



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

NOV 20 2012

OFFICE OF AIR AND RADIATION

Mr. Kevin Brown
Clean Diesel Technologies, Inc.
83 Commerce Valley Drive East
Thornhill, Ontario
L3T 7V1
Canada

Dear Mr. Brown:

The U.S. Environmental Protection Agency (EPA) has reviewed your request for verification of the Clean Diesel Technologies, Incorporated (CDTi) (formerly Engine Control Systems Limited) Purifilter EGR diesel particulate filter (DPF) for on-highway EGR engines listed in Attachment A. This technology incorporates a catalyzed diesel oxidation catalyst (DOC) and silicon carbide wall-flow filter with passive regeneration. The Purifilter EGR also includes an electronic data-logger to monitor exhaust backpressure and temperature with an alarm system that alerts fleet operators when the filter requires maintenance.

Based on our evaluation of your application, verification test data, and additional information provided, EPA hereby verifies that this technology reduces emissions of certain criteria pollutants by the percentages described in the table below, for the engine families listed in Attachment A.

Table with 4 columns: Manufacturer, Technology, Applicability, and Reductions (%). The Reductions (%) column is further divided into PM, NOx, HC, and CO. The data row shows CDTi, Purifilter EGR Diesel Particulate Filter (DPF), and reduction percentages of 90, N/A, 90, and 85.

This technology is approved for use on the engines detailed in the attachment, provided all of the operating criteria are met as described below:

- 1. As there may be variations from application to application, data logging and a review of actual vehicle operating conditions are required to ensure Purifilter EGR compatibility. The installer must provide the fleet owners and/or operators with a copy of the pre- and post-installation checklists, as well as copies of the data logging results. Fleet

owners/operators shall be responsible for adhering to the recommended maintenance schedule.

2. The engine exhaust temperature must be at least 240°C for at least 40% of the time the vehicle operates. In addition, the Duty Cycle Index (DCI), as defined by CDTi, must be achieved.
3. The engine NO_x-to-PM ratio must be greater than or equal to 18.
4. The engine must not have engine out opacity greater than 20% as measured by the SAE J1667 Recommended Practice.
5. The engine must not have been certified with an original equipment manufacturer (OEM) DPF.
6. The engine must be operated on ultra-low sulfur diesel (ULSD) fuel containing at maximum 15 ppm sulfur.
7. The engine must be operated with low-ash lubricating oil.
8. Fuel additives may not be mixed with fuel unless explicitly approved by EPA for use with this device.
9. The engine must be in proper operating condition, well maintained, and not consume lubricating oil at a rate greater than that specified by the engine manufacturer.
10. The vehicle may not be equipped with an oil burning system, and lube oil or other oils may not be mixed with the fuel.
11. CDTi installs a back-pressure monitor and logger unit and the remote driver display is visible to drivers while seated in the driver's seat.

CDTi estimates this device will incur no discernable fuel economy penalty when used in a compatible application.

If the Purifilter EGR is modified from the application description provided to EPA and not representative of products tested for verification, you must notify EPA immediately. This verification does not automatically confer to modified devices or devices that are similar to this verification.

Information on the Purifilter EGR, percent reductions, and applicable engines will be posted on the EPA's Verified Technology List website at: <http://www.epa.gov/cleandiesel/verification/verif-list.htm>. CDTi will be responsible for adhering to in-use testing program requirements, including submission of all in-use test data to EPA, as outlined in EPA's in-use test methods.

Thank you for participating in EPA's Technology Assessment Center Verification Program. If you have any questions or comments, please contact Michael Geller, of my staff, at (202) 343-9295.

Sincerely,

A handwritten signature in black ink that reads "Jim Blubaugh". The signature is written in a cursive, slightly slanted style.

Jim Blubaugh, Deputy Director
Transportation and Climate Division
Office of Transportation and Air Quality

Attachment A: Applicable Engine Families for the CDTi Purifier EGR
November 20, 2012

Model Year	Manufacturer	Engine Family	Displacement (L)
2002	Cummins	2CEXH0912XAG	14.9
2002	International	2NVXH0365AEA	6.0
2002	Mack	2MKXH11.9H64	11.9
2003	Cummins	3CEXA0359BAF	5.9
2003	Cummins	3CEXH0359BAG	5.9
2003	Cummins	3CEXH0359BAH	5.9
2003	Cummins	3CEXH0661MAT	10.8
2003	Cummins	3CEXH0661MAU	10.8
2003	Cummins	3CEXH0912XAH	14.9
2003	Cummins	3CEXH0912XAJ	14.9
2003	Detroit Diesel Corporation	3DDXH12.7EGY	12.7
2003	Detroit Diesel Corporation	3DDXH012.7FGY	12.7
2003	Detroit Diesel Corporation	3DDXH14.0ELY	14.0
2003	Detroit Diesel Corporation	3DDXH014.0FLY	14.0
2003	International	3NVXH0365AEA	6.0
2003	International	3NVXH06.0AEA	6.0
2003	International	3NVXH06.0AEC	6.0
2003	Mack	3MKXH11.9H64	11.9
2003	Mack	3MKXH11.9H70	11.9
2003	Volvo	3VTXH12.150S	12.1
2004	Caterpillar	4CPXH0442HBK	7.2
2004	Caterpillar	4CPXH0537HBK	8.8
2004	Caterpillar	4CPXH0537HBX	8.8
2004	Caterpillar	4CPXH0680EBK	11.1
2004	Caterpillar	4CPXH0763EBK	12.5
2004	Caterpillar	4CPXH0928EBK	15.2
2004	Cummins	4CEXH0359BAA	5.9
2004	Cummins	4CEXH0359BAD	5.9
2004	Cummins	4CEXA0359BAE	5.9
2004	Cummins	4CEXH0359BAG	5.9
2004	Cummins	4CEXH0359BAH	5.9
2004	Cummins	4CEXH0505CAR	8.3
2004	Cummins	4CEXH0505CAS	8.3
2004	Cummins	4CEXH0505CAU	8.3
2004	Cummins	4CEXH0540LAE	8.3
2004	Cummins	4CEXH0661MAT	10.8
2004	Cummins	4CEXH0661MAU	10.8

