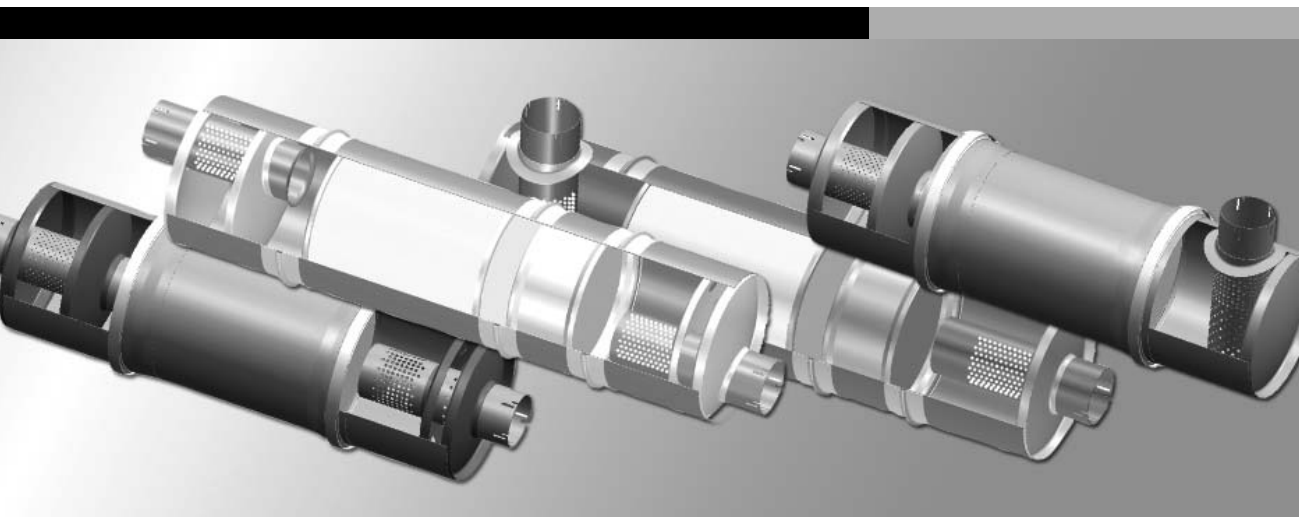


Diesel Particulate Filter (DPF) Muffler and Low-Temperature Filter (LTF) Muffler

Installation, Operation and Maintenance Manual



This owner's manual includes pre-installation requirements, installation instructions, warranty activation procedures and maintenance procedures for both Donaldson DPF and LTF Mufflers.

Donaldson®

Contents

Introduction 3

Pre-Installation Requirements..... 3

 Selecting the Right DPF or LTF Muffler.....3

 Inspect Mounting Hardware3

 Style 13

 Minimize Exhaust Tubing Lengths4

 Inspect Tubing.....4

Installation..... 4

 Remove the Existing Muffler4

 Install the DPF or LTF Muffler4

 Remove the Existing Muffler5

 Install the DPF or LTF Muffler5

Activating the Warranty..... 6

Operation, Maintenance and Service 6

 Conditions That May Plug A DPF/LTF Muffler7

 Filter Cleaning Interval7

 Filter Cleaning Equipment7

 Filter Cleaning Instructions.....7

 Record Filter Service8

 Ash Disposal8

 Disposal Information.....8

**Actions and Improper Maintenance
That May Void Your Warranty 8**

Through out this manual statements indicating precautions necessary to avoid equipment failure are referenced as a NOTE. Statements indicating potential hazards that could result in personal injury or property damage are referenced in CAUTION! boxes.

Read each section carefully prior to installing your Donaldson DPF Thermal Regenerator.

