California Environmental Protection Agency AIR RESOURCES BOARD	CUMMINS, INC.	EXECUTIVE ORDER A-021-0384-2 New On-Road Heavy-Duty Engines

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-02-003;

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]
2005	5CEXH0661MAT	10.8	Diesel	Diesel	HHDD	PCM, EGR, DDI, TC, CAC

ENGINE (L)	ENGINE MODELS / CODES (rated power, in hp)
10.8	See Attachment
*	*
*	*
*	*

* =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;
[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; WU (prefix) =warm-up catalyst; DPF=diesel particulate filter; 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=exhaust gas recirculation; 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; (2004may26)

Following are: 1) the FTP exhaust emission standards, or family emission limit(s) as applicable, under 13 CCR 1956.1 (urban bus) or 13 CCR 1956.8 (other than urban bus); 2) the EURO 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, in g/bhp-hr, for this engine family. "Diesel" CO, EURO 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 1956.1 or 13 CCR 1956.8 are in parentheses.) [4]

	NMHC		NOx		NMHC+NOx		CO		PM		HCHO	
	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO
STD	0.5	0.5	*	*	*	*	15.5	15.5	0.10	0.10	*	*
FEL	*	*	*	*	2.4	2.4	*	*	*	*	*	*
CERT	0.2	0.1	*	*	2.0	2.2	0.6	0.4	0.10	0.08	*	*
NTE	0.625		*		3.0		19.375		0.125		*	

[4] g/bhp-hr=grams per brake horsepower-hour; FTP=Federal Test Procedure; EURO=Euro III European Steady-State Cycle; 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: Certification to the FEL(s) listed above, as applicable, is subject to the following terms, limitations and conditions. The FEL(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) 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.

This Executive Order hereby supersedes Executive Order A-021-0384-1 dated June 24, 2005.

Executed at El Monte, California on this 12th day of December 2005.

J. Lorenzo for

Allen Lyons, Chief
Mobile Source Operations Division

Engine Model Summary Form

Attachment A-021-0384-2

Manufacturer: **Cummins Inc.**

Engine category: **On-highway HDDE**

EPA Engine Family: **5CEXH0661MAT**

Mfr Family Name: **353T**

Process Code:

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
8271;FR2989	ISM 450	450@1800	269	163	1450@1200	291	118	PCM, EGR, TC,
8271;FR2964	ISM 450	450@1800	269	163	1450@1200	291	118	PCM, EGR, TC,
8271;FR2990	ISM 400	400@1800	231	140	1450@1200	291	118	PCM, EGR, TC,
8271;FR2983	ISM 400	400@1800	231	140	1450@1200	291	118	PCM, EGR, TC,
8271;FR2984	ISM 400	400@1800	231	140	1350@1200	267	108	PCM, EGR, TC,
8271;FR2986	ISM 385	385@1800	224	136	1450@1200	291	118	PCM, EGR, TC,
8271;FR2978	ISM 385V	385@1800	224	136	1450@1200	291	118	PCM, EGR, TC,
8271;FR2979	ISM 385V	385@1800	224	136	1350@1200	267	108	PCM, EGR, TC,
8271;FR2953	ISM 370	385@1800	224	136	1450@1200	291	118	PCM, EGR, TC,
8271;FR2972	ISM 370	385@1800	224	136	1350@1200	267	108	PCM, EGR, TC,
8271;FR2987	ISM 365	365@1800	213	129	1350@1200	267	108	PCM, EGR, TC,
8271;FR2991	ISM 350	385@1800	224	136	1450@1200	291	118	PCM, EGR, TC,
8271;FR9980	ISM 350V	350@1800	204	124	1450@1200	291	118	PCM, EGR, TC,
8271;FR2963	ISM 350V	350@1800	204	124	1350@1200	267	108	PCM, EGR, TC,
8271;FR2973	ISM 350	365@1800	213	129	1350@1200	267	108	PCM, EGR, TC,
8271;FR2974	ISM 350ST	385@1800	224	136	1350@1200	267	108	PCM, EGR, TC,
8271;FR2988	ISM 340	450@1800	269	163	1350@1200	267	108	PCM, EGR, TC,
8271;FR2960	ISM 330	340@1800	199	121	1350@1200	267	108	PCM, EGR, TC,
8271;FR2992	ISM 330ST	370@1800	215	131	1350@1200	267	108	PCM, EGR, TC,
8377;FR2993	ISM 500	500@2000	270	182	1450@1300	285	125	PCM, EGR, TC,
8377;FR2994	ISM 500	500@2000	270	182	1450@1300	285	125	PCM, EGR, TC,
8377;FR20009	ISM 450	450@1900	255	163	1450@1300	285	125	PCM, EGR, TC,
8377;FR20010	ISM 430	450@1900	255	163	1450@1300	285	125	PCM, EGR, TC,
8377;FR20011	ISM 400	400@1800	241	146	1450@1300	285	125	PCM, EGR, TC,
8377;FR20012	ISM 450	450@1900	255	163	1450@1300	285	125	PCM, EGR, TC,
8503;FR2989	ISM 450	450@1800	269	163	1450@1200	291	118	PCM, EGR, TC,
8503;FR2964	ISM 450	450@1800	269	163	1450@1200	291	118	PCM, EGR, TC,
8503;FR2990	ISM 400	400@1800	231	140	1450@1200	291	118	PCM, EGR, TC,

