California Environmental Protection Agency AIR RESOURCES BOARD	CATERPILLAR INC.	EXECUTIVE ORDER U-R-001-0357 New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 of the Health and Safety Code; and

Pursuant to the December 15, 1998 Settlement Agreement between the Air Resources Board and the manufacturer, and any modifications thereof to the Settlement Agreement;

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-02-003;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engine and emission control system produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2009	9CPXL27.0ESK	27.0	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Direct Diesel Injection, Turbocharger, Charge Air Cooler and Engine Control Module	Loader, Tractor and Industrial Equipment

The engine models and codes are attached.

The following are the exhaust certification standards (STD) and certification levels (CERT) for hydrocarbon (HC), oxides of nitrogen (NOx), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kw-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			HC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
450 ≤ KW ≤ 560	Tier 3	STD	N/A	N/A	4.0	3.5	0.20	20	15	50
		CERT	--	--	3.7	2.8	0.16	14	3	22

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 15 day of January 2009.

Annette Hebert, Chief
Mobile Source Operations Division

ATTACHMENT 1 OF 1

Engine Model Summary Template

U-R-001-0357

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
9CPXL27.0ESK	Cert Test 2	C27	740@1800	222	269.1	2585@1300	276	241.5	EM, DI, TC, ECM
9CPXL27.0ESK	1 Cert Engine	C27	730@1800	214	259.5	2548@1300	273	238.5	EM, DI, TC,
9CPXL27.0ESK	2	C27	740@1800	214	259	2585@1300	264	231.2	EM, DI, TC,
9CPXL27.0ESK	3	C27	697@2000	183	246.3	2117@1300	222	194.6	EM, DI, TC,
9CPXL27.0ESK	4	C27	719@2000	188	253.2	2195@1300	229	200.7	EM, DI, TC,
9CPXL27.0ESK	5	C27	728@1800	211	255.7	2467@1200	254	205.4	EM, DI, TC,
9CPXL27.0ESK	6	C27	687@2000	182	245.5	2282@1200	236	190.3	EM, DI, TC,
9CPXL27.0ESK	7	C27	646@1800	187	226.1	2207@1200	238	192.5	EM, DI, TC,
9CPXL27.0ESK	8	C27	646@1800	188	228	2207@1200	238	192.5	EM, DI, TC,
9CPXL27.0ESK	10	C27	646@1800	185	224	2207@1200	232	187	EM, DI, TC,
9CPXL27.0ESK	11	C27	646@1800	185	224	2207@1200	232	187	EM, DI, TC,

Engine Model Summary Template

Engine Family	1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
9CPXL27.0ESK	Cert Test 2	C27	740@1800	222	269.1	2585@1300	276	241.5	EM, DI, TC,
9CPXL27.0ESK	1 Cert Engine	C27	730@1800	214	259.5	2548@1300	273	238.5	EM, DI, TC,
9CPXL27.0ESK	2	C27	740@1800	214	259	2585@1300	264	231.2	EM, DI, TC,
9CPXL27.0ESK	3	C27	697@2000	183	246.3	2117@1300	222	194.6	EM, DI, TC,
9CPXL27.0ESK	4	C27	719@2000	188	253.2	2195@1300	229	200.7	EM, DI, TC,
9CPXL27.0ESK	5	C27	728@1800	211	255.7	2467@1200	254	205.4	EM, DI, TC,
9CPXL27.0ESK	6	C27	687@2000	182	245.5	2282@1200	236	190.3	EM, DI, TC,
9CPXL27.0ESK	7	C27	646@1800	187	226.1	2207@1200	238	192.5	EM, DI, TC,
9CPXL27.0ESK	8	C27	646@1800	188	228	2207@1200	238	192.5	EM, DI, TC,
9CPXL27.0ESK	10	C27	646@1800	185	224	2207@1200	232	187	EM, DI, TC,
9CPXL27.0ESK	11	C27	646@1800	185	224	2207@1200	232	187	EM, DI, TC,
9CPXL27.0ESK	12	C27	646@1800	185	224	2207@1200	232	187	EM, DI, TC,
9CPXL27.0ESK	13	C27	597@1800	185	224	2054@1200	216	174	EM, DI, TC,