California Environmental Protection Agency Air Resources Board	CATERPILLAR INC.	EXECUTIVE ORDER U-R-001-0525 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)
2017	HCPXL27.0HXF	27.0	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Electronic Direct Injection, Turbocharger, Charge Air Cooler, Engine Control Module, Oxidation Catalyst, Exhaust Gas Recirculation	Tractor, Loader, Pump, Off-road Truck, Commercial 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
ELSE > 560 kW	Tier 4 Final	STD	0.19	3.5	N/A	3.5	0.04	N/A	N/A	N/A
		CERT	0.04	3.1	--	0.1	0.04	--	--	--

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 3 day of November 2016.

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

ATTACHMENT 1 OF 1

Engine Model Summary Template

W-R-001-0525
R/C 1/10/2018

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
HCPXL27.0HXF	Cert Test 1	C27	811@1800	232	281	3207@1200	306	247	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	Cert Test 2	C27	948@1800	272	330	3200@1200	312	252	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	Cert Test 3	C27	1046@1800	305	372	3412@1200	336	263	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	1	C27	811@1800	232	281	3207@1200	306	247	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	2	C27	811@1800	232	281	2778@1200	267	216	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	3	C27	761@1800	218	264	3002@1200	289	234	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	4	C27	761@1800	218	264	2573@1200	248	200	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	5	C27	798@1800	227	275	2689@1200	263	212	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	6	C27	874@1800	234	307	2947@1200	290	234	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	7	C27	948@1800	272	330	3200@1200	312	252	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	8	C27	948@1800	272	330	3200@1200	312	252	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	9	C27	752@1800	214	257	2583@1200	262	203	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	10	C27	756@1800	214	258	2679@1200	262	211	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	11	C27	874@1800	234	307	2947@1200	290	232	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	12	C27	797@1800	235	284	2660@1200	262	206	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	13	C27	797@1800	235	284	2660@1200	262	206	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	14	C27	872@1800	254	307	2924@1200	287	225	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	15	C27	872@1800	254	307	2924@1200	287	225	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	16	C27	947@1800	275	333	3171@1200	310	244	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	17	C27	947@1800	275	333	3171@1200	310	244	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	18	C27	1046@1800	305	372	3412@1200	336	263	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	19	C27	1046@1800	305	372	3412@1200	336	263	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	20	C27	811@1800	232	281	2778@1200	267	216	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	21	C27	752@1800	214	257	2583@1200	262	203	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	22	C27	1047@1800	299	362	3418@1200	329	266	DFI,TC,ECM,CAC,EGR,OC
HCPXL27.0HXF	23*	C27	872@1800	254	307	2924@1200	287	225	DFI,TC,ECM,CAC,EGR,OC

* add engine code 23