



Air Resources Board



Linda S. Adams
Acting Secretary for
Environmental Protection

Mary D. Nichols, Chairman
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Edmund G. Brown Jr.
Governor

January 14, 2011

Reference No.: 10-661-727

Mr. Kevin Brown
Marketing and Regulatory Affairs Manager
Engine Control Systems Limited
83 Commerce Valley Drive East
Thornhill, Ontario
Canada L3T 7T3

Dear Mr. Brown:

Staff of the Air Resources Board (ARB) reviewed your request for an extension of Engine Control Systems (ECS) Limited's Purifilter Plus™ verification to include certain on-road heavy-duty diesel engines certified by the United States Environmental Protection Agency (EPA). Based on the information submitted, ARB has granted an extension for Purifilter Plus™ to include model years 1994 through 2010 engines EPA certified to particulate matter emission levels of 0.1 grams per brake horsepower-hour or less. The extension includes engines certified with exhaust gas recirculation (EGR) but does not include EGR engines certified with diesel oxidation catalysts.

Enclosed please find Executive Order DE-08-010-03 for Purifilter Plus™. ARB reminds you to include the diesel emission control strategy family name on all identification labels. No changes are permitted to the system as described in the enclosed Executive Order. Any changes to the system, system components, applicable models, model years, etc., must be evaluated and approved by ARB. Additionally, as stated in the Procedure, ECS is responsible for record keeping requirements (Section 2702), honoring a warranty (Section 2707), and conducting in-use compliance testing (Section 2709).

Please note that ECS is also responsible for submitting a design change to the backpressure and monitoring system as specified in the letter (Reference No.: 10-661-630) sent from ARB, dated October 12, 2010. If the final design with appropriate supporting information is not submitted and approved by ARB within six months from the date of the aforementioned letter, ECS' Purifilter Plus™ verification will be revoked.

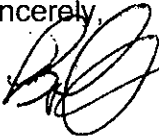
*The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption.
For a list of simple ways you can reduce demand and cut your energy costs, see our website: <http://www.arb.ca.gov>.*

California Environmental Protection Agency

Mr. Kevin Brown
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Thank you for participating in ARB's Diesel Emission Control Strategy Verification Program. If you have any questions or comments, please contact Ms. Shawn Daley, Manager, at (626) 575-6972, or by email to sdaley@arb.ca.gov, or Ms. Danielle Robinson, Air Resources Engineer, at (626) 450-6109, or by email to drobinso@arb.ca.gov.

Sincerely,



Robert H. Cross, Chief
Mobile Source Control Division

Enclosures

cc: Ms. Shawn Daley, Manager
Retrofit Assessment Section

Ms. Danielle Robinson
Air Resources Engineer
Retrofit Assessment Section

**State of California
AIR RESOURCES BOARD**

EXECUTIVE ORDER DE-08-010-03

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 Section 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 2710 of Title 13 of the California Code of Regulations (CCR)

Engine Control Systems (ECS) Limited
Purifilter Plus™

ARB has reviewed ECS' request for verification of the Purifilter Plus™ system (Purifilter Plus™ or system). 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 Purifilter Plus™ reduces emissions of diesel particulate matter (PM) consistent with a Level 3 Plus device (greater than or equal to 85 percent reductions and meets the 2009 nitrogen dioxide emissions limit) (Title 13, CCR, Sections 2702 (f) and Section 2708). Accordingly, the Executive Officer determines that the system merits verification and, subject to the terms and conditions specified below, classifies Purifilter Plus™ as a Level 3 Plus system for heavy-duty on-road vehicles using engines from the engine families listed in Attachment 1.

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

- The engine is originally manufactured from model years 1993 through 2010 having an engine family name listed in Attachment 1.
- The engine must be used by an on-road motor vehicle with a manufacturer's Gross Vehicle Weight Rating of over 14,000 pounds.
- 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 may or may not have exhaust gas recirculation (EGR).
- The engine may or may not have a pre-existing oxidation catalyst from the original equipment manufacturer except for the following:
 - Engines with EGR must not be certified with an oxidation catalyst.

- The engine must be in its original certified configuration, except that the pre-existing oxidation catalyst from the original equipment manufacturer (excluding EGR engines certified with oxidation catalysts previously described) may be removed if Purifilter Plus™ is installed. Should Purifilter Plus™ be removed, the oxidation catalyst from the original equipment manufacturer must be re-installed, returning the engine to its original certified configuration.
- The engine must not have a pre-existing diesel particulate filter (DPF) from the original equipment manufacturer.
- The engine must be certified for on-road applications.
- Only one filter may be installed per engine.
- Each Purifilter Plus™ system can only be used to treat the exhaust of one engine.
- The engine must be four-stroke.
- The engine can be turbocharged or naturally aspirated.
- The engine can be mechanically or electronically injected.
- The engine must be well maintained and 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.
- The engine must be operated on fuel that has a sulfur content of no more than 15 parts per million by weight.
- The product must not be operated with fuel additives, as defined in Section 2701 of Title 13, of the CCR, unless explicitly verified for use with fuel additive(s).
- The product must not be used with any other systems or engine modifications without ARB and manufacturer approval.
- The system must be installed with a backpressure monitor to notify the operator when the backpressure limit is reached. The notification must occur and be clearly visible to the operator while the vehicle or equipment is in use.
- Swapping of the filter or any other system components among vehicles is not permitted for systems under manufacturer warranty. Spare filters may be used during cleaning of primary filters, but upon completion of cleaning the primary filter must be promptly re-installed on the vehicle. Primary filters can only be installed on the original installation vehicle. Spare filters will be labeled as seen in Attachment 3. Swapping of spare filters must comply with Section 2706, Title 13, CCR, and the

