

Modifications to MOBILE2
Which Were Used by EPA to Respond
to Congressional Inquiries
on the Clean Air Act

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PREFACE

The modifications in the document were used by EPA to respond to Congressional inquiries regarding the impacts of changes in motor vehicle emissions. The modifications represent EPA's revised estimates of emissions from certain vehicle classes under current statutory standards, as well as expected differences in administratively determined standards from those assumed in the original version of MOBILE2 which are listed below.

Assumed Emission Standards Which Differ from MOBILE2 Assumptions

<u>Altitude Region</u> ^a	<u>Vehicle Type</u>	<u>Pollutant</u>	<u>Model Years</u>	<u>Assumed Emission Standard</u>	
Low	All LDT	NOx	1985	2.3	g/mi
			1986-2020	1.2 ^b	g/mi
	HDGV & HDDV	CO	1984-2020	35	g/bhp-hr
		NOx	1984-1985	10.7	g/bhp-hr
	LDDV	NOx	1986-2020	4.0	g/bhp-hr
			1983-1984	1.5	g/mi
High	All LDT	CO	1984-2020	14	g/mi
		NOx	1985	2.3	g/mi
			1986-2020	1.2 ^b	g/mi
	LDDV	NOx	1983-1984	1.5	g/mi

a: Non-California areas.

b: The mix of technology on LDTs expected under a 2.3 g/mi LDT NOx standard was assumed in calculating the CO emission factor for 1985 and later LDTs, however, EPA has in fact made an advance proposal for a 1.2 g/mi NOx standard to take effect in 1985 and the expected technology mix under a 1.2 g/mi NOx standard has been assumed in calculating the 1986 and later NOx emission factor.

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Table 1

Modified Emission Factors

<u>Region</u> ^(a)	<u>Vehicle</u> ^(b) <u>Type Code</u>	<u>Pollutant</u> ^(c) <u>Code</u>	<u>First</u> ^(d)	<u>Last</u> ^(d)	<u>Modified Emission Factors</u>	
			<u>Model</u> <u>Year</u>	<u>Model</u> <u>Year</u>	<u>Zero Mile</u>	<u>Deterioration</u> <u>Rate</u>
1	1	2	1981	1981	4.93	2.50
1	1	2	1982	1982	4.70	2.50
1	1	2	1983	2020	3.21	1.88
1	1	3	1983	2020	0.68	0.11
1	2	2	1984	2020	7.13	1.35
1	2	3	1985	1985	1.42	0.08
1	2	3	1986	2020	0.75	0.07
1	3	2	1984	2020	7.13	1.35
1	3	3	1985	1985	1.42	0.08
1	3	3	1986	2020	0.75	0.07
1	4	2	1979	1983	174.96	8.37
1	4	2	1984	1985	56.15	5.63
1	4	2	1986	2020	44.36	5.63
1	4	3	1984	1985	11.33	0.09
1	4	3	1986	2020	4.39	0.09
1	5	3	1983	1984	1.11	0.06
1	6	3	1985	1985	1.89	0.07
1	6	3	1986	2020	0.93	0.06
1	7	3	1985	1985	22.90	0.12
1	7	3	1986	2020	10.87	0.12

(a) 1 = Non-California Low Altitude
3 = Non-California High Altitude

(b) 1 = LDGV, 2 = LDGT1, 3 = LDGT2, 4 = HDGV, 5 = LDDV, 6 = LDDT, 7 = HDDV

(c) 2 = CO, 3 = NOx

(d) Only the last two digits of the model year are entered into MOBILE2.

Table 1, continued

Modified Emission Factors

Region ^(a)	Vehicle ^(b) Type Code	Pollutant ^(c) Code	First ^(d)	Last ^(d)	Modified Emission Factors	
			Model Year	Model Year	Zero Mile	Deterioration Rate
3	1	2	1981	1981	10.78	3.07
3	1	2	1982	1982	8.13	3.12
3	1	2	1983	1983	7.75	3.12
3	1	2	1984	2020	3.75	2.24
3	1	3	1981	1981	0.52	0.09
3	1	3	1982	1983	0.57	0.10
3	1	3	1984	2020	0.58	0.10
3	2	2	1984	2020	9.85	1.35
3	2	3	1984	1985	1.26	0.04
3	2	3	1986	2020	0.69	0.07
3	3	2	1984	2020	9.85	1.35
3	3	3	1984	1985	1.26	0.04
3	3	3	1986	2020	0.69	0.07
3	4	2	1979	1983	324.55	8.37
3	4	2	1984	1985	104.16	5.63
3	4	2	1986	2020	82.29	5.63
3	4	3	1984	1985	7.55	0.09
3	4	3	1986	2020	2.92	0.09
3	5	3	1983	1984	1.11	0.06
3	6	2	1984	2020	2.77	0.09
3	6	3	1985	1985	1.89	0.07
3	6	3	1986	2020	0.93	0.06
3	7	3	1985	1985	22.90	0.12
3	7	3	1986	2020	10.87	0.12

(a) 1 = Non-California Low Altitude

3 = Non-California High Altitude

(b) 1 = LDGV, 2 = LDGT1, 3 = LDGT2, 4 = HDGV, 5 = LDDV, 6 = LDDT, 7 = HDDV

(c) 1 = HC, 2 = CO, 3 = NOx

(d) Only the last two digits of the model year are entered into MOBILE2.

