

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-2-11

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, Front End Loader, Air Compressor

Fuel Type: Diesel

<u>Engine Family</u>	<u>Liters (Cubic Inches)</u>	<u>Exhaust Emission Control Systems and Special Features</u>
VCE855RGDTRA (A093)	14.0 (855)	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>
VCE855RGDTRA (A093)	0.2	1.2	6.8	0.1	17	7	25

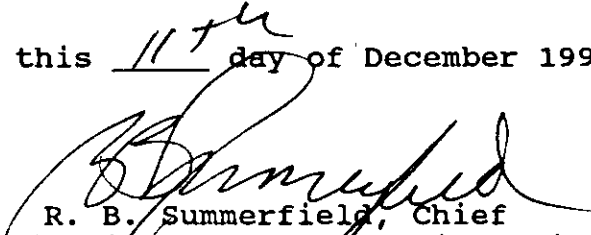
BE IT FURTHER RESOLVED: That the listed engine models comply with the "Exhaust Emission Standards and Test Procedures--Heavy-Duty Off-Road Diesel Cycle Engines" (Title 13, California Code of Regulations, Section 2423) for the aforementioned model year.

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 11<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 Cummins Engine Company, Inc. Engine Family (A093)VCE855RGDTRA  
 Displacement: 14 / 855 Liters/Cubic Inches Eng Config: Inline  
 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: 480 HP (358 KW) @ 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 X Other (specify) \_\_\_\_\_  
 Primary Service Equipment: Nonroad Heavy-Duty Diesel Front End Loaders, Ag Tractors, Air Compressors  
 Exhaust ECS (e.g., MFI, TC, CAC): \_\_\_\_\_ 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.
<u>1921</u>						
N14-C	480 @ 1800	264(160)	IN 3084891	N/A	N/A	N/A
	480 @ 1900	253(162)				
	480 @ 1900	253(162)				
	475 @ 2100	236(167)				
	475 @ 2100	236(167)				
	460 @ 1800	252(153)				
	460 @ 2100	229(162)				
	450 @ 2100	225(159)				
	450 @ 2100	225(159)				
	450 @ 2100	225(159)				
	440 @ 1800	242(147)				
	430 @ 2000	221(149)				
	430 @ 2000	221(149)				
	430 @ 2000	221(149)				
	425 @ 2100	210(149)				
	405 @ 1800	224(136)				
<u>2033</u>						
N14-C	425 @ 2100	209(148)	IN 3095023	N/A	N/A	N/A
	425 @ 2100	209(148)				
	420 @ 1800	226(137)				
	410 @ 2100	202(143)				
	400 @ 1800	217(132)				
	400 @ 2100	202(143)				
	400 @ 2100	202(143)				
	400 @ 2100	202(143)				
	400 @ 2100	202(143)				
	400 @ 2100	202(143)				
	400 @ 2100	202(143)				
	375 @ 2100	189(140)				
	360 @ 2100	181(128)				
	360 @ 1800	196(119)				

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 Valves/Ports per Cylinder 4 Strokes per Combustion Cycle 4  
 Maximum Rated Power: 480 HP ( 358 KW) @ 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 X Other (specify) \_\_\_\_\_  
 Primary Service Equipment: Nonroad Heavy-Duty Diesel Front End Loaders, Ag Tractors, Air Compressors  
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(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.
<u>2038</u> N14-C	360 @ 2100	181(128)	IN 3095955	N/A	N/A	N/A
	360 @ 2100	181(128)				
	360 @ 1800	198(120)				
	360 @ 1800	198(120)				
	350 @ 2100	177(125)				
	345 @ 1800	189(115)				
	335 @ 2100	169(120)				
	320 @ 2000	166(112)				
	315 @ 2100	161(114)				
	305 @ 1800	168(102)				

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ate Issued:  
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