989	1.2	1991	1.2	1994	1.2	1996	1.2	1998	1.2	2001	1.2	2004	1.2	2006	1.2
1984	1.2	1985	1.2	1986	1.2	1987	1.2	1990	1.2	1992	1.2	1995	1.2	1997	1.2	1999	1.2	2002	1.2	2005	1.2	2007	1.2
1985	1.2	1986	1.2	1987	1.2	1988	1.2	1991	1.2	1993	1.2	1996	1.2	1998	1.2	2000	1.2	2003	1.2	2006	1.2	2008	1.2
1986	1.2	1987	1.2	1988	1.2	1989	1.2	1992	1.2	1994	1.2	1997	1.2	1999	1.2	2001	1.2	2004	1.2	2007	1.2	2009	1.2
1987	1.1	1988	1.1	1989	1.1	1990	1.1	1993	1.1	1995	1.1	1998	1.1	2000	1.1	2002	1.1	2005	1.1	2008	1.1	2010	1.1
1988	1.1	1989	1.1	1990	1.1	1991	1.1	1994	1.1	1996	1.1	1999	1.1	2001	1.1	2003	1.1	2006	1.1	2009	1.1	2011	1.1
1989	1.1	1990	1.1	1991	1.1	1992	1.1	1995	1.1	1997	1.1	2000	1.1	2002	1.1	2004	1.1	2007	1.1	2010	1.1	2012	1.1
1990	1.0	1991	1.0	1992	1.0	1993	1.0	1996	1.0	1998	1.0	2001	1.0	2003	1.0	2005	1.0	2008	1.0	2011	1.0	2013	1.0
1991	1.0	1992	1.0	1993	1.0	1994	1.0	1997	1.0	1999	1.0	2002	1.0	2004	1.0	2006	1.0	2009	1.0	2012	1.0	2014	1.0
1992	1.0	1993	1.0	1994	1.0	1995	1.0	1998	1.0	2000	1.0	2003	1.0	2005	1.0	2007	1.0	2010	1.0	2013	1.0	2015	1.0
1993	0.9	1994	0.9	1995	0.9	1996	0.9	1999	0.9	2001	0.9	2004	0.9	2006	0.9	2008	0.9	2011	0.9	2014	0.9	2016	0.9
1994	0.9	1995	0.9	1996	0.9	1997	0.9	2000	0.9	2002	0.9	2005	0.9	2007	0.9	2009	0.9	2012	0.9	2015	0.9	2017	0.9
1995	0.9	1996	0.9	1997	0.9	1998	0.9	2001	0.9	2003	0.9	2006	0.9	2008	0.9	2010	0.9	2013	0.9	2016	0.9	2018	0.9
1996	0.8	1997	0.8	1998	0.8	1999	0.8	2002	0.8	2004	0.8	2007	0.8	2009	0.8	2011	0.8	2014	0.8	2017	0.8	2019	0.8
1997	0.8	1998	0.8	1999	0.8	2000	0.8	2003	0.8	2005	0.8	2008	0.8	2010	0.8	2012	0.8	2015	0.8	2018	0.8	2020	0.8

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in table 2.1.4A.

TABLE 2.2.1A

NONTAMPERED EXHAUST EMISSION RATES FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1968	9.350	0.180	10.250	11.150
	1968-1969	5.600	0.250	6.850	8.100
	1970-1971	4.580	0.370	6.430	8.280
	1972-1974	4.580	0.170	5.430	6.280
	1975-1976	3.400	0.270	4.750	6.100
	1977	1.600	0.270	2.950	4.300
	1978	3.530	0.270	4.880	6.230
	1979-1980	1.660	0.280	3.060	4.460
	1981	1.660	0.280	3.060	4.460
	1982-1983	1.070	0.150	1.820	2.570
	1984	1.050	0.150	1.800	2.550
	1985	0.510	0.080	0.910	1.310
	1986	0.450	0.080	0.850	1.250
	1987	0.390	0.080	0.790	1.190
	1988	0.460	0.080	0.860	1.260
	1989	0.460	0.080	0.860	1.260
	1990	0.460	0.080	0.860	1.260
	1991	0.460	0.080	0.860	1.260
	1992+	0.450	0.080	0.850	1.250
CO	Pre-1968	117.700	2.250	128.950	140.200
	1968-1969	85.540	2.250	96.790	108.040
	1970-1971	79.640	3.130	95.290	110.940
	1972-1974	75.630	2.440	87.830	100.030
	1975-1976	58.010	2.590	70.960	83.910
	1977	22.860	2.590	35.810	48.760
	1978	53.570	2.590	66.520	79.470
	1979-1980	44.250	2.430	56.400	68.550
	1981	44.250	2.430	56.400	68.550
	1982-1983	30.160	1.460	37.460	44.760
	1984	23.350	1.460	30.650	37.950
	1985	9.840	0.730	13.490	17.140
	1986	8.060	0.730	11.710	15.360
	1987	6.190	0.730	9.840	13.490
	1988	7.410	0.730	11.060	14.710
	1989	7.360	0.730	11.010	14.660
	1990	7.310	0.730	10.960	14.610
	1991	7.290	0.730	10.940	14.590
	1992+	7.100	0.730	10.750	14.400
NOx	Pre-1968	1.960	0.0	1.960	1.960
	1968-1972	2.910	0.0	2.910	2.910
	1973-1974	1.910	0.040	2.110	2.310
	1975-1976	1.880	0.030	2.030	2.180
	1977	2.250	0.030	2.400	2.550
	1978	1.880	0.030	2.030	2.180
	1979-1980	0.970	0.060	1.270	1.570
	1981	0.970	0.060	1.270	1.570
	1982-1983	1.460	0.030	1.610	1.760
	1984	1.220	0.070	1.570	1.920
	1985	1.240	0.040	1.440	1.640
	1986	1.080	0.040	1.280	1.480
	1987	0.910	0.040	1.110	1.310
	1988	0.820	0.040	1.020	1.220
	1989	0.820	0.040	1.020	1.220
	1990	0.810	0.040	1.010	1.210
	1991	0.810	0.040	1.010	1.210
	1992+	0.780	0.040	0.980	1.180

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile.
ZML = Zero mile level in grams/mile.
DR = Deterioration rate in grams/mile/10K miles.
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 2.2.1B

EXHAUST EMISSION RATES FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I
AT VARIOUS MILEAGE LEVELS
(RATES INCLUDE TAMPERING)

Pol	Model Years	Emission Rate (Grams/Mile) 0K	25K	50K	75K	100K	125K	150K
HC	Pre-1968	9.350	9.800	10.250	10.700	11.150	11.600	12.050
	1968-1969	5.615	6.244	6.874	7.503	8.133	8.762	9.392
	1970-1971	4.595	5.524	6.454	7.383	8.313	9.242	10.172
	1972	4.610	5.044	5.478	5.912	6.346	6.780	7.214
	1973-1974	4.669	5.121	5.573	6.026	6.478	6.930	7.382
	1975	3.993	4.891	5.850	6.781	7.711	8.642	9.552
	1976	4.066	4.998	5.995	6.959	7.924	8.889	9.835
	1977	2.214	3.135	4.110	5.055	5.999	6.944	7.881
	1978	4.144	5.065	6.040	6.985	7.929	8.874	9.811
	1979-1980	2.342	3.292	4.317	5.310	6.303	7.295	8.257
	1981	1.738	2.584	3.465	4.369	5.283	6.189	7.090
	1982	1.146	1.668	2.227	2.809	3.400	3.983	4.562
	1983	1.143	1.660	2.212	2.786	3.370	3.946	4.518
	1984	1.120	1.636	2.190	2.766	3.350	3.926	4.500
	1985	0.576	0.912	1.284	1.677	2.078	2.472	2.863
	1986	0.513	0.839	1.195	1.570	1.954	2.331	2.705
	1987	0.438	0.741	1.068	1.411	1.760	2.105	2.446
	1988-1991	0.508	0.809	1.135	1.476	1.823	2.165	2.505
	1992+	0.498	0.799	1.125	1.466	1.813	2.155	2.495
CO	Pre-1968	117.700	123.325	128.950	134.575	140.200	145.825	151.450
	1968-1969	85.871	91.597	97.323	103.049	108.776	114.502	120.228
	1970-1971	79.985	87.916	95.846	103.776	111.706	119.637	127.567
	1972	76.324	82.636	88.948	95.260	101.572	107.884	114.195
	1973-1974	77.713	84.448	91.184	97.920	104.655	111.391	118.126
	1975	64.351	72.987	82.227	91.206	100.185	109.164	117.722
	1976	65.040	73.974	83.551	92.832	102.113	111.393	120.274
	1977	29.282	38.115	47.462	56.535	65.608	74.681	83.531
	1978	59.992	68.825	78.172	87.245	96.318	105.391	114.241
	1979-1980	51.544	60.030	69.268	78.206	87.144	96.081	104.430
	1981	44.916	52.571	60.748	69.142	77.628	86.040	94.411
	1982	30.802	36.069	41.912	47.970	54.116	60.189	66.221
	1983	30.755	35.944	41.688	47.635	53.664	59.624	65.547
	1984	23.898	29.114	34.952	40.988	47.097	53.141	59.150
	1985	10.341	13.650	17.558	21.651	25.810	29.910	33.977
	1986	8.514	11.614	15.179	18.907	22.700	26.439	30.149
	1987	6.431	9.189	12.319	15.557	18.832	22.076	25.302
	1988	7.651	10.382	13.462	16.649	19.872	23.065	26.241
	1989	7.601	10.332	13.412	16.599	19.822	23.015	26.191
	1990	7.551	10.282	13.362	16.549	19.772	22.965	26.141
	1991	7.531	10.262	13.342	16.529	19.752	22.945	26.121
	1992+	7.341	10.072	13.152	16.339	19.562	22.755	25.931
NOx	Pre-1968	1.960	1.960	1.960	1.960	1.960	1.960	1.960
	1968-1972	2.910	2.910	2.910	2.910	2.910	2.910	2.910
	1973	2.006	2.156	2.306	2.456	2.606	2.757	2.907
	1974	2.018	2.174	2.331	2.487	2.643	2.800	2.956
	1975-1976	2.181	2.414	2.647	2.880	3.113	3.345	3.578
	1977	2.551	2.784	3.017	3.250	3.483	3.715	3.948
	1978	2.181	2.414	2.647	2.880	3.113	3.345	3.578
	1979-1980	1.308	1.635	1.962	2.289	2.616	2.944	3.271
	1981	0.970	1.191	1.461	1.800	2.139	2.479	2.818
	1982	1.460	1.607	1.802	2.066	2.331	2.596	2.861
	1983	1.461	1.609	1.806	2.072	2.339	2.606	2.873
	1984	1.222	1.472	1.772	2.142	2.513	2.883	3.253
	1985	1.243	1.422	1.652	1.951	2.252	2.552	2.852
	1986	1.085	1.269	1.505	1.812	2.120	2.428	2.735
	1987	0.926	1.147	1.425	1.777	2.134	2.488	2.840
	1988-1989	0.836	1.023	1.239	1.489	1.742	1.992	2.242
	1990-1991	0.826	1.013	1.229	1.479	1.732	1.982	2.232
	1992+	0.796	0.983	1.199	1.449	1.702	1.952	2.202

DATE : MAY 19, 1989

TABLE 2.2.2A

NONTAMPERED
CRANKCASE AND EVAPORATIVE HYDROCARBON EMISSIONS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS

Model Years	Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
Pre-1963	5.29	19.07	33.90	29.18	62.39
1963-1967	1.03	19.07	33.90	29.18	62.39
1968-1970	0.0	19.07	33.90	29.18	62.39
1971	0.0	14.18	21.16	20.99	50.15
1972-1976	0.0	14.07	17.15	20.96	44.93
1977	0.0	8.27	8.98	12.32	23.53
1978-1980	0.0	6.37	13.36	11.15	36.85
1981	0.0	3.50	7.73	7.91	37.69
1982	0.0	1.76	3.89	3.97	18.95
1983	0.0	1.76	3.89	3.97	18.98
1984	0.0	1.75	3.86	3.97	18.82
1985	0.0	1.69	3.73	3.87	18.19
1986	0.0	1.50	3.30	3.60	16.11
1987	0.0	1.30	2.84	3.33	13.87
1988	0.0	1.25	2.75	3.21	13.43
1989	0.0	1.25	2.74	3.22	13.35
1990	0.0	1.25	2.69	3.31	13.14
1991	0.0	1.25	2.69	3.32	13.11
1992+	0.0	1.22	2.63	3.29	12.82

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

DATE : MAY 19, 1989

TABLE 2.2.2B

TAMPERING OFFSETS FOR TOTAL
CRANKCASE AND EVAPORATIVE HC EMISSIONS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I
AT VARIOUS MILEAGE INTERVALS

Fuel RVP	Model Years	Tampering Offset (Grams/Mile)** 0K	25K	50K	75K	100K	125K	150K
9.0	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1969	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1970	0.0	0.03	0.08	0.13	0.18	0.23	0.28
	1971-1975	0.0	0.04	0.09	0.14	0.19	0.24	0.30
	1976	0.0	0.04	0.09	0.15	0.20	0.26	0.31
	1977-1978	0.0	0.05	0.12	0.20	0.27	0.35	0.42
	1979	0.0	0.05	0.12	0.20	0.27	0.34	0.42
	1980	0.0	0.03	0.08	0.13	0.18	0.23	0.28
	1981	0.0	0.04	0.10	0.16	0.23	0.29	0.35
	1982	0.0	0.04	0.10	0.16	0.23	0.29	0.35
	1983	0.0	0.04	0.10	0.16	0.22	0.29	0.35
	1984	0.0	0.04	0.10	0.16	0.22	0.28	0.34
	1985	0.0	0.04	0.10	0.16	0.22	0.28	0.34
	1986	0.0	0.04	0.10	0.16	0.21	0.27	0.33
	1987	0.0	0.04	0.10	0.16	0.21	0.27	0.33
	1988	0.0	0.04	0.10	0.16	0.21	0.27	0.33
	1989	0.0	0.04	0.10	0.15	0.21	0.27	0.32
	1990	0.0	0.04	0.10	0.15	0.21	0.27	0.32
	1991+	0.0	0.04	0.10	0.15	0.21	0.27	0.32
11.5	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1969	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1970	0.0	0.06	0.15	0.23	0.32	0.41	0.49
	1971-1975	0.0	0.05	0.13	0.20	0.28	0.36	0.43
	1976	0.0	0.06	0.15	0.23	0.32	0.41	0.50
	1977-1978	0.0	0.06	0.15	0.25	0.34	0.43	0.53
	1979	0.0	0.06	0.15	0.25	0.34	0.43	0.52
	1980	0.0	0.05	0.13	0.20	0.28	0.35	0.43
	1981	0.0	0.07	0.18	0.29	0.40	0.51	0.61
	1982	0.0	0.07	0.18	0.29	0.40	0.51	0.62
	1983	0.0	0.07	0.18	0.29	0.40	0.50	0.61
	1984	0.0	0.07	0.18	0.28	0.39	0.49	0.60
	1985	0.0	0.07	0.17	0.27	0.37	0.47	0.56
	1986	0.0	0.07	0.16	0.25	0.34	0.43	0.52
	1987	0.0	0.07	0.16	0.25	0.34	0.43	0.52
	1988	0.0	0.07	0.16	0.25	0.34	0.43	0.52
	1989	0.0	0.06	0.15	0.24	0.33	0.42	0.51
	1990	0.0	0.06	0.15	0.24	0.33	0.42	0.51
	1991+	0.0	0.06	0.15	0.24	0.33	0.42	0.51

* Based on calculated hot soak temperature of 82.0F,
Diurnal temperature rise from 60.0 to 84.0F,
Fuel RVPs of 9.0 and 11.5 psi with no weathering, tank level of 40.0%.

** Based on averages of 4.24 trips per day and 29.05 miles per day.

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TABLE 2.2.2C

NONTAMPERED
RUNNING LOSS EMISSIONS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Years	Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Pre-1971	7.0	0.36	0.52	1.13	2.16
	9.0	0.58	1.50	2.62	4.81
	10.4	1.06	2.70	4.00	5.63
	11.7	2.88	3.85	8.20	13.64
1971-1977	7.0	0.30	0.49	1.04	1.60
	9.0	0.49	1.15	2.37	3.60
	10.4	0.85	2.04	2.96	4.10
	11.7	2.15	2.85	5.97	9.87
1978-1980	7.0	0.24	0.42	0.97	1.39
	9.0	0.39	1.20	2.21	2.88
	10.4	0.68	1.70	2.38	3.23
	11.7	1.72	2.30	4.79	7.90
1981+	7.0	0.05	0.06	0.18	0.20
	9.0	0.07	0.13	0.42	0.62
	10.4	0.13	0.30	0.50	0.75
	11.7	0.36	0.47	1.03	1.73

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TABLE 2.2.2D

REFUELING EMISSIONS* FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Years	Fuel Economy (miles/gal)	Uncontrolled (grams/mile)	With Volatility Control** (grams/mile)	With Onboard** (grams/mile)	With both Volatility and Onboard** (grams/mile)
Pre-1971	11.1	0.52	0.52	0.52	0.52
1971	10.7	0.54	0.54	0.54	0.54
1972	10.8	0.53	0.53	0.53	0.53
1973-1974	10.6	0.54	0.54	0.54	0.54
1975	11.9	0.48	0.48	0.48	0.48
1976	12.3	0.47	0.47	0.47	0.47
1977	13.3	0.43	0.43	0.43	0.43
1978	13.0	0.44	0.44	0.44	0.44
1979	12.6	0.46	0.46	0.46	0.46
1980	15.7	0.37	0.37	0.37	0.37
1981	17.0	0.34	0.34	0.34	0.34
1982	17.3	0.33	0.33	0.33	0.33
1983	17.6	0.33	0.33	0.33	0.33
1984	17.2	0.34	0.34	0.34	0.34
1985	17.3	0.33	0.33	0.33	0.33
1986-1987	18.0	0.32	0.32	0.32	0.32
1988	17.7	0.33	0.33	0.33	0.33
1989-1991	17.8	0.32	0.32	0.32	0.32
1992	17.8	0.32	0.26	0.32	0.03
1993-1997	17.7	0.33	0.26	0.04	0.03
1998+	17.6	0.33	0.26	0.04	0.03

* Refueling Emissions (g/mi) = [Displacement (g/gal) + Spillage (g/gal)] / Fuel Economy (mi/gal).

** Volatility control assumed to start in 1992, with 7.0/7.8/9.0 RVP fuels for ASTM class A/B/C cities. Onboard assumed to start in 1993, and apply to LDGVs, LDGTs, and HDGVs.

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TABLE 2.2.3

HOT STABILIZED IDLE EMISSIONS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Pol	Model Years	Emission Rate (Grams/Hour) Nontampered Zero Mile	Nontampered 50,000 Mile	Nontampered 100,000 Mile	In-use Level* 50,000 Mile	In-use Level* 100,000 Mile
HC	Pre-1968	97.80	106.80	115.80	112.07	127.26
	1968-1969	45.60	63.60	81.60	68.87	93.06
	1970-1971	42.60	63.60	84.60	68.87	96.06
	1972-1974	44.40	56.40	68.40	61.67	79.86
	1975-1976	19.80	37.80	55.80	43.07	67.26
	1977	9.00	27.00	45.00	32.27	56.46
	1978	18.00	36.00	54.00	41.27	65.46
	1979-1980	23.90	51.06	76.92	56.34	88.38
	1981	18.55	45.89	72.77	51.16	84.23
	1982-1983	11.95	27.29	41.93	32.57	53.39
	1984	9.51	26.64	41.68	31.92	53.14
	1985	4.90	12.62	20.11	17.89	31.57
	1986	5.11	12.73	20.19	18.01	31.65
	1987	4.10	11.68	19.11	16.96	30.57
	1988	6.54	14.19	21.65	19.47	33.11
	1989	6.53	14.18	21.64	19.46	33.10
	1990	6.52	14.17	21.63	19.45	33.09
	1991	6.51	14.16	21.62	19.44	33.08
	1992+	6.17	13.84	21.29	19.11	32.75
CO	Pre-1968	958.80	1078.80	1198.80	1109.08	1267.47
	1968-1969	674.40	863.40	1052.40	893.68	1121.07
	1970-1971	775.80	1039.80	1303.80	1070.08	1372.47
	1972-1974	839.40	1067.40	1295.40	1097.68	1364.07
	1975-1976	465.60	681.60	897.60	711.88	966.27
	1977	180.00	396.00	612.00	426.28	680.67
	1978	363.00	579.00	795.00	609.28	863.67
	1979-1980	697.67	927.98	1136.67	958.25	1205.35
	1981	524.04	785.45	1021.56	815.73	1090.23
	1982-1983	352.11	516.37	661.56	546.65	730.23
	1984	294.65	450.27	589.55	480.55	658.22
	1985	65.97	139.75	208.82	170.02	277.50
	1986	50.77	123.06	191.04	153.34	259.72
	1987	44.40	114.62	181.32	144.89	250.00
	1988	75.06	140.26	205.11	170.54	273.78
	1989	73.85	139.04	203.88	169.31	272.56
	1990	72.62	137.77	202.60	168.05	271.28
	1991	72.25	137.37	202.17	167.64	270.85
	1992+	67.62	132.57	197.29	162.85	265.97
NOx	Pre-1968	6.60	6.60	6.60	6.61	6.62
	1968-1972	5.40	5.40	5.40	5.41	5.42
	1973-1978	4.20	4.20	4.20	4.21	4.22
	1979-1980	3.98	3.98	3.98	3.99	4.00
	1981	7.34	7.34	7.34	7.35	7.36
	1982-1983	7.37	7.37	7.37	7.38	7.39
	1984	7.62	7.62	7.62	7.63	7.64
	1985	6.96	6.96	6.96	6.97	6.98
	1986	2.00	2.00	2.00	2.01	2.02
	1987	1.73	1.73	1.73	1.74	1.75
	1988-1989	1.66	1.66	1.66	1.67	1.68
	1990-1991	1.65	1.65	1.65	1.66	1.67
	1992+	1.61	1.61	1.61	1.62	1.63

* In-use emission level includes tampering.

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TABLE 2.2.4A

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per truck *)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.070	15640.	0.023	15640.	1955.
2	0.092	14590.	0.092	15377.	11697.
3	0.088	13610.	0.088	14345.	26552.
4	0.083	12696.	0.083	13381.	40409.
5	0.077	11843.	0.077	12483.	53335.
6	0.072	11048.	0.072	11644.	65393.
7	0.067	10306.	0.067	10862.	76642.
8	0.062	9614.	0.062	10133.	87135.
9	0.057	8968.	0.057	9452.	96923.
10	0.051	8366.	0.051	8817.	106054.
11	0.047	7804.	0.047	8225.	114572.
12	0.041	7280.	0.041	7673.	122517.
13	0.036	6791.	0.036	7158.	129929.
14	0.031	6335.	0.031	6677.	136843.
15	0.026	5909.	0.026	6229.	143293.
16	0.021	5512.	0.021	5810.	149310.
17	0.016	5142.	0.016	5419.	154922.
18	0.011	4797.	0.011	5056.	160157.
19	0.007	4475.	0.007	4716.	165041.
20+	0.044	4174.	0.044	4400.	169597.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1,
where: JMAR(1) = MAR(1) and,
JMAR(MYI) = .25*MAR(MYI) + .75*MAR(MYI-1), MYI = 2,...,20+.

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TABLE 2.2.4C

TRIPS PER DAY AND MILES PER DAY FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Year Index*	Trips per Day	Miles per Day
1	4.66	42.85
2	4.60	42.13
3	4.54	39.30
4	4.48	36.66
5	4.43	34.20
6	4.37	31.90
7	4.31	29.76
8	4.25	27.76
9	4.19	25.90
10	4.13	24.16
11	4.08	22.54
12	4.02	21.02
13	3.96	19.61
14	3.90	18.29
15	3.84	17.06
16	3.78	15.92
17	3.72	14.85
18	3.67	13.85
19	3.61	12.92
20+	3.55	12.05

* The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

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TABLE 2.2.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I
JANUARY 1, 1988

Model Years	(A) LDT1 Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) LDGT1 Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.023	0.973	0.023	0.024	15640.	382.6	0.036
1987	0.092	0.991	0.091	0.098	15377.	1510.8	0.142
1986	0.088	0.980	0.086	0.093	14345.	1333.2	0.126
1985	0.083	0.989	0.082	0.088	13381.	1183.7	0.112
1984	0.077	0.974	0.075	0.081	12483.	1008.9	0.095
1983	0.072	0.958	0.069	0.074	11644.	865.5	0.082
1982	0.067	0.908	0.061	0.066	10862.	712.1	0.067
1981	0.062	0.918	0.057	0.061	10133.	621.5	0.059
1980	0.057	0.952	0.054	0.058	9452.	552.8	0.052
1979	0.051	0.985	0.050	0.054	8817.	477.3	0.045
1978	0.047	0.990	0.047	0.050	8225.	412.4	0.039
1977	0.041	1.000	0.041	0.044	7673.	339.0	0.032
1976	0.036	1.000	0.036	0.039	7158.	277.7	0.026
1975	0.031	1.000	0.031	0.033	6677.	223.1	0.021
1974	0.026	1.000	0.026	0.028	6229.	174.5	0.016
1973	0.021	1.000	0.021	0.023	5810.	131.5	0.012
1972	0.016	1.000	0.016	0.017	5419.	93.4	0.009
1971	0.011	1.000	0.011	0.012	5056.	59.9	0.006
1970	0.007	1.000	0.007	0.008	4716.	35.6	0.003
1969-	0.044	1.000	0.044	0.047	4400.	208.6	0.020
		DAF:	0.929		TFNORM:	10604.2	

WHERE :

A = January 1 registration mix from Table 2.2.4A,
B = Gasoline fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 2.2.4A.

NOTE : In general, the travel weighting fractions will change for every calendar year since the sales fraction (column B) changes for almost every model year.

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TABLE 2.2.6A

SPEED CORRECTION FACTOR COEFFICIENTS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = EXP(A + B*s + C*s**2+ D*S**3+ E*s**4+ F*s**5), HC & CO
= A + B*s + C*s**2+ D*s**3+ E*s**4 + F*s**5, NOx

Pollutant and Model Years	A	B	C	D	E	F
HC						
Pre-1968	0.224612E+01	-0.290973E+00	0.158890E-01	-0.472494E-03	0.694077E-05	-0.392798E-07
1968	0.202779E+01	-0.273049E+00	0.153577E-01	-0.460304E-03	0.678527E-05	-0.384880E-07
1969	0.215056E+01	-0.283620E+00	0.153836E-01	-0.442136E-03	0.628732E-05	-0.346311E-07
1970	0.223021E+01	-0.293648E+00	0.162356E-01	-0.484148E-03	0.711591E-05	-0.402861E-07
1971	0.212230E+01	-0.291072E+00	0.169089E-01	-0.526148E-03	0.802705E-05	-0.470117E-07
1972	0.215361E+01	-0.283451E+00	0.156948E-01	-0.469759E-03	0.693832E-05	-0.394707E-07
1973-1974	0.211340E+01	-0.285676E+00	0.163180E-01	-0.500793E-03	0.755067E-05	-0.437187E-07
1975-1978	0.239540E+01	-0.335781E+00	0.211609E-01	-0.731550E-03	0.120715E-04	-0.748567E-07
CO						
Pre-1968	0.181978E+01	-0.254663E+00	0.152347E-01	-0.487397E-03	0.758207E-05	-0.449514E-07
1968	0.186919E+01	-0.276679E+00	0.172335E-01	-0.558279E-03	0.871678E-05	-0.516980E-07
1969	0.182133E+01	-0.272054E+00	0.170304E-01	-0.552021E-03	0.862543E-05	-0.511440E-07
1970	0.201421E+01	-0.295188E+00	0.186353E-01	-0.621606E-03	0.993657E-05	-0.599779E-07
1971	0.204533E+01	-0.310618E+00	0.204852E-01	-0.708527E-03	0.116215E-04	-0.715690E-07
1972	0.231868E+01	-0.341147E+00	0.209446E-01	-0.665891E-03	0.102225E-04	-0.598265E-07
1973-1974	0.215487E+01	-0.329116E+00	0.210112E-01	-0.689057E-03	0.108390E-04	-0.647125E-07
1975-1978	0.248747E+01	-0.391562E+00	0.270721E-01	-0.976178E-03	0.165270E-04	-0.104317E-06
NOx						
Pre-1968	0.244424E+01	-0.250107E+00	0.138293E-01	-0.287025E-03	0.207585E-05	0.0
1968	0.188656E+01	-0.161289E+00	0.904995E-02	-0.185609E-03	0.132555E-05	0.0
1969	0.155777E+01	-0.113032E+00	0.671832E-02	-0.143409E-03	0.106079E-05	0.0
1970	0.204516E+01	-0.194014E+00	0.110736E-01	-0.231754E-03	0.168372E-05	0.0
1971	0.163262E+01	-0.121861E+00	0.703020E-02	-0.146293E-03	0.106141E-05	0.0
1972	0.144825E+01	-0.122444E+00	0.795024E-02	-0.171078E-03	0.125777E-05	0.0
1973-1974	0.153447E+01	-0.125671E+00	0.785919E-02	-0.169428E-03	0.125494E-05	0.0
1975-1978	0.942131E+00	-0.423240E-01	0.386253E-02	-0.939853E-04	0.753883E-06	0.0

* WHERE : s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16].

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TABLE 2.2.6B

SPEED CORRECTION FACTOR COEFFICIENTS FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = A/s + B, HC & CD
= EXP(A + B*s + C*s**2), NOx

Pollutant	Speed	Model Years	Coefficient A	B	C
HC	Low	1979-1980	41.27921	0.0	
		1981	14.50530	0.0	
		1982	13.13510	0.0	
		1983	13.72850	0.0	
		1984	12.87590	0.0	
		1985	12.29910	0.0	
		1986	6.03710	-0.03723	
		1987	5.02670	-0.01687	
		1988	4.79940	-0.01228	
		1989	4.76780	-0.01165	
		1990	4.73310	-0.01095	
		1991	4.72990	-0.01088	
		1992+	4.59730	-0.00821	
	High	1979+	8.10000	0.0	
CO	Low	1979-1980	563.51440	-3.44034	
		1981	168.89410	0.72193	
		1982	147.47639	0.80430	
		1983	158.07001	0.75053	
		1984	145.32240	0.77799	
		1985	137.36800	0.76426	
		1986	43.39830	1.33132	
		1987	30.59711	2.35788	
		1988	27.71680	2.58886	
		1989	27.31670	2.62094	
		1990	26.87669	2.65622	
		1991	26.83670	2.65943	
		1992+	25.15649	2.79417	
	High	1979+	60.00000	0.0	
NOx	All	1979-1980	1.04330	-0.026082	0.00042835
		1981	0.24736	-0.033673	0.00047036
		1982	0.22790	-0.033673	0.00047036
		1983	0.24101	-0.033673	0.00047036
		1984	0.23298	-0.033673	0.00047036
		1985	0.23289	-0.033673	0.00047036
		1986	-0.03836	-0.026426	0.00020485
		1987	-0.07312	-0.026426	0.00020485
		1988	-0.08094	-0.026426	0.00020485
		1989	-0.08203	-0.026426	0.00020485
		1990	-0.08323	-0.026426	0.00020485
		1991	-0.08333	-0.026426	0.00020485
		1992+	-0.08790	-0.026426	0.00020485

* WHERE: s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16].
Low = average speed ≤ 19.6 mph,
High = average speed > 19.6 mph.

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TABLE 2.2.7A

LOW (< 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* TCF(1) = TC(1)*(T - 75.0), 1981+ CO.
TCF(b) = EXP [TC(b)*(T - 75.0)], all others

Pol	Model Years	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1968	-0.20623E-01	-0.24032E-02	-0.10081E-02
	1968-1969	-0.24462E-01	-0.32017E-02	-0.86884E-03
	1970-1971	-0.21255E-01	-0.52755E-03	0.93659E-03
	1972-1974	-0.21427E-01	-0.39442E-03	0.49731E-02
	1975-1980	-0.23517E-01	-0.88057E-02	-0.16222E-02
	1981-1983	-0.26820E-01	-0.75815E-02	-0.51660E-02
	1984	-0.32775E-01	-0.83176E-02	-0.90264E-02
	1985	-0.32082E-01	-0.85130E-02	-0.90264E-02
	1986	-0.33863E-01	-0.75333E-02	-0.60835E-02
	1987	-0.29645E-01	-0.86205E-02	-0.70376E-02
	1988	-0.29076E-01	-0.90614E-02	-0.74167E-02
	1989	-0.28850E-01	-0.90467E-02	-0.74058E-02
	1990	-0.28022E-01	-0.87314E-02	-0.71430E-02
	1991	-0.27909E-01	-0.86831E-02	-0.71027E-02
	1992+	-0.27350E-01	-0.88233E-02	-0.72259E-02
CO	Pre-1968	-0.13487E-01	0.15784E-02	0.11097E-02
	1968-1969	-0.21126E-01	-0.15289E-02	0.15749E-02
	1970-1971	-0.20843E-01	-0.59951E-02	0.18253E-02
	1972-1974	-0.19091E-01	-0.42373E-03	0.57982E-02
	1975-1980	-0.24835E-01	-0.88336E-02	-0.11553E-02
	1981-1983	-0.12448E+01	-0.12478E-01	-0.74106E-02
	1984	-0.13095E+01	-0.14584E-01	-0.11371E-01
	1985	-0.12840E+01	-0.14584E-01	-0.11371E-01
	1986	-0.10914E+01	-0.13812E-01	-0.90777E-02
	1987	-0.98042E+00	-0.15565E-01	-0.90777E-02
	1988	-0.97360E+00	-0.16234E-01	-0.90777E-02
	1989	-0.96563E+00	-0.16220E-01	-0.90777E-02
	1990	-0.92922E+00	-0.15787E-01	-0.90777E-02
	1991	-0.92410E+00	-0.15721E-01	-0.90777E-02
	1992+	-0.90931E+00	-0.15947E-01	-0.90777E-02
NOx	Pre-1968	-0.16897E-03	-0.89245E-02	-0.72580E-02
	1968-1972	-0.25074E-03	-0.59791E-02	-0.62690E-02
	1973-1974	0.38855E-02	-0.24156E-02	-0.21188E-02
	1975-1978	-0.45504E-04	-0.12575E-02	-0.53153E-03
	1979-1980	-0.76044E-02	-0.68045E-02	-0.54198E-02
	1981-1983	-0.19000E-02	-0.61656E-02	-0.49643E-02
	1984	-0.45479E-02	-0.74823E-02	-0.90882E-02
	1985	-0.47657E-02	-0.69890E-02	-0.90882E-02
	1986	-0.43258E-02	-0.89681E-02	-0.94839E-02
	1987	-0.43258E-02	-0.76241E-02	-0.86355E-02
	1988	-0.43258E-02	-0.74160E-02	-0.85833E-02
	1989	-0.43258E-02	-0.73506E-02	-0.85224E-02
	1990	-0.43258E-02	-0.71351E-02	-0.82440E-02
	1991	-0.43258E-02	-0.71061E-02	-0.82048E-02
	1992+	-0.43258E-02	-0.69285E-02	-0.80917E-02

* WHERE :

TCF(b) = Low temperature correction factor for appropriate pollutant, ambient temperature (< 75F), and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = Low temperature correction factor coefficient for appropriate pollutant, reference temperature, and model year, for test segment b.

NOTE : The low temperature correction factor is used in conjunction with the correction factor given in Table 2.2.7C.

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TABLE 2.2.7B

HIGH (> 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
AND FUEL RVP CORRECTION FACTORS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* TCF(b) = EXP [TC(b)*(T - 75.0)], Pre-1981
TRCF(b) = EXP [RC(b)*(RVP - 9.0) + TC(b)*(T - 75.0)
+ TRC(b)*(RVP - 9.0)*(T - 75.0)], 1981+

Pol	Model Years	Parameter	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1968	TC	-0.14381E-01	0.13219E-02	0.34799E-02
	1968-1969		-0.12552E-01	0.42667E-02	0.75843E-02
	1970-1971		-0.10888E-01	-0.47925E-03	0.76666E-02
	1972-1974		-0.66107E-02	0.26288E-02	0.12320E-01
	1975-1980		-0.14095E-01	0.26179E-01	0.24297E-01
	1981-1985	RC	0.91402E-01	0.42060E-01	0.93179E-01
		TC	0.44270E-02	0.48358E-02	0.74688E-02
		TRC	0.29466E-02	0.0	0.47276E-02
	1986+	RC	0.23202E-01	0.15373E+00	0.13263E+00
		TC	0.0	0.86550E-02	0.83730E-02
		TRC	0.0	0.0	0.56009E-02
CO	Pre-1968	TC	-0.14691E-01	0.37462E-02	0.11014E-01
	1968-1969		-0.38767E-01	0.84685E-02	0.25179E-01
	1970-1971		-0.21165E-01	0.23603E-01	0.28483E-01
	1972-1974		-0.13146E-01	0.24717E-01	0.25848E-01
	1975-1980		-0.19612E-01	0.48537E-01	0.31439E-01
	1981-1985	RC	0.91345E-01	0.13968E+00	0.16322E+00
		TC	0.62182E-02	0.14943E-01	0.14923E-01
		TRC	0.0	0.0	0.0
	1986+	RC	0.40748E-01	0.26214E+00	0.23218E+00
		TC	0.35170E-02	0.14966E-01	0.20695E-01
		TRC	0.0	0.56416E-02	0.82344E-02
NOx	Pre-1968	TC	0.38841E-02	-0.87325E-02	-0.10839E-01
	1968-1972		-0.10389E-02	-0.92466E-02	-0.10108E-01
	1973-1974		-0.18301E-01	-0.10925E-01	-0.18042E-01
	1975-1978		-0.71420E-02	-0.87910E-02	-0.75470E-02
	1979-1980		-0.26153E-01	-0.18603E-01	-0.20878E-01
	1981-1985	RC	0.0	-0.40024E-01	0.0
		TC	0.0	0.0	0.0
		TRC	0.0	0.0	0.0
	1986+	RC	0.14219E-01	0.27491E-01	0.0
		TC	0.0	0.37789E-02	0.0
		TRC	0.0	0.0	0.0

* WHERE :

TCF(b) = High temperature correction factor for appropriate pollutant, ambient temperature, and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = High temperature correction factor coefficient for appropriate pollutant, temperature, and model year, for test segment b.
TRCF(b)= High temperature and fuel RVP correction factor for appropriate pollutant, ambient temperature, fuel RVP, and model year, for test segment b.
RC(b) = Fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, and model year, for test segment b.
RVP = Fuel volatility in psi.
TRC(b) = Combined temperature and fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, ambient temperature, and model year, for test segment b.

NOTE : The temperature correction factor is used in conjunction with the correction factor given in Table 2.2.7C.

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TABLE 2.2.7C

NORMALIZED BAG FRACTIONS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Pol	Model Years	Normalized Fractions: Test Segment 1 B1	Test Segment 1 D1	Test Segment 2 B2	Test Segment 2 D2	Test Segment 3 B3	Test Segment 3 D3	Total Test BO	Total Test DO
HC	Pre-1968	1.2820	0.0250	0.9730	0.0280	0.8390	0.0190	1.0000	0.0249
	1968-1969	1.3450	0.0740	0.9460	0.0540	0.8420	0.0480	1.0000	0.0565
	1970-1971	1.3450	0.1780	0.9190	0.1180	0.8940	0.0930	1.0000	0.1235
	1972-1974	1.3980	0.0600	0.8850	0.0550	0.9190	0.0360	1.0000	0.0508
	1975-1978	1.8560	0.3450	0.7650	0.2340	0.8030	0.1960	1.0000	0.2465
	1979-1980	2.0914	0.4073	0.6714	0.2752	0.8035	0.2972	1.0000	0.3082
	1981-1983	2.7957	0.1898	0.4428	0.2024	0.7084	0.1645	1.0000	0.1898
	1984	2.8662	0.2721	0.6530	0.2902	0.2540	0.2358	1.0000	0.2721
	1985	3.2436	0.2100	0.2334	0.1867	0.7701	0.1633	1.0000	0.1867
	1986	3.2304	0.2289	0.2289	0.2035	0.7885	0.1781	1.0000	0.2035
	1987	3.2688	0.2603	0.2025	0.2314	0.8100	0.2025	1.0000	0.2314
	1988	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1989	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1990	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1991	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1992+	2.3023	0.2623	0.6120	0.2331	0.7577	0.2040	1.0000	0.2331
CO	Pre-1968	1.2770	0.0330	1.0170	0.0290	0.7580	0.0250	1.0000	0.0287
	1968-1969	1.4420	0.0710	0.9960	0.0420	0.6740	0.0330	1.0000	0.0455
	1970-1971	1.5530	0.1090	0.9330	0.0790	0.7110	0.0380	1.0000	0.0740
	1972-1974	1.5730	0.0540	0.9020	0.0790	0.7550	0.0290	1.0000	0.0602
	1975-1978	1.9020	0.1700	0.8500	0.1510	0.6060	0.1050	1.0000	0.1423
	1979-1980	2.0939	0.3129	0.6895	0.1805	0.7671	0.1479	1.0000	0.1985
	1981-1983	2.6454	0.1633	0.4526	0.1020	0.8032	0.1076	1.0000	0.1163
	1984	2.5738	0.2181	0.3799	0.1362	0.9959	0.1436	1.0000	0.1553
	1985	3.4554	0.1471	0.2186	0.0914	0.6385	0.0971	1.0000	0.1043
	1986	3.2307	0.1795	0.3032	0.1115	0.6465	0.1185	1.0000	0.1272
	1987	2.8508	0.2342	0.4456	0.1455	0.6615	0.1546	1.0000	0.1660
	1988	1.5788	0.1945	0.8083	0.1209	0.9291	0.1284	1.0000	0.1379
	1989	1.5680	0.1958	0.8134	0.1216	0.9275	0.1292	1.0000	0.1387
	1990	1.5572	0.1973	0.8179	0.1226	0.9271	0.1302	1.0000	0.1398
	1991	1.5559	0.1974	0.8182	0.1226	0.9274	0.1303	1.0000	0.1399
	1992+	1.5064	0.2028	0.8408	0.1260	0.9216	0.1339	1.0000	0.1438
NOx	Pre-1968	1.1210	0.0090	0.7850	0.0010	1.3190	-0.0090	1.0000	-0.0001
	1968-1972	1.1990	-0.0040	0.7930	-0.0020	1.2450	0.0060	1.0000	-0.0002
	1973-1974	1.2620	0.0220	0.7700	0.0040	1.2420	0.0270	1.0000	0.0140
	1975-1978	1.2960	0.0120	0.7810	0.0040	1.1950	0.0160	1.0000	0.0089
	1979-1980	1.3666	0.0444	0.7444	0.0278	1.2111	0.0333	1.0000	0.0333
	1981-1983	1.3033	0.0061	0.8077	0.0184	1.1381	0.0245	1.0000	0.0184
	1984	1.0029	0.1343	0.9223	0.0358	1.1461	0.0537	1.0000	0.0627
	1985	1.1665	0.0724	0.8849	0.0161	1.0941	0.0322	1.0000	0.0322
	1986	1.2408	0.0833	0.8611	0.0185	1.0834	0.0370	1.0000	0.0370
	1987	1.3532	0.0990	0.8251	0.0220	1.0672	0.0440	1.0000	0.0440
	1988	1.3974	0.1094	0.8384	0.0243	1.0085	0.0486	1.0000	0.0486
	1989	1.3976	0.1103	0.8336	0.0245	1.0175	0.0490	1.0000	0.0490
	1990	1.4113	0.1114	0.8294	0.0248	1.0151	0.0495	1.0000	0.0495
	1991	1.4113	0.1114	0.8294	0.0248	1.0151	0.0495	1.0000	0.0495
	1992+	1.4452	0.1151	0.8185	0.0256	1.0104	0.0512	1.0000	0.0512

NOTE : The fractions given in this table are used in the calculation of the operating-mode/temperature correction factor (OMTCF).

WHERE :

```
OMTCF  = [(TERM1 + TERM2 + TERM3)/DENOM],
TERM1  =     W    *TCF(1)*(B1+D1*M),
TERM2  = (1-W-X)*TCF(2)*(B2+D2*M),
TERM3  =     X    *TCF(3)*(B3+D3*M),
DENOM  = BO + DO*M,
 W     = Fraction of VMT in the cold start mode,
 X     = Fraction of VMT in the  hot start mode,
TCF(b) = Temperature correction factor for pollutant, model
         year, for test segment b,
 M     = Cumulative mileage / 10,000 miles.
```

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TABLE 2.2.8A

AIR CONDITIONING CORRECTION FACTOR COEFFICIENTS FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* ACCF= U*V*(A + B*(T-75) -1) + 1

Model Years	HC A	HC B	CO A	CO B	NOx A	NOx B
Pre-1975	0.1023E+01	0.3344E-02	0.1202E+01	0.1808E-02	0.1299E+01	0.5643E-04
1975+	0.1000E+01	0.3512E-02	0.1130E+01	0.1528E-02	0.1221E+01	0.4262E-03

* WHERE :

ACCF = Air Conditioning Correction Factor,
V = Fraction of vehicles equipped with AC given in Table 2.2.8B,
U = Fraction of vehicles with AC that are using it = (DI-DILO)/(DIHI-DI), 0<=U<=1,
DI = Discomfort index = (DB+WB)*.4+15,
DILO = The highest discomfort index where no AC is used,
DIHI = The lowest discomfort index where all vehicles with AC use it,
DB = Dry bulb temperature (Fahrenheit),
WB = Wet bulb temperature (Fahrenheit),
T = Ambient temperature (Fahrenheit).

TABLE 2.2.8B

ESTIMATED FRACTION OF
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I
EQUIPPED WITH AIR CONDITIONING

Model Years	Fraction Equipped With Air Conditioning
Pre-1977	0.32
1977	0.52
1978+	0.39

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TABLE 2.2.8C

EXTRA LOAD CORRECTION FACTOR COEFFICIENTS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* XLCF = (XLC-1)*U + 1

Model Years	Coefficients (XLC) HC	CO	NOx
Pre-1968	1.0786	1.2765	0.9535
1968-1969	1.0495	1.1384	1.0313
1970-1971	1.0852	1.2478	1.0313
1972	1.0556	1.1347	1.0313
1973-1974	1.0556	1.1347	1.0753
1975+	1.0455	1.3058	1.0719

* WHERE :

XLCF = Extra load correction factor,
U = Fraction of VMT with an extra load,
XLC = Correction factor coefficient.

TABLE 2.2.8D

TRAILER TOWING CORRECTION FACTOR COEFFICIENTS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

* TTCF = (TTC-1)*U + 1

Model Years	Coefficients (TTC) HC	CO	NOx
Pre-1968	1.2614	1.9327	1.1184
1968-1969	1.2762	1.8940	1.1384
1970-1971	1.4598	2.4753	1.1384
1972	1.7288	2.1414	1.1384
1973-1974	1.7288	2.1414	1.2170
1975+	1.5909	3.9722	1.3875

* WHERE :

TTCF = Trailer towing correction factor,
U = Fraction of VMT towing a trailer,
TTC = Correction factor coefficient.

TABLE 2.2.9A

TAMPERING AND MISFUELING RATES
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Area	Model Years	System	Zero Mile Level	Det. Rate 1	Det. Rate 2	50,000 Mile Level	100,000 Mile Level
Non-I/M	Pre-1981	Air Pump Disablement	0.2155	0.02630	0.02630	0.347	0.478
		Catalyst Removal	0.2267	0.02260	0.02260	0.340	0.453
		EGR System Disabled	0.1037	0.02175	0.02175	0.212	0.321
		Filler Neck Damaged	0.1462	0.03684	0.03684	0.330	0.515
		Fuel Tank Misfueled	-0.0375	0.00857	0.00857	0.005	0.048
		Total Misfueled	0.1087	0.04541	0.04541	0.336	0.563
		PCV System Disabled	-0.0022	0.00419	0.00419	0.019	0.040
		Cannister Disconnect	-0.0185	0.01801	0.01801	0.072	0.162
		Both Cannister & Cap	-0.0121	0.01832	0.01832	0.079	0.171
	1981+	Air Pump Disablement	-0.0274	0.02619	0.02630	0.104	0.235
		Catalyst Removal	-0.0100	0.02074	0.02260	0.094	0.207
		EGR System Disabled	-0.0139	0.01374	0.02175	0.055	0.164
		Filler Neck Damaged	0.0087	0.00926	0.00926	0.055	0.101
		Fuel Tank Misfueled	0.0231	-0.00212	-0.00212	0.013	0.002
		Total Misfueled	0.0318	0.00714	0.00714	0.067	0.103
		PCV System Disabled	-0.0022	0.00419	0.00419	0.019	0.040
		Cannister Disconnect	-0.0185	0.01801	0.01801	0.072	0.162
		Both Cannister & Cap	-0.0121	0.01832	0.01832	0.079	0.171
With I/M	Pre-1981	Air Pump Disablement	0.2015	0.01561	0.01561	0.280	0.358
		Catalyst Removal	-0.0081	0.03342	0.03342	0.159	0.326
		EGR System Disabled	0.0880	0.01078	0.01078	0.142	0.196
		Filler Neck Damaged	0.0437	0.02806	0.02806	0.184	0.324
		Fuel Tank Misfueled	-0.0705	0.01076	0.01076	0.0	0.037
		Total Misfueled	-0.0268	0.03882	0.03882	0.167	0.361
		PCV System Disabled	-0.0068	0.00315	0.00315	0.009	0.025
		Cannister Disconnect	-0.0186	0.01349	0.01349	0.049	0.116
		Both Cannister & Cap	-0.0213	0.01484	0.01484	0.053	0.127
	1981+	Air Pump Disablement	-0.0044	0.00874	0.01561	0.039	0.117
		Catalyst Removal	0.0085	0.00618	0.03342	0.039	0.206
		EGR System Disabled	0.0068	0.00370	0.01078	0.025	0.079
		Filler Neck Damaged	0.0059	0.00380	0.00380	0.025	0.044
		Fuel Tank Misfueled	0.0097	0.00554	0.00554	0.037	0.065
		Total Misfueled	0.0156	0.00934	0.00934	0.062	0.109
		PCV System Disabled	-0.0068	0.00315	0.00315	0.009	0.025
		Cannister Disconnect	-0.0186	0.01349	0.01349	0.049	0.116
		Both Cannister & Cap	-0.0213	0.01484	0.01484	0.053	0.127

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TABLE 2.2.9B

EXCESS EMISSIONS
DUE TO TAMPERING AND/OR MISFUELING
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Type of Tampering	Emission Control System	Pollutant	Excess Emissions (g/mi) FTP	Bag 1	Bag 2	Bag 3	Idle (g/hr)
Air Pump Disablement	Oxidation	HC	1.37	1.80	1.37	1.04	27.38
		CO	30.61	34.67	33.90	21.28	506.08
	3way/Oxidation 3way	HC	0.85	1.36	0.76	0.61	
		Pre-1985					8.97
		1985+					11.71
		CO	21.02	31.80	18.21	18.25	
		Pre-1985					177.43
		1985+					215.29
Catalyst Removal	Oxidation	HC	3.05	2.31	3.40	2.95	42.83
		CO	28.01	41.40	28.97	16.06	124.82
	3way/Oxidation 3way	HC	2.04	1.80	2.25	1.81	42.83
		CO	13.74	16.32	14.11	11.07	124.82
		NOx	1.52	1.49	1.36	1.83	2.31
.otal Misfueled	Oxidation	HC	2.47	2.30	2.57	2.40	9.70
		CO	20.96	46.50	13.13	16.62	14.18
	3way/Oxidation 3way	HC	1.44	1.42	1.56	1.21	9.70
		CO	6.57	8.08	6.60	5.37	14.18
		NOx	0.57	0.64	0.45	0.74	0.13
EGR System Disabled		NOx					
		Pre-1975	1.21	1.40	0.96	1.54	
		1975-1978	3.31	3.82	2.63	4.21	
		1979-1987	3.48	4.11	2.68	4.53	
		1988+	1.23	1.36	1.19	1.21	
EGR System Disabled	and Catalyst Removal	NOx	3.39	3.02	3.46	3.55	
EGR System Disabled	and Total Misfueled	NOx	1.99	2.12	1.85	2.16	

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TABLE 2.2.9C

EXCESS CRANKCASE EMISSIONS
AND UNCONTROLLED
EVAPORATIVE HYDROCARBON EMISSIONS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Years	Excess Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
PCV System Disabled					
1964-1977	1.28				
1978-1979	1.27				
1980	1.24				
1981+	1.23				
Cannister Disconnect					
Pre-1971		19.07	42.15	29.18	93.10
1971		19.07	42.15	29.18	93.10
1972-1976		19.07	31.79	29.18	70.20
1977		14.67	24.45	22.45	54.00
1978-1980		17.28	25.22	24.05	55.71
1981+ CARB		8.45	23.15	18.00	51.13
1981+ FINJ		6.76	24.88	11.70	54.94
Missing Fuel Cap					
Pre-1971		19.07	42.15	29.18	93.10
1971		19.07	42.15	29.18	93.10
1972-1976		19.07	31.79	29.18	70.20
1977		14.67	24.45	22.45	54.00
1978-1980		17.28	25.22	24.05	55.71
1981+ CARB		0.0	23.15	0.0	51.13
1981+ FINJ		6.76	24.88	11.70	54.94

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

DATE : MAY 19, 1989

TABLE 2.2.9D

UNCONTROLLED
RUNNING LOSS EMISSIONS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Cannister Disconnect				
7.0	0.33	0.42	0.90	1.85
9.0	0.52	1.30	2.04	4.29
10.4	0.95	2.36	3.52	4.97
11.7	2.54	3.37	7.19	11.97
Missing Fuel Cap				
7.0	0.60	0.84	1.28	2.44
9.0	1.23	1.85	3.31	15.58
10.4	2.09	3.43	15.30	28.51
11.7	3.62	17.28	44.93	44.93

* Uncontrolled emissions applicable to 1971+ model year vehicles.

DATE : MAY 19, 1989

TABLE 2.2.10A

METHANE OFFSETS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Years	Methane Offsets (g/mi) FTP	Bag 1	Bag 2	Bag 3
Pre-1975	0.421	0.570	0.420	0.310
1975-1978	0.382	0.560	0.370	0.270
1979-1980	0.333	0.500	0.310	0.250
1981-1983	0.222	0.365	0.193	0.170
1984	0.182	0.271	0.167	0.145
1985	0.140	0.208	0.128	0.112
1986	0.094	0.139	0.085	0.076
1987	0.079	0.119	0.071	0.065
1988	0.072	0.109	0.064	0.059
1989	0.072	0.108	0.064	0.059
1990	0.071	0.108	0.064	0.058
1991	0.071	0.108	0.064	0.058
1992+	0.069	0.105	0.062	0.057

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

DATE : MAY 19, 1989

TABLE 2.2.10C

PERCENT TECHNOLOGY DISTRIBUTIONS
(EXHAUST AND EVAPORATIVE EMISSION SYSTEMS)
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Years	Air Pump Only	Oxidation Catalyst	3Way Catalyst	EGR System	Air Pump & Oxidation or 3Way Catalyst	EGR System & 3Way Catalyst
Pre-1968	0.0	0.0	0.0	0.0	0.0	0.0
1968-1971	5.0	0.0	0.0	0.0	0.0	0.0
1972	10.0	0.0	0.0	0.0	0.0	0.0
1973	30.0	0.0	0.0	80.0	0.0	0.0
1974	30.0	0.0	0.0	90.0	0.0	0.0
1975	10.0	70.0	0.0	90.0	30.0	0.0
1976	10.0	80.0	0.0	90.0	30.0	0.0
1977-1978	10.0	75.0	0.0	90.0	20.0	0.0
1979-1980	10.0	80.0	0.0	100.0	40.0	0.0
1981	0.0	95.0	5.0	100.0	50.0	5.0
1982	0.0	90.0	10.0	100.0	60.0	10.0
1983	0.0	80.0	20.0	100.0	60.0	20.0
1984	0.0	70.0	30.0	100.0	75.0	30.0
1985	0.0	60.0	40.0	100.0	75.0	40.0
1986	0.0	50.0	50.0	100.0	55.0	50.0
1987	0.0	5.0	95.0	100.0	55.0	95.0
1988+	0.0	5.0	95.0	100.0	50.0	95.0

Model Years	Evaporative Canister	PCV System
Pre-1963	0.0	0.0
1963-1967	0.0	0.0
1968-1970	0.0	100.0
1971+	100.0	100.0

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TABLE 2.2.10D

PERCENT TECHNOLOGY DISTRIBUTIONS
(FUEL DELIVERY SYSTEMS)
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I

Model Years	Carbureted	Ported Fuel-Injected	Throttle-Body Fuel-Injected
1981	99.1	0.9	0.0
1982	99.5	0.5	0.0
1983	99.8	0.2	0.0
1984	97.8	2.2	0.0
1985	88.6	6.8	4.6
1986	58.5	23.7	17.8
1987	26.5	43.2	30.3
1988	19.3	44.4	36.3
1989	18.3	45.8	35.9
1990	17.2	52.2	30.6
1991	17.1	53.1	29.8
1992+	12.9	55.7	31.4

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TABLE 2.2.11A

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	20.2	1967	20.2	1968	16.6	1969	16.6	1970	17.6	1971	16.2	1972	12.0	1973	12.0	1974	12.0	1975	12.5	1976	12.4	1977	9.4
1967	20.1	1968	16.5	1969	16.5	1970	17.5	1971	16.0	1972	11.9	1973	11.9	1974	11.9	1975	12.4	1976	12.3	1977	9.3	1978	10.9
1968	16.4	1969	16.4	1970	17.3	1971	15.8	1972	11.8	1973	11.8	1974	11.8	1975	12.3	1976	12.3	1977	9.2	1978	10.8	1979	9.1
1969	16.2	1970	17.1	1971	15.6	1972	11.7	1973	11.7	1974	11.8	1975	12.1	1976	12.1	1977	9.1	1978	10.7	1979	9.0	1980	8.9
1970	16.9	1971	15.4	1972	11.6	1973	11.6	1974	11.6	1975	12.0	1976	12.0	1977	9.0	1978	10.6	1979	8.8	1980	8.8	1981	7.5
1971	15.2	1972	11.5	1973	11.5	1974	11.5	1975	11.8	1976	11.8	1977	8.8	1978	10.4	1979	8.7	1980	8.7	1981	7.3	1982	4.4
1972	11.4	1973	11.4	1974	11.4	1975	11.6	1976	11.6	1977	8.6	1978	10.3	1979	8.5	1980	8.5	1981	7.2	1982	4.3	1983	4.3
1973	11.3	1974	11.3	1975	11.4	1976	11.4	1977	8.4	1978	10.1	1979	8.3	1980	8.3	1981	7.0	1982	4.3	1983	4.2	1984	4.2
1974	11.2	1975	11.2	1976	11.2	1977	8.2	1978	9.9	1979	8.1	1980	8.1	1981	6.8	1982	4.2	1983	4.1	1984	4.1	1985	2.7
1975	11.0	1976	11.0	1977	8.0	1978	9.6	1979	7.9	1980	7.9	1981	6.6	1982	4.1	1983	4.1	1984	4.0	1985	2.6	1986	2.5
1976	10.8	1977	7.8	1978	9.4	1979	7.6	1980	7.6	1981	6.4	1982	3.9	1983	4.0	1984	3.9	1985	2.6	1986	2.4	1987	2.3
1977	7.5	1978	9.2	1979	7.4	1980	7.4	1981	6.1	1982	3.8	1983	3.8	1984	3.8	1985	2.6	1986	2.4	1987	2.2	1988	2.3
1978	8.9	1979	7.1	1980	7.1	1981	5.8	1982	3.7	1983	3.7	1984	3.6	1985	2.5	1986	2.4	1987	2.2	1988	2.2	1989	2.2
1979	6.8	1980	6.8	1981	5.5	1982	3.5	1983	3.5	1984	3.5	1985	2.4	1986	2.3	1987	2.2	1988	2.1	1989	2.1	1990	2.1
1980	6.5	1981	5.2	1982	3.3	1983	3.3	1984	3.3	1985	2.3	1986	2.2	1987	2.1	1988	2.1	1989	2.1	1990	2.0	1991	2.0
1981	4.9	1982	3.1	1983	3.1	1984	3.1	1985	2.2	1986	2.1	1987	2.0	1988	2.0	1989	2.0	1990	2.0	1991	1.9	1992	1.9
1982	3.0	1983	3.0	1984	2.9	1985	2.1	1986	2.0	1987	1.9	1988	1.9	1989	1.9	1990	1.9	1991	1.9	1992	1.8	1993	1.8
1983	2.7	1984	2.7	1985	2.0	1986	1.9	1987	1.7	1988	1.8	1989	1.8	1990	1.8	1991	1.8	1992	1.7	1993	1.7	1994	1.7
1984	2.5	1985	1.9	1986	1.7	1987	1.6	1988	1.7	1989	1.7	1990	1.7	1991	1.7	1992	1.7	1993	1.6	1994	1.6	1995	1.6
1985	1.8	1986	1.7	1987	1.5	1988	1.6	1989	1.6	1990	1.6	1991	1.6	1992	1.6	1993	1.6	1994	1.5	1995	1.5	1996	1.5

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	11.0	1979	9.4	1980	9.3	1981	7.9	1984	4.7	1986	2.8	1989	2.7	1991	2.7	1993	2.7	1996	2.7	1999	2.7	2001	2.7
1979	9.2	1980	9.2	1981	7.8	1982	4.6	1985	2.9	1987	2.6	1990	2.7	1992	2.7	1994	2.7	1997	2.7	2000	2.7	2002	2.7
1980	9.1	1981	7.8	1982	4.6	1983	4.6	1986	2.7	1988	2.7	1991	2.7	1993	2.6	1995	2.6	1998	2.6	2001	2.6	2003	2.6
1981	7.6	1982	4.6	1983	4.5	1984	4.5	1987	2.6	1989	2.6	1992	2.6	1994	2.6	1996	2.6	1999	2.6	2002	2.6	2004	2.6
1982	4.5	1983	4.5	1984	4.4	1985	2.8	1988	2.6	1990	2.6	1993	2.6	1995	2.6	1997	2.6	2000	2.6	2003	2.6	2005	2.6
1983	4.4	1984	4.4	1985	2.8	1986	2.6	1989	2.5	1991	2.5	1994	2.5	1996	2.5	1998	2.5	2001	2.5	2004	2.5	2006	2.5
1984	4.3	1985	2.8	1986	2.6	1987	2.4	1990	2.5	1992	2.4	1995	2.5	1997	2.5	1999	2.5	2002	2.5	2005	2.5	2007	2.5
1985	2.7	1986	2.6	1987	2.4	1988	2.4	1991	2.4	1993	2.4	1996	2.4	1998	2.4	2000	2.4	2003	2.4	2006	2.4	2008	2.4
1986	2.5	1987	2.4	1988	2.4	1989	2.4	1992	2.3	1994	2.3	1997	2.3	1999	2.3	2001	2.3	2004	2.3	2007	2.3	2009	2.3
1987	2.4	1988	2.4	1989	2.3	1990	2.3	1993	2.3	1995	2.3	1998	2.3	2000	2.3	2002	2.3	2005	2.3	2008	2.3	2010	2.3
1988	2.3	1989	2.4	1990	2.3	1991	2.2	1994	2.2	1996	2.2	1999	2.2	2001	2.2	2003	2.2	2006	2.2	2009	2.2	2011	2.2
1989	2.3	1990	2.3	1991	2.2	1992	2.1	1995	2.1	1997	2.1	2000	2.1	2002	2.1	2004	2.1	2007	2.1	2010	2.1	2012	2.1
1990	2.2	1991	2.2	1992	2.1	1993	2.1	1996	2.1	1998	2.1	2001	2.1	2003	2.1	2005	2.1	2008	2.1	2011	2.1	2013	2.1
1991	2.1	1992	2.1	1993	2.0	1994	2.0	1997	2.0	1999	2.0	2002	2.0	2004	2.0	2006	2.0	2009	2.0	2012	2.0	2014	2.0
1992	2.0	1993	2.0	1994	1.9	1995	1.9	1998	1.9	2000	1.9	2003	1.9	2005	1.9	2007	1.9	2010	1.9	2013	1.9	2015	1.9
1993	1.9	1994	1.9	1995	1.8	1996	1.8	1999	1.8	2001	1.8	2004	1.8	2006	1.8	2008	1.8	2011	1.8	2014	1.8	2016	1.8
1994	1.8	1995	1.8	1996	1.7	1997	1.7	2000	1.7	2002	1.7	2005	1.7	2007	1.7	2009	1.7	2012	1.7	2015	1.7	2017	1.7
1995	1.7	1996	1.7	1997	1.6	1998	1.6	2001	1.6	2003	1.6	2006	1.6	2008	1.6	2010	1.6	2013	1.6	2016	1.6	2018	1.6
1996	1.6	1997	1.6	1998	1.5	1999	1.5	2002	1.5	2004	1.4	2007	1.5	2009	1.5	2011	1.5	2014	1.5	2017	1.5	2019	1.5
1997	1.5	1998	1.5	1999	1.4	2000	1.4	2003	1.4	2005	1.4	2008	1.4	2010	1.4	2012	1.4	2015	1.4	2018	1.4	2020	1.4

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52 1% of VMT in stabilized, and 27.3% of VMT in hot start, 60 TO 84F diurnal, 75F for hot soak and running loss emissions, 9 0 psi fuel RVP, 54 57% average in-use fuel tank level, including refueling emissions. Emissions are based on the January 1 mileage accumulation figures given in Table 2.2.4A.

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TABLE 2.2.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	155.9	1967	155.9	1968	123.7	1969	123.7	1970	132.7	1971	132.7	1972	117.0	1973	117.0	1974	117.0	1975	102.0	1976	102.0	1977	66.8
1967	154.9	1968	122.7	1969	122.7	1970	131.3	1971	131.3	1972	115.9	1973	115.9	1974	115.9	1975	100.8	1976	100.8	1977	65.6	1978	96.3
1968	121.6	1969	121.6	1970	129.8	1971	129.8	1972	114.7	1973	114.7	1974	114.7	1975	99.5	1976	99.5	1977	64.3	1978	95.1	1979	83.2
1969	120.4	1970	128.1	1971	128.1	1972	113.4	1973	113.4	1974	113.4	1975	98.1	1976	98.1	1977	63.0	1978	93.7	1979	81.9	1980	81.9
1970	126.4	1971	126.4	1972	112.1	1973	112.1	1974	112.1	1975	96.7	1976	96.7	1977	61.5	1978	92.3	1979	80.5	1980	80.5	1981	80.5
1971	124.5	1972	110.6	1973	110.6	1974	110.6	1975	95.1	1976	95.1	1977	60.0	1978	90.7	1979	79.1	1980	79.1	1981	79.1	1982	51.1
1972	109.0	1973	109.0	1974	109.0	1975	93.5	1976	93.5	1977	58.3	1978	89.0	1979	77.5	1980	77.5	1981	77.5	1982	50.1	1983	50.1
1973	107.3	1974	107.3	1975	91.7	1976	91.7	1977	56.5	1978	87.2	1979	75.8	1980	75.8	1981	75.8	1982	49.1	1983	49.1	1984	42.3
1974	105.5	1975	89.8	1976	89.8	1977	54.6	1978	85.3	1979	74.0	1980	74.0	1981	74.0	1982	48.1	1983	48.1	1984	41.2	1985	18.8
1975	87.7	1976	87.7	1977	52.5	1978	83.3	1979	72.1	1980	72.1	1981	72.1	1982	46.9	1983	46.9	1984	40.1	1985	18.2	1986	16.4
1976	85.5	1977	50.3	1978	81.0	1979	70.0	1980	70.0	1981	70.0	1982	45.7	1983	45.7	1984	38.8	1985	17.6	1986	15.8	1987	13.9
1977	48.0	1978	78.7	1979	67.8	1980	67.8	1981	67.8	1982	44.3	1983	44.3	1984	37.5	1985	16.9	1986	15.1	1987	13.3	1988	14.5
1978	76.1	1979	65.4	1980	65.4	1981	65.4	1982	42.9	1983	42.9	1984	36.1	1985	16.2	1986	14.4	1987	12.6	1988	13.8	1989	13.7
1979	62.9	1980	62.9	1981	62.9	1982	41.4	1983	41.4	1984	34.5	1985	15.4	1986	13.7	1987	11.8	1988	13.0	1989	13.0	1990	12.9
1980	60.1	1981	60.1	1982	39.7	1983	39.7	1984	32.9	1985	14.6	1986	12.8	1987	11.0	1988	12.2	1989	12.1	1990	12.1	1991	12.1
1981	57.2	1982	38.0	1983	38.0	1984	31.1	1985	13.7	1986	12.0	1987	10.1	1988	11.3	1989	11.3	1990	11.2	1991	11.2	1992	11.0
1982	36.1	1983	36.1	1984	29.3	1985	12.8	1986	11.0	1987	9.1	1988	10.4	1989	10.3	1990	10.3	1991	10.2	1992	10.1	1993	10.1
1983	34.0	1984	27.2	1985	11.8	1986	10.0	1987	8.1	1988	9.3	1989	9.3	1990	9.2	1991	9.2	1992	9.0	1993	9.0	1994	9.0
1984	25.1	1985	10.7	1986	8.9	1987	7.0	1988	8.3	1989	8.2	1990	8.2	1991	8.1	1992	8.0	1993	8.0	1994	8.0	1995	8.0
1985	10.0	1986	8.2	1987	6.3	1988	7.6	1989	7.5	1990	7.5	1991	7.4	1992	7.2	1993	7.2	1994	7.2	1995	7.2	1996	7.2

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	97.5	1979	85.5	1980	85.5	1981	85.5	1984	48.1	1986	20.4	1989	19.7	1991	19.7	1993	19.5	1996	19.5	1999	19.5	2001	19.5
1979	84.4	1980	84.4	1981	84.4	1982	54.3	1985	21.9	1987	18.2	1990	19.4	1992	19.2	1994	19.2	1997	19.2	2000	19.2	2002	19.2
1980	83.2	1981	83.2	1982	53.6	1983	53.6	1986	19.8	1988	19.1	1991	19.0	1993	18.8	1995	18.8	1998	18.8	2001	18.8	2003	18.8
1981	81.9	1982	52.8	1983	52.8	1984	46.0	1987	17.5	1989	18.7	1992	18.4	1994	18.4	1996	18.4	1999	18.4	2002	18.4	2004	18.4
1982	52.0	1983	52.0	1984	45.2	1985	20.7	1988	18.3	1990	18.2	1993	18.0	1995	18.0	1997	18.0	2000	18.0	2003	18.0	2005	18.0
1983	51.1	1984	44.3	1985	20.3	1986	18.5	1989	17.8	1991	17.8	1994	17.6	1996	17.6	1998	17.6	2001	17.6	2004	17.6	2006	17.6
1984	43.3	1985	19.8	1986	18.1	1987	16.2	1990	17.3	1992	17.1	1995	17.1	1997	17.1	1999	17.1	2002	17.1	2005	17.1	2007	17.1
1985	19.3	1986	17.5	1987	15.7	1988	16.9	1991	16.8	1993	16.6	1996	16.6	1998	16.6	2000	16.6	2003	16.6	2006	16.6	2008	16.6
1986	17.0	1987	15.1	1988	16.4	1989	16.3	1992	16.0	1994	16.0	1997	16.0	1999	16.0	2001	16.0	2004	16.0	2007	16.0	2009	16.0
1987	14.6	1988	15.8	1989	15.7	1990	15.7	1993	15.5	1995	15.5	1998	15.5	2000	15.5	2002	15.5	2005	15.5	2008	15.5	2010	15.5
1988	15.2	1989	15.1	1990	15.1	1991	15.0	1994	14.8	1996	14.8	1999	14.8	2001	14.8	2003	14.8	2006	14.8	2009	14.8	2011	14.8
1989	14.4	1990	14.4	1991	14.4	1992	14.2	1995	14.2	1997	14.2	2000	14.2	2002	14.2	2004	14.2	2007	14.2	2010	14.2	2012	14.2
1990	13.7	1991	13.7	1992	13.5	1993	13.5	1996	13.5	1998	13.5	2001	13.5	2003	13.5	2005	13.5	2008	13.5	2011	13.5	2013	13.5
1991	12.9	1992	12.7	1993	12.7	1994	12.7	1997	12.7	1999	12.7	2002	12.7	2004	12.7	2006	12.7	2009	12.7	2012	12.7	2014	12.7
1992	11.9	1993	11.9	1994	11.9	1995	11.9	1998	11.9	2000	11.9	2003	11.9	2005	11.9	2007	11.9	2010	11.9	2013	11.9	2015	11.9
1993	11.0	1994	11.0	1995	11.0	1996	11.0	1999	11.0	2001	11.0	2004	11.0	2006	11.0	2008	11.0	2011	11.0	2014	11.0	2016	11.0
1994	10.1	1995	10.1	1996	10.1	1997	10.1	2000	10.1	2002	10.1	2005	10.1	2007	10.1	2009	10.1	2012	10.1	2015	10.1	2017	10.1
1995	9.0	1996	9.0	1997	9.0	1998	9.0	2001	9.0	2003	9.0	2006	9.0	2008	9.0	2010	9.0	2013	9.0	2016	9.0	2018	9.0
1996	8.0	1997	8.0	1998	8.0	1999	8.0	2002	8.0	2004	8.0	2007	8.0	2009	8.0	2011	8.0	2014	8.0	2017	8.0	2019	8.0
1997	7.2	1998	7.2	1999	7.2	2000	7.2	2003	7.2	2005	7.2	2008	7.2	2010	7.2	2012	7.2	2015	7.2	2018	7.2	2020	7.2

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in Table 2.2.4A.

TABLE 2.2.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS I
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	2.0	1967	2.0	1968	2.9	1969	2.9	1970	2.9	1971	2.9	1972	2.9	1973	2.6	1974	2.6	1975	2.4	1976	2.4	1977	2.8
1967	2.0	1968	2.9	1969	2.9	1970	2.9	1971	2.9	1972	2.9	1973	2.6	1974	2.6	1975	2.4	1976	2.4	1977	2.7	1978	2.4
1968	2.9	1969	2.9	1970	2.9	1971	2.9	1972	2.9	1973	2.5	1974	2.5	1975	2.4	1976	2.4	1977	2.7	1978	2.4	1979	1.9
1969	2.9	1970	2.9	1971	2.9	1972	2.9	1973	2.5	1974	2.5	1975	2.3	1976	2.3	1977	2.7	1978	2.3	1979	1.9	1980	1.9
1970	2.9	1971	2.9	1972	2.9	1973	2.5	1974	2.5	1975	2.3	1976	2.3	1977	2.7	1978	2.3	1979	1.9	1980	1.9	1981	1.9
1971	2.9	1972	2.9	1973	2.5	1974	2.5	1975	2.3	1976	2.3	1977	2.7	1978	2.3	1979	1.8	1980	1.8	1981	1.8	1982	1.9
1972	2.9	1973	2.5	1974	2.5	1975	2.3	1976	2.3	1977	2.7	1978	2.3	1979	1.8	1980	1.8	1981	1.8	1982	1.9	1983	1.9
1973	2.4	1974	2.4	1975	2.3	1976	2.3	1977	2.6	1978	2.3	1979	1.7	1980	1.7	1981	1.7	1982	1.8	1983	1.8	1984	2.1
1974	2.4	1975	2.2	1976	2.2	1977	2.6	1978	2.2	1979	1.7	1980	1.7	1981	1.7	1982	1.8	1983	1.8	1984	2.1	1985	1.7
1975	2.2	1976	2.2	1977	2.6	1978	2.2	1979	1.7	1980	1.7	1981	1.7	1982	1.8	1983	1.8	1984	2.0	1985	1.7	1986	1.5
1976	2.2	1977	2.6	1978	2.2	1979	1.6	1980	1.6	1981	1.6	1982	1.8	1983	1.8	1984	2.0	1985	1.7	1986	1.5	1987	1.3
1977	2.5	1978	2.2	1979	1.6	1980	1.6	1981	1.6	1982	1.7	1983	1.7	1984	1.9	1985	1.6	1986	1.5	1987	1.3	1988	1.2
1978	2.1	1979	1.5	1980	1.5	1981	1.5	1982	1.7	1983	1.7	1984	1.8	1985	1.6	1986	1.4	1987	1.3	1988	1.2	1989	1.2
1979	1.4	1980	1.4	1981	1.4	1982	1.7	1983	1.7	1984	1.8	1985	1.5	1986	1.4	1987	1.2	1988	1.1	1989	1.1	1990	1.1
1980	1.4	1981	1.4	1982	1.7	1983	1.7	1984	1.7	1985	1.5	1986	1.3	1987	1.2	1988	1.1	1989	1.1	1990	1.1	1991	1.1
1981	1.3	1982	1.6	1983	1.6	1984	1.6	1985	1.5	1986	1.3	1987	1.1	1988	1.0	1989	1.0	1990	1.0	1991	1.0	1992	1.0
1982	1.6	1983	1.6	1984	1.5	1985	1.4	1986	1.2	1987	1.1	1988	1.0	1989	1.0	1990	1.0	1991	1.0	1992	0.9	1993	0.9
1983	1.5	1984	1.4	1985	1.3	1986	1.2	1987	1.0	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9	1994	0.9
1984	1.3	1985	1.3	1986	1.1	1987	1.0	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.8	1993	0.8	1994	0.8	1995	0.8
1985	1.2	1986	1.1	1987	0.9	1988	0.8	1989	0.8	1990	0.8	1991	0.8	1992	0.8	1993	0.8	1994	0.8	1995	0.8	1996	0.8

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	2.4	1979	2.0	1980	2.0	1981	2.0	1984	2.4	1986	1.8	1989	1.5	1991	1.5	1993	1.5	1996	1.5	1999	1.5	2001	1.5
1979	2.0	1980	2.0	1981	2.0	1982	2.0	1985	1.9	1987	1.6	1990	1.5	1992	1.4	1994	1.4	1997	1.4	2000	1.4	2002	1.4
1980	1.9	1981	1.9	1982	1.9	1983	1.9	1986	1.7	1988	1.5	1991	1.4	1993	1.4	1995	1.4	1998	1.4	2001	1.4	2003	1.4
1981	1.9	1982	1.9	1983	1.9	1984	2.3	1987	1.5	1989	1.4	1992	1.4	1994	1.4	1996	1.4	1999	1.4	2002	1.4	2004	1.4
1982	1.9	1983	1.9	1984	2.3	1985	1.8	1988	1.4	1990	1.4	1993	1.4	1995	1.4	1997	1.4	2000	1.4	2003	1.4	2005	1.4
1983	1.9	1984	2.2	1985	1.8	1986	1.7	1989	1.4	1991	1.4	1994	1.4	1996	1.4	1998	1.4	2001	1.4	2004	1.4	2006	1.4
1984	2.2	1985	1.8	1986	1.6	1987	1.5	1990	1.4	1992	1.3	1995	1.3	1997	1.3	1999	1.3	2002	1.3	2005	1.3	2007	1.3
1985	1.8	1986	1.6	1987	1.4	1988	1.3	1991	1.3	1993	1.3	1996	1.3	1998	1.3	2000	1.3	2003	1.3	2006	1.3	2008	1.3
1986	1.6	1987	1.4	1988	1.3	1989	1.3	1992	1.3	1994	1.3	1997	1.3	1999	1.3	2001	1.3	2004	1.3	2007	1.3	2009	1.3
1987	1.4	1988	1.3	1989	1.3	1990	1.3	1993	1.2	1995	1.2	1998	1.2	2000	1.2	2002	1.2	2005	1.2	2008	1.2	2010	1.2
1988	1.2	1989	1.2	1990	1.2	1991	1.2	1994	1.2	1996	1.2	1999	1.2	2001	1.2	2003	1.2	2006	1.2	2009	1.2	2011	1.2
1989	1.2	1990	1.2	1991	1.2	1992	1.2	1995	1.2	1997	1.2	2000	1.2	2002	1.2	2004	1.2	2007	1.2	2010	1.2	2012	1.2
1990	1.2	1991	1.2	1992	1.1	1993	1.1	1996	1.1	1998	1.1	2001	1.1	2003	1.1	2005	1.1	2008	1.1	2011	1.1	2013	1.1
1991	1.1	1992	1.1	1993	1.1	1994	1.1	1997	1.1	1999	1.1	2002	1.1	2004	1.1	2006	1.1	2009	1.1	2012	1.1	2014	1.1
1992	1.0	1993	1.0	1994	1.0	1995	1.0	1998	1.0	2000	1.0	2003	1.0	2005	1.0	2007	1.0	2010	1.0	2013	1.0	2015	1.0
1993	1.0	1994	1.0	1995	1.0	1996	1.0	1999	1.0	2001	1.0	2004	1.0	2006	1.0	2008	1.0	2011	1.0	2014	1.0	2016	1.0
1994	0.9	1995	0.9	1996	0.9	1997	0.9	2000	0.9	2002	0.9	2005	0.9	2007	0.9	2009	0.9	2012	0.9	2015	0.9	2017	0.9
1995	0.9	1996	0.9	1997	0.9	1998	0.9	2001	0.9	2003	0.9	2006	0.9	2008	0.9	2010	0.9	2013	0.9	2016	0.9	2018	0.9
1996	0.8	1997	0.8	1998	0.8	1999	0.8	2002	0.8	2004	0.8	2007	0.8	2009	0.8	2011	0.8	2014	0.8	2017	0.8	2019	0.8
1997	0.8	1998	0.8	1999	0.8	2000	0.8	2003	0.8	2005	0.8	2008	0.8	2010	0.8	2012	0.8	2015	0.8	2018	0.8	2020	0.8

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in Table 2.2.4A.

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TABLE 2.3.1A

NONTAMPERED EXHAUST EMISSION RATES FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1970	12.350	0.180	13.250	14.150
	1970-1973	8.560	0.250	9.810	11.060
	1974-1978	8.560	0.170	9.410	10.260
	1979-1980	1.660	0.280	3.060	4.460
	1981	1.660	0.280	3.060	4.460
	1982-1983	1.070	0.150	1.820	2.570
	1984	1.050	0.150	1.800	2.550
	1985	0.510	0.080	0.910	1.310
	1986	0.450	0.080	0.850	1.250
	1987	0.390	0.080	0.790	1.190
	1988	0.460	0.080	0.860	1.260
	1989	0.460	0.080	0.860	1.260
	1990	0.460	0.080	0.860	1.260
	1991	0.460	0.080	0.860	1.260
	1992+	0.450	0.080	0.850	1.250
CO	Pre-1970	141.350	2.250	152.600	163.850
	1970-1973	107.720	2.550	120.470	133.220
	1974-1978	107.720	2.440	119.920	132.120
	1979-1980	44.250	2.430	56.400	68.550
	1981	44.250	2.430	56.400	68.550
	1982-1983	30.160	1.460	37.460	44.760
	1984	23.350	1.460	30.650	37.950
	1985	9.840	0.730	13.490	17.140
	1986	8.060	0.730	11.710	15.360
	1987	6.190	0.730	9.840	13.490
	1988	7.410	0.730	11.060	14.710
	1989	7.360	0.730	11.010	14.660
	1990	7.310	0.730	10.960	14.610
	1991	7.290	0.730	10.940	14.590
	1992+	7.100	0.730	10.750	14.400
NOx	Pre-1970	3.100	0.0	3.100	3.100
	1970-1973	4.320	0.0	4.320	4.320
	1974-1978	3.070	0.040	3.270	3.470
	1979-1980	0.970	0.060	1.270	1.570
	1981	0.970	0.060	1.270	1.570
	1982-1983	1.460	0.030	1.610	1.760
	1984	1.220	0.070	1.570	1.920
	1985	1.240	0.040	1.440	1.640
	1986	1.080	0.040	1.280	1.480
	1987	0.910	0.040	1.110	1.310
	1988	0.820	0.040	1.020	1.220
	1989	0.820	0.040	1.020	1.220
	1990	0.810	0.040	1.010	1.210
	1991	0.810	0.040	1.010	1.210
	1992+	0.780	0.040	0.980	1.180

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile.
ZML = Zero mile level in grams/mile.
DR = Deterioration rate in grams/mile/10K miles.
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 2.3.1B

EXHAUST EMISSION RATES FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
AT VARIOUS MILEAGE LEVELS
(RATES INCLUDE TAMPERING)

Pol	Model Years	Emission Rate (Grams/Mile) 0K	25K	50K	75K	100K	125K	150K
HC	Pre-1970	12.350	12.800	13.250	13.700	14.150	14.600	15.050
	1970-1973	8.560	9.185	9.810	10.435	11.060	11.685	12.310
	1974-1978	8.560	8.985	9.410	9.835	10.260	10.685	11.110
	1979-1980	2.474	3.475	4.569	5.623	6.677	7.732	8.747
	1981	1.740	2.588	3.472	4.380	5.297	6.207	7.112
	1982	1.150	1.677	2.242	2.831	3.430	4.021	4.607
	1983	1.146	1.668	2.227	2.809	3.400	3.983	4.562
	1984	1.120	1.636	2.190	2.766	3.350	3.926	4.500
	1985	0.576	0.912	1.284	1.677	2.078	2.472	2.863
	1986	0.513	0.839	1.195	1.570	1.954	2.331	2.705
	1987	0.442	0.749	1.083	1.433	1.790	2.142	2.490
	1988-1991	0.512	0.818	1.150	1.498	1.852	2.202	2.548
	1992+	0.502	0.808	1.140	1.488	1.842	2.192	2.538
CO	Pre-1970	141.350	146.975	152.600	158.225	163.850	169.475	175.100
	1970-1973	107.720	114.095	120.470	126.845	133.220	139.595	145.970
	1974-1978	107.720	113.820	119.920	126.020	132.120	138.220	144.320
	1979-1980	52.461	61.273	71.026	80.403	89.779	99.155	107.796
	1981	44.939	52.632	60.856	69.303	77.846	86.312	94.735
	1982	30.850	36.194	42.135	48.305	54.568	60.754	66.896
	1983	30.802	36.069	41.912	47.970	54.116	60.189	66.221
	1984	23.898	29.114	34.952	40.988	47.097	53.141	59.150
	1985	10.341	13.650	17.558	21.651	25.810	29.910	33.977
	1986	8.514	11.614	15.179	18.907	22.700	26.439	30.149
	1987	6.479	9.312	12.539	15.886	19.276	22.630	25.964
	1988	7.699	10.504	13.679	16.972	20.308	23.609	26.890
	1989	7.649	10.454	13.629	16.922	20.258	23.559	26.840
	1990	7.599	10.404	13.579	16.872	20.208	23.509	26.790
	1991	7.579	10.384	13.559	16.852	20.188	23.489	26.770
	1992+	7.389	10.194	13.369	16.662	19.998	23.299	26.580
NOx	Pre-1970	3.100	3.100	3.100	3.100	3.100	3.100	3.100
	1970-1972	4.320	4.320	4.320	4.320	4.320	4.320	4.320
	1973	4.357	4.376	4.395	4.415	4.434	4.453	4.472
	1974-1978	3.106	3.225	3.344	3.462	3.581	3.700	3.819
	1979-1980	1.308	1.635	1.962	2.289	2.616	2.944	3.271
	1981	0.970	1.191	1.461	1.800	2.139	2.478	2.818
	1982	1.460	1.606	1.801	2.065	2.329	2.593	2.858
	1983	1.460	1.607	1.802	2.066	2.331	2.596	2.861
	1984	1.222	1.472	1.772	2.142	2.513	2.883	3.253
	1985	1.243	1.422	1.652	1.951	2.252	2.552	2.852
	1986	1.085	1.269	1.505	1.812	2.120	2.428	2.735
	1987	0.923	1.134	1.400	1.740	2.083	2.424	2.764
	1988-1989	0.833	1.008	1.211	1.447	1.684	1.920	2.155
	1990-1991	0.823	0.998	1.201	1.437	1.674	1.910	2.145
	1992+	0.793	0.968	1.171	1.407	1.644	1.880	2.115

DATE : MAY 19, 1989

TABLE 2.3.2A

NONTAMPERED
CRANKCASE AND EVAPORATIVE HYDROCARBON EMISSIONS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
Pre-1968	7.35	23.50	55.03	35.96	101.26
1968-1978	0.0	23.50	55.03	35.96	101.26
1979-1980	0.0	3.20	6.71	5.59	18.50
1981	0.0	1.76	3.88	3.97	18.92
1982	0.0	1.76	3.89	3.97	18.95
1983	0.0	1.76	3.89	3.97	18.98
1984	0.0	1.75	3.86	3.97	18.82
1985	0.0	1.69	3.73	3.87	18.19
1986	0.0	1.50	3.30	3.60	16.11
1987	0.0	1.30	2.84	3.33	13.87
1988	0.0	1.25	2.75	3.21	13.43
1989	0.0	1.25	2.74	3.22	13.35
1990	0.0	1.25	2.69	3.31	13.14
1991	0.0	1.25	2.69	3.32	13.11
1992+	0.0	1.22	2.63	3.29	12.82

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

DATE : MAY 19, 1989

TABLE 2.3.2B

TAMPERING OFFSETS FOR TOTAL
CRANKCASE AND EVAPORATIVE HC EMISSIONS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
AT VARIOUS MILEAGE INTERVALS

Fuel RVP	Model Years	Tampering Offset (Grams/Mile)** 0K	25K	50K	75K	100K	125K	150K
9.0	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1969	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1970-1976	0.0	0.01	0.02	0.04	0.05	0.07	0.08
	1977	0.0	0.01	0.02	0.04	0.05	0.07	0.08
	1978	0.0	0.06	0.15	0.24	0.33	0.43	0.52
	1979	0.0	0.06	0.15	0.24	0.33	0.42	0.52
	1980	0.0	0.04	0.10	0.16	0.22	0.28	0.34
	1981	0.0	0.04	0.10	0.16	0.22	0.28	0.34
	1982	0.0	0.04	0.10	0.16	0.22	0.28	0.34
	1983	0.0	0.04	0.10	0.16	0.22	0.28	0.34
	1984	0.0	0.04	0.10	0.16	0.22	0.28	0.34
	1985	0.0	0.04	0.10	0.15	0.21	0.27	0.33
	1986	0.0	0.04	0.10	0.15	0.21	0.26	0.32
	1987	0.0	0.04	0.09	0.15	0.20	0.26	0.31
	1988	0.0	0.04	0.09	0.15	0.20	0.26	0.31
	1989	0.0	0.04	0.09	0.15	0.20	0.26	0.31
	1990	0.0	0.04	0.09	0.15	0.20	0.26	0.31
	1991+	0.0	0.04	0.09	0.15	0.20	0.26	0.31
11.5	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1969	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1970-1976	0.0	0.01	0.03	0.04	0.06	0.07	0.09
	1977	0.0	0.01	0.03	0.04	0.06	0.07	0.09
	1978	0.0	0.08	0.21	0.34	0.46	0.59	0.72
	1979	0.0	0.08	0.21	0.34	0.46	0.59	0.72
	1980	0.0	0.07	0.18	0.28	0.39	0.49	0.60
	1981	0.0	0.07	0.18	0.28	0.39	0.49	0.60
	1982	0.0	0.07	0.18	0.28	0.39	0.49	0.60
	1983	0.0	0.07	0.17	0.28	0.39	0.49	0.60
	1984	0.0	0.07	0.17	0.28	0.38	0.48	0.59
	1985	0.0	0.07	0.16	0.26	0.35	0.45	0.55
	1986	0.0	0.06	0.15	0.24	0.33	0.42	0.50
	1987	0.0	0.06	0.15	0.24	0.32	0.41	0.49
	1988	0.0	0.06	0.15	0.23	0.32	0.41	0.49
	1989	0.0	0.06	0.15	0.23	0.32	0.40	0.49
	1990	0.0	0.06	0.15	0.23	0.32	0.40	0.49
	1991+	0.0	0.06	0.15	0.23	0.31	0.40	0.48

* Based on calculated hot soak temperature of 82.0F,
Diurnal temperature rise from 60.0 to 84.0F,
Fuel RVPs of 9.0 and 11.5 psi with no weathering, tank level of 40.0%.

** Based on averages of 4.24 trips per day and 30.80 miles per day.

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TABLE 2.3.2C

NONTAMPERED
RUNNING LOSS EMISSIONS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Pre-1979	7.0	0.36	0.52	1.13	2.16
	9.0	0.58	1.50	2.62	4.81
	10.4	1.06	2.70	4.00	5.63
	11.7	2.88	3.85	8.20	13.64
1979-1980	7.0	0.24	0.42	0.97	1.39
	9.0	0.39	1.20	2.21	2.88
	10.4	0.68	1.70	2.38	3.23
	11.7	1.72	2.30	4.79	7.90
1981+	7.0	0.05	0.06	0.18	0.20
	9.0	0.07	0.13	0.42	0.62
	10.4	0.13	0.30	0.50	0.75
	11.7	0.36	0.47	1.03	1.73

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TABLE 2.3.2D

REFUELING EMISSIONS* FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Fuel Economy (miles/gal)	Uncontrolled (grams/mile)	With Volatility Control** (grams/mile)	With Onboard** (grams/mile)	With both Volatility and Onboard** (grams/mile)
Pre-1971	11.1	0.52	0.52	0.52	0.52
1971	10.7	0.54	0.54	0.54	0.54
1972	10.8	0.53	0.53	0.53	0.53
1973-1974	10.6	0.54	0.54	0.54	0.54
1975	11.9	0.48	0.48	0.48	0.48
1976	12.3	0.47	0.47	0.47	0.47
1977	13.3	0.43	0.43	0.43	0.43
1978	13.0	0.44	0.44	0.44	0.44
1979	12.6	0.46	0.46	0.46	0.46
1980	15.7	0.37	0.37	0.37	0.37
1981	17.0	0.34	0.34	0.34	0.34
1982	17.3	0.33	0.33	0.33	0.33
1983	17.6	0.33	0.33	0.33	0.33
1984	17.2	0.34	0.34	0.34	0.34
1985	17.3	0.33	0.33	0.33	0.33
1986-1987	18.0	0.32	0.32	0.32	0.32
1988	17.7	0.33	0.33	0.33	0.33
1989-1991	17.8	0.32	0.32	0.32	0.32
1992	17.8	0.32	0.26	0.32	0.03
1993-1997	17.7	0.33	0.26	0.04	0.03
1998+	17.6	0.33	0.26	0.04	0.03

* Refueling Emissions (g/mi) = [Displacement (g/gal) + Spillage (g/gal)] / Fuel Economy (mi/gal).

** Volatility control assumed to start in 1992, with 7.0/7.8/9.0 RVP fuels for ASTM class A/B/C cities. Onboard assumed to start in 1993, and apply to LDGVs, LDGTs, and HDGVs.

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TABLE 2.3.3

HOT STABILIZED IDLE EMISSIONS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Pol	Model Years	Emission Rate (Grams/Hour) Nontampered Zero Mile	Nontampered 50,000 Mile	Nontampered 100,000 Mile	In-use Level* 50,000 Mile	In-use Level* 100,000 Mile
HC	Pre-1970	123.60	132.60	141.60	137.95	153.24
	1970-1973	65.40	77.40	89.40	82.75	101.04
	1974-1978	65.40	74.40	83.40	79.75	95.04
	1979-1980	23.90	51.06	76.92	56.41	88.56
	1981	18.55	45.89	72.77	51.24	84.41
	1982-1983	11.95	27.29	41.93	32.64	53.57
	1984	9.51	26.64	41.68	31.99	53.32
	1985	4.90	12.62	20.11	17.97	31.75
	1986	5.11	12.73	20.19	18.08	31.82
	1987	4.10	11.68	19.11	17.03	30.75
	1988	6.54	14.19	21.65	19.54	33.29
	1989	6.53	14.18	21.64	19.53	33.28
	1990	6.52	14.17	21.63	19.52	33.27
	1991	6.51	14.16	21.62	19.51	33.26
	1992+	6.17	13.84	21.29	19.19	32.93
CO	Pre-1970	1322.40	1457.40	1592.40	1489.03	1664.24
	1970-1973	764.40	920.40	1076.40	952.03	1148.24
	1974-1978	764.40	911.40	1058.40	943.03	1130.24
	1979-1980	697.67	927.98	1136.67	959.61	1208.51
	1981	524.04	785.45	1021.56	817.08	1093.40
	1982-1983	352.11	516.37	661.56	548.00	733.40
	1984	294.65	450.27	589.55	481.91	661.39
	1985	65.97	139.75	208.82	171.38	280.66
	1986	50.77	123.06	191.04	154.69	262.88
	1987	44.40	114.62	181.32	146.25	253.16
	1988	75.06	140.26	205.11	171.89	276.95
	1989	73.85	139.04	203.88	170.67	275.72
	1990	72.62	137.77	202.60	169.40	274.44
	1991	72.25	137.37	202.17	169.00	274.01
	1992+	67.62	132.57	197.29	164.20	269.13
NOx	Pre-1970	6.00	6.00	6.00	6.00	6.00
	1970-1973	3.00	3.00	3.00	3.00	3.00
	1974-1978	2.40	2.40	2.40	2.40	2.40
	1979-1980	3.98	3.98	3.98	3.98	3.98
	1981	7.34	7.34	7.34	7.34	7.34
	1982-1983	7.37	7.37	7.37	7.37	7.37
	1984	7.62	7.62	7.62	7.62	7.62
	1985	6.96	6.96	6.96	6.96	6.96
	1986	2.00	2.00	2.00	2.00	2.00
	1987	1.73	1.73	1.73	1.73	1.73
	1988-1989	1.66	1.66	1.66	1.66	1.66
	1990-1991	1.65	1.65	1.65	1.65	1.65
	1992+	1.61	1.61	1.61	1.61	1.61

* In-use emission level includes tampering.

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TABLE 2.3.4A

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per truck *)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.070	17608.	0.023	17608.	2201.
2	0.092	16217.	0.092	17260.	13163.
3	0.088	14937.	0.088	15897.	29731.
4	0.083	13758.	0.083	14642.	44991.
5	0.077	12671.	0.077	13486.	59047.
6	0.072	11671.	0.072	12421.	71992.
7	0.067	10749.	0.067	11440.	83915.
8	0.062	9901.	0.062	10537.	94897.
9	0.057	9119.	0.057	9705.	105012.
10	0.051	8399.	0.051	8939.	114329.
11	0.047	7736.	0.047	8233.	122909.
12	0.041	7125.	0.041	7583.	130812.
13	0.036	6562.	0.036	6984.	138092.
14	0.031	6044.	0.031	6432.	144796.
15	0.026	5567.	0.026	5925.	150970.
16	0.021	5127.	0.021	5457.	156658.
17	0.016	4723.	0.016	5026.	161896.
18	0.011	4350.	0.011	4630.	166721.
19	0.007	4006.	0.007	4264.	171165.
20+	0.044	3690.	0.044	3927.	175257.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1, where: JMAR(1) = MAR(1) and,
JMAR(MYI) = .25*MAR(MYI) + .75*MAR(MYI-1), MYI = 2,...,20+.

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TABLE 2.3.4C

TRIPS PER DAY AND MILES PER DAY FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Year Index*	Trips per Day	Miles per Day
1	4.66	48.24
2	4.60	47.29
3	4.54	43.55
4	4.48	40.12
5	4.43	36.95
6	4.37	34.03
7	4.31	31.34
8	4.25	28.87
9	4.19	26.59
10	4.13	24.49
11	4.08	22.56
12	4.02	20.78
13	3.96	19.13
14	3.90	17.62
15	3.84	16.23
16	3.78	14.95
17	3.72	13.77
18	3.67	12.68
19	3.61	11.68
20+	3.55	10.76

* The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

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TABLE 2.3.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
JANUARY 1, 1988

Model Years	(A) LDT2 Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) LDGT2 Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.023	0.973	0.023	0.024	17608.	430.8	0.038
1987	0.092	0.991	0.091	0.098	17260.	1695.8	0.151
1986	0.088	0.980	0.086	0.093	15897.	1477.4	0.131
1985	0.083	0.989	0.082	0.088	14642.	1295.3	0.115
1984	0.077	0.974	0.075	0.081	13486.	1090.0	0.097
1983	0.072	0.958	0.069	0.074	12421.	923.3	0.082
1982	0.067	0.908	0.061	0.066	11440.	750.0	0.067
1981	0.062	0.918	0.057	0.061	10537.	646.3	0.057
1980	0.057	0.952	0.054	0.058	9705.	567.5	0.050
1979	0.051	0.985	0.050	0.054	8939.	483.9	0.043
1978	0.047	0.990	0.047	0.050	8233.	412.8	0.037
1977	0.041	1.000	0.041	0.044	7583.	335.1	0.030
1976	0.036	1.000	0.036	0.039	6984.	271.0	0.024
1975	0.031	1.000	0.031	0.033	6432.	214.9	0.019
1974	0.026	1.000	0.026	0.028	5925.	166.0	0.015
1973	0.021	1.000	0.021	0.023	5457.	123.5	0.011
1972	0.016	1.000	0.016	0.017	5026.	86.7	0.008
1971	0.011	1.000	0.011	0.012	4630.	54.9	0.005
1970	0.007	1.000	0.007	0.008	4264.	32.2	0.003
1969-	0.044	1.000	0.044	0.047	3927.	186.2	0.017
		DAF:	0.929		TFNORM:	11243.4	

WHERE :

A = January 1 registration mix from Table 2.3.4A,
B = Gasoline fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 2.3.4A.

NOTE : In general, the travel weighting fractions will change for every calendar year since the sales fraction (column B) changes for almost every model year.

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TABLE 2.3.6A

SPEED CORRECTION FACTOR COEFFICIENTS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = EXP(A + B*s + C*s**2+ D*S**3+ E*s**4+ F*s**5), HC & CO
= A + B*s + C*s**2+ D*s**3+ E*s**4 + F*s**5, NOx

Pollutant and Model Years	A	B	C	D	E	F
HC						
Pre-1970	0.224612E+01	-0.290973E+00	0.158890E-01	-0.472494E-03	0.694077E-05	-0.392798E-07
1970-1973	0.215361E+01	-0.283451E+00	0.156948E-01	-0.469759E-03	0.693832E-05	-0.394707E-07
1974-1978	0.211340E+01	-0.285676E+00	0.163180E-01	-0.500793E-03	0.755067E-05	-0.437187E-07
CO						
Pre-1970	0.181978E+01	-0.254663E+00	0.152347E-01	-0.487397E-03	0.758207E-05	-0.449514E-07
1970-1973	0.231868E+01	-0.341147E+00	0.209446E-01	-0.665891E-03	0.102225E-04	-0.598265E-07
1974-1978	0.215487E+01	-0.329116E+00	0.210112E-01	-0.689057E-03	0.108390E-04	-0.647125E-07
NOx						
Pre-1970	0.244424E+01	-0.250107E+00	0.138293E-01	-0.287025E-03	0.207585E-05	0.0
1970-1973	0.144825E+01	-0.122444E+00	0.795024E-02	-0.171078E-03	0.125777E-05	0.0
1974-1978	0.153447E+01	-0.125671E+00	0.785919E-02	-0.169428E-03	0.125494E-05	0.0

* WHERE : s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16].

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TABLE 2.3.6B

SPEED CORRECTION FACTOR COEFFICIENTS FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = A/s + B, HC & CO
= EXP(A + B*s + C*s**2), NOx

Pollutant	Speed	Model Years	Coefficient A	B	C
HC	Low	1979-1980	41.27921	0.0	
		1981	14.50530	0.0	
		1982	13.13510	0.0	
		1983	13.72850	0.0	
		1984	12.87590	0.0	
		1985	12.29910	0.0	
		1986	6.03710	-0.03723	
		1987	5.02670	-0.01687	
		1988	4.79940	-0.01228	
		1989	4.76780	-0.01165	
		1990	4.73310	-0.01095	
		1991	4.72990	-0.01088	
		1992+	4.59730	-0.00821	
	High	1979+	8.10000	0.0	
CO	Low	1979-1980	563.51440	-3.44034	
		1981	168.89410	0.72193	
		1982	147.47639	0.80430	
		1983	158.07001	0.75053	
		1984	145.32240	0.77799	
		1985	137.36800	0.76426	
		1986	43.39830	1.33132	
		1987	30.59711	2.35788	
		1988	27.71680	2.58886	
		1989	27.31670	2.62094	
		1990	26.87669	2.65622	
		1991	26.83670	2.65943	
		1992+	25.15649	2.79417	
	High	1979+	60.00000	0.0	
NOx	All	1979-1980	1.04330	-0.026082	0.00042835
		1981	0.24736	-0.033673	0.00047036
		1982	0.22790	-0.033673	0.00047036
		1983	0.24101	-0.033673	0.00047036
		1984	0.23298	-0.033673	0.00047036
		1985	0.23289	-0.033673	0.00047036
		1986	-0.03836	-0.026426	0.00020485
		1987	-0.07312	-0.026426	0.00020485
		1988	-0.08094	-0.026426	0.00020485
		1989	-0.08203	-0.026426	0.00020485
		1990	-0.08323	-0.026426	0.00020485
		1991	-0.08333	-0.026426	0.00020485
		1992+	-0.08790	-0.026426	0.00020485

* WHERE: s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16],
Low = average speed ≤ 19.6 mph,
High = average speed > 19.6 mph.

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TABLE 2.3.7A

LOW (< 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* TCF(1) = TC(1)*(T - 75.0), 1981+ CO,
TCF(b) = EXP [TC(b)*(T - 75.0)], all others

Pol	Model Years	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1970	-0.20623E-01	-0.24032E-02	-0.10081E-02
	1970-1973	-0.24462E-01	-0.32017E-02	-0.86884E-03
	1974-1978	-0.21255E-01	-0.52755E-03	0.93659E-03
	1979-1980	-0.23517E-01	-0.88057E-02	-0.16222E-02
	1981-1983	-0.26820E-01	-0.75815E-02	-0.51660E-02
	1984	-0.32775E-01	-0.83176E-02	-0.90264E-02
	1985	-0.32082E-01	-0.85130E-02	-0.90264E-02
	1986	-0.33863E-01	-0.75333E-02	-0.60835E-02
	1987	-0.29645E-01	-0.86205E-02	-0.70376E-02
	1988	-0.29076E-01	-0.90614E-02	-0.74167E-02
	1989	-0.28850E-01	-0.90467E-02	-0.74058E-02
	1990	-0.28022E-01	-0.87314E-02	-0.71430E-02
	1991	-0.27909E-01	-0.86831E-02	-0.71027E-02
	1992+	-0.27350E-01	-0.88233E-02	-0.72259E-02
CO	Pre-1970	-0.13487E-01	0.15784E-02	0.11097E-02
	1970-1973	-0.21126E-01	-0.15289E-02	0.15749E-02
	1974-1978	-0.20843E-01	-0.59951E-02	0.18253E-02
	1979-1980	-0.24835E-01	-0.88336E-02	-0.11553E-02
	1981-1983	-0.12448E+01	-0.12478E-01	-0.74106E-02
	1984	-0.13095E+01	-0.14584E-01	-0.11371E-01
	1985	-0.12840E+01	-0.14584E-01	-0.11371E-01
	1986	-0.10914E+01	-0.13812E-01	-0.90777E-02
	1987	-0.98042E+00	-0.15565E-01	-0.90777E-02
	1988	-0.97360E+00	-0.16234E-01	-0.90777E-02
	1989	-0.96563E+00	-0.16220E-01	-0.90777E-02
	1990	-0.92922E+00	-0.15787E-01	-0.90777E-02
	1991	-0.92410E+00	-0.15721E-01	-0.90777E-02
	1992+	-0.90931E+00	-0.15947E-01	-0.90777E-02
NOx	Pre-1970	-0.16897E-03	-0.89245E-02	-0.72580E-02
	1970-1973	-0.25074E-03	-0.59791E-02	-0.62690E-02
	1974-1978	0.38855E-02	-0.24156E-02	-0.21188E-02
	1979-1980	-0.76044E-02	-0.68045E-02	-0.54198E-02
	1981-1983	-0.19000E-02	-0.61656E-02	-0.49643E-02
	1984	-0.45479E-02	-0.74823E-02	-0.90882E-02
	1985	-0.47657E-02	-0.69890E-02	-0.90882E-02
	1986	-0.43258E-02	-0.89681E-02	-0.94839E-02
	1987	-0.43258E-02	-0.76241E-02	-0.86355E-02
	1988	-0.43258E-02	-0.74160E-02	-0.85833E-02
	1989	-0.43258E-02	-0.73506E-02	-0.85224E-02
	1990	-0.43258E-02	-0.71351E-02	-0.82440E-02
	1991	-0.43258E-02	-0.71061E-02	-0.82048E-02
	1992+	-0.43258E-02	-0.69285E-02	-0.80917E-02

* WHERE :

TCF(b) = Low temperature correction factor for appropriate pollutant, ambient temperature (< 75F), and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = Low temperature correction factor coefficient for appropriate pollutant, reference temperature, and model year, for test segment b.

NOTE : The low temperature correction factor is used in conjunction with the correction factor given in Table 2.3.7C.

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TABLE 2.3.7B

HIGH (> 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
AND FUEL RVP CORRECTION FACTORS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* TCF(b) = EXP [TC(b)*(T - 75.0)], Pre-1981
TRCF(b) = EXP [RC(b)*(RVP - 9.0) + TC(b)*(T - 75.0)
+ TRC(b)*(RVP - 9.0)*(T - 75.0)], 1981+

Pol	Model Years	Parameter	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1970	TC	-0.14381E-01	0.13219E-02	0.34799E-02
	1970-1973		-0.12552E-01	0.42667E-02	0.75843E-02
	1974-1978		-0.10888E-01	-0.47925E-03	0.76666E-02
	1979-1980		-0.14095E-01	0.26179E-01	0.24297E-01
	1981-1985	RC	0.91402E-01	0.42060E-01	0.93179E-01
		TC	0.44270E-02	0.48358E-02	0.74688E-02
		TRC	0.29466E-02	0.0	0.47276E-02
	1986+	RC	0.23202E-01	0.15373E+00	0.13263E+00
		TC	0.0	0.86550E-02	0.83730E-02
		TRC	0.0	0.0	0.56009E-02
CO	Pre-1970	TC	-0.14691E-01	0.37462E-02	0.11014E-01
	1970-1973		-0.38767E-01	0.84685E-02	0.25179E-01
	1974-1978		-0.21165E-01	0.23603E-01	0.28483E-01
	1979-1980		-0.19612E-01	0.48537E-01	0.31439E-01
	1981-1985	RC	0.91345E-01	0.13968E+00	0.16322E+00
		TC	0.62182E-02	0.14943E-01	0.14923E-01
		TRC	0.0	0.0	0.0
	1986+	RC	0.40748E-01	0.26214E+00	0.23218E+00
		TC	0.35170E-02	0.14966E-01	0.20695E-01
		TRC	0.0	0.56416E-02	0.82344E-02
NOx	Pre-1970	TC	0.38841E-02	-0.87325E-02	-0.10839E-01
	1970-1973		-0.10389E-02	-0.92466E-02	-0.10108E-01
	1974-1978		-0.18301E-01	-0.10925E-01	-0.18042E-01
	1979-1980		-0.26153E-01	-0.18603E-01	-0.20878E-01
	1981-1985	RC	0.0	-0.40024E-01	0.0
		TC	0.0	0.0	0.0
		TRC	0.0	0.0	0.0
	1986+	RC	0.14219E-01	0.27491E-01	0.0
		TC	0.0	0.37789E-02	0.0
		TRC	0.0	0.0	0.0

* WHERE :

TCF(b) = High temperature correction factor for appropriate pollutant, ambient temperature, and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = High temperature correction factor coefficient for appropriate pollutant, temperature, and model year, for test segment b.
TRCF(b)= High temperature and fuel RVP correction factor for appropriate pollutant, ambient temperature, fuel RVP, and model year, for test segment b.
RC(b) = Fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, and model year, for test segment b.
RVP = Fuel volatility in psi.
TRC(b) = Combined temperature and fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, ambient temperature, and model year, for test segment b.

