

Pursuant to the authority vested in the 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-14-012;

**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 <sup>1</sup>		STANDARDS & TEST PROCEDURE	INTENDED SERVICE CLASS <sup>2</sup>	ECS & SPECIAL FEATURES <sup>3</sup>	DIAGNOSTIC <sup>6</sup>
			Diesel					
2019	KDDXH07.7MDE	5.1, 7.7	Diesel		Diesel	MHDD	DDI, TC, CAC, ECM, EGR, OC, PTOX, SCR-U, AMOX	OBD(\$)
PRIMARY ENGINE'S IDLE EMISSIONS CONTROL <sup>5</sup>		ADDITIONAL IDLE EMISSIONS CONTROL <sup>5</sup>						
30g		N/A						
ENGINE (L)	ENGINE MODELS / CODES (rated power, in hp)							
5.1	See attachment for engine models and ratings							
7.7	See attachment for engine models and ratings							

<sup>1</sup> =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;  
<sup>2</sup> 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;  
<sup>3</sup> 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; 2 (prefix)=parallel; (2) (suffix)=in series.  
<sup>5</sup> 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).  
<sup>6</sup> 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.). <sup>4</sup>

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					*	*					*	*
CERT	0.000	0.002	0.06	0.01	*	*	0.3	0.01	0.001	0.000	*	*
NTE	0.21		0.30		*		19.4		0.02		*	

<sup>4</sup> 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 Dec. 12, 2002, as last amended Oct. 21, 2014 using the 2014 model year National Heavy-Duty Engine and Vehicle Greenhouse Gas Program as specified in Section 1036.108 of the HDDE Test Procedures. The manufacturer has submitted the required information and therefore has met the criteria necessary to receive a California Executive Order based on the Environmental Protection Agency's Certificate of Conformity for the above listed engine family.

In g/bhp-hr	EPA CERTIFICATE OF CONFORMITY				PRIMARY INTENDED SERVICE CLASS	
	KDDXH07.7MDE-001				TRACTOR/VOCATIONAL	
	CO <sub>2</sub>				CH <sub>4</sub>	N <sub>2</sub> O
	FTP		SET			
STD	576		487		0.10	0.10
FCL	516		474		*	*
FEL	532		488		0.10	0.10
CERT	508		461		0.02	0.05

<sup>4</sup> 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<sub>2</sub>=carbon dioxide; CH<sub>4</sub>=methane; N<sub>2</sub>O=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.

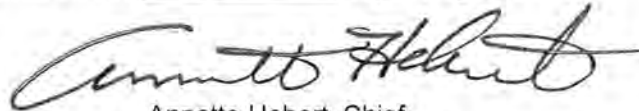
**BE IT FURTHER RESOLVED:** The listed engine models are conditionally certified in accordance with 13 CCR Section 1971.1(k) (deficiency and fines provisions for certification of malfunction and diagnostic system) because the heavy-duty on-board diagnostic (HD OBD) system of the listed engine models has been determined to have nine deficiencies for model DD8 and eight deficiencies for model DD5. The listed engine models DD8 and DD5 are approved subject to the manufacturer paying a fine of \$325 per engine model DD8 for the third through ninth deficiencies and \$275 per engine model DD5 for the third through eighth deficiencies in the listed engine family that is produced and delivered for sale in California. On a quarterly basis, the manufacturer shall submit to the Air Resources Board reports of the number of engines produced and delivered for sale in California and pay the full fine owed for that quarter pursuant to this conditional certification. Payment shall be made payable to the State Treasurer for deposit in the Air Pollution Control Fund no later than thirty (30) days after the end of each calendar quarter during the 2018 model-year production period. Failure to pay the quarterly fine, in full, in the time provided, may be cause for the Executive Officer to rescind this conditional certification, effective from the start of the quarter in question, in which case all engines covered under this conditional certification for that quarter and all future quarters would be deemed uncertified and subject to a civil penalty of up to \$37,500 per engine pursuant to HSC Section 43154.

**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).

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 at El Monte, California on this 13 day of August 2018.



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

## Engine Model Summary Template A-290-0167

8-1-2018

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
KDDXH07.7MDE	I	DD8-DS-R	330@2200	154.4	111.9	1000@1400	184.2	84.9	ECM, TC, CAC
KDDXH07.7MDE	II	DD8-DS-R	350@2200	166.2	120.4	1050@1400	194.9	89.9	EGR, PTOX
KDDXH07.7MDE	III	DD8-DS-R	375@2200	181.1	131.2	1050@1400	194.9	89.9	OC, DDI
KDDXH07.7MDE	IV	DD8-DS-F	330@2200	154.4	111.9	1000@1400	184.2	84.9	AMOX, SCR-U
KDDXH07.7MDE	V	DD8-DS-F	350@2200	166.2	120.4	1050@1400	194.9	89.9	(all ratings)
KDDXH07.7MDE	VI	DD8-DS-F	375@2200	181.1	131.2	1050@1400	194.9	89.9	
KDDXH07.7MDE	VII	DD8-SS-F	260@2200	119.4	87.4	660@1400	120.3	56.0	
KDDXH07.7MDE	VIII	DD8-SS-F	260@2200	119.4	87.4	720@1400	131.2	61.1	
KDDXH07.7MDE	IX	DD8-SS-F	280@2200	128.4	94.0	800@1400	143.0	67.2	
KDDXH07.7MDE	X	DD8-SS-F	300@2200	139.2	101.9	860@1400	155.1	72.2	
KDDXH07.7MDE	XI	DD8-SS-F	260@2200	119.4	87.4	660@1400	120.3	56.0	
KDDXH07.7MDE	XII	DD8-SS-R	260@2200	119.4	87.4	660@1400	120.3	56.0	
KDDXH07.7MDE	XIII	DD8-SS-R	260@2200	119.4	87.4	720@1400	131.2	61.1	
KDDXH07.7MDE	XIV	DD8-SS-R	280@2200	128.4	94.0	800@1400	143.0	67.2	
KDDXH07.7MDE	XV	DD8-SS-R	300@2200	139.2	101.9	860@1400	155.1	72.2	
KDDXH07.7MDE	XVI	DD8-SS-R	260@2200	119.4	87.4	660@1400	120.3	56.0	
KDDXH07.7MDE	XVII	DD5	200@2200	136.7	64.9	560@1400	152.4	46.2	
KDDXH07.7MDE	XVIII	DD5	220@2200	149.3	72.4	560@1400	152.4	46.2	
KDDXH07.7MDE	XIX	DD5	240@2200	163.9	79.0	660@1400	181.7	55.4	