(page 1 of 2)

State of California AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-2-13

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:

<u>Typical</u>	Equipment	<u>Usage</u> :	Ag.	Equipment, I		Drill Rig,	
			Fror	nt End	Loade	er, Exc	cavator

Fuel Type: Diesel

<u>Engine Family</u>	<u>Liters (Cubic Inches)</u>	Exhaust Emission Control <u>Systems and Special Features</u>
VCE19.RJDTRA (A193)	19.0 (1150)	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):

Exhaust	<u>Emissions</u>	(g/bhp-hr)		<u>Smoke O</u>	pacity (%)
THC	<u>co</u>	NOx	PM	<u>Accel</u>	Lug	<u>Peak</u>
1.0	8.5	6.9	0.4	20	15	50

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EXECUTIVE ORDER U-R-2-13 (Page 2 of 2)

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</u>	Emission	(g/b)	np-hr)	Smoke	<u>Opacity (</u>	8)
Engine Family	THC	<u>co</u>	<u>NOx</u>	PM	<u>Accel</u>	Lug	<u>Peak</u>
VCE19.RJDTRA (A193)	0.3	1.8	6.0	0.2	15	4	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 // day of December 1996.

R. B. Summerfield, Chief Mobile Source Operations Division

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1997 AIR RESOURCES BOARD SUPPLEMENTAL DATA SHEET HEAVY-DUTY OFF-ROAD DIESEL ENGINES									
Manufacturer Cummins Engine Company, Inc. Engine Family (A193) VCE19.RJDTRA									
Displacement: 19.0 / 1150 Liters/Cubic Inches Eng Config: I-6									
All Codes in Eng Fam: CA 🗌 49S 🗍 50S 🔯 Cert Test Procedures: ARB 🖾 EPA🔀									
Valves/Ports per Cylinder 4/2 Strokes per Combustion Cycle									
Maximum Rated Power: 600 HP 447 KW) @ 1800 RPM									
Ignition: Compression 🛛 Compression with Glow Plug 🗌 Spark 🗌									
Fuel Type(s):	Dedicated 🔀	- Flex-Fue	1 Dual Fu	el 🗌 🛛 Diese					
	CNG 📋	LNG 🗌 LPG	Other (specify	.)					
Diesel Cert Fu	uel: 40 CFR 8	9.330-96 🛛	Other (specify)					
Primary Servic	ce Equipment:	Front End Loa	ders, Excavators, Dr	ill Rigs, and	Ag Equipment				
Exhaust ECS (e	e.g., MFI, TC,	CAC):T	C,CAC	······································					
	T		(use_abbreviat	ions per SAE J	1930 JUN93)				
Engine Model	Rated HP	Fuel Rate @ Rated HP				PTOX /			
(Eng Code)	@ RPM	mm ³ / stroke	Fuel Pump & Injector	ECM/PCM Part No.	EGR Valve	Catalytic Converter			
		(lbs/hr)	Part No.		Part No.	Part No.			
<u>2008</u> QSK19-C									
			IN-3866961 IN-3867761	3087122	N/A	N/A			
	600 @ 2100	297(210)	FP-3088415	3867401					
	600 @ 2100	297(210)				ł			
	600 @ 1800	336(204)							
	590 @ 1800 545 @ 2100	331(201) 271(192)							
	525 3 2100	258(183)							
	525 @ 2000	283(191)							
	525 @ 1800 525 @ 1800	292(177)							
	510 @ 1800	292(177) 280(170)							
	500 @ 1800	277(168)							
	500 @ 1800 · 480 @ 1800	277(168)							
	450 @ 2100	273(166) 230(163)							
	450 @ 2000	237(160)							
	450 @ 1800	252(153)							
	450 @ 1800	252(153)							
<u>2225</u> QSK19-C	190 9 0000	0.5.0							
ADVID C	480 3 2000	252(170)	IN 3866961	3867401	N/A	N/A			
			IN-3867761 FP 3088415						
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