

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-684

Relating to Exemptions under
Section 27156 of the Vehicle Code

SK Energy
Econix DPF-A Diesel Particulate Filter

Pursuant to the authority vested in the Air Resources Board by Section 27156 of the Vehicle Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-02-003;

IT IS ORDERED AND RESOLVED: That installation of the Econix DPF-A diesel particulate filter, manufactured by SK Energy Co., Ltd. of 99, Sorin-dong, Jongro-gu, Seoul, Korea, has been found not to reduce the effectiveness of the applicable engine emission control systems, and therefore, the Econix DPF-A diesel particulate filter is exempt from the prohibitions in Section 27156 of the Vehicle Code for installation on heavy-duty on-road vehicles equipped with 1992 through 2006 model-year diesel engines with displacements from 5.9 to 13 liters and horsepower ratings from 150 to 500.

The engines must be certified to 0.10 g/bhp-hr or lower particulate matter standard. This Executive Order excludes engines originally certified with a diesel particulate filter.

Econix DPF-A diesel particulate filters exempted under this Executive Order and their major components are identified in Attachment A.

This Executive Order is based on emission tests conducted by SK Energy with the Econix DPF-A diesel particulate filter. Test data showed no adverse impact on engine emissions. The same emissions impact is expected when the Econix DPF-A diesel particulate filter is installed on any of the engines listed above.

This Executive Order is valid provided that installation instructions for the Econix DPF-A diesel particulate filter do not recommend tuning the engines to specifications different from those of the engine manufacturer.

Changes made to the design or operating conditions of the Econix DPF-A diesel particulate filter, as exempted by the Air Resources Board, which adversely affect the performance of the engine's emission control system, shall invalidate this Executive Order.

Marketing of the Econix DPF-A diesel particulate 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 approval is obtained from the Air Resources Board.

This Executive Order shall not apply to any Econix DPF-A diesel particulate filter advertised, offered for sale, sold with, or installed on a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

This Executive Order does not constitute any opinion as to the effect the use of the Econix DPF-A diesel particulate filter may have on any warranty either expressed or implied by the engine manufacturer.

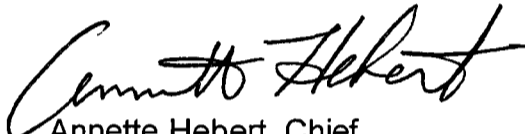
No claim of any kind, such as "Approved by the Air Resources Board," may be made with respect to the action taken herein in any advertising or other oral or written communication.

In addition to the foregoing, the Air Resources Board reserves the right in the future to review this Executive Order and the exemption provided herein to assure that the exempted add-on or modified part continues to meet the standards and procedures of California Code of Regulations, Title 13, Section 2222, et seq.

THIS EXECUTIVE ORDER DOES NOT CONSTITUTE A CERTIFICATION, ACCREDITATION, APPROVAL, OR ANY OTHER TYPE OF ENDORSEMENT BY THE AIR RESOURCES BOARD OF ANY CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF SK ENERGY'S ECONIX DPF-A DIESEL PARTICULATE FILTER.

Violation of any of the above conditions shall be grounds for revocation of this Executive Order. The Executive Order may be revoked only after a ten-day written notice of intention to revoke the Executive Order, in which period the holder of the Executive Order may request in writing a hearing to contest the proposed revocation. If a hearing is requested, it shall be held within ten days of receipt of the request, and the Executive Order may not be revoked until a determination is made after a hearing that grounds for revocation exist.

Executed at El Monte, California, this 19 day of January 2011.


Annette Hebert, Chief
Mobile Source Operations Division

Attachment A

Econix DPF-A Diesel Particulate Filter	
Model	Filter Capacity
Category 0	9.88 liters
Category I	17.45 liters
Category II	27 liters

Component
Controller
ECU
Filter element
Exhaust pressure sensor
Front and aft temperature sensors
Diesel fuel hose, pump, and nozzle
Diesel injector with solenoid valve
Igniter
Air pump

EVALUATION SUMMARY

Manufacturer Name: SK Energy

Name of Device: Econix DPF-A diesel particulate filter

Background:

SK Energy of 1175 N. Del Rio Pl., Ontario, California 91764 has applied for exemption of its Econix DPF-A diesel particulate filter from the prohibitions in Section 27156 of the California Vehicle Code (VC 27156). The filter is designed for heavy-duty on-road vehicles equipped with 1992 through 2006 model-year diesel engines.

Recommendation:

Grant exemption to SK Energy and issue Executive Order D-684. The exemption covers installation of the Econix DPF-A diesel particulate filter on heavy-duty on-road vehicles equipped with 1992 through 2006 model-year diesel engines. The engines must meet 0.10 g/bhp-hr or lower particulate matter emission standard. The exemption covers engines originally certified with a diesel oxidation catalyst (DOC). On DOC engines, the Econix DPF-A diesel particulate filter will be installed downstream of the DOC with the pressure monitor installed upstream of the DOC. The exemption excludes any engines originally certified with a diesel particulate filter. Econix DPF-A diesel particulate filters exempted under this Executive Order and their major components are identified in Attachment A.

Device Description:

The Econix DPF-A diesel particulate filter is an actively regenerated filter designed to reduce diesel particulate matter emissions. It is intended for use on applications that typically operate for 8 hours and allow regeneration after each operation. The stainless steel fibrous mesh wall-flow filter is porous and has alternating cells that are plugged to force the exhaust gases to flow through the cell walls where particulate matter is trapped. The trapped particulate matter is burned off and the filter is regenerated using diesel fuel and a burner while the engine idles. Regeneration is initiated by the vehicle operator following a predetermined schedule (e.g. after every 8-hour operation) and/or when the operator is notified via lights and alarms in the cabin. The visual and audible notification occurs when the monitoring system determines that the filter loading capacity or the backpressure threshold has been reached. Regeneration time ranges from 8 to 12 minutes. SK Energy recommends filter cleaning once a year and periodic inspection and cleaning of the fuel system components.

Discussion/Basis for the Recommendation:

To demonstrate that the Econix DPF-A diesel particulate filter does not adversely affect engine emissions, SK Energy submitted the following test results:

Test Configuration	FTP Exhaust Emissions (g/bhp-hr)			
	THC	CO	NOx	PM
Baseline 1	0.236	0.858	4.035	0.084
With filter	0.195	0.975	4.168	0.005
Percent change	-17.5	13.6	3.3	-94.4
Baseline 2	0.187	0.820	4.057	0.072
With filter after 50K-mile durability	0.184	0.865	4.054	0.006
Percent change	-1.3	5.5	-0.1	-91.6
2000 standards	1.3	15.5	4.0	0.10

Notes:

Emissions are weighted averages of one cold start and four hot start tests.
50,000-mile on-road durability testing was conducted on a 1995 Freightliner equipped with a 1995 DDC Series 60 12.7 liter engine.

Emission test results showed that emissions with the Econix DPF-A diesel particulate filter are within the allowable limits of baseline emissions. Durability testing confirmed proper regeneration. It is concluded that SK Energy's Econix DPF-A diesel particulate filter will not have any adverse impact on emissions and meets the requirements for a VC 27156 exemption for the engines listed in the Executive Order.