California Environmental Protection Agency AIR RESOURCES BOARD	DETROIT DIESEL CORPORATION	EXECUTIVE ORDER U-R-007-0086 New Off-Road Compression-Ignition Engines

Pursuant to the authority vested in the Air Resources Board by Sections 43013, 43018, 43101, 43102, 43104 and 43105 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-02-003;

IT IS ORDERED AND RESOLVED: That the following compression-ignition engines and emission control systems produced by the manufacturer are certified as described below for use in off-road equipment. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	DISPLACEMENT (liters)	FUEL TYPE	USEFUL LIFE (hours)
2004	4DDXL12.7VGD	12.7	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Direct Diesel Injection, Engine Control Module, Turbocharger, Charge Air Cooler	Crane, Loader, Tractor, Dozer, Pump, Compressor, Generator Set

The engine models and codes are attached.

The following are the exhaust certification standards (STD) and certification levels (CERT) for hydrocarbons (HC), oxides of nitrogen (NOx), or non-methane hydrocarbons plus oxides of nitrogen (NMHC+NOx), carbon monoxide (CO), and particulate matter (PM) in grams per kilowatt-hour (g/kW-hr), and the opacity-of-smoke certification standards and certification levels in percent (%) during acceleration (Accel), lugging (Lug), and the peak value from either mode (Peak) for this engine family (Title 13, California Code of Regulations, (13 CCR) Section 2423):

RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			HC	NOx	NMHC+NOx	CO	PM	ACCEL	LUG	PEAK
225 ≤ KW < 450	Tier 2	STD	N/A	N/A	6.4	3.5	0.20	20	15	50
		CERT	--	--	5.8	0.8	0.18	13	3	29

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has submitted the information and materials to demonstrate certification compliance with 13 CCR Section 2424 (emission control labels), and 13 CCR Sections 2425 and 2426 (emission control system warranty).

Engines certified under this Executive Order must conform to all applicable California emission regulations.

This Executive Order is only granted to the engine family and model-year listed above. Engines in this family that are produced for any other model-year are not covered by this Executive Order.

Executed at El Monte, California on this 23RD day of December 2003.

Allen Lyons, Chief
Mobile Source Operations Division

Engine Model Summary Form

Manufacturer: **Detroit Diesel Corporation**

Engine category: **Nonroad CI**

EPA Engine Family: **4DDXL12.7VGD**

Mfr Family Name: **SERIES 60, 12.7L**

Process Code: **New Submission**

EO#U-R-007-0086

ATTACHMENT (PAGE 1 OF 2)

1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
5173	S60, 12.7L	500 @ 2100	252.5	176.3	1550 @ 1350	281.7	126.5	EC TAA (all ratings)
		500 @ 1800 (373 KW)	269.6	161.4	1550 @ 1350	281.7	126.5	
5174	S60, 12.7L	475 @ 2100	241.3	168.5	1550 @ 1350	283.6	127.3	DDI, ECM, TC, CAC (ALL MODELS)
		475 @ 1800	277.4	166.1	1550 @ 1350	283.6	127.3	
5175	S60, 12.7L	450 @ 2100	227.7	159.0	1550 @ 1350	286.7	128.7	
		450 @ 1800	260.2	155.8	1550 @ 1350	286.7	128.7	
5176	S60, 12.7L	425 @ 2100	221.7	154.8	1475 @ 1350	272.6	122.4	
		425 @ 1800	251.3	150.4	1475 @ 1350	272.6	122.4	
5177	S60, 12.7L	400 @ 2100	210.1	146.7	1400 @ 1350	259.1	116.3	
		400 @ 1800	235.1	140.7	1400 @ 1350	259.1	116.3	
5178	S60, 12.7L	375 @ 2100	198.3	138.5	1350 @ 1350	250.8	112.6	
		375 @ 1800	218.1	130.6	1350 @ 1350	250.8	112.6	
5179	S60, 12.7L	350 @ 2100	184.1	128.6	1350 @ 1350	252.8	113.5	
		350 @ 1800	207.6	124.3	1350 @ 1350	252.8	113.5	
5180	S60, 12.7L	325 @ 2100	171.4	119.7	1150 @ 1350	213.1	95.7	
		325 @ 1800	192.9	115.5	1150 @ 1350	213.1	95.7	
5181	S60, 12.7L	300 @ 2100	158.4	110.6	1050 @ 1350	195.1	87.6	
		300 @ 1800 (225 KW)	177.5	106.3	1050 @ 1350	195.1	87.6	

Engine Model Summary Form

Manufacturer: **Detroit Diesel Corporation**

Engine category: **Nonroad CI**

EPA Engine Family: **4DDXL12.7VGD**

Mfr Family Name: **SERIES 60, 12.7L**

Process Code: **New Sub - continued**

EO # V-R-007-0086

ATTACHMENT (PAGE 2 OF 2)

1.Engine Code	2.Engine Model	3.BHP@RPM (SAE Gross)	4.Fuel Rate: mm/stroke @ peak HP (for diesel only)	5.Fuel Rate: (lbs/hr) @ peak HP (for diesels only)	6.Torque @ RPM (SEA Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
5182	S60, 12.7L Constant speed	490 @ 1800	277.8	166.3	NA	NA	NA	EC, TAA (ALL RATINGS)
5183	S60, 12.7L Constant speed	455 @ 1800	264.0	158.1	NA	NA	NA	
5184	S60, 12.7l Constant speed	415 @ 1800	235.9	141.2	NA	NA	NA	
5185	S60, 12.7L	500 @ 2100	247.1	172.6	1650 @ 1350	312.8	140.4	
		500 @ 1800	277.9	166.4	1650 @ 1350	312.8	140.4	
5186	S60, 12.7L	450 @ 2100	222.0	155.0	1550 @ 1350	297.3	133.5	
		450 @ 1800	256.5	153.5	1550 @ 1350	297.3	133.5	
5187	S60, 12.7L	400 @ 2100	197.2	137.7	1550 @ 1350	299.1	134.3	
		400 @ 1800	226.6	135.6	1550 @ 1350	299.1	134.3	
5170	S60, 12.7L	500 @ 2300	245.1	187.5	1650 @ 1350	298.9	134.2	
5171	S60, 12.7L	445 @ 2200	228.8	167.4	1475 @ 1350	273.3	122.7	
5172	S60, 12.7L	400 @ 2200	202.9	148.4	1350 @ 1350	248.3	111.5	