

## Summary of Current and Historical Light-Duty Vehicle Emission Standards

<b>US EPA Federal Light-Duty Vehicle Emission Standards for Air Pollutants</b>								
<b>Tier 2 Program</b>								
Standard	Model Year	Vehicles	Emission Limits at Full Useful Life (100,000-120,000 miles)					Air Pollution Score
			Maximum Allowed Grams per Mile					
			NO <sub>x</sub>	NMOG	CO	PM	HCHO	
Bin 1	2004+	LDV, LLDT, HLDT, MDPV	0.00	0.000	0.0	0.0	0.0	10
Bin 2	2004+	LDV, LLDT, HLDT, MDPV	0.02	0.010	2.1	0.01	0.004	9
Bin 3	2004+	LDV, LLDT, HLDT, MDPV	0.03	0.055	2.1	0.01	0.011	8
Bin 4	2004+	LDV, LLDT, HLDT, MDPV	0.04	0.070	2.1	0.01	0.011	7
Bin 5	2004+	LDV, LLDT, HLDT, MDPV	0.07	0.090	4.2	0.01	0.018	6
Bin 6	2004+	LDV, LLDT, HLDT, MDPV	0.10	0.090	4.2	0.01	0.018	5
Bin 7	2004+	LDV, LLDT, HLDT, MDPV	0.15	0.090	4.2	0.02	0.018	4
Bin 8a	2004+	LDV, LLDT, HLDT, MDPV	0.20	0.125	4.2	0.02	0.018	3
Bin 8b	2004-2008	HLDT, MDPV	0.20	0.156	4.2	0.02	0.018	3
Bin 9a	2004-2006	LDV, LLDT	0.30	0.090	4.2	0.06	0.018	2
Bin 9b	2004-2006	LDT2	0.30	0.130	4.2	0.06	0.018	2
Bin 9c	2004-2008	HLDT, MDPV	0.30	0.180	4.2	0.06	0.018	2
Bin 10a	2004-2006	LDV, LLDT	0.60	0.156	4.2	0.08	0.018	1
Bin 10b	2004-2008	HLDT, MDPV	0.60	0.230	6.4	0.08	0.027	1
Bin 10c	2004-2008	LDT4, MDPV	0.60	0.280	6.4	0.08	0.027	1
Bin 11	2004-2008	MDPV	0.90	0.280	7.3	0.12	0.032	0
<b>Tier 1 Program</b>								
LDV	1994-2003	LDV	0.6	0.31	4.2	0.10	--	1
LDT1	1994-2003	LDT1	0.6	0.31	4.2	0.10	0.8	1
LDV diesel	1994-2003	LDV	1.25	0.31	4.2	0.10	--	0
LDT1 diesel	1994-2003	LDT1	1.25	0.31	4.2	0.10	0.8	0
LDT2	1994-2003	LDT2	0.97	0.40	5.5	0.10	0.8	0
LDT3	1994-2003	LDT3	0.98	0.46	6.4	0.10	0.8	0
LDT4	1994-2003	LDT4	1.53	0.56	7.3	0.12	0.8	0

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<b>EPA Emission standards: Historical</b>								
Standard	Model Year	Vehicles	Emission Limits at Half Useful Life (50,000 miles)					Air Pollution Score
			Maximum Allowed Grams per Mile					
<b>CARS</b>			<b>NOx</b>	<b>NMHC</b>	<b>CO</b>	<b>PM</b>	<b>THC</b>	
Tier 0 LDV	1987-1993	LDV	1.0	--	3.4	0.2	0.41	none
1985-1986	1985-1986	LDV	1.0	--	3.4	0.6	0.41	none
1984	1984	LDV	1.0	--	3.4	0.6	0.41	none
1983	1983	LDV	1.0	--	3.4	0.6	0.41	none
1982	1982	LDV	1.0	--	3.4	0.6	0.41	none
1981	1981	LDV	1.0	--	3.4	--	0.41	none
1980	1980	LDV	2.0	--	7	--	0.41	none
1978-1979	1978-1979	LDV	2.0	--	15	--	1.5	none
1977	1977	LDV	2.0	--	15	--	1.5	none
1975-1976	1975-1976	LDV	3.1	--	15	--	1.5	none
1973-1974	1973-1974	LDV	3.0	--	39	--	3.4	none
pre-control levels	pre-1968	LDV	3.5	--	87	--	8.8	none
<b>TRUCKS</b>								
Tier 0 LDT1	1988-1993	LDT1	1.2	--	10	0.26	0.8	none
Tier 0 LDT2-3	1988-1993	LDT2-4	1.7	--	10	0.26	0.8	none
1987	1987	LDT	2.3	--	10	0.26	0.8	none
1984-1986	1984-1986	LDT	2.3	--	10	0.6	0.8	none
1982-1983	1982-1983	LDT	2.3	--	18	0.6	1.7	none
1981	1981	LDT	2.3	--	18	--	1.7	none
1979-1980	1979-1980	LDT	2.3	--	18	--	1.7	none
1978	1978	LDT	3.1	--	20	--	2	none
1975-1977	1975-1977	LDT	3.1	--	20	--	2	none
1973-1974	1973-1974	LDT	3	--	39	--	3.4	none
pre-control levels	pre-1968	LDT	3.6	--	39	--	6.5	none
note: The test procedures in the years between 1968 and 1972 were different enough from the current procedure that the standards are not comparable. The procedure changed again in 1975 to roughly its current form.								

