

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-1-62

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. 1998 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: Industrial Equipment, Wheel Loader, Wheel Tractor, Motor Grader, Excavator, Generator, Pipelayer, Scraper, Agricultural Tractor, Articulated Truck

Fuel Type: Diesel

<u>Engine Family</u>	<u>Liters (Cubic Inches)</u>		<u>Exhaust Emission Control Systems and Special Features</u>
WCPXL10.5MRG	10.5	(638)	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 matters (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):

<u>Exhaust Emissions (g/bhp-hp)</u>				<u>Smoke Opacity (%)</u>		
<u>THC</u>	<u>CO</u>	<u>NOx</u>	<u>PM</u>	<u>Accel</u>	<u>Lug</u>	<u>Peak</u>
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:

<u>Exhaust Emissions (g/bhp-hr)</u>					<u>Smoke Opacity (%)</u>		
<u>Engine Family</u>	<u>THC</u>	<u>CO</u>	<u>NOx</u>	<u>PM</u>	<u>Accel</u>	<u>Lug</u>	<u>Peak</u>
WCPXL10.5MRG	0.3	1.6	6.5	0.2	16	4	36

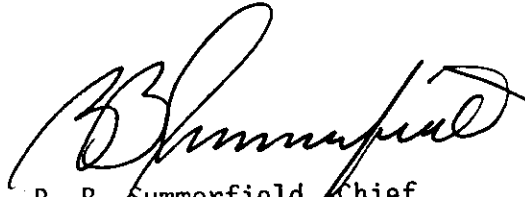
BE IT FURTHER RESOLVED: That the listed engine models comply with the "Exhaust Emission Standards and Test Procedures--Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2423) for the aforementioned model year.

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 9th day of December 1997.



R. B. Summerfield, Chief
Mobile Source Operations Division

EO: U-R-J-62

LARGE ENGINE MODEL SUMMARY

Manufacturer: **CATERPILLAR INC.** Process Code: **New Submission** Manufacturer Family Name: **NA**

EPA Engine Family: **WCPXL10.5MRG** 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

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	1378 @ 1200	266	107.0	EM, DI, TC, SPL,
2	3306	300 @ 2200	154	113.6	988 @ 1400	195	91.7	EM, D CA C, SPL,
3	3306	275 @ 2200	140	103.4	893 @ 1400	176	82.8	EM, D CA C, SPL,
4	3306	275 @ 2200	140	103.4	893 @ 1400	176	82.8	EM, D CA C, SPL,
5	3306	300 @ 2100	160	112.7	1020 @ 1400	206	97.0	EM, D CA C, SPL,
6	3306	300 @ 2200	154	114.0	952 @ 1400	198	93.4	EM, D CA C, SPL,
7	3306	279 @ 2200	149	110.1	906 @ 1400	187	88.0	EM, D CA C, SPL,
8	3306	270 @ 2200	139	102.6	876 @ 1400	176	83.1	EM, D CA C, SPL,
9	3306	285 @ 2200	148	109.5	980 @ 1400	195	91.7	EM, D CA C, SPL,
10	3306	285 @ 2200	148	109.5	680 @ 1400	176	83.1	EM, D CA C, SPL,
11	3306	246 @ 2200	128	94.8	798 @ 1400	162	76.1	EM, D CA C, SPL,
12	3306	245 @ 2200	130	96.0	760 @ 1400	156	73.3	EM, D CA C, SPL,
13	3306	240 @ 2200	130	96.0	745 @ 1400	151	71.1	EM, D CA C, SPL,
14	3306	230 @ 2200	120	89.0	733 @ 1400	149	70.1	EM, D CA C, SPL,
15	3306	255 @ 2200	136	100.5	894 @ 1400	160	75.1	EM, D CA C, SPL,
16	3306	257 @ 2100	139	98.4	867 @ 1400	172	81.2	EM, D CA C, SPL,
17	3306	247 @ 2100	134	94.3	828 @ 1400	164	77.0	EM, D CA C, SPL,
18	3306	229 @ 1850	134	83.1	800 @ 1200	180	72.5	EM, D CA C, SPL,
19	3306	236 @ 1800	140	84.6	861 @ 1200	183	74.0	EM, D CA C, SPL,
20	3306	236 @ 1800	141	85.5	861 @ 1200	188	76.1	EM, D CA C, SPL,
21	3306	236 @ 1800	137	83.1	861 @ 1200	186	75.1	EM, D CA C, SPL,
22	3306	221 @ 1900	126	80.8	757 @ 1200	173	70.0	EM, D CA C, SPL,
23	3306	214 @ 1900	122	77.8	710 @ 1200	162	65.7	EM, D CA C, SPL,
24	3306	270 @ 2200	142	104.8	883 @ 1400	176	83.1	EM, D CA C, SPL,
25	3306	266 @ 2200	139	103.2	870 @ 1400	174	82.0	EM, D CA C, SPL,
26	3306	275 @ 2200	144	106.2	906 @ 1400	178	83.6	EM, D CA C, SPL,
27	3306	350 @ 1800	205	124.0	1164 @ 1350	242	110.0	EM, D CA C, SPL,
28	3306	350 @ 1800	185	112.0	1215 @ 1400	205	96.0	EM, D CA C, SPL,
29	3306	343 @ 1800	201	121.0	1123 @ 1400	226	106.0	EM, D CA C, SPL,
30	3306	343 @ 1800	180	109.0	1123 @ 1400	198	93.0	EM, D CA C, SPL,
31	3306	349 @ 1800	210	127.0	1217 @ 1350	247	112.0	EM, D CA C, SPL,
32	3306	308 @ 1800	182	110.0	1030 @ 1350	207	94.0	EM, D CA C, SPL,
		225 @ 2000	177	124.0	1116 @ 1400	222	105.0	EM, D CA C, SPL,

