Supporting Information: Table 1. Description of Test Vehicles

Vehicle ID	MY	OEM	Model	Certification	Displacement	Mileage	Test Weight	Dynamometer Road Load Coefficients		
						mi	kg	A (kg)	B (kg/(km/h))	C (kg/(km/h)^2)
SU1	2000	Honda	Accord	SULEV	2.3 L	11,958	1474	13.8	0.049	0.00335
SU2	2001	Nissan	Sentra CA	SULEV	1.8 L	6,592	1361	11.3	0.040	0.00275
U1	2001	Chrysler	Sebring	ULEV	2.4 L	19,677	1701	15.7	0.056	0.00381
U2	2001	Acura	CL	ULEV	3.2 L	20,523	1701	15.7	0.056	0.00381
L1	2000	Jeep	Grand Cherokee	LEV	4.7 L	29,571	2041	22.6	0.080	0.00549
L2	2001	Ford	Taurus	LEV	3.0 L	23,553	1644	15.5	0.055	0.00376
L3	2001	Chevrolet	Cavalier	LEV	2.4 L	22,482	1417	11.5	0.041	0.00280
L4	2001	Chevrolet	Silverado	LEV	5.3 L	8,380	2155	21.8	0.078	0.00529

Supporting Information: Table 2. Properties of the Test Fuel

API Gravity	66.3 @ 15.6°C/15.6°C
RVP	6.7 psi
Base Sulfur	5 ppmw
Benzene	0.1 wt %
Aromatics	16.4 wt. %
	14.0 vol. %
Olefins	0.5 vol. %
T50	101.3°C
T90	117.6°C

Sulfur doping levels: Nominal 30 ppmw: 1st batch 30 ppmw and 2nd batch 31.6 ppmw

RVP: Reid vapor pressure

T50: 50% distillation temperature point

T90: 90% distillation temperature point

Supporting Information: Table 3. Summary of Emissions (Unit: g/km)

		SU1		SU2		U1		U2		L1		L2		L3		L4		Average
		OE	Aged	OE	Aged	OE	Aged	OE	Aged	OE	Aged	OE	Aged	OE	Aged	OE	Aged	
FTP	NH_3	0.001	0.004	0.002	0.001	0.014	0.007	0.006	0.016	0.018	0.017	0.000	0.001	0.000	0.001	0.018	0.053	**0.010**
	THC	0.013	0.012	0.006	0.008	0.021	0.020	0.022	0.034	0.062	0.061	0.035	0.041	0.030	0.034	0.052	0.074	**0.033**
	CO	0.090	0.112	0.110	0.100	0.284	0.267	0.183	0.455	0.719	0.951	0.324	0.341	0.545	0.682	0.672	0.883	**0.420**
	NO_x	0.011	0.014	0.005	0.005	0.016	0.015	0.040	0.043	0.064	0.117	0.024	0.022	0.045	0.030	0.079	0.077	**0.038**
	CO_2	214.4	215.1	203.6	204.0	252.3	252.6	249.9	245.6	359.5	334.1	269.8	268.9	211.3	208.0	332.1	341.7	**260.2**
Hot Running 505	NH_3		0.001	0.001	0.000	0.002	0.001	0.002	0.001	0.013	0.009		0.003	0.001	0.001	0.018	0.050	**0.007**
	THC		0.001	0.002	0.001	0.002	0.002	0.001	0.002	0.006	0.009		0.028	0.002	0.002	0.015	0.021	**0.007**
	CO		0.070	0.039	0.017	0.000	0.047	0.042	0.024	0.007	0.008		0.061	0.020	0.035	0.169	0.202	**0.053**
	NO_x		0.001	0.002	0.002	0.006	0.004	0.085	0.029	0.002	0.068		0.006	0.019	0.022	0.024	0.019	**0.021**
	CO_2		194.6	187.1	189.1	227.4	224.8	216.7	208.1	311.9	284.9		232.2	182.4	183.5	300.2	297.4	**231.4**
NYCC	NH_3		0.007	0.007	0.005	0.007	0.004	0.013	0.007	0.017	0.011		0.018	0.001	0.002	0.052	0.088	**0.017**
	THC		0.000	0.002	0.001	0.000	0.009	0.004	0.006	0.029	0.031		0.053	0.002	0.006	0.027	0.040	**0.015**
	CO		0.133	0.023	0.182	0.110	0.213	0.133	0.057	0.040	0.032		0.203	0.373	0.237	0.496	0.542	**0.198**
	NO_x		0.007	0.000	0.001	0.001	0.065	0.017	0.029	0.134	0.135		0.016	0.095	0.139	0.016	0.025	**0.049**
	CO_2		325.0	285.6	297.9	425.6	416.3	420.3	408.2	646.6	584.2		468.5	314.3	307.5	570.3	557.3	**430.5**
US06	NH_3	0.004	0.001	0.018	0.014	0.086	0.059	0.055	0.063	0.144	0.129	0.019	0.028	0.018	0.017	0.040	0.123	**0.051**
	THC	0.004	0.002	0.002	0.002	0.023	0.028	0.020	0.016	0.052	0.055	0.035	0.069	0.008	0.009	0.039	0.040	**0.025**
	CO	0.725	0.280	3.456	2.529	10.565	9.890	5.021	4.543	4.867	1.894	1.950	2.792	1.635	1.179	0.533	0.797	**3.291**
	NO_x	0.003	0.005	0.003	0.002	0.041	0.067	0.042	0.123	0.058	0.088	0.004	0.008	0.074	0.056	0.057	0.112	**0.046**
	CO_2	196.4	193.6	205.6	200.4	231.4	230.8	208.4	203.4	325.7	294.0	219.2	220.1	175.1	172.8	295.3	292.9	**229.1**
MEC01v7	NH_3		0.002	0.044	0.037	0.061	0.064	0.061	0.050	0.118	0.123	0.049	0.044	0.050	0.062	0.041	0.092	**0.060**
	THC		0.002	0.002	0.002	0.037	0.049	0.047	0.052	0.096	0.119	0.095	0.126	0.012	0.020	0.048	0.065	**0.052**
	CO		4.275	6.147	4.722	21.245	23.867	12.570	13.836	15.747	21.834	8.497	8.753	4.427	3.843	5.829	6.460	**10.803**
	NO_x		0.009	0.003	0.006	0.018	0.019	0.018	0.031	0.030	0.047	0.006	0.012	0.057	0.066	0.050	0.095	**0.031**
	CO_2		179.5	186.5	187.5	206.1	207.7	189.5	188.1	287.1	261.2	210.6	200.7	159.5	159.8	281.6	273.5	**211.9**

Supporting Information: Table 4. Summary of Correlation Coefficients (R^2) of Equivalence Ratio (λ) vs. Tailpipe-Out NH_3 Emissions

MY	Vehicle	λ	
		OE	Aged
2000	SU1	N/A*	
2001	SU2	0.38	0.23
2001	U1	0.22	0.21
2001	U2	0.30	0.26
2000	L1	0.13	0.39
2001	L2	0.52**	0.34
2001	L3	0.15	0.17
2001	L4	0.10	0.29

*: NH_3 emissions are too low to compare

**: MEC01v7 cycle only.