

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-1-44

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: Track-Type Tractor, Wheel Loader, Scraper, Cold Planner, Industrial Equipment

Fuel Type: Diesel

<u>Engine Family</u>	<u>Liters (Cubic Inches)</u>	<u>Exhaust Emission Control Systems and Special Features</u>
VCP18.RZDARN	18.0 (1099)	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 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>
VCP18.RZDARN	0.1	1.6	6.6	0.2	17	4	28

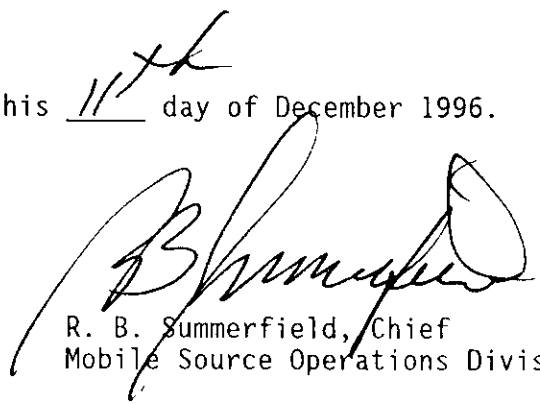
BE IT FURTHER RESOLVED: That the listed engine models comply with the "Exhaust Emission Standards and Test Procedures--Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2423) for the aforementioned model year.

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 VCP18.RZDARN
 Displacement 18.0 / 1099 Liters/Cubic Inches Engine Configuration: V8
 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: 740 HP (552 KW) @ 2100 RPM
 Ignition: Compression XX Compression with Glow Plug _____ Spark _____
 Fuel Type (s): Dedicated XX 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: Track-type Loader, Track-type Tractors, Wheel Loaders, Wheel Tractors, Trucks, Scrapers, Industrial, Cold Planners
 Exhaust ECS (e.g., MFI, TC, CAC): EM, DI, TC, ECM, CAC

(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.
3408 (1)	443 @ 1900	195 (166.0)	1313098/1313098	1278493	----	----
3408 (2)	443 @ 1900	195 (166.0)	1313098/1313098	1306138	----	----
3408 (3)	458 @ 2000	191 (171.2)	1313098/1313098	1266633	----	----
3408 (4)	428 @ 2000	174 (155.7)	1313098/1313098	1266633	----	----
3408 (5)	418 @ 1900	176 (150.1)	1313098/1313098	1299436	----	----
3408 (6)	487 @ 2100	203 (191.4)	1313098/1313098	1278497	----	----
3408 (7)	474 @ 2000	197 (176.7)	1313098/1313098	1276280	----	----
3408 (8)	515 @ 2000	216 (193.5)	1313098/1313098	1276280	----	----
3408 (9)	525 @ 2100	214 (201.3)	1313098/1313098	1283114	----	----
3408 (10)	600 @ 2100	230 (216.8)	1313098/1313098	1382619	----	----
3408 (11)	490 @ 2000	204 (182.9)	1313098/1313098	1362164	----	----
3408 (12)	525 @ 2000	224 (201.1)	1313098/1313098	1361507	----	----
3408 (13)	510 @ 2000	211 (189.6)	1313098/1313098	1286009	----	----
3408 (14)	503 @ 1800	236 (190.2)	1313098/1313098	1286009	----	----
3408 (15)	474 @ 2000	191 (171.7)	1313098/1313098	1286009	----	----
3408 (16)	MIN 400 @ 1800	176 (142.0)	1313098/1313098	1305751	----	----
3408 (17)	425 @ 1800	186 (150.3)	1313098/1313098	1305751	----	----

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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.
3408 (18)	450 @ 1800	196 (158.3)	1313098/1313098	1305751	----	----
3408 (19)	475 @ 1800	208 (167.9)	1313098/1313098	1305751	----	----
3408 (20)	475 @ 2000	194 (174.1)	1313098/1313098	1305751	----	----
3408 (21)	500 @ 2000	213 (190.9)	1313098/1313098	1305751	----	----
3408 (22)	525 @ 2000	224 (201.1)	1313098/1313098	1305751	----	----
3408 (23)	500 @ 1800	233 (188.4)	1313098/1313098	1305751	----	----
3408 (24)	525 @ 2100	204 (192.3)	1313099/1313099	1302941	----	----
3408 (25)	550 @ 2100	220 (206.9)	1313099/1313099	1302941	----	----
3408 (26)	575 @ 2100	228 (214.3)	1313099/1313099	1302941	----	----
3408 (27)	600 @ 2100	230 (216.9)	1313099/1313099	1302941	----	----
3408 (28)	625 @ 2100	245 (230.6)	1313099/1313099	1302941	----	----
3408 (29)	625 @ 2100	240 (226.5)	1313099/1313099	1302941	----	----
3408 (30)	650 @ 2100	252 (237.3)	1313099/1313099	1302941	----	----
3408 (31)	675 @ 2100	264 (249.1)	1313099/1313099	1302941	----	----
3408 (32)	MAX 740 @ 2100	302 (284.1)	1313099/1313099	1302941	----	----

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