34	3306	330 @ 2200	174	9.0	1095 @ 1400	218	103.0	EM, DÇAC, SPL,
35	3306	325 @ 2200	167	3.0	1071 @ 1400	213	100.0	EM, DÇAC, SPL,
36	3306	290 @ 2200	152	112.0	944 @ 1400	185	87.0	EM, DÇAC, SPL,
37	3306	275 @ 2200	144	107.0	890 @ 1400	174	82.0	EM, DÇAC, SPL,
38	3306	325 @ 2100	174	123.0	1040 @ 1400	217	102.0	EM, DÇAC, SPL,
39	3306	335 @ 2000	182	123.0	1145 @ 1400	230	108.0	EM, DÇAC, SPL,
40	3306	330 @ 2000	179	121.0	1124 @ 1400	225	106.0	EM, DÇAC, SPL,
41	3306	325 @ 2000	194	130.0	1058 @ 1400	220	103.0	EM, DÇAC, SPL,
42	3306	295 @ 2000	160	107.0	958 @ 1400	192	90.0	EM, DÇAC, SPL,
43	3306	275 @ 2000	149	100.0	889 @ 1400	174	82.0	EM, DÇAC, SPL,
44	3306	335 @ 1800	205	124.0	1227 @ 1200	256	103.0	EM, DÇAC, SPL,
45	3306	330 @ 1800	202	122.0	1203 @ 1200	251	101.0	EM, DÇAC, SPL,
46	3306	325 @ 1800	198	120.0	1124 @ 1200	245	99.0	EM, DÇAC, SPL,
47	3306	270 @ 1800	159	96.0	935 @ 1200	191	77.0	EM, DÇAC, SPL,
48	3306	240 @ 1800	141	85.0	819 @ 1200	167	67.0	EM, DÇAC, SPL,
49	3306	335 @ 2200	176	130.0	1137 @ 1400	225	106.0	EM, DÇAC, SPL,