NOTE : The temperature correction factor is used in conjunction with the correction factor given in Table 2.3.7C.

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TABLE 2.3.7C

NORMALIZED BAG FRACTIONS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

		Normalized Fractions							
	Model	Test Segment 1		Test Segment 2		Test Segment 3		Total Test	
Pol	Years	B1	D1	B2	D2	B3	D3	BO	DO
HC	Pre-1970	1.2820	0.0250	0.9730	0.0280	0.8390	0.0190	1.0000	0.0249
	1970-1973	1.3450	0.0740	0.9460	0.0540	0.8420	0.0480	1.0000	0.0565
	1974-1978	1.3980	0.0600	0.8850	0.0550	0.9190	0.0360	1.0000	0.0508
	1979-1980	2.0914	0.4073	0.6714	0.2752	0.8035	0.2972	1.0000	0.3082
	1981-1983	2.7957	0.1898	0.4428	0.2024	0.7084	0.1645	1.0000	0.1898
	1984	2.8662	0.2721	0.6530	0.2902	0.2540	0.2358	1.0000	0.2721
	1985	3.2436	0.2100	0.2334	0.1867	0.7701	0.1633	1.0000	0.1867
	1986	3.2304	0.2289	0.2289	0.2035	0.7885	0.1781	1.0000	0.2035
	1987	3.2688	0.2603	0.2025	0.2314	0.8100	0.2025	1.0000	0.2314
	1988	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1989	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1990	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1991	2.2349	0.2579	0.6304	0.2292	0.7736	0.2006	1.0000	0.2292
	1992+	2.3023	0.2623	0.6120	0.2331	0.7577	0.2040	1.0000	0.2331
CO	Pre-1970	1.2770	0.0330	1.0170	0.0290	0.7580	0.0250	1.0000	0.0287
	1970-1973	1.4420	0.0710	0.9960	0.0420	0.6740	0.0330	1.0000	0.0455
	1974-1978	1.5730	0.0540	0.9020	0.0790	0.7550	0.0290	1.0000	0.0602
	1979-1980	2.0939	0.3129	0.6895	0.1805	0.7671	0.1479	1.0000	0.1985
	1981-1983	2.6454	0.1633	0.4526	0.1020	0.8032	0.1076	1.0000	0.1163
	1984	2.5738	0.2181	0.3799	0.1362	0.9959	0.1436	1.0000	0.1553
	1985	3.4554	0.1471	0.2186	0.0914	0.6385	0.0971	1.0000	0.1043
	1986	3.2307	0.1795	0.3032	0.1115	0.6465	0.1185	1.0000	0.1272
	1987	2.8508	0.2342	0.4456	0.1455	0.6615	0.1546	1.0000	0.1660
	1988	1.5788	0.1945	0.8083	0.1209	0.9291	0.1284	1.0000	0.1379
	1989	1.5680	0.1958	0.8134	0.1216	0.9275	0.1292	1.0000	0.1387
	1990	1.5572	0.1973	0.8179	0.1226	0.9271	0.1302	1.0000	0.1398
	1991	1.5559	0.1974	0.8182	0.1226	0.9274	0.1303	1.0000	0.1399
	1992+	1.5064	0.2028	0.8408	0.1260	0.9216	0.1339	1.0000	0.1438
NOx	Pre-1970	1.1210	0.0090	0.7850	0.0010	1.3190	-0.0090	1.0000	-0.0001
	1970-1973	1.1990	-0.0040	0.7930	-0.0020	1.2450	0.0060	1.0000	-0.0002
	1974-1978	1.2620	0.0220	0.7700	0.0040	1.2420	0.0270	1.0000	0.0140
	1979-1980	1.3666	0.0444	0.7444	0.0278	1.2111	0.0333	1.0000	0.0333
	1981-1983	1.3033	0.0061	0.8077	0.0184	1.1381	0.0245	1.0000	0.0184
	1984	1.0029	0.1343	0.9223	0.0358	1.1461	0.0537	1.0000	0.0627
	1985	1.1665	0.0724	0.8849	0.0161	1.0941	0.0322	1.0000	0.0322
	1986	1.2408	0.0833	0.8611	0.0185	1.0834	0.0370	1.0000	0.0370
	1987	1.3532	0.0990	0.8251	0.0220	1.0672	0.0440	1.0000	0.0440
	1988	1.3974	0.1094	0.8384	0.0243	1.0085	0.0486	1.0000	0.0486
	1989	1.3976	0.1103	0.8336	0.0245	1.0175	0.0490	1.0000	0.0490
	1990	1.4113	0.1114	0.8294	0.0248	1.0151	0.0495	1.0000	0.0495
	1991	1.4113	0.1114	0.8294	0.0248	1.0151	0.0495	1.0000	0.0495
	1992+	1.4452	0.1151	0.8185	0.0256	1.0104	0.0512	1.0000	0.0512

NOTE : The fractions given in this table are used in the calculation of the operating-mode/temperature correction factor (OMTCF).

WHERE :

OMTCF = [(TERM1 + TERM2 + TERM3)/DENOM].
TERM1 = W =TCF(1)*(B1+D1*M).
TERM2 = (1-W-X)*TCF(2)*(B2+D2*M).
TERM3 = X =TCF(3)*(B3+D3*M).
DENOM = BO + DO*M.
W = Fraction of VMT in the cold start mode.
X = Fraction of VMT in the hot start mode.
TCF(b) = Temperature correction factor for pollutant, model year, for test segment b.
M = Cumulative mileage / 10,000 miles.

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TABLE 2.3.8A

AIR CONDITIONING CORRECTION FACTOR COEFFICIENTS FOR
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* ACCF= U*V*(A + B*(T-75) -1) + 1

Model	HC		CO		NOx	
Years	A	B	A	B	A	B
Pre-1979	0.1023E+01	0.3344E-02	0.1202E+01	0.1808E-02	0.1299E+01	0.5643E-04
1979+	0.1000E+01	0.3512E-02	0.1130E+01	0.1528E-02	0.1221E+01	0.4262E-03

* WHERE :

ACCF = Air Conditioning Correction Factor,
V = Fraction of vehicles equipped with AC given in Table 2.3.8B,
U = Fraction of vehicles with AC that are using it = (DI-DILO)/(DIHI-DI), 0<=U<=1,
DI = Discomfort index = (DB+WB)*.4+15,
DILO = The highest discomfort index where no AC is used,
DIHI = The lowest discomfort index where all vehicles with AC use it,
DB = Dry bulb temperature (Fahrenheit),
WB = Wet bulb temperature (Fahrenheit),
T = Ambient temperature (Fahrenheit).

TABLE 2.3.8B

ESTIMATED FRACTION OF
HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
EQUIPPED WITH AIR CONDITIONING

Model Years	Fraction Equipped With Air Conditioning
Pre-1977	0.32
1977	0.52
1978+	0.39

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TABLE 2.3.8C

EXTRA LOAD CORRECTION FACTOR COEFFICIENTS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* XLCF = (XLC-1)*U + 1

Model Years	Coefficients (XLC) HC	CO	NOx
Pre-1970	1.0786	1.2765	0.9535
1970-1973	1.0495	1.1384	1.0313
1974-1978	1.0556	1.1347	1.0753
1979+	1.0455	1.3058	1.0719

* WHERE :

XLCF = Extra load correction factor,
U = Fraction of VMT with an extra load,
XLC = Correction factor coefficient.

TABLE 2.3.8D

TRAILER TOWING CORRECTION FACTOR COEFFICIENTS
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

* TTCF = (TTC-1)*U + 1

Model Years	Coefficients (TTC) HC	CO	NOx
Pre-1970	1.2614	1.9327	1.1184
1970-1973	1.2762	1.8940	1.1384
1974-1978	1.7288	2.1414	1.2170
1979+	1.5909	3.9722	1.3875

* WHERE :

TTCF = Trailer towing correction factor,
U = Fraction of VMT towing a trailer,
TTC = Correction factor coefficient.

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TABLE 2.3.9A

TAMPERING AND MISFUELING RATES
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Area	Model Years	System	Zero Mile Level	Det. Rate 1	Det. Rate 2	50,000 Mile Level	100,000 Mile Level
Non-I/M	Pre-1981	Air Pump Disablement	0.2155	0.02630	0.02630	0.347	0.478
		Catalyst Removal	0.2267	0.02260	0.02260	0.340	0.453
		EGR System Disabled	0.1037	0.02175	0.02175	0.212	0.321
		Filler Neck Damaged	0.1462	0.03684	0.03684	0.330	0.515
		Fuel Tank Misfueled	-0.0375	0.00857	0.00857	0.005	0.048
		Total Misfueled	0.1087	0.04541	0.04541	0.336	0.563
		PCV System Disabled	-0.0022	0.00419	0.00419	0.019	0.040
		Cannister Disconnect	-0.0185	0.01801	0.01801	0.072	0.162
		Both Cannister & Cap	-0.0121	0.01832	0.01832	0.079	0.171
	1981+	Air Pump Disablement	-0.0274	0.02619	0.02630	0.104	0.235
		Catalyst Removal	-0.0100	0.02074	0.02260	0.094	0.207
		EGR System Disabled	-0.0139	0.01374	0.02175	0.055	0.164
		Filler Neck Damaged	0.0087	0.00926	0.00926	0.055	0.101
		Fuel Tank Misfueled	0.0231	-0.00212	-0.00212	0.013	0.002
		Total Misfueled	0.0318	0.00714	0.00714	0.067	0.103
		PCV System Disabled	-0.0022	0.00419	0.00419	0.019	0.040
		Cannister Disconnect	-0.0185	0.01801	0.01801	0.072	0.162
		Both Cannister & Cap	-0.0121	0.01832	0.01832	0.079	0.171
With I/M	Pre-1981	Air Pump Disablement	0.2015	0.01561	0.01561	0.280	0.358
		Catalyst Removal	-0.0081	0.03342	0.03342	0.159	0.326
		EGR System Disabled	0.0880	0.01078	0.01078	0.142	0.196
		Filler Neck Damaged	0.0437	0.02806	0.02806	0.184	0.324
		Fuel Tank Misfueled	-0.0705	0.01076	0.01076	0.0	0.037
		Total Misfueled	-0.0268	0.03882	0.03882	0.167	0.361
		PCV System Disabled	-0.0068	0.00315	0.00315	0.009	0.025
		Cannister Disconnect	-0.0186	0.01349	0.01349	0.049	0.116
		Both Cannister & Cap	-0.0213	0.01484	0.01484	0.053	0.127
	1981+	Air Pump Disablement	-0.0044	0.00874	0.01561	0.039	0.117
		Catalyst Removal	0.0085	0.00618	0.03342	0.039	0.206
		EGR System Disabled	0.0068	0.00370	0.01078	0.025	0.079
		Filler Neck Damaged	0.0059	0.00380	0.00380	0.025	0.044
		Fuel Tank Misfueled	0.0097	0.00554	0.00554	0.037	0.065
		Total Misfueled	0.0156	0.00934	0.00934	0.062	0.109
		PCV System Disabled	-0.0068	0.00315	0.00315	0.009	0.025
		Cannister Disconnect	-0.0186	0.01349	0.01349	0.049	0.116
		Both Cannister & Cap	-0.0213	0.01484	0.01484	0.053	0.127

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TABLE 2.3.9B

EXCESS EMISSIONS
DUE TO TAMPERING AND/OR MISFUELING
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Type of Tampering	Emission Control System	Pollutant	Excess Emissions (g/mi) FTP	Bag 1	Bag 2	Bag 3	Idle (g/hr)
Air Pump Disablement	Oxidation	HC	1.37	1.80	1.37	1.04	27.38
		CO	30.61	34.67	33.90	21.28	506.08
	3way/Oxidation 3way	HC	0.85	1.36	0.76	0.61	
		Pre-1985					8.97
		1985+					11.71
		CO	21.02	31.80	18.21	18.25	
		Pre-1985					177.43
		1985+					215.29
Catalyst Removal	Oxidation	HC	3.05	2.31	3.40	2.95	42.83
		CO	28.01	41.40	28.97	16.06	124.82
	3way/Oxidation 3way	HC	2.04	1.80	2.25	1.81	42.83
		CO	13.74	16.32	14.11	11.07	124.82
		NOx	1.52	1.49	1.36	1.83	2.31
.otal Misfueled	Oxidation	HC	2.47	2.30	2.57	2.40	9.70
		CO	20.96	46.50	13.13	16.62	14.18
	3way/Oxidation 3way	HC	1.44	1.42	1.56	1.21	9.70
		CO	6.57	8.08	6.60	5.37	14.18
		NOx	0.57	0.64	0.45	0.74	0.13
EGR System Disabled		NOx					
		Pre-1979	1.21	1.40	0.96	1.54	
		1979-1978	3.31	3.82	2.63	4.21	
		1979-1987	3.48	4.11	2.68	4.53	
		1988+	1.23	1.36	1.19	1.21	
EGR System Disabled	and Catalyst Removal	NOx	3.39	3.02	3.46	3.55	
EGR System Disabled	and Total Misfueled	NOx	1.99	2.12	1.85	2.16	

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TABLE 2.3.9C

EXCESS CRANKCASE EMISSIONS
AND UNCONTROLLED
EVAPORATIVE HYDROCARBON EMISSIONS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Excess Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
PCV System Disabled					
1964-1977	1.28				
1978-1979	1.27				
1980	1.24				
1981+	1.23				
Cannister Disconnect					
Pre-1979		23.50	68.06	36.39	150.33
1979-1980		17.28	25.22	24.05	55.71
1981+ CARB		8.45	24.88	18.00	54.94
1981+ FINJ		6.76	24.88	11.70	54.94
Missing Fuel Cap					
Pre-1979		23.50	68.06	36.39	150.33
1979-1980		17.28	25.22	24.05	55.71
1981+ CARB		0.0	24.88	0.0	54.94
1981+ FINJ		6.76	24.88	11.70	54.94

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

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TABLE 2.3.9D

UNCONTROLLED
RUNNING LOSS EMISSIONS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Cannister Disconnect				
7.0	0.33	0.42	0.90	1.85
9.0	0.52	1.30	2.04	4.29
10.4	0.95	2.36	3.52	4.97
11.7	2.54	3.37	7.19	11.97
Missing Fuel Cap				
7.0	0.60	0.84	1.28	2.44
9.0	1.23	1.85	3.31	15.58
10.4	2.09	3.43	15.30	28.51
11.7	3.62	17.28	44.93	44.93

* Uncontrolled emissions applicable to 1979+ model year vehicles.

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TABLE 2.3.10A

METHANE OFFSETS*
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Methane Offsets (g/mi) FTP	Bag 1	Bag 2	Bag 3
Pre-1974	0.421	0.570	0.420	0.310
1974-1978	0.421	0.570	0.420	0.310
1979-1980	0.333	0.500	0.310	0.250
1981-1983	0.222	0.365	0.193	0.170
1984	0.182	0.271	0.167	0.145
1985	0.140	0.208	0.128	0.112
1986	0.094	0.139	0.085	0.076
1987	0.079	0.119	0.071	0.065
1988	0.072	0.109	0.064	0.059
1989	0.072	0.108	0.064	0.059
1990	0.071	0.108	0.064	0.058
1991	0.071	0.108	0.064	0.058
1992+	0.069	0.105	0.062	0.057

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

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TABLE 2.3.10C

PERCENT TECHNOLOGY DISTRIBUTIONS
(EXHAUST AND EVAPORATIVE EMISSION SYSTEMS)
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Air Pump Only	Oxidation Catalyst	3Way Catalyst	EGR System	Air Pump & Oxidation or 3Way Catalyst	EGR System & 3Way Catalyst
Pre-1973	0.0	0.0	0.0	0.0	0.0	0.0
1973-1978	0.0	0.0	0.0	30.0	0.0	0.0
1979-1981	0.0	100.0	0.0	100.0	50.0	0.0
1982	0.0	100.0	0.0	100.0	60.0	0.0
1983	0.0	90.0	10.0	100.0	60.0	10.0
1984	0.0	70.0	30.0	100.0	75.0	30.0
1985	0.0	60.0	40.0	100.0	75.0	40.0
1986	0.0	50.0	50.0	100.0	55.0	50.0
1987	0.0	15.0	85.0	100.0	55.0	85.0
1988+	0.0	15.0	85.0	100.0	50.0	85.0

Model Years	Evaporative Canister	PCV System
Pre-1968	0.0	0.0
1968-1970	0.0	100.0
1971-1978	5.0	100.0
1979+	100.0	100.0

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TABLE 2.3.10D

PERCENT TECHNOLOGY DISTRIBUTIONS
(FUEL DELIVERY SYSTEMS)
FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II

Model Years	Carbureted	Ported Fuel-Injected	Throttle-Body Fuel-Injected
1981	99.1	0.9	0.0
1982	99.5	0.5	0.0
1983	99.8	0.2	0.0
1984	97.8	2.2	0.0
1985	88.6	6.8	4.6
1986	58.5	23.7	17.8
1987	26.5	43.2	30.3
1988	19.3	44.4	36.3
1989	18.3	45.8	35.9
1990	17.2	52.2	30.6
1991	17.1	53.1	29.8
1992+	12.9	55.7	31.4

DATE : MAY 19, 1989

TABLE 2.3.11A

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	32.7	1967	32.7	1968	25.3	1969	25.3	1970	22.7	1971	22.8	1972	22.8	1973	22.8	1974	21.4	1975	21.3	1976	21.3	1977	21.3
1967	32.6	1968	25.2	1969	25.2	1970	22.6	1971	22.6	1972	22.7	1973	22.7	1974	21.3	1975	21.3	1976	21.2	1977	21.2	1978	21.2
1968	25.2	1969	25.2	1970	22.5	1971	22.5	1972	22.5	1973	22.5	1974	21.2	1975	21.2	1976	21.2	1977	21.2	1978	21.1	1979	8.5
1969	25.1	1970	22.4	1971	22.4	1972	22.4	1973	22.4	1974	21.1	1975	21.1	1976	21.1	1977	21.1	1978	21.1	1979	8.4	1980	8.3
1970	22.3	1971	22.3	1972	22.3	1973	22.3	1974	21.0	1975	21.0	1976	21.0	1977	21.0	1978	21.0	1979	8.2	1980	8.2	1981	7.3
1971	22.1	1972	22.1	1973	22.1	1974	20.9	1975	20.9	1976	20.9	1977	20.9	1978	21.0	1979	8.1	1980	8.1	1981	7.2	1982	4.6
1972	22.0	1973	22.0	1974	20.8	1975	20.8	1976	20.8	1977	20.8	1978	20.8	1979	8.0	1980	8.0	1981	7.1	1982	4.6	1983	4.5
1973	21.8	1974	20.7	1975	20.7	1976	20.7	1977	20.7	1978	20.7	1979	7.8	1980	7.8	1981	6.9	1982	4.5	1983	4.5	1984	4.4
1974	20.6	1975	20.6	1976	20.6	1977	20.6	1978	20.6	1979	7.6	1980	7.6	1981	6.7	1982	4.4	1983	4.4	1984	4.3	1985	2.8
1975	20.4	1976	20.4	1977	20.4	1978	20.4	1979	7.3	1980	7.3	1981	6.5	1982	4.3	1983	4.3	1984	4.2	1985	2.8	1986	2.6
1976	20.3	1977	20.3	1978	20.3	1979	7.1	1980	7.1	1981	6.3	1982	4.2	1983	4.2	1984	4.2	1985	2.7	1986	2.6	1987	2.4
1977	20.1	1978	20.1	1979	6.8	1980	6.8	1981	6.0	1982	4.0	1983	4.0	1984	4.0	1985	2.7	1986	2.5	1987	2.4	1988	2.4
1978	20.0	1979	6.5	1980	6.5	1981	5.7	1982	3.9	1983	3.9	1984	3.9	1985	2.6	1986	2.5	1987	2.3	1988	2.3	1989	2.3
1979	6.2	1980	6.2	1981	5.4	1982	3.7	1983	3.7	1984	3.7	1985	2.5	1986	2.4	1987	2.3	1988	2.3	1989	2.3	1990	2.2
1980	5.9	1981	5.1	1982	3.5	1983	3.5	1984	3.5	1985	2.5	1986	2.3	1987	2.2	1988	2.2	1989	2.2	1990	2.2	1991	2.1
1981	4.7	1982	3.3	1983	3.3	1984	3.3	1985	2.3	1986	2.2	1987	2.1	1988	2.1	1989	2.1	1990	2.1	1991	2.1	1992	2.0
1982	3.1	1983	3.1	1984	3.1	1985	2.2	1986	2.1	1987	2.0	1988	2.0	1989	2.0	1990	2.0	1991	2.0	1992	1.9	1993	1.9
1983	2.9	1984	2.9	1985	2.1	1986	2.0	1987	1.8	1988	1.9	1989	1.9	1990	1.9	1991	1.9	1992	1.8	1993	1.8	1994	1.8
1984	2.6	1985	2.0	1986	1.8	1987	1.7	1988	1.7	1989	1.8	1990	1.8	1991	1.8	1992	1.7	1993	1.7	1994	1.7	1995	1.6
1985	1.9	1986	1.7	1987	1.6	1988	1.7	1989	1.7	1990	1.7	1991	1.7	1992	1.7	1993	1.7	1994	1.6	1995	1.6	1996	1.6

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	21.3	1979	8.7	1980	8.6	1981	7.8	1984	4.9	1986	2.9	1989	2.8	1991	2.8	1993	2.8	1996	2.8	1999	2.8	2001	2.8
1979	8.6	1980	8.6	1981	7.7	1982	4.8	1985	3.0	1987	2.8	1990	2.8	1992	2.8	1994	2.8	1997	2.8	2000	2.8	2002	2.8
1980	8.5	1981	7.6	1982	4.8	1983	4.8	1986	2.9	1988	2.8	1991	2.8	1993	2.8	1995	2.8	1998	2.8	2001	2.8	2003	2.8
1981	7.5	1982	4.8	1983	4.7	1984	4.7	1987	2.7	1989	2.7	1992	2.7	1994	2.7	1996	2.7	1999	2.7	2002	2.7	2004	2.7
1982	4.7	1983	4.7	1984	4.6	1985	2.9	1988	2.7	1990	2.7	1993	2.7	1995	2.7	1997	2.7	2000	2.7	2003	2.7	2005	2.7
1983	4.6	1984	4.6	1985	2.9	1986	2.8	1989	2.7	1991	2.6	1994	2.6	1996	2.6	1998	2.6	2001	2.6	2004	2.6	2006	2.6
1984	4.5	1985	3.0	1986	2.7	1987	2.6	1990	2.6	1992	2.6	1995	2.6	1997	2.6	1999	2.6	2002	2.6	2005	2.6	2007	2.6
1985	2.9	1986	2.8	1987	2.5	1988	2.6	1991	2.6	1993	2.5	1996	2.5	1998	2.5	2000	2.5	2003	2.5	2006	2.5	2008	2.5
1986	2.7	1987	2.6	1988	2.5	1989	2.5	1992	2.5	1994	2.5	1997	2.5	1999	2.5	2001	2.5	2004	2.5	2007	2.5	2009	2.5
1987	2.5	1988	2.6	1989	2.5	1990	2.4	1993	2.4	1995	2.4	1998	2.4	2000	2.4	2002	2.4	2005	2.4	2008	2.4	2010	2.4
1988	2.5	1989	2.5	1990	2.4	1991	2.4	1994	2.4	1996	2.3	1999	2.3	2001	2.3	2003	2.3	2006	2.3	2009	2.3	2011	2.3
1989	2.4	1990	2.4	1991	2.3	1992	2.3	1995	2.3	1997	2.3	2000	2.3	2002	2.3	2004	2.3	2007	2.3	2010	2.3	2012	2.3
1990	2.3	1991	2.3	1992	2.2	1993	2.2	1996	2.2	1998	2.2	2001	2.2	2003	2.2	2005	2.2	2008	2.2	2011	2.2	2013	2.2
1991	2.2	1992	2.2	1993	2.1	1994	2.1	1997	2.1	1999	2.1	2002	2.1	2004	2.1	2006	2.1	2009	2.1	2012	2.1	2014	2.1
1992	2.1	1993	2.1	1994	2.0	1995	2.0	1998	2.0	2000	2.0	2003	2.0	2005	2.0	2007	2.0	2010	2.0	2013	2.0	2015	2.0
1993	2.0	1994	2.0	1995	1.9	1996	1.9	1999	1.9	2001	1.9	2004	1.9	2006	1.9	2008	1.9	2011	1.9	2014	1.9	2016	1.9
1994	1.9	1995	1.9	1996	1.8	1997	1.8	2000	1.8	2002	1.8	2005	1.8	2007	1.8	2009	1.8	2012	1.8	2015	1.8	2017	1.8
1995	1.8	1996	1.8	1997	1.7	1998	1.7	2001	1.7	2003	1.7	2006	1.7	2008	1.7	2010	1.7	2013	1.7	2016	1.7	2018	1.7
1996	1.6	1997	1.7	1998	1.6	1999	1.5	2002	1.5	2004	1.5	2007	1.5	2009	1.5	2011	1.5	2014	1.5	2017	1.5	2019	1.5
1997	1.6	1998	1.6	1999	1.5	2000	1.5	2003	1.5	2005	1.4	2008	1.4	2010	1.4	2012	1.4	2015	1.4	2018	1.4	2020	1.4

*MY -- Indicates the model year.
**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start, 60 TO 84F diurnal, 75F for hot soak and running loss emissions, 9.0 psi fuel RVP, 54.57% average in-use fuel tank level, including refueling emissions. Emissions are based on the January 1 mileage accumulation figures given in Table 2.3.4A

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TABLE 2.3.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	180.8	1967	180.8	1968	180.8	1969	180.8	1970	152.5	1971	152.5	1972	152.5	1973	152.5	1974	150.5	1975	150.5	1976	150.5	1977	150.5
1967	179.9	1968	179.9	1969	179.9	1970	151.4	1971	151.4	1972	151.4	1973	151.4	1974	149.5	1975	149.5	1976	149.5	1977	149.5	1978	149.5
1968	178.9	1969	178.9	1970	150.3	1971	150.3	1972	150.3	1973	150.3	1974	148.4	1975	148.4	1976	148.4	1977	148.4	1978	148.4	1979	84.8
1969	177.8	1970	149.0	1971	149.0	1972	149.0	1973	149.0	1974	147.3	1975	147.3	1976	147.3	1977	147.3	1978	147.3	1979	83.6	1980	83.6
1970	147.7	1971	147.7	1972	147.7	1973	147.7	1974	146.0	1975	146.0	1976	146.0	1977	146.0	1978	146.0	1979	82.3	1980	82.3	1981	82.3
1971	146.3	1972	146.3	1973	146.3	1974	144.6	1975	144.6	1976	144.6	1977	144.6	1978	144.6	1979	81.0	1980	81.0	1981	81.0	1982	52.2
1972	144.7	1973	144.7	1974	143.1	1975	143.1	1976	143.1	1977	143.1	1978	143.1	1979	79.5	1980	79.5	1981	79.5	1982	51.3	1983	51.3
1973	143.0	1974	141.5	1975	141.5	1976	141.5	1977	141.5	1978	141.5	1979	77.8	1980	77.8	1981	77.8	1982	50.3	1983	50.3	1984	43.5
1974	139.7	1975	139.7	1976	139.7	1977	139.7	1978	139.7	1979	76.1	1980	76.1	1981	76.1	1982	49.3	1983	49.3	1984	42.5	1985	19.4
1975	137.7	1976	137.7	1977	137.7	1978	137.7	1979	74.1	1980	74.1	1981	74.1	1982	48.1	1983	48.1	1984	41.3	1985	18.8	1986	17.0
1976	135.7	1977	135.7	1978	135.7	1979	72.1	1980	72.1	1981	72.1	1982	46.9	1983	46.9	1984	40.1	1985	18.2	1986	16.4	1987	14.5
1977	133.4	1978	133.4	1979	69.8	1980	69.8	1981	69.8	1982	45.5	1983	45.5	1984	38.7	1985	17.5	1986	15.7	1987	13.9	1988	15.1
1978	130.9	1979	67.3	1980	67.3	1981	67.3	1982	44.0	1983	44.0	1984	37.2	1985	16.8	1986	15.0	1987	13.1	1988	14.3	1989	14.3
1979	64.7	1980	64.7	1981	64.7	1982	42.4	1983	42.4	1984	35.6	1985	16.0	1986	14.2	1987	12.3	1988	13.5	1989	13.5	1990	13.4
1980	61.8	1981	61.8	1982	40.7	1983	40.7	1984	33.9	1985	15.1	1986	13.3	1987	11.4	1988	12.7	1989	12.6	1990	12.6	1991	12.5
1981	58.6	1982	38.8	1983	38.8	1984	32.0	1985	14.2	1986	12.4	1987	10.5	1988	11.7	1989	11.7	1990	11.6	1991	11.6	1992	11.4
1982	36.7	1983	36.7	1984	29.9	1985	13.1	1986	11.3	1987	9.5	1988	10.7	1989	10.6	1990	10.6	1991	10.6	1992	10.4	1993	10.4
1983	34.5	1984	27.7	1985	12.0	1986	10.2	1987	8.4	1988	9.6	1989	9.5	1990	9.5	1991	9.5	1992	9.3	1993	9.3	1994	9.3
1984	25.3	1985	10.8	1986	9.0	1987	7.2	1988	8.4	1989	8.3	1990	8.3	1991	8.3	1992	8.1	1993	8.1	1994	8.1	1995	8.1
1985	10.0	1986	8.2	1987	6.4	1988	7.6	1989	7.5	1990	7.5	1991	7.5	1992	7.3	1993	7.3	1994	7.3	1995	7.3	1996	7.3

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	150.5	1979	86.9	1980	86.9	1981	86.9	1984	49.0	1986	20.9	1989	20.2	1991	20.1	1993	19.9	1996	19.9	1999	19.9	2001	19.9
1979	85.9	1980	85.9	1981	85.9	1982	55.2	1985	22.3	1987	18.7	1990	19.8	1992	19.6	1994	19.6	1997	19.6	2000	19.6	2002	19.6
1980	84.8	1981	84.8	1982	54.5	1983	54.5	1986	20.2	1988	19.6	1991	19.5	1993	19.3	1995	19.3	1998	19.3	2001	19.3	2003	19.3
1981	83.6	1982	53.8	1983	53.8	1984	47.0	1987	18.0	1989	19.2	1992	18.9	1994	18.9	1996	18.9	1999	18.9	2002	18.9	2004	18.9
1982	53.0	1983	53.0	1984	46.2	1985	21.3	1988	18.9	1990	18.8	1993	18.5	1995	18.5	1997	18.5	2000	18.5	2003	18.5	2005	18.5
1983	52.2	1984	45.4	1985	20.9	1986	19.1	1989	18.4	1991	18.3	1994	18.1	1996	18.1	1998	18.1	2001	18.1	2004	18.1	2006	18.1
1984	44.5	1985	20.4	1986	18.6	1987	16.8	1990	17.9	1992	17.7	1995	17.7	1997	17.7	1999	17.7	2002	17.7	2005	17.7	2007	17.7
1985	19.9	1986	18.1	1987	16.3	1988	17.5	1991	17.4	1993	17.2	1996	17.2	1998	17.2	2000	17.2	2003	17.2	2006	17.2	2008	17.2
1986	17.6	1987	15.7	1988	17.0	1989	16.9	1992	16.7	1994	16.7	1997	16.7	1999	16.7	2001	16.7	2004	16.7	2007	16.7	2009	16.7
1987	15.2	1988	16.4	1989	16.3	1990	16.3	1993	16.1	1995	16.1	1998	16.1	2000	16.1	2002	16.1	2005	16.1	2008	16.1	2010	16.1
1988	15.8	1989	15.7	1990	15.7	1991	15.6	1994	15.5	1996	15.5	1999	15.5	2001	15.5	2003	15.5	2006	15.5	2009	15.5	2011	15.5
1989	15.0	1990	15.0	1991	15.0	1992	14.8	1995	14.8	1997	14.8	2000	14.8	2002	14.8	2004	14.8	2007	14.8	2010	14.8	2012	14.8
1990	14.2	1991	14.2	1992	14.0	1993	14.0	1996	14.0	1998	14.0	2001	14.0	2003	14.0	2005	14.0	2008	14.0	2011	14.0	2013	14.0
1991	13.4	1992	13.2	1993	13.2	1994	13.2	1997	13.2	1999	13.2	2002	13.2	2004	13.2	2006	13.2	2009	13.2	2012	13.2	2014	13.2
1992	12.4	1993	12.4	1994	12.4	1995	12.4	1998	12.4	2000	12.4	2003	12.4	2005	12.4	2007	12.4	2010	12.4	2013	12.4	2015	12.4
1993	11.4	1994	11.4	1995	11.4	1996	11.4	1999	11.4	2001	11.4	2004	11.4	2006	11.4	2008	11.4	2011	11.4	2014	11.4	2016	11.4
1994	10.4	1995	10.4	1996	10.4	1997	10.4	2000	10.4	2002	10.4	2005	10.4	2007	10.4	2009	10.4	2012	10.4	2015	10.4	2017	10.4
1995	9.3	1996	9.3	1997	9.3	1998	9.3	2001	9.3	2003	9.3	2006	9.3	2008	9.3	2010	9.3	2013	9.3	2016	9.3	2018	9.3
1996	8.1	1997	8.1	1998	8.1	1999	8.1	2002	8.1	2004	8.1	2007	8.1	2009	8.1	2011	8.1	2014	8.1	2017	8.1	2019	8.1
1997	7.3	1998	7.3	1999	7.3	2000	7.3	2003	7.3	2005	7.3	2008	7.3	2010	7.3	2012	7.3	2015	7.3	2018	7.3	2020	7.3

*MY -- Indicates the model year.

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in Table 2.3.4A.

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TABLE 2.3.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY GASOLINE POWERED TRUCKS II
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	3.1	1967	3.1	1968	3.1	1969	3.1	1970	4.3	1971	4.3	1972	4.3	1973	4.3	1974	3.8	1975	3.8	1976	3.8	1977	3.8
1967	3.1	1968	3.1	1969	3.1	1970	4.3	1971	4.3	1972	4.3	1973	4.3	1974	3.8	1975	3.8	1976	3.8	1977	3.8	1978	3.8
1968	3.1	1969	3.1	1970	4.3	1971	4.3	1972	4.3	1973	4.3	1974	3.7	1975	3.7	1976	3.7	1977	3.7	1978	3.7	1979	2.0
1969	3.1	1970	4.3	1971	4.3	1972	4.3	1973	4.3	1974	3.7	1975	3.7	1976	3.7	1977	3.7	1978	3.7	1979	1.9	1980	1.9
1970	4.3	1971	4.3	1972	4.3	1973	4.3	1974	3.7	1975	3.7	1976	3.7	1977	3.7	1978	3.7	1979	1.9	1980	1.9	1981	1.9
1971	4.3	1972	4.3	1973	4.3	1974	3.7	1975	3.7	1976	3.7	1977	3.7	1978	3.7	1979	1.9	1980	1.9	1981	1.9	1982	1.9
1972	4.3	1973	4.3	1974	3.7	1975	3.7	1976	3.7	1977	3.7	1978	3.7	1979	1.8	1980	1.8	1981	1.8	1982	1.9	1983	1.9
1973	4.3	1974	3.6	1975	3.6	1976	3.6	1977	3.6	1978	3.6	1979	1.8	1980	1.8	1981	1.8	1982	1.9	1983	1.9	1984	2.2
1974	3.6	1975	3.6	1976	3.6	1977	3.6	1978	3.6	1979	1.8	1980	1.8	1981	1.8	1982	1.9	1983	1.9	1984	2.1	1985	1.8
1975	3.6	1976	3.6	1977	3.6	1978	3.6	1979	1.7	1980	1.7	1981	1.7	1982	1.8	1983	1.8	1984	2.1	1985	1.7	1986	1.6
1976	3.5	1977	3.5	1978	3.5	1979	1.7	1980	1.7	1981	1.7	1982	1.8	1983	1.8	1984	2.0	1985	1.7	1986	1.5	1987	1.4
1977	3.5	1978	3.5	1979	1.6	1980	1.6	1981	1.6	1982	1.8	1983	1.8	1984	2.0	1985	1.7	1986	1.5	1987	1.3	1988	1.2
1978	3.5	1979	1.5	1980	1.5	1981	1.5	1982	1.7	1983	1.7	1984	1.9	1985	1.6	1986	1.5	1987	1.3	1988	1.2	1989	1.2
1979	1.5	1980	1.5	1981	1.5	1982	1.7	1983	1.7	1984	1.8	1985	1.6	1986	1.4	1987	1.2	1988	1.2	1989	1.2	1990	1.1
1980	1.4	1981	1.4	1982	1.7	1983	1.7	1984	1.7	1985	1.5	1986	1.4	1987	1.2	1988	1.1	1989	1.1	1990	1.1	1991	1.1
1981	1.3	1982	1.6	1983	1.6	1984	1.6	1985	1.5	1986	1.3	1987	1.1	1988	1.1	1989	1.1	1990	1.0	1991	1.0	1992	1.0
1982	1.6	1983	1.6	1984	1.5	1985	1.4	1986	1.3	1987	1.1	1988	1.0	1989	1.0	1990	1.0	1991	1.0	1992	1.0	1993	1.0
1983	1.5	1984	1.4	1985	1.4	1986	1.2	1987	1.0	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9	1994	0.9
1984	1.3	1985	1.3	1986	1.1	1987	1.0	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.8	1993	0.8	1994	0.8	1995	0.8
1985	1.2	1986	1.1	1987	0.9	1988	0.8	1989	0.8	1990	0.8	1991	0.8	1992	0.8	1993	0.8	1994	0.8	1995	0.8	1996	0.8

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	3.8	1979	2.0	1980	2.0	1981	2.0	1984	2.4	1986	1.8	1989	1.5	1991	1.5	1993	1.5	1996	1.5	1999	1.5	2001	1.5
1979	2.0	1980	2.0	1981	2.0	1982	2.0	1985	1.9	1987	1.6	1990	1.5	1992	1.5	1994	1.5	1997	1.5	2000	1.5	2002	1.5
1980	2.0	1981	2.0	1982	2.0	1983	2.0	1986	1.7	1988	1.5	1991	1.5	1993	1.4	1995	1.4	1998	1.4	2001	1.4	2003	1.4
1981	1.9	1982	1.9	1983	1.9	1984	2.4	1987	1.6	1989	1.5	1992	1.4	1994	1.4	1996	1.4	1999	1.4	2002	1.4	2004	1.4
1982	1.9	1983	1.9	1984	2.3	1985	1.9	1988	1.4	1990	1.4	1993	1.4	1995	1.4	1997	1.4	2000	1.4	2003	1.4	2005	1.4
1983	1.9	1984	2.3	1985	1.8	1986	1.7	1989	1.4	1991	1.4	1994	1.4	1996	1.4	1998	1.4	2001	1.4	2004	1.4	2006	1.4
1984	2.2	1985	1.8	1986	1.7	1987	1.5	1990	1.4	1992	1.4	1995	1.4	1997	1.4	1999	1.4	2002	1.4	2005	1.4	2007	1.4
1985	1.8	1986	1.6	1987	1.5	1988	1.4	1991	1.4	1993	1.3	1996	1.3	1998	1.3	2000	1.3	2003	1.3	2006	1.3	2008	1.3
1986	1.6	1987	1.4	1988	1.3	1989	1.3	1992	1.3	1994	1.3	1997	1.3	1999	1.3	2001	1.3	2004	1.3	2007	1.3	2009	1.3
1987	1.4	1988	1.3	1989	1.3	1990	1.3	1993	1.3	1995	1.3	1998	1.3	2000	1.3	2002	1.3	2005	1.3	2008	1.3	2010	1.3
1988	1.3	1989	1.3	1990	1.3	1991	1.3	1994	1.2	1996	1.2	1999	1.2	2001	1.2	2003	1.2	2006	1.2	2009	1.2	2011	1.2
1989	1.2	1990	1.2	1991	1.2	1992	1.2	1995	1.2	1997	1.2	2000	1.2	2002	1.2	2004	1.2	2007	1.2	2010	1.2	2012	1.2
1990	1.2	1991	1.2	1992	1.2	1993	1.2	1996	1.2	1998	1.2	2001	1.2	2003	1.2	2005	1.2	2008	1.2	2011	1.2	2013	1.2
1991	1.1	1992	1.1	1993	1.1	1994	1.1	1997	1.1	1999	1.1	2002	1.1	2004	1.1	2006	1.1	2009	1.1	2012	1.1	2014	1.1
1992	1.1	1993	1.1	1994	1.1	1995	1.1	1998	1.1	2000	1.1	2003	1.1	2005	1.1	2007	1.1	2010	1.1	2013	1.1	2015	1.1
1993	1.0	1994	1.0	1995	1.0	1996	1.0	1999	1.0	2001	1.0	2004	1.0	2006	1.0	2008	1.0	2011	1.0	2014	1.0	2016	1.0
1994	1.0	1995	1.0	1996	1.0	1997	1.0	2000	1.0	2002	1.0	2005	1.0	2007	1.0	2009	1.0	2012	1.0	2015	1.0	2017	1.0
1995	0.9	1996	0.9	1997	0.9	1998	0.9	2001	0.9	2003	0.9	2006	0.9	2008	0.9	2010	0.9	2013	0.9	2016	0.9	2018	0.9
1996	0.8	1997	0.8	1998	0.8	1999	0.8	2002	0.8	2004	0.8	2007	0.8	2009	0.8	2011	0.8	2014	0.8	2017	0.8	2019	0.8
1997	0.8	1998	0.8	1999	0.8	2000	0.8	2003	0.8	2005	0.8	2008	0.8	2010	0.8	2012	0.8	2015	0.8	2018	0.8	2020	0.8

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in Table 2.3.4A.

TABLE 2.4.1A

NONTAMPERED EXHAUST EMISSION RATES FOR
HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1963	26.870	0.370	28.720	30.570
	1963-1969	26.320	0.360	28.120	29.920
	1970-1973	13.250	0.390	15.200	17.150
	1974	13.100	0.260	14.400	15.700
	1975	12.090	0.240	13.290	14.490
	1976	11.460	0.220	12.560	13.660
	1977-1978	9.810	0.190	10.760	11.710
	1979	5.000	0.180	5.900	6.800
	1980	4.700	0.170	5.550	6.400
	1981-1983	4.450	0.160	5.250	6.050
	1984	4.440	0.160	5.240	6.040
	1985	3.120	0.050	3.370	3.620
	1986	2.730	0.050	2.980	3.230
	1987-1989	1.400	0.090	1.850	2.300
	1990	1.390	0.090	1.840	2.290
	1991-2000	1.390	0.090	1.840	2.290
	2001+	1.380	0.090	1.830	2.280
CO	Pre-1963	430.720	5.760	459.520	488.320
	1963-1969	421.810	5.640	450.010	478.210
	1970-1973	298.100	7.050	333.350	368.600
	1974	294.580	6.670	327.930	361.280
	1975	272.000	6.160	302.800	333.600
	1976	257.710	5.830	286.860	316.010
	1977-1978	220.630	4.990	245.580	270.530
	1979	102.530	4.790	126.480	150.430
	1980	96.410	4.510	118.960	141.510
	1981-1983	91.290	4.270	112.640	133.990
	1984	90.990	4.250	112.240	133.490
	1985	64.160	0.860	68.460	72.760
	1986	50.570	0.860	54.870	59.170
	1987-1989	30.620	0.640	33.820	37.020
	1990	30.550	0.640	33.750	36.950
	1991-2000	30.380	0.640	33.580	36.780
	2001+	30.240	0.640	33.440	36.640
NOx	Pre-1963	6.270	0.0	6.270	6.270
	1963-1969	6.140	0.0	6.140	6.140
	1970-1973	6.580	0.0	6.580	6.580
	1974	4.740	0.090	5.190	5.640
	1975	4.370	0.080	4.770	5.170
	1976	4.140	0.070	4.490	4.840
	1977-1978	3.550	0.060	3.850	4.150
	1979	3.970	0.060	4.270	4.570
	1980	3.730	0.060	4.030	4.330
	1981-1983	3.530	0.050	3.780	4.030
	1984	3.520	0.050	3.770	4.020
	1985	3.480	0.030	3.630	3.780
	1986	3.470	0.030	3.620	3.770
	1987-1989	3.470	0.030	3.620	3.770
	1990	3.410	0.040	3.610	3.810
	1991-2000	2.820	0.040	3.020	3.220
	2001+	2.810	0.040	3.010	3.210

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile.
ZML = Zero mile level in grams/mile.
DR = Deterioration rate in grams/mile/10K miles.
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 2.4.1B

EXHAUST EMISSION RATES FOR
HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES
AT VARIOUS MILEAGE LEVELS
(RATES INCLUDE TAMPERING)

Pol	Model Years	Emission Rate (Grams/Mile) 0K	25K	50K	75K	100K	125K	150K
HC	Pre-1970	26.320	27.220	28.120	29.020	29.920	30.820	31.720
	1970-1973	13.250	14.225	15.200	16.175	17.150	18.125	19.100
	1974	13.100	13.750	14.400	15.050	15.700	16.350	17.000
	1975	12.090	12.690	13.290	13.890	14.490	15.090	15.690
	1976	11.460	12.010	12.560	13.110	13.660	14.210	14.760
	1977-1978	9.810	10.285	10.760	11.235	11.710	12.185	12.660
	1979	5.000	5.450	5.900	6.350	6.800	7.250	7.700
	1980	4.700	5.125	5.550	5.975	6.400	6.825	7.250
	1981	4.450	4.850	5.250	5.650	6.050	6.450	6.850
	1982-1983	4.490	4.911	5.331	5.750	6.169	6.590	7.007
	1984	4.481	4.903	5.324	5.743	6.163	6.584	7.002
	1985	3.159	3.305	3.450	3.593	3.738	3.883	4.024
	1986	2.769	2.915	3.060	3.203	3.347	3.493	3.634
	1987	1.665	2.011	2.355	2.690	3.005	3.309	3.607
	1988-1989	1.746	2.135	2.520	2.892	3.245	3.588	3.917
	1990+	1.826	2.260	2.689	3.101	3.498	3.887	4.254
CO	Pre-1970	421.810	435.910	450.010	464.110	478.210	492.310	506.410
	1970-1973	298.100	315.725	333.350	350.975	368.600	386.225	403.850
	1974	294.580	311.255	327.930	344.605	361.280	377.955	394.630
	1975	272.000	287.400	302.800	318.200	333.600	349.000	364.400
	1976	257.710	272.285	286.860	301.435	316.010	330.585	345.160
	1977-1978	220.630	233.105	245.580	258.055	270.530	283.005	295.480
	1979	102.530	114.505	126.480	138.455	150.430	162.405	174.380
	1980	96.410	107.685	118.960	130.235	141.510	152.785	164.060
	1981	91.290	101.965	112.640	123.315	133.990	144.665	155.340
	1982-1983	91.668	102.534	113.395	124.237	135.093	145.954	156.783
	1984	91.374	102.193	113.006	123.801	134.610	145.424	156.206
	1985	64.530	66.867	69.198	71.512	73.839	76.171	78.472
	1986	50.940	53.277	55.608	57.922	60.249	62.581	64.882
	1987	33.884	36.779	39.648	42.437	44.947	47.307	49.570
	1988-1989	34.677	37.964	41.212	44.345	47.200	49.902	52.452
	1990	35.293	38.902	42.464	45.881	49.060	52.102	54.935
	1991+	35.123	38.732	42.294	45.711	48.890	51.932	54.765
NOx	Pre-1970	6.140	6.140	6.140	6.140	6.140	6.140	6.140
	1970-1973	6.580	6.580	6.580	6.580	6.580	6.580	6.580
	1974	4.740	4.965	5.190	5.415	5.640	5.865	6.090
	1975	4.370	4.570	4.770	4.970	5.170	5.370	5.570
	1976	4.140	4.315	4.490	4.665	4.840	5.015	5.190
	1977-1978	3.550	3.700	3.850	4.000	4.150	4.300	4.450
	1979	3.970	4.120	4.270	4.420	4.570	4.720	4.870
	1980	3.730	3.880	4.030	4.180	4.330	4.480	4.630
	1981-1983	3.530	3.655	3.780	3.905	4.030	4.155	4.280
	1984	3.520	3.645	3.770	3.895	4.020	4.145	4.270
	1985	3.599	3.737	3.874	4.011	4.149	4.286	4.424
	1986	3.595	3.736	3.877	4.018	4.158	4.299	4.440
	1987	3.628	3.781	3.934	4.086	4.239	4.394	4.548
	1988-1989	3.622	3.773	3.923	4.074	4.225	4.378	4.531
	1990	3.789	4.083	4.377	4.668	4.959	5.247	5.533
	1991+	3.199	3.493	3.787	4.078	4.369	4.657	4.943

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TABLE 2.4.2A

NONTAMPERED
CRANKCASE AND EVAPORATIVE HYDROCARBON EMISSIONS*
FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
Pre-1968	7.35	23.50	55.03	35.96	101.26
1968-1984	0.0	23.50	55.03	35.96	101.26
1985+	0.0	2.75	6.08	6.21	29.67

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84f one hour heat build,
No fuel weathering, tested at 40% tank level.

Based on averages of 6.88 trips per day and 33.97 miles per day.

DATE : MAY 19, 1989

TABLE 2.4.2B

TAMPERING OFFSETS FOR TOTAL
CRANKCASE AND EVAPORATIVE HC EMISSIONS*
FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES
AT VARIOUS MILEAGE INTERVALS

Fuel RVP	Model Years	Tampering Offset (Grams/Mile)**						
		0K	25K	50K	75K	100K	125K	150K
9.0	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1979	0.0	0.01	0.03	0.04	0.05	0.07	0.08
	1980-1983	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1984+	0.0	0.11	0.29	0.47	0.66	0.84	1.02
11.5	Pre-1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	1967-1979	0.0	0.01	0.03	0.04	0.05	0.07	0.08
	1980-1983	0.0	0.01	0.02	0.04	0.05	0.06	0.08
	1984+	0.0	0.16	0.43	0.69	0.96	1.22	1.49

* Based on calculated hot soak temperature of 82.0F,
Diurnal temperature rise from 60.0 to 84.0F,
Fuel RVPs of 9.0 and 11.5 psi with no weathering, tank level of 40.0%.

** Based on averages of 6.88 trips per day and 33.97 miles per day.

DATE : MAY 19, 1989

TABLE 2.4.2C

NONTAMPERED
RUNNING LOSS EMISSIONS
FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Pre-1985	7.0	0.36	0.52	1.13	2.16
	9.0	0.58	1.50	2.62	4.81
	10.4	1.06	2.70	4.00	5.63
	11.7	2.88	3.85	8.20	13.64
1985+	7.0	0.24	0.42	0.97	1.39
	9.0	0.39	1.20	2.21	2.88
	10.4	0.68	1.70	2.38	3.23
	11.7	1.72	2.30	4.79	7.90

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TABLE 2.4.2D

REFUELING EMISSIONS* FOR
HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Fuel Economy (miles/gal)	Uncontrolled (grams/mile)	With Volatility Control** (grams/mile)	With Onboard** (grams/mile)	With both Volatility and Onboard** (grams/mile)
Pre-1971	6.4	0.89	0.89	0.89	0.89
1971	6.1	0.95	0.95	0.95	0.95
1972	5.7	1.01	1.01	1.01	1.01
1973	6.1	0.95	0.95	0.95	0.95
1974	6.5	0.89	0.89	0.89	0.89
1975	6.9	0.83	0.83	0.83	0.83
1976	6.8	0.85	0.85	0.85	0.85
1977	7.2	0.81	0.81	0.81	0.81
1978	7.7	0.75	0.75	0.75	0.75
1979	8.1	0.71	0.71	0.71	0.71
1980	8.8	0.66	0.66	0.66	0.66
1981	9.1	0.63	0.63	0.63	0.63
1982	9.4	0.61	0.61	0.61	0.61
1983	9.9	0.58	0.58	0.58	0.58
1984-1985	10.0	0.58	0.58	0.58	0.58
1986	10.0	0.58	0.58	0.58	0.58
1987	10.1	0.57	0.57	0.57	0.57
1988	10.1	0.57	0.57	0.57	0.57
1989	10.2	0.57	0.57	0.57	0.57
1990	10.3	0.56	0.56	0.56	0.56
1991	10.3	0.56	0.56	0.56	0.56
1992	10.4	0.55	0.44	0.55	0.05
1993	10.6	0.54	0.43	0.06	0.05
1994	10.7	0.54	0.43	0.06	0.05
1995	10.8	0.53	0.42	0.06	0.05
1996	10.9	0.53	0.42	0.06	0.05
1997	10.9	0.53	0.42	0.06	0.05
1998	10.9	0.53	0.42	0.06	0.05
1999	11.0	0.52	0.42	0.06	0.05
2000+	11.1	0.52	0.41	0.06	0.05

* Refueling Emissions (g/mi) = [Displacement (g/gal) + Spillage (g/gal)] / Fuel Economy (mi/gal).

** Volatility control assumed to start in 1992, with 7.0/7.8/9.0 RVP fuels for ASTM class A/B/C cities. Onboard assumed to start in 1993, and apply to LDGVs, LDGTs, and HDGVs.

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TABLE 2.4.3

HOT STABILIZED IDLE EMISSIONS FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Pol	Model Years	Emission Rate (Grams/Hour) Nontampered Zero Mile	Nontampered 50,000 Mile	Nontampered 100,000 Mile	In-use Level* 50,000 Mile	In-use Level* 100,000 Mile
HC	Pre-1970	169.80	181.80	193.80	182.63	194.95
	1970-1973	52.20	64.20	76.20	65.03	77.35
	1974-1978	52.20	58.20	64.20	59.03	65.35
	1979-1983	26.40	29.40	32.40	30.23	33.55
	1984	9.70	27.19	42.53	28.02	43.69
	1985	5.00	12.88	20.52	13.71	21.67
	1986	5.75	13.53	21.13	14.36	22.29
	1987-1990	7.71	15.52	23.13	16.35	24.28
	1991+	7.42	15.23	22.85	16.07	24.00
CO	Pre-1970	1545.00	1704.00	1863.00	1706.27	1866.09
	1970-1973	408.00	492.00	576.00	494.27	579.09
	1974-1978	408.00	489.00	570.00	491.27	573.09
	1979-1983	425.40	509.40	593.40	511.67	596.49
	1984	292.33	451.12	593.24	453.40	596.33
	1985	59.72	135.01	205.49	137.28	208.58
	1986	75.38	149.15	218.52	151.43	221.62
	1987-1989	127.78	194.29	260.46	196.57	263.55
	1990	127.22	193.71	259.86	195.98	262.95
	1991+	124.89	191.16	257.21	193.44	260.30
NOx	Pre-1970	3.00	3.00	3.00	3.00	3.00
	1970-1983	1.80	1.80	1.80	1.80	1.80
	1984-1985	7.11	7.11	7.11	7.11	7.11
	1986+	2.35	2.35	2.35	2.35	2.35

* In-use emission level includes tampering.

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TABLE 2.4.4

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per vehicle*)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.065	18211.	0.0	0.	0.
2	0.131	16767.	0.131	18211.	9105.
3	0.113	15437.	0.113	16767.	26595.
4	0.097	14213.	0.097	15437.	42696.
5	0.084	13086.	0.084	14213.	57522.
6	0.072	12048.	0.072	13086.	71171.
7	0.062	11093.	0.062	12048.	83738.
8	0.054	10213.	0.054	11093.	95308.
9	0.046	9403.	0.046	10213.	105961.
10	0.040	8657.	0.040	9403.	115769.
11	0.034	7971.	0.034	8657.	124799.
12	0.030	7339.	0.030	7971.	133113.
13	0.026	6757.	0.026	7339.	140768.
14	0.022	6221.	0.022	6757.	147816.
15	0.019	5728.	0.019	6221.	154305.
16	0.016	5273.	0.016	5728.	160279.
17	0.014	4855.	0.014	5273.	165780.
18	0.012	4470.	0.012	4855.	170844.
19	0.010	4116.	0.010	4470.	175506.
20+	0.052	3789.	0.052	4116.	179799.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1,
where: JMAR(1) = 0 and,
JMAR(MYI) = MAR(MYI-1), MYI = 2,...,20+.

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TABLE 2.4.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES
JANUARY 1, 1988

Model Years	(A) HDGV Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) HDGV Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.0	1.000	0.0	0.0	0.	0.0	0.0
1987	0.131	1.000	0.131	0.140	18211.	2554.2	0.206
1986	0.113	1.000	0.113	0.121	16767.	2028.6	0.164
1985	0.097	1.000	0.097	0.104	15437.	1603.2	0.129
1984	0.084	1.000	0.084	0.090	14213.	1278.3	0.103
1983	0.072	1.000	0.072	0.077	13086.	1008.8	0.081
1982	0.062	1.000	0.062	0.066	12048.	799.8	0.065
1981	0.054	1.000	0.054	0.058	11093.	641.4	0.052
1980	0.046	1.000	0.046	0.049	10213.	503.0	0.041
1979	0.040	1.000	0.040	0.043	9403.	402.7	0.032
1978	0.034	1.000	0.034	0.036	8657.	315.1	0.025
1977	0.030	1.000	0.030	0.032	7971.	256.0	0.021
1976	0.026	1.000	0.026	0.028	7339.	204.3	0.016
1975	0.022	1.000	0.022	0.024	6757.	159.2	0.013
1974	0.019	1.000	0.019	0.020	6221.	126.6	0.010
1973	0.016	1.000	0.016	0.017	5728.	98.1	0.008
1972	0.014	1.000	0.014	0.015	5273.	79.0	0.006
1971	0.012	1.000	0.012	0.013	4855.	62.4	0.005
1970	0.010	1.000	0.010	0.011	4470.	47.9	0.004
1969-	0.052	1.000	0.052	0.056	4116.	229.2	0.018
		DAF:	0.935		TFNORM:	12397.5	

WHERE :

A = January 1 registration mix from Table 2.4.4,
B = Gasoline fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 2.4.4.

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TABLE 2.4.6

SPEED CORRECTION FACTOR COEFFICIENTS FOR
HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

* SCF(s) = EXP(A + B*s + C*s**2), HC & CO
= A + B*s + C*s**2, NOx

Pol	Model Years	Coefficients A	B	C
HC	All	1.60800	-0.09700	0.00083
CO	All	1.52000	-0.09800	0.00110
NOx	All	0.82400	0.00880	0.0

* WHERE: s = average speed (mph).

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TABLE 2.4.7A

LOW (< 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

* TCF = EXP [TC*(T - 75.0)]

Pollutant	Model Years	TC
HC	Pre-1970	-0.58903E-02
	1970-1973	-0.73870E-02
	1974-1978	-0.49759E-02
	1979-1983	-0.28549E-02
	1984	-0.74107E-02
	1985+	-0.92859E-02
CO	Pre-1970	-0.20576E-02
	1970-1973	-0.45541E-02
	1974-1978	-0.42899E-02
	1979-1983	-0.13085E-02
	1984	-0.77117E-02
	1985+	-0.60195E-02
NOx	Pre-1970	-0.64315E-02
	1970-1973	-0.55456E-02
	1974-1978	-0.13969E-02
	1979-1983	-0.46352E-03
	1984	-0.57524E-02
	1985+	-0.19733E-02

* WHERE :

TCF = Low temperature correction factor for appropriate pollutant, ambient temperature (< 75F), and model year,
T = Ambient temperature (Fahrenheit),
TC = Low temperature correction factor coefficient for appropriate pollutant, and model year.

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TABLE 2.4.7B

HIGH (> 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
AND FUEL RVP CORRECTION FACTORS
FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

* TCF = EXP [TC*(T - 75.0)], Pre-1985
TRCF = EXP [RC*(RVP - 9.0) + TC*(T - 75.0)
+ TRC*(RVP - 9.0)*(T - 75.0)], 1985+

Pol	Model Years	Parameter	Coefficient
HC	Pre-1970	TC	0.13458E-02
	1970-1973		0.52317E-02
	1974-1978		0.54651E-02
	1979-1983		0.10082E-01
	1984		0.20546E-01
	1985+	RC	0.42060E-01
		TC	0.48358E-02
		TRC	0.0
CO	Pre-1970	TC	0.81720E-02
	1970-1973		0.20268E-01
	1974-1978		0.24127E-01
	1979-1983		0.22061E-01
	1984		0.27019E-01
	1985+	RC	0.13968E+00
		TC	0.14943E-01
		TRC	0.0
NOx	Pre-1970	TC	-0.83986E-02
	1970-1973		-0.86880E-02
	1974-1978		-0.18079E-01
	1979-1983		-0.74889E-02
	1984		-0.21593E-01
	1985+	RC	-0.40024E-01
		TC	0.0
		TRC	0.0

* WHERE :

TCF = High temperature correction factor for appropriate pollutant, ambient temperature, and model year.
T = Ambient temperature (Fahrenheit).
TC = High temperature correction factor coefficient for appropriate pollutant, temperature, and model year.
TRCF = High temperature and fuel RVP correction factor for appropriate pollutant, ambient temperature, fuel RVP, and model year.
RC = Fuel RVP correction factor coefficient for appropriate pollutant, fuel RVP, and model year.
RVP = Fuel volatility in psi.
TRC = Combined temperature and fuel RVP correction factor coefficient for appropriate pollutant, ambient temperature, fuel RVP, and model year.

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TABLE 2.4.9A

TAMPERING AND MISFUELING RATES
FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Area	Model Years	System	Zero Mile Level	Det. Rate 1	Det. Rate 2	50,000 Mile Level	100,000 Mile Level
Non-I/M	All	Air Pump Disablement	0.2155	0.02630	0.02630	0.347	0.478
		Catalyst Removal	0.2267	0.02260	0.02260	0.340	0.453
		EGR System Disabled	0.1037	0.02175	0.02175	0.212	0.321
		Filler Neck Damaged	0.1462	0.03684	0.03684	0.330	0.515
		Fuel Tank Misfueled	-0.0375	0.00857	0.00857	0.005	0.048
		Total Misfueled	0.1087	0.04541	0.04541	0.336	0.563
		PCV System Disabled	-0.0022	0.00419	0.00419	0.019	0.040
		Cannister Disconnect	-0.0185	0.01801	0.01801	0.072	0.162
		Both Cannister & Cap	-0.0121	0.01832	0.01832	0.079	0.171
With I/M	All	Air Pump Disablement	0.2015	0.01561	0.01561	0.280	0.358
		Catalyst Removal	-0.0081	0.03342	0.03342	0.159	0.326
		EGR System Disabled	0.0880	0.01078	0.01078	0.142	0.196
		Filler Neck Damaged	0.0437	0.02806	0.02806	0.184	0.324
		Fuel Tank Misfueled	-0.0705	0.01076	0.01076	0.0	0.037
		Total Misfueled	-0.0268	0.03882	0.03882	0.167	0.361
		PCV System Disabled	-0.0068	0.00315	0.00315	0.009	0.025
		Cannister Disconnect	-0.0186	0.01349	0.01349	0.049	0.116
		Both Cannister & Cap	-0.0213	0.01484	0.01484	0.053	0.127

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TABLE 2.4.9B

EXCESS EMISSIONS
DUE TO TAMPERING AND/OR MISFUELING
FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Type of Tampering	Emission Control System	Pollutant	Excess Emissions (g/mi) FTP	Bag 1	Bag 2	Bag 3	Idle (g/hr)
Air Pump Disablement	Oxidation	HC	1.37	1.80	1.37	1.04	27.38
		CO	30.61	34.67	33.90	21.28	506.08
	3way/Oxidation 3way	HC	0.85	1.36	0.76	0.61	
		Pre-1985					8.97
		1985+					11.71
		CO	21.02	31.80	18.21	18.25	
		Pre-1985					177.43
		1985+					215.29
Catalyst Removal	Oxidation	HC	3.05	2.31	3.40	2.95	42.83
		CO	28.01	41.40	28.97	16.06	124.82
	3way/Oxidation 3way	HC	2.04	1.80	2.25	1.81	42.83
		CO	13.74	16.32	14.11	11.07	124.82
		NOx	1.52	1.49	1.36	1.83	2.31
.otal Misfueled	Oxidation	HC	2.47	2.30	2.57	2.40	9.70
		CO	20.96	46.50	13.13	16.62	14.18
	3way/Oxidation 3way	HC	1.44	1.42	1.56	1.21	9.70
		CO	6.57	8.08	6.60	5.37	14.18
		NOx	0.57	0.64	0.45	0.74	0.13
EGR System Disabled		NOx					
		Pre-1990	1.21	1.40	0.96	1.54	
		1990+	3.31	3.82	2.63	4.21	
EGR System Disabled	and Catalyst Removal	NOx	3.39	3.02	3.46	3.55	
EGR System Disabled	and Total Misfueled	NOx	1.99	2.12	1.85	2.16	

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TABLE 2.4.9C

EXCESS CRANKCASE EMISSIONS
AND UNCONTROLLED
EVAPORATIVE HYDROCARBON EMISSIONS*
FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Excess Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
PCV System Disabled					
1964-1980	1.34				
1981+	1.29				
Cannister Disconnect					
Pre-1985		23.50	68.06	35.96	150.33
1985+		19.07	36.28	30.30	80.12
Missing Fuel Cap					
Pre-1985		23.50	68.06	35.96	150.33
1985+		19.07	36.28	30.30	80.12

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

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TABLE 2.4.9D

UNCONTROLLED
RUNNING LOSS EMISSIONS*
FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Fuel RVP (psi)	Emission Rate (Grams/Mile) 80.0F	87.0F	95.0F	105.0F
Cannister Disconnect				
7.0	0.33	0.42	0.90	1.85
9.0	0.52	1.30	2.04	4.29
10.4	0.95	2.36	3.52	4.97
11.7	2.54	3.37	7.19	11.97
Missing Fuel Cap				
7.0	0.60	0.84	1.28	2.44
9.0	1.23	1.85	3.31	15.58
10.4	2.09	3.43	15.30	28.51
11.7	3.62	17.28	44.93	44.93

* Uncontrolled emissions applicable to 1985+ model year vehicles.

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TABLE 2.4.10A

METHANE OFFSETS*
FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Methane Offsets (Grams/Mile)
Pre-1979	0.910
1979-1986	0.600
1987+	0.350

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

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TABLE 2.4.10B

CONVERSION FACTORS
FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Conversion Factors*
Pre-1962	1.548
1962	1.536
1963	1.536
1964	1.527
1965	1.516
1966	1.518
1967	1.497
1968	1.479
1969	1.449
1970	1.449
1971	1.437
1972	1.419
1973	1.422
1974	1.313
1975	1.244
1976	1.073
1977	1.057
1978	1.022
1979	0.961
1980	0.935
1981	0.912
1982	0.884
1983	0.907
1984	0.896
1985	0.894
1986	0.897
1987	0.895
1988	0.894
1989	0.893
1990	0.893
1991	0.892
1992	0.891
1993	0.890
1994	0.889
1995	0.887
1996	0.886
1997+	0.885

* Convert from grams/brake-hoursepower/hour to grams/mile units.

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TABLE 2.4.10C

PERCENT TECHNOLOGY DISTRIBUTIONS
(EXHAUST AND EVAPORATIVE EMISSION SYSTEMS)
FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES

Model Years	Air Pump Only	Oxidation Catalyst	3Way Catalyst	EGR System	Air Pump & Oxidation or 3Way Catalyst	EGR System & 3Way Catalyst
Pre-1982	0.0	0.0	0.0	0.0	0.0	0.0
1982-1984	0.0	5.0	0.0	0.0	0.0	0.0
1985	0.0	5.0	0.0	95.0	0.0	0.0
1986	0.0	5.0	0.0	100.0	0.0	0.0
1987	7.0	15.0	15.0	100.0	30.0	15.0
1988-1989	7.0	25.0	15.0	100.0	30.0	15.0
1990+	7.0	30.0	25.0	100.0	30.0	25.0

Model Years	Evaporative Canister	PCV System
Pre-1968	0.0	0.0
1968-1984	0.0	100.0
1985+	100.0	100.0

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TABLE 2.4.11A

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BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	46.9	1967	46.9	1968	39.5	1969	39.5	1970	27.0	1971	27.0	1972	27.1	1973	27.0	1974	24.5	1975	23.1	1976	22.1	1977	19.9
1967	46.7	1968	39.4	1969	39.4	1970	26.8	1971	26.8	1972	26.9	1973	26.9	1974	24.4	1975	23.0	1976	22.0	1977	19.8	1978	19.8
1968	39.2	1969	39.2	1970	26.6	1971	26.6	1972	26.6	1973	26.7	1974	24.4	1975	23.0	1976	21.9	1977	19.7	1978	19.7	1979	14.7
1969	39.0	1970	26.4	1971	26.4	1972	26.4	1973	26.4	1974	24.2	1975	22.9	1976	21.9	1977	19.7	1978	19.6	1979	14.7	1980	14.2
1970	26.2	1971	26.2	1972	26.2	1973	26.2	1974	24.0	1975	22.7	1976	21.8	1977	19.6	1978	19.6	1979	14.6	1980	14.1	1981	13.7
1971	26.0	1972	26.0	1973	26.0	1974	23.8	1975	22.5	1976	21.6	1977	19.6	1978	19.5	1979	14.5	1980	14.0	1981	13.6	1982	13.6
1972	25.7	1973	25.7	1974	23.7	1975	22.4	1976	21.4	1977	19.4	1978	19.5	1979	14.4	1980	13.9	1981	13.5	1982	13.5	1983	13.5
1973	25.5	1974	23.5	1975	22.2	1976	21.3	1977	19.2	1978	19.3	1979	14.4	1980	13.9	1981	13.4	1982	13.4	1983	13.4	1984	13.3
1974	23.3	1975	22.0	1976	21.1	1977	19.1	1978	19.1	1979	14.2	1980	13.8	1981	13.4	1982	13.3	1983	13.2	1984	13.3	1985	5.7
1975	21.8	1976	20.9	1977	18.9	1978	18.9	1979	14.0	1980	13.6	1981	13.3	1982	13.2	1983	13.2	1984	13.1	1985	5.7	1986	5.2
1976	20.7	1977	18.7	1978	18.7	1979	13.8	1980	13.4	1981	13.1	1982	13.1	1983	13.1	1984	13.0	1985	5.6	1986	5.2	1987	4.3
1977	18.6	1978	18.6	1979	13.6	1980	13.2	1981	12.9	1982	12.9	1983	13.0	1984	12.9	1985	5.6	1986	5.2	1987	4.3	1988	4.2
1978	18.4	1979	13.4	1980	13.0	1981	12.7	1982	12.7	1983	12.8	1984	12.8	1985	5.6	1986	5.2	1987	4.2	1988	4.2	1989	4.1
1979	13.2	1980	12.9	1981	12.5	1982	12.5	1983	12.5	1984	12.6	1985	5.6	1986	5.2	1987	4.1	1988	4.1	1989	4.1	1990	4.0
1980	12.6	1981	12.3	1982	12.3	1983	12.3	1984	12.3	1985	5.5	1986	5.2	1987	4.1	1988	4.0	1989	3.9	1990	4.0	1991	3.9
1981	12.1	1982	12.1	1983	12.1	1984	12.1	1985	5.4	1986	5.0	1987	4.0	1988	3.9	1989	3.9	1990	3.8	1991	3.8	1992	3.8
1982	11.9	1983	11.9	1984	11.9	1985	5.3	1986	4.9	1987	3.8	1988	3.9	1989	3.8	1990	3.7	1991	3.7	1992	3.7	1993	3.7
1983	11.6	1984	11.6	1985	5.2	1986	4.8	1987	3.6	1988	3.7	1989	3.7	1990	3.6	1991	3.6	1992	3.5	1993	3.5	1994	3.5
1984	11.3	1985	5.1	1986	4.7	1987	3.4	1988	3.4	1989	3.5	1990	3.6	1991	3.5	1992	3.4	1993	3.4	1994	3.4	1995	3.4
1985	5.1	1986	4.7	1987	3.4	1988	3.4	1989	3.4	1990	3.4	1991	3.5	1992	3.4	1993	3.4	1994	3.3	1995	3.3	1996	3.3

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	19.8	1979	14.8	1980	14.3	1981	13.8	1984	13.7	1986	5.3	1989	4.7	1991	4.6	1993	4.6	1996	4.6	1999	4.6	2001	4.6
1979	14.7	1980	14.2	1981	13.8	1982	13.7	1985	5.6	1987	4.6	1990	4.6	1992	4.6	1994	4.6	1997	4.6	2000	4.6	2002	4.6
1980	14.2	1981	13.7	1982	13.7	1983	13.7	1986	5.2	1988	4.6	1991	4.6	1993	4.6	1995	4.5	1998	4.5	2001	4.5	2003	4.5
1981	13.7	1982	13.7	1983	13.6	1984	13.6	1987	4.5	1989	4.5	1992	4.5	1994	4.5	1996	4.5	1999	4.5	2002	4.5	2004	4.5
1982	13.6	1983	13.6	1984	13.5	1985	5.6	1988	4.5	1990	4.5	1993	4.5	1995	4.5	1997	4.4	2000	4.4	2003	4.4	2005	4.4
1983	13.5	1984	13.5	1985	5.6	1986	5.2	1989	4.4	1991	4.4	1994	4.4	1996	4.4	1998	4.4	2001	4.4	2004	4.4	2006	4.4
1984	13.4	1985	5.6	1986	5.2	1987	4.4	1990	4.4	1992	4.4	1995	4.4	1997	4.4	1999	4.3	2002	4.3	2005	4.3	2007	4.3
1985	5.6	1986	5.2	1987	4.4	1988	4.4	1991	4.3	1993	4.3	1996	4.3	1998	4.3	2000	4.3	2003	4.3	2006	4.2	2008	4.2
1986	5.2	1987	4.4	1988	4.3	1989	4.3	1992	4.2	1994	4.2	1997	4.2	1999	4.2	2001	4.2	2004	4.2	2007	4.2	2009	4.2
1987	4.3	1988	4.3	1989	4.3	1990	4.2	1993	4.2	1995	4.2	1998	4.2	2000	4.1	2002	4.1	2005	4.1	2008	4.1	2010	4.1
1988	4.3	1989	4.2	1990	4.2	1991	4.1	1994	4.1	1996	4.1	1999	4.1	2001	4.1	2003	4.0	2006	4.0	2009	4.0	2011	4.0
1989	4.2	1990	4.1	1991	4.1	1992	4.1	1995	4.0	1997	4.0	2000	4.0	2002	4.0	2004	4.0	2007	3.9	2010	3.9	2012	3.9
1990	4.1	1991	4.0	1992	4.0	1993	4.0	1996	3.9	1998	3.9	2001	3.9	2003	3.9	2005	3.9	2008	3.8	2011	3.8	2013	3.8
1991	4.0	1992	3.9	1993	3.9	1994	3.9	1997	3.8	1999	3.8	2002	3.8	2004	3.8	2006	3.8	2009	3.7	2012	3.7	2014	3.7
1992	3.8	1993	3.8	1994	3.8	1995	3.7	1998	3.7	2000	3.7	2003	3.7	2005	3.7	2007	3.6	2010	3.6	2013	3.6	2015	3.6
1993	3.7	1994	3.7	1995	3.6	1996	3.6	1999	3.6	2001	3.5	2004	3.5	2006	3.5	2008	3.5	2011	3.5	2014	3.5	2016	3.5
1994	3.6	1995	3.6	1996	3.5	1997	3.5	2000	3.4	2002	3.4	2005	3.4	2007	3.4	2009	3.4	2012	3.4	2015	3.4	2017	3.4
1995	3.4	1996	3.4	1997	3.4	1998	3.3	2001	3.3	2003	3.3	2006	3.3	2008	3.3	2010	3.2	2013	3.2	2016	3.2	2018	3.2
1996	3.3	1997	3.3	1998	3.2	1999	3.2	2002	3.1	2004	3.1	2007	3.1	2009	3.1	2011	3.1	2014	3.1	2017	3.1	2019	3.1
1997	3.2	1998	3.2	1999	3.1	2000	3.1	2003	3.0	2005	3.0	2008	3.0	2010	3.0	2012	3.0	2015	3.0	2018	3.0	2020	3.0

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 60 TO 84F diurnal, 75F for hot soak and running loss emissions, 9.0 psi fuel RVP, 54.57% average in-use fuel tank level, including refueling emissions. Emissions are based on the January 1 mileage accumulation figures given in Table 2.4.4.

TABLE 2.4.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	523.2	1967	523.2	1968	523.2	1969	523.2	1970	424.9	1971	424.9	1972	424.9	1973	424.9	1974	414.5	1975	382.8	1976	362.5	1977	310.3
1967	520.8	1968	520.8	1969	520.8	1970	421.8	1971	421.8	1972	421.8	1973	421.8	1974	411.6	1975	380.1	1976	360.0	1977	308.2	1978	308.2
1968	518.2	1969	518.2	1970	418.5	1971	418.5	1972	418.5	1973	418.5	1974	408.5	1975	377.2	1976	357.3	1977	305.9	1978	305.9	1979	184.4
1969	515.3	1970	415.0	1971	415.0	1972	415.0	1973	415.0	1974	405.2	1975	374.1	1976	354.4	1977	303.4	1978	303.4	1979	181.9	1980	171.2
1970	411.1	1971	411.1	1972	411.1	1973	411.1	1974	401.5	1975	370.7	1976	351.2	1977	300.6	1978	300.6	1979	179.3	1980	168.7	1981	159.7
1971	406.9	1972	406.9	1973	406.9	1974	397.5	1975	367.1	1976	347.7	1977	297.6	1978	297.6	1979	176.4	1980	166.0	1981	157.2	1982	157.2
1972	402.3	1973	402.3	1974	393.2	1975	363.1	1976	343.9	1977	294.4	1978	294.4	1979	173.3	1980	163.1	1981	154.4	1982	154.4	1983	154.4
1973	397.3	1974	388.5	1975	358.7	1976	339.8	1977	290.9	1978	290.9	1979	170.0	1980	159.9	1981	151.4	1982	151.4	1983	151.4	1984	150.8
1974	383.4	1975	354.0	1976	335.3	1977	287.1	1978	287.1	1979	166.3	1980	156.4	1981	148.1	1982	148.1	1983	148.1	1984	147.6	1985	75.6
1975	348.9	1976	330.5	1977	282.9	1978	282.9	1979	162.3	1980	152.7	1981	144.6	1982	144.6	1983	144.6	1984	144.0	1985	74.9	1986	61.3
1976	325.2	1977	278.4	1978	278.4	1979	158.0	1980	148.6	1981	140.7	1982	140.7	1983	140.7	1984	140.2	1985	74.1	1986	60.5	1987	38.0
1977	273.5	1978	273.5	1979	153.3	1980	144.2	1981	136.5	1982	136.5	1983	136.5	1984	136.0	1985	73.3	1986	59.7	1987	37.4	1988	37.4
1978	268.2	1979	148.2	1980	139.4	1981	132.0	1982	132.0	1983	132.0	1984	131.5	1985	72.4	1986	58.8	1987	36.7	1988	36.7	1989	36.7
1979	142.6	1980	134.2	1981	127.0	1982	127.0	1983	127.0	1984	126.6	1985	71.4	1986	57.8	1987	36.0	1988	36.0	1989	36.0	1990	35.9
1980	128.5	1981	121.7	1982	121.7	1983	121.7	1984	121.2	1985	70.3	1986	56.7	1987	35.2	1988	35.2	1989	35.2	1990	35.1	1991	34.9
1981	115.9	1982	115.9	1983	115.9	1984	115.4	1985	69.1	1986	55.5	1987	34.3	1988	34.3	1989	34.3	1990	34.2	1991	34.1	1992	34.1
1982	109.5	1983	109.5	1984	109.1	1985	67.8	1986	54.2	1987	33.4	1988	33.4	1989	33.4	1990	33.3	1991	33.1	1992	33.1	1993	33.1
1983	102.6	1984	102.3	1985	66.4	1986	52.9	1987	32.3	1988	32.3	1989	32.3	1990	32.3	1991	32.1	1992	32.1	1993	32.1	1994	32.1
1984	94.9	1985	64.9	1986	51.4	1987	31.2	1988	31.2	1989	31.2	1990	31.1	1991	31.0	1992	31.0	1993	31.0	1994	31.0	1995	31.0
1985	64.2	1986	50.6	1987	30.6	1988	30.6	1989	30.6	1990	30.6	1991	30.4	1992	30.4	1993	30.4	1994	30.4	1995	30.4	1996	30.4

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	310.3	1979	188.7	1980	177.5	1981	168.1	1984	167.4	1986	66.0	1989	42.1	1991	41.9	1993	41.9	1996	41.9	1999	41.9	2001	41.7
1979	186.6	1980	175.6	1981	166.2	1982	166.2	1985	79.3	1987	41.9	1990	41.8	1992	41.6	1994	41.6	1997	41.6	2000	41.6	2002	41.5
1980	173.5	1981	164.2	1982	164.2	1983	164.2	1986	65.3	1988	41.6	1991	41.3	1993	41.3	1995	41.3	1998	41.3	2001	41.2	2003	41.2
1981	162.1	1982	162.1	1983	162.1	1984	161.4	1987	41.2	1989	41.2	1992	41.0	1994	41.0	1996	41.0	1999	41.0	2002	40.8	2004	40.8
1982	159.7	1983	159.7	1984	159.1	1985	77.9	1988	40.9	1990	40.8	1993	40.6	1995	40.6	1997	40.6	2000	40.6	2003	40.5	2005	40.5
1983	157.2	1984	156.6	1985	77.4	1986	63.8	1989	40.5	1991	40.3	1994	40.3	1996	40.3	1998	40.3	2001	40.1	2004	40.1	2006	40.1
1984	153.8	1985	76.9	1986	63.3	1987	40.1	1990	40.0	1992	39.8	1995	39.8	1997	39.8	1999	39.8	2002	39.7	2005	39.7	2007	39.7
1985	76.3	1986	62.7	1987	39.6	1988	39.6	1991	39.4	1993	39.4	1996	39.4	1998	39.4	2000	39.4	2003	39.2	2006	39.2	2008	39.2
1986	62.0	1987	39.1	1988	39.1	1989	39.1	1992	38.9	1994	38.9	1997	38.9	1999	38.9	2001	38.8	2004	38.8	2007	38.8	2009	38.8
1987	38.6	1988	38.6	1989	38.6	1990	38.5	1993	38.4	1995	38.4	1998	38.4	2000	38.4	2002	38.2	2005	38.2	2008	38.2	2010	38.2
1988	38.0	1989	38.0	1990	38.0	1991	37.8	1994	37.8	1996	37.8	1999	37.8	2001	37.6	2003	37.6	2006	37.6	2009	37.6	2011	37.6
1989	37.4	1990	37.3	1991	37.2	1992	37.2	1995	37.2	1997	37.2	2000	37.2	2002	37.0	2004	37.0	2007	37.0	2010	37.0	2012	37.0
1990	36.6	1991	36.5	1992	36.5	1993	36.5	1996	36.5	1998	36.5	2001	36.3	2003	36.3	2005	36.3	2008	36.3	2011	36.3	2013	36.3
1991	35.7	1992	35.7	1993	35.7	1994	35.7	1997	35.7	1999	35.7	2002	35.6	2004	35.6	2006	35.6	2009	35.6	2012	35.6	2014	35.6
1992	34.9	1993	34.9	1994	34.9	1995	34.9	1998	34.9	2000	34.9	2003	34.8	2005	34.8	2007	34.8	2010	34.8	2013	34.8	2015	34.8
1993	34.1	1994	34.1	1995	34.1	1996	34.1	1999	34.1	2001	33.9	2004	33.9	2006	33.9	2008	33.9	2011	33.9	2014	33.9	2016	33.9
1994	33.1	1995	33.1	1996	33.1	1997	33.1	2000	33.1	2002	33.0	2005	33.0	2007	33.0	2009	33.0	2012	33.0	2015	33.0	2017	33.0
1995	32.1	1996	32.1	1997	32.1	1998	32.1	2001	31.9	2003	31.9	2006	31.9	2008	31.9	2010	31.9	2013	31.9	2016	31.9	2018	31.9
1996	31.0	1997	31.0	1998	31.0	1999	31.0	2002	30.8	2004	30.8	2007	30.8	2009	30.8	2011	30.8	2014	30.8	2017	30.8	2019	30.8
1997	30.4	1998	30.4	1999	30.4	2000	30.4	2003	30.2	2005	30.2	2008	30.2	2010	30.2	2012	30.2	2015	30.2	2018	30.2	2020	30.2

*MY Indicates the model year.

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F. Emissions are based on the January 1 mileage accumulation figures given in Table 2.4.4.

TABLE 2.4.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
HEAVY DUTY GASOLINE POWERED VEHICLES
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	6.1	1967	6.1	1968	6.1	1969	6.1	1970	6.6	1971	6.6	1972	6.6	1973	6.6	1974	6.4	1975	5.8	1976	5.4	1977	4.6
1967	6.1	1968	6.1	1969	6.1	1970	6.6	1971	6.6	1972	6.6	1973	6.6	1974	6.3	1975	5.8	1976	5.4	1977	4.6	1978	4.6
1968	6.1	1969	6.1	1970	6.6	1971	6.6	1972	6.6	1973	6.6	1974	6.3	1975	5.7	1976	5.3	1977	4.6	1978	4.6	1979	5.0
1969	6.1	1970	6.6	1971	6.6	1972	6.6	1973	6.6	1974	6.2	1975	5.7	1976	5.3	1977	4.5	1978	4.5	1979	5.0	1980	4.7
1970	6.6	1971	6.6	1972	6.6	1973	6.6	1974	6.2	1975	5.7	1976	5.3	1977	4.5	1978	4.5	1979	4.9	1980	4.7	1981	4.3
1971	6.6	1972	6.6	1973	6.6	1974	6.1	1975	5.6	1976	5.2	1977	4.5	1978	4.5	1979	4.9	1980	4.7	1981	4.3	1982	4.3
1972	6.6	1973	6.6	1974	6.1	1975	5.6	1976	5.2	1977	4.4	1978	4.4	1979	4.9	1980	4.6	1981	4.3	1982	4.3	1983	4.3
1973	6.6	1974	6.0	1975	5.5	1976	5.1	1977	4.4	1978	4.4	1979	4.8	1980	4.6	1981	4.2	1982	4.2	1983	4.2	1984	4.2
1974	5.9	1975	5.4	1976	5.1	1977	4.3	1978	4.3	1979	4.8	1980	4.5	1981	4.2	1982	4.2	1983	4.2	1984	4.2	1985	3.9
1975	5.4	1976	5.0	1977	4.3	1978	4.3	1979	4.7	1980	4.5	1981	4.2	1982	4.2	1983	4.2	1984	4.1	1985	3.9	1986	3.8
1976	5.0	1977	4.2	1978	4.2	1979	4.7	1980	4.4	1981	4.1	1982	4.1	1983	4.1	1984	4.1	1985	3.8	1986	3.8	1987	3.8
1977	4.2	1978	4.2	1979	4.6	1980	4.4	1981	4.1	1982	4.1	1983	4.1	1984	4.0	1985	3.8	1986	3.8	1987	3.8	1988	3.8
1978	4.1	1979	4.5	1980	4.3	1981	4.0	1982	4.0	1983	4.0	1984	4.0	1985	3.8	1986	3.8	1987	3.8	1988	3.8	1989	3.8
1979	4.5	1980	4.2	1981	3.9	1982	3.9	1983	3.9	1984	3.9	1985	3.7	1986	3.7	1987	3.7	1988	3.7	1989	3.7	1990	3.7
1980	4.2	1981	3.9	1982	3.9	1983	3.9	1984	3.9	1985	3.7	1986	3.7	1987	3.7	1988	3.7	1989	3.7	1990	3.7	1991	3.1
1981	3.8	1982	3.8	1983	3.8	1984	3.8	1985	3.7	1986	3.6	1987	3.6	1988	3.6	1989	3.6	1990	3.6	1991	3.1	1992	3.1
1982	3.7	1983	3.7	1984	3.7	1985	3.6	1986	3.6	1987	3.6	1988	3.6	1989	3.6	1990	3.6	1991	3.0	1992	3.0	1993	3.0
1983	3.7	1984	3.7	1985	3.6	1986	3.5	1987	3.5	1988	3.5	1989	3.5	1990	3.5	1991	2.9	1992	2.9	1993	2.9	1994	2.9
1984	3.6	1985	3.5	1986	3.5	1987	3.5	1988	3.5	1989	3.5	1990	3.4	1991	2.9	1992	2.9	1993	2.9	1994	2.9	1995	2.9
1985	3.5	1986	3.5	1987	3.5	1988	3.5	1989	3.5	1990	3.4	1991	2.8	1992	2.8	1993	2.8	1994	2.8	1995	2.8	1996	2.8

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	4.6	1979	5.0	1980	4.8	1981	4.4	1984	4.4	1986	4.0	1989	4.0	1991	3.5	1993	3.5	1996	3.5	1999	3.5	2001	3.5
1979	5.0	1980	4.8	1981	4.4	1982	4.4	1985	4.0	1987	4.0	1990	4.1	1992	3.5	1994	3.5	1997	3.5	2000	3.5	2002	3.5
1980	4.8	1981	4.4	1982	4.4	1983	4.4	1986	4.0	1988	4.0	1991	3.5	1993	3.5	1995	3.5	1998	3.5	2001	3.5	2003	3.5
1981	4.4	1982	4.4	1983	4.4	1984	4.3	1987	4.0	1989	4.0	1992	3.5	1994	3.5	1996	3.5	1999	3.5	2002	3.5	2004	3.5
1982	4.3	1983	4.3	1984	4.3	1985	4.0	1988	4.0	1990	4.1	1993	3.5	1995	3.5	1997	3.5	2000	3.5	2003	3.5	2005	3.5
1983	4.3	1984	4.3	1985	3.9	1986	3.9	1989	3.9	1991	3.4	1994	3.4	1996	3.4	1998	3.4	2001	3.4	2004	3.4	2006	3.4
1984	4.3	1985	3.9	1986	3.9	1987	3.9	1990	4.0	1992	3.4	1995	3.4	1997	3.4	1999	3.4	2002	3.4	2005	3.4	2007	3.4
1985	3.9	1986	3.9	1987	3.9	1988	3.9	1991	3.4	1993	3.4	1996	3.4	1998	3.4	2000	3.4	2003	3.4	2006	3.4	2008	3.4
1986	3.9	1987	3.9	1988	3.9	1989	3.9	1992	3.4	1994	3.4	1997	3.4	1999	3.4	2001	3.3	2004	3.3	2007	3.3	2009	3.3
1987	3.8	1988	3.8	1989	3.8	1990	3.9	1993	3.3	1995	3.3	1998	3.3	2000	3.3	2002	3.3	2005	3.3	2008	3.3	2010	3.3
1988	3.8	1989	3.8	1990	3.9	1991	3.3	1994	3.3	1996	3.3	1999	3.3	2001	3.3	2003	3.3	2006	3.3	2009	3.3	2011	3.3
1989	3.8	1990	3.8	1991	3.2	1992	3.2	1995	3.2	1997	3.2	2000	3.2	2002	3.2	2004	3.2	2007	3.2	2010	3.2	2012	3.2
1990	3.8	1991	3.2	1992	3.2	1993	3.2	1996	3.2	1998	3.2	2001	3.2	2003	3.2	2005	3.2	2008	3.2	2011	3.2	2013	3.2
1991	3.2	1992	3.2	1993	3.2	1994	3.2	1997	3.2	1999	3.2	2002	3.1	2004	3.1	2006	3.1	2009	3.1	2012	3.1	2014	3.1
1992	3.1	1993	3.1	1994	3.1	1995	3.1	1998	3.1	2000	3.1	2003	3.1	2005	3.1	2007	3.1	2010	3.1	2013	3.1	2015	3.1
1993	3.1	1994	3.1	1995	3.1	1996	3.1	1999	3.1	2001	3.0	2004	3.0	2006	3.0	2008	3.0	2011	3.0	2014	3.0	2016	3.0
1994	3.0	1995	3.0	1996	3.0	1997	3.0	2000	3.0	2002	3.0	2005	3.0	2007	3.0	2009	3.0	2012	3.0	2015	3.0	2017	3.0
1995	2.9	1996	2.9	1997	2.9	1998	2.9	2001	2.9	2003	2.9	2006	2.9	2008	2.9	2010	2.9	2013	2.9	2016	2.9	2018	2.9
1996	2.9	1997	2.9	1998	2.9	1999	2.9	2002	2.8	2004	2.8	2007	2.8	2009	2.8	2011	2.8	2014	2.8	2017	2.8	2019	2.8
1997	2.8	1998	2.8	1999	2.8	2000	2.8	2003	2.8	2005	2.8	2008	2.8	2010	2.8	2012	2.8	2015	2.8	2018	2.8	2020	2.8

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F. Emissions are based on the January 1 mileage accumulation figures given in Table 2.4.4.

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TABLE 2.5.1

NONTAMPERED EXHAUST EMISSION RATES FOR
HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1975	3.010	0.080	3.410	3.810
	1975-1976	0.970	0.070	1.320	1.670
	1977	0.970	0.070	1.320	1.670
	1978	0.970	0.070	1.320	1.670
	1979	0.970	0.070	1.320	1.670
	1980-1981	0.670	0.030	0.820	0.970
	1982-1983	0.400	0.030	0.550	0.700
	1984+	0.290	0.030	0.440	0.590
CO	Pre-1975	4.740	0.130	5.390	6.040
	1975-1976	2.050	0.090	2.500	2.950
	1977	2.050	0.090	2.500	2.950
	1978	2.050	0.090	2.500	2.950
	1979	2.050	0.090	2.500	2.950
	1980-1981	2.010	0.040	2.210	2.410
	1982-1983	2.010	0.040	2.210	2.410
	1984+	1.150	0.040	1.350	1.550
NOx	Pre-1975	1.460	0.040	1.660	1.860
	1975-1976	1.400	0.040	1.600	1.800
	1977	1.400	0.040	1.600	1.800
	1978	1.400	0.040	1.600	1.800
	1979	1.400	0.040	1.600	1.800
	1980	1.400	0.040	1.600	1.800
	1981-1984	1.310	0.030	1.460	1.610
	1985+	0.870	0.030	1.020	1.170

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile,
ZML = Zero mile level in grams/mile,
DR = Deterioration rate in grams/mile/10K miles,
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 2.5.3

NONTAMPERED HOT STABILIZED IDLE EMISSIONS
FOR HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

* IER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate
HC	Pre-1975	19.20	0.60
	1975-1976	4.20	0.0
	1977	5.40	0.0
	1978	8.40	0.0
	1979	7.20	0.0
	1980-1981	4.20	0.0
	1982-1983	2.40	0.0
	1984+	1.80	0.0
CO	Pre-1975	24.00	0.60
	1975-1976	15.00	0.60
	1977	16.80	0.60
	1978	18.00	0.60
	1979	19.20	0.60
	1980-1983	15.60	0.60
	1984+	9.00	0.60
NOx	Pre-1975	7.80	0.0
	1975-1976	13.20	0.0
	1977	10.20	0.60
	1978	7.80	0.60
	1979	10.80	0.60
	1980	11.40	0.60
	1981-1984	8.40	0.60
	1985+	5.40	0.60

* WHERE : IER = Nontampered idle emissions in grams/hour,
ZML = Zero mile level in grams/hour
DR = Deterioration rate in grams/hour/10K miles,
M = Cumulative mileage / 10,000 miles.

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TABLE 2.5.4A

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per vehicle*)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.062	17825.	0.021	17825.	2228.
2	0.082	16478.	0.082	17488.	13327.
3	0.079	15233.	0.079	16167.	30145.
4	0.075	14081.	0.075	14945.	45692.
5	0.071	13017.	0.071	13815.	60063.
6	0.067	12033.	0.067	12771.	73349.
7	0.063	11124.	0.063	11806.	85630.
8	0.060	10283.	0.060	10914.	96984.
9	0.056	9506.	0.056	10089.	107479.
10	0.052	8788.	0.052	9326.	117181.
11	0.048	8123.	0.048	8622.	126150.
12	0.045	7509.	0.045	7969.	134440.
13	0.041	6942.	0.041	7367.	142104.
14	0.037	6417.	0.037	6811.	149189.
15	0.033	5932.	0.033	6296.	155739.
16	0.029	5484.	0.029	5820.	161793.
17	0.026	5069.	0.026	5380.	167390.
18	0.022	4686.	0.022	4973.	172564.
19	0.018	4332.	0.018	4597.	177346.
20+	0.034	4005.	0.034	4250.	181768.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1, where: JMAR(1) = MAR(1) and,
JMAR(MYI) = .25*MAR(MYI) + .75*MAR(MYI-1), MYI = 2,....,20+.

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TABLE 2.5.4B

DIESEL SALES FRACTION FOR
HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

Model Years	Diesel Sales Fraction
Pre-1971	0.0
1971	0.001
1972-1973	0.002
1974-1977	0.003
1978	0.009
1979	0.026
1980	0.045
1981	0.060
1982	0.039
1983	0.014
1984	0.012
1985	0.009
1986	0.004
1987	0.004
1988	0.010
1989	0.016
1990	0.021
1991	0.027
1992	0.033
1993	0.039
1994	0.045
1995+	0.050

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TABLE 2.5.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES
JANUARY 1, 1988

Model Years	(A) LDV Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) LDDV Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.021	0.010	0.000	0.014	17825.	258.0	0.023
1987	0.082	0.004	0.000	0.023	17488.	401.8	0.035
1986	0.079	0.004	0.000	0.022	16167.	357.8	0.031
1985	0.075	0.009	0.001	0.047	14945.	706.6	0.062
1984	0.071	0.012	0.001	0.060	13815.	824.4	0.072
1983	0.067	0.014	0.001	0.066	12771.	839.1	0.074
1982	0.063	0.039	0.002	0.172	11806.	2031.8	0.178
1981	0.060	0.060	0.004	0.252	10914.	2752.0	0.242
1980	0.056	0.045	0.003	0.177	10089.	1780.8	0.156
1979	0.052	0.026	0.001	0.095	9326.	883.2	0.078
1978	0.048	0.009	0.000	0.030	8622.	260.9	0.023
1977	0.045	0.003	0.000	0.009	7969.	75.4	0.007
1976	0.041	0.003	0.000	0.009	7367.	63.5	0.006
1975	0.037	0.003	0.000	0.008	6811.	53.0	0.005
1974	0.033	0.003	0.000	0.007	6296.	43.7	0.004
1973	0.029	0.002	0.000	0.004	5820.	23.6	0.002
1972	0.026	0.002	0.000	0.004	5380.	19.6	0.002
1971	0.022	0.001	0.000	0.002	4973.	7.7	0.001
1970	0.018	0.0	0.0	0.0	4597.	0.0	0.0
1969-	0.034	0.0	0.0	0.0	4250.	0.0	0.0
		DAF:	0.014		TFNORM:	11382.8	

WHERE :

A = January 1 registration mix from Table 2.5.4A,
B = Diesel fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 2.5.4A.

NOTE : In general, the travel weighting fractions will change for every calendar year since the sales fraction (column B) changes for almost every model year.

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TABLE 2.5.6

SPEED CORRECTION FACTOR COEFFICIENTS FOR
HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = EXP(A + B*s + C*s**2)

Pol	Model Years	Coefficients A	B	C
HC	All	0.90900	-0.05500	0.00044
CO	All	1.37520	-0.08800	0.00091
NOx	All	0.66800	-0.04800	0.00071

* WHERE :

s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16].

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TABLE 2.5.7

NORMALIZED BAG FRACTIONS FOR HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

		Normalized Fractions							
	Model	Test Segment 1		Test Segment 2		Test Segment 3		Total Test	
Pol	Years	B1	D1	B2	D2	B3	D3	BO	DO
HC	Pre-1975	1.2090	0.0710	1.0730	0.0560	0.7030	0.0640	1.0000	0.0613
	1975-1976	1.2090	0.1050	1.0730	0.0840	0.7030	0.0880	1.0000	0.0894
	1977	1.2090	0.1050	1.0730	0.0840	0.7030	0.0880	1.0000	0.0894
	1978	1.2090	0.1050	1.0730	0.0840	0.7030	0.0880	1.0000	0.0894
	1979	1.2090	0.1050	1.0730	0.0840	0.7030	0.0880	1.0000	0.0894
	1980+	1.3490	0.1030	0.9690	0.1380	0.7960	0.1030	1.0000	0.1212
CO	Pre-1975	1.1990	0.0600	0.9350	0.0420	0.9740	0.0510	1.0000	0.0482
	1975-1976	1.1990	0.0670	0.9350	0.0480	0.9740	0.0570	1.0000	0.0544
	1977	1.1990	0.0670	0.9350	0.0480	0.9740	0.0570	1.0000	0.0544
	1978	1.1990	0.0670	0.9350	0.0480	0.9740	0.0570	1.0000	0.0544
	1979	1.1990	0.0670	0.9350	0.0480	0.9740	0.0570	1.0000	0.0544
	1980+	1.1500	0.0610	0.9940	0.0260	0.8990	0.0350	1.0000	0.0357
NOx	Pre-1975	1.0680	0.0260	0.9810	0.0290	0.9850	0.0260	1.0000	0.0276
	1975-1976	1.0680	0.0310	0.9810	0.0330	0.9850	0.0300	1.0000	0.0318
	1977	1.0680	0.0310	0.9810	0.0330	0.9850	0.0300	1.0000	0.0318
	1978	1.0680	0.0310	0.9810	0.0330	0.9850	0.0300	1.0000	0.0318
	1979	1.0680	0.0310	0.9810	0.0330	0.9850	0.0300	1.0000	0.0318
	1980	0.9690	0.0310	1.0620	0.0470	0.9060	0.0310	1.0000	0.0393
	1981-1982	0.9690	0.0310	1.0620	0.0470	0.9060	0.0310	1.0000	0.0393
	1983+	0.9690	0.0310	1.0620	0.0470	0.9060	0.0310	1.0000	0.0393

NOTE : The fractions given in this table are used in the calculation of the operating-mode/temperature correction factor (OMTCF).

WHERE :

OMTCF = [(TERM1 + TERM2 + TERM3)/DENOM],
TERM1 = W *TCF(1)*(B1+D1*M),
TERM2 = (1-W-X)*TCF(2)*(B2+D2*M),
TERM3 = X *TCF(3)*(B3+D3*M),
DENOM = BO + DO*M,
W = Fraction of VMT in the cold start mode,
X = Fraction of VMT in the hot start mode,
TCF(b) = Temperature correction factor for pollutant, model year, for test segment b,
M = Cumulative mileage / 10,000 miles.

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TABLE 2.5.10A

METHANE OFFSETS*
FOR HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES

Model Years	Methane Offsets (Grams/Mile)
Pre-1975	0.099
1975-1979	0.025
1980+	0.025

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

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TABLE 2.5.11A

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BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	4.5	1967	4.5	1968	4.5	1969	4.5	1970	4.5	1971	4.5	1972	4.5	1973	4.5	1974	4.5	1975	2.2	1976	2.2	1977	2.2
1967	4.4	1968	4.4	1969	4.4	1970	4.4	1971	4.4	1972	4.4	1973	4.4	1974	4.4	1975	2.2	1976	2.2	1977	2.2	1978	2.2
1968	4.4	1969	4.4	1970	4.4	1971	4.4	1972	4.4	1973	4.4	1974	4.4	1975	2.2	1976	2.2	1977	2.2	1978	2.2	1979	2.2
1969	4.3	1970	4.3	1971	4.3	1972	4.3	1973	4.3	1974	4.3	1975	2.1	1976	2.1	1977	2.1	1978	2.1	1979	2.1	1980	1.2
1970	4.3	1971	4.3	1972	4.3	1973	4.3	1974	4.3	1975	2.1	1976	2.1	1977	2.1	1978	2.1	1979	2.1	1980	1.2	1981	1.2
1971	4.3	1972	4.3	1973	4.3	1974	4.3	1975	2.1	1976	2.1	1977	2.1	1978	2.1	1979	2.1	1980	1.1	1981	1.1	1982	0.9
1972	4.2	1973	4.2	1974	4.2	1975	2.0	1976	2.0	1977	2.0	1978	2.0	1979	2.0	1980	1.1	1981	1.1	1982	0.8	1983	0.8
1973	4.1	1974	4.1	1975	2.0	1976	2.0	1977	2.0	1978	2.0	1979	2.0	1980	1.1	1981	1.1	1982	0.8	1983	0.8	1984	0.7
1974	4.1	1975	1.9	1976	1.9	1977	1.9	1978	1.9	1979	1.9	1980	1.1	1981	1.1	1982	0.8	1983	0.8	1984	0.7	1985	0.7
1975	1.9	1976	1.9	1977	1.9	1978	1.9	1979	1.9	1980	1.0	1981	1.0	1982	0.8	1983	0.8	1984	0.7	1985	0.7	1986	0.7
1976	1.8	1977	1.8	1978	1.8	1979	1.8	1980	1.0	1981	1.0	1982	0.8	1983	0.8	1984	0.6	1985	0.6	1986	0.6	1987	0.6
1977	1.7	1978	1.7	1979	1.7	1980	1.0	1981	1.0	1982	0.7	1983	0.7	1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6
1978	1.6	1979	1.6	1980	1.0	1981	1.0	1982	0.7	1983	0.7	1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6	1989	0.6
1979	1.6	1980	0.9	1981	0.9	1982	0.7	1983	0.7	1984	0.5	1985	0.5	1986	0.5	1987	0.5	1988	0.5	1989	0.5	1990	0.5
1980	0.9	1981	0.9	1982	0.6	1983	0.6	1984	0.5	1985	0.5	1986	0.5	1987	0.5	1988	0.5	1989	0.5	1990	0.5	1991	0.5
1981	0.9	1982	0.6	1983	0.6	1984	0.5	1985	0.5	1986	0.5	1987	0.5	1988	0.5	1989	0.5	1990	0.5	1991	0.5	1992	0.5
1982	0.5	1983	0.5	1984	0.4	1985	0.4	1986	0.4	1987	0.4	1988	0.4	1989	0.4	1990	0.4	1991	0.4	1992	0.4	1993	0.4
1983	0.5	1984	0.4	1985	0.4	1986	0.4	1987	0.4	1988	0.4	1989	0.4	1990	0.4	1991	0.4	1992	0.4	1993	0.4	1994	0.4
1984	0.3	1985	0.3	1986	0.3	1987	0.3	1988	0.3	1989	0.3	1990	0.3	1991	0.3	1992	0.3	1993	0.3	1994	0.3	1995	0.3
1985	0.3	1986	0.3	1987	0.3	1988	0.3	1989	0.3	1990	0.3	1991	0.3	1992	0.3	1993	0.3	1994	0.3	1995	0.3	1996	0.3

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	2.2	1979	2.2	1980	1.2	1981	1.2	1984	0.8	1986	0.8	1989	0.8	1991	0.8	1993	0.8	1996	0.8	1999	0.8	2001	0.8
1979	2.2	1980	1.2	1981	1.2	1982	0.9	1985	0.8	1987	0.8	1990	0.8	1992	0.8	1994	0.8	1997	0.8	2000	0.8	2002	0.8
1980	1.2	1981	1.2	1982	0.9	1983	0.9	1986	0.8	1988	0.8	1991	0.8	1993	0.8	1995	0.8	1998	0.8	2001	0.8	2003	0.8
1981	1.2	1982	0.9	1983	0.9	1984	0.8	1987	0.8	1989	0.8	1992	0.8	1994	0.8	1996	0.8	1999	0.8	2002	0.8	2004	0.8
1982	0.9	1983	0.9	1984	0.8	1985	0.8	1988	0.8	1990	0.8	1993	0.8	1995	0.8	1997	0.8	2000	0.8	2003	0.8	2005	0.8
1983	0.9	1984	0.8	1985	0.8	1986	0.8	1989	0.8	1991	0.8	1994	0.8	1996	0.8	1998	0.8	2001	0.8	2004	0.8	2006	0.8
1984	0.7	1985	0.7	1986	0.7	1987	0.7	1990	0.7	1992	0.7	1995	0.7	1997	0.7	1999	0.7	2002	0.7	2005	0.7	2007	0.7
1985	0.7	1986	0.7	1987	0.7	1988	0.7	1991	0.7	1993	0.7	1996	0.7	1998	0.7	2000	0.7	2003	0.7	2006	0.7	2008	0.7
1986	0.7	1987	0.7	1988	0.7	1989	0.7	1992	0.7	1994	0.7	1997	0.7	1999	0.7	2001	0.7	2004	0.7	2007	0.7	2009	0.7
1987	0.7	1988	0.7	1989	0.7	1990	0.7	1993	0.7	1995	0.7	1998	0.7	2000	0.7	2002	0.7	2005	0.7	2008	0.7	2010	0.7
1988	0.6	1989	0.6	1990	0.6	1991	0.6	1994	0.6	1996	0.6	1999	0.6	2001	0.6	2003	0.6	2006	0.6	2009	0.6	2011	0.6
1989	0.6	1990	0.6	1991	0.6	1992	0.6	1995	0.6	1997	0.6	2000	0.6	2002	0.6	2004	0.6	2007	0.6	2010	0.6	2012	0.6
1990	0.6	1991	0.6	1992	0.6	1993	0.6	1996	0.6	1998	0.6	2001	0.6	2003	0.6	2005	0.6	2008	0.6	2011	0.6	2013	0.6
1991	0.5	1992	0.5	1993	0.5	1994	0.5	1997	0.5	1999	0.5	2002	0.5	2004	0.5	2006	0.5	2009	0.5	2012	0.5	2014	0.5
1992	0.5	1993	0.5	1994	0.5	1995	0.5	1998	0.5	2000	0.5	2003	0.5	2005	0.5	2007	0.5	2010	0.5	2013	0.5	2015	0.5
1993	0.5	1994	0.5	1995	0.5	1996	0.5	1999	0.5	2001	0.5	2004	0.5	2006	0.5	2008	0.5	2011	0.5	2014	0.5	2016	0.5
1994	0.4	1995	0.4	1996	0.4	1997	0.4	2000	0.4	2002	0.4	2005	0.4	2007	0.4	2009	0.4	2012	0.4	2015	0.4	2017	0.4
1995	0.4	1996	0.4	1997	0.4	1998	0.4	2001	0.4	2003	0.4	2006	0.4	2008	0.4	2010	0.4	2013	0.4	2016	0.4	2018	0.4
1996	0.3	1997	0.3	1998	0.3	1999	0.3	2002	0.3	2004	0.3	2007	0.3	2009	0.3	2011	0.3	2014	0.3	2017	0.3	2019	0.3
1997	0.3	1998	0.3	1999	0.3	2000	0.3	2003	0.3	2005	0.3	2008	0.3	2010	0.3	2012	0.3	2015	0.3	2018	0.3	2020	0.3

*MY Indicates the model year.