<b>California and Northeast States Light-Duty Vehicle Emission Standards for Air Pollutants</b>								
<b>LEV II Program</b>								
Standard	Model Year	Vehicles	Emission Limits at Full Useful Life (100,000-120,000 miles)					Air Pollution Score
			Maximum Allowed Grams per Mile					
			NOx	NMOG	CO	PM	HCHO	
ZEV	2004+	LDV, LDT	0.00	0.000	0.0	0.0	0.0	10
PZEV*	2004+	LDV, LDT	0.02	0.010	1.0	0.01	0.004	9.5
SULEV II	2004+	LDV, LDT	0.02	0.010	1.0	0.01	0.004	9
ULEV II	2004+	LDV, LDT	0.07	0.055	2.1	0.01	0.011	7
LEV II	2004+	LDV, LDT	0.07	0.090	4.2	0.01	0.018	6
LEV II option 1	2004+	LDV, LDT	0.10	0.090	4.2	0.01	0.018	5
SULEV II	2004+	MDV4	0.10	0.100	3.2	0.06	0.008	4
ULEV II	2004+	MDV4	0.20	0.143	6.4	0.06	0.016	3
LEV II	2004+	MDV4	0.20	0.195	6.4	0.12	0.032	2
SULEV II	2004+	MDV5	0.20	0.117	3.7	0.06		3
ULEV II	2004+	MDV5	0.40	0.167	7.3	0.06		2
LEV II	2004+	MDV5	0.40	0.230	7.3	0.12		1

\*PZEVs have the same standards as SULEV II , but manufacturers must guarantee that the PZEVs meet the standards for a longer vehicle lifetime--15 years/150,000 miles--plus have a fully-sealed, zero-emissions fuel system.

<b>California and Northeast States Light-Duty Vehicle Emission Standards for Air Pollutants</b>								
<b>LEV I Program</b>								
Standard	Model Year	Vehicles	Emission Limits at Full Useful Life (100,000-120,000 miles)					Air Pollution Score
			Maximum Allowed Grams per Mile					
			NOx	NMOG	CO	PM	HCHO	
ULEV I diesel	2001-2006	LDV, LDT1	0.30	0.055	2.1	0.04	0.011	3
ULEV I	2001-2006	LDV, LDT1	0.30	0.055	2.1	n/a	0.011	3
SULEV I	2001-2006	MDV2	0.30	0.072	3.2	0.05	0.006	2
LEV I diesel	2001-2006	LDV, LDT1	0.30	0.090	4.2	0.08	0.018	2
LEV I	2001-2006	LDV, LDT1	0.30	0.090	4.2	n/a	0.018	2
ILEV		LDV, LDT1	0.30	0.090	4.2	0.08		2
ULEV I	2001-2006	MDV2	0.30	0.107	2.5	0.04	0.012	2
LEV I	2001-2006	LDV, LDT1	0.30	0.156/0.31	4.2	0.08		2
SULEV I	2001-2006	MDV3	0.45	0.084	3.7	0.06	0.008	2
ULEV I diesel	2001-2006	MDV2	0.50	0.070	2.8	0.05	0.013	2
ULEV I	2001-2006	MDV2	0.50	0.070	2.8	n/a	0.013	2
SULEV I	2001-2006	MDV4	0.50	0.100	4.1	0.06	0.010	2
ILEV		LDT2	0.50	0.130	5.5	0.08		1
LEV I diesel	2001-2006	LDT2	0.50	0.130	5.5	0.10	0.023	1
LEV I	2001-2006	LDT2	0.50	0.130	5.5	n/a	0.023	1
ULEV I	2001-2006	MDV2	0.60	0.143	6.4	0.05	0.013	1
TLEV I diesel	2001-2003	LDV, LDT1	0.60	0.156	4.2	0.08	0.018	1
TLEV I	2001-2003	LDV, LDT1	0.60	0.156	4.2	n/a	0.018	1
LEV I	2001-2006	MDV2	0.60	0.230	6.4	0.10	0.027	1
SULEV I	2001-2006	MDV5	0.70	0.130	5.2	0.06	0.013	1
ULEV I	2001-2006	MDV3	0.90	0.167	7.3	0.06	0.016	1
TLEV I diesel	2001-2006	LDT2	0.90	0.200	5.5	0.10	0.023	1
TLEV I	2001-2006	LDT2	0.90	0.200	5.5	n/a	0.023	1
LEV I	2001-2006	MDV3	0.90	0.280	7.3	0.12	0.032	0
ULEV I	2001-2006	MDV4	1.00	0.197	8.1	0.06	0.021	0
LEV I	2001-2006	MDV4	1.00	0.330	8.1	0.12	0.040	0
ULEV I	2001-2006	MDV5	1.50	0.197	10.3	0.06	0.026	0
LEV I	2001-2006	MDV5	1.50	0.430	10.3	0.12	0.052	0

