

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
2021	MCEXH0721XCA	11.8	Diesel		Diesel	HHDD-UB	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)							
11.8	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/MH 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; ID/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 =emission 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	*	*
CERT	0.01	0.01	0.09	0.06	*	*	0.4	0.03	0.004	0.004	*	*
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 December 12, 2002, as last amended April 18, 2019.

PRIMARY INTENDED SERVICE CLASS: Tractor/Vocational				
In g/bhp-hr	CO ₂		CH ₄	N ₂ O
	FTP	SET		
STD	513	447	0.10	0.10
FCL	509	456	*	*
FEL	524	470	0.10	0.10
CERT	503	455	0.02	0.09

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: 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: 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 NO_x] 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 April 18, 2019, 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: The listed engine model X12 500 is 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 has been determined to have four deficiencies, and therefore is approved subject to the manufacturer paying a fine of \$75 per engine for the third through fourth deficiencies in the listed engine family that is produced and delivered for sale in California. Furthermore, the remaining 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 has been determined to have five deficiencies, and therefore is approved subject to the manufacturer paying a fine of \$125 per engine for the third through fifth deficiencies in the listed engine family that is produced and delivered for sale in California. On a quarterly basis, the manufacturer shall submit to California 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 2021 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.

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 12th day of November 2020.



