

# **Technical Bulletin**

# Diesel Particulate Filter Installation



National Clean Diesel Campaign www.epa.gov/cleandiesel

### **Pre-Installation**

Prior to installing any retrofit device, engine inspection and maintenance should be performed to ensure proper engine operation, vehicle exhaust system integrity, and amount of lubrication oil consumption.

## **Technology Selection**

To select the best Diesel Particulate Filter (DPF) for a specific vehicle it is necessary to identify:

Vehicle Type: Highway or Nonroad:

- Vehicle Class: School Bus, Class 8A Tractor, Ferry, Locomotive, Forklift, etc
- · Vehicle Specifications: Manufacture , Model, Year
- Engine Specifications: Manufacture , Model, Year, Displacement, Horsepower; Location, Turbo-charge, Exhaust Gas Recirculation (EGR)
- EPA Engine Family Name: Can be found on the engine's emission label and contains 11 or 12 characters such as TCP7.2RZBDBRB or 3NVXHO466ANA
- Annual Miles Traveled (Highway) or Annual Hours of Operation (Nonroad)
- · Engine-out PM emission levels and
- · Engine duty cycle and the resultant exhaust temperatures.



Diesel Particulate Filter (DPF) installed on municipal truck

The verified diesel retrofit technologies lists of the United States Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) define the specific engine operating criteria that must be met in order to successfully apply a particular retrofit technology. (www. epa.gov/otaq/retrofit/verif-list.htm). Installing retrofits on engines not included in the verification designation may void the engine and emission control component warranties, and may be considered tampering.

#### Exhaust Temperature Data Logging

The exhaust temperature is the main factor determining whether a passive or active DPF is applicable for a specific vehicle or piece of equipment. The required minimum exhaust temperatures for regeneration of passive DPF systems range from approximately 240°C for 50 percent of the operating cycle to 400°C for 30 minutes. Active DPF systems rely on an additional heat source and are therefore not dependant on the engine duty cycle and the resultant exhaust temperatures for filter regeneration.

Data logging must be performed on each vehicle to document exhaust temperatures. If varying vehicle routes or sporadic work loads are used, or significant changes in ambient temperatures are expected, data logging under different conditions may be necessary to accurately document duty cycle and the resultant exhaust temperatures. Exhaust pipe insulation may be used to retain heat. If insulation is used, data logging should be performed with insulation installed. Fleets should maintain data logging records for all vehicles for later reference.

#### Installation

Installation may be performed by the retrofit supplier, or the retrofit supplier may provide training to fleet personal to perform installation.

Since a DPF typically weighs more and may be larger than the muffle, stronger clamps and brackets may be required in place of those used with the original muffle. Failure to utilize appropriate hardware can result in a mechanical failure of support brackets and damage to the equipment. To facilitate removal of the DPF for cleaning, quick-release clamps are often used. DPFs typically come in a kit that includes the mounting brackets.

In some applications, the DPF matches the dimensions of the conventional muffler and can be installed as a muffler replacement. In other cases the space available for DPF installation on the vehicle or equipment is very restricted and the DPF configuration must be customdesigned. Safety, visibility, and vibration may also need to be addressed by a custom installation. The time required for DPF installation will vary depending on the situation and can range from two to twelve hours.

Passive systems impose strict requirements on exhaust temperatures and must be mounted within a set distance from the exhaust manifold, as specified by the manufacturer. Exhaust pipe insulation may be used to retain heat. Active systems may have more flexibility in their installation location.

#### **Backpressure Monitoring**

An exhaust backpressure monitoring and operator notification system must be installed with every DPF. If exhaust backpressure exceeds certain thresholds the operator is notified that maintenance is needed. It is important that all vehicle/equipment operators and fleet service technicians are properly trained to recognize and respond to high backpressure alert signals.