CALIFORNIA AIR RESOURCES BOARD	Detroit Diesel Corporation	**EXECUTIVE ORDER A-290-0186** **New On-Road Heavy-Duty Engines** **Page 1 of 2**

Pursuant to the authority vested in California Air Resources Board by Health and Safety Code Division 26, Part 5, Chapter 2; and pursuant to the authority vested in the undersigned by Health and Safety Code Sections 39515 and 39516 and Executive Order G-19-095;

IT IS ORDERED AND RESOLVED: The engine and emission control systems produced by the manufacturer are certified as described below for use in on-road motor vehicles with a manufacturer's GVWR over 14,000 pounds. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	ENGINE SIZES (L)	FUEL TYPE [1]	STANDARDS & TEST PROCEDURE	INTENDED SERVICE CLASS [2]	ECS & SPECIAL FEATURES [3]	DIAGNOSTIC [6]
2023	PDDXH12.8TCC	12.8	Diesel	Diesel	HHDD	TC, CAC, EGR, DDI, ECM, OC, PTOX, SCR-U, AMOX	OBD(P)

PRIMARY ENGINE'S IDLE EMISSIONS CONTROL [5]	ADDITIONAL IDLE EMISSIONS CONTROL [5]
30g	N/A

ENGINE (L)	ENGINE MODELS / CODES (rated power, in hp)
12.8	See attachment for engine models and ratings

***** =not applicable; **GVWR**=gross vehicle weight rating; **13 CCR xyz**=Title 13, California Code of Regulations, Section xyz; **40 CFR 86.abc**=Title 40, Code of Federal Regulations, Section 86.abc; **L**=liter; **hp**=horsepower; **kw**=kilowatt; **hr**=hour;

[1] **CNG/LNG**=compressed/liquefied natural gas; **LPG**=liquefied petroleum gas; **E85**=85% ethanol fuel; **MF**=multi fuel a.k.a. **BF**=bi fuel; **DF**=dual fuel; **FF**=flexible fuel;

[2] **L/M/H HDD**=light/medium/heavy heavy-duty diesel; **UB**=urban bus; **HDO**=heavy duty Otto;

[3] **ECS**=emission control system; **TWC/OC**=three-way/oxidizing catalyst; **NAC**=NOx adsorption catalyst; **SCR-U** / **SCR-N**=selective catalytic reduction – urea / -- ammonia; **WU (prefix)**=warm-up catalyst; **DPF**=diesel particulate filter; **PTOX**=periodic trap oxidizer; **HO2S/O2S**=heated/oxygen sensor; **HAFS/AFS**=heated/air-fuel-ratio sensor (a.k.a., universal or linear oxygen sensor); **TBI**=throttle body fuel injection; **SFI/MFI**=sequential/multi port fuel injection; **DGI**=direct gasoline injection; **GCARB**=gaseous carburetor; **IDI/DDI**=indirect/direct diesel injection; **TC/SC**=turbo/super charger; **CAC**=charge air cooler; **EGR / EGR-C**=exhaust gas recirculation / cooled EGR; **PAIR/AIR**=pulsed/secondary air injection; **SPL**=smoke puff limiter; **ECM/PCM**=engine/powertrain control module; **EM**=engine modification; **AMOX**=Ammonia Oxidation Catalyst; **NOXS**=NOx sensor; **2 (prefix)**=parallel; **(2) (suffix)**=in series;

[5] **ESS**=engine shutdown system (per 13 CCR 1956.8(a)(6)(A)(1); **30g**=30 g/hr NOx (per 13 CCR 1956.8(a)(6)(C); **APS** =internal combustion auxiliary power system**; ALT**=alternative method (per 13 CCR 1956.8(a)(6)(D); **Exempt**=exempted per 13 CCR 1956.8(a)(6)(B) or for CNG/LNG fuel systems; **N/A**=not applicable (e.g., Otto engines and vehicles);

[6] **EMD**=engine manufacturer diagnostic system (13 CCR 1971); OBD**(F) / (P) / ($)**=full / partial / partial with a fine / on-board diagnostic;);

