



DCL International Inc.



Vehicle Pre-Assessments for Extended DPF Performance

MDEC 2013
October 7-10, 2011, Toronto
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Outline

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- Engine Characteristics and Maintenance History
- Visual Inspection
- Data Logging
- Opacity Test
- Safety Analysis
- Summary



Introduction

Vehicle Pre-Assessments for Extended DPF Performance



Engine Characteristics and Maintenance History

▪ Fuel

- Sulfur level
- Biodiesel specification
- Additives



▪ Oil

- Consumption rate exceed 1 quart every 30 hours?
- CJ4



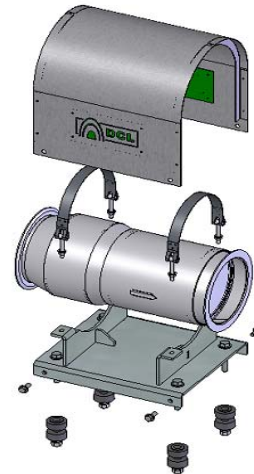
Engine Characteristics and Maintenance History

- **History of turbocharger replacements**
 - More than two in past 3 years?
- **History of fuel injector replacements**
 - More than two in past 3 years?
- **History of EGR component replacements**
 - More than once in past 3 years?
- **History of cylinder valve replacements**
 - More than once in past 3 years?



Engine Characteristics and Maintenance History

- **Record of DPF installation including:**
 - Engine hours at installation
 - DPF make, model, serial number
 - Data logger serial number
 - Installation date



Visual Inspection

- **Check for exhaust leaks**
 - Manifold to tailpipe
- **Snap to idle test**
 - Blue or white smoke exiting the tailpipe?
 - Audible combustion problems?
- **Check the intake air filter**
 - Visible signs of leaks at seal connectors?
 - Visible cracks in the charge air cooler?
 - Audible turbo spooling problems?



Visual Inspection

- **Engine oil or diesel fuel present in exhaust system**
- **Leaks from the turbocharger seals**
- **Excessive crankcase vent tube emissions or dripping oil at the vent tube**



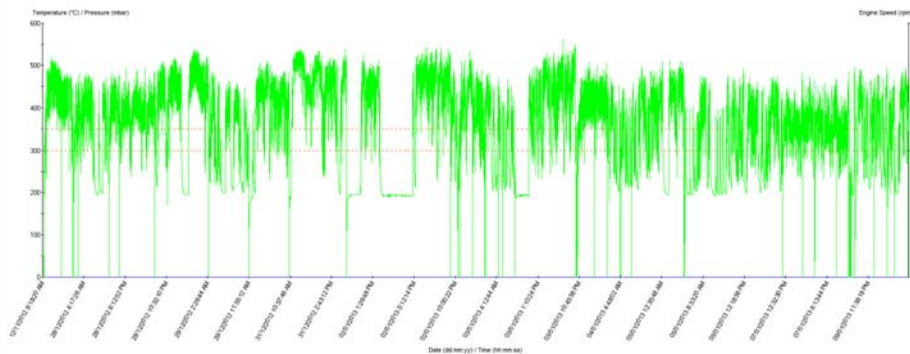
Visual Inspection

- Tampering of fuel pump, governor setting, or EGR valve
- Active error codes on the Engine Control Module
- Available space for the retrofit



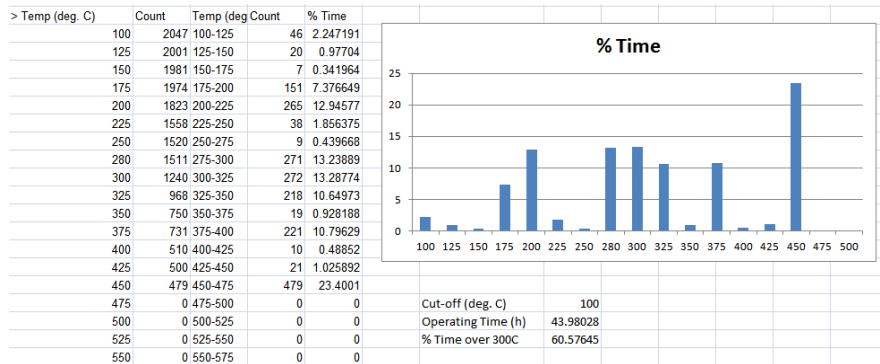
Data Logging

- Log ~ 40 hours machine time



Data Logging

- Confirm filter criteria are achieved



Opacity Test

- Use SAE J1667 protocol
 - Opacity should be less than 20%



Safety Analysis

- Evaluate the location of the retrofit device installation and consider its impact on:
 - Visibility
 - Location of device relative to fuel lines
 - Impact of device on structural integrity of framework or vehicle stability
 - Exposure of hot surfaces that may lead to thermal hazards and the need for heat shield



Summary



Retrofit Pre-Installation Checklist for DPFs

The following lists the reference information for DCL, as required by California Code of Regulations, Title 13, Division 3, Chapter 14, Section 2702. The information below must be carefully filled out.