Examples:

NOTE	Comments highlighting concerns that may result in vehicle or equipment damage OR used to call-out important application steps or procedures.
-------------	--

	CAUTION! Comments highlighting personal safety, injury or equipment damaged are considered warning statements and are called out as CAUTION with the triangle symbol.
---	---

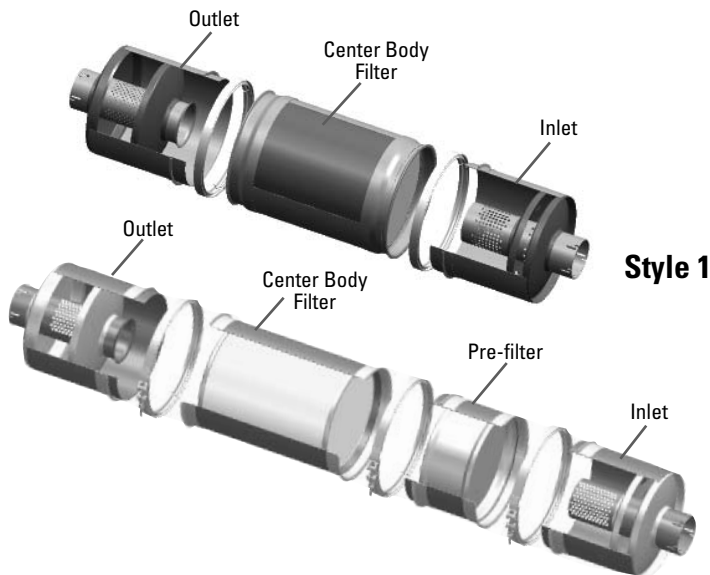
Consult your Donaldson distributor, dealer or Donaldson if you have questions regarding the installation or warranty.

Introduction

The Donaldson DPF and LTF Muffler is designed to reduce harmful emissions from in-use diesel engines. Besides reducing diesel particulate matter emissions by 85%, diesel particulate filters (DPF) are also effective at reducing hydrocarbon emissions. The California ARB has classified several hydrocarbon emissions as toxic air contaminants.

Mufflers with diesel particulate filters are reliable, provide substantial benefits in air quality, and the filter requires routine cleaning.

Exploded view illustration of a DPF Muffler (upper) and LTF Muffler (lower) sections.



	CAUTION! Installations must be approved by Donaldson or an authorized dealer to obtain full warranty coverage.
Installations must be approved by Donaldson to obtain full warranty coverage. For optimum performance, follow all the installation, operation and maintenance recommendations covered in this manual.	

Pre-Installation Requirements

Your Donaldson DPF/LTF Muffler includes the following parts:

Qty.	Description
1	DPF or LTF Muffler
1	Documentation package that includes this owner's manual, a warranty registration card, warranty statement, and engine tag (for CARB requirement).

Donaldson's pre-installation requirements are provided below. In order to maximize this new emissions performance and life, installation must meet these requirements.

NOTE	Engine Must Meet OEM Specifications
The engine must be inspected by a qualified technician to verify the engine is operating within the engine OEM's specifications. If the engine does not meet specifications, necessary repairs must be made prior to DPF Muffler installation. The technician must document compliance on the warranty registration form. Failure to comply may void the warranty. The warranty and warranty registration card are separate documents in the documentation package.	

Selecting the Right DPF or LTF Muffler

Be sure you have selected the proper model for your vehicle. Application of the wrong model will affect exhaust system backpressure. Failure to apply the proper model may cause engine damage and void the warranty. If engine size exceeds the rating of a single unit, a dual system will be required.

Inspect Mounting Hardware

A DPF and LTF Muffler weighs considerably more than traditional OEM truck muffler (60-75 lbs. vs. 30 lbs. [27-34 kg vs 13.6 kg]). Inspect any mounting system hardware intended for reuse to ensure it is in good condition and can adequately support the added weight. Look for signs of rust, corrosion or fatigue. Do not reuse suspect components. Heavy-duty components should be used.