Following are: 1) the FTP exhaust emission standards, or family emission limit(s) as applicable, under 13 CCR 1956.8; 2) the SET and NTE limits under the applicable California exhaust emission standards and test procedures for heavy-duty diesel engines and vehicles (Test Procedures); and 3) the corresponding certification levels, for this engine family. "Diesel" CO, SET and NTE certification compliance may have been demonstrated by the manufacturer as provided under the applicable Test Procedures in lieu of testing. (For flexible- and dual-fueled engines, the CERT values in brackets [ ] are those when tested on conventional test fuel. For multi-fueled engines, the STD and CERT values for default operation permitted in 13 CCR 1956.8 are in parentheses.). [4]

in g/bhp-hr	NMHC		NOx		NMHC+NOx		CO		PM		HCHO	
	FTP	SET	FTP	SET	FTP	SET	FTP	SET	FTP	SET	FTP	SET
STD	0.14	0.14	0.20	0.20	*	*	15.5	15.5	0.01	0.01	*	*
FEL	*	*	0.15	0.15	*	*	*	*	*	*	*	*
CERT	0.000	0.002	0.07	0.01	*	*	0.05	0.04	0.001	0.000	*	*
NTE	0.21		0.22		*		19.4		0.02		*	

[4] **g/bhp-hr**=grams per brake horsepower-hour; **FTP**=Federal Test Procedure; **SET**=Supplemental emissions testing; **NTE**=Not-to-Exceed; **STD**=standard or emission test cap; **FEL**=family emission limit; **CERT**=certification level; **NMHC/HC**=non-methane/hydrocarbon; **NOx**=oxides of nitrogen; **CO**=carbon monoxide; **PM**=particulate matter; **HCHO**=formaldehyde;

BE IT FURTHER RESOLVED: The manufacturer has demonstrated compliance with the Greenhouse Gas Emission Standards as specified in Title 13 CCR 1956.8 and the incorporated "California Exhaust Emission Standards and Test Procedures for 2004 and Subsequent Model Heavy Duty Diesel-Engines and Vehicles" (HDDE Test Procedures) adopted December 12, 2002, as last amended September 9, 2021.

	PRIMARY INTENDED SERVICE CLASS: Tractor and Vocational			
In g/bhp-hr	CO_2		CH_4	N_2O
	FTP	SET		
STD	513	447	0.10	0.10
FCL	486	438	*	*
FEL	501	451	0.10	0.10
CERT	479	432	0.02	0.07

[4] **g/bhp-hr**=grams per brake horsepower-hour; **FTP**=Federal Test Procedure; **SET**=Supplemental emissions testing; **STD** = standard or emission test cap; **FEL**=family emission limit; **FCL**=family certification level; **CERT**=certification level; **CO_2=**carbon dioxide; **CH_4=**methane**; N_2O**=nitrous oxide; **VOCATIONAL**=vocational engine; **TRACTOR**=tractor engine

BE IT FURTHER RESOLVED: Certification to the FEL(s) / FCL(s) listed above, as applicable, is subject to the following terms, limitations and conditions. The FEL(s) / FCL(s) is the emission level declared by the manufacturer and serves in lieu of an emission standard for certification purposes in any averaging, banking, or trading (ABT) programs. It will be used for determining compliance of any engine in this family and compliance with such ABT programs.

BE IT FURTHER RESOLVED: For the listed engine models the manufacturer has submitted the materials to demonstrate certification compliance with 13 CCR 1965 (emission control labels), 13 CCR 1971.1 (on-board diagnostic, full or partial compliance) and 13 CCR 2035 et seq. (emission control warranty).

BE IT FURTHER RESOLVED: Except in vehicle applications exempted per 13 CCR 1956.8(a)(6)(B), engines in this engine family certified under 13 CCR 1956.8(a)(6)(C) [30 g/hr NOx] and section 35.B.4 of the incorporated "California Exhaust Emissions Standards and Test Procedures for 2004 and Subsequent Model Heavy-Duty Diesel Engines and Vehicles" (HDDE Test Procedures) adopted December 12, 2002, as last amended September 9, 2021, shall be provided with an approved "Certified Clean Idle" label that shall be affixed to the vehicle into which the engine is installed.

Engines certified under this Executive Order must conform to all applicable California emission regulations.

The Bureau of Automotive Repair will be notified by copy of this Executive Order.

Executed on this 22nd day of December 2022.

