

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-1-38

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, Agricultural Tractor

Fuel Type: Diesel

<u>Engine Family</u>	<u>Liters</u>	<u>(Cubic Inches)</u>	<u>Exhaust Emission Control Systems and Special Features</u>
VCP12.RZDARM	12.0	(729)	Turbocharger Charge Air Cooler Engine Control Module

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>Exhaust Emissions (g/bhp-hr)</u>					<u>Smoke Opacity (%)</u>		
<u>Engine Family</u>	<u>THC</u>	<u>CO</u>	<u>NOx</u>	<u>PM</u>	<u>Accel</u>	<u>Lug</u>	<u>Peak</u>
VCP12.RZDARM	0.2	1.7	6.3	0.1	4	4	9

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 VCP12.RZDARM
 Displacement 12.0 / 729 Liters/Cubic Inches Engine Configuration: I6
 All Codes in Eng. Family: CA 49S 50S XX Cert Test Procedures: ARB XX EPA XX
 Valves/Ports per Cylinder 4 valve/cyl Strokes per Combustion Cycle: 4
 Maximum Rated Power: 500 HP (373 KW) @ 2100 RPM
 Ignition: Compression XX Compression with Glow Plug Spark
 Fuel Type (s): Dedicated XX Flex-Fuel XX Dual-Fuel XX Diesel XX M100 XX M85 XX
 CNG XX LNG XX LPG XX Other (specify) XX
 Diesel Cert Fuel: 40 CFR 86.1313-94 XX Other (specify) XX
 Primary Service Equipment: Industrial, Agricultural Tractor, Articulated Dump Truck, Excavator
 Exhaust ECS (e.g., MFI, TC, CAC): EM, TC, CAC, DI, ECM

(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.
3196 (1)	MAX 500 @ 2100	228 (160.7)	1165426/1165426	1394659	----	----
3196 (2)	380 @ 2100	169 (119.5)	1165426/1165426	1261442	----	----
3196 (3)	370 @ 2100	165 (116.5)	1165426/1165426	1261442	----	----
3196 (4)	340 @ 2100	154 (108.9)	1165426/1165426	1261442	----	----
3196 (5)	MIN 327 @ 2100	167 (112.4)	1372500/1372500	1430411	----	----
3196 (6)	420 @ 2100	189 (133.4)	1165426/1165426	1376737	----	----
3196 (7)	385 @ 2100	173 (121.9)	1165426/1165426	1376737	----	----
3196 (8)	350 @ 2100	158 (111.6)	1165426/1165426	1376737	----	----
3196 (9)	420 @ 2100	189 (133.4)	1165426/1165426	1462628	----	----
3196 (10)	412 @ 2000	205 (138.2)	1372500/1372500	1434840	----	----
3196 (11)	385 @ 2100	173 (121.9)	1165426/1165426	1469361	----	----

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