State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-1-40

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, Tractor, Motor Grader, Wheel Loader, Scraper, Generator, Articulated Dump Truck

Fuel Type: Diesel

Engine Family	Liters	(Cubic Inches)	Exhaust Emission Control Systems and Special Features
VCP14.RZDARJ	14.6	(893)	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):

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
VCP14.RZDARJ	0.1	2.7	6.6	0.3	15	5	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 4th 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: VCP14.RZDARJ

Displacement: 14.6 / 893 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: 4 valves/cyl. Strokes per Combustion Cycle: 4

Maximum Rated Power: 559 HP (447 KW) @ 1800 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 Tractor, Motor Grader, Wheel Loader, Scrapers, Truck, Gen Set, Articulated Dump Truck, Cold Planners

Exhaust ECS (e.g., MFI, TC, CAC): EM, TC, SPL, DI, 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.
3406 (1)	320 @ 2100	174 (122.8)	(D)/1007562	----	----	----
3406 (2)	325 @ 2100	172 (121.8)	(D)/1007562	----	----	----
3406 (3)	338 @ 2100	184 (130.2)	(D)/1007562	----	----	----
3406 (4)	341 @ 2100	186 (131.6)	(D)/1007562	----	----	----
3406 (5)	328 @ 2100	178 (126.1)	(D)/1007562	----	----	----
3406 (6)	289 @ 1850	162 (100.7)	(C)/1007562	----	----	----
3406 (7)	365 @ 2000	191 (128.7)	(C)/1043377	----	----	----
3406 (8)	355 @ 2000	192 (129.5)	(C)/1043377	----	----	----
3406 (9)	400 @ 2000	213 (143.1)	(C)/1043377	----	----	----
3406 (10)	460 @ 2100	237 (167.1)	(E)/1305187	----	----	----

FUEL PART PUMP NO.				
(B)	(C)	(D)	(E)	(F)
1108896	7E9709	1044407	1305186	1295389
1247098	1195978	1308158	1313533	1311955
	1270889	1313531	1325133	1313530
	1303048	1371607	1350737	1323122
	1293029	1352690	1352699	1352691
		1350738		1350735

ISSUE DATE	03 SEPT 96							
REVISION NO.	1							
REVISION DATE	22 OCT 97							

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.
3406 (11)	325 @ 1800	190 (114.8)	(B)/1043377	----	----	----
3406 (12)	345 @ 1800	201 (122.0)	(B)/1043377	----	----	----
3406 (13)	325 @ 2000	174 (116.8)	(B)/1043377	----	----	----
3406 (14)	340 @ 2000	181 (121.8)	(B)/1043377	----	----	----
3406 (15)	325 @ 2100	168 (118.9)	(B)/1043377	----	----	----
3406 (16)	325 @ 2100	174 (122.9)	(B)/1043377	----	----	----
3406 (17)	500 @ 2100	255 (180.0)	(F)/1295672	----	----	----
3406 (18)	360 @ 2000	190 (127.8)	(C)/1119363	----	----	----
3406 (19)	360 @ 1800	203 (122.8)	(C)/1119363	----	----	----
3406 (20)	360 @ 2100	185 (130.6)	(C)/1119363	----	----	----
3406 (21)	380 @ 2100	195 (137.7)	(C)/1119363	----	----	----
3406 (22)	397 @ 2100	207 (146.0)	(C)/1119363	----	----	----
3406 (23)	390 @ 2100	201 (141.9)	(C)/1119363	----	----	----
3406 (24)	435 @ 2100	227 (160.5)	(C)/1119363	----	----	----
3406 (25)	347 @ 1900	189 (120.8)	(C)/1119363	----	----	----
3406 (26)	382 @ 1900	208 (133.2)	(C)/1119363	----	----	----
3406 (27)	375 @ 1800	211 (127.6)	(C)/1119363	----	----	----
3406 (28)	390 @ 2000	207 (139.3)	(C)/1119363	----	----	----
3406 (29)	400 @ 1800	227 (137.6)	(C)/1119363	----	----	----
3406 (30)	375 @ 2000	198 (133.3)	(C)/1119363	----	----	----

FUEL PART PUMP NO.				
(B)	(C)	(D)	(E)	(F)
1108896	7E9709	1044407	1305186	1295389
1247098	1195978	1308158	1313533	1311955
	1270889	1313531	1325133	1313530
	1303048	1371607	1350737	1323122
	1293029	1352690	1352699	1352691
		1350738		1350735

ISSUE DATE	03 SEPT 96							
REVISION NO.								
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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.
3406 (31)	400 @ 1800	227 (137.6)	(C)/1043377	----	----	----
3406 (32)	375 @ 2000	198 (133.3)	(C)/1043377	----	----	----
3406 (33)	400 @ 2000	212 (142.7)	(C)/1043377	----	----	----
3406 (34)	375 @ 2100	193 (136.2)	(C)/1043377	----	----	----
3406 (35)	400 @ 2100	206 (145.8)	(C)/1043377	----	----	----
3406 (36)	485 @ 2100	251 (181.9)	(C)/1043377	----	----	----
3406 (37)	385 @ 1800	218 (132.3)	(D)/1305190	----	----	----
3406 (38)	440 @ 2000	231 (155.4)	(E)/1305187	----	----	----
3406 (39)	440 @ 1800	251 (151.9)	(D)/1305190	----	----	----
3406 (40)	440 @ 1900	242 (154.8)	(D)/1305190	----	----	----
3406 (41)	430 @ 2100	220 (155.7)	(E)/1305187	----	----	----
3406 (42)	335 @ 2100	174 (122.8)	(B)/1043377	----	----	----
3406 (43)	465 @ 1800	267 (161.4)	(D)/1305190	----	----	----
3406 (44)	490 @ 2100	249 (175.7)	(F)/1305187	----	----	----
3406 (45)	500 @ 2100	255 (180.0)	(F)/1305187	----	----	----
3406 (46)	515 @ 1900	284 (181.2)	(E)/1305187	----	----	----
3406 (47)	515 @ 2100	264 (186.2)	(F)/1305187	----	----	----
3406 (48)	459 @ 1800	262 (158.3)	(D)/1305190	----	----	----
3406 (49)	530 @ 1800	303 (183.7)	(E)/1305187	----	----	----
3406 (50)	490 @ 2100	265 (186.9)	(E)/1305187	----	----	----
3406 (51)	MAX 599 @ 1800	352 (213.4)	(F)/1305187	----	----	----
3406 (52)	400 @ 1900	221 (141.4)	(C)/1043377	----	----	----
3406 (53)	*MIN 264 @ 1900*	*142 (91.0)*	*(C)/1007562*	----	----	----

FUEL PART PUMP NO.				
(B)	(C)	(D)	(E)	(F)
1108896	7E9709	1044407	1305186	1295389
1247098	1195978	1308158	1313533	1311955
	1270889	1313531	1325133	1313530
	1303048	1371607	1350737	1323122
	1293029	1352690	1352699	1352691
		1350738		1350735

ISSUE DATE	03 SEPT 96							
REVISION NO.	1	*2*						
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