

**Appendix 11-2: Federal and Texas Programs Related to On-Road and
Non-Road Mobile Sources**

Mobile Source Control Programs Applicable to Texas (Current and Known Future)

Revised: October 10, 2007

Source Category	Control Measure Description	Implementation Began	Regulatory Authority	Affected Pollutants																																									
<i>On-Road Sources: Gasoline Vehicles</i>																																													
Passenger cars and Light-duty trucks	Vehicle emissions inspection/maintenance (I/M) testing program <ul style="list-style-type: none"> Requires regular inspection of vehicles 2–24 years old in affected counties. Vehicles must be inspected through Department of Public Safety–certified inspection stations for emissions of nitrogen oxide (NO_x), volatile organic compounds (VOC) and carbon monoxide (CO). See: http://www.tceq.state.tx.us/implementation/air/mobilesource/vim/overview.html	January 1, 1995	Texas Health and Safety Code, §382.037 30 TAC 114 Subchapter C	HC, CO																																									
Passenger cars, Light-duty trucks, and Heavy light-duty trucks	Federal Tier 0 emission standards for model year 1975 – 1993 <ul style="list-style-type: none"> Passenger cars (Light-duty vehicles): <6,000 lbs Gross Vehicle Weight Rating (GVWR) Light-Duty Trucks 1: 0 – 6,000lbs GVWR (0 – 3,750lbs Loaded Vehicle Weight) Light-Duty Trucks 2: 0 – 6,000lbs GVWR (0 – 5750lbs Loaded Vehicle Weight) Heavy Light-Duty Trucks 3: 6,000 – 8,500lbs GVWR (0-5750lbs Loaded Vehicle Weight) GVWR Heavy Light-Duty Trucks 4: 6,000 – 8,500lbs GVWR (>5750lbs Loaded Vehicle Weight) GVWR <table border="1"> <thead> <tr> <th rowspan="2">Vehicle Type</th> <th colspan="5">Tier 0 Emission standards–120,000 mile useful life (g/mile)</th> </tr> <tr> <th>THC</th> <th>NMHC</th> <th>CO</th> <th>NO_x</th> <th>PM*</th> </tr> </thead> <tbody> <tr> <td>LDV^(a)</td> <td>0.41</td> <td>0.34</td> <td>3.4</td> <td>1.0</td> <td>0.20</td> </tr> <tr> <td>LDT1</td> <td>0.80</td> <td>0.67</td> <td>10</td> <td>1.2</td> <td>0.26</td> </tr> <tr> <td>LDT2</td> <td>0.80</td> <td>0.67</td> <td>10</td> <td>1.7</td> <td>0.13</td> </tr> <tr> <td>LDT3</td> <td>0.80</td> <td>0.67</td> <td>10</td> <td>1.7</td> <td>0.26</td> </tr> <tr> <td>LDT4</td> <td>0.80</td> <td>0.67</td> <td>10</td> <td>1.7</td> <td>0.13</td> </tr> </tbody> </table> <p>a. 50,000 mile useful life *Only applies to diesel vehicles.</p> See: http://www.epa.gov/otaq/stds-ld.htm	Vehicle Type	Tier 0 Emission standards–120,000 mile useful life (g/mile)					THC	NMHC	CO	NO _x	PM*	LDV ^(a)	0.41	0.34	3.4	1.0	0.20	LDT1	0.80	0.67	10	1.2	0.26	LDT2	0.80	0.67	10	1.7	0.13	LDT3	0.80	0.67	10	1.7	0.26	LDT4	0.80	0.67	10	1.7	0.13	Phased in from 1975-1993	40 Code of Federal Regulations (CFR) Part 86.	HC, NMHC, CO, NO _x , PM,
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Passenger cars,	Federal Tier 1 emission standards for model year 1994 - 2004	Phased in from	40 CFR 86.708-94	HC,																																									

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<i>On-Road Sources: Gasoline Vehicles</i>									
Light-duty trucks, and Heavy light-duty trucks	<ul style="list-style-type: none"> • Passenger cars: <6,000 lbs Gross Vehicle Weight Rating (GVWR) • Light-Duty Trucks 1: 0 – 6,000lbs GVWR (0 – 3,750lbs Loaded Vehicle Weight) • Light-Duty Trucks 2: 0 – 6,000lbs GVWR (0 – 5750lbs Loaded Vehicle Weight) • Heavy Light-Duty Trucks 3: 6,000 – 8,500lbs GVWR (0-5750lbs Loaded Vehicle Weight) GVWR • Heavy Light-Duty Trucks 4: 6,000 – 8,500lbs GVWR (>5750lbs Loaded Vehicle Weight) GVWR 	1994-2004	40 CFR 86.708-98 40 CFR 86.709-94 40 CFR 86.709-99	NMHC, CO, NO _x , PM,					
	Tier 1 Emission standards–120,000 mile useful life (g/mile)								
	Vehicle Type				THC	NMHC	CO	NO _x	PM
	LDV				-	0.31	4.2	0.6	0.10
	LDT1				0.80	0.31	4.2	0.6	0.10
	LDT2				0.80	0.40	5.5	0.97	0.10
	LDT3				0.80	0.46	6.4	0.98	0.10
	LDT4				0.80	0.56	7.3	1.53	0.12
See: http://www.epa.gov/otaq/stds-ld.htm									

