

State of California  
AIR RESOURCES BOARD

## EXECUTIVE ORDER U-R-1-34

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, Excavator, Generator

Fuel Type: Diesel

<u>Engine Family</u>	<u>Liters (Cubic Inches)</u>		<u>Exhaust Emission Control Systems and Special Features</u>
VCP10.RZDARD	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>Engine Family</u>	<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>
VCP10.RZDARD	0.2	1.6	5.1	0.2	17	3	39

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 17<sup>th</sup> 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.RZDARD  
 Displacement 10.5 / 638 Liters/Cubic Inches Engine Configuration: 16  
 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: 397 HP ( 296 KW) @ 1800 RPM  
 Ignition: Compression XX Compression with Glow Plug \_\_\_\_\_ Spark \_\_\_\_\_  
 Fuel Type (s): Dedicated  Flex-Fuel \_\_\_\_\_ Dual-Fuel \_\_\_\_\_ Diesel  M100 \_\_\_\_\_ M85 \_\_\_\_\_  
                                   CNG \_\_\_\_\_ LNG \_\_\_\_\_ LPG \_\_\_\_\_ Other (specify) \_\_\_\_\_  
 Diesel Cert Fuel: 40 CFR 86.1313-94 XX Other (specify) \_\_\_\_\_  
 Primary Service Equipment: Industrial, Excavator, Gen Set  
 Exhaust ECS (e.g., MFI, TC, CAC): EM, DI, SPL, TC, CAC

(Use abbreviations per SAE J1930 JUN93)

Engine Model (Eng. Code)	Rated HP @ RPM	Fuel Rate @ Rated HP mm <sup>3</sup> /stroke (lbs/hr)	Fuel Pump & Injector Part No.	ECM/PCM Part No.	EGR Valve Part No.	PTOX / Catalytic Converter Part No.
3306 (1)	360 @ 2200	181 (134.0)	6I2832/1313190	---	---	---
3306 (2)	345 @ 2200	174 (128.8)	6I2832/1313190	---	---	---
3306 (3)	335 @ 2200	170 (125.5)	6I2832/1313190	---	---	---
3306 (4)	325 @ 2000	172 (115.5)	6I2832/1313190	---	---	---
3306 (5)	306 @ 2000	163 (109.4)	1207622/7W7045	---	---	---
3306 (6)	305 @ 2000	161 (108.3)	6I2832/1313190	---	---	---
3306 (7)	MAX 397 @ 1800	244 (147.5)	6I2832/1313190	---	---	---
3306 (8)	377 @ 1800	220 (133.2)	6I2832/1313190	---	---	---
3306 (9)	343 @ 2200	164 (122.0)	6I2832/1313190	---	---	---
3306 (10)	315 @ 2200	160 (118.0)	6I2832/1313190	---	---	---
3306 (11)	300 @ 2200	146 (108.0)	6I2832/1313190	---	---	---
3306 (12)	370 @ 2000	195 (131.0)	6I2832/1313190	---	---	---
3306 (13)	355 @ 2000	188 (127.0)	6I2832/1313190	---	---	---
3306 (14)	335 @ 2000	177 (119.0)	6I2832/1313190	---	---	---

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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 <sup>3</sup> /stroke (lbs/hr)	Fuel Pump & Injector Part No.	ECM/PCM Part No.	EGR Valve Part No.	PTOX / Catalytic Converter Part No.
3306 (15)	375 @ 1800	217 (131.0)	6I2832/1313190	---	---	---
3306 (16)	360 @ 1800	209 (127.0)	6I2832/1313190	---	---	---
3306 (17)	340 @ 1800	197 (119.0)	6I2832/1313190	---	---	---
3306 (18)	320 @ 1800	185 (112.0)	6I2832/1313190	---	---	---
3306 (19)	MIN 300 @ 1800	174 (105.0)	6I2832/1313190	---	---	---

ISSUE DATE	03 SEPT 96							
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