**E Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on January 1 mileage accumulation figures given in Table 2.5.4A.

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TABLE 2.5.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	7.1	1967	7.1	1968	7.1	1969	7.1	1970	7.1	1971	7.1	1972	7.1	1973	7.1	1974	7.1	1975	3.7	1976	3.7	1977	3.7
1967	7.0	1968	7.0	1969	7.0	1970	7.0	1971	7.0	1972	7.0	1973	7.0	1974	7.0	1975	3.6	1976	3.6	1977	3.6	1978	3.6
1968	7.0	1969	7.0	1970	7.0	1971	7.0	1972	7.0	1973	7.0	1974	7.0	1975	3.6	1976	3.6	1977	3.6	1978	3.6	1979	3.6
1969	6.9	1970	6.9	1971	6.9	1972	6.9	1973	6.9	1974	6.9	1975	3.6	1976	3.6	1977	3.6	1978	3.6	1979	3.6	1980	2.7
1970	6.8	1971	6.8	1972	6.8	1973	6.8	1974	6.8	1975	3.5	1976	3.5	1977	3.5	1978	3.5	1979	3.5	1980	2.7	1981	2.7
1971	6.8	1972	6.8	1973	6.8	1974	6.8	1975	3.5	1976	3.5	1977	3.5	1978	3.5	1979	3.5	1980	2.6	1981	2.6	1982	2.6
1972	6.7	1973	6.7	1974	6.7	1975	3.4	1976	3.4	1977	3.4	1978	3.4	1979	3.4	1980	2.6	1981	2.6	1982	2.6	1983	2.6
1973	6.6	1974	6.6	1975	3.3	1976	3.3	1977	3.3	1978	3.3	1979	3.3	1980	2.6	1981	2.6	1982	2.6	1983	2.6	1984	1.7
1974	6.5	1975	3.3	1976	3.3	1977	3.3	1978	3.3	1979	3.3	1980	2.5	1981	2.5	1982	2.5	1983	2.5	1984	1.7	1985	1.7
1975	3.2	1976	3.2	1977	3.2	1978	3.2	1979	3.2	1980	2.5	1981	2.5	1982	2.5	1983	2.5	1984	1.7	1985	1.7	1986	1.7
1976	3.1	1977	3.1	1978	3.1	1979	3.1	1980	2.5	1981	2.5	1982	2.5	1983	2.5	1984	1.6	1985	1.6	1986	1.6	1987	1.6
1977	3.0	1978	3.0	1979	3.0	1980	2.4	1981	2.4	1982	2.4	1983	2.4	1984	1.6	1985	1.6	1986	1.6	1987	1.6	1988	1.6
1978	2.9	1979	2.9	1980	2.4	1981	2.4	1982	2.4	1983	2.4	1984	1.5	1985	1.5	1986	1.5	1987	1.5	1988	1.5	1989	1.5
1979	2.8	1980	2.4	1981	2.4	1982	2.4	1983	2.4	1984	1.5	1985	1.5	1986	1.5	1987	1.5	1988	1.5	1989	1.5	1990	1.5
1980	2.3	1981	2.3	1982	2.3	1983	2.3	1984	1.4	1985	1.4	1986	1.4	1987	1.4	1988	1.4	1989	1.4	1990	1.4	1991	1.4
1981	2.2	1982	2.2	1983	2.2	1984	1.4	1985	1.4	1986	1.4	1987	1.4	1988	1.4	1989	1.4	1990	1.4	1991	1.4	1992	1.4
1982	2.2	1983	2.2	1984	1.3	1985	1.3	1986	1.3	1987	1.3	1988	1.3	1989	1.3	1990	1.3	1991	1.3	1992	1.3	1993	1.3
1983	2.1	1984	1.3	1985	1.3	1986	1.3	1987	1.3	1988	1.3	1989	1.3	1990	1.3	1991	1.3	1992	1.3	1993	1.3	1994	1.3
1984	1.2	1985	1.2	1986	1.2	1987	1.2	1988	1.2	1989	1.2	1990	1.2	1991	1.2	1992	1.2	1993	1.2	1994	1.2	1995	1.2
1985	1.2	1986	1.2	1987	1.2	1988	1.2	1989	1.2	1990	1.2	1991	1.2	1992	1.2	1993	1.2	1994	1.2	1995	1.2	1996	1.2

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	3.7	1979	3.7	1980	2.7	1981	2.7	1984	1.9	1986	1.9	1989	1.9	1991	1.9	1993	1.9	1996	1.9	1999	1.9	2001	1.9
1979	3.6	1980	2.7	1981	2.7	1982	2.7	1985	1.9	1987	1.9	1990	1.9	1992	1.9	1994	1.9	1997	1.9	2000	1.9	2002	1.9
1980	2.7	1981	2.7	1982	2.7	1983	2.7	1986	1.8	1988	1.8	1991	1.8	1993	1.8	1995	1.8	1998	1.8	2001	1.8	2003	1.8
1981	2.7	1982	2.7	1983	2.7	1984	1.8	1987	1.8	1989	1.8	1992	1.8	1994	1.8	1996	1.8	1999	1.8	2002	1.8	2004	1.8
1982	2.7	1983	2.7	1984	1.8	1985	1.8	1988	1.8	1990	1.8	1993	1.8	1995	1.8	1997	1.8	2000	1.8	2003	1.8	2005	1.8
1983	2.6	1984	1.8	1985	1.8	1986	1.8	1989	1.8	1991	1.8	1994	1.8	1996	1.8	1998	1.8	2001	1.8	2004	1.8	2006	1.8
1984	1.7	1985	1.7	1986	1.7	1987	1.7	1990	1.7	1992	1.7	1995	1.7	1997	1.7	1999	1.7	2002	1.7	2005	1.7	2007	1.7
1985	1.7	1986	1.7	1987	1.7	1988	1.7	1991	1.7	1993	1.7	1996	1.7	1998	1.7	2000	1.7	2003	1.7	2006	1.7	2008	1.7
1986	1.7	1987	1.7	1988	1.7	1989	1.7	1992	1.7	1994	1.7	1997	1.7	1999	1.7	2001	1.7	2004	1.7	2007	1.7	2009	1.7
1987	1.7	1988	1.7	1989	1.7	1990	1.7	1993	1.7	1995	1.7	1998	1.7	2000	1.7	2002	1.7	2005	1.7	2008	1.7	2010	1.7
1988	1.6	1989	1.6	1990	1.6	1991	1.6	1994	1.6	1996	1.6	1999	1.6	2001	1.6	2003	1.6	2006	1.6	2009	1.6	2011	1.6
1989	1.6	1990	1.6	1991	1.6	1992	1.6	1995	1.6	1997	1.6	2000	1.6	2002	1.6	2004	1.6	2007	1.6	2010	1.6	2012	1.6
1990	1.5	1991	1.5	1992	1.5	1993	1.5	1996	1.5	1998	1.5	2001	1.5	2003	1.5	2005	1.5	2008	1.5	2011	1.5	2013	1.5
1991	1.5	1992	1.5	1993	1.5	1994	1.5	1997	1.5	1999	1.5	2002	1.5	2004	1.5	2006	1.5	2009	1.5	2012	1.5	2014	1.5
1992	1.4	1993	1.4	1994	1.4	1995	1.4	1998	1.4	2000	1.4	2003	1.4	2005	1.4	2007	1.4	2010	1.4	2013	1.4	2015	1.4
1993	1.4	1994	1.4	1995	1.4	1996	1.4	1999	1.4	2001	1.4	2004	1.4	2006	1.4	2008	1.4	2011	1.4	2014	1.4	2016	1.4
1994	1.3	1995	1.3	1996	1.3	1997	1.3	2000	1.3	2002	1.3	2005	1.3	2007	1.3	2009	1.3	2012	1.3	2015	1.3	2017	1.3
1995	1.3	1996	1.3	1997	1.3	1998	1.3	2001	1.3	2003	1.3	2006	1.3	2008	1.3	2010	1.3	2013	1.3	2016	1.3	2018	1.3
1996	1.2	1997	1.2	1998	1.2	1999	1.2	2002	1.2	2004	1.2	2007	1.2	2009	1.2	2011	1.2	2014	1.2	2017	1.2	2019	1.2
1997	1.2	1998	1.2	1999	1.2	2000	1.2	2003	1.2	2005	1.2	2008	1.2	2010	1.2	2012	1.2	2015	1.2	2018	1.2	2020	1.2

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on January 1 mileage accumulation figures given in Table 2.5.4A.

TABLE 2.5.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED VEHICLES
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	2.2	1967	2.2	1968	2.2	1969	2.2	1970	2.2	1971	2.2	1972	2.2	1973	2.2	1974	2.2	1975	2.1	1976	2.1	1977	2.1
1967	2.2	1968	2.2	1969	2.2	1970	2.2	1971	2.2	1972	2.2	1973	2.2	1974	2.2	1975	2.1	1976	2.1	1977	2.1	1978	2.1
1968	2.1	1969	2.1	1970	2.1	1971	2.1	1972	2.1	1973	2.1	1974	2.1	1975	2.1	1976	2.1	1977	2.1	1978	2.1	1979	2.1
1969	2.1	1970	2.1	1971	2.1	1972	2.1	1973	2.1	1974	2.1	1975	2.1	1976	2.1	1977	2.1	1978	2.1	1979	2.1	1980	2.1
1970	2.1	1971	2.1	1972	2.1	1973	2.1	1974	2.1	1975	2.0	1976	2.0	1977	2.0	1978	2.0	1979	2.0	1980	2.0	1981	1.8
1971	2.1	1972	2.1	1973	2.1	1974	2.1	1975	2.0	1976	2.0	1977	2.0	1978	2.0	1979	2.0	1980	2.0	1981	1.8	1982	1.8
1972	2.1	1973	2.1	1974	2.1	1975	2.0	1976	2.0	1977	2.0	1978	2.0	1979	2.0	1980	2.0	1981	1.8	1982	1.8	1983	1.8
1973	2.0	1974	2.0	1975	2.0	1976	2.0	1977	2.0	1978	2.0	1979	2.0	1980	2.0	1981	1.7	1982	1.7	1983	1.7	1984	1.7
1974	2.0	1975	1.9	1976	1.9	1977	1.9	1978	1.9	1979	1.9	1980	1.9	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.3
1975	1.9	1976	1.9	1977	1.9	1978	1.9	1979	1.9	1980	1.9	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.2	1986	1.2
1976	1.9	1977	1.9	1978	1.9	1979	1.9	1980	1.9	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.2	1986	1.2	1987	1.2
1977	1.8	1978	1.8	1979	1.8	1980	1.8	1981	1.6	1982	1.6	1983	1.6	1984	1.6	1985	1.2	1986	1.2	1987	1.2	1988	1.2
1978	1.8	1979	1.8	1980	1.8	1981	1.6	1982	1.6	1983	1.6	1984	1.6	1985	1.2	1986	1.2	1987	1.2	1988	1.2	1989	1.2
1979	1.7	1980	1.7	1981	1.6	1982	1.6	1983	1.6	1984	1.6	1985	1.1	1986	1.1	1987	1.1	1988	1.1	1989	1.1	1990	1.1
1980	1.7	1981	1.5	1982	1.5	1983	1.5	1984	1.5	1985	1.1	1986	1.1	1987	1.1	1988	1.1	1989	1.1	1990	1.1	1991	1.1
1981	1.5	1982	1.5	1983	1.5	1984	1.5	1985	1.0	1986	1.0	1987	1.0	1988	1.0	1989	1.0	1990	1.0	1991	1.0	1992	1.0
1982	1.4	1983	1.4	1984	1.4	1985	1.0	1986	1.0	1987	1.0	1988	1.0	1989	1.0	1990	1.0	1991	1.0	1992	1.0	1993	1.0
1983	1.4	1984	1.4	1985	1.0	1986	1.0	1987	1.0	1988	1.0	1989	1.0	1990	1.0	1991	1.0	1992	1.0	1993	1.0	1994	1.0
1984	1.3	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9	1994	0.9	1995	0.9
1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9	1991	0.9	1992	0.9	1993	0.9	1994	0.9	1995	0.9	1996	0.9

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	2.1	1979	2.1	1980	2.1	1981	1.9	1984	1.9	1986	1.4	1989	1.4	1991	1.4	1993	1.4	1996	1.4	1999	1.4	2001	1.4
1979	2.1	1980	2.1	1981	1.8	1982	1.8	1985	1.4	1987	1.4	1990	1.4	1992	1.4	1994	1.4	1997	1.4	2000	1.4	2002	1.4
1980	2.1	1981	1.8	1982	1.8	1983	1.8	1986	1.4	1988	1.4	1991	1.4	1993	1.4	1995	1.4	1998	1.4	2001	1.4	2003	1.4
1981	1.8	1982	1.8	1983	1.8	1984	1.8	1987	1.4	1989	1.4	1992	1.4	1994	1.4	1996	1.4	1999	1.4	2002	1.4	2004	1.4
1982	1.8	1983	1.8	1984	1.8	1985	1.4	1988	1.4	1990	1.4	1993	1.4	1995	1.4	1997	1.4	2000	1.4	2003	1.4	2005	1.4
1983	1.8	1984	1.8	1985	1.3	1986	1.3	1989	1.3	1991	1.3	1994	1.3	1996	1.3	1998	1.3	2001	1.3	2004	1.3	2006	1.3
1984	1.8	1985	1.3	1986	1.3	1987	1.3	1990	1.3	1992	1.3	1995	1.3	1997	1.3	1999	1.3	2002	1.3	2005	1.3	2007	1.3
1985	1.3	1986	1.3	1987	1.3	1988	1.3	1991	1.3	1993	1.3	1996	1.3	1998	1.3	2000	1.3	2003	1.3	2006	1.3	2008	1.3
1986	1.3	1987	1.3	1988	1.3	1989	1.3	1992	1.3	1994	1.3	1997	1.3	1999	1.3	2001	1.3	2004	1.3	2007	1.3	2009	1.3
1987	1.2	1988	1.2	1989	1.2	1990	1.2	1993	1.2	1995	1.2	1998	1.2	2000	1.2	2002	1.2	2005	1.2	2008	1.2	2010	1.2
1988	1.2	1989	1.2	1990	1.2	1991	1.2	1994	1.2	1996	1.2	1999	1.2	2001	1.2	2003	1.2	2006	1.2	2009	1.2	2011	1.2
1989	1.2	1990	1.2	1991	1.2	1992	1.2	1995	1.2	1997	1.2	2000	1.2	2002	1.2	2004	1.2	2007	1.2	2010	1.2	2012	1.2
1990	1.2	1991	1.2	1992	1.2	1993	1.2	1996	1.2	1998	1.2	2001	1.2	2003	1.2	2005	1.2	2008	1.2	2011	1.2	2013	1.2
1991	1.1	1992	1.1	1993	1.1	1994	1.1	1997	1.1	1999	1.1	2002	1.1	2004	1.1	2006	1.1	2009	1.1	2012	1.1	2014	1.1
1992	1.1	1993	1.1	1994	1.1	1995	1.1	1998	1.1	2000	1.1	2003	1.1	2005	1.1	2007	1.1	2010	1.1	2013	1.1	2015	1.1
1993	1.0	1994	1.0	1995	1.0	1996	1.0	1999	1.0	2001	1.0	2004	1.0	2006	1.0	2008	1.0	2011	1.0	2014	1.0	2016	1.0
1994	1.0	1995	1.0	1996	1.0	1997	1.0	2000	1.0	2002	1.0	2005	1.0	2007	1.0	2009	1.0	2012	1.0	2015	1.0	2017	1.0
1995	1.0	1996	1.0	1997	1.0	1998	1.0	2001	1.0	2003	1.0	2006	1.0	2008	1.0	2010	1.0	2013	1.0	2016	1.0	2018	1.0
1996	0.9	1997	0.9	1998	0.9	1999	0.9	2002	0.9	2004	0.9	2007	0.9	2009	0.9	2011	0.9	2014	0.9	2017	0.9	2019	0.9
1997	0.9	1998	0.9	1999	0.9	2000	0.9	2003	0.9	2005	0.9	2008	0.9	2010	0.9	2012	0.9	2015	0.9	2018	0.9	2020	0.9

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on January 1 mileage accumulation figures given in Table 2.5.4A.

TABLE 2.6.1

NONTAMPERED EXHAUST EMISSION RATES FOR
HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1978	1.980	0.080	2.380	2.780
	1978	1.980	0.080	2.380	2.780
	1979-1980	1.980	0.080	2.380	2.780
	1981-1983	0.990	0.040	1.190	1.390
	1984+	0.540	0.040	0.740	0.940
CO	Pre-1978	3.450	0.100	3.950	4.450
	1978	3.450	0.100	3.950	4.450
	1979-1980	3.450	0.100	3.950	4.450
	1981-1983	3.450	0.100	3.950	4.450
	1984+	2.330	0.040	2.530	2.730
NOx	Pre-1978	1.830	0.060	2.130	2.430
	1978	1.830	0.060	2.130	2.430
	1979	1.830	0.060	2.130	2.430
	1980	1.830	0.060	2.130	2.430
	1981-1984	1.480	0.030	1.630	1.780
	1985-1987	1.480	0.030	1.630	1.780
	1988-1989	1.070	0.030	1.220	1.370
	1990+	1.030	0.030	1.180	1.330

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile,
ZML = Zero mile level in grams/mile,
DR = Deterioration rate in grams/mile/10K miles,
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 2.6.3

NONTAMPERED HOT STABILIZED IDLE EMISSIONS
FOR HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

* IER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate
HC	Pre-1979	10.80	0.60
	1979-1983	13.80	0.60
	1984+	4.20	0.60
CO	Pre-1979	31.80	1.20
	1979	32.40	1.20
	1980-1983	32.40	0.60
	1984+	18.60	0.60
NOx	Pre-1979	11.40	0.60
	1979	19.20	0.60
	1980-1984	20.40	0.60
	1985+	7.80	0.60

* WHERE : IER = Nontampered idle emissions in grams/hour,
ZML = Zero mile level in grams/hour
DR = Deterioration rate in grams/hour/10K miles,
M = Cumulative mileage / 10,000 miles.

DATE : MAY 19, 1989

TABLE 2.6.4A

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per truck *)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.070	20140.	0.023	20140.	2517.
2	0.092	17572.	0.092	19498.	15025.
3	0.088	15432.	0.088	17037.	33252.
4	0.083	13639.	0.083	14984.	49230.
5	0.077	12133.	0.077	13262.	63326.
6	0.072	10863.	0.072	11816.	75843.
7	0.067	9788.	0.067	10594.	87030.
8	0.062	8877.	0.062	9560.	97091.
9	0.057	8103.	0.057	8683.	106200.
10	0.051	7444.	0.051	7938.	114500.
11	0.047	6883.	0.047	7304.	122112.
12	0.041	6405.	0.041	6763.	129138.
13	0.036	5999.	0.036	6304.	135665.
14	0.031	5655.	0.031	5913.	141767.
15	0.026	5365.	0.026	5582.	147510.
16	0.021	5123.	0.021	5304.	152948.
17	0.016	4924.	0.016	5073.	158133.
18	0.011	4763.	0.011	4884.	163108.
19	0.007	4637.	0.007	4731.	167912.
20+	0.044	4543.	0.044	4613.	172582.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1, where: JMAR(1) = MAR(1) and,
JMAR(MYI) = .25*MAR(MYI) + .75*MAR(MYI-1), MYI = 2,...,20+.

DATE : MAY 19, 1989

TABLE 2.6.4B

DIESEL SALES FRACTION FOR
HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

Model Years	Diesel Sales Fraction
Pre-1978	0.0
1978	0.010
1979	0.015
1980	0.048
1981	0.082
1982	0.092
1983	0.042
1984	0.026
1985	0.011
1986	0.020
1987	0.009
1988	0.027
1989	0.044
1990	0.062
1991	0.080
1992	0.097
1993	0.115
1994	0.132
1995+	0.150

DATE : MAY 19, 1989

TABLE 2.6.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS
JANUARY 1, 1988

Model Years	(A) LDT1 Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) LDDT Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.023	0.027	0.001	0.026	20140.	520.5	0.045
1987	0.092	0.009	0.001	0.034	19498.	662.3	0.057
1986	0.088	0.020	0.002	0.072	17037.	1230.1	0.106
1985	0.083	0.011	0.001	0.037	14984.	561.2	0.049
1984	0.077	0.026	0.002	0.082	13262.	1089.2	0.094
1983	0.072	0.042	0.003	0.124	11816.	1465.8	0.127
1982	0.067	0.092	0.006	0.253	10594.	2679.0	0.232
1981	0.062	0.082	0.005	0.209	9560.	1993.9	0.172
1980	0.057	0.048	0.003	0.112	8683.	974.6	0.084
1979	0.051	0.015	0.001	0.031	7938.	249.1	0.022
1978	0.047	0.010	0.000	0.019	7304.	140.8	0.012
1977	0.041	0.0	0.0	0.0	6763.	0.0	0.0
1976	0.036	0.0	0.0	0.0	6304.	0.0	0.0
1975	0.031	0.0	0.0	0.0	5913.	0.0	0.0
1974	0.026	0.0	0.0	0.0	5582.	0.0	0.0
1973	0.021	0.0	0.0	0.0	5304.	0.0	0.0
1972	0.016	0.0	0.0	0.0	5073.	0.0	0.0
1971	0.011	0.0	0.0	0.0	4884.	0.0	0.0
1970	0.007	0.0	0.0	0.0	4731.	0.0	0.0
1969-	0.044	0.0	0.0	0.0	4613.	0.0	0.0
		DAF:	0.024		TFNORM:	11566.7	

WHERE :

A = January 1 registration mix from Table 2.6.4A,
B = Diesel fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 2.6.4A.

NOTE : In general, the travel weighting fractions will change for every calendar year since the sales fraction (column B) changes for almost every model year.

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TABLE 2.6.6

SPEED CORRECTION FACTOR COEFFICIENTS FOR
HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = EXP(A + B*s + C*s**2)

Pol	Model Years	Coefficients A	B	C
HC	All	0.90900	-0.05500	0.00044
CO	All	1.37520	-0.08800	0.00091
NOx	All	0.66800	-0.04800	0.00071

* WHERE :

s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16].

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TABLE 2.6.7

NORMALIZED BAG FRACTIONS FOR HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

		Normalized Fractions							
	Model	Test Segment 1		Test Segment 2		Test Segment 3		Total Test	
Pol	Years	B1	D1	B2	D2	B3	D3	BO	DO
HC	Pre-1979	1.2090	0.1120	1.0730	0.0910	0.7030	0.0930	1.0000	0.0959
	1979	1.2090	0.1100	1.0730	0.0890	0.7030	0.0920	1.0000	0.0941
	1980-1982	1.2090	0.1100	1.0730	0.0890	0.7030	0.0920	1.0000	0.0941
	1983+	1.2090	0.1150	1.0730	0.0930	0.7030	0.0950	1.0000	0.0981
CO	Pre-1979	1.1990	0.0620	0.9350	0.0440	0.9740	0.0530	1.0000	0.0502
	1979	1.1990	0.0600	0.9350	0.0430	0.9740	0.0510	1.0000	0.0487
	1980-1982	1.1990	0.0570	0.9350	0.0400	0.9740	0.0480	1.0000	0.0457
	1983+	1.1990	0.0570	0.9350	0.0400	0.9740	0.0480	1.0000	0.0457
NOx	Pre-1979	1.0680	0.0330	0.9810	0.0360	0.9850	0.0320	1.0000	0.0343
	1979	1.0680	0.0330	0.9810	0.0350	0.9850	0.0320	1.0000	0.0338
	1980-1984	1.0680	0.0360	0.9810	0.0380	0.9850	0.0350	1.0000	0.0368
	1985+	1.0680	0.0710	0.9810	0.0720	0.9850	0.0680	1.0000	0.0707

NOTE : The fractions given in this table are used in the calculation of the operating-mode/temperature correction factor (OMTCF).

WHERE :

OMTCF = [(TERM1 + TERM2 + TERM3)/DENOM].
TERM1 = W *TCF(1)*(B1+D1*M).
TERM2 = (1-W-X)*TCF(2)*(B2+D2*M).
TERM3 = X *TCF(3)*(B3+D3*M).
DENOM = BO + DO*M.
W = Fraction of VMT in the cold start mode.
X = Fraction of VMT in the hot start mode.
TCF(b) = Temperature correction factor for pollutant, model year, for test segment b.
M = Cumulative mileage / 10,000 miles.

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TABLE 2.6.10A

METHANE OFFSETS*
FOR HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS

Model Years	Methane Offsets (Grams/Mile)
Pre-1979	0.079
1979-1980	0.079
1981-1983	0.040
1984+	0.022

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

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TABLE 2.6.11A

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BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	3.4	1967	3.4	1968	3.4	1969	3.4	1970	3.4	1971	3.4	1972	3.4	1973	3.4	1974	3.4	1975	3.4	1976	3.4	1977	3.4
1967	3.3	1968	3.3	1969	3.3	1970	3.3	1971	3.3	1972	3.3	1973	3.3	1974	3.3	1975	3.3	1976	3.3	1977	3.3	1978	3.3
1968	3.3	1969	3.3	1970	3.3	1971	3.3	1972	3.3	1973	3.3	1974	3.3	1975	3.3	1976	3.3	1977	3.3	1978	3.3	1979	3.3
1969	3.2	1970	3.2	1971	3.2	1972	3.2	1973	3.2	1974	3.2	1975	3.2	1976	3.2	1977	3.2	1978	3.2	1979	3.2	1980	3.2
1970	3.2	1971	3.2	1972	3.2	1973	3.2	1974	3.2	1975	3.2	1976	3.2	1977	3.2	1978	3.2	1979	3.2	1980	3.2	1981	1.6
1971	3.2	1972	3.2	1973	3.2	1974	3.2	1975	3.2	1976	3.2	1977	3.2	1978	3.2	1979	3.2	1980	3.2	1981	1.6	1982	1.6
1972	3.1	1973	3.1	1974	3.1	1975	3.1	1976	3.1	1977	3.1	1978	3.1	1979	3.1	1980	3.1	1981	1.6	1982	1.6	1983	1.6
1973	3.1	1974	3.1	1975	3.1	1976	3.1	1977	3.1	1978	3.1	1979	3.1	1980	3.1	1981	1.5	1982	1.5	1983	1.5	1984	1.1
1974	3.0	1975	3.0	1976	3.0	1977	3.0	1978	3.0	1979	3.0	1980	3.0	1981	1.5	1982	1.5	1983	1.5	1984	1.1	1985	1.1
1975	3.0	1976	3.0	1977	3.0	1978	3.0	1979	3.0	1980	3.0	1981	1.5	1982	1.5	1983	1.5	1984	1.0	1985	1.0	1986	1.0
1976	2.9	1977	2.9	1978	2.9	1979	2.9	1980	2.9	1981	1.4	1982	1.4	1983	1.4	1984	1.0	1985	1.0	1986	1.0	1987	1.0
1977	2.8	1978	2.8	1979	2.8	1980	2.8	1981	1.4	1982	1.4	1983	1.4	1984	1.0	1985	1.0	1986	1.0	1987	1.0	1988	1.0
1978	2.8	1979	2.8	1980	2.8	1981	1.4	1982	1.4	1983	1.4	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9
1979	2.7	1980	2.7	1981	1.3	1982	1.3	1983	1.3	1984	0.9	1985	0.9	1986	0.9	1987	0.9	1988	0.9	1989	0.9	1990	0.9
1980	2.6	1981	1.3	1982	1.3	1983	1.3	1984	0.8	1985	0.8	1986	0.8	1987	0.8	1988	0.8	1989	0.8	1990	0.8	1991	0.8
1981	1.2	1982	1.2	1983	1.2	1984	0.8	1985	0.8	1986	0.8	1987	0.8	1988	0.8	1989	0.8	1990	0.8	1991	0.8	1992	0.8
1982	1.2	1983	1.2	1984	0.7	1985	0.7	1986	0.7	1987	0.7	1988	0.7	1989	0.7	1990	0.7	1991	0.7	1992	0.7	1993	0.7
1983	1.1	1984	0.7	1985	0.7	1986	0.7	1987	0.7	1988	0.7	1989	0.7	1990	0.7	1991	0.7	1992	0.7	1993	0.7	1994	0.7
1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6	1989	0.6	1990	0.6	1991	0.6	1992	0.6	1993	0.6	1994	0.6	1995	0.6
1985	0.5	1986	0.5	1987	0.5	1988	0.5	1989	0.5	1990	0.5	1991	0.5	1992	0.5	1993	0.5	1994	0.5	1995	0.5	1996	0.5

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	3.4	1979	3.4	1980	3.4	1981	1.7	1984	1.2	1986	1.2	1989	1.2	1991	1.2	1993	1.2	1996	1.2	1999	1.2	2001	1.2
1979	3.3	1980	3.3	1981	1.7	1982	1.7	1985	1.2	1987	1.2	1990	1.2	1992	1.2	1994	1.2	1997	1.2	2000	1.2	2002	1.2
1980	3.3	1981	1.6	1982	1.6	1983	1.6	1986	1.2	1988	1.2	1991	1.2	1993	1.2	1995	1.2	1998	1.2	2001	1.2	2003	1.2
1981	1.6	1982	1.6	1983	1.6	1984	1.2	1987	1.2	1989	1.2	1992	1.2	1994	1.2	1996	1.2	1999	1.2	2002	1.2	2004	1.2
1982	1.6	1983	1.6	1984	1.2	1985	1.2	1988	1.2	1990	1.2	1993	1.2	1995	1.2	1997	1.2	2000	1.2	2003	1.2	2005	1.2
1983	1.6	1984	1.1	1985	1.1	1986	1.1	1989	1.1	1991	1.1	1994	1.1	1996	1.1	1998	1.1	2001	1.1	2004	1.1	2006	1.1
1984	1.1	1985	1.1	1986	1.1	1987	1.1	1990	1.1	1992	1.1	1995	1.1	1997	1.1	1999	1.1	2002	1.1	2005	1.1	2007	1.1
1985	1.1	1986	1.1	1987	1.1	1988	1.1	1991	1.1	1993	1.1	1996	1.1	1998	1.1	2000	1.1	2003	1.1	2006	1.1	2008	1.1
1986	1.1	1987	1.1	1988	1.1	1989	1.1	1992	1.1	1994	1.1	1997	1.1	1999	1.1	2001	1.1	2004	1.1	2007	1.1	2009	1.1
1987	1.0	1988	1.0	1989	1.0	1990	1.0	1993	1.0	1995	1.0	1998	1.0	2000	1.0	2002	1.0	2005	1.0	2008	1.0	2010	1.0
1988	1.0	1989	1.0	1990	1.0	1991	1.0	1994	1.0	1996	1.0	1999	1.0	2001	1.0	2003	1.0	2006	1.0	2009	1.0	2011	1.0
1989	1.0	1990	1.0	1991	1.0	1992	1.0	1995	1.0	1997	1.0	2000	1.0	2002	1.0	2004	1.0	2007	1.0	2010	1.0	2012	1.0
1990	0.9	1991	0.9	1992	0.9	1993	0.9	1996	0.9	1998	0.9	2001	0.9	2003	0.9	2005	0.9	2008	0.9	2011	0.9	2013	0.9
1991	0.9	1992	0.9	1993	0.9	1994	0.9	1997	0.9	1999	0.9	2002	0.9	2004	0.9	2006	0.9	2009	0.9	2012	0.9	2014	0.9
1992	0.8	1993	0.8	1994	0.8	1995	0.8	1998	0.8	2000	0.8	2003	0.8	2005	0.8	2007	0.8	2010	0.8	2013	0.8	2015	0.8
1993	0.8	1994	0.8	1995	0.8	1996	0.8	1999	0.8	2001	0.8	2004	0.8	2006	0.8	2008	0.8	2011	0.8	2014	0.8	2016	0.8
1994	0.7	1995	0.7	1996	0.7	1997	0.7	2000	0.7	2002	0.7	2005	0.7	2007	0.7	2009	0.7	2012	0.7	2015	0.7	2017	0.7
1995	0.7	1996	0.7	1997	0.7	1998	0.7	2001	0.7	2003	0.7	2006	0.7	2008	0.7	2010	0.7	2013	0.7	2016	0.7	2018	0.7
1996	0.6	1997	0.6	1998	0.6	1999	0.6	2002	0.6	2004	0.6	2007	0.6	2009	0.6	2011	0.6	2014	0.6	2017	0.6	2019	0.6
1997	0.5	1998	0.5	1999	0.5	2000	0.5	2003	0.5	2005	0.5	2008	0.5	2010	0.5	2012	0.5	2015	0.5	2018	0.5	2020	0.5

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on January 1 mileage accumulation figures given in Table 2.6.4A.

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TABLE 2.6.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	5.2	1967	5.2	1968	5.2	1969	5.2	1970	5.2	1971	5.2	1972	5.2	1973	5.2	1974	5.2	1975	5.2	1976	5.2	1977	5.2
1967	5.1	1968	5.1	1969	5.1	1970	5.1	1971	5.1	1972	5.1	1973	5.1	1974	5.1	1975	5.1	1976	5.1	1977	5.1	1978	5.1
1968	5.1	1969	5.1	1970	5.1	1971	5.1	1972	5.1	1973	5.1	1974	5.1	1975	5.1	1976	5.1	1977	5.1	1978	5.1	1979	5.1
1969	5.0	1970	5.0	1971	5.0	1972	5.0	1973	5.0	1974	5.0	1975	5.0	1976	5.0	1977	5.0	1978	5.0	1979	5.0	1980	5.0
1970	5.0	1971	5.0	1972	5.0	1973	5.0	1974	5.0	1975	5.0	1976	5.0	1977	5.0	1978	5.0	1979	5.0	1980	5.0	1981	5.0
1971	4.9	1972	4.9	1973	4.9	1974	4.9	1975	4.9	1976	4.9	1977	4.9	1978	4.9	1979	4.9	1980	4.9	1981	4.9	1982	4.9
1972	4.9	1973	4.9	1974	4.9	1975	4.9	1976	4.9	1977	4.9	1978	4.9	1979	4.9	1980	4.9	1981	4.9	1982	4.9	1983	4.9
1973	4.8	1974	4.8	1975	4.8	1976	4.8	1977	4.8	1978	4.8	1979	4.8	1980	4.8	1981	4.8	1982	4.8	1983	4.8	1984	2.9
1974	4.7	1975	4.7	1976	4.7	1977	4.7	1978	4.7	1979	4.7	1980	4.7	1981	4.7	1982	4.7	1983	4.7	1984	2.8	1985	2.8
1975	4.7	1976	4.7	1977	4.7	1978	4.7	1979	4.7	1980	4.7	1981	4.7	1982	4.7	1983	4.7	1984	2.8	1985	2.8	1986	2.8
1976	4.6	1977	4.6	1978	4.6	1979	4.6	1980	4.6	1981	4.6	1982	4.6	1983	4.6	1984	2.8	1985	2.8	1986	2.8	1987	2.8
1977	4.5	1978	4.5	1979	4.5	1980	4.5	1981	4.5	1982	4.5	1983	4.5	1984	2.8	1985	2.8	1986	2.8	1987	2.8	1988	2.8
1978	4.4	1979	4.4	1980	4.4	1981	4.4	1982	4.4	1983	4.4	1984	2.7	1985	2.7	1986	2.7	1987	2.7	1988	2.7	1989	2.7
1979	4.3	1980	4.3	1981	4.3	1982	4.3	1983	4.3	1984	2.7	1985	2.7	1986	2.7	1987	2.7	1988	2.7	1989	2.7	1990	2.7
1980	4.2	1981	4.2	1982	4.2	1983	4.2	1984	2.6	1985	2.6	1986	2.6	1987	2.6	1988	2.6	1989	2.6	1990	2.6	1991	2.6
1981	4.1	1982	4.1	1983	4.1	1984	2.6	1985	2.6	1986	2.6	1987	2.6	1988	2.6	1989	2.6	1990	2.6	1991	2.6	1992	2.6
1982	3.9	1983	3.9	1984	2.5	1985	2.5	1986	2.5	1987	2.5	1988	2.5	1989	2.5	1990	2.5	1991	2.5	1992	2.5	1993	2.5
1983	3.8	1984	2.5	1985	2.5	1986	2.5	1987	2.5	1988	2.5	1989	2.5	1990	2.5	1991	2.5	1992	2.5	1993	2.5	1994	2.5
1984	2.4	1985	2.4	1986	2.4	1987	2.4	1988	2.4	1989	2.4	1990	2.4	1991	2.4	1992	2.4	1993	2.4	1994	2.4	1995	2.4
1985	2.3	1986	2.3	1987	2.3	1988	2.3	1989	2.3	1990	2.3	1991	2.3	1992	2.3	1993	2.3	1994	2.3	1995	2.3	1996	2.3

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	5.2	1979	5.2	1980	5.2	1981	5.2	1984	3.0	1986	3.0	1989	3.0	1991	3.0	1993	3.0	1996	3.0	1999	3.0	2001	3.0
1979	5.1	1980	5.1	1981	5.1	1982	5.1	1985	3.0	1987	3.0	1990	3.0	1992	3.0	1994	3.0	1997	3.0	2000	3.0	2002	3.0
1980	5.1	1981	5.1	1982	5.1	1983	5.1	1986	3.0	1988	3.0	1991	3.0	1993	3.0	1995	3.0	1998	3.0	2001	3.0	2003	3.0
1981	5.0	1982	5.0	1983	5.0	1984	3.0	1987	3.0	1989	3.0	1992	3.0	1994	3.0	1996	3.0	1999	3.0	2002	3.0	2004	3.0
1982	5.0	1983	5.0	1984	2.9	1985	2.9	1988	2.9	1990	2.9	1993	2.9	1995	2.9	1997	2.9	2000	2.9	2003	2.9	2005	2.9
1983	4.9	1984	2.9	1985	2.9	1986	2.9	1989	2.9	1991	2.9	1994	2.9	1996	2.9	1998	2.9	2001	2.9	2004	2.9	2006	2.9
1984	2.9	1985	2.9	1986	2.9	1987	2.9	1990	2.9	1992	2.9	1995	2.9	1997	2.9	1999	2.9	2002	2.9	2005	2.9	2007	2.9
1985	2.9	1986	2.9	1987	2.9	1988	2.9	1991	2.9	1993	2.9	1996	2.9	1998	2.9	2000	2.9	2003	2.9	2006	2.9	2008	2.9
1986	2.8	1987	2.8	1988	2.8	1989	2.8	1992	2.8	1994	2.8	1997	2.8	1999	2.8	2001	2.8	2004	2.8	2007	2.8	2009	2.8
1987	2.8	1988	2.8	1989	2.8	1990	2.8	1993	2.8	1995	2.8	1998	2.8	2000	2.8	2002	2.8	2005	2.8	2008	2.8	2010	2.8
1988	2.8	1989	2.8	1990	2.8	1991	2.8	1994	2.8	1996	2.8	1999	2.8	2001	2.8	2003	2.8	2006	2.8	2009	2.8	2011	2.8
1989	2.8	1990	2.8	1991	2.8	1992	2.8	1995	2.8	1997	2.8	2000	2.8	2002	2.8	2004	2.8	2007	2.8	2010	2.8	2012	2.8
1990	2.7	1991	2.7	1992	2.7	1993	2.7	1996	2.7	1998	2.7	2001	2.7	2003	2.7	2005	2.7	2008	2.7	2011	2.7	2013	2.7
1991	2.7	1992	2.7	1993	2.7	1994	2.7	1997	2.7	1999	2.7	2002	2.7	2004	2.7	2006	2.7	2009	2.7	2012	2.7	2014	2.7
1992	2.6	1993	2.6	1994	2.6	1995	2.6	1998	2.6	2000	2.6	2003	2.6	2005	2.6	2007	2.6	2010	2.6	2013	2.6	2015	2.6
1993	2.6	1994	2.6	1995	2.6	1996	2.6	1999	2.6	2001	2.6	2004	2.6	2006	2.6	2008	2.6	2011	2.6	2014	2.6	2016	2.6
1994	2.5	1995	2.5	1996	2.5	1997	2.5	2000	2.5	2002	2.5	2005	2.5	2007	2.5	2009	2.5	2012	2.5	2015	2.5	2017	2.5
1995	2.5	1996	2.5	1997	2.5	1998	2.5	2001	2.5	2003	2.5	2006	2.5	2008	2.5	2010	2.5	2013	2.5	2016	2.5	2018	2.5
1996	2.4	1997	2.4	1998	2.4	1999	2.4	2002	2.4	2004	2.4	2007	2.4	2009	2.4	2011	2.4	2014	2.4	2017	2.4	2019	2.4
1997	2.3	1998	2.3	1999	2.3	2000	2.3	2003	2.3	2005	2.3	2008	2.3	2010	2.3	2012	2.3	2015	2.3	2018	2.3	2020	2.3

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27 3% of VMT in hot start. Emissions are based on January 1 mileage accumulation figures given in Table 2.6.4A.

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TABLE 2.6.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
LIGHT DUTY DIESEL POWERED TRUCKS
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	2.9	1967	2.9	1968	2.9	1969	2.9	1970	2.9	1971	2.9	1972	2.9	1973	2.9	1974	2.9	1975	2.9	1976	2.9	1977	2.9
1967	2.8	1968	2.8	1969	2.8	1970	2.8	1971	2.8	1972	2.8	1973	2.8	1974	2.8	1975	2.8	1976	2.8	1977	2.8	1978	2.8
1968	2.8	1969	2.8	1970	2.8	1971	2.8	1972	2.8	1973	2.8	1974	2.8	1975	2.8	1976	2.8	1977	2.8	1978	2.8	1979	2.8
1969	2.8	1970	2.8	1971	2.8	1972	2.8	1973	2.8	1974	2.8	1975	2.8	1976	2.8	1977	2.8	1978	2.8	1979	2.8	1980	2.8
1970	2.7	1971	2.7	1972	2.7	1973	2.7	1974	2.7	1975	2.7	1976	2.7	1977	2.7	1978	2.7	1979	2.7	1980	2.7	1981	1.9
1971	2.7	1972	2.7	1973	2.7	1974	2.7	1975	2.7	1976	2.7	1977	2.7	1978	2.7	1979	2.7	1980	2.7	1981	1.9	1982	1.9
1972	2.7	1973	2.7	1974	2.7	1975	2.7	1976	2.7	1977	2.7	1978	2.7	1979	2.7	1980	2.7	1981	1.9	1982	1.9	1983	1.9
1973	2.6	1974	2.6	1975	2.6	1976	2.6	1977	2.6	1978	2.6	1979	2.6	1980	2.6	1981	1.9	1982	1.9	1983	1.9	1984	1.9
1974	2.6	1975	2.6	1976	2.6	1977	2.6	1978	2.6	1979	2.6	1980	2.6	1981	1.9	1982	1.9	1983	1.9	1984	1.9	1985	1.9
1975	2.6	1976	2.6	1977	2.6	1978	2.6	1979	2.6	1980	2.6	1981	1.8	1982	1.8	1983	1.8	1984	1.8	1985	1.8	1986	1.8
1976	2.5	1977	2.5	1978	2.5	1979	2.5	1980	2.5	1981	1.8	1982	1.8	1983	1.8	1984	1.8	1985	1.8	1986	1.8	1987	1.8
1977	2.5	1978	2.5	1979	2.5	1980	2.5	1981	1.8	1982	1.8	1983	1.8	1984	1.8	1985	1.8	1986	1.8	1987	1.8	1988	1.4
1978	2.4	1979	2.4	1980	2.4	1981	1.8	1982	1.8	1983	1.8	1984	1.8	1985	1.8	1986	1.8	1987	1.8	1988	1.4	1989	1.4
1979	2.4	1980	2.4	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.7	1986	1.7	1987	1.7	1988	1.3	1989	1.3	1990	1.3
1980	2.3	1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.7	1986	1.7	1987	1.7	1988	1.3	1989	1.3	1990	1.3	1991	1.3
1981	1.7	1982	1.7	1983	1.7	1984	1.7	1985	1.7	1986	1.7	1987	1.7	1988	1.3	1989	1.3	1990	1.2	1991	1.2	1992	1.2
1982	1.6	1983	1.6	1984	1.6	1985	1.6	1986	1.6	1987	1.6	1988	1.2	1989	1.2	1990	1.2	1991	1.2	1992	1.2	1993	1.2
1983	1.6	1984	1.6	1985	1.6	1986	1.6	1987	1.6	1988	1.2	1989	1.2	1990	1.1	1991	1.1	1992	1.1	1993	1.1	1994	1.1
1984	1.5	1985	1.5	1986	1.5	1987	1.5	1988	1.1	1989	1.1	1990	1.1	1991	1.1	1992	1.1	1993	1.1	1994	1.1	1995	1.1
1985	1.5	1986	1.5	1987	1.5	1988	1.1	1989	1.1	1990	1.0	1991	1.0	1992	1.0	1993	1.0	1994	1.0	1995	1.0	1996	1.0

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1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	2.9	1979	2.9	1980	2.9	1981	2.0	1984	2.0	1986	2.0	1989	1.6	1991	1.5	1993	1.5	1996	1.5	1999	1.5	2001	1.5
1979	2.8	1980	2.8	1981	2.0	1982	2.0	1985	2.0	1987	2.0	1990	1.5	1992	1.5	1994	1.5	1997	1.5	2000	1.5	2002	1.5
1980	2.8	1981	2.0	1982	2.0	1983	2.0	1986	2.0	1988	1.6	1991	1.5	1993	1.5	1995	1.5	1998	1.5	2001	1.5	2003	1.5
1981	2.0	1982	2.0	1983	2.0	1984	2.0	1987	2.0	1989	1.5	1992	1.5	1994	1.5	1996	1.5	1999	1.5	2002	1.5	2004	1.5
1982	1.9	1983	1.9	1984	1.9	1985	1.9	1988	1.5	1990	1.5	1993	1.5	1995	1.5	1997	1.5	2000	1.5	2003	1.5	2005	1.5
1983	1.9	1984	1.9	1985	1.9	1986	1.9	1989	1.5	1991	1.5	1994	1.5	1996	1.5	1998	1.5	2001	1.5	2004	1.5	2006	1.5
1984	1.9	1985	1.9	1986	1.9	1987	1.9	1990	1.5	1992	1.5	1995	1.5	1997	1.5	1999	1.5	2002	1.5	2005	1.5	2007	1.5
1985	1.9	1986	1.9	1987	1.9	1988	1.5	1991	1.4	1993	1.4	1996	1.4	1998	1.4	2000	1.4	2003	1.4	2006	1.4	2008	1.4
1986	1.9	1987	1.9	1988	1.5	1989	1.5	1992	1.4	1994	1.4	1997	1.4	1999	1.4	2001	1.4	2004	1.4	2007	1.4	2009	1.4
1987	1.8	1988	1.4	1989	1.4	1990	1.4	1993	1.4	1995	1.4	1998	1.4	2000	1.4	2002	1.4	2005	1.4	2008	1.4	2010	1.4
1988	1.4	1989	1.4	1990	1.4	1991	1.4	1994	1.4	1996	1.4	1999	1.4	2001	1.4	2003	1.4	2006	1.4	2009	1.4	2011	1.4
1989	1.4	1990	1.3	1991	1.3	1992	1.3	1995	1.3	1997	1.3	2000	1.3	2002	1.3	2004	1.3	2007	1.3	2010	1.3	2012	1.3
1990	1.3	1991	1.3	1992	1.3	1993	1.3	1996	1.3	1998	1.3	2001	1.3	2003	1.3	2005	1.3	2008	1.3	2011	1.3	2013	1.3
1991	1.3	1992	1.3	1993	1.3	1994	1.3	1997	1.3	1999	1.3	2002	1.3	2004	1.3	2006	1.3	2009	1.3	2012	1.3	2014	1.3
1992	1.3	1993	1.3	1994	1.3	1995	1.3	1998	1.3	2000	1.3	2003	1.3	2005	1.3	2007	1.3	2010	1.3	2013	1.3	2015	1.3
1993	1.2	1994	1.2	1995	1.2	1996	1.2	1999	1.2	2001	1.2	2004	1.2	2006	1.2	2008	1.2	2011	1.2	2014	1.2	2016	1.2
1994	1.2	1995	1.2	1996	1.2	1997	1.2	2000	1.2	2002	1.2	2005	1.2	2007	1.2	2009	1.2	2012	1.2	2015	1.2	2017	1.2
1995	1.1	1996	1.1	1997	1.1	1998	1.1	2001	1.1	2003	1.1	2006	1.1	2008	1.1	2010	1.1	2013	1.1	2016	1.1	2018	1.1
1996	1.1	1997	1.1	1998	1.1	1999	1.1	2002	1.1	2004	1.1	2007	1.1	2009	1.1	2011	1.1	2014	1.1	2017	1.1	2019	1.1
1997	1.0	1998	1.0	1999	1.0	2000	1.0	2003	1.0	2005	1.0	2008	1.0	2010	1.0	2012	1.0	2015	1.0	2018	1.0	2020	1.0

*MY -- Indicates the model year.

**E - Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on January 1 mileage accumulation figures given in Table 2.6.4A.

TABLE 2.7.1

NONTAMPERED EXHAUST EMISSION RATES FOR
HIGH ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	50,000 Mile Emission Level	100,000 Mile Emission Level
HC	Pre-1967	8.130	0.060	8.430	8.730
	1967-1968	8.430	0.060	8.730	9.030
	1969	8.700	0.060	9.000	9.300
	1970	8.770	0.060	9.070	9.370
	1971-1973	9.010	0.060	9.310	9.610
	1974-1976	9.000	0.060	9.300	9.600
	1977	9.190	0.060	9.490	9.790
	1978	9.020	0.060	9.320	9.620
	1979	8.070	0.0	8.070	8.070
	1980-1981	7.280	0.0	7.280	7.280
	1982	6.370	0.0	6.370	6.370
	1983	6.130	0.0	6.130	6.130
	1984	6.470	0.0	6.470	6.470
	1985	5.950	0.0	5.950	5.950
	1986	5.250	0.0	5.250	5.250
	1987	5.140	0.0	5.140	5.140
	1988-1989	5.010	0.0	5.010	5.010
	1990	4.900	0.0	4.900	4.900
	1991-2000	4.830	0.0	4.830	4.830
	2001+	4.820	0.0	4.820	4.820
CO	Pre-1967	18.050	0.140	18.750	19.450
	1967-1968	18.710	0.150	19.460	20.210
	1969	19.300	0.150	20.050	20.800
	1970	19.470	0.150	20.220	20.970
	1971-1973	19.990	0.160	20.790	21.590
	1974-1976	19.970	0.160	20.770	21.570
	1977	20.380	0.160	21.180	21.980
	1978	20.010	0.160	20.810	21.610
	1979	24.560	0.120	25.160	25.760
	1980-1981	22.170	0.110	22.720	23.270
	1982	19.390	0.090	19.840	20.290
	1983	18.650	0.090	19.100	19.550
	1984	19.710	0.100	20.210	20.710
	1985	18.110	0.090	18.560	19.010
	1986	18.130	0.090	18.580	19.030
	1987	17.750	0.090	18.200	18.650
	1988-1989	17.320	0.080	17.720	18.120
	1990	16.920	0.080	17.320	17.720
	1991-2000	16.680	0.080	17.080	17.480
	2001+	16.660	0.080	17.060	17.460
NOx	Pre-1967	22.990	0.170	23.840	24.690
	1967-1968	23.830	0.180	24.730	25.630
	1969	24.590	0.180	25.490	26.390
	1970	24.800	0.190	25.750	26.700
	1971-1973	25.460	0.190	26.410	27.360
	1974-1976	25.440	0.190	26.390	27.340
	1977	25.970	0.190	26.920	27.870
	1978	25.500	0.190	26.450	27.400
	1979	23.780	0.0	23.780	23.780
	1980-1981	21.470	0.0	21.470	21.470
	1982	18.770	0.0	18.770	18.770
	1983	18.060	0.0	18.060	18.060
	1984	19.080	0.0	19.080	19.080
	1985	17.530	0.0	17.530	17.530
	1986	17.560	0.0	17.560	17.560
	1987	17.180	0.0	17.180	17.180
	1988-1989	16.770	0.0	16.770	16.770
	1990	9.790	0.0	9.790	9.790
	1991-2000	8.010	0.0	8.010	8.010
	2001+	7.990	0.0	7.990	7.990

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile.
ZML = Zero mile level in grams/mile.
DR = Deterioration rate in grams/mile/10K miles.
M = Cumulative mileage / 10,000 miles.

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TABLE 2.7.3

NONTAMPERED HOT STABILIZED IDLE EMISSIONS
FOR HIGH ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES

* IER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate
HC	Pre-1985	49.80	0.0
	1985+	37.20	0.0
CO	All	70.20	0.60
NOx	Pre-1985	55.20	0.0
	1985+	13.20	0.0

* WHERE : IER = Nontampered idle emissions in grams/hour,
ZML = Zero mile level in grams/hour
DR = Deterioration rate in grams/hour/10K miles,
M = Cumulative mileage / 10,000 miles.

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TABLE 2.7.4

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
HIGH ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per vehicle*)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.082	56990.	0.0	0.	0.
2	0.165	52418.	0.165	56990.	28495.
3	0.135	48214.	0.135	52418.	83199.
4	0.111	44348.	0.111	48214.	133514.
5	0.091	40792.	0.091	44348.	179795.
6	0.075	37522.	0.075	40792.	222364.
7	0.061	34514.	0.061	37522.	261521.
8	0.050	31749.	0.050	34514.	297538.
9	0.041	29205.	0.041	31749.	330670.
10	0.034	26865.	0.034	29205.	361147.
11	0.028	24713.	0.028	26865.	389182.
12	0.023	22735.	0.023	24713.	414971.
13	0.019	20914.	0.019	22735.	438695.
14	0.015	19240.	0.015	20914.	460519.
15	0.013	17700.	0.013	19240.	480596.
16	0.010	16283.	0.010	17700.	499065.
17	0.009	14980.	0.009	16283.	516057.
18	0.007	13781.	0.007	14980.	531688.
19	0.006	12678.	0.006	13781.	546069.
20+	0.024	11665.	0.024	12678.	559298.

* Default information that may be altered by the MOBILE4 user with information about the local area. This mileage distribution is applicable to calendar year 1988 only.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1, where: JMAR(1) = 0 and,
JMAR(MYI) = MAR(MYI-1), MYI = 2,...,20+.

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TABLE 2.7.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
HIGH ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES
JANUARY 1, 1988

Model Years	(A) HDDV Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) HDDV Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.0	1.000	0.0	0.0	0.	0.0	0.0
1987	0.165	1.000	0.165	0.180	56990.	10254.4	0.245
1986	0.135	1.000	0.135	0.147	52418.	7716.9	0.184
1985	0.111	1.000	0.111	0.121	48214.	5836.1	0.139
1984	0.091	1.000	0.091	0.099	44348.	4400.9	0.105
1983	0.075	1.000	0.075	0.082	40792.	3336.3	0.080
1982	0.061	1.000	0.061	0.067	37522.	2496.0	0.060
1981	0.050	1.000	0.050	0.055	34514.	1881.9	0.045
1980	0.041	1.000	0.041	0.045	31749.	1419.5	0.034
1979	0.034	1.000	0.034	0.037	29205.	1082.8	0.026
1978	0.028	1.000	0.028	0.031	26865.	820.3	0.020
1977	0.023	1.000	0.023	0.025	24713.	619.9	0.015
1976	0.019	1.000	0.019	0.021	22735.	471.1	0.011
1975	0.015	1.000	0.015	0.016	20914.	342.1	0.008
1974	0.013	1.000	0.013	0.014	19240.	272.8	0.007
1973	0.010	1.000	0.010	0.011	17700.	193.0	0.005
1972	0.009	1.000	0.009	0.010	16283.	159.8	0.004
1971	0.007	1.000	0.007	0.008	14980.	114.4	0.003
1970	0.006	1.000	0.006	0.007	13781.	90.2	0.002
1969-	0.024	1.000	0.024	0.026	12678.	331.8	0.008
			DAF: 0.918		TFNORM:	41840.1	

WHERE :

A = January 1 registration mix from Table 2.7.4,
B = Diesel fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 2.7.4.

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TABLE 2.7.6

SPEED CORRECTION FACTOR COEFFICIENTS FOR
HIGH ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES

* SCF(s) = EXP(A + B*s + C*s**2)

Pol	Model Years	Coefficients A	B	C
HC	All	0.92400	-0.05500	0.00044
CO	All	1.39600	-0.08800	0.00091
NOx	All	0.67600	-0.04800	0.00071

* WHERE: s = average speed (mph).

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TABLE 2.7.10A

METHANE OFFSETS*
FOR HIGH ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES

Model Years	Methane Offsets (Grams/Mile)
Pre-1978	0.333
1978-1981	0.333
1982-1987	0.271
1988+	0.230

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

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TABLE 2.7.10B

CONVERSION FACTORS
FOR HIGH ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES

Model Years	Conversion Factors*
Pre-1962	2.850
1962	2.858
1963	2.874
1964	2.890
1965	2.900
1966	2.964
1967	2.995
1968	3.074
1969	3.100
1970	3.161
1971	3.197
1972	3.188
1973	3.213
1974	3.146
1975	3.179
1976	3.246
1977	3.187
1978	2.999
1979	2.716
1980	2.698
1981	2.376
1982	2.277
1983	2.406
1984	2.211
1985	2.214
1986	2.167
1987	2.132
1988	2.099
1989	2.066
1990	2.050
1991	2.033
1992	2.033
1993	2.033
1994	2.039
1995	2.039
1996	2.037
1997+	2.036

* Convert from grams/brake-hoursepower/hour to grams/mile units.

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TABLE 2.7.11A

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BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	11.5	1967	11.8	1968	11.8	1969	12.1	1970	12.1	1971	12.4	1972	12.4	1973	12.4	1974	12.4	1975	12.4	1976	12.4	1977	12.5
1967	11.7	1968	11.7	1969	12.0	1970	12.0	1971	12.3	1972	12.3	1973	12.3	1974	12.3	1975	12.3	1976	12.3	1977	12.5	1978	12.3
1968	11.6	1969	11.9	1970	12.0	1971	12.2	1972	12.2	1973	12.2	1974	12.2	1975	12.2	1976	12.2	1977	12.4	1978	12.2	1979	8.1
1969	11.8	1970	11.9	1971	12.1	1972	12.1	1973	12.1	1974	12.1	1975	12.1	1976	12.1	1977	12.3	1978	12.1	1979	8.1	1980	7.3
1970	11.8	1971	12.0	1972	12.0	1973	12.0	1974	12.0	1975	12.0	1976	12.0	1977	12.2	1978	12.0	1979	8.1	1980	7.3	1981	7.3
1971	11.9	1972	11.9	1973	11.9	1974	11.9	1975	11.9	1976	11.9	1977	12.1	1978	11.9	1979	8.1	1980	7.3	1981	7.3	1982	6.4
1972	11.8	1973	11.8	1974	11.8	1975	11.8	1976	11.8	1977	12.0	1978	11.8	1979	8.1	1980	7.3	1981	7.3	1982	6.4	1983	6.1
1973	11.6	1974	11.6	1975	11.6	1976	11.6	1977	11.8	1978	11.7	1979	8.1	1980	7.3	1981	7.3	1982	6.4	1983	6.1	1984	6.5
1974	11.5	1975	11.5	1976	11.5	1977	11.7	1978	11.5	1979	8.1	1980	7.3	1981	7.3	1982	6.4	1983	6.1	1984	6.5	1985	5.9
1975	11.3	1976	11.3	1977	11.5	1978	11.4	1979	8.1	1980	7.3	1981	7.3	1982	6.4	1983	6.1	1984	6.5	1985	5.9	1986	5.3
1976	11.2	1977	11.4	1978	11.2	1979	8.1	1980	7.3	1981	7.3	1982	6.4	1983	6.1	1984	6.5	1985	5.9	1986	5.3	1987	5.1
1977	11.2	1978	11.0	1979	8.1	1980	7.3	1981	7.3	1982	6.4	1983	6.1	1984	6.5	1985	5.9	1986	5.3	1987	5.1	1988	5.0
1978	10.8	1979	8.1	1980	7.3	1981	7.3	1982	6.4	1983	6.1	1984	6.5	1985	5.9	1986	5.3	1987	5.1	1988	5.0	1989	5.0
1979	8.1	1980	7.3	1981	7.3	1982	6.4	1983	6.1	1984	6.5	1985	5.9	1986	5.3	1987	5.1	1988	5.0	1989	5.0	1990	4.9
1980	7.3	1981	7.3	1982	6.4	1983	6.1	1984	6.5	1985	5.9	1986	5.3	1987	5.1	1988	5.0	1989	5.0	1990	4.9	1991	4.8
1981	7.3	1982	6.4	1983	6.1	1984	6.5	1985	5.9	1986	5.3	1987	5.1	1988	5.0	1989	5.0	1990	4.9	1991	4.8	1992	4.8
1982	6.4	1983	6.1	1984	6.5	1985	5.9	1986	5.3	1987	5.1	1988	5.0	1989	5.0	1990	4.9	1991	4.8	1992	4.8	1993	4.8
1983	6.1	1984	6.5	1985	5.9	1986	5.3	1987	5.1	1988	5.0	1989	5.0	1990	4.9	1991	4.8	1992	4.8	1993	4.8	1994	4.8
1984	6.5	1985	5.9	1986	5.3	1987	5.1	1988	5.0	1989	5.0	1990	4.9	1991	4.8	1992	4.8	1993	4.8	1994	4.8	1995	4.8
1985	5.9	1986	5.3	1987	5.1	1988	5.0	1989	5.0	1990	4.9	1991	4.8	1992	4.8	1993	4.8	1994	4.8	1995	4.8	1996	4.8

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	12.4	1979	8.1	1980	7.3	1981	7.3	1984	6.5	1986	5.3	1989	5.0	1991	4.8	1993	4.8	1996	4.8	1999	4.8	2001	4.8
1979	8.1	1980	7.3	1981	7.3	1982	6.4	1985	5.9	1987	5.1	1990	4.9	1992	4.8	1994	4.8	1997	4.8	2000	4.8	2002	4.8
1980	7.3	1981	7.3	1982	6.4	1983	6.1	1986	5.3	1988	5.0	1991	4.8	1993	4.8	1995	4.8	1998	4.8	2001	4.8	2003	4.8
1981	7.3	1982	6.4	1983	6.1	1984	6.5	1987	5.1	1989	5.0	1992	4.8	1994	4.8	1996	4.8	1999	4.8	2002	4.8	2004	4.8
1982	6.4	1983	6.1	1984	6.5	1985	5.9	1988	5.0	1990	4.9	1993	4.8	1995	4.8	1997	4.8	2000	4.8	2003	4.8	2005	4.8
1983	6.1	1984	6.5	1985	5.9	1986	5.3	1989	5.0	1991	4.8	1994	4.8	1996	4.8	1998	4.8	2001	4.8	2004	4.8	2006	4.8
1984	6.5	1985	5.9	1986	5.3	1987	5.1	1990	4.9	1992	4.8	1995	4.8	1997	4.8	1999	4.8	2002	4.8	2005	4.8	2007	4.8
1985	5.9	1986	5.3	1987	5.1	1988	5.0	1991	4.8	1993	4.8	1996	4.8	1998	4.8	2000	4.8	2003	4.8	2006	4.8	2008	4.8
1986	5.3	1987	5.1	1988	5.0	1989	5.0	1992	4.8	1994	4.8	1997	4.8	1999	4.8	2001	4.8	2004	4.8	2007	4.8	2009	4.8
1987	5.1	1988	5.0	1989	5.0	1990	4.9	1993	4.8	1995	4.8	1998	4.8	2000	4.8	2002	4.8	2005	4.8	2008	4.8	2010	4.8
1988	5.0	1989	5.0	1990	4.9	1991	4.8	1994	4.8	1996	4.8	1999	4.8	2001	4.8	2003	4.8	2006	4.8	2009	4.8	2011	4.8
1989	5.0	1990	4.9	1991	4.8	1992	4.8	1995	4.8	1997	4.8	2000	4.8	2002	4.8	2004	4.8	2007	4.8	2010	4.8	2012	4.8
1990	4.9	1991	4.8	1992	4.8	1993	4.8	1996	4.8	1998	4.8	2001	4.8	2003	4.8	2005	4.8	2008	4.8	2011	4.8	2013	4.8
1991	4.8	1992	4.8	1993	4.8	1994	4.8	1997	4.8	1999	4.8	2002	4.8	2004	4.8	2006	4.8	2009	4.8	2012	4.8	2014	4.8
1992	4.8	1993	4.8	1994	4.8	1995	4.8	1998	4.8	2000	4.8	2003	4.8	2005	4.8	2007	4.8	2010	4.8	2013	4.8	2015	4.8
1993	4.8	1994	4.8	1995	4.8	1996	4.8	1999	4.8	2001	4.8	2004	4.8	2006	4.8	2008	4.8	2011	4.8	2014	4.8	2016	4.8
1994	4.8	1995	4.8	1996	4.8	1997	4.8	2000	4.8	2002	4.8	2005	4.8	2007	4.8	2009	4.8	2012	4.8	2015	4.8	2017	4.8
1995	4.8	1996	4.8	1997	4.8	1998	4.8	2001	4.8	2003	4.8	2006	4.8	2008	4.8	2010	4.8	2013	4.8	2016	4.8	2018	4.8
1996	4.8	1997	4.8	1998	4.8	1999	4.8	2002	4.8	2004	4.8	2007	4.8	2009	4.8	2011	4.8	2014	4.8	2017	4.8	2019	4.8
1997	4.8	1998	4.8	1999	4.8	2000	4.8	2003	4.8	2005	4.8	2008	4.8	2010	4.8	2012	4.8	2015	4.8	2018	4.8	2020	4.8

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F. Emissions are based on the January 1 mileage accumulation figures given in Table 2.7.4.

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TABLE 2.7.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	25.9	1967	27.1	1968	27.1	1969	27.7	1970	27.9	1971	28.9	1972	28.9	1973	28.9	1974	28.9	1975	28.9	1976	28.9	1977	29.3
1967	26.9	1968	26.9	1969	27.5	1970	27.7	1971	28.7	1972	28.7	1973	28.7	1974	28.7	1975	28.7	1976	28.7	1977	29.1	1978	28.7
1968	26.7	1969	27.3	1970	27.4	1971	28.5	1972	28.5	1973	28.5	1974	28.5	1975	28.5	1976	28.5	1977	28.9	1978	28.5	1979	30.9
1969	27.0	1970	27.2	1971	28.2	1972	28.2	1973	28.2	1974	28.2	1975	28.2	1976	28.2	1977	28.6	1978	28.3	1979	30.8	1980	27.8
1970	27.0	1971	28.0	1972	28.0	1973	28.0	1974	28.0	1975	28.0	1976	28.0	1977	28.4	1978	28.0	1979	30.5	1980	27.7	1981	27.7
1971	27.7	1972	27.7	1973	27.7	1974	27.7	1975	27.7	1976	27.7	1977	28.1	1978	27.7	1979	30.3	1980	27.5	1981	27.5	1982	23.7
1972	27.4	1973	27.4	1974	27.3	1975	27.3	1976	27.3	1977	27.7	1978	27.4	1979	30.1	1980	27.2	1981	27.2	1982	23.5	1983	22.8
1973	27.0	1974	27.0	1975	27.0	1976	27.0	1977	27.4	1978	27.0	1979	29.8	1980	27.0	1981	27.0	1982	23.3	1983	22.6	1984	24.1
1974	26.6	1975	26.6	1976	26.6	1977	27.0	1978	26.6	1979	29.5	1980	26.7	1981	26.7	1982	23.1	1983	22.4	1984	23.9	1985	21.8
1975	26.2	1976	26.2	1977	26.6	1978	26.2	1979	29.2	1980	26.5	1981	26.5	1982	22.9	1983	22.2	1984	23.6	1985	21.6	1986	21.6
1976	25.7	1977	26.2	1978	25.8	1979	28.9	1980	26.1	1981	26.1	1982	22.6	1983	21.9	1984	23.3	1985	21.4	1986	21.4	1987	21.0
1977	25.7	1978	25.3	1979	28.5	1980	25.8	1981	25.8	1982	22.4	1983	21.6	1984	23.0	1985	21.1	1986	21.1	1987	20.7	1988	20.0
1978	24.8	1979	28.1	1980	25.4	1981	25.4	1982	22.1	1983	21.3	1984	22.7	1985	20.8	1986	20.8	1987	20.4	1988	19.7	1989	19.7
1979	27.7	1980	25.0	1981	25.0	1982	21.7	1983	21.0	1984	22.3	1985	20.5	1986	20.5	1987	20.1	1988	19.4	1989	19.4	1990	19.0
1980	24.6	1981	24.6	1982	21.4	1983	20.7	1984	21.9	1985	20.1	1986	20.1	1987	19.8	1988	19.1	1989	19.1	1990	18.7	1991	18.5
1981	24.1	1982	21.0	1983	20.3	1984	21.5	1985	19.7	1986	19.7	1987	19.4	1988	18.8	1989	18.8	1990	18.4	1991	18.1	1992	18.1
1982	20.6	1983	19.9	1984	21.0	1985	19.3	1986	19.3	1987	19.0	1988	18.4	1989	18.4	1990	18.0	1991	17.7	1992	17.7	1993	17.7
1983	19.4	1984	20.5	1985	18.9	1986	18.9	1987	18.5	1988	18.0	1989	18.0	1990	17.6	1991	17.3	1992	17.3	1993	17.3	1994	17.3
1984	20.0	1985	18.4	1986	18.4	1987	18.0	1988	17.5	1989	17.5	1990	17.1	1991	16.9	1992	16.9	1993	16.9	1994	16.9	1995	16.9
1985	18.1	1986	18.1	1987	17.8	1988	17.3	1989	17.3	1990	16.9	1991	16.7	1992	16.7	1993	16.7	1994	16.7	1995	16.7	1996	16.7

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	29.0	1979	31.3	1980	28.3	1981	28.3	1984	25.3	1986	23.2	1989	21.8	1991	21.2	1993	21.2	1996	21.2	1999	21.2	2001	21.1
1979	31.1	1980	28.2	1981	28.2	1982	24.3	1985	23.0	1987	22.7	1990	21.3	1992	21.0	1994	21.0	1997	21.0	2000	21.0	2002	21.0
1980	28.0	1981	28.0	1982	24.2	1983	23.4	1986	22.9	1988	21.6	1991	20.9	1993	20.9	1995	20.9	1998	20.9	2001	20.9	2003	20.9
1981	27.8	1982	24.0	1983	23.3	1984	24.9	1987	22.4	1989	21.4	1992	20.8	1994	20.8	1996	20.8	1999	20.8	2002	20.8	2004	20.8
1982	23.9	1983	23.1	1984	24.7	1985	22.6	1988	21.3	1990	20.9	1993	20.7	1995	20.7	1997	20.7	2000	20.7	2003	20.7	2005	20.7
1983	23.0	1984	24.5	1985	22.4	1986	22.5	1989	21.2	1991	20.5	1994	20.5	1996	20.5	1998	20.5	2001	20.5	2004	20.5	2006	20.5
1984	24.3	1985	22.3	1986	22.3	1987	21.9	1990	20.6	1992	20.4	1995	20.4	1997	20.4	1999	20.4	2002	20.3	2005	20.3	2007	20.3
1985	22.1	1986	22.1	1987	21.7	1988	20.8	1991	20.2	1993	20.2	1996	20.2	1998	20.2	2000	20.2	2003	20.2	2006	20.2	2008	20.2
1986	21.9	1987	21.5	1988	20.6	1989	20.6	1992	20.0	1994	20.0	1997	20.0	1999	20.0	2001	20.0	2004	20.0	2007	20.0	2009	20.0
1987	21.3	1988	20.4	1989	20.4	1990	20.0	1993	19.8	1995	19.8	1998	19.8	2000	19.8	2002	19.8	2005	19.8	2008	19.8	2010	19.8
1988	20.2	1989	20.2	1990	19.8	1991	19.6	1994	19.6	1996	19.6	1999	19.6	2001	19.5	2003	19.5	2006	19.5	2009	19.5	2011	19.5
1989	20.0	1990	19.6	1991	19.3	1992	19.3	1995	19.3	1997	19.3	2000	19.3	2002	19.3	2004	19.3	2007	19.3	2010	19.3	2012	19.3
1990	19.3	1991	19.1	1992	19.1	1993	19.1	1996	19.1	1998	19.1	2001	19.0	2003	19.0	2005	19.0	2008	19.0	2011	19.0	2013	19.0
1991	18.8	1992	18.8	1993	18.8	1994	18.8	1997	18.8	1999	18.8	2002	18.8	2004	18.8	2006	18.8	2009	18.8	2012	18.8	2014	18.8
1992	18.5	1993	18.5	1994	18.5	1995	18.5	1998	18.5	2000	18.5	2003	18.4	2005	18.4	2007	18.4	2010	18.4	2013	18.4	2015	18.4
1993	18.1	1994	18.1	1995	18.1	1996	18.1	1999	18.1	2001	18.1	2004	18.1	2006	18.1	2008	18.1	2011	18.1	2014	18.1	2016	18.1
1994	17.7	1995	17.7	1996	17.7	1997	17.7	2000	17.7	2002	17.7	2005	17.7	2007	17.7	2009	17.7	2012	17.7	2015	17.7	2017	17.7
1995	17.3	1996	17.3	1997	17.3	1998	17.3	2001	17.3	2003	17.3	2006	17.3	2008	17.3	2010	17.3	2013	17.3	2016	17.3	2018	17.3
1996	16.9	1997	16.9	1998	16.9	1999	16.9	2002	16.9	2004	16.9	2007	16.9	2009	16.9	2011	16.9	2014	16.9	2017	16.9	2019	16.9
1997	16.7	1998	16.7	1999	16.7	2000	16.7	2003	16.7	2005	16.7	2008	16.7	2010	16.7	2012	16.7	2015	16.7	2018	16.7	2020	16.7

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F. Emissions are based on the January 1 mileage accumulation figures given in Table 2.7.4.

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TABLE 2.7.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
HEAVY DUTY DIESEL POWERED VEHICLES
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	32.5	1967	33.9	1968	33.9	1969	34.7	1970	35.4	1971	36.1	1972	36.1	1973	36.1	1974	36.1	1975	36.1	1976	36.1	1977	36.6
1967	33.7	1968	33.7	1969	34.4	1970	35.2	1971	35.8	1972	35.8	1973	35.8	1974	35.8	1975	35.8	1976	35.8	1977	36.3	1978	35.9
1968	33.4	1969	34.2	1970	34.9	1971	35.6	1972	35.6	1973	35.6	1974	35.5	1975	35.5	1976	35.5	1977	36.1	1978	35.6	1979	23.8
1969	33.9	1970	34.6	1971	35.3	1972	35.3	1973	35.3	1974	35.2	1975	35.2	1976	35.2	1977	35.8	1978	35.3	1979	23.8	1980	21.5
1970	34.3	1971	34.9	1972	34.9	1973	34.9	1974	34.9	1975	34.9	1976	34.9	1977	35.5	1978	35.0	1979	23.8	1980	21.5	1981	21.5
1971	34.6	1972	34.6	1973	34.6	1974	34.6	1975	34.6	1976	34.6	1977	35.1	1978	34.6	1979	23.8	1980	21.5	1981	21.5	1982	18.8
1972	34.2	1973	34.2	1974	34.2	1975	34.2	1976	34.2	1977	34.7	1978	34.2	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1
1973	33.8	1974	33.8	1975	33.8	1976	33.8	1977	34.3	1978	33.8	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1
1974	33.3	1975	33.3	1976	33.3	1977	33.9	1978	33.4	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5
1975	32.8	1976	32.8	1977	33.4	1978	32.9	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6
1976	32.3	1977	32.8	1978	32.4	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2
1977	32.3	1978	31.8	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8
1978	31.2	1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8
1979	23.8	1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8
1980	21.5	1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8	1991	8.0
1981	21.5	1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8	1991	8.0	1992	8.0
1982	18.8	1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8	1991	8.0	1992	8.0	1993	8.0
1983	18.1	1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8	1991	8.0	1992	8.0	1993	8.0	1994	8.0
1984	19.1	1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8	1991	8.0	1992	8.0	1993	8.0	1994	8.0	1995	8.0
1985	17.5	1986	17.6	1987	17.2	1988	16.8	1989	16.8	1990	9.8	1991	8.0	1992	8.0	1993	8.0	1994	8.0	1995	8.0	1996	8.0

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	36.1	1979	23.8	1980	21.5	1981	21.5	1984	19.1	1986	17.6	1989	16.8	1991	8.0	1993	8.0	1996	8.0	1999	8.0	2001	8.0
1979	23.8	1980	21.5	1981	21.5	1982	18.8	1985	17.5	1987	17.2	1990	9.8	1992	8.0	1994	8.0	1997	8.0	2000	8.0	2002	8.0
1980	21.5	1981	21.5	1982	18.8	1983	18.1	1986	17.6	1988	16.8	1991	8.0	1993	8.0	1995	8.0	1998	8.0	2001	8.0	2003	8.0
1981	21.5	1982	18.8	1983	18.1	1984	19.1	1987	17.2	1989	16.8	1992	8.0	1994	8.0	1996	8.0	1999	8.0	2002	8.0	2004	8.0
1982	18.8	1983	18.1	1984	19.1	1985	17.5	1988	16.8	1990	9.8	1993	8.0	1995	8.0	1997	8.0	2000	8.0	2003	8.0	2005	8.0
1983	18.1	1984	19.1	1985	17.5	1986	17.6	1989	16.8	1991	8.0	1994	8.0	1996	8.0	1998	8.0	2001	8.0	2004	8.0	2006	8.0
1984	19.1	1985	17.5	1986	17.6	1987	17.2	1990	9.8	1992	8.0	1995	8.0	1997	8.0	1999	8.0	2002	8.0	2005	8.0	2007	8.0
1985	17.5	1986	17.6	1987	17.2	1988	16.8	1991	8.0	1993	8.0	1996	8.0	1998	8.0	2000	8.0	2003	8.0	2006	8.0	2008	8.0
1986	17.6	1987	17.2	1988	16.8	1989	16.8	1992	8.0	1994	8.0	1997	8.0	1999	8.0	2001	8.0	2004	8.0	2007	8.0	2009	8.0
1987	17.2	1988	16.8	1989	16.8	1990	9.8	1993	8.0	1995	8.0	1998	8.0	2000	8.0	2002	8.0	2005	8.0	2008	8.0	2010	8.0
1988	16.8	1989	16.8	1990	9.8	1991	8.0	1994	8.0	1996	8.0	1999	8.0	2001	8.0	2003	8.0	2006	8.0	2009	8.0	2011	8.0
1989	16.8	1990	9.8	1991	8.0	1992	8.0	1995	8.0	1997	8.0	2000	8.0	2002	8.0	2004	8.0	2007	8.0	2010	8.0	2012	8.0
1990	9.8	1991	8.0	1992	8.0	1993	8.0	1996	8.0	1998	8.0	2001	8.0	2003	8.0	2005	8.0	2008	8.0	2011	8.0	2013	8.0
1991	8.0	1992	8.0	1993	8.0	1994	8.0	1997	8.0	1999	8.0	2002	8.0	2004	8.0	2006	8.0	2009	8.0	2012	8.0	2014	8.0
1992	8.0	1993	8.0	1994	8.0	1995	8.0	1998	8.0	2000	8.0	2003	8.0	2005	8.0	2007	8.0	2010	8.0	2013	8.0	2015	8.0
1993	8.0	1994	8.0	1995	8.0	1996	8.0	1999	8.0	2001	8.0	2004	8.0	2006	8.0	2008	8.0	2011	8.0	2014	8.0	2016	8.0
1994	8.0	1995	8.0	1996	8.0	1997	8.0	2000	8.0	2002	8.0	2005	8.0	2007	8.0	2009	8.0	2012	8.0	2015	8.0	2017	8.0
1995	8.0	1996	8.0	1997	8.0	1998	8.0	2001	8.0	2003	8.0	2006	8.0	2008	8.0	2010	8.0	2013	8.0	2016	8.0	2018	8.0
1996	8.0	1997	8.0	1998	8.0	1999	8.0	2002	8.0	2004	8.0	2007	8.0	2009	8.0	2011	8.0	2014	8.0	2017	8.0	2019	8.0
1997	8.0	1998	8.0	1999	8.0	2000	8.0	2003	8.0	2005	8.0	2008	8.0	2010	8.0	2012	8.0	2015	8.0	2018	8.0	2020	8.0

*MY -- Indicates the model year.
**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F. Emissions are based on the January 1 mileage accumulation figures given in Table 2.7.4.

TABLE 2.8.1

NONTAMPERED EXHAUST EMISSION RATES FOR
HIGH ALTITUDE
MOTORCYCLES

* BER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate	12,000 Mile Emission Level	24,000 Mile Emission Level
HC	Pre-1978	11.430	0.750	12.330	13.230
	1978-1979	3.020	1.440	4.748	6.476
	1980-1981	2.950	1.150	4.330	5.710
	1982-1984	2.520	0.950	3.660	4.800
	1985-1987	2.000	0.750	2.900	3.800
	1988+	1.840	0.700	2.680	3.520
CO	Pre-1978	50.130	3.220	53.994	57.858
	1978-1979	37.070	3.560	41.342	45.614
	1980-1981	33.090	2.530	36.126	39.162
	1982+	32.890	2.460	35.842	38.794
NOx	Pre-1978	0.140	0.030	0.176	0.212
	1978-1979	0.450	0.0	0.450	0.450
	1980+	0.570	0.0	0.570	0.570

* WHERE : BER = Nontampered basic exhaust emission rates in grams/mile,
ZML = Zero mile level in grams/mile,
DR = Deterioration rate in grams/mile/10K miles,
M = Cumulative mileage / 10,000 miles.

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TABLE 2.8.2

NONTAMPERED
CRANKCASE AND EVAPORATIVE HYDROCARBON EMISSIONS*
FOR HIGH ALTITUDE
MOTORCYCLES

Model Years	Crankcase (Gm/Mile)	--- RVP = 9.0 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)	--- RVP = 11.5 psi -- Hot Soak (Gm/Test)	Diurnal (Gm/Test)
Pre-1978	0.40	5.21	8.49	7.98	15.63
1978-1979	0.0	11.71	11.43	17.93	21.02
1980-1981	0.0	12.53	11.87	19.17	21.84
1982-1984	0.0	12.94	12.01	19.79	22.10
1985+	0.0	12.87	12.16	19.69	22.36

* Hot Soak emissions = 82F ambient temperature,
Diurnal emissions = 60 to 84F one hour heat build,
No fuel weathering, tested at 40% tank level.

Based on averages of 1.35 trips per day and 10.02 miles per day.

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TABLE 2.8.3

NONTAMPERED HOT STABILIZED IDLE EMISSIONS
FOR HIGH ALTITUDE
MOTORCYCLES

* IER = ZML + (DR * M)

Pol	Model Years	Zero Mile Emission Level	Deterioration Rate
HC	Pre-1978	144.60	25.20
	1978-1979	31.80	21.60
	1980+	46.80	22.80
CO	Pre-1978	301.80	13.80
	1978-1979	140.40	30.00
	1980+	153.60	15.60
NOx	Pre-1978	0.60	0.0
	1978+	1.20	0.0

* WHERE : IER = Nontampered idle emissions in grams/hour,
ZML = Zero mile level in grams/hour
DR = Deterioration rate in grams/hour/10K miles,
M = Cumulative mileage / 10,000 miles.

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TABLE 2.8.4

REGISTRATION MIX AND
MILEAGE ACCUMULATION RATES FOR
HIGH ALTITUDE
MOTORCYCLES

Model Year Index**	July 1 Registration Mix*	Mileage Accumulation Rate (per vehicle*)	Jan 1 Registration Mix	Jan 1 Mileage Accumulation Rate*** (fleet)	Jan 1 Mileage Accumulation (fleet)
1	0.144	4786.	0.048	0.	0.
2	0.168	4475.	0.168	4786.	2393.
3	0.135	4164.	0.135	4475.	7023.
4	0.109	3853.	0.109	4164.	11343.
5	0.088	3543.	0.088	3853.	15351.
6	0.070	3232.	0.070	3543.	19049.
7	0.056	2921.	0.056	3232.	22437.
8	0.045	2611.	0.045	2921.	25513.
9	0.036	2300.	0.036	2611.	28279.
10	0.029	1989.	0.029	2300.	30735.
11	0.023	1678.	0.023	1989.	32879.
12	0.097	1368.	0.097	1678.	34713.
13	0.0	0.	0.0	1368.	36236.
14	0.0	0.	0.0	0.	36920.
15	0.0	0.	0.0	0.	36920.
16	0.0	0.	0.0	0.	36920.
17	0.0	0.	0.0	0.	36920.
18	0.0	0.	0.0	0.	36920.
19	0.0	0.	0.0	0.	36920.
20+	0.0	0.	0.0	0.	36920.

* Default information that may be altered by the MOBILE4 user with information about the local area.

** The indices refer to the most recent model year vehicles in any given calendar year. Index 1 references the newest model year vehicles and index 20+ references the oldest model year vehicles.

*** Sales weighted fleet mileage accumulation adjusted to January 1, where: JMAR(1) = 0 and,
JMAR(MYI) = MAR(MYI-1), MYI = 2,...,20+.

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TABLE 2.8.5

EXAMPLE TRAVEL WEIGHTING FRACTION CALCULATION FOR
HIGH ALTITUDE
MOTORCYCLES
JANUARY 1, 1988

Model Years	(A) MC Fleet Registration	(B) Sales Fraction	(A*B)	(C=A*B/DAF) MC Registration	(D) Annual Mileage Accrual Rate	(C*D)	(C*D/TFNORM) Travel Fractions
1988	0.048	1.000	0.048	0.0	0.	0.0	0.0
1987	0.168	1.000	0.168	0.196	4786.	939.3	0.257
1986	0.135	1.000	0.135	0.158	4475.	705.8	0.193
1985	0.109	1.000	0.109	0.127	4164.	530.2	0.145
1984	0.088	1.000	0.088	0.103	3853.	396.1	0.108
1983	0.070	1.000	0.070	0.082	3543.	289.7	0.079
1982	0.056	1.000	0.056	0.065	3232.	211.4	0.058
1981	0.045	1.000	0.045	0.053	2921.	153.6	0.042
1980	0.036	1.000	0.036	0.042	2611.	109.8	0.030
1979	0.029	1.000	0.029	0.034	2300.	77.9	0.021
1978	0.023	1.000	0.023	0.027	1989.	53.4	0.015
1977	0.097	1.000	0.097	0.113	1678.	190.1	0.052
1976	0.0	1.000	0.0	0.0	1368.	0.0	0.0
1975	0.0	1.000	0.0	0.0	0.	0.0	0.0
1974	0.0	1.000	0.0	0.0	0.	0.0	0.0
1973	0.0	1.000	0.0	0.0	0.	0.0	0.0
1972	0.0	1.000	0.0	0.0	0.	0.0	0.0
1971	0.0	1.000	0.0	0.0	0.	0.0	0.0
1970	0.0	1.000	0.0	0.0	0.	0.0	0.0
1969-	0.0	1.000	0.0	0.0	0.	0.0	0.0
		DAF:	0.904		TFNORM:	3657.4	

WHERE :

A = January 1 registration mix from Table 2.8.4,
B = Gasoline fleet sales fractions,
D = Sales weighted fleet mileage accumulation rate from Table 2.8.4.

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TABLE 2.8.6

SPEED CORRECTION FACTOR COEFFICIENTS FOR HIGH ALTITUDE MOTORCYCLES

* SCF(s,sadj) = SF(s)/SF(sadj)

SF(s) = EXP(A + B*s + C*s**2+ D*S**3+ E*s**4+ F*s**5), HC & CO
= A + B*s + C*s**2+ D*s**3+ E*s**4 + F*s**5, NOx

Pollutant and Model Years	A	B	C	D	E	F
HC						
Pre-1978	0.224612E+01	-0.290973E+00	0.158890E-01	-0.472494E-03	0.694077E-05	-0.392798E-07
1978-1979	0.215056E+01	-0.283620E+00	0.153836E-01	-0.442136E-03	0.628732E-05	-0.346311E-07
1980+	0.212230E+01	-0.291072E+00	0.169089E-01	-0.526148E-03	0.802705E-05	-0.470117E-07
CO						
Pre-1978	0.181978E+01	-0.254663E+00	0.152347E-01	-0.487397E-03	0.758207E-05	-0.449514E-07
1978-1979	0.182133E+01	-0.272054E+00	0.170304E-01	-0.552021E-03	0.862543E-05	-0.511440E-07
1980+	0.204533E+01	-0.310618E+00	0.204852E-01	-0.708527E-03	0.116215E-04	-0.715690E-07
NOx						
Pre-1978	0.244424E+01	-0.250107E+00	0.138293E-01	-0.287025E-03	0.207585E-05	0.0
1978+	0.144825E+01	-0.122444E+00	0.795024E-02	-0.171078E-03	0.125777E-05	0.0

* WHERE : s = average speed (mph),
sadj = basic test procedure speed; adjusted for fraction of cold start operation x and fraction of hot start operation w, [1/sadj = (w+x)/26 + (1-w-x)/16].

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TABLE 2.8.7A

LOW (< 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
FOR HIGH ALTITUDE
MOTORCYCLES

* TCF(b) = EXP [TC(b)*(T - 75.0)]

Pol	Model Years	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1978	-0.20623E-01	-0.24032E-02	-0.10081E-02
	1978-1979	-0.24462E-01	-0.32017E-02	-0.86884E-03
	1980+	-0.21255E-01	-0.52755E-03	0.93659E-03
CO	Pre-1978	-0.13487E-01	0.15784E-02	-0.11097E-02
	1978-1979	-0.21126E-01	-0.15289E-02	0.15749E-02
	1980+	-0.20843E-01	-0.59951E-02	0.18253E-02
NOx	Pre-1978	-0.16897E-03	-0.89245E-02	-0.72580E-02
	1978+	-0.25074E-03	-0.59791E-02	-0.62690E-02

* WHERE :

TCF(b) = Low temperature correction factor for appropriate pollutant, ambient temperature (< 75F), and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = Low temperature correction factor coefficient for appropriate pollutant, reference temperature, and model year, for test segment b.

NOTE : The low temperature correction factor is used in conjunction with the correction factor given in Table 2.8.7C.

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TABLE 2.8.7B

HIGH (> 75F) TEMPERATURE CORRECTION FACTOR COEFFICIENTS
FOR HIGH ALTITUDE
MOTORCYCLES

$$= TCF(b) = EXP [TC(b)*(T - 75.0)]$$

Pol	Model Years	Test Segment 1	Test Segment 2	Test Segment 3
HC	Pre-1978	-0.14381E-01	0.13219E-02	0.34799E-02
	1978-1979	-0.12552E-01	0.42667E-02	0.75843E-02
	1980+	-0.10888E-01	-0.47925E-03	0.76666E-02
CO	Pre-1978	-0.14691E-01	0.37462E-02	0.11014E-01
	1978-1979	-0.38767E-01	0.84685E-02	0.25179E-01
	1980+	-0.21165E-01	0.23603E-01	0.28483E-01
NOx	Pre-1978	0.38841E-02	-0.87325E-02	-0.10839E-01
	1978+	-0.10389E-02	-0.92466E-02	-0.10108E-01

= WHERE :

TCF(b) = High temperature correction factor for appropriate pollutant, ambient temperature, and model year, for test segment b.
T = Ambient temperature (Fahrenheit).
TC(b) = High temperature correction factor coefficient for appropriate pollutant, temperature, and model year, for test segment b.

NOTE : The temperature correction factor is used in conjunction with the correction factor given in Table 2.8.7C.

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TABLE 2.8.7C

NORMALIZED BAG FRACTIONS FOR HIGH ALTITUDE MOTORCYCLES

Pol	Model Years	Normalized Fractions: Test Segment 1 B1	Test Segment 1 D1	Test Segment 2 B2	Test Segment 2 D2	Test Segment 3 B3	Test Segment 3 D3	Total Test BO	Total Test DO
HC	Pre-1978	1.2823	0.1059	0.9726	0.0774	0.8393	0.0843	1.0000	0.0854
	1978-1979	1.2818	0.7474	0.9728	0.5470	0.8392	0.5929	1.0000	0.6012
	1980+	1.2829	0.7427	0.9713	0.5454	0.8414	0.5869	1.0000	0.5973
CO	Pre-1978	1.2772	0.1523	1.0172	0.0877	0.7580	0.0712	1.0000	0.0964
	1978-1979	1.2774	0.2308	1.0171	0.1324	0.7580	0.1078	1.0000	0.1459
	1980+	1.2776	0.2284	1.0171	0.1314	0.7579	0.1068	1.0000	0.1445
NOx	Pre-1978	1.1112	0.1984	0.7937	0.1191	1.3097	0.1191	1.0000	0.1191
	1978+	1.1118	0.0	0.7899	0.0	1.3166	0.0	1.0000	0.0

NOTE : The fractions given in this table are used in the calculation of the operating-mode/temperature correction factor (OMTCF).

WHERE :

OMTCF = [(TERM1 + TERM2 + TERM3)/DENOM],
TERM1 = W *TCF(1)*(B1+D1*M),
TERM2 = (1-W-X)*TCF(2)*(B2+D2*M),
TERM3 = X *TCF(3)*(B3+D3*M),
DENOM = BO + DO*M,
W = Fraction of VMT in the cold start mode,
X = Fraction of VMT in the hot start mode,
TCF(b) = Temperature correction factor for pollutant, model year, for test segment b,
M = Cumulative mileage / 10,000 miles.

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TABLE 2.8.10A

METHANE OFFSETS*
FOR HIGH ALTITUDE
MOTORCYCLES

Model Years	Methane Offsets (Grams/Mile)
Pre-1978	0.068
1978-1979	0.034
1980+	0.037

* Methane offsets are used to estimate nonmethane hydrocarbon emissions (NMHC), i.e., NMHC = Total HC - Methane Offset.

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TABLE 2.8.11A

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BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
MOTORCYCLES
TOTAL NONMETHANE HC

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	15.7	1967	15.7	1968	15.7	1969	15.7	1970	15.7	1971	15.7	1972	15.7	1973	15.7	1974	15.7	1975	15.7	1976	15.7	1977	15.7
1967	15.7	1968	15.7	1969	15.7	1970	15.7	1971	15.7	1972	15.7	1973	15.7	1974	15.7	1975	15.7	1976	15.7	1977	15.7	1978	10.1
1968	15.7	1969	15.7	1970	15.7	1971	15.7	1972	15.7	1973	15.7	1974	15.7	1975	15.7	1976	15.7	1977	15.7	1978	10.1	1979	10.1
1969	15.7	1970	15.7	1971	15.7	1972	15.7	1973	15.7	1974	15.7	1975	15.7	1976	15.7	1977	15.7	1978	10.1	1979	10.1	1980	9.1
1970	15.7	1971	15.7	1972	15.7	1973	15.7	1974	15.7	1975	15.7	1976	15.7	1977	15.7	1978	10.1	1979	10.1	1980	9.1	1981	9.1
1971	15.7	1972	15.7	1973	15.7	1974	15.7	1975	15.7	1976	15.7	1977	15.7	1978	10.1	1979	10.1	1980	9.1	1981	9.1	1982	8.0
1972	15.7	1973	15.7	1974	15.7	1975	15.7	1976	15.7	1977	15.7	1978	10.1	1979	10.1	1980	9.1	1981	9.1	1982	8.0	1983	8.0
1973	15.6	1974	15.6	1975	15.6	1976	15.6	1977	15.6	1978	10.1	1979	10.1	1980	9.0	1981	9.0	1982	7.9	1983	7.9	1984	7.9
1974	15.5	1975	15.5	1976	15.5	1977	15.5	1978	9.8	1979	9.8	1980	8.9	1981	8.9	1982	7.8	1983	7.8	1984	7.8	1985	6.6
1975	15.4	1976	15.4	1977	15.4	1978	9.6	1979	9.6	1980	8.6	1981	8.6	1982	7.6	1983	7.6	1984	7.6	1985	6.4	1986	6.4
1976	15.2	1977	15.2	1978	9.3	1979	9.3	1980	8.4	1981	8.4	1982	7.4	1983	7.4	1984	7.4	1985	6.3	1986	6.3	1987	6.3
1977	15.0	1978	8.9	1979	8.9	1980	8.1	1981	8.1	1982	7.2	1983	7.2	1984	7.2	1985	6.1	1986	6.1	1987	6.1	1988	5.8
1978	8.5	1979	8.5	1980	7.8	1981	7.8	1982	6.9	1983	6.9	1984	6.9	1985	5.9	1986	5.9	1987	5.9	1988	5.6	1989	5.6
1979	8.1	1980	7.4	1981	7.4	1982	6.6	1983	6.6	1984	6.6	1985	5.6	1986	5.6	1987	5.6	1988	5.4	1989	5.4	1990	5.4
1980	7.1	1981	7.1	1982	6.3	1983	6.3	1984	6.3	1985	5.4	1986	5.4	1987	5.4	1988	5.1	1989	5.1	1990	5.1	1991	5.1
1981	6.6	1982	5.9	1983	5.9	1984	5.9	1985	5.1	1986	5.1	1987	5.1	1988	4.9	1989	4.9	1990	4.9	1991	4.9	1992	4.9
1982	5.6	1983	5.6	1984	5.6	1985	4.8	1986	4.8	1987	4.8	1988	4.6	1989	4.6	1990	4.6	1991	4.6	1992	4.6	1993	4.6
1983	5.1	1984	5.1	1985	4.5	1986	4.5	1987	4.5	1988	4.3	1989	4.3	1990	4.3	1991	4.3	1992	4.3	1993	4.3	1994	4.3
1984	4.7	1985	4.1	1986	4.1	1987	4.1	1988	4.0	1989	4.0	1990	4.0	1991	4.0	1992	4.0	1993	4.0	1994	4.0	1995	4.0
1985	4.0	1986	4.0	1987	4.0	1988	3.8	1989	3.8	1990	3.8	1991	3.8	1992	3.8	1993	3.8	1994	3.8	1995	3.8	1996	3.8

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	10.1	1979	10.1	1980	9.1	1981	9.1	1984	8.0	1986	6.7	1989	6.4	1991	6.4	1993	6.4	1996	6.4	1999	6.4	2001	6.4
1979	10.1	1980	9.1	1981	9.1	1982	8.0	1985	6.7	1987	6.7	1990	6.4	1992	6.4	1994	6.4	1997	6.4	2000	6.4	2002	6.4
1980	9.1	1981	9.1	1982	8.0	1983	8.0	1986	6.7	1988	6.4	1991	6.4	1993	6.4	1995	6.4	1998	6.4	2001	6.4	2003	6.4
1981	9.1	1982	8.0	1983	8.0	1984	8.0	1987	6.7	1989	6.4	1992	6.4	1994	6.4	1996	6.4	1999	6.4	2002	6.4	2004	6.4
1982	8.0	1983	8.0	1984	8.0	1985	6.7	1988	6.4	1990	6.4	1993	6.4	1995	6.4	1997	6.4	2000	6.4	2003	6.4	2005	6.4
1983	8.0	1984	8.0	1985	6.7	1986	6.7	1989	6.4	1991	6.4	1994	6.4	1996	6.4	1998	6.4	2001	6.4	2004	6.4	2006	6.4
1984	8.0	1985	6.7	1986	6.7	1987	6.7	1990	6.4	1992	6.4	1995	6.4	1997	6.4	1999	6.4	2002	6.4	2005	6.4	2007	6.4
1985	6.7	1986	6.7	1987	6.7	1988	6.3	1991	6.3	1993	6.3	1996	6.3	1998	6.3	2000	6.3	2003	6.3	2006	6.3	2008	6.3
1986	6.6	1987	6.6	1988	6.2	1989	6.2	1992	6.2	1994	6.2	1997	6.2	1999	6.2	2001	6.2	2004	6.2	2007	6.2	2009	6.2
1987	6.4	1988	6.1	1989	6.1	1990	6.1	1993	6.1	1995	6.1	1998	6.1	2000	6.1	2002	6.1	2005	6.1	2008	6.1	2010	6.1
1988	6.0	1989	6.0	1990	6.0	1991	6.0	1994	6.0	1996	6.0	1999	6.0	2001	6.0	2003	6.0	2006	6.0	2009	6.0	2011	6.0
1989	5.8	1990	5.8	1991	5.8	1992	5.8	1995	5.8	1997	5.8	2000	5.8	2002	5.8	2004	5.8	2007	5.8	2010	5.8	2012	5.8
1990	5.6	1991	5.6	1992	5.6	1993	5.6	1996	5.6	1998	5.6	2001	5.6	2003	5.6	2005	5.6	2008	5.6	2011	5.6	2013	5.6
1991	5.4	1992	5.4	1993	5.4	1994	5.4	1997	5.4	1999	5.4	2002	5.4	2004	5.4	2006	5.4	2009	5.4	2012	5.4	2014	5.4
1992	5.1	1993	5.1	1994	5.1	1995	5.1	1998	5.1	2000	5.1	2003	5.1	2005	5.1	2007	5.1	2010	5.1	2013	5.1	2015	5.1
1993	4.9	1994	4.9	1995	4.9	1996	4.9	1999	4.9	2001	4.9	2004	4.9	2006	4.9	2008	4.9	2011	4.9	2014	4.9	2016	4.9
1994	4.6	1995	4.6	1996	4.6	1997	4.6	2000	4.6	2002	4.6	2005	4.6	2007	4.6	2009	4.6	2012	4.6	2015	4.6	2017	4.6
1995	4.3	1996	4.3	1997	4.3	1998	4.3	2001	4.3	2003	4.3	2006	4.3	2008	4.3	2010	4.3	2013	4.3	2016	4.3	2018	4.3
1996	4.0	1997	4.0	1998	4.0	1999	4.0	2002	4.0	2004	4.0	2007	4.0	2009	4.0	2011	4.0	2014	4.0	2017	4.0	2019	4.0
1997	3.8	1998	3.8	1999	3.8	2000	3.8	2003	3.8	2005	3.8	2008	3.8	2010	3.8	2012	3.8	2015	3.8	2018	3.8	2020	3.8

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start, 60 TO 84F diurnal, 75F for hot soak 9.0 psi fuel RVP, 54.57% average in-use fuel tank level. Emissions are based on January 1 mileage accumulation figures given in Table 2.8.4.

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TABLE 2.8.11B

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
MOTORCYCLES
CO

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	62.0	1967	62.0	1968	62.0	1969	62.0	1970	62.0	1971	62.0	1972	62.0	1973	62.0	1974	62.0	1975	62.0	1976	62.0	1977	62.0
1967	62.0	1968	62.0	1969	62.0	1970	62.0	1971	62.0	1972	62.0	1973	62.0	1974	62.0	1975	62.0	1976	62.0	1977	62.0	1978	50.2
1968	62.0	1969	62.0	1970	62.0	1971	62.0	1972	62.0	1973	62.0	1974	62.0	1975	62.0	1976	62.0	1977	62.0	1978	50.2	1979	50.2
1969	62.0	1970	62.0	1971	62.0	1972	62.0	1973	62.0	1974	62.0	1975	62.0	1976	62.0	1977	62.0	1978	50.2	1979	50.2	1980	42.4
1970	62.0	1971	62.0	1972	62.0	1973	62.0	1974	62.0	1975	62.0	1976	62.0	1977	62.0	1978	50.2	1979	50.2	1980	42.4	1981	42.4
1971	62.0	1972	62.0	1973	62.0	1974	62.0	1975	62.0	1976	62.0	1977	62.0	1978	50.2	1979	50.2	1980	42.4	1981	42.4	1982	42.0
1972	62.0	1973	62.0	1974	62.0	1975	62.0	1976	62.0	1977	62.0	1978	50.2	1979	50.2	1980	42.4	1981	42.4	1982	42.0	1983	42.0
1973	61.8	1974	61.8	1975	61.8	1976	61.8	1977	61.8	1978	50.0	1979	50.0	1980	42.3	1981	42.3	1982	41.8	1983	41.8	1984	41.8
1974	61.3	1975	61.3	1976	61.3	1977	61.3	1978	49.4	1979	49.4	1980	41.9	1981	41.9	1982	41.4	1983	41.4	1984	41.4	1985	41.4
1975	60.7	1976	60.7	1977	60.7	1978	48.8	1979	48.8	1980	41.4	1981	41.4	1982	41.0	1983	41.0	1984	41.0	1985	41.0	1986	41.0
1976	60.0	1977	60.0	1978	48.0	1979	48.0	1980	40.9	1981	40.9	1982	40.5	1983	40.5	1984	40.5	1985	40.5	1986	40.5	1987	40.5
1977	59.3	1978	47.2	1979	47.2	1980	40.3	1981	40.3	1982	39.9	1983	39.9	1984	39.9	1985	39.9	1986	39.9	1987	39.9	1988	39.9
1978	46.2	1979	46.2	1980	39.6	1981	39.6	1982	39.2	1983	39.2	1984	39.2	1985	39.2	1986	39.2	1987	39.2	1988	39.2	1989	39.2
1979	45.1	1980	38.8	1981	38.8	1982	38.4	1983	38.4	1984	38.4	1985	38.4	1986	38.4	1987	38.4	1988	38.4	1989	38.4	1990	38.4
1980	37.9	1981	37.9	1982	37.6	1983	37.6	1984	37.6	1985	37.6	1986	37.6	1987	37.6	1988	37.6	1989	37.6	1990	37.6	1991	37.6
1981	37.0	1982	36.7	1983	36.7	1984	36.7	1985	36.7	1986	36.7	1987	36.7	1988	36.7	1989	36.7	1990	36.7	1991	36.7	1992	36.7
1982	35.7	1983	35.7	1984	35.7	1985	35.7	1986	35.7	1987	35.7	1988	35.7	1989	35.7	1990	35.7	1991	35.7	1992	35.7	1993	35.7
1983	34.6	1984	34.6	1985	34.6	1986	34.6	1987	34.6	1988	34.6	1989	34.6	1990	34.6	1991	34.6	1992	34.6	1993	34.6	1994	34.6
1984	33.5	1985	33.5	1986	33.5	1987	33.5	1988	33.5	1989	33.5	1990	33.5	1991	33.5	1992	33.5	1993	33.5	1994	33.5	1995	33.5
1985	32.9	1986	32.9	1987	32.9	1988	32.9	1989	32.9	1990	32.9	1991	32.9	1992	32.9	1993	32.9	1994	32.9	1995	32.9	1996	32.9

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	50.2	1979	50.2	1980	42.4	1981	42.4	1984	42.0	1986	42.0	1989	42.0	1991	42.0	1993	42.0	1996	42.0	1999	42.0	2001	42.0
1979	50.2	1980	42.4	1981	42.4	1982	42.0	1985	42.0	1987	42.0	1990	42.0	1992	42.0	1994	42.0	1997	42.0	2000	42.0	2002	42.0
1980	42.4	1981	42.4	1982	42.0	1983	42.0	1986	42.0	1988	42.0	1991	42.0	1993	42.0	1995	42.0	1998	42.0	2001	42.0	2003	42.0
1981	42.4	1982	42.0	1983	42.0	1984	42.0	1987	42.0	1989	42.0	1992	42.0	1994	42.0	1996	42.0	1999	42.0	2002	42.0	2004	42.0
1982	42.0	1983	42.0	1984	42.0	1985	42.0	1988	42.0	1990	42.0	1993	42.0	1995	42.0	1997	42.0	2000	42.0	2003	42.0	2005	42.0
1983	42.0	1984	42.0	1985	42.0	1986	42.0	1989	42.0	1991	42.0	1994	42.0	1996	42.0	1998	42.0	2001	42.0	2004	42.0	2006	42.0
1984	42.0	1985	42.0	1986	42.0	1987	42.0	1990	42.0	1992	42.0	1995	42.0	1997	42.0	1999	42.0	2002	42.0	2005	42.0	2007	42.0
1985	41.8	1986	41.8	1987	41.8	1988	41.8	1991	41.8	1993	41.8	1996	41.8	1998	41.8	2000	41.8	2003	41.8	2006	41.8	2008	41.8
1986	41.4	1987	41.4	1988	41.4	1989	41.4	1992	41.4	1994	41.4	1997	41.4	1999	41.4	2001	41.4	2004	41.4	2007	41.4	2009	41.4
1987	41.0	1988	41.0	1989	41.0	1990	41.0	1993	41.0	1995	41.0	1998	41.0	2000	41.0	2002	41.0	2005	41.0	2008	41.0	2010	41.0
1988	40.5	1989	40.5	1990	40.5	1991	40.5	1994	40.5	1996	40.5	1999	40.5	2001	40.5	2003	40.5	2006	40.5	2009	40.5	2011	40.5
1989	39.9	1990	39.9	1991	39.9	1992	39.9	1995	39.9	1997	39.9	2000	39.9	2002	39.9	2004	39.9	2007	39.9	2010	39.9	2012	39.9
1990	39.2	1991	39.2	1992	39.2	1993	39.2	1996	39.2	1998	39.2	2001	39.2	2003	39.2	2005	39.2	2008	39.2	2011	39.2	2013	39.2
1991	38.4	1992	38.4	1993	38.4	1994	38.4	1997	38.4	1999	38.4	2002	38.4	2004	38.4	2006	38.4	2009	38.4	2012	38.4	2014	38.4
1992	37.6	1993	37.6	1994	37.6	1995	37.6	1998	37.6	2000	37.6	2003	37.6	2005	37.6	2007	37.6	2010	37.6	2013	37.6	2015	37.6
1993	36.7	1994	36.7	1995	36.7	1996	36.7	1999	36.7	2001	36.7	2004	36.7	2006	36.7	2008	36.7	2011	36.7	2014	36.7	2016	36.7
1994	35.7	1995	35.7	1996	35.7	1997	35.7	2000	35.7	2002	35.7	2005	35.7	2007	35.7	2009	35.7	2012	35.7	2015	35.7	2017	35.7
1995	34.6	1996	34.6	1997	34.6	1998	34.6	2001	34.6	2003	34.6	2006	34.6	2008	34.6	2010	34.6	2013	34.6	2016	34.6	2018	34.6
1996	33.5	1997	33.5	1998	33.5	1999	33.5	2002	33.5	2004	33.5	2007	33.5	2009	33.5	2011	33.5	2014	33.5	2017	33.5	2019	33.5
1997	32.9	1998	32.9	1999	32.9	2000	32.9	2003	32.9	2005	32.9	2008	32.9	2010	32.9	2012	32.9	2015	32.9	2018	32.9	2020	32.9

*MY -- Indicates the model year.
**E - Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in Table 2.8.4.

