Passive Diesel Particulate Filter (DPF) technology provides the highest tailpipe PM reduction available today (>90%), making them a popular choice for retrofit programs. However, DPFs are sensitive to exhaust temperature and can plug unless they are exposed to minimum exhaust temperatures that will burn the soot they capture.

Donaldson LNF Mufflers are designed for on-road 1994 - 2006 model year engines using ULSD fuel where the Weighted Average exhaust Temperature (WAT) of the application is greater than 237°C for non-EGR and 263°C for EGR engines.
LNF Mufflers are verified by CARB for use in the Diesel Risk Reduction Program as a Level 3+ device.

Voluntary Retrofit Program.

* Removes 85% or greater diesel particulate matter

Donaldson LNF Mufflers

The Preferred Solution for PM and NO2 Emissions

... every Low NO2 Filter (LTF) Muffler Kits includes our new and improved Emissions Device Monitor (EDM)!

LNF Muffler Kit

Features Advantages

Customer-preferred passive DPF technology

- Lowest cost approach to high-efficiency exhaust filtration
- Lowest complexity product

Proprietary pre-filter design enhances device operation

- Removes up to 1/3 of PM, reducing load on wall-flow DPF
- Produces NO2 for DPF regeneration

Innovative catalyst coating on 200 cpsi ceramic DPF substrate

- Provides high filtration efficiency at lower backpressure
- Produces NO2 in zone where needed
- Prevents excess NO2 emissions

Optimized flow distribution provides uniform flow across entire DPF face

- Increases flow (hp) capacity
- Provides uniform soot loading for improved operation
- Reduces product cost
- Eliminates excess NO2 emissions

Similar application temperature criteria compared to current DPF technology

- Broader application range

Modular design permits installation flexibility

- Reduces installation and service time when cleaning the DPF

Gasket-free design

- Lower cost during DPF ash cleaning

New “Weighted Average Temperature” (WAT) analysis method for data logging

- Provides more accurate indication of likelihood of successful regenerations for a given duty-cycle
- Accounts for higher soot burn rates associated with higher temps

Upgraded Emissions Device Monitor (EDM).

- Improves operator interface
- Increases memory increases for data and fault collection to support troubleshooting
- Permits temperature monitoring
- Provides convenient push button reset
- Expands voltage range (12-24V)

Donaldson LNF Mufflers and system components are protected internationally by patents, both issued and pending.
**Emissions Technology =**
**Partial Filter + DPF**

**Efficiency: 85%+ PM and 0% NOx**

### Controlling NO\(_2\) Emissions

Many catalyst-based diesel particulate filters, or diesel oxidation catalysts, promote the oxidation of nitric oxide (NO), the main component of NOx, to nitrogen dioxide (NO\(_2\)), thus increasing the NO\(_2\) proportion in NOx emissions. Even though the total NOx is not increased, this may present a potential health and environmental issue, as NO\(_2\) is a more reactive and toxic gas than NO.

Source: California ARB

### LNF Muffler Selection Procedure & Criteria

Donaldson has a nine-step selection procedure (page 7) that is required in order to apply the LNF Muffler.

This tailpipe solution is applicable for non-EGR engines when data logging results show your weighted average temperature is greater than 237º C.

For EGR engines, the weighted average exhaust temperature must be greater than 263º C.

The LNF Muffler application requires the use of ULSD fuel and CJ-4 engine lube oil.

### Service Requirements

- Under normal operation, the filter requires cleaning annually, every 50,000 miles, 1,800 hours or when the EDM alerts are tripped.
- Severe or "cold" service applications may require more frequent cleaning
- DPF cleaning system is available from Donaldson (see back page)
Emissions Device Monitor (EDM)
Kit# X009650

Included with every LNF Muffler Kit

The Emissions Device Monitor detects excessive engine backpressure created by the flow restriction of an overloaded diesel particulate filter. Lights indicate when filter cleaning is required. The small, solid-state monitor mounts inside the cab.