Information	
Vehicle Owner (Company Name, Contact Name, Address, Phone, Email)	
Vehicle Make, Model, Identification Number	
Engine Make/Power, Serial Number, Serial Number	
DPF Part Number	
DPF Serial Number	
Date of Completion of Vehicle Assessment	
Date of Completion of DPF Installation	

The following list outlines the key technical aspects of a diesel retrofit candidate engine that must be checked prior to installation of a vented diesel particulate filter (DPF) emission control device on a vehicle.

Engine Characteristics and Maintenance History	Yes	No
Is the candidate engine (base model) listed in all terms and conditions of the verification letter (model year, engine family, engine configurations) for the retrofit device being considered?		
Does the diesel fuel used comply with terms and conditions of retrofit device verification letter (sulfur level, biodiesel specifications, fuel additives)?		
Does the engine oil consumption rate exceed 1 quart every 800 miles or 20 hours for off-road?		
Is the engine operating on CCA fuel?		
Is there a history of turbocharger replacements? More than two in past 3 years?		
Is there a history of fuel injectors replacements? More than two in past 3 years?		
Is there a history of EGR component replacements? More than once in past 3 years?		
Is there a history of cylinder/wave replacements? More than once in past 3 years?		

RevB: The Sunbelt Checklist for DPFs Last Updated: Dec 2012 Page 1/4

Visual Inspection	Yes	No
Are there any visual integrity problems in the exhaust system (hazardous leaks - manifold to tailpipe)?		
At normal engine temperature and following snap to idle, is there visible white or blue smoke exiting tailpipe?		
Are there any visible combustion problems?		
Is the intake air filter in good condition?		
Are there any indications of air intake system leaks (possible signs of leaks at seal connections, visible cracks in the charge air cooler, audible turbo spooling problems, high tailpipe opacity)?		
Are there any visible signs of engine oil or diesel fuel present on exhaust system?		
Are there any visible signs of leaks from the turbocharger seals?		
Are there any visible signs of excessive crankcase vent/fuel emissions or dripping oil at the vent/fuel?		
Has the fuel pump, governor setting, or EGR valve been tampered with?		
Does the Engine Control Module show any active error codes?		
Is there available space for the retrofit?		

If any of the shaded boxes have been checked, the engine manufacturer fails the pre-assessment and should not be retrofit without further consultation with the diesel retrofit device manufacturer. If the engine/vehicle passes the pre-assessment, please proceed to the second page for further pre-installation considerations.

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Summary

Other Considerations:

- ___ **Engine mileage accumulation at install (On Road):** _____
- ___ **Engine hour accumulation at install (Off Road):** _____
- ___ If engine mileage accumulation is greater than the following values, the technology provider advises the owner that the higher rate of spontaneous engine component failures may result in unwanted failure of the emission control device.
 - Class 0 (0-33,000 hrs.) - 400,000 miles
 - Class 6.7 (33,001-33,500 hrs.) - 200,000 miles
 - Class 4.5 (14,001-19,500 hrs.) - 150,000 miles
- ___ **Exhaust peak opacity (per SAE J1667 protocols):** _____
 - Certain Mack engines - +15% limit
 - All other engines - +20% limit
 - Note: Manufacturer's operational requirements for Max. Exhaust Peak opacity: +10%. If in the right of the technology provider and be distributed to meet a vehicle over the opacity value is below the limit it, in that option, the vehicle presents additional safety risks.
- ___ **Data logging and duty cycle evaluation:** The application duty cycle must comply with the terms and conditions of retrofit device verification letter.
- ___ **Conduct safety analysis:** Evaluate the location of the retrofit device installation and consider its impact on:
 - Visibility
 - Location of device relative to fuel lines
 - Impact of device on structural integrity of framework or vehicle stability
 - Exposure of hot surfaces that may lead to thermal hazards and the need for heat shield
 Installer must be aware that some states or jurisdictions may have regulations governing the safe installation of diesel retrofit devices that must be considered as part of this safety analysis.
- ___ **Time Frame:** The assessment must be performed no more than 15 days prior to installation.
- ___ **Record Keeping:** The installer must maintain this record and provide a copy to DCL.

Sign-Off

Name: _____
 Title: _____
 Company: _____
 Date: _____

