California Environmental Protection Agency **Air Resources Board**	**DOOSAN INFRACORE CO., LTD.**	**EXECUTIVE ORDER U-R-019-0141** 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	GDICL02.4LEA	2.392	Diesel	8000

SPECIAL FEATURES & EMISSION CONTROL SYSTEMS	TYPICAL EQUIPMENT APPLICATION
Exhaust Gas Recirculation, Diesel Oxidation Catalyst, Electronic Direct Injection, Turbocharger, Charge Air Cooler, Electronic Control Module	Loader, Tractor, Compressor, Generator, Excavator, Auxiliary Power Unit, Forklift, Toolcat, Construction Equipment

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
19 ≤ kW < 56	Tier 4 Final	STD	N/A	N/A	4.7	5.0	0.03	N/A	N/A	N/A
		CERT	--	--	3.9	0.1	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.

J. Serrano

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

Engine Model Summary Template

ATTACHMENT 1 of 2

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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
GDICL02.4LEA	DL02-LEL05	D24NAP	55.4@2600	51.4	13.5	280@1600	63.1	10.2	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LEL00	D24NAP	55.2@2600	48.8	12.8	280@1800	61.1	11.1	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LEL01	D24NAP	49.2@2600	43.7	11.5	245@1800	53.8	9.8	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LEL02	D24NAP	45.5@2600	41.0	10.7	225@1800	49.5	9.0	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LEL03	D24NAP	36.6@2600	34.3	9.0	175@1800	39.1	7.1	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LEL04	D24NAP	45.5@2600	41.0	10.7	225@1800	49.5	9.0	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LEU00	D24NAP	45.5@2600	41.0	10.7	225@1800	49.5	9.0	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LEE00	D24NAP	36.6@2200	37.3	8.3	205@1600	44.9	7.2	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LEE01	D24NAP	31.3@2200	32.7	7.3	150@1600	34.7	5.6	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LEF00	D24NAP	45.6@2200	45.3	10.0	262@1600	56.8	9.2	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LEF01	D24NAP	44.7@2400	43.5	10.5	191@1600	44.2	7.1	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LEG00	D24PP	51@1800	60.0	10.6	268@1800	60.0	10.6	EGR,DOC,DFI,TC, CAC,ECM

Engine Model Summary Template

ATTACHMENT 2 of 2

U-R-019-0141
1/5/16

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
GDICL02.4LEA	DL02-LEG00	D24PP	42@1500	57.9	8.8	267@1500	57.9	8.8	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LEG01	D24PP	51@1800	60.0	10.6	268@1800	60.0	10.6	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LEG01	D24PP	42@1500	57.9	8.8	267@1500	57.9	8.8	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LER02	D24NAP	55.2@2600	48.8	12.8	280@1800	61.1	11.1	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LER03	D24NAP	49.2@2600	43.7	11.5	245@1800	53.8	9.8	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LER04	D24NAP	45.5@2600	41.0	10.7	225@1800	49.5	9.0	EGR,DOC,DFI,TC, CAC,ECM
GDICL02.4LEA	DL02-LER05	D24NAP	36.6@2600	34.3	9.0	175@1800	39.1	7.1	EGR,DOC,DFI,TC, CAC,ECM
*GDICL02.4LEA	DL02-LER06	D24NAP	53.9@2600	47.3	12.8	280@1700	61.1	11.1	EGR,DOC,DFI,TC, CAC,ECM

***New Model Added**