Features
- Standardized, solid-state filter service monitor
- Self-diagnostic filter service monitor
- Remote mount indicator
- Remote-mount pressure transducer and thermocouple converts readings into electronic signal
- Serviceable pressure transducer and thermocouple
- All wires terminated in standard connectors (Bosch or Delphi) and covered in protective looms
- Stores last 500 hours of backpressure, temperature and faults
- Removable memory module
- Engine signal wire
- Monitor communicates through USB connector
- Keyed power vs. always on
- Fixed backpressure and temperature monitor measurement set-points
- Push button reset tool (sold separately)

Advantages
- Small package size
- Facilitates troubleshooting of electronics and LNF Muffler performance
- Smaller size compared to competitive designs
- Increases flexibility of location and reduces cost of installations
- Increases accuracy
- Reduces installation time
- Eliminates cost/challenge of long copper tubing runs to filter monitor
- Reduces risk of copper tubing kinks/damage and erroneous readings
- Reduces cost of component replacement (sensor only vs. entire monitor)
- Reduces installation time
- Environment-proof design increases reliability
- Provides picture of operating trends
- Facilitates troubleshooting
- Remove and transfer data simply to another device for data analysis
- May be connected to engine ECM and/or an audible alarm
- Easier access to computer compared to competitive RS-232 connection ports
- Does not draw on battery nor record unneeded information
- Lengthens life of monitor
- Prevent inadvertent changes that may impact product integrity
- Reduces installation time
- Can reset warning lights and retrieve data without use of PC

Memory Module
Stores 10x more hours than previous monitor!

Monitoring software and cable
Kit No. X007999
Sold separately

10 ft. Wire Harness
Part No.
50 ft. wire harness available, order Part No.

90º Fitting
Compression Fitting
Rebuildable Fitting
Mounting Bracket
Part No. P231735
Half Coupling (connects to fitting welded on exhaust pipe)

Small Electronic Control Unit
Part No. P237488

ECU Mounts (3)
Red to Power
Black to Ground

Main Harness Part No.

Sensor Harness Part No. P231738
Pressure Transducer Part No. P232081
Stainless Steel Braided Hose Part No. P231736
Temperature Sensor Part No. P232037
In-Cab Lighted Display Part No. P231782

Additional Signal Wire for Connecting to ECM or audible alert box.

COM Port for Computer Link-up Part No.
Push Button Link-Up (sold sep.) Part No.

Half Coupling (connects to fitting welded on exhaust pipe)
It is important to understand the exhaust temperature profile before applying a DPF muffler. Insufficient temperatures may lead to premature DPF plugging and increased maintenance to keep the filter clean and engine running.

A data-logger is a device used to record the exhaust temperature during engine operation. The recorder is operated for several days under ‘normal operating conditions to provide a reasonable snapshot of the exhaust temperature profile. Engine duty-cycle plays a big role in exhaust temperatures, and is influenced by factors such as vehicle speed, load, idling, geography, ambient temperatures and driver tendencies.

Donaldson recommends capturing three days of normal daily operation using the Donaldson data logger.

**Steps to Capture Exhaust Temp Profile With a Donaldson Data Logger**

1. Set-up Data Logger from computer to record data at a prescribed time.
2. Weld the half coupling into the exhaust system for data logger temperature probe.
3. Mount the Data Logger case to exhaust tube or frame rail.
4. Route the thermocouple cable from the compression fitting to the data-logger case.
5. Operate the vehicle for three days under ‘normal operating conditions’
6. Download data from the Data Logger and uninstall data logger.
7. Forward data and vehicle profile form to Donaldson at emissions@donaldson.com.

Line graph created from data downloaded from data logger in Donaldson field test. Engineers will analyze the data notify you that the vehicle is suitable for an LNF Muffler retrofit.
Over 40 Kits Available
designed for EGR & Non-EGR Engines

Selection Procedure

Step 1
Retrieve the following engine and vehicle information. (Hint: The Donaldson Profile Form [in MS-Excel] is a great guide to use. Contact Donaldson Retrofit Sales for a copy.)