Table 2

Internal Modifications Required to MOBILE2 to Maintain
Consistency With Modified Emission Factors

The internal modifications listed in the following table are required to maintain consistency with the modified emission factors. Without these modifications, incorrect results will be calculated for all MOBILE2 runs involving high altitude CO emission factors, an I/M program that inspects light-duty trucks, temperatures outside the range of 68°F to 86°F, or nonstandard operating mode parameters (standard parameters are PCCN = 20.6, PCHC = 27.3, and PCCC = 20.6).

With these modifications, consistent CO and NO_x emission factors will be calculated. However, the HC output from MOBILE2 with these modifications will not be meaningful and should not be used. The original MOBILE2, or MOBILE1, should continue to be used for calculating all HC emission factors.

Table 2, Continued
Internal Modifications Required to
MOBILE2 to Maintain Consistency
With Modified Emission Factors

LINE NUMBER	ORIGINAL MOBILE2 SOURCE	LINE NUMBER	MODIFIED MOBILE2 SOURCE
SUBPROGRAM PCLEFT			
40084	IF(MY.GE.1975 AND MY.LE.1984) ITECH=2	40084	IF(MY.GE.1975 AND MY.LE.1985) ITECH=2
40088	IF(MY.GE.1979 AND MY.LE.1984) ITECH=2	40088	IF(MY.GE.1979 AND MY.LE.1985) ITECH=2
40089	300 IF(MY.GT.1984) ITECH=4	40089	300 IF(MY.GT.1985) ITECH=4
SUBPROGRAM BLOCK DATA 3			
55375	* 1983, 1984, 0000, 0000, 0000,	55375	* 1983, 0000, 0000, 0000, 0000,
55377	* 1983, 2020, 0000, 0000, 0000,	55377	* 1983, 0000, 0000, 0000, 0000,
55393	* 1983, 1984, 1985, 0000, 0000,	55393	* 1983, 1984, 0000, 0000, 0000,
55395	* 1983, 1984, 2020, 0000, 0000,	55395	* 1983, 1984, 0000, 0000, 0000,
SUBPROGRAM BLOCK DATA 16			
68052	* 1967, 1969, 1971, 1974, 1980, 1984, 2020, 0000, 0000,	68052	* 1967, 1969, 1971, 1974, 1980, 1985, 2020, 0000, 0000,
68053	* 1967, 1972, 1974, 1978, 1980, 1984, 2020, 0000, 0000,	68053	* 1967, 1972, 1974, 1978, 1980, 1985, 2020, 0000, 0000,
68060	* 1967, 1969, 1971, 1974, 1980, 1984, 2020, 0000, 0000,	68060	* 1967, 1969, 1971, 1974, 1980, 1985, 2020, 0000, 0000,
68061	* 1967, 1972, 1974, 1978, 1980, 1984, 2020, 0000, 0000/	68061	* 1967, 1972, 1974, 1978, 1980, 1985, 2020, 0000, 0000/
68067	* 1969, 1973, 1978, 1980, 1984, 2020, 0000, 0000, 0000,	68067	* 1969, 1973, 1978, 1980, 1985, 2020, 0000, 0000, 0000,
68068	* 1969, 1973, 1978, 1980, 1984, 2020, 0000, 0000, 0000,	68068	* 1969, 1973, 1978, 1980, 1985, 2020, 0000, 0000, 0000,
68075	* 1969, 1973, 1978, 1980, 1984, 2020, 0000, 0000, 0000,	68075	* 1969, 1973, 1978, 1980, 1985, 2020, 0000, 0000, 0000,
68076	* 1969, 1973, 1978, 1980, 1984, 2020, 0000, 0000, 0000/	68076	* 1969, 1973, 1978, 1980, 1985, 2020, 0000, 0000, 0000/
68082	* 1969, 1973, 1978, 1983, 1984, 2020, 0000, 0000, 0000,	68082	* 1969, 1973, 1978, 2020, 0000, 0000, 0000, 0000, 0000,
68083	* 1969, 1973, 1978, 1983, 1984, 2020, 0000, 0000, 0000,	68083	* 1969, 1973, 1978, 2020, 0000, 0000, 0000, 0000, 0000,
68090	* 1969, 1973, 1978, 1983, 1984, 2020, 0000, 0000, 0000,	68090	* 1969, 1973, 1978, 2020, 0000, 0000, 0000, 0000, 0000,
68091	* 1969, 1973, 1978, 1983, 1984, 2020, 0000, 0000, 0000/	68091	* 1969, 1973, 1978, 2020, 0000, 0000, 0000, 0000, 0000/
68098	* 1974, 1976, 1977, 1978, 1979, 1980, 1982, 2020, 0000,	68098	* 1974, 1976, 1977, 1978, 1979, 1980, 1984, 2020, 0000,
68106	* 1974, 1976, 1977, 1978, 1979, 1980, 1982, 2020, 0000/	68106	* 1974, 1976, 1977, 1978, 1979, 1980, 1984, 2020, 0000/
68113	* 1978, 1979, 1984, 2020, 0000, 0000, 0000, 0000, 0000,	68113	* 1978, 1979, 1985, 2020, 0000, 0000, 0000, 0000, 0000,
68121	* 1978, 1979, 1984, 2020, 0000, 0000, 0000, 0000, 0000/	68121	* 1978, 1979, 1985, 2020, 0000, 0000, 0000, 0000, 0000/

