

**State of California
AIR RESOURCES BOARD**

The diesel emission control strategy described herein qualifies as a potential compliance option for the Air Resources Board's (ARB) in-use diesel fleet rules.

EXECUTIVE ORDER DE-06-006-07

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* Sections 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 2711 of Title 13 of the *California Code of Regulations* (CCR):

HUSS, Incorporated
FS-MK Series Diesel Particulate Filter

ARB has reviewed HUSS Incorporated's (HUSS) request for verification of the FS-MK Series Diesel Particulate Filter (FS-MK filter). 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 FS-MK filter reduces emissions of diesel particulate matter consistent with a Level 3 device (greater than or equal to 85 percent reductions) (Title 13 CCR Sections 2702 (f) and 2708) and is compliant with the 2009 nitrogen dioxide emissions limit. Accordingly, the Executive Officer determines that the system merits verification and, subject to the terms and conditions specified below, classifies the FS-MK filter as a Level 3 Plus system for on-road applications that use heavy-duty diesel engines of all model years up through and including 2006. Engines for which the FS-MK filter is verified, the verified parts list, the verified labels, swapping and re-designation information, and other product information can be found here:

<http://www.arb.ca.gov/diesel/verdev/companies/huss/fs-mk-onroad.htm>

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

- No more than two filters may be installed per engine. If two filters are installed, each filter must be canned separately and the two filters must be installed in parallel. For engines that are original engine manufacturer dual exhaust systems, one filter may be installed per exhaust system.
- Each FS-MK filter system can only be used to treat the exhaust from one engine.
- The certification status of the engine (whether it is certified in California, by the United States Environmental Protection Agency (Federal), or not certified) must be determined prior to sale or installation of a device.

- For certified engines, the engine family name must be determined prior to sale or installation of the device.
- California certified engines must be listed on the website shown above.
- If it is determined that an engine is a federal certified engine, then it must meet all the terms and conditions of the Executive Order.
- For California or federal certified engines, the certification must be reviewed to ensure the engine meets the terms and conditions of the Executive Order.
- Engines that are not California or federal certified must meet all the terms and conditions of the Executive Order.
- Engines for which a certification status cannot be identified are not eligible.
- 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 have a maximum power output rating of 810 horsepower or less.
- The engine may have external exhaust gas recirculation.
- The engine may have internal exhaust gas recirculation.
- The engine must not be certified with a diesel oxidation catalyst (DOC) from the original equipment manufacturer (OEM), unless the following conditions are met:
 - The OEM DOC is left in place and not removed.
 - The FS-MK filter is installed downstream of the DOC.
 - The backpressure sensor is installed upstream of the DOC.
- The engine must not be certified with a diesel particulate filter (DPF) from the OEM.
- The engine can be mechanically or electronically controlled.
- The engine can be turbocharged or naturally aspirated.
- Certified engines must be in their original certified configuration.
- 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 system must not be operated with fuel additives, as defined in Section 2701 of Title 13, CCR, unless explicitly verified for use with the fuel additive(s).
- Per the verifying device manufacturer, the FS-MK filter may be installed on vehicles that use the following closed crankcase ventilation (CCV) devices:
 - Donaldson Spiracle S040004, S040005, and S040020
 - Engine Control Systems (Racor) CCV4500, CCV6000, and CCV8000
 - Cummins Filtration CCV Kit CV51118
- 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 FS-MK filter, manufactured by HUSS, Incorporated of 75524 El Duna Court Suite H, Palm Desert, California 92211, has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and therefore, the FS-MK filter is exempt from the prohibitions in Section 27156 of the *Vehicle Code* for installation on all heavy-duty on-road vehicles meeting the terms and conditions of this Executive Order. This exemption is only valid provided the engines meet the aforementioned conditions.

The FS-MK filter must be installed as designed, and the following major components must be installed in the following order in the exhaust system: one backpressure sensor, one diesel fuel burner, Module A, one wall-flow DPF (Module B), and Module C. Two sets of these components may also be installed in parallel. The system must be equipped with an electronic control system that monitors backpressure and notifies the operator in a clearly visible manner when the backpressure limits have been reached while the vehicle is in use. HUSS may or may not include an optional notification buzzer which is not a warrantable part and is not considered a part of the verified system. The major components of the FS-MK system are identified in the parts list. The parts list and schematics of the approved product and engine labels are available on the website shown above.