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Model Year	Manufacturer	Engine Family	Displacement (L)
2004	Cummins	4CEXH0912XAH	14.9
2004	Cummins	4CEXH0912XAJ	14.9
2004	DDC	4DDXH12.7EGY	12.7
2004	DDC	4DDXH14.0ELY	14.0
2004	General Engine Products	4GEPH06.5527	6.5
2004	Hino	4HMXH04.7JTA	4.7
2004	Hino	4HMXH07.7JTA	7.7
2004	Hino	4HMXH07.7JTB	7.7
2004	International	4NVXH0365AEB	6.0
2004	International	4NVXH06.0AEB	6.0
2004	International	4NVXH06.0AED	6.0
2004	International	4NVXH0466AEA	7.6
2004	International	4NVXH0570AEA	9.3
2004	Isuzu	4SZXH05.23AA	5.2
2004	Isuzu	4SZH06.63AK	6.6
2004	Isuzu	4SZXH06.64AA	6.6
2004	Isuzu	4SZXH06.64AW	6.6
2004	Isuzu	4SZXH07.84RA	7.8
2004	Isuzu	4SZXH07.84RW	7.8
2004	Mack	4MKXH11.9H64	11.9
2004	Mack	4MKXH11.9H70	11.9
2004	Mack	4MKXH11.9H73	11.9
2004	Mercedes	4MBXH4.25DJA	4.3
2004	Mercedes	4MBXH6.37DJA	6.4
2004	Mercedes	4MBXH12.8DJA	12.8
2004	Volvo	4VTXH12.150S	12.1
2005	Caterpillar	5CPXH0442HBK	7.2
2005	Caterpillar	5CPXH0537HBK	8.8
2005	Caterpillar	5CPXH0680EBK	11.1
2005	Caterpillar	5CPXH0763EBK	12.5
2005	Caterpillar	5CPXH0928EBK	15.2
2005	Cummins	5CEXH0359BAA	5.9
2005	Cummins	5CEXH0359BAB	5.9
2005	Cummins	5CEXH0359BAD	5.9
2005	Cummins	5CEXA0359BAE	5.9
2005	Cummins	5CEXH0359BAF	5.9
2005	Cummins	5CEXH0359BAG	5.9
2005	Cummins	5CEXH0359BAH	5.9

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Model Year	Manufacturer	Engine Family	Displacement (L)
2005	Cummins	5CEXH0505CAR	8.3
2005	Cummins	5CEXH0505CAW	8.3
2005	Cummins	5CEXH0505CAX	8.3
2005	Cummins	5CEXH0505CAY	8.3
2005	Cummins	5CEXH0540LAE	8.8
2005	Cummins	5CEXH0540LAH	8.9
2005	Cummins	5CEXH0540LAI	8.9
2005	Cummins	5CEXH0661MAT	10.8
2005	Cummins	5CEXH0661MAU	10.8
2005	Cummins	5CEXH0661MAX	10.8
2005	Cummins	5CEXH0912XAH	14.9
2005	Cummins	5CEXH0912XAJ	14.9
2005	DDC	5DDXH12.7EGY	12.7
2005	DDC	5DDXH14.0ELY	14.0
2005	General Engine Products	5GEPH06.5527	6.5
2005	General Motors	5GMXH06.6590	6.5
2005	General Motors	5GMXH06.6591	6.6
2005	General Motors	5GMXH06.6592	6.6
2005	General Motors	5GMXH06.6593	6.6
2005	Hino	5HMXH04.7JTA	4.7
2005	Hino	5HMXH07.7JTA	7.7
2005	Hino	5HMXH07.7JTB	7.7
2005	International	5NVXH0275AEA	4.5
2005	International	5NVXH0365AEC	6.0
2005	International	5NVXH06.0AEC	6.0
2005	International	5NVXH06.0AED	6.0
2005	International	5NVXH0466AEA	7.6
2005	International	5NVXH0570AEA	9.3
2005	Isuzu	5SZXH05.23AB	5.2
2005	Isuzu	5SZXH07.84RA	7.8
2005	Isuzu	5SZXH07.84RB	7.8
2005	Isuzu	5SZXH07.84RW	7.8
2005	Mack	5MKXH11.9H70	11.9
2005	Mack	5MKXH11.9H73	11.9
2005	Mercedes	5MBXH4.25DJA	4.3
2005	Mercedes	5MBXH6.37DJA	6.4
2005	Mercedes	5MBXH7.20DJA	4.8
2005	Mercedes	5MBXH7.20DJA	7.2
2005	Mercedes	5MBXH12.8DJA	12.8

