State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER DE-04-012-02

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 39616 and Executive Order G-02-003;

Relating to Exemptions under Section 38395 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)
Combifilter

ARB has reviewed ECS's request for verification of the Combifilter. 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 Combifilter reduces emissions of diesel particulate matter (PM) consistent with a Level 3 device (greater than or equal to 85 percent reductions) (Title 13 CCR Sections 2702 (f) and (g) and Section 2708). Accordingly, the Executive Officer determines that the system merits verification and, subject to the terms and conditions specified below, classifies the Combifilter as a Level 3 system, for rubber-tired non-road applications.

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

- The engine must be model year 2007 or older, and not belong to any of the excluded engine families listed in Attachment 1.
- The engine must be certified for off-road applications at a PM emission level equal to 0.45 grams per brake horsepower-hour (g/bhp-hr) or less. An engine that is not certified but tested to show an emission level equal to 0.45 g/bhp-hr or less is also acceptable.
- The application must not be a transport refrigeration unit or an auxiliary power unit.
- The engine displacement must be equal to or less than 12 liters.
- The engine must be in a captive fleet with a low or intermittent duty cycle.
- The engine must be able to return to regeneration control panel after operating for 8-10 hours.
- The engine can be turbocharged or naturally aspirated.
- The engine must be in its original certified or original engine manufacturer's (OEM) configuration.
- The engine must not have a pre-existing OEM oxidation catalyst.
- The engine must not have a pre-existing diesel particulate filter.
- The engine must be four-stroke.

- The engine must be certified in California for off-road applications. An engine that is not subject to California certification standards and is legal for sale in California for off-road applications is also acceptable.
- The engine must be certified to the tiers listed below:

Tier 0	Unregulated engines with PM ≤ 0.45 g/bhp-hr up to 600 HP (450 kW)
Tier 1	Engine size ≤ 600 HP (450 kW); PM ≤ 0.45 g/bhp-hr
Tier 2	Engine size ≤ 600 HP (450 kW); PM ≤ 0.45 g/bhp-hr
Tier 3	Engine size ≤ 600 HP (450 kW); PM ≤ 0.45 g/bhp-hr

  An engine that is not subject to the California certification standards and is legal for sale in California for off-road applications is also acceptable if the PM emissions are 0.45 g/bhp-hr or lower.
- The engine does not employ exhaust gas recirculation.
- ECS must review actual operating conditions (duty cycle, baseline emissions, exhaust temperature profiles, and engine backpressure) prior to retrofitting an engine with the Combifilter to ensure compatibility.
- The engine can be mechanically or electronically controlled.
- 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 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 the fuel additive(s).
- The engine must be operated on diesel fuel with a sulfur content of no more than 15 parts per million by weight.
- The product must not be used with any other systems or engine modifications without ARB and the manufacturer's 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.
- The other terms and conditions specified below.

IT IS ALSO ORDERED AND RESOLVED: That installation of the Combifilter, manufactured by Engine Control Systems, 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 Combifilter is exempt from the prohibitions in Section 27156 of the Vehicle Code for installation on heavy-duty off-road vehicles not listed in Attachment 1.

This exemption is only valid provided the engines meet the aforementioned conditions. The Combifilter is an actively regenerated non-catalyzed diesel particulate filter. The collected diesel particulate matter (PM) is stored in the filter matrix until the unit is regenerated via an electrically-heated regeneration system. The major components of the Combifilter are identified in Attachment 2.

This Executive Order is valid provided that installation instructions for the Combifilter do not recommend tuning the engine to specifications different from those of the engine manufacturer.

No changes are permitted to the device without the written approval of ARB. Changes from the verified design without written approval of the ARB shall invalidate this Executive Order.

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

Marketing of the Combifilter 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 approval is obtained from ARB.

This Executive Order shall not apply to any Combifilter advertised, offered for sale, sold with, or installed on a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

The ARB estimates that the Combifilter might incur an average fuel economy penalty of 4.7 percent.

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

CA/ECS/2004/PM3+/ N00/OFF/DPF03

The designated family name **CA/ECS/2004/PM3+/ N00/OFF/DPF03** replaces **CA/LUB/2004/PM3/N00/DPF03**.

Additionally, as stated in the Diesel Emission Control Strategy Verification Procedure, ECS is responsible for record keeping 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, California Code of Regulations (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 (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

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 California Code of Regulations, Title 13, Section 2222, et seq and California Code of Regulations, Title 13, Sections 2700 through 2710.

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

This Executive Order does not release Engine Control Systems 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-04-012-02 hereby supersedes Executive Order DE-04-012-01 dated April 24, 2007 and Executive Order DE-04-012 dated December 13, 2004.

Executed at El Monte, California, this 1st day of March 2010.

Robert H. Cross, Chief
Mobile Source Control Division

Attachment 1: Engine Families Excluded from the Combifilter Diesel Particulate Filter Verification
Attachment 2: Combifilter System Parts List
Attachment 3: Label