California Environmental Protection Agency AIR RESOURCES BOARD	LIEBHERR MACHINES BULLE SA	EXECUTIVE ORDER U-R-018-0050 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 engine and emission control system 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	4LHAL9.96ATA	6.64 and 9.96	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Direct Diesel Injection, Turbocharger, Charge Air Cooler, Electronic Control Module	Crane, Loader, Dozer, Compressor

The engine models and codes are attached.

The following are the exhaust certification standards (STD) and certification levels (CERT) for hydrocarbon (HC), oxides of nitrogen (NOx), or non-methane hydrocarbon 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
130 ≤ kW < 225	Tier 2	STD	N/A	N/A	6.6	3.5	0.20	20	15	50
		CERT	--	--	6.2	0.7	0.12	13	2	44

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 30TH day of March 2004.

Allen Lyons, Chief
Mobile Source Operations Division

Engine Model Summary Form

U_R-018-0050

ATTACHMENT

Manufacturer: **LIEBHERR MACHINES BULLE SA**

Engine category: **Nonroad CI**

EPA Engine Family: **4LHAL9.96ATA**

Mfr Family Name: **NA**

Process Code: **New Submission**

1.Engine Code	2.Engine Model	kW	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
NA	D 926 TI-E		327@2000	179@327	NA	1092@1500	212@1500	NA	DDL, IAT, TC, CAC,
NA	D 924 TI-E		245@1800	209@245	NA	789@1400	227@1400	NA	IAT, TC, CAC,
NA	D 926 TI-E		367@2100	191@367	NA	1195@1300-14	226@1195	NA	IAT, TC, CAC,
NA	D 926 TI-E		327@2000	179@327	NA	1092@1500	212@1500	NA	IAT, TC, CAC,
NA	D 924 TI-E		245@1800	209@245	NA	789@1400	227@1400	NA	IAT, TC, CAC,
NA	D 926 TI-E	274	367@2100	191@367	NA	1195@1300-14	226@1195	NA	IAT, TC, CAC,
NA	D 924 TI-E		245@2100	202@245	NA	774@1575	230@774	NA	IAT, TC, CAC,
NA	D 926 TI-E		327@2000	179@327	NA	1092@1500	212@1500	NA	IAT, TC, CAC,
NA	D 924 TI-E		245@1800	209@245	NA	789@1400	227@1400	NA	IAT, TC, CAC,
NA	D 926 TI-E		367@2100	191@367	NA	1195@1300-14	226@1195	NA	IAT, TC, CAC,
NA	D 924 TI-E		245@2100	202@245	NA	774@1575	230@774	NA	IAT, TC, CAC,
NA	D 926 TI-E		244@2000	134@244	NA	734@1500	143@734	NA	IAT, TC, CAC,
NA	D 926 TI-E		327@2000	172@327	NA	1111@1500	210@1111	NA	IAT, TC, CAC,
NA	D 924 TI-E		197@2000	158@197	NA	649@1575	184@649	NA	IAT, TC, CAC,
NA	D 924 TI-E	123	165@1800	143@162	NA	557@1530	160@557	NA	IAT, TC, CAC,
NA	D 926 TI-E		327@1900	182@327	NA	1106@1500	212@1106	NA	IAT, TC, CAC,