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Passenger cars, and Light light-duty trucks	National Low Emission Vehicle (NLEV) emission standards for model year 1999 - 2004 <ul style="list-style-type: none"> • Passenger cars: <6,000 lbs Gross Vehicle Weight Rating (GVWR) • Light-Duty Trucks 1: 0 – 6,000lbs GVWR (0 – 3,750lbs Loaded Vehicle Weight) • Light-Duty Trucks 2: 0 – 6,000lbs GVWR (0 – 5750lbs Loaded Vehicle Weight) 	Phased in from 1999-2004	40 CFR 86.1708-99 40 CFR 86.1709-99	HC, NMOG, CO, NO _x , PM, HCHO																																																																																																						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="text-align: center;">Vehicle Type</th> <th rowspan="2" style="text-align: center;">Emission Category</th> <th colspan="6" style="text-align: center;">NLEV Emission standards–100,000 mile useful life (g/mile)</th> </tr> <tr> <th style="text-align: center;">THC</th> <th style="text-align: center;">NMOG</th> <th style="text-align: center;">CO</th> <th style="text-align: center;">NO_x</th> <th style="text-align: center;">PM</th> <th style="text-align: center;">HCHO</th> </tr> </thead> <tbody> <tr> <td rowspan="4" style="text-align: center;">LDV</td> <td style="text-align: center;">TLEV</td> <td style="text-align: center;">-</td> <td style="text-align: center;">0.156</td> <td style="text-align: center;">4.2</td> <td style="text-align: center;">0.6</td> <td style="text-align: center;">0.08</td> <td style="text-align: center;">0.018</td> </tr> <tr> <td style="text-align: center;">LEV</td> <td style="text-align: center;">-</td> <td style="text-align: center;">0.090</td> <td style="text-align: center;">4.2</td> <td style="text-align: center;">0.3</td> <td style="text-align: center;">0.08</td> <td style="text-align: center;">0.018</td> </tr> <tr> <td style="text-align: center;">ULEV</td> <td style="text-align: center;">-</td> <td style="text-align: center;">0.055</td> <td style="text-align: center;">2.1</td> <td style="text-align: center;">0.3</td> <td style="text-align: center;">0.04</td> <td style="text-align: center;">0.011</td> </tr> <tr> <td style="text-align: center;">ZEV</td> <td style="text-align: center;">-</td> <td style="text-align: center;">0.000</td> <td style="text-align: center;">0.0</td> <td style="text-align: center;">0.0</td> <td style="text-align: center;">0.00</td> <td style="text-align: center;">0.000</td> </tr> <tr> <td rowspan="4" style="text-align: center;">LDT1</td> <td style="text-align: center;">TLEV</td> <td style="text-align: center;">0.80</td> <td style="text-align: center;">0.156</td> <td style="text-align: center;">4.2</td> <td style="text-align: center;">0.6</td> <td style="text-align: center;">0.08</td> <td style="text-align: center;">0.018</td> </tr> <tr> <td style="text-align: center;">LEV</td> <td style="text-align: center;">0.80</td> <td style="text-align: center;">0.090</td> <td style="text-align: center;">4.2</td> <td style="text-align: center;">0.3</td> <td style="text-align: center;">0.08</td> <td style="text-align: center;">0.018</td> </tr> <tr> <td style="text-align: center;">ULEV</td> <td style="text-align: center;">0.80</td> <td style="text-align: center;">0.055</td> <td style="text-align: center;">2.1</td> <td style="text-align: center;">0.3</td> <td style="text-align: center;">0.04</td> <td style="text-align: center;">0.011</td> </tr> <tr> <td style="text-align: center;">ZEV</td> <td style="text-align: center;">0.00</td> <td style="text-align: center;">0.000</td> <td style="text-align: center;">0.0</td> <td style="text-align: center;">0.0</td> <td style="text-align: center;">0.00</td> <td style="text-align: center;">0.000</td> </tr> <tr> <td rowspan="4" style="text-align: center;">LDT2</td> <td style="text-align: center;">TLEV</td> <td style="text-align: center;">0.80</td> <td style="text-align: center;">0.200</td> <td style="text-align: center;">5.5</td> <td style="text-align: center;">0.9</td> <td style="text-align: center;">0.10</td> <td style="text-align: center;">0.023</td> </tr> <tr> <td style="text-align: center;">LEV</td> <td style="text-align: center;">0.80</td> <td style="text-align: center;">0.130</td> <td style="text-align: center;">5.5</td> <td style="text-align: center;">0.5</td> <td style="text-align: center;">0.10</td> <td style="text-align: center;">0.023</td> </tr> <tr> <td style="text-align: center;">ULEV</td> <td style="text-align: center;">0.80</td> <td style="text-align: center;">0.070</td> <td style="text-align: center;">2.8</td> <td style="text-align: center;">0.5</td> <td style="text-align: center;">0.05</td> <td style="text-align: center;">0.013</td> </tr> <tr> <td style="text-align: center;">ZEV</td> <td style="text-align: center;">0.00</td> <td style="text-align: center;">0.000</td> <td style="text-align: center;">0.0</td> <td style="text-align: center;">0.0</td> <td style="text-align: center;">0.00</td> <td style="text-align: center;">0.000</td> </tr> </tbody> </table>				Vehicle Type	Emission Category	NLEV Emission standards–100,000 mile useful life (g/mile)						THC	NMOG	CO	NO _x	PM	HCHO	LDV	TLEV	-	0.156	4.2	0.6	0.08	0.018	LEV	-	0.090	4.2	0.3	0.08	0.018	ULEV	-	0.055	2.1	0.3	0.04	0.011	ZEV	-	0.000	0.0	0.0	0.00	0.000	LDT1	TLEV	0.80	0.156	4.2	0.6	0.08	0.018	LEV	0.80	0.090	4.2	0.3	0.08	0.018	ULEV	0.80	0.055	2.1	0.3	0.04	0.011	ZEV	0.00	0.000	0.0	0.0	0.00	0.000	LDT2	TLEV	0.80	0.200	5.5	0.9	0.10	0.023	LEV	0.80	0.130	5.5	0.5	0.10	0.023	ULEV	0.80	0.070	2.8	0.5	0.05	0.013	ZEV	0.00	0.000	0.0	0.0	0.00	0.000	
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<i>On-Road Sources: Gasoline Vehicles</i>											
Passenger cars, Light-duty trucks, Heavy light-duty trucks, and Medium-duty passenger vehicles.	Federal Tier 2 emission standards for model year 2004 and beyond <ul style="list-style-type: none"> • Passenger cars: <6,000 lbs Gross Vehicle Weight Rating (GVWR) • Light-Duty Trucks 1: 0 – 6,000lbs GVWR (0 – 3,750lbs Loaded Vehicle Weight) • Light-Duty Trucks 2: 0 – 6,000lbs GVWR (0 – 5750lbs Loaded Vehicle Weight) • Heavy Light-Duty Trucks 3: 6,000 – 8,500lbs GVWR (0-5750lbs Loaded Vehicle Weight) GVWR • Heavy Light-Duty Trucks 4: 6,000 – 8,500lbs GVWR (>5750lbs Loaded Vehicle Weight) GVWR • Medium Duty Passenger Vehicles: 8,500 –10,000lbs GVWR 	Phased-in from model year 2004-2007 (Passenger Cars, LDT 1&2) Phased-in from model year 2008-2009 (LDT3 & LDT4 and MDPV)	40 CFR 86.1811	NO _x , NMOG, CO, HCHO, PM							
	Tier 2 Emission standards–120,000 mile useful life (g/mile)										
	Vehicle Type				Vehicle Emission Category	NO _x	NMOG	CO	HCHO	PM from Diesel Vehicles	
	All PCs, LDTs, MDPVs				Bin 11	0.9	0.280	7.3	0.032	0.12	
					Bin 10	0.6	0.156/0.230*	4.2/6.4*	0.018/0.027*	0.08	
					Bin 9	0.3	0.090/0.180*	4.2	0.018	0.06	
					The temporary bins above expire in 2006 for LDV/LDTs and in 2008 for HLDTs.						
					Bin 8	0.20	0.125/0.156*	4.2	0.018	0.02	
					Bin 7	0.15	0.090	4.2	0.018	0.02	
					Bin 6	0.10	0.090	4.2	0.018	0.01	

