

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-1-102

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, Dozer and Industrial Equipment

Fuel Type: Diesel

<u>Engine Family</u>	<u>Liters (Cubic Inches)</u>		<u>Exhaust Emission Control Systems and Special Features</u>
XCPXL27.0HRP	27.0	(1658)	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	1.3	6.5	0.1	13	3	30

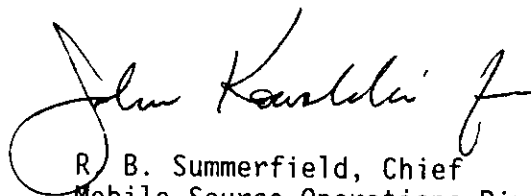
BE IT FURTHER RESOLVED: That the listed engine models comply with the "Exhaust Emission Standards and Test Procedures--Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2423) for the aforementioned model year.

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 23rd day of December 1998.



R. B. Summerfield, Chief
Mobile Source Operations Division

LARGE ENGINE MODEL SUMMARY

11/25/98

E0: U-R-1-102

Manufacturer: CATERPILLAR INC.

Process Code: New Submission

EPA Engine Family: XCPXL27.0HRP

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	3412	750 @ 1800	211	255.2	2844 @ 1200	286	230.7	EM, DI, TC, ECM,
2	3412	654 @ 1800	186	224.9	2089 @ 1200	208	167.6	EM, DI, TC, ECM,
3	3412	682 @ 2000	180	242.9	2087 @ 1200	204	164.7	EM, DI, TC, ECM,
4	3412	682 @ 2000	180	242.9	2087 @ 1200	204	164.7	EM, DI, TC, ECM,
5	3412	704 @ 2000	185	248.8	2155 @ 1200	216	174.7	EM, DI, TC, ECM,
6	3412	692 @ 1800	194	235.3	2227 @ 1200	222	179.5	EM, DI, TC, ECM,
7	3412	725 @ 2000	193	259.1	2227 @ 1200	220	177.4	EM, DI, TC, ECM,
8	3412	660 @ 2000	174	233.5	2148 @ 1200	216	172.4	EM, DI, TC, ECM,
9	3412	675 @ 2000	175	235.9	2227 @ 1200	224	180.8	EM, DI, TC, ECM,
10	3412	600 @ 1800	171	207.1	2101 @ 1200	214	172.9	EM, DI, TC, ECM,
11	3412	650 @ 1800	187	226.7	2278 @ 1200	230	185.6	EM, DI, TC, ECM,
12	3412	700 @ 1800	203	246.3	2452 @ 1200	250	201.9	EM, DI, TC, ECM,
13	3412	735 @ 1800	215	259.8	2573 @ 1200	264	213.4	EM, DI, TC, ECM,
14	3412	700 @ 2000	186	250.9	2206 @ 1400	215	202.8	EM, DI, TC, ECM,
15	3412	750 @ 2000	202	272.4	2362 @ 1400	233	219.7	EM, DI, TC, ECM,
16	3412	750 @ 1800	218	263.8	2625 @ 1200	271	218.8	EM, DI, TC, ECM,
17	3412	700 @ 2100	190	268.9	2101 @ 1400	205	193.5	EM, DI, TC, ECM,
18	3412	750 @ 2100	195	276.1	2250 @ 1400	220	207.0	EM, DI, TC, ECM,
19	3412	725 @ 2000	193	259.1	2227 @ 1200	220	177.4	EM, DI, TC, ECM,