State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-1-87

Relating to Certification of New Heavy-Duty Off-Road Equipment Engines

CATERPILLAR, INC.

Pursuant to the authority vested in the Air Resources Board by Sections 43000.5, 43013 and 43018 of the Health and Safety Code; and,

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-45-9;

IT IS ORDERED AND RESOLVED: That the following Caterpillar, Inc. 1999 model-year engine, with rated power between 175 and 750 horsepower, and exhaust emission control systems are certified as described below for use in heavy-duty off-road equipment:

Typical Equipment Usage: Loader, Generator and Industrial Equipment

Fuel Type: Diesel

Engine Family	Liters	(Cubic Inches)	Exhaust Emission Control Systems and Special Features
XCPXL10.5MRG	10.5	(644)	Turbocharger Smoke Puff Limiter Charge Air Cooler

Engine models and codes are listed on attachments. Production engines shall be in all material respects the same as those for which certification is granted.

The total hydrocarbons (THC), carbon monoxide (CO), nitrogen oxides (NOx), and particulate matter (PM) certification exhaust emission standards, in grams per brake horsepower-hour (g/bhp-hr), and the opacity of smoke emission standards, in percent (%), during acceleration (Accel), lugging (Lug), and peak (Peak) modes, for this engine family are (Title 13, California Code of Regulations, Section 2423):

Exhaust Emissions (g/bhp-hr)				Smoke Opacity (%)		
THC	CO	NOx	PM	Accel	Lug	Peak
1.0	8.5	6.9	0.4	20	15	50

The THC, CO, NOx and PM exhaust emission certification values, in g/bhp-hr, and the opacity of smoke emission certification values, in percent (%), for this engine family are:

Exhaust Emissions (g/bhp-hr)				Smoke Opacity (%)		
THC	CO	NOx	PM	Accel	Lug	Peak
0.4	1.6	6.8	0.2	16	4	36

BE IT FURTHER RESOLVED: That the listed engine models comply with the "Exhaust Emission Standards and Test Procedures--Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2423) for the aforementioned model year.

BE IT FURTHER RESOLVED: That the listed engine models also comply with the "Emission Control Labels--1996 and Later Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2424) for the aforementioned model year.

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the materials to demonstrate certification compliance with the Board's emission control system warranty provisions (Title 13, California Code of Regulations, Section 2425 et seq.).

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

Executed at El Monte, California this 16th day of December 1998.

John Kourklis for

R. B. Summerfield, Chief
Mobile Source Operations Division

LARGE ENGINE MODEL SUMMARY

10/21/98

EO 4-R-1-87

Manufacturer: CATERPILLAR INC.

