State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER U-R-18-3

Relating to Certification of New Heavy-Duty Off-Road Equipment Engines

LIEBHERR MACHINES BULLE

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 Liebherr Machines Bulle 1996 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: Excavator, Loader, Tractor, Rough Terrain Crane

Fuel Type: Diesel

Engine Family	Liters (Cubic Inches)	Exhaust Emission Control Systems and Special Features
TLH9.9R6DASA	9.9/6.6 (608/405)	Turbocharger Charge Air Cooler Smoke Puff Limiter

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 Emissions (g/bhp-hp)				Smoke Opaciity (%)		
THC	CO	NOx	PM	Accel	Lug	Peak
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:

	Exhaust Emissions (g/bhp-hr)				Smoke Opacity (%)		
Engine Family	THC	CO	NOx	PM	Accel	Lug	Peak
TLH9.9R6DASA	0.3	0.5	4.7	0.1	5	5	14

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 27th day of August 1996.

John Kowalski for

R. B. Summerfield
Assistant Division Chief
Mobile Source Division

E.O. # U-R-18-3

1996 AIR RESOURCE BOARD SUPPLEMENTAL DATA SHEET
HEAVY-DUTY OFF-ROAD DIESEL ENGINES

Manufacturer : *Liebherr Machines Bulle* Engine Family : *TLH9.9R6DASA*
Displacement : *9.96 (608) / 6.64 (405)* Liters / Cubic Inches Engine Conf . : *I6 (I4)*
Valves / Ports per Cylinder : *2 valves per cylinder* Stroke per Combustion Cycle : *4-stroke*
All codes in Eng. Family : CA__49S__50Sxx Cert Stds & Test Procedures :Caxx EPAxx
Maximum Rated Power : *231 HP @ 1800 RPM (172 KW @ 1800 RPM)*
Ignition : Compression xx Compression with Glow Plug _____ Spark_____
Fuel Type(s) : Dedicated xx Flex Fuel___Dual-Fuel__ Diesel xx M100 ____ M85___
CNG__ LNG___ LPG__ Other (specify) : _____
Diesel Cert Fuel : *40 CFR 86.1313-94 B2* Other (specify) : _____
Primary Service Equipment :*Construction Machinery*
Exhaust ECS (e.g. OC, TWC, PTOX, IFI, TC, CAC) *SPL , TC , CAC*
(Use abbreviations per **SAE J1930 Jun93**)

Engine Model	Rated HP @RPM	Fuel Rate @ Rated HP mm3 /stroke	Fuel Pump & Injector Part No.	ECM / PCM Part No.	EGR Valve Part No.	PTOX / Catalytic Converter Part No.
D 926 T-E	227 @ 2000	126 ± 4	0 403 474 112 KBEL 84 P 148 DLLA 145 P 632	N/A	N/A	N/A
D 926 T-E	231 @ 1800	140 ± 5	0 403 474 112 KBEL 84 P 148 DLLA 145 P 632	N/A	N/A	N/A
D 926 T-E	183 @ 1800	110 ± 4	0 403 474 112 KBEL 84 P 148 DLLA 145 P 632	N/A	N/A	N/A
				N/A	N/A	N/A

Date Issued : 07/28/1996

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