Table 3

Special I/M Credits Required to Maintain Consistency
With Modified Emission Factors

Explanation

Low Altitude Areas - The I/M credits for CO emissions from Technology 4 vehicles appearing in the original MOBILE2 are not compatible with the alternate emission factors given in Table 1. New compatible CO credits have been generated and appear below and in the accompanying low-altitude punched card deck.

High Altitude Areas - The affected EPA Regional Offices were notified on August 4, 1981 (C. Gray to Air and Hazardous Materials Division Directors, Regions 8-10, copy subsequently sent to Region 6) of the availability of a complete set of alternate I/M credits for high-altitude areas, covering Technology 1 through 4 vehicles. The Technology 4 credits for CO in that set of credits are not compatible with the alternate emission factors given in Table 1. A new complete and compatible set of credits appear below and in the accompanying high-altitude punched card deck.

Additional card decks can be requested by calling (313)668-4235 or FTS 374-8235.

Instructions for Use

Low Altitude Areas - The punched card deck (including the first card which contains the number "9" and the following title cards) must be supplied to MOBILE2 during execution on I/O Unit 4. In addition, the input record describing the I/M program parameters (see Users Manual Section 2.2.4 on page 26) must have all eight parameters specified, with the eighth -- the new data flag -- having a value of "2" to indicate that only Technology 4 I/M credits will be altered. The HC output from MOBILE2 with these modifications and new I/M credits should be ignored, and the HC output from the original MOBILE2, or MOBILE1, used instead.

High Altitude Areas - Instructions for use are the same as for low-altitude areas, except that the new data flag should have a value of "3" to indicate that all I/M credits will be altered.

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*****
** SPECIAL LOW-ALTITUDE CO I/M CREDITS FOR TECH 4 **
** VEHICLES TO MAINTAIN CONSISTENCY WITH MODIFIED **
** EMISSION FACTORS FOR LOW-ALTITUDE VEHICLES **
** RELEASED IN APRIL 1982. THESE CREDITS ARE VALID **
** ONLY FOR LOW-ALTITUDE REGIONS. **
** >>IGNORE ALL HC OUTPUT WHEN USING THESE CREDITS.<< **
** >> CALL (313) 668-4365 FOR ASSISTANCE << **
*****
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 31
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 31 31
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 31 31 31
0 0 0 0 0 0 0 0 0 0 0 0 0 0 31 31 31 31
0 0 0 0 0 0 0 0 0 0 0 0 0 31 31 31 31 31
0 0 0 0 0 0 0 0 0 0 0 0 31 31 31 30 30 30
0 0 0 0 0 0 0 0 0 0 0 31 31 30 30 30 30 30
0 0 0 0 0 0 0 0 0 0 31 30 30 30 30 30 30 30
0 0 0 0 0 0 0 0 0 30 30 30 30 30 30 30 29 29
0 0 0 0 0 0 0 30 30 30 30 30 30 30 29 29 29 29
0 0 0 0 0 30 30 30 30 30 30 30 29 29 29 29 28 28
0 0 0 0 0 30 30 30 30 30 29 29 29 29 29 28 28 27
0 0 0 30 30 30 30 29 29 29 29 29 28 28 28 27 26 24
0 30 30 30 30 29 29 29 29 29 28 28 27 27 26 25 24 22
30 30 30 30 29 29 29 29 29 28 28 28 27 27 26 25 24 7
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 35
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 35 35
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 35 35 35
0 0 0 0 0 0 0 0 0 0 0 0 0 0 35 35 35 35
0 0 0 0 0 0 0 0 0 0 0 0 0 35 34 34 34 34
0 0 0 0 0 0 0 0 0 0 0 0 34 34 34 34 34 34
0 0 0 0 0 0 0 0 0 0 34 34 34 34 34 34 34 34
0 0 0 0 0 0 0 0 0 34 34 34 34 34 34 33 33 33
0 0 0 0 0 0 0 0 34 34 34 34 34 34 33 33 33 33
0 0 0 0 0 0 0 34 34 34 34 34 34 33 33 33 32 32 32
0 0 0 0 0 34 34 34 34 33 33 33 33 33 33 32 32 31
0 0 0 34 34 34 33 33 33 33 33 33 32 32 32 31 31 30 29
0 34 34 34 33 33 33 33 33 33 32 32 32 31 31 30 29 28
34 34 34 33 33 33 33 33 33 32 32 32 31 31 30 29 28 8
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 39
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 39 39
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 39 39 38
0 0 0 0 0 0 0 0 0 0 0 0 0 0 39 38 38 38
0 0 0 0 0 0 0 0 0 0 0 0 0 38 38 38 38 38
0 0 0 0 0 0 0 0 0 0 0 0 38 38 38 38 38 38
0 0 0 0 0 0 0 0 0 0 38 38 38 38 38 38 38 38
0 0 0 0 0 0 0 0 0 38 38 38 38 38 38 38 37 37