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<i>On-Road Sources: Gasoline Vehicles</i>									
		Bin 5	0.07	0.090	4.2	0.018	0.01		
		Bin 4	0.04	0.070	2.1	0.011	0.01		
		Bin 3	0.03	0.055	2.1	0.011	0.01		
		Bin 2	0.02	0.010	2.1	0.004	0.01		
		Bin 1	0.0	0.000	0.000	0.000	0.00		
	* Higher NMOG, CO and HCHO values only apply for HLDTs and MDPVs.								
	See: http://www.epa.gov/otaq/stds-ld.htm								
Heavy-duty gasoline engines	Federal Heavy-duty gasoline engine standards (g/bhp-hr)						Phased in from 1988-2007	40 CFR 86.088-10 40 CFR 86.091-10 40 CFR 86.098-10 40 CFR 86.005-10	HC, CO, NO _x
	MY	8,500 –14,000lbs GVWR			>14,000lbs GVWR				
		CO	HC	NO _x	CO	HC	NO _x		
	1988-1990	14.4	1.1	10.6	37.1	1.9	10.6		
	1991-1997	14.4	1.1	5.0	37.1	1.9	5.0		
	1998-2004	14.4	1.1	4.0	37.1	1.9	4.0		
	2005-2007	14.4	NO _x +NMHC =1.0		37.1	NO _x +NMHC =1.0			
Heavy-duty gasoline engines	Federal Heavy-duty gasoline engine standards (>8,500 lbs GVWR)						Phased in from model year 2008 – 2009	40 CFR 86.008-10	NMHC, CO, NO _x , PM
	MY	CO	NMHC	NO _x	PM				
	2008+	14.4	0.14	0.2	0.01				
	These standards apply to all non passenger vehicles and those passenger vehicles that are not covered under the Tier II program. (66 FR 5002, Jan. 18, 2001)								
	See: http://www.epa.gov/otaq/hd-hwy.htm								
Motorcycles	Federal motorcycle standards (engine sizes >50cc)						Phased in from 1980-2010	40 CFR 86.410-80 40 CFR 86.410-90 40 CFR 86.410-2006	HC, CO, NO _x
	MY	Engine Class	Engine Size (cc)	Emission Standards (g/km)					
				HC	CO				
	1980-2005	all	>50	5.0	12.0				

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<i>On-Road Sources: Gasoline Vehicles</i>									
	2006+	I	0 to 169	1.0	12.0				
	2006+	II	170 to 279	1.0	12.0				
				HC+ NO _x	CO				
	2006-2009	III	280+	1.4	12.0				
	2010+	III	280+	0.8	12.0				
	See: http://www.epa.gov/otaq/roadbike.htm								
Gasoline fuel	Federal Tier II Low Sulfur Gasoline standards					Phased in from 2004	40 CFR 80.195	Sox, PM	
	Compliance as of January 1:		2004	2005	2006+				
	Refinery Average, ppm		-	30	30				
	Corporate Pool Average (ppm)		120	90	--				
	Per-Gallon Cap (ppm)		300	300	80				
	(65 FR 6698, February 10, 2000)								
Gasoline fuel	Federal Reformulated Gasoline standards (applicable to DFW & HGB ozone nonattainment area counties)					January 1, 1996	40 CFR 80.41	VOC, Toxics, NO _x	
	RFG Model		Reduction Percent Per Gallon Standard						
			VOC	Toxic	NO _x	Benzene % vol max			
	Phase I Complex (Jan. 1, 1998 - Dec. 31, 1999)		≥35.1	≥15.0	≥0.0	1.0			
	Phase II Complex (Jan. 1, 2000 +)		≥27.5	≥20.0	≥5.5	1.0			
	See: http://www.epa.gov/otaq/rfg.htm								
Gasoline fuel	Oxygenated Gasoline Program requires gasoline in El Paso County to contain at least 2.7 % oxygen by weight minimum from October 1 to March 31 each year.					October 1, 1992	30 TAC 114 Subchapter D	VOC	