PDI CAC on all models

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8503;FR2[illegible]	ISM 400	400@1800	231	[illegible]	1450@1200	291	118 DDI	P[illegible] EGR, TC,
8503;FR2[illegible]	ISM 400	400@1800	231	[illegible]	1350@1200	267	108 CAC	PC[illegible] EGR, TC,
8503;FR2986	ISM 385	385@1800	224	136	1450@1200	291	118 ↓	PCM, EGR, TC,
8503;FR2978	ISM 385V	385@1800	224	136	1450@1200	291	118 on	PCM, EGR, TC,
8503;FR2979	ISM 385V	385@1800	224	136	1350@1200	267	108 all	PCM, EGR, TC,
8503;FR2953	ISM 370	385@1800	224	136	1450@1200	291	118 models	PCM, EGR, TC,
8503;FR2972	ISM 370	385@1800	224	136	1350@1200	267	108	PCM, EGR, TC,
8503;FR2987	ISM 365	365@1800	213	129	1350@1200	267	108	PCM, EGR, TC,
8503;FR2991	ISM 350	385@1800	224	136	1450@1200	291	118	PCM, EGR, TC,
8503;FR9980	ISM 350V	350@1800	204	124	1450@1200	291	118	PCM, EGR, TC,
8503;FR2963	ISM 350V	350@1800	204	124	1350@1200	267	108	PCM, EGR, TC,
8503;FR2973	ISM 350	365@1800	213	129	1350@1200	267	108	PCM, EGR, TC,
8503;FR2974	ISM 350ST	385@1800	224	136	1350@1200	267	108	PCM, EGR, TC,
8503;FR2988	ISM 340	450@1800	269	163	1350@1200	267	108	PCM, EGR, TC,
8503;FR2960	ISM 330	340@1800	199	121	1350@1200	267	108	PCM, EGR, TC,
8503;FR2992	ISM 330ST	370@1800	215	131	1350@1200	267	108	PCM, EGR, TC,
8557;FR2953	ISM 370	385@1800	197	141	1450@1200	243	116	PCM, EGR, TC,
8557;FR2972	ISM 370	385@1800	197	141	1350@1200	226	108	PCM, EGR, TC,
8557;FR2973	ISM 350	365@1800	188	134	1350@1200	226	108	PCM, EGR, TC,
8557;FR2974	ISM 350ST	385@1800	197	141	1350@1200	226	108	PCM, EGR, TC,
8557;FR2991	ISM 350ST	385@1800	197	141	1450@1200	243	116	PCM, EGR, TC,
8557;FR2960	ISM 330	340@1800	178	127	1350@1200	226	108	PCM, EGR, TC,
8557;FR2978	ISM 385V	385@1800	197	141	1450@1200	243	116	PCM, EGR, TC,
8557;FR2979	ISM 385V	385@1800	197	141	1350@1200	226	108	PCM, EGR, TC,
8557;FR2980	ISM 350V	350@1800	182	130	1450@1200	243	116	PCM, EGR, TC,
8557;FR2963	ISM 350V	350@1800	182	130	1350@1200	226	108	PCM, EGR, TC,
8557;FR2986	ISM 385	385@1800	197	141	1350@1200	226	108	PCM, EGR, TC,
8557;FR2987	ISM 365	365@1800	188	134	1350@1200	226	108	PCM, EGR, TC,
8557;FR2998	ISM 340	340@1800	178	127	1350@1200	226	108	PCM, EGR, TC,
8557;FR20035	ISM 385V	385@1800	224	136	1450@1200	291	118	PCM, EGR, TC,

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