California Environmental Protection Agency AIR RESOURCES BOARD	LIEBHERR MACHINES BULLE SA	EXECUTIVE ORDER U-R-018-0023 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-45-9;

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)
2001	1LHAL9.96ARA	6.6 and 10.0	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Direct Diesel Injection, Turbocharger, Smoke Puff Limiter	Crane, Loader, Dozer, Compressor

ENGINE MODELS (rated power in kilowatts, kw)	Please see attachment

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
130≤ KW < 225	Tier 1	STD	1.3	9.2	N/A	11.4	0.54	20	15	50
75≤KW<130	Tier 1	STD	N/A	9.2	N/A	N/A	N/A	20	15	50
		CERT	0.2	6.4	--	0.5	0.06	9	6	30

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 28th day of June 2001.

R. B. Summerfield, Chief
Mobile Source Operations Division

ATTACHMENT

Engine Model Summary Form

U-R- 8-002

Manufacturer: **LIEBHERR MACHINES BULLE SA**

Engine category: **Nonroad CI**

EPA Engine Family: **1LHAL9.96ARA**

Mfr Family Name: **NA**

Process Code: ~~**New Submission**~~ Running Change 9/18/01

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
NA	D926TI-E	294@2000	152@294	NA	915@1300	175@915	NA	SPL, TC, CAC,
NA	D926TI-E	240@1800	134@240	NA	811@1100-1300	152@811	NA	SPL, TC, CAC, RPM
NA	D926TI-E	272@2000	143@272	NA	863@1200-1300	201@863	NA	SPL, TC, CAC, RPM
NA	D926TI-E	294@1800	165@294	NA	959@1200-1300	188@959	NA	SPL, TC, CAC, RPM
NA	D926TI-E	* 327@1800	191@327	NA	1121@1150	215@1121	NA	SPL, TC, CAC, RPM
NA	D926TI-E	256@2000	133@256	NA	811@1100	155@811	NA	SPL, TC, CAC, RPM
NA	D924TI-E	174@1800	150@174	NA	553@1300-1400	158@553	NA	SPL, TC, CAC, RPM
NA	D924TI-E	204@1800	173@204	NA	664@1200-1400	192@664	NA	SPL, TC, CAC, RPM
NA	D924TI-E	185@2000	146@185	NA	568@1200-1400	162@568	NA	SPL, TC, CAC, RPM
NA	D924TI-E	192@2000	149@192	NA	601@1200-1300	173@601	NA	SPL, TC, CAC, RPM
NA	D926TI-E	200@1800	116@200	NA	675@1300	125@675	NA	SPL, TC, CAC, RPM
NA	D924TI-E	173@2000	143@173	NA	555@1200	167@555	NA	SPL, TC, CAC, RPM
NA	D924TI-E	197@2000	162@197	NA	637@1200	192@637	NA	SPL, TC, CAC, RPM
NA	D926TI-E	244@2000	128@244	NA	798@1300	149@798	NA	SPL, TC, CAC, RPM
NA	D926TI-E	300@2000	161@300	NA	974@1200-1300	184@974	NA	SPL, TC, CAC, RPM

* 327 BHP rating is shown for emission certification process only. This rating will not be sold in California. 9/18/01