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<i>On-Road Sources: Gasoline Vehicles</i>																											
Gasoline fuel	Federal gasoline volatility standards limiting summertime gasoline Reid vapor pressure (RVP) from May 1 to September 15 each year.	Phased in from 1991.	40 CFR 80.27 40 CFR 81.344	VOC																							
	<table border="1"> <thead> <tr> <th rowspan="2">Texas</th> <th colspan="5">RVP Maximum (psi)</th> </tr> <tr> <th>May</th> <th>Jun</th> <th>Jul</th> <th>Aug</th> <th>Sep</th> </tr> </thead> <tbody> <tr> <td>Volatility attainment areas</td> <td>9.0</td> <td>9.0</td> <td>9.0</td> <td>9.0</td> <td>9.0</td> </tr> <tr> <td>Volatility nonattainment areas*</td> <td>9.0</td> <td>7.8</td> <td>7.8</td> <td>7.8</td> <td>7.8</td> </tr> </tbody> </table>				Texas	RVP Maximum (psi)					May	Jun	Jul	Aug	Sep	Volatility attainment areas	9.0	9.0	9.0	9.0	9.0	Volatility nonattainment areas*	9.0	7.8	7.8	7.8	7.8
	Texas					RVP Maximum (psi)																					
					May	Jun	Jul	Aug	Sep																		
Volatility attainment areas	9.0	9.0	9.0	9.0	9.0																						
Volatility nonattainment areas*	9.0	7.8	7.8	7.8	7.8																						
*Hardin, Jefferson, and Orange Counties. See: http://www.epa.gov/otaq/volatility.htm																											
Gasoline fuel	El Paso low Reid vapor pressure (RVP) Program limits gasoline RVP to 7.0 psi maximum in El Paso County from May 1 to September 16 each year.	May 1, 1996	30 TAC 115 Subchapter C, Div. 5	VOC																							
Gasoline fuel	East Texas Low RVP Gasoline Program limits gasoline RVP to 7.8 psi maximum in 95 central and eastern Texas counties from May 1 to October 1 each year.	May 1, 2000	30 TAC 114 Subchapter H, Div. 1	VOC																							

Source Category	Control Measure Description	Implementation Began	Regulatory Authority	Affected Pollutants
<i>On-Road Sources: Diesel Vehicles</i>				
Diesel Fuel	Federal ultra-low sulfur diesel (ULSD) standards for diesel used to power on-highway motor vehicles limit sulfur content to 15 ppm maximum. Diesel must also have a cetane index of at least 40 or contain no more than 35% aromatic hydrocarbons. (66 FR 5002, Jan. 18, 2001) See: http://epa.gov/otaq/regs/fuels/diesel/diesel.htm	Phased in from June 1, 2006, thru October 15, 2006.	40 CFR 80.510	SO _x , PM, PM2.5
Diesel Fuel	Texas Low Emission Diesel Fuel (TxLED) Program limits diesel fuel aromatic hydrocarbon content to 10% by volume maximum and requires a cetane number of 48 minimum in all diesel sold or supplied for use in 110 central and eastern Texas Counties. The TxLED requirements also apply to marine diesel (DMX, DMA, MGO) in the eight county Houston/Galveston/Brazoria ozone nonattainment area. Alternative diesel formulations allowed for compliance. See: http://www.tceq.state.tx.us/implementation/air/sip/cleandiesel.html	Phase in completed on January 31, 2006. Marine diesel rules to be phased in October 1, 2007 to January	30 TAC 114 Subchapter H, Div. 2	NO _x