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Model Year	Manufacturer	Engine Family	Displacement (L)
2005	Mitsubishi Fuso	5MFTH04.9M5A	4.9
2005	Mitsubishi Fuso	5MFTH07.5M6A	7.5
2005	Volvo	5VTXH12.150S	12.1
2006	Caterpillar	6CPXH0442HBK	7.2
2006	Caterpillar	6CPXH0537HBK	8.8
2006	Caterpillar	6CPXH0680EBK	11.1
2006	Caterpillar	6CPXH0763EBK	12.5
2006	Caterpillar	6CPXH0928EBK	15.2
2006	Cummins	6CEXH0359BAA	5.9
2006	Cummins	6CEXH0359BAB	5.9
2006	Cummins	6CEXH0359BAD	5.9
2006	Cummins	6CEXA0359BAE	5.9
2006	Cummins	6CEXH0359BAF	5.9
2006	Cummins	6CEXH0359BAG	5.9
2006	Cummins	6CEXH0359BAH	5.9
2006	Cummins	6CEXH0359BAI	5.9
2006	Cummins	6CEXH0505CAW	8.3
2006	Cummins	6CEXH0505CAX	8.3
2006	Cummins	6CEXH0505CAY	8.3
2006	Cummins	6CEXH0540LAI	8.9
2006	Cummins	6CEXH0540LAJ	8.9
2006	Cummins	6CEXH0661MAT	10.8
2006	Cummins	6CEXH0661MAU	10.8
2006	Cummins	6CEXH0661MAX	10.8
2006	Cummins	6CEXH0912XAH	14.9
2006	Cummins	6CEXH0912XAJ	14.9
2006	DDC	6DDXH12.7EGY	12.7
2006	DDC	6DDXH14.0ELY	14.0
2006	General Engine Products	6GEPH06.6595	6.6
2006	General Engine Products	6GEPH06.5527	6.5
2006	General Motors	6GMXH06.6590	6.6
2006	General Motors	6GMXH06.6591	6.6
2006	Hino	6HMXH04.7JTA	4.7
2006	Hino	6HMXH07.7JTA	7.7
2006	Hino	6HMXH07.7JTB	7.7
2005	International	6NVXH0275AEA	4.5
2005	International	6NVXH0365AEC	6.0
2006	International	6NVXH06.0AEC	6.0

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Model Year	Manufacturer	Engine Family	Displacement (L)
2006	International	6NVXH06.0AED	6.0
2006	International	6NVXH0466AEA	7.6
2006	International	6NVXH0570AEA	9.3
2006	Isuzu	6SZXH05.23AB	5.2
2006	Isuzu	6SZXH07.84RA	7.8
2006	Isuzu	6SZXH07.84RW	7.8
2006	Mack	6MKXH11.9H70	11.9
2006	Mack	6MKXH11.9H73	11.9
2006	Mack	6MKXH10.8C02	10.8
2006	Mercedes	6MBXH4.25DJA	4.3
2006	Mercedes	6MBXH6.37DJA	6.4
2006	Mercedes	6MBXH7.20DJA	4.8
2006	Mercedes	6MBXH7.20DJA	7.2
2006	Mercedes	6MBXH12.8DJA	12.8
2006	Mitsubishi Fuso	6MFTH04.9M5A	4.9
2006	Mitsubishi Fuso	6MFTH07.5M6A	7.5
2006	Volvo	6VTXH12.150S	12.1
2006	Volvo	6VTXH16.1C01	16.1
2007	Cummins	7CEXH0661MAC	10.8
2007	International	7NVXH06.0AEC	6.0
2007	International	7NVXH06.0AED	6.0
2008	Cummins	8CEXH0661MAC	10.8
2008	DDC	8DDXH06.4TER	6.4
2008	DDC	8DDXH07.2TER	4.8
2008	DDC	8DDXH07.2TER	7.2
2008	DDC	8DDXH12.8TER	12.8
2008	International	8NVXH06.0AEC	6.0
2008	International	8NVXH06.0AED	6.0
2009	Cummins	9CEXH0661MAC	10.8
2009	DDC	9DDXH06.4TER	6.4
2009	DDC	9DDXH07.2TER	4.8
2009	DDC	9DDXH07.2TER	7.2
2009	DDC	9DDXH12.8TER	12.8
2009	International	9NVXH06.0AEC	6.0
2009	International	9NVXH06.0AED	6.0
2010	DDC	ADDXH06.4TER	6.4
2010	DDC	ADDXH07.2TER	4.8
2010	DDC	ADDXH07.2TER	7.2
2010	DDC	ADDXH12.8TER	12.8