## LIEBHERR MACHINES BULLE SA

EXECUTIVE ORDER U-R-018-0159 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-14-012;

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)		
2018	JLHAL7.01SQC	7.01	Diesel	8000		
SPECIAL	FEATURES & EMISSION		TYPICAL EQUIPMENT APPLICATION			
Turbocharger, Charge Air Cooler, Electronic Control Module, Electronic Direct Injection, Selective Catalyst Reduction-Urea (SCR-U), Ammonia Oxidation Catalyst, DEF Quality Sensor			Crane, Loader, Dozer, Other Industrial Equipment			

The engine models and codes are attached.

The following are the exhaust certification standards (STD) and certification levels (CERT) for non-methane hydrocarbon (NMHC), 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	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)				OPACITY (%)			
POWER CLASS			NMHC	NOx	NMHC+NOx	со	PM	ACCEL	LUG	PEAK
130 ≤ kW ≤ 560	Tier 4 Final	STD	0.19	0.40	N/A	3.5	0.02	N/A	N/A	N/A
		CERT	0.01	0.34		0.3	0.02			

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

\_ day of October 2017

Annette Hebert, Chief

Emissions Compliance, Automotive Regulations and Science Division

## **Engine Model Summary Template**

## ATTACHMENT 1 OF 1

U-R-018-0159 10/09/17

Engine Family	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		9.Emission Control aeDevice Per SAE J1930
JLHAL7.01SQC	R04LQ7101	D934 A7-04	268@1900	220@268	92	933@1350	260@933	78	TC, CAC, ECM, DDI, SCR-U, AMOX, DQS
JLHAL7.01SQC	R04LQ7102	D934 A7-04	235@1900	195@235	82	933@1350	260@933	. 78	TC, CAC, ECM, DDI, SCR-U, AMOX, DQS
JLHAL7.01SQC	R04LQ7103	D934 A7-04	268@1900	220@268	92	933@1350	260@933	78	TC, CAC, ECM, DDI, SCR-U, AMOX, DQS
JLHAL7.01SQC	R04LQ7105	D934 A7-24	268@1900	220@268	92	933@1350	260@933	78	TC, CAC, ECM, DDI, SCR-U, AMOX, DQS