policy document found here: <http://www.arb.ca.gov/diesel/verdev/swap/swap.htm>. Engines fitted with Purifilter Plus™ must not be operated without all properly working components.

- Purifilter Plus™ in its entirety can be re-designated to other vehicles or equipment within a common ownership fleet only if authorized by ECS. Re-designations must be performed in accordance with Section 2706, Title 13, CCR, and the policy document found here: <http://www.arb.ca.gov/diesel/verdev/swap/swap.htm>.
- The other terms and conditions specified below.

IT IS ALSO ORDERED AND RESOLVED: That installation of the Purifilter Plus™ system, manufactured by ECS of 83 Commerce Valley Drive East, Thornhill, Ontario L3T 7T3, has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and therefore, the Purifilter Plus™ system is exempt from the prohibitions in Section 27156 of the Vehicle Code for installation on heavy-duty on-road vehicles using engines listed in Attachment 1. This exemption is only valid provided the engines meet the aforementioned conditions.

The Purifilter Plus™ system must be installed as designed and the following major components must be installed in the following order in the exhaust tailpipe from upstream to downstream: one backpressure sensor and one thermocouple (these can be in reverse order or in the same cross-sectional area before the inlet section), one inlet section containing the electric heating element, and one catalyzed DPF. The system must also be equipped with a backpressure monitor and data logger that notifies the operator in a clearly visible manner when the backpressure limits have been reached while the vehicle or equipment is in use. The major components of the Purifilter Plus™ system are identified in Attachment 2. Schematics of the approved product and engine labels are shown in Attachment 3.

This Executive Order is valid provided that installation instructions for the Purifilter Plus™ system do not recommend tuning the vehicle to specifications different from those of the vehicle manufacturer.

Prior to sale of a Purifilter Plus™ system, ECS must provide each prospective owner or purchaser of a Purifilter Plus™ system with a written estimate of the number of hours of vehicle operation that will typically elapse before regeneration is required. ECS must also provide, in writing, the length of time of a typical regeneration event.

Changes made to the design or operating conditions of the Purifilter Plus™ system, 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 the Purifilter Plus™ system. Any changes to the device must be evaluated and approved by ARB in writing. Failure to do so shall invalidate this Executive Order.

ECS must ensure that the installation of Purifilter Plus™ conforms to all applicable industrial safety requirements.

Marketing of the Purifilter Plus™ system 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 Attachment 3 of this Executive Order. Changes or modifications to the label or label placement are prohibited without prior written approval from ARB.

This Executive Order does not apply to any Purifilter Plus™ system advertised, offered for sale, sold with, or installed on a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

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

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

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

Additionally, as stated in the Diesel Emission Control Strategy Verification Procedure, ECS is responsible for record keeping requirements (Section 2702), honoring the 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.

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 Title 13, CCR, Section 2222, et seq, and Title 13, CCR, Sections 2700 through 2710.

Systems included in this Executive Order shall conform to all applicable California emissions regulations.

This Executive Order does not release ECS 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 DE-08-010-03 hereby supersedes Executive Order DE-08-010-02 dated October 13, 2010, Executive Order DE-08-010-01 dated March 1, 2010, and Executive Order DE-08-010 dated December 23, 2008.

Executed at El Monte, California, on this 14th day of January 2011.



Robert H. Cross, Chief
Mobile Source Control Division

- Attachment 1: Table 1: ARB-Approved California Engine Families for the ECS' Purifilter Plus™
Table 2: ARB-Approved Engine Families for ECS' Purifilter Plus™
Table 3: ARB-Approved Federal Engine Families for ECS Purifilter Plus™
- Attachment 2: Part 1: Parts List for the ECS Purifilter Plus™ Diesel Particulate Filter
Part 2: Purifilter Plus™ / Stamped Unidirectional Flanges
- Attachment 3: California Verification Labels for Purifilter Plus™ Verified Hwy Applications and
California Verification Labels for Purifilter Plus™ Verified Hwy Applications WARRANTY REPLACEMENT FILTERS
- Attachment 4: Conditions for Spare Filter Swapping and Re-designation Policy for the Engine Control Systems (ECS) Purifilter Plus™ and Conditions for Re-Designation of ECS' Purifilter Plus™ System