

**State of California  
AIR RESOURCES BOARD**

**EXECUTIVE ORDER DE-04-011**

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 27156 of the Vehicle Code, and Verification under Sections 2700 through 2710 of Title 13 of the California Code of Regulations

Environmental Solutions Worldwide, Inc. (ESW)  
Particulate Reactor

ARB has reviewed ESW's request for verification of the Particulate Reactor. 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 Particulate Reactor reduces emissions of diesel particulate matter (PM) consistent with a Level 2 device (greater than or equal to 50 percent reductions) (Title 13 California Code of Regulations ("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 Particulate Reactor as a Level 2 system for the applications listed in Table 1 and engine families listed in Attachment 1.

Table 1: Appropriate Applications for the Particulate Reactor

| Diesel Emission Control Strategy | Application                   |
|----------------------------------|-------------------------------|
| Particulate Reactor              | All On-Road Applications Only |

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

- The engines are originally manufactured from model year 1991 through 1993 having the engine family numbers listed in Attachment 1.
- The engines do not employ exhaust gas recirculation.
- The application must have a duty cycle with an average exhaust temperature profile greater than 300 degrees Celsius for at least 7 percent of the operating cycle.
- The engine must not have a pre-existing original equipment manufacturer oxidation catalyst.
- The engine must not have a pre-existing diesel particulate filter.
- The engine must be certified in California for on-road applications.

- The engine must be certified at a PM emission level of at most 0.25 grams per brake horsepower-hour (g/bhp-hr), and greater than 0.01 g/bhp-hr.
- The engine must be four-stroke.
- The engine can be turbocharged or naturally-aspirated.
- 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.
- The engine must be operated on fuel that has a sulfur content of no more than 500 parts per million by weight.
- The other terms and conditions specified below.

IT IS ALSO ORDERED AND RESOLVED: That installation of the Particulate Reactor, manufactured by Environmental Solutions Worldwide, Inc. of 132 Penn Avenue, Telford, Pennsylvania 18969, has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and therefore, the Particulate Reactor is exempt from the prohibitions in Section 27156 of the Vehicle Code for installation on heavy-duty on-road vehicles listed in Attachment 1.

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

The Particulate Reactor consists of a catalyzed wire mesh and a backpressure monitor. The major components of the Particulate Reactor are identified in Attachment 2.

This Executive Order is valid provided that installation instructions for the Particulate Reactor 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 Particulate Reactor, 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. The ARB must be notified in writing of any changes to any part of the Particulate Reactor. Any changes to the device must be evaluated and approved by ARB. Failure to do so shall invalidate this Executive Order.

Marketing of the Particulate Reactor 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 Particulate Reactor 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 (g)), the ARB assigns each Diesel Emission Control Strategy a

family name. The designated family name for the verification as outlined above is: CA/ESW/2004/PM2/N00/ON/DOC01.

Additionally, as stated in the Diesel Emission Control Strategy Verification Procedure, ESW is responsible for honoring the required warranty (Section 2707) and conducting in-use compliance testing (Section 2709).

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.

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

Executed at El Monte, California, this 13<sup>th</sup> day of September 2004.

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Robert H. Cross, Chief  
Mobile Source Control Division

Attachment 1: Engine Families for which the ESW Particulate Reactor is Verified

Attachment 2: Parts List for the ESW Particulate Reactor