California Environmental Protection Agency AIR RESOURCES BOARD	CATERPILLAR INC.	EXECUTIVE ORDER A-013-0189-1 New On-Road Heavy-Duty Engines

Pursuant to the authority vested in the Air Resources Board by Health and Safety Code Division 26, Part 5, Chapter 2; and pursuant to the authority vested in the undersigned by Health and Safety Code Sections 39515 and 39516 and Executive Order G-02-003;

IT IS ORDERED AND RESOLVED: The engine and emission control systems produced by the manufacturer are certified as described below for use in on-road motor vehicles with a manufacturer's GVWR over 14,000 pounds. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	ENGINE SIZES (L)	FUEL TYPE [1]	STANDARDS & TEST PROCEDURE	INTENDED SERVICE CLASS [2]	ECS & SPECIAL FEATURES [3]
2007	7CPXH0928E1K	15.1	Diesel	Diesel	HHDD	DDI, TC(2), CAC, ECM, EGR, PTOX

ENGINE (L)	ENGINE MODELS / CODES (rated power, in hp)
15.1	See Attachments for running changes adding new engine ratings; covering ratings from RC#1 through RC#9.
*	*
*	*
*	*

* =not applicable; **GVWR**=gross vehicle weight rating; **13 CCR xyz**=Title 13, California Code of Regulations, Section xyz; **40 CFR 86.abc**=Title 40, Code of Federal Regulations, Section 86.abc; **L**=liter; hp=horsepower; **kw**=kilowatt;
[1] **CNG/LNG**=compressed/liquefied natural gas; **LPG**=liquefied petroleum gas; **E85**=85% ethanol fuel; **MF**=multi fuel a.k.a. **BF**=bi fuel; **DF**=dual fuel; **FF**=flexible fuel;
[2] **L/M/H HDD**=light/medium/heavy heavy-duty diesel; **UB**=urban bus; **HDO**=heavy duty Otto;
[3] **ECS**=emission control system; **TWC/OC**=three-way/oxidizing catalyst; **WU (prefix)** =warm-up catalyst; **DPF**=diesel particulate filter; **PTOX**=Periodic Trap Oxidizer; **HO2S/O2S**=heated/oxygen sensor; **HAFS/AFS**=heated/air-fuel-ratio sensor (a.k.a., universal or linear oxygen sensor); **TBI**=throttle body fuel injection; **SFI/MFI**=sequential/multi port fuel injection; **DGI**=direct gasoline injection; **GCARB**=gaseous carburetor; **IDI/DDI**=indirect/direct diesel injection; **TC/SC**=turbo/super charger; **CAC**=charge air cooler; **EGR**=exhaust gas recirculation; **PAIR/AIR**=pulsed/secondary air injection; **SPL**=smoke puff limiter; **ECM/PCM**=engine/powertrain control module; **EM**=engine modification; **2 (prefix)**=parallel; **(2) (suffix)**=in series (2007Jan06)

Following are: 1) the FTP exhaust emission standards, or family emission limit(s) as applicable, under 13 CCR 1956.1 (urban bus) or 13 CCR 1956.8 (other than urban bus); 2) the EURO and NTE limits under the applicable California exhaust emission standards and test procedures for heavy-duty diesel engines and vehicles (Test Procedures); and 3) the corresponding certification levels, in g/bhp-hr, for this engine family. "Diesel" CO, EURO and NTE certification compliance may have been demonstrated by the manufacturer as provided under the applicable Test Procedures in lieu of testing. (For flexible- and dual-fueled engines, the CERT values in brackets [ ] are those when tested on conventional test fuel. For multi-fueled engines, the STD and CERT values for default operation permitted in 13 CCR 1956.1 or 13 CCR 1956.8 are in parentheses.)[4]

	NMHC		NOx		NMHC+NOx		CO		PM		HCHO	
	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO
STD	0.14	0.14	*	*	*	*	15.5	15.5	0.01	0.01	*	*
FEL	*	*	1.16	1.16	1.3	1.3	*	*	*	*	*	*
CERT	0.02	0.03	0.8	0.7	0.9	0.8	1.7	0.1	0.01	0.01	*	*
NTE	0.21		1.74		2.0		19.4		0.02		*	

[4] **g/bhp-hr**=grams per brake horsepower-hour; **FTP**=Federal Test Procedure; **EURO**=Euro III European Steady-State Cycle; **NTE**=Not-to-Exceed; **STD**=standard or emission test cap; **FEL**=family emission limit; **CERT**=certification level; **NMHC/HC**=non-methane/hydrocarbon; **NOx**=oxides of nitrogen; **CO**=carbon monoxide; **PM**=particulate matter; **HCHO**=formaldehyde;

BE IT FURTHER RESOLVED: Certification to the FEL(s) listed above, as applicable, is subject to the following terms, limitations and conditions. The FEL(s) is the emission level declared by the manufacturer and serves in lieu of an emission standard for certification purposes in any averaging, banking, or trading (ABT) programs. It will be used for determining compliance of any engine in this family and compliance with such ABT programs.