Robin U. Lang

Robin U. Lang, Chief
Emissions Certification and Compliance Division

Attachment: Engine Models **EO #:** A-290-0186 **Family:** PDDXH12.8TCC **Attachment Last Revised:** 12/14/2022

Model	Code	Trim	Config	Displacement	Displacement - Units	Peak Power	Peak Power - Units	Peak Power - Speed (rpm)	Peak Power - Fueling	Peak Power - Fuel Units	Peak Torque	Peak Torque - Units	Peak Torque - Speed (rpm)	Peak Torque - Fuel	Peak Torque - Fuel Units	OBD	GHG	Special	Notes
DD13 TCO	I		L6	12.8	Liters	450	horsepower	1550	136.8	lb/hr	1550	lb-ft	1000	134.1	lb/hr	Partial			
DD13 TCO	II		L6	12.8	Liters	450	horsepower	1500	136.5	lb/hr	1750	lb-ft	1000	151.7	lb/hr	Partial			
DD13 TCO			L6	12.8	Liters	425	horsepower	1500	127.8	lb/hr	1750	lb-ft	1000	151.7	lb/hr	Partial			
DD13 TCO	III		L6	12.8	Liters	410	horsepower	1500	122.6	lb/hr	1450	lb-ft	1000	125.4	lb/hr	Partial			
DD13 TCO	IV		L6	12.8	Liters	410	horsepower	1500	122.6	lb/hr	1650	lb-ft	1000	142.8	lb/hr	Partial			
DD13 TCO	V		L6	12.8	Liters	410	horsepower	1500	122.6	lb/hr	1550	lb-ft	1000	134.1	lb/hr	Partial			
DD13 TCO	VI		L6	12.8	Liters	450	horsepower	1500	136.5	lb/hr	1850	lb-ft	1000	160.6	lb/hr	Partial			
DD13 TCO			L6	12.8	Liters	425	horsepower	1500	127.8	lb/hr	1850	lb-ft	1000	160.6	lb/hr	Partial			
DD13 TCO	VII		L6	12.8	Liters	435	horsepower	1500	131.2	lb/hr	1550	lb-ft	1000	134.1	lb/hr	Partial			
DD13 TCO	VIII		L6	12.8	Liters	450	horsepower	1500	136.5	lb/hr	1650	lb-ft	1000	142.8	lb/hr	Partial			
DD13 TCO	IX		L6	12.8	Liters	470	horsepower	1525	143.7	lb/hr	1650	lb-ft	1000	142.8	lb/hr	Partial			
DD13 HP	X		L6	12.8	Liters	410	horsepower	1625	126.8	lb/hr	1450	lb-ft	1100	89.4	lb/hr	Partial			
DD13 HP	XI		L6	12.8	Liters	450	horsepower	1625	139.1	lb/hr	1550	lb-ft	1100	95.5	lb/hr	Partial			
DD13 HP	XII		L6	12.8	Liters	470	horsepower	1625	145.6	lb/hr	1650	lb-ft	1100	101.7	lb/hr	Partial			
DD13 HP	XIII		L6	12.8	Liters	450	horsepower	1625	139.1	lb/hr	1650	lb-ft	1100	101.7	lb/hr	Partial			
DD13 HP	XIV		L6	12.8	Liters	525	horsepower	1625	164.8	lb/hr	1850	lb-ft	1100	114.2	lb/hr	Partial			
DD13 HP	XV		L6	12.8	Liters	370	horsepower	1625	113.8	lb/hr	1250	lb-ft	1100	77.6	lb/hr	Partial			
DD13 HP	XVI		L6	12.8	Liters	380	horsepower	1625	116.6	lb/hr	1450	lb-ft	1100	89.4	lb/hr	Partial			
DD13 HP	XVII		L6	12.8	Liters	410	horsepower	1625	126.8	lb/hr	1650	lb-ft	1100	101.7	lb/hr	Partial			
DD13 HP	XVIII		L6	12.8	Liters	505	horsepower	1625	158.3	lb/hr	1850	lb-ft	1100	114.2	lb/hr	Partial			
DD13 HP	XIX		L6	12.8	Liters	450	horsepower	1625	139.1	lb/hr	1550	lb-ft	1100	95.5	lb/hr	Partial			