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LARGE ENGINE MODEL SUMMARY

EO: U-R-1-62

Manufacturer: **CATERPILLAR INC.** Process Code: **New Sub - continued**

EPA Engine Family: **WCPXL10.5MRG** 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	320 @ 2200	176	124.0	1072 @ 1400	211	99.0	EM, DI, TC, SPL,
51	3306	310 @ 2200	164	122.0	1029 @ 1400	209	98.0	EM, D CA C, SPL,
52	3306	300 @ 2200	159	118.0	990 @ 1400	203	95.0	EM, D CA C, SPL,
53	3306	290 @ 2200	153	113.0	953 @ 1400	193	91.0	EM, D CA C, SPL,
54	3306	285 @ 2200	146	108.0	933 @ 1400	183	86.0	EM, D CA C, SPL,
55	3306	275 @ 2200	141	104.0	895 @ 1400	176	83.0	EM, D CA C, SPL,
56	3306	310 @ 2100	167	118.0	1008 @ 1400	202	95.0	EM, D CA C, SPL,
57	3306	260 @ 2200	134	99.0	812 @ 1400	162	76.0	EM, D CA C, SPL,
58	3306	300 @ 2100	161	114.0	983 @ 1400	194	91.0	EM, D CA C, SPL,
59	3306	270 @ 2100	146	103.0	883 @ 1400	181	85.0	EM, D CA C, SPL,
60	3306	330 @ 2000	186	125.0	1126 @ 1400	223	105.0	EM, D CA C, SPL,
61	3306	310 @ 2000	173	116.0	1044 @ 1400	205	97.0	EM, D CA C, SPL,
62	3306	290 @ 2000	160	108.0	964 @ 1400	189	89.0	EM, D CA C, SPL,
63	3306	275 @ 2000	151	102.0	910 @ 1400	178	84.0	EM, D CA C, SPL,
64	3306	310 @ 1850	181	113.0	1045 @ 1400	206	97.0	EM, D CA C, SPL,
65	3306	300 @ 1850	176	110.0	988 @ 1400	187	88.0	EM, D CA C, SPL,
66	3306	335 @ 1800	204	123.0	1237 @ 1200	251	101.0	EM, D CA C, SPL,
67	3306	310 @ 1800	186	113.0	1149 @ 1200	228	92.0	EM, D CA C, SPL,
68	3306	300 @ 1800	181	110.0	1014 @ 1400	204	96.0	EM, D CA C, SPL,
69	3306	290 @ 1800	173	105.0	1068 @ 1200	210	85.0	EM, D CA C, SPL,
70	3306	285 @ 1800	170	103.0	1049 @ 1200	206	83.0	EM, D CA C, SPL,
71	3306	260 @ 1800	154	93.0	888 @ 1200	187	75.0	EM, D CA C, SPL,
72	3306	250 @ 2300	120	92.0	771 @ 1400	156	74.0	EM, D CA C, SPL,
73	3306	275 @ 2200	144	106.0	913 @ 1400	184	87.0	EM, D CA C, SPL,
74	3306	265 @ 2200	138	102.0	848 @ 1400	177	83.0	EM, D CA C, SPL,
75	3306	270 @ 2200	140	104.0	893 @ 1400	180	85.0	EM, D CA C, SPL,
76	3306	260 @ 2200	135	100.0	853 @ 1400	172	81.0	EM, D CA C, SPL,
77	3306	250 @ 2200	130	96.0	813 @ 1400	165	78.0	EM, D CA C, SPL,
78	3306	230 @ 2200	120	89.0	738 @ 1400	149	70.0	EM, D CA C, SPL,
79	3306	225 @ 2200	118	87.0	719 @ 1400	146	69.0	EM, D CA C, SPL,
80	3306	210 @ 2200	112	83.0	666 @ 1400	135	63.0	EM, D CA C, SPL,
81	3306	250 @ 2100	137	97.0	838 @ 1400	169	80.0	EM, D CA C, SPL,
82	3306	275 @ 2000	159	107.0	957 @ 1400	193	91.0	FM D CA C, SPL,

83	3306	265 @ 2000	153	93.0	919 @ 1400	186	88.0	EM, DCAF, SPL,
84	3306	260 @ 2000	151	1.0	900 @ 1400	182	86.0	, DCAF, SPL,
85	3306	250 @ 2000	144	97.0	861 @ 1400	174	82.0	EM, DCAF, SPL,
86	3306	230 @ 2000	133	89.0	783 @ 1400	159	75.0	EM, DCAF, SPL,
87	3306	210 @ 2000	122	82.0	702 @ 1400	142	67.0	EM, DCAF, SPL,
88	3306	275 @ 1800	170	103.0	1028 @ 1200	210	85.0	EM, DCAF, SPL,
89	3306	275 @ 1800	158	96.0	949 @ 1200	190	77.0	EM, DCAF, SPL,
90	3306	265 @ 1800	164	99.0	987 @ 1200	202	82.0	EM, DCAF, SPL,
91	3306	265 @ 1800	155	94.0	917 @ 1200	185	75.0	EM, DCAF, SPL,
92	3306	260 @ 1800	161	97.0	967 @ 1200	198	80.0	EM, DCAF, SPL,
93	3306	260 @ 1800	152	92.0	895 @ 1200	168	68.0	EM, DCAF, SPL,
94	3306	250 @ 1800	155	94.0	927 @ 1200	190	77.0	EM, DCAF, SPL,
95	3306	250 @ 1800	145	88.0	885 @ 1200	166	78.0	EM, DCAF, SPL,
96	3306	245 @ 1800	151	92.0	907 @ 1200	186	75.0	EM, DCAF, SPL,
97	3306	245 @ 1800	142	86.0	840 @ 1200	175	71.0	EM, DCAF, SPL,
98	3306	230 @ 1800	142	86.0	847 @ 1200	173	70.0	EM, DCAF, SPL,
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