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0	0	0	0	0	0	0	0	0	0	38	38	38	38	38	38	37	37	37	37	61
0	0	0	0	0	0	0	0	0	38	38	38	38	38	38	37	37	37	37	37	62
0	0	0	0	0	0	0	0	38	38	38	38	38	38	37	37	37	37	37	36	63
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0	0	0	0	0	38	38	38	38	38	37	37	37	37	37	37	37	36	36	36	65
0	0	0	0	38	38	38	37	37	37	37	37	37	37	37	36	36	36	35	35	66
0	0	0	38	38	38	37	37	37	37	37	37	37	37	36	36	36	35	35	34	67
0	0	38	38	38	37	37	37	37	37	37	37	36	36	36	35	35	34	33	32	68
0	38	38	37	37	37	37	37	37	37	37	36	36	36	35	35	34	33	31	29	69
38	38	37	37	37	37	37	37	37	37	36	36	36	35	35	34	33	31	29	9	70
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71
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0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	42	74
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	42	42	75
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	42	42	42	42	76
0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	42	42	42	42	42	77
0	0	0	0	0	0	0	0	0	0	0	0	0	42	42	42	42	42	42	42	78
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0	0	0	0	0	0	0	42	42	42	42	42	42	41	41	41	41	41	40	40	83
0	0	0	0	0	0	42	42	42	42	41	41	41	41	41	41	41	40	40	40	84
0	0	0	0	0	42	42	42	42	41	41	41	41	41	41	41	40	40	39	39	85
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0	0	0	42	42	42	41	41	41	41	41	41	41	40	40	40	39	39	38	37	87
0	0	42	42	42	41	41	41	41	41	41	41	40	40	40	39	39	38	37	35	88
0	42	42	42	41	41	41	41	41	41	41	40	40	40	39	39	38	37	35	32	89
42	42	42	41	41	41	41	41	41	41	40	40	40	39	39	38	37	35	32	10	90
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	92
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	93
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	46	94
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	46	46	46	95
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	46	46	46	46	96
0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	46	46	46	46	46	97
0	0	0	0	0	0	0	0	0	0	0	0	0	46	46	46	46	46	46	45	98
0	0	0	0	0	0	0	0	0	0	0	0	46	46	46	46	46	46	45	45	99
0	0	0	0	0	0	0	0	0	0	46	46	46	46	46	46	46	45	45	45	100
0	0	0	0	0	0	0	0	0	46	46	46	46	46	46	45	45	45	45	45	101
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0	0	0	0	46	46	46	46	46	46	45	45	45	45	45	44	44	44	43	43	105
0	0	0	46	46	46	46	46	45	45	45	45	45	45	44	44	44	43	43	42	106
0	0	46	46	46	46	46	45	45	45	45	45	45	44	44	44	44	43	43	42	107
0	46	46	46	46	46	45	45	45	45	45	45	44	44	44	44	43	43	42	41	108
46	46	46	46	45	45	45	45	45	45	44	44	44	44	43	43	42	41	39	36	109
																				110

[illegible]

Special I/M Credits Required to Maintain Consistency With Modified Emission Factors

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Table 3, Continued

Special I/M Credits Required to Maintain Consistency
With Modified Emission Factors

(Page 3 of 9 containing high-altitude I/M credits)

121	0
122	0
123	0
124	0
125	0
126	0
127	0
128	0
129	0
130	0
131	0
132	0
133	0
134	0
135	0
136	0
137	0
138	0
139	0
140	0
141	0
142	0
143	0
144	0
145	0
146	0
147	0
148	0
149	0
150	0
151	0
152	0
153	0
154	0
155	0
156	0
157	0
158	0
159	0
160	0
161	0
162	0
163	0
164	0
165	0
166	0
167	0
168	0
169	0
170	0
171	0
172	0
173	0
174	0
175	0
176	0
177	0
178	0
179	0
180	0

[illegible]

Table 3, Continued

Special I/M Credits Required to Maintain Consistency
With Modified Emission Factors

(Page 5 of 9 containing high-altitude I/M credits)

