State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER B-62-5

Relating to Conversion of Engines to Alternative Fuels

AMERICAN POWER GROUP

Pursuant to the authority vested in the Air Resources Board by Sections 43004 and 43006 of the Health and Safety Code and Section 10753(d) of the Revenue and Taxation Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-14-012;

IT IS ORDERED AND RESOLVED: The bi-fuel compressed natural gas/diesel (CNG/diesel) and liquefied natural gas/diesel (LNG/diesel) retrofit system, manufactured by American Power Group (APG) of 2503 East Poplar Street, Algona, Iowa 50611, is certified as described below for the following 2011 model-year Volvo Powertrain Corporation 12.8L Heavy Heavy-Duty Diesel Engine.

Fuel Type: Diesel to bi-fuel CNG/diesel or LNG/diesel

Engine Family: BVPTH12.8S01 Displacement: 12.8 liter

Engine Models: See Attachment A

Major Retrofit System Components:

Component	Part Number
High Pressure Shutoff Valve	100603
High Pressure Regulator	100618
Low Pressure Shutoff Valve	102235
Low Pressure Regulator	102111
Electronic Throttle Body	101120
Venturi Mixer Tube Assembly	101569
Venturi Sleeve	101254
Low vacuum Sensor	101254
Electronic Control Module	101398
Remote Display Unit	102114
Dedicated Wiring Harness	101763
	101764
	101808

All emission control systems and the engine manufacturer's tune-up label shall be retained. The engine shall be adjusted to APG's tune-up specifications. The production

retrofit system shall be in all material respect the same as that for which certification is granted.

The certification exhaust emission standards for this engine family in grams per brake horsepower-hour are:

FTP and SET	NMHC	NOx	CO	PM
Emissions Standards (g/bhp.hr)				
HDDE @ 10 Years/435,000 Miles/22,000 hrs	0.14	0.20	15.5	0.01
Family Emission Limit				0.00

The certification exhaust emission values for this engine family with the diesel and bi-fuel CNG/diesel or bi-fuel LNG/diesel retrofit system in grams per brake horsepower-hour are:

Certification Levels (g/bhp.hr) @ 10 Years or 435,000 Miles or 22,000 hrs		NMHC	NOx	CO	PM
CNG/Diesel or LNG/Diesel	FTP	0.002	0.20	6.1	0.001
	SET	0.000	0.18	0.1	0.000
Diesel	FTP	0.01	0.12	*	0.003
	SET	0.003	0.11	*	0.001

BE IT FURTHER RESOLVED: The retrofit system manufacturer has submitted and the Executive Officer hereby approves the materials in the application to demonstrate certification compliance with the emission standards set forth in Section 4 of the "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems for 2004 and Subsequent Model Year On-Road Motor Vehicles and Engines."

BE IT FURTHER RESOLVED: The retrofit system manufacturer has submitted and the Executive Officer hereby approves the materials in the application to demonstrate certification compliance with the on-board diagnostic system requirements in Section 6 of the "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems for 2004 and Subsequent Model Year On-Road Motor Vehicles and Engines."

BE IT FURTHER RESOLVED: The retrofit system manufacturer shall provide a supplemental emission control information label, which shall be affixed in a permanent manner adjacent to the original Vehicle Emission Control Information label, and shall comply with the labeling requirements described in Section 3(e) of the "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems for 2004 and Subsequent Model Year On-Road Motor Vehicles and Engines."

BE IT FURTHER RESOLVED: The retrofit system manufacturer has submitted and the Executive Officer hereby approves the materials required to demonstrate certification compliance with the warranty requirements, including warranty notification under

Sections 3(f)(5) , 3(g), and 9 of the "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems for 2004 and Subsequent Model Year On-Road Motor Vehicles and Engines."

BE IT FURTHER RESOLVED: The retrofit system manufacturer may be subject to in-use enforcement emission testing as described in Section 12 of the "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems for 2004 and Subsequent Model Year On-Road Motor Vehicles and Engines."

BE IT FURTHER RESOLVED: The retrofit system manufacturer shall maintain a record of each engine on which the retrofit system is installed as required in Section 3(h) of the "California Certification and Installation Procedures for Alternative Fuel Retrofit Systems for 2004 and Subsequent Model Year On-Road Motor Vehicles and Engines." The manufacturer shall supply a copy of installation information upon request and annually report the annual sales by March 1 of the following calendar year.