Process Code: New Submission

EPA Engine Family: XCPXL10.5MRG

Manufacturer Family Name: NA

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
Note: Peak HP	and Peak Torque	fuel rates are	nominal values.	Due to product-	ion engine avgs.	these fuel rates	may change.	
1 - Cert Engine	3306	362 @ 1800	220	133.0	1328 @ 1200	266	107.0	EM, DI, TC, SPL,
2	3306	320 @ 1800	208	126.0	1196 @ 1400	234	110.0	EM, DI, TC, SPL,
3	3306	349 @ 1800	208	126.0	1196 @ 1400	234	110.0	EM, DI, TC, SPL,
4	3306	311 @ 1800	202	122.0	1142 @ 1400	221	104.0	EM, DI, TC, SPL,
5	3306	311 @ 1800	202	122.0	1142 @ 1400	221	104.0	EM, DI, TC, SPL,
6	3306	311 @ 1800	202	122.0	1142 @ 1400	221	104.0	EM, DI, TC, SPL,
7	3306	306 @ 1800	197	120.0	1134 @ 1400	223	105.0	EM, DI, TC, SPL,
8	3306	306 @ 1800	197	120.0	1134 @ 1400	223	105.0	EM, DI, TC, SPL,
9	3306	330 @ 2200	168	124.0	1092 @ 1400	217	102.0	EM, DI, TC, SPL,
10	3306	325 @ 2200	167	123.0	1074 @ 1400	213	100.0	EM, DI, TC, SPL,
11	3306	325 @ 2100	168	119.0	1047 @ 1400	209	99.0	EM, DI, TC, SPL,
12	3306	325 @ 2100	168	119.0	1047 @ 1400	209	99.0	EM, DI, TC, SPL,
13	3306	325 @ 2000	172	116.0	1057 @ 1400	208	98.0	EM, DI, TC, SPL,
14	3306	295 @ 2000	160	107.0	929 @ 1400	192	90.0	EM, DI, TC, SPL,
15	3306	325 @ 1800	198	120.0	1125 @ 1200	233	94.0	EM, DI, TC, SPL,
16	3306	325 @ 1800	198	120.0	1125 @ 1200	233	94.0	EM, DI, TC, SPL, CAC
17	3306	310 @ 2200	164	121.0	1029 @ 1400	209	98.0	EM, DI, TC, SPL,
18	3306	300 @ 2200	159	118.0	991 @ 1400	203	95.0	EM, DI, TC, SPL,
19	3306	285 @ 2200	146	108.0	934 @ 1400	183	86.0	EM, DI, TC, SPL,
20	3306	310 @ 2100	167	118.0	1008 @ 1400	206	97.0	EM, DI, TC, SPL,
21	3306	310 @ 2100	167	118.0	1008 @ 1400	206	97.0	EM, DI, TC, SPL,
22	3306	260 @ 2200	134	99.0	817 @ 1400	162	76.0	EM, DI, TC, SPL,
23	3306	300 @ 2100	161	114.0	986 @ 1400	198	93.0	EM, DI, TC, SPL,
24	3306	300 @ 2100	160	113.0	985 @ 1400	194	92.0	EM, DI, TC, SPL,
25	3306	270 @ 2100	146	103.0	884 @ 1400	181	85.0	EM, DI, TC, SPL,
26	3306	310 @ 2000	169	114.0	1044 @ 1400	205	97.0	EM, DI, TC, SPL,
27	3306	290 @ 2000	160	108.0	963 @ 1400	194	91.0	EM, DI, TC, SPL,
28	3306	275 @ 2000	149	100.0	897 @ 1400	181	85.0	EM, DI, TC, SPL,
29	3306	310 @ 1850	178	111.0	1034 @ 1400	209	99.0	EM, DI, TC, SPL,
30	3306	300 @ 1850	176	110.0	992 @ 1400	202	95.0	EM, DI, TC, SPL,
31	3306	310 @ 1800	186	113.0	1073 @ 1200	225	91.0	EM, DI, TC, SPL,
32	3306	300 @ 1800	179	109.0	1017 @ 1400	207	97.0	EM, DI, TC, SPL,

33	3306	300 @ 1800	179	[illegible].0	1020 @ 1400	207	97.0	F DI, TC, SPL,
34	3306	300 @ 1800	181	[illegible].0	1015 @ 1400	204	96.0	E. , DI, TC, SPL,
35	3306	300 @ 1800	178	108.0	1014 @ 1400	204	96.0	EM, DI, TC, SPL,
36	3306	285 @ 1800	170	103.0	981 @ 1200	206	83.0	EM, DI, TC, SPL,
37	3306	260 @ 1800	154	93.0	888 @ 1200	187	75.0	EM, DI, TC, SPL,
38	3306	265 @ 2200	138	102.0	847 @ 1400	168	79.0	EM, DI, TC, SPL,
39	3306	260 @ 2200	134	99.0	854 @ 1400	163	77.0	EM, DI, TC, SPL,
40	3306	250 @ 2200	130	96.0	800 @ 1400	159	75.0	EM, DI, TC, SPL,
41	3306	230 @ 2200	120	89.0	738 @ 1400	149	70.0	EM, DI, TC, SPL,
42	3306	225 @ 2200	118	87.0	701 @ 1400	141	67.0	EM, DI, TC, SPL,
43	3306	250 @ 2100	132	93.0	791 @ 1400	156	74.0	EM, DI, TC, SPL,
44	3306	250 @ 2100	132	93.0	791 @ 1400	156	74.0	EM, DI, TC, SPL,
45	3306	195 @ 2100	106	74.0	630 @ 1400	119	55.0	EM, DI, TC, SPL,
46	3306	231 @ 2000	123	83.0	718 @ 1400	144	68.0	EM, DI, TC, SPL,
47	3306	210 @ 2000	113	76.0	653 @ 1400	131	62.0	EM, DI, TC, SPL,
48	3306	265 @ 1800	155	94.0	942 @ 1200	185	75.0	EM, DI, TC, SPL,
49	3306	250 @ 1800	145	88.0	848 @ 1400	166	78.0	EM, DI, TC, SPL,