08	08	09	10	11	12	13	14	14	18	17	16	15	14	13	11	10	09	09	241
08	09	09	10	11	12	13	14	19	17	17	16	14	13	12	11	10	09	09	242
08	09	10	11	12	12	14	20	19	17	16	15	14	12	11	10	09	08	08	243
08	09	10	11	12	13	21	20	19	17	15	14	13	11	10	09	08	08	08	244
09	10	11	12	13	22	21	19	18	16	14	13	12	11	09	08	07	07	08	245
09	10	11	12	24	22	21	19	17	16	14	12	11	10	09	07	07	07	08	246
09	10	11	25	23	22	20	19	17	15	14	12	11	09	08	07	06	06	07	247
09	11	26	25	23	22	21	19	17	15	13	11	10	08	07	06	06	06	07	248
10	28	27	25	24	22	20	19	16	15	13	11	10	08	06	05	05	05	06	249
28	27	26	24	22	21	19	17	15	13	11	10	08	07	06	05	05	06	02	250
02	06	04	04	05	07	09	11	13	15	17	19	21	23	24	25	26	27	29	251
07	04	04	05	06	08	10	12	14	17	19	21	22	24	25	26	27	28	15	252
07	05	05	06	07	09	11	13	15	17	19	21	23	24	25	26	27	15	15	253
08	06	05	06	07	09	11	12	15	17	19	21	22	24	25	26	16	15	14	254
09	07	06	07	08	10	11	13	15	17	18	21	22	23	24	16	15	15	14	255
09	07	07	08	09	10	12	13	15	17	19	20	22	23	17	15	15	14	14	256
10	08	08	08	10	11	12	14	16	17	19	20	22	18	17	15	14	14	13	257
10	09	08	09	10	12	13	15	16	18	19	21	19	17	16	14	14	13	13	258
10	09	09	10	11	12	14	15	17	18	19	20	18	17	15	14	13	13	13	259
11	10	10	10	12	13	14	16	17	19	20	19	18	16	15	13	12	12	13	260
11	10	10	11	12	13	15	16	18	21	20	18	17	16	14	13	12	12	12	261
11	11	10	12	13	14	15	17	22	21	19	18	16	15	13	12	11	11	12	262
12	11	11	12	13	15	16	23	22	20	18	17	15	14	12	11	10	11	12	263
12	11	12	13	14	15	24	23	21	20	18	16	14	13	11	10	10	10	11	264
12	12	12	14	15	25	24	22	21	19	17	15	14	12	10	09	09	09	11	265
12	12	13	14	27	25	24	22	20	18	17	15	13	11	10	08	08	08	10	266
13	13	14	28	27	25	24	22	20	18	16	14	13	11	09	08	07	07	09	267
13	13	30	29	27	26	25	23	21	19	16	14	12	10	08	07	06	06	09	268
13	31	30	29	27	26	25	23	21	19	16	14	12	09	08	06	05	06	08	269
31	30	29	28	26	25	23	21	19	17	14	12	10	08	06	05	06	07	02	270
03	08	07	07	09	12	14	17	19	21	23	24	25	27	28	29	30	31	31	271
09	07	07	09	11	14	17	19	20	22	24	25	26	28	29	30	30	31	18	272
10	08	08	10	12	15	17	19	21	23	24	25	27	28	29	30	31	20	18	273
11	09	09	11	13	16	18	20	22	23	25	26	27	28	29	30	21	19	17	274
11	10	10	12	14	16	19	20	22	23	25	26	27	29	30	22	20	19	17	275
12	10	11	13	15	17	19	21	23	24	25	26	28	29	22	21	20	18	17	276
13	11	12	14	16	18	20	22	23	25	26	27	28	23	21	20	19	17	17	277
13	12	13	14	17	19	21	22	24	25	26	27	24	22	21	20	18	17	16	278
13	13	13	15	18	20	22	23	24	26	27	25	24	22	20	19	18	16	16	279
14	14	14	16	18	20	22	23	24	26	26	25	23	21	20	18	17	16	16	280
14	14	15	17	18	20	22	23	25	27	26	24	23	21	19	17	16	15	15	281
15	15	16	17	19	21	22	23	28	27	25	24	22	20	19	16	15	14	15	282
15	15	17	18	19	21	23	29	28	27	25	24	22	20	18	16	14	13	14	283
15	16	18	19	20	21	29	28	27	26	25	23	21	19	17	15	13	12	14	284
16	17	18	19	20	30	29	28	27	25	24	22	20	18	16	14	12	11	13	285
16	17	19	20	31	30	29	27	26	25	23	22	20	18	15	13	11	11	12	286
16	18	19	31	31	29	28	27	26	24	23	21	19	17	14	12	10	10	12	287
16	18	32	31	30	29	28	27	25	24	22	20	18	16	13	11	09	08	11	288
17	32	32	31	30	29	27	26	25	23	21	19	17	15	12	10	08	08	10	289
33	32	31	30	29	28	26	25	24	22	20	18	15	12	10	08	07	09	03	290
04	11	09	11	13	16	18	20	22	24	25	26	27	28	30	31	32	33	34	291
12	10	10	13	15	18	20	22	23	25	26	27	28	29	31	32	33	33	22	292
13	11	12	14	17	19	21	22	24	25	27	28	28	30	31	32	33	26	21	293
14	12	13	16	18	20	22	23	25	26	27	28	29	30	31	32	27	25	21	294
14	13	15	17	19	21	22	24	25	27	28	29	30	31	32	27	26	24	21	295
15	15	16	18	20	22	23	25	26	27	29	30	30	31	28	27	25	24	20	296
16	16	18	20	21	23	24	25	27	28	29	30	31	29	28	27	25	23	20	297
17	18	20	21	22	24	25	26	28	29	30	31	29	28	27	26	24	22	20	298
17	19	21	23	24	25	27	28	29	30	31	30	29	28	26	25	23	22	19	299
18	20	22	24	25	26	27	28	29	30	30	29	28	27	26	24	23	21	18	300