BE IT FURTHER RESOLVED: The listed engine models have been certified to the split engine family standards under 13 CCR 1956.8(b) [Diesel engines] or 13 CCR 1956.8(d) [Otto engines] and the incorporated 40 CFR 86.007-15(m)(9).

BE IT FURTHER RESOLVED: For the listed engine models the manufacturer has submitted the materials to demonstrate certification compliance with 13 CCR 1965 (emission control labels) and 13 CCR 2035 et seq. (emission control warranty).

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

The Bureau of Automotive Repair will be notified by copy of this Executive Order.

This Executive Order hereby supersedes Executive Order A-013-0189, dated January 16, 2007.

Executed at El Monte, California on this 22 day of October 2007.

Annette Hebert

Annette Hebert, Chief
Mobile Source Operations Division

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
7CPXH0928E1K	1	C15	550@1800	330	199.6	1850@1200	343	138.5	DDI ~~EM, DI, TC~~
7CPXH0928E1K	2	C15	550@1800	330	198.7	1850@1200	353	138.3	TC(2) EM, DI, TC
7CPXH0928E1K	3	C15	490@1800	296	179.4	1850@1200	344	139.0	CAC EM, DI, TC
7CPXH0928E1K	4	C15	490@1800	307	185.7	1850@1200	352	142.1	ECM EM, DI, TC
7CPXH0928E1K	5	C15	490@1800	298	180.2	1650@1200	306	123.6	EGR EM, DI, TC
7CPXH0928E1K	6	C15	490@1800	309	187.0	1650@1200	312	126.1	EM EM, DI, TC
7CPXH0928E1K	7	C15	490@1800	296	179.4	1850@1200	344	139.0	PTOX EM, DI, TC
7CPXH0928E1K	8	C15	490@1800	307	185.7	1850@1200	352	142.1	EM, DI, TC
7CPXH0928E1K	9	C15	490@1800	309	187.0	1650@1200	312	126.1	EM, DI, TC
7CPXH0928E1K	10	C15	490@1800	296	179.4	1850@1200	344	139.0	EM, DI, TC
7CPXH0928E1K	11	C15	490@1800	309	187.0	1650@1200	312	126.1	EM, DI, TC

ATTACHMENT

A-013-0189-1

R/C #1

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
7CPXH0928E1K	12	C15	450@1800	275	166.4	1650@1200	312	125.9	EM, DI, TC
7CPXH0928E1K	13	C15	450@1800	288	174.2	1650@1200	309	124.6	EGR, EM, DI, TC
7CPXH0928E1K	14	C15	450@1800	291	175.9	1550@1200	293	118.1	DDI EM, DI, TC
7CPXH0928E1K	15	C15	450@1800	277	167.5	1750@1200	337	136.1	TC(2) EM, DI, TC
7CPXH0928E1K	16	C15	450@1800	291	175.9	1550@1200	293	118.1	CAC EM, DI, TC
7CPXH0928E1K	17	C15	450@1800	277	167.5	1750@1200	337	136.1	ECM EM, DI, TC
7CPXH0928E1K	18	C15	450@1800	290	175.8	1750@1200	333	134.5	PTOX EM, DI, TC
7CPXH0928E1K	19	C15	450@1800	291	175.9	1550@1200	293	118.1	EM EM, DI, TC
7CPXH0928E1K	20	C15	450@1800	274	165.6	1550@1200	291	117.4	EM, DI, TC
7CPXH0928E1K	21	C15	450@1800	291	175.9	1550@1200	293	118.1	EM, DI, TC
7CPXH0928E1K	22	C15	450@1800	275	166.4	1650@1200	312	125.9	EM, DI, TC
7CPXH0928E1K	23	C15	450@1800	288	174.2	1650@1200	309	124.6	EM, DI, TC
7CPXH0928E1K	24	C15	490@1800	295	178.4	1850@1200	328	132.3	EM, DI, TC
7CPXH0928E1K	25	C15	490@1800	307	185.7	1750@1200	331	133.5	EM, DI, TC
7CPXH0928E1K	26	C15	490@1800	309	187.0	1650@1200	312	126.1	EM, DI, TC
7CPXH0928E1K	27	C15	515@1800	312	188.9	1850@1200	336	143.5	EM, DI, TC
7CPXH0928E1K	28	C15	515@1800	316	191.5	1850@1200	352	142.1	EM, DI, TC

