

**State of California  
AIR RESOURCES BOARD**

**EXECUTIVE ORDER DE-09-010**

Pursuant to the authority vested in the Air Resources Board (ARB) by Health and Safety Code, Div. 26, Part 5, Chap. 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

ESW Canada  
ThermaCat™ System

ARB has reviewed ESW Canada's (ESWC) request for verification of the ThermaCat™ 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 the ThermaCat™ system 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 (NO<sub>2</sub>) emissions limit) (Title 13, California Code of Regulations (CCR), sections 2702 (f) and 2708). Accordingly, the Executive Officer determines that the system merits verification and, subject to the terms and conditions specified below, classifies the ThermaCat™ as a Level 3 Plus system for off-road vehicles using off-road diesel engines from the engine families listed in Attachment 1.

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

- The engine must be model year 1996 through 2009 and have an engine family name listed in Attachment 1.
- The engine must be certified for off-road applications.
- The application must have a duty cycle with an average temperature profile greater than or equal to 210 degrees Celsius for 15 percent of the operating cycle.
- The engine must be certified to a PM emission level of at most 0.2 grams per brake horsepower hour (g/bhp-hr), and greater than 0.01 g/bhp-hr.
- The engine must be rated to no more than 300 horsepower and at least 175 horsepower.
- The engine must have a displacement of no more than 15 liters and at least 5 liters.
- The engine may not be certified by ARB as having exhaust gas recirculation.
- The engine must not have a pre-existing original equipment manufacturer (OEM) diesel particulate filter.
- The engine may or may not have a pre-existing OEM oxidation catalyst.
- The engine must remain in its original certified configuration, except that if an OEM oxidation catalyst is present, it may be removed if the ThermaCat™ system is installed. Should the ThermaCat™ system be removed, the OEM

oxidation catalyst must be re-installed, returning the engine to its original certified configuration.

- The engine must be four-stroke.
- The engine can be turbocharged or naturally aspirated.
- The engine can be electronically or mechanically controlled.
- 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 product must not be operated with a fuel additive, as defined in Title 13, CCR, Section 2701, unless explicitly verified for use with the fuel additive.
- 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 the ThermaCat™ system, manufactured by ESWC of 335 Connie Crescent, Concord, Ontario Canada LK4 5R2, has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and therefore, the ThermaCat™ system is exempt from the prohibitions in Sections 38390 and 38391 of the Vehicle Code for installation on off-road vehicles using engines listed in Attachment 1.

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

The ThermaCat™ system consists of a catalyzed diesel oxidation catalyst, a catalyzed silicon carbide wall-flow diesel particulate filter, a fuel injection system, two thermocouples, a backpressure monitor and a system warning display. The major components of the ThermaCat™ 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 ThermaCat™ system do not recommend tuning the vehicle to specifications different from those of the vehicle manufacturer.

Changes made to the design or operating conditions of the ThermaCat™ 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 ThermaCat™ system. 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 ThermaCat™ system using identification other than that shown in this Executive Order or for an application other than that listed in this Executive Order is 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 ThermoCat™ system advertised, offered for sale, sold 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 (i)), the ARB assigns each Diesel Emission Control Strategy a family name. The designated family name for the verification as outlined above is:

**CA/ESW/2009/PM3+/N00/OF/DPF01**

As stated in the Procedure, ESWC is responsible for complying with 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 (ASTM) specification D6751 applicable for 15 parts per million sulfur content;
- The diesel fuel portion of the blend complies with Title 13, CCR, sections 2281 and 2282; and
- The use of biodiesel applies to devices verified to reduce only diesel particulate matter.

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

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

This Executive Order does not release ESWC from complying with all other applicable regulations.

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

Executed at El Monte, California, and effective this the 28<sup>th</sup> day of April 2009.

/s/

Robert H. Cross, Chief  
Mobile Source Control Division

Attachment 1: ARB Approved Engine Families for the ThermaCat™ System

Attachment 2: Parts List for the ThermaCat™ System

Attachment 3: Labels for the ThermaCat™ System