NOTE	Inspect Mounting Hardware
A DPF or LTF Muffler is at least two times heavier than a traditional OEM truck muffler. The mounting system should be inspected to ensure it is in good condition and can adequately support the added weight. Inspect all hardware intended for reuse for rust, corrosion or fatigue. Replace all questionable components with heavy-duty components.	

Minimize Exhaust Tubing Lengths

The engine exhaust temperature has an affect on emissions performance. To optimize performance, the inlet on the new device must be less than 10 ft. (3m) downstream from the turbocharger outlet flange when measured along the piping center line. Placement beyond 10 ft. (3m) may result in a plugged filter and void the warranty.

The emissions device should be mounted as close to the engine as possible, but must be isolated from engine vibration. Do not hard-mount the DPF or LTF Muffler directly to the engine.

NOTE	Mount the New Emissions Device Less than 10 ft. (3m) from the Turbocharger
Mount the DPF or LTF Muffler less than 10 Ft. (3m) downstream from the turbocharger outlet. Mounting the DPF/LTF Muffler beyond this distance may cause plugging and void the warranty.	

Inspect Tubing

To maximize emission aftertreatment effectiveness, exhaust tubing should be structurally sound and leak-free. Inspect the exhaust tubing for leaks due to damage or corrosion, and replace defective components. Also look for flaking due to corrosion and/or soot build-up. Loose contaminants can be blown onto the filter face and cause plugging, increased backpressure and degraded engine performance.

NOTE	Rust, Corrosion and Soot on Existing Exhaust Tubing
If you see any evidence of rust or corrosion on existing tubing between the turbocharger and DPF/LTF Muffler inlet, replace with new aluminized steel tubing. If reusing existing exhaust tubing, banging and tapping on the tubing may dislodge soot. Be sure to clean out any pipes prior to installing new components. Operate engine at high idle to blow out exhaust pipes prior to the installation of the DPF/LTF Muffler. Protect yourself and others from loud straight pipe noise.	

Installation

The following section includes separate procedures for **vertical and horizontal installations**. Please use the procedure that matches your current muffler orientation.

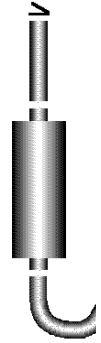
Make sure to review all pre-installation requirements before proceeding with the installation.

NOTE	Any Engine Problems Must be Resolved PRIOR to Installing the new Emissions Device.
DPF and LTF Mufflers may plug if the engine is not properly maintained. This is especially true when operated under low-load or low ambient temperature conditions, idled for extended periods of time or if the engine is not properly calibrated for the specific fuel-type being used. To prevent the occurrence of plugging, engine problems must be resolved prior to installing the new device.	

Vertical Installation

Remove the Existing Muffler

1. Loosen stack clamp at muffler outlet (top). Remove stack and clamp.
2. Loosen tubing clamp at muffler inlet (bottom).
3. Loosen clamps on flex tubing. Remove clamps, flex and elbow.
4. Remove muffler and heat shield mounting bands.



Install the DPF or LTF Muffler

1. Inspect the mounting brackets, bands, supports and/or stanchion for any damage, cracks or corrosion. Mounting components must be strong enough to adequately support the additional 30-45 lbs. (13.6-20 kg) weight. Replace any existing mounting parts that appear rusted, damaged or of questionable strength with heavy-duty parts.
2. Place muffler/heat shield mounting bands around the body and finger-tighten. Position the new emissions device on mast in position of original muffler. Secure on the mast with mounting bands.

	CAUTION! Do Not Overtighten Bands or Clamps on Muffler Body
The filter inside could be damaged if you deform the muffler body by overtightening clamps.	

3. Position flex tubing and clamps onto exhaust tube. Do not tighten clamps until all tubing is assembled.
4. Position inlet elbow and muffler inlet clamp. Locate flex tube so that there are equal lengths of rigid tubing (within the flex) on both ends. Tighten clamps to secure flex tubing and inlet elbow.

