California Environmental Protection Agency **Air Resources Board**	VOLVO CONSTRUCTION EQUIPMENT AB	**EXECUTIVE ORDER U-R-003-0076** 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)
2016	GVSXL16.1T4F	16.1	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Electronic Direct Injection, Turbocharger, Charge Air Cooler, Electronic Control Modules, Smoke Puff Limiter, Exhaust Gas Recirculation, Diesel Oxidation Catalyst, Periodic Trap Oxidizer, Selective Catalytic Reduction-Urea, Ammonia Oxidation Catalyst	Loaders, 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 POWER CLASS	EMISSION STANDARD CATEGORY		EXHAUST (g/kw-hr)					OPACITY (%)		
			NMHC	NOx	NMHC+NOx	CO	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	0.12	0.24	--	0.02	0.005	--	--	--

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 19th day of February 2016.

J. Lourenco
for Annette Hebert, Chief
Emissions Compliance, Automotive Regulations and Science Division

Attachment 1 of 1

Engine Model Summary Template

U-R-003-0076

2-11-2016

Engine Family	1.Engine Code	2.Engine Model	3.kW@RPM (SAE Gross)	4.Fuel Rate: mm^3/stroke @ peak kW (for diesel only)	5.Fuel Rate: (kg/hr) @ peak kW (for diesels only)	6.Torque Nm@ RPM (SEA Gross)	7.Fuel Rate: mm^3/stroke@ peak torque	8.Fuel Rate: (kg/hr)@ peak torque	9.Emission Control Device Per SAE J1930
GVSXL16,1T4F	16-21*) 16-24	D16J	357@1800	270 ± 4%	72 ± 4%	2576@1050	352 ± 4%	56 ± 4%	EM,ECM,TC,CAC,EGR,SPL,DDI,DPF,SCR-U,DOC
GVSXL16,1T4F	**) ref to 16-21	D16J	330@1800	251 ± 4%	69 ± 4%	2576@1050	352 ± 4%	56 ± 4%	EM,ECM,TC,CAC,EGR,SPL,DDI,DPF,SCR-U,DOC
GVSXL16,1T4F	16-36	D16J	393@1800	298 ± 4%	82 ± 4%	2570@1350	347 ± 4%	71 ± 4%	EM,ECM,TC,CAC,EGR,SPL,DDI,DPF,SCR-U,DOC
GVSXL16,1T4F	16-53	D16J	393@1800	298 ± 4%	82 ± 4%	2570@1350	347 ± 4%	71 ± 4%	EM,ECM,TC,CAC,EGR,SPL,DDI,DPF,SCR-U,DOC

Amox

*) test engine

**) Multi torque curve