

 <b>AIR RESOURCES BOARD</b>	<b>LIEBHERR MACHINES BULLE SA</b>	<b>EXECUTIVE ORDER U-R-018-0074</b> New Off-Road Compression-Ignition Engines
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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)
2006	6LHAL10.5LPA	10.5	Diesel	8000
SPECIAL FEATURES & EMISSION CONTROL SYSTEMS			TYPICAL EQUIPMENT APPLICATION	
Direct Diesel Injection, Turbocharger, Charge Air Cooler, Electronic Control Module, Smoke Puff Limiter			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 (NO<sub>x</sub>), or non-methane hydrocarbon plus oxides of nitrogen (NMHC+NO<sub>x</sub>), 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):

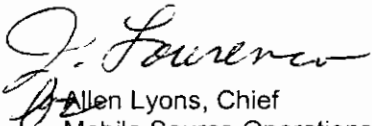
RATED POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kW-hr)					OPACITY (%)		
			HC	NO <sub>x</sub>	NMHC+NO <sub>x</sub>	CO	PM	ACCEL	LUG	PEAK
130 ≤ kW < 225	Tier 3	STD	N/A	N/A	4.0	3.5	0.20	20	15	50
225 ≤ kW < 450	Tier 3	STD	N/A	N/A	4.0	3.5	0.20	20	15	50
		CERT	--	--	4.0	0.9	0.14	7	5	10

**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 28<sup>th</sup> day of April 2006.

  
 Allen Lyons, Chief  
 Mobile Source Operations Division

# Engine Model Summary Form

U-R-018-0074

ATTACHMENT 1 OF 4

Manufacturer: **Liebherr Machines Bulle SA**  
 Engine category: **Nonroad CI**  
 EPA Engine Family: **6LHAL10.5LPA**  
 Mfr Family Name: **NA**  
 Process Code: **New Submission**

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	D 936 R06L61017	284@2000	152@284	NA	941@1300	182@941	NA	DI, SI, IAT, TC, CAC, J, ECM FCM, MAP, FOT
NA	D 936 R06L61016	271@2000	145@271	NA	935@1300	173@935	NA	IAT, TC, CAC, FCM, MAP, FOT
NA	D 936 R06L61013	325@1800	180@325	NA	1122@1500	209@1122	NA	IAT, TC, CAC, FCM, MAP, FOT
NA	D 934 R04L61003	204@1800	192@204	NA	706@1500	231@706	NA	IAT, TC, CAC, FCM, MAP, FOT
NA	D 934 R04L61006	204@2000	185@204	NA	706@1500	231@706	NA	IAT, TC, CAC, FCM, MAP, FOT
NA	D 936 R06L61021	365@2000	203@365	NA	1265@1300	259@1265	NA	IAT, TC, CAC, FCM, MAP, FOT
NA	D 936 R06L61014	365@1900	203@365	NA	1269@1300	259@1269	NA	IAT, TC, CAC, FCM, MAP, FOT
NA	D 934 R04L61005	244@1900	211@244	NA	845@1500	254@845	NA	IAT, TC, CAC, FCM, MAP, FOT
NA	D 936 R06L61015	365@2000	203@365	NA	1266@1300	259@1266	NA	IAT, TC, CAC, FCM, MAP, FOT

# Engine Model Summary Form

U-R-016 2074

ATTACHMENT 2 OF 4

Manufacturer: **Liebherr Machines Bulle SA**  
 Engine category: **Nonroad CI**  
 EPA Engine Family: **6LHAL10.5LPA**  
 Mfr Family Name:  
 Process Code: **Running Change**

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	D 934 R04L61008	204@2000	175@204	NA	702@1500	216@702	NA	DI, IAT, TC, CAC, ECM
NA	D 936 R06L61019	325@1800	196@325	NA	1125@1500	224@1125	NA	IAT, TC, CAC, ECM
NA	D 936 R06L61024	325@1800	196@325	NA	1125@1500	224@1125	NA	IAT, TC, CAC, ECM
NA	D 934 R04L61007	204@1800	186@204	NA	706@1500	219@706	NA	IAT, TC, CAC, ECM
NA	D 934 R04L61009	190@2000	168@190	NA	660@1500	217@660	NA	IAT, TC, CAC, ECM

# Engine Model

Manufacturer: **Liebherr Machines Bulle SA**  
 Engine category: **Nonroad CI**  
 EPA Engine Family: **6LHAL10.5LPA**  
 Mfr Family Name:  
 Process Code: **Running Change**

ATTACHMENT 3 OF 4

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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
D 936 R06L61020	UP 20	DLLA 145 P 1503	K29-3569 QXAKB <small>4E.00.071A</small>	YES	NA	YES	1) Oil pressure	1) 10025124
D 936 R06L61023	UP 20	DLLA 145 P 1503	K29-3569 QXAKB <small>4E.00.071A</small>	YES	NA	YES	1) Oil pressure	1) 10025124
D 936 R06L61018	UP 20	DLLA 145 P 1645	K29-3569 QXAKB <small>4E.00.071A</small>	YES	NA	YES	1) Oil pressure	1) 10025124

# Engine Model

Manufacturer: Liebherr Machines Bulle SA

Engine category: Nonroad CI

EPA Engine Family: 6LHAL10.5LPA

Mfr Family Name:

Process Code: Running Change

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ATTACHMENT 4 OF 4

1. Engine Code	2. Engine Model	3. BHP@RPM (SAE Gross)	4. Fuel Rate: mm <sup>3</sup> /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 <sup>3</sup> /stroke@peak torque	8. Fuel Rate: (lbs/hr)@peak torque	9. Emission Control Device Per SAE J1930
NA	D 934 R04L61010	190@2000	168@190	NA	660@1500	217@660	NA	IAT, TC, CAC, EGR, MAP, DEF