State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-1-35

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. 1997 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, Track-type Tractor, Motor Grader

Fuel Type: Diesel

Engine Family	Liters	(Cubic Inches)	Exhaust Emission Control Systems and Special Features
VCP10.RZDARF	10.5	(638)	Turbocharger Smoke Puff Limiter

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):

Exhaust Emissions (g/bhp-hp)				Smoke Opaciity (%)		
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 (%)		
Engine Family	THC	CO	NOx	PM	Accel	Lug	Peak
VCP10.RZDARF	0.7	2.0	5.7	0.3	13	1	34

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 11th day of December 1996.

R. B. Summerfield, Chief
Mobile Source Operations Division

1997 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET
HEAVY-DUTY OFF-ROAD DIESEL ENGINES

Manufacturer: Caterpillar Inc. Engine Family: VCP10.RZDARF

Displacement: 10.5 / 638 Liters/Cubic Inches Engine Configuration: I6

All Codes in Eng. Family: CA ____ 49S ____ 50S XX Cert Test Procedures: ARB ____ EPA XX

Valves/Ports per Cylinder: 2 valves/cyl. Strokes per Combustion Cycle: 4

Maximum Rated Power: 225 HP (168 KW) @ 2000 RPM

Ignition: Compression XX Compression with Glow Plug ____ Spark ____

Fuel Type (s): Dedicated X Flex-Fuel ____ Dual-Fuel ____ Diesel XX M100 ____ M85 ____

CNG ____ LNG ____ LPG ____ Other (specify) ____

Diesel Cert Fuel: 40 CFR 86.1313-94 XX Other (specify) ____

Primary Service Equipment: Industrial, Track-type Tractors, Motor Graders

Exhaust ECS (e.g., MFI, TC, CAC): EM, DI, SPL, TC

(Use abbreviations per **SAE J1930 JUN93**)

Engine Model (Eng. Code)	Rated HP @ RPM	Fuel Rate @ Rated HP mm^3/stroke (lbs/hr)	Fuel Pump & Injector Part No.	ECM/PCM Part No.	EGR Valve Part No.	PTOX / Catalytic Converter Part No.
3306 (1)	215 @ 2200	120 (88.8)	1312652/7W7038	----	----	----
3306 (2)	205 @ 2200	118 (86.8)	1312652/7W7038	----	----	----
3306 (3)	200 @ 2200	107 (79.4)	1312652/7W7038	----	----	----
3306 (4)	190 @ 2200	109 (80.7)	1312652/7W7038	----	----	----
3306 (5)	200 @ 2100	117 (82.3)	1312652/7W7038	----	----	----
3306 (6)	MAX 225 @ 2000	135 (90.7)	1312652/7W7038	----	----	----
3306 (7)	210 @ 2000	125 (84.1)	1312652/7W7038	----	----	----
3306 (8)	200 @ 2000	119 (80.0)	1312652/7W7038	----	----	----
3306 (9)	190 @ 2000	113 (76.2)	1312652/7W7038	----	----	----
3306 (10)	190 @ 2000	113 (76.2)	1312652/7W7038	----	----	----
3306 (11)	170 @ 2000	95 (64.0)	1312652/7W7038	----	----	----
3306 (12)	220 @ 1800	135 (81.7)	1312652/7W7038	----	----	----
3306 (13)	220 @ 1800	135 (81.7)	1312652/7W7038	----	----	----
3306 (14)	200 @ 1800	122 (73.8)	1312652/7W7038	----	----	----
3306 (15)	194 @ 1800	122 (74.1)	1113769/7W7038	----	----	----
3306 (16)	189 @ 1800	118 (71.7)	1113769/7W7038	----	----	----

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1997 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET
HEAVY-DUTY OFF-ROAD DIESEL ENGINES

Engine Model (Eng. Code)	Rated HP @ RPM	Fuel Rate @ Rated HP mm^3/stroke (lbs/hr)	Fuel Pump & Injector Part No.	ECM/PCM Part No.	EGR Valve Part No.	PTOX / Catalytic Converter Part No.
3306 (17)	179 @ 1900	110 (70.4)	1113769/7W7038	----	----	----
3306 (18)	164 @ 1900	98 (62.8)	1113769/7W7038	----	----	----
3306 (19)	185 @ 1800	113 (68.5)	1312652/7W7038	----	----	----
3306 (20)	179 @ 1800	114 (68.9)	1113769/7W7038	----	----	----
3306 (21)	175 @ 1800	108 (65.2)	1312652/7W7038	----	----	----
3306 (22)	MIN 150 @ 1800	90 (54.2)	1312652/7W7038	----	----	----
3306 (23)	154 @ 1900	93 (59.1)	1113769/7W7038	----	----	----
3306 (24)	205 @ 1900	126 (80.4)	1113769/7W7038	----	----	----
3306 (25)	198 @ 1900	121 (77.4)	1113769/7W7038	----	----	----
3306 (26)	194 @ 1900	118 (75.7)	1113769/7W7038	----	----	----
3306 (27)	199 @ 1900	122 (77.8)	1113769/7W7038	----	----	----
3306 (28)	189 @ 1900	115 (73.5)	1113769/7W7038	----	----	----
3306 (29)	194 @ 1900	118 (75.7)	1113769/7W7038	----	----	----

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