

State of California  
AIR RESOURCES BOARD

## EXECUTIVE ORDER U-R-1-99

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, Tractor and Industrial Equipment

Fuel Type: Diesel

<u>Engine Family</u>	<u>Liters (Cubic Inches)</u>	<u>Exhaust Emission Control Systems and Special Features</u>
XCPXL18.0HRN	18.0 (1105)	Turbocharger Engine Control Module 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):

<u>Exhaust Emissions (g/bhp-hr)</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>THC</u>	<u>CO</u>	<u>NOx</u>	<u>PM</u>	<u>Accel</u>	<u>Lug</u>	<u>Peak</u>
0.1	1.6	6.6	0.2	17	4	28

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 23<sup>rd</sup> day of December 1998.



R. B. Summerfield, Chief  
Mobile Source Operations Division

# LARGE ENGINE MODEL SUMMARY

11/25/98

EO: U-R-1-99

Manufacturer: CATERPILLAR INC.

Process Code: New Submission

EPA Engine Family: XCPXL18.0HRN

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
<b>Note: Peak Hp</b>	<b>and Peak Torque</b>	<b>fuel rates are</b>	<b>nominal values.</b>	<b>Due to product-</b>	<b>ion engine avgs.</b>	<b>these fuel rates</b>	<b>may change.</b>	
1 - Cert Engine	3408	740 @ 2100	302	284.1	2222 @ 1400	338	214.4	EM, DI, TC, ECM,
2	3408	443 @ 1900	194	166.0	1797 @ 1050	285	134.3	EM, DI, TC, ECM,
3	3408	443 @ 1900	194	166.0	1797 @ 1050	285	134.3	EM, DI, TC, ECM,
4	3408	458 @ 2000	191	171.2	1549 @ 1200	242	130.4	EM, DI, TC, ECM,
5	3408	419 @ 1900	179	152.6	1471 @ 1200	221	118.8	EM, DI, TC, ECM,
6	3408	457 @ 1900	194	165.5	1595 @ 1200	241	129.9	EM, DI, TC, ECM,
7	3408	418 @ 1900	176	150.1	1350 @ 1200	205	110.5	EM, DI, TC, ECM,
8	3408	525 @ 2100	214	201.3	1615 @ 1200	253	136.1	EM, DI, TC, ECM,
9	3408	435 @ 2100	171	161.0	1295 @ 1200	193	103.8	EM, DI, TC, ECM,
10	3408	487 @ 2100	203	191.4	1452 @ 1200	232	124.6	EM, DI, TC, ECM,
11	3408	474 @ 2000	197	176.7	1519 @ 1300	237	137.8	EM, DI, TC, ECM,
12	3408	515 @ 2000	216	193.5	1656 @ 1300	256	149.1	EM, DI, TC, ECM,
13	3408	525 @ 2100	214	201.3	1615 @ 1200	253	136.1	EM, DI, TC, ECM,
14	3408	625 @ 2100	240	226.5	1876 @ 1400	286	179.9	EM, DI, TC, ECM,
15	3408	490 @ 2000	204	182.9	1560 @ 1500	232	155.8	EM, DI, TC, ECM,
16	3408	510 @ 2000	211	189.6	1653 @ 1300	252	146.8	EM, DI, TC, ECM,
17	3408	474 @ 2000	191	171.7	1518 @ 1300	225	131.1	EM, DI, TC, ECM,
18	3408	525 @ 2000	224	201.1	1655 @ 1400	252	158.1	EM, DI, TC, ECM,
19	3408	510 @ 2000	211	189.6	1653 @ 1300	252	146.8	EM, DI, TC, ECM,
20	3408	503 @ 1800	236	190.2	1653 @ 1300	252	146.8	EM, DI, TC, ECM,
21	3408	474 @ 2000	191	171.7	1518 @ 1300	225	131.1	EM, DI, TC, ECM,
22	3408	475 @ 1800	210	169.5	1663 @ 1200	262	140.9	EM, DI, TC, ECM,
23	3408	400 @ 1800	176	141.9	1399 @ 1200	225	121.2	EM, DI, TC, ECM,
24	3408	425 @ 1800	186	150.3	1488 @ 1200	234	126.1	EM, DI, TC, ECM,
25	3408	450 @ 1800	196	158.4	1575 @ 1200	244	131.2	EM, DI, TC, ECM,
26	3408	475 @ 1800	208	167.9	1662 @ 1200	260	139.8	EM, DI, TC, ECM,
27	3408	475 @ 2000	194	174.1	1497 @ 1400	222	139.4	EM, DI, TC, ECM,
28	3408	500 @ 2000	213	190.7	1577 @ 1400	240	150.4	EM, DI, TC, ECM,
29	3408	525 @ 2000	224	201.1	1655 @ 1400	252	158.1	EM, DI, TC, ECM,
30	3408	500 @ 1800	233	188.4	1752 @ 1200	282	151.7	EM, DI, TC, ECM,
31	3408	525 @ 2100	204	192.3	1575 @ 1400	242	151.7	EM, DI, TC, ECM,
32	3408	550 @ 2100	220	206.9	1650 @ 1400	254	159.8	EM, DI, TC, ECM,

33	3408	575 @ 2100	228	214	1727 @ 1400	266	166.9	EM, TC, ECM,
34	3408	600 @ 2100	230	21	1801 @ 1400	274	172.2	EM, TC, ECM,
35	3408	625 @ 2100	245	230.6	1876 @ 1400	286	179.8	EM, DI, TC, ECM,
36	3408	600 @ 2100	234	220.1	1801 @ 1400	275	172.9	EM, DI, TC, ECM,
37	3408	625 @ 2100	240	226.5	1876 @ 1400	286	179.9	EM, DI, TC, ECM,
38	3408	650 @ 2100	252	237.3	1952 @ 1400	297	186.6	EM, DI, TC, ECM,
39	3408	675 @ 2100	264	249.1	2025 @ 1400	308	193.4	EM, DI, TC, ECM,

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