Engine family: XCPXL10.5 MRG

EO: U-R-1-87

LARGE ENGINE MODEL SUMMARY

10/21/98

EO: U-R-1-87

Manufacturer: CATERPILLAR INC.

Process Code: New Sub - continued

EPA Engine Family: XCPXL10.5MRG

Manufacturer Family Name:

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
Note: Peak HP	and Peak Torque	fuel rates are	nominal values.	Due to product-	ion engine avgs.	these fuel rates	may change.	
50	3306	250 @ 1800	149	90.0	887 @ 1400	177	83.0	EM, DI, TC, SPL,
51	3306	250 @ 1800	145	88.0	848 @ 1400	166	78.0	EM, DI, TC, SPL,
52	3306	250 @ 1800	145	88.0	832 @ 1400	166	78.0	EM, DI, TC, SPL,
53	3306	230 @ 1800	133	81.0	782 @ 1200	162	65.0	EM, DI, TC, SPL,
54	3306	210 @ 1800	121	74.0	704 @ 1200	143	58.0	EM, DI, TC, SPL,
55	3306	300 @ 2200	154	114.0	952 @ 1400	198	93.4	EM, DI, TC, SPL,
56	3306	300 @ 2200	154	113.6	988 @ 1400	195	91.7	EM, DI, TC, SPL,
57	3306	275 @ 2200	140	103.4	893 @ 1400	176	82.8	EM, DI, TC, SPL,
58	3306	275 @ 2200	140	103.4	893 @ 1400	176	82.8	EM, DI, TC, SPL,
59	3306	300 @ 2100	160	112.7	1020 @ 1400	206	97.0	EM, DI, TC, SPL,
60	3306	215 @ 2100	113	79.8	685 @ 1400	135	63.7	EM, DI, TC, SPL,
61	3306	300 @ 2100	160	112.7	1020 @ 1400	199	93.8	EM, DI, TC, SPL,
62	3306	279 @ 2200	149	110.1	906 @ 1400	187	88.0	EM, DI, TC, SPL,
63	3306	270 @ 2200	139	102.6	876 @ 1400	176	83.1	EM, DI, TC, SPL,
64	3306	291 @ 2200	147	108.5	982 @ 1400	195	91.7	EM, DI, TC, SPL, CA
65	3306	285 @ 2200	148	109.5	920 @ 1400	187	88.2	EM, DI, TC, SPL,
66	3306	245 @ 2200	128	94.8	798 @ 1400	155	72.8	EM, DI, TC, SPL,
67	3306	240 @ 2200	125	92.4	745 @ 1400	156	73.3	EM, DI, TC, SPL,
68	3306	229 @ 2200	116	86.1	735 @ 1400	146	68.6	EM, DI, TC, SPL,
69	3306	229 @ 2200	116	86.1	735 @ 1400	146	68.6	EM, DI, TC, SPL,
70	3306	229 @ 2200	122	90.1	699 @ 1400	142	67.0	EM, DI, TC, SPL,
71	3306	229 @ 2200	122	90.1	699 @ 1400	142	67.0	EM, DI, TC, SPL,
72	3306	258 @ 2200	133	98.3	947 @ 1400	191	89.7	EM, DI, TC, SPL,
73	3306	258 @ 2200	133	98.3	947 @ 1400	191	89.7	EM, DI, TC, SPL,
74	3306	257 @ 2200	133	98.4	867 @ 1400	169	79.8	EM, DI, TC, SPL,
75	3306	257 @ 2100	139	98.4	867 @ 1400	169	79.8	EM, DI, TC, SPL,
76	3306	247 @ 2100	132	93.1	828 @ 1400	164	77.0	EM, DI, TC, SPL,
77	3306	247 @ 2100	132	93.1	828 @ 1400	164	77.0	EM, DI, TC, SPL,
78	3306	247 @ 2100	132	93.1	828 @ 1400	164	77.0	EM, DI, TC, SPL,
79	3306	247 @ 2100	132	93.1	828 @ 1400	164	77.0	EM, DI, TC, SPL,
80	3306	229 @ 1850	134	83.1	800 @ 1200	180	72.5	EM, DI, TC, SPL,
81	3306	226 @ 1850	132	82.0	789 @ 1200	177	71.5	EM, DI, TC, SPL,