TABLE 2.8.11C

DATE : MAY 19, 1989

BY MODEL YEAR EMISSION LEVELS FOR HIGH ALTITUDE
MOTORCYCLES
NOx

January 1 of Calendar Year

1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1966	0.3	1967	0.3	1968	0.3	1969	0.3	1970	0.3	1971	0.3	1972	0.3	1973	0.3	1974	0.3	1975	0.3	1976	0.3	1977	0.3
1967	0.3	1968	0.3	1969	0.3	1970	0.3	1971	0.3	1972	0.3	1973	0.3	1974	0.3	1975	0.3	1976	0.3	1977	0.3	1978	0.5
1968	0.3	1969	0.3	1970	0.3	1971	0.3	1972	0.3	1973	0.3	1974	0.3	1975	0.3	1976	0.3	1977	0.3	1978	0.5	1979	0.5
1969	0.3	1970	0.3	1971	0.3	1972	0.3	1973	0.3	1974	0.3	1975	0.3	1976	0.3	1977	0.3	1978	0.5	1979	0.5	1980	0.6
1970	0.3	1971	0.3	1972	0.3	1973	0.3	1974	0.3	1975	0.3	1976	0.3	1977	0.3	1978	0.5	1979	0.5	1980	0.6	1981	0.6
1971	0.3	1972	0.3	1973	0.3	1974	0.3	1975	0.3	1976	0.3	1977	0.3	1978	0.5	1979	0.5	1980	0.6	1981	0.6	1982	0.6
1972	0.3	1973	0.3	1974	0.3	1975	0.3	1976	0.3	1977	0.3	1978	0.5	1979	0.5	1980	0.6	1981	0.6	1982	0.6	1983	0.6
1973	0.3	1974	0.3	1975	0.3	1976	0.3	1977	0.3	1978	0.5	1979	0.5	1980	0.6	1981	0.6	1982	0.6	1983	0.6	1984	0.6
1974	0.3	1975	0.3	1976	0.3	1977	0.3	1978	0.5	1979	0.5	1980	0.6	1981	0.6	1982	0.6	1983	0.6	1984	0.6	1985	0.6
1975	0.2	1976	0.2	1977	0.2	1978	0.5	1979	0.5	1980	0.6	1981	0.6	1982	0.6	1983	0.6	1984	0.6	1985	0.6	1986	0.6
1976	0.2	1977	0.2	1978	0.5	1979	0.5	1980	0.6	1981	0.6	1982	0.6	1983	0.6	1984	0.6	1985	0.6	1986	0.6	1987	0.6
1977	0.2	1978	0.5	1979	0.5	1980	0.6	1981	0.6	1982	0.6	1983	0.6	1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6
1978	0.5	1979	0.5	1980	0.6	1981	0.6	1982	0.6	1983	0.6	1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6	1989	0.6
1979	0.5	1980	0.6	1981	0.6	1982	0.6	1983	0.6	1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6	1989	0.6	1990	0.6
1980	0.6	1981	0.6	1982	0.6	1983	0.6	1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6	1989	0.6	1990	0.6	1991	0.6
1981	0.6	1982	0.6	1983	0.6	1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6	1989	0.6	1990	0.6	1991	0.6	1992	0.6
1982	0.6	1983	0.6	1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6	1989	0.6	1990	0.6	1991	0.6	1992	0.6	1993	0.6
1983	0.6	1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6	1989	0.6	1990	0.6	1991	0.6	1992	0.6	1993	0.6	1994	0.6
1984	0.6	1985	0.6	1986	0.6	1987	0.6	1988	0.6	1989	0.6	1990	0.6	1991	0.6	1992	0.6	1993	0.6	1994	0.6	1995	0.6
1985	0.6	1986	0.6	1987	0.6	1988	0.6	1989	0.6	1990	0.6	1991	0.6	1992	0.6	1993	0.6	1994	0.6	1995	0.6	1996	0.6

January 1 of Calendar Year

1997		1998		1999		2000		2003		2005		2008		2010		2012		2015		2018		2020	
MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**	MY*	E**
1978	0.5	1979	0.5	1980	0.6	1981	0.6	1984	0.6	1986	0.6	1989	0.6	1991	0.6	1993	0.6	1996	0.6	1999	0.6	2001	0.6
1979	0.5	1980	0.6	1981	0.6	1982	0.6	1985	0.6	1987	0.6	1990	0.6	1992	0.6	1994	0.6	1997	0.6	2000	0.6	2002	0.6
1980	0.6	1981	0.6	1982	0.6	1983	0.6	1986	0.6	1988	0.6	1991	0.6	1993	0.6	1995	0.6	1998	0.6	2001	0.6	2003	0.6
1981	0.6	1982	0.6	1983	0.6	1984	0.6	1987	0.6	1989	0.6	1992	0.6	1994	0.6	1996	0.6	1999	0.6	2002	0.6	2004	0.6
1982	0.6	1983	0.6	1984	0.6	1985	0.6	1988	0.6	1990	0.6	1993	0.6	1995	0.6	1997	0.6	2000	0.6	2003	0.6	2005	0.6
1983	0.6	1984	0.6	1985	0.6	1986	0.6	1989	0.6	1991	0.6	1994	0.6	1996	0.6	1998	0.6	2001	0.6	2004	0.6	2006	0.6
1984	0.6	1985	0.6	1986	0.6	1987	0.6	1990	0.6	1992	0.6	1995	0.6	1997	0.6	1999	0.6	2002	0.6	2005	0.6	2007	0.6
1985	0.6	1986	0.6	1987	0.6	1988	0.6	1991	0.6	1993	0.6	1996	0.6	1998	0.6	2000	0.6	2003	0.6	2006	0.6	2008	0.6
1986	0.6	1987	0.6	1988	0.6	1989	0.6	1992	0.6	1994	0.6	1997	0.6	1999	0.6	2001	0.6	2004	0.6	2007	0.6	2009	0.6
1987	0.6	1988	0.6	1989	0.6	1990	0.6	1993	0.6	1995	0.6	1998	0.6	2000	0.6	2002	0.6	2005	0.6	2008	0.6	2010	0.6
1988	0.6	1989	0.6	1990	0.6	1991	0.6	1994	0.6	1996	0.6	1999	0.6	2001	0.6	2003	0.6	2006	0.6	2009	0.6	2011	0.6
1989	0.6	1990	0.6	1991	0.6	1992	0.6	1995	0.6	1997	0.6	2000	0.6	2002	0.6	2004	0.6	2007	0.6	2010	0.6	2012	0.6
1990	0.6	1991	0.6	1992	0.6	1993	0.6	1996	0.6	1998	0.6	2001	0.6	2003	0.6	2005	0.6	2008	0.6	2011	0.6	2013	0.6
1991	0.6	1992	0.6	1993	0.6	1994	0.6	1997	0.6	1999	0.6	2002	0.6	2004	0.6	2006	0.6	2009	0.6	2012	0.6	2014	0.6
1992	0.6	1993	0.6	1994	0.6	1995	0.6	1998	0.6	2000	0.6	2003	0.6	2005	0.6	2007	0.6	2010	0.6	2013	0.6	2015	0.6
1993	0.6	1994	0.6	1995	0.6	1996	0.6	1999	0.6	2001	0.6	2004	0.6	2006	0.6	2008	0.6	2011	0.6	2014	0.6	2016	0.6
1994	0.6	1995	0.6	1996	0.6	1997	0.6	2000	0.6	2002	0.6	2005	0.6	2007	0.6	2009	0.6	2012	0.6	2015	0.6	2017	0.6
1995	0.6	1996	0.6	1997	0.6	1998	0.6	2001	0.6	2003	0.6	2006	0.6	2008	0.6	2010	0.6	2013	0.6	2016	0.6	2018	0.6
1996	0.6	1997	0.6	1998	0.6	1999	0.6	2002	0.6	2004	0.6	2007	0.6	2009	0.6	2011	0.6	2014	0.6	2017	0.6	2019	0.6
1997	0.6	1998	0.6	1999	0.6	2000	0.6	2003	0.6	2005	0.6	2008	0.6	2010	0.6	2012	0.6	2015	0.6	2018	0.6	2020	0.6

*MY -- Indicates the model year.

**E -- Indicates the average grams/mile emission level for model year "MY" on January 1 of the given calendar year. These emission levels are calculated for the basic test conditions: 19.6 MPH, TEMP=75 Degrees F, 20.6% of VMT traveled in cold start, 52.1% of VMT in stabilized, and 27.3% of VMT in hot start. Emissions are based on the January 1 mileage accumulation figures given in Table 2.8.4.

Appendix I

EMISSION SENSITIVITY TABLES - ALL VEHICLES COMBINED

This appendix contains, for all mobile sources combined, for several calendar years between 1980 and 2010:

1. average exhaust emission factors for various ambient temperatures, cold/hot start VMT weightings, and for a range of average speed combinations, and,

2. average emission factors by component under FTP cold/hot start VMT weightings and FTP average speed for different levels of fuel volatility (in psi), and for a range of "typical" ambient temperature profiles.

This appendix includes one case that represents the average national emission factors as generated from the standard test conditions (in Tables 1.4, 1.10, and 1.16 for exhaust NMHC, CO, and NOx, respectively, and in Table 2.1 for emissions by component) as well as other scenarios that can be used to assess the sensitivity of the emission factors to changing input conditions. All emission factors are given in units of grams of pollutant per vehicle mile traveled, with the exception of idle emission factors which are given in units of grams of pollutant per hour time. The exhaust hydrocarbon emissions are nonmethane. The evaporative HC emissions include the crankcase emissions.

Emission factors presented in this section are intended to assist those individuals interested in compiling approximate mobile source emission estimates for large areas, such as an individual air quality control region or the entire nation.

The emission factor calculation techniques presented in this document are strongly recommended for the formulation of localized emission estimates required for air quality modeling or for the evaluation of air pollutant control strategies. Many factors, which vary with geographic location and estimation situation, can affect emission estimates considerably. The factors of concern include: average speed, percentage of VMT in cold/hot start vehicle operation, percentage of travel by vehicle type, average ambient temperature profile, level of fuel volatility, air conditioning usage, vehicle load, trailer towing, and humidity. Clearly, the innumerable combinations make it impossible to present mobile source emission factors for each application. An effort has been made, therefore, to present emission factors for a range of conditions. The following conditions are considered for each of these cases:

1. The VMT mixes are those calculated from MOBILE4. They are as follows:

Calendar Year	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
1980	0.708	0.129	0.085	0.015	0.006	0.001	0.045	0.010
1988	0.708	0.128	0.086	0.015	0.013	0.004	0.036	0.010
1990	0.710	0.127	0.086	0.015	0.013	0.004	0.034	0.010
1995	0.703	0.122	0.085	0.015	0.023	0.011	0.030	0.010
2000	0.693	0.116	0.085	0.015	0.035	0.017	0.029	0.010
2010	0.685	0.112	0.086	0.015	0.043	0.021	0.029	0.010

2. For the exhaust emission factor tables (designated by 1.x), each table represents one average speed. There are 6 different speeds: 2.5, 5.0, 10.0, 19.6, 35.0, and 55.0 mph. Each table presents six calendar years: 1980, 1988, 1990, 1995, 2000, and 2010. Each calendar year presents 35 combinations of five temperatures and seven operating modes. The five temperatures are: 0°, 25°, 50°, 75°, and 100°F. The seven operating mode combinations are shown in the following:

Operating Mode Combinations

MOBILE4 Input	Description
0/0/0	100% Stabilized
0/100/0	100% Hot Start
100/0/100	100% Cold Start
50/0/50	50% Cold Start, 50% Stabilized
0/50/0	50% Hot Start, 50% Stabilized
50/50/50	50% Cold Start, 50% Hot Start
20.6/27.3/20.6	20.6% Cold Start, 52.1% Stabilized, and 27.3% Hot Start (FTP conditions)

3. For the emission factors by component tables (designated by 2.x), all emissions are based on FTP operating mode with 19.6 mph average speed. Each table represents one typical ambient temperature profile. The given temperature profile in MOBILE4 determines the ambient temperatures used to calculate all emissions: exhaust HC, CO, and NOx, and evaporative hot soak, diurnal, and running loss emissions. The four typical temperatrue profiles used are:

Description of Temperature Profile	Temperature in °F				
	Diurnal				
	Minimum	Maximum	Exhaust	Hot Soak	Running Loss Emissions
FTP Conditions	60.0	84.0	78.1	80.2	81.0
ASTM Class A	66.9	95.1	88.3	90.3	91.3
ASTM Class B	71.2	91.6	87.0	88.1	88.8
ASTM Class C	65.9	85.0	80.6	81.8	82.5

4. Each table presents six calendar years. Each calendar year presents six level of fuel volatilities: 7.0, 8.0, 9.0, 10.0, 10.4, and 11.7 psi RVP. The seven components are:

   Evaporative HC Emissions (hot soak and diurnal),
   Refueling Loss Emissions,
   Running loss Emissions,
   Exhaust NMHC Emissions,
   Combined NMHC (sum of the above four) Emissions,
   Exhaust CO Emissions, and
   Exhaust NOx Emissions.

TABLE 1.1

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	27.88	25.18	22.91	20.99	26.23
1980	0.0	100.0	0.0	27.79	27.65	27.61	27.68	37.87
1980	100.0	0.0	100.0	228.13	130.85	75.31	43.56	32.69
1980	50.0	0.0	50.0	106.88	66.81	43.48	29.77	28.62
1980	0.0	50.0	0.0	27.68	26.00	24.62	23.49	30.62
1980	50.0	50.0	50.0	127.96	79.25	51.46	35.62	35.28
1980	20.6	27.3	20.6	60.04	42.63	32.23	25.92	29.57
1988	0.0	0.0	0.0	18.32	15.46	13.15	11.26	16.10
1988	0.0	100.0	0.0	19.85	18.42	17.24	16.28	23.21
1988	100.0	0.0	100.0	217.23	109.09	55.74	28.99	24.38
1988	50.0	0.0	50.0	93.35	50.85	29.24	17.93	19.10
1988	0.0	50.0	0.0	18.77	16.49	14.63	13.11	18.73
1988	50.0	50.0	50.0	118.54	63.76	36.49	22.63	23.80
1988	20.6	27.3	20.6	49.15	30.44	20.51	14.98	18.74
1990	0.0	0.0	0.0	16.18	13.51	11.34	9.58	13.57
1990	0.0	100.0	0.0	18.41	16.72	15.31	14.15	19.58
1990	100.0	0.0	100.0	206.30	101.74	51.01	26.02	22.58
1990	50.0	0.0	50.0	87.43	46.64	26.24	15.74	16.85
1990	0.0	50.0	0.0	16.93	14.64	12.78	11.26	15.78
1990	50.0	50.0	50.0	112.35	59.23	33.16	20.09	21.08
1990	20.6	27.3	20.6	45.63	27.63	18.19	13.00	16.10
1995	0.0	0.0	0.0	11.92	9.73	7.95	6.51	8.52
1995	0.0	100.0	0.0	15.33	13.27	11.54	10.07	12.24
1995	100.0	0.0	100.0	167.52	81.53	40.21	20.11	18.68
1995	50.0	0.0	50.0	69.88	36.52	20.00	11.59	12.28
1995	0.0	50.0	0.0	13.16	11.03	9.27	7.83	9.90
1995	50.0	50.0	50.0	91.42	47.40	25.87	15.09	15.46
1995	20.6	27.3	20.6	36.21	21.35	13.57	9.29	10.79
2000	0.0	0.0	0.0	8.92	7.29	5.96	4.89	5.33
2000	0.0	100.0	0.0	12.64	10.67	9.01	7.63	7.74
2000	100.0	0.0	100.0	125.83	62.57	31.47	16.03	15.73
2000	50.0	0.0	50.0	52.60	27.98	15.52	9.07	9.23
2000	0.0	50.0	0.0	10.31	8.55	7.10	5.91	6.23
2000	50.0	50.0	50.0	69.23	36.62	20.24	11.83	11.73
2000	20.6	27.3	20.6	27.47	16.40	10.48	7.15	7.40
2010	0.0	0.0	0.0	8.49	6.94	5.68	4.66	5.08
2010	0.0	100.0	0.0	11.47	9.71	8.23	6.99	7.08
2010	100.0	0.0	100.0	91.99	49.32	26.55	14.37	14.09
2010	50.0	0.0	50.0	40.10	22.99	13.59	8.34	8.49
2010	0.0	50.0	0.0	9.61	7.98	6.65	5.54	5.83
2010	50.0	50.0	50.0	51.73	29.52	17.39	10.68	10.58
2010	20.6	27.3	20.6	21.98	14.05	9.42	6.64	6.88

TABLE 1.1 : NMHC AT 2.5 MPH.

TABLE 1.2

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	16.58	15.03	13.73	12.62	15.53
1980	0.0	100.0	0.0	16.56	16.46	16.42	16.44	22.20
1980	100.0	0.0	100.0	132.70	76.32	44.09	25.63	19.32
1980	50.0	0.0	50.0	62.49	39.23	25.67	17.69	16.93
1980	0.0	50.0	0.0	16.48	15.51	14.70	14.05	18.04
1980	50.0	50.0	50.0	74.63	46.39	30.25	21.04	20.76
1980	20.6	27.3	20.6	35.28	25.17	19.13	15.46	17.46
1988	0.0	0.0	0.0	9.98	8.47	7.25	6.25	8.83
1988	0.0	100.0	0.0	10.68	9.95	9.36	8.88	12.63
1988	100.0	0.0	100.0	113.26	57.35	29.57	15.54	13.03
1988	50.0	0.0	50.0	49.02	26.98	15.70	9.75	10.35
1988	0.0	50.0	0.0	10.17	8.98	8.01	7.22	10.23
1988	50.0	50.0	50.0	61.97	33.65	19.46	12.21	12.83
1988	20.6	27.3	20.6	26.01	16.29	11.10	8.20	10.21
1990	0.0	0.0	0.0	8.65	7.26	6.13	5.21	7.32
1990	0.0	100.0	0.0	9.71	8.85	8.15	7.57	10.48
1990	100.0	0.0	100.0	105.82	52.55	26.57	13.69	11.84
1990	50.0	0.0	50.0	45.13	24.29	13.82	8.39	8.97
1990	0.0	50.0	0.0	8.99	7.82	6.86	6.08	8.48
1990	50.0	50.0	50.0	57.76	30.70	17.36	10.63	11.16
1990	20.6	27.3	20.6	23.71	14.51	9.66	6.97	8.62
1995	0.0	0.0	0.0	6.18	5.05	4.14	3.41	4.45
1995	0.0	100.0	0.0	7.85	6.81	5.94	5.20	6.34
1995	100.0	0.0	100.0	83.96	41.01	20.32	10.24	9.49
1995	50.0	0.0	50.0	35.17	18.48	10.19	5.96	6.32
1995	0.0	50.0	0.0	6.78	5.70	4.80	4.07	5.15
1995	50.0	50.0	50.0	45.91	23.91	13.13	7.72	7.92
1995	20.6	27.3	20.6	18.32	10.87	6.96	4.81	5.59
2000	0.0	0.0	0.0	4.59	3.77	3.09	2.55	2.77
2000	0.0	100.0	0.0	6.44	5.45	4.61	3.91	3.98
2000	100.0	0.0	100.0	62.74	31.29	15.81	8.11	7.96
2000	50.0	0.0	50.0	26.32	14.07	7.86	4.64	4.72
2000	0.0	50.0	0.0	5.28	4.39	3.66	3.06	3.22
2000	50.0	50.0	50.0	34.59	18.37	10.21	6.01	5.97
2000	20.6	27.3	20.6	13.82	8.30	5.34	3.68	3.81
2010	0.0	0.0	0.0	4.39	3.60	2.97	2.45	2.66
2010	0.0	100.0	0.0	5.89	4.99	4.24	3.61	3.66
2010	100.0	0.0	100.0	46.14	24.81	13.41	7.31	7.17
2010	50.0	0.0	50.0	20.20	11.63	6.92	4.29	4.36
2010	0.0	50.0	0.0	4.95	4.13	3.45	2.89	3.04
2010	50.0	50.0	50.0	26.01	14.90	8.83	5.46	5.42
2010	20.6	27.3	20.6	11.14	7.16	4.84	3.44	3.56

TABLE 1.3

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	8.81	7.99	7.30	6.72	8.23
1980	0.0	100.0	0.0	8.79	8.72	8.68	8.67	11.64
1980	100.0	0.0	100.0	68.74	39.61	22.96	13.42	10.16
1980	50.0	0.0	50.0	32.53	20.49	13.47	9.33	8.94
1980	0.0	50.0	0.0	8.75	8.23	7.80	7.45	9.52
1980	50.0	50.0	50.0	38.76	24.16	15.82	11.05	10.90
1980	20.6	27.3	20.6	18.47	13.23	10.09	8.18	9.22
1988	0.0	0.0	0.0	5.17	4.40	3.77	3.26	4.59
1988	0.0	100.0	0.0	5.49	5.13	4.83	4.58	6.50
1988	100.0	0.0	100.0	56.76	28.87	14.97	7.93	6.65
1988	50.0	0.0	50.0	24.70	13.68	8.02	5.02	5.33
1988	0.0	50.0	0.0	5.26	4.65	4.15	3.74	5.29
1988	50.0	50.0	50.0	31.13	17.00	9.90	6.25	6.57
1988	20.6	27.3	20.6	13.18	8.32	5.71	4.24	5.27
1990	0.0	0.0	0.0	4.46	3.75	3.17	2.70	3.79
1990	0.0	100.0	0.0	4.96	4.53	4.18	3.88	5.37
1990	100.0	0.0	100.0	52.74	26.30	13.37	6.94	6.00
1990	50.0	0.0	50.0	22.60	12.24	7.01	4.30	4.59
1990	0.0	50.0	0.0	4.62	4.02	3.53	3.14	4.37
1990	50.0	50.0	50.0	28.85	15.42	8.77	5.41	5.69
1990	20.6	27.3	20.6	11.94	7.36	4.93	3.59	4.43
1995	0.0	0.0	0.0	3.16	2.59	2.13	1.76	2.29
1995	0.0	100.0	0.0	3.98	3.46	3.02	2.65	3.23
1995	100.0	0.0	100.0	41.55	20.37	10.15	5.15	4.78
1995	50.0	0.0	50.0	17.47	9.23	5.13	3.03	3.21
1995	0.0	50.0	0.0	3.45	2.91	2.46	2.09	2.64
1995	50.0	50.0	50.0	22.76	11.91	6.58	3.90	4.00
1995	20.6	27.3	20.6	9.15	5.47	3.53	2.45	2.85
2000	0.0	0.0	0.0	2.35	1.94	1.60	1.32	1.44
2000	0.0	100.0	0.0	3.27	2.77	2.35	2.00	2.04
2000	100.0	0.0	100.0	31.05	15.54	7.90	4.09	4.01
2000	50.0	0.0	50.0	13.08	7.03	3.96	2.36	2.40
2000	0.0	50.0	0.0	2.70	2.25	1.88	1.58	1.66
2000	50.0	50.0	50.0	17.16	9.15	5.12	3.05	3.02
2000	20.6	27.3	20.6	6.91	4.18	2.71	1.88	1.95
2010	0.0	0.0	0.0	2.27	1.87	1.55	1.28	1.39
2010	0.0	100.0	0.0	3.01	2.56	2.18	1.87	1.89
2010	100.0	0.0	100.0	23.07	12.44	6.76	3.72	3.65
2010	50.0	0.0	50.0	10.14	5.87	3.52	2.21	2.24
2010	0.0	50.0	0.0	2.55	2.13	1.79	1.50	1.58
2010	50.0	50.0	50.0	13.04	7.50	4.47	2.79	2.77
2010	20.6	27.3	20.6	5.63	3.64	2.48	1.78	1.84

TABLE 1.4

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	4.91	4.46	4.08	3.76	4.59
1980	0.0	100.0	0.0	4.89	4.85	4.83	4.83	6.45
1980	100.0	0.0	100.0	38.05	21.94	12.73	7.45	5.64
1980	50.0	0.0	50.0	18.05	11.38	7.49	5.20	4.98
1980	0.0	50.0	0.0	4.88	4.59	4.35	4.16	5.29
1980	50.0	50.0	50.0	21.47	13.40	8.78	6.14	6.05
1980	20.6	27.3	20.6	10.26	7.36	5.62	4.56	5.13
1988	0.0	0.0	0.0	2.76	2.36	2.03	1.76	2.47
1988	0.0	100.0	0.0	2.90	2.72	2.57	2.44	3.47
1988	100.0	0.0	100.0	29.28	15.00	7.83	4.18	3.49
1988	50.0	0.0	50.0	12.82	7.16	4.23	2.67	2.84
1988	0.0	50.0	0.0	2.80	2.48	2.22	2.01	2.84
1988	50.0	50.0	50.0	16.09	8.86	5.20	3.31	3.48
1988	20.6	27.3	20.6	6.88	4.38	3.03	2.27	2.82
1990	0.0	0.0	0.0	2.35	1.98	1.69	1.44	2.02
1990	0.0	100.0	0.0	2.58	2.37	2.19	2.05	2.84
1990	100.0	0.0	100.0	26.83	13.48	6.90	3.61	3.11
1990	50.0	0.0	50.0	11.57	6.32	3.65	2.26	2.41
1990	0.0	50.0	0.0	2.42	2.12	1.87	1.66	2.32
1990	50.0	50.0	50.0	14.71	7.92	4.55	2.83	2.98
1990	20.6	27.3	20.6	6.15	3.82	2.59	1.90	2.34
1995	0.0	0.0	0.0	1.62	1.34	1.10	0.91	1.19
1995	0.0	100.0	0.0	2.02	1.76	1.55	1.36	1.67
1995	100.0	0.0	100.0	20.74	10.22	5.12	2.62	2.42
1995	50.0	0.0	50.0	8.76	4.66	2.61	1.55	1.65
1995	0.0	50.0	0.0	1.77	1.49	1.27	1.08	1.37
1995	50.0	50.0	50.0	11.38	5.99	3.33	1.99	2.05
1995	20.6	27.3	20.6	4.61	2.77	1.80	1.26	1.47
2000	0.0	0.0	0.0	1.20	0.99	0.82	0.69	0.74
2000	0.0	100.0	0.0	1.66	1.41	1.20	1.02	1.04
2000	100.0	0.0	100.0	15.46	7.77	3.97	2.07	2.03
2000	50.0	0.0	50.0	6.54	3.53	2.00	1.21	1.23
2000	0.0	50.0	0.0	1.37	1.15	0.96	0.81	0.85
2000	50.0	50.0	50.0	8.56	4.59	2.58	1.55	1.54
2000	20.6	27.3	20.6	3.47	2.11	1.38	0.97	1.00
2010	0.0	0.0	0.0	1.17	0.97	0.81	0.67	0.73
2010	0.0	100.0	0.0	1.55	1.32	1.13	0.97	0.98
2010	100.0	0.0	100.0	11.70	6.32	3.45	1.91	1.87
2010	50.0	0.0	50.0	5.16	3.00	1.81	1.14	1.16
2010	0.0	50.0	0.0	1.31	1.10	0.93	0.78	0.82
2010	50.0	50.0	50.0	6.62	3.82	2.29	1.44	1.43
2010	20.6	27.3	20.6	2.87	1.87	1.28	0.92	0.95

TABLE 1.4 : NMHC AT 19.6 MPH.

TABLE 1.5

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	2.91	2.66	2.44	2.26	2.72
1980	0.0	100.0	0.0	2.91	2.89	2.88	2.88	3.80
1980	100.0	0.0	100.0	22.65	13.07	7.59	4.44	3.35
1980	50.0	0.0	50.0	10.77	6.80	4.48	3.11	2.95
1980	0.0	50.0	0.0	2.90	2.74	2.60	2.49	3.13
1980	50.0	50.0	50.0	12.78	7.98	5.23	3.66	3.57
1980	20.6	27.3	20.6	6.11	4.39	3.36	2.73	3.04
1988	0.0	0.0	0.0	1.56	1.34	1.15	1.00	1.40
1988	0.0	100.0	0.0	1.63	1.53	1.45	1.38	1.95
1988	100.0	0.0	100.0	16.35	8.40	4.40	2.36	1.96
1988	50.0	0.0	50.0	7.26	4.06	2.40	1.52	1.60
1988	0.0	50.0	0.0	1.58	1.40	1.26	1.14	1.60
1988	50.0	50.0	50.0	8.99	4.97	2.93	1.87	1.96
1988	20.6	27.3	20.6	3.89	2.48	1.72	1.29	1.59
1990	0.0	0.0	0.0	1.32	1.12	0.95	0.82	1.14
1990	0.0	100.0	0.0	1.44	1.32	1.23	1.15	1.59
1990	100.0	0.0	100.0	14.84	7.48	3.84	2.02	1.73
1990	50.0	0.0	50.0	6.51	3.56	2.06	1.28	1.36
1990	0.0	50.0	0.0	1.36	1.19	1.05	0.94	1.30
1990	50.0	50.0	50.0	8.14	4.40	2.53	1.58	1.66
1990	20.6	27.3	20.6	3.46	2.15	1.46	1.07	1.32
1995	0.0	0.0	0.0	0.91	0.75	0.62	0.51	0.67
1995	0.0	100.0	0.0	1.11	0.97	0.85	0.75	0.92
1995	100.0	0.0	100.0	11.37	5.61	2.82	1.45	1.34
1995	50.0	0.0	50.0	4.90	2.60	1.46	0.87	0.92
1995	0.0	50.0	0.0	0.99	0.83	0.71	0.61	0.76
1995	50.0	50.0	50.0	6.24	3.29	1.84	1.10	1.13
1995	20.6	27.3	20.6	2.58	1.55	1.01	0.71	0.82
2000	0.0	0.0	0.0	0.68	0.56	0.46	0.39	0.42
2000	0.0	100.0	0.0	0.92	0.78	0.67	0.57	0.58
2000	100.0	0.0	100.0	8.52	4.29	2.20	1.15	1.13
2000	50.0	0.0	50.0	3.66	1.98	1.13	0.68	0.69
2000	0.0	50.0	0.0	0.77	0.64	0.54	0.46	0.48
2000	50.0	50.0	50.0	4.72	2.53	1.43	0.86	0.85
2000	20.6	27.3	20.6	1.94	1.18	0.77	0.54	0.56
2010	0.0	0.0	0.0	0.66	0.55	0.45	0.38	0.41
2010	0.0	100.0	0.0	0.86	0.74	0.63	0.54	0.55
2010	100.0	0.0	100.0	6.52	3.53	1.93	1.07	1.05
2010	50.0	0.0	50.0	2.89	1.68	1.02	0.64	0.65
2010	0.0	50.0	0.0	0.73	0.62	0.52	0.44	0.46
2010	50.0	50.0	50.0	3.69	2.13	1.28	0.81	0.80
2010	20.6	27.3	20.6	1.61	1.05	0.72	0.52	0.54

TABLE 1.6

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	2.14	1.96	1.81	1.67	1.99
1980	0.0	100.0	0.0	2.14	2.13	2.12	2.12	2.76
1980	100.0	0.0	100.0	16.57	9.57	5.56	3.26	2.45
1980	50.0	0.0	50.0	7.90	5.00	3.30	2.30	2.16
1980	0.0	50.0	0.0	2.13	2.02	1.92	1.84	2.28
1980	50.0	50.0	50.0	9.36	5.85	3.84	2.69	2.61
1980	20.6	27.3	20.6	4.49	3.23	2.48	2.02	2.22
1988	0.0	0.0	0.0	1.06	0.91	0.79	0.69	0.95
1988	0.0	100.0	0.0	1.10	1.03	0.98	0.94	1.32
1988	100.0	0.0	100.0	10.88	5.62	2.96	1.59	1.32
1988	50.0	0.0	50.0	4.85	2.73	1.63	1.03	1.09
1988	0.0	50.0	0.0	1.06	0.95	0.86	0.78	1.09
1988	50.0	50.0	50.0	5.99	3.33	1.97	1.27	1.32
1988	20.6	27.3	20.6	2.61	1.67	1.17	0.88	1.08
1990	0.0	0.0	0.0	0.88	0.75	0.64	0.55	0.76
1990	0.0	100.0	0.0	0.95	0.88	0.82	0.77	1.06
1990	100.0	0.0	100.0	9.73	4.93	2.54	1.34	1.15
1990	50.0	0.0	50.0	4.28	2.35	1.37	0.85	0.90
1990	0.0	50.0	0.0	0.90	0.79	0.70	0.63	0.87
1990	50.0	50.0	50.0	5.34	2.90	1.68	1.06	1.10
1990	20.6	27.3	20.6	2.28	1.43	0.97	0.72	0.88
1995	0.0	0.0	0.0	0.59	0.49	0.40	0.34	0.44
1995	0.0	100.0	0.0	0.72	0.63	0.55	0.49	0.60
1995	100.0	0.0	100.0	7.29	3.60	1.81	0.94	0.86
1995	50.0	0.0	50.0	3.14	1.68	0.94	0.56	0.60
1995	0.0	50.0	0.0	0.64	0.54	0.46	0.39	0.50
1995	50.0	50.0	50.0	4.00	2.12	1.18	0.71	0.73
1995	20.6	27.3	20.6	1.66	1.00	0.65	0.46	0.54
2000	0.0	0.0	0.0	0.44	0.36	0.30	0.25	0.27
2000	0.0	100.0	0.0	0.59	0.50	0.43	0.37	0.38
2000	100.0	0.0	100.0	5.44	2.75	1.41	0.74	0.73
2000	50.0	0.0	50.0	2.35	1.27	0.73	0.44	0.45
2000	0.0	50.0	0.0	0.50	0.42	0.35	0.30	0.31
2000	50.0	50.0	50.0	3.02	1.63	0.92	0.56	0.55
2000	20.6	27.3	20.6	1.25	0.76	0.50	0.35	0.37
2010	0.0	0.0	0.0	0.43	0.35	0.30	0.25	0.27
2010	0.0	100.0	0.0	0.56	0.48	0.41	0.35	0.36
2010	100.0	0.0	100.0	4.17	2.26	1.24	0.69	0.68
2010	50.0	0.0	50.0	1.85	1.08	0.66	0.42	0.42
2010	0.0	50.0	0.0	0.48	0.40	0.34	0.29	0.30
2010	50.0	50.0	50.0	2.36	1.37	0.82	0.52	0.52
2010	20.6	27.3	20.6	1.03	0.68	0.47	0.34	0.35

TABLE 1.6 : NMHC AT 55.0 MPH.

TABLE 1.7

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	398.64	358.02	324.82	297.70	583.63
1980	0.0	100.0	0.0	296.38	304.81	314.72	326.26	607.02
1980	100.0	0.0	100.0	3173.36	1866.54	1106.73	660.92	414.25
1980	50.0	0.0	50.0	1458.94	934.46	623.21	435.58	514.78
1980	0.0	50.0	0.0	357.27	335.71	319.23	307.07	588.74
1980	50.0	50.0	50.0	1734.87	1085.67	710.72	493.59	510.64
1980	20.6	27.3	20.6	808.88	581.12	443.50	358.98	558.11
1988	0.0	0.0	0.0	256.70	208.17	170.98	142.29	321.68
1988	0.0	100.0	0.0	213.51	194.82	180.98	171.10	312.32
1988	100.0	0.0	100.0	1904.23	1164.89	693.71	371.89	284.40
1988	50.0	0.0	50.0	887.38	575.71	372.07	229.96	307.03
1988	0.0	50.0	0.0	239.23	202.29	174.14	152.71	316.24
1988	50.0	50.0	50.0	1058.87	679.85	437.34	271.50	298.36
1988	20.6	27.3	20.6	504.55	354.94	254.72	183.66	312.67
1990	0.0	0.0	0.0	222.45	175.02	139.40	112.46	253.34
1990	0.0	100.0	0.0	187.37	166.02	149.73	137.51	242.76
1990	100.0	0.0	100.0	1475.11	916.48	552.07	295.10	240.37
1990	50.0	0.0	50.0	706.14	462.96	300.01	182.77	248.76
1990	0.0	50.0	0.0	208.14	170.96	142.90	121.67	248.10
1990	50.0	50.0	50.0	831.24	541.25	350.90	216.30	241.56
1990	20.6	27.3	20.6	412.10	290.34	206.84	146.12	248.57
1995	0.0	0.0	0.0	143.66	105.45	77.99	58.15	113.32
1995	0.0	100.0	0.0	126.60	105.46	88.71	75.41	116.46
1995	100.0	0.0	100.0	705.43	464.97	291.57	154.49	142.29
1995	50.0	0.0	50.0	368.77	251.12	164.87	96.69	126.23
1995	0.0	50.0	0.0	136.20	105.10	82.07	64.90	114.62
1995	50.0	50.0	50.0	416.01	285.22	190.14	114.95	129.37
1995	20.6	27.3	20.6	231.60	164.80	115.71	77.54	119.30
2000	0.0	0.0	0.0	91.17	63.76	44.85	31.77	36.31
2000	0.0	100.0	0.0	80.02	64.10	51.51	41.57	52.00
2000	100.0	0.0	100.0	310.50	231.77	155.19	79.90	83.93
2000	50.0	0.0	50.0	187.96	137.84	93.27	52.44	56.89
2000	0.0	50.0	0.0	85.70	63.50	47.47	35.84	42.92
2000	50.0	50.0	50.0	195.26	147.93	103.35	60.74	67.96
2000	20.6	27.3	20.6	127.87	93.98	66.12	42.45	48.33
2010	0.0	0.0	0.0	70.40	49.17	34.57	24.52	27.32
2010	0.0	100.0	0.0	51.88	42.09	34.28	28.05	35.06
2010	100.0	0.0	100.0	230.51	169.40	110.43	52.75	54.67
2010	50.0	0.0	50.0	144.19	104.76	69.69	37.54	40.12
2010	0.0	50.0	0.0	61.79	45.86	34.41	26.12	30.83
2010	50.0	50.0	50.0	141.20	105.74	72.35	40.40	44.87
2010	20.6	27.3	20.6	96.01	70.20	48.90	30.74	34.49

TABLE 1.7 : CO AT 2.5 MPH.

TABLE 1.8

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	225.92	203.92	185.91	171.18	327.45
1980	0.0	100.0	0.0	170.24	174.92	180.47	186.94	343.99
1980	100.0	0.0	100.0	1755.82	1038.37	619.59	372.88	236.12
1980	50.0	0.0	50.0	811.63	523.38	351.72	247.89	290.17
1980	0.0	50.0	0.0	203.34	191.72	182.86	176.35	331.63
1980	50.0	50.0	50.0	963.03	606.65	400.03	279.91	290.05
1980	20.6	27.3	20.6	452.70	327.66	251.90	205.25	314.39
1988	0.0	0.0	0.0	137.58	112.20	92.71	77.64	172.71
1988	0.0	100.0	0.0	113.90	104.36	97.34	92.38	168.32
1988	100.0	0.0	100.0	1008.24	617.34	368.28	198.40	151.78
1988	50.0	0.0	50.0	471.39	306.55	198.86	123.77	164.39
1988	0.0	50.0	0.0	127.96	108.75	94.10	82.94	169.96
1988	50.0	50.0	50.0	561.07	360.85	232.81	145.39	160.05
1988	20.6	27.3	20.6	268.57	189.63	136.77	99.32	167.77
1990	0.0	0.0	0.0	118.86	93.91	75.16	60.96	135.27
1990	0.0	100.0	0.0	99.62	88.53	80.08	73.77	129.92
1990	100.0	0.0	100.0	779.86	485.45	292.82	156.63	128.01
1990	50.0	0.0	50.0	374.82	246.41	160.11	97.84	132.64
1990	0.0	50.0	0.0	110.98	91.50	76.78	65.66	132.53
1990	50.0	50.0	50.0	439.74	286.99	186.45	115.20	128.96
1990	20.6	27.3	20.6	219.07	154.85	110.71	78.54	132.68
1995	0.0	0.0	0.0	78.53	57.70	42.75	31.96	60.69
1995	0.0	100.0	0.0	68.85	57.38	48.29	41.06	62.74
1995	100.0	0.0	100.0	379.57	251.62	158.04	83.08	77.22
1995	50.0	0.0	50.0	200.13	136.91	90.02	52.54	68.07
1995	0.0	50.0	0.0	74.27	57.37	44.86	35.54	61.54
1995	50.0	50.0	50.0	224.21	154.50	103.16	62.07	69.98
1995	20.6	27.3	20.6	125.92	89.91	63.22	42.30	64.16
2000	0.0	0.0	0.0	53.59	37.62	26.59	18.96	21.63
2000	0.0	100.0	0.0	46.40	37.29	30.08	24.38	30.44
2000	100.0	0.0	100.0	182.43	135.98	90.77	46.31	48.70
2000	50.0	0.0	50.0	110.82	81.27	54.95	30.80	33.43
2000	0.0	50.0	0.0	50.10	37.25	27.97	21.23	25.37
2000	50.0	50.0	50.0	114.41	86.63	60.43	35.35	39.57
2000	20.6	27.3	20.6	75.15	55.32	38.96	25.04	28.49
2010	0.0	0.0	0.0	44.34	31.09	21.97	15.68	17.45
2010	0.0	100.0	0.0	32.88	26.72	21.81	17.90	22.25
2010	100.0	0.0	100.0	143.93	105.98	69.27	33.31	34.64
2010	50.0	0.0	50.0	90.28	65.74	43.88	23.82	25.48
2010	0.0	50.0	0.0	39.00	29.04	21.88	16.68	19.63
2010	50.0	50.0	50.0	88.41	66.35	45.54	25.60	28.45
2010	20.6	27.3	20.6	60.30	44.21	30.92	19.57	21.93

TABLE 1.8 : CO AT 5.0 MPH.

TABLE 1.9

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	113.44	102.45	93.46	86.12	164.12
1980	0.0	100.0	0.0	86.38	88.43	90.91	93.84	171.37
1980	100.0	0.0	100.0	863.78	511.71	306.19	185.03	118.89
1980	50.0	0.0	50.0	401.04	259.32	174.89	123.78	145.60
1980	0.0	50.0	0.0	102.42	96.52	91.99	88.64	165.79
1980	50.0	50.0	50.0	475.08	300.07	198.55	139.43	145.13
1980	20.6	27.3	20.6	224.84	163.25	125.88	102.84	157.41
1988	0.0	0.0	0.0	69.79	56.78	46.82	39.13	86.61
1988	0.0	100.0	0.0	58.38	53.23	49.40	46.65	84.24
1988	100.0	0.0	100.0	505.49	310.92	185.90	99.66	77.61
1988	50.0	0.0	50.0	237.39	154.93	100.60	62.31	83.03
1988	0.0	50.0	0.0	65.13	55.20	47.62	41.84	85.15
1988	50.0	50.0	50.0	281.93	182.08	117.65	73.15	80.93
1988	20.6	27.3	20.6	135.66	95.97	69.19	50.05	84.34
1990	0.0	0.0	0.0	61.64	48.52	38.70	31.29	68.47
1990	0.0	100.0	0.0	52.17	46.12	41.49	37.99	66.06
1990	100.0	0.0	100.0	399.81	250.59	151.51	80.22	66.70
1990	50.0	0.0	50.0	193.40	127.77	83.04	50.25	67.94
1990	0.0	50.0	0.0	57.73	47.43	39.65	33.77	67.21
1990	50.0	50.0	50.0	225.99	148.35	96.50	59.10	66.38
1990	20.6	27.3	20.6	113.32	80.29	57.32	40.36	67.55
1995	0.0	0.0	0.0	44.48	32.53	24.00	17.89	32.47
1995	0.0	100.0	0.0	38.84	32.26	27.04	22.89	34.22
1995	100.0	0.0	100.0	210.99	141.53	89.12	45.95	43.45
1995	50.0	0.0	50.0	112.71	77.71	51.08	29.32	37.38
1995	0.0	50.0	0.0	41.97	32.31	25.18	19.88	33.21
1995	50.0	50.0	50.0	124.92	86.90	58.08	34.42	38.83
1995	20.6	27.3	20.6	71.02	50.89	35.72	23.64	34.88
2000	0.0	0.0	0.0	34.06	23.88	16.86	12.01	13.56
2000	0.0	100.0	0.0	28.88	23.23	18.75	15.19	18.84
2000	100.0	0.0	100.0	116.68	86.87	57.65	28.81	30.39
2000	50.0	0.0	50.0	71.14	52.12	35.08	19.37	20.98
2000	0.0	50.0	0.0	31.58	23.47	17.61	13.36	15.83
2000	50.0	50.0	50.0	72.78	55.05	38.20	22.00	24.61
2000	20.6	27.3	20.6	47.92	35.24	24.74	15.76	17.84
2010	0.0	0.0	0.0	30.61	21.41	15.09	10.74	11.84
2010	0.0	100.0	0.0	22.70	18.41	14.98	12.25	15.08
2010	100.0	0.0	100.0	98.95	73.08	47.81	22.91	23.96
2010	50.0	0.0	50.0	62.25	45.38	30.28	16.37	17.50
2010	0.0	50.0	0.0	26.92	20.00	15.03	11.43	13.32
2010	50.0	50.0	50.0	60.82	45.74	31.40	17.58	19.52
2010	20.6	27.3	20.6	41.59	30.49	21.30	13.43	14.97

TABLE 1.10

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	60.24	54.39	49.62	45.74	87.49
1980	0.0	100.0	0.0	45.95	46.97	48.21	49.68	90.19
1980	100.0	0.0	100.0	453.34	268.71	160.95	97.41	62.93
1980	50.0	0.0	50.0	211.29	136.73	92.32	65.44	77.33
1980	0.0	50.0	0.0	54.36	51.20	48.78	46.99	87.84
1980	50.0	50.0	50.0	249.65	157.84	104.58	73.55	76.56
1980	20.6	27.3	20.6	118.70	86.26	66.59	54.45	83.50
1988	0.0	0.0	0.0	37.22	30.15	24.75	20.60	45.79
1988	0.0	100.0	0.0	31.20	28.32	26.16	24.58	44.14
1988	100.0	0.0	100.0	269.11	166.22	99.41	52.68	41.54
1988	50.0	0.0	50.0	126.96	83.04	53.80	32.93	44.05
1988	0.0	50.0	0.0	34.73	29.31	25.18	22.03	44.81
1988	50.0	50.0	50.0	150.15	97.27	62.78	38.63	42.84
1988	20.6	27.3	20.6	72.50	51.28	36.84	26.40	44.54
1990	0.0	0.0	0.0	33.93	26.52	21.01	16.88	36.59
1990	0.0	100.0	0.0	28.79	25.30	22.61	20.57	35.34
1990	100.0	0.0	100.0	219.89	138.87	83.99	43.56	36.71
1990	50.0	0.0	50.0	107.14	71.08	46.04	27.29	36.73
1990	0.0	50.0	0.0	31.78	25.95	21.56	18.25	35.90
1990	50.0	50.0	50.0	124.34	82.09	53.30	32.06	36.02
1990	20.6	27.3	20.6	62.66	44.41	31.53	21.87	36.27
1995	0.0	0.0	0.0	27.57	19.96	14.58	10.75	18.55
1995	0.0	100.0	0.0	23.77	19.63	16.34	13.72	20.01
1995	100.0	0.0	100.0	129.44	87.98	55.39	27.62	26.54
1995	50.0	0.0	50.0	70.14	48.70	31.87	17.74	22.13
1995	0.0	50.0	0.0	25.86	19.75	15.27	11.95	19.18
1995	50.0	50.0	50.0	76.61	53.80	35.87	20.67	23.27
1995	20.6	27.3	20.6	44.06	31.61	22.03	14.26	20.36
2000	0.0	0.0	0.0	24.10	16.79	11.76	8.30	9.25
2000	0.0	100.0	0.0	19.89	15.96	12.84	10.37	12.78
2000	100.0	0.0	100.0	84.14	62.47	41.10	19.91	21.02
2000	50.0	0.0	50.0	51.33	37.49	25.01	13.46	14.50
2000	0.0	50.0	0.0	22.11	16.35	12.20	9.19	10.79
2000	50.0	50.0	50.0	52.01	39.21	26.97	15.14	16.90
2000	20.6	27.3	20.6	34.19	25.04	17.43	10.90	12.24
2010	0.0	0.0	0.0	23.50	16.33	11.41	8.03	8.76
2010	0.0	100.0	0.0	17.32	13.97	11.30	9.17	11.22
2010	100.0	0.0	100.0	76.59	56.63	36.97	17.49	18.36
2010	50.0	0.0	50.0	48.16	35.07	23.30	12.42	13.25
2010	0.0	50.0	0.0	20.62	15.23	11.35	8.55	9.89
2010	50.0	50.0	50.0	46.95	35.30	24.13	13.33	14.79
2010	20.6	27.3	20.6	32.06	23.43	16.26	10.12	11.22

TABLE 1.11

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	34.24	31.03	28.43	26.33	49.57
1980	0.0	100.0	0.0	26.36	26.94	27.64	28.46	51.01
1980	100.0	0.0	100.0	253.59	150.97	90.88	55.29	35.79
1980	50.0	0.0	50.0	119.22	77.47	52.57	37.46	43.83
1980	0.0	50.0	0.0	30.98	29.27	27.97	27.01	49.74
1980	50.0	50.0	50.0	139.98	88.96	59.26	41.88	43.40
1980	20.6	27.3	20.6	67.16	49.03	38.03	31.24	47.30
1988	0.0	0.0	0.0	20.51	16.62	13.64	11.35	25.40
1988	0.0	100.0	0.0	17.65	15.94	14.66	13.71	24.43
1988	100.0	0.0	100.0	151.00	93.76	56.17	29.51	23.52
1988	50.0	0.0	50.0	70.38	46.04	29.82	18.22	24.41
1988	0.0	50.0	0.0	19.27	16.24	13.94	12.18	24.78
1988	50.0	50.0	50.0	84.32	54.85	35.41	21.61	23.97
1988	20.6	27.3	20.6	40.18	28.41	20.40	14.60	24.65
1990	0.0	0.0	0.0	18.50	14.49	11.49	9.24	20.24
1990	0.0	100.0	0.0	16.65	14.54	12.91	11.67	19.81
1990	100.0	0.0	100.0	125.93	80.13	48.54	24.81	21.17
1990	50.0	0.0	50.0	59.54	39.51	25.58	15.13	20.38
1990	0.0	50.0	0.0	17.68	14.41	11.96	10.11	19.88
1990	50.0	50.0	50.0	71.29	47.33	30.73	18.24	20.49
1990	20.6	27.3	20.6	34.79	24.65	17.49	12.11	20.09
1995	0.0	0.0	0.0	14.47	10.52	7.71	5.71	10.07
1995	0.0	100.0	0.0	14.68	12.07	10.00	8.35	11.97
1995	100.0	0.0	100.0	79.66	54.62	34.43	16.85	16.37
1995	50.0	0.0	50.0	39.34	27.32	17.88	9.94	12.40
1995	0.0	50.0	0.0	14.51	11.07	8.56	6.69	10.73
1995	50.0	50.0	50.0	47.17	33.35	22.21	12.60	14.17
1995	20.6	27.3	20.6	24.63	17.67	12.31	7.96	11.37
2000	0.0	0.0	0.0	12.09	8.43	5.92	4.19	4.69
2000	0.0	100.0	0.0	13.03	10.44	8.39	6.76	8.30
2000	100.0	0.0	100.0	56.24	41.71	27.34	13.06	13.80
2000	50.0	0.0	50.0	28.89	21.10	14.07	7.57	8.15
2000	0.0	50.0	0.0	12.44	9.19	6.86	5.17	6.06
2000	50.0	50.0	50.0	34.64	26.08	17.86	9.91	11.05
2000	20.6	27.3	20.6	19.13	14.01	9.75	6.10	6.84
2010	0.0	0.0	0.0	11.51	8.01	5.61	3.96	4.33
2010	0.0	100.0	0.0	11.81	9.50	7.67	6.20	7.57
2010	100.0	0.0	100.0	52.57	38.89	25.36	11.93	12.54
2010	50.0	0.0	50.0	27.13	19.76	13.13	6.99	7.46
2010	0.0	50.0	0.0	11.61	8.57	6.39	4.81	5.56
2010	50.0	50.0	50.0	32.19	24.20	16.51	9.07	10.06
2010	20.6	27.3	20.6	17.94	13.11	9.10	5.66	6.27

TABLE 1.11: CO AT 35.0 MPH.

TABLE 1.12

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	25.25	22.98	21.14	19.65	36.41
1980	0.0	100.0	0.0	19.79	20.16	20.62	21.17	37.45
1980	100.0	0.0	100.0	180.41	108.01	65.49	40.23	26.63
1980	50.0	0.0	50.0	85.49	55.98	38.32	27.58	32.31
1980	0.0	50.0	0.0	22.97	21.75	20.82	20.14	36.51
1980	50.0	50.0	50.0	100.10	64.08	43.05	30.70	32.04
1980	20.6	27.3	20.6	48.61	35.78	27.98	23.15	34.78
1988	0.0	0.0	0.0	14.19	11.57	9.56	8.01	17.87
1988	0.0	100.0	0.0	12.07	10.96	10.12	9.51	16.97
1988	100.0	0.0	100.0	101.51	62.87	37.69	20.01	16.03
1988	50.0	0.0	50.0	47.59	31.15	20.26	12.55	16.96
1988	0.0	50.0	0.0	13.27	11.25	9.70	8.52	17.33
1988	50.0	50.0	50.0	56.79	36.91	23.90	14.76	16.50
1988	20.6	27.3	20.6	27.32	19.38	14.00	10.14	17.20
1990	0.0	0.0	0.0	12.61	9.95	7.95	6.44	14.11
1990	0.0	100.0	0.0	11.21	9.84	8.79	7.98	13.61
1990	100.0	0.0	100.0	83.88	53.20	32.23	16.64	14.24
1990	50.0	0.0	50.0	39.85	26.44	17.18	10.30	14.00
1990	0.0	50.0	0.0	11.98	9.84	8.21	6.98	13.77
1990	50.0	50.0	50.0	47.54	31.52	20.51	12.31	13.93
1990	20.6	27.3	20.6	23.38	16.61	11.86	8.31	13.88
1995	0.0	0.0	0.0	9.59	7.02	5.19	3.88	6.90
1995	0.0	100.0	0.0	9.65	7.97	6.63	5.56	8.02
1995	100.0	0.0	100.0	51.87	35.48	22.38	11.05	10.75
1995	50.0	0.0	50.0	25.72	17.87	11.73	6.60	8.31
1995	0.0	50.0	0.0	9.58	7.36	5.72	4.51	7.27
1995	50.0	50.0	50.0	30.76	21.73	14.50	8.31	9.38
1995	20.6	27.3	20.6	16.16	11.63	8.14	5.33	7.67
2000	0.0	0.0	0.0	7.88	5.54	3.92	2.81	3.16
2000	0.0	100.0	0.0	8.48	6.82	5.50	4.45	5.47
2000	100.0	0.0	100.0	36.00	26.73	17.57	8.47	8.97
2000	50.0	0.0	50.0	18.58	13.60	9.12	4.96	5.37
2000	0.0	50.0	0.0	8.11	6.02	4.52	3.43	4.03
2000	50.0	50.0	50.0	22.24	16.77	11.53	6.46	7.22
2000	20.6	27.3	20.6	12.36	9.09	6.36	4.02	4.53
2010	0.0	0.0	0.0	7.50	5.26	3.72	2.65	2.91
2010	0.0	100.0	0.0	7.70	6.21	5.03	4.08	4.98
2010	100.0	0.0	100.0	33.66	24.93	16.30	7.74	8.15
2010	50.0	0.0	50.0	17.45	12.74	8.50	4.59	4.90
2010	0.0	50.0	0.0	7.57	5.62	4.21	3.20	3.70
2010	50.0	50.0	50.0	20.68	15.57	10.66	5.91	6.56
2010	20.6	27.3	20.6	11.60	8.50	5.94	3.73	4.15

TABLE 1.12: CO AT 55.0 MPH.

TABLE 1.13

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	6.48	5.91	5.43	5.02	4.35
1980	0.0	100.0	0.0	8.12	7.41	6.81	6.29	5.15
1980	100.0	0.0	100.0	7.10	6.78	6.52	6.32	5.51
1980	50.0	0.0	50.0	6.83	6.39	6.03	5.73	5.00
1980	0.0	50.0	0.0	7.40	6.75	6.19	5.72	4.80
1980	50.0	50.0	50.0	7.61	7.10	6.67	6.30	5.33
1980	20.6	27.3	20.6	7.13	6.57	6.10	5.70	4.87
1988	0.0	0.0	0.0	4.18	3.75	3.39	3.09	2.87
1988	0.0	100.0	0.0	5.78	5.10	4.54	4.08	3.63
1988	100.0	0.0	100.0	5.35	4.95	4.61	4.32	3.88
1988	50.0	0.0	50.0	4.72	4.31	3.97	3.67	3.35
1988	0.0	50.0	0.0	4.94	4.40	3.94	3.57	3.23
1988	50.0	50.0	50.0	5.56	5.03	4.57	4.20	3.75
1988	20.6	27.3	20.6	4.82	4.33	3.93	3.59	3.26
1990	0.0	0.0	0.0	3.82	3.41	3.07	2.79	2.65
1990	0.0	100.0	0.0	5.42	4.74	4.18	3.72	3.39
1990	100.0	0.0	100.0	5.08	4.68	4.34	4.04	3.70
1990	50.0	0.0	50.0	4.40	4.00	3.66	3.37	3.14
1990	0.0	50.0	0.0	4.57	4.03	3.60	3.23	3.00
1990	50.0	50.0	50.0	5.25	4.71	4.26	3.88	3.54
1990	20.6	27.3	20.6	4.46	3.99	3.60	3.27	3.04
1995	0.0	0.0	0.0	2.83	2.49	2.20	1.96	1.97
1995	0.0	100.0	0.0	4.37	3.73	3.21	2.78	2.66
1995	100.0	0.0	100.0	4.24	3.86	3.53	3.23	3.09
1995	50.0	0.0	50.0	3.45	3.10	2.79	2.53	2.47
1995	0.0	50.0	0.0	3.51	3.04	2.65	2.33	2.27
1995	50.0	50.0	50.0	4.30	3.80	3.37	3.01	2.88
1995	20.6	27.3	20.6	3.46	3.04	2.69	2.39	2.34
2000	0.0	0.0	0.0	2.38	2.10	1.86	1.66	1.74
2000	0.0	100.0	0.0	3.83	3.25	2.78	2.39	2.39
2000	100.0	0.0	100.0	3.81	3.48	3.18	2.92	2.89
2000	50.0	0.0	50.0	3.00	2.70	2.44	2.21	2.24
2000	0.0	50.0	0.0	3.01	2.60	2.26	1.98	2.02
2000	50.0	50.0	50.0	3.82	3.37	2.98	2.65	2.64
2000	20.6	27.3	20.6	2.98	2.62	2.32	2.06	2.10
2010	0.0	0.0	0.0	2.20	1.97	1.76	1.59	1.66
2010	0.0	100.0	0.0	3.60	3.09	2.66	2.31	2.31
2010	100.0	0.0	100.0	3.73	3.40	3.11	2.85	2.83
2010	50.0	0.0	50.0	2.87	2.60	2.35	2.15	2.17
2010	0.0	50.0	0.0	2.81	2.45	2.15	1.90	1.94
2010	50.0	50.0	50.0	3.66	3.24	2.89	2.58	2.57
2010	20.6	27.3	20.6	2.81	2.49	2.22	1.99	2.02

TABLE 1.13: NOx AT 2.5 MPH.

TABLE 1.14

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	5.99	5.46	5.02	4.64	4.00
1980	0.0	100.0	0.0	7.55	6.89	6.33	5.84	4.76
1980	100.0	0.0	100.0	6.60	6.30	6.05	5.87	5.08
1980	50.0	0.0	50.0	6.33	5.92	5.59	5.31	4.60
1980	0.0	50.0	0.0	6.86	6.26	5.74	5.30	4.43
1980	50.0	50.0	50.0	7.07	6.59	6.19	5.85	4.92
1980	20.6	27.3	20.6	6.60	6.09	5.65	5.28	4.49
1988	0.0	0.0	0.0	3.89	3.48	3.15	2.86	2.65
1988	0.0	100.0	0.0	5.40	4.77	4.24	3.80	3.37
1988	100.0	0.0	100.0	4.99	4.62	4.30	4.02	3.60
1988	50.0	0.0	50.0	4.40	4.02	3.69	3.42	3.10
1988	0.0	50.0	0.0	4.61	4.10	3.68	3.32	3.00
1988	50.0	50.0	50.0	5.20	4.69	4.27	3.91	3.49
1988	20.6	27.3	20.6	4.49	4.04	3.66	3.34	3.03
1990	0.0	0.0	0.0	3.56	3.17	2.85	2.58	2.45
1990	0.0	100.0	0.0	5.06	4.42	3.90	3.46	3.15
1990	100.0	0.0	100.0	4.74	4.36	4.04	3.76	3.43
1990	50.0	0.0	50.0	4.10	3.72	3.40	3.13	2.91
1990	0.0	50.0	0.0	4.26	3.76	3.34	3.00	2.78
1990	50.0	50.0	50.0	4.90	4.39	3.97	3.61	3.29
1990	20.6	27.3	20.6	4.16	3.72	3.35	3.04	2.82
1995	0.0	0.0	0.0	2.64	2.32	2.05	1.82	1.82
1995	0.0	100.0	0.0	4.08	3.48	2.99	2.59	2.48
1995	100.0	0.0	100.0	3.96	3.61	3.30	3.02	2.88
1995	50.0	0.0	50.0	3.23	2.89	2.60	2.36	2.30
1995	0.0	50.0	0.0	3.28	2.84	2.47	2.16	2.11
1995	50.0	50.0	50.0	4.02	3.55	3.14	2.80	2.68
1995	20.6	27.3	20.6	3.23	2.84	2.51	2.23	2.18
2000	0.0	0.0	0.0	2.22	1.95	1.73	1.54	1.61
2000	0.0	100.0	0.0	3.58	3.04	2.60	2.23	2.23
2000	100.0	0.0	100.0	3.56	3.25	2.97	2.72	2.70
2000	50.0	0.0	50.0	2.80	2.52	2.28	2.06	2.09
2000	0.0	50.0	0.0	2.81	2.43	2.11	1.84	1.88
2000	50.0	50.0	50.0	3.57	3.15	2.78	2.48	2.47
2000	20.6	27.3	20.6	2.78	2.44	2.16	1.92	1.95
2010	0.0	0.0	0.0	2.06	1.83	1.64	1.48	1.55
2010	0.0	100.0	0.0	3.36	2.89	2.49	2.16	2.16
2010	100.0	0.0	100.0	3.48	3.18	2.91	2.66	2.64
2010	50.0	0.0	50.0	2.68	2.42	2.20	2.00	2.03
2010	0.0	50.0	0.0	2.63	2.29	2.01	1.77	1.81
2010	50.0	50.0	50.0	3.42	3.03	2.70	2.41	2.40
2010	20.6	27.3	20.6	2.62	2.32	2.07	1.85	1.89

TABLE 1.14: NOx AT 5.0 MPH.

TABLE 1.15

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	5.40	4.91	4.51	4.16	3.56
1980	0.0	100.0	0.0	6.86	6.26	5.75	5.30	4.27
1980	100.0	0.0	100.0	5.96	5.69	5.48	5.31	4.55
1980	50.0	0.0	50.0	5.71	5.34	5.04	4.79	4.11
1980	0.0	50.0	0.0	6.21	5.66	5.19	4.79	3.96
1980	50.0	50.0	50.0	6.41	5.98	5.61	5.31	4.41
1980	20.6	27.3	20.6	5.97	5.50	5.10	4.77	4.01
1988	0.0	0.0	0.0	3.47	3.10	2.80	2.54	2.34
1988	0.0	100.0	0.0	4.85	4.27	3.80	3.40	2.99
1988	100.0	0.0	100.0	4.46	4.13	3.84	3.60	3.20
1988	50.0	0.0	50.0	3.94	3.59	3.30	3.05	2.75
1988	0.0	50.0	0.0	4.13	3.67	3.28	2.96	2.66
1988	50.0	50.0	50.0	4.65	4.20	3.82	3.50	3.10
1988	20.6	27.3	20.6	4.02	3.61	3.27	2.98	2.68
1990	0.0	0.0	0.0	3.16	2.81	2.52	2.28	2.15
1990	0.0	100.0	0.0	4.52	3.94	3.47	3.08	2.78
1990	100.0	0.0	100.0	4.22	3.88	3.59	3.34	3.04
1990	50.0	0.0	50.0	3.64	3.31	3.02	2.78	2.56
1990	0.0	50.0	0.0	3.79	3.34	2.97	2.66	2.45
1990	50.0	50.0	50.0	4.37	3.91	3.53	3.21	2.91
1990	20.6	27.3	20.6	3.70	3.31	2.97	2.69	2.48
1995	0.0	0.0	0.0	2.33	2.05	1.81	1.60	1.60
1995	0.0	100.0	0.0	3.62	3.09	2.65	2.29	2.19
1995	100.0	0.0	100.0	3.51	3.20	2.92	2.67	2.55
1995	50.0	0.0	50.0	2.86	2.56	2.30	2.08	2.02
1995	0.0	50.0	0.0	2.91	2.51	2.18	1.91	1.86
1995	50.0	50.0	50.0	3.57	3.14	2.78	2.48	2.37
1995	20.6	27.3	20.6	2.86	2.51	2.21	1.97	1.92
2000	0.0	0.0	0.0	1.95	1.72	1.52	1.35	1.42
2000	0.0	100.0	0.0	3.17	2.69	2.29	1.97	1.97
2000	100.0	0.0	100.0	3.15	2.87	2.63	2.40	2.38
2000	50.0	0.0	50.0	2.48	2.23	2.01	1.82	1.84
2000	0.0	50.0	0.0	2.48	2.14	1.86	1.62	1.65
2000	50.0	50.0	50.0	3.16	2.78	2.46	2.19	2.18
2000	20.6	27.3	20.6	2.46	2.16	1.90	1.69	1.72
2010	0.0	0.0	0.0	1.81	1.61	1.44	1.29	1.36
2010	0.0	100.0	0.0	2.98	2.55	2.20	1.90	1.90
2010	100.0	0.0	100.0	3.08	2.81	2.57	2.35	2.33
2010	50.0	0.0	50.0	2.37	2.14	1.94	1.76	1.78
2010	0.0	50.0	0.0	2.32	2.02	1.77	1.56	1.59
2010	50.0	50.0	50.0	3.03	2.68	2.38	2.13	2.12
2010	20.6	27.3	20.6	2.32	2.05	1.82	1.63	1.66

TABLE 1.16

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	5.11	4.64	4.23	3.89	3.27
1980	0.0	100.0	0.0	6.60	6.01	5.49	5.05	4.00
1980	100.0	0.0	100.0	5.58	5.36	5.18	5.05	4.29
1980	50.0	0.0	50.0	5.38	5.04	4.76	4.53	3.84
1980	0.0	50.0	0.0	5.95	5.40	4.94	4.54	3.69
1980	50.0	50.0	50.0	6.09	5.68	5.34	5.05	4.15
1980	20.6	27.3	20.6	5.68	5.23	4.84	4.51	3.73
1988	0.0	0.0	0.0	3.06	2.73	2.46	2.23	2.02
1988	0.0	100.0	0.0	4.29	3.79	3.37	3.02	2.62
1988	100.0	0.0	100.0	3.90	3.62	3.38	3.18	2.79
1988	50.0	0.0	50.0	3.46	3.16	2.90	2.69	2.40
1988	0.0	50.0	0.0	3.66	3.25	2.91	2.63	2.32
1988	50.0	50.0	50.0	4.10	3.70	3.38	3.10	2.70
1988	20.6	27.3	20.6	3.55	3.19	2.89	2.64	2.34
1990	0.0	0.0	0.0	2.73	2.43	2.18	1.97	1.84
1990	0.0	100.0	0.0	3.91	3.42	3.02	2.68	2.39
1990	100.0	0.0	100.0	3.63	3.34	3.10	2.89	2.60
1990	50.0	0.0	50.0	3.14	2.86	2.61	2.40	2.20
1990	0.0	50.0	0.0	3.29	2.90	2.58	2.31	2.10
1990	50.0	50.0	50.0	3.77	3.38	3.06	2.79	2.50
1990	20.6	27.3	20.6	3.20	2.86	2.58	2.34	2.13
1995	0.0	0.0	0.0	1.95	1.71	1.51	1.34	1.34
1995	0.0	100.0	0.0	3.03	2.58	2.22	1.92	1.83
1995	100.0	0.0	100.0	2.94	2.67	2.44	2.23	2.12
1995	50.0	0.0	50.0	2.39	2.14	1.93	1.74	1.69
1995	0.0	50.0	0.0	2.44	2.10	1.83	1.60	1.55
1995	50.0	50.0	50.0	2.98	2.63	2.33	2.07	1.97
1995	20.6	27.3	20.6	2.40	2.10	1.85	1.65	1.60
2000	0.0	0.0	0.0	1.61	1.42	1.25	1.11	1.17
2000	0.0	100.0	0.0	2.61	2.22	1.89	1.62	1.62
2000	100.0	0.0	100.0	2.60	2.37	2.16	1.98	1.96
2000	50.0	0.0	50.0	2.04	1.83	1.65	1.49	1.52
2000	0.0	50.0	0.0	2.05	1.77	1.53	1.33	1.36
2000	50.0	50.0	50.0	2.60	2.29	2.02	1.80	1.79
2000	20.6	27.3	20.6	2.03	1.78	1.57	1.39	1.41
2010	0.0	0.0	0.0	1.49	1.33	1.19	1.06	1.12
2010	0.0	100.0	0.0	2.45	2.10	1.81	1.56	1.56
2010	100.0	0.0	100.0	2.54	2.31	2.11	1.93	1.92
2010	50.0	0.0	50.0	1.95	1.76	1.59	1.45	1.47
2010	0.0	50.0	0.0	1.91	1.66	1.46	1.28	1.31
2010	50.0	50.0	50.0	2.49	2.21	1.96	1.75	1.74
2010	20.6	27.3	20.6	1.91	1.69	1.50	1.34	1.36

TABLE 1.16: NOx AT 19.6 MPH.

TABLE 1.17

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	5.46	4.93	4.48	4.09	3.40
1980	0.0	100.0	0.0	7.12	6.46	5.89	5.39	4.22
1980	100.0	0.0	100.0	5.87	5.66	5.50	5.38	4.57
1980	50.0	0.0	50.0	5.72	5.35	5.06	4.82	4.06
1980	0.0	50.0	0.0	6.40	5.80	5.27	4.83	3.88
1980	50.0	50.0	50.0	6.49	6.06	5.69	5.39	4.40
1980	20.6	27.3	20.6	6.08	5.58	5.15	4.80	3.93
1988	0.0	0.0	0.0	2.92	2.62	2.36	2.15	1.92
1988	0.0	100.0	0.0	4.09	3.63	3.25	2.92	2.49
1988	100.0	0.0	100.0	3.67	3.42	3.21	3.03	2.64
1988	50.0	0.0	50.0	3.28	3.01	2.78	2.59	2.27
1988	0.0	50.0	0.0	3.50	3.13	2.81	2.54	2.21
1988	50.0	50.0	50.0	3.88	3.53	3.23	2.98	2.56
1988	20.6	27.3	20.6	3.39	3.06	2.78	2.55	2.22
1990	0.0	0.0	0.0	2.54	2.27	2.04	1.85	1.69
1990	0.0	100.0	0.0	3.61	3.18	2.82	2.52	2.21
1990	100.0	0.0	100.0	3.31	3.07	2.85	2.67	2.38
1990	50.0	0.0	50.0	2.90	2.65	2.43	2.24	2.02
1990	0.0	50.0	0.0	3.05	2.71	2.42	2.18	1.95
1990	50.0	50.0	50.0	3.46	3.12	2.84	2.60	2.29
1990	20.6	27.3	20.6	2.97	2.66	2.41	2.19	1.97
1995	0.0	0.0	0.0	1.69	1.49	1.32	1.18	1.16
1995	0.0	100.0	0.0	2.59	2.22	1.92	1.67	1.57
1995	100.0	0.0	100.0	2.50	2.28	2.09	1.91	1.80
1995	50.0	0.0	50.0	2.06	1.85	1.66	1.51	1.45
1995	0.0	50.0	0.0	2.10	1.82	1.59	1.40	1.35
1995	50.0	50.0	50.0	2.55	2.25	2.00	1.79	1.69
1995	20.6	27.3	20.6	2.06	1.81	1.61	1.44	1.38
2000	0.0	0.0	0.0	1.34	1.19	1.05	0.94	0.98
2000	0.0	100.0	0.0	2.14	1.82	1.56	1.34	1.34
2000	100.0	0.0	100.0	2.12	1.94	1.77	1.63	1.61
2000	50.0	0.0	50.0	1.68	1.52	1.37	1.24	1.26
2000	0.0	50.0	0.0	1.69	1.46	1.27	1.11	1.14
2000	50.0	50.0	50.0	2.13	1.88	1.67	1.48	1.48
2000	20.6	27.3	20.6	1.67	1.47	1.30	1.16	1.18
2010	0.0	0.0	0.0	1.24	1.10	0.99	0.89	0.93
2010	0.0	100.0	0.0	2.00	1.72	1.48	1.29	1.29
2010	100.0	0.0	100.0	2.06	1.88	1.72	1.58	1.57
2010	50.0	0.0	50.0	1.60	1.45	1.31	1.19	1.21
2010	0.0	50.0	0.0	1.57	1.37	1.20	1.06	1.09
2010	50.0	50.0	50.0	2.03	1.80	1.60	1.43	1.43
2010	20.6	27.3	20.6	1.57	1.39	1.24	1.11	1.13

TABLE 1.18

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	6.71	6.07	5.54	5.08	4.24
1980	0.0	100.0	0.0	8.68	7.89	7.22	6.63	5.23
1980	100.0	0.0	100.0	7.27	6.99	6.78	6.63	5.63
1980	50.0	0.0	50.0	7.04	6.60	6.24	5.95	5.03
1980	0.0	50.0	0.0	7.83	7.10	6.48	5.95	4.81
1980	50.0	50.0	50.0	7.97	7.44	7.00	6.63	5.43
1980	20.6	27.3	20.6	7.46	6.86	6.35	5.92	4.88
1988	0.0	0.0	0.0	3.49	3.15	2.86	2.62	2.33
1988	0.0	100.0	0.0	4.79	4.29	3.86	3.51	2.98
1988	100.0	0.0	100.0	4.33	4.04	3.80	3.60	3.11
1988	50.0	0.0	50.0	3.90	3.59	3.33	3.11	2.72
1988	0.0	50.0	0.0	4.14	3.72	3.37	3.07	2.66
1988	50.0	50.0	50.0	4.56	4.17	3.83	3.55	3.04
1988	20.6	27.3	20.6	4.01	3.65	3.33	3.07	2.67
1990	0.0	0.0	0.0	2.96	2.67	2.42	2.22	2.02
1990	0.0	100.0	0.0	4.12	3.66	3.28	2.96	2.58
1990	100.0	0.0	100.0	3.79	3.52	3.28	3.09	2.72
1990	50.0	0.0	50.0	3.36	3.08	2.84	2.64	2.36
1990	0.0	50.0	0.0	3.52	3.16	2.85	2.59	2.30
1990	50.0	50.0	50.0	3.95	3.59	3.28	3.02	2.65
1990	20.6	27.3	20.6	3.43	3.10	2.83	2.59	2.31
1995	0.0	0.0	0.0	1.82	1.62	1.45	1.31	1.27
1995	0.0	100.0	0.0	2.68	2.32	2.03	1.79	1.68
1995	100.0	0.0	100.0	2.58	2.36	2.17	2.00	1.87
1995	50.0	0.0	50.0	2.16	1.96	1.78	1.63	1.55
1995	0.0	50.0	0.0	2.21	1.94	1.72	1.53	1.46
1995	50.0	50.0	50.0	2.63	2.35	2.10	1.90	1.77
1995	20.6	27.3	20.6	2.17	1.93	1.73	1.56	1.48
2000	0.0	0.0	0.0	1.34	1.20	1.08	0.98	1.02
2000	0.0	100.0	0.0	2.05	1.76	1.53	1.34	1.33
2000	100.0	0.0	100.0	2.02	1.85	1.71	1.58	1.57
2000	50.0	0.0	50.0	1.64	1.49	1.36	1.25	1.26
2000	0.0	50.0	0.0	1.65	1.45	1.28	1.14	1.15
2000	50.0	50.0	50.0	2.03	1.81	1.62	1.46	1.45
2000	20.6	27.3	20.6	1.63	1.45	1.30	1.17	1.19
2010	0.0	0.0	0.0	1.22	1.11	1.01	0.92	0.96
2010	0.0	100.0	0.0	1.87	1.63	1.43	1.26	1.26
2010	100.0	0.0	100.0	1.93	1.77	1.64	1.51	1.51
2010	50.0	0.0	50.0	1.53	1.40	1.28	1.18	1.20
2010	0.0	50.0	0.0	1.51	1.34	1.19	1.07	1.09
2010	50.0	50.0	50.0	1.90	1.70	1.53	1.39	1.38
2010	20.6	27.3	20.6	1.51	1.35	1.22	1.11	1.13

TABLE 1.18: NOx AT 55.0 MPH.

TABLE 1.19

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	32.09	28.79	26.02	23.70	30.19
1980	0.0	100.0	0.0	30.29	29.89	29.59	29.39	40.90
1980	100.0	0.0	100.0	246.68	141.35	81.37	47.17	35.21
1980	50.0	0.0	50.0	119.73	74.71	48.53	33.13	32.16
1980	0.0	50.0	0.0	31.21	29.09	27.34	25.89	34.39
1980	50.0	50.0	50.0	138.48	85.62	55.48	38.28	38.06
1980	20.6	27.3	20.6	67.45	47.73	35.94	28.74	33.26
1988	0.0	0.0	0.0	20.21	17.03	14.44	12.34	17.76
1988	0.0	100.0	0.0	21.45	19.80	18.42	17.27	24.73
1988	100.0	0.0	100.0	233.88	117.35	59.93	31.19	26.35
1988	50.0	0.0	50.0	101.68	55.39	31.85	19.52	20.91
1988	0.0	50.0	0.0	20.55	17.99	15.89	14.17	20.38
1988	50.0	50.0	50.0	127.67	68.57	39.17	24.23	25.54
1988	20.6	27.3	20.6	53.62	33.19	22.32	16.26	20.46
1990	0.0	0.0	0.0	17.72	14.77	12.39	10.45	14.87
1990	0.0	100.0	0.0	19.81	17.93	16.36	15.05	20.87
1990	100.0	0.0	100.0	219.88	108.51	54.46	27.85	24.22
1990	50.0	0.0	50.0	94.02	50.25	28.33	17.03	18.30
1990	0.0	50.0	0.0	18.40	15.89	13.83	12.15	17.11
1990	50.0	50.0	50.0	119.84	63.22	35.41	21.45	22.54
1990	20.6	27.3	20.6	49.20	29.84	19.67	14.05	17.48
1995	0.0	0.0	0.0	12.85	10.51	8.62	7.09	9.29
1995	0.0	100.0	0.0	16.30	14.15	12.33	10.80	13.19
1995	100.0	0.0	100.0	175.81	85.82	42.49	21.38	19.82
1995	50.0	0.0	50.0	73.66	38.66	21.29	12.44	13.19
1995	0.0	50.0	0.0	14.10	11.85	9.99	8.46	10.73
1995	50.0	50.0	50.0	96.06	49.98	27.41	16.09	16.51
1995	20.6	27.3	20.6	38.31	22.70	14.52	10.01	11.66
2000	0.0	0.0	0.0	9.47	7.77	6.39	5.27	5.72
2000	0.0	100.0	0.0	13.30	11.25	9.54	8.10	8.23
2000	100.0	0.0	100.0	130.39	64.93	32.74	16.76	16.44
2000	50.0	0.0	50.0	54.68	29.17	16.27	9.58	9.74
2000	0.0	50.0	0.0	10.90	9.07	7.56	6.32	6.66
2000	50.0	50.0	50.0	71.84	38.09	21.14	12.43	12.33
2000	20.6	27.3	20.6	28.67	17.20	11.05	7.60	7.87
2010	0.0	0.0	0.0	8.88	7.29	6.00	4.95	5.38
2010	0.0	100.0	0.0	11.94	10.13	8.61	7.33	7.43
2010	100.0	0.0	100.0	94.44	50.67	27.33	14.86	14.57
2010	50.0	0.0	50.0	41.29	23.72	14.08	8.71	8.86
2010	0.0	50.0	0.0	10.03	8.36	6.98	5.85	6.15
2010	50.0	50.0	50.0	53.19	30.40	17.97	11.10	11.00
2010	20.6	27.3	20.6	22.72	14.57	9.83	6.97	7.21

TABLE 1.20

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	19.54	17.65	16.05	14.70	18.32
1980	0.0	100.0	0.0	18.48	18.24	18.07	17.96	24.53
1980	100.0	0.0	100.0	145.79	83.87	48.54	28.35	21.34
1980	50.0	0.0	50.0	71.34	44.79	29.32	20.21	19.51
1980	0.0	50.0	0.0	19.02	17.81	16.80	15.96	20.76
1980	50.0	50.0	50.0	82.13	51.05	33.31	23.16	22.94
1980	20.6	27.3	20.6	40.45	28.83	21.88	17.64	20.13
1988	0.0	0.0	0.0	11.21	9.52	8.15	7.03	9.93
1988	0.0	100.0	0.0	11.70	10.86	10.17	9.59	13.65
1988	100.0	0.0	100.0	122.50	62.05	32.04	16.91	14.26
1988	50.0	0.0	50.0	53.83	29.70	17.34	10.81	11.52
1988	0.0	50.0	0.0	11.32	9.98	8.88	7.98	11.33
1988	50.0	50.0	50.0	67.10	36.46	21.11	13.25	13.95
1988	20.6	27.3	20.6	28.66	18.00	12.29	9.09	11.33
1990	0.0	0.0	0.0	9.63	8.09	6.84	5.83	8.17
1990	0.0	100.0	0.0	10.57	9.63	8.84	8.18	11.32
1990	100.0	0.0	100.0	113.20	56.32	28.56	14.80	12.84
1990	50.0	0.0	50.0	48.84	26.40	15.09	9.22	9.88
1990	0.0	50.0	0.0	9.92	8.62	7.56	6.70	9.35
1990	50.0	50.0	50.0	61.89	32.98	18.70	11.49	12.08
1990	20.6	27.3	20.6	25.78	15.85	10.60	7.68	9.50
1995	0.0	0.0	0.0	6.75	5.55	4.58	3.79	4.94
1995	0.0	100.0	0.0	8.44	7.35	6.43	5.65	6.91
1995	100.0	0.0	100.0	88.32	43.31	21.59	10.98	10.17
1995	50.0	0.0	50.0	37.21	19.68	10.95	6.48	6.87
1995	0.0	50.0	0.0	7.36	6.21	5.26	4.48	5.67
1995	50.0	50.0	50.0	48.38	25.33	14.01	8.32	8.54
1995	20.6	27.3	20.6	19.50	11.66	7.54	5.26	6.12
2000	0.0	0.0	0.0	4.95	4.09	3.38	2.81	3.04
2000	0.0	100.0	0.0	6.86	5.82	4.95	4.22	4.30
2000	100.0	0.0	100.0	65.12	32.55	16.52	8.55	8.40
2000	50.0	0.0	50.0	27.46	14.75	8.31	4.97	5.05
2000	0.0	50.0	0.0	5.66	4.73	3.97	3.34	3.51
2000	50.0	50.0	50.0	35.99	19.19	10.74	6.39	6.35
2000	20.6	27.3	20.6	14.51	8.78	5.71	3.98	4.11
2010	0.0	0.0	0.0	4.68	3.86	3.20	2.67	2.88
2010	0.0	100.0	0.0	6.20	5.28	4.51	3.86	3.91
2010	100.0	0.0	100.0	47.46	25.57	13.88	7.64	7.49
2010	50.0	0.0	50.0	20.89	12.09	7.25	4.55	4.62
2010	0.0	50.0	0.0	5.25	4.40	3.69	3.11	3.27
2010	50.0	50.0	50.0	26.83	15.42	9.19	5.74	5.70
2010	20.6	27.3	20.6	11.60	7.50	5.12	3.68	3.80

TABLE 1.20: NMHC AT 5.0 MPH.

TABLE 1.21

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	10.84	9.83	8.97	8.25	10.15
1980	0.0	100.0	0.0	10.27	10.14	10.04	9.98	13.47
1980	100.0	0.0	100.0	78.71	45.43	26.42	15.55	11.80
1980	50.0	0.0	50.0	38.74	24.45	16.11	11.20	10.80
1980	0.0	50.0	0.0	10.56	9.91	9.37	8.92	11.46
1980	50.0	50.0	50.0	44.49	27.78	18.23	12.77	12.64
1980	20.6	27.3	20.6	22.10	15.85	12.11	9.82	11.12
1988	0.0	0.0	0.0	5.98	5.11	4.40	3.82	5.32
1988	0.0	100.0	0.0	6.18	5.76	5.41	5.12	7.23
1988	100.0	0.0	100.0	62.32	31.80	16.57	8.86	7.47
1988	50.0	0.0	50.0	27.61	15.39	9.09	5.75	6.11
1988	0.0	50.0	0.0	6.01	5.32	4.77	4.31	6.04
1988	50.0	50.0	50.0	34.25	18.78	10.99	6.99	7.35
1988	20.6	27.3	20.6	14.82	9.42	6.51	4.87	6.03
1990	0.0	0.0	0.0	5.08	4.30	3.66	3.14	4.35
1990	0.0	100.0	0.0	5.52	5.05	4.65	4.32	5.95
1990	100.0	0.0	100.0	57.03	28.57	14.62	7.67	6.65
1990	50.0	0.0	50.0	24.79	13.53	7.83	4.86	5.19
1990	0.0	50.0	0.0	5.21	4.56	4.02	3.58	4.94
1990	50.0	50.0	50.0	31.28	16.81	9.63	6.00	6.30
1990	20.6	27.3	20.6	13.19	8.20	5.55	4.08	5.01
1995	0.0	0.0	0.0	3.51	2.90	2.41	2.01	2.60
1995	0.0	100.0	0.0	4.34	3.79	3.33	2.94	3.58
1995	100.0	0.0	100.0	43.85	21.61	10.85	5.59	5.17
1995	50.0	0.0	50.0	18.58	9.90	5.57	3.35	3.55
1995	0.0	50.0	0.0	3.81	3.22	2.75	2.35	2.96
1995	50.0	50.0	50.0	24.09	12.70	7.09	4.26	4.38
1995	20.6	27.3	20.6	9.81	5.93	3.88	2.74	3.18
2000	0.0	0.0	0.0	2.58	2.15	1.79	1.50	1.62
2000	0.0	100.0	0.0	3.53	3.01	2.57	2.20	2.24
2000	100.0	0.0	100.0	32.30	16.23	8.30	4.36	4.28
2000	50.0	0.0	50.0	13.70	7.43	4.24	2.57	2.62
2000	0.0	50.0	0.0	2.94	2.47	2.08	1.77	1.85
2000	50.0	50.0	50.0	17.91	9.62	5.44	3.28	3.26
2000	20.6	27.3	20.6	7.31	4.47	2.94	2.08	2.15
2010	0.0	0.0	0.0	2.46	2.05	1.71	1.44	1.55
2010	0.0	100.0	0.0	3.22	2.76	2.36	2.03	2.07
2010	100.0	0.0	100.0	23.79	12.87	7.05	3.93	3.85
2010	50.0	0.0	50.0	10.54	6.15	3.73	2.38	2.42
2010	0.0	50.0	0.0	2.75	2.31	1.96	1.66	1.74
2010	50.0	50.0	50.0	13.51	7.81	4.70	2.98	2.96
2010	20.6	27.3	20.6	5.91	3.86	2.67	1.94	2.01

TABLE 1.21: NMHC AT 10.0 MPH.

TABLE 1.22

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	6.40	5.84	5.36	4.95	6.00
1980	0.0	100.0	0.0	6.06	6.01	5.97	5.95	7.95
1980	100.0	0.0	100.0	46.41	26.82	15.62	9.21	7.01
1980	50.0	0.0	50.0	22.91	14.48	9.57	6.68	6.40
1980	0.0	50.0	0.0	6.24	5.88	5.58	5.34	6.77
1980	50.0	50.0	50.0	26.24	16.41	10.80	7.58	7.48
1980	20.6	27.3	20.6	13.07	9.40	7.20	5.87	6.58
1988	0.0	0.0	0.0	3.31	2.85	2.48	2.17	2.97
1988	0.0	100.0	0.0	3.37	3.16	2.99	2.85	4.01
1988	100.0	0.0	100.0	32.96	16.99	8.95	4.84	4.06
1988	50.0	0.0	50.0	14.76	8.33	4.98	3.20	3.38
1988	0.0	50.0	0.0	3.31	2.95	2.66	2.42	3.37
1988	50.0	50.0	50.0	18.16	10.08	5.97	3.85	4.04
1988	20.6	27.3	20.6	7.98	5.14	3.60	2.73	3.35
1990	0.0	0.0	0.0	2.76	2.35	2.02	1.75	2.39
1990	0.0	100.0	0.0	2.95	2.71	2.52	2.36	3.25
1990	100.0	0.0	100.0	29.55	14.96	7.74	4.11	3.55
1990	50.0	0.0	50.0	12.98	7.17	4.21	2.65	2.82
1990	0.0	50.0	0.0	2.81	2.48	2.20	1.98	2.71
1990	50.0	50.0	50.0	16.25	8.84	5.13	3.24	3.40
1990	20.6	27.3	20.6	6.96	4.38	3.01	2.24	2.74
1995	0.0	0.0	0.0	1.83	1.52	1.27	1.07	1.38
1995	0.0	100.0	0.0	2.23	1.96	1.73	1.54	1.88
1995	100.0	0.0	100.0	22.00	10.91	5.52	2.88	2.66
1995	50.0	0.0	50.0	9.38	5.04	2.87	1.75	1.85
1995	0.0	50.0	0.0	1.98	1.68	1.44	1.24	1.56
1995	50.0	50.0	50.0	12.12	6.44	3.63	2.21	2.27
1995	20.6	27.3	20.6	4.99	3.04	2.01	1.44	1.67
2000	0.0	0.0	0.0	1.34	1.12	0.94	0.80	0.86
2000	0.0	100.0	0.0	1.81	1.55	1.33	1.15	1.17
2000	100.0	0.0	100.0	16.13	8.15	4.20	2.23	2.19
2000	50.0	0.0	50.0	6.88	3.76	2.17	1.34	1.36
2000	0.0	50.0	0.0	1.51	1.28	1.09	0.93	0.97
2000	50.0	50.0	50.0	8.97	4.85	2.77	1.69	1.68
2000	20.6	27.3	20.6	3.69	2.28	1.52	1.09	1.12
2010	0.0	0.0	0.0	1.29	1.08	0.91	0.77	0.83
2010	0.0	100.0	0.0	1.67	1.44	1.24	1.07	1.09
2010	100.0	0.0	100.0	12.10	6.57	3.62	2.04	2.00
2010	50.0	0.0	50.0	5.39	3.16	1.94	1.25	1.27
2010	0.0	50.0	0.0	1.43	1.21	1.03	0.89	0.93
2010	50.0	50.0	50.0	6.89	4.01	2.43	1.56	1.55
2010	20.6	27.3	20.6	3.04	2.00	1.40	1.03	1.06

TABLE 1.23

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	4.12	3.79	3.50	3.26	3.86
1980	0.0	100.0	0.0	3.91	3.90	3.89	3.90	5.12
1980	100.0	0.0	100.0	30.34	17.54	10.21	6.02	4.57
1980	50.0	0.0	50.0	15.01	9.49	6.28	4.39	4.15
1980	0.0	50.0	0.0	4.02	3.82	3.65	3.51	4.36
1980	50.0	50.0	50.0	17.13	10.72	7.05	4.95	4.85
1980	20.6	27.3	20.6	8.52	6.14	4.72	3.86	4.25
1988	0.0	0.0	0.0	1.97	1.71	1.50	1.33	1.78
1988	0.0	100.0	0.0	1.98	1.87	1.79	1.72	2.39
1988	100.0	0.0	100.0	19.22	9.99	5.30	2.89	2.41
1988	50.0	0.0	50.0	8.75	4.97	3.00	1.94	2.02
1988	0.0	50.0	0.0	1.96	1.77	1.61	1.48	2.02
1988	50.0	50.0	50.0	10.60	5.93	3.55	2.30	2.40
1988	20.6	27.3	20.6	4.74	3.07	2.17	1.66	2.00
1990	0.0	0.0	0.0	1.61	1.39	1.20	1.05	1.41
1990	0.0	100.0	0.0	1.69	1.57	1.47	1.39	1.90
1990	100.0	0.0	100.0	16.83	8.58	4.47	2.40	2.06
1990	50.0	0.0	50.0	7.53	4.19	2.47	1.57	1.65
1990	0.0	50.0	0.0	1.64	1.45	1.30	1.18	1.59
1990	50.0	50.0	50.0	9.26	5.08	2.97	1.89	1.98
1990	20.6	27.3	20.6	4.04	2.56	1.77	1.33	1.61
1995	0.0	0.0	0.0	1.04	0.86	0.73	0.61	0.78
1995	0.0	100.0	0.0	1.24	1.09	0.97	0.86	1.05
1995	100.0	0.0	100.0	12.12	6.03	3.07	1.60	1.48
1995	50.0	0.0	50.0	5.27	2.84	1.62	0.99	1.05
1995	0.0	50.0	0.0	1.11	0.95	0.82	0.71	0.88
1995	50.0	50.0	50.0	6.68	3.56	2.02	1.23	1.27
1995	20.6	27.3	20.6	2.80	1.72	1.14	0.82	0.94
2000	0.0	0.0	0.0	0.76	0.64	0.54	0.46	0.49
2000	0.0	100.0	0.0	1.01	0.86	0.75	0.65	0.66
2000	100.0	0.0	100.0	8.91	4.52	2.34	1.25	1.22
2000	50.0	0.0	50.0	3.87	2.12	1.22	0.76	0.77
2000	0.0	50.0	0.0	0.85	0.72	0.62	0.53	0.55
2000	50.0	50.0	50.0	4.96	2.69	1.54	0.95	0.94
2000	20.6	27.3	20.6	2.08	1.29	0.86	0.62	0.64
2010	0.0	0.0	0.0	0.73	0.61	0.52	0.44	0.47
2010	0.0	100.0	0.0	0.94	0.81	0.70	0.61	0.62
2010	100.0	0.0	100.0	6.77	3.68	2.03	1.15	1.13
2010	50.0	0.0	50.0	3.03	1.78	1.10	0.71	0.72
2010	0.0	50.0	0.0	0.81	0.69	0.59	0.51	0.53
2010	50.0	50.0	50.0	3.85	2.24	1.37	0.88	0.87
2010	20.6	27.3	20.6	1.71	1.13	0.79	0.59	0.61

TABLE 1.23: NMHC AT 35.0 MPH.

TABLE 1.24

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	3.28	3.04	2.83	2.65	3.07
1980	0.0	100.0	0.0	3.12	3.12	3.13	3.14	4.07
1980	100.0	0.0	100.0	24.38	14.10	8.21	4.83	3.67
1980	50.0	0.0	50.0	12.10	7.66	5.07	3.55	3.31
1980	0.0	50.0	0.0	3.20	3.06	2.94	2.84	3.47
1980	50.0	50.0	50.0	13.75	8.61	5.67	3.99	3.87
1980	20.6	27.3	20.6	6.85	4.94	3.81	3.12	3.39
1988	0.0	0.0	0.0	1.42	1.25	1.11	0.99	1.29
1988	0.0	100.0	0.0	1.41	1.35	1.30	1.26	1.73
1988	100.0	0.0	100.0	13.48	7.08	3.80	2.09	1.73
1988	50.0	0.0	50.0	6.20	3.56	2.18	1.42	1.46
1988	0.0	50.0	0.0	1.41	1.28	1.18	1.09	1.46
1988	50.0	50.0	50.0	7.45	4.21	2.55	1.67	1.73
1988	20.6	27.3	20.6	3.37	2.21	1.58	1.22	1.45
1990	0.0	0.0	0.0	1.13	0.98	0.86	0.76	1.00
1990	0.0	100.0	0.0	1.17	1.09	1.03	0.99	1.34
1990	100.0	0.0	100.0	11.43	5.88	3.10	1.68	1.43
1990	50.0	0.0	50.0	5.15	2.90	1.73	1.11	1.16
1990	0.0	50.0	0.0	1.14	1.02	0.92	0.84	1.13
1990	50.0	50.0	50.0	6.30	3.49	2.06	1.33	1.39
1990	20.6	27.3	20.6	2.78	1.78	1.25	0.95	1.13
1995	0.0	0.0	0.0	0.68	0.57	0.48	0.41	0.52
1995	0.0	100.0	0.0	0.81	0.72	0.64	0.57	0.70
1995	100.0	0.0	100.0	7.82	3.91	1.99	1.05	0.97
1995	50.0	0.0	50.0	3.41	1.85	1.06	0.65	0.69
1995	0.0	50.0	0.0	0.73	0.63	0.54	0.47	0.59
1995	50.0	50.0	50.0	4.32	2.31	1.32	0.81	0.83
1995	20.6	27.3	20.6	1.82	1.12	0.75	0.54	0.63
2000	0.0	0.0	0.0	0.50	0.42	0.36	0.31	0.33
2000	0.0	100.0	0.0	0.65	0.56	0.49	0.43	0.44
2000	100.0	0.0	100.0	5.71	2.90	1.51	0.81	0.79
2000	50.0	0.0	50.0	2.49	1.37	0.80	0.50	0.50
2000	0.0	50.0	0.0	0.56	0.47	0.41	0.35	0.37
2000	50.0	50.0	50.0	3.18	1.73	1.00	0.62	0.61
2000	20.6	27.3	20.6	1.34	0.84	0.56	0.41	0.42
2010	0.0	0.0	0.0	0.48	0.40	0.34	0.30	0.31
2010	0.0	100.0	0.0	0.61	0.53	0.46	0.40	0.41
2010	100.0	0.0	100.0	4.35	2.37	1.32	0.75	0.73
2010	50.0	0.0	50.0	1.96	1.16	0.71	0.47	0.47
2010	0.0	50.0	0.0	0.53	0.45	0.39	0.34	0.35
2010	50.0	50.0	50.0	2.48	1.45	0.89	0.58	0.57
2010	20.6	27.3	20.6	1.11	0.74	0.52	0.39	0.40

TABLE 1.24: NMHC AT 55.0 MPH.

TABLE 1.25

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	497.28	436.12	386.49	346.23	755.81
1980	0.0	100.0	0.0	330.78	333.28	337.21	342.65	657.21
1980	100.0	0.0	100.0	3710.28	2127.57	1232.01	720.97	465.83
1980	50.0	0.0	50.0	1777.29	1110.22	722.17	492.61	630.89
1980	0.0	50.0	0.0	423.58	388.56	361.05	339.80	709.60
1980	50.0	50.0	50.0	2020.53	1230.42	784.61	531.81	561.52
1980	20.6	27.3	20.6	980.48	685.80	509.81	402.46	679.42
1988	0.0	0.0	0.0	328.01	262.03	211.68	173.03	406.94
1988	0.0	100.0	0.0	274.23	244.40	221.26	203.48	365.26
1988	100.0	0.0	100.0	2142.66	1310.79	794.05	450.23	364.61
1988	50.0	0.0	50.0	1037.15	672.67	439.51	280.48	387.75
1988	0.0	50.0	0.0	304.13	252.65	213.27	183.11	387.65
1988	50.0	50.0	50.0	1208.44	777.59	507.66	326.85	364.93
1988	20.6	27.3	20.6	604.61	424.59	305.52	222.29	388.50
1990	0.0	0.0	0.0	281.67	220.10	173.86	138.92	320.79
1990	0.0	100.0	0.0	239.04	209.04	185.59	167.35	291.79
1990	100.0	0.0	100.0	1692.53	1049.62	641.97	362.98	304.32
1990	50.0	0.0	50.0	833.63	545.99	357.86	226.02	313.32
1990	0.0	50.0	0.0	262.91	214.05	177.01	148.83	307.40
1990	50.0	50.0	50.0	965.78	629.33	413.78	265.17	298.06
1990	20.6	27.3	20.6	496.87	349.88	250.67	179.81	310.38
1995	0.0	0.0	0.0	175.21	129.49	96.45	72.45	145.64
1995	0.0	100.0	0.0	154.75	129.41	109.27	93.23	145.31
1995	100.0	0.0	100.0	820.06	536.96	340.69	191.32	175.99
1995	50.0	0.0	50.0	432.32	293.71	195.29	119.86	159.02
1995	0.0	50.0	0.0	166.12	128.89	101.21	80.48	145.39
1995	50.0	50.0	50.0	487.41	333.18	224.98	142.28	160.65
1995	20.6	27.3	20.6	275.32	196.27	139.41	96.16	150.96
2000	0.0	0.0	0.0	104.02	73.22	51.91	37.14	42.77
2000	0.0	100.0	0.0	92.85	74.50	59.99	48.51	60.38
2000	100.0	0.0	100.0	321.82	243.57	167.22	92.01	97.33
2000	50.0	0.0	50.0	200.50	148.43	102.46	60.63	66.15
2000	0.0	50.0	0.0	98.40	73.26	55.07	41.84	50.16
2000	50.0	50.0	50.0	207.33	159.03	113.60	70.26	78.86
2000	20.6	27.3	20.6	140.51	104.07	74.34	49.31	56.35
2010	0.0	0.0	0.0	77.82	54.75	38.86	27.90	31.18
2010	0.0	100.0	0.0	57.91	47.10	38.47	31.58	39.08
2010	100.0	0.0	100.0	234.70	174.07	115.33	57.73	60.32
2010	50.0	0.0	50.0	150.62	110.19	74.40	41.73	44.75
2010	0.0	50.0	0.0	68.51	51.15	38.63	29.56	34.78
2010	50.0	50.0	50.0	146.30	110.59	76.90	44.65	49.70
2010	20.6	27.3	20.6	102.65	75.56	53.34	34.48	38.71

TABLE 1.25: CO AT 2.5 MPH.

TABLE 1.26

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	291.34	257.84	230.60	208.44	435.76
1980	0.0	100.0	0.0	195.73	197.48	200.11	203.68	383.85
1980	100.0	0.0	100.0	2081.45	1204.23	704.56	417.38	273.26
1980	50.0	0.0	50.0	1010.09	637.97	420.20	290.61	365.12
1980	0.0	50.0	0.0	248.70	229.78	214.97	203.59	410.96
1980	50.0	50.0	50.0	1138.59	700.86	452.34	310.53	328.55
1980	20.6	27.3	20.6	562.07	398.01	299.59	239.34	393.28
1988	0.0	0.0	0.0	178.21	143.56	117.04	96.62	221.92
1988	0.0	100.0	0.0	146.99	131.74	119.96	110.99	198.91
1988	100.0	0.0	100.0	1141.14	698.92	424.13	241.52	195.48
1988	50.0	0.0	50.0	556.58	362.11	237.70	152.94	209.82
1988	0.0	50.0	0.0	164.25	137.43	116.91	101.18	211.13
1988	50.0	50.0	50.0	644.06	415.33	272.05	176.26	197.19
1988	20.6	27.3	20.6	325.17	229.48	166.22	122.05	211.04
1990	0.0	0.0	0.0	152.13	119.65	95.21	76.70	173.56
1990	0.0	100.0	0.0	127.68	112.11	99.97	90.57	157.52
1990	100.0	0.0	100.0	898.25	558.22	341.95	193.56	162.76
1990	50.0	0.0	50.0	445.55	292.81	192.63	122.25	168.58
1990	0.0	50.0	0.0	141.29	115.66	96.22	81.43	166.04
1990	50.0	50.0	50.0	512.96	335.17	220.96	142.06	160.14
1990	20.6	27.3	20.6	266.09	188.20	135.53	97.84	167.40
1995	0.0	0.0	0.0	96.16	71.24	53.25	40.20	78.54
1995	0.0	100.0	0.0	84.44	70.70	59.76	51.05	78.70
1995	100.0	0.0	100.0	440.44	290.11	184.48	103.02	95.64
1995	50.0	0.0	50.0	234.50	160.16	106.77	65.40	86.09
1995	0.0	50.0	0.0	90.91	70.69	55.65	44.40	78.53
1995	50.0	50.0	50.0	262.44	180.40	122.12	77.03	87.17
1995	20.6	27.3	20.6	149.85	107.29	76.43	52.77	81.62
2000	0.0	0.0	0.0	61.44	43.50	31.08	22.46	25.86
2000	0.0	100.0	0.0	54.07	43.59	35.29	28.71	35.70
2000	100.0	0.0	100.0	189.75	143.28	98.02	53.48	56.62
2000	50.0	0.0	50.0	118.63	87.85	60.64	35.85	39.14
2000	0.0	50.0	0.0	57.79	43.26	32.73	25.06	30.02
2000	50.0	50.0	50.0	121.91	93.43	66.65	41.09	46.16
2000	20.6	27.3	20.6	82.91	61.55	44.09	29.35	33.56
2010	0.0	0.0	0.0	49.46	35.02	25.05	18.16	20.34
2010	0.0	100.0	0.0	37.11	30.29	24.85	20.49	25.29
2010	100.0	0.0	100.0	147.64	109.67	72.91	36.88	38.61
2010	50.0	0.0	50.0	95.01	69.70	47.29	26.83	28.84
2010	0.0	50.0	0.0	43.68	32.79	24.93	19.21	22.59
2010	50.0	50.0	50.0	92.3	69.98	48.88	28.68	31.95
2010	20.6	27.3	20.6	65.02	48.05	34.12	22.29	25.06

TABLE 1.26: CO AT 5.0 MPH.

TABLE 1.27

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	161.36	143.74	129.38	117.69	238.21
1980	0.0	100.0	0.0	109.52	110.55	112.09	114.15	212.20
1980	100.0	0.0	100.0	1116.73	650.66	383.77	229.50	151.79
1980	50.0	0.0	50.0	547.10	348.48	231.70	161.88	200.42
1980	0.0	50.0	0.0	138.13	128.26	120.54	114.64	225.59
1980	50.0	50.0	50.0	613.12	380.60	247.93	171.83	182.00
1980	20.6	27.3	20.6	306.50	219.05	166.40	134.07	215.83
1988	0.0	0.0	0.0	94.71	76.65	62.82	52.16	117.05
1988	0.0	100.0	0.0	77.98	70.01	63.88	59.22	105.48
1988	100.0	0.0	100.0	597.12	367.29	223.63	127.53	103.78
1988	50.0	0.0	50.0	293.17	191.63	126.31	81.55	110.87
1988	0.0	50.0	0.0	87.18	73.22	62.54	54.35	111.55
1988	50.0	50.0	50.0	337.55	218.65	143.75	93.38	104.63
1988	20.6	27.3	20.6	171.70	121.75	88.59	65.33	111.50
1990	0.0	0.0	0.0	81.36	64.11	51.15	41.35	91.35
1990	0.0	100.0	0.0	68.23	59.91	53.43	48.41	83.45
1990	100.0	0.0	100.0	472.93	295.76	181.76	102.48	87.00
1990	50.0	0.0	50.0	236.34	156.19	103.06	65.29	89.26
1990	0.0	50.0	0.0	75.50	61.90	51.59	43.76	87.59
1990	50.0	50.0	50.0	270.58	177.84	117.59	75.45	85.23
1990	20.6	27.3	20.6	141.49	100.52	72.58	52.42	88.43
1995	0.0	0.0	0.0	54.49	40.25	30.03	22.64	42.29
1995	0.0	100.0	0.0	47.63	39.79	33.55	28.57	43.17
1995	100.0	0.0	100.0	243.69	162.44	103.65	57.00	53.72
1995	50.0	0.0	50.0	131.53	90.58	60.45	36.57	47.35
1995	0.0	50.0	0.0	51.39	39.88	31.34	24.97	42.64
1995	50.0	50.0	50.0	145.66	101.11	68.60	42.79	48.45
1995	20.6	27.3	20.6	84.31	60.63	43.18	29.60	44.55
2000	0.0	0.0	0.0	39.03	27.63	19.75	14.28	16.33
2000	0.0	100.0	0.0	33.60	27.14	22.01	17.94	22.24
2000	100.0	0.0	100.0	121.88	91.72	62.28	33.26	35.23
2000	50.0	0.0	50.0	76.28	56.38	38.71	22.57	24.59
2000	0.0	50.0	0.0	36.39	27.26	20.64	15.83	18.86
2000	50.0	50.0	50.0	77.74	59.43	42.15	25.60	28.74
2000	20.6	27.3	20.6	52.87	39.22	28.01	18.52	21.09
2010	0.0	0.0	0.0	34.20	24.18	17.27	12.50	13.92
2010	0.0	100.0	0.0	25.67	20.93	17.14	14.11	17.35
2010	100.0	0.0	100.0	102.29	76.09	50.59	25.52	26.78
2010	50.0	0.0	50.0	65.83	48.31	32.76	18.53	19.91
2010	0.0	50.0	0.0	30.21	22.65	17.19	13.23	15.48
2010	50.0	50.0	50.0	63.98	48.51	33.86	19.82	22.06
2010	20.6	27.3	20.6	45.01	33.26	23.59	15.37	17.23

TABLE 1.27: CO AT 10.0 MPH.

TABLE 1.28

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	99.96	89.73	81.38	74.58	146.00
1980	0.0	100.0	0.0	67.15	68.18	69.51	71.19	131.09
1980	100.0	0.0	100.0	676.18	396.86	235.72	141.86	92.93
1980	50.0	0.0	50.0	335.00	215.02	144.05	101.40	122.51
1980	0.0	50.0	0.0	85.13	79.62	75.37	72.16	138.56
1980	50.0	50.0	50.0	371.66	232.52	152.62	106.53	112.01
1980	20.6	27.3	20.6	188.07	135.49	103.74	84.22	132.31
1988	0.0	0.0	0.0	54.46	44.38	36.64	30.67	67.35
1988	0.0	100.0	0.0	43.83	39.57	36.34	33.94	60.52
1988	100.0	0.0	100.0	341.67	210.65	128.28	72.92	58.72
1988	50.0	0.0	50.0	169.08	110.80	73.15	47.25	63.25
1988	0.0	50.0	0.0	49.63	41.94	36.07	31.59	64.02
1988	50.0	50.0	50.0	192.75	125.11	82.31	53.43	59.62
1988	20.6	27.3	20.6	98.68	70.20	51.24	37.93	63.84
1990	0.0	0.0	0.0	46.98	37.10	29.69	24.10	52.12
1990	0.0	100.0	0.0	38.68	34.03	30.43	27.68	47.56
1990	100.0	0.0	100.0	271.97	171.00	105.09	58.55	49.64
1990	50.0	0.0	50.0	137.06	90.94	59.98	37.69	50.85
1990	0.0	50.0	0.0	43.23	35.52	29.69	25.28	49.89
1990	50.0	50.0	50.0	155.33	102.52	67.76	43.12	48.60
1990	20.6	27.3	20.6	81.76	58.24	42.07	30.28	50.38
1995	0.0	0.0	0.0	33.63	24.63	18.21	13.61	24.31
1995	0.0	100.0	0.0	28.95	24.07	20.19	17.09	25.32
1995	100.0	0.0	100.0	148.58	100.28	63.97	34.15	32.56
1995	50.0	0.0	50.0	81.32	56.37	37.46	22.07	27.98
1995	0.0	50.0	0.0	31.50	24.28	18.95	14.99	24.72
1995	50.0	50.0	50.0	88.76	62.18	42.08	25.62	28.94
1995	20.6	27.3	20.6	51.99	37.43	26.49	17.82	26.03
2000	0.0	0.0	0.0	27.37	19.23	13.63	9.75	11.04
2000	0.0	100.0	0.0	22.87	18.44	14.92	12.12	15.01
2000	100.0	0.0	100.0	88.00	65.85	44.18	22.81	24.08
2000	50.0	0.0	50.0	54.88	40.35	27.40	15.53	16.82
2000	0.0	50.0	0.0	25.22	18.79	14.14	10.77	12.77
2000	50.0	50.0	50.0	55.43	42.15	29.55	17.46	19.54
2000	20.6	27.3	20.6	37.49	27.65	19.56	12.67	14.35
2010	0.0	0.0	0.0	26.07	18.27	12.91	9.22	10.20
2010	0.0	100.0	0.0	19.38	15.72	12.79	10.46	12.85
2010	100.0	0.0	100.0	79.47	59.04	39.09	19.42	20.35
2010	50.0	0.0	50.0	50.90	37.24	25.09	13.95	14.93
2010	0.0	50.0	0.0	22.94	17.07	12.84	9.78	11.41
2010	50.0	50.0	50.0	49.4[illegible]	37.38	25.94	14.94	16.60
2010	20.6	27.3	20.6	34.56	25.41	17.88	11.47	12.81

TABLE 1.28: CO AT 19.6 MPH.

