California Environmental Protection Agency AIR RESOURCES BOARD	CUMMINS, INC.	EXECUTIVE ORDER A-021-0386-1 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	5CEXH0912XAH	14.9	Diesel	Diesel	HHDD	PCM, EGR, DDI, TC, CAC

ENGINE (L)	ENGINE MODELS / CODES (rated power, in hp)
14.9	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	*	*	2.5	2.5	15.5	15.5	*	*	*	*
FEL	*	*	*	*	*	*	*	*	0.09	0.09	*	*
CERT	0.2	0.1	*	*	2.3	1.9	1.0	0.4	0.09	0.07	*	*
NTE	0.625		*		3.125		19.375		0.1125		*	

[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-021-0386 dated December 20, 2004.

Executed at El Monte, California on this 6TH day of June 2005.

Allen Lyons, Chief
Mobile Source Operations Division

Engine Model Summary Form

A-021-0386-1

" Attachment "

Manufacturer: **Cummins Inc.**

Engine category: **On-highway HDDE**

EPA Engine Family: **5CEXH0912XAH**

Mfr Family Name: **103H**

Process Code: **New Submission**

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
8259;FR10427	ISX 500	525@1800	337	204	1850@1200	388	157	CAC, PCM, EGR, TC,
8259;FR10426	ISX 500ST2	525@1800	337	204	1650@1200	337	137	PCM, EGR, TC,
8259;FR10425	ISX 500	525@1800	337	204	1650@1200	337	137	PCM, EGR, TC,
8259;FR10422	ISX 475	500@1800	315	191	1650@1200	337	137	PCM, EGR, TC,
8259;FR10421	ISX 450	464@1800	280	170	1650@1200	337	137	PCM, EGR, TC,
8259;FR10419	ISX 450ST2	464@1800	280	170	1450@1200	296	120	PCM, EGR, TC,
8259;FR10418	ISX 400	425@1800	254	154	1650@1200	337	137	PCM, EGR, TC,
8259;FR10416	ISX 400ST2	425@1800	254	154	1450@1200	296	120	PCM, EGR, TC,
8259;FR10415	ISX 400	425@1800	254	154	1450@1200	296	120	PCM, EGR, TC,
8285;FR10481	ISX 500	525@1800	325	197	1850@1200	371	150	PCM, EGR, TC,
8285;FR10480	ISX 500	525@1800	325	197	1650@1200	320	129	PCM, EGR, TC,
8285;FR10482	ISX 500ST	525@1800	325	197	1650@1200	320	129	PCM, EGR, TC,
8285;FR10485	ISX 525	525@1800	325	197	1650@1200	320	129	PCM, EGR, TC,
8285;FR10486	ISX 525	525@1800	325	197	1650@1200	320	129	PCM, EGR, TC,
8285;FR10478	ISX 475	500@1800	304	185	1850@1200	371	150	PCM, EGR, TC,
8285;FR10477	ISX 475	500@1800	304	185	1650@1200	320	129	PCM, EGR, TC,
8285;FR10479	ISX 475ST	500@1800	304	185	1650@1200	320	129	PCM, EGR, TC,
8285;FR10475	ISX 450	464@1800	266	162	1650@1200	320	129	PCM, EGR, TC,
8285;FR10474	ISX 450	464@1800	266	162	1550@1200	291	118	PCM, EGR, TC,
8285;FR10471	ISX 400	425@1800	241	146	1650@1200	320	129	PCM, EGR, TC,
8285;FR10470	ISX 400	425@1800	241	146	1550@1200	291	118	PCM, EGR, TC,
8285;FR10469	ISX 400	425@1800	241	146	1450@1200	273	110	PCM, EGR, TC,
8285;FR10492	ISX 465V	464@1800	266	162	1650@1200	320	129	PCM, EGR, TC,
8285;FR10493	ISX 325V	425@1800	241	146	1450@1200	273	110	PCM, EGR, TC,
8283;FR10484	ISX 565	590@1800	349	212	1850@1200	371	150	PCM, EGR, TC,
8283;FR10483	ISX 530	550@1800	328	199	1850@1200	371	150	PCM, EGR, TC,
8283;FR10481	ISX 500	525@1800	315	191	1850@1200	371	150	PCM, EGR, TC,
[illegible]	ISX 500	525@1800	315	191	1650@1200	327	132	PCM, EGR, TC,

A-021-0386-1

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8283;FR10482	ISX 500ST	525@1800	315	191	1650@1200	327	132	PCM, EGR, TC,
8283;FR10478	ISX 475	500@1800	295	179	1850@1200	371	150	PCM, EGR, TC,
8283;FR10477	ISX 475	500@1800	295	179	1650@1200	327	132	PCM, EGR, TC,
8283;FR10479	ISX 475ST	500@1800	295	179	1650@1200	327	132	PCM, EGR, TC,
8283;FR10485	ISX 525	525@1800	315	191	1650@1200	327	132	PCM, EGR, TC,
8283;FR10486	ISX 525	525@1800	315	191	1650@1200	327	132	PCM, EGR, TC,
8283;FR10507	ISX 600	600@1800	355	216	1850@1200	370	150	PCM, EGR, TC,
8283;FR10508	ISX 600	600@1800	355	216	1850@1200	370	150	PCM, EGR, TC,
8518;FR10507	ISX 600	600@1800	357	217	1850@1200	358	145	PCM, EGR, TC,
8518;FR10485	ISX 525	525@1800	325	197	1650@1200	327	132	PCM, EGR, TC,
8518;FR10486	ISX 525	525@1800	325	197	1650@1200	327	132	PCM, EGR, TC,
8518;FR10484	ISX 565	590@1800	350	212	1850@1200	358	145	PCM, EGR, TC,
8518;FR10483	ISX 530	550@1800	335	203	1850@1200	358	145	PCM, EGR, TC,
8519;FR10481	ISX 500	525@1800	325	197	1850@1200	358	145	PCM, EGR, TC,
8519;FR10480	ISX 500	525@1800	325	197	1650@1200	327	132	PCM, EGR, TC,
8519;FR10482	ISX 500ST	525@1800	325	197	1650@1200	327	132	PCM, EGR, TC,
8519;FR10478	ISX 475	500@1800	308	187	1850@1200	358	145	PCM, EGR, TC,
8519;FR10477	ISX 475	500@1800	308	187	1650@1200	327	132	PCM, EGR, TC,
8519;FR10479	ISX 475ST	500@1800	308	187	1650@1200	327	132	PCM, EGR, TC,
8518;FR10602	ISX 530	540@1800	329	200	1590@1200	321	130	PCM, EGR, TC,
8383: FR10480	ISX 500	535@1800	315	191	1650@1200	327	132	PCM, EGR, TC