California Environmental Protection Agency AIR RESOURCES BOARD	VOLVO POWERTRAIN CORPORATION	EXECUTIVE ORDER A-242-0051-1 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]	DIAGNOSTIC [6]
2009	9VPTH12.8H02	12.8	Diesel	Diesel	HHDD	DDI, TC, CAC, ECM, EGR, OC, PTOX	EMD

PRIMARY ENGINE'S IDLE EMISSIONS CONTROL [5]	ADDITIONAL IDLE EMISSIONS CONTROL [5]
30g	N/A.

ENGINE (L)	ENGINE MODELS / CODES (rated power, in hp)
12.8	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/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; **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;

[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**=on-board diagnostic system (13 CCR 1971.1);

Following are: 1) the FTP exhaust emission standards, or family emission limit(s) as applicable, under 13 CCR 1956.8; 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, 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 1956.8 are in parentheses.).[4]

in g/bhp-hr	NMHC		NOx		NMHC+NOx		CO		PM		HCHO	
	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO
STD	0.14	0.14	*	*	*	*	15.5	15.5	*	*	*	*
FEL	*	*	1.16	1.16	1.3	1.3	*	*	0.00	0.00	*	*
CERT	0.03	0.02	1.1	1.02	1.13	1.04	*	*	0.001	0.000	*	*
NTE	0.21		1.74		2.0		19.4		0.02		*	

[4] **g/bhp-hr**=grams per brake horsepower-hour; **FTP**=Federel Test Procedure; **EURO**=Euro III European Steady-State Cycle, including **RMCSET**=ram mode cycle 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; **(Rev.: 2007-02-26)**

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: 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" adopted Dec. 12, 2002, as last amended Sep. 1, 2006, 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 models have been certified to the split engine family standards under 13 CCR 1956.8(b) [diesel engines] or 13 CCR 1956.8(d) [Otto engines] and the incorporated 40 CFR 86.007-15(m)(9).

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.

This Executive Order hereby cancels and replaces Executive Order A-242-0051 dated, December 23, 2008.

The Bureau of Automotive Repair will be notified by copy of this Executive Order.

Executed at El Monte, California on this 17th day of December 2009.

Annette Hebert, Chief
Mobile Source Operations Division

Attachment A-242-00541

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
9VPTH12.8H02	N/A	MP8 - 485M	338 @ 2100	182.6	126.6	1765 @ 1100	324.5	117.9	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	MP8 - 455M	338 @ 2100	182.6	126.6	1733 @ 1100	318.5	115.7	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	MP8 - 425M	338 @ 2100	182.6	126.6	1631 @ 1100	311.3	113.1	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	MP8 - 485C	338 @ 2100	182.6	126.6	1693 @ 1100	322.1	117.0	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	MP8 - 445C	338 @ 2100	182.6	126.6	1693 @ 1100	319.7	116.1	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	MP8 - 415C	338 @ 2100	182.6	126.6	1693 @ 1100	319.7	116.1	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	MP8 - 485E	338 @ 2100	182.6	126.6	1693 @ 1100	319.7	116.1	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	MP8 - 455E	338 @ 2100	182.6	126.6	1693 @ 1100	319.7	116.1	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	MP8 - 425E	338 @ 2100	182.6	126.6	1590 @ 1200	300.5	119.1	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	D13F- 485	338 @ 2100	182.6	126.6	1693 @ 1050	317.3	110.0	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	D13F- 435	338 @ 2100	182.6	126.6	1693 @ 1050	317.3	110.0	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	D13F- 425	338 @ 2100	182.6	126.6	1591 @ 1050	302.9	105.0	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	D13F- 405	338 @ 2100	182.6	126.6	1489 @ 1000	276.5	91.3	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	D13F- 375	326 @ 2100	179.1	124.2	1489 @ 1000	276.5	91.3	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	D13F- 335	307 @ 2100	174.4	120.9	1387 @ 1000	268.0	88.5	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	D13F- 515P	338 @ 2100	182.6	126.6	1733 @ 1100	318.5	115.7	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	D13F- 485P	338 @ 2100	182.6	126.6	1647 @ 1050	308.8	107.0	EM,EC,TC,CAC,DI,EGR,DPF
9VPTH12.8H02	N/A	D13F- 435P	338 @ 2100	182.6	126.6	1647 @ 1050	308.8	107.0	EM,EC,TC,CAC,DI,EGR,DPF

DD1, TC, CAC, ECM, EGR, OC, PTOX

All Ratings