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<i>On-Road Sources: Diesel Vehicles</i>																																	
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Passenger cars, light-duty trucks, heavy light-duty trucks	Federal Tier 0 emission standards for model years 1975 – 1993. See notes under <i>Gasoline Vehicles</i> section.	Phased in from 1975-1993	40 CFR Part 86	HC, NMHC, CO, NO _x , PM,																													
Passenger cars, light-duty trucks, heavy light-duty trucks	Federal Tier 1 emission standards for model years 1994 – 2004 See notes under <i>Gasoline Vehicles</i> section.	Phased-in from model year 1994	40 CFR 86.708-94 40 CFR 86.708-98 40 CFR 86.709-94 40 CFR 86.709-99	HC,NO _x ,PM																													
Passenger cars, light-duty trucks, heavy light-duty trucks, medium - duty passenger vehicles	Federal Tier II emission standards (66 FR6698, February 10, 2000) See notes under <i>Gasoline Vehicles</i> section.	Phased-in from model year 2004-2007 (Passenger Cars, LDT 1&2) Phased-in from model year 2008-2009 (LDT3 & LDT4 and MDPV)	40 CFR 86.1811	NMOG,NO _x , PM																													
Heavy-Duty Diesel Engines	Federal emission standards for On-Highway Heavy-Duty Diesel Engines. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Model Year</th> <th colspan="4">On-Highway Heavy-Duty Diesel Engine Emission Standards (g/bhp-hr)</th> </tr> <tr> <th>CO</th> <th>HC</th> <th>NO_x</th> <th>PM</th> </tr> </thead> <tbody> <tr> <td>1984 -1987</td> <td>15.5</td> <td>1.3</td> <td>10.7</td> <td>0.60</td> </tr> <tr> <td>1988 - 1990</td> <td>15.5</td> <td>1.3</td> <td>6.0</td> <td>0.60</td> </tr> <tr> <td>1991 - 1993</td> <td>15.5</td> <td>1.3</td> <td>5.0</td> <td>0.25</td> </tr> <tr> <td>1994 - 1997</td> <td>15.5</td> <td>1.3</td> <td>5.0</td> <td>0.10</td> </tr> </tbody> </table>	Model Year	On-Highway Heavy-Duty Diesel Engine Emission Standards (g/bhp-hr)				CO	HC	NO _x	PM	1984 -1987	15.5	1.3	10.7	0.60	1988 - 1990	15.5	1.3	6.0	0.60	1991 - 1993	15.5	1.3	5.0	0.25	1994 - 1997	15.5	1.3	5.0	0.10	Phased in from 1984 to 2007	40 CFR 86.091-11 40 CFR 86.093-11 40 CFR 86.094-11 40 CFR 86.099-11 40 CFR 86.004-11 40 CFR 86.007-11	CO, HC, NO _x , PM
Model Year	On-Highway Heavy-Duty Diesel Engine Emission Standards (g/bhp-hr)																																
	CO	HC	NO _x	PM																													
1984 -1987	15.5	1.3	10.7	0.60																													
1988 - 1990	15.5	1.3	6.0	0.60																													
1991 - 1993	15.5	1.3	5.0	0.25																													
1994 - 1997	15.5	1.3	5.0	0.10																													

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Source Category	Control Measure Description					Implementation Began	Regulatory Authority	Affected Pollutants
<i>On-Road Sources: Diesel Vehicles</i>								
	1998 - 2003	15.5	1.3	4.0	0.10			
	Model Year	CO	NMHC	NO _x	PM			
	2004 - 2006*	15.5	NMHC+ NO _x = 2.4		0.10			
	2007+	15.5	0.14	0.2	0.01			
	See: http://www.epa.gov/otaq/hd-hwy.htm							
Heavy-Duty Diesel Engines	Federal In-use emissions standard – Not-To-Exceed (NTE) Standards – Upper limit standards for emissions tests conducted under in-use conditions. Consent Decree (CD) required most manufacturers to meet NTE standards by no later than October 1, 2002. Under the CD, the NTE standards are 1.25 x 2004 federal heavy duty diesel engine standard (65 FR 59896, Oct. 6, 2000). For 2007 model year NTE standards are 1.5 x applicable federal heavy duty diesel engine standard (66 FR 5002, Jan. 18, 2001).					Phased in from model year 2003	40 CFR 86.007–11	CO, HC, NO _x , PM

Source Category	Control Measure Description					Implementation Began	Regulatory Authority	Affected Pollutants
<i>Non-Road Sources: Gasoline Equipment</i>								
Lawn & Garden Equipment	Federal Emission Standards for New Non-Road Spark Ignition Engines <19 kW (25 HP) – <u>Handheld</u> small gasoline engines					Phased in from model year 1997	40 CFR 90.103	HC, NMHC, CO, NO _x
	Examples of equipment	Engine Class	Engine Size	Emission Standards (g/kW-hr)		Model Year Effective for HC+NO _x		
				CO	HC+NO _x			
	Household	III	<20cc	805g	238g	2002		

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Source Category	Control Measure Description					Implementation Began	Regulatory Authority	Affected Pollutants
<i>Non-Road Sources: Gasoline Equipment</i>								
	leaf blowers, chain saws	IV	>20<50cc	805g (Effective MY 2002)	196g 148g 99g 50g	2002 2003 2004 2005		
	Commercial chainsaws	V	<50cc	603g (Effective MY 2004)	143g 119g 96g 72g	2004 2005 2006 2007		
See: http://www.epa.gov/otaq/equip-ld.htm								
Lawn & Garden Equipment	Federal Emission Standards for New Non-Road Spark Ignition Engines <19 kW (25 HP) – <u>Non-Handheld</u> small gasoline engines					Phased in from model year 1997	40 CFR 90.103	HC, NMHC, CO, NO _x
	Examples of equipment	Engine Class	Engine Size	Emission Standards (g/kW-hr)		Model Year Effective for HC+NO _x		
	Walk-behind lawn mowers	IA	<66cc	610g	50.0g	2001		
		IB	>66<100cc	610g	40.0g	2001		
		I	100cc<225cc	610g	16.1g	2007		
	Lawn and garden tractors	II	>225cc	N/A	18.0g	2001		
		II	>225cc		16.6g	2002		
		II	>225cc		15.0g	2003		
		II	>225cc		13.6g	2004		
		II	>225cc	610g	12.1g	2005		
See: http://www.epa.gov/otaq/equip-ld.htm								

