

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-2-15

Relating to Certification of New Heavy-Duty Off-Road Equipment Engines

CUMMINS ENGINE COMPANY, 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 Cummins Engine Company 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: Ag. Tractor, Generator Drive, Drill Rig, Front End Loader, Excavator

Fuel Type: Diesel

<u>Engine Family</u>	<u>Liters (Cubic Inches)</u>	<u>Exhaust Emission Control Systems and Special Features</u>
VCE661RGDTRA (A353)	10.8 (661)	Turbocharger 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-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>
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 Emission (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>
VCE661RGDTRA (A353)	0.2	1.1	6.7	0.1	16	2	50

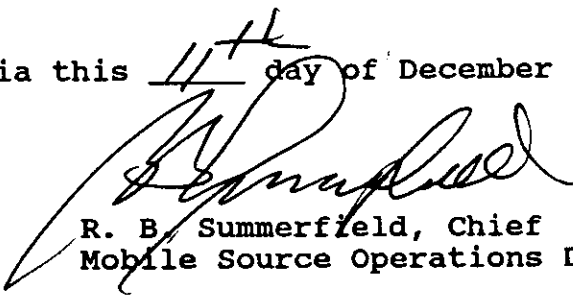
BE IT FURTHER RESOLVED: That the listed engine models comply with the "Exhaust Emission Standards and Test Procedures--Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2423) for the aforementioned model year.

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 Cummins Engine Company, Inc. Engine Family (A353)VCE661RGDTRA
 Displacement: 10.8 / 661 Liters/Cubic Inches Eng Config: I-6
 All Codes in Eng Fam: CA 49S 50S Cert Test Procedures: ARB EPA
 Valves/Ports per Cylinder 4 Strokes per Combustion Cycle 4
 Maximum Rated Power: 350/380 HP (261/283 KW) @ 2100/1800 RPM
 Ignition: Compression 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 89.330-96 Other (specify) _____
 Primary Service Equipment: Front End Loaders, Excavators, Drill Rigs, and Ag Equipment
Generator Drives
 Exhaust ECS (e.g., MFI, TC, CAC): ~~TC~~ TC, 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.				
<u>1897</u> M11-C	350 @ 2100	166(117.7)	IN 3087648	N/A	N/A	N/A				
	350 @ 2100	166(117.7)								
	350 @ 2100	166(117.7)								
	335 @ 1800	178(108.3)								
	330 @ 2100	158(111.7)								
	330 @ 2100	158(111.7)								
	330 @ 2100	158(111.7)								
	320 @ 2000	158(106.7)								
	320 @ 2000	158(106.7)								
	315 @ 1800	169(102.5)								
	310 @ 2100	149(105.5)								
	290 @ 1800	170(103.2)								
<u>2119</u> M11-C	300 @ 2100	144(102.1)					IN 3087648	N/A	N/A	N/A
	290 @ 2100	141(99.5)								
	290 @ 2100	141(99.5)								
	280 @ 2100	137(96.8)								
	275 @ 1800	150(91.3)								
	275 @ 1800	150(91.3)								
	270 @ 2100	132(93.5)								
	270 @ 2100	132(93.5)								
	270 @ 2000	137(92.6)								
	265 @ 1700	152(87.2)								
	260 @ 2100	128(90.4)								
	250 @ 2100	123(87.2)								
	250 @ 2100	123(87.2)								
	245 @ 2100	121(85.6)								
	245 @ 2100	121(85.6)								
	245 @ 2000	126(85.3)								
	245 @ 1800	136(82.8)								
	225 @ 2100	113(80.0)								
	225 @ 1800	127(76.9)								

Date Issued:

Revisions:

SUBMITTED

OCT 11 1996

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HEAVY-DUTY OFF-ROAD DIESEL ENGINES

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 All Codes in Eng Fam: CA 49S 50S Cert Test Procedures: ARB EPA
 Valves/Ports per Cylinder 4 Strokes per Combustion Cycle 4
 Maximum Rated Power: 350/380 HP (261/283 KW) @ 2100/1800 RPM
 Ignition: Compression 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 89.330-96 Other (specify) _____
 Primary Service Equipment: Front End Loaders, Excavators, Drill Rigs, and Ag Equipment
 Generator Drives
 Exhaust ECS (e.g., MFI, TC, CAC): ~~the~~ TC, 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.
<u>2165</u> M11-G	380 @ 1800 345 @ 1800	202(122.4) 191(115.5)	IN 3087648	N/A	N/A	N/A
Date Issued:						
Revisions:						

SUBMITTED
OCT 11 1996