The FS-MK filter system is comprised of one or two wall-flow DPFs designed to filter the exhaust from a single engine. FS-MK filter systems with multiple flow-through DPFs that are individually-canned in parallel or in series (or any combination thereof) are not valid under this Executive Order. Channeling exhaust from a single engine through multiple individually-canned FS-MK filter systems, deployed in parallel or in series or any combination thereof, is also not valid under this Executive Order unless the engine has a dual exhaust system as described above.

This Executive Order is valid provided that installation instructions for the FS-MK filter do not recommend tuning the vehicle to specifications different from those of the vehicle manufacturer.

No changes are permitted to the device without the written approval of ARB. Changes from the verified design without written approval of ARB 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 FS-MK filter. Any changes to the device must be evaluated and approved in writing by ARB. Failure to do so shall invalidate this Executive Order.

Prior to sale of an FS-MK system, HUSS must provide each prospective owner/purchaser of the system with a written estimate of the number of hours of vehicle operation that will elapse before regeneration is required for each vehicle. HUSS must also provide, in writing, the amount of time required for a typical regeneration event.

If, after installation of an FS-MK system on a vehicle, HUSS determines that a larger size FS-MK system is necessary to give the hours of vehicle operation between regenerations that were required by the owner at the time of installation, and the need for the larger system does not derive from a change in engine condition or duty cycle relative to when the vehicle was first assessed by HUSS or the installer, HUSS may not charge the owner for more than the incremental cost of the larger FS-MK system.

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

HUSS must ensure that the installation of the FS-MK filter conforms to all applicable industrial safety requirements.

Marketing of the FS-MK filter 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 the label information on the website shown above. 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 FS-MK filter advertised, offered for sale, offered for lease, sold with, leased with, or installed on a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

As specified in Section 2706(j) (Title 13, CCR) of the *Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines* (Procedure), ARB assigns each Diesel Emission Control Strategy a family name. The designated family name for the verification as outlined above is:

CA/HUS/2006/PM3+/N00/ON/DPF01

As stated in the Procedure, HUSS is responsible for recordkeeping requirements (Section 2702), honoring the required warranty (Section 2707), and conducting in-use compliance testing (Section 2709).

Use of system parts or replacement parts not authorized by HUSS may be grounds for denial of a warranty claim.

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.
- 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.

The FS-MK system must not be located over any occupied space (e.g., driver or passenger compartments), or installed in a way which would result in noncompliance with any applicable safety standards including but not limited to Federal Motor Carrier Safety Administration, Subpart G, Miscellaneous Parts and Accessories, Section 393.83 Exhaust Systems, and any other location deemed unacceptable by HUSS.

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.

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

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 CCR, Title 13, Section 2222, et seq, and CCR, Title 13, Sections 2700 through 2711.

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

The terms and conditions of this Executive Order must be satisfied regardless of where the system is sold in order for the system to be considered verified.

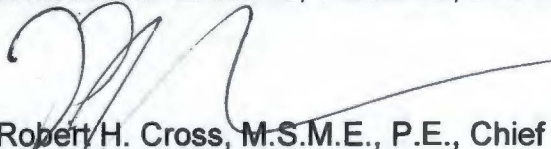
Systems sold as verified, or which carry ARB approved label, must satisfy all the terms and conditions of this Executive Order.

This Executive Order does not release HUSS 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 hereby supersedes Executive Orders DE-06-006-06 (dated February 17, 2012), DE-06-006-05 (dated August 16, 2011), DE-06-006-04 (dated February 14, 2011), DE-06-006-03 (dated October 8, 2009), DE 06-006-02 (dated August 5, 2009), DE-06-006-01 (dated July 25, 2008), and DE-06-006 (dated November 13, 2006). Each document on the webpage <http://www.arb.ca.gov/diesel/verdev/companies/huss/fs-mk-offroad.htm> which relates to Executive Order Series DE-06-006 is superseded by the document with the most current effective date.

Executed at El Monte, California, and effective this 31th day of January 2013.



Robert H. Cross, M.S.M.E., P.E., Chief
Mobile Source Control Division