



$$BER_C = BER \text{ (g/mi)} * StCF \text{ (mi)} \quad (6.7-2)$$

where  $BER_C$  = corrected emission rate (g/100 sec for the overnight soak),  
 $BER$  = basic emission rate of UC bag 1 (g/mi),  
 $StCF$  = Start Correction Factor (mi per 100 sec).

**Table 6.7-1. Start Correction Factors**

	Non-Catalyst	Oxidation Catalyst	Three-Way Catalyst	
			Carb/TBI	MPFI
HC	0.4565	0.6010	0.6472	0.7897
CO	0.4283	0.5838	0.6087	0.8168
NO <sub>x</sub>	0.2235	0.2306	0.3448	0.4948
CO <sub>2</sub>	0.3632	0.3584	0.3546	0.3365
* CARB - Carbureted TBI – Throttle-Body Fuel Injection MPFI – Multipoint Fuel Injection				

### 6.7.3 Application of Correction Factors in Start Methodology

Once the overnight start emissions are calculated, soak factors are applied to estimate the emissions of those trips that begin after shorter soak periods. The soak factors are calculated using the following polynomial equation.

$$\begin{aligned} &\text{Normalized Start Emissions of} \\ &\text{HC, CO, NO}_x, \text{ and CO}_2 \quad = \quad a_0 + a_1 * t + a_2 * t^2 \end{aligned} \quad (6.7-3)$$

where  $t$  = soak time (minutes),  
 $a_i$  = coefficients of the curves,  
Normalized start emissions = grams per soak time  $i$  divided by grams per overnight soak.

The corresponding coefficients and soak time intervals for each technology group are given in Table 6.7-2. By using the above continuous functions in conjunction with the start emissions produced following a cold soak, it is possible to estimate the amount of start emissions produced after any soak time.

**Table 6.7-2. Coefficients by Technology Group for All Light- and Medium-Duty Vehicles**

<b>(a) Non-catalyst vehicles</b>									
	<b>HC curve 1</b>	<b>HC curve 2</b>	<b>CO curve 1</b>	<b>CO curve 2</b>	<b>NOx curve 1</b>	<b>NOx curve 2</b>	<b>CO2 curve 1</b>	<b>CO2 curve 2</b>	
a0	0.3806708	0.4362844	0.4380312	-0.085415	1.31568216	2.48061071	0.36302129	0.99064304	
a1	-0.001638	0.0007826	-0.00998	0.0030314	0.0275196	-0.0001841	0.00697116	1.2996E-05	
a2	6.642E-05		7.019E-05	-2.12E-06	-0.0001531	-2.6E-06	-1.335E-05		
domain (min)	0-52	53-720	0-119	120-720	0-119	120-720	0-115	116-720	
<b>(b) Catalyst-equipped vehicles</b>									
	<b>HC curve 1</b>	<b>HC curve 2</b>	<b>CO curve 1</b>	<b>CO curve 2</b>	<b>NOx curve 1</b>	<b>NOx curve 2</b>	<b>CO2 curve 1</b>	<b>CO2 curve 2</b>	
a0	0	0.5713026	0	0.7064116	0.11796024	1.12983289	0	0.25889542	
a1	0.012723	0.0007196	0.0119476	0.0003344	0.02966956	2.2138E-05	0.00433672	0.0014848	
a2	-6.3E-05	-1.76E-07	-4.76E-05	1.001E-07	-0.000215	-3.04E-07	-2.393E-06	-6.364E-07	
domain (min)	0-89	90-720	0-116	117-720	0-61	62-720	0-96	97-720	
<b>(c) Advanced catalyst equipped vehicle</b>									
	<b>HC curve 1</b>	<b>HC curve 2</b>	<b>CO curve 1</b>	<b>CO curve 2</b>	<b>NOx curve 1</b>	<b>NOx curve 2</b>	<b>CO2 curve 1</b>	<b>CO2 curve 2</b>	
a0	0	0.5064134	0	0.4473331	1.05016953	1.37178406	0.0537617	0.31251366	
a1	0.0056083	0.0006855	0.0070714	0.0016176	0.00361983	0.00026788	0.00114395	0.00095484	
a2	-5.09E-06		-1.33E-05	-1.18E-06	-5.575E-06	-1.089E-06	1.6526E-05		
domain (min)	0-117	118-720	0-107	108-720	0-113	114-720	0-119	120-720	

While StCF are allocated into four technology groups, the Soak Factors that allocate the emissions associated with different soak periods are defined by three groups: Non-catalyst, Catalyst-equipped, and Advanced Catalyst vehicles (formerly referred to as Electrically-Heated Catalyst). In order to accommodate the different technology groups for the StCF and Soak Factors, it is suggested that the matrix shown in either Table 6.7-3a or 6.7-3b be used. These tables contain the same information; they are both given here for further clarification.

**Table 6.7-3a. Application of Correction Factors by Technology Group**

Technology Groups of Basic Emission Rates	Corresponding Correction Factors	
	Start Correction Factor	Soak Factor
1-3, 40, 50-51, 70-71, 90-91,150-151	I	A
4-7, 41	II	B
8-10, 14, 16-17, 19, 27, 42	III	B
11-13, 15, 18, 20, 26, 43, 52-55, 72-75, 92, 152	IV	B
21-24, 28-30	IV	C
<b>KEY</b>		
Start Correction Factors		
I = Non-Catalyst		
II = Oxidation Catalyst		
III = Three-Way Catalyst Carbureted/Throttle-Body Fuel Injection		
IV = Three-Way Catalyst/Multipoint Fuel Injection		
Soak Factors		
A = Non-Catalyst		
B = Catalyst-Equipped		
C = Advanced Catalyst		

**Table 6.7-3b. Application of Correction Factors by Technology Group**

Technology Groups	Correction Factors (CF)	
	Start CF	Soak CF
1	I	A
2	I	A
3	I	A
4	II	B
5	II	B
6	II	B
7	II	B
8	III	B
9	III	B
10	III	B
11	IV	B
12	IV	B
13	IV	B
14	III	B
15	IV	B
16	III	B
17	III	B
18	IV	B
19	III	B
20	IV	B
21	IV	C
22	IV	C
23	IV	C
24	IV	C
26	IV	B
27	III	B
28	IV	C
29	IV	C
30	IV	C
40	I	A
41	II	B
42	III	B
43	IV	B
50	I	A
51	I	A
52	IV	B
53	IV	B
54	IV	B
55	IV	B
70	I	A
71	I	A
72	IV	B
73	IV	B
74	IV	B
75	IV	B
90	I	A
91	I	A
92	IV	B
150	I	A
151	I	A
152	IV	B