TABLE 1.29

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	65.51	59.42	54.43	50.37	94.63
1980	0.0	100.0	0.0	43.69	44.66	45.84	47.26	85.97
1980	100.0	0.0	100.0	432.33	256.13	153.48	93.13	60.42
1980	50.0	0.0	50.0	217.71	141.00	95.31	67.69	79.33
1980	0.0	50.0	0.0	55.60	52.50	50.15	48.44	90.23
1980	50.0	50.0	50.0	238.01	150.39	99.66	70.19	73.19
1980	20.6	27.3	20.6	122.43	89.05	68.83	56.40	85.95
1988	0.0	0.0	0.0	32.60	26.87	22.46	19.04	40.97
1988	0.0	100.0	0.0	26.13	23.74	21.95	20.67	36.85
1988	100.0	0.0	100.0	206.35	127.66	77.89	44.29	35.28
1988	50.0	0.0	50.0	101.88	66.83	44.25	28.82	37.93
1988	0.0	50.0	0.0	29.55	25.21	21.91	19.40	38.87
1988	50.0	50.0	50.0	116.24	75.70	49.92	32.48	36.07
1988	20.6	27.3	20.6	59.26	42.29	31.06	23.22	38.57
1990	0.0	0.0	0.0	27.16	21.67	17.54	14.41	31.00
1990	0.0	100.0	0.0	23.00	20.28	18.20	16.62	28.49
1990	100.0	0.0	100.0	162.88	102.95	63.38	35.13	29.75
1990	50.0	0.0	50.0	80.50	53.44	35.33	22.35	29.93
1990	0.0	50.0	0.0	25.17	20.82	17.55	15.07	29.63
1990	50.0	50.0	50.0	92.94	61.61	40.79	25.88	29.12
1990	20.6	27.3	20.6	47.86	34.18	24.80	18.01	29.80
1995	0.0	0.0	0.0	17.92	13.19	9.81	7.38	13.45
1995	0.0	100.0	0.0	17.81	14.75	12.32	10.39	15.19
1995	100.0	0.0	100.0	91.15	62.05	39.62	20.82	20.01
1995	50.0	0.0	50.0	46.00	31.88	21.18	12.49	15.81
1995	0.0	50.0	0.0	17.78	13.72	10.72	8.49	14.00
1995	50.0	50.0	50.0	54.48	38.40	25.97	15.60	17.60
1995	20.6	27.3	20.6	29.30	21.10	14.94	10.06	14.70
2000	0.0	0.0	0.0	13.85	9.77	6.95	5.00	5.71
2000	0.0	100.0	0.0	14.90	12.00	9.69	7.86	9.73
2000	100.0	0.0	100.0	58.87	43.95	29.34	14.91	15.72
2000	50.0	0.0	50.0	31.04	22.80	15.48	8.77	9.51
2000	0.0	50.0	0.0	14.23	10.60	7.98	6.08	7.23
2000	50.0	50.0	50.0	36.88	27.97	19.51	11.39	12.72
2000	20.6	27.3	20.6	21.06	15.53	10.99	7.12	8.08
2010	0.0	0.0	0.0	12.88	9.06	6.44	4.62	5.16
2010	0.0	100.0	0.0	13.15	10.64	8.64	7.04	8.65
2010	100.0	0.0	100.0	54.64	40.57	26.80	13.22	13.85
2010	50.0	0.0	50.0	28.82	21.08	14.20	7.90	8.45
2010	0.0	50.0	0.0	12.96	9.65	7.26	5.53	6.48
2010	50.0	50.0	50.0	33.90	25.60	17.72	10.13	11.25
2010	20.6	27.3	20.6	19.42	14.28	10.05	6.45	7.22

TABLE 1.30

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	54.94	50.24	46.38	43.22	78.36
1980	0.0	100.0	0.0	36.88	37.78	38.88	40.18	72.30
1980	100.0	0.0	100.0	350.89	209.68	126.78	77.66	50.69
1980	50.0	0.0	50.0	178.73	116.89	79.82	57.27	65.89
1980	0.0	50.0	0.0	46.68	44.38	42.66	41.42	75.16
1980	50.0	50.0	50.0	193.88	123.73	82.83	58.92	61.50
1980	20.6	27.3	20.6	101.14	74.34	58.04	47.99	71.49
1988	0.0	0.0	0.0	24.67	20.67	17.56	15.13	31.65
1988	0.0	100.0	0.0	19.01	17.53	16.47	15.74	28.30
1988	100.0	0.0	100.0	152.16	93.72	57.13	32.85	25.66
1988	50.0	0.0	50.0	76.01	49.90	33.25	22.03	28.64
1988	0.0	50.0	0.0	22.02	19.08	16.84	15.14	29.94
1988	50.0	50.0	50.0	85.59	55.63	36.80	24.29	26.98
1988	20.6	27.3	20.6	44.22	31.75	23.57	17.95	29.48
1990	0.0	0.0	0.0	19.77	16.02	13.17	10.99	23.31
1990	0.0	100.0	0.0	16.12	14.41	13.11	12.15	21.06
1990	100.0	0.0	100.0	115.54	72.65	44.69	25.07	20.99
1990	50.0	0.0	50.0	57.66	38.29	25.46	16.41	21.94
1990	0.0	50.0	0.0	18.04	15.14	12.94	11.29	22.12
1990	50.0	50.0	50.0	65.83	43.53	28.90	18.61	21.03
1990	20.6	27.3	20.6	34.31	24.63	18.06	13.36	22.09
1995	0.0	0.0	0.0	12.15	9.05	6.81	5.19	9.49
1995	0.0	100.0	0.0	11.90	9.92	8.34	7.08	10.44
1995	100.0	0.0	100.0	60.43	40.97	26.17	13.90	13.34
1995	50.0	0.0	50.0	30.70	21.27	14.20	8.50	10.84
1995	0.0	50.0	0.0	11.98	9.32	7.35	5.88	9.76
1995	50.0	50.0	50.0	36.16	25.45	17.26	10.49	11.89
1995	20.6	27.3	20.6	19.63	14.18	10.12	6.91	10.18
2000	0.0	0.0	0.0	9.20	6.56	4.73	3.46	4.00
2000	0.0	100.0	0.0	9.84	7.97	6.47	5.29	6.57
2000	100.0	0.0	100.0	38.12	28.46	19.06	9.81	10.35
2000	50.0	0.0	50.0	20.25	14.92	10.19	5.88	6.40
2000	0.0	50.0	0.0	9.43	7.09	5.39	4.15	4.97
2000	50.0	50.0	50.0	23.98	18.21	12.77	7.55	8.46
2000	20.6	27.3	20.6	13.83	10.25	7.31	4.82	5.51
2010	0.0	0.0	0.0	8.56	6.10	4.39	3.21	3.62
2010	0.0	100.0	0.0	8.72	7.09	5.79	4.75	5.86
2010	100.0	0.0	100.0	35.42	26.30	17.43	8.72	9.14
2010	50.0	0.0	50.0	18.83	13.81	9.36	5.31	5.71
2010	0.0	50.0	0.0	8.61	6.46	4.91	3.79	4.47
2010	50.0	50.0	50.0	22.07	16.70	11.61	6.74	7.50
2010	20.6	27.3	20.6	12.77	9.44	6.70	4.38	4.93

TABLE 1.31

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	5.76	5.30	4.91	4.58	4.03
1980	0.0	100.0	0.0	6.78	6.26	5.80	5.41	4.51
1980	100.0	0.0	100.0	5.89	5.68	5.52	5.40	4.77
1980	50.0	0.0	50.0	5.89	5.57	5.31	5.10	4.51
1980	0.0	50.0	0.0	6.44	5.93	5.49	5.11	4.36
1980	50.0	50.0	50.0	6.34	5.97	5.66	5.40	4.64
1980	20.6	27.3	20.6	6.19	5.76	5.40	5.09	4.41
1988	0.0	0.0	0.0	3.99	3.58	3.24	2.95	2.78
1988	0.0	100.0	0.0	5.49	4.83	4.29	3.85	3.47
1988	100.0	0.0	100.0	5.07	4.71	4.39	4.12	3.75
1988	50.0	0.0	50.0	4.50	4.11	3.79	3.52	3.24
1988	0.0	50.0	0.0	4.72	4.19	3.76	3.40	3.11
1988	50.0	50.0	50.0	5.28	4.77	4.34	3.98	3.61
1988	20.6	27.3	20.6	4.60	4.14	3.75	3.43	3.15
1990	0.0	0.0	0.0	3.72	3.32	2.99	2.71	2.61
1990	0.0	100.0	0.0	5.30	4.62	4.06	3.60	3.32
1990	100.0	0.0	100.0	4.98	4.59	4.25	3.96	3.67
1990	50.0	0.0	50.0	4.29	3.90	3.58	3.30	3.10
1990	0.0	50.0	0.0	4.46	3.93	3.49	3.14	2.94
1990	50.0	50.0	50.0	5.14	4.60	4.16	3.78	3.50
1990	20.6	27.3	20.6	4.36	3.89	3.51	3.18	2.99
1995	0.0	0.0	0.0	2.89	2.54	2.24	1.99	2.01
1995	0.0	100.0	0.0	4.53	3.85	3.30	2.85	2.75
1995	100.0	0.0	100.0	4.42	4.03	3.68	3.37	3.24
1995	50.0	0.0	50.0	3.57	3.20	2.88	2.60	2.56
1995	0.0	50.0	0.0	3.62	3.12	2.71	2.37	2.34
1995	50.0	50.0	50.0	4.47	3.94	3.49	3.11	3.00
1995	20.6	27.3	20.6	3.56	3.13	2.76	2.45	2.41
2000	0.0	0.0	0.0	2.52	2.22	1.96	1.75	1.83
2000	0.0	100.0	0.0	4.13	3.50	2.98	2.56	2.56
2000	100.0	0.0	100.0	4.13	3.77	3.44	3.15	3.12
2000	50.0	0.0	50.0	3.23	2.90	2.61	2.37	2.40
2000	0.0	50.0	0.0	3.23	2.78	2.41	2.10	2.15
2000	50.0	50.0	50.0	4.13	3.64	3.21	2.86	2.84
2000	20.6	27.3	20.6	3.19	2.80	2.47	2.19	2.23
2010	0.0	0.0	0.0	2.36	2.10	1.87	1.68	1.77
2010	0.0	100.0	0.0	3.91	3.35	2.88	2.50	2.50
2010	100.0	0.0	100.0	4.07	3.71	3.39	3.10	3.07
2010	50.0	0.0	50.0	3.11	2.81	2.54	2.31	2.34
2010	0.0	50.0	0.0	3.04	2.64	2.31	2.03	2.08
2010	50.0	50.0	50.0	3.99	3.53	3.14	2.80	2.78
2010	20.6	27.3	20.6	3.03	2.68	2.39	2.13	2.17

TABLE 1.31: NOx AT 2.5 MPH.

TABLE 1.32

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	5.08	4.68	4.35	4.06	3.57
1980	0.0	100.0	0.0	5.99	5.54	5.14	4.80	4.01
1980	100.0	0.0	100.0	5.28	5.08	4.92	4.80	4.21
1980	50.0	0.0	50.0	5.23	4.95	4.72	4.53	3.99
1980	0.0	50.0	0.0	5.68	5.24	4.86	4.53	3.86
1980	50.0	50.0	50.0	5.63	5.31	5.03	4.80	4.11
1980	20.6	27.3	20.6	5.47	5.10	4.78	4.51	3.91
1988	0.0	0.0	0.0	3.66	3.28	2.97	2.70	2.54
1988	0.0	100.0	0.0	5.06	4.45	3.94	3.53	3.18
1988	100.0	0.0	100.0	4.69	4.34	4.04	3.79	3.44
1988	50.0	0.0	50.0	4.14	3.78	3.48	3.22	2.97
1988	0.0	50.0	0.0	4.34	3.85	3.44	3.11	2.85
1988	50.0	50.0	50.0	4.87	4.39	3.99	3.66	3.31
1988	20.6	27.3	20.6	4.23	3.80	3.44	3.14	2.89
1990	0.0	0.0	0.0	3.44	3.06	2.75	2.49	2.39
1990	0.0	100.0	0.0	4.91	4.27	3.75	3.32	3.06
1990	100.0	0.0	100.0	4.61	4.25	3.94	3.66	3.39
1990	50.0	0.0	50.0	3.97	3.61	3.30	3.03	2.85
1990	0.0	50.0	0.0	4.12	3.63	3.22	2.88	2.70
1990	50.0	50.0	50.0	4.76	4.26	3.84	3.49	3.22
1990	20.6	27.3	20.6	4.03	3.59	3.23	2.93	2.75
1995	0.0	0.0	0.0	2.69	2.36	2.08	1.85	1.87
1995	0.0	100.0	0.0	4.23	3.60	3.07	2.65	2.56
1995	100.0	0.0	100.0	4.13	3.76	3.43	3.14	3.02
1995	50.0	0.0	50.0	3.33	2.98	2.68	2.42	2.38
1995	0.0	50.0	0.0	3.38	2.91	2.52	2.20	2.17
1995	50.0	50.0	50.0	4.18	3.68	3.25	2.89	2.79
1995	20.6	27.3	20.6	3.32	2.91	2.57	2.28	2.24
2000	0.0	0.0	0.0	2.35	2.07	1.83	1.62	1.70
2000	0.0	100.0	0.0	3.86	3.27	2.79	2.39	2.39
2000	100.0	0.0	100.0	3.87	3.52	3.22	2.94	2.92
2000	50.0	0.0	50.0	3.01	2.70	2.44	2.20	2.24
2000	0.0	50.0	0.0	3.01	2.59	2.24	1.96	2.00
2000	50.0	50.0	50.0	3.86	3.40	3.00	2.66	2.65
2000	20.6	27.3	20.6	2.98	2.61	2.30	2.04	2.08
2010	0.0	0.0	0.0	2.20	1.95	1.74	1.56	1.64
2010	0.0	100.0	0.0	3.66	3.13	2.69	2.33	2.33
2010	100.0	0.0	100.0	3.81	3.47	3.17	2.90	2.87
2010	50.0	0.0	50.0	2.90	2.62	2.37	2.15	2.18
2010	0.0	50.0	0.0	2.84	2.47	2.16	1.89	1.94
2010	50.0	50.0	50.0	3.73	3.30	2.93	2.61	2.60
2010	20.6	27.3	20.6	2.83	2.51	2.22	1.98	2.02

TABLE 1.33

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	4.26	3.93	3.66	3.42	3.00
1980	0.0	100.0	0.0	5.05	4.67	4.35	4.07	3.39
1980	100.0	0.0	100.0	4.51	4.32	4.18	4.07	3.53
1980	50.0	0.0	50.0	4.43	4.19	3.99	3.82	3.34
1980	0.0	50.0	0.0	4.77	4.40	4.09	3.83	3.25
1980	50.0	50.0	50.0	4.78	4.50	4.26	4.07	3.46
1980	20.6	27.3	20.6	4.61	4.30	4.03	3.81	3.28
1988	0.0	0.0	0.0	3.19	2.86	2.58	2.34	2.20
1988	0.0	100.0	0.0	4.43	3.89	3.45	3.08	2.77
1988	100.0	0.0	100.0	4.12	3.81	3.54	3.31	3.00
1988	50.0	0.0	50.0	3.63	3.31	3.04	2.81	2.58
1988	0.0	50.0	0.0	3.79	3.36	3.00	2.71	2.47
1988	50.0	50.0	50.0	4.28	3.85	3.49	3.19	2.88
1988	20.6	27.3	20.6	3.70	3.32	3.00	2.73	2.51
1990	0.0	0.0	0.0	3.01	2.67	2.40	2.16	2.08
1990	0.0	100.0	0.0	4.32	3.75	3.28	2.90	2.67
1990	100.0	0.0	100.0	4.06	3.74	3.45	3.21	2.96
1990	50.0	0.0	50.0	3.49	3.16	2.89	2.65	2.49
1990	0.0	50.0	0.0	3.62	3.18	2.82	2.52	2.35
1990	50.0	50.0	50.0	4.19	3.74	3.37	3.06	2.82
1990	20.6	27.3	20.6	3.54	3.15	2.83	2.56	2.40
1995	0.0	0.0	0.0	2.38	2.08	1.83	1.62	1.64
1995	0.0	100.0	0.0	3.74	3.18	2.72	2.34	2.26
1995	100.0	0.0	100.0	3.65	3.32	3.03	2.77	2.66
1995	50.0	0.0	50.0	2.94	2.63	2.36	2.13	2.09
1995	0.0	50.0	0.0	2.98	2.57	2.22	1.94	1.91
1995	50.0	50.0	50.0	3.70	3.25	2.87	2.55	2.46
1995	20.6	27.3	20.6	2.94	2.57	2.26	2.00	1.97
2000	0.0	0.0	0.0	2.07	1.82	1.60	1.42	1.49
2000	0.0	100.0	0.0	3.41	2.89	2.46	2.10	2.10
2000	100.0	0.0	100.0	3.42	3.11	2.84	2.60	2.57
2000	50.0	0.0	50.0	2.66	2.39	2.15	1.94	1.97
2000	0.0	50.0	0.0	2.66	2.29	1.98	1.72	1.76
2000	50.0	50.0	50.0	3.42	3.00	2.65	2.35	2.34
2000	20.6	27.3	20.6	2.63	2.31	2.03	1.80	1.83
2010	0.0	0.0	0.0	1.94	1.72	1.53	1.37	1.44
2010	0.0	100.0	0.0	3.24	2.77	2.38	2.05	2.05
2010	100.0	0.0	100.0	3.37	3.07	2.80	2.56	2.53
2010	50.0	0.0	50.0	2.56	2.31	2.09	1.89	1.92
2010	0.0	50.0	0.0	2.50	2.18	1.90	1.66	1.70
2010	50.0	50.0	50.0	3.30	2.92	2.59	2.30	2.29
2010	20.6	27.3	20.6	2.50	2.21	1.96	1.74	1.78

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TABLE 1.33: NOx AT 10.0 MPH.

TABLE 1.34

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	3.93	3.61	3.34	3.11	2.68
1980	0.0	100.0	0.0	4.72	4.35	4.03	3.75	3.07
1980	100.0	0.0	100.0	4.12	3.96	3.84	3.75	3.22
1980	50.0	0.0	50.0	4.07	3.85	3.66	3.51	3.03
1980	0.0	50.0	0.0	4.45	4.09	3.78	3.52	2.94
1980	50.0	50.0	50.0	4.42	4.15	3.93	3.75	3.14
1980	20.6	27.3	20.6	4.27	3.97	3.72	3.50	2.97
1988	0.0	0.0	0.0	2.77	2.47	2.23	2.02	1.87
1988	0.0	100.0	0.0	3.85	3.38	2.99	2.68	2.37
1988	100.0	0.0	100.0	3.55	3.28	3.06	2.86	2.57
1988	50.0	0.0	50.0	3.13	2.86	2.63	2.43	2.21
1988	0.0	50.0	0.0	3.30	2.92	2.61	2.35	2.12
1988	50.0	50.0	50.0	3.70	3.33	3.02	2.77	2.47
1988	20.6	27.3	20.6	3.21	2.88	2.60	2.37	2.15
1990	0.0	0.0	0.0	2.56	2.28	2.04	1.84	1.75
1990	0.0	100.0	0.0	3.69	3.20	2.81	2.48	2.26
1990	100.0	0.0	100.0	3.45	3.18	2.94	2.73	2.50
1990	50.0	0.0	50.0	2.97	2.69	2.46	2.26	2.10
1990	0.0	50.0	0.0	3.09	2.72	2.41	2.15	1.99
1990	50.0	50.0	50.0	3.57	3.19	2.87	2.61	2.38
1990	20.6	27.3	20.6	3.02	2.69	2.41	2.18	2.02
1995	0.0	0.0	0.0	1.98	1.73	1.52	1.35	1.35
1995	0.0	100.0	0.0	3.12	2.65	2.26	1.94	1.87
1995	100.0	0.0	100.0	3.04	2.76	2.52	2.30	2.21
1995	50.0	0.0	50.0	2.45	2.19	1.97	1.77	1.73
1995	0.0	50.0	0.0	2.48	2.14	1.85	1.61	1.58
1995	50.0	50.0	50.0	3.08	2.70	2.39	2.12	2.04
1995	20.6	27.3	20.6	2.45	2.14	1.88	1.67	1.63
2000	0.0	0.0	0.0	1.71	1.50	1.32	1.17	1.23
2000	0.0	100.0	0.0	2.81	2.38	2.02	1.73	1.73
2000	100.0	0.0	100.0	2.81	2.56	2.34	2.13	2.11
2000	50.0	0.0	50.0	2.19	1.96	1.77	1.59	1.62
2000	0.0	50.0	0.0	2.19	1.88	1.63	1.41	1.44
2000	50.0	50.0	50.0	2.81	2.47	2.18	1.93	1.92
2000	20.6	27.3	20.6	2.17	1.90	1.67	1.48	1.50
2010	0.0	0.0	0.0	1.59	1.41	1.26	1.12	1.18
2010	0.0	100.0	0.0	2.66	2.27	1.95	1.68	1.68
2010	100.0	0.0	100.0	2.77	2.52	2.30	2.10	2.08
2010	50.0	0.0	50.0	2.11	1.90	1.72	1.55	1.58
2010	0.0	50.0	0.0	2.06	1.79	1.56	1.37	1.40
2010	50.0	50.0	50.0	2.72	2.40	2.13	1.89	1.88
2010	20.6	27.3	20.6	2.06	1.81	1.61	1.43	1.46

TABLE 1.34: NOx AT 19.6 MPH.

TABLE 1.35

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	4.48	4.08	3.73	3.44	2.90
1980	0.0	100.0	0.0	5.43	4.97	4.57	4.22	3.38
1980	100.0	0.0	100.0	4.51	4.37	4.27	4.19	3.59
1980	50.0	0.0	50.0	4.57	4.31	4.11	3.94	3.36
1980	0.0	50.0	0.0	5.13	4.68	4.29	3.95	3.23
1980	50.0	50.0	50.0	4.97	4.67	4.42	4.21	3.48
1980	20.6	27.3	20.6	4.88	4.51	4.19	3.93	3.27
1988	0.0	0.0	0.0	2.66	2.39	2.15	1.96	1.78
1988	0.0	100.0	0.0	3.67	3.25	2.89	2.60	2.26
1988	100.0	0.0	100.0	3.32	3.09	2.90	2.73	2.41
1988	50.0	0.0	50.0	2.98	2.73	2.53	2.35	2.10
1988	0.0	50.0	0.0	3.18	2.83	2.54	2.29	2.02
1988	50.0	50.0	50.0	3.50	3.17	2.90	2.67	2.34
1988	20.6	27.3	20.6	3.07	2.77	2.52	2.30	2.04
1990	0.0	0.0	0.0	2.37	2.12	1.90	1.72	1.60
1990	0.0	100.0	0.0	3.38	2.95	2.61	2.32	2.07
1990	100.0	0.0	100.0	3.12	2.88	2.68	2.51	2.26
1990	50.0	0.0	50.0	2.72	2.48	2.27	2.10	1.92
1990	0.0	50.0	0.0	2.86	2.53	2.25	2.02	1.83
1990	50.0	50.0	50.0	3.25	2.92	2.64	2.41	2.17
1990	20.6	27.3	20.6	2.78	2.49	2.24	2.04	1.86
1995	0.0	0.0	0.0	1.69	1.48	1.31	1.16	1.16
1995	0.0	100.0	0.0	2.63	2.25	1.93	1.67	1.59
1995	100.0	0.0	100.0	2.56	2.33	2.13	1.95	1.86
1995	50.0	0.0	50.0	2.08	1.86	1.68	1.52	1.47
1995	0.0	50.0	0.0	2.11	1.83	1.59	1.39	1.35
1995	50.0	50.0	50.0	2.60	2.29	2.03	1.81	1.72
1995	20.6	27.3	20.6	2.08	1.83	1.61	1.43	1.39
2000	0.0	0.0	0.0	1.41	1.24	1.10	0.98	1.02
2000	0.0	100.0	0.0	2.29	1.94	1.66	1.42	1.42
2000	100.0	0.0	100.0	2.29	2.09	1.90	1.74	1.73
2000	50.0	0.0	50.0	1.79	1.61	1.45	1.31	1.33
2000	0.0	50.0	0.0	1.80	1.55	1.34	1.17	1.19
2000	50.0	50.0	50.0	2.29	2.02	1.78	1.58	1.58
2000	20.6	27.3	20.6	1.78	1.56	1.38	1.22	1.24
2010	0.0	0.0	0.0	1.31	1.17	1.04	0.94	0.98
2010	0.0	100.0	0.0	2.16	1.85	1.59	1.38	1.38
2010	100.0	0.0	100.0	2.24	2.04	1.87	1.71	1.69
2010	50.0	0.0	50.0	1.72	1.55	1.40	1.27	1.29
2010	0.0	50.0	0.0	1.68	1.46	1.28	1.13	1.15
2010	50.0	50.0	50.0	2.20	1.95	1.73	1.54	1.54
2010	20.6	27.3	20.6	1.68	1.49	1.32	1.18	1.20

TABLE 1.36

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	Combined for Eight Vehicle Types @ Ambient Temperature 0 F	25 F	50 F	75 F	100 F
1980	0.0	0.0	0.0	5.67	5.17	4.74	4.38	3.72
1980	0.0	100.0	0.0	6.84	6.27	5.78	5.35	4.30
1980	100.0	0.0	100.0	5.73	5.55	5.41	5.32	4.57
1980	50.0	0.0	50.0	5.79	5.47	5.21	4.99	4.28
1980	0.0	50.0	0.0	6.46	5.91	5.43	5.02	4.12
1980	50.0	50.0	50.0	6.28	5.91	5.60	5.33	4.44
1980	20.6	27.3	20.6	6.16	5.70	5.31	4.99	4.18
1988	0.0	0.0	0.0	3.18	2.87	2.61	2.40	2.16
1988	0.0	100.0	0.0	4.29	3.83	3.45	3.13	2.70
1988	100.0	0.0	100.0	3.89	3.64	3.42	3.24	2.84
1988	50.0	0.0	50.0	3.53	3.26	3.02	2.83	2.51
1988	0.0	50.0	0.0	3.75	3.37	3.05	2.78	2.44
1988	50.0	50.0	50.0	4.09	3.73	3.43	3.18	2.77
1988	20.6	27.3	20.6	3.64	3.30	3.02	2.79	2.46
1990	0.0	0.0	0.0	2.76	2.48	2.26	2.06	1.91
1990	0.0	100.0	0.0	3.81	3.38	3.01	2.71	2.40
1990	100.0	0.0	100.0	3.52	3.27	3.05	2.87	2.56
1990	50.0	0.0	50.0	3.12	2.86	2.64	2.46	2.23
1990	0.0	50.0	0.0	3.28	2.93	2.64	2.39	2.15
1990	50.0	50.0	50.0	3.66	3.32	3.03	2.79	2.48
1990	20.6	27.3	20.6	3.19	2.88	2.62	2.41	2.18
1995	0.0	0.0	0.0	1.79	1.59	1.42	1.28	1.26
1995	0.0	100.0	0.0	2.67	2.31	2.01	1.77	1.67
1995	100.0	0.0	100.0	2.59	2.37	2.18	2.00	1.89
1995	50.0	0.0	50.0	2.15	1.94	1.76	1.61	1.55
1995	0.0	50.0	0.0	2.19	1.92	1.69	1.50	1.44
1995	50.0	50.0	50.0	2.63	2.34	2.09	1.88	1.78
1995	20.6	27.3	20.6	2.15	1.91	1.71	1.53	1.48
2000	0.0	0.0	0.0	1.39	1.24	1.12	1.01	1.05
2000	0.0	100.0	0.0	2.16	1.86	1.61	1.40	1.40
2000	100.0	0.0	100.0	2.15	1.97	1.82	1.67	1.66
2000	50.0	0.0	50.0	1.72	1.56	1.42	1.30	1.32
2000	0.0	50.0	0.0	1.73	1.51	1.33	1.18	1.20
2000	50.0	50.0	50.0	2.16	1.92	1.71	1.54	1.53
2000	20.6	27.3	20.6	1.71	1.52	1.36	1.22	1.24
2010	0.0	0.0	0.0	1.28	1.16	1.05	0.96	1.00
2010	0.0	100.0	0.0	2.01	1.74	1.52	1.34	1.34
2010	100.0	0.0	100.0	2.08	1.91	1.75	1.62	1.61
2010	50.0	0.0	50.0	1.63	1.48	1.36	1.25	1.26
2010	0.0	50.0	0.0	1.60	1.41	1.25	1.12	1.14
2010	50.0	50.0	50.0	2.04	1.82	1.64	1.48	1.47
2010	20.6	27.3	20.6	1.60	1.43	1.29	1.17	1.19

TABLE 1.36: NOx AT 55.0 MPH.

TABLE 2.1

LOW ALTITUDE

EMISSION FACTORS (GRAMS/MILE) FOR FTP CONDITIONS
60 - 84 F DIURNAL, 80 F HOT SOAK

Cal. Year	Pollutant By Component	Combined for Eight Vehicle Types @ Reid Vapor Pressure (psi) 7.0	8.0	9.0	10.0	10.4	11.5
1980	Combined NMHC	6.66	6.83	7.20	7.79	8.05	9.34
1980	Exhaust NMHC	4.61	4.61	4.61	4.64	4.65	4.70
1980	Evaporative HC	1.32	1.37	1.62	1.90	2.03	2.41
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41
1980	Running Loss HC	0.32	0.44	0.57	0.84	0.96	1.82
1980	Exhaust CO	56.44	56.44	56.44	57.22	57.59	58.63
1980	Exhaust NOx	4.40	4.40	4.40	4.40	4.40	4.40
1988	Combined NMHC	3.23	3.35	3.58	4.00	4.19	5.09
1988	Exhaust NMHC	2.32	2.32	2.32	2.38	2.41	2.49
1988	Evaporative HC	0.51	0.54	0.68	0.84	0.92	1.14
1988	Refueling Loss	0.19	0.21	0.24	0.26	0.27	0.30
1988	Running Loss HC	0.20	0.27	0.35	0.52	0.60	1.17
1988	Exhaust CO	27.81	27.81	27.81	29.09	29.75	31.76
1988	Exhaust NOx	2.59	2.59	2.59	2.59	2.59	2.59
1990	Combined NMHC	2.71	2.82	3.03	3.41	3.59	4.43
1990	Exhaust NMHC	1.94	1.94	1.94	2.00	2.04	2.13
1990	Evaporative HC	0.40	0.43	0.54	0.69	0.75	0.95
1990	Refueling Loss	0.18	0.20	0.23	0.25	0.26	0.28
1990	Running Loss HC	0.19	0.25	0.32	0.47	0.54	1.07
1990	Exhaust CO	23.08	23.08	23.08	24.52	25.28	27.65
1990	Exhaust NOx	2.30	2.30	2.30	2.30	2.30	2.31
1995	Combined NMHC	1.85	1.95	2.12	2.47	2.63	3.40
1995	Exhaust NMHC	1.29	1.29	1.29	1.36	1.40	1.51
1995	Evaporative HC	0.24	0.26	0.36	0.47	0.53	0.69
1995	Refueling Loss	0.16	0.18	0.20	0.23	0.23	0.26
1995	Running Loss HC	0.16	0.21	0.27	0.41	0.47	0.94
1995	Exhaust CO	14.96	14.96	14.96	16.58	17.48	20.36
1995	Exhaust NOx	1.64	1.64	1.64	1.64	1.65	1.65
2000	Combined NMHC	1.45	1.53	1.69	2.02	2.17	2.91
2000	Exhaust NMHC	0.98	0.98	0.98	1.05	1.09	1.21
2000	Evaporative HC	0.16	0.18	0.27	0.38	0.42	0.57
2000	Refueling Loss	0.15	0.17	0.19	0.21	0.22	0.24
2000	Running Loss HC	0.15	0.20	0.25	0.38	0.44	0.88
2000	Exhaust CO	11.32	11.32	11.32	13.00	13.94	17.03
2000	Exhaust NOx	1.39	1.39	1.39	1.40	1.41	1.42
2010	Combined NMHC	1.38	1.47	1.62	1.94	2.09	2.81
2010	Exhaust NMHC	0.94	0.94	0.94	1.01	1.05	1.16
2010	Evaporative HC	0.15	0.17	0.25	0.35	0.40	0.54
2010	Refueling Loss	0.15	0.17	0.19	0.21	0.22	0.24
2010	Running Loss HC	0.15	0.19	0.24	0.37	0.43	0.87
2010	Exhaust CO	10.50	10.50	10.50	12.13	13.05	16.07
2010	Exhaust NOx	1.34	1.34	1.34	1.35	1.36	1.37

TABLE 2.2

LOW ALTITUDE

EMISSION FACTORS (GRAMS/MILE) FOR ASTM CLASS A CITIES
67 - 95 F DIURNAL, 90 F HOT SOAK

Cal. Year	Pollutant By Component	Combined for Eight Vehicle Types @ Reid Vapor Pressure (psi) 7.0	8.0	9.0	10.0	10.4	11.5
1980	Combined NMHC	7.95	8.32	9.11	10.16	10.63	12.51
1980	Exhaust NMHC	4.80	4.80	4.80	4.82	4.84	4.90
1980	Evaporative HC	1.98	2.04	2.34	2.84	3.06	3.78
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41
1980	Running Loss HC	0.77	1.07	1.56	2.09	2.32	3.42
1980	Exhaust CO	65.81	65.81	65.81	66.50	67.10	68.75
1980	Exhaust NOx	4.06	4.06	4.06	4.06	4.06	4.06
1988	Combined NMHC	4.03	4.25	4.72	5.41	5.77	7.15
1988	Exhaust NMHC	2.54	2.54	2.54	2.58	2.62	2.73
1988	Evaporative HC	0.82	0.85	1.02	1.31	1.45	1.89
1988	Refueling Loss	0.25	0.28	0.30	0.30	0.30	0.30
1988	Running Loss HC	0.43	0.59	0.86	1.22	1.41	2.23
1988	Exhaust CO	34.14	34.14	34.14	35.12	36.01	38.76
1988	Exhaust NOx	2.46	2.46	2.46	2.46	2.46	2.46
1990	Combined NMHC	3.38	3.58	3.98	4.61	4.96	6.26
1990	Exhaust NMHC	2.13	2.13	2.13	2.17	2.21	2.33
1990	Evaporative HC	0.64	0.67	0.82	1.07	1.18	1.57
1990	Refueling Loss	0.24	0.26	0.28	0.28	0.28	0.28
1990	Running Loss HC	0.38	0.52	0.75	1.09	1.28	2.07
1990	Exhaust CO	28.38	28.38	28.38	29.48	30.51	33.76
1990	Exhaust NOx	2.21	2.21	2.21	2.21	2.21	2.21
1995	Combined NMHC	2.29	2.45	2.77	3.33	3.66	4.85
1995	Exhaust NMHC	1.40	1.40	1.40	1.45	1.50	1.63
1995	Evaporative HC	0.38	0.41	0.52	0.72	0.81	1.12
1995	Refueling Loss	0.21	0.24	0.26	0.26	0.26	0.26
1995	Running Loss HC	0.30	0.41	0.59	0.90	1.09	1.84
1995	Exhaust CO	17.87	17.87	17.87	19.12	20.31	24.34
1995	Exhaust NOx	1.62	1.62	1.62	1.62	1.63	1.63
2000	Combined NMHC	1.75	1.89	2.17	2.69	3.00	4.14
2000	Exhaust NMHC	1.03	1.03	1.03	1.08	1.13	1.26
2000	Evaporative HC	0.25	0.28	0.38	0.55	0.63	0.90
2000	Refueling Loss	0.20	0.22	0.24	0.24	0.24	0.24
2000	Running Loss HC	0.26	0.36	0.51	0.81	1.00	1.73
2000	Exhaust CO	12.84	12.84	12.84	14.14	15.41	19.78
2000	Exhaust NOx	1.41	1.41	1.41	1.41	1.42	1.43
2010	Combined NMHC	1.67	1.81	2.07	2.58	2.88	3.98
2010	Exhaust NMHC	0.99	0.99	0.99	1.03	1.08	1.21
2010	Evaporative HC	0.22	0.25	0.34	0.50	0.57	0.83
2010	Refueling Loss	0.20	0.22	0.24	0.24	0.24	0.24
2010	Running Loss HC	0.26	0.35	0.50	0.80	0.99	1.70
2010	Exhaust CO	11.92	11.92	11.92	13.19	14.44	18.76
2010	Exhaust NOx	1.36	1.36	1.36	1.36	1.37	1.38

TABLE 2.3

LOW ALTITUDE

EMISSION FACTORS (GRAMS/MILE) FOR ASTM CLASS B CITIES
71 - 92 F DIURNAL, 88 F HOT SOAK

Cal. Year	Pollutant By Component	Combined for Eight Vehicle Types @ Reid Vapor Pressure (psi) 7.0	8.0	9.0	10.0	10.4	11.5
1980	Combined NMHC	7.54	7.87	8.55	9.49	9.92	11.43
1980	Exhaust NMHC	4.77	4.77	4.77	4.80	4.82	4.87
1980	Evaporative HC	1.77	1.82	2.08	2.49	2.66	3.22
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41
1980	Running Loss HC	0.59	0.88	1.30	1.80	2.03	2.93
1980	Exhaust CO	64.35	64.35	64.35	65.11	65.68	67.23
1980	Exhaust NOx	4.10	4.10	4.10	4.10	4.10	4.10
1988	Combined NMHC	3.79	3.99	4.38	5.02	5.33	6.43
1988	Exhaust NMHC	2.51	2.51	2.51	2.55	2.59	2.70
1988	Evaporative HC	0.71	0.74	0.88	1.11	1.22	1.54
1988	Refueling Loss	0.23	0.25	0.28	0.30	0.30	0.30
1988	Running Loss HC	0.34	0.49	0.71	1.05	1.22	1.89
1988	Exhaust CO	33.16	33.16	33.16	34.27	35.14	37.79
1988	Exhaust NOx	2.47	2.47	2.47	2.47	2.47	2.47
1990	Combined NMHC	3.17	3.35	3.69	4.27	4.57	5.61
1990	Exhaust NMHC	2.10	2.10	2.10	2.15	2.19	2.31
1990	Evaporative HC	0.56	0.58	0.70	0.90	0.99	1.27
1990	Refueling Loss	0.21	0.24	0.26	0.28	0.28	0.28
1990	Running Loss HC	0.30	0.43	0.63	0.94	1.11	1.74
1990	Exhaust CO	27.57	27.57	27.57	28.82	29.82	32.96
1990	Exhaust NOx	2.22	2.22	2.22	2.22	2.22	2.23
1995	Combined NMHC	2.15	2.29	2.56	3.07	3.35	4.30
1995	Exhaust NMHC	1.39	1.39	1.39	1.44	1.49	1.62
1995	Evaporative HC	0.32	0.34	0.44	0.59	0.66	0.89
1995	Refueling Loss	0.19	0.21	0.24	0.26	0.26	0.26
1995	Running Loss HC	0.25	0.35	0.49	0.78	0.94	1.54
1995	Exhaust CO	17.44	17.44	17.44	18.85	20.02	23.92
1995	Exhaust NOx	1.62	1.62	1.62	1.63	1.63	1.64
2000	Combined NMHC	1.64	1.76	1.99	2.48	2.74	3.65
2000	Exhaust NMHC	1.03	1.03	1.03	1.08	1.13	1.26
2000	Evaporative HC	0.21	0.23	0.31	0.45	0.51	0.70
2000	Refueling Loss	0.18	0.20	0.22	0.24	0.24	0.24
2000	Running Loss HC	0.22	0.31	0.43	0.70	0.86	1.44
2000	Exhaust CO	12.63	12.63	12.63	14.11	15.34	19.58
2000	Exhaust NOx	1.41	1.41	1.41	1.41	1.42	1.43
2010	Combined NMHC	1.56	1.68	1.91	2.37	2.63	3.52
2010	Exhaust NMHC	0.98	0.98	0.98	1.03	1.08	1.21
2010	Evaporative HC	0.18	0.20	0.28	0.40	0.46	0.64
2010	Refueling Loss	0.18	0.20	0.22	0.24	0.24	0.24
2010	Running Loss HC	0.22	0.30	0.43	0.69	0.85	1.42
2010	Exhaust CO	11.72	11.72	11.72	13.16	14.38	18.58
2010	Exhaust NOx	1.36	1.36	1.36	1.36	1.37	1.38

TABLE 2.4

LOW ALTITUDE

EMISSION FACTORS (GRAMS/MILE) FOR ASTM CLASS C CITIES
66 - 85 F DIURNAL, 82 F HOT SOAK

Cal. Year	Pollutant By Component	Combined for Eight Vehicle Types @ Reid Vapor Pressure (psi) 7.0	8.0	9.0	10.0	10.4	11.5
1980	Combined NMHC	6.80	7.01	7.43	8.09	8.38	9.61
1980	Exhaust NMHC	4.65	4.65	4.65	4.68	4.70	4.74
1980	Evaporative HC	1.39	1.43	1.67	1.96	2.09	2.48
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41
1980	Running Loss HC	0.36	0.53	0.71	1.04	1.19	1.99
1980	Exhaust CO	58.32	58.32	58.32	59.13	59.55	60.71
1980	Exhaust NOx	4.31	4.31	4.31	4.31	4.31	4.31
1988	Combined NMHC	3.32	3.46	3.72	4.18	4.39	5.28
1988	Exhaust NMHC	2.37	2.37	2.37	2.42	2.46	2.54
1988	Evaporative HC	0.54	0.56	0.69	0.86	0.94	1.16
1988	Refueling Loss	0.19	0.21	0.24	0.26	0.27	0.30
1988	Running Loss HC	0.22	0.31	0.42	0.63	0.73	1.27
1988	Exhaust CO	29.11	29.11	29.11	30.39	31.11	33.29
1988	Exhaust NOx	2.56	2.56	2.56	2.55	2.55	2.55
1990	Combined NMHC	2.78	2.91	3.13	3.56	3.76	4.59
1990	Exhaust NMHC	1.98	1.98	1.98	2.04	2.08	2.18
1990	Evaporative HC	0.42	0.44	0.55	0.70	0.76	0.96
1990	Refueling Loss	0.18	0.20	0.23	0.25	0.26	0.28
1990	Running Loss HC	0.20	0.28	0.37	0.57	0.66	1.17
1990	Exhaust CO	24.18	24.18	24.18	25.63	26.46	29.03
1990	Exhaust NOx	2.28	2.28	2.28	2.28	2.28	2.28
1995	Combined NMHC	1.90	2.00	2.19	2.57	2.75	3.52
1995	Exhaust NMHC	1.32	1.32	1.32	1.39	1.43	1.54
1995	Evaporative HC	0.24	0.26	0.35	0.47	0.52	0.69
1995	Refueling Loss	0.16	0.18	0.20	0.23	0.23	0.26
1995	Running Loss HC	0.17	0.24	0.31	0.49	0.57	1.03
1995	Exhaust CO	15.59	15.59	15.59	17.23	18.20	21.36
1995	Exhaust NOx	1.63	1.63	1.63	1.64	1.64	1.65
2000	Combined NMHC	1.47	1.56	1.73	2.09	2.26	2.99
2000	Exhaust NMHC	0.99	0.99	0.99	1.06	1.10	1.23
2000	Evaporative HC	0.16	0.18	0.26	0.37	0.41	0.56
2000	Refueling Loss	0.15	0.17	0.19	0.21	0.22	0.24
2000	Running Loss HC	0.16	0.22	0.28	0.45	0.52	0.97
2000	Exhaust CO	11.67	11.67	11.67	13.38	14.40	17.82
2000	Exhaust NOx	1.40	1.40	1.40	1.40	1.41	1.42
2010	Combined NMHC	1.40	1.49	1.65	2.01	2.18	2.89
2010	Exhaust NMHC	0.95	0.95	0.95	1.02	1.06	1.18
2010	Evaporative HC	0.14	0.16	0.24	0.34	0.38	0.52
2010	Refueling Loss	0.15	0.17	0.19	0.21	0.22	0.24
2010	Running Loss HC	0.16	0.21	0.28	0.44	0.52	0.95
2010	Exhaust CO	10.83	10.83	10.83	12.49	13.49	16.84
2010	Exhaust NOx	1.35	1.35	1.35	1.36	1.36	1.37

TABLE 2.4 : FOR ASTM CLASS C CITIES.

TABLE 2.5

HIGH ALTITUDE

EMISSION FACTORS (GRAMS/MILE) FOR FTP CONDITIONS
60 - 84 F DIURNAL, 80 F HOT SOAK

Cal. Year	Pollutant By Component	Combined for Eight Vehicle Types @ Reid Vapor Pressure (psi) 7.0	8.0	9.0	10.0	10.4	11.5
1980	Combined NMHC	8.51	8.71	9.21	9.97	10.30	11.82
1980	Exhaust NMHC	5.92	5.92	5.92	5.96	5.98	6.04
1980	Evaporative HC	1.86	1.94	2.31	2.76	2.95	3.56
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41
1980	Running Loss HC	0.32	0.44	0.57	0.84	0.96	1.82
1980	Exhaust CO	87.52	87.52	87.52	88.83	89.47	91.22
1980	Exhaust NOx	3.42	3.42	3.42	3.42	3.42	3.42
1988	Combined NMHC	3.91	4.06	4.36	4.88	5.11	6.17
1988	Exhaust NMHC	2.79	2.79	2.79	2.85	2.88	2.98
1988	Evaporative HC	0.73	0.78	0.99	1.25	1.36	1.73
1988	Refueling Loss	0.19	0.21	0.24	0.26	0.27	0.30
1988	Running Loss HC	0.20	0.27	0.35	0.52	0.60	1.17
1988	Exhaust CO	39.95	39.95	39.95	41.75	42.69	45.51
1988	Exhaust NOx	2.34	2.34	2.34	2.34	2.34	2.34
1990	Combined NMHC	3.23	3.35	3.62	4.08	4.30	5.27
1990	Exhaust NMHC	2.29	2.29	2.29	2.36	2.40	2.50
1990	Evaporative HC	0.57	0.61	0.78	1.00	1.10	1.42
1990	Refueling Loss	0.18	0.20	0.23	0.25	0.26	0.28
1990	Running Loss HC	0.19	0.25	0.32	0.47	0.54	1.07
1990	Exhaust CO	31.95	31.95	31.95	33.85	34.84	37.92
1990	Exhaust NOx	2.16	2.16	2.16	2.16	2.16	2.16
1995	Combined NMHC	2.11	2.22	2.42	2.82	3.00	3.86
1995	Exhaust NMHC	1.47	1.47	1.47	1.54	1.58	1.70
1995	Evaporative HC	0.32	0.35	0.48	0.64	0.72	0.96
1995	Refueling Loss	0.16	0.18	0.20	0.23	0.23	0.26
1995	Running Loss HC	0.16	0.21	0.27	0.41	0.47	0.94
1995	Exhaust CO	18.71	18.71	18.71	20.60	21.64	24.97
1995	Exhaust NOx	1.66	1.66	1.66	1.67	1.67	1.68
2000	Combined NMHC	1.60	1.70	1.87	2.24	2.40	3.20
2000	Exhaust NMHC	1.10	1.10	1.10	1.18	1.22	1.34
2000	Evaporative HC	0.20	0.22	0.33	0.47	0.53	0.73
2000	Refueling Loss	0.15	0.17	0.19	0.21	0.22	0.24
2000	Running Loss HC	0.15	0.20	0.25	0.38	0.44	0.88
2000	Exhaust CO	13.15	13.15	13.15	15.03	16.07	19.50
2000	Exhaust NOx	1.48	1.48	1.48	1.49	1.49	1.51
2010	Combined NMHC	1.51	1.61	1.77	2.12	2.28	3.05
2010	Exhaust NMHC	1.04	1.04	1.04	1.12	1.16	1.27
2010	Evaporative HC	0.17	0.20	0.29	0.42	0.48	0.67
2010	Refueling Loss	0.15	0.17	0.19	0.21	0.22	0.24
2010	Running Loss HC	0.15	0.19	0.24	0.37	0.43	0.87
2010	Exhaust CO	11.90	11.90	11.90	13.68	14.68	17.97
2010	Exhaust NOx	1.44	1.44	1.44	1.45	1.45	1.47

TABLE 2.6

HIGH ALTITUDE

EMISSION FACTORS (GRAMS/MILE) FOR ASTM CLASS A CITIES
67 - 95 F DIURNAL, 90 F HOT SOAK

Cal. Year	Pollutant By Component	Combined for Eight Vehicle Types @ Reid Vapor Pressure (psi) 7.0	8.0	9.0	10.0	10.4	11.5
1980	Combined NMHC	10.16	10.56	11.53	12.89	13.51	15.98
1980	Exhaust NMHC	6.16	6.16	6.16	6.20	6.22	6.30
1980	Evaporative HC	2.82	2.92	3.39	4.19	4.56	5.85
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41
1980	Running Loss HC	0.77	1.07	1.56	2.09	2.32	3.42
1980	Exhaust CO	103.02	103.02	103.02	104.19	105.19	107.96
1980	Exhaust NOx	3.19	3.19	3.19	3.19	3.19	3.19
1988	Combined NMHC	4.90	5.15	5.72	6.61	7.07	8.89
1988	Exhaust NMHC	3.03	3.03	3.03	3.08	3.12	3.25
1988	Evaporative HC	1.19	1.25	1.53	2.01	2.24	3.11
1988	Refueling Loss	0.25	0.28	0.30	0.30	0.30	0.30
1988	Running Loss HC	0.43	0.59	0.86	1.22	1.41	2.23
1988	Exhaust CO	48.98	48.98	48.98	50.35	51.60	55.38
1988	Exhaust NOx	2.24	2.24	2.24	2.24	2.24	2.24
1990	Combined NMHC	4.03	4.25	4.74	5.54	5.97	7.67
1990	Exhaust NMHC	2.50	2.50	2.50	2.55	2.59	2.73
1990	Evaporative HC	0.92	0.98	1.21	1.62	1.82	2.59
1990	Refueling Loss	0.24	0.26	0.28	0.28	0.28	0.28
1990	Running Loss HC	0.38	0.52	0.75	1.09	1.28	2.07
1990	Exhaust CO	39.28	39.28	39.28	40.71	42.04	46.21
1990	Exhaust NOx	2.09	2.09	2.09	2.09	2.09	2.09
1995	Combined NMHC	2.62	2.79	3.17	3.83	4.21	5.70
1995	Exhaust NMHC	1.59	1.59	1.59	1.64	1.69	1.83
1995	Evaporative HC	0.52	0.56	0.73	1.03	1.18	1.77
1995	Refueling Loss	0.21	0.24	0.26	0.26	0.26	0.26
1995	Running Loss HC	0.30	0.41	0.59	0.90	1.09	1.84
1995	Exhaust CO	22.44	22.44	22.44	23.88	25.27	29.88
1995	Exhaust NOx	1.65	1.65	1.65	1.65	1.66	1.67
2000	Combined NMHC	1.94	2.09	2.40	2.99	3.35	4.72
2000	Exhaust NMHC	1.16	1.16	1.16	1.21	1.25	1.40
2000	Evaporative HC	0.31	0.35	0.49	0.73	0.85	1.35
2000	Refueling Loss	0.20	0.22	0.24	0.24	0.24	0.24
2000	Running Loss HC	0.26	0.36	0.51	0.81	1.00	1.73
2000	Exhaust CO	14.91	14.91	14.91	16.35	17.75	22.57
2000	Exhaust NOx	1.50	1.50	1.50	1.50	1.51	1.52
2010	Combined NMHC	1.82	1.97	2.26	2.82	3.16	4.47
2010	Exhaust NMHC	1.09	1.09	1.09	1.14	1.19	1.32
2010	Evaporative HC	0.27	0.30	0.42	0.64	0.75	1.20
2010	Refueling Loss	0.20	0.22	0.24	0.24	0.24	0.24
2010	Running Loss HC	0.26	0.35	0.50	0.80	0.99	1.70
2010	Exhaust CO	13.49	13.49	13.49	14.88	16.24	20.93
2010	Exhaust NOx	1.45	1.45	1.45	1.46	1.46	1.48

TABLE 2.7

HIGH ALTITUDE

EMISSION FACTORS (GRAMS/MILE) FOR ASTM CLASS B CITIES
71 - 92 F DIURNAL, 88 F HOT SOAK

Cal. Year	Pollutant By Component	Combined for Eight Vehicle Types @ Reid Vapor Pressure (psi) 7.0	8.0	9.0	10.0	10.4	11.5
1980	Combined NMHC	9.64	10.00	10.83	12.02	12.56	14.47
1980	Exhaust NMHC	6.13	6.13	6.13	6.16	6.19	6.26
1980	Evaporative HC	2.52	2.59	3.00	3.65	3.94	4.87
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41
1980	Running Loss HC	0.59	0.88	1.30	1.80	2.03	2.93
1980	Exhaust CO	100.60	100.60	100.60	101.89	102.83	105.45
1980	Exhaust NOx	3.22	3.22	3.22	3.22	3.22	3.22
1988	Combined NMHC	4.60	4.82	5.29	6.08	6.47	7.83
1988	Exhaust NMHC	3.00	3.00	3.00	3.05	3.09	3.21
1988	Evaporative HC	1.03	1.08	1.31	1.68	1.85	2.43
1988	Refueling Loss	0.23	0.25	0.28	0.30	0.30	0.30
1988	Running Loss HC	0.34	0.49	0.71	1.05	1.22	1.89
1988	Exhaust CO	47.60	47.60	47.60	49.14	50.35	54.01
1988	Exhaust NOx	2.25	2.25	2.25	2.25	2.25	2.25
1990	Combined NMHC	3.78	3.98	4.38	5.09	5.44	6.71
1990	Exhaust NMHC	2.47	2.47	2.47	2.52	2.57	2.70
1990	Evaporative HC	0.80	0.84	1.03	1.34	1.48	1.99
1990	Refueling Loss	0.21	0.24	0.26	0.28	0.28	0.28
1990	Running Loss HC	0.30	0.43	0.63	0.94	1.11	1.74
1990	Exhaust CO	38.16	38.16	38.16	39.79	41.08	45.11
1990	Exhaust NOx	2.10	2.10	2.10	2.10	2.10	2.10
1995	Combined NMHC	2.45	2.60	2.91	3.50	3.81	4.93
1995	Exhaust NMHC	1.57	1.57	1.57	1.63	1.68	1.82
1995	Evaporative HC	0.44	0.47	0.61	0.83	0.94	1.31
1995	Refueling Loss	0.19	0.21	0.24	0.26	0.26	0.26
1995	Running Loss HC	0.25	0.35	0.49	0.78	0.94	1.54
1995	Exhaust CO	21.89	21.89	21.89	23.52	24.87	29.35
1995	Exhaust NOx	1.65	1.65	1.65	1.66	1.66	1.67
2000	Combined NMHC	1.81	1.94	2.20	2.73	3.02	4.05
2000	Exhaust NMHC	1.15	1.15	1.15	1.21	1.25	1.39
2000	Evaporative HC	0.26	0.28	0.39	0.57	0.66	0.97
2000	Refueling Loss	0.18	0.20	0.22	0.24	0.24	0.24
2000	Running Loss HC	0.22	0.31	0.43	0.70	0.86	1.44
2000	Exhaust CO	14.67	14.67	14.67	16.30	17.67	22.35
2000	Exhaust NOx	1.49	1.49	1.49	1.50	1.51	1.52
2010	Combined NMHC	1.70	1.83	2.07	2.58	2.85	3.84
2010	Exhaust NMHC	1.09	1.09	1.09	1.14	1.19	1.32
2010	Evaporative HC	0.22	0.24	0.34	0.50	0.58	0.86
2010	Refueling Loss	0.18	0.20	0.22	0.24	0.24	0.24
2010	Running Loss HC	0.22	0.30	0.43	0.69	0.85	1.42
2010	Exhaust CO	13.27	13.27	13.27	14.84	16.17	20.73
2010	Exhaust NOx	1.45	1.45	1.45	1.46	1.46	1.48

TABLE 2.8

HIGH ALTITUDE

EMISSION FACTORS (GRAMS/MILE) FOR ASTM CLASS C CITIES
66 - 85 F DIURNAL, 82 F HOT SOAK

Cal. Year	Pollutant By Component	Combined for Eight Vehicle Types @ Reid Vapor Pressure (psi) 7.0	8.0	9.0	10.0	10.4	11.5
1980	Combined NMHC	8.69	8.93	9.48	10.31	10.68	12.15
1980	Exhaust NMHC	5.97	5.97	5.97	6.01	6.03	6.09
1980	Evaporative HC	1.95	2.02	2.39	2.85	3.05	3.67
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41
1980	Running Loss HC	0.36	0.53	0.71	1.04	1.19	1.99
1980	Exhaust CO	90.63	90.63	90.63	91.99	92.70	94.67
1980	Exhaust NOx	3.36	3.36	3.36	3.36	3.36	3.36
1988	Combined NMHC	4.02	4.18	4.51	5.07	5.33	6.38
1988	Exhaust NMHC	2.84	2.84	2.84	2.90	2.94	3.04
1988	Evaporative HC	0.77	0.81	1.02	1.28	1.39	1.77
1988	Refueling Loss	0.19	0.21	0.24	0.26	0.27	0.30
1988	Running Loss HC	0.22	0.31	0.42	0.63	0.73	1.27
1988	Exhaust CO	41.80	41.80	41.80	43.61	44.62	47.66
1988	Exhaust NOx	2.31	2.31	2.31	2.31	2.31	2.31
1990	Combined NMHC	3.31	3.45	3.74	4.24	4.48	5.44
1990	Exhaust NMHC	2.34	2.34	2.34	2.40	2.44	2.55
1990	Evaporative HC	0.60	0.63	0.80	1.02	1.12	1.44
1990	Refueling Loss	0.18	0.20	0.23	0.25	0.26	0.28
1990	Running Loss HC	0.20	0.28	0.37	0.57	0.66	1.17
1990	Exhaust CO	33.47	33.47	33.47	35.37	36.45	39.78
1990	Exhaust NOx	2.14	2.14	2.14	2.14	2.14	2.15
1995	Combined NMHC	2.16	2.27	2.49	2.92	3.13	3.98
1995	Exhaust NMHC	1.50	1.50	1.50	1.57	1.61	1.73
1995	Evaporative HC	0.33	0.36	0.48	0.64	0.72	0.96
1995	Refueling Loss	0.16	0.18	0.20	0.23	0.23	0.26
1995	Running Loss HC	0.17	0.24	0.31	0.49	0.57	1.03
1995	Exhaust CO	19.51	19.51	19.51	21.42	22.54	26.19
1995	Exhaust NOx	1.66	1.66	1.66	1.66	1.67	1.68
2000	Combined NMHC	1.63	1.73	1.91	2.30	2.49	3.28
2000	Exhaust NMHC	1.12	1.12	1.12	1.19	1.23	1.36
2000	Evaporative HC	0.20	0.22	0.32	0.45	0.51	0.71
2000	Refueling Loss	0.15	0.17	0.19	0.21	0.22	0.24
2000	Running Loss HC	0.16	0.22	0.28	0.45	0.52	0.97
2000	Exhaust CO	13.56	13.56	13.56	15.46	16.60	20.38
2000	Exhaust NOx	1.48	1.48	1.48	1.49	1.50	1.51
2010	Combined NMHC	1.53	1.63	1.81	2.18	2.36	3.13
2010	Exhaust NMHC	1.06	1.06	1.06	1.13	1.17	1.29
2010	Evaporative HC	0.17	0.19	0.28	0.40	0.46	0.65
2010	Refueling Loss	0.15	0.17	0.19	0.21	0.22	0.24
2010	Running Loss HC	0.16	0.21	0.28	0.44	0.52	0.95
2010	Exhaust CO	12.27	12.27	12.27	14.08	15.17	18.82
2010	Exhaust NOx	1.44	1.44	1.44	1.45	1.46	1.47

Appendix J

EMISSION SENSITIVITY TABLES BY VEHICLE TYPE

Appendix J is arranged in the same way as the Appendix I, except that the emission factors are disaggregated by vehicle type. The LDGT category combines LDGT1s and LDGT2s. For the emission factors by component tables, only LDGVs, LDGTs, and HDGVs are given. An additional table (Table 3.1) provides hot stabilized idle emission factors (NMHC, CO, and NOx) for both low- and high-altitude regions and six calendar years.

TABLE 1.1

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	LDDV 0-100F	LDDT 0-100F	HDDV 0-100F	HDGV
1980	0.0	0.0	0.0	26.50	23.84	21.61	19.73	25.16	34.33	31.22	28.59	26.36	32.41	1.19	1.89	10.66	59.56 @ 0F
1980	0.0	100.0	0.0	25.73	25.72	25.82	26.01	36.33	36.28	36.24	36.28	36.40	49.28	1.27	1.86	10.66	51.45 @ 25F
1980	100.0	0.0	100.0	224.18	128.01	73.20	41.91	31.15	303.56	173.65	99.46	57.04	42.32	2.01	3.10	10.66	44.45 @ 50F
1980	50.0	0.0	50.0	104.66	64.99	41.92	28.39	27.40	139.76	86.86	56.14	38.15	35.97	1.50	2.35	10.66	38.39 @ 75F
1980	0.0	50.0	0.0	26.06	24.46	23.15	22.09	29.40	34.77	32.89	31.33	30.05	38.66	1.20	1.85	10.66	43.61 @100F
1980	50.0	50.0	50.0	124.95	76.87	49.51	33.96	33.74	169.92	104.95	67.87	46.72	45.80	1.64	2.48	10.66	
1980	20.6	27.3	20.6	58.19	40.98	30.74	24.54	28.36	77.62	54.84	41.32	33.16	37.24	1.32	2.05	10.66	
1988	0.0	0.0	0.0	17.47	14.68	12.42	10.58	15.70	24.20	20.40	17.31	14.78	20.21	1.22	1.54	6.08	26.41 @ 0F
1988	0.0	100.0	0.0	18.40	17.16	16.15	15.34	22.51	28.18	25.87	23.93	22.29	30.58	1.40	1.77	6.08	22.46 @ 25F
1988	100.0	0.0	100.0	219.00	108.94	55.10	28.31	23.58	282.50	143.64	73.88	38.42	32.54	1.91	2.60	6.08	19.15 @ 50F
1988	50.0	0.0	50.0	93.21	50.19	28.51	17.24	18.54	122.38	67.24	38.78	23.70	24.74	1.48	1.94	6.08	16.36 @ 75F
1988	0.0	50.0	0.0	17.70	15.52	13.76	12.33	18.22	25.55	22.36	19.73	17.56	24.04	1.27	1.61	6.08	20.15 @100F
1988	50.0	50.0	50.0	118.70	63.05	35.63	21.82	23.05	155.34	84.76	48.90	30.35	31.56	1.65	2.19	6.08	
1988	20.6	27.3	20.6	48.47	29.61	19.70	14.24	18.21	64.97	40.56	27.37	19.92	24.12	1.35	1.74	6.08	
1990	0.0	0.0	0.0	15.33	12.74	10.64	8.94	13.22	21.85	18.20	15.23	12.81	17.07	1.17	1.39	5.45	21.47 @ 0F
1990	0.0	100.0	0.0	17.05	15.56	14.34	13.34	19.04	26.48	23.72	21.41	19.46	25.60	1.35	1.57	5.45	17.91 @ 25F
1990	100.0	0.0	100.0	211.44	103.35	51.33	25.89	22.31	256.50	128.15	64.70	33.00	28.84	1.84	2.35	5.45	14.98 @ 50F
1990	50.0	0.0	50.0	88.50	46.63	25.88	15.28	16.52	110.71	59.84	33.95	20.42	21.41	1.42	1.76	5.45	12.55 @ 75F
1990	0.0	50.0	0.0	15.87	13.72	11.97	10.55	15.36	23.49	20.20	17.50	15.27	20.23	1.22	1.44	5.45	15.39 @100F
1990	50.0	50.0	50.0	114.24	59.46	32.84	19.62	20.67	141.49	75.93	43.05	26.23	27.22	1.59	1.96	5.45	
1990	20.6	27.3	20.6	45.45	27.08	17.57	12.39	15.72	58.97	36.26	24.09	17.24	20.54	1.30	1.57	5.45	
1995	0.0	0.0	0.0	11.07	8.98	7.28	5.90	8.14	17.45	14.20	11.58	9.45	11.47	0.91	1.17	4.68	17.66 @ 0F
1995	0.0	100.0	0.0	14.30	12.42	10.81	9.46	11.84	22.81	19.53	16.78	14.48	16.66	1.03	1.27	4.68	14.24 @ 25F
1995	100.0	0.0	100.0	177.54	85.82	42.02	20.83	19.26	200.39	98.22	48.44	24.03	22.48	1.46	1.96	4.68	11.49 @ 50F
1995	50.0	0.0	50.0	72.84	37.55	20.22	11.47	12.25	86.26	45.81	25.44	14.93	15.57	1.12	1.47	4.68	9.27 @ 75F
1995	0.0	50.0	0.0	12.24	10.23	8.58	7.22	9.50	19.42	16.17	13.51	11.33	13.40	0.94	1.19	4.68	10.76 @100F
1995	50.0	50.0	50.0	95.92	49.12	26.42	15.14	15.55	111.60	58.88	32.61	19.26	19.57	1.25	1.62	4.68	
1995	20.6	27.3	20.6	36.87	21.30	13.26	8.88	10.55	46.57	28.15	18.27	12.70	14.18	1.01	1.30	4.68	
2000	0.0	0.0	0.0	7.88	6.43	5.24	4.28	4.68	14.69	11.82	9.52	7.67	8.39	0.90	1.23	4.45	16.89 @ 0F
2000	0.0	100.0	0.0	11.66	9.84	8.31	7.01	7.08	20.02	16.74	14.01	11.72	11.86	1.02	1.36	4.45	13.36 @ 25F
2000	100.0	0.0	100.0	132.99	65.97	33.10	16.78	16.47	161.75	79.76	39.41	19.51	19.15	1.43	2.06	4.45	10.55 @ 50F
2000	50.0	0.0	50.0	54.49	28.66	15.66	8.96	9.10	69.95	37.35	20.75	12.12	12.43	1.10	1.54	4.45	8.32 @ 75F
2000	0.0	50.0	0.0	9.29	7.70	6.39	5.30	5.58	16.68	13.67	11.20	9.19	9.69	0.93	1.26	4.45	9.36 @100F
2000	50.0	50.0	50.0	72.32	37.90	20.70	11.90	11.78	90.89	48.25	26.71	15.61	15.51	1.22	1.71	4.45	
2000	20.6	27.3	20.6	27.63	16.17	10.11	6.74	6.97	38.29	23.22	15.01	10.30	10.74	1.00	1.37	4.45	
2010	0.0	0.0	0.0	7.64	6.25	5.11	4.18	4.57	13.78	11.05	8.86	7.11	7.78	0.99	1.31	4.40	16.85 @ 0F
2010	0.0	100.0	0.0	10.55	8.95	7.60	6.44	6.50	18.63	15.56	12.99	10.84	10.93	1.11	1.47	4.40	13.21 @ 25F
2010	100.0	0.0	100.0	91.98	50.29	27.50	15.04	14.75	140.37	70.82	35.73	18.03	17.69	1.52	2.20	4.40	10.33 @ 50F
2010	50.0	0.0	50.0	39.62	22.95	13.60	8.30	8.43	61.42	33.54	18.97	11.22	11.51	1.19	1.65	4.40	8.04 @ 75F
2010	0.0	50.0	0.0	8.74	7.27	6.05	5.04	5.30	15.60	12.74	10.41	8.51	8.96	1.02	1.35	4.40	8.83 @100F
2010	50.0	50.0	50.0	51.26	29.62	17.55	10.74	10.63	79.50	43.19	24.36	14.43	14.31	1.31	1.84	4.40	
2010	20.6	27.3	20.6	21.27	13.61	9.08	6.32	6.54	34.18	21.13	13.82	9.54	9.94	1.09	1.47	4.40	

TABLE 1.1 NMHC AT 2.5 MPH

TABLE 1.2

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	LDDV- 0-100F	LDDT- 0-100F	HDDV- 0-100F	HDGV
1980	0.0	0.0	0.0	15.38	13.90	12.66	11.60	14.56	20.14	18.34	16.81	15.52	18.98	1.04	1.66	9.37	47.46 @ 0F
1980	0.0	100.0	0.0	14.98	14.99	15.05	15.18	20.94	21.25	21.23	21.25	21.31	28.71	1.12	1.64	9.37	41.00 @ 25F
1980	100.0	0.0	100.0	129.50	74.06	42.41	24.32	18.09	177.54	101.59	58.20	33.38	24.76	1.77	2.73	9.37	35.42 @ 50F
1980	50.0	0.0	50.0	60.62	37.72	24.40	16.58	15.88	81.86	50.90	32.93	22.39	21.05	1.32	2.06	9.37	30.60 @ 75F
1980	0.0	50.0	0.0	15.15	14.26	13.53	12.95	16.98	20.38	19.29	18.39	17.65	22.59	1.06	1.62	9.37	34.76 @100F
1980	50.0	50.0	50.0	72.24	44.52	28.73	19.75	19.51	99.40	61.41	39.72	27.35	26.73	1.44	2.18	9.37	
1980	20.6	27.3	20.6	33.74	23.82	17.93	14.36	16.41	45.48	32.15	24.24	19.47	21.77	1.16	1.80	9.37	
1988	0.0	0.0	0.0	9.33	7.87	6.69	5.73	8.44	12.91	10.93	9.30	7.98	10.89	1.07	1.35	5.34	21.05 @ 0F
1988	0.0	100.0	0.0	9.70	9.10	8.61	8.23	12.07	14.86	13.71	12.73	11.92	16.40	1.23	1.56	5.34	17.90 @ 25F
1988	100.0	0.0	100.0	113.64	56.92	28.99	14.99	12.42	147.63	75.48	39.04	20.41	17.15	1.68	2.29	5.34	15.26 @ 50F
1988	50.0	0.0	50.0	48.63	26.40	15.12	9.22	9.87	64.18	35.49	20.60	12.67	13.18	1.30	1.71	5.34	13.04 @ 75F
1988	0.0	50.0	0.0	9.40	8.28	7.38	6.65	9.78	13.56	11.91	10.55	9.43	12.92	1.12	1.41	5.34	16.06 @100F
1988	50.0	50.0	50.0	61.67	33.01	18.80	11.61	12.24	81.24	44.59	25.89	16.16	16.78	1.45	1.92	5.34	
1988	20.6	27.3	20.6	25.39	15.65	10.50	7.65	9.74	34.18	21.48	14.58	10.67	12.92	1.19	1.53	5.34	
1990	0.0	0.0	0.0	8.04	6.70	5.62	4.75	6.99	11.44	9.55	8.02	6.77	9.03	1.03	1.23	4.79	17.11 @ 0F
1990	0.0	100.0	0.0	8.82	8.09	7.49	7.01	10.04	13.71	12.33	11.18	10.21	13.51	1.18	1.38	4.79	14.27 @ 25F
1990	100.0	0.0	100.0	107.88	53.04	26.50	13.44	11.52	132.16	66.34	33.66	17.26	14.97	1.61	2.06	4.79	11.94 @ 50F
1990	50.0	0.0	50.0	45.36	24.06	13.45	8.00	8.63	57.20	31.08	17.73	10.72	11.22	1.25	1.54	4.79	10.01 @ 75F
1990	0.0	50.0	0.0	8.27	7.18	6.29	5.57	8.11	12.23	10.55	9.18	8.04	10.69	1.07	1.27	4.79	12.27 @100F
1990	50.0	50.0	50.0	58.35	30.56	16.99	10.23	10.78	72.93	39.34	22.42	13.73	14.24	1.40	1.72	4.79	
1990	20.6	27.3	20.6	23.38	14.03	9.17	6.52	8.26	30.53	18.87	12.60	9.07	10.82	1.14	1.38	4.79	
1995	0.0	0.0	0.0	5.59	4.53	3.67	2.98	4.13	8.83	7.19	5.87	4.80	5.85	0.80	1.03	4.11	14.08 @ 0F
1995	0.0	100.0	0.0	7.16	6.23	5.43	4.75	5.99	11.48	9.85	8.48	7.33	8.49	0.91	1.12	4.11	11.35 @ 25F
1995	100.0	0.0	100.0	88.52	42.87	21.02	10.44	9.63	100.82	49.51	24.46	12.16	11.34	1.29	1.72	4.11	9.16 @ 50F
1995	50.0	0.0	50.0	36.38	18.79	10.14	5.76	6.16	43.44	23.11	12.86	7.56	7.89	0.98	1.29	4.11	7.39 @ 75F
1995	0.0	50.0	0.0	6.15	5.15	4.32	3.63	4.81	9.80	8.17	6.84	5.74	6.83	0.83	1.05	4.11	8.58 @100F
1995	50.0	50.0	50.0	47.84	24.55	13.23	7.60	7.81	56.15	29.68	16.47	9.75	9.91	1.10	1.42	4.11	
1995	20.6	27.3	20.6	18.44	10.68	6.66	4.47	5.33	23.46	14.21	9.24	6.43	7.21	0.89	1.15	4.11	
2000	0.0	0.0	0.0	3.92	3.19	2.61	2.13	2.33	7.31	5.88	4.74	3.82	4.17	0.79	1.08	3.91	13.46 @ 0F
2000	0.0	100.0	0.0	5.80	4.89	4.13	3.49	3.52	9.96	8.33	6.97	5.83	5.90	0.89	1.19	3.91	10.65 @ 25F
2000	100.0	0.0	100.0	66.00	32.76	16.45	8.34	8.19	80.47	39.68	19.61	9.71	9.53	1.26	1.81	3.91	8.41 @ 50F
2000	50.0	0.0	50.0	27.05	14.24	7.78	4.46	4.52	34.80	18.59	10.33	6.03	6.19	0.97	1.36	3.91	6.63 @ 75F
2000	0.0	50.0	0.0	4.62	3.83	3.18	2.64	2.77	8.30	6.80	5.57	4.57	4.82	0.82	1.11	3.91	7.46 @100F
2000	50.0	50.0	50.0	35.90	18.83	10.29	5.91	5.85	45.22	24.01	13.29	7.77	7.72	1.07	1.50	3.91	
2000	20.6	27.3	20.6	13.72	8.04	5.02	3.35	3.46	19.05	11.56	7.47	5.13	5.34	0.88	1.21	3.91	
2010	0.0	0.0	0.0	3.81	3.12	2.55	2.09	2.28	6.86	5.50	4.41	3.54	3.87	0.87	1.15	3.87	13.43 @ 0F
2010	0.0	100.0	0.0	5.27	4.47	3.79	3.22	3.24	9.27	7.74	6.46	5.40	5.44	0.97	1.29	3.87	10.53 @ 25F
2010	100.0	0.0	100.0	45.91	25.11	13.73	7.51	7.36	69.87	35.25	17.79	8.97	8.80	1.33	1.94	3.87	8.23 @ 50F
2010	50.0	0.0	50.0	19.78	11.45	6.79	4.14	4.21	30.57	16.70	9.44	5.58	5.73	1.04	1.44	3.87	6.41 @ 75F
2010	0.0	50.0	0.0	4.36	3.63	3.02	2.51	2.65	7.76	6.34	5.18	4.24	4.46	0.90	1.19	3.87	7.04 @100F
2010	50.0	50.0	50.0	25.59	14.79	8.76	5.36	5.30	39.57	21.50	12.12	7.19	7.12	1.15	1.61	3.87	
2010	20.6	27.3	20.6	10.62	6.79	4.53	3.15	3.27	17.01	10.52	6.88	4.75	4.95	0.95	1.29	3.87	

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TABLE 1.3

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	LDDV 0-100F	LDDT 0-100F	HDDV 0-100F	HDGV
1980	0.0	0.0	0.0	7.99	7.23	6.58	6.03	7.56	10.39	9.44	8.64	7.97	9.78	0.82	1.30	7.36	31.10 @ 0F
1980	0.0	100.0	0.0	7.78	7.78	7.81	7.87	10.83	10.90	10.88	10.88	10.90	14.71	0.88	1.29	7.36	26.87 @ 25F
1980	100.0	0.0	100.0	67.05	38.36	21.97	12.60	9.36	90.98	52.04	29.80	17.09	12.65	1.39	2.14	7.36	23.21 @ 50F
1980	50.0	0.0	50.0	31.43	19.57	12.66	8.61	8.23	42.02	26.12	16.89	11.48	10.81	1.03	1.62	7.36	20.05 @ 75F
1980	0.0	50.0	0.0	7.87	7.41	7.03	6.72	8.80	10.49	9.92	9.44	9.05	11.61	0.83	1.27	7.36	22.77 @100F
1980	50.0	50.0	50.0	37.42	23.07	14.89	10.24	10.09	50.94	31.46	20.34	13.99	13.68	1.13	1.71	7.36	
1980	20.6	27.3	20.6	17.50	12.36	9.31	7.46	8.50	23.36	16.51	12.44	9.98	11.19	0.91	1.41	7.36	
1988	0.0	0.0	0.0	4.73	4.00	3.40	2.91	4.29	6.54	5.53	4.71	4.03	5.53	0.84	1.06	4.19	13.79 @ 0F
1988	0.0	100.0	0.0	4.89	4.59	4.35	4.16	6.12	7.49	6.91	6.42	6.01	8.30	0.96	1.22	4.19	11.73 @ 25F
1988	100.0	0.0	100.0	56.72	28.51	14.56	7.55	6.23	74.08	37.92	19.63	10.27	8.62	1.32	1.80	4.19	10.00 @ 50F
1988	50.0	0.0	50.0	24.35	13.27	7.62	4.66	4.99	32.26	17.86	10.38	6.39	6.66	1.02	1.34	4.19	8.54 @ 75F
1988	0.0	50.0	0.0	4.76	4.19	3.74	3.37	4.97	6.85	6.02	5.33	4.76	6.55	0.88	1.11	4.19	10.52 @100F
1988	50.0	50.0	50.0	30.80	16.55	9.46	5.86	6.18	40.78	22.41	13.03	8.14	8.46	1.14	1.51	4.19	
1988	20.6	27.3	20.6	12.74	7.88	5.30	3.87	4.94	17.20	10.82	7.35	5.39	6.54	0.93	1.20	4.19	
1990	0.0	0.0	0.0	4.06	3.38	2.84	2.40	3.54	5.77	4.81	4.04	3.41	4.57	0.81	0.96	3.76	11.21 @ 0F
1990	0.0	100.0	0.0	4.41	4.06	3.76	3.52	5.07	6.88	6.19	5.61	5.13	6.81	0.93	1.09	3.76	9.35 @ 25F
1990	100.0	0.0	100.0	53.52	26.40	13.23	6.73	5.75	66.11	33.23	16.88	8.66	7.50	1.27	1.62	3.76	7.82 @ 50F
1990	50.0	0.0	50.0	22.57	12.01	6.74	4.02	4.34	28.65	15.59	8.90	5.39	5.65	0.98	1.21	3.76	6.56 @ 75F
1990	0.0	50.0	0.0	4.16	3.61	3.17	2.81	4.10	6.15	5.31	4.62	4.05	5.40	0.84	1.00	3.76	8.04 @100F
1990	50.0	50.0	50.0	28.97	15.23	8.49	5.13	5.41	36.49	19.71	11.25	6.90	7.16	1.10	1.35	3.76	
1990	20.6	27.3	20.6	11.66	7.02	4.61	3.28	4.17	15.31	9.48	6.34	4.56	5.46	0.90	1.08	3.76	
1995	0.0	0.0	0.0	2.78	2.26	1.83	1.48	2.07	4.40	3.58	2.92	2.39	2.92	0.63	0.81	3.23	9.22 @ 0F
1995	0.0	100.0	0.0	3.55	3.09	2.69	2.36	2.99	5.71	4.90	4.22	3.65	4.24	0.71	0.88	3.23	7.44 @ 25F
1995	100.0	0.0	100.0	43.60	21.16	10.40	5.17	4.76	50.06	24.60	12.16	6.05	5.63	1.01	1.35	3.23	6.00 @ 50F
1995	50.0	0.0	50.0	17.94	9.29	5.02	2.86	3.06	21.58	11.49	6.40	3.76	3.93	0.77	1.01	3.23	4.84 @ 75F
1995	0.0	50.0	0.0	3.06	2.56	2.15	1.81	2.40	4.88	4.07	3.40	2.86	3.41	0.65	0.82	3.23	5.62 @100F
1995	50.0	50.0	50.0	23.57	12.12	6.55	3.77	3.87	27.88	14.75	8.19	4.85	4.94	0.86	1.11	3.23	
1995	20.6	27.3	20.6	9.11	5.29	3.30	2.22	2.65	11.66	7.07	4.60	3.20	3.60	0.70	0.90	3.23	
2000	0.0	0.0	0.0	1.94	1.58	1.29	1.05	1.15	3.62	2.91	2.35	1.89	2.07	0.62	0.85	3.07	8.82 @ 0F
2000	0.0	100.0	0.0	2.86	2.42	2.04	1.72	1.74	4.93	4.13	3.45	2.89	2.92	0.70	0.94	3.07	6.98 @ 25F
2000	100.0	0.0	100.0	32.50	16.16	8.12	4.13	4.05	39.83	19.65	9.71	4.81	4.72	0.99	1.42	3.07	5.51 @ 50F
2000	50.0	0.0	50.0	13.33	7.03	3.85	2.20	2.24	17.23	9.20	5.11	2.99	3.06	0.76	1.06	3.07	4.35 @ 75F
2000	0.0	50.0	0.0	2.28	1.89	1.57	1.30	1.37	4.11	3.37	2.76	2.26	2.39	0.64	0.87	3.07	4.89 @100F
2000	50.0	50.0	50.0	17.68	9.29	5.08	2.92	2.89	22.38	11.89	6.58	3.85	3.82	0.84	1.18	3.07	
2000	20.6	27.3	20.6	6.77	3.97	2.48	1.66	1.71	9.43	5.72	3.70	2.54	2.65	0.69	0.95	3.07	
2010	0.0	0.0	0.0	1.90	1.55	1.27	1.04	1.14	3.40	2.73	2.19	1.75	1.92	0.68	0.90	3.04	8.80 @ 0F
2010	0.0	100.0	0.0	2.63	2.23	1.89	1.60	1.62	4.60	3.84	3.20	2.67	2.70	0.76	1.02	3.04	6.90 @ 25F
2010	100.0	0.0	100.0	22.88	12.51	6.84	3.74	3.67	34.62	17.46	8.81	4.45	4.36	1.05	1.52	3.04	5.39 @ 50F
2010	50.0	0.0	50.0	9.86	5.71	3.38	2.06	2.10	15.15	8.27	4.68	2.77	2.84	0.82	1.14	3.04	4.20 @ 75F
2010	0.0	50.0	0.0	2.17	1.81	1.51	1.25	1.32	3.85	3.14	2.57	2.10	2.21	0.70	0.93	3.04	4.61 @100F
2010	50.0	50.0	50.0	12.75	7.37	4.37	2.67	2.64	19.61	10.65	6.01	3.56	3.53	0.91	1.27	3.04	
2010	20.6	27.3	20.6	5.29	3.39	2.26	1.57	1.63	8.43	5.21	3.41	2.35	2.45	0.75	1.01	3.04	

TABLE 1.3 : NMHC AT 10.0 MPH.

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TABLE 1.4

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	LDDV 0-100F	LDDT 0-100F	HDDV 0-100F	HDGV	
1980	0.0	0.0	0.0	4.45	4.02	3.67	3.37	4.20	5.77	5.24	4.79	4.40	5.43	0.55	0.87	4.92	15.52	@ 0F
1980	0.0	100.0	0.0	4.33	4.33	4.34	4.37	5.99	6.02	6.00	5.99	6.00	8.11	0.59	0.86	4.92	13.40	@ 25F
1980	100.0	0.0	100.0	37.13	21.25	12.18	6.99	5.19	50.18	28.68	16.42	9.41	6.96	0.93	1.43	4.92	11.58	@ 50F
1980	50.0	0.0	50.0	17.44	10.87	7.04	4.79	4.57	23.23	14.43	9.33	6.34	5.98	0.69	1.08	4.92	10.00	@ 75F
1980	0.0	50.0	0.0	4.38	4.12	3.91	3.74	4.88	5.81	5.49	5.22	4.99	6.42	0.55	0.85	4.92	11.36	@100F
1980	50.0	50.0	50.0	20.73	12.79	8.26	5.68	5.59	28.10	17.34	11.20	7.70	7.53	0.76	1.15	4.92		
1980	20.6	27.3	20.6	9.72	6.87	5.18	4.15	4.72	12.92	9.13	6.87	5.51	6.19	0.61	0.94	4.92		
1988	0.0	0.0	0.0	2.51	2.13	1.81	1.56	2.29	3.47	2.94	2.50	2.14	2.95	0.56	0.71	2.80	6.88	@ 0F
1988	0.0	100.0	0.0	2.56	2.41	2.30	2.20	3.25	3.93	3.63	3.38	3.17	4.41	0.64	0.82	2.80	5.85	@ 25F
1988	100.0	0.0	100.0	29.10	14.74	7.58	3.96	3.24	38.52	19.79	10.28	5.40	4.50	0.88	1.20	2.80	4.99	@ 50F
1988	50.0	0.0	50.0	12.57	6.91	4.00	2.46	2.63	16.83	9.36	5.46	3.37	3.52	0.68	0.90	2.80	4.26	@ 75F
1988	0.0	50.0	0.0	2.51	2.22	1.98	1.79	2.65	3.62	3.18	2.82	2.52	3.49	0.58	0.74	2.80	5.25	@100F
1988	50.0	50.0	50.0	15.83	8.57	4.94	3.08	3.25	21.23	11.71	6.83	4.28	4.45	0.76	1.01	2.80		
1988	20.6	27.3	20.6	6.61	4.13	2.80	2.05	2.62	9.00	5.69	3.88	2.85	3.47	0.62	0.80	2.80		
1990	0.0	0.0	0.0	2.12	1.77	1.49	1.26	1.87	3.02	2.52	2.12	1.79	2.41	0.54	0.64	2.51	5.59	@ 0F
1990	0.0	100.0	0.0	2.27	2.10	1.95	1.84	2.66	3.56	3.22	2.92	2.68	3.58	0.62	0.73	2.51	4.67	@ 25F
1990	100.0	0.0	100.0	27.05	13.43	6.78	3.47	2.95	34.04	17.17	8.75	4.51	3.88	0.85	1.08	2.51	3.90	@ 50F
1990	50.0	0.0	50.0	11.47	6.16	3.48	2.09	2.26	14.80	8.08	4.63	2.82	2.95	0.65	0.81	2.51	3.27	@ 75F
1990	0.0	50.0	0.0	2.16	1.88	1.66	1.47	2.16	3.21	2.77	2.41	2.12	2.85	0.56	0.67	2.51	4.01	@100F
1990	50.0	50.0	50.0	14.66	7.77	4.37	2.65	2.80	18.80	10.19	5.84	3.59	3.73	0.73	0.90	2.51		
1990	20.6	27.3	20.6	5.96	3.62	2.39	1.71	2.18	7.92	4.92	3.30	2.39	2.86	0.60	0.72	2.51		
1995	0.0	0.0	0.0	1.41	1.14	0.93	0.75	1.06	2.24	1.82	1.49	1.22	1.50	0.42	0.54	2.16	4.60	@ 0F
1995	0.0	100.0	0.0	1.78	1.55	1.35	1.19	1.52	2.89	2.48	2.14	1.85	2.17	0.48	0.59	2.16	3.71	@ 25F
1995	100.0	0.0	100.0	21.61	10.54	5.20	2.60	2.38	25.28	12.44	6.16	3.07	2.85	0.68	0.90	2.16	2.99	@ 50F
1995	50.0	0.0	50.0	8.93	4.64	2.52	1.44	1.55	10.91	5.82	3.25	1.91	2.00	0.51	0.68	2.16	2.42	@ 75F
1995	0.0	50.0	0.0	1.54	1.29	1.08	0.91	1.23	2.48	2.06	1.73	1.45	1.74	0.44	0.55	2.16	2.80	@100F
1995	50.0	50.0	50.0	11.70	6.04	3.28	1.89	1.95	14.08	7.46	4.15	2.46	2.51	0.58	0.75	2.16		
1995	20.6	27.3	20.6	4.55	2.65	1.66	1.12	1.35	5.90	3.58	2.33	1.63	1.84	0.47	0.60	2.16		
2000	0.0	0.0	0.0	0.97	0.79	0.64	0.52	0.57	1.81	1.46	1.18	0.95	1.03	0.42	0.57	2.05	4.40	@ 0F
2000	0.0	100.0	0.0	1.43	1.20	1.02	0.86	0.87	2.47	2.06	1.73	1.44	1.46	0.47	0.63	2.05	3.48	@ 25F
2000	100.0	0.0	100.0	16.09	8.02	4.05	2.06	2.02	19.93	9.83	4.86	2.41	2.36	0.66	0.95	2.05	2.75	@ 50F
2000	50.0	0.0	50.0	6.61	3.49	1.92	1.10	1.12	8.62	4.61	2.56	1.49	1.53	0.51	0.71	2.05	2.17	@ 75F
2000	0.0	50.0	0.0	1.14	0.94	0.78	0.65	0.68	2.06	1.69	1.38	1.13	1.19	0.43	0.58	2.05	2.44	@100F
2000	50.0	50.0	50.0	8.76	4.61	2.53	1.46	1.44	11.20	5.95	3.29	1.93	1.91	0.56	0.79	2.05		
2000	20.6	27.3	20.6	3.36	1.98	1.24	0.83	0.85	4.72	2.86	1.85	1.27	1.32	0.46	0.63	2.05		
2010	0.0	0.0	0.0	0.96	0.79	0.64	0.53	0.58	1.70	1.37	1.10	0.88	0.96	0.46	0.60	2.03	4.39	@ 0F
2010	0.0	100.0	0.0	1.33	1.13	0.96	0.81	0.82	2.30	1.92	1.60	1.34	1.35	0.51	0.68	2.03	3.44	@ 25F
2010	100.0	0.0	100.0	11.60	6.34	3.47	1.90	1.86	17.35	8.75	4.42	2.23	2.19	0.70	1.02	2.03	2.69	@ 50F
2010	50.0	0.0	50.0	5.00	2.89	1.72	1.05	1.06	7.59	4.15	2.35	1.39	1.42	0.55	0.76	2.03	2.10	@ 75F
2010	0.0	50.0	0.0	1.10	0.92	0.76	0.63	0.67	1.93	1.57	1.29	1.05	1.11	0.47	0.62	2.03	2.30	@100F
2010	50.0	50.0	50.0	6.47	3.74	2.21	1.35	1.34	9.83	5.34	3.01	1.78	1.77	0.61	0.85	2.03		
2010	20.6	27.3	20.6	2.68	1.72	1.15	0.80	0.82	4.23	2.61	1.71	1.18	1.23	0.50	0.68	2.03		

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TABLE 1.5

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	2.69	2.44	2.23	2.06	2.52	3.37	3.06	2.81	2.59	3.16	0.34	0.54	3.05	7.00 @ 0F
1980	0.0	100.0	0.0	2.63	2.63	2.64	2.65	3.57	3.51	3.49	3.49	3.48	4.67	0.36	0.53	3.05	6.05 @ 25F
1980	100.0	0.0	100.0	22.33	12.80	7.35	4.23	3.13	29.11	16.64	9.53	5.46	4.03	0.58	0.89	3.05	5.22 @ 50F
1980	50.0	0.0	50.0	10.52	6.57	4.27	2.91	2.75	13.53	8.41	5.44	3.70	3.47	0.43	0.67	3.05	4.51 @ 75F
1980	0.0	50.0	0.0	2.65	2.50	2.38	2.28	2.93	3.39	3.21	3.05	2.92	3.72	0.34	0.53	3.05	5.13 @100F
1980	50.0	50.0	50.0	12.48	7.72	4.99	3.44	3.35	16.31	10.07	6.51	4.47	4.35	0.47	0.71	3.05	
1980	20.6	27.3	20.6	5.87	4.16	3.15	2.53	2.83	7.53	5.32	4.01	3.22	3.59	0.38	0.59	3.05	
1988	0.0	0.0	0.0	1.43	1.21	1.04	0.89	1.30	1.94	1.65	1.40	1.20	1.65	0.35	0.44	1.74	3.10 @ 0F
1988	0.0	100.0	0.0	1.44	1.36	1.30	1.25	1.84	2.19	2.03	1.89	1.77	2.45	0.40	0.51	1.74	2.64 @ 25F
1988	100.0	0.0	100.0	16.24	8.26	4.27	2.23	1.83	21.46	11.03	5.73	3.01	2.51	0.55	0.75	1.74	2.25 @ 50F
1988	50.0	0.0	50.0	7.14	3.93	2.28	1.41	1.50	9.43	5.24	3.06	1.89	1.97	0.42	0.56	1.74	1.92 @ 75F
1988	0.0	50.0	0.0	1.43	1.26	1.13	1.02	1.50	2.03	1.78	1.58	1.41	1.95	0.36	0.46	1.74	2.37 @100F
1988	50.0	50.0	50.0	8.84	4.81	2.78	1.74	1.83	11.83	6.53	3.81	2.39	2.48	0.47	0.63	1.74	
1988	20.6	27.3	20.6	3.76	2.35	1.60	1.17	1.49	5.04	3.19	2.17	1.60	1.94	0.39	0.50	1.74	
1990	0.0	0.0	0.0	1.20	1.00	0.85	0.72	1.05	1.69	1.41	1.19	1.00	1.35	0.34	0.40	1.56	2.52 @ 0F
1990	0.0	100.0	0.0	1.27	1.17	1.09	1.03	1.49	1.98	1.79	1.63	1.49	1.99	0.38	0.45	1.56	2.10 @ 25F
1990	100.0	0.0	100.0	14.91	7.44	3.77	1.94	1.64	18.92	9.55	4.87	2.51	2.16	0.52	0.67	1.56	1.76 @ 50F
1990	50.0	0.0	50.0	6.45	3.47	1.96	1.18	1.27	8.29	4.53	2.60	1.58	1.65	0.41	0.50	1.56	1.48 @ 75F
1990	0.0	50.0	0.0	1.22	1.06	0.93	0.83	1.21	1.79	1.55	1.35	1.19	1.59	0.35	0.41	1.56	1.81 @100F
1990	50.0	50.0	50.0	8.09	4.30	2.43	1.48	1.56	10.45	5.67	3.25	2.00	2.08	0.45	0.56	1.56	
1990	20.6	27.3	20.6	3.35	2.04	1.35	0.97	1.23	4.44	2.76	1.85	1.34	1.60	0.37	0.45	1.56	
1995	0.0	0.0	0.0	0.79	0.64	0.52	0.42	0.59	1.25	1.02	0.83	0.68	0.84	0.26	0.33	1.34	2.08 @ 0F
1995	0.0	100.0	0.0	0.98	0.85	0.75	0.65	0.84	1.59	1.37	1.18	1.02	1.19	0.30	0.36	1.34	1.67 @ 25F
1995	100.0	0.0	100.0	11.80	5.77	2.85	1.43	1.31	13.94	6.86	3.40	1.69	1.57	0.42	0.56	1.34	1.35 @ 50F
1995	50.0	0.0	50.0	4.98	2.59	1.41	0.80	0.86	6.08	3.24	1.81	1.06	1.11	0.32	0.42	1.34	1.09 @ 75F
1995	0.0	50.0	0.0	0.86	0.72	0.61	0.51	0.68	1.38	1.15	0.96	0.81	0.97	0.27	0.34	1.34	1.27 @100F
1995	50.0	50.0	50.0	6.39	3.31	1.80	1.04	1.07	7.77	4.11	2.29	1.36	1.38	0.36	0.46	1.34	
1995	20.6	27.3	20.6	2.54	1.48	0.93	0.63	0.75	3.29	2.00	1.30	0.90	1.02	0.29	0.37	1.34	
2000	0.0	0.0	0.0	0.55	0.44	0.36	0.30	0.32	1.02	0.82	0.66	0.53	0.58	0.26	0.35	1.27	1.98 @ 0F
2000	0.0	100.0	0.0	0.79	0.66	0.56	0.47	0.48	1.36	1.14	0.95	0.80	0.81	0.29	0.39	1.27	1.57 @ 25F
2000	100.0	0.0	100.0	8.83	4.41	2.23	1.14	1.11	11.01	5.43	2.69	1.33	1.31	0.41	0.59	1.27	1.24 @ 50F
2000	50.0	0.0	50.0	3.70	1.96	1.07	0.62	0.63	4.83	2.58	1.43	0.84	0.86	0.31	0.44	1.27	0.98 @ 75F
2000	0.0	50.0	0.0	0.64	0.53	0.44	0.36	0.38	1.15	0.94	0.77	0.63	0.67	0.27	0.36	1.27	1.10 @100F
2000	50.0	50.0	50.0	4.81	2.54	1.40	0.81	0.80	6.19	3.29	1.82	1.06	1.06	0.35	0.49	1.27	
2000	20.6	27.3	20.6	1.88	1.11	0.69	0.46	0.48	2.64	1.60	1.04	0.71	0.74	0.29	0.39	1.27	
2010	0.0	0.0	0.0	0.54	0.44	0.36	0.30	0.32	0.96	0.77	0.62	0.50	0.54	0.28	0.37	1.26	1.98 @ 0F
2010	0.0	100.0	0.0	0.74	0.63	0.53	0.45	0.46	1.27	1.06	0.89	0.74	0.75	0.32	0.42	1.26	1.55 @ 25F
2010	100.0	0.0	100.0	6.47	3.54	1.93	1.06	1.04	9.60	4.84	2.44	1.23	1.21	0.43	0.63	1.26	1.21 @ 50F
2010	50.0	0.0	50.0	2.80	1.62	0.96	0.59	0.60	4.25	2.32	1.31	0.78	0.80	0.34	0.47	1.26	0.94 @ 75F
2010	0.0	50.0	0.0	0.62	0.51	0.43	0.36	0.37	1.08	0.88	0.72	0.59	0.62	0.29	0.39	1.26	1.04 @100F
2010	50.0	50.0	50.0	3.61	2.08	1.23	0.75	0.75	5.44	2.95	1.67	0.99	0.98	0.38	0.53	1.26	
2010	20.6	27.3	20.6	1.50	0.96	0.64	0.45	0.46	2.37	1.46	0.96	0.66	0.69	0.31	0.42	1.26	

TABLE 1.5 : NMHC AT 35.0 MPH.