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Source Category	Control Measure Description	Implementation Began	Regulatory Authority	Affected Pollutants																																												
<i>Non-Road Sources: Gasoline Equipment</i>																																																
Commercial, Industrial (Large spark ignition engines)	TCEQ regulations under 30 TAC 114.420-429 require all new large nonroad spark-ignition (LSI) engines greater than 25 HP sold in Texas to be certified to meet the California emission standards specified under Title 13 California Code of Regulations (13 CCR) §2433(b), effective on November 18, 1999. These rules were adopted in April 2000 and further revised in December 2000. In November 2002, EPA adopted federal emission standards for MY2004 LSI engines that were equivalent to the 1999 California standards adopted by Texas. In addition, the 2002 Federal rules also established Tier 2 standards for MY2007 LSI engines that were more stringent than the California rules.	April 19, 2000	30 TAC 114.420-429	HC, NO _x , CO																																												
Commercial, Industrial (Large spark ignition engines)	<p>Federal Emission Standards for New Large Non-Road Spark-Ignition Engines >19 kW (25 HP)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Model Year</th> <th rowspan="2">Phase-in Stage</th> <th rowspan="2">Test Type</th> <th colspan="2">Emission Standard (g/kW-hr)</th> </tr> <tr> <th>HC+ NO_x</th> <th>CO</th> </tr> </thead> <tbody> <tr> <td>2004–2006</td> <td>Tier 1</td> <td>Steady state</td> <td>4.0</td> <td>50</td> </tr> <tr> <td>2007+</td> <td>Tier 2</td> <td>Transient & Steady state</td> <td>2.7</td> <td>4.4</td> </tr> <tr> <td>2007+</td> <td></td> <td>Field testing</td> <td>3.8</td> <td>6.5</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Model Year</th> <th rowspan="2">Phase-in Stage</th> <th rowspan="2">Test Type</th> <th colspan="2">Alternate Severe Duty Emission Standard (g/kW-hr)</th> </tr> <tr> <th>HC+ NO_x</th> <th>CO</th> </tr> </thead> <tbody> <tr> <td>2004–2006</td> <td>Tier 1</td> <td>Steady state</td> <td>4.0</td> <td>130.0</td> </tr> <tr> <td>2007+</td> <td>Tier 2</td> <td>Transient & Steady state</td> <td>2.7</td> <td>130.0</td> </tr> <tr> <td>2007+</td> <td></td> <td>Field testing</td> <td>3.8</td> <td>200.0</td> </tr> </tbody> </table> <p>Evaporative hydrocarbon emissions may not exceed 0.2 grams per gallon of fuel tank capacity.</p> <p>See: http://epa.gov/nonroad/</p>	Model Year	Phase-in Stage	Test Type	Emission Standard (g/kW-hr)		HC+ NO _x	CO	2004–2006	Tier 1	Steady state	4.0	50	2007+	Tier 2	Transient & Steady state	2.7	4.4	2007+		Field testing	3.8	6.5	Model Year	Phase-in Stage	Test Type	Alternate Severe Duty Emission Standard (g/kW-hr)		HC+ NO _x	CO	2004–2006	Tier 1	Steady state	4.0	130.0	2007+	Tier 2	Transient & Steady state	2.7	130.0	2007+		Field testing	3.8	200.0	Phased in from model year 2004 to 2007	40 CFR 1048.101 Fed. Rules are more stringent than TCEQ regulations cited under 30 TAC 114.420-429.	HC, NO _x , CO
Model Year	Phase-in Stage				Test Type	Emission Standard (g/kW-hr)																																										
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Source Category	Control Measure Description	Implementation Began	Regulatory Authority	Affected Pollutants				
<i>Non-Road Sources: Gasoline Equipment</i>								
Recreational Vehicles	Federal emission standards for snowmobiles, off-highway motorcycles, and all-terrain vehicles (ATV's) (67 FR 682242, November 8, 2002)		40 CFR 1051.103 40 CFR 1051.105 40 CFR 1051.107	HC, NO _x , CO				
	Snow mobiles							
	Phase	Model Year			Phase-in (%)	Emission Standards (g/k W-hr)		
						HC	HC+NO _x	CO
	Phase 1	2006			50	100	–	275
	Phase 1	2007–2009			100	100	–	275
	Phase 2	2010 and 2011			100	75	–	275
	Phase 3	2012+			100	75	*	200
	*See 40 CFR 1051.103(a)(2).							
	Off-highway Motorcycles							
Phase	Model Year	Phase-in (%)	Emission Standards (g/Km)					
			HC+NO _x	CO				
Phase 1	2006	50	2.0	25				
	2007–2009	100	2.0	25				
All Terrain Vehicles (ATV) and off-road utility vehicles								
Phase	Model Year	Phase-in (%)	Emission Standards (g/Km)					
			HC+NO _x	CO				
Phase 1	2006	50	1.5	35				
	2007–2009	100	1.5	35				
See: http://epa.gov/otaq/recveh.htm								
Recreational Vehicles	Federal evaporative emission standards limiting permeation emissions from fuel tanks and fuel hoses. This standard applies to all recreation vehicles and engines.	Phased in from model year 2008	40 CFR 1051.110	VOC				
	Model Year				Emission component	Permeation Standards (g/m ² /day)		
	2008+				Fuel Tank	1.5		
	Fuel hoses	15.0						

