

**State of California
AIR RESOURCES BOARD**

EXECUTIVE ORDER DE-08-008-05

Pursuant to the authority vested in the Air Resources Board (ARB) 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;

Relating to Exemptions under Section 27156 of the Vehicle Code, and Verification under Sections 2700 through 2711 of Title 13 of the California Code of Regulations (CCR):

Johnson Matthey, Incorporated
Continuously Regenerating Technology (CRT[®]) Particulate Filter

ARB has reviewed Johnson Matthey, Incorporated's request for verification of the CRT[®] Particulate Filter. Based on an evaluation of the data provided, and pursuant to the terms and conditions specified below, the Executive Officer of ARB hereby finds that the CRT[®] Particulate Filter reduces emissions of diesel particulate matter (PM) consistent with a Level 3 Plus device (greater than or equal to an 85 percent reduction and meets the 2009 nitrogen dioxide emissions limit) (Title 13 CCR Section 2702 and Section 2708). Accordingly, the Executive Officer determines that the system merits verification and, subject to the terms and conditions specified below, classifies the CRT[®] Particulate Filter as a Level 3 Plus system for heavy-duty diesel on-road vehicles. Engines for which the CRT[®] system is verified, the verified parts list, the verified labels, swapping and re-designation information, and other product information can be found here:

<http://www.arb.ca.gov/diesel/verdev/companies/jm/crt.htm>

The aforementioned verification is subject to the following terms and conditions:

- The engine must be originally manufactured from model year 1994 through 2004 and have an engine family name listed at:
<http://www.arb.ca.gov/diesel/verdev/companies/jm/crt.htm>
- The engine must be used by an on-road motor vehicle with a manufacturer's Gross Vehicle Weight Rating of over 14,000 pounds.
- Only one system may be installed per engine, and it must be installed in the verified configuration.
- Each CRT[®] Particulate Filter can only be used to treat the exhaust of one engine.
- The engine must not be certified by ARB as having exhaust gas recirculation.

- The application must have a duty cycle with an average temperature profile greater than 240 degrees Celsius for 40 percent of the operating cycle.
- The engine must be certified at a PM emission level of at most 0.1 grams per brake horsepower-hour (g/bhp-hr) and greater than 0.01 g/bhp-hr.
- The engine must be certified at an oxides of nitrogen (NOx) or non-methane hydrocarbon plus NOx emission level above 3.2 g/bhp-hr.
- The certified engine emissions levels must be such that the NOx to PM ratio is at least 8.
- The engine must be rated to at least 100 horsepower and at most 650 horsepower.
- The engine may or may not have a pre-existing original equipment manufacturer oxidation catalyst.
- The engine must be in its original certified configuration, except that the pre-existing oxidation catalyst from the original equipment manufacturer may be removed if CRT[®] Particulate Filter is installed. Should CRT[®] Particulate Filter be removed, the oxidation catalyst from the original equipment manufacturer must be reinstalled, returning the engine to its original certified configuration.
- The engine must not have a pre-existing diesel particulate filter (DPF).
- The engine must be certified in California for on-road applications.
- The engine must have a four-stroke combustion cycle.
- The engine may be turbocharged or naturally aspirated.
- The engine can be mechanically or electronically injected.
- The engine must be well maintained and must not consume lubricating oil at a rate greater than that specified by the engine manufacturer.
- Lube oil, or other oil, must not be mixed with the fuel.
- CRT[®] Particulate Filter must not be operated with fuel additives, as defined in Section 2701 of Title 13, of the CCR, unless explicitly verified for use with the fuel additive(s).
- CRT[®] Particulate Filter must not be used with any other systems or engine modifications without ARB and manufacturer approval.

- Swapping of the filter or re-designation of the system is permitted.
- The other terms and conditions specified below.

IT IS ALSO ORDERED AND RESOLVED: That installation of CRT[®] Particulate Filter, manufactured by Johnson Matthey, Incorporated, of 900 Forge Avenue, Suite 100, Audubon, Pennsylvania 19403-2305, has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and therefore, CRT[®] Particulate Filter is exempt from the prohibitions in Section 27156 of the Vehicle Code for installation on heavy-duty on-road vehicles. This exemption is only valid provided the engines meet the aforementioned conditions.

CRT[®] Particulate Filter must be installed as designed and consists of the following major components listed in order from exhaust inlet to outlet as they are arranged within the exhaust system of the vehicle: one inlet head with one backpressure sample hose (for backpressure sensor); and thermocouple, one diesel oxidation catalyst, one DPF, and one outlet head. CRT[®] Particulate Filter also includes a backpressure and temperature monitor with a remote display module. The major components of CRT[®] Particulate Filter and schematics of the approved product and engine labels are identified and shown, respectively, at <http://www.arb.ca.gov/diesel/verdev/companies/jm/crt.htm>.