TABLE 1.6

LOW ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	1.99	1.82	1.67	1.55	1.86	2.44	2.23	2.04	1.88	2.28	0.25	0.40	2.24	4.48 @ 0F
1980	0.0	100.0	0.0	1.96	1.96	1.96	1.97	2.62	2.53	2.52	2.51	2.51	3.33	0.27	0.39	2.24	3.87 @ 25F
1980	100.0	0.0	100.0	16.43	9.44	5.43	3.13	2.31	20.92	11.96	6.85	3.93	2.90	0.42	0.65	2.24	3.34 @ 50F
1980	50.0	0.0	50.0	7.77	4.87	3.17	2.17	2.03	9.76	6.07	3.93	2.68	2.50	0.31	0.49	2.24	2.89 @ 75F
1980	0.0	50.0	0.0	1.97	1.86	1.78	1.71	2.15	2.46	2.32	2.21	2.12	2.67	0.25	0.39	2.24	3.28 @100F
1980	50.0	50.0	50.0	9.20	5.70	3.70	2.55	2.47	11.73	7.24	4.68	3.22	3.11	0.35	0.52	2.24	
1980	20.6	27.3	20.6	4.34	3.09	2.34	1.89	2.09	5.44	3.85	2.91	2.33	2.58	0.28	0.43	2.24	
1988	0.0	0.0	0.0	0.97	0.82	0.71	0.61	0.88	1.30	1.10	0.94	0.81	1.10	0.26	0.32	1.28	1.99 @ 0F
1988	0.0	100.0	0.0	0.97	0.92	0.88	0.85	1.24	1.45	1.35	1.26	1.18	1.64	0.29	0.37	1.28	1.69 @ 25F
1988	100.0	0.0	100.0	10.81	5.53	2.87	1.51	1.23	14.12	7.28	3.80	2.00	1.66	0.40	0.55	1.28	1.44 @ 50F
1988	50.0	0.0	50.0	4.77	2.64	1.54	0.96	1.01	6.22	3.47	2.03	1.26	1.31	0.31	0.41	1.28	1.23 @ 75F
1988	0.0	50.0	0.0	0.96	0.86	0.77	0.70	1.02	1.35	1.19	1.05	0.94	1.30	0.27	0.34	1.28	1.52 @100F
1988	50.0	50.0	50.0	5.89	3.23	1.88	1.18	1.24	7.79	4.31	2.52	1.59	1.65	0.35	0.46	1.28	
1988	20.6	27.3	20.6	2.52	1.58	1.08	0.80	1.01	3.33	2.11	1.45	1.07	1.29	0.28	0.37	1.28	
1990	0.0	0.0	0.0	0.80	0.67	0.57	0.48	0.70	1.11	0.93	0.79	0.67	0.89	0.25	0.29	1.15	1.62 @ 0F
1990	0.0	100.0	0.0	0.83	0.77	0.73	0.69	0.99	1.30	1.17	1.07	0.98	1.32	0.28	0.33	1.15	1.35 @ 25F
1990	100.0	0.0	100.0	9.76	4.89	2.49	1.28	1.08	12.34	6.25	3.20	1.65	1.41	0.39	0.49	1.15	1.13 @ 50F
1990	50.0	0.0	50.0	4.23	2.29	1.30	0.79	0.84	5.42	2.97	1.71	1.04	1.09	0.30	0.37	1.15	0.94 @ 75F
1990	0.0	50.0	0.0	0.81	0.70	0.62	0.56	0.81	1.18	1.02	0.89	0.78	1.05	0.26	0.30	1.15	1.16 @100F
1990	50.0	50.0	50.0	5.30	2.83	1.60	0.98	1.04	6.82	3.71	2.13	1.32	1.36	0.33	0.41	1.15	
1990	20.6	27.3	20.6	2.20	1.35	0.90	0.65	0.82	2.90	1.81	1.22	0.88	1.06	0.27	0.33	1.15	
1995	0.0	0.0	0.0	0.51	0.41	0.33	0.27	0.38	0.80	0.65	0.53	0.44	0.54	0.19	0.25	0.98	1.33 @ 0F
1995	0.0	100.0	0.0	0.63	0.55	0.48	0.42	0.54	1.02	0.88	0.75	0.65	0.77	0.22	0.27	0.98	1.07 @ 25F
1995	100.0	0.0	100.0	7.54	3.69	1.82	0.91	0.84	8.91	4.39	2.18	1.08	1.01	0.31	0.41	0.98	0.87 @ 50F
1995	50.0	0.0	50.0	3.19	1.66	0.90	0.51	0.55	3.89	2.07	1.16	0.68	0.71	0.24	0.31	0.98	0.70 @ 75F
1995	0.0	50.0	0.0	0.55	0.46	0.39	0.33	0.44	0.88	0.74	0.62	0.52	0.62	0.20	0.25	0.98	0.81 @100F
1995	50.0	50.0	50.0	4.08	2.11	1.15	0.67	0.69	4.97	2.63	1.47	0.87	0.89	0.26	0.34	0.98	
1995	20.6	27.3	20.6	1.63	0.95	0.59	0.40	0.48	2.10	1.28	0.83	0.58	0.65	0.21	0.27	0.98	
2000	0.0	0.0	0.0	0.35	0.28	0.23	0.19	0.21	0.65	0.52	0.42	0.34	0.37	0.19	0.26	0.94	1.27 @ 0F
2000	0.0	100.0	0.0	0.50	0.42	0.36	0.30	0.30	0.87	0.73	0.61	0.51	0.51	0.21	0.29	0.94	1.01 @ 25F
2000	100.0	0.0	100.0	5.62	2.81	1.42	0.72	0.71	7.01	3.46	1.71	0.85	0.83	0.30	0.43	0.94	0.79 @ 50F
2000	50.0	0.0	50.0	2.35	1.24	0.68	0.39	0.40	3.07	1.64	0.91	0.53	0.55	0.23	0.32	0.94	0.63 @ 75F
2000	0.0	50.0	0.0	0.41	0.34	0.28	0.23	0.24	0.73	0.60	0.49	0.40	0.43	0.20	0.26	0.94	0.70 @100F
2000	50.0	50.0	50.0	3.06	1.61	0.89	0.51	0.51	3.94	2.09	1.16	0.68	0.67	0.26	0.36	0.94	
2000	20.6	27.3	20.6	1.20	0.70	0.44	0.30	0.31	1.68	1.02	0.66	0.45	0.47	0.21	0.29	0.94	
2010	0.0	0.0	0.0	0.34	0.28	0.23	0.19	0.21	0.61	0.49	0.39	0.31	0.35	0.21	0.27	0.93	1.27 @ 0F
2010	0.0	100.0	0.0	0.47	0.40	0.34	0.29	0.29	0.81	0.68	0.56	0.47	0.48	0.23	0.31	0.93	0.99 @ 25F
2010	100.0	0.0	100.0	4.12	2.25	1.23	0.67	0.66	6.11	3.08	1.56	0.79	0.77	0.32	0.46	0.93	0.78 @ 50F
2010	50.0	0.0	50.0	1.78	1.03	0.61	0.37	0.38	2.70	1.48	0.83	0.49	0.51	0.25	0.35	0.93	0.61 @ 75F
2010	0.0	50.0	0.0	0.39	0.33	0.27	0.23	0.24	0.69	0.56	0.46	0.38	0.39	0.21	0.28	0.93	0.66 @100F
2010	50.0	50.0	50.0	2.30	1.33	0.79	0.48	0.48	3.46	1.88	1.06	0.63	0.62	0.28	0.39	0.93	
2010	20.6	27.3	20.6	0.96	0.61	0.41	0.28	0.29	1.51	0.93	0.61	0.42	0.44	0.23	0.31	0.93	

TABLE 1.7

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	LDGV 25 F	LDGV 50 F	LDGV 75 F	LDGV 100 F	LDGT 0 F	LDGT 25 F	LDGT 50 F	LDGT 75 F	LDGT 100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	391.26	351.96	320.15	294.44	589.78	490.12	435.75	390.66	353.27	680.54	3.68	5.16	49.66	817.73 @ 0F
1980	0.0	100.0	0.0	287.99	297.88	309.34	322.55	600.39	353.96	365.48	378.21	392.31	749.13	6.28	8.92	49.66	744.13 @ 25F
1980	100.0	0.0	100.0	3214.46	1886.87	1115.05	661.74	410.37	4049.81	2368.66	1393.72	825.36	483.78	7.74	10.94	49.66	677.66 @ 50F
1980	50.0	0.0	50.0	1470.40	938.89	623.84	434.10	517.74	1848.85	1172.66	772.06	531.59	597.63	5.17	7.29	49.66	617.61 @ 75F
1980	0.0	50.0	0.0	349.92	329.63	314.52	303.81	590.73	433.61	405.16	382.77	365.52	699.14	4.63	6.53	49.66	1031.24 @100F
1980	50.0	50.0	50.0	1751.22	1092.37	712.20	492.15	505.38	2201.89	1367.07	885.96	608.84	616.46	7.01	9.93	49.66	
1980	20.6	27.3	20.6	809.19	579.33	440.97	356.44	560.73	1013.98	719.85	541.95	432.58	656.45	4.80	6.77	49.66	
1988	0.0	0.0	0.0	251.19	203.92	167.71	139.78	330.78	326.05	259.32	208.51	169.59	358.90	3.87	4.26	41.32	375.00 @ 0F
1988	0.0	100.0	0.0	198.77	183.00	171.73	164.17	306.71	299.99	267.08	241.63	222.12	390.52	6.39	7.57	41.32	338.29 @ 25F
1988	100.0	0.0	100.0	1997.29	1214.26	708.76	357.79	263.71	2199.08	1360.36	847.04	514.59	409.30	8.63	9.23	41.32	306.10 @ 50F
1988	50.0	0.0	50.0	920.13	592.24	375.85	222.86	304.66	1041.48	681.83	454.23	301.91	377.92	5.63	6.09	41.32	277.80 @ 75F
1988	0.0	50.0	0.0	230.25	195.18	168.60	148.52	319.81	314.58	261.11	220.22	188.86	368.22	4.78	5.47	41.32	460.21 @100F
1988	50.0	50.0	50.0	1098.03	698.63	440.24	260.98	285.21	1249.53	813.72	544.33	368.36	399.91	7.51	8.40	41.32	
1988	20.6	27.3	20.6	512.78	357.62	253.10	178.37	314.09	611.72	432.66	315.08	233.97	371.57	5.08	5.66	41.32	
1990	0.0	0.0	0.0	216.76	170.66	136.03	109.85	261.75	284.97	219.43	170.63	134.07	274.90	3.81	4.03	39.24	293.63 @ 0F
1990	0.0	100.0	0.0	175.89	156.68	142.26	131.73	237.55	258.99	224.75	197.98	177.12	301.13	6.26	7.13	39.24	262.25 @ 25F
1990	100.0	0.0	100.0	1545.75	954.62	564.09	284.38	226.42	1682.65	1057.92	665.76	402.28	334.40	8.49	8.70	39.24	234.86 @ 50F
1990	50.0	0.0	50.0	730.53	475.34	302.72	176.98	248.54	823.08	544.56	363.28	237.59	298.44	5.54	5.75	39.24	210.93 @ 75F
1990	0.0	50.0	0.0	200.33	164.74	137.96	117.83	251.31	273.52	220.53	180.50	150.13	283.33	4.70	5.16	39.24	347.46 @100F
1990	50.0	50.0	50.0	860.82	555.65	353.18	208.05	231.98	970.82	641.33	431.87	289.70	317.76	7.38	7.91	39.24	
1990	20.6	27.3	20.6	417.55	291.81	205.10	141.54	250.65	498.36	352.71	254.59	184.98	288.99	4.99	5.34	39.24	
1995	0.0	0.0	0.0	139.26	101.64	74.56	54.97	115.59	192.03	138.16	100.04	72.93	123.92	3.46	3.68	35.81	188.00 @ 0F
1995	0.0	100.0	0.0	123.03	102.02	85.37	72.12	112.94	167.29	137.91	114.70	96.33	143.48	5.50	6.46	35.81	165.17 @ 25F
1995	100.0	0.0	100.0	753.66	492.97	303.80	153.08	139.49	766.45	516.82	337.90	197.58	185.28	7.45	7.90	35.81	145.41 @ 50F
1995	50.0	0.0	50.0	385.49	260.15	167.82	94.30	126.74	423.37	292.58	197.27	122.73	149.48	4.93	5.24	35.81	128.29 @ 75F
1995	0.0	50.0	0.0	132.34	101.55	78.72	61.69	114.71	180.53	137.22	105.49	82.10	131.51	4.20	4.70	35.81	194.14 @100F
1995	50.0	50.0	50.0	438.35	297.50	194.59	112.60	126.21	466.87	327.37	226.30	146.96	164.38	6.47	7.18	35.81	
1995	20.6	27.3	20.6	236.12	166.38	114.93	74.67	119.67	280.33	200.77	142.74	98.23	138.46	4.46	4.86	35.81	
2000	0.0	0.0	0.0	85.02	58.66	40.48	27.94	30.80	134.08	91.30	62.22	42.44	47.45	3.45	3.74	34.74	146.57 @ 0F
2000	0.0	100.0	0.0	77.08	60.82	48.01	37.92	46.27	108.40	86.30	68.75	54.81	67.29	5.47	6.59	34.74	127.40 @ 25F
2000	100.0	0.0	100.0	323.26	241.84	160.41	78.98	83.75	349.11	265.32	181.53	97.74	104.12	7.48	8.05	34.74	110.89 @ 50F
2000	50.0	0.0	50.0	190.54	139.59	93.21	50.00	53.71	231.19	169.46	115.26	66.19	71.83	4.93	5.33	34.74	96.67 @ 75F
2000	0.0	50.0	0.0	80.96	59.19	43.48	32.09	37.34	121.85	88.53	64.75	47.68	56.03	4.18	4.78	34.74	132.65 @100F
2000	50.0	50.0	50.0	200.17	151.33	104.21	58.45	65.01	228.76	175.81	125.14	76.27	85.71	6.47	7.32	34.74	
2000	20.6	27.3	20.6	126.07	92.12	63.72	39.23	43.73	167.25	121.84	85.34	55.01	62.09	4.45	4.95	34.74	
2010	0.0	0.0	0.0	62.48	43.04	29.65	20.43	21.83	113.46	76.16	51.13	34.32	36.68	3.55	3.84	34.42	132.71 @ 0F
2010	0.0	100.0	0.0	45.93	36.61	29.18	23.25	28.16	79.40	63.28	50.43	40.19	48.68	5.69	6.79	34.42	114.17 @ 25F
2010	100.0	0.0	100.0	226.85	168.07	109.29	50.51	53.34	297.63	219.82	142.00	64.19	67.79	7.87	8.29	34.42	98.22 @ 50F
2010	50.0	0.0	50.0	139.49	101.62	66.96	34.52	36.59	198.65	142.62	93.17	48.14	51.06	5.14	5.48	34.42	84.50 @ 75F
2010	0.0	50.0	0.0	54.72	40.02	29.43	21.75	24.79	97.69	70.19	50.80	37.03	42.23	4.32	4.92	34.42	109.47 @100F
2010	50.0	50.0	50.0	136.39	102.34	69.23	36.88	40.75	188.52	141.55	96.22	52.19	58.23	6.78	7.54	34.42	
2010	20.6	27.3	20.6	89.89	65.46	44.86	26.94	29.51	139.85	100.20	68.21	41.47	45.60	4.61	5.09	34.42	

TABLE 1.8

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	217.62	196.84	180.02	166.45	325.14	275.13	245.32	220.62	200.14	380.54	3.00	4.21	40.54	653.38 @ 0F
1980	0.0	100.0	0.0	161.77	167.59	174.28	181.96	335.43	199.66	206.27	213.57	221.62	420.51	5.13	7.28	40.54	594.57 @ 25F
1980	100.0	0.0	100.0	1768.15	1042.98	619.60	369.88	229.23	2255.98	1322.94	780.61	463.69	271.65	6.31	8.94	40.54	541.46 @ 50F
1980	50.0	0.0	50.0	811.49	521.05	348.31	243.95	286.46	1032.31	656.76	433.86	299.84	334.55	4.22	5.95	40.54	493.48 @ 75F
1980	0.0	50.0	0.0	195.20	184.72	176.99	171.62	327.33	243.77	228.31	216.18	206.87	391.56	3.78	5.33	40.54	823.98 @100F
1980	50.0	50.0	50.0	964.96	605.29	396.94	275.92	282.33	1227.82	764.60	497.09	342.66	346.08	5.72	8.11	40.54	
1980	20.6	27.3	20.6	447.81	322.56	247.03	200.84	310.45	567.15	403.99	305.20	244.42	367.56	3.92	5.52	40.54	
1988	0.0	0.0	0.0	132.46	107.95	89.15	74.63	174.75	172.49	137.68	111.14	90.78	191.08	3.16	3.48	33.73	299.63 @ 0F
1988	0.0	100.0	0.0	104.16	96.28	90.74	87.13	162.96	156.77	140.09	127.24	117.44	207.04	5.21	6.18	33.73	270.30 @ 25F
1988	100.0	0.0	100.0	1053.44	640.51	374.11	189.50	138.74	1165.57	720.48	447.77	271.08	213.81	7.04	7.53	33.73	244.58 @ 50F
1988	50.0	0.0	50.0	485.81	312.93	198.91	118.43	160.63	552.52	361.70	240.86	159.97	199.49	4.59	4.97	33.73	221.97 @ 75F
1988	0.0	50.0	0.0	121.11	103.06	89.39	79.08	169.21	165.59	137.92	116.75	100.52	195.60	3.90	4.47	33.73	367.71 @100F
1988	50.0	50.0	50.0	578.80	368.40	232.42	138.31	150.85	661.17	430.28	287.50	194.26	210.42	6.13	6.85	33.73	
1988	20.6	27.3	20.6	270.49	188.94	134.06	94.89	165.94	323.81	229.21	167.10	124.26	196.88	4.15	4.62	33.73	
1990	0.0	0.0	0.0	113.79	89.79	71.76	58.13	137.38	151.24	116.59	90.81	71.49	145.81	3.11	3.29	32.03	234.62 @ 0F
1990	0.0	100.0	0.0	91.78	81.95	74.62	69.31	125.03	135.66	117.96	104.14	93.39	159.06	5.11	5.82	32.03	209.54 @ 25F
1990	100.0	0.0	100.0	812.94	502.65	297.11	149.56	118.87	893.16	561.60	352.58	211.49	174.87	6.93	7.10	32.03	187.66 @ 50F
1990	50.0	0.0	50.0	384.84	250.73	159.77	93.35	130.41	437.73	289.66	192.93	125.59	157.27	4.52	4.69	32.03	168.54 @ 75F
1990	0.0	50.0	0.0	104.90	86.46	72.60	62.20	131.96	144.39	116.57	95.56	79.64	149.96	3.84	4.21	32.03	277.62 @100F
1990	50.0	50.0	50.0	452.36	292.30	185.86	109.43	121.95	514.41	339.78	228.36	152.44	166.96	6.02	6.46	32.03	
1990	20.6	27.3	20.6	219.62	153.68	108.14	74.69	131.57	264.45	187.22	135.06	97.96	152.69	4.08	4.36	32.03	
1995	0.0	0.0	0.0	74.37	54.13	39.60	29.12	60.12	105.60	75.74	54.68	39.75	66.55	2.83	3.01	29.23	150.21 @ 0F
1995	0.0	100.0	0.0	65.43	54.16	45.23	38.12	59.18	90.56	74.60	61.98	51.99	76.98	4.49	5.27	29.23	131.98 @ 25F
1995	100.0	0.0	100.0	401.95	264.30	162.94	81.10	74.39	416.77	281.88	183.72	105.63	99.28	6.08	6.45	29.23	116.19 @ 50F
1995	50.0	0.0	50.0	206.76	140.00	90.21	50.10	66.75	231.83	160.42	107.79	66.19	80.26	4.02	4.27	29.23	102.51 @ 75F
1995	0.0	50.0	0.0	70.52	54.00	41.77	32.67	59.84	98.63	74.80	57.38	44.57	70.62	3.43	3.83	29.23	155.12 @100F
1995	50.0	50.0	50.0	233.69	159.23	104.09	59.61	66.78	253.67	178.24	122.85	78.81	88.13	5.28	5.86	29.23	
1995	20.6	27.3	20.6	126.40	89.17	61.47	39.61	62.68	153.41	109.85	77.86	53.16	74.35	3.64	3.97	29.23	
2000	0.0	0.0	0.0	49.10	33.87	23.36	16.11	17.70	78.23	53.18	36.17	24.62	27.38	2.81	3.05	28.36	117.11 @ 0F
2000	0.0	100.0	0.0	43.73	34.54	27.29	21.57	26.31	62.21	49.53	39.46	31.46	38.56	4.46	5.38	28.36	101.79 @ 25F
2000	100.0	0.0	100.0	188.96	141.03	93.10	45.18	47.88	205.29	155.37	105.44	55.52	59.09	6.10	6.57	28.36	88.60 @ 50F
2000	50.0	0.0	50.0	111.51	81.57	54.27	28.78	30.87	135.79	99.24	67.12	37.99	41.11	4.03	4.35	28.36	77.24 @ 75F
2000	0.0	50.0	0.0	46.41	33.94	24.93	18.41	21.37	70.64	51.26	37.45	27.54	32.24	3.41	3.90	28.36	105.99 @100F
2000	50.0	50.0	50.0	116.34	87.78	60.20	33.38	37.09	133.75	102.45	72.45	43.49	48.83	5.28	5.98	28.36	
2000	20.6	27.3	20.6	73.23	53.46	36.88	22.55	25.09	97.71	71.03	49.55	31.68	35.65	3.63	4.04	28.36	
2010	0.0	0.0	0.0	39.37	27.12	18.69	12.87	13.76	69.03	46.34	31.11	20.88	22.32	2.89	3.13	28.10	106.04 @ 0F
2010	0.0	100.0	0.0	28.95	23.07	18.39	14.65	17.75	48.31	38.50	30.68	24.45	29.62	4.65	5.55	28.10	91.23 @ 25F
2010	100.0	0.0	100.0	142.99	105.93	68.88	31.83	33.62	181.10	133.75	86.40	39.05	41.24	6.42	6.77	28.10	78.48 @ 50F
2010	50.0	0.0	50.0	87.92	64.05	42.20	21.76	23.06	120.87	86.77	56.69	29.29	31.07	4.19	4.47	28.10	67.52 @ 75F
2010	0.0	50.0	0.0	34.48	25.22	18.54	13.71	15.63	59.43	42.71	30.91	22.53	25.69	3.53	4.02	28.10	87.47 @100F
2010	50.0	50.0	50.0	85.97	64.50	43.63	23.24	25.68	114.70	86.12	58.54	31.75	35.43	5.53	6.16	28.10	
2010	20.6	27.3	20.6	56.65	41.26	28.27	16.98	18.60	85.09	60.96	41.50	25.23	27.74	3.77	4.15	28.10	

TABLE 1.9

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	107.60	97.34	89.06	82.40	160.66	134.61	119.98	107.89	97.90	187.21	2.07	2.90	27.95	434.70 @ 0F
1980	0.0	100.0	0.0	80.44	83.21	86.39	90.04	165.13	97.95	101.05	104.48	108.27	204.67	3.54	5.02	27.95	395.57 @ 25F
1980	100.0	0.0	100.0	869.84	513.42	305.28	182.44	113.24	1100.13	644.86	380.50	226.11	132.97	4.35	6.16	27.95	360.24 @ 50F
1980	50.0	0.0	50.0	399.88	256.96	171.93	120.55	141.48	504.15	320.63	211.82	146.45	164.21	2.91	4.10	27.95	328.32 @ 75F
1980	0.0	50.0	0.0	96.65	91.45	87.61	84.93	161.47	119.29	111.68	105.70	101.12	191.70	2.61	3.68	27.95	548.20 @100F
1980	50.0	50.0	50.0	475.14	298.31	195.84	136.24	139.19	599.04	372.96	242.49	167.19	168.82	3.95	5.59	27.95	
1980	20.6	27.3	20.6	220.95	159.28	122.08	99.32	153.22	277.13	197.36	149.10	119.43	180.16	2.70	3.81	27.95	
1988	0.0	0.0	0.0	66.13	53.64	44.09	36.74	86.32	86.68	68.90	55.38	45.05	94.88	2.18	2.40	23.26	199.35 @ 0F
1988	0.0	100.0	0.0	52.38	48.15	45.13	43.11	80.24	79.42	70.65	63.86	58.66	102.67	3.59	4.26	23.26	179.83 @ 25F
1988	100.0	0.0	100.0	527.32	321.66	187.87	94.14	69.65	583.11	362.13	225.60	136.05	108.60	4.86	5.19	23.26	162.72 @ 50F
1988	50.0	0.0	50.0	243.65	157.19	99.69	58.68	79.78	277.32	182.05	121.23	80.06	100.02	3.17	3.43	23.26	147.68 @ 75F
1988	0.0	50.0	0.0	60.59	51.33	44.31	39.02	83.47	83.44	69.22	58.35	50.03	97.05	2.69	3.08	23.26	244.64 @100F
1988	50.0	50.0	50.0	289.85	184.91	116.50	68.62	74.95	331.26	216.39	144.73	97.35	105.63	4.23	4.73	23.26	
1988	20.6	27.3	20.6	135.57	94.64	66.90	46.92	82.08	162.72	115.24	83.85	62.02	98.11	2.86	3.18	23.26	
1990	0.0	0.0	0.0	58.04	45.55	36.20	29.15	68.49	78.47	60.06	46.44	36.30	73.29	2.15	2.27	22.09	156.09 @ 0F
1990	0.0	100.0	0.0	47.27	41.96	37.96	35.03	62.61	70.53	60.98	53.50	47.67	80.21	3.52	4.01	22.09	139.41 @ 25F
1990	100.0	0.0	100.0	416.51	258.98	153.17	75.95	61.04	456.40	289.08	181.84	107.86	90.42	4.78	4.90	22.09	124.85 @ 50F
1990	50.0	0.0	50.0	197.88	129.33	82.21	47.28	65.77	225.36	149.77	99.63	64.08	80.10	3.12	3.24	22.09	112.13 @ 75F
1990	0.0	50.0	0.0	53.68	44.01	36.76	31.31	65.91	74.93	60.12	48.98	40.56	75.49	2.65	2.90	22.09	184.71 @100F
1990	50.0	50.0	50.0	231.09	150.47	95.56	55.49	61.83	263.47	175.03	117.67	77.76	85.31	4.15	4.45	22.09	
1990	20.6	27.3	20.6	112.77	78.93	55.29	37.71	65.97	136.51	96.72	69.53	49.93	77.24	2.81	3.01	22.09	
1995	0.0	0.0	0.0	41.43	29.98	21.80	15.93	31.52	60.96	43.35	31.01	22.33	35.90	1.95	2.07	20.15	99.94 @ 0F
1995	0.0	100.0	0.0	36.38	29.99	24.92	20.89	31.78	51.46	42.19	34.86	29.05	42.09	3.09	3.64	20.15	87.80 @ 25F
1995	100.0	0.0	100.0	223.15	148.38	91.66	44.65	41.57	233.37	159.56	103.87	58.08	55.34	4.19	4.45	20.15	77.30 @ 50F
1995	50.0	0.0	50.0	115.94	79.07	50.88	27.67	36.15	131.90	91.75	61.39	36.82	44.12	2.77	2.95	20.15	68.20 @ 75F
1995	0.0	50.0	0.0	39.23	29.91	23.02	17.91	31.71	56.55	42.60	32.44	25.00	38.37	2.36	2.64	20.15	103.21 @100F
1995	50.0	50.0	50.0	129.76	89.18	58.29	32.77	36.67	142.41	100.88	69.36	43.56	48.72	3.64	4.04	20.15	
1995	20.6	27.3	20.6	70.71	50.02	34.36	21.80	33.52	87.57	62.74	44.21	29.70	40.60	2.51	2.74	20.15	
2000	0.0	0.0	0.0	31.14	21.46	14.80	10.20	11.15	50.31	34.11	23.15	15.72	17.34	1.94	2.10	19.56	77.91 @ 0F
2000	0.0	100.0	0.0	27.05	21.40	16.93	13.40	16.32	39.12	31.15	24.82	19.78	24.20	3.08	3.71	19.56	67.73 @ 25F
2000	100.0	0.0	100.0	121.80	90.63	59.45	28.27	29.95	133.37	100.39	67.40	34.42	36.58	4.21	4.53	19.56	58.95 @ 50F
2000	50.0	0.0	50.0	72.00	52.57	34.80	18.18	19.45	88.09	64.13	43.04	23.88	25.75	2.78	3.00	19.56	51.39 @ 75F
2000	0.0	50.0	0.0	29.15	21.31	15.66	11.56	13.39	45.04	32.63	23.79	17.47	20.35	2.35	2.69	19.56	70.52 @100F
2000	50.0	50.0	50.0	74.43	56.01	38.19	20.84	23.13	86.24	65.77	46.11	27.10	30.39	3.64	4.12	19.56	
2000	20.6	27.3	20.6	46.82	34.14	23.47	14.21	15.77	62.94	45.62	31.66	20.01	22.42	2.50	2.78	19.56	
2010	0.0	0.0	0.0	27.82	19.16	13.20	9.10	9.72	46.82	31.43	21.10	14.16	15.13	1.99	2.16	19.38	70.55 @ 0F
2010	0.0	100.0	0.0	20.46	16.30	12.99	10.35	12.54	32.76	26.11	20.81	16.58	20.09	3.20	3.82	19.38	60.69 @ 25F
2010	100.0	0.0	100.0	101.05	74.87	48.68	22.49	23.75	122.83	90.71	58.60	26.49	27.97	4.43	4.67	19.38	52.21 @ 50F
2010	50.0	0.0	50.0	62.13	45.26	29.82	15.37	16.29	81.98	58.85	38.45	19.86	21.07	2.89	3.09	19.38	44.92 @ 75F
2010	0.0	50.0	0.0	24.37	17.82	13.10	9.68	11.04	40.31	28.96	20.96	15.28	17.42	2.43	2.77	19.38	58.19 @100F
2010	50.0	50.0	50.0	60.75	45.58	30.84	16.42	18.15	77.79	58.41	39.70	21.54	24.03	3.81	4.25	19.38	
2010	20.6	27.3	20.6	40.04	29.15	19.98	11.99	13.14	57.71	41.35	28.15	17.11	18.82	2.60	2.86	19.38	

TABLE 1.9 : CO AT 10.0 MPH.

TABLE 1.10

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	LDDV 0-100F	LDDT 0-100F	HDDV 0-100F	HDGV
1980	0.0	0.0	0.0	56.93	51.52	47.18	43.69	85.16	71.95	63.97	57.40	51.99	101.27	1.15	1.61	15.55	231.93 @ 0F
1980	0.0	100.0	0.0	42.74	44.14	45.76	47.62	86.74	52.09	53.62	55.32	57.20	107.86	1.97	2.79	15.55	211.05 @ 25F
1980	100.0	0.0	100.0	454.86	268.80	160.09	95.86	59.73	582.59	340.92	200.92	119.32	70.71	2.42	3.43	15.55	192.20 @ 50F
1980	50.0	0.0	50.0	209.89	135.06	90.54	63.62	74.77	267.91	170.09	112.22	77.51	88.18	1.62	2.28	15.55	175.17 @ 75F
1980	0.0	50.0	0.0	51.15	48.40	46.38	44.97	85.20	63.57	59.37	56.08	53.55	102.46	1.45	2.05	15.55	292.49 @100F
1980	50.0	50.0	50.0	248.80	156.47	102.93	71.74	73.24	317.34	197.27	128.12	88.26	89.28	2.20	3.11	15.55	
1980	20.6	27.3	20.6	116.23	83.92	64.43	52.51	80.91	147.40	104.78	79.04	63.24	96.52	1.50	2.12	15.55	
1988	0.0	0.0	0.0	35.08	28.32	23.16	19.21	45.36	46.83	37.06	29.66	24.02	50.94	1.21	1.33	12.94	106.36 @ 0F
1988	0.0	100.0	0.0	27.88	25.50	23.77	22.58	41.81	42.80	37.93	34.14	31.23	54.35	2.00	2.37	12.94	95.95 @ 25F
1988	100.0	0.0	100.0	280.08	171.53	100.16	49.48	37.08	313.02	195.28	121.74	72.76	58.75	2.70	2.89	12.94	86.82 @ 50F
1988	50.0	0.0	50.0	129.95	84.00	53.13	30.82	42.07	149.71	98.52	65.50	42.85	53.83	1.76	1.91	12.94	78.79 @ 75F
1988	0.0	50.0	0.0	32.15	27.10	23.29	20.41	43.67	44.99	37.18	31.21	26.65	51.74	1.50	1.71	12.94	130.53 @100F
1988	50.0	50.0	50.0	153.98	98.51	61.96	36.03	39.45	177.91	116.60	77.94	52.00	56.55	2.35	2.63	12.94	
1988	20.6	27.3	20.6	72.22	50.39	35.46	24.59	43.09	87.83	62.21	45.13	33.13	52.53	1.59	1.77	12.94	
1990	0.0	0.0	0.0	31.71	24.73	19.54	15.64	36.40	44.26	33.58	25.75	19.95	39.86	1.19	1.26	12.29	83.28 @ 0F
1990	0.0	100.0	0.0	26.02	22.95	20.62	18.90	33.38	39.44	33.89	29.54	26.14	43.37	1.96	2.23	12.29	74.38 @ 25F
1990	100.0	0.0	100.0	229.02	143.47	84.89	41.19	33.57	252.31	161.18	101.39	58.92	50.14	2.66	2.72	12.29	66.61 @ 50F
1990	50.0	0.0	50.0	109.47	71.86	45.53	25.62	35.41	126.00	84.14	55.79	35.18	43.96	1.73	1.80	12.29	59.83 @ 75F
1990	0.0	50.0	0.0	29.38	23.96	19.89	16.84	35.04	42.07	33.51	27.10	22.28	40.94	1.47	1.62	12.29	98.55 @100F
1990	50.0	50.0	50.0	127.52	83.21	52.75	30.04	33.48	145.87	97.54	65.46	42.53	46.76	2.31	2.48	12.29	
1990	20.6	27.3	20.6	62.21	43.56	30.35	20.36	35.26	76.46	54.20	38.75	27.42	42.10	1.56	1.67	12.29	
1995	0.0	0.0	0.0	25.50	18.31	13.21	9.58	17.88	39.54	27.85	19.72	14.05	21.53	1.08	1.15	11.22	53.32 @ 0F
1995	0.0	100.0	0.0	22.25	18.25	15.07	12.55	18.58	32.54	26.55	21.81	18.04	25.51	1.72	2.02	11.22	46.85 @ 25F
1995	100.0	0.0	100.0	136.80	92.26	57.10	26.99	25.60	146.28	101.18	65.62	35.27	34.11	2.33	2.48	11.22	41.24 @ 50F
1995	50.0	0.0	50.0	72.06	49.59	31.84	16.82	21.42	84.27	58.93	39.18	22.77	26.91	1.54	1.64	11.22	36.39 @ 75F
1995	0.0	50.0	0.0	24.06	18.24	13.95	10.79	18.22	36.29	27.13	20.49	15.66	23.15	1.31	1.47	11.22	55.06 @100F
1995	50.0	50.0	50.0	79.52	55.25	36.09	19.77	22.09	89.41	63.86	43.71	26.66	29.81	2.03	2.25	11.22	
1995	20.6	27.3	20.6	43.77	31.07	21.24	13.20	19.51	56.08	40.18	28.10	18.49	24.61	1.40	1.52	11.22	
2000	0.0	0.0	0.0	22.35	15.39	10.60	7.30	7.94	36.63	24.78	16.77	11.35	12.42	1.08	1.17	10.88	41.57 @ 0F
2000	0.0	100.0	0.0	18.88	14.96	11.86	9.40	11.44	27.80	22.15	17.64	14.06	17.16	1.71	2.06	10.88	36.13 @ 25F
2000	100.0	0.0	100.0	88.91	65.94	42.97	19.99	21.16	98.15	73.46	48.77	24.08	25.55	2.34	2.52	10.88	31.45 @ 50F
2000	50.0	0.0	50.0	52.65	38.36	25.26	12.98	13.86	64.72	46.94	31.25	16.97	18.23	1.55	1.67	10.88	27.42 @ 75F
2000	0.0	50.0	0.0	20.69	15.13	11.12	8.21	9.48	32.50	23.50	17.10	12.54	14.53	1.31	1.50	10.88	37.62 @100F
2000	50.0	50.0	50.0	53.90	40.45	27.41	14.70	16.30	62.98	47.80	33.21	19.07	21.35	2.03	2.29	10.88	
2000	20.6	27.3	20.6	33.88	24.67	16.90	10.13	11.20	45.91	33.17	22.89	14.30	15.95	1.39	1.55	10.88	
2010	0.0	0.0	0.0	22.16	15.27	10.52	7.25	7.74	35.94	24.12	16.19	10.87	11.62	1.11	1.20	10.78	37.64 @ 0F
2010	0.0	100.0	0.0	16.29	12.99	10.35	8.25	9.99	25.15	20.04	15.97	12.73	15.42	1.78	2.13	10.78	32.38 @ 25F
2010	100.0	0.0	100.0	80.52	59.65	38.79	17.92	18.92	94.29	69.63	44.98	20.33	21.47	2.46	2.60	10.78	27.86 @ 50F
2010	50.0	0.0	50.0	49.50	36.06	23.76	12.25	12.98	62.93	45.18	29.51	15.24	16.17	1.61	1.72	10.78	23.97 @ 75F
2010	0.0	50.0	0.0	19.41	14.20	10.44	7.72	8.80	30.94	22.23	16.09	11.73	13.37	1.35	1.54	10.78	31.05 @100F
2010	50.0	50.0	50.0	48.40	36.32	24.57	13.08	14.46	59.72	44.84	30.48	16.53	18.44	2.12	2.36	10.78	
2010	20.6	27.3	20.6	31.90	23.23	15.91	9.56	10.47	44.30	31.74	21.60	13.13	14.44	1.44	1.59	10.78	

TABLE 1.11

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	LDGV 25 F	LDGV 50 F	LDGV 75 F	LDGV 100 F	LDGT 0 F	LDGT 25 F	LDGT 50 F	LDGT 75 F	LDGT 100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	32.62	29.65	27.27	25.38	48.54	40.20	35.87	32.32	29.42	56.60	0.64	0.89	8.62	129.30 @ 0F
1980	0.0	100.0	0.0	24.75	25.55	26.46	27.51	49.38	29.40	30.25	31.19	32.23	60.04	1.09	1.55	8.62	117.66 @ 25F
1980	100.0	0.0	100.0	255.70	151.83	90.92	54.77	34.20	321.45	188.71	111.65	66.61	39.63	1.34	1.90	8.62	107.15 @ 50F
1980	50.0	0.0	50.0	119.12	77.02	51.91	36.70	42.63	148.84	94.82	62.82	43.61	49.31	0.90	1.27	8.62	97.66 @ 75F
1980	0.0	50.0	0.0	29.39	27.90	26.82	26.08	48.54	35.62	33.37	31.61	30.27	57.19	0.80	1.13	8.62	163.06 @100F
1980	50.0	50.0	50.0	140.22	88.69	58.69	41.14	41.79	175.42	109.48	71.42	49.42	49.84	1.22	1.73	8.62	
1980	20.6	27.3	20.6	66.18	48.04	37.08	30.37	46.11	82.08	58.58	44.38	35.67	53.92	0.83	1.17	8.62	
1988	0.0	0.0	0.0	19.35	15.61	12.77	10.58	25.18	25.71	20.36	16.31	13.22	28.21	0.67	0.74	7.17	59.30 @ 0F
1988	0.0	100.0	0.0	15.76	14.33	13.29	12.56	23.10	24.38	21.50	19.27	17.54	30.20	1.11	1.31	7.17	53.49 @ 25F
1988	100.0	0.0	100.0	157.35	96.84	56.60	27.64	20.95	175.20	110.08	68.91	41.05	33.56	1.50	1.60	7.17	48.40 @ 50F
1988	50.0	0.0	50.0	72.06	46.58	29.44	17.03	23.30	82.96	54.63	36.34	23.77	29.86	0.98	1.06	7.17	43.93 @ 75F
1988	0.0	50.0	0.0	17.83	15.01	12.87	11.26	24.14	24.99	20.63	17.31	14.77	28.62	0.83	0.95	7.17	72.77 @100F
1988	50.0	50.0	50.0	86.55	55.59	34.95	20.10	22.02	99.79	65.79	44.09	29.30	31.88	1.30	1.46	7.17	
1988	20.6	27.3	20.6	40.03	27.92	19.62	13.58	23.84	48.67	34.48	25.02	18.36	29.09	0.88	0.98	7.17	
1990	0.0	0.0	0.0	17.36	13.55	10.71	8.58	20.18	23.87	18.14	13.93	10.81	21.88	0.66	0.70	6.81	46.43 @ 0F
1990	0.0	100.0	0.0	15.04	13.18	11.76	10.71	18.69	23.03	19.68	17.05	14.98	24.48	1.09	1.24	6.81	41.47 @ 25F
1990	100.0	0.0	100.0	131.37	82.89	49.11	23.45	19.38	144.29	93.02	58.69	33.72	29.13	1.48	1.51	6.81	37.14 @ 50F
1990	50.0	0.0	50.0	60.90	39.98	25.31	14.20	19.66	69.89	46.70	30.96	19.49	24.38	0.96	1.00	6.81	33.35 @ 75F
1990	0.0	50.0	0.0	16.35	13.31	11.04	9.33	19.41	23.40	18.61	15.02	12.33	22.63	0.82	0.90	6.81	54.94 @100F
1990	50.0	50.0	50.0	73.20	48.03	30.44	17.08	19.03	83.66	56.35	37.87	24.35	26.80	1.28	1.37	6.81	
1990	20.6	27.3	20.6	34.57	24.20	16.84	11.28	19.54	42.38	30.04	21.46	15.17	23.29	0.87	0.93	6.81	
1995	0.0	0.0	0.0	13.43	9.68	7.01	5.10	9.76	20.40	14.41	10.24	7.32	11.46	0.60	0.64	6.22	29.73 @ 0F
1995	0.0	100.0	0.0	13.77	11.25	9.25	7.66	11.14	20.45	16.63	13.60	11.19	15.54	0.95	1.12	6.22	26.12 @ 25F
1995	100.0	0.0	100.0	84.33	57.39	35.59	16.55	15.90	90.65	63.26	41.03	21.62	21.15	1.29	1.37	6.22	22.99 @ 50F
1995	50.0	0.0	50.0	40.48	27.86	17.88	9.45	12.02	47.21	33.02	21.95	12.75	15.05	0.86	0.91	6.22	20.29 @ 75F
1995	0.0	50.0	0.0	13.51	10.24	7.83	6.05	10.21	20.35	15.21	11.48	8.77	12.93	0.73	0.81	6.22	30.70 @100F
1995	50.0	50.0	50.0	49.05	34.32	22.42	12.11	13.52	55.55	39.94	27.31	16.41	18.35	1.12	1.25	6.22	
1995	20.6	27.3	20.6	24.50	17.40	11.89	7.39	10.92	31.31	22.43	15.69	10.31	13.71	0.77	0.84	6.22	
2000	0.0	0.0	0.0	11.16	7.69	5.30	3.65	3.97	18.21	12.33	8.35	5.66	6.21	0.60	0.65	6.03	23.18 @ 0F
2000	0.0	100.0	0.0	12.47	9.89	7.84	6.22	7.56	18.50	14.73	11.74	9.36	11.41	0.95	1.14	6.03	20.15 @ 25F
2000	100.0	0.0	100.0	59.78	44.28	28.78	13.27	14.05	66.20	49.44	32.68	15.92	16.88	1.30	1.40	6.03	17.54 @ 50F
2000	50.0	0.0	50.0	29.67	21.62	14.23	7.31	7.81	36.48	26.45	17.61	9.56	10.27	0.86	0.93	6.03	15.29 @ 75F
2000	0.0	50.0	0.0	11.65	8.52	6.26	4.63	5.34	18.31	13.24	9.64	7.06	8.18	0.73	0.83	6.03	20.98 @100F
2000	50.0	50.0	50.0	36.13	27.08	18.31	9.75	10.81	42.35	32.09	22.21	12.64	14.14	1.12	1.27	6.03	
2000	20.6	27.3	20.6	18.97	13.82	9.46	5.67	6.27	25.71	18.58	12.82	8.01	8.93	0.77	0.86	6.03	
2010	0.0	0.0	0.0	10.74	7.40	5.10	3.51	3.75	17.59	11.81	7.93	5.32	5.69	0.62	0.67	5.98	20.99 @ 0F
2010	0.0	100.0	0.0	11.31	9.02	7.19	5.73	6.94	17.23	13.73	10.94	8.72	10.56	0.99	1.18	5.98	18.05 @ 25F
2010	100.0	0.0	100.0	55.90	41.41	26.93	12.44	13.14	64.61	47.71	30.82	13.93	14.71	1.37	1.44	5.98	15.53 @ 50F
2010	50.0	0.0	50.0	27.93	20.35	13.41	6.91	7.32	35.49	25.48	16.64	8.60	9.12	0.89	0.95	5.98	13.36 @ 75F
2010	0.0	50.0	0.0	10.95	8.01	5.89	4.35	4.96	17.45	12.54	9.07	6.61	7.54	0.75	0.85	5.98	17.31 @100F
2010	50.0	50.0	50.0	33.61	25.21	17.06	9.08	10.04	40.92	30.72	20.88	11.32	12.64	1.18	1.31	5.98	
2010	20.6	27.3	20.6	17.86	13.01	8.91	5.35	5.86	24.81	17.77	12.10	7.35	8.09	0.80	0.88	5.98	

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TABLE 1.12

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	23.36	21.35	19.74	18.47	34.70	29.07	25.98	23.45	21.38	41.15	0.57	0.79	7.63	131.91 @ 0F
1980	0.0	100.0	0.0	17.98	18.56	19.23	19.99	35.44	21.36	21.96	22.62	23.36	43.18	0.97	1.37	7.63	120.04 @ 25F
1980	100.0	0.0	100.0	180.48	107.66	64.81	39.29	24.64	230.11	135.27	80.18	47.96	28.73	1.19	1.68	7.63	109.32 @ 50F
1980	50.0	0.0	50.0	84.43	54.89	37.23	26.51	30.52	106.88	68.21	45.30	31.54	35.79	0.80	1.12	7.63	99.63 @ 75F
1980	0.0	50.0	0.0	21.14	20.15	19.44	18.96	34.74	25.78	24.17	22.92	21.97	41.37	0.71	1.00	7.63	166.36 @100F
1980	50.0	50.0	50.0	99.23	63.11	42.02	29.64	30.04	125.74	78.61	51.40	35.66	35.95	1.08	1.53	7.63	
1980	20.6	27.3	20.6	47.09	34.39	26.71	22.02	33.00	59.06	42.24	32.08	25.84	39.06	0.74	1.04	7.63	
1988	0.0	0.0	0.0	13.01	10.53	8.64	7.18	17.23	17.42	13.85	11.14	9.06	19.62	0.60	0.65	6.35	60.49 @ 0F
1988	0.0	100.0	0.0	10.42	9.53	8.88	8.43	15.60	16.15	14.33	12.91	11.82	20.53	0.98	1.16	6.35	54.57 @ 25F
1988	100.0	0.0	100.0	104.93	64.32	37.54	18.45	13.88	118.90	74.22	46.21	27.47	22.19	1.33	1.42	6.35	49.38 @ 50F
1988	50.0	0.0	50.0	48.15	31.05	19.63	11.44	15.74	56.32	36.93	24.50	16.04	20.30	0.87	0.94	6.35	44.82 @ 75F
1988	0.0	50.0	0.0	11.91	10.06	8.66	7.60	16.41	16.77	13.90	11.72	10.04	19.70	0.74	0.84	6.35	74.24 @100F
1988	50.0	50.0	50.0	57.67	36.92	23.21	13.44	14.74	67.53	44.27	29.56	19.64	21.36	1.15	1.29	6.35	
1988	20.6	27.3	20.6	26.75	18.65	13.13	9.14	16.17	32.94	23.29	16.90	12.43	19.93	0.78	0.87	6.35	
1990	0.0	0.0	0.0	11.55	9.05	7.18	5.77	13.73	15.84	12.09	9.31	7.25	14.98	0.59	0.62	6.03	47.37 @ 0F
1990	0.0	100.0	0.0	9.85	8.67	7.78	7.12	12.53	15.03	12.89	11.22	9.90	16.37	0.96	1.10	6.03	42.30 @ 25F
1990	100.0	0.0	100.0	86.98	54.64	32.32	15.53	12.72	96.43	61.75	38.76	22.24	19.01	1.31	1.34	6.03	37.89 @ 50F
1990	50.0	0.0	50.0	40.38	26.44	16.74	9.46	13.18	46.67	31.03	20.52	12.93	16.31	0.85	0.88	6.03	34.03 @ 75F
1990	0.0	50.0	0.0	10.81	8.84	7.35	6.24	13.12	15.42	12.30	9.97	8.21	15.32	0.72	0.79	6.03	56.05 @100F
1990	50.0	50.0	50.0	48.41	31.66	20.05	11.32	12.63	55.73	37.32	24.99	16.07	17.69	1.13	1.22	6.03	
1990	20.6	27.3	20.6	22.91	16.03	11.17	7.53	13.16	28.19	19.93	14.23	10.08	15.70	0.77	0.82	6.03	
1995	0.0	0.0	0.0	8.70	6.28	4.56	3.32	6.47	13.20	9.35	6.66	4.78	7.65	0.53	0.57	5.50	30.33 @ 0F
1995	0.0	100.0	0.0	8.84	7.23	5.96	4.95	7.24	13.14	10.70	8.77	7.24	10.15	0.85	0.99	5.50	26.65 @ 25F
1995	100.0	0.0	100.0	54.55	37.00	22.90	10.67	10.20	59.15	41.06	26.55	14.00	13.61	1.14	1.21	5.50	23.46 @ 50F
1995	50.0	0.0	50.0	26.20	17.99	11.54	6.11	7.83	30.75	21.44	14.23	8.28	9.85	0.76	0.81	5.50	20.70 @ 75F
1995	0.0	50.0	0.0	8.72	6.61	5.07	3.93	6.71	13.13	9.83	7.44	5.69	8.53	0.64	0.72	5.50	31.32 @100F
1995	50.0	50.0	50.0	31.69	22.12	14.43	7.81	8.72	36.15	25.88	17.66	10.62	11.88	0.99	1.10	5.50	
1995	20.6	27.3	20.6	15.84	11.23	7.68	4.78	7.15	20.32	14.54	10.17	6.70	9.02	0.69	0.75	5.50	
2000	0.0	0.0	0.0	7.10	4.89	3.37	2.32	2.53	11.59	7.85	5.31	3.60	3.95	0.53	0.57	5.34	23.64 @ 0F
2000	0.0	100.0	0.0	7.94	6.29	4.99	3.96	4.81	11.77	9.38	7.47	5.95	7.26	0.84	1.01	5.34	20.55 @ 25F
2000	100.0	0.0	100.0	38.04	28.18	18.31	8.45	8.94	42.13	31.46	20.79	10.13	10.74	1.15	1.24	5.34	17.89 @ 50F
2000	50.0	0.0	50.0	18.88	13.76	9.06	4.65	4.97	23.21	16.83	11.20	6.08	6.53	0.76	0.82	5.34	15.60 @ 75F
2000	0.0	50.0	0.0	7.41	5.42	3.98	2.94	3.40	11.65	8.42	6.13	4.49	5.21	0.64	0.74	5.34	21.40 @100F
2000	50.0	50.0	50.0	22.99	17.24	11.65	6.20	6.88	26.95	20.42	14.13	8.04	9.00	1.00	1.13	5.34	
2000	20.6	27.3	20.6	12.07	8.79	6.02	3.61	3.99	16.36	11.82	8.16	5.10	5.68	0.68	0.76	5.34	
2010	0.0	0.0	0.0	6.83	4.71	3.24	2.23	2.39	11.20	7.52	5.05	3.39	3.62	0.55	0.59	5.29	21.41 @ 0F
2010	0.0	100.0	0.0	7.20	5.74	4.57	3.64	4.41	10.96	8.74	6.96	5.55	6.72	0.87	1.04	5.29	18.42 @ 25F
2010	100.0	0.0	100.0	35.57	26.35	17.13	7.92	8.36	41.11	30.36	19.61	8.86	9.36	1.21	1.27	5.29	15.85 @ 50F
2010	50.0	0.0	50.0	17.77	12.95	8.53	4.40	4.66	22.58	16.21	10.59	5.47	5.80	0.79	0.84	5.29	13.63 @ 75F
2010	0.0	50.0	0.0	6.97	5.10	3.75	2.77	3.16	11.10	7.98	5.77	4.21	4.80	0.66	0.76	5.29	17.66 @100F
2010	50.0	50.0	50.0	21.39	16.05	10.85	5.78	6.39	26.04	19.55	13.29	7.21	8.04	1.04	1.16	5.29	
2010	20.6	27.3	20.6	11.37	8.28	5.67	3.40	3.73	15.79	11.31	7.70	4.68	5.15	0.71	0.78	5.29	

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TABLE 1.13

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	LDDV 0-100F	LDDT 0-100F	HDDV 0-100F	HDGV
1980	0.0	0.0	0.0	4.40	3.77	3.25	2.81	2.11	4.56	3.99	3.52	3.12	2.40	2.40	3.07	50.24	7.46 @ 0F
1980	0.0	100.0	0.0	6.11	5.35	4.70	4.13	2.95	6.49	5.78	5.17	4.64	3.34	2.78	3.68	50.24	6.90 @ 25F
1980	100.0	0.0	100.0	5.16	4.76	4.44	4.18	3.34	4.91	4.76	4.66	4.60	3.73	3.00	3.98	50.24	6.40 @ 50F
1980	50.0	0.0	50.0	4.81	4.31	3.90	3.55	2.80	4.79	4.45	4.17	3.95	3.15	2.67	3.48	50.24	5.97 @ 75F
1980	0.0	50.0	0.0	5.35	4.65	4.05	3.53	2.59	5.65	5.00	4.44	3.97	2.94	2.57	3.34	50.24	4.35 @100F
1980	50.0	50.0	50.0	5.64	5.06	4.57	4.15	3.15	5.70	5.27	4.91	4.62	3.54	2.89	3.83	50.24	
1980	20.6	27.3	20.6	5.09	4.47	3.95	3.51	2.65	5.25	4.73	4.30	3.93	3.01	2.60	3.39	50.24	
1988	0.0	0.0	0.0	2.86	2.43	2.06	1.75	1.52	3.57	3.05	2.61	2.24	2.05	2.69	2.84	34.24	5.90 @ 0F
1988	0.0	100.0	0.0	4.49	3.80	3.22	2.75	2.27	5.67	4.84	4.14	3.56	3.10	2.67	3.35	34.24	5.57 @ 25F
1988	100.0	0.0	100.0	4.11	3.68	3.32	3.01	2.54	4.94	4.51	4.14	3.82	3.35	2.82	3.59	34.24	5.26 @ 50F
1988	50.0	0.0	50.0	3.44	3.02	2.66	2.35	2.00	4.21	3.74	3.34	2.99	2.67	2.75	3.18	34.24	4.98 @ 75F
1988	0.0	50.0	0.0	3.64	3.08	2.62	2.24	1.88	4.57	3.91	3.35	2.88	2.56	2.68	3.07	34.24	4.38 @100F
1988	50.0	50.0	50.0	4.30	3.74	3.27	2.88	2.40	5.31	4.67	4.14	3.69	3.23	2.74	3.47	34.24	
1988	20.6	27.3	20.6	3.52	3.03	2.61	2.27	1.91	4.38	3.80	3.31	2.90	2.58	2.71	3.10	34.24	
1990	0.0	0.0	0.0	2.63	2.22	1.88	1.59	1.43	3.33	2.82	2.40	2.04	1.95	2.51	2.46	32.20	5.80 @ 0F
1990	0.0	100.0	0.0	4.23	3.55	2.99	2.52	2.16	5.46	4.59	3.87	3.28	2.97	2.47	2.90	32.20	5.49 @ 25F
1990	100.0	0.0	100.0	3.93	3.51	3.15	2.84	2.47	4.92	4.46	4.06	3.70	3.36	2.61	3.12	32.20	5.20 @ 50F
1990	50.0	0.0	50.0	3.23	2.81	2.47	2.17	1.91	4.06	3.58	3.17	2.82	2.60	2.55	2.75	32.20	4.94 @ 75F
1990	0.0	50.0	0.0	3.38	2.84	2.40	2.03	1.77	4.32	3.65	3.09	2.63	2.42	2.49	2.66	32.20	4.60 @100F
1990	50.0	50.0	50.0	4.08	3.53	3.07	2.68	2.32	5.19	4.52	3.96	3.49	3.16	2.54	3.01	32.20	
1990	20.6	27.3	20.6	3.28	2.80	2.40	2.07	1.81	4.17	3.58	3.09	2.68	2.47	2.51	2.69	32.20	
1995	0.0	0.0	0.0	2.15	1.80	1.52	1.28	1.27	2.88	2.42	2.03	1.71	1.76	1.95	1.92	18.79	4.85 @ 0F
1995	0.0	100.0	0.0	3.72	3.08	2.55	2.12	1.99	4.92	4.05	3.33	2.75	2.66	1.91	2.28	18.79	4.61 @ 25F
1995	100.0	0.0	100.0	3.56	3.18	2.84	2.53	2.37	4.85	4.36	3.93	3.55	3.41	2.02	2.45	18.79	4.39 @ 50F
1995	50.0	0.0	50.0	2.77	2.41	2.10	1.84	1.76	3.75	3.28	2.88	2.53	2.49	1.98	2.16	18.79	4.18 @ 75F
1995	0.0	50.0	0.0	2.85	2.37	1.98	1.65	1.59	3.78	3.14	2.61	2.17	2.16	1.93	2.08	18.79	4.15 @100F
1995	50.0	50.0	50.0	3.64	3.13	2.69	2.33	2.18	4.88	4.20	3.63	3.15	3.04	1.97	2.37	18.79	
1995	20.6	27.3	20.6	2.78	2.36	2.01	1.71	1.64	3.73	3.16	2.69	2.30	2.28	1.95	2.11	18.79	
2000	0.0	0.0	0.0	1.79	1.52	1.28	1.09	1.16	2.60	2.18	1.82	1.53	1.64	1.86	1.91	15.16	4.60 @ 0F
2000	0.0	100.0	0.0	3.33	2.75	2.27	1.87	1.87	4.47	3.65	2.98	2.43	2.43	1.81	2.27	15.16	4.38 @ 25F
2000	100.0	0.0	100.0	3.24	2.91	2.61	2.34	2.31	4.68	4.20	3.78	3.40	3.36	1.91	2.43	15.16	4.17 @ 50F
2000	50.0	0.0	50.0	2.42	2.12	1.86	1.64	1.67	3.50	3.06	2.68	2.35	2.40	1.88	2.15	15.16	3.97 @ 75F
2000	0.0	50.0	0.0	2.46	2.05	1.71	1.43	1.47	3.41	2.82	2.32	1.92	1.98	1.84	2.07	15.16	4.06 @100F
2000	50.0	50.0	50.0	3.29	2.83	2.44	2.11	2.09	4.58	3.93	3.38	2.91	2.90	1.86	2.35	15.16	
2000	20.6	27.3	20.6	2.41	2.06	1.75	1.50	1.54	3.41	2.89	2.45	2.08	2.13	1.85	2.09	15.16	
2010	0.0	0.0	0.0	1.65	1.41	1.22	1.05	1.12	2.40	2.02	1.70	1.43	1.53	1.91	1.95	14.00	4.50 @ 0F
2010	0.0	100.0	0.0	3.16	2.65	2.22	1.86	1.86	4.13	3.37	2.76	2.25	2.25	1.84	2.31	14.00	4.28 @ 25F
2010	100.0	0.0	100.0	3.23	2.90	2.60	2.34	2.31	4.55	4.09	3.67	3.29	3.25	1.95	2.47	14.00	4.08 @ 50F
2010	50.0	0.0	50.0	2.34	2.06	1.82	1.61	1.64	3.34	2.92	2.56	2.25	2.29	1.92	2.19	14.00	3.88 @ 75F
2010	0.0	50.0	0.0	2.31	1.95	1.65	1.40	1.44	3.15	2.60	2.15	1.78	1.84	1.88	2.11	14.00	4.01 @100F
2010	50.0	50.0	50.0	3.20	2.77	2.41	2.10	2.08	4.34	3.73	3.21	2.77	2.75	1.90	2.39	14.00	
2010	20.6	27.3	20.6	2.29	1.97	1.70	1.47	1.51	3.19	2.71	2.30	1.96	2.01	1.90	2.13	14.00	

TABLE 1.13: NOx AT 2.5 MPH.

TABLE 1.14

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	4.10	3.52	3.04	2.63	1.98	4.32	3.80	3.36	2.98	2.29	2.16	2.76	45.15	7.65 @ 0F
1980	0.0	100.0	0.0	5.72	5.01	4.41	3.88	2.77	6.19	5.52	4.94	4.44	3.19	2.50	3.31	45.15	7.08 @ 25F
1980	100.0	0.0	100.0	4.84	4.47	4.17	3.92	3.11	4.68	4.54	4.45	4.41	3.54	2.69	3.58	45.15	6.57 @ 50F
1980	50.0	0.0	50.0	4.50	4.04	3.65	3.33	2.61	4.55	4.23	3.98	3.78	3.00	2.40	3.13	45.15	6.12 @ 75F
1980	0.0	50.0	0.0	5.00	4.35	3.79	3.32	2.42	5.37	4.77	4.25	3.80	2.81	2.31	3.01	45.15	4.46 @100F
1980	50.0	50.0	50.0	5.28	4.74	4.29	3.90	2.94	5.43	5.03	4.70	4.43	3.37	2.60	3.44	45.15	
1980	20.6	27.3	20.6	4.76	4.19	3.70	3.30	2.48	4.99	4.51	4.10	3.76	2.87	2.34	3.04	45.15	
1988	0.0	0.0	0.0	2.70	2.29	1.95	1.66	1.43	3.36	2.87	2.46	2.11	1.93	2.42	2.55	30.78	6.06 @ 0F
1988	0.0	100.0	0.0	4.24	3.59	3.05	2.60	2.14	5.34	4.56	3.90	3.36	2.92	2.40	3.01	30.78	5.71 @ 25F
1988	100.0	0.0	100.0	3.88	3.48	3.14	2.84	2.40	4.64	4.24	3.90	3.60	3.15	2.53	3.23	30.78	5.40 @ 50F
1988	50.0	0.0	50.0	3.25	2.85	2.51	2.22	1.89	3.97	3.52	3.14	2.83	2.51	2.47	2.85	30.78	5.11 @ 75F
1988	0.0	50.0	0.0	3.44	2.91	2.48	2.12	1.77	4.31	3.68	3.16	2.72	2.40	2.41	2.76	30.78	4.49 @100F
1988	50.0	50.0	50.0	4.06	3.53	3.09	2.72	2.27	4.99	4.40	3.90	3.48	3.04	2.47	3.12	30.78	
1988	20.6	27.3	20.6	3.33	2.86	2.47	2.14	1.81	4.13	3.58	3.12	2.74	2.43	2.43	2.79	30.78	
1990	0.0	0.0	0.0	2.48	2.09	1.77	1.50	1.35	3.13	2.66	2.26	1.92	1.83	2.25	2.21	28.94	5.95 @ 0F
1990	0.0	100.0	0.0	3.99	3.35	2.82	2.38	2.04	5.13	4.32	3.64	3.09	2.79	2.22	2.61	28.94	5.63 @ 25F
1990	100.0	0.0	100.0	3.70	3.31	2.97	2.68	2.32	4.62	4.19	3.81	3.49	3.16	2.34	2.80	28.94	5.34 @ 50F
1990	50.0	0.0	50.0	3.04	2.65	2.32	2.05	1.80	3.81	3.36	2.98	2.65	2.44	2.29	2.48	28.94	5.06 @ 75F
1990	0.0	50.0	0.0	3.18	2.68	2.26	1.92	1.67	4.06	3.43	2.91	2.47	2.28	2.24	2.39	28.94	4.72 @100F
1990	50.0	50.0	50.0	3.84	3.33	2.89	2.53	2.18	4.88	4.25	3.73	3.29	2.97	2.28	2.70	28.94	
1990	20.6	27.3	20.6	3.09	2.64	2.27	1.95	1.71	3.92	3.37	2.91	2.52	2.33	2.26	2.41	28.94	
1995	0.0	0.0	0.0	2.02	1.69	1.43	1.20	1.19	2.70	2.27	1.91	1.60	1.65	1.75	1.73	16.88	4.97 @ 0F
1995	0.0	100.0	0.0	3.50	2.89	2.40	1.99	1.87	4.61	3.80	3.13	2.58	2.50	1.72	2.05	16.88	4.73 @ 25F
1995	100.0	0.0	100.0	3.35	2.99	2.66	2.38	2.23	4.55	4.10	3.69	3.33	3.20	1.82	2.20	16.88	4.50 @ 50F
1995	50.0	0.0	50.0	2.61	2.27	1.98	1.73	1.65	3.52	3.08	2.70	2.38	2.34	1.78	1.94	16.88	4.29 @ 75F
1995	0.0	50.0	0.0	2.68	2.23	1.86	1.55	1.49	3.55	2.95	2.45	2.04	2.02	1.73	1.87	16.88	4.26 @100F
1995	50.0	50.0	50.0	3.42	2.94	2.53	2.19	2.05	4.58	3.94	3.41	2.96	2.85	1.77	2.13	16.88	
1995	20.6	27.3	20.6	2.62	2.22	1.89	1.61	1.55	3.50	2.97	2.53	2.16	2.14	1.75	1.89	16.88	
2000	0.0	0.0	0.0	1.68	1.42	1.20	1.02	1.09	2.44	2.04	1.71	1.44	1.54	1.67	1.72	13.62	4.72 @ 0F
2000	0.0	100.0	0.0	3.13	2.58	2.13	1.76	1.76	4.20	3.43	2.80	2.28	2.28	1.63	2.04	13.62	4.50 @ 25F
2000	100.0	0.0	100.0	3.05	2.73	2.45	2.20	2.18	4.39	3.95	3.55	3.19	3.16	1.72	2.19	13.62	4.28 @ 50F
2000	50.0	0.0	50.0	2.28	2.00	1.75	1.54	1.57	3.29	2.88	2.52	2.21	2.25	1.69	1.93	13.62	4.08 @ 75F
2000	0.0	50.0	0.0	2.31	1.93	1.61	1.34	1.38	3.20	2.64	2.18	1.80	1.86	1.65	1.86	13.62	4.17 @100F
2000	50.0	50.0	50.0	3.09	2.66	2.29	1.98	1.97	4.30	3.69	3.17	2.74	2.72	1.67	2.11	13.62	
2000	20.6	27.3	20.6	2.27	1.93	1.65	1.41	1.44	3.20	2.71	2.30	1.95	2.00	1.67	1.88	13.62	
2010	0.0	0.0	0.0	1.55	1.33	1.14	0.98	1.06	2.26	1.90	1.60	1.34	1.44	1.71	1.75	12.58	4.62 @ 0F
2010	0.0	100.0	0.0	2.97	2.49	2.08	1.74	1.74	3.88	3.17	2.59	2.11	2.11	1.66	2.07	12.58	4.40 @ 25F
2010	100.0	0.0	100.0	3.03	2.72	2.44	2.19	2.17	4.28	3.84	3.45	3.09	3.06	1.75	2.22	12.58	4.19 @ 50F
2010	50.0	0.0	50.0	2.20	1.94	1.71	1.52	1.54	3.14	2.75	2.41	2.11	2.15	1.73	1.97	12.58	3.98 @ 75F
2010	0.0	50.0	0.0	2.17	1.83	1.55	1.31	1.35	2.96	2.45	2.02	1.67	1.73	1.69	1.90	12.58	4.12 @100F
2010	50.0	50.0	50.0	3.00	2.61	2.26	1.97	1.96	4.08	3.50	3.02	2.60	2.59	1.70	2.15	12.58	
2010	20.6	27.3	20.6	2.15	1.85	1.60	1.38	1.42	3.00	2.54	2.16	1.84	1.89	1.70	1.92	12.58	

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TABLE 1.15

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	3.79	3.27	2.83	2.46	1.85	4.14	3.66	3.25	2.90	2.23	1.79	2.29	37.46	8.04 @ 0F
1980	0.0	100.0	0.0	5.31	4.67	4.11	3.64	2.59	5.96	5.34	4.80	4.33	3.11	2.07	2.74	37.46	7.44 @ 25F
1980	100.0	0.0	100.0	4.48	4.15	3.88	3.66	2.89	4.48	4.37	4.31	4.29	3.41	2.24	2.97	37.46	6.90 @ 50F
1980	50.0	0.0	50.0	4.16	3.75	3.40	3.12	2.43	4.36	4.08	3.85	3.68	2.90	1.99	2.60	37.46	6.43 @ 75F
1980	0.0	50.0	0.0	4.63	4.04	3.54	3.11	2.27	5.16	4.60	4.12	3.70	2.73	1.92	2.49	37.46	4.69 @100F
1980	50.0	50.0	50.0	4.90	4.41	4.00	3.65	2.74	5.22	4.86	4.56	4.31	3.26	2.16	2.85	37.46	
1980	20.6	27.3	20.6	4.41	3.89	3.45	3.09	2.32	4.79	4.35	3.98	3.66	2.78	1.94	2.52	37.46	
1988	0.0	0.0	0.0	2.48	2.10	1.79	1.53	1.32	3.06	2.62	2.25	1.94	1.76	2.01	2.11	25.53	6.36 @ 0F
1988	0.0	100.0	0.0	3.88	3.29	2.80	2.40	1.96	4.86	4.16	3.57	3.09	2.66	1.99	2.50	25.53	6.00 @ 25F
1988	100.0	0.0	100.0	3.53	3.17	2.87	2.61	2.19	4.21	3.85	3.55	3.29	2.86	2.10	2.68	25.53	5.67 @ 50F
1988	50.0	0.0	50.0	2.97	2.61	2.30	2.05	1.73	3.60	3.21	2.87	2.59	2.29	2.05	2.37	25.53	5.37 @ 75F
1988	0.0	50.0	0.0	3.15	2.68	2.28	1.95	1.63	3.92	3.36	2.89	2.50	2.19	2.00	2.29	25.53	4.72 @100F
1988	50.0	50.0	50.0	3.70	3.23	2.84	2.50	2.08	4.53	4.01	3.56	3.19	2.76	2.05	2.59	25.53	
1988	20.6	27.3	20.6	3.05	2.62	2.27	1.98	1.66	3.75	3.27	2.86	2.51	2.21	2.02	2.31	25.53	
1990	0.0	0.0	0.0	2.25	1.90	1.61	1.37	1.22	2.83	2.40	2.05	1.75	1.65	1.87	1.83	24.01	6.25 @ 0F
1990	0.0	100.0	0.0	3.61	3.04	2.56	2.17	1.85	4.63	3.90	3.30	2.81	2.52	1.84	2.17	24.01	5.92 @ 25F
1990	100.0	0.0	100.0	3.34	2.99	2.69	2.43	2.10	4.16	3.78	3.45	3.16	2.85	1.94	2.32	24.01	5.61 @ 50F
1990	50.0	0.0	50.0	2.75	2.40	2.11	1.86	1.63	3.44	3.04	2.70	2.41	2.21	1.90	2.05	24.01	5.32 @ 75F
1990	0.0	50.0	0.0	2.89	2.43	2.06	1.75	1.52	3.67	3.11	2.64	2.25	2.06	1.85	1.98	24.01	4.96 @100F
1990	50.0	50.0	50.0	3.48	3.01	2.63	2.30	1.98	4.40	3.84	3.37	2.98	2.68	1.89	2.24	24.01	
1990	20.6	27.3	20.6	2.80	2.40	2.06	1.78	1.55	3.54	3.05	2.64	2.29	2.10	1.87	2.00	24.01	
1995	0.0	0.0	0.0	1.80	1.52	1.27	1.07	1.07	2.41	2.02	1.70	1.43	1.47	1.45	1.43	14.01	5.22 @ 0F
1995	0.0	100.0	0.0	3.12	2.59	2.15	1.78	1.67	4.11	3.39	2.79	2.31	2.23	1.42	1.70	14.01	4.97 @ 25F
1995	100.0	0.0	100.0	2.99	2.67	2.38	2.13	1.99	4.05	3.65	3.29	2.97	2.85	1.51	1.83	14.01	4.73 @ 50F
1995	50.0	0.0	50.0	2.33	2.03	1.77	1.55	1.48	3.14	2.75	2.41	2.12	2.09	1.48	1.61	14.01	4.51 @ 75F
1995	0.0	50.0	0.0	2.39	1.99	1.66	1.39	1.33	3.17	2.63	2.19	1.82	1.81	1.44	1.55	14.01	4.48 @100F
1995	50.0	50.0	50.0	3.06	2.63	2.26	1.95	1.83	4.08	3.52	3.04	2.64	2.54	1.47	1.77	14.01	
1995	20.6	27.3	20.6	2.34	1.98	1.69	1.44	1.38	3.12	2.65	2.26	1.93	1.90	1.45	1.57	14.01	
2000	0.0	0.0	0.0	1.50	1.27	1.07	0.91	0.97	2.16	1.81	1.52	1.27	1.36	1.39	1.43	11.30	4.96 @ 0F
2000	0.0	100.0	0.0	2.78	2.30	1.90	1.56	1.56	3.73	3.04	2.48	2.03	2.03	1.35	1.69	11.30	4.72 @ 25F
2000	100.0	0.0	100.0	2.71	2.43	2.18	1.96	1.94	3.90	3.51	3.15	2.84	2.80	1.43	1.81	11.30	4.50 @ 50F
2000	50.0	0.0	50.0	2.03	1.78	1.56	1.37	1.40	2.92	2.56	2.24	1.96	2.00	1.40	1.60	11.30	4.28 @ 75F
2000	0.0	50.0	0.0	2.06	1.72	1.43	1.19	1.23	2.85	2.35	1.94	1.60	1.65	1.37	1.54	11.30	4.38 @100F
2000	50.0	50.0	50.0	2.75	2.36	2.04	1.76	1.75	3.82	3.27	2.82	2.43	2.42	1.39	1.75	11.30	
2000	20.6	27.3	20.6	2.02	1.72	1.47	1.25	1.28	2.85	2.41	2.04	1.73	1.78	1.38	1.56	11.30	
2010	0.0	0.0	0.0	1.38	1.18	1.02	0.87	0.94	2.01	1.69	1.42	1.19	1.28	1.42	1.45	10.44	4.85 @ 0F
2010	0.0	100.0	0.0	2.65	2.21	1.85	1.55	1.55	3.45	2.82	2.30	1.88	1.88	1.38	1.72	10.44	4.62 @ 25F
2010	100.0	0.0	100.0	2.70	2.42	2.18	1.95	1.93	3.81	3.42	3.07	2.75	2.72	1.45	1.84	10.44	4.40 @ 50F
2010	50.0	0.0	50.0	1.95	1.73	1.52	1.35	1.37	2.79	2.44	2.14	1.88	1.91	1.43	1.63	10.44	4.19 @ 75F
2010	0.0	50.0	0.0	1.93	1.63	1.38	1.17	1.20	2.63	2.18	1.80	1.49	1.54	1.40	1.57	10.44	4.32 @100F
2010	50.0	50.0	50.0	2.67	2.32	2.02	1.75	1.74	3.63	3.12	2.69	2.32	2.30	1.41	1.78	10.44	
2010	20.6	27.3	20.6	1.91	1.65	1.42	1.23	1.26	2.67	2.26	1.92	1.64	1.68	1.41	1.59	10.44	

TABLE 1.15: NOx AT 10.0 MPH.

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TABLE 1.16

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	LDGV 25 F	LDGV 50 F	LDGV 75 F	LDGV 100 F	LDGT 0 F	LDGT 25 F	LDGT 50 F	LDGT 75 F	LDGT 100 F	LDDV 0-100F	LDDT 0-100F	HDDV 0-100F	HDGV
1980	0.0	0.0	0.0	3.84	3.33	2.90	2.53	1.92	4.41	3.92	3.51	3.15	2.43	1.38	1.77	28.91	8.79 @ 0F
1980	0.0	100.0	0.0	5.36	4.73	4.18	3.71	2.67	6.33	5.70	5.15	4.67	3.36	1.60	2.12	28.91	8.13 @ 25F
1980	100.0	0.0	100.0	4.42	4.13	3.90	3.73	2.98	4.70	4.63	4.61	4.62	3.67	1.73	2.29	28.91	7.54 @ 50F
1980	50.0	0.0	50.0	4.16	3.78	3.46	3.19	2.51	4.61	4.35	4.14	3.98	3.14	1.54	2.00	28.91	7.03 @ 75F
1980	0.0	50.0	0.0	4.69	4.11	3.61	3.19	2.35	5.49	4.92	4.43	4.01	2.97	1.48	1.92	28.91	5.12 @100F
1980	50.0	50.0	50.0	4.89	4.43	4.04	3.72	2.82	5.52	5.16	4.88	4.64	3.52	1.66	2.20	28.91	
1980	20.6	27.3	20.6	4.44	3.94	3.52	3.17	2.40	5.09	4.65	4.28	3.96	3.02	1.50	1.95	28.91	
1988	0.0	0.0	0.0	2.27	1.94	1.66	1.43	1.22	2.78	2.39	2.07	1.80	1.61	1.55	1.63	19.71	6.95 @ 0F
1988	0.0	100.0	0.0	3.52	3.01	2.58	2.23	1.80	4.38	3.78	3.27	2.85	2.41	1.54	1.93	19.71	6.56 @ 25F
1988	100.0	0.0	100.0	3.17	2.87	2.61	2.39	2.00	3.76	3.47	3.22	3.01	2.58	1.62	2.07	19.71	6.20 @ 50F
1988	50.0	0.0	50.0	2.69	2.38	2.12	1.90	1.60	3.25	2.91	2.63	2.39	2.08	1.58	1.83	19.71	5.87 @ 75F
1988	0.0	50.0	0.0	2.88	2.47	2.12	1.83	1.51	3.56	3.07	2.66	2.32	2.00	1.54	1.76	19.71	5.16 @100F
1988	50.0	50.0	50.0	3.35	2.94	2.60	2.31	1.90	4.07	3.62	3.24	2.93	2.50	1.58	2.00	19.71	
1988	20.6	27.3	20.6	2.78	2.41	2.10	1.84	1.53	3.39	2.98	2.62	2.33	2.02	1.56	1.78	19.71	
1990	0.0	0.0	0.0	2.01	1.70	1.45	1.24	1.10	2.49	2.13	1.83	1.57	1.46	1.44	1.41	18.53	6.83 @ 0F
1990	0.0	100.0	0.0	3.20	2.70	2.30	1.96	1.65	4.06	3.44	2.93	2.51	2.22	1.42	1.67	18.53	6.46 @ 25F
1990	100.0	0.0	100.0	2.93	2.64	2.39	2.17	1.86	3.62	3.30	3.03	2.79	2.49	1.50	1.79	18.53	6.13 @ 50F
1990	50.0	0.0	50.0	2.44	2.14	1.89	1.68	1.45	3.01	2.68	2.39	2.15	1.94	1.47	1.59	18.53	5.81 @ 75F
1990	0.0	50.0	0.0	2.57	2.18	1.86	1.59	1.36	3.23	2.75	2.35	2.02	1.82	1.43	1.53	18.53	5.42 @100F
1990	50.0	50.0	50.0	3.07	2.67	2.34	2.06	1.75	3.84	3.37	2.98	2.65	2.35	1.46	1.73	18.53	
1990	20.6	27.3	20.6	2.49	2.14	1.85	1.61	1.39	3.11	2.69	2.35	2.05	1.86	1.45	1.55	18.53	
1995	0.0	0.0	0.0	1.52	1.28	1.08	0.91	0.90	2.02	1.70	1.44	1.21	1.24	1.12	1.11	10.81	5.71 @ 0F
1995	0.0	100.0	0.0	2.62	2.18	1.81	1.51	1.40	3.45	2.84	2.35	1.95	1.87	1.10	1.31	10.81	5.43 @ 25F
1995	100.0	0.0	100.0	2.51	2.24	2.00	1.79	1.67	3.39	3.06	2.76	2.50	2.39	1.16	1.41	10.81	5.17 @ 50F
1995	50.0	0.0	50.0	1.96	1.71	1.49	1.31	1.24	2.63	2.31	2.03	1.79	1.75	1.14	1.24	10.81	4.93 @ 75F
1995	0.0	50.0	0.0	2.01	1.68	1.41	1.18	1.12	2.66	2.21	1.85	1.55	1.52	1.11	1.20	10.81	4.89 @100F
1995	50.0	50.0	50.0	2.57	2.21	1.90	1.65	1.54	3.42	2.95	2.56	2.23	2.13	1.13	1.36	10.81	
1995	20.6	27.3	20.6	1.97	1.67	1.43	1.22	1.16	2.62	2.23	1.90	1.63	1.60	1.12	1.21	10.81	
2000	0.0	0.0	0.0	1.23	1.04	0.88	0.75	0.80	1.78	1.49	1.25	1.05	1.12	1.07	1.10	8.72	5.42 @ 0F
2000	0.0	100.0	0.0	2.30	1.89	1.56	1.29	1.29	3.07	2.50	2.04	1.67	1.67	1.04	1.30	8.72	5.16 @ 25F
2000	100.0	0.0	100.0	2.23	2.00	1.80	1.61	1.60	3.21	2.89	2.60	2.33	2.31	1.10	1.40	8.72	4.91 @ 50F
2000	50.0	0.0	50.0	1.67	1.46	1.28	1.13	1.15	2.40	2.10	1.84	1.61	1.64	1.08	1.23	8.72	4.68 @ 75F
2000	0.0	50.0	0.0	1.70	1.41	1.18	0.98	1.01	2.34	1.93	1.60	1.32	1.36	1.06	1.19	8.72	4.78 @100F
2000	50.0	50.0	50.0	2.26	1.95	1.68	1.45	1.44	3.14	2.69	2.32	2.00	1.99	1.07	1.35	8.72	
2000	20.6	27.3	20.6	1.66	1.42	1.21	1.03	1.06	2.34	1.98	1.68	1.43	1.46	1.07	1.20	8.72	
2010	0.0	0.0	0.0	1.13	0.97	0.84	0.72	0.77	1.65	1.39	1.17	0.98	1.06	1.10	1.12	8.06	5.30 @ 0F
2010	0.0	100.0	0.0	2.18	1.82	1.52	1.28	1.28	2.84	2.32	1.89	1.55	1.55	1.06	1.33	8.06	5.05 @ 25F
2010	100.0	0.0	100.0	2.22	1.99	1.79	1.61	1.59	3.13	2.81	2.52	2.26	2.24	1.12	1.42	8.06	4.80 @ 50F
2010	50.0	0.0	50.0	1.61	1.42	1.25	1.11	1.13	2.30	2.01	1.76	1.55	1.57	1.11	1.26	8.06	4.57 @ 75F
2010	0.0	50.0	0.0	1.59	1.34	1.14	0.96	0.99	2.16	1.79	1.48	1.22	1.26	1.08	1.22	8.06	4.73 @100F
2010	50.0	50.0	50.0	2.20	1.91	1.66	1.44	1.43	2.98	2.56	2.21	1.90	1.89	1.09	1.38	8.06	
2010	20.6	27.3	20.6	1.57	1.36	1.17	1.01	1.04	2.19	1.86	1.58	1.35	1.38	1.09	1.23	8.06	

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TABLE 1.17

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	4.34	3.78	3.30	2.89	2.21	5.10	4.55	4.08	3.67	2.85	1.20	1.53	25.08	9.98 @ 0F
1980	0.0	100.0	0.0	6.02	5.32	4.71	4.19	3.05	7.27	6.56	5.94	5.40	3.92	1.39	1.84	25.08	9.23 @ 25F
1980	100.0	0.0	100.0	4.84	4.57	4.36	4.20	3.41	5.36	5.31	5.31	5.35	4.29	1.50	1.99	25.08	8.57 @ 50F
1980	50.0	0.0	50.0	4.64	4.23	3.90	3.62	2.89	5.31	5.02	4.80	4.63	3.67	1.33	1.74	25.08	7.98 @ 75F
1980	0.0	50.0	0.0	5.29	4.65	4.10	3.62	2.69	6.34	5.69	5.14	4.66	3.47	1.28	1.67	25.08	5.82 @100F
1980	50.0	50.0	50.0	5.43	4.94	4.54	4.20	3.23	6.31	5.94	5.63	5.38	4.10	1.44	1.91	25.08	
1980	20.6	27.3	20.6	4.99	4.44	3.98	3.60	2.75	5.86	5.37	4.96	4.61	3.53	1.30	1.69	25.08	
1988	0.0	0.0	0.0	2.22	1.91	1.65	1.43	1.20	2.70	2.34	2.05	1.79	1.57	1.34	1.41	17.09	7.90 @ 0F
1988	0.0	100.0	0.0	3.40	2.93	2.54	2.21	1.76	4.22	3.67	3.21	2.82	2.34	1.33	1.67	17.09	7.45 @ 25F
1988	100.0	0.0	100.0	3.01	2.75	2.52	2.33	1.92	3.59	3.34	3.12	2.95	2.49	1.41	1.79	17.09	7.04 @ 50F
1988	50.0	0.0	50.0	2.60	2.32	2.08	1.88	1.56	3.13	2.83	2.58	2.37	2.02	1.37	1.59	17.09	6.66 @ 75F
1988	0.0	50.0	0.0	2.81	2.42	2.10	1.83	1.48	3.45	3.00	2.63	2.31	1.96	1.34	1.53	17.09	5.86 @100F
1988	50.0	50.0	50.0	3.21	2.84	2.53	2.27	1.84	3.90	3.50	3.16	2.88	2.42	1.37	1.73	17.09	
1988	20.6	27.3	20.6	2.70	2.36	2.07	1.83	1.50	3.29	2.90	2.58	2.31	1.97	1.35	1.55	17.09	
1990	0.0	0.0	0.0	1.89	1.61	1.39	1.19	1.03	2.31	1.99	1.72	1.49	1.36	1.25	1.23	16.07	7.76 @ 0F
1990	0.0	100.0	0.0	2.97	2.53	2.17	1.87	1.54	3.73	3.19	2.75	2.37	2.06	1.23	1.45	16.07	7.34 @ 25F
1990	100.0	0.0	100.0	2.69	2.43	2.21	2.02	1.71	3.30	3.02	2.79	2.60	2.27	1.30	1.56	16.07	6.96 @ 50F
1990	50.0	0.0	50.0	2.26	2.00	1.78	1.60	1.36	2.77	2.48	2.23	2.02	1.80	1.27	1.38	16.07	6.60 @ 75F
1990	0.0	50.0	0.0	2.41	2.06	1.77	1.53	1.28	2.99	2.57	2.22	1.92	1.70	1.24	1.33	16.07	6.16 @100F
1990	50.0	50.0	50.0	2.83	2.48	2.19	1.95	1.63	3.51	3.11	2.77	2.48	2.16	1.27	1.50	16.07	
1990	20.6	27.3	20.6	2.33	2.02	1.76	1.54	1.30	2.87	2.51	2.20	1.94	1.72	1.26	1.34	16.07	
1995	0.0	0.0	0.0	1.29	1.09	0.92	0.78	0.76	1.71	1.44	1.22	1.04	1.04	0.97	0.96	9.38	6.48 @ 0F
1995	0.0	100.0	0.0	2.20	1.84	1.53	1.28	1.18	2.89	2.40	2.00	1.67	1.58	0.95	1.14	9.38	6.17 @ 25F
1995	100.0	0.0	100.0	2.11	1.88	1.68	1.51	1.39	2.83	2.56	2.32	2.10	1.99	1.01	1.22	9.38	5.87 @ 50F
1995	50.0	0.0	50.0	1.66	1.44	1.26	1.11	1.04	2.21	1.94	1.72	1.52	1.47	0.99	1.08	9.38	5.60 @ 75F
1995	0.0	50.0	0.0	1.70	1.43	1.20	1.01	0.95	2.24	1.88	1.57	1.32	1.28	0.96	1.04	9.38	5.55 @100F
1995	50.0	50.0	50.0	2.16	1.86	1.61	1.40	1.28	2.86	2.48	2.16	1.89	1.78	0.98	1.18	9.38	
1995	20.6	27.3	20.6	1.66	1.42	1.21	1.04	0.98	2.20	1.88	1.62	1.39	1.35	0.97	1.05	9.38	
2000	0.0	0.0	0.0	0.99	0.83	0.70	0.60	0.64	1.43	1.19	1.00	0.84	0.90	0.93	0.95	7.57	6.16 @ 0F
2000	0.0	100.0	0.0	1.83	1.51	1.24	1.03	1.03	2.45	2.00	1.64	1.34	1.34	0.90	1.13	7.57	5.86 @ 25F
2000	100.0	0.0	100.0	1.78	1.59	1.43	1.28	1.27	2.56	2.30	2.07	1.86	1.84	0.96	1.21	7.57	5.58 @ 50F
2000	50.0	0.0	50.0	1.33	1.17	1.02	0.90	0.92	1.92	1.68	1.47	1.29	1.31	0.94	1.07	7.57	5.32 @ 75F
2000	0.0	50.0	0.0	1.35	1.13	0.94	0.78	0.81	1.87	1.55	1.28	1.05	1.09	0.92	1.03	7.57	5.44 @100F
2000	50.0	50.0	50.0	1.80	1.55	1.34	1.15	1.15	2.51	2.15	1.85	1.60	1.59	0.93	1.17	7.57	
2000	20.6	27.3	20.6	1.33	1.13	0.96	0.82	0.84	1.87	1.58	1.34	1.14	1.17	0.93	1.05	7.57	
2010	0.0	0.0	0.0	0.89	0.77	0.66	0.57	0.61	1.31	1.10	0.92	0.78	0.83	0.95	0.97	6.99	6.02 @ 0F
2010	0.0	100.0	0.0	1.72	1.44	1.21	1.01	1.01	2.24	1.83	1.50	1.22	1.22	0.92	1.15	6.99	5.73 @ 25F
2010	100.0	0.0	100.0	1.76	1.58	1.41	1.27	1.26	2.48	2.22	1.99	1.79	1.77	0.97	1.23	6.99	5.46 @ 50F
2010	50.0	0.0	50.0	1.27	1.12	0.99	0.88	0.89	1.82	1.59	1.39	1.22	1.24	0.96	1.09	6.99	5.19 @ 75F
2010	0.0	50.0	0.0	1.26	1.06	0.90	0.76	0.78	1.71	1.42	1.17	0.97	1.00	0.94	1.05	6.99	5.37 @100F
2010	50.0	50.0	50.0	1.74	1.51	1.31	1.14	1.13	2.36	2.03	1.75	1.51	1.50	0.95	1.19	6.99	
2010	20.6	27.3	20.6	1.24	1.07	0.93	0.80	0.82	1.74	1.47	1.25	1.06	1.09	0.95	1.06	6.99	

TABLE 1.17: NOx AT 35.0 MPH.

TABLE 1.18

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	LDDV- 0-100F	LDDT- 0-100F	HDDV- 0-100F	HDGV
1980	0.0	0.0	0.0	5.19	4.51	3.94	3.45	2.63	6.02	5.37	4.81	4.34	3.35	1.65	2.11	34.47	11.53 @ 0F
1980	0.0	100.0	0.0	7.19	6.36	5.64	5.02	3.63	8.56	7.73	7.01	6.38	4.62	1.91	2.52	34.47	10.67 @ 25F
1980	100.0	0.0	100.0	5.87	5.52	5.24	5.03	4.06	6.38	6.31	6.29	6.32	5.05	2.06	2.73	34.47	9.90 @ 50F
1980	50.0	0.0	50.0	5.58	5.08	4.67	4.33	3.44	6.29	5.95	5.68	5.47	4.32	1.83	2.39	34.47	9.22 @ 75F
1980	0.0	50.0	0.0	6.32	5.55	4.90	4.33	3.20	7.47	6.71	6.06	5.50	4.09	1.77	2.29	34.47	6.72 @100F
1980	50.0	50.0	50.0	6.53	5.94	5.44	5.02	3.85	7.47	7.02	6.65	6.35	4.83	1.98	2.63	34.47	
1980	20.6	27.3	20.6	5.97	5.32	4.77	4.30	3.28	6.93	6.35	5.86	5.44	4.16	1.79	2.32	34.47	
1988	0.0	0.0	0.0	2.53	2.19	1.90	1.65	1.35	3.10	2.70	2.36	2.07	1.80	1.85	1.94	23.49	9.13 @ 0F
1988	0.0	100.0	0.0	3.84	3.33	2.90	2.54	1.99	4.83	4.22	3.70	3.27	2.69	1.83	2.30	23.49	8.61 @ 25F
1988	100.0	0.0	100.0	3.41	3.10	2.84	2.63	2.12	4.14	3.84	3.60	3.39	2.84	1.94	2.46	23.49	8.13 @ 50F
1988	50.0	0.0	50.0	2.96	2.64	2.37	2.14	1.74	3.61	3.27	2.98	2.73	2.31	1.89	2.18	23.49	7.70 @ 75F
1988	0.0	50.0	0.0	3.19	2.76	2.41	2.11	1.68	3.96	3.46	3.04	2.68	2.25	1.84	2.10	23.49	6.77 @100F
1988	50.0	50.0	50.0	3.63	3.22	2.87	2.58	2.06	4.48	4.03	3.65	3.33	2.76	1.88	2.38	23.49	
1988	20.6	27.3	20.6	3.06	2.69	2.37	2.10	1.69	3.78	3.35	2.98	2.68	2.26	1.86	2.13	23.49	
1990	0.0	0.0	0.0	2.09	1.79	1.55	1.34	1.13	2.55	2.21	1.91	1.66	1.50	1.72	1.69	22.09	8.96 @ 0F
1990	0.0	100.0	0.0	3.23	2.78	2.40	2.08	1.68	4.10	3.53	3.05	2.65	2.27	1.69	1.99	22.09	8.48 @ 25F
1990	100.0	0.0	100.0	2.93	2.65	2.40	2.20	1.81	3.62	3.32	3.07	2.86	2.47	1.79	2.14	22.09	8.04 @ 50F
1990	50.0	0.0	50.0	2.49	2.20	1.96	1.76	1.46	3.06	2.74	2.47	2.24	1.96	1.75	1.89	22.09	7.63 @ 75F
1990	0.0	50.0	0.0	2.65	2.28	1.97	1.71	1.40	3.30	2.85	2.47	2.15	1.87	1.71	1.82	22.09	7.12 @100F
1990	50.0	50.0	50.0	3.08	2.71	2.40	2.14	1.74	3.86	3.43	3.06	2.76	2.37	1.74	2.06	22.09	
1990	20.6	27.3	20.6	2.56	2.23	1.95	1.71	1.41	3.17	2.78	2.45	2.17	1.89	1.73	1.84	22.09	
1995	0.0	0.0	0.0	1.28	1.08	0.92	0.78	0.74	1.68	1.42	1.21	1.03	1.02	1.34	1.32	12.89	7.49 @ 0F
1995	0.0	100.0	0.0	2.15	1.80	1.51	1.27	1.15	2.83	2.36	1.98	1.66	1.55	1.31	1.56	12.89	7.13 @ 25F
1995	100.0	0.0	100.0	2.06	1.83	1.63	1.46	1.31	2.74	2.48	2.25	2.05	1.91	1.39	1.68	12.89	6.79 @ 50F
1995	50.0	0.0	50.0	1.63	1.42	1.24	1.09	1.00	2.16	1.90	1.68	1.49	1.42	1.36	1.48	12.89	6.47 @ 75F
1995	0.0	50.0	0.0	1.68	1.41	1.19	1.01	0.92	2.20	1.85	1.56	1.32	1.26	1.32	1.43	12.89	6.42 @100F
1995	50.0	50.0	50.0	2.10	1.81	1.57	1.37	1.23	2.79	2.42	2.11	1.85	1.73	1.35	1.62	12.89	
1995	20.6	27.3	20.6	1.64	1.40	1.20	1.03	0.94	2.16	1.85	1.60	1.38	1.32	1.34	1.45	12.89	
2000	0.0	0.0	0.0	0.86	0.73	0.62	0.52	0.56	1.26	1.06	0.89	0.75	0.80	1.28	1.31	10.40	7.12 @ 0F
2000	0.0	100.0	0.0	1.60	1.32	1.09	0.89	0.89	2.18	1.78	1.45	1.19	1.19	1.24	1.55	10.40	6.77 @ 25F
2000	100.0	0.0	100.0	1.54	1.38	1.24	1.11	1.10	2.25	2.03	1.82	1.64	1.62	1.31	1.67	10.40	6.45 @ 50F
2000	50.0	0.0	50.0	1.16	1.02	0.89	0.78	0.80	1.70	1.48	1.30	1.14	1.16	1.29	1.47	10.40	6.14 @ 75F
2000	0.0	50.0	0.0	1.18	0.99	0.82	0.68	0.70	1.66	1.37	1.13	0.94	0.96	1.26	1.42	10.40	6.28 @100F
2000	50.0	50.0	50.0	1.57	1.35	1.16	1.00	1.00	2.22	1.90	1.64	1.41	1.41	1.28	1.61	10.40	
2000	20.6	27.3	20.6	1.16	0.99	0.84	0.72	0.74	1.66	1.40	1.19	1.01	1.04	1.27	1.44	10.40	
2010	0.0	0.0	0.0	0.76	0.66	0.56	0.48	0.52	1.11	0.94	0.79	0.66	0.71	1.31	1.34	9.60	6.96 @ 0F
2010	0.0	100.0	0.0	1.47	1.23	1.03	0.86	0.86	1.91	1.56	1.28	1.04	1.04	1.27	1.58	9.60	6.63 @ 25F
2010	100.0	0.0	100.0	1.50	1.34	1.21	1.08	1.07	2.11	1.89	1.70	1.52	1.51	1.34	1.70	9.60	6.31 @ 50F
2010	50.0	0.0	50.0	1.08	0.96	0.85	0.75	0.76	1.55	1.35	1.19	1.04	1.06	1.32	1.50	9.60	6.00 @ 75F
2010	0.0	50.0	0.0	1.07	0.90	0.76	0.65	0.67	1.46	1.21	1.00	0.82	0.85	1.29	1.45	9.60	6.20 @100F
2010	50.0	50.0	50.0	1.48	1.29	1.12	0.97	0.96	2.01	1.73	1.49	1.28	1.27	1.30	1.64	9.60	
2010	20.6	27.3	20.6	1.06	0.91	0.79	0.68	0.70	1.48	1.26	1.07	0.91	0.93	1.30	1.46	9.60	

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TABLE 1.19

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	LDDV- 0-100F	LDDT- 0-100F	HDDV- 0-100F	HDGV
1980	0.0	0.0	0.0	30.34	27.06	24.33	22.04	28.82	37.43	33.72	30.61	27.99	35.36	2.30	4.03	21.15	76.88 @ 0F
1980	0.0	100.0	0.0	28.12	27.88	27.74	27.68	39.49	36.22	35.93	35.70	35.55	49.52	2.46	3.97	21.15	66.42 @ 25F
1980	100.0	0.0	100.0	247.51	140.99	80.42	45.93	33.79	307.60	175.29	100.02	57.14	41.93	3.91	6.64	21.15	57.38 @ 50F
1980	50.0	0.0	50.0	118.70	73.37	47.05	31.62	30.76	148.69	91.95	59.05	39.80	37.92	2.91	5.02	21.15	49.55 @ 75F
1980	0.0	50.0	0.0	29.30	27.26	25.59	24.22	32.99	36.70	34.41	32.50	30.91	40.90	2.33	3.94	21.15	56.37 @100F
1980	50.0	50.0	50.0	137.81	84.44	54.08	36.81	36.64	171.91	105.61	67.86	46.35	45.72	3.19	5.31	21.15	
1980	20.6	27.3	20.6	65.90	46.10	34.30	27.13	31.87	82.55	57.91	43.26	34.40	39.40	2.56	4.38	21.15	
1988	0.0	0.0	0.0	18.81	15.73	13.24	11.22	16.94	26.74	22.42	18.90	16.02	22.08	1.70	2.40	13.35	33.33 @ 0F
1988	0.0	100.0	0.0	19.33	17.93	16.78	15.82	23.52	30.71	27.96	25.63	23.65	32.52	1.94	2.77	13.35	28.20 @ 25F
1988	100.0	0.0	100.0	231.53	115.10	58.15	29.82	24.78	316.34	159.68	81.47	42.00	36.01	2.65	4.06	13.35	23.89 @ 50F
1988	50.0	0.0	50.0	99.56	53.58	30.37	18.29	19.79	138.08	75.27	42.99	25.97	27.27	2.05	3.03	13.35	20.28 @ 75F
1988	0.0	50.0	0.0	18.86	16.46	14.51	12.93	19.41	28.10	24.42	21.38	18.88	26.01	1.77	2.51	13.35	25.09 @100F
1988	50.0	50.0	50.0	125.43	66.52	37.46	22.82	24.15	173.53	93.82	53.55	32.82	34.26	2.29	3.41	13.35	
1988	20.6	27.3	20.6	51.77	31.56	20.91	15.02	19.43	72.90	45.06	30.07	21.62	26.32	1.88	2.71	13.35	
1990	0.0	0.0	0.0	16.35	13.54	11.26	9.42	14.16	24.03	19.94	16.61	13.90	18.61	1.52	1.98	12.16	27.08 @ 0F
1990	0.0	100.0	0.0	17.82	16.21	14.88	13.76	19.88	28.86	25.72	23.07	20.82	27.39	1.74	2.25	12.16	22.44 @ 25F
1990	100.0	0.0	100.0	221.52	108.32	53.79	27.11	23.28	284.59	141.60	71.14	36.09	31.81	2.36	3.34	12.16	18.62 @ 50F
1990	50.0	0.0	50.0	93.38	49.23	27.30	16.08	17.48	123.47	66.43	37.45	22.35	23.54	1.84	2.49	12.16	15.47 @ 75F
1990	0.0	50.0	0.0	16.78	14.46	12.56	11.02	16.28	25.75	22.05	19.00	16.49	21.91	1.58	2.06	12.16	19.04 @100F
1990	50.0	50.0	50.0	119.67	62.26	34.33	20.44	21.57	156.73	83.66	47.10	28.46	29.60	2.05	2.80	12.16	
1990	20.6	27.3	20.6	47.99	28.59	18.50	13.00	16.65	65.52	40.04	26.40	18.74	22.40	1.68	2.23	12.16	
1995	0.0	0.0	0.0	11.57	9.38	7.61	6.17	8.61	18.87	15.34	12.49	10.18	12.40	0.97	1.43	10.66	22.01 @ 0F
1995	0.0	100.0	0.0	14.77	12.85	11.21	9.83	12.45	24.60	21.04	18.06	15.56	17.93	1.09	1.55	10.66	17.63 @ 25F
1995	100.0	0.0	100.0	183.39	88.82	43.57	21.63	19.92	218.67	107.20	52.86	26.21	24.58	1.55	2.40	10.66	14.11 @ 50F
1995	50.0	0.0	50.0	75.38	38.94	21.01	11.94	12.78	94.23	50.01	27.72	16.22	16.95	1.19	1.79	10.66	11.27 @ 75F
1995	0.0	50.0	0.0	12.73	10.65	8.93	7.52	10.02	20.98	17.46	14.56	12.19	14.47	1.00	1.45	10.66	13.13 @100F
1995	50.0	50.0	50.0	99.08	50.83	27.39	15.73	16.18	121.64	64.12	35.46	20.89	21.26	1.32	1.97	10.66	
1995	20.6	27.3	20.6	38.20	22.11	13.78	9.25	11.07	50.74	30.62	19.82	13.73	15.37	1.07	1.59	10.66	
2000	0.0	0.0	0.0	7.91	6.46	5.27	4.30	4.70	16.01	12.91	10.40	8.39	9.17	0.89	1.44	10.23	20.79 @ 0F
2000	0.0	100.0	0.0	11.72	9.89	8.35	7.05	7.12	21.87	18.31	15.34	12.86	13.02	1.00	1.59	10.23	16.33 @ 25F
2000	100.0	0.0	100.0	134.04	66.43	33.30	16.87	16.56	179.02	88.43	43.77	21.70	21.31	1.41	2.43	10.23	12.79 @ 50F
2000	50.0	0.0	50.0	54.91	28.85	15.76	9.01	9.15	77.29	41.30	22.95	13.39	13.73	1.09	1.82	10.23	9.97 @ 75F
2000	0.0	50.0	0.0	9.34	7.74	6.42	5.32	5.60	18.21	14.93	12.26	10.06	10.61	0.92	1.48	10.23	11.26 @100F
2000	50.0	50.0	50.0	72.88	38.16	20.82	11.96	11.84	100.44	53.37	29.56	17.28	17.17	1.21	2.01	10.23	
2000	20.6	27.3	20.6	27.83	16.27	10.16	6.77	7.00	42.18	25.57	16.51	11.33	11.81	0.99	1.61	10.23	
2010	0.0	0.0	0.0	7.64	6.25	5.11	4.18	4.57	14.52	11.64	9.34	7.49	8.20	0.96	1.51	10.11	20.68 @ 0F
2010	0.0	100.0	0.0	10.55	8.95	7.60	6.44	6.50	19.75	16.49	13.76	11.49	11.59	1.07	1.70	10.11	16.11 @ 25F
2010	100.0	0.0	100.0	91.98	50.29	27.50	15.04	14.75	150.89	76.13	38.41	19.38	19.01	1.48	2.55	10.11	12.49 @ 50F
2010	50.0	0.0	50.0	39.62	22.95	13.60	8.30	8.43	65.84	35.91	20.28	11.96	12.27	1.15	1.90	10.11	9.61 @ 75F
2010	0.0	50.0	0.0	8.74	7.27	6.05	5.04	5.30	16.48	13.46	11.00	8.99	9.47	0.99	1.56	10.11	10.61 @100F
2010	50.0	50.0	50.0	51.26	29.62	17.55	10.74	10.63	85.32	46.31	26.09	15.43	15.30	1.27	2.12	10.11	
2010	20.6	27.3	20.6	21.27	13.61	9.08	6.32	6.54	36.49	22.51	14.69	10.12	10.54	1.06	1.70	10.11	

TABLE 1.19: NMHC AT 2.5 MPH.

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TABLE 1.20

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	LDGV 25 F	LDGV 50 F	LDGV 75 F	LDGV 100 F	LDGT 0 F	LDGT 25 F	LDGT 50 F	LDGT 75 F	LDGT 100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	17.84	16.02	14.49	13.20	16.90	22.65	20.49	18.67	17.14	21.36	2.02	3.54	18.59	61.27 @ 0F
1980	0.0	100.0	0.0	16.52	16.43	16.38	16.39	23.03	21.93	21.78	21.67	21.61	29.79	2.16	3.49	18.59	52.93 @ 25F
1980	100.0	0.0	100.0	144.21	82.31	47.04	26.92	19.85	185.77	105.96	60.52	34.61	25.44	3.44	5.84	18.59	45.73 @ 50F
1980	50.0	0.0	50.0	69.51	43.10	27.74	18.73	18.06	90.03	55.75	35.87	24.24	22.96	2.56	4.41	18.59	39.49 @ 75F
1980	0.0	50.0	0.0	17.22	16.10	15.19	14.44	19.31	22.22	20.89	19.79	18.87	24.67	2.04	3.46	18.59	44.93 @ 100F
1980	50.0	50.0	50.0	80.37	49.37	31.71	21.65	21.44	103.85	63.87	41.10	28.11	27.61	2.80	4.66	18.59	
1980	20.6	27.3	20.6	38.63	27.14	20.28	16.13	18.68	49.98	35.13	26.31	20.98	23.81	2.25	3.85	18.59	
1988	0.0	0.0	0.0	10.13	8.52	7.22	6.16	9.19	14.41	12.14	10.29	8.78	12.04	1.49	2.11	11.73	26.57 @ 0F
1988	0.0	100.0	0.0	10.24	9.56	9.00	8.55	12.70	16.27	14.90	13.73	12.75	17.58	1.71	2.43	11.73	22.47 @ 25F
1988	100.0	0.0	100.0	120.59	60.40	30.74	15.88	13.12	165.80	84.22	43.25	22.44	19.06	2.33	3.57	11.73	19.04 @ 50F
1988	50.0	0.0	50.0	52.25	28.38	16.23	9.86	10.62	72.82	40.00	23.02	14.03	14.66	1.80	2.66	11.73	16.16 @ 75F
1988	0.0	50.0	0.0	10.09	8.86	7.86	7.05	10.51	15.03	13.13	11.56	10.26	14.12	1.55	2.20	11.73	20.00 @ 100F
1988	50.0	50.0	50.0	65.41	34.98	19.87	12.21	12.91	91.04	49.56	28.49	17.59	18.32	2.02	3.00	11.73	
1988	20.6	27.3	20.6	27.29	16.80	11.24	8.15	10.48	38.58	24.04	16.17	11.72	14.23	1.65	2.39	11.73	
1990	0.0	0.0	0.0	8.63	7.18	6.01	5.06	7.54	12.66	10.54	8.82	7.42	9.93	1.34	1.74	10.68	21.58 @ 0F
1990	0.0	100.0	0.0	9.24	8.46	7.81	7.27	10.54	14.99	13.42	12.10	10.98	14.52	1.53	1.98	10.68	17.88 @ 25F
1990	100.0	0.0	100.0	113.34	55.76	27.87	14.14	12.07	146.94	73.49	37.13	18.94	16.56	2.08	2.94	10.68	14.84 @ 50F
1990	50.0	0.0	50.0	48.06	25.53	14.27	8.48	9.19	64.05	34.67	19.67	11.82	12.40	1.61	2.19	10.68	12.33 @ 75F
1990	0.0	50.0	0.0	8.79	7.61	6.65	5.87	8.65	13.48	11.59	10.03	8.75	11.66	1.39	1.81	10.68	15.18 @ 100F
1990	50.0	50.0	50.0	61.29	32.11	17.84	10.70	11.30	80.96	43.46	24.61	14.96	15.54	1.80	2.46	10.68	
1990	20.6	27.3	20.6	24.79	14.90	9.72	6.89	8.81	34.06	20.95	13.90	9.93	11.87	1.48	1.96	10.68	
1995	0.0	0.0	0.0	5.85	4.74	3.85	3.12	4.38	9.57	7.80	6.36	5.19	6.35	0.85	1.26	9.37	17.55 @ 0F
1995	0.0	100.0	0.0	7.41	6.45	5.64	4.95	6.31	12.40	10.63	9.14	7.90	9.16	0.96	1.36	9.37	14.05 @ 25F
1995	100.0	0.0	100.0	91.52	44.41	21.82	10.85	9.97	110.17	54.12	26.75	13.30	12.42	1.36	2.10	9.37	11.24 @ 50F
1995	50.0	0.0	50.0	37.68	19.51	10.55	6.00	6.44	47.55	25.29	14.06	8.25	8.62	1.04	1.58	9.37	8.98 @ 75F
1995	0.0	50.0	0.0	6.41	5.36	4.50	3.79	5.09	10.61	8.84	7.39	6.20	7.40	0.88	1.28	9.37	10.46 @ 100F
1995	50.0	50.0	50.0	49.46	25.43	13.73	7.90	8.14	61.28	32.37	17.94	10.60	10.79	1.16	1.73	9.37	
1995	20.6	27.3	20.6	19.12	11.10	6.93	4.66	5.60	25.62	15.49	10.06	6.98	7.84	0.94	1.40	9.37	
2000	0.0	0.0	0.0	3.94	3.21	2.62	2.14	2.34	7.97	6.42	5.18	4.17	4.56	0.79	1.27	8.99	16.57 @ 0F
2000	0.0	100.0	0.0	5.83	4.92	4.15	3.50	3.54	10.88	9.11	7.64	6.40	6.48	0.88	1.40	8.99	13.02 @ 25F
2000	100.0	0.0	100.0	66.52	32.99	16.55	8.39	8.23	89.08	44.01	21.78	10.80	10.61	1.24	2.13	8.99	10.19 @ 50F
2000	50.0	0.0	50.0	27.26	14.33	7.83	4.48	4.55	38.46	20.55	11.42	6.66	6.84	0.96	1.60	8.99	7.94 @ 75F
2000	0.0	50.0	0.0	4.64	3.85	3.19	2.65	2.79	9.06	7.43	6.10	5.01	5.28	0.81	1.30	8.99	8.97 @ 100F
2000	50.0	50.0	50.0	36.17	18.95	10.35	5.94	5.89	49.98	26.56	14.71	8.60	8.54	1.06	1.77	8.99	
2000	20.6	27.3	20.6	13.82	8.09	5.05	3.37	3.48	20.99	12.73	8.22	5.64	5.88	0.87	1.42	8.99	
2010	0.0	0.0	0.0	3.81	3.12	2.55	2.09	2.28	7.23	5.80	4.65	3.73	4.08	0.85	1.33	8.88	16.48 @ 0F
2010	0.0	100.0	0.0	5.27	4.47	3.79	3.22	3.24	9.83	8.20	6.85	5.72	5.77	0.94	1.49	8.88	12.84 @ 25F
2010	100.0	0.0	100.0	45.91	25.11	13.73	7.51	7.36	75.11	37.89	19.12	9.65	9.46	1.30	2.24	8.88	9.95 @ 50F
2010	50.0	0.0	50.0	19.78	11.45	6.79	4.14	4.21	32.77	17.87	10.09	5.95	6.10	1.01	1.67	8.88	7.66 @ 75F
2010	0.0	50.0	0.0	4.36	3.63	3.02	2.51	2.65	8.20	6.70	5.48	4.48	4.71	0.87	1.37	8.88	8.45 @ 100F
2010	50.0	50.0	50.0	25.59	14.79	8.76	5.36	5.30	42.47	23.05	12.98	7.68	7.61	1.12	1.86	8.88	
2010	20.6	27.3	20.6	10.62	6.79	4.53	3.15	3.27	18.16	11.21	7.31	5.04	5.25	0.93	1.49	8.88	

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TABLE 1.21

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	LDGV 25 F	LDGV 50 F	LDGV 75 F	LDGV 100 F	LDGT 0 F	LDGT 25 F	LDGT 50 F	LDGT 75 F	LDGT 100 F	LDDV 0-100F	LDDT 0-100F	HDDV 0-100F	HDGV
1980	0.0	0.0	0.0	9.57	8.62	7.82	7.14	9.06	12.31	11.16	10.19	9.37	11.60	1.59	2.78	14.59	40.15 @ 0F
1980	0.0	100.0	0.0	8.86	8.82	8.81	8.82	12.32	11.93	11.86	11.81	11.79	16.17	1.70	2.74	14.59	34.68 @ 25F
1980	100.0	0.0	100.0	77.17	44.07	25.21	14.43	10.66	101.04	57.66	32.94	18.85	13.87	2.70	4.58	14.59	29.96 @ 50F
1980	50.0	0.0	50.0	37.27	23.13	14.91	10.08	9.69	49.02	30.37	19.56	13.23	12.50	2.01	3.46	14.59	25.88 @ 75F
1980	0.0	50.0	0.0	9.24	8.66	8.18	7.79	10.35	12.08	11.38	10.80	10.31	13.40	1.60	2.72	14.59	29.44 @100F
1980	50.0	50.0	50.0	43.01	26.45	17.01	11.63	11.49	56.48	34.76	22.38	15.32	15.02	2.20	3.66	14.59	
1980	20.6	27.3	20.6	20.72	14.57	10.91	8.70	10.02	27.21	19.14	14.35	11.46	12.94	1.77	3.02	14.59	
1988	0.0	0.0	0.0	5.23	4.42	3.75	3.22	4.77	7.46	6.30	5.36	4.58	6.26	1.17	1.66	9.21	17.41 @ 0F
1988	0.0	100.0	0.0	5.24	4.91	4.64	4.42	6.57	8.35	7.67	7.09	6.60	9.11	1.34	1.91	9.21	14.72 @ 25F
1988	100.0	0.0	100.0	60.96	30.68	15.69	8.14	6.70	84.57	43.11	22.21	11.56	9.78	1.83	2.80	9.21	12.48 @ 50F
1988	50.0	0.0	50.0	26.54	14.50	8.34	5.10	5.47	37.27	20.55	11.88	7.27	7.57	1.41	2.09	9.21	10.59 @ 75F
1988	0.0	50.0	0.0	5.19	4.57	4.07	3.66	5.44	7.75	6.79	5.99	5.34	7.34	1.22	1.73	9.21	13.10 @100F
1988	50.0	50.0	50.0	33.10	17.79	10.16	6.28	6.64	46.46	25.39	14.65	9.08	9.44	1.58	2.36	9.21	
1988	20.6	27.3	20.6	13.90	8.61	5.80	4.22	5.42	19.78	12.38	8.36	6.09	7.38	1.30	1.87	9.21	
1990	0.0	0.0	0.0	4.41	3.68	3.09	2.61	3.88	6.48	5.41	4.54	3.83	5.12	1.05	1.36	8.39	14.14 @ 0F
1990	0.0	100.0	0.0	4.68	4.29	3.98	3.72	5.40	7.61	6.84	6.18	5.62	7.46	1.20	1.55	8.39	11.72 @ 25F
1990	100.0	0.0	100.0	56.72	28.03	14.07	7.17	6.10	74.36	37.30	18.90	9.67	8.43	1.63	2.31	8.39	9.72 @ 50F
1990	50.0	0.0	50.0	24.16	12.90	7.25	4.33	4.69	32.50	17.65	10.06	6.06	6.35	1.27	1.72	8.39	8.08 @ 75F
1990	0.0	50.0	0.0	4.48	3.89	3.40	3.02	4.44	6.88	5.93	5.14	4.50	6.00	1.09	1.42	8.39	9.94 @100F
1990	50.0	50.0	50.0	30.70	16.16	9.02	5.44	5.75	40.99	22.07	12.54	7.65	7.94	1.41	1.93	8.39	
1990	20.6	27.3	20.6	12.50	7.55	4.96	3.53	4.51	17.31	10.68	7.12	5.10	6.10	1.16	1.54	8.39	
1995	0.0	0.0	0.0	2.92	2.36	1.92	1.55	2.19	4.80	3.91	3.19	2.61	3.20	0.67	0.99	7.35	11.50 @ 0F
1995	0.0	100.0	0.0	3.67	3.20	2.80	2.46	3.15	6.19	5.31	4.57	3.95	4.60	0.75	1.07	7.35	9.21 @ 25F
1995	100.0	0.0	100.0	45.11	21.94	10.80	5.38	4.93	54.92	27.02	13.37	6.66	6.20	1.07	1.65	7.35	7.37 @ 50F
1995	50.0	0.0	50.0	18.60	9.65	5.23	2.98	3.20	23.73	12.64	7.04	4.14	4.32	0.82	1.24	7.35	5.89 @ 75F
1995	0.0	50.0	0.0	3.19	2.67	2.24	1.89	2.54	5.31	4.43	3.70	3.11	3.72	0.69	1.00	7.35	6.86 @100F
1995	50.0	50.0	50.0	24.39	12.57	6.80	3.92	4.04	30.56	16.16	8.97	5.31	5.40	0.91	1.36	7.35	
1995	20.6	27.3	20.6	9.46	5.50	3.44	2.32	2.79	12.79	7.75	5.04	3.50	3.94	0.74	1.10	7.35	
2000	0.0	0.0	0.0	1.94	1.59	1.30	1.06	1.16	3.95	3.18	2.56	2.07	2.26	0.62	1.00	7.06	10.86 @ 0F
2000	0.0	100.0	0.0	2.88	2.43	2.05	1.73	1.75	5.39	4.51	3.78	3.17	3.21	0.69	1.10	7.06	8.53 @ 25F
2000	100.0	0.0	100.0	32.76	16.27	8.17	4.15	4.07	44.11	21.79	10.79	5.35	5.26	0.98	1.68	7.06	6.68 @ 50F
2000	50.0	0.0	50.0	13.44	7.07	3.87	2.22	2.25	19.05	10.18	5.66	3.30	3.39	0.75	1.25	7.06	5.21 @ 75F
2000	0.0	50.0	0.0	2.29	1.90	1.58	1.31	1.38	4.49	3.68	3.02	2.48	2.62	0.64	1.02	7.06	5.88 @100F
2000	50.0	50.0	50.0	17.82	9.35	5.11	2.94	2.91	24.75	13.15	7.29	4.26	4.23	0.83	1.39	7.06	
2000	20.6	27.3	20.6	6.82	3.99	2.50	1.66	1.72	10.40	6.30	4.07	2.79	2.91	0.68	1.11	7.06	
2010	0.0	0.0	0.0	1.90	1.55	1.27	1.04	1.14	3.58	2.87	2.30	1.85	2.02	0.66	1.04	6.97	10.80 @ 0F
2010	0.0	100.0	0.0	2.63	2.23	1.89	1.60	1.62	4.87	4.06	3.39	2.83	2.86	0.74	1.17	6.97	8.41 @ 25F
2010	100.0	0.0	100.0	22.88	12.51	6.84	3.74	3.67	37.21	18.77	9.47	4.78	4.69	1.02	1.76	6.97	6.52 @ 50F
2010	50.0	0.0	50.0	9.86	5.71	3.38	2.06	2.10	16.24	8.85	5.00	2.95	3.02	0.80	1.31	6.97	5.02 @ 75F
2010	0.0	50.0	0.0	2.17	1.81	1.51	1.25	1.32	4.06	3.32	2.71	2.22	2.34	0.68	1.08	6.97	5.54 @100F
2010	50.0	50.0	50.0	12.75	7.37	4.37	2.67	2.64	21.04	11.42	6.43	3.81	3.77	0.88	1.46	6.97	
2010	20.6	27.3	20.6	5.29	3.39	2.26	1.57	1.63	9.00	5.55	3.62	2.50	2.60	0.73	1.17	6.97	

TABLE 1.21 NMHC AT 10.0 MPH

TABLE 1.22

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	LDGV 25 F	LDGV 50 F	LDGV 75 F	LDGV 100 F	LDGT 0 F	LDGT 25 F	LDGT 50 F	LDGT 75 F	LDGT 100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	5.62	5.09	4.64	4.26	5.32	7.39	6.72	6.16	5.68	6.96	1.06	1.86	9.75	20.03 @ 0F
1980	0.0	100.0	0.0	5.20	5.19	5.19	5.22	7.21	7.17	7.14	7.12	7.11	9.68	1.13	1.83	9.75	17.30 @ 25F
1980	100.0	0.0	100.0	45.14	25.81	14.78	8.47	6.28	60.70	34.66	19.82	11.35	8.37	1.81	3.06	9.75	14.95 @ 50F
1980	50.0	0.0	50.0	21.88	13.61	8.79	5.97	5.70	29.50	18.30	11.80	7.99	7.52	1.34	2.31	9.75	12.91 @ 75F
1980	0.0	50.0	0.0	5.42	5.10	4.84	4.63	6.06	7.26	6.85	6.52	6.24	8.03	1.07	1.82	9.75	14.69 @100F
1980	50.0	50.0	50.0	25.17	15.50	9.99	6.85	6.74	33.93	20.90	13.47	9.23	9.02	1.47	2.45	9.75	
1980	20.6	27.3	20.6	12.17	8.58	6.45	5.16	5.88	16.37	11.53	8.66	6.93	7.77	1.18	2.02	9.75	
1988	0.0	0.0	0.0	2.87	2.43	2.08	1.80	2.63	4.09	3.48	2.97	2.56	3.48	0.78	1.11	6.16	8.68 @ 0F
1988	0.0	100.0	0.0	2.82	2.66	2.53	2.43	3.61	4.51	4.17	3.87	3.63	5.01	0.89	1.27	6.16	7.35 @ 25F
1988	100.0	0.0	100.0	31.99	16.27	8.40	4.40	3.60	45.09	23.15	12.01	6.30	5.28	1.22	1.87	6.16	6.23 @ 50F
1988	50.0	0.0	50.0	14.07	7.78	4.52	2.80	2.98	20.01	11.13	6.49	4.00	4.15	0.95	1.40	6.16	5.28 @ 75F
1988	0.0	50.0	0.0	2.82	2.50	2.24	2.03	3.00	4.23	3.72	3.30	2.96	4.06	0.81	1.16	6.16	6.54 @100F
1988	50.0	50.0	50.0	17.41	9.46	5.46	3.41	3.60	24.80	13.66	7.94	4.96	5.15	1.06	1.57	6.16	
1988	20.6	27.3	20.6	7.42	4.65	3.16	2.33	2.97	10.66	6.73	4.59	3.36	4.06	0.87	1.25	6.16	
1990	0.0	0.0	0.0	2.37	1.98	1.68	1.43	2.10	3.48	2.92	2.46	2.09	2.78	0.70	0.91	5.60	7.06 @ 0F
1990	0.0	100.0	0.0	2.45	2.27	2.12	1.99	2.91	4.02	3.63	3.30	3.02	4.03	0.80	1.04	5.60	5.85 @ 25F
1990	100.0	0.0	100.0	29.13	14.53	7.36	3.78	3.20	39.00	19.69	10.04	5.17	4.47	1.09	1.54	5.60	4.85 @ 50F
1990	50.0	0.0	50.0	12.51	6.76	3.84	2.32	2.50	17.14	9.38	5.38	3.27	3.41	0.85	1.15	5.60	4.03 @ 75F
1990	0.0	50.0	0.0	2.38	2.08	1.83	1.63	2.40	3.66	3.17	2.77	2.44	3.25	0.73	0.95	5.60	4.96 @100F
1990	50.0	50.0	50.0	15.79	8.40	4.74	2.89	3.05	21.51	11.66	6.67	4.10	4.25	0.95	1.29	5.60	
1990	20.6	27.3	20.6	6.51	3.98	2.64	1.90	2.43	9.15	5.69	3.82	2.76	3.29	0.78	1.03	5.60	
1995	0.0	0.0	0.0	1.48	1.20	0.97	0.79	1.13	2.46	2.01	1.64	1.35	1.66	0.44	0.66	4.91	5.74 @ 0F
1995	0.0	100.0	0.0	1.85	1.61	1.41	1.24	1.61	3.15	2.71	2.34	2.03	2.38	0.50	0.71	4.91	4.59 @ 25F
1995	100.0	0.0	100.0	22.40	10.94	5.41	2.71	2.47	27.92	13.77	6.84	3.41	3.17	0.71	1.10	4.91	3.68 @ 50F
1995	50.0	0.0	50.0	9.27	4.84	2.63	1.51	1.62	12.09	6.46	3.61	2.13	2.22	0.55	0.83	4.91	2.94 @ 75F
1995	0.0	50.0	0.0	1.61	1.35	1.13	0.96	1.30	2.71	2.27	1.90	1.60	1.93	0.46	0.67	4.91	3.42 @100F
1995	50.0	50.0	50.0	12.13	6.28	3.41	1.97	2.04	15.53	8.24	4.59	2.72	2.77	0.61	0.91	4.91	
1995	20.6	27.3	20.6	4.73	2.76	1.74	1.17	1.42	6.52	3.96	2.58	1.80	2.03	0.50	0.73	4.91	
2000	0.0	0.0	0.0	0.97	0.79	0.65	0.53	0.58	1.98	1.60	1.28	1.04	1.13	0.41	0.67	4.72	5.42 @ 0F
2000	0.0	100.0	0.0	1.44	1.21	1.02	0.86	0.87	2.70	2.26	1.90	1.59	1.61	0.46	0.74	4.72	4.26 @ 25F
2000	100.0	0.0	100.0	16.23	8.08	4.07	2.07	2.03	22.09	10.91	5.40	2.68	2.63	0.65	1.12	4.72	3.33 @ 50F
2000	50.0	0.0	50.0	6.66	3.52	1.93	1.11	1.12	9.54	5.10	2.83	1.65	1.70	0.50	0.84	4.72	2.60 @ 75F
2000	0.0	50.0	0.0	1.15	0.95	0.79	0.65	0.69	2.25	1.85	1.51	1.24	1.31	0.43	0.68	4.72	2.93 @100F
2000	50.0	50.0	50.0	8.83	4.65	2.55	1.47	1.45	12.39	6.59	3.65	2.14	2.12	0.56	0.93	4.72	
2000	20.6	27.3	20.6	3.39	1.99	1.24	0.83	0.86	5.21	3.16	2.04	1.40	1.46	0.46	0.75	4.72	
2010	0.0	0.0	0.0	0.96	0.79	0.64	0.53	0.58	1.79	1.44	1.15	0.93	1.01	0.44	0.70	4.66	5.39 @ 0F
2010	0.0	100.0	0.0	1.33	1.13	0.96	0.81	0.82	2.44	2.04	1.70	1.42	1.43	0.49	0.78	4.66	4.20 @ 25F
2010	100.0	0.0	100.0	11.60	6.34	3.47	1.90	1.86	18.65	9.41	4.75	2.40	2.35	0.68	1.17	4.66	3.25 @ 50F
2010	50.0	0.0	50.0	5.00	2.89	1.72	1.05	1.06	8.14	4.44	2.51	1.48	1.52	0.53	0.88	4.66	2.51 @ 75F
2010	0.0	50.0	0.0	1.10	0.92	0.76	0.63	0.67	2.04	1.66	1.36	1.11	1.17	0.46	0.72	4.66	2.76 @100F
2010	50.0	50.0	50.0	6.47	3.74	2.21	1.35	1.34	10.55	5.72	3.22	1.91	1.89	0.59	0.98	4.66	
2010	20.6	27.3	20.6	2.68	1.72	1.15	0.80	0.82	4.51	2.78	1.82	1.25	1.30	0.49	0.78	4.66	

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TABLE 1.23

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	3.68	3.36	3.09	2.85	3.47	4.85	4.45	4.12	3.83	4.55	0.66	1.15	6.05	9.04 @ 0F
1980	0.0	100.0	0.0	3.41	3.41	3.43	3.46	4.68	4.74	4.73	4.74	4.75	6.32	0.70	1.14	6.05	7.81 @ 25F
1980	100.0	0.0	100.0	29.47	16.88	9.69	5.56	4.14	40.05	22.91	13.12	7.52	5.57	1.12	1.90	6.05	6.74 @ 50F
1980	50.0	0.0	50.0	14.36	8.95	5.81	3.96	3.74	19.54	12.15	7.86	5.35	4.96	0.83	1.44	6.05	5.82 @ 75F
1980	0.0	50.0	0.0	3.55	3.37	3.21	3.09	3.95	4.78	4.55	4.35	4.19	5.26	0.67	1.13	6.05	6.63 @100F
1980	50.0	50.0	50.0	16.44	10.15	6.56	4.51	4.41	22.40	13.82	8.93	6.14	5.95	0.91	1.52	6.05	
1980	20.6	27.3	20.6	7.98	5.65	4.27	3.44	3.84	10.82	7.65	5.77	4.65	5.10	0.73	1.25	6.05	
1988	0.0	0.0	0.0	1.72	1.47	1.28	1.11	1.58	2.44	2.09	1.80	1.57	2.08	0.49	0.69	3.82	3.92 @ 0F
1988	0.0	100.0	0.0	1.66	1.58	1.52	1.47	2.16	2.66	2.47	2.31	2.18	2.98	0.56	0.79	3.82	3.31 @ 25F
1988	100.0	0.0	100.0	18.60	9.54	4.97	2.62	2.14	26.36	13.62	7.11	3.75	3.13	0.76	1.16	3.82	2.81 @ 50F
1988	50.0	0.0	50.0	8.36	4.65	2.73	1.70	1.79	11.82	6.62	3.89	2.42	2.48	0.59	0.87	3.82	2.38 @ 75F
1988	0.0	50.0	0.0	1.69	1.51	1.36	1.25	1.80	2.51	2.23	1.99	1.80	2.42	0.51	0.72	3.82	2.95 @100F
1988	50.0	50.0	50.0	10.13	5.56	3.24	2.05	2.15	14.51	8.04	4.71	2.97	3.05	0.66	0.98	3.82	
1988	20.6	27.3	20.6	4.41	2.79	1.92	1.43	1.79	6.31	4.01	2.76	2.04	2.43	0.54	0.78	3.82	
1990	0.0	0.0	0.0	1.39	1.17	1.00	0.86	1.23	2.03	1.72	1.46	1.25	1.64	0.44	0.57	3.48	3.18 @ 0F
1990	0.0	100.0	0.0	1.41	1.31	1.23	1.17	1.70	2.32	2.11	1.93	1.78	2.35	0.50	0.64	3.48	2.64 @ 25F
1990	100.0	0.0	100.0	16.47	8.28	4.23	2.19	1.85	22.41	11.38	5.84	3.02	2.60	0.68	0.96	3.48	2.19 @ 50F
1990	50.0	0.0	50.0	7.24	3.93	2.25	1.37	1.47	9.96	5.48	3.17	1.94	2.00	0.52	0.71	3.48	1.82 @ 75F
1990	0.0	50.0	0.0	1.38	1.22	1.08	0.97	1.41	2.13	1.86	1.63	1.45	1.91	0.45	0.59	3.48	2.24 @100F
1990	50.0	50.0	50.0	8.94	4.80	2.73	1.68	1.77	12.37	6.74	3.88	2.40	2.48	0.59	0.80	3.48	
1990	20.6	27.3	20.6	3.77	2.32	1.56	1.13	1.42	5.32	3.33	2.25	1.64	1.93	0.48	0.64	3.48	
1995	0.0	0.0	0.0	0.83	0.68	0.55	0.44	0.63	1.40	1.14	0.94	0.77	0.94	0.28	0.41	3.05	2.59 @ 0F
1995	0.0	100.0	0.0	1.01	0.88	0.78	0.68	0.88	1.76	1.52	1.31	1.14	1.34	0.31	0.44	3.05	2.07 @ 25F
1995	100.0	0.0	100.0	12.24	5.99	2.97	1.49	1.36	15.56	7.69	3.83	1.92	1.77	0.44	0.69	3.05	1.66 @ 50F
1995	50.0	0.0	50.0	5.18	2.70	1.47	0.84	0.90	6.82	3.65	2.04	1.21	1.26	0.34	0.51	3.05	1.32 @ 75F
1995	0.0	50.0	0.0	0.90	0.75	0.63	0.53	0.73	1.53	1.28	1.08	0.91	1.09	0.29	0.42	3.05	1.54 @100F
1995	50.0	50.0	50.0	6.63	3.44	1.87	1.09	1.12	8.66	4.60	2.57	1.53	1.56	0.38	0.56	3.05	
1995	20.6	27.3	20.6	2.64	1.54	0.97	0.65	0.79	3.68	2.24	1.47	1.02	1.15	0.31	0.45	3.05	
2000	0.0	0.0	0.0	0.55	0.45	0.37	0.30	0.33	1.12	0.90	0.73	0.58	0.64	0.26	0.41	2.93	2.44 @ 0F
2000	0.0	100.0	0.0	0.79	0.67	0.56	0.48	0.48	1.49	1.25	1.05	0.88	0.89	0.29	0.46	2.93	1.92 @ 25F
2000	100.0	0.0	100.0	8.90	4.44	2.24	1.14	1.12	12.21	6.04	2.99	1.48	1.46	0.40	0.69	2.93	1.50 @ 50F
2000	50.0	0.0	50.0	3.73	1.97	1.08	0.62	0.63	5.34	2.85	1.59	0.93	0.95	0.31	0.52	2.93	1.17 @ 75F
2000	0.0	50.0	0.0	0.64	0.53	0.44	0.37	0.38	1.26	1.03	0.85	0.70	0.73	0.26	0.42	2.93	1.32 @100F
2000	50.0	50.0	50.0	4.85	2.56	1.40	0.81	0.80	6.85	3.64	2.02	1.18	1.17	0.35	0.57	2.93	
2000	20.6	27.3	20.6	1.90	1.11	0.70	0.46	0.48	2.92	1.77	1.14	0.78	0.82	0.28	0.46	2.93	
2010	0.0	0.0	0.0	0.54	0.44	0.36	0.30	0.32	1.01	0.81	0.65	0.52	0.57	0.27	0.43	2.89	2.43 @ 0F
2010	0.0	100.0	0.0	0.74	0.63	0.53	0.45	0.46	1.35	1.13	0.94	0.79	0.79	0.31	0.49	2.89	1.89 @ 25F
2010	100.0	0.0	100.0	6.47	3.54	1.93	1.06	1.04	10.32	5.21	2.63	1.32	1.30	0.42	0.73	2.89	1.47 @ 50F
2010	50.0	0.0	50.0	2.80	1.62	0.96	0.59	0.60	4.56	2.48	1.40	0.83	0.85	0.33	0.54	2.89	1.13 @ 75F
2010	0.0	50.0	0.0	0.62	0.51	0.43	0.36	0.37	1.14	0.93	0.76	0.62	0.65	0.28	0.45	2.89	1.25 @100F
2010	50.0	50.0	50.0	3.61	2.08	1.23	0.75	0.75	5.84	3.17	1.78	1.06	1.05	0.37	0.61	2.89	
2010	20.6	27.3	20.6	1.50	0.96	0.64	0.45	0.46	2.53	1.56	1.02	0.70	0.73	0.30	0.49	2.89	

TABLE 1.23: NMHC AT 35.0 MPH.