Table 3, Continued
Special I/M Credits Required to Maintain Consistency
With Modified Emission Factors
(Page 6 of 9 containing high-altitude I/M credits)

18	21	23	24	26	27	28	29	30	30	29	28	27	26	25	24	22	20	18	301
19	22	23	25	26	28	29	30	31	30	29	28	27	25	24	23	21	19	17	302
20	22	24	26	27	28	29	31	30	29	28	26	25	24	22	21	20	18	17	303
20	23	25	27	28	29	31	30	29	28	27	25	24	23	21	20	18	16	16	304
20	24	25	27	28	31	30	30	29	27	26	25	23	22	20	18	16	15	15	305
21	24	26	27	32	31	30	29	28	27	25	24	22	21	19	17	15	13	14	306
21	25	27	32	31	30	29	28	27	26	25	23	22	20	18	16	13	12	14	307
21	26	33	32	31	30	28	28	27	25	24	22	21	19	17	14	12	11	13	308
22	33	33	32	31	29	28	27	26	25	23	22	20	18	15	13	10	10	12	309
34	33	32	31	30	28	27	26	25	24	22	20	18	16	13	11	09	11	04	310
02	08	12	15	17	20	21	22	23	24	25	25	25	26	27	28	28	29	30	311
06	11	14	16	18	20	22	23	24	24	24	25	25	26	27	27	28	29	05	312
05	09	11	13	15	16	19	20	22	23	23	23	24	24	25	25	25	08	05	313
05	08	10	11	13	14	15	16	18	19	20	21	23	23	24	24	10	09	05	314
04	07	09	11	12	13	14	15	16	17	18	19	20	21	21	12	11	10	07	315
04	07	09	10	12	13	14	15	16	16	17	18	19	20	13	12	11	10	06	316
03	06	08	09	11	12	13	14	15	16	17	18	19	14	13	12	10	09	05	317
02	05	07	09	10	12	13	14	15	16	17	17	15	14	13	12	11	10	07	318
03	05	07	09	10	11	13	14	15	15	16	16	15	14	13	12	11	10	06	319
02	05	07	09	10	11	12	13	14	15	17	16	15	15	14	13	13	11	07	320
02	05	07	08	09	10	11	11	11	19	18	18	18	16	16	15	13	11	07	321
01	04	06	07	07	08	08	08	23	22	21	20	19	18	17	15	13	11	07	322
02	04	06	06	06	07	07	26	24	23	22	21	20	18	17	15	13	10	07	323
00	03	05	05	06	06	27	26	25	23	22	21	20	19	17	16	14	11	07	324
00	03	05	05	06	28	27	26	24	23	22	21	20	19	18	16	14	11	08	325
01	04	05	05	30	29	28	27	26	24	23	22	21	19	18	16	14	12	08	326
00	03	03	32	31	31	30	28	27	26	25	23	22	20	19	17	15	13	09	327
00	03	34	34	34	33	32	31	31	29	28	26	24	22	20	19	17	13	09	328
00	37	36	35	35	34	34	33	32	31	31	29	28	26	24	21	19	16	10	329
37	37	36	35	34	34	33	33	32	31	31	30	28	26	23	21	17	12	03	330
04	15	20	23	26	27	27	28	28	29	29	30	31	31	32	32	33	33	34	331
13	19	23	25	27	27	28	28	29	29	30	30	31	32	32	33	33	34	11	332
11	18	21	24	26	27	28	28	28	29	29	30	30	31	32	32	33	15	11	333
10	16	19	22	24	26	27	28	28	28	29	29	30	30	31	31	19	15	11	334
09	14	17	20	22	24	25	26	27	27	27	28	28	29	29	21	19	16	11	335
08	13	16	19	20	22	23	24	25	26	27	27	28	28	23	21	19	16	11	336
08	13	16	18	20	21	22	23	24	25	26	27	28	25	23	21	19	16	11	337
07	12	15	17	19	20	22	23	24	25	26	27	26	25	23	21	19	16	11	338
06	11	14	17	18	20	21	22	23	24	25	28	26	25	23	22	19	16	12	339
06	11	14	16	18	19	20	21	22	23	28	27	26	25	23	21	19	16	12	340
06	10	13	15	17	18	19	20	21	29	28	27	26	25	23	22	20	17	12	341
06	10	13	15	17	18	20	21	30	29	28	27	26	25	23	22	20	17	12	342
05	09	12	14	16	18	19	32	31	30	29	28	27	26	25	23	21	17	12	343
05	09	12	14	16	18	34	33	32	31	30	29	28	27	25	24	22	18	13	344
05	09	12	14	16	35	34	34	33	32	31	30	29	27	26	24	22	19	13	345
05	08	11	14	36	35	35	34	34	33	32	31	30	28	27	25	23	19	13	346
04	08	12	37	37	36	35	35	34	33	32	32	31	30	28	26	24	20	14	347
04	08	39	39	38	37	36	36	35	34	34	33	33	32	31	29	26	22	15	348
04	39	39	38	37	37	36	36	35	35	34	33	33	33	32	30	28	23	16	349
39	38	38	37	37	36	36	35	35	34	34	33	33	32	31	29	25	19	05	350
05	21	27	29	30	31	31	32	32	33	33	33	33	34	34	34	35	35	36	351
18	26	28	30	31	31	31	32	33	33	33	34	34	34	35	35	35	36	15	352
17	24	27	29	30	31	31	32	32	33	34	34	35	35	36	36	37	23	15	353
15	23	27	29	30	31	31	31	32	33	33	34	34	35	35	36	27	23	15	354
14	22	26	28	29	30	31	31	32	32	32	33	34	34	35	30	27	23	15	355
13	21	25	28	30	31	32	32	33	33	33	33	34	34	32	30	27	23	16	356
13	21	25	28	30	31	32	33	34	34	34	35	35	34	32	30	27	23	16	357
12	21	25	28	30	31	32	33	34	35	35	36	35	33	32	30	27	23	16	358
12	20	25	27	28	30	31	32	32	33	34	36	35	33	32	30	27	23	16	359
12	20	24	26	28	29	30	31	32	33	36	35	34	33	32	30	27	24	16	360

