California Environmental Protection Agency **Air Resources Board**	**DOOSAN INFRACORE CO., LTD.**	**EXECUTIVE ORDER U-R-019-0138** 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	GDICL05.8LEA	5.89	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Exhaust Gas Recirculation, Diesel Oxidation Catalyst, Selective Catalyst Reduction-Urea, Electronic Direct Injection, Turbocharger, Charge Air Cooler, Electronic Control Module, DEF Quality Sensor, Ammonia Oxidation Catalyst	Loader, Compressor, Excavator, Forklift

The engine models and codes are attached.

The following are the exhaust certification standards (STD), or family emission limit(s) (FEL) as applicable, 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
75 ≤ kW ≤ 560	Tier 4 Final	STD	0.19	0.40	--	3.5	0.02	N/A	N/A	N/A
		CERT	0.03	0.18	--	0.4	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).

BE IT FURTHER RESOLVED: That for the listed engine models, the manufacturer has complied with the more stringent set of standards from the various power categories in conformance with Section 1039.230 (e) of the "California Exhaust Emission Standards and Test Procedures for 2008 and Later Tier 4 Off-Road Compression-Ignition Engines, Part I-C" adopted October 20, 2005 and last amended October 25, 2012.

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 17th day of December 2015.

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

Attachment 1 of 1

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Engine Model Summary Template

Engine Family	1.Engine Code	2.Engine Model	3.kW@RPM (SAE Gross)	4.Fuel Rate: mm/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/stroke@peak torque	8.Fuel Rate: (kg/hr)@peak torque	9.Emission Control Device Per SAE J1930
GDICL05.8LEA	DL06-LEE02	DL06P	141.2@1900	111.3	30.5	804@1400	124.8	25.2	EGR,DOC,SCR,DFI,TC,CAC,ECM
GDICL05.8LEA	DL06-LEE00	DL06P	124.0@1800	103.1	26.7	755@1400	115.7	23.4	EGR,DOC,SCR,DFI,TC,CAC,ECM
GDICL05.8LEA	DL06-LEE01	DL06P	113.2@2000	88.5	25.5	647@1400	98.2	19.8	EGR,DOC,SCR,DFI,TC,CAC,ECM
GDICL05.8LEA	DL06-LEE03	DL06P	129.4@1900	101.0	27.7	755@1400	115.7	23.4	EGR,DOC,SCR,DFI,TC,CAC,ECM
GDICL05.8LEA	DL06-LEE04	DL06P	141.2@1900	111.3	30.5	804@1400	124.8	25.2	EGR,DOC,SCR,DFI,TC,CAC,ECM
GDICL05.8LEA	DL06-LEE05	DL06P	141.2@1900	111.3	30.5	804@1400	124.8	25.2	EGR,DOC,SCR,DFI,TC,CAC,ECM
GDICL05.8LEA	DL06-LEE07	DL06P	102.2@2000	79.7	23.0	588@1400	89.4	18.1	EGR,DOC,SCR,DFI,TC,CAC,ECM
GDICL05.8LEA	DL06-LEL00	DL06P	127.9@2100	96.3	29.2	804@1400	124.8	25.2	EGR,DOC,SCR,DFI,TC,CAC,ECM
GDICL05.8LEA	DL06-LEF00	DL06P	139.7@2100	106.2	32.2	785@1400	120.4	24.3	EGR,DOC,SCR,DFI,TC,CAC,ECM
GDICL05.8LEA	DL06-LEF01	DL06P	128.7@2100	97.1	29.4	726@1400	111.0	22.4	EGR,DOC,SCR,DFI,TC,CAC,ECM
GDICL05.8LEA	DL06-LEL02	DL06P	119@2100	89.7	27.2	736@1400	111.0	22.4	EGR,DOC,SCR,DFI,TC,CAC,ECM