Allen Lyons, Chief
Emissions Certification and Compliance Division

Attachment: Engine Models

EO #: A-021-0729

Family: MCEXH0721XCA

Attachment Revised: 11/9/2020

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
X12 350	XH1			12	Liters	350	horsepower	1800	113	lb/hr	1350	lb-ft	1000	79	lb/hr	Partial with Fines	Tractor		
X12 370	XH2			12	Liters	370	horsepower	1800	120	lb/hr	1350	lb-ft	1000	79	lb/hr	Partial with Fines	Tractor		
X12 380	XH3			12	Liters	380	horsepower	1800	123	lb/hr	1450	lb-ft	1000	85	lb/hr	Partial with Fines	Tractor		
X12 400ST	XH4			12	Liters	400	horsepower	1800	130	lb/hr	1700	lb-ft	1000	102	lb/hr	Partial with Fines	Tractor		
X12 400EX	XH5			12	Liters	400	horsepower	1800	130	lb/hr	1700	lb-ft	1000	102	lb/hr	Partial with Fines	Tractor		
X12 410	XH6			12	Liters	410	horsepower	1800	133	lb/hr	1450	lb-ft	1000	85	lb/hr	Partial with Fines	Tractor		
X12 410	XH7			12	Liters	410	horsepower	1900	145	lb/hr	1450	lb-ft	1000	85	lb/hr	Partial with Fines	Tractor		
X12 410	XH8			12	Liters	410	horsepower	1800	133	lb/hr	1650	lb-ft	1000	99	lb/hr	Partial with Fines	Tractor		
X12 410ST	XH9			12	Liters	410	horsepower	1800	133	lb/hr	1650	lb-ft	1000	99	lb/hr	Partial with Fines	Tractor		
X12 380EX	XH10			12	Liters	380	horsepower	1800	123	lb/hr	1450	lb-ft	1000	85	lb/hr	Partial with Fines	Tractor		
X12 430	XH11			12	Liters	430	horsepower	1800	141	lb/hr	1550	lb-ft	1000	92	lb/hr	Partial with Fines	Tractor		
X12 430	XH12			12	Liters	430	horsepower	1800	141	lb/hr	1650	lb-ft	1000	99	lb/hr	Partial with Fines	Tractor		
X12 455	XH13			12	Liters	455	horsepower	1800	151	lb/hr	1700	lb-ft	1000	102	lb/hr	Partial with Fines	Tractor		
X12 455ST	XH14			12	Liters	455	horsepower	1800	151	lb/hr	1700	lb-ft	1000	102	lb/hr	Partial with Fines	Tractor		
X12 455EX	XH15			12	Liters	455	horsepower	1800	151	lb/hr	1700	lb-ft	1000	102	lb/hr	Partial with Fines	Tractor		
X12 350	XH16			12	Liters	350	horsepower	1900	114	lb/hr	1350	lb-ft	1000	79	lb/hr	Partial with Fines	Vocational		
X12 350	XH17			12	Liters	350	horsepower	1900	114	lb/hr	1450	lb-ft	1000	85	lb/hr	Partial with Fines	Vocational		
X12 365	XH18			12	Liters	365	horsepower	1850	119	lb/hr	1250	lb-ft	900	66	lb/hr	Partial with Fines	Vocational		
X12 370	XH19			12	Liters	370	horsepower	1900	121	lb/hr	1350	lb-ft	1000	79	lb/hr	Partial with Fines	Vocational		
X12 380	XH20			12	Liters	380	horsepower	1900	125	lb/hr	1450	lb-ft	1000	85	lb/hr	Partial with Fines	Vocational		
X12 410	XH21			12	Liters	410	horsepower	1900	135	lb/hr	1450	lb-ft	1000	85	lb/hr	Partial with Fines	Vocational		
X12 430	XH22			12	Liters	430	horsepower	1900	142	lb/hr	1550	lb-ft	1000	92	lb/hr	Partial with Fines	Vocational		
X12 430	XH23			12	Liters	430	horsepower	1900	142	lb/hr	1650	lb-ft	1000	99	lb/hr	Partial with Fines	Vocational		
X12 455	XH24			12	Liters	455	horsepower	1900	153	lb/hr	1550	lb-ft	1000	92	lb/hr	Partial with Fines	Vocational		
X12 455	XH25			12	Liters	455	horsepower	1900	153	lb/hr	1700	lb-ft	1000	102	lb/hr	Partial with Fines	Vocational		
X12 475	XH26			12	Liters	475	horsepower	1900	161	lb/hr	1700	lb-ft	1000	102	lb/hr	Partial with Fines	Vocational		
X12 500	XH27			12	Liters	500	horsepower	1900	177	lb/hr	1700	lb-ft	1000	102	lb/hr	Partial with Fines	Vocational		
X12 350	XH28			12	Liters	350	horsepower	1900	114	lb/hr	1350	lb-ft	1000	79	lb/hr	Partial with Fines	Vocational		
X12 350	XH29			12	Liters	350	horsepower	1900	114	lb/hr	1450	lb-ft	1000	85	lb/hr	Partial with Fines	Vocational		
X12 365	XH30			12	Liters	365	horsepower	1850	119	lb/hr	1250	lb-ft	900	66	lb/hr	Partial with Fines	Vocational		
X12 380	XH31			12	Liters	380	horsepower	1900	125	lb/hr	1450	lb-ft	1000	85	lb/hr	Partial with Fines	Vocational		
X12 410	XH32			12	Liters	410	horsepower	1900	135	lb/hr	1450	lb-ft	1000	85	lb/hr	Partial with Fines	Vocational		
X12 455	XH33			12	Liters	455	horsepower	1900	153	lb/hr	1550	lb-ft	1000	92	lb/hr	Partial with Fines	Vocational		
X12 455	XH34			12	Liters	455	horsepower	1900	153	lb/hr	1700	lb-ft	1000	102	lb/hr	Partial with Fines	Vocational		
X12 455	XH35			12	Liters	455	horsepower	1900	153	lb/hr	1550	lb-ft	1000	92	lb/hr	Partial with Fines	Vocational		
X12 500	XH36			12	Liters	500	horsepower	1900	177	lb/hr	1700	lb-ft	1000	102	lb/hr	Partial with Fines	Vocational		
X12 455	XHE1			12	Liters	455	horsepower	1900	153	lb/hr	1700	lb-ft	1000	102	lb/hr	Partial with Fines	Vocational		Emergency rating
X12 500	XHE2			12	Liters	500	horsepower	1900	177	lb/hr	1700	lb-ft	1000	102	lb/hr	Partial with Fines	Vocational		Emergency rating
X12 410	XH37			12	Liters	410	horsepower	1900	135	lb/hr	1450	lb-ft	1000	85	lb/hr	Partial with Fines	Vocational		Urban Bus rating