Table 3, Continued

Special I/M Credits Required to Maintain Consistency
With Modified Emission Factors

(Page 7 of 9 containing high-altitude I/M credits)

11	20	24	26	27	28	29	31	32	37	36	35	34	33	31	30	27	24	16	361	
11	19	23	25	27	28	30	31	38	37	36	35	34	33	32	30	28	25	16	362	
11	19	22	25	27	29	30	39	38	38	37	36	35	34	33	31	29	25	16	363	
11	18	22	25	27	29	39	39	38	38	38	37	36	35	34	32	30	25	16	364	
10	18	22	25	27	39	38	38	38	37	37	37	36	35	34	32	29	25	17	365	
10	17	22	25	39	38	37	37	36	36	35	35	35	34	33	32	29	25	17	366	
10	17	22	40	39	39	38	37	37	36	35	35	34	34	33	32	30	26	18	367	
10	17	40	40	39	38	38	37	37	36	36	35	34	34	33	32	30	27	20	368	
10	39	38	38	37	37	37	36	36	36	36	35	34	34	33	33	31	28	21	369	
38	38	37	37	37	36	36	36	36	36	35	34	34	34	33	32	30	23	06	370	
06	24	30	32	33	33	33	34	34	34	34	35	35	35	36	36	37	37	37	371	
22	29	32	33	33	33	34	34	34	35	35	35	36	36	36	37	37	38	17	372	
20	28	32	33	33	33	34	34	35	35	36	36	36	37	38	38	39	27	17	373	
18	27	31	32	33	33	34	34	35	35	36	37	37	38	38	39	33	27	17	374	
17	26	30	32	33	33	34	34	35	36	36	37	38	38	39	37	33	27	17	375	
16	25	30	32	33	33	34	34	35	35	36	37	37	38	39	36	33	27	17	376	
16	25	29	32	33	34	34	35	35	36	37	37	38	40	39	36	32	27	17	377	
15	25	30	32	34	35	36	37	37	37	38	39	41	40	38	36	33	28	17	378	
15	24	30	33	35	36	37	38	38	39	39	42	41	39	38	36	32	27	17	379	
14	24	30	33	34	36	37	38	38	39	42	41	40	39	37	35	32	27	17	380	
14	24	30	32	34	36	37	38	39	42	41	40	39	38	37	35	32	27	17	381	
14	25	30	33	35	37	38	39	42	41	41	40	39	38	37	35	32	27	17	382	
14	25	30	33	35	37	38	41	40	39	39	39	38	38	36	35	32	27	17	383	
14	24	29	33	35	37	40	39	39	38	37	37	37	37	36	34	32	27	18	384	
14	24	29	33	36	40	39	39	38	37	37	36	36	35	35	34	32	28	18	385	
14	24	30	33	41	40	39	39	38	37	37	36	36	35	35	34	32	28	19	386	
14	23	30	41	40	39	39	38	38	37	37	36	36	35	35	34	32	29	19	387	
14	24	40	39	39	38	37	37	37	36	36	35	35	35	34	34	33	29	21	388	
13	38	38	38	37	37	36	36	36	35	35	35	34	34	34	34	33	30	22	389	
38	38	37	37	36	36	36	35	35	35	34	34	34	34	34	34	33	31	25	07	390
07	24	30	31	32	32	33	33	33	33	34	34	35	35	36	36	36	36	36	391	
22	29	31	32	32	33	33	33	34	34	34	35	35	36	36	37	37	37	16	392	
20	29	32	33	33	34	34	35	35	35	36	36	37	37	38	38	39	29	16	393	
19	29	33	34	35	35	35	36	36	37	37	37	38	38	39	39	35	28	16	394	
18	29	33	34	35	35	36	36	36	37	37	38	38	39	39	38	35	28	16	395	
18	29	33	34	35	35	36	36	37	37	38	38	39	40	42	39	35	29	16	396	
17	28	32	34	35	35	36	36	37	38	38	39	39	43	41	39	35	29	16	397	
17	28	32	34	35	36	37	37	38	38	39	40	43	42	41	38	35	29	16	398	
17	28	33	35	36	37	38	38	39	39	40	43	42	41	40	38	34	29	17	399	
17	28	33	36	37	38	39	39	40	41	41	41	40	39	39	37	34	28	17	400	
17	28	34	37	39	39	40	41	41	41	40	39	39	38	37	36	33	28	17	401	
17	29	34	38	40	41	42	43	40	39	39	38	38	37	36	35	33	28	17	402	
16	29	35	38	41	42	43	40	39	38	38	37	37	36	35	34	32	28	17	403	
16	29	35	39	41	43	39	39	38	38	37	36	36	35	35	34	32	28	17	404	
16	29	35	39	42	40	39	38	38	37	37	36	36	35	35	34	33	29	18	405	
16	28	35	38	39	39	38	38	37	37	36	36	36	35	35	34	33	29	18	406	
16	28	35	39	39	38	38	37	37	37	36	36	35	35	35	34	33	29	19	407	
16	29	39	38	38	37	37	36	36	35	35	35	34	34	33	33	32	29	20	408	
16	37	37	37	36	36	35	35	34	34	34	33	33	33	32	32	31	29	22	409	
36	36	36	36	36	35	35	34	34	33	33	33	33	32	32	31	30	24	07	410	
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0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	33	33	33	33	417	
0	0	0	0	0	0	0	0	0	0	0	0	0	33	33	33	33	33	33	418	
0	0	0	0	0	0	0	0	0	0	0	0	33	33	33	33	33	33	33	419	
0	0	0	0	0	0	0	0	0	0	0	33	33	33	33	33	33	33	32	420	