The retrofit system certified under this Executive Order must conform to all applicable California emission regulations. Certification of the retrofit system shall not be construed as a certification to sell, offer for sale, or advertise any component of the retrofit system as an individually certified part.

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

Executed at El Monte, California on this 19th day of April 2016.

For Annette Hebert, Chief
Emissions Compliance, Automotive Regulations and Science Division

Engine Model Summary Template

Attachment A
3/21/16

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 (SAE Gross)	7.Fuel Rate: mm/stroke@peak torque	8.Fuel Rate: (lbs/hr)@peak torque	9.Emission Control Device Per SAE J1930
BVPTH12.8S01	N / A	D13H - 500	500 @ 1700	307.5	174.5	1812 @ 1050	336.8	118.1	EM,EC,TC,
BVPTH12.8S01	N / A	D13H - 475	475 @ 1800	279.7	168.1	1734 @ 1050	324.6	113.8	EM,EC,TC,
BVPTH12.8S01	N / A	D13H - 435	435 @ 1700	286.7	162.7	1711 @ 1050	317.8	111.4	EM,EC,TC,
BVPTH12.8S01	N / A	D13H - 425	425 @ 1700	273.2	155.1	1600 @ 1050	297.7	104.4	EM,EC,TC,
BVPTH12.8S01	N / A	D13H - 425	425 @ 1700	258.8	146.9	1807 @ 1050	340.4	119.3	EM,EC,TC,
BVPTH12.8S01	N / A	D13H - 405	405 @ 1700	250.2	142.0	1508 @ 1000	278.1	92.9	EM,EC,TC,
BVPTH12.8S01	N / A	D13H - 405	405 @ 1700	246.2	139.8	1732 @ 1050	326.8	114.6	EM,EC,TC,
BVPTH12.8S01	N / A	D13H - 375	375 @ 1700	236.7	134.4	1506 @ 1000	277.6	92.7	EM,EC,TC,
BVPTH12.8S01	N / A	D13H - 500P	500 @ 1700	298.9	169.7	1765 @ 1050	328.3	115.1	EM,EC,TC,
BVPTH12.8S01	N / A	D13H - 435P	435 @ 1700	268.4	152.3	1727 @ 1050	321.3	112.6	EM,EC,TC,
BVPTH12.8S01	N / A	MP8 - 505E	505 @ 1700	308.2	174.9	1824 @ 1100	340.3	125	EM,EC,TC,
BVPTH12.8S01	N / A	MP8 - 445E	445 @ 1700	286.0	162.3	1780 @ 1100	330.4	121.3	EM,EC,TC,
BVPTH12.8S01	N / A	MP8 - 415E	415 @ 1700	266.9	151.5	1702 @ 1100	314.4	115.5	EM,EC,TC,
BVPTH12.8S01	N / A	MP8 - 505C	505 @ 1500	341.9	171.3	1824 @ 1100	336.2	123.5	EM,EC,TC,
BVPTH12.8S01	N / A	MP8 - 445C	445 @ 1500	311.3	155.9	1780 @ 1100	330.4	121.3	EM,EC,TC,
BVPTH12.8S01	N / A	MP8 - 415C	415 @ 1500	290.1	145.3	1702 @ 1100	314.4	115.5	EM,EC,TC,
BVPTH12.8S01	N / A	MP8 - 505M	505 @ 1700	309.2	175.5	1837 @ 1100	340.7	125.1	EM,EC,TC,
BVPTH12.8S01	N / A	MP8 - 455M	455 @ 1700	282.1	160.2	1715 @ 1100	317.9	116.8	EM,EC,TC,
BVPTH12.8S01	N / A	MP8 - 425M	425 @ 1700	274.1	155.6	1602 @ 1100	296.6	109	EM,EC,TC,
BVPTH12.8S01	N / A	D13H-455	455@1700	277	157	1761@1050	329	115	EM,EC,TC,

All Codes:
ECM, TC, CAC, EGR, DDI, DOC, PTOX, SCR, AMOX