ATTACHMENT

RC # 2

A-013-0189-1

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
7CPXH0928E1K	29	C15	450@1800	274	165.6	1550@1200	291	117.4	~~EM, DI, TC~~
7CPXH0928E1K	30	C15	450@1800	291	175.9	1550@1200	293	118.1	~~EM, DI, TC~~
7CPXH0928E1K	31	C15	515@1800	313	189.7	1650@1200	319	128.8	~~EM, DI, TC~~

DDI, TC(2), ECM, CAC, EGR, PTOX, EM

ATTACHMENT

RC # 3

A-013-0189-1

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
7CPXH0928E1K	32	C15	625@1800	377	228.3	2050@1200	395	159.3	~~EM, DI, TC~~
7CPXH0928E1K	33	C15	625@1800	377	228.3	2050@1200	395	159.3	~~EM, DI, TC~~
7CPXH0928E1K	34	C15	600@1800	354	214.4	1850@1200	350	141.3	~~EM, DI, TC~~
7CPXH0928E1K	35	C15	600@1800	354	214.4	1850@1200	350	141.3	~~EM, DI, TC~~

DDI, TC(2), CAC, ECM, EGR, PTOX, EM

ATTACHMENT

A-013-0189-1

RC #4

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
7CPXH0928E1K	36	C15	600@1800	361	218.5	2050@1200	395	159.3	~~EM, DI, TC~~
7CPXH0928E1K	37	C15	600@1800	361	218.5	2050@1200	395	159.3	EM, DI, TC

DDI, TC(2), CAC, EM, ECM, EGR, PTOX

ATTACHMENT

RC #5

A-013-0189-1

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
7CPXH0928E1K	38	C15	600@1800	366	221.4	1850@1200	358	144.4	DDI EM, DI, TC
7CPXH0928E1K	39	C15	600@1800	366	221.4	1850@1200	358	144.4	TC(2) EM, DI, TC
7CPXH0928E1K	40	C15	600@1800	361	218.5	2050@1200	395	159.3	CAC EM, DI, TC
7CPXH0928E1K	41	C15	600@1800	361	218.5	2050@1200	395	159.3	ECM EM, DI, TC
7CPXH0928E1K	42	C15	625@1800	377	228.3	2050@1200	395	159.3	EGR EM, DI, TC
7CPXH0928E1K	43	C15	625@1800	377	228.3	2050@1200	395	159.3	PTOX EM, DI, TC

GEM

ATTACHMENT

A013-0189-1

RC # 6

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
7CPXH0928E1K	44	C15	625@1800	386	233.7	1900@1200	374	150.8	~~EM, DI, TC~~
7CPXH0928E1K	45	C15	625@1800	386	233.7	1900@1200	374	150.8	~~EM, DI, TC~~

DDI, TC(2), CAC, EGM, EGR, PTOX, EM

ATTACHMENT

RC # 7

A-013-0189-1

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
7CPXH0928E1K	46	C15	515@1800	313	189.4	1650@1200	308	124.5	DDI EM, DI, TC
7CPXH0928E1K	47	C15	515@1800	317	192.1	1650@1200	312	125.9	~~EGM~~ EM, DI, TC
7CPXH0928E1K	48	C15	490@1800	303	183.2	1650@1200	332	134.1	TC(2) EM, DI, TC
7CPXH0928E1K	49	C15	490@1800	301	183.2	1850@1200	374	150.9	CAC EM, DI, TC
7CPXH0928E1K	50	C15	550@1800	330	199.6	1850@1200	372	150.0	EGR EM, DI, TC
									PTOX
									EGR

RC #8

ATTACHMENT

A-013-0189-1

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
7CPXH0928E1K	51	C15	600@1800	371	224.5	1850@1200	359	145.0	~~EM, DI, TC~~
7CPXH0928E1K	52	C15	600@1800	371	224.5	1850@1200	359	145.0	~~EM, DI, TC~~

DDI, TC(2), CAC
ECM, EGR, PTOX
EM

ATTACHMENT

A-013-0189-1

RC #9