

The Development of an Engine Exhaust Pressure and Temperature Monitoring System

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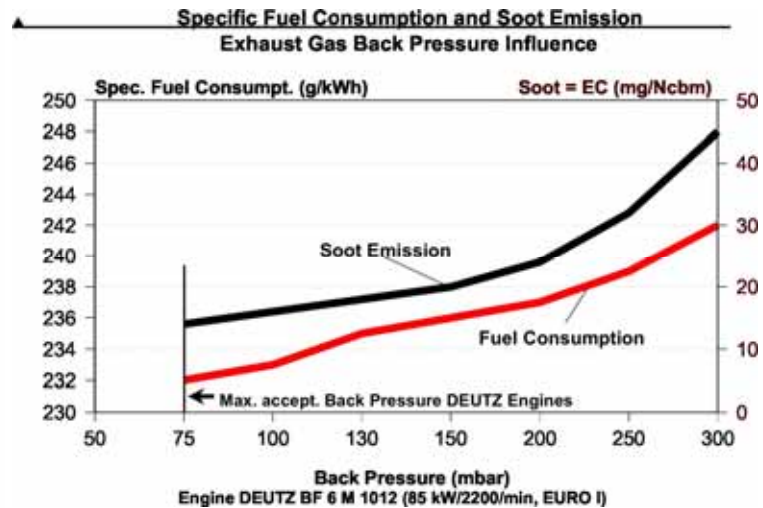
Introduction – Why a Monitoring System?

- Cordierite and SiC Diesel Particulate Filters (DPF) are the most effective means of controlling Particulate Matter (PM) emissions from diesel exhaust.
- While effective, the DPF can plug due to:
 - low exhaust temperature (passive units)
 - changes in machine operating cycles
 - ash buildup
 - engine problems (excessive oil consumption, turbo leaks, etc.)
 - maintenance issues
- The above will raise the pressure in the exhaust system

Introduction – Why a Monitoring System? (continued)

- The best maintenance program may not catch the problem before it becomes critical.
- DPF plugging can have serious side effects:
 - increased fuel consumption and emissions
 - filter damage
 - turbocharger damage
 - equipment down time
 - lost productivity
- Early warning of a DPF problem and protection from it is critical to keep costs down.

Increased Fuel Consumption



Damaged Filter



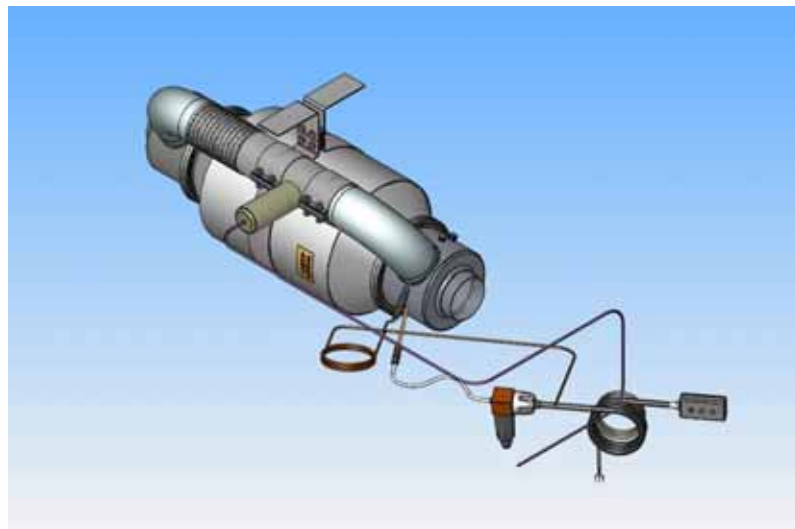
Engine/Filter Warranty Issues

- A highly loaded or plugged DPF could negatively impact engine warranty.
- A highly loaded filter may experience uncontrolled regeneration, which is not covered by the filter warranty.
- The Monitor System can help avoid these issues.

Filter/Engine Protection Measures

- Indicator lights
- Audible Alarm
- Temperature Gauge
- Engine shutdown
- DPF bypass system
- Other DPF protection systems

Filter Monitor & Bypass System



Advanced Monitoring System Features

- Memory of events (alerts) with date and time stamp.
 - normal operation (not stored)
 - first level warning
 - second level warning
 - engine hours
 - set able warning levels
- Capability to download stored data to a computer.
- Real time monitoring of back pressure and temperature when connected via serial link to a computer.
- Capability to control engine/filter protection devices.

Screen shots of PTLOG Program

The top screenshot shows the 'PTLOG™250 Event Logger' window. It features two vertical bar graphs: 'Temperature and Pressure' on the left and 'Pressure' on the right. The temperature scale ranges from 0°C to 600°C, and the pressure scale ranges from 0 to 200 kPa. Below the graphs, there are controls for 'Sampling Period (s)', 'Requests: 79', 'Pressure: 79', and 'Sampling at 2 min'. The current readings are 'Temp: 79.4' and 'Press: 109.2'. There are 'Start' and 'Cancel' buttons at the bottom.

The bottom screenshot shows the 'PTLOG™250 Filter Logger' window. It displays 'PTLOG™250 Information' with the following details:

Get Status	Time	10/11/2003 10:06:00 AM
Update Clock	Event	Green, Yellow, Red
Download/Event	Serial Number	3
Acquisition	Engine Hours	3
	Manufacture Date	45 21 06 95 04 03
	Output File	C:\Program Files\PTLOG250 Event Logger\TextM

The N+T logo is visible in the bottom right corner of the window.

Summary

- Product commercially available.
- Over one thousand units in use.
- Can be used with any manufacturer's filter.
- Easy installation and operation.

Filters with Monitoring & Bypass Systems



Questions & Comments