[illegible]

0	0	0	0	0	0	0	0	0	48	47	47	47	47	47	47	47	47	46	481
0	0	0	0	0	0	0	0	47	47	47	47	47	47	47	47	47	46	46	482
0	0	0	0	0	0	0	47	47	47	47	47	47	47	47	47	46	46	46	483
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0	47	47	47	47	47	47	47	46	46	46	46	45	45	45	44	43	42	40	489
47	47	47	47	47	47	46	46	46	46	45	45	45	44	43	42	40	37	12	490
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	491
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53	492
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53	53	493
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0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53	53	53	53	495
0	0	0	0	0	0	0	0	0	0	0	0	0	0	53	53	53	52	52	496
0	0	0	0	0	0	0	0	0	0	0	0	0	53	53	53	52	52	52	497
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52	52	52	52	52	52	52	52	51	51	51	50	50	50	49	48	47	45	42	509
																		13	510

Table 3, Continued
Special I/M Credits Required to Maintain Consistency
With Modified Emission Factors
(Page 9 of 9 containing high-altitude I/M credits)

Table 4

Comparison of Original and Modified
Composite Motor Vehicle CO and NOx Emission Factors
as of December 31, 1987

(Note: All values assume national inputs except as specified)

Region (Altitude)	Pollutant	Temperature (°F).	Speed (mph)	I/M*	12/31/87 Composite Emission Factor(g/mi)		
					Original MOBILE2	Modified	Change(%)
Low	CO	75	19.6	No	27.84	27.57	-1.0%
Low	CO	75	30.0	No	18.41	18.17	-1.3%
Low	CO	25	19.6	No	45.66	43.76	-4.2%
Low	CO	25	30.0	No	30.31	28.98	-4.4%
Low	CO	75	19.6	Yes	21.31	22.02	3.3%
Low	CO	75	30.0	Yes	14.06	14.47	2.9%
Low	CO	25	19.6	Yes	34.23	34.07	-0.5%
Low	CO	25	30.0	Yes	22.69	22.52	-0.7%
High	CO	75	19.6	No	40.66	39.01	-4.1%
High	CO	75	30.0	No	27.49	26.29	-4.4%
High	CO	25	19.6	No	66.27	61.03	-7.9%
High	CO	25	30.0	No	44.82	41.21	-8.1%
High	CO	75	19.6	Yes	33.54	33.68	0.4%
High	CO	75	30.0	Yes	22.67	22.67	0.0%
High	CO	25	19.6	Yes	53.58	51.52	-3.8%
High	CO	25	30.0	Yes	36.26	34.77	-4.1%
Low	NOx	75	19.6	N/A	2.51	2.62	4.4%
Low	NOx	75	30.0	N/A	2.78	2.87	3.2%
Low	NOx	25	19.6	N/A	2.73	2.83	3.7%
Low	NOx	25	30.0	N/A	3.04	3.12	2.6%
High	NOx	75	19.6	N/A	2.30	2.21	-3.9%
High	NOx	75	30.0	N/A	2.55	2.40	-5.9%
High	NOx	25	19.6	N/A	2.48	2.37	-4.4%
High	NOx	25	30.0	N/A	2.77	2.60	-6.1%

* The I/M program assumed consists of 20% stringency factor for pre-1981 vehicles, 50% identification rate for 1981 and later vehicles, no mechanic training, 20 model years inspected, and inspection of light-duty vehicles only beginning on January 1, 1983.

Corrected 9/17/82