NOTE	Flex is not approved in all locations, check local ordinances.
-------------	--

NOTE	Avoid Excessive Force on Inlet and Outlet Piping!
Excessive force on the inlet and outlet piping in conjunction with vehicle vibration can result in stress cracking where the pipe or pipe supports contact the emissions device inlet. Failures caused by excessive force are a result of improper installation and may not be covered under the warranty.	

- Position clamp over outlet tube on the emissions device. Insert the stack into the muffler outlet and tighten securely. If using a straight stack, install rain cap.

NOTE	Water from Rain and Truck Washing Can Poison the Filter
Water can also damage the filter retention material inside the device. Vertical tail pipes must be fitted with rain caps or curved outlets.	

- Verify that all bolts and fasteners have been sufficiently tightened.
- Operate vehicle and check for exhaust leaks. Repair any leaks.
- Turn off the engine.
- To meet CARB requirements, permanently attach the product identification tag (supplied in documentation package) in a clearly visible location on the engine. CARB regulations require a product identification tag be permanently installed on the engine in a clear, visible location. Application of the engine tag is not necessary for U.S. EPA regulations.

NOTE	CARB Requirement
California ARB regulations require a product identification tag be permanently installed on the engine in a clear, visible location.	

- Fill out and return the Warranty Registration Card (included in the documentation package in the box). Failure to return the warranty registration card within 30 days of installation may void the warranty.

Horizontal Installation

Remove the Existing Muffler



- Loosen clamp at muffler outlet. Remove clamp and tailpipe.
- Remove clamp at muffler inlet.
- Loosen muffler mounting bands and remove muffler.

Install the DPF or LTF Muffler

- Inspect the mounting brackets, bands, hangers, and supports for any damage, cracks or corrosion. Mounting components must be strong enough to adequately support the additional 30-45 lbs. (13.6-20 kg) weight. Replace any existing mounting parts that appear rusted, damaged or of questionable strength with heavy-duty parts.

NOTE	Mounting System Space Allowance
Allow 1" (25mm) space for engine movement and thermal expansion around the DPF or LTF Muffler.	

- On vehicles with a vertical tailpipe, drill a 1/4" (6mm) drain hole 6" (152 mm) from the outlet end of the DPF or LTF Muffler.

NOTE	Drain Hole Required on Horizontal Mount with Vertical Tailpipe
Horizontally-mounted, vertical tailpipe systems must have a 0.25" (6mm) diameter drain hole drilled through the lowest point of the body, 6" (152mm) from the outlet end of the DPF Muffler. Rain and truck wash water can poison the filter, reducing emission performance. Water can also damage the filter retention material in the unit. Vertical tailpipes must be fitted with rain caps or curved outlets.	

- Position the emissions device in the mounting bands, position the drain hole at the bottom and mount in position. Be sure the mounting bands do not cover the drain hole.
- Tighten clamp on inlet.

	CAUTION! Do Not Overtighten Bands or Clamps on the Muffler Body
The catalytic filter inside could be damaged if you deform the muffler body by overtightening clamps.	

- Install tailpipe and secure clamp on muffler outlet/tailpipe joint.



CAUTION! Avoid Rigid Mounting of the new emissions device.

The original equipment muffler should have flexible hangers installed to allow for thermal expansion. If your system does not have flexible hangers, appropriate hangers should be installed.

6. Verify that all bolts and fasteners have been sufficiently tightened.
7. Operate vehicle and check for exhaust leaks. Repair any leaks.
8. Turn off the engine.
9. To meet CARB requirements, permanently attach the product identification tag (supplied in documentation package) in a clearly visible location on the engine. CARB regulations require a product identification tag be permanently installed on the engine in a clear, visible location. Application of the engine tag is not necessary for U.S. EPA regulations.

NOTE	CARB Requirement
California ARB regulations require a product identification tag be permanently installed on the engine in a clear, visible location.	