CRT[®] Particulate Filter includes one wall-flow DPF designed to filter the exhaust from a single engine. CRT[®] Particulate Filter systems with multiple DPFs, including designs with two or more filter components canned together or multiple individually-canned filter components in parallel or in series (or any combination thereof), are not valid under this Executive Order. Channeling exhaust from a single engine through multiple CRT[®] Particulate Filter systems, deployed in parallel or in series or any combination thereof, is also not valid under this Executive Order.

This Executive Order is valid provided that installation instructions for CRT[®] Particulate Filter do not recommend tuning the vehicle to specifications different from those of the vehicle manufacturer.

Changes made to the design or operating conditions of CRT[®] Particulate Filter, as exempted by ARB, which adversely affect the performance of the vehicle's pollution control system, shall invalidate this Executive Order.

No changes are permitted to the device. ARB must be notified in writing of any changes to any part of CRT[®] Particulate Filter. Any changes to the device must be evaluated and approved in writing by ARB. Failure to do so shall invalidate this Executive Order.

Marketing of the CRT[®] Particulate Filter using identification other than that shown in this Executive Order or for an application other than that listed in this Executive Order shall be prohibited unless prior written approval is obtained from ARB.

Identification must include both device and engine labels consistent with the requirements of Title 13, CCR, Section 2706, and California verification labels of this Executive Order. Changes or modifications to the label or label placement are prohibited without prior written approval from ARB.

This Executive Order shall not apply to any CRT[®] Particulate Filter advertised, offered for sale, offered for lease, sold with, leased with, or installed on a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

As specified in the Diesel Emission Control Strategy Verification Procedure (Title 13, CCR, Section 2706), ARB assigns each Diesel Emission Control Strategy a family name. The designated family name for the verification as outlined above is:

CA/JMI/2008/PM3+/N00/ON/DPF01

Johnson Matthey, Incorporated, their distributors, or installers shall review the actual operating conditions prior to retrofitting an engine with CRT[®] Particulate Filter to ensure compliance with the terms and conditions of this Executive Order.

As stated in the Procedure, Johnson Matthey, Incorporated, is responsible for recordkeeping requirements (Section 2702), honoring the required warranty (Section 2707), and conducting in-use compliance testing (Section 2709).

This Executive Order is valid provided that the diesel fuel used in conjunction with the device complies with Title 13, CCR, Sections 2281 and 2282, and if biodiesel is used, the biodiesel blend shall be 20 percent or less subject to the following conditions:

- The biodiesel portion of the blend complies with the American Society for Testing and Materials specification D6751 applicable for 15 parts per million sulfur content; and
- The diesel fuel portion of the blend complies with Title 13, CCR, Sections 2281 and 2282.

Other alternative diesel fuels such as, but not limited to, ethanol diesel blends and water emulsified diesel fuel are excluded from this Executive Order.

Proper engine maintenance is critical for the proper functioning of the diesel emission control strategy. The owner and/or operator of the vehicle on which the diesel emission control strategy is installed, is strongly advised to adhere to all good engine maintenance practices. Failure to document proper engine maintenance, including keeping records of the engine's oil consumption, may be grounds for denial of a warranty claim.

The CRT® particulate filter must not be located over any occupied space (e.g., driver or passenger compartments), or installed in a way which would result in noncompliance with any applicable safety standards including but not limited to Federal Motor Carrier Safety Administration, Subpart G, Miscellaneous Parts and Accessories, Section 393.83 Exhaust Systems, and any other location deemed unacceptable by Johnson Matthey, Incorporated.

Johnson Matthey, Incorporated, must ensure that the installation of the CRT® Particulate Filter conforms to all applicable industrial safety requirements.

The terms and conditions of this verification must be satisfied regardless of where the system is sold in order for the system to be considered verified.

Systems sold as verified, or which carry an ARB-approved label, must satisfy all the terms and conditions of this verification.

A copy of this Executive Order must be provided to the ultimate purchaser at the time of sale.

In addition to the foregoing, ARB reserves the right in the future to review this Executive Order and the exemption and verification provided herein to assure that the exempted and verified add-on or modified part continues to meet the standards and procedures of CCR, Title 13, Section 2222, et seq, and CCR, Title 13, Sections 2700 through 2711.

Systems verified under this Executive Order shall conform to all applicable California emissions regulations.

This Executive Order does not release Johnson Matthey, Incorporated, from complying with all other applicable regulations.

Violation of any of the above conditions shall be grounds for revocation of this Executive Order.

This Executive Order hereby supersedes Executive Orders DE-08-008-04 (dated July 11, 2011), DE-08-008-03 (dated June 28, 2011), DE-08-008-02 (dated November 3, 2009); DE-08-008-01 (dated July 31, 2009); and DE-08-008 (dated December 30, 2008).

Executed at El Monte, California, this 6th day of September 2012.



Robert H. Cross, M.S.M.E., P.E.
Chief, Mobile Source Control Division