



LIEBHERR MACHINES BULLE SA

EXECUTIVE ORDER U-R-018-0101
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)
2010	ALHAL9.54SPA	9.54	Diesel	8,000
SPECIAL FEATURES & EMISSION CONTROL SYSTEMS			TYPICAL EQUIPMENT APPLICATION	
Electronic Direct 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 (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
75 ≤ kW < 130	Tier 3	STD	N/A	N/A	4.0	5.0	0.30	20	15	50
130 ≤ kW < 225	Tier 3	STD	N/A	N/A	4.0	3.5	0.20	20	15	50
		CERT	--	--	3.8	1.7	0.20	20	4	29

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 26 day of January 2010.

Annette Hebert, Chief
Mobile Source Operations Division

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ATTACHMENT
Engine Model Summary Template

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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	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
ALHAL9.54SPA	NA	D934 R04S61008	204@1800	190@204	NA	708@1500	222@708	NA	IAT,TC,CAC, ECM,MAP, ECT,RPM,SPL, DDI
ALHAL9.54SPA	NA	D934 R04S61012	130@1800	117@130	NA	446@1500	140@446	NA	IAT,TC,CAC, ECM,MAP, ECT,RPM,SPL, DDI
ALHAL9.54SPA	NA	D934 R04S61013	143@2000	129@143	NA	490@1500	153@490	NA	IAT,TC,CAC, ECM,MAP, ECT,RPM,SPL, DDI
ALHAL9.54SPA	NA	D934 R04S61004	177@2000	156@177	NA	606@1500	187@606	NA	IAT,TC,CAC, ECM,MAP, ECT,RPM,SPL, DDI
ALHAL9.54SPA	NA	D934 R04S61015	164@2000	145@164	NA	566@1500	180@566	NA	IAT,TC,CAC, ECM,MAP, ECT,RPM,SPL, DDI
ALHAL9.54SPA	NA	D934 R04S61017	197@1800	173@197	NA	678@1500	207@678	NA	IAT,TC,CAC, ECM,MAP, ECT,RPM,SPL, DDI
ALHAL9.54SPA	NA	D934 R04S61018	177@2000	157@177	NA	606@1500	188@606	NA	IAT,TC,CAC, ECM,MAP, ECT,RPM,SPL, DDI
ALHAL9.54SPA	NA	D934 R04S61019	164@1800	149@164	NA	556@1500	172@556	NA	IAT,TC,CAC, ECM,MAP, ECT,RPM,SPL, DDI
ALHAL9.54SPA	NA	D934 R04S61020	176@2000	157@176	NA	606@1500	188@606	NA	IAT,TC,CAC, ECM,MAP, ECT,RPM,SPL, DDI