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<b>Glossary</b>		
LDV	Light Duty Vehicle	Passenger Car
LDT	Light Duty Truck	Truck (pickup, minivan, van, SUV) up to 8500 pounds GVWR, divided into sizes based on weight
LDT1	Light Duty Truck 1	Truck up to 6000 pounds GVWR and 3750 pounds LVW
LDT2	Light Duty Truck 2	Truck up to 6000 pounds GVWR, and between 3751 and 5750 pounds LVW
LDT3	Light Duty Truck 3	Truck between 6001 and 8500 pounds GVWR, and between 3751 and 5750 pounds ALVW
LDT4	Light Duty Truck 4	Truck between 6001 and 8500 pounds GVWR, and over 5750 pounds ALVW
LLDT	Light Light Duty Truck	Truck up to 6000 pounds GVWR; includes LDT1 and LDT2
HLDT	Heavy Light Duty Truck	Truck between 6001 and 8500 pounds GVWR; includes LDT3 and LDT4
MDPV	Medium Duty Passenger Vehicle	Truck between 8501 and 10,000 lbs GVWR
MDV	Medium Duty Vehicle	For California standards, a vehicle between 6000 and 14,000 lbs GVWR, divided into sizes based on ALVW
MDV1	Medium Duty Vehicle 1	For California standards, an MDV up to 3750 pounds ALVW
MDV2	Medium Duty Vehicle 2	For California standards, an MDV between 3751 and 5750 pounds ALVW
MDV3	Medium Duty Vehicle 3	For California standards, an MDV between 5751 and 8500 pounds ALVW
MDV4	Medium Duty Vehicle 4	For California standards, an MDV between 8501 and 10,000 pounds ALVW
MDV5	Medium Duty Vehicle 5	For California standards, an MDV between 10,001 and 14,000 pounds ALVW
LVW	Loaded Vehicle Weight	Nominal empty vehicle weight + 300 lbs
ALVW	Adjusted Loaded Vehicle Weight	Average of the curb (empty) weight and the GVWR
GVRW	Gross Vehicle Weight Rating	Maximum fully loaded vehicle weight
Bin	Tier 2 Bin	A set of emission standards within the Tier 2 Program. Manufacturers must certify that each vehicle will not exceed the pollution limits for the selected bin. Manufacturers may choose from the range of bins, as long as all vehicles they sell each model year fall below a certain average emissions limit.
Tier 2	Tier 2 Program	Replaced the Tier 1 Program with even cleaner emission standards
Tier 1	Tier 1 Program	EPA's first program after the Clean Air Act of 1994, setting more stringent vehicle emission standards nationwide than had previously existed
LEV II	LEV II Program	Replaced the LEV I Program with even cleaner emission standards

<b>Glossary (continued)</b>		
LEV I	LEV I Program	California's first "Low Emission Vehicle" program, setting more stringent vehicle emission standards for California than had previously existed
LEV	Low Emission Vehicle	The average emissions standard within the LEV program
TLEV	Transitional Low Emission Vehicle	A temporary emissions standard bridging the gap between the looser Tier 1 and the more stringent LEV standards
ILEV	Inherently Low Emission Vehicle	An emissions standard for alternatively-fueled vehicles with closed and pressurized fuel systems
ULEV	Ultra Low Emission Vehicle	An emissions standard within the LEV program and tighter than the LEV standard
SULEV	Super Ultra Low Emissions Vehicle	An emissions standard that is tighter than the ULEV standard
PZEV	Partial Zero Emission Vehicle	An emission standard that is equivalent to the SULEV standard, with longer vehicle lifetime requirements--150,000 miles/15 years--and a fully sealed, zero-emissions fuel system
ZEV	Zero Emission Vehicle	The tightest emissions standard: zero emissions
NOx	Oxides of Nitrogen	Compounds containing nitrogen and oxygen; they combine with hydrocarbons in the sunlight to form smog
NMOG	Non-Methane Organic Compounds	Compounds containing carbon; they combine with NOx in the sunlight to form smog
NMHC	Non-Methane Hydrocarbons	A subset of NMOGs, containing only carbon and hydrogen; they combine with NOx to form smog
THC	Total Hydrocarbons	All hydrocarbons, including methane; they combine with NOx to form smog
PM	Particulate Matter	Tiny particles of solid matter that lodge in the lungs and deposit on buildings
HCHO	Formaldehyde	A lung irritant and carcinogen
CO	Carbon Monoxide	A colorless, odorless, poisonous gas