

**State of California
AIR RESOURCES BOARD**

EXECUTIVE ORDER DE-06-007-05

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 38395 of the Vehicle Code and Verification under Sections 2700 through 2711 of Title 13 of the California Code of Regulations (CCR):

HUSS Umwelttechnik GmbH
FS-MK Series Diesel Particulate Filter

ARB has reviewed HUSS Umwelttechnik GmbH'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 off-road applications and portable equipment that use diesel engines of all model years up through and including 2010.

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 cased 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 engine must be model year 2010 or older.
- 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 in Attachment 1.
- 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.

- Regarding 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 have a maximum power output rating of 810 horsepower or less.
- The engine must not have external exhaust gas recirculation.
- The engine may have internal exhaust gas recirculation.
- The engine must not be certified with an oxidation catalyst from the original equipment manufacturer unless the following conditions are met:
 - The original equipment diesel oxidation catalyst is left in place and not removed.
 - The FS-MK filter is installed downstream of the diesel oxidation catalyst.
 - The backpressure sensor is installed upstream of the diesel oxidation catalyst.
- The engine must not be certified with a diesel particulate filter from the original equipment manufacturer.
- The engine must not be certified with a selective catalytic reduction system.
- The engine can be mechanically or electronically controlled.
- The engine can be turbocharged or naturally aspirated.
- Certified engines must be in original certified configuration.
- Certified engines must be certified for off-road applications unless the on-road certified engine is used to power off-road vehicles and equipment.
- The application must not be a transport refrigeration unit, an auxiliary power unit, a rubber tired gantry crane, marine, or locomotive.
- 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. FS-MK must not be operated with fuel additives, as defined in Section 2701 of Title 13, of the 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.
- Swapping of the filter(s) among other vehicles or equipment is not permitted.
- The FS-MK filter system in its entirety can be re-designated to other vehicles or equipment within a common ownership fleet only if authorized by HUSS. Re-designations must be performed in accordance with Section 2706, title 13, CCR and the policy document found here: <http://www.arb.ca.gov/diesel/verdev/swap/swap.htm>.
 - If an FS-MK filter system verified under a previous Executive Order is selected for re-designation and certain authorized engines and applications from the previous Executive Order have been excluded in this Executive Order, the FS-MK filter system must not be installed on those engines and applications.
- The other terms and conditions specified below.

IT IS ALSO ORDERED AND RESOLVED: That installation of the FS-MK filter, manufactured by HUSS Umwelttechnik GmbH of Nordostpark 74, D-90411 Nürnberg, Germany, 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 Sections 38390 and 38391 of the Vehicle Code for installation on all off-road equipment.

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 tailpipe: one backpressure sensor, one diesel fuel burner, Module A, one wall-flow diesel particulate filter (Module B), and module C or two backpressure sensors, two diesel fuel burners, two Module A parts, two wall-flow diesel particulate filters (Module B), and two Module C parts in parallel. The system must also be equipped with an electronic control system that monitors backpressures and notifies the operator in a clearly visible manner when the backpressure limits have been reached while the vehicle or equipment 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 filter 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 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. 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 FS-MK with a written estimate of the number of hours of vehicle

operation that will elapse for each installation before regeneration is required. HUSS must also provide, in writing, the length of time of a typical regeneration event.

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 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 FS-MK filter 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 (CCR, Title 13, Section 2706), 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/OFF/DPF01

As stated in the Diesel Emission Control Strategy Verification Procedure, HUSS 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, 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.

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.

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-06-007-04 (dated October 8, 2009), DE-06-007-03 (dated August 5, 2009), DE-06-007-02 (dated August 18, 2008), Executive order DE-06-007-01 (dated March 23, 2007), and DE-06-007 (dated November 13, 2006).

Executed at El Monte, California, and effective this 14th day of February 2011.



Robert H. Cross, Chief
Mobile Source Control Division

Attachment 1: Table 1: California certified off-road engines approved for HUSS FS-MK

Table 2: California certified off-road engines (with DOCs) approved for
HUSS FS-MK

Attachment 2: Parts List for the FS-MK Filter

Attachment 3: Label for the HUSS FS-MK System

HUSS FS MK System Re-Designated Label

HUSS FS-MK System Replacement Label