10. Fill out and return the Warranty Registration Card (included in the documentation package in the box). Failure to return the warranty registration card within 30 days of installation may void the warranty.

Activating the Warranty

A warranty registration card is included in the documentation package. Fill in all the information requested and answer all the questions immediately after completing the installation and return the card to Donaldson via the postage-paid card.

NOTE	Complete the Warranty Registration Card and Mail.
Failure to complete the warranty information requested by Donaldson within 30 days of installation of the emission control system may void this warranty.	

Please contact Donaldson, at the phone number provided on the back cover, with installation questions or problems.

Operation, Maintenance and Service

Operation

The device you just installed has been designed and verified for use on most medium- and heavy-duty truck and bus applications. To ensure proper functioning of these products, Donaldson preventive maintenance and service procedures must be incorporated into your regular vehicle maintenance routines.

Maintenance and Service

Preventive maintenance recommendations during normally scheduled vehicle maintenance

1. Inspect the emissions device, exhaust piping and mounting brackets.
2. Look for leaks, structural failures (cracks) and loose or missing fasteners.
3. Repair or replace defective parts, as appropriate.

NOTE	Do Not Use Fuels Blended with Lube Oil
Engine oil must not be blended with the engine's fuel since the oil may cause reduced emissions performance and deposits in the filter that may cause higher backpressure, plugging and reduced engine performance and void the warranty.	

NOTE	For Electronically Controlled Engines
Electronically controlled engines are certified with a specific fuel and electronic program based on engine configuration and model year. Use only the fuel and electronic program specified for your engine. Using the incorrect fuel and/or electronic program may cause excessive soot generation and filter plugging and may void the warranty.	

	CAUTION! Lube Oil
Certain components found in engine lube oil can poison catalysts. To protect against filter failure and/or plugging, ensure that the engine is not consuming oil at a rate higher than specified by the engine manufacturer. Use low ash oils, when possible. Do not use fuel blended with lube oil. Check with your local Donaldson dealer to review additives before use.	

Conditions That May Plug A DPF/LTF Muffler

- Engine operation at low load or idling for extended periods of time
- Improper engine maintenance
- Improper engine calibration for the specific fuel type being used
- If you're using our LTF Muffler, the above conditions may plug the pre-filter. To clean the pre-filter, follow the instructions 1-4 under "Filter Cleaning Instructions." The pre-filter does NOT require regular service under normal operating conditions during its life, the filter in the LTF muffler will need routine service.

Filter Maintenance

The filter inside the DPF or LTF muffler removes particulate matter and inorganic ash from diesel exhaust. Under normal operating conditions the filter collects and burns particulate matter. However, inorganic ash from the oil does not burn so it slowly accumulates in the filter. This makes it necessary to remove the ash from the filter on a periodic basis.


The filter does not require any additional maintenance other than routine cleaning.

A filter service monitor (or backpressure monitor) should be installed in a visible area inside the cab. The monitor detects excessive engine backpressure created by the flow restriction of an overloaded diesel particulate filter. When excessive backpressure is detected, a visual warning light is activated to notify the vehicle operator that filter service is required. The kit is included with most Donaldson DPF and LTF Muffler kits.

Filter Cleaning Interval

The DPF component must be done every 12 months or every 50,000 miles, whichever comes first. Some applications including older, higher emission engines may require more frequent cleaning.

Executing the following ash removal (filter cleaning) guidelines will maintain filter performance, proper operation and durability. Failure to follow the procedure may void the warranty


	CAUTION! Failure to follow the ash removal (filter cleaning) guidelines may void the warranty.
---	---

Proper original equipment manufacturer engine maintenance procedures must be followed to ensure proper operation of your new emissions device. Oil consumption that exceeds the original engine manufacturer's specifications will increase filter cleaning.

