**State of California**
**AIR RESOURCES BOARD**

**EXECUTIVE ORDER DE-09-009-03**

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

Donaldson Company, Incorporated
Low $NO_2$ Filter (LNF) System

ARB has reviewed Donaldson Company's request for the verification of the LNF 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 LNF system reduces emissions of diesel particulate matter (PM) consistent with a Level 3 Plus device (greater than or equal to an 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, subject to the terms and conditions specified below, classifies the LNF system as a Level 3 Plus system for heavy-duty on-road applications that use heavy-duty 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 1993 through 2006 and have an engine family name listed in Attachment 1.
- The engine must be certified for on-road applications.
- The engine must be certified to a PM emission level of at most 0.1 grams per brake horsepower-hour (g/bhp-hr), and greater than 0.01g/bhp-hr.
- 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 application must have a duty cycle with an exhaust temperature profile that:
  - Results in a Weighted Average Temperature (WAT) that is at least 237 degrees Celsius; or
  - Is either greater than 235 degrees Celsius for at least 40 percent of the time or greater than 300 degrees Celsius for at least 10 percent of the time.

- The engine must be rated to at least 100 horsepower (hp) and no more than 600 hp.
- The engine may or may not be certified 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 LNF system is installed. Should the LNF system be removed, the OEM oxidation catalyst must be re-installed, returning the engine to its original certified configuration.
- The engine must have a four-stroke combustion cycle.
- The engine must be turbocharged.
- The engine may be mechanically or electronically controlled.
- The engine must be well maintained and must 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 15 parts per million by weight.
- 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 Section 2701 of Title 13, CCR, unless explicitly verified for use with the fuel additive.
- The product must not be used with any other systems or engine modifications without approval from ARB and the manufacturer.
- Each vehicle that is a candidate for installation of the LNF system based on the WAT criterion must first have its exhaust temperature measured and recorded for an appropriate period of time during typical operation. Donaldson or its authorized representative must maintain these data for each LNF-equipped vehicle and make them available to ARB upon request.

- The other terms and conditions specified below.

IT IS ALSO ORDERED AND RESOLVED: That installation of the LNF system, manufactured by Donaldson Company, Incorporated, of Post Office Box 1299, Minneapolis, Minnesota, 55440-1299, has been found not to reduce the effectiveness of the applicable vehicle pollution control system, and the LNF system therefore is exempt from the prohibitions in Section 27156 of the Vehicle Code for installation on heavy-duty on-road vehicles using engines listed in Attachment 1.

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

The LNF system consists of the following major system components, listed in order from exhaust inlet to outlet as they are arranged within the exhaust system of the vehicle: one inlet section, one catalyzed flow-through filter, one catalyzed wall-flow diesel particulate filter, and one outlet section. The LNF system also includes a backpressure monitor and warning system. The major components of the LNF system are identified in Attachment 2. Schematics of the approved product and engine labels are shown in Attachment 3. The WAT criterion is described in Attachment 4.

This Executive Order is valid provided that installation instructions for the LNF 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 LNF system, as exempted by ARB, which adversely affect the performance of the vehicle's pollution control system shall invalidate this Executive Order.

Donaldson Company Incorporated must ensure that the installation of the LNF conforms to all applicable industrial safety requirements.

No changes are permitted to the device. ARB must be notified, in writing, of any changes to any part of the LNF 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 LNF system 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 shall not apply to any LNF system advertised, offered for sale, sold with, or installed on a motor vehicle prior to or concurrent with transfer to an ultimate purchaser.

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

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/DON/2009/PM3+/N00/ON/DPF02**

As stated in the Procedure, Donaldson Company is responsible for honoring the warranty for the LNF system (Section 2707), record keeping requirements (Section 2702), 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; and

- 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 oil consumption may be grounds for denial of a warranty claim.

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 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 Donaldson Company 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-09-009-02 (dated November 23, 2010), DE-09-009-01 (dated October 26, 2009) and DE-09-009 (dated April 28, 2009).

Executed at El Monte, California, and effective this 30th day of June 2011.

Robert H. Cross, Chief
Mobile Source Control Division

Attachment 1: Table 1: ARB-Approved Engine Families for the Donaldson LNF System
Table 2: ARB-Approved Federal Engine Families for the Donaldson LNF System

Attachment 2: Parts List for the Donaldson LNF Diesel Particulate Filter

Attachment 3: Device and Engine Label for the Donaldson LNF Muffler System and Replacement Label for the Donaldson LNF Muffler System (used if original label is lost or damaged)

Attachment 4: Definition of Weighted Average Temperature (WAT)