83	3306	236 @ 1800	141	.5	861 @ 1200	188	76.1	, DI, TC, SPL,
84	3306	236 @ 1800	141	85.4	861 @ 1200	186	75.1	EM, DI, TC, SPL,
85	3306	240 @ 1800	143	86.8	875 @ 1200	189	76.3	EM, DI, TC, SPL,
86	3306	221 @ 1900	127	80.8	757 @ 1200	173	70.0	EM, DI, TC, SPL,
87	3306	201 @ 1900	115	73.5	694 @ 1200	136	55.0	EM, DI, TC, SPL,
88	3306	214 @ 1900	122	77.8	735 @ 1200	145	58.4	EM, DI, TC, SPL,
89	3306	211 @ 1900	120	76.7	723 @ 1200	142	57.4	EM, DI, TC, SPL,
90	3306	194 @ 1900	111	70.7	664 @ 1200	131	52.7	EM, DI, TC, SPL,
91	3306	191 @ 1900	109	69.6	654 @ 1200	129	51.9	EM, DI, TC, SPL,
92	3306	270 @ 2200	142	104.8	882 @ 1400	176	83.1	EM, DI, TC, SPL,
93	3306	250 @ 2200	132	97.3	774 @ 1400	150	70.7	EM, DI, TC, SPL,
94	3306	275 @ 2200	144	106.2	893 @ 1400	175	82.6	EM, DI, TC, SPL,
95	3306	225 @ 2200	117	86.8	720 @ 1400	146	68.8	EM, DI, TC, SPL,
96	3306	292 @ 1800	190	115.0	1085 @ 1400	208	98.0	EM, DI, TC, SPL,
97	3306	290 @ 2000	168	113.0	1013 @ 1400	197	93.0	EM, DI, TC, SPL,
98	3306	210 @ 2000	113	76.0	640 @ 1400	129	61.0	EM, DI, TC, SPL,

Engine family: XCPXL10.5MRG, EO: U-R-1-87

LARGE ENGINE MODEL SUMMARY

10/21/98

EO: U-R-1-87

Manufacturer: CATERPILLAR INC.

Process Code: New Sub - continued

EPA Engine Family: XCPXL10.5MRG

Manufacturer Family Name:

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
Note: Peak HP	and Peak Torque	fuel rates are	nominal values.	Due to product-	ion engine avgs.	these fuel rates	may change.	
99	3306	210 @ 2000	113	76.0	651 @ 1400	131	62.0	EM, DI, TC, SPL,C