Filter Cleaning Equipment


The following three items are required to perform the filter cleaning process:

- A source of compressed dry air (80-100 psi / 550-670 kPa) with a standard shop air-gun
- Dust mask, gloves and safety glasses
- An industrial vacuum cleaner or a dust/ash collecting unit designed for diesel particulate filters.

	CAUTION! Wear Protective Gear During Cleaning
A dust mask, gloves and safety glasses should be worn while performing the cleaning process.	

Filter Cleaning Instructions

The preferred method of cleaning a filter would be the Donaldson DPF Cleaning Pulse Cleaner and/or DPF Thermal Regenerator. Inquire with Donaldson for more information on our two-stage cleaning system. If you do not have access to our cleaning system, the instructions below can be used. Please know what your local codes regarding cleaning ash with an air nozzle.

	CAUTION! Do not use STEAM or DETERGENTS to clean the filter.
Donaldson does not recommend cleaning the filter with steam and/or other detergents. Use of these products may damage and/or deactivate the filter.	

1. Before removing the filter for cleaning, mark the exhaust side (outlet) of the filter so you have a position reference when re-installing.
2. Loosen the two body clamps and remove the filter from the emissions device.
3. Using compressed air on the outlet side and a vacuum on the inlet side, blow air through the filter while capturing the ash in the vacuum cleaner. Alternatively, connect the inlet side of the filter to a dust/ash collecting unit.
4. Avoiding direct contact of the air nozzle with the filter surface, slowly move the air nozzle across the

face of the filter, directing air into each individual cell. Continue this process for approximately 30-40 minutes. Cleaning time depends on the filter diameter. Filters with diameters larger than 10.5" (267mm) may require longer cleaning time.

5. Reinstall the filter in the reverse direction from which it was removed. The side of the filter with the mark should be on the inlet side.
6. Place the filter back into the same position in the emissions device and re-tighten body clamps.
7. If your vehicle is equipped with a filter monitoring (or backpressure monitor), reset using the directions supplied with the monitor.

Record Filter Service

Regulatory agencies require that you maintain the following filter service and cleaning records:

- Date of installation
- Vehicle mileage at the time of installation
- Part number
- Serial number
- Date of filter cleaning
- Mileage at each filter cleaning

Ash Disposal

Disposal of ash should be in accordance with all local laws and regulations.

Disposal Information

Filters used in DPF and LTF Mufflers use a precious metal catalyst to reduce carbon monoxide, hydrocarbons and diesel particulate matter emissions. Typical metals may include platinum, palladium and rhodium. These materials can be recycled from damaged or deactivated DPF or LTF Mufflers. Please dispose of DPF or LTF Mufflers in accordance with local regulations and laws; recycle when possible.

Actions and Improper Maintenance That May Void Your Warranty

The following conditions are considered to be abuse, neglect or improper maintenance that may void your warranty:

- Misapplication or improper installation of the DPF or LTF Muffler (failure to adhere to the Donaldson owners manual)
- Failures or damage caused by mounting system failures
- Modifications, alterations or attempted repair of the DPF or LTF Muffler
- The use of fuels not consistent with EPA/CARB regulations, fuel other than that for which the engine is calibrated or fuels blended with used lube oil
- Damage to the catalyst or plugging caused by water entry
- Operating conditions that result in plugged and/or poisoned catalysts
- Physical damage caused by misuse, abuse or road hazards including (but not limited to) dents, cuts or fractures to the exterior or interior of the emissions device
- Failure to return the warranty registration card within 30 days of installation



Donaldson

Donaldson Company, Inc.
Minneapolis, MN
55440-1299

www.donaldson.com

Manual No. P479312 Rev. 2
© 2006 Donaldson Company, Inc.
Printed in the U.S.A.
Equal Opportunity Employer
Donaldson Company, Inc. reserves the right to change or discontinue any model or specification at any time and without notice.

North & South America
866-675-2847

Europe & Middle East
32-16-38-3811

Asia Pacific
65-6311-7373

South Africa
27-11-997-6000

Australia
612-4350-2033