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TABLE 1.24

HIGH ALTITUDE

EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	LDDV 0-100F	LDDT 0-100F	HDDV 0-100F	HDGV
1980	0.0	0.0	0.0	2.95	2.72	2.52	2.34	2.77	3.95	3.65	3.40	3.18	3.69	0.48	0.85	4.45	5.78 @ 0F
1980	0.0	100.0	0.0	2.74	2.76	2.78	2.81	3.73	3.88	3.89	3.90	3.91	5.13	0.52	0.83	4.45	5.00 @ 25F
1980	100.0	0.0	100.0	23.55	13.52	7.77	4.47	3.34	32.71	18.74	10.75	6.17	4.58	0.82	1.40	4.45	4.32 @ 50F
1980	50.0	0.0	50.0	11.54	7.22	4.70	3.22	3.00	16.01	9.97	6.47	4.42	4.06	0.61	1.06	4.45	3.73 @ 75F
1980	0.0	50.0	0.0	2.85	2.72	2.61	2.53	3.16	3.90	3.73	3.59	3.47	4.27	0.49	0.83	4.45	4.24 @100F
1980	50.0	50.0	50.0	13.15	8.14	5.27	3.64	3.53	18.29	11.31	7.32	5.04	4.85	0.67	1.12	4.45	
1980	20.6	27.3	20.6	6.41	4.56	3.46	2.80	3.07	8.86	6.28	4.76	3.85	4.15	0.54	0.92	4.45	
1988	0.0	0.0	0.0	1.24	1.08	0.94	0.84	1.15	1.75	1.52	1.32	1.17	1.51	0.36	0.50	2.81	2.51 @ 0F
1988	0.0	100.0	0.0	1.18	1.14	1.10	1.08	1.56	1.88	1.76	1.66	1.58	2.15	0.41	0.58	2.81	2.12 @ 25F
1988	100.0	0.0	100.0	13.03	6.75	3.55	1.89	1.53	18.39	9.59	5.06	2.69	2.22	0.56	0.86	2.81	1.80 @ 50F
1988	50.0	0.0	50.0	5.91	3.33	1.98	1.25	1.30	8.33	4.71	2.80	1.77	1.78	0.43	0.64	2.81	1.53 @ 75F
1988	0.0	50.0	0.0	1.21	1.09	1.00	0.93	1.31	1.79	1.60	1.45	1.32	1.75	0.37	0.53	2.81	1.89 @100F
1988	50.0	50.0	50.0	7.10	3.94	2.33	1.48	1.55	10.14	5.68	3.36	2.14	2.18	0.48	0.72	2.81	
1988	20.6	27.3	20.6	3.13	2.01	1.40	1.06	1.30	4.46	2.87	2.00	1.50	1.75	0.39	0.57	2.81	
1990	0.0	0.0	0.0	0.96	0.82	0.71	0.62	0.87	1.41	1.20	1.04	0.90	1.15	0.32	0.42	2.56	2.04 @ 0F
1990	0.0	100.0	0.0	0.96	0.90	0.86	0.83	1.19	1.59	1.45	1.34	1.25	1.65	0.37	0.47	2.56	1.69 @ 25F
1990	100.0	0.0	100.0	11.12	5.64	2.91	1.52	1.27	15.25	7.81	4.04	2.11	1.80	0.50	0.70	2.56	1.40 @ 50F
1990	50.0	0.0	50.0	4.93	2.71	1.57	0.97	1.02	6.83	3.79	2.22	1.37	1.40	0.39	0.52	2.56	1.16 @ 75F
1990	0.0	50.0	0.0	0.95	0.85	0.76	0.70	0.99	1.47	1.30	1.15	1.03	1.34	0.33	0.43	2.56	1.43 @100F
1990	50.0	50.0	50.0	6.04	3.27	1.88	1.17	1.23	8.42	4.63	2.69	1.68	1.72	0.43	0.59	2.56	
1990	20.6	27.3	20.6	2.58	1.61	1.09	0.80	1.00	3.65	2.31	1.58	1.16	1.36	0.35	0.47	2.56	
1995	0.0	0.0	0.0	0.54	0.43	0.35	0.29	0.41	0.91	0.75	0.62	0.51	0.63	0.20	0.30	2.24	1.66 @ 0F
1995	0.0	100.0	0.0	0.65	0.57	0.50	0.44	0.57	1.14	0.99	0.86	0.75	0.88	0.23	0.33	2.24	1.33 @ 25F
1995	100.0	0.0	100.0	7.82	3.83	1.90	0.95	0.87	10.10	5.01	2.50	1.26	1.16	0.33	0.50	2.24	1.06 @ 50F
1995	50.0	0.0	50.0	3.31	1.73	0.94	0.54	0.58	4.44	2.38	1.34	0.80	0.83	0.25	0.38	2.24	0.85 @ 75F
1995	0.0	50.0	0.0	0.58	0.48	0.41	0.34	0.47	1.00	0.84	0.71	0.60	0.72	0.21	0.31	2.24	0.99 @100F
1995	50.0	50.0	50.0	4.24	2.20	1.20	0.69	0.72	5.62	3.00	1.68	1.00	1.02	0.28	0.42	2.24	
1995	20.6	27.3	20.6	1.69	0.99	0.62	0.42	0.51	2.40	1.47	0.96	0.68	0.76	0.23	0.33	2.24	
2000	0.0	0.0	0.0	0.35	0.29	0.23	0.19	0.21	0.71	0.57	0.46	0.37	0.41	0.19	0.30	2.15	1.56 @ 0F
2000	0.0	100.0	0.0	0.50	0.43	0.36	0.30	0.31	0.95	0.80	0.67	0.56	0.57	0.21	0.33	2.15	1.23 @ 25F
2000	100.0	0.0	100.0	5.67	2.83	1.43	0.73	0.71	7.77	3.84	1.90	0.94	0.93	0.30	0.51	2.15	0.96 @ 50F
2000	50.0	0.0	50.0	2.37	1.25	0.69	0.39	0.40	3.40	1.82	1.01	0.59	0.60	0.23	0.38	2.15	0.75 @ 75F
2000	0.0	50.0	0.0	0.41	0.34	0.28	0.23	0.25	0.80	0.66	0.54	0.44	0.47	0.19	0.31	2.15	0.85 @100F
2000	50.0	50.0	50.0	3.09	1.63	0.89	0.51	0.51	4.36	2.32	1.28	0.75	0.75	0.25	0.42	2.15	
2000	20.6	27.3	20.6	1.21	0.71	0.44	0.30	0.31	1.85	1.13	0.73	0.50	0.52	0.21	0.34	2.15	
2010	0.0	0.0	0.0	0.34	0.28	0.23	0.19	0.21	0.64	0.52	0.41	0.33	0.36	0.20	0.32	2.13	1.56 @ 0F
2010	0.0	100.0	0.0	0.47	0.40	0.34	0.29	0.29	0.86	0.72	0.60	0.50	0.50	0.23	0.36	2.13	1.21 @ 25F
2010	100.0	0.0	100.0	4.12	2.25	1.23	0.67	0.66	6.57	3.31	1.67	0.84	0.83	0.31	0.54	2.13	0.94 @ 50F
2010	50.0	0.0	50.0	1.78	1.03	0.61	0.37	0.38	2.90	1.58	0.89	0.53	0.54	0.24	0.40	2.13	0.72 @ 75F
2010	0.0	50.0	0.0	0.39	0.33	0.27	0.23	0.24	0.73	0.59	0.48	0.40	0.42	0.21	0.33	2.13	0.80 @100F
2010	50.0	50.0	50.0	2.30	1.33	0.79	0.48	0.48	3.71	2.02	1.14	0.67	0.67	0.27	0.45	2.13	
2010	20.6	27.3	20.6	0.96	0.61	0.41	0.28	0.29	1.61	0.99	0.65	0.45	0.46	0.22	0.36	2.13	

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TABLE 1.25

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	LDGV 25 F	LDGV 50 F	LDGV 75 F	LDGV 100 F	LDGT 0 F	LDGT 25 F	LDGT 50 F	LDGT 75 F	LDGT 100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	488.93	427.70	378.48	338.94	765.69	586.50	511.90	450.60	400.21	851.81	6.01	8.76	79.07	1326.49 @ 0F
1980	0.0	100.0	0.0	316.47	320.68	326.34	333.59	644.05	380.55	386.48	393.45	401.56	791.72	10.24	15.15	79.07	1207.28 @ 25F
1980	100.0	0.0	100.0	3763.22	2151.09	1239.43	719.11	454.64	4718.45	2686.19	1538.44	886.99	528.27	12.62	18.59	79.07	1099.61 @ 50F
1980	50.0	0.0	50.0	1788.01	1111.94	719.12	487.00	633.50	2248.77	1386.16	885.87	591.69	706.53	8.45	12.38	79.07	1002.33 @ 75F
1980	0.0	50.0	0.0	413.75	379.07	352.26	331.96	710.92	491.56	451.11	418.88	393.52	816.41	7.56	11.09	79.07	1678.02 @100F
1980	50.0	50.0	50.0	2039.84	1235.88	782.89	526.35	549.34	2549.50	1536.34	965.95	644.27	659.99	11.43	16.87	79.07	
1980	20.6	27.3	20.6	979.03	680.91	503.38	395.54	681.71	1214.70	836.34	611.25	474.72	772.79	7.84	11.49	79.07	
1988	0.0	0.0	0.0	312.17	249.44	201.54	164.76	411.48	437.61	342.06	269.83	214.95	467.80	5.51	8.90	67.74	586.23 @ 0F
1988	0.0	100.0	0.0	239.92	215.83	197.54	183.89	342.19	429.09	373.19	328.91	293.84	500.67	9.12	15.82	67.74	527.38 @ 25F
1988	100.0	0.0	100.0	2191.59	1326.07	780.82	411.25	317.80	2660.92	1660.21	1064.46	690.50	584.24	12.36	19.28	67.74	475.86 @ 50F
1988	50.0	0.0	50.0	1047.30	671.32	428.32	260.25	372.34	1303.03	856.56	579.97	399.43	509.68	8.04	12.73	67.74	430.65 @ 75F
1988	0.0	50.0	0.0	281.30	233.97	197.93	170.48	381.54	429.96	350.58	289.83	243.20	476.24	6.82	11.43	67.74	706.88 @100F
1988	50.0	50.0	50.0	1215.75	770.95	489.18	297.57	330.00	1545.01	1016.70	696.68	492.17	542.45	10.74	17.55	67.74	
1988	20.6	27.3	20.6	595.61	413.30	292.14	206.78	379.14	786.75	556.67	407.21	305.47	489.24	7.25	11.82	67.74	
1990	0.0	0.0	0.0	268.03	209.51	165.50	132.20	326.91	375.04	286.05	220.03	170.75	356.11	5.02	7.82	64.70	466.58 @ 0F
1990	0.0	100.0	0.0	213.28	187.70	167.96	152.87	275.63	361.20	309.10	267.79	234.99	388.96	8.29	13.86	64.70	415.14 @ 25F
1990	100.0	0.0	100.0	1746.51	1071.68	638.35	336.95	272.61	2028.00	1283.69	829.88	534.83	463.76	11.31	16.91	64.70	370.33 @ 50F
1990	50.0	0.0	50.0	846.55	548.25	351.39	211.73	304.78	1020.20	677.41	459.49	312.48	396.72	7.34	11.18	64.70	331.25 @ 75F
1990	0.0	50.0	0.0	244.81	199.42	165.10	139.12	304.85	366.19	292.43	236.64	194.23	366.19	6.21	10.03	64.70	536.67 @100F
1990	50.0	50.0	50.0	979.90	629.69	403.15	244.91	274.12	1194.60	796.40	548.83	384.91	426.36	9.80	15.39	64.70	
1990	20.6	27.3	20.6	491.67	342.35	241.16	168.37	305.83	633.63	449.26	326.75	241.27	378.01	6.61	10.38	64.70	
1995	0.0	0.0	0.0	165.86	121.86	89.99	66.80	147.13	240.33	173.13	125.46	91.49	159.56	3.74	6.32	59.68	317.12 @ 0F
1995	0.0	100.0	0.0	144.41	120.43	101.41	86.28	138.30	218.26	179.90	149.47	125.26	186.00	5.98	11.10	59.68	277.57 @ 25F
1995	100.0	0.0	100.0	872.90	564.58	349.81	185.32	166.80	910.47	614.34	410.88	257.64	243.52	8.13	13.58	59.68	243.38 @ 50F
1995	50.0	0.0	50.0	447.07	299.87	194.97	114.08	156.69	509.11	352.15	241.49	157.76	193.75	5.36	8.99	59.68	213.78 @ 75F
1995	0.0	50.0	0.0	156.79	120.97	94.32	74.36	143.67	229.12	174.46	134.28	104.55	169.59	4.55	8.07	59.68	316.14 @100F
1995	50.0	50.0	50.0	508.65	342.50	225.61	135.80	152.55	564.36	397.12	280.17	191.45	214.76	7.06	12.34	59.68	
1995	20.6	27.3	20.6	275.82	194.12	135.23	90.20	149.16	344.05	247.01	177.65	125.62	178.93	4.84	8.35	59.68	
2000	0.0	0.0	0.0	91.11	62.88	43.40	29.95	33.21	164.37	112.42	76.97	52.76	59.71	3.51	6.24	58.20	258.79 @ 0F
2000	0.0	100.0	0.0	83.31	65.62	51.71	40.78	49.82	139.43	111.41	89.09	71.30	87.87	5.58	10.99	58.20	224.36 @ 25F
2000	100.0	0.0	100.0	329.55	248.12	166.70	85.27	90.49	380.29	296.50	212.71	128.91	137.62	7.64	13.43	58.20	194.72 @ 50F
2000	50.0	0.0	50.0	196.70	144.66	97.54	53.81	57.93	261.38	194.44	136.62	85.02	92.76	5.03	8.89	58.20	169.19 @ 75F
2000	0.0	50.0	0.0	87.07	63.63	46.71	34.45	40.22	152.14	111.13	81.72	60.50	71.69	4.26	7.97	58.20	228.97 @100F
2000	50.0	50.0	50.0	206.43	156.87	109.21	63.02	70.15	259.86	203.95	150.90	100.11	112.74	6.61	12.21	58.20	
2000	20.6	27.3	20.6	132.20	96.81	67.38	42.16	47.14	197.49	145.33	103.99	70.16	79.74	4.53	8.25	58.20	
2010	0.0	0.0	0.0	64.77	44.62	30.74	21.18	22.63	130.40	87.54	58.76	39.45	42.15	3.55	6.25	57.70	241.50 @ 0F
2010	0.0	100.0	0.0	47.81	38.10	30.37	24.20	29.31	92.11	73.41	58.51	46.63	56.48	5.69	11.05	57.70	207.76 @ 25F
2010	100.0	0.0	100.0	229.05	170.28	111.50	52.72	55.67	307.81	230.00	152.19	74.37	78.54	7.87	13.49	57.70	178.73 @ 50F
2010	50.0	0.0	50.0	141.74	103.49	68.58	35.95	38.11	212.46	153.44	101.98	55.60	58.98	5.14	8.92	57.70	153.76 @ 75F
2010	0.0	50.0	0.0	56.81	41.56	30.56	22.59	25.76	112.66	80.99	58.63	42.76	48.77	4.32	8.00	57.70	199.20 @100F
2010	50.0	50.0	50.0	138.43	104.19	70.93	38.46	42.49	199.96	151.71	105.35	60.50	67.51	6.78	12.27	57.70	
2010	20.6	27.3	20.6	92.06	67.14	46.19	28.02	30.69	154.44	111.03	76.44	47.88	52.66	4.61	8.28	57.70	

TABLE 1.25: CO AT 2.5 MPH.

TABLE 1.26

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	279.53	246.91	220.69	199.63	432.09	342.16	300.34	265.94	237.62	491.01	4.91	7.15	64.54	1059.88 @ OF
1980	0.0	100.0	0.0	181.65	184.87	188.95	193.97	368.73	220.09	224.18	228.89	234.28	456.80	8.36	12.37	64.54	964.63 @ 25F
1980	100 0	0.0	100.0	2096.45	1207.74	701.77	410.93	259.50	2664.68	1526.06	879.61	510.62	304.07	10.30	15.18	64.54	878.60 @ 50F
1980	50.0	0.0	50.0	1006.17	631.44	412.51	282.47	358.01	1283.28	796.76	513.24	345.73	406.72	6.90	10.11	64.54	800.88 @ 75F
1980	0.0	50.0	0.0	236.46	218.50	204.74	194.48	403.02	285.82	263.58	245.92	232.10	470.79	6.17	9.05	64.54	1340.76 @100F
1980	50.0	50.0	50.0	1139.05	696.30	445.36	302.45	314.12	1442.38	875.12	554.25	372.45	380.44	9.33	13.77	64.54	
1980	20.6	27.3	20.6	553.20	388.67	290.40	230.63	385.90	696.52	483.40	356.16	278.75	445.34	6.40	9.38	64.54	
1988	0.0	0.0	0.0	166.52	133.89	108.92	89.71	220.38	233.20	183.29	145.48	116.68	251.46	4.50	7.26	55.30	468.40 @ OF
1988	0.0	100.0	0.0	126.07	114.02	104.98	98.35	183.34	223.41	195.10	172.74	155.11	265.37	7.44	12.91	55.30	421.38 @ 25F
1988	100.0	0.0	100.0	1163.26	703.92	414.68	219.06	167.84	1410.48	879.14	562.14	362.89	304.26	10.09	15.74	55.30	380.22 @ 50F
1988	50.0	0.0	50.0	558.48	358.37	229.15	139.97	198.13	694.12	456.29	308.77	212.41	269.77	6.56	10.39	55.30	344.10 @ 75F
1988	0.0	50.0	0.0	149.07	124.70	106.16	92.07	204.17	226.77	185.74	154.34	130.23	254.33	5.57	9.33	55.30	564.81 @100F
1988	50.0	50.0	50.0	644.66	408.97	259.83	158.71	175.59	816.94	537.12	367.44	259.00	284.81	8.77	14.33	55.30	
1988	20.6	27.3	20.6	317.14	220.58	156.50	111.48	202.43	417.92	296.07	216.91	163.06	260.36	5.92	9.65	55.30	
1990	0.0	0.0	0.0	141.80	111.29	88.32	70.93	173.43	199.95	152.91	118.00	91.92	190.25	4.10	6.39	52.82	372.80 @ OF
1990	0.0	100.0	0.0	111.49	98.45	88.45	80.87	145.96	188.51	161.69	140.45	123.63	205.23	6.77	11.32	52.82	331.70 @ 25F
1990	100.0	0.0	100.0	922.14	566.45	337.47	177.91	143.49	1074.71	680.16	438.45	280.49	241.76	9.23	13.81	52.82	295.90 @ 50F
1990	50.0	0.0	50.0	448.65	290.98	186.70	112.60	161.03	543.37	360.85	244.38	165.51	209.38	5.99	9.12	52.82	264.68 @ 75F
1990	0 0	50.0	0.0	128.82	105.32	87.57	74.15	161.45	193.41	154.79	125.58	103.40	194.49	5.07	8.19	52.82	428.81 @100F
1990	50.0	50.0	50.0	516.81	332.45	212.96	129.39	144.72	631.61	420.92	289.45	202.06	223.49	8.00	12.56	52 82	
1990	20.6	27.3	20.6	260.09	181.44	128.08	89.67	161.82	336.64	238.83	173.70	128.15	200.28	5.40	8.47	52.82	
1995	0.0	0.0	0.0	88.26	64.68	47.65	35.28	76.51	132.06	94.93	68.65	49.98	85.93	3.06	5.16	48.71	253.38 @ OF
1995	0.0	100.0	0.0	76.56	63.74	53.57	45.48	72.33	117.58	96.87	80.44	67.37	99.59	4.88	9.06	48.71	221.78 @ 25F
1995	100.0	0.0	100.0	463.61	301.37	186.80	97.85	88.60	492.73	333.37	222.25	137.31	129.92	6.64	11.08	48.71	194 46 @ 50F
1995	50.0	0.0	50.0	238.72	160.64	104.33	60.40	82.32	277.85	192.42	131.54	84.98	103.91	4.38	7.34	48.71	170.82 @ 75F
1995	0.0	50.0	0.0	83.27	64.12	49.90	39.26	74.87	124.85	94.91	72.94	56.72	91.11	3.72	6.58	48.71	252.60 @100F
1995	50.0	50.0	50.0	270.08	182.55	120.18	71.66	80.46	305.16	215.12	151.35	102.34	114.75	5.76	10.07	48.71	
1995	20.6	27.3	20.6	147.04	103.60	72.03	47.70	77.99	187.73	134.77	96.68	67.92	96.07	3.95	6.82	48.71	
2000	0.0	0.0	0.0	52.45	36.18	24.96	17.22	19.01	95.16	64.94	44.36	30.33	34.10	2.86	5.09	47 51	206.78 @ OF
2000	0.0	100.0	0.0	47.11	37.15	29.31	23.14	28.25	79.12	63.20	50.52	40.41	49.71	4.55	8.97	47 51	179.27 @ 25F
2000	100.0	0.0	100.0	192.40	144.48	96.55	48.63	51.57	222.04	172.12	122.20	72.28	77.08	6 23	10.96	47 51	155.58 @ 50F
2000	50.0	0.0	50.0	114.90	84.37	56.65	30.88	33.19	152.38	112.91	78.76	48.23	52.46	4.11	7.26	47 51	135.18 @ 75F
2000	0.0	50.0	0.0	49.76	36.37	26.70	19.70	22.95	87.39	63.72	46.77	34.57	40.79	3 48	6.51	47.51	182 95 @100F
2000	50.0	50.0	50.0	119.76	90.82	62.93	35.88	39.91	150.58	117.66	86.36	56.35	63.40	5.39	9.97	47.51	
2000	20.6	27.3	20.6	76.60	56.04	38.90	24.16	26.96	114.40	83.94	59.77	39.96	45.25	3.70	6.74	47 51	
2010	0.0	0.0	0.0	40.82	28.12	19.37	13.35	14.26	79.34	53.26	35.75	24.00	25.65	2.89	5.10	47.10	192.96 @ OF
2010	0.0	100.0	0.0	30.13	24.01	19.14	15.25	18.47	56.04	44.66	35.60	28.37	34.36	4.65	9.02	47.10	166 00 @ 25F
2010	100 0	0 0	100 0	144.38	107.32	70.27	33.22	35.08	187.29	139.94	92.60	45.25	47.78	6.42	11.01	47 10	142.81 @ 50F
2010	50 0	0 0	50 0	89 34	65 23	43.22	22.66	24.02	129.27	93.36	62.05	33.83	35.88	4.19	7 28	47 10	122 86 @ 75F
2010	0 0	50 0	0 0	35 80	26 19	19.26	14.24	16.23	68.55	49.27	35.67	26.02	29.67	3 53	6 53	47 10	159 16 @100F
2010	50 0	50 0	50 0	87 25	65 67	44.71	24 24	26 78	121 67	92.30	64.10	36.81	41.07	5 53	10.02	47 10	
2010	20 6	27 3	20 6	58 02	42 32	29 11	17 66	19.34	93 97	67.55	46.51	29.13	32.04	3.77	6.76	47.10	

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TABLE 1.27

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	LDGV 25 F	LDGV 50 F	LDGV 75 F	LDGV 100 F	LDGT 0 F	LDGT 25 F	LDGT 50 F	LDGT 75 F	LDGT 100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	152.37	135.55	122.02	111.16	232.79	187.13	164.96	146.70	131.67	266.15	3.39	4.93	44.51	705.15 @ OF
1980	0.0	100.0	0.0	99.60	101.64	104.15	107.18	201.25	119.97	122.44	125.25	128.44	248.17	5.77	8.53	44.51	641.78 @ 25F
1980	100.0	0.0	100.0	1122.16	650.47	380.46	224.37	141.50	1424.47	819.57	474.76	277.09	165.17	7.10	10.46	44.51	584.55 @ 50F
1980	50.0	0.0	50.0	542.48	342.82	225.65	155.77	193.34	690.99	431.38	279.55	189.52	220.49	4.75	6.97	44.51	532.83 @ 75F
1980	0.0	50.0	0.0	129.01	119.94	113.04	107.96	218.10	156.10	144.48	135.27	128.10	255.44	4.25	6.24	44.51	892.02 @100F
1980	50.0	50.0	50.0	610.88	376.05	242.31	165.77	171.38	772.22	471.01	300.01	202.76	206.67	6.44	9.50	44.51	
1980	20.6	27.3	20.6	299.21	211.82	159.50	127.63	208.62	376.41	262.81	194.81	153.35	241.54	4.41	6.47	44.51	
1988	0.0	0.0	0.0	87.10	70.23	57.34	47.41	114.47	122.24	96.28	76.62	61.64	130.93	3.10	5.01	38.13	311.63 @ OF
1988	0.0	100.0	0.0	65.74	59.54	54.91	51.56	95.83	116.00	101.38	89.85	80.79	137.83	5.13	8.90	38.13	280.35 @ 25F
1988	100.0	0.0	100.0	607.80	368.92	217.70	114.85	87.88	732.51	458.23	293.41	188.87	158.31	6.96	10.85	38.13	252.96 @ 50F
1988	50.0	0.0	50.0	292.92	188.47	120.70	73.71	103.10	362.46	239.02	161.97	111.26	140.36	4.52	7.16	38.13	228.93 @ 75F
1988	0.0	50.0	0.0	77.82	65.26	55.72	48.48	106.24	118.36	97.09	80.82	68.35	132.26	3.84	6.43	38.13	375.77 @100F
1988	50.0	50.0	50.0	336.77	214.23	136.31	83.21	91.86	424.25	279.80	191.63	134.83	148.07	6.04	9.88	38.13	
1988	20.6	27.3	20.6	166.15	115.83	82.33	58.71	105.32	218.24	155.00	113.73	85.51	135.43	4.08	6.65	38.13	
1990	0.0	0.0	0.0	74.36	58.37	46.36	37.29	89.69	106.69	81.44	62.76	48.85	99.32	2.83	4.40	36.42	248.03 @ OF
1990	0.0	100.0	0.0	58.46	51.58	46.32	42.35	75.99	99.34	85.10	73.83	64.92	107.11	4.67	7.80	36.42	220.68 @ 25F
1990	100.0	0.0	100.0	483.98	298.85	178.36	93.35	75.67	563.73	358.77	231.50	146.86	127.03	6.36	9.52	36.42	196.87 @ 50F
1990	50.0	0.0	50.0	236.45	153.95	98.83	59.22	83.85	287.32	191.57	129.73	87.25	109.64	4.13	6.29	36.42	176.09 @ 75F
1990	0.0	50.0	0.0	67.51	55.20	45.91	38.92	83.66	102.64	82.01	66.45	54.66	101.52	3.50	5.65	36.42	285.29 @100F
1990	50.0	50.0	50.0	271.22	175.22	112.34	67.85	75.83	331.53	221.93	152.66	105.89	117.07	5.52	8.66	36.42	
1990	20.6	27.3	20.6	136.86	95.69	67.55	47.12	84.01	178.27	126.72	92.10	67.66	104.68	3.72	5.84	36.42	
1995	0.0	0.0	0.0	48.71	35.49	25.99	19.13	39.89	76.36	54.52	39.16	28.32	46.84	2.11	3.56	33.59	168.58 @ OF
1995	0.0	100.0	0.0	42.24	35.02	29.29	24.73	38.56	66.49	54.61	45.17	37.68	54.78	3.37	6.25	33.59	147.56 @ 25F
1995	100.0	0.0	100.0	254.49	167.36	104.00	53.42	49.08	275.15	188.03	125.22	75.62	72.20	4.58	7.64	33.59	129.38 @ 50F
1995	50.0	0.0	50.0	132.33	89.72	58.21	33.06	44.21	157.74	109.80	74.82	47.45	57.32	3.02	5.06	33.59	113.65 @ 75F
1995	0.0	50.0	0.0	45.92	35.20	27.26	21.34	39.40	71.53	54.09	41.35	31.98	49.92	2.56	4.54	33.59	168.06 @100F
1995	50.0	50.0	50.0	148.37	101.19	66.64	39.07	43.82	170.82	121.32	85.20	56.65	63.49	3.97	6.94	33.59	
1995	20.6	27.3	20.6	81.38	57.51	39.86	26.02	41.39	107.01	76.89	54.93	38.12	52.79	2.72	4.70	33.59	
2000	0.0	0.0	0.0	33.12	22.84	15.74	10.85	11.91	60.55	41.20	28.05	19.12	21.29	1.98	3.51	32.76	137.57 @ OF
2000	0.0	100.0	0.0	29.01	22.92	18.11	14.32	17.46	48.97	39.10	31.24	24.97	30.64	3.14	6.19	32.76	119.27 @ 25F
2000	100.0	0.0	100.0	123.83	92.66	61.48	30.30	32.12	142.92	109.93	76.95	43.96	46.81	4.30	7.56	32.76	103.51 @ 50F
2000	50.0	0.0	50.0	74.00	54.22	36.21	19.42	20.82	97.88	72.15	49.84	29.83	32.31	2.83	5.00	32.76	89.94 @ 75F
2000	0.0	50.0	0.0	31.11	22.74	16.70	12.33	14.31	55.02	40.01	29.30	21.61	25.34	2.40	4.49	32.76	121.72 @100F
2000	50.0	50.0	50.0	76.42	57.79	39.79	22.31	24.79	95.94	74.51	54.09	34.47	38.72	3.72	6.87	32.76	
2000	20.6	27.3	20.6	48.79	35.65	24.66	15.16	16.87	72.85	53.25	37.66	24.85	28.00	2.55	4.65	32.76	
2010	0.0	0.0	0.0	28.84	19.87	13.69	9.43	10.08	53.81	36.12	24.25	16.28	17.39	1.99	3.52	32.48	128.38 @ OF
2010	0.0	100.0	0.0	21.29	16.97	13.52	10.78	13.05	38.01	30.29	24.14	19.24	23.30	3.20	6.22	32.48	110.44 @ 25F
2010	100.0	0.0	100.0	102.04	75.85	49.66	23.48	24.79	127.03	94.92	62.80	30.69	32.41	4.43	7.59	32.48	95.01 @ 50F
2010	50.0	0.0	50.0	63.13	46.10	30.54	16.01	16.97	87.68	63.32	42.08	22.94	24.34	2.89	5.02	32.48	81.74 @ 75F
2010	0.0	50.0	0.0	25.30	18.51	13.61	10.06	11.47	46.49	33.42	24.19	17.65	20.13	2.43	4.51	32.48	105.89 @100F
2010	50.0	50.0	50.0	61.66	46.41	31.59	17.13	18.92	82.52	62.60	43.47	24.96	27.85	3.81	6.91	32.48	
2010	20.6	27.3	20.6	41.00	29.90	20.57	12.48	13.67	63.73	45.82	31.54	19.76	21.73	2.60	4.66	32.48	

TABLE 1.27: CO AT 10.0 MPH.

TABLE 1.28

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	LDDV- 0-100F	LDDT- 0-100F	HDDV- 0-100F	HDGV
1980	0.0	0.0	0.0	94.49	84.91	77.21	71.02	142.53	120.23	106.51	95.18	85.83	168.84	1.88	2.74	24.76	376.23 @ 0F
1980	0.0	100.0	0.0	61.71	63.30	65.20	67.44	124.90	75.75	77.58	79.65	81.96	156.96	3.21	4.75	24.76	342.42 @ 25F
1980	100.0	0.0	100.0	675.06	394.79	233.03	138.73	87.36	879.50	509.34	297.02	174.53	103.93	3.95	5.82	24.76	311.88 @ 50F
1980	50.0	0.0	50.0	330.46	210.91	140.29	97.92	118.36	432.41	272.01	177.67	121.43	139.34	2.65	3.88	24.76	284.29 @ 75F
1980	0.0	50.0	0.0	79.81	74.88	71.18	68.54	134.07	99.66	92.65	87.11	82.82	161.83	2.37	3.47	24.76	475.93 @100F
1980	50.0	50.0	50.0	368.38	229.04	149.12	103.08	106.13	477.63	293.46	188.33	128.24	130.44	3.58	5.28	24.76	
1980	20.6	27.3	20.6	183.05	131.00	99.73	80.65	128.01	236.82	166.70	124.54	98.74	152.89	2.45	3.60	24.76	
1988	0.0	0.0	0.0	50.15	40.77	33.60	28.06	65.88	70.77	56.12	45.00	36.52	76.10	1.73	2.79	21.21	166.27 @ 0F
1988	0.0	100.0	0.0	37.19	33.90	31.50	29.81	55.35	64.83	56.94	50.75	45.92	78.55	2.85	4.95	21.21	149.58 @ 25F
1988	100.0	0.0	100.0	347.78	211.72	125.18	66.10	50.18	418.06	262.05	167.46	106.87	88.72	3.87	6.04	21.21	134.96 @ 50F
1988	50.0	0.0	50.0	168.97	109.10	70.10	42.99	59.02	209.01	138.17	93.64	64.11	80.14	2.52	3.99	21.21	122.15 @ 75F
1988	0.0	50.0	0.0	44.44	37.55	32.33	28.39	61.12	67.47	55.66	46.63	39.71	76.17	2.14	3.58	21.21	200.49 @100F
1988	50.0	50.0	50.0	192.48	122.81	78.34	47.95	52.77	241.45	159.49	109.11	76.40	83.64	3.36	5.50	21.21	
1988	20.6	27.3	20.6	95.62	66.94	47.82	34.33	60.47	125.46	89.38	65.74	49.50	77.75	2.27	3.70	21.21	
1990	0.0	0.0	0.0	42.70	33.65	26.87	21.75	51.02	62.94	48.08	37.11	28.96	57.57	1.57	2.45	20.26	132.33 @ 0F
1990	0.0	100.0	0.0	33.18	29.35	26.45	24.29	43.36	56.63	48.57	42.21	37.19	61.18	2.60	4.34	20.26	117.74 @ 25F
1990	100.0	0.0	100.0	277.66	172.51	103.13	53.48	43.47	325.23	208.03	133.92	83.57	72.08	3.54	5.30	20.26	105.04 @ 50F
1990	50.0	0.0	50.0	136.72	89.47	57.51	34.26	47.79	167.91	112.37	75.95	50.50	62.88	2.30	3.50	20.26	93.95 @ 75F
1990	0.0	50.0	0.0	38.54	31.62	26.43	22.52	47.57	59.66	47.70	38.70	31.89	58.44	1.95	3.14	20.26	152.21 @100F
1990	50.0	50.0	50.0	155.42	100.93	64.79	38.88	43.41	190.93	128.30	88.06	60.38	66.63	3.07	4.82	20.26	
1990	20.6	27.3	20.6	78.87	55.36	39.15	27.27	47.81	104.06	74.14	53.83	39.34	60.18	2.07	3.25	20.26	
1995	0.0	0.0	0.0	29.65	21.44	15.58	11.38	22.50	49.66	35.21	25.12	18.04	28.57	1.17	1.98	18.69	89.94 @ 0F
1995	0.0	100.0	0.0	25.60	21.11	17.54	14.71	22.35	41.76	34.19	28.19	23.41	33.44	1.87	3.48	18.69	78.73 @ 25F
1995	100.0	0.0	100.0	153.91	102.71	63.98	31.94	29.89	171.92	118.70	78.73	45.98	44.27	2.55	4.25	18.69	69.03 @ 50F
1995	50.0	0.0	50.0	81.14	55.52	35.96	19.88	25.92	100.62	70.38	47.69	29.49	35.13	1.68	2.82	18.69	60.63 @ 75F
1995	0.0	50.0	0.0	27.87	21.24	16.35	12.72	22.47	45.86	34.49	26.22	20.17	30.49	1.43	2.53	18.69	89.66 @100F
1995	50.0	50.0	50.0	89.76	61.91	40.76	23.32	26.12	106.84	76.44	53.46	34.70	38.86	2.21	3.86	18.69	
1995	20.6	27.3	20.6	49.75	35.28	24.34	15.58	23.89	68.45	49.21	34.95	23.87	32.29	1.52	2.61	18.69	
2000	0.0	0.0	0.0	23.66	16.30	11.23	7.73	8.44	43.60	29.57	20.06	13.62	15.02	1.10	1.95	18.23	73.40 @ 0F
2000	0.0	100.0	0.0	20.14	15.94	12.62	10.00	12.17	34.20	27.29	21.79	17.41	21.29	1.75	3.44	18.23	63.63 @ 25F
2000	100.0	0.0	100.0	90.25	67.27	44.30	21.33	22.59	104.16	79.47	54.78	30.09	31.98	2.39	4.21	18.23	55.23 @ 50F
2000	50.0	0.0	50.0	53.97	39.45	26.20	13.81	14.76	71.18	52.19	35.67	20.82	22.44	1.58	2.78	18.23	47.99 @ 75F
2000	0.0	50.0	0.0	21.97	16.06	11.80	8.72	10.08	39.16	28.40	20.74	15.26	17.77	1.33	2.50	18.23	64.94 @100F
2000	50.0	50.0	50.0	55.20	41.61	28.46	15.66	17.38	69.18	53.38	38.29	23.75	26.64	2.07	3.82	18.23	
2000	20.6	27.3	20.6	35.18	25.67	17.68	10.76	11.92	52.50	38.21	26.83	17.46	19.55	1.42	2.59	18.23	
2010	0.0	0.0	0.0	22.97	15.83	10.90	7.51	8.03	41.30	27.73	18.61	12.49	13.35	1.11	1.96	18.07	68.49 @ 0F
2010	0.0	100.0	0.0	16.96	13.52	10.77	8.59	10.40	29.17	23.25	18.53	14.77	17.89	1.78	3.46	18.07	58.93 @ 25F
2010	100.0	0.0	100.0	81.30	60.43	39.57	18.70	19.75	97.51	72.86	48.21	23.56	24.87	2.46	4.23	18.07	50.69 @ 50F
2010	50.0	0.0	50.0	50.30	36.73	24.33	12.75	13.52	67.30	48.60	32.30	17.61	18.68	1.61	2.79	18.07	43.61 @ 75F
2010	0.0	50.0	0.0	20.15	14.74	10.84	8.01	9.14	35.68	25.65	18.57	13.54	15.45	1.35	2.51	18.07	56.50 @100F
2010	50.0	50.0	50.0	49.13	36.98	25.17	13.64	15.07	63.34	48.06	33.37	19.16	21.38	2.12	3.84	18.07	
2010	20.6	27.3	20.6	32.66	23.82	16.39	9.94	10.89	48.92	35.17	24.21	15.17	16.68	1.44	2.59	18.07	

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TABLE 1.29

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	62.07	56.50	52.00	48.39	92.61	81.26	72.56	65.35	59.38	111.96	1.04	1.52	13.73	209.75 @ 0F
1980	0.0	100.0	0.0	40.60	41.91	43.43	45.20	82.34	50.58	52.06	53.70	55.53	105.07	1.78	2.63	13.73	190.90 @ 25F
1980	100.0	0.0	100.0	429.54	253.91	151.51	91.20	57.39	570.44	333.38	196.20	116.34	69.06	2.19	3.23	13.73	173.88 @ 50F
1980	50.0	0.0	50.0	213.97	138.09	92.93	65.67	76.98	285.87	181.55	119.76	82.66	92.41	1.47	2.15	13.73	158.49 @ 75F
1980	0.0	50.0	0.0	52.39	49.71	47.76	46.43	87.58	67.09	62.83	59.48	56.92	107.85	1.31	1.93	13.73	265.33 @100F
1980	50.0	50.0	50.0	235.07	147.91	97.47	68.20	69.86	310.51	192.72	124.95	85.93	87.06	1.98	2.93	13.73	
1980	20.6	27.3	20.6	118.99	86.20	66.44	54.39	83.46	157.35	111.90	84.43	67.56	101.68	1.36	1.99	13.73	
1988	0.0	0.0	0.0	30.10	24.81	20.74	17.59	40.19	42.58	34.18	27.77	22.84	46.72	0.96	1.55	11.76	92.70 @ 0F
1988	0.0	100.0	0.0	22.31	20.49	19.20	18.34	33.95	38.69	34.17	30.65	27.93	47.82	1.58	2.75	11.76	83.39 @ 25F
1988	100.0	0.0	100.0	209.98	128.36	76.16	40.39	30.43	252.68	158.91	101.61	64.62	53.08	2.15	3.35	11.76	75.24 @ 50F
1988	50.0	0.0	50.0	101.72	65.82	42.52	26.43	35.59	126.57	83.68	56.76	38.98	48.06	1.40	2.21	11.76	68.10 @ 75F
1988	0.0	50.0	0.0	26.57	22.71	19.80	17.61	37.27	40.31	33.56	28.40	24.45	46.48	1.18	1.98	11.76	111.77 @100F
1988	50.0	50.0	50.0	116.15	74.42	47.68	29.36	32.19	145.68	96.54	66.13	46.28	50.45	1.86	3.05	11.76	
1988	20.6	27.3	20.6	57.45	40.42	29.12	21.21	36.71	75.67	54.06	39.94	30.29	47.10	1.26	2.05	11.76	
1990	0.0	0.0	0.0	24.73	19.72	15.95	13.09	30.40	36.31	28.06	21.93	17.33	34.42	0.87	1.36	11.23	73.78 @ 0F
1990	0.0	100.0	0.0	19.76	17.53	15.86	14.65	26.02	33.98	29.19	25.43	22.49	36.91	1.44	2.41	11.23	65.64 @ 25F
1990	100.0	0.0	100.0	165.78	103.63	62.15	32.13	26.21	196.21	126.10	81.19	50.28	43.18	1.96	2.94	11.23	58.56 @ 50F
1990	50.0	0.0	50.0	80.00	52.44	33.85	20.38	28.21	99.52	66.53	44.97	29.99	37.04	1.27	1.94	11.23	52.38 @ 75F
1990	0.0	50.0	0.0	22.45	18.57	15.67	13.51	28.29	34.88	28.07	22.95	19.07	34.90	1.08	1.74	11.23	84.86 @100F
1990	50.0	50.0	50.0	92.77	60.58	39.01	23.39	26.12	115.10	77.65	53.31	36.38	40.05	1.70	2.67	11.23	
1990	20.6	27.3	20.6	46.06	32.45	23.10	16.29	28.35	61.35	43.77	31.88	23.43	35.73	1.15	1.80	11.23	
1995	0.0	0.0	0.0	15.70	11.39	8.31	6.09	12.34	26.26	18.76	13.50	9.78	15.89	0.65	1.10	10.36	50.14 @ 0F
1995	0.0	100.0	0.0	15.73	12.92	10.69	8.92	13.29	26.26	21.47	17.66	14.65	20.70	1.04	1.93	10.36	43.89 @ 25F
1995	100.0	0.0	100.0	93.89	63.30	39.53	19.44	18.43	107.33	74.63	49.48	28.45	27.53	1.41	2.36	10.36	38.48 @ 50F
1995	50.0	0.0	50.0	45.55	31.18	20.19	11.15	14.54	57.58	40.24	27.27	16.89	20.10	0.93	1.56	10.36	33.80 @ 75F
1995	0.0	50.0	0.0	15.65	11.92	9.18	7.14	12.59	26.10	19.67	14.99	11.57	17.56	0.79	1.40	10.36	49.99 @100F
1995	50.0	50.0	50.0	54.81	38.11	25.11	14.18	15.86	66.79	48.05	33.57	21.55	24.11	1.23	2.14	10.36	
1995	20.6	27.3	20.6	27.84	19.75	13.62	8.72	13.36	38.95	28.01	19.92	13.65	18.50	0.84	1.45	10.36	
2000	0.0	0.0	0.0	11.83	8.15	5.62	3.87	4.23	21.75	14.76	10.03	6.82	7.54	0.61	1.08	10.10	40.92 @ 0F
2000	0.0	100.0	0.0	13.27	10.52	8.33	6.60	8.03	22.59	18.03	14.39	11.49	14.04	0.97	1.91	10.10	35.48 @ 25F
2000	100.0	0.0	100.0	60.64	45.14	29.64	14.14	14.96	70.00	53.23	36.47	19.71	20.93	1.33	2.33	10.10	30.79 @ 50F
2000	50.0	0.0	50.0	30.41	22.23	14.76	7.78	8.31	40.11	29.40	20.09	11.72	12.63	0.87	1.54	10.10	26.75 @ 75F
2000	0.0	50.0	0.0	12.37	9.05	6.65	4.91	5.68	22.06	16.00	11.68	8.59	10.01	0.74	1.38	10.10	36.21 @100F
2000	50.0	50.0	50.0	36.96	27.83	18.99	10.37	11.50	46.29	35.63	25.43	15.60	17.49	1.15	2.12	10.10	
2000	20.6	27.3	20.6	19.70	14.38	9.90	6.02	6.68	29.40	21.40	15.02	9.78	10.95	0.79	1.43	10.10	
2010	0.0	0.0	0.0	11.13	7.67	5.28	3.64	3.89	20.22	13.57	9.11	6.12	6.54	0.62	1.09	10.02	38.19 @ 0F
2010	0.0	100.0	0.0	11.77	9.38	7.48	5.96	7.22	19.99	15.93	12.70	10.12	12.26	0.99	1.92	10.02	32.85 @ 25F
2010	100.0	0.0	100.0	56.44	41.96	27.47	12.98	13.71	66.82	49.93	33.03	16.14	17.04	1.37	2.34	10.02	28.26 @ 50F
2010	50.0	0.0	50.0	28.38	20.72	13.73	7.20	7.63	37.95	27.41	18.22	9.93	10.53	0.89	1.55	10.02	24.31 @ 75F
2010	0.0	50.0	0.0	11.37	8.32	6.12	4.52	5.15	20.12	14.47	10.47	7.64	8.71	0.75	1.39	10.02	31.50 @100F
2010	50.0	50.0	50.0	34.11	25.67	17.47	9.47	10.47	43.40	32.93	22.86	13.13	14.65	1.18	2.13	10.02	
2010	20.6	27.3	20.6	18.29	13.34	9.18	5.57	6.10	27.40	19.70	13.56	8.49	9.34	0.80	1.44	10.02	

TABLE 1.29: CO AT 35.0 MPH.

TABLE 1.30

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	LDDV 0-100F	LDDT 0-100F	HDDV 0-100F	HDGV
1980	0.0	0.0	0.0	50.95	46.86	43.56	40.91	75.22	68.82	61.77	55.90	51.03	93.64	0.92	1.35	12.15	213.99 @ 0F
1980	0.0	100.0	0.0	33.47	34.73	36.17	37.82	68.10	42.51	43.90	45.43	47.11	88.50	1.57	2.33	12.15	194.76 @ 25F
1980	100.0	0.0	100.0	345.05	205.68	123.75	75.12	47.09	470.46	276.63	163.78	97.68	57.82	1.94	2.86	12.15	177.39 @ 50F
1980	50.0	0.0	50.0	173.58	113.05	76.81	54.82	62.62	237.95	152.15	101.09	70.22	77.26	1.30	1.90	12.15	161.69 @ 75F
1980	0.0	50.0	0.0	43.01	41.18	39.90	39.09	71.61	56.66	53.30	50.68	48.68	90.48	1.16	1.70	12.15	270.70 @100F
1980	50.0	50.0	50.0	189.26	120.21	79.96	56.47	57.59	256.48	160.26	104.60	72.40	73.16	1.76	2.59	12.15	
1980	20.6	27.3	20.6	96.84	70.87	55.18	45.61	68.08	131.49	94.18	71.54	57.60	85.18	1.20	1.77	12.15	
1988	0.0	0.0	0.0	22.35	18.71	15.90	13.71	30.47	31.56	25.71	21.20	17.69	35.71	0.85	1.37	10.41	94.57 @ 0F
1988	0.0	100.0	0.0	15.89	14.85	14.15	13.76	25.72	26.90	24.11	21.97	20.35	35.46	1.40	2.43	10.41	85.08 @ 25F
1988	100.0	0.0	100.0	153.86	93.60	55.50	29.87	21.85	186.60	116.24	73.54	46.36	36.78	1.90	2.96	10.41	76.76 @ 50F
1988	50.0	0.0	50.0	75.22	48.65	31.60	20.02	26.45	94.14	61.97	41.91	28.82	35.20	1.23	1.96	10.41	69.47 @ 75F
1988	0.0	50.0	0.0	19.41	16.85	14.94	13.51	28.22	29.11	24.57	21.09	18.42	35.08	1.05	1.76	10.41	114.03 @100F
1988	50.0	50.0	50.0	84.88	54.22	34.83	21.82	23.79	106.75	70.18	47.76	33.35	36.12	1.65	2.70	10.41	
1988	20.6	27.3	20.6	42.36	29.94	21.79	16.17	27.59	55.81	39.90	29.59	22.62	35.14	1.11	1.82	10.41	
1990	0.0	0.0	0.0	17.58	14.21	11.67	9.73	22.36	25.82	20.22	16.01	12.84	25.54	0.77	1.20	9.94	75.27 @ 0F
1990	0.0	100.0	0.0	13.48	12.13	11.15	10.47	18.85	22.91	19.91	17.57	15.75	26.41	1.27	2.13	9.94	66.97 @ 25F
1990	100.0	0.0	100.0	116.35	72.32	43.31	22.68	18.16	140.26	89.17	56.85	35.01	29.22	1.74	2.60	9.94	59.74 @ 50F
1990	50.0	0.0	50.0	56.53	37.00	23.99	14.70	20.26	71.42	47.47	31.98	21.38	26.34	1.13	1.72	9.94	53.44 @ 75F
1990	0.0	50.0	0.0	15.70	13.16	11.27	9.86	20.67	24.26	19.75	16.34	13.76	25.49	0.95	1.54	9.94	86.57 @100F
1990	50.0	50.0	50.0	64.91	42.23	27.23	16.57	18.50	81.59	54.54	37.21	25.38	27.82	1.51	2.36	9.94	
1990	20.6	27.3	20.6	32.47	22.95	16.48	11.83	20.57	43.60	31.09	22.71	16.82	25.82	1.02	1.60	9.94	
1995	0.0	0.0	0.0	10.22	7.43	5.43	3.99	8.24	17.43	12.55	9.10	6.66	11.09	0.57	0.97	9.17	51.16 @ 0F
1995	0.0	100.0	0.0	10.13	8.34	6.91	5.78	8.69	17.03	13.99	11.57	9.66	13.88	0.92	1.71	9.17	44.78 @ 25F
1995	100.0	0.0	100.0	61.10	41.01	25.55	12.58	11.86	71.96	49.57	32.67	18.78	17.92	1.25	2.09	9.17	39.26 @ 50F
1995	50.0	0.0	50.0	29.65	20.23	13.09	7.25	9.53	38.59	26.83	18.14	11.28	13.51	0.82	1.38	9.17	34.49 @ 75F
1995	0.0	50.0	0.0	10.13	7.74	5.97	4.65	8.33	17.15	12.99	9.97	7.74	12.02	0.70	1.24	9.17	51.00 @100F
1995	50.0	50.0	50.0	35.61	24.67	16.23	9.18	10.27	44.50	31.78	22.12	14.22	15.90	1.08	1.90	9.17	
1995	20.6	27.3	20.6	18.10	12.82	8.84	5.68	8.81	25.91	18.61	13.25	9.13	12.57	0.74	1.28	9.17	
2000	0.0	0.0	0.0	7.53	5.19	3.57	2.46	2.69	13.84	9.40	6.38	4.34	4.80	0.54	0.96	8.94	41.75 @ 0F
2000	0.0	100.0	0.0	8.45	6.69	5.30	4.20	5.11	14.38	11.47	9.16	7.31	8.93	0.86	1.69	8.94	36.19 @ 25F
2000	100.0	0.0	100.0	38.59	28.73	18.86	9.00	9.52	44.54	33.88	23.21	12.54	13.32	1.17	2.06	8.94	31.41 @ 50F
2000	50.0	0.0	50.0	19.35	14.15	9.39	4.95	5.29	25.52	18.71	12.79	7.46	8.04	0.77	1.37	8.94	27.29 @ 75F
2000	0.0	50.0	0.0	7.87	5.76	4.23	3.12	3.61	14.04	10.18	7.44	5.47	6.37	0.65	1.23	8.94	36.94 @100F
2000	50.0	50.0	50.0	23.52	17.71	12.08	6.60	7.32	29.46	22.67	16.18	9.93	11.13	1.02	1.88	8.94	
2000	20.6	27.3	20.6	12.54	9.15	6.30	3.83	4.25	18.71	13.62	9.56	6.22	6.97	0.70	1.27	8.94	
2010	0.0	0.0	0.0	7.08	4.88	3.36	2.32	2.48	12.87	8.64	5.80	3.89	4.16	0.55	0.96	8.87	38.96 @ 0F
2010	0.0	100.0	0.0	7.49	5.97	4.76	3.79	4.59	12.72	10.14	8.08	6.44	7.80	0.87	1.70	8.87	33.51 @ 25F
2010	100.0	0.0	100.0	35.92	26.70	17.48	8.26	8.73	42.52	31.77	21.02	10.27	10.85	1.21	2.07	8.87	28.83 @ 50F
2010	50.0	0.0	50.0	18.06	13.19	8.74	4.58	4.85	24.15	17.44	11.59	6.32	6.70	0.79	1.37	8.87	24.80 @ 75F
2010	0.0	50.0	0.0	7.24	5.29	3.89	2.88	3.28	12.81	9.20	6.66	4.86	5.54	0.66	1.23	8.87	32.13 @100F
2010	50.0	50.0	50.0	21.71	16.34	11.12	6.03	6.66	27.62	20.95	14.55	8.35	9.32	1.04	1.89	8.87	
2010	20.6	27.3	20.6	11.64	8.49	5.84	3.54	3.88	17.43	12.53	8.63	5.40	5.94	0.71	1.27	8.87	

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TABLE 1.31

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 2.5 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	3.62	3.11	2.69	2.34	1.77	3.95	3.49	3.10	2.76	2.13	2.40	3.02	50.24	5.04 @ 0F
1980	0.0	100.0	0.0	4.70	4.13	3.63	3.21	2.29	5.11	4.59	4.13	3.73	2.67	2.78	3.62	50.24	4.66 @ 25F
1980	100.0	0.0	100.0	3.85	3.59	3.38	3.21	2.56	3.76	3.70	3.67	3.68	2.94	3.00	3.92	50.24	4.33 @ 50F
1980	50.0	0.0	50.0	3.80	3.43	3.13	2.88	2.28	3.96	3.72	3.53	3.38	2.68	2.67	3.43	50.24	4.03 @ 75F
1980	0.0	50.0	0.0	4.33	3.77	3.29	2.89	2.11	4.77	4.25	3.80	3.42	2.52	2.57	3.29	50.24	2.94 @100F
1980	50.0	50.0	50.0	4.28	3.86	3.50	3.21	2.43	4.44	4.14	3.90	3.70	2.80	2.89	3.77	50.24	
1980	20.6	27.3	20.6	4.08	3.61	3.20	2.86	2.17	4.41	4.01	3.67	3.38	2.57	2.60	3.34	50.24	
1988	0.0	0.0	0.0	2.72	2.30	1.94	1.65	1.46	3.34	2.85	2.44	2.09	1.94	2.69	2.79	34.23	4.06 @ 0F
1988	0.0	100.0	0.0	4.26	3.58	3.02	2.56	2.15	5.24	4.45	3.80	3.26	2.87	2.67	3.30	34.23	3.83 @ 25F
1988	100.0	0.0	100.0	3.90	3.50	3.16	2.87	2.47	4.50	4.12	3.79	3.50	3.11	2.82	3.54	34.23	3.62 @ 50F
1988	50.0	0.0	50.0	3.27	2.86	2.52	2.24	1.94	3.89	3.46	3.09	2.78	2.50	2.75	3.13	34.23	3.43 @ 75F
1988	0.0	50.0	0.0	3.46	2.92	2.47	2.10	1.80	4.27	3.64	3.11	2.68	2.39	2.68	3.02	34.23	3.01 @100F
1988	50.0	50.0	50.0	4.08	3.54	3.09	2.71	2.31	4.87	4.28	3.79	3.38	2.99	2.74	3.42	34.23	
1988	20.6	27.3	20.6	3.35	2.87	2.47	2.14	1.84	4.07	3.53	3.07	2.69	2.42	2.71	3.06	34.23	
1990	0.0	0.0	0.0	2.58	2.17	1.83	1.55	1.43	3.18	2.69	2.28	1.94	1.87	2.51	2.43	32.20	4.00 @ 0F
1990	0.0	100.0	0.0	4.20	3.50	2.92	2.45	2.15	5.18	4.34	3.65	3.08	2.81	2.47	2.87	32.20	3.79 @ 25F
1990	100.0	0.0	100.0	3.91	3.50	3.14	2.83	2.52	4.63	4.20	3.83	3.50	3.21	2.61	3.08	32.20	3.59 @ 50F
1990	50.0	0.0	50.0	3.19	2.78	2.44	2.15	1.93	3.84	3.39	3.00	2.67	2.49	2.55	2.72	32.20	3.41 @ 75F
1990	0.0	50.0	0.0	3.34	2.79	2.35	1.98	1.76	4.11	3.47	2.93	2.49	2.31	2.49	2.63	32.20	3.18 @100F
1990	50.0	50.0	50.0	4.05	3.50	3.03	2.64	2.33	4.90	4.27	3.74	3.29	3.01	2.54	2.98	32.20	
1990	20.6	27.3	20.6	3.24	2.76	2.36	2.03	1.82	3.96	3.40	2.93	2.54	2.37	2.51	2.66	32.20	
1995	0.0	0.0	0.0	2.27	1.91	1.60	1.35	1.37	2.83	2.38	2.00	1.68	1.73	1.95	1.92	18.78	3.80 @ 0F
1995	0.0	100.0	0.0	4.00	3.30	2.73	2.26	2.15	4.85	3.98	3.27	2.70	2.62	1.91	2.28	18.78	3.62 @ 25F
1995	100.0	0.0	100.0	3.87	3.46	3.09	2.76	2.62	4.77	4.29	3.87	3.49	3.37	2.02	2.45	18.78	3.44 @ 50F
1995	50.0	0.0	50.0	2.98	2.59	2.26	1.98	1.92	3.69	3.23	2.83	2.49	2.47	1.98	2.16	18.78	3.28 @ 75F
1995	0.0	50.0	0.0	3.04	2.53	2.10	1.75	1.71	3.73	3.09	2.57	2.13	2.13	1.93	2.08	18.78	3.27 @100F
1995	50.0	50.0	50.0	3.94	3.38	2.91	2.51	2.39	4.81	4.14	3.57	3.10	3.00	1.97	2.36	18.78	
1995	20.6	27.3	20.6	2.98	2.53	2.15	1.83	1.78	3.67	3.11	2.65	2.26	2.25	1.95	2.10	18.78	
2000	0.0	0.0	0.0	2.03	1.72	1.45	1.23	1.32	2.59	2.17	1.82	1.52	1.63	1.86	1.91	15.16	3.79 @ 0F
2000	0.0	100.0	0.0	3.79	3.13	2.59	2.14	2.14	4.46	3.64	2.97	2.43	2.43	1.81	2.27	15.16	3.61 @ 25F
2000	100.0	0.0	100.0	3.74	3.35	3.01	2.70	2.67	4.67	4.20	3.77	3.39	3.36	1.91	2.43	15.16	3.44 @ 50F
2000	50.0	0.0	50.0	2.77	2.43	2.14	1.88	1.91	3.50	3.06	2.68	2.35	2.39	1.88	2.15	15.16	3.27 @ 75F
2000	0.0	50.0	0.0	2.80	2.33	1.95	1.63	1.67	3.40	2.81	2.32	1.91	1.97	1.84	2.07	15.16	3.35 @100F
2000	50.0	50.0	50.0	3.76	3.24	2.80	2.42	2.40	4.57	3.92	3.37	2.91	2.89	1.86	2.35	15.16	
2000	20.6	27.3	20.6	2.75	2.34	2.00	1.71	1.75	3.40	2.88	2.44	2.07	2.13	1.85	2.09	15.16	
2010	0.0	0.0	0.0	1.89	1.63	1.40	1.20	1.29	2.40	2.02	1.70	1.43	1.53	1.91	1.95	14.00	3.80 @ 0F
2010	0.0	100.0	0.0	3.65	3.06	2.56	2.14	2.14	4.13	3.37	2.76	2.25	2.25	1.84	2.31	14.00	3.61 @ 25F
2010	100.0	0.0	100.0	3.76	3.37	3.03	2.72	2.69	4.55	4.09	3.67	3.29	3.25	1.95	2.47	14.00	3.44 @ 50F
2010	50.0	0.0	50.0	2.71	2.39	2.11	1.87	1.90	3.34	2.92	2.56	2.25	2.29	1.92	2.19	14.00	3.27 @ 75F
2010	0.0	50.0	0.0	2.66	2.25	1.90	1.61	1.66	3.15	2.60	2.15	1.78	1.84	1.88	2.11	14.00	3.38 @100F
2010	50.0	50.0	50.0	3.70	3.21	2.79	2.43	2.41	4.34	3.73	3.21	2.77	2.75	1.90	2.39	14.00	
2010	20.6	27.3	20.6	2.64	2.28	1.96	1.70	1.74	3.19	2.71	2.30	1.96	2.01	1.90	2.13	14.00	

TABLE 1.31: NOx AT 2.5 MPH.

TABLE 1.32

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 5.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	3.14	2.71	2.35	2.04	1.54	3.41	3.02	2.68	2.40	1.85	2.16	2.72	45.15	5.17 @ 0F
1980	0.0	100.0	0.0	4.11	3.62	3.19	2.82	2.01	4.43	3.98	3.59	3.25	2.33	2.50	3.26	45.15	4.78 @ 25F
1980	100.0	0.0	100.0	3.45	3.19	2.99	2.83	2.22	3.31	3.25	3.21	3.21	2.54	2.69	3.52	45.15	4.44 @ 50F
1980	50.0	0.0	50.0	3.35	3.02	2.75	2.52	1.98	3.45	3.24	3.07	2.94	2.32	2.40	3.08	45.15	4.14 @ 75F
1980	0.0	50.0	0.0	3.77	3.29	2.88	2.53	1.85	4.12	3.68	3.30	2.97	2.19	2.31	2.96	45.15	3.01 @100F
1980	50.0	50.0	50.0	3.78	3.40	3.09	2.82	2.12	3.87	3.61	3.40	3.23	2.43	2.60	3.39	45.15	
1980	20.6	27.3	20.6	3.57	3.16	2.81	2.51	1.89	3.82	3.48	3.19	2.94	2.23	2.34	3.00	45.15	
1988	0.0	0.0	0.0	2.52	2.13	1.80	1.53	1.35	3.07	2.62	2.24	1.92	1.78	2.42	2.51	30.77	4.16 @ 0F
1988	0.0	100.0	0.0	3.95	3.32	2.80	2.37	1.99	4.84	4.11	3.50	3.00	2.65	2.40	2.97	30.77	3.93 @ 25F
1988	100.0	0.0	100.0	3.64	3.26	2.94	2.66	2.29	4.17	3.81	3.50	3.23	2.87	2.53	3.18	30.77	3.71 @ 50F
1988	50.0	0.0	50.0	3.04	2.66	2.34	2.07	1.80	3.59	3.19	2.85	2.56	2.31	2.47	2.81	30.77	3.52 @ 75F
1988	0.0	50.0	0.0	3.21	2.70	2.28	1.94	1.66	3.93	3.35	2.86	2.46	2.20	2.41	2.72	30.77	3.09 @100F
1988	50.0	50.0	50.0	3.79	3.29	2.87	2.51	2.14	4.50	3.96	3.50	3.12	2.76	2.47	3.07	30.77	
1988	20.6	27.3	20.6	3.11	2.66	2.29	1.98	1.70	3.75	3.25	2.83	2.48	2.23	2.43	2.75	30.77	
1990	0.0	0.0	0.0	2.41	2.02	1.70	1.44	1.33	2.95	2.49	2.12	1.80	1.73	2.25	2.18	28.94	4.10 @ 0F
1990	0.0	100.0	0.0	3.92	3.26	2.72	2.28	2.00	4.81	4.02	3.38	2.85	2.61	2.22	2.58	28.94	3.89 @ 25F
1990	100.0	0.0	100.0	3.66	3.27	2.94	2.65	2.35	4.31	3.91	3.56	3.25	2.98	2.34	2.77	28.94	3.68 @ 50F
1990	50.0	0.0	50.0	2.98	2.60	2.27	2.00	1.80	3.57	3.15	2.79	2.48	2.31	2.29	2.45	28.94	3.50 @ 75F
1990	0.0	50.0	0.0	3.11	2.60	2.18	1.84	1.64	3.81	3.21	2.72	2.30	2.15	2.24	2.36	28.94	3.26 @100F
1990	50.0	50.0	50.0	3.79	3.27	2.83	2.47	2.18	4.56	3.97	3.47	3.05	2.80	2.28	2.68	28.94	
1990	20.6	27.3	20.6	3.02	2.57	2.20	1.89	1.69	3.68	3.15	2.72	2.35	2.20	2.26	2.39	28.94	
1995	0.0	0.0	0.0	2.14	1.80	1.51	1.27	1.28	2.65	2.22	1.87	1.57	1.62	1.75	1.72	16.88	3.90 @ 0F
1995	0.0	100.0	0.0	3.76	3.10	2.56	2.12	2.02	4.54	3.72	3.06	2.52	2.45	1.72	2.05	16.88	3.71 @ 25F
1995	100.0	0.0	100.0	3.64	3.25	2.90	2.59	2.46	4.47	4.02	3.62	3.27	3.16	1.82	2.20	16.88	3.53 @ 50F
1995	50.0	0.0	50.0	2.80	2.44	2.13	1.86	1.81	3.45	3.02	2.65	2.33	2.31	1.78	1.94	16.88	3.37 @ 75F
1995	0.0	50.0	0.0	2.86	2.38	1.98	1.65	1.61	3.49	2.89	2.40	2.00	1.99	1.73	1.87	16.88	3.35 @100F
1995	50.0	50.0	50.0	3.70	3.18	2.73	2.36	2.24	4.50	3.87	3.34	2.90	2.81	1.77	2.12	16.88	
1995	20.6	27.3	20.6	2.80	2.37	2.02	1.72	1.67	3.44	2.91	2.48	2.11	2.10	1.75	1.89	16.88	
2000	0.0	0.0	0.0	1.90	1.61	1.37	1.16	1.24	2.43	2.04	1.71	1.43	1.53	1.67	1.72	13.62	3.89 @ 0F
2000	0.0	100.0	0.0	3.56	2.94	2.43	2.01	2.01	4.19	3.42	2.79	2.28	2.28	1.63	2.04	13.62	3.70 @ 25F
2000	100.0	0.0	100.0	3.51	3.15	2.83	2.54	2.51	4.39	3.94	3.54	3.19	3.15	1.72	2.19	13.62	3.53 @ 50F
2000	50.0	0.0	50.0	2.60	2.28	2.01	1.77	1.80	3.28	2.87	2.52	2.20	2.24	1.69	1.93	13.62	3.36 @ 75F
2000	0.0	50.0	0.0	2.63	2.19	1.83	1.53	1.57	3.20	2.64	2.18	1.80	1.85	1.65	1.86	13.62	3.44 @100F
2000	50.0	50.0	50.0	3.54	3.05	2.63	2.27	2.26	4.29	3.68	3.17	2.73	2.71	1.67	2.11	13.62	
2000	20.6	27.3	20.6	2.59	2.20	1.88	1.61	1.65	3.20	2.70	2.29	1.95	2.00	1.67	1.88	13.62	
2010	0.0	0.0	0.0	1.78	1.53	1.31	1.13	1.21	2.26	1.90	1.60	1.34	1.44	1.71	1.75	12.58	3.89 @ 0F
2010	0.0	100.0	0.0	3.43	2.87	2.40	2.01	2.01	3.88	3.17	2.59	2.11	2.11	1.66	2.07	12.58	3.71 @ 25F
2010	100.0	0.0	100.0	3.53	3.17	2.84	2.55	2.52	4.28	3.84	3.45	3.09	3.06	1.75	2.22	12.58	3.53 @ 50F
2010	50.0	0.0	50.0	2.54	2.25	1.98	1.76	1.79	3.14	2.75	2.41	2.11	2.15	1.73	1.97	12.58	3.36 @ 75F
2010	0.0	50.0	0.0	2.50	2.11	1.79	1.51	1.56	2.96	2.45	2.02	1.67	1.73	1.69	1.90	12.58	3.47 @100F
2010	50.0	50.0	50.0	3.48	3.02	2.62	2.28	2.27	4.08	3.50	3.02	2.60	2.59	1.70	2.15	12.58	
2010	20.6	27.3	20.6	2.48	2.14	1.85	1.59	1.64	3.00	2.54	2.16	1.84	1.89	1.70	1.92	12.58	

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TABLE 1.33

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 10.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	LDGV 25 F	LDGV 50 F	LDGV 75 F	LDGV 100 F	LDGT 0 F	LDGT 25 F	LDGT 50 F	LDGT 75 F	LDGT 100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	2.63	2.28	1.98	1.73	1.30	2.88	2.56	2.28	2.05	1.58	1.79	2.26	37.46	5.43 @ 0F
1980	0.0	100.0	0.0	3.47	3.07	2.71	2.41	1.71	3.76	3.39	3.07	2.79	2.00	2.07	2.70	37.46	5.03 @ 25F
1980	100.0	0.0	100.0	2.98	2.75	2.57	2.42	1.87	2.87	2.81	2.77	2.76	2.16	2.24	2.92	37.46	4.67 @ 50F
1980	50.0	0.0	50.0	2.85	2.57	2.34	2.15	1.66	2.94	2.77	2.63	2.52	1.97	1.99	2.56	37.46	4.35 @ 75F
1980	0.0	50.0	0.0	3.16	2.77	2.43	2.15	1.56	3.48	3.12	2.81	2.54	1.88	1.92	2.45	37.46	3.17 @100F
1980	50.0	50.0	50.0	3.23	2.91	2.64	2.41	1.79	3.31	3.10	2.92	2.77	2.08	2.16	2.81	37.46	
1980	20.6	27.3	20.6	3.02	2.67	2.38	2.13	1.59	3.24	2.96	2.72	2.52	1.91	1.94	2.49	37.46	
1988	0.0	0.0	0.0	2.24	1.89	1.60	1.36	1.20	2.71	2.32	1.98	1.70	1.58	2.01	2.08	25.53	4.37 @ 0F
1988	0.0	100.0	0.0	3.52	2.95	2.49	2.11	1.78	4.27	3.63	3.10	2.66	2.34	1.99	2.46	25.53	4.13 @ 25F
1988	100.0	0.0	100.0	3.25	2.91	2.62	2.37	2.04	3.70	3.38	3.10	2.86	2.53	2.10	2.64	25.53	3.90 @ 50F
1988	50.0	0.0	50.0	2.71	2.37	2.09	1.85	1.60	3.18	2.82	2.52	2.27	2.04	2.05	2.33	25.53	3.69 @ 75F
1988	0.0	50.0	0.0	2.85	2.41	2.04	1.73	1.48	3.47	2.96	2.53	2.18	1.95	2.00	2.25	25.53	3.24 @100F
1988	50.0	50.0	50.0	3.38	2.93	2.56	2.24	1.91	3.98	3.50	3.10	2.76	2.44	2.05	2.55	25.53	
1988	20.6	27.3	20.6	2.77	2.37	2.04	1.76	1.52	3.31	2.87	2.50	2.19	1.97	2.02	2.28	25.53	
1990	0.0	0.0	0.0	2.15	1.81	1.52	1.29	1.19	2.61	2.21	1.88	1.60	1.54	1.87	1.81	24.01	4.31 @ 0F
1990	0.0	100.0	0.0	3.50	2.91	2.43	2.04	1.79	4.25	3.56	3.00	2.53	2.31	1.84	2.14	24.01	4.08 @ 25F
1990	100.0	0.0	100.0	3.27	2.93	2.63	2.36	2.10	3.83	3.47	3.16	2.88	2.65	1.94	2.30	24.01	3.87 @ 50F
1990	50.0	0.0	50.0	2.66	2.32	2.03	1.79	1.61	3.17	2.79	2.47	2.20	2.05	1.90	2.03	24.01	3.67 @ 75F
1990	0.0	50.0	0.0	2.78	2.32	1.95	1.65	1.47	3.38	2.85	2.41	2.04	1.90	1.85	1.96	24.01	3.42 @100F
1990	50.0	50.0	50.0	3.39	2.92	2.53	2.20	1.94	4.04	3.52	3.08	2.71	2.48	1.89	2.22	24.01	
1990	20.6	27.3	20.6	2.70	2.30	1.97	1.69	1.51	3.26	2.80	2.41	2.09	1.95	1.87	1.98	24.01	
1995	0.0	0.0	0.0	1.91	1.60	1.35	1.13	1.15	2.35	1.98	1.66	1.39	1.44	1.45	1.43	14.01	4.10 @ 0F
1995	0.0	100.0	0.0	3.36	2.77	2.29	1.90	1.80	4.03	3.31	2.72	2.24	2.18	1.42	1.70	14.01	3.90 @ 25F
1995	100.0	0.0	100.0	3.25	2.90	2.59	2.32	2.20	3.97	3.57	3.22	2.90	2.81	1.51	1.82	14.01	3.71 @ 50F
1995	50.0	0.0	50.0	2.50	2.18	1.90	1.66	1.61	3.07	2.69	2.35	2.07	2.05	1.48	1.61	14.01	3.54 @ 75F
1995	0.0	50.0	0.0	2.55	2.12	1.77	1.47	1.44	3.10	2.57	2.13	1.77	1.77	1.44	1.55	14.01	3.52 @100F
1995	50.0	50.0	50.0	3.31	2.84	2.44	2.11	2.00	4.00	3.44	2.97	2.57	2.49	1.47	1.76	14.01	
1995	20.6	27.3	20.6	2.50	2.12	1.80	1.53	1.49	3.05	2.59	2.20	1.88	1.87	1.45	1.57	14.01	
2000	0.0	0.0	0.0	1.69	1.44	1.22	1.03	1.10	2.16	1.81	1.52	1.27	1.36	1.39	1.43	11.30	4.09 @ 0F
2000	0.0	100.0	0.0	3.17	2.62	2.16	1.79	1.79	3.72	3.04	2.48	2.02	2.02	1.35	1.69	11.30	3.89 @ 25F
2000	100.0	0.0	100.0	3.13	2.80	2.52	2.26	2.23	3.90	3.50	3.15	2.83	2.80	1.43	1.81	11.30	3.71 @ 50F
2000	50.0	0.0	50.0	2.32	2.03	1.79	1.57	1.60	2.92	2.55	2.23	1.96	1.99	1.40	1.60	11.30	3.53 @ 75F
2000	0.0	50.0	0.0	2.34	1.95	1.63	1.36	1.40	2.84	2.34	1.93	1.60	1.64	1.37	1.54	11.30	3.61 @100F
2000	50.0	50.0	50.0	3.15	2.71	2.34	2.02	2.01	3.81	3.27	2.81	2.43	2.41	1.39	1.75	11.30	
2000	20.6	27.3	20.6	2.30	1.96	1.67	1.43	1.47	2.84	2.40	2.04	1.73	1.77	1.38	1.56	11.30	
2010	0.0	0.0	0.0	1.58	1.36	1.17	1.00	1.08	2.01	1.69	1.42	1.19	1.28	1.42	1.45	10.44	4.09 @ 0F
2010	0.0	100.0	0.0	3.05	2.55	2.14	1.79	1.79	3.45	2.82	2.30	1.88	1.88	1.38	1.72	10.44	3.89 @ 25F
2010	100.0	0.0	100.0	3.14	2.82	2.53	2.27	2.24	3.81	3.42	3.07	2.75	2.72	1.45	1.84	10.44	3.71 @ 50F
2010	50.0	0.0	50.0	2.26	2.00	1.77	1.56	1.59	2.79	2.44	2.14	1.88	1.91	1.43	1.63	10.44	3.53 @ 75F
2010	0.0	50.0	0.0	2.22	1.88	1.59	1.35	1.39	2.63	2.18	1.80	1.49	1.54	1.40	1.57	10.44	3.65 @100F
2010	50.0	50.0	50.0	3.10	2.69	2.33	2.03	2.02	3.63	3.12	2.69	2.32	2.30	1.41	1.78	10.44	
2010	20.6	27.3	20.6	2.21	1.90	1.64	1.42	1.45	2.67	2.26	1.92	1.64	1.68	1.41	1.59	10.44	

TABLE 1.33: NOx AT 10.0 MPH.

TABLE 1.34

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 19.6 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	LDDV- 0-100F	LDDT- 0-100F	HDDV- 0-100F	HDGV
1980	0.0	0.0	0.0	2.64	2.30	2.01	1.76	1.34	3.08	2.76	2.47	2.23	1.73	1.38	1.74	28.91	5.93 @ 0F
1980	0.0	100.0	0.0	3.47	3.07	2.73	2.43	1.74	4.01	3.63	3.31	3.02	2.18	1.60	2.09	28.91	5.49 @ 25F
1980	100.0	0.0	100.0	2.92	2.72	2.56	2.44	1.90	3.03	2.99	2.97	2.98	2.35	1.73	2.26	28.91	5.10 @ 50F
1980	50.0	0.0	50.0	2.82	2.57	2.35	2.18	1.70	3.14	2.97	2.84	2.73	2.15	1.54	1.97	28.91	4.75 @ 75F
1980	0.0	50.0	0.0	3.17	2.79	2.46	2.18	1.60	3.73	3.36	3.04	2.76	2.05	1.48	1.90	28.91	3.46 @100F
1980	50.0	50.0	50.0	3.19	2.89	2.64	2.44	1.82	3.52	3.31	3.14	3.00	2.27	1.66	2.17	28.91	
1980	20.6	27.3	20.6	3.01	2.68	2.40	2.17	1.63	3.46	3.18	2.94	2.73	2.08	1.50	1.92	28.91	
1988	0.0	0.0	0.0	2.02	1.71	1.46	1.25	1.09	2.43	2.09	1.80	1.56	1.42	1.55	1.61	19.70	4.78 @ 0F
1988	0.0	100.0	0.0	3.13	2.65	2.25	1.92	1.60	3.78	3.23	2.78	2.40	2.09	1.54	1.90	19.70	4.51 @ 25F
1988	100.0	0.0	100.0	2.87	2.58	2.34	2.13	1.82	3.26	2.99	2.76	2.56	2.25	1.62	2.04	19.70	4.26 @ 50F
1988	50.0	0.0	50.0	2.42	2.13	1.88	1.68	1.44	2.83	2.52	2.27	2.06	1.82	1.58	1.80	19.70	4.04 @ 75F
1988	0.0	50.0	0.0	2.56	2.17	1.85	1.58	1.34	3.09	2.66	2.29	1.98	1.75	1.54	1.74	19.70	3.54 @100F
1988	50.0	50.0	50.0	3.00	2.61	2.29	2.02	1.71	3.52	3.11	2.77	2.48	2.17	1.58	1.97	19.70	
1988	20.6	27.3	20.6	2.48	2.14	1.85	1.61	1.37	2.96	2.58	2.26	2.00	1.77	1.56	1.76	19.70	
1990	0.0	0.0	0.0	1.89	1.60	1.35	1.15	1.05	2.28	1.94	1.65	1.41	1.34	1.44	1.40	18.53	4.71 @ 0F
1990	0.0	100.0	0.0	3.04	2.55	2.14	1.81	1.57	3.68	3.10	2.62	2.23	2.01	1.42	1.65	18.53	4.46 @ 25F
1990	100.0	0.0	100.0	2.83	2.54	2.29	2.07	1.82	3.30	3.00	2.74	2.51	2.28	1.50	1.77	18.53	4.23 @ 50F
1990	50.0	0.0	50.0	2.32	2.03	1.79	1.58	1.41	2.75	2.43	2.16	1.94	1.78	1.47	1.57	18.53	4.01 @ 75F
1990	0.0	50.0	0.0	2.43	2.05	1.73	1.47	1.29	2.94	2.49	2.12	1.81	1.66	1.43	1.51	18.53	3.74 @100F
1990	50.0	50.0	50.0	2.94	2.54	2.21	1.94	1.69	3.49	3.05	2.68	2.37	2.15	1.46	1.71	18.53	
1990	20.6	27.3	20.6	2.36	2.02	1.74	1.50	1.33	2.83	2.44	2.12	1.84	1.70	1.45	1.53	18.53	
1995	0.0	0.0	0.0	1.60	1.35	1.13	0.95	0.96	1.97	1.65	1.39	1.17	1.20	1.12	1.10	10.81	4.48 @ 0F
1995	0.0	100.0	0.0	2.81	2.32	1.92	1.59	1.51	3.36	2.76	2.28	1.88	1.82	1.10	1.31	10.81	4.26 @ 25F
1995	100.0	0.0	100.0	2.72	2.43	2.17	1.94	1.83	3.31	2.98	2.69	2.43	2.34	1.16	1.41	10.81	4.06 @ 50F
1995	50.0	0.0	50.0	2.10	1.83	1.59	1.39	1.35	2.56	2.24	1.97	1.74	1.71	1.14	1.24	10.81	3.86 @ 75F
1995	0.0	50.0	0.0	2.14	1.78	1.48	1.24	1.20	2.59	2.15	1.79	1.49	1.48	1.11	1.20	10.81	3.85 @100F
1995	50.0	50.0	50.0	2.76	2.37	2.05	1.77	1.67	3.33	2.87	2.48	2.15	2.08	1.13	1.36	10.81	
1995	20.6	27.3	20.6	2.10	1.78	1.51	1.29	1.25	2.55	2.16	1.85	1.58	1.56	1.12	1.21	10.81	
2000	0.0	0.0	0.0	1.40	1.18	1.00	0.85	0.91	1.78	1.49	1.25	1.05	1.12	1.07	1.10	8.72	4.47 @ 0F
2000	0.0	100.0	0.0	2.61	2.16	1.78	1.47	1.47	3.06	2.50	2.04	1.66	1.66	1.04	1.30	8.72	4.25 @ 25F
2000	100.0	0.0	100.0	2.57	2.31	2.07	1.86	1.84	3.21	2.88	2.59	2.33	2.30	1.10	1.40	8.72	4.05 @ 50F
2000	50.0	0.0	50.0	1.91	1.68	1.47	1.29	1.32	2.40	2.10	1.84	1.61	1.64	1.08	1.23	8.72	3.86 @ 75F
2000	0.0	50.0	0.0	1.93	1.61	1.34	1.12	1.15	2.34	1.93	1.59	1.31	1.35	1.06	1.19	8.72	3.95 @100F
2000	50.0	50.0	50.0	2.59	2.23	1.93	1.67	1.65	3.14	2.69	2.31	2.00	1.98	1.07	1.35	8.72	
2000	20.6	27.3	20.6	1.90	1.62	1.38	1.18	1.21	2.34	1.98	1.68	1.42	1.46	1.07	1.20	8.72	
2010	0.0	0.0	0.0	1.30	1.12	0.96	0.82	0.89	1.65	1.39	1.17	0.98	1.06	1.10	1.12	8.06	4.47 @ 0F
2010	0.0	100.0	0.0	2.51	2.10	1.76	1.47	1.47	2.84	2.32	1.89	1.55	1.55	1.06	1.33	8.06	4.26 @ 25F
2010	100.0	0.0	100.0	2.58	2.32	2.08	1.87	1.85	3.13	2.81	2.52	2.26	2.24	1.12	1.42	8.06	4.05 @ 50F
2010	50.0	0.0	50.0	1.86	1.64	1.45	1.28	1.31	2.30	2.01	1.76	1.55	1.57	1.11	1.26	8.06	3.85 @ 75F
2010	0.0	50.0	0.0	1.83	1.55	1.31	1.11	1.14	2.16	1.79	1.48	1.22	1.26	1.08	1.22	8.06	3.98 @100F
2010	50.0	50.0	50.0	2.55	2.21	1.92	1.67	1.66	2.98	2.56	2.21	1.90	1.89	1.09	1.38	8.06	
2010	20.6	27.3	20.6	1.82	1.57	1.35	1.17	1.20	2.19	1.86	1.58	1.35	1.38	1.09	1.23	8.06	

TABLE 1.34: NOx AT 19.6 MPH.

96h

TABLE 1.35

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 35.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	LDGV 25 F	LDGV 50 F	LDGV 75 F	LDGV 100 F	LDGT 0 F	LDGT 25 F	LDGT 50 F	LDGT 75 F	LDGT 100 F	LDDV 0-100F	LDDT 0-100F	HDDV 0-100F	HDGV
1980	0.0	0.0	0.0	3.33	2.90	2.54	2.23	1.71	4.12	3.69	3.31	2.99	2.32	1.20	1.51	25.08	6.74 @ 0F
1980	0.0	100.0	0.0	4.30	3.81	3.39	3.03	2.19	5.32	4.82	4.38	4.00	2.91	1.39	1.81	25.08	6.24 @ 25F
1980	100.0	0.0	100.0	3.44	3.26	3.12	3.01	2.43	3.89	3.88	3.89	3.93	3.15	1.50	1.96	25.08	5.79 @ 50F
1980	50.0	0.0	50.0	3.45	3.16	2.93	2.73	2.18	4.12	3.92	3.76	3.64	2.89	1.33	1.71	25.08	5.40 @ 75F
1980	0.0	50.0	0.0	3.98	3.50	3.10	2.75	2.04	4.98	4.48	4.06	3.68	2.75	1.28	1.64	25.08	3.93 @100F
1980	50.0	50.0	50.0	3.87	3.53	3.25	3.02	2.31	4.61	4.35	4.14	3.97	3.03	1.44	1.88	25.08	
1980	20.6	27.3	20.6	3.74	3.34	3.01	2.72	2.09	4.60	4.22	3.91	3.64	2.79	1.30	1.66	25.08	
1988	0.0	0.0	0.0	1.99	1.71	1.47	1.27	1.08	2.42	2.10	1.82	1.59	1.41	1.34	1.40	17.09	5.43 @ 0F
1988	0.0	100.0	0.0	3.03	2.59	2.23	1.92	1.56	3.70	3.20	2.78	2.43	2.06	1.33	1.65	17.09	5.12 @ 25F
1988	100.0	0.0	100.0	2.71	2.47	2.26	2.08	1.74	3.14	2.91	2.72	2.55	2.19	1.41	1.77	17.09	4.84 @ 50F
1988	50.0	0.0	50.0	2.34	2.08	1.86	1.68	1.41	2.77	2.50	2.28	2.09	1.81	1.37	1.56	17.09	4.59 @ 75F
1988	0.0	50.0	0.0	2.52	2.16	1.86	1.61	1.33	3.07	2.66	2.32	2.04	1.75	1.34	1.51	17.09	4.03 @100F
1988	50.0	50.0	50.0	2.87	2.53	2.24	2.00	1.65	3.42	3.05	2.75	2.49	2.13	1.37	1.71	17.09	
1988	20.6	27.3	20.6	2.43	2.11	1.84	1.62	1.36	2.92	2.57	2.28	2.04	1.76	1.35	1.52	17.09	
1990	0.0	0.0	0.0	1.77	1.51	1.29	1.10	0.98	2.14	1.83	1.58	1.36	1.26	1.25	1.21	16.07	5.35 @ 0F
1990	0.0	100.0	0.0	2.79	2.36	2.01	1.71	1.45	3.41	2.90	2.48	2.13	1.88	1.23	1.43	16.07	5.07 @ 25F
1990	100.0	0.0	100.0	2.56	2.31	2.09	1.91	1.65	3.00	2.75	2.54	2.35	2.09	1.30	1.54	16.07	4.80 @ 50F
1990	50.0	0.0	50.0	2.14	1.89	1.67	1.49	1.30	2.55	2.27	2.04	1.84	1.66	1.27	1.36	16.07	4.56 @ 75F
1990	0.0	50.0	0.0	2.26	1.92	1.64	1.41	1.21	2.76	2.36	2.02	1.75	1.56	1.24	1.31	16.07	4.25 @100F
1990	50.0	50.0	50.0	2.68	2.34	2.05	1.81	1.55	3.20	2.82	2.51	2.24	1.98	1.27	1.49	16.07	
1990	20.6	27.3	20.6	2.19	1.89	1.64	1.43	1.24	2.64	2.30	2.01	1.77	1.59	1.26	1.33	16.07	
1995	0.0	0.0	0.0	1.34	1.13	0.95	0.80	0.80	1.66	1.40	1.18	1.00	1.01	0.97	0.96	9.38	5.09 @ 0F
1995	0.0	100.0	0.0	2.33	1.93	1.60	1.34	1.25	2.81	2.32	1.93	1.60	1.53	0.95	1.14	9.38	4.84 @ 25F
1995	100.0	0.0	100.0	2.25	2.01	1.80	1.61	1.51	2.75	2.48	2.25	2.03	1.94	1.01	1.22	9.38	4.61 @ 50F
1995	50.0	0.0	50.0	1.74	1.52	1.33	1.16	1.11	2.14	1.88	1.66	1.47	1.43	0.99	1.08	9.38	4.39 @ 75F
1995	0.0	50.0	0.0	1.78	1.49	1.24	1.04	1.00	2.18	1.81	1.52	1.27	1.25	0.96	1.04	9.38	4.38 @100F
1995	50.0	50.0	50.0	2.29	1.97	1.70	1.47	1.38	2.78	2.40	2.09	1.82	1.74	0.98	1.18	9.38	
1995	20.6	27.3	20.6	1.75	1.48	1.27	1.08	1.04	2.14	1.82	1.56	1.34	1.31	0.97	1.05	9.38	
2000	0.0	0.0	0.0	1.11	0.94	0.80	0.68	0.73	1.42	1.19	1.00	0.84	0.89	0.93	0.95	7.57	5.07 @ 0F
2000	0.0	100.0	0.0	2.08	1.72	1.42	1.17	1.17	2.45	2.00	1.63	1.33	1.33	0.90	1.13	7.57	4.83 @ 25F
2000	100.0	0.0	100.0	2.05	1.84	1.65	1.48	1.46	2.56	2.30	2.07	1.86	1.84	0.96	1.21	7.57	4.60 @ 50F
2000	50.0	0.0	50.0	1.52	1.33	1.17	1.03	1.05	1.92	1.68	1.47	1.29	1.31	0.94	1.07	7.57	4.38 @ 75F
2000	0.0	50.0	0.0	1.54	1.28	1.07	0.89	0.92	1.87	1.54	1.27	1.05	1.08	0.92	1.03	7.57	4.48 @100F
2000	50.0	50.0	50.0	2.06	1.78	1.53	1.32	1.32	2.50	2.15	1.85	1.60	1.59	0.93	1.17	7.57	
2000	20.6	27.3	20.6	1.51	1.29	1.10	0.94	0.96	1.87	1.58	1.34	1.14	1.17	0.93	1.05	7.57	
2010	0.0	0.0	0.0	1.03	0.88	0.76	0.65	0.70	1.31	1.10	0.92	0.78	0.83	0.95	0.97	6.99	5.08 @ 0F
2010	0.0	100.0	0.0	1.98	1.66	1.39	1.16	1.16	2.24	1.83	1.50	1.22	1.22	0.92	1.15	6.99	4.83 @ 25F
2010	100.0	0.0	100.0	2.04	1.83	1.65	1.48	1.46	2.48	2.22	1.99	1.79	1.77	0.97	1.23	6.99	4.60 @ 50F
2010	50.0	0.0	50.0	1.47	1.30	1.15	1.02	1.03	1.82	1.59	1.39	1.22	1.24	0.96	1.09	6.99	4.38 @ 75F
2010	0.0	50.0	0.0	1.44	1.22	1.03	0.88	0.90	1.71	1.42	1.17	0.97	1.00	0.94	1.05	6.99	4.53 @100F
2010	50.0	50.0	50.0	2.01	1.75	1.52	1.32	1.31	2.36	2.03	1.75	1.51	1.50	0.95	1.19	6.99	
2010	20.6	27.3	20.6	1.44	1.24	1.07	0.92	0.95	1.74	1.47	1.25	1.06	1.09	0.95	1.06	6.99	

TABLE 1.35: NOx AT 35.0 MPH.

