



Air Resources Board



Linda S. Adams
Secretary for
Environmental Protection

Mary D. Nichols, Chairman
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El Monte, California 91731 www.arb.ca.gov

Arnold Schwarzenegger
Governor

October 20, 2008

Mr. Kevin Brown
Engine Control Systems, Limited
165 Pony Drive
Newmarket, Ontario
L3Y 7V1

Ref. No.: 08-661-379

Dear Mr. Brown:

Using the *Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines* (Procedure), Air Resources Board (ARB) staff reviewed your application for conditional verification of Purifilter™ for use with off-road diesel engines. Based on an evaluation of the data provided, and pursuant to the terms and conditions specified below, ARB hereby finds that Purifilter™ reduces emissions of diesel particulate matter (PM) consistent with a Level 3 Plus device (greater than or equal to an 85 percent reduction). ARB also finds that 33 percent of the durability demonstration period was satisfactorily completed using Purifilter™. Accordingly, ARB determines that the system merits conditional verification and, subject to the terms and conditions specified below, classifies Engine Control Systems' (ECS) Purifilter™ as a Level 3 Plus system for heavy-duty off-road vehicles using engines from the engine families listed in Attachment 1.

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

- Purifilter™ is conditionally verified for a period not to exceed three years from the date of this letter. For the Purifilter™ to be considered for full verification, ECS must complete all remaining requirements as specified in the letter 08-661-380 within three years of the date of this letter.
- Conditional verification is equivalent to verification for the purposes of satisfying the requirements of in-use emission control regulations.
- Only one filter can be installed per engine. For engines that are original engine manufacturer dual exhaust systems, including two exhaust manifolds, two mufflers, etc., no more than one filter can be installed per exhaust manifold.
- The engine must be originally manufactured from model year 1996 through 2008 having an engine family name listed in Attachment 1.
- The engine must have a maximum power output rating of at least 50 horsepower and at most 750 horsepower.

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

- The engine must be in its original certified configuration.
- The engine must be certified at a PM emission level of at most 0.2 g/bhp-hr, and greater than 0.01 g/bhp-hr.
- The engine must not employ exhaust gas recirculation.
- The application must have a duty cycle with an exhaust temperature profile greater than 280 degrees Celsius for at least 25 percent of the time for engines certified to an emissions level of 0.1 grams per brake horsepower hour (g/bhp-hr) or less.
- The application must have a duty cycle with an exhaust temperature profile greater than 320 degrees Celsius for at least 25 percent of the time for engines certified to an emissions level greater than 0.1 grams per brake g/bhp-hr and up to 0.2 g/bhp-hr.
- The engine may or may not have a pre-existing oxidation catalyst from the original equipment manufacturer.
- The engine must not have a pre-existing diesel particulate filter from the original equipment manufacturer.
- The engine must be certified for off-road applications.
- The engine must be four-stroke.
- The engine can be turbocharged or naturally aspirated.
- The engine can be mechanically or electronically injected.
- The engine should be well maintained and not consume lubricating oil at a rate greater than that specified by the engine manufacturer.
- Lube oil, or other oil, should 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 California Code of Regulations (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 other terms and conditions specified below.

It is also ordered and resolved that installation of Purifilter™, manufactured by Engine Control Systems, Limited, 165 Pony Drive, Newmarket, Ontario, Canada L3Y 7V1, has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and therefore, Purifilter™ is exempt from the prohibitions in Section 27156 of the Vehicle Code for installation on heavy-duty off-road vehicles using engines listed in Attachment 1.

This exemption is only valid provided the engines meet the aforementioned conditions.

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ARB reserves the right in the future to review this conditional verification letter and the exemption provided herein to assure that the exempted and conditionally verified add-on or modified part continues to meet the standards and procedures of Title 13, sections 2222, et seq and sections 2700 through 2710, of the CCR.

The Purifilter™ consists of a catalyzed passive diesel particulate filter and a backpressure monitor. The major components of the Purifilter™ system are identified in Attachment 2. Engine labels are shown in Attachment 3.

No changes are permitted to the device. ARB must be notified, in writing, of any changes to any part of Purifilter™. Any changes to the device must be evaluated and approved by ARB. Failure to do so shall invalidate this conditional verification.

Changes made to the design or operating conditions of Purifilter™, as exempted by ARB, which adversely affect the performance of the vehicle's pollution control system, shall invalidate this conditional verification.

Marketing of Purifilter™ using identification other than that shown in this conditional verification letter or for an application other than that listed in this conditional verification letter shall be prohibited unless prior approval is obtained from ARB.

This conditional verification shall not apply to any Purifilter™ advertised, offered for sale, sold with, or installed on a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

ARB estimates that Purifilter™ has no significant effect on average fuel economy.

As specified in the Procedure, ARB assigns each diesel emission control strategy a family name. The designated family name for the conditional verification as outlined above is:

CA/ECS/2008/PM3+/N00/OFF/DPF01.

Additionally, as stated in the Procedure, ECS is responsible for honoring the required warranty (section 2707) and conducting in-use compliance testing (section 2709).

This conditional verification 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:

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- The biodiesel portion of the blend complies with the American Society for Testing and Materials (ASTM) specification D6751 applicable for 15 ppm sulfur content;
- The diesel fuel portion of the blend complies with Title 13, CCR, sections 2281 and 2282;
- The use of biodiesel applies to devices verified to reduce only diesel particulate matter; and

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

Systems conditionally verified in this letter shall conform to all applicable California emissions regulations.

This conditional verification 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 conditional verification.

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 at sdaley@arb.ca.gov.

Sincerely,

/s/

Robert H. Cross, Chief
Mobile Source Control Division

Attachment 1: ARB-Approved Engine Families for the ECS Purifier

Attachment 2: Parts List for the ECS Purifier

Attachment 3: Label for the ECS Purifier

cc: Ms. Shawn Daley, Manager
Retrofit Assessment Section

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bcc: Erik White, MSCD
Danielle Robinson, MSCD