

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-1-90

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: Industrial Equipment

Fuel Type: Diesel

<u>Engine Family</u>	<u>Liters (Cubic Inches)</u>		<u>Exhaust Emission Control Systems and Special Features</u>
XCPXL18.0MRJ	18.0	(1104)	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):

<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>
0.2	2.2	6.7	0.3	17	4	25

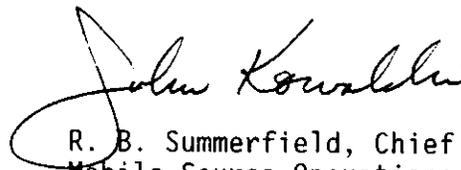
BE IT FURTHER RESOLVED: That the listed engine models comply with the "Exhaust Emission Standards and Test Procedures--Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2423) for the aforementioned model year.

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 16<sup>th</sup> day of December 1998.



R. B. Summerfield, Chief  
Mobile Source Operations Division

# LARGE ENGINE MODEL SUMMARY

10/21/98

EO: U-R-1-90

Manufacturer: CATERPILLAR INC.

Process Code: New Submission

EPA Engine Family: XCPXL18.0MRJ

Manufacturer Family Name: NA

<b>1.Engine Code</b>	<b>2.Engine Model</b>	<b>3.BHP@RPM (SAE Gross)</b>	<b>4.Fuel Rate: mm/stroke @ peak HP (for diesel only)</b>	<b>5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)</b>	<b>6.Torque @ RPM (SEA Gross)</b>	<b>7.Fuel Rate: mm/stroke@peak torque</b>	<b>8.Fuel Rate: (lbs/hr)@peak torque</b>	<b>9.Emission Control Device Per SAE J1930</b>
----------------------	-----------------------	----------------------------------	---	---	---------------------------------------	---	--	--

Note: Peak HP2 1 - Cert Engine	and Peak Torque 3408	fuel rates are 535 @ 2100	nominal values. 222	Due to product- ion engine avgs. 209.4	these fuel rates 1705 @ 1400 268	may change. 168.1	
2	3408	505 @ 2100	206	194.2	1601 @ 1400	250	EM, DI, TC, SPL,
3	3408	475 @ 2100	192	181.1	1497 @ 1400	233	EM, DI, TC, SPL,
4	3408	525 @ 2100	212	199.3	1671 @ 1400	256	EM, DI, TC, SPL,
5	3408	425 @ 2100	171	160.7	1311 @ 1400	205	EM, DI, TC, SPL,
6	3408	490 @ 2100	181	170.9	1404 @ 1400	218	EM, DI, TC, SPL,
7	3408	505 @ 2000	207	185.7	1625 @ 1400	246	EM, DI, TC, SPL,
8	3408	475 @ 1800	215	173.3	1561 @ 1350	246	EM, DI, TC, SPL,
9	3408	505 @ 1800	230	186.0	1662 @ 1350	262	EM, DI, TC, SPL,
10	3408	450 @ 2000	187	167.9	1432 @ 1400	223	EM, DI, TC, SPL,
11	3408	490 @ 2000	202	180.8	1575 @ 1400	241	EM, DI, TC, SPL,
12	3408	425 @ 1800	191	154.5	1393 @ 1350	223	EM, DI, TC, SPL,
13	3408	450 @ 1800	203	163.5	1477 @ 1350	232	EM, DI, TC, SPL,
14	3408	465 @ 1800	210	169.8	1530 @ 1350	240	EM, DI, TC, SPL,
15	3408	405 @ 1900	192	163.6	1528 @ 1200	243	EM, DI, TC, SPL,
16	3408	505 @ 2100	206	194.2	1601 @ 1400	250	EM, DI, TC, SPL,
17	3408	505 @ 2100	206	194.2	1601 @ 1400	250	EM, DI, TC, SPL,
18	3408	525 @ 2100	212	199.3	1671 @ 1400	256	EM, DI, TC, SPL,
19	3408	525 @ 2100	212	199.3	1671 @ 1400	256	EM, DI, TC, SPL,
20	3408	475 @ 2100	192	181.1	1497 @ 1400	233	EM, DI, TC, SPL,
21	3408	525 @ 2100	212	199.3	1671 @ 1400	256	EM, DI, TC, SPL,
22	3408	505 @ 2100	206	194.2	1601 @ 1400	250	EM, DI, TC, SPL,
23	3408	505 @ 2100	206	194.2	1601 @ 1400	250	EM, DI, TC, SPL,

↑

↓