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<th>Engine Data</th>
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Step 2
Check the engine’s family number against those listed on the CARB web site for the LNF Muffler. The engine family number listing is an attachment to the California ARB Executive Order. If your engine decal family number is found on the Approved Engine Family Listing for the approved technology, proceed to Step 3. If not, you can not apply our product to the vehicle.

Step 3
Install a temperature data logger per Donaldson guidelines and retrieve a temperature trace representative of that vehicle’s typical duty cycle. (We recommend Donaldson data logger X807947)

Step 4
E-mail the temperature trace with a completed Donaldson profile form to emissions@donaldson.com. (Hint: The temperature trace can be attached to the Profile Form by clicking on the “Import Temp Data” tab at the top of the Profile Form.)

Step 5
Donaldson engineers will review data logging results and respond (via email) with a recommendation to proceed with LNF Muffler retrofit or not. If approval is granted, proceed to next step.

Step 6
Retrieve the engine’s exhaust flow (cfm) data. (It is recommended this information comes from the engine manufacturer, but if not available, use Donaldson Engine & Exhaust HP guide on our web site or contact Donaldson Emissions Retrofit engineering.)

Step 7
Using the the most current LNF Muffler sales brochure, select and order the model that best matches (1) your exhaust flow rate (cfm) and (2) your existing muffler configuration.

Step 8
Upon receipt of your LNF Muffler kit, locate and review the documentation packages included with the kit. Proceed with your retrofit installation per the instructions included in the documentation package. Be sure to:

- Attach the supplied engine tag to the vehicle (compliance requirement)
- Activate your warranty
- Add DPF filter service into the vehicle maintenance schedule

Step 9
Retain all emissions retrofit documentation on each vehicle. Including:

- Temperature data / profile form
- Donaldson response letter that approved retrofit application
- Date of install
- Mileage/hours at install
- Installation and owner information

Step 10
Retain all emissions retrofit documentation on each vehicle. Including:

- Temperature data / profile form
- Donaldson response letter that approved retrofit application
- Date of install
- Mileage/hours at install
- Installation and owner information
### LNF Muffler Kits Service Parts

**Exhaust Flow Up to 1750 CFM**

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**Exhaust Flow Up to 2100 CFM**

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**Exhaust Flow Up to 2400 CFM**

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**Exhaust Flow Up to 2700 CFM**

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**Footnotes:**

(1) = Inlet offset from center position

(2) = Outlet offset from center position

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**V-Band Clamps**

The separate sections of LNF Muffler are connected by heavy-duty V-band clamps that create a reliable joint seal.

- 10" Body Dia. | P227750
- 11" Body Dia. | P229625
- 13" Body Dia. | P229651

---

**Pre-Filter DPF Assembly**

- Pre Filter Assembly
- DPF Assembly

---

**Donaldson LNF Mufflers**

DRAFT - 1 OCT 2008

ID - Inner Diameter  Dia. = Diameter
DPF Filter Cleaning System

- Simple and easy to operate
- Recommended for OE and retrofit DPF devices
- Effective on Donaldson and competitive DPF designs
- Designed using decades of experience with enclosed filtration systems

The maintenance of the emissions devices has become more complex and vehicle owners may find the dealer shop to be their best choice for repair and maintenance.

All new trucks will have a removable Diesel Particulate Filter (DPF) that will require cleaning.

As you consider your options for shop tools to maintain the new emissions devices on trucks, we think the Donaldson two-stage DPF cleaning system is your best choice!

For more information, contact Donaldson or visit our Emissions+Exhaust web site at www.donaldson.com/emissions

Donaldson Company, Inc.
Minneapolis, MN
55440-1299
www.donaldson.com

Brochure No. F110000 (10/0)
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