

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 ¹	STANDARDS & TEST PROCEDURE	INTENDED SERVICE CLASS ²	ECS & SPECIAL FEATURES ³	DIAGNOSTIC ⁶
2017	HCEXH0540LAX	8.9	Diesel	Diesel	MHDD	DDI, TC, CAC, ECM, EGR, OC, PTOX, SCR-U, AMOX	OBD(\$)
PRIMARY ENGINE'S IDLE EMISSIONS CONTROL ⁵		ADDITIONAL IDLE EMISSIONS CONTROL ⁵					
30g		N/A					
ENGINE (L)	ENGINE MODELS / CODES (rated power, in hp)						
8.9	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; SF/MF=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;
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.)

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	*	*
CERT	0.02	0.02	0.16	0.17	*	*	0.2	0.00	0.001	0.001	*	*
NTE	0.21		0.30		*		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 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.

EPA CERTIFICATE OF CONFORMITY				PRIMARY INTENDED SERVICE CLASS	
HCEXH0540LAX-007				TRACTOR / VOCATIONAL	
in g/bhp-hr	CO ₂		CH ₄	N ₂ O	
	FTP	SET			
STD	576	487	0.10	0.10	
FCL	553	499	*	*	
FEL	570	514	0.10	0.10	
CERT	546	499	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; CO₂=carbon dioxide; CH₄=methane; N₂O=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: 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 Dec. 12, 2002, as last amended Oct. 21, 2014, shall be provided with an approved "Certified Clean Idle" label that shall be affixed to the vehicle into which the engine is installed.

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: That the manufacturer has elected to include engine models in this engine family which are identified for "emergency vehicle use only". These "emergency vehicle use only" engines are exempt from requirements imposed pursuant to California law and the regulations adopted pursuant thereto for motor vehicle pollution control devices per California Vehicle Code Section 27156.2. The manufacturer must clearly label these engines for "emergency vehicle use only" on the engines' emission control label.

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 fourteen deficiencies. The listed engine models are approved subject to the manufacturer paying a fine of \$500 per engine for the third through fourteenth 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 2017 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 \$5000 per engine pursuant to HSC Section 4315.


BE IT FURTHER RESOLVED: The Cummins hybrid engine ratings listed on this Executive Order may only be used with new on-road Parker Hannifin hybrid system models whose on-board diagnostic system have been approved as compatible.


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.

This Executive Order hereby supersedes Executive Order A-021-0658 dated October 7, 2016.

Executed at El Monte, California on this 26th day of January 2017.


Annette Hebert, Chief

 Emissions Compliance, Automotive Regulations and Science Division

R/c

EO#: A-021-0658-1

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Engine Model Summary Template

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
HCEXH0540LAX	4758;FR95181	L9 450	450@2100	228	161	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95182	L9 400	400@2100	199	141	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95184	L9 380	380@1900	201	129	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95183	L9 380	380@2000	194	131	1150@1400	222	105	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95185	L9 370	370@1900	195	125	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95187	L9 350	350@2000	176	119	1150@1400	217	102	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95186	L9 350	350@2000	177	119	1000@1400	188	89	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95188	L9 330	330@2000	167	112	1000@1400	187	88	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95189	L9 300	300@2000	151	102	860@1300	163	71	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95190	L9 270	270@2000	139	94	800@1300	154	68	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95191	L9 260	260@2200	125	92	720@1300	138	61	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95181	PX-9 450	450@2100	228	161	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95182	PX-9 400	400@2100	199	141	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95184	PX-9 380	380@1900	201	129	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95183	PX-9 380	380@2000	194	131	1150@1400	222	105	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95185	PX-9 370	370@1900	195	125	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95187	PX-9 350	350@2000	176	119	1150@1400	217	102	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95186	PX-9 350	350@2000	177	119	1000@1400	188	89	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95188	PX-9 330	330@2000	167	112	1000@1400	187	88	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95189	PX-9 300	300@2000	151	102	860@1300	163	71	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95190	PX-9 270	270@2000	139	94	800@1300	154	68	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95191	PX-9 260	260@2200	125	92	720@1300	138	61	SCRC, PTOX, PC
HCEXH0540LAX									
HCEXH0540LAX	Emergency	Vehicle	Ratings	Below					
HCEXH0540LAX	4758;FR95181	L9 450 EV	450@2100	228	161	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95182	L9 400 EV	400@2100	199	141	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95183	L9 380 EV	380@2000	194	131	1150@1400	222	105	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95185	L9 370 EV	370@1900	195	125	1250@1400	239	113	SCRC, PTOX, PC

DDI, TC, CAC,
ECM, EGR, OC, PTOX,
SCR-U, AMOX

R/C

EO#: A-021-0658-1

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HCEXH0540LAX	4759;FR95186	L9 350 EV	350@2000	177	119	1000@1400	188	89	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95188	L9 330 EV	330@2000	167	112	1000@1400	187	88	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95189	L9 300 EV	300@2000	151	102	860@1300	163	71	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95190	L9 270 EV	270@2000	139	94	800@1300	154	68	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95181	PX-9 450EV	450@2100	228	161	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95182	PX-9 400EV	400@2100	199	141	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95183	PX-9 380EV	380@2000	194	131	1150@1400	222	105	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95185	PX-9 370EV	370@1900	195	125	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95186	PX-9 350EV	350@2000	177	119	1000@1400	188	89	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95188	PX-9 330EV	330@2000	167	112	1000@1400	187	88	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95189	PX-9 300EV	300@2000	151	102	860@1300	163	71	SCRC, PTOX, PC
HCEXH0540LAX	4759;FR95190	PX-9 270EV	270@2000	139	94	800@1300	154	68	SCRC, PTOX, PC
HCEXH0540LAX									
HCEXH0540LAX		Hybrid							
HCEXH0540LAX	4758;FR95185	L9 370H	370@1900	195	125	1250@1400	239	113	SCRC, PTOX, PC
HCEXH0540LAX	4758;FR95185	PX-9 370H	370@1900	195	125	1250@1400	239	113	SCRC, PTOX, PC

DDI, TC, CAC,
EGM, EGR, OC, PTO,
SCR-U, AMOX