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Source Category	Control Measure Description	Implementation Began	Regulatory Authority	Affected Pollutants																																
<i>Non-Road Sources: Gasoline Equipment</i>																																				
	See: http://epa.gov/otaq/recveh.htm																																			
Recreational Marine	Federal emission standards for recreational marine spark-ignition (SI) outboard and personal watercraft engines <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="text-align: center;">Model year</th> <th colspan="2" style="text-align: center;">HC+ NO_x emission standards by model year (g/kW-hr)</th> </tr> <tr> <th style="text-align: center;">P < 4.3 kW</th> <th style="text-align: center;">P > 4.3 kW</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1998</td> <td style="text-align: center;">278.00</td> <td style="text-align: center;">$(0.917 \times (151 + 557/P0.9)) + 2.44$</td> </tr> <tr> <td style="text-align: center;">1999</td> <td style="text-align: center;">253.00</td> <td style="text-align: center;">$(0.833 \times (151 + 557/P0.9)) + 2.89$</td> </tr> <tr> <td style="text-align: center;">2000</td> <td style="text-align: center;">228.00</td> <td style="text-align: center;">$(0.750 \times (151 + 557/P0.9)) + 3.33$</td> </tr> <tr> <td style="text-align: center;">2001</td> <td style="text-align: center;">204.00</td> <td style="text-align: center;">$(0.667 \times (151 + 557/P0.9)) + 3.78$</td> </tr> <tr> <td style="text-align: center;">2002</td> <td style="text-align: center;">179.00</td> <td style="text-align: center;">$(0.583 \times (151 + 557/P0.9)) + 4.22$</td> </tr> <tr> <td style="text-align: center;">2003</td> <td style="text-align: center;">155.00</td> <td style="text-align: center;">$(0.500 \times (151 + 557/P0.9)) + 4.67$</td> </tr> <tr> <td style="text-align: center;">2004</td> <td style="text-align: center;">130.00</td> <td style="text-align: center;">$(0.417 \times (151 + 557/P0.9)) + 5.11$</td> </tr> <tr> <td style="text-align: center;">2005</td> <td style="text-align: center;">105.00</td> <td style="text-align: center;">$(0.333 \times (151 + 557/P0.9)) + 5.56$</td> </tr> <tr> <td style="text-align: center;">2006 and later</td> <td style="text-align: center;">81.00</td> <td style="text-align: center;">$(0.250 \times (151 + 557/P0.9)) + 6.00$</td> </tr> </tbody> </table> See: http://epa.gov/otaq/marinesi.htm	Model year	HC+ NO _x emission standards by model year (g/kW-hr)		P < 4.3 kW	P > 4.3 kW	1998	278.00	$(0.917 \times (151 + 557/P0.9)) + 2.44$	1999	253.00	$(0.833 \times (151 + 557/P0.9)) + 2.89$	2000	228.00	$(0.750 \times (151 + 557/P0.9)) + 3.33$	2001	204.00	$(0.667 \times (151 + 557/P0.9)) + 3.78$	2002	179.00	$(0.583 \times (151 + 557/P0.9)) + 4.22$	2003	155.00	$(0.500 \times (151 + 557/P0.9)) + 4.67$	2004	130.00	$(0.417 \times (151 + 557/P0.9)) + 5.11$	2005	105.00	$(0.333 \times (151 + 557/P0.9)) + 5.56$	2006 and later	81.00	$(0.250 \times (151 + 557/P0.9)) + 6.00$	Phased in from model year 1998	40 CFR 91.104	HC, NO _x
Model year	HC+ NO _x emission standards by model year (g/kW-hr)																																			
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Source Category	Control Measure Description	Implementation Began	Regulatory Authority	Affected Pollutants
<i>Non-Road Sources: Diesel Equipment</i>				
Diesel fuel	Federal standards for nonroad, locomotive and marine (NRLM) diesel fuels <ul style="list-style-type: none"> • 500 ppm effective June 2007 for NRLM diesel fuels • 15 ppm effective June 2010 for NR diesel fuel • 15 ppm effective June 2012 for LM diesel fuels 	Phased in from 2007 - 2012	40 CFR 80.500 40 CFR 80.510	
Diesel Fuel	Texas Low Emission Diesel Fuel (TxLED) Program. See notes under <i>On-Road Sources: Diesel Vehicles</i> section. See: http://www.tceq.state.tx.us/implementation/air/sip/cleandiesel.html	Phase in completed on January 31, 2006. Marine diesel rules to be phased in October 1,	30 TAC 114 Subchapter H, Div. 2	NO _x

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Source Category	Control Measure Description	Implementation Began	Regulatory Authority	Affected Pollutants							
<i>Non-Road Sources: Diesel Equipment</i>											
		2007 to January 1, 2008.									
Construction, Industrial, Agricultural, Airport Ground Support, Light Commercial Equipment	Federal Tier 1–Tier 3 Non-Road Engine Emission Standards				Phased in from model year 1996 - 2008	40 CFR 89.112	HC, CO, NO _x , PM				
	Federal Tier 1-3 Non-road Diesel Engine Emission Standards, g/kW-hr (g/bhp·hr)										
	Engine Power	Tier	Year	CO				HC	NMHC+ NO _x	NO _x	PM
	kW < 8 (hp < 11)	Tier 1	2000	8.0 (6.0)				-	10.5 (7.8)	-	1.0 (0.75)
		Tier 2	2005	8.0 (6.0)				-	7.5 (5.6)	-	0.8 (0.6)
	8 ≤ kW < 19 (11 ≤ hp < 25)	Tier 1	2000	6.6 (4.9)				-	9.5 (7.1)	-	0.8 (0.6)
		Tier 2	2005	6.6 (4.9)				-	7.5 (5.6)	-	0.8 (0.6)
	19 ≤ kW < 37 (25 ≤ hp < 50)	Tier 1	1999	5.5 (4.1)				-	9.5 (7.1)	-	0.8 (0.6)
		Tier 2	2004	5.5 (4.1)				-	7.5 (5.6)	-	0.6 (0.45)
	37 ≤ kW < 75 (50 ≤ hp < 100)	Tier 1	1998	-				-	-	9.2 (6.9)	-
		Tier 2	2004	5.0 (3.7)				-	7.5 (5.6)	-	0.4 (0.3)
		Tier 3	2008	5.0 (3.7)				-	4.7 (3.5)	-	
	75 ≤ kW < 130 (100 ≤ hp < 175)	Tier 1	1997	-				-	-	9.2 (6.9)	-
		Tier 2	2000	5.0 (3.7)				-	6.6 (4.9)	-	0.3

