



Pursuant to the authority vested in California 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)
2019	KVSXL16.1T4F	16.1	Diesel	8000
SPECIAL FEATURES & EMISSION CONTROL SYSTEMS			TYPICAL EQUIPMENT APPLICATION	
Electronic Control Modules, Turbocharger, Charge Air Cooler, Exhaust Gas Recirculation, Smoke Puff Limiter, Electronic Direct Injection, Periodic Trap Oxidizer, Selective Catalytic Reduction-Urea, Diesel Oxidation Catalyst, Ammonia Oxidation Catalyst			Loaders, Haulers, Excavators	

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	0.01	--	--	--

**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 December 2018.

Annette Hebert, Chief  
Emissions Compliance, Automotive Regulations and Science Division

ATTACHMENT 1 OF 1

EO #: U-R-003-0089

**Engine Model Summary Template**

Date: 10/08/2018

Engine Family	1.Engine Code	2.Engine Model	3.kW@RPM (SAE Gross)	4.Fuel Rate: mm <sup>3</sup> /stroke @ peak kW (for diesel only)	5.Fuel Rate: mm <sup>3</sup> /stroke @ peak kW (for diesels only)	6.Torque Nm@ RPM (SEA Gross)	7.Fuel Rate: mm <sup>3</sup> /stroke@ peak torque	8.Fuel Rate: (kg/hr)@ peak torque	9.Emission Control Device Per SAE J1930
KVSXL16,1T4F	*)16-21	D16J	345@1900	270 ± 4%	72 ± 4%	2576@1050	352 ± 4%	56 ± 4%	EM,ECM,TC,CAC,EGR,SPL,DDI,DPF,SCR-U,DOC
KVSXL16,1T4F	** 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
KVSXL16,1T4F	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
*) test engine									
**) Multi torque curve									

P70X AMOX