TABLE 1.36

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE) AT 55.0 MPH

Cal. Year	Cold/Hot Start VMT Percentages PCCN	PCHC	PCCC	LDGV 0 F	25 F	50 F	75 F	100 F	LDGT 0 F	25 F	50 F	75 F	100 F	-LDDV- 0-100F	-LDDT- 0-100F	-HDDV- 0-100F	----HDGV----
1980	0.0	0.0	0.0	4.09	3.57	3.12	2.74	2.10	5.06	4.52	4.06	3.66	2.84	1.65	2.07	34.47	7.79 @ 0F
1980	0.0	100.0	0.0	5.30	4.69	4.17	3.72	2.69	6.54	5.92	5.38	4.90	3.56	1.91	2.48	34.47	7.21 @ 25F
1980	100.0	0.0	100.0	4.26	4.03	3.84	3.70	2.98	4.78	4.76	4.77	4.82	3.85	2.06	2.69	34.47	6.69 @ 50F
1980	50.0	0.0	50.0	4.26	3.90	3.60	3.36	2.67	5.06	4.81	4.61	4.46	3.54	1.83	2.35	34.47	6.24 @ 75F
1980	0.0	50.0	0.0	4.90	4.31	3.81	3.38	2.50	6.11	5.50	4.97	4.51	3.36	1.77	2.26	34.47	4.54 @100F
1980	50.0	50.0	50.0	4.78	4.36	4.01	3.71	2.84	5.66	5.34	5.07	4.86	3.71	1.98	2.59	34.47	
1980	20.6	27.3	20.6	4.61	4.11	3.70	3.35	2.56	5.64	5.18	4.79	4.47	3.42	1.79	2.29	34.47	
1988	0.0	0.0	0.0	2.25	1.94	1.68	1.45	1.21	2.80	2.43	2.12	1.86	1.63	1.85	1.92	23.49	6.27 @ 0F
1988	0.0	100.0	0.0	3.38	2.90	2.51	2.19	1.74	4.26	3.70	3.23	2.84	2.38	1.83	2.27	23.49	5.92 @ 25F
1988	100.0	0.0	100.0	3.01	2.74	2.50	2.31	1.89	3.62	3.36	3.14	2.95	2.51	1.94	2.43	23.49	5.59 @ 50F
1988	50.0	0.0	50.0	2.63	2.34	2.10	1.89	1.56	3.21	2.90	2.64	2.43	2.08	1.89	2.15	23.49	5.30 @ 75F
1988	0.0	50.0	0.0	2.83	2.44	2.12	1.84	1.49	3.55	3.09	2.71	2.38	2.02	1.84	2.07	23.49	4.65 @100F
1988	50.0	50.0	50.0	3.19	2.82	2.51	2.25	1.82	3.94	3.53	3.19	2.90	2.44	1.88	2.35	23.49	
1988	20.6	27.3	20.6	2.72	2.38	2.09	1.85	1.51	3.38	2.99	2.66	2.38	2.03	1.86	2.10	23.49	
1990	0.0	0.0	0.0	1.92	1.64	1.41	1.22	1.05	2.36	2.04	1.76	1.53	1.39	1.72	1.67	22.09	6.18 @ 0F
1990	0.0	100.0	0.0	2.98	2.54	2.18	1.87	1.54	3.74	3.20	2.76	2.38	2.07	1.69	1.97	22.09	5.85 @ 25F
1990	100.0	0.0	100.0	2.72	2.45	2.22	2.03	1.71	3.28	3.01	2.78	2.58	2.27	1.79	2.11	22.09	5.55 @ 50F
1990	50.0	0.0	50.0	2.30	2.03	1.81	1.61	1.37	2.80	2.51	2.26	2.05	1.82	1.75	1.87	22.09	5.27 @ 75F
1990	0.0	50.0	0.0	2.44	2.09	1.79	1.55	1.30	3.05	2.62	2.26	1.96	1.73	1.71	1.80	22.09	4.91 @100F
1990	50.0	50.0	50.0	2.85	2.49	2.20	1.95	1.62	3.51	3.11	2.77	2.48	2.17	1.74	2.04	22.09	
1990	20.6	27.3	20.6	2.36	2.04	1.78	1.56	1.31	2.92	2.55	2.24	1.98	1.75	1.73	1.82	22.09	
1995	0.0	0.0	0.0	1.30	1.09	0.92	0.78	0.76	1.62	1.37	1.16	0.99	0.99	1.34	1.32	12.89	5.88 @ 0F
1995	0.0	100.0	0.0	2.22	1.85	1.54	1.29	1.19	2.73	2.27	1.89	1.58	1.49	1.31	1.56	12.89	5.59 @ 25F
1995	100.0	0.0	100.0	2.14	1.90	1.70	1.52	1.39	2.65	2.39	2.17	1.97	1.86	1.39	1.68	12.89	5.33 @ 50F
1995	50.0	0.0	50.0	1.67	1.46	1.27	1.11	1.04	2.08	1.83	1.62	1.44	1.38	1.36	1.48	12.89	5.07 @ 75F
1995	0.0	50.0	0.0	1.71	1.43	1.20	1.01	0.95	2.13	1.78	1.50	1.26	1.22	1.32	1.43	12.89	5.06 @100F
1995	50.0	50.0	50.0	2.18	1.88	1.62	1.40	1.29	2.69	2.33	2.03	1.77	1.68	1.35	1.62	12.89	
1995	20.6	27.3	20.6	1.68	1.43	1.22	1.04	0.98	2.08	1.78	1.53	1.32	1.27	1.34	1.44	12.89	
2000	0.0	0.0	0.0	0.97	0.82	0.69	0.59	0.63	1.26	1.06	0.89	0.74	0.79	1.28	1.31	10.40	5.86 @ 0F
2000	0.0	100.0	0.0	1.81	1.49	1.23	1.02	1.02	2.17	1.77	1.45	1.18	1.18	1.24	1.55	10.40	5.58 @ 25F
2000	100.0	0.0	100.0	1.77	1.59	1.43	1.28	1.26	2.25	2.02	1.82	1.64	1.62	1.31	1.67	10.40	5.31 @ 50F
2000	50.0	0.0	50.0	1.32	1.16	1.02	0.89	0.91	1.69	1.48	1.30	1.14	1.16	1.29	1.47	10.40	5.06 @ 75F
2000	0.0	50.0	0.0	1.34	1.11	0.93	0.77	0.80	1.66	1.37	1.13	0.93	0.96	1.26	1.42	10.40	5.18 @100F
2000	50.0	50.0	50.0	1.79	1.54	1.33	1.15	1.14	2.21	1.90	1.63	1.41	1.40	1.28	1.61	10.40	
2000	20.6	27.3	20.6	1.31	1.12	0.95	0.81	0.83	1.65	1.40	1.19	1.01	1.03	1.27	1.44	10.40	
2010	0.0	0.0	0.0	0.88	0.75	0.65	0.56	0.60	1.11	0.94	0.79	0.66	0.71	1.31	1.34	9.60	5.87 @ 0F
2010	0.0	100.0	0.0	1.69	1.42	1.19	0.99	0.99	1.91	1.56	1.28	1.04	1.04	1.27	1.58	9.60	5.59 @ 25F
2010	100.0	0.0	100.0	1.74	1.56	1.40	1.26	1.24	2.11	1.89	1.70	1.52	1.51	1.34	1.70	9.60	5.32 @ 50F
2010	50.0	0.0	50.0	1.25	1.11	0.98	0.87	0.88	1.55	1.35	1.19	1.04	1.06	1.32	1.50	9.60	5.06 @ 75F
2010	0.0	50.0	0.0	1.23	1.04	0.88	0.75	0.77	1.46	1.21	1.00	0.82	0.85	1.29	1.45	9.60	5.23 @100F
2010	50.0	50.0	50.0	1.72	1.49	1.29	1.13	1.12	2.01	1.73	1.49	1.28	1.27	1.30	1.64	9.60	
2010	20.6	27.3	20.6	1.22	1.06	0.91	0.79	0.81	1.48	1.26	1.07	0.91	0.93	1.30	1.46	9.60	

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TABLE 2.1

LOW ALTITUDE

EMISSION FACTORS (GRAMS/MILE) FOR FTP CONDITIONS
60 - 84 F DIURNAL, 80 F HOT SOAK

Cal. Year	Pollutant By Component	LDGV 7.0	LDGV 8.0	LDGV 9.0	LDGV 10.0	LDGV 10.4	LDGV 11.5	LDGT 7.0	LDGT 8.0	LDGT 9.0	LDGT 10.0	LDGT 10.4	LDGT 11.5	HDGV 7.0	HDGV 8.0	HDGV 9.0	HDGV 10.0	HDGV 10.4	HDGV 11.5
1980	Combined NMHC	6.24	6.42	6.79	7.38	7.65	8.97	7.97	8.17	8.60	9.28	9.58	11.04	14.98	15.24	16.16	17.40	17.92	20.12
1980	Exhaust NMHC	4.19	4.19	4.19	4.23	4.25	4.29	5.56	5.56	5.56	5.59	5.61	5.65	10.16	10.16	10.16	10.16	10.16	10.16
1980	Evaporative HC	1.30	1.35	1.58	1.86	1.98	2.36	1.57	1.64	1.93	2.28	2.43	2.88	3.61	3.72	4.49	5.37	5.73	6.78
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41	0.48	0.48	0.48	0.48	0.48	0.48	0.82	0.82	0.82	0.82	0.82	0.82
1980	Running Loss HC	0.34	0.47	0.60	0.88	1.01	1.91	0.35	0.49	0.63	0.93	1.06	2.03	0.39	0.54	0.69	1.05	1.21	2.36
1980	Exhaust CO	54.42	54.42	54.42	55.29	55.71	56.88	65.43	65.43	65.43	66.17	66.52	67.50	186.46	186.46	186.46	186.46	186.46	186.46
1980	Exhaust NOx	3.05	3.05	3.05	3.05	3.05	3.05	3.83	3.83	3.83	3.83	3.83	3.83	6.75	6.75	6.75	6.75	6.75	6.75
1988	Combined NMHC	3.03	3.16	3.40	3.83	4.03	5.01	3.86	3.97	4.22	4.64	4.84	5.67	6.92	7.18	7.85	8.77	9.17	10.89
1988	Exhaust NMHC	2.11	2.11	2.11	2.16	2.19	2.27	2.91	2.91	2.91	2.99	3.03	3.15	4.37	4.37	4.37	4.41	4.42	4.47
1988	Evaporative HC	0.50	0.52	0.65	0.81	0.88	1.10	0.56	0.59	0.75	0.93	1.01	1.26	1.82	1.89	2.37	2.94	3.17	3.87
1988	Refueling Loss	0.19	0.21	0.24	0.26	0.27	0.30	0.23	0.26	0.29	0.32	0.33	0.36	0.39	0.44	0.50	0.55	0.57	0.62
1988	Running Loss HC	0.23	0.31	0.40	0.59	0.68	1.33	0.16	0.21	0.27	0.40	0.46	0.90	0.33	0.46	0.60	0.88	1.01	1.93
1988	Exhaust CO	25.99	25.99	25.99	27.22	27.86	29.80	34.69	34.69	34.69	36.45	37.37	40.14	83.98	83.98	83.98	85.62	86.48	89.10
1988	Exhaust NOx	1.79	1.79	1.79	1.79	1.79	1.80	2.28	2.28	2.28	2.27	2.27	2.26	5.75	5.75	5.75	5.67	5.63	5.52
1990	Combined NMHC	2.54	2.66	2.87	3.28	3.46	4.39	3.23	3.33	3.53	3.92	4.10	4.86	5.38	5.61	6.17	6.98	7.32	8.85
1990	Exhaust NMHC	1.76	1.76	1.76	1.82	1.85	1.94	2.44	2.44	2.44	2.53	2.58	2.71	3.36	3.36	3.36	3.40	3.42	3.48
1990	Evaporative HC	0.39	0.41	0.52	0.66	0.72	0.92	0.43	0.46	0.59	0.75	0.82	1.03	1.32	1.38	1.76	2.21	2.40	2.98
1990	Refueling Loss	0.18	0.20	0.22	0.25	0.26	0.28	0.22	0.25	0.28	0.31	0.32	0.35	0.38	0.43	0.48	0.53	0.55	0.60
1990	Running Loss HC	0.22	0.29	0.36	0.55	0.63	1.25	0.13	0.18	0.22	0.34	0.39	0.76	0.32	0.44	0.58	0.84	0.95	1.80
1990	Exhaust CO	21.57	21.57	21.57	22.95	23.68	25.95	28.74	28.74	28.74	30.75	31.83	35.15	63.81	63.81	63.81	65.74	66.76	69.84
1990	Exhaust NOx	1.58	1.58	1.58	1.58	1.58	1.59	2.02	2.02	2.02	2.02	2.02	2.02	5.74	5.74	5.74	5.62	5.57	5.42
1995	Combined NMHC	1.73	1.83	2.02	2.39	2.56	3.43	2.23	2.31	2.47	2.82	2.99	3.65	3.90	4.11	4.55	5.23	5.53	6.88
1995	Exhaust NMHC	1.15	1.15	1.15	1.22	1.25	1.36	1.66	1.66	1.66	1.77	1.83	2.00	2.47	2.47	2.47	2.53	2.56	2.65
1995	Evaporative HC	0.23	0.25	0.34	0.46	0.52	0.68	0.26	0.28	0.38	0.50	0.56	0.73	0.77	0.81	1.08	1.41	1.56	1.99
1995	Refueling Loss	0.16	0.18	0.20	0.22	0.23	0.26	0.21	0.24	0.26	0.29	0.30	0.33	0.36	0.40	0.45	0.50	0.51	0.57
1995	Running Loss HC	0.19	0.25	0.32	0.49	0.56	1.13	0.10	0.14	0.17	0.26	0.30	0.59	0.30	0.43	0.56	0.79	0.90	1.67
1995	Exhaust CO	13.89	13.89	13.89	15.45	16.31	19.09	19.33	19.33	19.33	21.68	22.97	27.15	38.56	38.56	38.56	41.06	42.38	46.37
1995	Exhaust NOx	1.21	1.21	1.21	1.22	1.22	1.23	1.63	1.63	1.63	1.64	1.64	1.65	4.90	4.90	4.90	4.77	4.71	4.54
2000	Combined NMHC	1.33	1.43	1.60	1.96	2.13	2.97	1.76	1.83	1.97	2.29	2.45	3.07	3.46	3.66	4.07	4.71	5.00	6.30
2000	Exhaust NMHC	0.84	0.84	0.84	0.91	0.95	1.06	1.29	1.29	1.29	1.41	1.47	1.66	2.21	2.21	2.21	2.28	2.32	2.42
2000	Evaporative HC	0.15	0.17	0.26	0.37	0.42	0.58	0.17	0.19	0.27	0.37	0.42	0.56	0.61	0.64	0.88	1.18	1.31	1.70
2000	Refueling Loss	0.16	0.18	0.20	0.22	0.22	0.25	0.21	0.23	0.26	0.29	0.30	0.33	0.34	0.38	0.43	0.47	0.49	0.54
2000	Running Loss HC	0.18	0.24	0.30	0.46	0.53	1.09	0.09	0.12	0.15	0.23	0.26	0.53	0.30	0.42	0.55	0.78	0.88	1.64
2000	Exhaust CO	10.51	10.51	10.51	12.17	13.09	16.14	14.88	14.88	14.88	17.34	18.72	23.26	28.83	28.83	28.83	31.59	33.04	37.43
2000	Exhaust NOx	1.04	1.04	1.04	1.05	1.05	1.07	1.43	1.43	1.43	1.45	1.45	1.47	4.67	4.67	4.67	4.54	4.47	4.30
2010	Combined NMHC	1.28	1.38	1.55	1.91	2.08	2.92	1.65	1.73	1.86	2.18	2.33	2.94	3.28	3.47	3.86	4.49	4.76	6.04
2010	Exhaust NMHC	0.81	0.81	0.81	0.88	0.92	1.03	1.20	1.20	1.20	1.32	1.38	1.56	2.13	2.13	2.13	2.21	2.24	2.35
2010	Evaporative HC	0.14	0.16	0.24	0.35	0.40	0.56	0.16	0.18	0.25	0.35	0.39	0.53	0.52	0.55	0.77	1.05	1.17	1.54
2010	Refueling Loss	0.16	0.18	0.20	0.22	0.22	0.25	0.21	0.23	0.26	0.29	0.30	0.33	0.33	0.37	0.41	0.46	0.48	0.52
2010	Running Loss HC	0.18	0.24	0.30	0.46	0.53	1.08	0.09	0.12	0.15	0.22	0.26	0.52	0.30	0.42	0.55	0.78	0.88	1.62
2010	Exhaust CO	9.92	9.92	9.92	11.54	12.45	15.46	13.68	13.68	13.68	16.09	17.45	21.95	25.10	25.10	25.10	27.97	29.47	34.04
2010	Exhaust NOx	1.01	1.01	1.01	1.03	1.03	1.05	1.35	1.35	1.35	1.37	1.38	1.40	4.57	4.57	4.57	4.43	4.37	4.19

TABLE 2.1 : FOR FTP CONDITIONS.

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TABLE 2.2

LOW ALTITUDE

EMISSION FACTORS (GRAMS/MILE) AT ASTM CLASS A CITIES
67 - 95 F DIURNAL, 90 F HOT SOAK

Cal. Year	Pollutant By Component	LDGV 7.0	LDGV 8.0	LDGV 9.0	LDGV 10.0	LDGV 10.4	LDGV 11.5	LDGT 7.0	LDGT 8.0	LDGT 9.0	LDGT 10.0	LDGT 10.4	LDGT 11.5	HDGV 7.0	HDGV 8.0	HDGV 9.0	HDGV 10.0	HDGV 10.4	HDGV 11.5
1980	Combined NMHC	7.73	8.11	8.94	10.04	10.54	12.52	8.95	9.36	10.20	11.29	11.79	13.78	16.59	17.07	18.33	20.16	20.99	23.94
1980	Exhaust NMHC	4.39	4.39	4.39	4.41	4.44	4.50	5.79	5.79	5.79	5.81	5.83	5.89	10.70	10.70	10.70	10.70	10.70	10.70
1980	Evaporative HC	2.12	2.18	2.49	3.02	3.26	4.02	1.85	1.92	2.22	2.70	2.91	3.60	4.22	4.34	5.00	6.10	6.57	7.98
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41	0.48	0.48	0.48	0.48	0.48	0.48	0.82	0.82	0.82	0.82	0.82	0.82
1980	Running Loss HC	0.81	1.13	1.65	2.20	2.43	3.58	0.83	1.16	1.71	2.30	2.56	3.80	0.86	1.22	1.81	2.54	2.90	4.45
1980	Exhaust CO	63.51	63.51	63.51	64.28	64.95	66.80	76.04	76.04	76.04	76.71	77.28	78.87	229.52	229.52	229.52	229.52	229.52	229.52
1980	Exhaust NOx	2.72	2.72	2.72	2.72	2.72	2.72	3.42	3.42	3.42	3.42	3.42	3.42	5.93	5.93	5.93	5.93	5.93	5.93
1988	Combined NMHC	3.92	4.16	4.65	5.41	5.82	7.35	4.53	4.75	5.18	5.77	6.06	7.22	8.27	8.73	9.75	11.05	11.62	13.80
1988	Exhaust NMHC	2.33	2.33	2.33	2.37	2.40	2.51	3.17	3.17	3.17	3.23	3.28	3.44	4.77	4.77	4.77	4.79	4.81	4.85
1988	Evaporative HC	0.86	0.90	1.08	1.38	1.52	1.98	0.69	0.73	0.89	1.16	1.28	1.69	2.18	2.26	2.69	3.40	3.72	4.69
1988	Refueling Loss	0.25	0.28	0.30	0.30	0.30	0.30	0.30	0.33	0.36	0.36	0.36	0.36	0.52	0.57	0.62	0.62	0.62	0.62
1988	Running Loss HC	0.47	0.65	0.95	1.37	1.60	2.56	0.37	0.51	0.75	1.02	1.14	1.72	0.80	1.13	1.67	2.24	2.47	3.63
1988	Exhaust CO	32.34	32.34	32.34	33.32	34.22	36.98	41.67	41.67	41.67	42.93	44.08	47.57	103.77	103.77	103.77	104.81	105.76	108.64
1988	Exhaust NOx	1.66	1.66	1.66	1.66	1.66	1.66	2.14	2.14	2.14	2.14	2.13	2.13	5.41	5.41	5.41	5.36	5.32	5.21
1990	Combined NMHC	3.28	3.49	3.92	4.62	5.01	6.47	3.80	3.98	4.35	4.87	5.14	6.19	6.54	6.98	7.91	9.03	9.50	11.42
1990	Exhaust NMHC	1.95	1.95	1.95	1.99	2.03	2.15	2.65	2.65	2.65	2.72	2.78	2.96	3.66	3.66	3.66	3.69	3.71	3.77
1990	Evaporative HC	0.67	0.70	0.85	1.11	1.23	1.64	0.54	0.58	0.72	0.95	1.06	1.42	1.59	1.66	2.00	2.59	2.84	3.67
1990	Refueling Loss	0.24	0.26	0.28	0.28	0.28	0.28	0.29	0.32	0.35	0.35	0.35	0.35	0.50	0.55	0.60	0.60	0.60	0.60
1990	Running Loss HC	0.42	0.58	0.83	1.24	1.47	2.40	0.31	0.43	0.63	0.85	0.95	1.46	0.79	1.11	1.64	2.15	2.34	3.37
1990	Exhaust CO	26.94	26.94	26.94	28.03	29.04	32.25	34.46	34.46	34.46	35.92	37.29	41.62	78.99	78.99	78.99	80.21	81.33	84.72
1990	Exhaust NOx	1.48	1.48	1.48	1.48	1.48	1.49	1.94	1.94	1.94	1.93	1.93	1.93	5.52	5.52	5.52	5.45	5.40	5.25
1995	Combined NMHC	2.20	2.37	2.71	3.35	3.73	5.10	2.64	2.79	3.08	3.52	3.76	4.69	4.84	5.26	6.08	7.01	7.39	9.04
1995	Exhaust NMHC	1.26	1.26	1.26	1.31	1.35	1.48	1.79	1.79	1.79	1.87	1.94	2.15	2.65	2.65	2.65	2.68	2.72	2.81
1995	Evaporative HC	0.38	0.41	0.53	0.74	0.83	1.16	0.34	0.37	0.48	0.67	0.75	1.05	0.94	0.99	1.24	1.68	1.88	2.54
1995	Refueling Loss	0.21	0.23	0.26	0.26	0.26	0.26	0.28	0.30	0.33	0.33	0.33	0.33	0.47	0.52	0.57	0.57	0.57	0.57
1995	Running Loss HC	0.34	0.46	0.66	1.05	1.29	2.20	0.23	0.32	0.47	0.65	0.74	1.16	0.78	1.10	1.63	2.08	2.23	3.13
1995	Exhaust CO	16.80	16.80	16.80	18.02	19.19	23.13	22.72	22.72	22.72	24.49	26.20	31.94	46.71	46.71	46.71	48.30	49.75	54.14
1995	Exhaust NOx	1.19	1.19	1.19	1.19	1.20	1.21	1.62	1.62	1.62	1.62	1.63	1.64	4.82	4.82	4.82	4.75	4.69	4.52
2000	Combined NMHC	1.64	1.79	2.10	2.70	3.08	4.41	2.09	2.22	2.47	2.87	3.10	3.97	4.33	4.74	5.53	6.41	6.76	8.35
2000	Exhaust NMHC	0.89	0.89	0.89	0.93	0.98	1.11	1.38	1.38	1.38	1.45	1.53	1.75	2.35	2.35	2.35	2.39	2.43	2.53
2000	Evaporative HC	0.24	0.27	0.38	0.56	0.64	0.93	0.24	0.26	0.36	0.52	0.59	0.85	0.75	0.79	1.02	1.41	1.59	2.20
2000	Refueling Loss	0.21	0.23	0.25	0.25	0.25	0.25	0.27	0.30	0.33	0.33	0.33	0.33	0.45	0.49	0.54	0.54	0.54	0.54
2000	Running Loss HC	0.30	0.41	0.58	0.96	1.21	2.12	0.20	0.28	0.41	0.57	0.65	1.04	0.78	1.11	1.63	2.07	2.21	3.08
2000	Exhaust CO	11.94	11.94	11.94	13.22	14.48	18.81	17.01	17.01	17.01	18.91	20.77	27.19	34.05	34.05	34.05	35.79	37.39	42.23
2000	Exhaust NOx	1.05	1.05	1.05	1.06	1.06	1.08	1.45	1.45	1.45	1.46	1.47	1.49	4.66	4.66	4.66	4.58	4.51	4.34
2010	Combined NMHC	1.57	1.72	2.02	2.61	2.98	4.30	1.98	2.11	2.35	2.74	2.96	3.81	4.11	4.51	5.29	6.14	6.48	8.02
2010	Exhaust NMHC	0.86	0.86	0.86	0.90	0.95	1.08	1.28	1.28	1.28	1.36	1.42	1.64	2.25	2.25	2.25	2.29	2.33	2.44
2010	Evaporative HC	0.21	0.23	0.33	0.50	0.58	0.85	0.23	0.25	0.34	0.50	0.57	0.81	0.65	0.69	0.89	1.26	1.44	2.02
2010	Refueling Loss	0.21	0.23	0.25	0.25	0.25	0.25	0.27	0.30	0.33	0.33	0.33	0.33	0.44	0.48	0.52	0.52	0.52	0.52
2010	Running Loss HC	0.30	0.41	0.58	0.96	1.21	2.12	0.20	0.28	0.40	0.56	0.64	1.03	0.78	1.10	1.63	2.06	2.19	3.04
2010	Exhaust CO	11.27	11.27	11.27	12.54	13.78	18.11	15.67	15.67	15.67	17.57	19.44	25.94	29.24	29.24	29.24	31.05	32.71	37.73
2010	Exhaust NOx	1.03	1.03	1.03	1.04	1.04	1.06	1.37	1.37	1.37	1.38	1.39	1.41	4.57	4.57	4.57	4.49	4.43	4.25

TABLE 2.3

LOW ALTITUDE

EMISSION FACTORS (GRAMS/MILE) AT ASTM CLASS B CITIES
71 - 92 F DIURNAL, 88 F HOT SOAK

Cal. Year	Pollutant By Component	LDGV 7.0	LDGV 8.0	LDGV 9.0	LDGV 10.0	LDGV 10.4	LDGV 11.5	LDGT 7.0	LDGT 8.0	LDGT 9.0	LDGT 10.0	LDGT 10.4	LDGT 11.5	HDGV 7.0	HDGV 8.0	HDGV 9.0	HDGV 10.0	HDGV 10.4	HDGV 11.5
1980	Combined NMHC	7.27	7.62	8.32	9.30	9.75	11.34	8.59	8.96	9.69	10.68	11.14	12.75	16.07	16.52	17.68	19.36	20.12	22.56
1980	Exhaust NMHC	4.36	4.36	4.36	4.39	4.41	4.47	5.75	5.75	5.75	5.78	5.80	5.86	10.63	10.63	10.63	10.63	10.63	10.63
1980	Evaporative HC	1.88	1.92	2.19	2.62	2.81	3.39	1.71	1.77	2.03	2.43	2.60	3.14	3.96	4.06	4.70	5.69	6.10	7.31
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41	0.48	0.48	0.48	0.48	0.48	0.48	0.82	0.82	0.82	0.82	0.82	0.82
1980	Running Loss HC	0.63	0.93	1.37	1.89	2.13	3.07	0.64	0.96	1.43	1.99	2.25	3.26	0.66	1.02	1.53	2.23	2.57	3.80
1980	Exhaust CO	62.08	62.08	62.08	62.93	63.57	65.31	74.36	74.36	74.36	75.10	75.64	77.13	223.47	223.47	223.47	223.47	223.47	223.47
1980	Exhaust NOx	2.76	2.76	2.76	2.76	2.76	2.76	3.47	3.47	3.47	3.47	3.47	3.47	6.03	6.03	6.03	6.03	6.03	6.03
1988	Combined NMHC	3.65	3.87	4.28	4.98	5.33	6.54	4.30	4.50	4.86	5.42	5.69	6.64	7.82	8.26	9.18	10.42	10.94	12.74
1988	Exhaust NMHC	2.29	2.29	2.29	2.34	2.38	2.48	3.13	3.13	3.13	3.20	3.25	3.41	4.72	4.72	4.72	4.74	4.76	4.80
1988	Evaporative HC	0.75	0.77	0.92	1.16	1.26	1.60	0.62	0.65	0.79	1.01	1.10	1.41	2.02	2.08	2.49	3.12	3.39	4.20
1988	Refueling Loss	0.23	0.25	0.28	0.30	0.30	0.30	0.27	0.30	0.33	0.36	0.36	0.36	0.47	0.52	0.57	0.62	0.62	0.62
1988	Running Loss HC	0.39	0.55	0.79	1.18	1.39	2.16	0.28	0.41	0.61	0.86	0.98	1.46	0.61	0.94	1.41	1.94	2.18	3.11
1988	Exhaust CO	31.35	31.35	31.35	32.46	33.32	35.98	40.60	40.60	40.60	42.03	43.15	46.56	101.00	101.00	101.00	102.20	103.14	106.00
1988	Exhaust NOx	1.67	1.67	1.67	1.67	1.68	1.68	2.16	2.16	2.16	2.15	2.15	2.14	5.45	5.45	5.45	5.39	5.35	5.25
1990	Combined NMHC	3.06	3.25	3.61	4.25	4.58	5.74	3.60	3.77	4.07	4.57	4.82	5.68	6.15	6.56	7.39	8.46	8.90	10.47
1990	Exhaust NMHC	1.92	1.92	1.92	1.97	2.01	2.12	2.62	2.62	2.62	2.70	2.76	2.93	3.62	3.62	3.62	3.65	3.67	3.73
1990	Evaporative HC	0.58	0.60	0.72	0.92	1.02	1.31	0.48	0.51	0.63	0.81	0.90	1.16	1.47	1.52	1.84	2.35	2.57	3.24
1990	Refueling Loss	0.21	0.24	0.26	0.28	0.28	0.28	0.26	0.29	0.32	0.35	0.35	0.35	0.46	0.50	0.55	0.60	0.60	0.60
1990	Running Loss HC	0.35	0.49	0.70	1.07	1.27	2.02	0.23	0.34	0.50	0.71	0.81	1.23	0.60	0.92	1.38	1.86	2.06	2.90
1990	Exhaust CO	26.12	26.12	26.12	27.34	28.32	31.42	33.60	33.60	33.60	35.26	36.59	40.81	76.86	76.86	76.86	78.28	79.39	82.75
1990	Exhaust NOx	1.49	1.49	1.49	1.49	1.50	1.50	1.95	1.95	1.95	1.94	1.94	1.94	5.54	5.54	5.54	5.47	5.41	5.26
1995	Combined NMHC	2.05	2.20	2.49	3.07	3.39	4.48	2.49	2.62	2.86	3.29	3.51	4.28	4.51	4.90	5.63	6.52	6.88	8.23
1995	Exhaust NMHC	1.25	1.25	1.25	1.30	1.34	1.47	1.78	1.78	1.78	1.86	1.93	2.13	2.62	2.62	2.62	2.67	2.70	2.79
1995	Evaporative HC	0.32	0.34	0.44	0.60	0.67	0.91	0.29	0.32	0.41	0.56	0.62	0.84	0.86	0.89	1.12	1.50	1.66	2.18
1995	Refueling Loss	0.19	0.21	0.23	0.26	0.26	0.26	0.25	0.28	0.30	0.33	0.33	0.33	0.43	0.47	0.52	0.57	0.57	0.57
1995	Running Loss HC	0.29	0.40	0.57	0.91	1.11	1.85	0.17	0.25	0.37	0.54	0.62	0.98	0.60	0.91	1.36	1.79	1.96	2.70
1995	Exhaust CO	16.37	16.37	16.37	17.74	18.88	22.70	22.23	22.23	22.23	24.24	25.91	31.49	45.58	45.58	45.58	47.41	48.85	53.22
1995	Exhaust NOx	1.19	1.19	1.19	1.19	1.20	1.21	1.62	1.62	1.62	1.62	1.63	1.64	4.83	4.83	4.83	4.74	4.68	4.52
2000	Combined NMHC	1.53	1.66	1.92	2.47	2.78	3.85	1.96	2.07	2.27	2.67	2.87	3.60	4.01	4.40	5.10	5.94	6.28	7.57
2000	Exhaust NMHC	0.88	0.88	0.88	0.94	0.98	1.11	1.37	1.37	1.37	1.46	1.53	1.74	2.33	2.33	2.33	2.38	2.42	2.52
2000	Evaporative HC	0.20	0.22	0.31	0.45	0.51	0.72	0.20	0.22	0.30	0.42	0.48	0.66	0.68	0.71	0.91	1.24	1.39	1.86
2000	Refueling Loss	0.19	0.21	0.23	0.25	0.25	0.25	0.25	0.27	0.30	0.33	0.33	0.33	0.41	0.45	0.49	0.54	0.54	0.54
2000	Running Loss HC	0.26	0.36	0.50	0.84	1.04	1.77	0.15	0.21	0.31	0.47	0.54	0.87	0.60	0.91	1.37	1.78	1.94	2.65
2000	Exhaust CO	11.74	11.74	11.74	13.20	14.42	18.63	16.71	16.71	16.71	18.87	20.69	26.92	33.33	33.33	33.33	35.35	36.93	41.74
2000	Exhaust NOx	1.05	1.05	1.05	1.06	1.06	1.08	1.45	1.45	1.45	1.46	1.47	1.49	4.66	4.66	4.66	4.57	4.50	4.33
2010	Combined NMHC	1.46	1.60	1.85	2.39	2.70	3.75	1.85	1.96	2.16	2.54	2.75	3.45	3.80	4.18	4.87	5.68	6.01	7.26
2010	Exhaust NMHC	0.85	0.85	0.85	0.90	0.95	1.08	1.27	1.27	1.27	1.36	1.43	1.64	2.23	2.23	2.23	2.28	2.32	2.43
2010	Evaporative HC	0.17	0.18	0.27	0.40	0.46	0.66	0.19	0.21	0.28	0.40	0.46	0.63	0.58	0.61	0.80	1.11	1.25	1.69
2010	Refueling Loss	0.19	0.21	0.23	0.25	0.25	0.25	0.25	0.27	0.30	0.33	0.33	0.33	0.39	0.44	0.48	0.52	0.52	0.52
2010	Running Loss HC	0.26	0.36	0.50	0.84	1.04	1.77	0.15	0.21	0.31	0.46	0.54	0.86	0.60	0.91	1.36	1.77	1.92	2.62
2010	Exhaust CO	11.08	11.08	11.08	12.52	13.73	17.93	15.40	15.40	15.40	17.55	19.37	25.67	28.67	28.67	28.67	30.77	32.42	37.41
2010	Exhaust NOx	1.03	1.03	1.03	1.04	1.04	1.06	1.37	1.37	1.37	1.38	1.39	1.41	4.57	4.57	4.57	4.48	4.41	4.24

TABLE 2.3 : FOR ASTM CLASS B CITIES.

TABLE 2.4

LOW ALTITUDE

EMISSION FACTORS (GRAMS/MILE) AT ASTM CLASS C CITIES
66 - 85 F DIURNAL, 82 F HOT SOAK

Cal. Year	Pollutant By Component	LDGV 7.0	LDGV 8.0	LDGV 9.0	LDGV 10.0	LDGV 10.4	LDGV 11.5	LDGT 7.0	LDGT 8.0	LDGT 9.0	LDGT 10.0	LDGT 10.4	LDGT 11.5	HDGV 7.0	HDGV 8.0	HDGV 9.0	HDGV 10.0	HDGV 10.4	HDGV 11.5
1980	Combined NMHC	6.41	6.63	7.05	7.73	8.03	9.30	8.05	8.29	8.77	9.51	9.83	11.21	15.17	15.47	16.43	17.74	18.30	20.41
1980	Exhaust NMHC	4.23	4.23	4.23	4.27	4.29	4.34	5.60	5.60	5.60	5.64	5.65	5.70	10.29	10.29	10.29	10.29	10.29	10.29
1980	Evaporative HC	1.39	1.43	1.66	1.96	2.08	2.47	1.57	1.62	1.90	2.24	2.38	2.82	3.63	3.73	4.45	5.33	5.69	6.73
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41	0.48	0.48	0.48	0.48	0.48	0.48	0.82	0.82	0.82	0.82	0.82	0.82
1980	Running Loss HC	0.38	0.55	0.75	1.09	1.24	2.08	0.39	0.58	0.79	1.15	1.32	2.21	0.42	0.63	0.87	1.30	1.50	2.57
1980	Exhaust CO	56.23	56.23	56.23	57.13	57.61	58.92	67.52	67.52	67.52	68.29	68.70	69.80	196.13	196.13	196.13	196.13	196.13	196.13
1980	Exhaust NOx	2.97	2.97	2.97	2.97	2.97	2.97	3.72	3.72	3.72	3.72	3.72	3.72	6.54	6.54	6.54	6.54	6.54	6.54
1988	Combined NMHC	3.13	3.28	3.55	4.04	4.26	5.22	3.92	4.06	4.31	4.77	4.98	5.79	7.06	7.36	8.07	9.05	9.48	11.11
1988	Exhaust NMHC	2.15	2.15	2.15	2.21	2.24	2.33	2.97	2.97	2.97	3.05	3.09	3.22	4.47	4.47	4.47	4.50	4.51	4.56
1988	Evaporative HC	0.53	0.56	0.68	0.85	0.92	1.14	0.56	0.58	0.73	0.91	0.98	1.22	1.83	1.89	2.34	2.90	3.14	3.82
1988	Refueling Loss	0.19	0.21	0.24	0.26	0.27	0.30	0.23	0.26	0.29	0.32	0.33	0.36	0.39	0.44	0.50	0.55	0.57	0.62
1988	Running Loss HC	0.25	0.36	0.47	0.72	0.83	1.45	0.17	0.25	0.33	0.49	0.57	0.98	0.37	0.56	0.77	1.11	1.26	2.10
1988	Exhaust CO	27.28	27.28	27.28	28.53	29.23	31.36	36.12	36.12	36.12	37.86	38.83	41.78	88.43	88.43	88.43	90.01	90.89	93.58
1988	Exhaust NOx	1.76	1.76	1.76	1.76	1.76	1.76	2.24	2.24	2.24	2.24	2.23	2.23	5.66	5.66	5.66	5.58	5.55	5.44
1990	Combined NMHC	2.63	2.76	3.00	3.45	3.66	4.57	3.28	3.39	3.61	4.02	4.21	4.95	5.49	5.77	6.38	7.23	7.59	9.05
1990	Exhaust NMHC	1.80	1.80	1.80	1.86	1.89	1.99	2.49	2.49	2.49	2.58	2.63	2.78	3.43	3.43	3.43	3.47	3.49	3.55
1990	Evaporative HC	0.41	0.43	0.54	0.68	0.75	0.94	0.43	0.45	0.57	0.73	0.79	1.00	1.33	1.37	1.73	2.18	2.37	2.93
1990	Refueling Loss	0.18	0.20	0.22	0.25	0.26	0.28	0.22	0.25	0.28	0.31	0.32	0.35	0.38	0.43	0.48	0.53	0.55	0.60
1990	Running Loss HC	0.23	0.33	0.43	0.66	0.76	1.36	0.14	0.20	0.27	0.41	0.47	0.83	0.36	0.54	0.74	1.05	1.19	1.96
1990	Exhaust CO	22.68	22.68	22.68	24.08	24.88	27.37	29.93	29.93	29.93	31.94	33.08	36.65	67.23	67.23	67.23	69.09	70.13	73.30
1990	Exhaust NOx	1.55	1.55	1.55	1.55	1.56	1.56	2.00	2.00	2.00	2.00	2.00	2.00	5.68	5.68	5.68	5.57	5.52	5.37
1995	Combined NMHC	1.78	1.89	2.09	2.51	2.70	3.56	2.26	2.35	2.52	2.89	3.06	3.72	3.98	4.24	4.74	5.45	5.76	7.03
1995	Exhaust NMHC	1.17	1.17	1.17	1.24	1.28	1.39	1.69	1.69	1.69	1.80	1.86	2.04	2.51	2.51	2.51	2.57	2.60	2.69
1995	Evaporative HC	0.24	0.25	0.35	0.46	0.52	0.68	0.25	0.27	0.37	0.49	0.54	0.70	0.77	0.80	1.06	1.39	1.53	1.95
1995	Refueling Loss	0.16	0.18	0.20	0.22	0.23	0.26	0.21	0.24	0.26	0.29	0.30	0.33	0.36	0.40	0.45	0.50	0.51	0.57
1995	Running Loss HC	0.21	0.28	0.37	0.58	0.68	1.24	0.11	0.15	0.20	0.31	0.36	0.65	0.34	0.52	0.72	1.00	1.12	1.83
1995	Exhaust CO	14.51	14.51	14.51	16.09	17.03	20.10	20.07	20.07	20.07	22.44	23.84	28.41	40.40	40.40	40.40	42.81	44.17	48.28
1995	Exhaust NOx	1.20	1.20	1.20	1.21	1.21	1.23	1.62	1.62	1.62	1.63	1.64	1.65	4.88	4.88	4.88	4.76	4.70	4.53
2000	Combined NMHC	1.35	1.46	1.64	2.04	2.24	3.07	1.78	1.86	2.00	2.34	2.51	3.13	3.53	3.78	4.25	4.92	5.22	6.44
2000	Exhaust NMHC	0.85	0.85	0.85	0.92	0.96	1.08	1.31	1.31	1.31	1.43	1.49	1.69	2.24	2.24	2.24	2.31	2.35	2.45
2000	Evaporative HC	0.15	0.17	0.25	0.36	0.41	0.57	0.16	0.18	0.26	0.36	0.40	0.54	0.61	0.64	0.86	1.15	1.28	1.66
2000	Refueling Loss	0.16	0.18	0.20	0.22	0.22	0.25	0.21	0.23	0.26	0.29	0.30	0.33	0.34	0.38	0.43	0.47	0.49	0.54
2000	Running Loss HC	0.19	0.26	0.34	0.54	0.64	1.19	0.10	0.13	0.17	0.27	0.32	0.58	0.34	0.52	0.72	0.99	1.11	1.80
2000	Exhaust CO	10.84	10.84	10.84	12.52	13.54	16.91	15.37	15.37	15.37	17.87	19.38	24.40	30.03	30.03	30.03	32.68	34.17	38.69
2000	Exhaust NOx	1.04	1.04	1.04	1.05	1.06	1.07	1.44	1.44	1.44	1.45	1.46	1.48	4.67	4.67	4.67	4.54	4.48	4.30
2010	Combined NMHC	1.30	1.41	1.59	1.99	2.18	3.01	1.67	1.75	1.89	2.22	2.39	2.99	3.35	3.59	4.04	4.69	4.98	6.17
2010	Exhaust NMHC	0.82	0.82	0.82	0.89	0.93	1.05	1.22	1.22	1.22	1.33	1.39	1.59	2.16	2.16	2.16	2.23	2.27	2.38
2010	Evaporative HC	0.13	0.15	0.23	0.34	0.39	0.53	0.15	0.17	0.24	0.34	0.38	0.51	0.52	0.54	0.75	1.02	1.14	1.50
2010	Refueling Loss	0.16	0.18	0.20	0.22	0.22	0.25	0.21	0.23	0.26	0.29	0.30	0.33	0.33	0.37	0.41	0.46	0.48	0.52
2010	Running Loss HC	0.19	0.26	0.34	0.54	0.64	1.18	0.09	0.13	0.17	0.27	0.31	0.57	0.34	0.52	0.71	0.98	1.09	1.77
2010	Exhaust CO	10.23	10.23	10.23	11.88	12.88	16.23	14.13	14.13	14.13	16.60	18.09	23.11	26.06	26.06	26.06	28.81	30.36	35.06
2010	Exhaust NOx	1.02	1.02	1.02	1.03	1.04	1.05	1.36	1.36	1.36	1.37	1.38	1.40	4.57	4.57	4.57	4.44	4.38	4.20

TABLE 2.5

HIGH ALTITUDE

EMISSION FACTORS (GRAMS/MILE) FOR FTP CONDITIONS
60 - 84 F DIURNAL, 80 F HOT SOAK

Cal. Year	Pollutant By Component	LDGV 7.0	LDGV 8.0	LDGV 9.0	LDGV 10.0	LDGV 10.4	LDGV 11.5	LDGT 7.0	LDGT 8.0	LDGT 9.0	LDGT 10.0	LDGT 10.4	LDGT 11.5	HDGV 7.0	HDGV 8.0	HDGV 9.0	HDGV 10.0	HDGV 10.4	HDGV 11.5
1980	Combined NMHC	7.80	8.01	8.52	9.29	9.63	11.20	10.02	10.24	10.81	11.65	12.03	13.73	19.11	19.40	20.56	22.07	22.72	25.31
1980	Exhaust NMHC	5.21	5.21	5.21	5.26	5.28	5.34	6.99	6.99	6.99	7.03	7.05	7.10	13.12	13.12	13.12	13.12	13.12	13.12
1980	Evaporative HC	1.84	1.92	2.29	2.74	2.94	3.55	2.19	2.28	2.71	3.21	3.43	4.11	4.79	4.93	5.93	7.09	7.58	9.02
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41	0.48	0.48	0.48	0.48	0.48	0.48	0.82	0.82	0.82	0.82	0.82	0.82
1980	Running Loss HC	0.34	0.47	0.60	0.88	1.01	1.91	0.35	0.49	0.63	0.93	1.06	2.03	0.39	0.54	0.69	1.05	1.21	2.36
1980	Exhaust CO	83.85	83.85	83.85	85.33	86.05	88.04	102.30	102.30	102.30	103.51	104.10	105.72	302.71	302.71	302.71	302.71	302.71	302.71
1980	Exhaust NOx	2.09	2.09	2.09	2.09	2.09	2.09	2.64	2.64	2.64	2.64	2.64	2.64	4.57	4.57	4.57	4.57	4.57	4.57
1988	Combined NMHC	3.53	3.69	4.00	4.54	4.78	5.92	4.61	4.75	5.06	5.60	5.84	6.85	8.57	8.85	9.67	10.80	11.29	13.31
1988	Exhaust NMHC	2.39	2.39	2.39	2.45	2.48	2.57	3.44	3.44	3.44	3.53	3.58	3.72	5.43	5.43	5.43	5.47	5.49	5.55
1988	Evaporative HC	0.72	0.77	0.98	1.23	1.35	1.72	0.79	0.84	1.07	1.34	1.47	1.87	2.42	2.51	3.15	3.90	4.22	5.20
1988	Refueling Loss	0.19	0.21	0.24	0.26	0.27	0.30	0.23	0.26	0.29	0.32	0.33	0.36	0.39	0.44	0.50	0.55	0.57	0.62
1988	Running Loss HC	0.23	0.31	0.40	0.59	0.68	1.33	0.16	0.21	0.27	0.40	0.46	0.90	0.33	0.46	0.60	0.88	1.01	1.93
1988	Exhaust CO	36.30	36.30	36.30	37.96	38.82	41.42	51.81	51.81	51.81	54.52	55.93	60.17	130.09	130.09	130.09	133.11	134.70	139.53
1988	Exhaust NOx	1.57	1.57	1.57	1.57	1.58	1.58	1.96	1.96	1.96	1.95	1.95	1.94	3.96	3.96	3.96	3.90	3.87	3.80
1990	Combined NMHC	2.90	3.04	3.31	3.80	4.02	5.07	3.78	3.90	4.17	4.65	4.87	5.77	6.60	6.85	7.54	8.51	8.94	10.74
1990	Exhaust NMHC	1.95	1.95	1.95	2.02	2.05	2.15	2.82	2.82	2.82	2.92	2.98	3.14	4.14	4.14	4.14	4.20	4.22	4.30
1990	Evaporative HC	0.55	0.59	0.77	0.98	1.08	1.39	0.61	0.66	0.84	1.08	1.18	1.53	1.76	1.83	2.34	2.95	3.22	4.03
1990	Refueling Loss	0.18	0.20	0.22	0.25	0.26	0.28	0.22	0.25	0.28	0.31	0.32	0.35	0.38	0.43	0.48	0.53	0.55	0.60
1990	Running Loss HC	0.22	0.29	0.36	0.55	0.63	1.25	0.13	0.18	0.22	0.34	0.39	0.76	0.32	0.44	0.58	0.84	0.95	1.80
1990	Exhaust CO	28.92	28.92	28.92	30.65	31.57	34.37	41.21	41.21	41.21	44.04	45.54	50.17	100.08	100.08	100.08	103.75	105.69	111.56
1990	Exhaust NOx	1.47	1.47	1.47	1.48	1.48	1.49	1.82	1.82	1.82	1.82	1.82	1.82	3.96	3.96	3.96	3.88	3.84	3.74
1995	Combined NMHC	1.86	1.97	2.18	2.60	2.79	3.73	2.51	2.60	2.81	3.23	3.43	4.22	4.68	4.91	5.45	6.27	6.64	8.22
1995	Exhaust NMHC	1.20	1.20	1.20	1.27	1.31	1.41	1.84	1.84	1.84	1.96	2.02	2.21	3.00	3.00	3.00	3.08	3.12	3.23
1995	Evaporative HC	0.30	0.33	0.46	0.62	0.69	0.93	0.35	0.39	0.54	0.72	0.81	1.09	1.02	1.08	1.45	1.90	2.11	2.75
1995	Refueling Loss	0.16	0.18	0.20	0.22	0.23	0.26	0.21	0.24	0.26	0.29	0.30	0.33	0.36	0.40	0.45	0.50	0.51	0.57
1995	Running Loss HC	0.19	0.25	0.32	0.49	0.56	1.13	0.10	0.14	0.17	0.26	0.30	0.59	0.30	0.43	0.56	0.79	0.90	1.67
1995	Exhaust CO	16.43	16.43	16.43	18.17	19.12	22.19	24.97	24.97	24.97	27.87	29.46	34.59	64.13	64.13	64.13	68.80	71.25	78.70
1995	Exhaust NOx	1.28	1.28	1.28	1.29	1.30	1.31	1.57	1.57	1.57	1.58	1.59	1.60	3.85	3.85	3.85	3.74	3.69	3.56
2000	Combined NMHC	1.36	1.46	1.65	2.03	2.21	3.10	1.95	2.03	2.21	2.60	2.78	3.51	4.09	4.31	4.81	5.59	5.94	7.46
2000	Exhaust NMHC	0.84	0.84	0.84	0.92	0.95	1.06	1.43	1.43	1.43	1.55	1.62	1.82	2.65	2.65	2.65	2.74	2.78	2.91
2000	Evaporative HC	0.17	0.20	0.31	0.44	0.50	0.70	0.22	0.26	0.38	0.53	0.60	0.84	0.80	0.86	1.18	1.59	1.78	2.37
2000	Refueling Loss	0.16	0.18	0.20	0.22	0.22	0.25	0.21	0.23	0.26	0.29	0.30	0.33	0.34	0.38	0.43	0.47	0.49	0.54
2000	Running Loss HC	0.18	0.24	0.30	0.46	0.53	1.09	0.09	0.12	0.15	0.23	0.26	0.53	0.30	0.42	0.55	0.78	0.88	1.64
2000	Exhaust CO	11.17	11.17	11.17	12.91	13.89	17.10	18.16	18.16	18.16	21.11	22.75	28.15	50.41	50.41	50.41	55.46	58.11	66.16
2000	Exhaust NOx	1.18	1.18	1.18	1.20	1.20	1.22	1.43	1.43	1.43	1.44	1.45	1.47	3.85	3.85	3.85	3.74	3.68	3.54
2010	Combined NMHC	1.29	1.40	1.58	1.95	2.13	3.00	1.78	1.86	2.03	2.40	2.58	3.28	3.86	4.08	4.55	5.30	5.64	7.13
2010	Exhaust NMHC	0.81	0.81	0.81	0.88	0.92	1.03	1.28	1.28	1.28	1.40	1.46	1.65	2.55	2.55	2.55	2.64	2.69	2.83
2010	Evaporative HC	0.15	0.17	0.27	0.39	0.45	0.64	0.21	0.24	0.35	0.50	0.56	0.79	0.69	0.74	1.04	1.43	1.60	2.16
2010	Refueling Loss	0.16	0.18	0.20	0.22	0.22	0.25	0.21	0.23	0.26	0.29	0.30	0.33	0.33	0.37	0.41	0.46	0.48	0.52
2010	Running Loss HC	0.18	0.24	0.30	0.46	0.53	1.08	0.09	0.12	0.15	0.22	0.26	0.52	0.30	0.42	0.55	0.78	0.88	1.62
2010	Exhaust CO	10.32	10.32	10.32	12.00	12.94	16.07	15.79	15.79	15.79	18.57	20.14	25.34	45.68	45.68	45.68	50.89	53.63	61.94
2010	Exhaust NOx	1.17	1.17	1.17	1.19	1.19	1.21	1.35	1.35	1.35	1.37	1.38	1.40	3.86	3.86	3.86	3.74	3.68	3.53

TABLE 2.5 : FOR FTP CONDITIONS.

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TABLE 2.6

HIGH ALTITUDE

EMISSION FACTORS (GRAMS/MILE) AT ASTM CLASS A CITIES
67 - 95 F DIURNAL, 90 F HOT SOAK

Cal. Year	Pollutant By Component	LDGV 7.0	LDGV 8.0	LDGV 9.0	LDGV 10.0	LDGV 10.4	LDGV 11.5	LDGT 7.0	LDGT 8.0	LDGT 9.0	LDGT 10.0	LDGT 10.4	LDGT 11.5	HDGV 7.0	HDGV 8.0	HDGV 9.0	HDGV 10.0	HDGV 10.4	HDGV 11.5
1980	Combined NMHC	9.73	10.15	11.18	12.63	13.29	15.91	11.16	11.61	12.60	13.95	14.58	17.12	21.06	21.58	23.07	25.33	26.36	30.13
1980	Exhaust NMHC	5.46	5.46	5.46	5.49	5.52	5.60	7.27	7.27	7.27	7.30	7.33	7.40	13.82	13.82	13.82	13.82	13.82	13.82
1980	Evaporative HC	3.05	3.15	3.66	4.52	4.92	6.31	2.58	2.69	3.13	3.86	4.21	5.43	5.56	5.73	6.63	8.15	8.82	11.04
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41	0.48	0.48	0.48	0.48	0.48	0.48	0.82	0.82	0.82	0.82	0.82	0.82
1980	Running Loss HC	0.81	1.13	1.65	2.20	2.43	3.58	0.83	1.16	1.71	2.30	2.56	3.80	0.86	1.22	1.81	2.54	2.90	4.45
1980	Exhaust CO	99.00	99.00	99.00	100.31	101.44	104.56	119.54	119.54	119.54	120.63	121.58	124.19	373.02	373.02	373.02	373.02	373.02	373.02
1980	Exhaust NOx	1.86	1.86	1.86	1.86	1.86	1.86	2.36	2.36	2.36	2.36	2.36	2.36	4.01	4.01	4.01	4.01	4.01	4.01
1988	Combined NMHC	4.64	4.91	5.52	6.49	7.01	9.01	5.38	5.62	6.15	6.91	7.31	8.92	10.14	10.63	11.82	13.43	14.16	17.04
1988	Exhaust NMHC	2.64	2.64	2.64	2.68	2.72	2.84	3.73	3.73	3.73	3.80	3.86	4.05	5.93	5.93	5.93	5.96	5.98	6.04
1988	Evaporative HC	1.28	1.34	1.63	2.14	2.39	3.31	0.99	1.05	1.31	1.74	1.95	2.78	2.89	3.00	3.59	4.62	5.09	6.74
1988	Refueling Loss	0.25	0.28	0.30	0.30	0.30	0.30	0.30	0.33	0.36	0.36	0.36	0.36	0.52	0.57	0.62	0.62	0.62	0.62
1988	Running Loss HC	0.47	0.65	0.95	1.37	1.60	2.56	0.37	0.51	0.75	1.02	1.14	1.72	0.80	1.13	1.67	2.24	2.47	3.63
1988	Exhaust CO	45.22	45.22	45.22	46.54	47.74	51.38	62.06	62.06	62.06	63.97	65.71	70.98	160.35	160.35	160.35	162.27	164.01	169.32
1988	Exhaust NOx	1.47	1.47	1.47	1.47	1.47	1.48	1.86	1.86	1.86	1.85	1.85	1.84	3.72	3.72	3.72	3.68	3.66	3.59
1990	Combined NMHC	3.80	4.03	4.56	5.43	5.91	7.79	4.43	4.64	5.09	5.76	6.12	7.59	7.93	8.40	9.47	10.86	11.48	14.06
1990	Exhaust NMHC	2.16	2.16	2.16	2.21	2.25	2.38	3.06	3.06	3.06	3.14	3.20	3.41	4.53	4.53	4.53	4.56	4.59	4.67
1990	Evaporative HC	0.98	1.03	1.28	1.70	1.91	2.72	0.77	0.83	1.05	1.43	1.62	2.37	2.11	2.21	2.70	3.55	3.95	5.41
1990	Refueling Loss	0.24	0.26	0.28	0.28	0.28	0.28	0.29	0.32	0.35	0.35	0.35	0.35	0.50	0.55	0.60	0.60	0.60	0.60
1990	Running Loss HC	0.42	0.58	0.83	1.24	1.47	2.40	0.31	0.43	0.63	0.85	0.95	1.46	0.79	1.11	1.64	2.15	2.34	3.37
1990	Exhaust CO	36.21	36.21	36.21	37.57	38.84	42.78	49.31	49.31	49.31	51.35	53.24	59.18	123.33	123.33	123.33	125.66	127.79	134.24
1990	Exhaust NOx	1.40	1.40	1.40	1.40	1.41	1.41	1.76	1.76	1.76	1.76	1.76	1.76	3.81	3.81	3.81	3.76	3.72	3.62
1995	Combined NMHC	2.40	2.58	2.98	3.72	4.15	5.81	2.98	3.15	3.50	4.07	4.39	5.67	5.74	6.19	7.13	8.29	8.80	11.06
1995	Exhaust NMHC	1.33	1.33	1.33	1.37	1.42	1.55	1.99	1.99	1.99	2.07	2.14	2.37	3.23	3.23	3.23	3.27	3.32	3.43
1995	Evaporative HC	0.52	0.56	0.74	1.04	1.19	1.80	0.48	0.53	0.71	1.02	1.18	1.81	1.26	1.34	1.71	2.37	2.69	3.93
1995	Refueling Loss	0.21	0.23	0.26	0.26	0.26	0.26	0.28	0.30	0.33	0.33	0.33	0.33	0.47	0.52	0.57	0.57	0.57	0.57
1995	Running Loss HC	0.34	0.46	0.66	1.05	1.29	2.20	0.23	0.32	0.47	0.65	0.74	1.16	0.78	1.10	1.63	2.08	2.23	3.13
1995	Exhaust CO	20.05	20.05	20.05	21.40	22.69	27.01	29.41	29.41	29.41	31.59	33.68	40.68	77.23	77.23	77.23	80.18	82.88	91.07
1995	Exhaust NOx	1.27	1.27	1.27	1.28	1.28	1.29	1.57	1.57	1.57	1.58	1.58	1.59	3.79	3.79	3.79	3.73	3.68	3.55
2000	Combined NMHC	1.69	1.85	2.19	2.85	3.26	4.82	2.32	2.47	2.78	3.30	3.60	4.80	5.06	5.50	6.41	7.50	7.99	10.16
2000	Exhaust NMHC	0.89	0.89	0.89	0.94	0.98	1.12	1.52	1.52	1.52	1.60	1.68	1.92	2.82	2.82	2.82	2.88	2.92	3.05
2000	Evaporative HC	0.29	0.32	0.46	0.70	0.83	1.33	0.33	0.38	0.53	0.80	0.94	1.51	1.01	1.08	1.41	2.02	2.32	3.49
2000	Refueling Loss	0.21	0.23	0.25	0.25	0.25	0.25	0.27	0.30	0.33	0.33	0.33	0.33	0.45	0.49	0.54	0.54	0.54	0.54
2000	Running Loss HC	0.30	0.41	0.58	0.96	1.21	2.12	0.20	0.28	0.41	0.57	0.65	1.04	0.78	1.11	1.63	2.07	2.21	3.08
2000	Exhaust CO	12.68	12.68	12.68	14.03	15.35	19.90	20.74	20.74	20.74	23.00	25.21	32.80	59.33	59.33	59.33	62.53	65.45	74.31
2000	Exhaust NOx	1.20	1.20	1.20	1.21	1.22	1.23	1.45	1.45	1.45	1.46	1.47	1.49	3.84	3.84	3.84	3.77	3.72	3.58
2010	Combined NMHC	1.59	1.76	2.07	2.71	3.11	4.61	2.15	2.29	2.59	3.09	3.37	4.52	4.78	5.22	6.10	7.16	7.62	9.75
2010	Exhaust NMHC	0.86	0.86	0.86	0.90	0.95	1.08	1.36	1.36	1.36	1.44	1.51	1.74	2.70	2.70	2.70	2.75	2.80	2.94
2010	Evaporative HC	0.23	0.26	0.39	0.60	0.71	1.16	0.32	0.36	0.51	0.76	0.89	1.42	0.87	0.94	1.25	1.83	2.11	3.25
2010	Refueling Loss	0.21	0.23	0.25	0.25	0.25	0.25	0.27	0.30	0.33	0.33	0.33	0.33	0.44	0.48	0.52	0.52	0.52	0.52
2010	Running Loss HC	0.30	0.41	0.58	0.96	1.21	2.12	0.20	0.28	0.40	0.56	0.64	1.03	0.78	1.10	1.63	2.06	2.19	3.04
2010	Exhaust CO	11.72	11.72	11.72	13.03	14.33	18.82	18.09	18.09	18.09	20.28	22.44	29.94	53.20	53.20	53.20	56.50	59.51	68.66
2010	Exhaust NOx	1.19	1.19	1.19	1.20	1.20	1.22	1.37	1.37	1.37	1.38	1.39	1.41	3.86	3.86	3.86	3.79	3.73	3.58

TABLE 2.7

HIGH ALTITUDE

EMISSION FACTORS (GRAMS/MILE) AT ASTM CLASS B CITIES
71 - 92 F DIURNAL, 88 F HOT SOAK

Cal. Year	Pollutant By Component	LDGV 7.0	LDGV 8.0	LDGV 9.0	LDGV 10.0	LDGV 10.4	LDGV 11.5	LDGT 7.0	LDGT 8.0	LDGT 9.0	LDGT 10.0	LDGT 10.4	LDGT 11.5	HDGV 7.0	HDGV 8.0	HDGV 9.0	HDGV 10.0	HDGV 10.4	HDGV 11.5
1980	Combined NMHC	9.14	9.52	10.39	11.65	12.23	14.25	10.74	11.15	12.00	13.20	13.76	15.73	20.46	20.94	22.31	24.34	25.25	28.27
1980	Exhaust NMHC	5.42	5.42	5.42	5.46	5.49	5.57	7.23	7.23	7.23	7.26	7.29	7.36	13.73	13.73	13.73	13.73	13.73	13.73
1980	Evaporative HC	2.69	2.76	3.20	3.90	4.20	5.20	2.39	2.47	2.86	3.46	3.73	4.63	5.24	5.37	6.23	7.56	8.14	9.91
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41	0.48	0.48	0.48	0.48	0.48	0.48	0.82	0.82	0.82	0.82	0.82	0.82
1980	Running Loss HC	0.63	0.93	1.37	1.89	2.13	3.07	0.64	0.96	1.43	1.99	2.25	3.26	0.66	1.02	1.53	2.23	2.57	3.80
1980	Exhaust CO	96.62	96.62	96.62	98.07	99.14	102.09	116.81	116.81	116.81	118.02	118.91	121.37	363.15	363.15	363.15	363.15	363.15	363.15
1980	Exhaust NOx	1.88	1.88	1.88	1.88	1.88	1.88	2.39	2.39	2.39	2.39	2.39	2.39	4.07	4.07	4.07	4.07	4.07	4.07
1988	Combined NMHC	4.31	4.55	5.06	5.91	6.34	7.84	5.12	5.33	5.77	6.47	6.80	8.02	9.63	10.09	11.16	12.65	13.29	15.53
1988	Exhaust NMHC	2.60	2.60	2.60	2.65	2.69	2.81	3.68	3.68	3.68	3.77	3.83	4.01	5.86	5.86	5.86	5.89	5.92	5.98
1988	Evaporative HC	1.10	1.14	1.39	1.78	1.96	2.57	0.88	0.93	1.14	1.48	1.64	2.19	2.68	2.77	3.32	4.19	4.57	5.82
1988	Refueling Loss	0.23	0.25	0.28	0.30	0.30	0.30	0.27	0.30	0.33	0.36	0.36	0.36	0.47	0.52	0.57	0.62	0.62	0.62
1988	Running Loss HC	0.39	0.55	0.79	1.18	1.39	2.16	0.28	0.41	0.61	0.86	0.98	1.46	0.61	0.94	1.41	1.94	2.18	3.11
1988	Exhaust CO	43.84	43.84	43.84	45.33	46.48	49.99	60.50	60.50	60.50	62.67	64.37	69.52	156.11	156.11	156.11	158.32	160.06	165.33
1988	Exhaust NOx	1.48	1.48	1.48	1.48	1.48	1.49	1.87	1.87	1.87	1.87	1.86	1.86	3.74	3.74	3.74	3.71	3.68	3.61
1990	Combined NMHC	3.53	3.74	4.17	4.94	5.33	6.73	4.21	4.39	4.75	5.37	5.68	6.78	7.48	7.92	8.87	10.15	10.70	12.68
1990	Exhaust NMHC	2.13	2.13	2.13	2.19	2.23	2.35	3.03	3.03	3.03	3.11	3.18	3.38	4.47	4.47	4.47	4.51	4.54	4.62
1990	Evaporative HC	0.84	0.87	1.08	1.40	1.55	2.07	0.69	0.73	0.91	1.20	1.33	1.82	1.95	2.02	2.46	3.18	3.49	4.55
1990	Refueling Loss	0.21	0.24	0.26	0.28	0.28	0.28	0.26	0.29	0.32	0.35	0.35	0.35	0.46	0.50	0.55	0.60	0.60	0.60
1990	Running Loss HC	0.35	0.49	0.70	1.07	1.27	2.02	0.23	0.34	0.50	0.71	0.81	1.23	0.60	0.92	1.38	1.86	2.06	2.90
1990	Exhaust CO	35.09	35.09	35.09	36.63	37.85	41.65	48.09	48.09	48.09	50.40	52.25	58.05	120.07	120.07	120.07	122.77	124.88	131.30
1990	Exhaust NOx	1.41	1.41	1.41	1.41	1.41	1.42	1.76	1.76	1.76	1.76	1.76	1.76	3.82	3.82	3.82	3.77	3.73	3.63
1995	Combined NMHC	2.22	2.39	2.71	3.36	3.71	4.96	2.80	2.94	3.23	3.75	4.02	5.00	5.36	5.78	6.60	7.67	8.12	9.83
1995	Exhaust NMHC	1.31	1.31	1.31	1.36	1.40	1.53	1.97	1.97	1.97	2.06	2.13	2.36	3.20	3.20	3.20	3.25	3.29	3.41
1995	Evaporative HC	0.44	0.47	0.61	0.83	0.94	1.32	0.41	0.45	0.59	0.82	0.94	1.34	1.14	1.20	1.52	2.06	2.30	3.15
1995	Refueling Loss	0.19	0.21	0.23	0.26	0.26	0.26	0.25	0.28	0.30	0.33	0.33	0.33	0.43	0.47	0.52	0.57	0.57	0.57
1995	Running Loss HC	0.29	0.40	0.57	0.91	1.11	1.85	0.17	0.25	0.37	0.54	0.62	0.98	0.60	0.91	1.36	1.79	1.96	2.70
1995	Exhaust CO	19.51	19.51	19.51	21.03	22.29	26.48	28.77	28.77	28.77	31.24	33.28	40.09	75.41	75.41	75.41	78.83	81.51	89.64
1995	Exhaust NOx	1.27	1.27	1.27	1.28	1.28	1.30	1.57	1.57	1.57	1.58	1.58	1.59	3.80	3.80	3.80	3.73	3.68	3.55
2000	Combined NMHC	1.56	1.71	1.98	2.58	2.91	4.08	2.17	2.29	2.54	3.02	3.27	4.18	4.71	5.11	5.90	6.91	7.33	8.97
2000	Exhaust NMHC	0.89	0.89	0.89	0.94	0.98	1.11	1.50	1.50	1.50	1.60	1.68	1.91	2.80	2.80	2.80	2.86	2.91	3.04
2000	Evaporative HC	0.23	0.26	0.37	0.55	0.63	0.94	0.27	0.30	0.43	0.62	0.72	1.07	0.90	0.95	1.24	1.73	1.95	2.74
2000	Refueling Loss	0.19	0.21	0.23	0.25	0.25	0.25	0.25	0.27	0.30	0.33	0.33	0.33	0.41	0.45	0.49	0.54	0.54	0.54
2000	Running Loss HC	0.26	0.36	0.50	0.84	1.04	1.77	0.15	0.21	0.31	0.47	0.54	0.87	0.60	0.91	1.37	1.78	1.94	2.65
2000	Exhaust CO	12.47	12.47	12.47	14.00	15.29	19.71	20.39	20.39	20.39	22.95	25.11	32.48	58.11	58.11	58.11	61.80	64.70	73.50
2000	Exhaust NOx	1.20	1.20	1.20	1.21	1.21	1.23	1.45	1.45	1.45	1.46	1.46	1.48	3.84	3.84	3.84	3.76	3.71	3.57
2010	Combined NMHC	1.48	1.62	1.88	2.45	2.78	3.91	2.00	2.12	2.36	2.81	3.06	3.93	4.44	4.84	5.61	6.58	6.99	8.59
2010	Exhaust NMHC	0.85	0.85	0.85	0.90	0.95	1.08	1.35	1.35	1.35	1.44	1.51	1.74	2.68	2.68	2.68	2.74	2.79	2.93
2010	Evaporative HC	0.18	0.21	0.30	0.46	0.54	0.82	0.26	0.29	0.40	0.59	0.68	1.01	0.77	0.82	1.09	1.55	1.76	2.51
2010	Refueling Loss	0.19	0.21	0.23	0.25	0.25	0.25	0.25	0.27	0.30	0.33	0.33	0.33	0.39	0.44	0.48	0.52	0.52	0.52
2010	Running Loss HC	0.26	0.36	0.50	0.84	1.04	1.77	0.15	0.21	0.31	0.46	0.54	0.86	0.60	0.91	1.36	1.77	1.92	2.62
2010	Exhaust CO	11.53	11.53	11.53	13.02	14.28	18.63	17.78	17.78	17.78	20.26	22.36	29.63	52.18	52.18	52.18	55.99	58.99	68.07
2010	Exhaust NOx	1.19	1.19	1.19	1.20	1.20	1.22	1.37	1.37	1.37	1.38	1.39	1.41	3.86	3.86	3.86	3.78	3.72	3.57

TABLE 2.7 : FOR ASTM CLASS B CITIES.

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TABLE 2.8

HIGH ALTITUDE

EMISSION FACTORS (GRAMS/MILE) AT ASTM CLASS C CITIES
66 - 85 F DIURNAL, 82 F HOT SOAK

Cal. Year	Pollutant By Component	LDGV 7.0	LDGV 8.0	LDGV 9.0	LDGV 10.0	LDGV 10.4	LDGV 11.5	LDGT 7.0	LDGT 8.0	LDGT 9.0	LDGT 10.0	LDGT 10.4	LDGT 11.5	HDGV 7.0	HDGV 8.0	HDGV 9.0	HDGV 10.0	HDGV 10.4	HDGV 11.5
1980	Combined NMHC	8.02	8.26	8.83	9.69	10.07	11.61	10.11	10.38	10.98	11.88	12.28	13.90	19.35	19.68	20.86	22.46	23.14	25.65
1980	Exhaust NMHC	5.26	5.26	5.26	5.31	5.33	5.40	7.05	7.05	7.05	7.09	7.11	7.17	13.29	13.29	13.29	13.29	13.29	13.29
1980	Evaporative HC	1.97	2.04	2.41	2.88	3.09	3.72	2.19	2.27	2.66	3.16	3.38	4.04	4.82	4.94	5.89	7.05	7.54	8.97
1980	Refueling Loss	0.41	0.41	0.41	0.41	0.41	0.41	0.48	0.48	0.48	0.48	0.48	0.48	0.82	0.82	0.82	0.82	0.82	0.82
1980	Running Loss HC	0.38	0.55	0.75	1.09	1.24	2.08	0.39	0.58	0.79	1.15	1.32	2.21	0.42	0.63	0.87	1.30	1.50	2.57
1980	Exhaust CO	86.87	86.87	86.87	88.41	89.21	91.43	105.70	105.70	105.70	106.97	107.63	109.45	318.50	318.50	318.50	318.50	318.50	318.50
1980	Exhaust NOx	2.03	2.03	2.03	2.03	2.03	2.03	2.57	2.57	2.57	2.57	2.57	2.57	4.42	4.42	4.42	4.42	4.42	4.42
1988	Combined NMHC	3.66	3.83	4.17	4.77	5.04	6.17	4.69	4.84	5.16	5.72	5.98	6.96	8.74	9.06	9.92	11.10	11.62	13.55
1988	Exhaust NMHC	2.44	2.44	2.44	2.51	2.54	2.63	3.50	3.50	3.50	3.60	3.65	3.80	5.54	5.54	5.54	5.59	5.61	5.67
1988	Evaporative HC	0.77	0.81	1.02	1.28	1.40	1.78	0.79	0.83	1.04	1.31	1.43	1.82	2.43	2.51	3.11	3.86	4.18	5.15
1988	Refueling Loss	0.19	0.21	0.24	0.26	0.27	0.30	0.23	0.26	0.29	0.32	0.33	0.36	0.39	0.44	0.50	0.55	0.57	0.62
1988	Running Loss HC	0.25	0.36	0.47	0.72	0.83	1.45	0.17	0.25	0.33	0.49	0.57	0.98	0.37	0.56	0.77	1.11	1.26	2.10
1988	Exhaust CO	38.11	38.11	38.11	39.80	40.74	43.57	53.92	53.92	53.92	56.59	58.08	62.57	136.90	136.90	136.90	139.80	141.44	146.40
1988	Exhaust NOx	1.55	1.55	1.55	1.55	1.55	1.55	1.93	1.93	1.93	1.93	1.93	1.92	3.89	3.89	3.89	3.84	3.81	3.74
1990	Combined NMHC	3.00	3.15	3.45	3.98	4.23	5.28	3.84	3.97	4.24	4.74	4.98	5.87	6.73	7.03	7.76	8.78	9.22	10.94
1990	Exhaust NMHC	2.00	2.00	2.00	2.07	2.10	2.20	2.87	2.87	2.87	2.98	3.03	3.20	4.23	4.23	4.23	4.28	4.31	4.39
1990	Evaporative HC	0.59	0.62	0.79	1.01	1.11	1.43	0.61	0.64	0.82	1.05	1.15	1.49	1.76	1.83	2.31	2.91	3.17	3.98
1990	Refueling Loss	0.18	0.20	0.22	0.25	0.26	0.28	0.22	0.25	0.28	0.31	0.32	0.35	0.38	0.43	0.48	0.53	0.55	0.60
1990	Running Loss HC	0.23	0.33	0.43	0.66	0.76	1.36	0.14	0.20	0.27	0.41	0.47	0.83	0.36	0.54	0.74	1.05	1.19	1.96
1990	Exhaust CO	30.42	30.42	30.42	32.18	33.17	36.24	42.90	42.90	42.90	45.71	47.30	52.26	105.32	105.32	105.32	108.85	110.84	116.88
1990	Exhaust NOx	1.45	1.45	1.45	1.46	1.46	1.47	1.80	1.80	1.80	1.80	1.80	1.80	3.92	3.92	3.92	3.85	3.81	3.71
1995	Combined NMHC	1.91	2.03	2.26	2.72	2.94	3.87	2.54	2.64	2.86	3.29	3.50	4.28	4.78	5.05	5.64	6.49	6.87	8.37
1995	Exhaust NMHC	1.23	1.23	1.23	1.30	1.34	1.45	1.87	1.87	1.87	1.99	2.06	2.25	3.05	3.05	3.05	3.13	3.17	3.29
1995	Evaporative HC	0.31	0.34	0.46	0.62	0.70	0.93	0.35	0.38	0.52	0.70	0.78	1.05	1.02	1.07	1.42	1.87	2.07	2.69
1995	Refueling Loss	0.16	0.18	0.20	0.22	0.23	0.26	0.21	0.24	0.26	0.29	0.30	0.33	0.36	0.40	0.45	0.50	0.51	0.57
1995	Running Loss HC	0.21	0.28	0.37	0.58	0.68	1.24	0.11	0.15	0.20	0.31	0.36	0.65	0.34	0.52	0.72	1.00	1.12	1.83
1995	Exhaust CO	17.19	17.19	17.19	18.95	19.99	23.37	25.94	25.94	25.94	28.85	30.58	36.18	67.11	67.11	67.11	71.59	74.12	81.78
1995	Exhaust NOx	1.28	1.28	1.28	1.29	1.29	1.31	1.57	1.57	1.57	1.58	1.59	1.60	3.83	3.83	3.83	3.73	3.69	3.55
2000	Combined NMHC	1.38	1.49	1.69	2.11	2.32	3.20	1.97	2.06	2.24	2.64	2.83	3.56	4.17	4.44	4.99	5.79	6.15	7.60
2000	Exhaust NMHC	0.86	0.86	0.86	0.92	0.96	1.08	1.45	1.45	1.45	1.57	1.64	1.85	2.69	2.69	2.69	2.78	2.82	2.95
2000	Evaporative HC	0.17	0.20	0.30	0.43	0.49	0.69	0.22	0.25	0.36	0.51	0.58	0.81	0.80	0.85	1.15	1.56	1.74	2.31
2000	Refueling Loss	0.16	0.18	0.20	0.22	0.22	0.25	0.21	0.23	0.26	0.29	0.30	0.33	0.34	0.38	0.43	0.47	0.49	0.54
2000	Running Loss HC	0.19	0.26	0.34	0.54	0.64	1.19	0.10	0.13	0.17	0.27	0.32	0.58	0.34	0.52	0.72	0.99	1.11	1.80
2000	Exhaust CO	11.52	11.52	11.52	13.29	14.36	17.91	18.76	18.76	18.76	21.74	23.54	29.50	52.46	52.46	52.46	57.31	60.04	68.33
2000	Exhaust NOx	1.19	1.19	1.19	1.20	1.21	1.22	1.43	1.43	1.43	1.45	1.45	1.47	3.85	3.85	3.85	3.74	3.69	3.55
2010	Combined NMHC	1.31	1.42	1.61	2.02	2.22	3.09	1.80	1.89	2.06	2.44	2.63	3.33	3.94	4.20	4.72	5.50	5.85	7.26
2010	Exhaust NMHC	0.82	0.82	0.82	0.89	0.93	1.05	1.29	1.29	1.29	1.41	1.48	1.68	2.58	2.58	2.58	2.67	2.72	2.86
2010	Evaporative HC	0.14	0.16	0.25	0.38	0.43	0.62	0.20	0.23	0.34	0.48	0.54	0.76	0.68	0.73	1.01	1.39	1.56	2.10
2010	Refueling Loss	0.16	0.18	0.20	0.22	0.22	0.25	0.21	0.23	0.26	0.29	0.30	0.33	0.33	0.37	0.41	0.46	0.48	0.52
2010	Running Loss HC	0.19	0.26	0.34	0.54	0.64	1.18	0.09	0.13	0.17	0.27	0.31	0.57	0.34	0.52	0.71	0.98	1.09	1.77
2010	Exhaust CO	10.64	10.64	10.64	12.36	13.39	16.87	16.32	16.32	16.32	19.16	20.89	26.67	47.42	47.42	47.42	52.43	55.24	63.80
2010	Exhaust NOx	1.18	1.18	1.18	1.19	1.20	1.21	1.36	1.36	1.36	1.37	1.38	1.40	3.86	3.86	3.86	3.75	3.69	3.54

TABLE 3.1

HOT STABILIZED IDLE EMISSION FACTORS (GRAMS/HOUR)

Pollutant	Region	Cal. Year	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	ALL
NMHC	LOW	1980	57.98	59.21	64.83	3.45	6.89	21.60	56.90
NMHC	LOW	1988	31.76	37.91	28.47	2.07	8.75	18.53	32.45
NMHC	LOW	1990	26.30	33.38	25.29	2.00	8.03	17.53	27.48
NMHC	LOW	1995	16.81	25.87	25.28	1.82	6.91	16.54	18.90
NMHC	LOW	2000	12.41	21.75	25.64	1.80	7.49	16.29	14.67
NMHC	LOW	2010	12.02	20.29	25.92	1.80	8.16	16.20	14.00
NMHC	HIGH	1980	60.40	67.70	68.37	7.62	13.99	49.80	61.88
NMHC	HIGH	1988	31.71	42.98	28.09	3.75	14.73	42.63	34.51
NMHC	HIGH	1990	26.47	37.55	24.75	3.24	11.52	40.30	29.38
NMHC	HIGH	1995	17.03	27.93	25.54	2.10	7.40	37.98	20.19
NMHC	HIGH	2000	11.91	23.61	26.16	1.85	7.65	37.41	15.41
NMHC	HIGH	2010	11.43	21.13	26.79	1.80	8.16	37.20	14.48
CO	LOW	1980	800.00	840.62	594.34	11.75	19.49	52.54	760.85
CO	LOW	1988	376.40	419.51	319.76	14.32	22.94	50.05	364.81
CO	LOW	1990	296.93	341.78	271.62	14.17	22.31	49.50	291.41
CO	LOW	1995	157.73	218.80	244.80	12.47	21.29	48.49	163.52
CO	LOW	2000	98.75	163.14	236.62	12.64	21.90	47.99	108.59
CO	LOW	2010	85.10	146.45	230.01	13.42	22.56	47.99	94.79
CO	HIGH	1980	934.16	961.44	651.43	19.63	33.99	82.54	884.14
CO	HIGH	1988	451.81	576.84	374.36	19.65	32.12	80.05	453.95
CO	HIGH	1990	358.91	470.01	318.88	18.14	27.68	79.50	364.67
CO	HIGH	1995	187.34	290.94	285.06	13.41	22.05	78.49	200.96
CO	HIGH	2000	108.09	215.98	274.08	12.84	22.12	77.99	127.23
CO	HIGH	2010	90.49	181.85	266.13	13.42	22.56	77.99	107.02
NOx	LOW	1980	8.14	5.28	3.39	11.83	20.09	55.20	9.52
NOx	LOW	1988	4.67	4.93	3.93	13.69	23.31	31.30	5.84
NOx	LOW	1990	3.79	4.03	3.36	12.78	18.01	23.53	4.67
NOx	LOW	1995	2.44	2.64	2.73	9.42	11.44	15.80	3.15
NOx	LOW	2000	1.83	2.10	2.53	9.14	11.36	13.90	2.67
NOx	LOW	2010	1.64	1.82	2.43	9.82	11.76	13.20	2.59
NOx	HIGH	1980	4.79	4.07	1.92	11.22	18.70	55.20	6.86
NOx	HIGH	1988	3.51	4.68	3.27	13.59	21.36	31.30	4.93
NOx	HIGH	1990	3.03	3.86	2.92	12.71	16.89	23.53	4.07
NOx	HIGH	1995	2.23	2.64	2.58	9.40	11.26	15.80	2.98
NOx	HIGH	2000	1.83	2.10	2.48	9.14	11.32	13.90	2.66
NOx	HIGH	2010	1.64	1.82	2.43	9.82	11.76	13.20	2.57

TABLE 3.1 : FOR HOT STABILIZED IDLE EMISSIONS.

Appendix K

EMISSION SENSITIVITY TABLES (A/C, EXTRA LOAD, AND TRAILER TOWING)

The following tables show the sensitivity of the MOBILE4 emission factors to variations in air conditioner usage, extra vehicle loads, and the percentage of vehicles towing trailers. The LDGT category is a weighted average of LDGT1s and LDGT2s. The following conditions are included:

Altitudes: Low, High

Air Conditioner Usage: 0%, 50%, 100%

Extra Load Percentage: 0%, 5%, 10%, 15%

Trailer Towing Percentage: 0%, 5%, 10%

TABLE 1

LOW ALTITUDE

NMHC EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 0 %

WET BULB TEMPERATURE = 66 F
DRY BULB TEMPERATURE = 71 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	4.28	4.38	4.48	5.68	5.83	5.98	4.70	4.80	4.91
1980	5 %	4.30	4.40	4.50	5.70	5.85	5.99	4.72	4.82	4.92
1980	10 %	4.31	4.41	4.51	5.72	5.86	6.01	4.73	4.83	4.93
1980	15 %	4.33	4.43	4.53	5.73	5.88	6.03	4.74	4.84	4.95
1988	0 %	2.15	2.21	2.27	2.98	3.06	3.15	2.36	2.43	2.49
1988	5 %	2.15	2.21	2.28	2.99	3.07	3.16	2.37	2.43	2.49
1988	10 %	2.16	2.22	2.28	2.99	3.08	3.17	2.37	2.44	2.50
1988	15 %	2.16	2.23	2.29	3.00	3.09	3.17	2.38	2.44	2.51
1995	0 %	1.19	1.22	1.26	1.72	1.77	1.82	1.33	1.37	1.40
1995	5 %	1.19	1.23	1.26	1.72	1.77	1.82	1.33	1.37	1.40
1995	10 %	1.19	1.23	1.26	1.72	1.78	1.83	1.34	1.37	1.41
1995	15 %	1.20	1.23	1.27	1.73	1.78	1.83	1.34	1.38	1.41
2010	0 %	0.84	0.87	0.89	1.25	1.28	1.32	0.97	0.99	1.02
2010	5 %	0.84	0.87	0.89	1.25	1.29	1.32	0.97	1.00	1.02
2010	10 %	0.85	0.87	0.90	1.25	1.29	1.33	0.97	1.00	1.02
2010	15 %	0.85	0.87	0.90	1.26	1.29	1.33	0.98	1.00	1.02

*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 71 F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 1 : NMHC @ 0 % A/C USAGE

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TABLE 2

LOW ALTITUDE

NMHC EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 50 %

WET BULB TEMPERATURE = 71 F
DRY BULB TEMPERATURE = 79 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	4.24	4.34	4.44	5.60	5.75	5.89	4.65	4.75	4.85
1980	5 %	4.25	4.35	4.45	5.62	5.76	5.91	4.66	4.76	4.86
1980	10 %	4.26	4.36	4.46	5.64	5.78	5.93	4.67	4.78	4.88
1980	15 %	4.28	4.38	4.48	5.65	5.80	5.94	4.69	4.79	4.89
1988	0 %	2.14	2.20	2.26	2.94	3.03	3.11	2.35	2.41	2.47
1988	5 %	2.14	2.20	2.27	2.95	3.04	3.12	2.36	2.42	2.48
1988	10 %	2.15	2.21	2.27	2.96	3.04	3.13	2.36	2.42	2.49
1988	15 %	2.15	2.22	2.28	2.96	3.05	3.14	2.37	2.43	2.49
1995	0 %	1.16	1.20	1.23	1.68	1.73	1.78	1.31	1.34	1.38
1995	5 %	1.17	1.20	1.24	1.68	1.73	1.78	1.31	1.34	1.38
1995	10 %	1.17	1.20	1.24	1.69	1.74	1.79	1.31	1.35	1.38
1995	15 %	1.17	1.21	1.24	1.69	1.74	1.79	1.31	1.35	1.38
2010	0 %	0.82	0.84	0.87	1.21	1.25	1.28	0.95	0.97	0.99
2010	5 %	0.82	0.84	0.87	1.21	1.25	1.29	0.95	0.97	0.99
2010	10 %	0.82	0.85	0.87	1.22	1.25	1.29	0.95	0.97	1.00
2010	15 %	0.82	0.85	0.87	1.22	1.26	1.29	0.95	0.97	1.00

*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 79 F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 3

LOW ALTITUDE

NMHC EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 100 %

WET BULB TEMPERATURE = 79 F
DRY BULB TEMPERATURE = 86 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	4.44	4.55	4.65	5.83	5.98	6.13	4.85	4.96	5.06
1980	5 %	4.46	4.56	4.67	5.85	6.00	6.15	4.86	4.97	5.08
1980	10 %	4.47	4.58	4.68	5.87	6.02	6.17	4.88	4.98	5.09
1980	15 %	4.48	4.59	4.70	5.88	6.04	6.19	4.89	5.00	5.10
1988	0 %	2.34	2.40	2.47	3.15	3.25	3.34	2.54	2.61	2.67
1988	5 %	2.34	2.41	2.48	3.16	3.25	3.35	2.55	2.61	2.68
1988	10 %	2.35	2.42	2.48	3.17	3.26	3.36	2.55	2.62	2.69
1988	15 %	2.35	2.42	2.49	3.18	3.27	3.36	2.56	2.63	2.69
1995	0 %	1.27	1.31	1.34	1.79	1.84	1.90	1.41	1.44	1.48
1995	5 %	1.27	1.31	1.35	1.79	1.85	1.90	1.41	1.45	1.48
1995	10 %	1.27	1.31	1.35	1.80	1.85	1.91	1.41	1.45	1.49
1995	15 %	1.28	1.32	1.35	1.80	1.86	1.91	1.41	1.45	1.49
2010	0 %	0.87	0.90	0.92	1.28	1.32	1.36	1.00	1.02	1.05
2010	5 %	0.87	0.90	0.92	1.28	1.32	1.36	1.00	1.02	1.05
2010	10 %	0.87	0.90	0.93	1.29	1.32	1.36	1.00	1.02	1.05
2010	15 %	0.88	0.90	0.93	1.29	1.33	1.37	1.00	1.03	1.05

*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 86 F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

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TABLE 4

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 0 %

WET BULB TEMPERATURE = 66 F
DRY BULB TEMPERATURE = 71 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	54.05	58.40	62.76	65.29	70.33	75.37	56.03	60.19	64.36
1980	5 %	54.69	59.10	63.51	65.98	71.08	76.19	56.62	60.84	65.06
1980	10 %	55.32	59.79	64.25	66.68	71.84	77.00	57.22	61.49	65.76
1980	15 %	55.96	60.48	65.00	67.37	72.59	77.81	57.82	62.14	66.47
1988	0 %	26.13	29.24	32.34	34.80	38.99	43.18	27.88	30.97	34.06
1988	5 %	26.47	29.62	32.77	35.25	39.50	43.75	28.22	31.35	34.49
1988	10 %	26.81	30.00	33.19	35.70	40.01	44.32	28.55	31.73	34.91
1988	15 %	27.15	30.38	33.62	36.16	40.53	44.89	28.89	32.11	35.34
1995	0 %	14.39	16.53	18.67	19.90	22.76	25.61	15.41	17.51	19.60
1995	5 %	14.61	16.79	18.96	20.20	23.10	26.00	15.63	17.75	19.88
1995	10 %	14.83	17.04	19.24	20.49	23.43	26.38	15.84	18.00	20.16
1995	15 %	15.05	17.29	19.53	20.79	23.77	26.76	16.06	18.25	20.44
2010	0 %	10.52	12.09	13.65	14.40	16.54	18.68	11.05	12.54	14.03
2010	5 %	10.68	12.27	13.86	14.62	16.79	18.97	11.20	12.72	14.23
2010	10 %	10.84	12.45	14.07	14.84	17.05	19.25	11.35	12.89	14.43
2010	15 %	11.00	12.64	14.27	15.06	17.30	19.54	11.51	13.07	14.63

*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 71 F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 4 : CO @ 0 % A/C USAGE

TABLE 5

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 50 %

WET BULB TEMPERATURE = 71 F
DRY BULB TEMPERATURE = 79 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	57.50	62.19	66.87	68.34	73.67	78.99	59.30	63.76	68.22
1980	5 %	58.18	62.92	67.67	69.07	74.46	79.84	59.94	64.45	68.97
1980	10 %	58.85	63.66	68.46	69.80	75.25	80.70	60.57	65.14	69.72
1980	15 %	59.52	64.39	69.26	70.52	76.04	81.55	61.20	65.83	70.46
1988	0 %	27.79	31.08	34.36	36.23	40.59	44.94	29.45	32.70	35.96
1988	5 %	28.15	31.48	34.81	36.70	41.12	45.54	29.80	33.10	36.41
1988	10 %	28.51	31.89	35.26	37.17	41.65	46.13	30.15	33.50	36.85
1988	15 %	28.86	32.29	35.72	37.64	42.18	46.73	30.51	33.90	37.30
1995	0 %	14.79	16.99	19.18	20.12	23.01	25.89	15.77	17.91	20.05
1995	5 %	15.01	17.25	19.48	20.42	23.35	26.27	15.99	18.16	20.34
1995	10 %	15.24	17.51	19.77	20.72	23.69	26.66	16.21	18.42	20.62
1995	15 %	15.47	17.76	20.06	21.02	24.03	27.04	16.43	18.67	20.91
2010	0 %	10.52	12.09	13.65	14.21	16.32	18.43	11.03	12.52	14.00
2010	5 %	10.68	12.27	13.86	14.42	16.57	18.71	11.18	12.69	14.20
2010	10 %	10.85	12.46	14.07	14.64	16.82	18.99	11.33	12.87	14.40
2010	15 %	11.01	12.64	14.28	14.86	17.07	19.27	11.49	13.04	14.60

*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 79 F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 6

LOW ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 100 %

WET BULB TEMPERATURE = 79 F
DRY BULB TEMPERATURE = 86 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	66.93	72.60	78.28	78.28	84.58	90.88	68.56	73.93	79.30
1980	5 %	67.72	73.47	79.21	79.12	85.50	91.88	69.30	74.73	80.17
1980	10 %	68.51	74.33	80.15	79.96	86.41	92.87	70.04	75.54	81.05
1980	15 %	69.30	75.19	81.08	80.80	87.33	93.86	70.77	76.35	81.93
1988	0 %	33.99	38.06	42.13	42.34	47.47	52.61	35.37	39.35	43.32
1988	5 %	34.43	38.56	42.68	42.89	48.10	53.31	35.80	39.83	43.87
1988	10 %	34.87	39.06	43.24	43.44	48.73	54.01	36.23	40.32	44.41
1988	15 %	35.32	39.56	43.80	44.00	49.35	54.71	36.66	40.81	44.96
1995	0 %	17.72	20.35	22.99	23.14	26.45	29.76	18.56	21.10	23.64
1995	5 %	17.99	20.66	23.34	23.48	26.84	30.21	18.83	21.40	23.98
1995	10 %	18.26	20.98	23.69	23.82	27.24	30.65	19.09	21.70	24.31
1995	15 %	18.53	21.29	24.04	24.16	27.63	31.09	19.35	22.00	24.65
2010	0 %	12.10	13.90	15.70	16.06	18.45	20.83	12.54	14.25	15.95
2010	5 %	12.29	14.11	15.94	16.31	18.73	21.15	12.72	14.45	16.18
2010	10 %	12.47	14.33	16.18	16.55	19.01	21.47	12.89	14.65	16.40
2010	15 %	12.66	14.54	16.42	16.80	19.29	21.79	13.07	14.85	16.63

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*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 86 F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 7

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 0 %

WET BULB TEMPERATURE = 66 F
DRY BULB TEMPERATURE = 71 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	3.22	3.26	3.30	4.01	4.06	4.10	4.56	4.60	4.64
1980	5 %	3.23	3.27	3.31	4.02	4.07	4.12	4.57	4.60	4.64
1980	10 %	3.23	3.27	3.31	4.03	4.08	4.13	4.57	4.61	4.65
1980	15 %	3.24	3.28	3.32	4.04	4.09	4.14	4.58	4.62	4.66
1988	0 %	1.88	1.91	1.94	2.37	2.41	2.45	2.67	2.70	2.74
1988	5 %	1.88	1.92	1.95	2.38	2.42	2.46	2.68	2.71	2.74
1988	10 %	1.89	1.92	1.95	2.39	2.43	2.47	2.69	2.72	2.75
1988	15 %	1.90	1.93	1.96	2.40	2.44	2.48	2.69	2.72	2.75
1995	0 %	1.25	1.27	1.30	1.67	1.70	1.74	1.68	1.70	1.72
1995	5 %	1.25	1.28	1.30	1.68	1.71	1.74	1.68	1.71	1.73
1995	10 %	1.26	1.28	1.31	1.68	1.72	1.75	1.69	1.71	1.73
1995	15 %	1.26	1.29	1.31	1.69	1.72	1.75	1.69	1.71	1.74
2010	0 %	1.03	1.05	1.07	1.38	1.41	1.43	1.36	1.38	1.40
2010	5 %	1.04	1.06	1.08	1.38	1.41	1.44	1.37	1.39	1.40
2010	10 %	1.04	1.06	1.08	1.39	1.42	1.44	1.37	1.39	1.41
2010	15 %	1.05	1.07	1.09	1.39	1.42	1.45	1.37	1.39	1.41

*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 71 F AMBIENT TEMPERATURE, 19.6 MPH AVERAGE SPEED, AND 75 GRAINS WATER/LB OF DRY AIR HUMIDITY.

TABLE 8

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 50 %

WET BULB TEMPERATURE = 71 F
DRY BULB TEMPERATURE = 79 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	3.24	3.28	3.32	3.97	4.02	4.07	4.56	4.60	4.64
1980	5 %	3.25	3.29	3.33	3.98	4.03	4.08	4.57	4.60	4.64
1980	10 %	3.25	3.29	3.33	3.99	4.04	4.09	4.57	4.61	4.65
1980	15 %	3.26	3.30	3.34	4.00	4.05	4.10	4.58	4.62	4.66
1988	0 %	1.92	1.95	1.99	2.37	2.41	2.45	2.70	2.73	2.76
1988	5 %	1.93	1.96	1.99	2.38	2.42	2.46	2.71	2.74	2.77
1988	10 %	1.93	1.97	2.00	2.39	2.43	2.47	2.71	2.74	2.78
1988	15 %	1.94	1.97	2.01	2.39	2.44	2.48	2.72	2.75	2.78
1995	0 %	1.30	1.33	1.35	1.70	1.73	1.76	1.72	1.74	1.77
1995	5 %	1.31	1.33	1.36	1.70	1.74	1.77	1.72	1.75	1.77
1995	10 %	1.31	1.34	1.36	1.71	1.74	1.77	1.73	1.75	1.78
1995	15 %	1.32	1.34	1.37	1.72	1.75	1.78	1.73	1.76	1.78
2010	0 %	1.10	1.12	1.14	1.41	1.44	1.47	1.41	1.43	1.45
2010	5 %	1.10	1.12	1.14	1.42	1.44	1.47	1.42	1.44	1.46
2010	10 %	1.11	1.13	1.15	1.42	1.45	1.48	1.42	1.44	1.46
2010	15 %	1.11	1.13	1.15	1.43	1.45	1.48	1.42	1.44	1.46

*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 79 F AMBIENT TEMPERATURE, 19.6 MPH AVERAGE SPEED, AND 75 GRAINS WATER/LB OF DRY AIR HUMIDITY.

TABLE 9

LOW ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 100 %

WET BULB TEMPERATURE = 79 F
DRY BULB TEMPERATURE = 86 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	3.19	3.23	3.27	3.85	3.89	3.94	4.49	4.53	4.57
1980	5 %	3.20	3.24	3.28	3.86	3.90	3.95	4.50	4.53	4.57
1980	10 %	3.21	3.25	3.29	3.87	3.91	3.96	4.50	4.54	4.58
1980	15 %	3.21	3.25	3.29	3.88	3.92	3.97	4.51	4.55	4.59
1988	0 %	1.96	1.99	2.02	2.37	2.41	2.45	2.72	2.75	2.79
1988	5 %	1.96	2.00	2.03	2.38	2.42	2.46	2.73	2.76	2.79
1988	10 %	1.97	2.00	2.04	2.39	2.43	2.47	2.73	2.77	2.80
1988	15 %	1.98	2.01	2.04	2.39	2.44	2.48	2.74	2.77	2.81
1995	0 %	1.38	1.41	1.44	1.76	1.80	1.83	1.79	1.81	1.84
1995	5 %	1.39	1.42	1.44	1.77	1.80	1.84	1.79	1.82	1.84
1995	10 %	1.39	1.42	1.45	1.77	1.81	1.84	1.80	1.82	1.85
1995	15 %	1.40	1.43	1.45	1.78	1.81	1.85	1.80	1.83	1.85
2010	0 %	1.19	1.22	1.24	1.49	1.52	1.55	1.49	1.51	1.54
2010	5 %	1.20	1.22	1.24	1.49	1.52	1.55	1.50	1.52	1.54
2010	10 %	1.20	1.23	1.25	1.50	1.53	1.56	1.50	1.52	1.54
2010	15 %	1.21	1.23	1.25	1.50	1.53	1.56	1.50	1.53	1.55

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*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 86 F AMBIENT TEMPERATURE, 19.6 MPH AVERAGE SPEED, AND 75 GRAINS WATER/LB OF DRY AIR HUMIDITY.

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TABLE 10

HIGH ALTITUDE

NMHC EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 0 %

WET BULB TEMPERATURE = 66 F
DRY BULB TEMPERATURE = 71 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	4.33	4.43	4.53	5.73	5.88	6.03	4.74	4.84	4.95
1980	5 %	5.32	5.45	5.57	7.15	7.34	7.52	6.04	6.17	6.30
1980	10 %	5.34	5.47	5.59	7.17	7.36	7.55	6.06	6.19	6.31
1980	15 %	5.36	5.48	5.61	7.20	7.38	7.57	6.07	6.20	6.33
1988	0 %	2.16	2.23	2.29	3.00	3.09	3.17	2.38	2.44	2.51
1988	5 %	2.44	2.51	2.58	3.52	3.62	3.72	2.84	2.91	2.98
1988	10 %	2.44	2.51	2.58	3.53	3.63	3.73	2.84	2.92	2.99
1988	15 %	2.45	2.52	2.59	3.54	3.64	3.74	2.85	2.92	2.99
1995	0 %	1.20	1.23	1.27	1.73	1.78	1.83	1.34	1.38	1.41
1995	5 %	1.24	1.28	1.32	1.90	1.96	2.02	1.51	1.55	1.59
1995	10 %	1.24	1.28	1.32	1.91	1.96	2.02	1.51	1.55	1.59
1995	15 %	1.25	1.28	1.32	1.91	1.97	2.03	1.52	1.55	1.59
2010	0 %	0.85	0.87	0.90	1.26	1.29	1.33	0.98	1.00	1.02
2010	5 %	0.84	0.87	0.89	1.32	1.36	1.40	1.08	1.10	1.13
2010	10 %	0.84	0.87	0.89	1.33	1.37	1.41	1.08	1.10	1.13
2010	15 %	0.85	0.87	0.90	1.33	1.37	1.41	1.08	1.11	1.13

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*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 71 F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 11

HIGH ALTITUDE

NMHC EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 50 %

WET BULB TEMPERATURE = 71 F
DRY BULB TEMPERATURE = 79 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	4.28	4.38	4.48	5.65	5.80	5.94	4.69	4.79	4.89
1980	5 %	5.26	5.39	5.51	7.05	7.23	7.41	5.97	6.10	6.23
1980	10 %	5.28	5.40	5.53	7.07	7.25	7.43	5.99	6.12	6.24
1980	15 %	5.30	5.42	5.55	7.09	7.27	7.46	6.00	6.13	6.26
1988	0 %	2.15	2.22	2.28	2.96	3.05	3.14	2.37	2.43	2.49
1988	5 %	2.43	2.50	2.57	3.47	3.57	3.68	2.82	2.89	2.96
1988	10 %	2.43	2.50	2.57	3.48	3.58	3.68	2.83	2.90	2.97
1988	15 %	2.44	2.51	2.58	3.49	3.59	3.69	2.83	2.90	2.98
1995	0 %	1.17	1.21	1.24	1.69	1.74	1.79	1.31	1.35	1.38
1995	5 %	1.22	1.25	1.29	1.86	1.91	1.97	1.49	1.52	1.56
1995	10 %	1.22	1.26	1.29	1.86	1.92	1.98	1.49	1.52	1.56
1995	15 %	1.22	1.26	1.30	1.87	1.92	1.98	1.49	1.53	1.56
2010	0 %	0.82	0.85	0.87	1.22	1.26	1.29	0.95	0.97	1.00
2010	5 %	0.82	0.84	0.87	1.29	1.32	1.36	1.05	1.08	1.10
2010	10 %	0.82	0.84	0.87	1.29	1.33	1.36	1.05	1.08	1.10
2010	15 %	0.82	0.85	0.87	1.29	1.33	1.37	1.06	1.08	1.10

*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 79 F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

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TABLE 12

HIGH ALTITUDE

NMHC EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 100 %

WET BULB TEMPERATURE = 79 F
DRY BULB TEMPERATURE = 86 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	4.48	4.59	4.70	5.88	6.04	6.19	4.89	5.00	5.10
1980	5 %	5.53	5.66	5.79	7.33	7.52	7.71	6.23	6.36	6.50
1980	10 %	5.54	5.68	5.81	7.35	7.54	7.73	6.24	6.38	6.51
1980	15 %	5.56	5.69	5.83	7.37	7.57	7.76	6.26	6.39	6.53
1988	0 %	2.35	2.42	2.49	3.18	3.27	3.36	2.56	2.63	2.69
1988	5 %	2.65	2.73	2.80	3.71	3.82	3.93	3.03	3.11	3.19
1988	10 %	2.66	2.73	2.81	3.72	3.83	3.94	3.04	3.12	3.20
1988	15 %	2.66	2.74	2.82	3.73	3.84	3.95	3.05	3.13	3.20
1995	0 %	1.28	1.32	1.35	1.80	1.86	1.91	1.41	1.45	1.49
1995	5 %	1.33	1.37	1.41	1.98	2.04	2.10	1.59	1.63	1.67
1995	10 %	1.33	1.37	1.41	1.99	2.05	2.11	1.59	1.63	1.67
1995	15 %	1.34	1.38	1.42	1.99	2.05	2.11	1.60	1.64	1.68
2010	0 %	0.88	0.90	0.93	1.29	1.33	1.37	1.00	1.03	1.05
2010	5 %	0.87	0.90	0.92	1.36	1.40	1.44	1.10	1.13	1.15
2010	10 %	0.87	0.90	0.92	1.36	1.40	1.44	1.10	1.13	1.16
2010	15 %	0.87	0.90	0.93	1.36	1.41	1.45	1.11	1.13	1.16

*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 86 F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 13

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 0 %

WET BULB TEMPERATURE = 66 F
DRY BULB TEMPERATURE = 71 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	55.96	60.48	65.00	67.37	72.59	77.81	57.82	62.14	66.47
1980	5 %	83.12	90.17	97.22	102.08	110.25	118.41	86.75	93.50	100.25
1980	10 %	84.11	91.25	98.39	103.17	111.43	119.70	87.68	94.52	101.35
1980	15 %	85.09	92.33	99.56	104.26	112.62	120.98	88.62	95.54	102.46
1988	0 %	27.15	30.38	33.62	36.16	40.53	44.89	28.89	32.11	35.34
1988	5 %	36.22	40.50	44.78	51.74	58.01	64.29	39.78	44.16	48.53
1988	10 %	36.68	41.02	45.37	52.41	58.78	65.14	40.26	44.69	49.13
1988	15 %	37.15	41.55	45.95	53.09	59.54	66.00	40.73	45.23	49.72
1995	0 %	15.05	17.29	19.53	20.79	23.77	26.76	16.06	18.25	20.44
1995	5 %	16.87	19.38	21.89	25.48	29.12	32.76	19.09	21.61	24.12
1995	10 %	17.13	19.68	22.22	25.86	29.55	33.25	19.35	21.90	24.46
1995	15 %	17.39	19.97	22.56	26.24	29.98	33.73	19.61	22.20	24.79
2010	0 %	11.00	12.64	14.27	15.06	17.30	19.54	11.51	13.07	14.63
2010	5 %	10.92	12.54	14.16	16.51	18.97	21.42	12.43	14.03	15.63
2010	10 %	11.08	12.73	14.38	16.76	19.26	21.75	12.60	14.22	15.84
2010	15 %	11.25	12.92	14.60	17.02	19.55	22.07	12.76	14.41	16.05

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*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 71 F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 14

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 50 %

WET BULB TEMPERATURE = 71 F
DRY BULB TEMPERATURE = 79 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	59.52	64.39	69.26	70.52	76.04	81.55	61.20	65.83	70.46
1980	5 %	88.75	96.36	103.97	106.87	115.48	124.09	92.06	99.30	106.54
1980	10 %	89.80	97.51	105.22	108.01	116.72	125.44	93.05	100.38	107.71
1980	15 %	90.85	98.67	106.48	109.15	117.97	126.79	94.04	101.46	108.89
1988	0 %	28.86	32.29	35.72	37.64	42.18	46.73	30.51	33.90	37.30
1988	5 %	38.82	43.39	47.97	54.09	60.65	67.21	42.26	46.90	51.55
1988	10 %	39.32	43.96	48.60	54.80	61.45	68.10	42.77	47.47	52.18
1988	15 %	39.82	44.52	49.23	55.51	62.25	69.00	43.27	48.04	52.82
1995	0 %	15.47	17.76	20.06	21.02	24.03	27.04	16.43	18.67	20.91
1995	5 %	17.50	20.10	22.70	26.00	29.70	33.41	19.70	22.29	24.89
1995	10 %	17.77	20.41	23.05	26.38	30.14	33.90	19.97	22.60	25.23
1995	15 %	18.04	20.72	23.40	26.76	30.58	34.40	20.23	22.91	25.58
2010	0 %	11.01	12.64	14.28	14.86	17.07	19.27	11.49	13.04	14.60
2010	5 %	10.95	12.57	14.20	16.40	18.84	21.28	12.46	14.06	15.66
2010	10 %	11.11	12.76	14.42	16.66	19.13	21.61	12.63	14.25	15.87
2010	15 %	11.28	12.96	14.63	16.91	19.42	21.93	12.79	14.44	16.08

*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 79 F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 15

HIGH ALTITUDE

CO EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 100 %

WET BULB TEMPERATURE = 79 F
DRY BULB TEMPERATURE = 86 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	69.30	75.19	81.08	80.80	87.33	93.86	70.77	76.35	81.93
1980	5 %	104.20	113.48	122.75	122.82	133.03	143.23	107.15	115.91	124.67
1980	10 %	105.44	114.84	124.24	124.14	134.47	144.81	108.31	117.18	126.06
1980	15 %	106.69	116.21	125.73	125.46	135.92	146.38	109.47	118.46	127.45
1988	0 %	35.32	39.56	43.80	44.00	49.35	54.71	36.66	40.81	44.96
1988	5 %	47.52	53.19	58.86	63.09	70.80	78.50	50.70	56.36	62.02
1988	10 %	48.14	53.89	59.64	63.92	71.73	79.55	51.31	57.06	62.80
1988	15 %	48.75	54.59	60.42	64.74	72.67	80.60	51.93	57.75	63.57
1995	0 %	18.53	21.29	24.04	24.16	27.63	31.09	19.35	22.00	24.65
1995	5 %	21.09	24.22	27.36	29.94	34.20	38.47	23.21	26.30	29.39
1995	10 %	21.41	24.59	27.78	30.38	34.71	39.04	23.53	26.66	29.80
1995	15 %	21.73	24.96	28.19	30.82	35.21	39.61	23.85	27.03	30.21
2010	0 %	12.66	14.54	16.42	16.80	19.29	21.79	13.07	14.85	16.63
2010	5 %	12.59	14.46	16.33	18.54	21.30	24.06	14.13	15.96	17.78
2010	10 %	12.78	14.68	16.58	18.83	21.63	24.42	14.32	16.17	18.03
2010	15 %	12.97	14.90	16.83	19.11	21.95	24.79	14.51	16.39	18.27

*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 86 F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 16

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 0 %

WET BULB TEMPERATURE = 66 F
DRY BULB TEMPERATURE = 71 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	3.24	3.28	3.32	4.04	4.09	4.14	4.58	4.62	4.66
1980	5 %	2.20	2.23	2.26	2.76	2.80	2.83	3.53	3.56	3.59
1980	10 %	2.21	2.23	2.26	2.77	2.81	2.84	3.54	3.57	3.59
1980	15 %	2.21	2.24	2.27	2.78	2.81	2.85	3.54	3.57	3.60
1988	0 %	1.90	1.93	1.96	2.40	2.44	2.48	2.69	2.72	2.75
1988	5 %	1.64	1.67	1.70	2.04	2.07	2.11	2.40	2.43	2.46
1988	10 %	1.65	1.68	1.71	2.04	2.08	2.11	2.41	2.44	2.46
1988	15 %	1.65	1.68	1.71	2.05	2.09	2.12	2.41	2.44	2.47
1995	0 %	1.26	1.29	1.31	1.69	1.72	1.75	1.69	1.71	1.74
1995	5 %	1.32	1.35	1.37	1.62	1.65	1.68	1.70	1.72	1.75
1995	10 %	1.33	1.35	1.38	1.62	1.65	1.69	1.70	1.73	1.75
1995	15 %	1.33	1.36	1.38	1.63	1.66	1.69	1.71	1.73	1.76
2010	0 %	1.05	1.07	1.09	1.39	1.42	1.45	1.37	1.39	1.41
2010	5 %	1.19	1.22	1.24	1.38	1.41	1.43	1.46	1.48	1.50
2010	10 %	1.20	1.22	1.24	1.38	1.41	1.44	1.46	1.48	1.50
2010	15 %	1.20	1.23	1.25	1.39	1.42	1.44	1.47	1.49	1.51

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*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 71 F AMBIENT TEMPERATURE, 19.6 MPH AVERAGE SPEED, AND 75 GRAINS WATER/LB OF DRY AIR HUMIDITY.

TABLE 17

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 50 %

WET BULB TEMPERATURE = 71 F
DRY BULB TEMPERATURE = 79 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	3.26	3.30	3.34	4.00	4.05	4.10	4.58	4.62	4.66
1980	5 %	2.22	2.25	2.27	2.74	2.77	2.81	3.54	3.56	3.59
1980	10 %	2.22	2.25	2.28	2.75	2.78	2.82	3.54	3.57	3.60
1980	15 %	2.23	2.26	2.28	2.75	2.79	2.82	3.55	3.57	3.60
1988	0 %	1.94	1.97	2.01	2.39	2.44	2.48	2.72	2.75	2.78
1988	5 %	1.69	1.72	1.75	2.04	2.08	2.11	2.43	2.46	2.49
1988	10 %	1.69	1.72	1.75	2.05	2.08	2.12	2.44	2.47	2.50
1988	15 %	1.70	1.73	1.76	2.05	2.09	2.13	2.44	2.47	2.50
1995	0 %	1.32	1.34	1.37	1.72	1.75	1.78	1.73	1.76	1.78
1995	5 %	1.38	1.41	1.44	1.64	1.67	1.71	1.75	1.77	1.80
1995	10 %	1.39	1.42	1.44	1.65	1.68	1.71	1.75	1.78	1.80
1995	15 %	1.39	1.42	1.45	1.65	1.69	1.72	1.76	1.78	1.81
2010	0 %	1.11	1.13	1.15	1.43	1.45	1.48	1.42	1.44	1.46
2010	5 %	1.27	1.29	1.32	1.41	1.44	1.47	1.51	1.54	1.56
2010	10 %	1.27	1.30	1.32	1.42	1.44	1.47	1.52	1.54	1.56
2010	15 %	1.28	1.30	1.33	1.42	1.45	1.48	1.52	1.54	1.57

*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 79 F AMBIENT TEMPERATURE, 19.6 MPH AVERAGE SPEED, AND 75 GRAINS WATER/LB OF DRY AIR HUMIDITY.

TABLE 17: NOx @ 50 % A/C USAGE

TABLE 18

HIGH ALTITUDE

NOx EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 100 %

WET BULB TEMPERATURE = 79 F
DRY BULB TEMPERATURE = 86 F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE 0%	5%	10%	EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE 0%	5%	10%
1980	0 %	3.21	3.25	3.29	3.88	3.92	3.97	4.51	4.55	4.59
1980	5 %	2.18	2.21	2.24	2.66	2.69	2.72	3.49	3.51	3.54
1980	10 %	2.19	2.22	2.24	2.66	2.69	2.73	3.49	3.52	3.55
1980	15 %	2.19	2.22	2.25	2.67	2.70	2.73	3.50	3.53	3.55
1988	0 %	1.98	2.01	2.04	2.39	2.44	2.48	2.74	2.77	2.81
1988	5 %	1.73	1.76	1.79	2.05	2.09	2.12	2.46	2.49	2.52
1988	10 %	1.74	1.77	1.80	2.06	2.09	2.13	2.47	2.50	2.53
1988	15 %	1.74	1.77	1.80	2.07	2.10	2.14	2.48	2.50	2.53
1995	0 %	1.40	1.43	1.45	1.78	1.81	1.85	1.80	1.83	1.85
1995	5 %	1.48	1.51	1.54	1.71	1.74	1.78	1.83	1.85	1.88
1995	10 %	1.48	1.51	1.54	1.72	1.75	1.78	1.83	1.86	1.88
1995	15 %	1.49	1.52	1.55	1.72	1.75	1.79	1.84	1.86	1.89
2010	0 %	1.21	1.23	1.25	1.50	1.53	1.56	1.50	1.53	1.55
2010	5 %	1.38	1.40	1.43	1.49	1.52	1.55	1.60	1.63	1.65
2010	10 %	1.38	1.41	1.44	1.49	1.52	1.55	1.61	1.63	1.66
2010	15 %	1.39	1.42	1.44	1.50	1.53	1.56	1.61	1.64	1.66

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*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR UNDER CONDITIONS OF 20.6 % COLD START VMT, 27.3 % HOT START VMT, 86 F AMBIENT TEMPERATURE, 19.6 MPH AVERAGE SPEED, AND 75 GRAINS WATER/LB OF DRY AIR HUMIDITY.

TABLE 18: NOx @ 100 % A/C USAGE

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