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Source Category	Control Measure Description							Implementation Began	Regulatory Authority	Affected Pollutants
<i>Non-Road Sources: Diesel Equipment</i>										
		2	3							
		Tier 3	2007	5.0 (3.7)	-	4.0 (3.0)	-		(0.22)	
130 ≤ kW < 225 (175 ≤ hp < 300)		Tier 1	1996	11.4 (8.5)	1.3 (1.0)	-	9.2 (6.9)		0.54 (0.4)	
		Tier 2	2003	3.5 (2.6)	-	6.6 (4.9)	-		0.2 (0.15)	
		Tier 3	2006	3.5 (2.6)	-	4.0 (3.0)	-			
225 ≤ kW < 450 (300 ≤ hp < 600)		Tier 1	1996	11.4 (8.5)	1.3 (1.0)	-	9.2 (6.9)		0.54 (0.4)	
		Tier 2	2001	3.5 (2.6)	-	6.4 (4.8)	-		0.2 (0.15)	
		Tier 3	2006	3.5 (2.6)	-	4.0 (3.0)	-			
450 ≤ kW < 560 (600 ≤ hp < 750)		Tier 1	1996	11.4 (8.5)	1.3 (1.0)	-	9.2 (6.9)		0.54 (0.4)	
		Tier 2	2002	3.5 (2.6)	-	6.4 (4.8)	-		0.2 (0.15)	
		Tier 3	2006	3.5 (2.6)	-	4.0 (3.0)	-			
kW ≥ 560 (hp ≥ 750)		Tier 1	2000	11.4 (8.5)	1.3 (1.0)	-	9.2 (6.9)		0.54 (0.4)	
		Tier 2	2006	3.5 (2.6)	-	6.4 (4.8)	-		0.2 (0.15)	
See: http://www.epa.gov/nonroad-diesel/regulations.htm										

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<i>Non-Road Sources: Diesel Equipment</i>										
Construction, Industrial, Agricultural, Airport Ground Support, Light Commercial Equipment	Federal Tier 4 Non-Road Engine Emission Standards (38958 <i>Federal Register</i> / Vol. 69, No. 124 / Tuesday, June 29, 2004)		Phased in from model year 2008 - 2015	40 CFR 1039.101 40 CFR 1039.102	NMHC, CO, PM, NO _x					
	Federal Tier 4 Non-road Diesel Engine Emission Standards [2008-2014] —Engines Up To 560 kW, g/kW-hr (g/bhp-hr)									
	Engine Power	Year				CO	NMHC	NMHC+ NO _x	NO _x	PM
	kW < 8 (hp < 11)	2008				8.0 (6.0)	-	7.5 (5.6)	-	0.4 ^a (0.3)
	8 ≤ kW < 19 (11 ≤ hp < 25)	2008				6.6 (4.9)	-	7.5 (5.6)	-	0.4 (0.3)
	19 ≤ kW < 37 (25 ≤ hp < 50)	2008				5.5 (4.1)	-	7.5 (5.6)	-	0.3 (0.22)
		2013				5.5 (4.1)	-	4.7 (3.5)	-	0.03 (0.022)
	37 ≤ kW < 56 (50 ≤ hp < 75)	2008				5.0 (3.7)	-	4.7 (3.5)	-	0.3 ^b (0.22)
		2013				5.0 (3.7)	-	4.7 (3.5)	-	0.03 (0.022)
	56 ≤ kW < 130 (75 ≤ hp < 175)	2012-2014 ^c				5.0 (3.7)	0.19 (0.14)	-	0.40 (0.30)	0.02 (0.015)
	130 ≤ kW ≤ 560 (175 ≤ hp ≤ 750)	2011-2014 ^d				3.5 (2.6)	0.19 (0.14)	-	0.40 (0.30)	0.02 (0.015)
	a - hand-startable, air-cooled, DI engines may be certified to Tier 2 standards through 2009 and to an optional PM standard of 0.6 g/kW-hr starting in 2010 b - 0.4 g/kW-hr (Tier 2) if manufacturer complies with the 0.03 g/kW-hr standard from 2012 c - PM/CO: full compliance from 2012; NO _x /HC: Option 1 (if banked Tier 2 credits used)—50% engines must comply in 2012-2013; Option 2 (if no Tier 2 credits claimed)—									

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<i>Non-Road Sources: Diesel Equipment</i>																																																				
	25% engines must comply in 2012-2014, with full compliance from 2014.12.31 d - PM/CO: full compliance from 2011; NO _x /HC: 50% engines must comply in 2011-2013																																																			
	Federal Tier 4 Non-road Diesel Engine Emission Standards [2011-2014] —Engines Above 560 kW, g/kW-hr (g/bhp-hr)																																																			
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(Standards are based on displacement in liters per cylinder) (Less than 50 hp marine engines are regulated under the Tier 2 and Tier 3 federal off-road engine standards.)</p> <table border="1"> <thead> <tr> <th colspan="6">Marine Diesel Tier 2 Exhaust Emission Standards (g/kW-hr)</th> </tr> <tr> <th>Engine Displacement in liters/cylinder (D) & rated power (kW)</th> <th>Category</th> <th>Model Year</th> <th>THC+NO_x</th> <th>CO</th> <th>PM</th> </tr> </thead> <tbody> <tr> <td rowspan="2">D <0.9 & power ≥37 kW</td> <td>Category 1, Commercial</td> <td>2005</td> <td>7.5</td> <td>5.0</td> <td data-bbox="1308 703 1381 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	D ≥30.0 all power levels	Category 3	EPA has not finalized Tier 2 standards for Category 3 engines.			
See: http://www.epa.gov/otaq/marine.htm						