

## SUBJECT: DPF Inspection and Cleaning Recommendations

Department: Service  
Section: Engine  
Model(s): All  
Model Year(s): 2008 & After  
Effective Date: 9/11/2012  
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Supersedes:

### Purpose:

This bulletin is to notify the dealers of the recommended inspection and cleaning procedures to be use with the Diesel Particulate Filter (DPF) on 2008 model year and after UD Trucks. This procedure will include a four (4) step process to aid the technician in proper visual inspection, testing and cleaning of the DPF to avoid excessive vehicle down time and unnecessary costs.

### Procedure:

It is recommended that any DPF cleaning should always included a thermal cleaning process. Thermal cleaning raises the DPF temperature in order to properly burn off any residual soot left over from pneumatic cleaning. Any cleaning process that does not include a thermal process may not sufficiently remove all the soot from the DPF filter and may require additional or repetitive cleanings.

**NOTE:** Consult the DPF Cleaning equipment manufacturers guidelines for recommended thermal cleaning procedures for **Oil or Coolant saturated DPF filters**. Failure to follow the equipment manufacturers guidelines may result in damage to the DPF filter.

### STEP 1: Initial visual inspection and testing.

The following information will guide the technician to properly inspect a DPF filter and determine if a filter can be cleaned and reused. While this inspection will not guarantee a filter can be cleaned completely, it will identify failed filters through visual inspection and testing prior to attempting the cleaning process.

DPF damages such as; melting, large surface cracks, weakened cell structure, loose or displaced ceramic, internal and external ceramic defects may be found during the initial inspection. If any of these conditions are found, the DPF should be replaced.

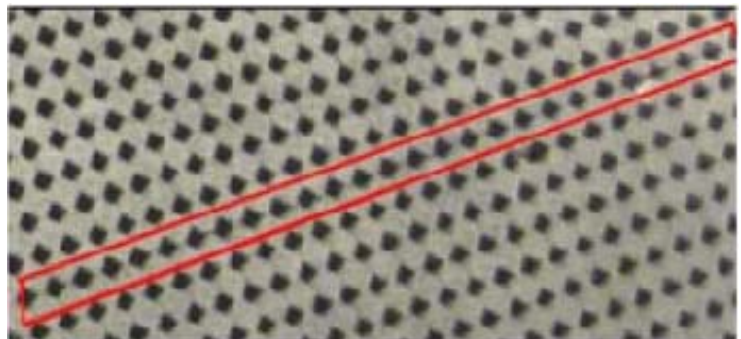
### Visual Inspection

The following are examples of DPF conditions that require replacement of the DPF filter.

Major Ceramic Substrate damage



Multiple cracks or cracks extending across several cells.



**Visual Inspection Continued:**

Outlet side is dirty and blotchy.  
Soot has passed through the DPF to the outlet side.

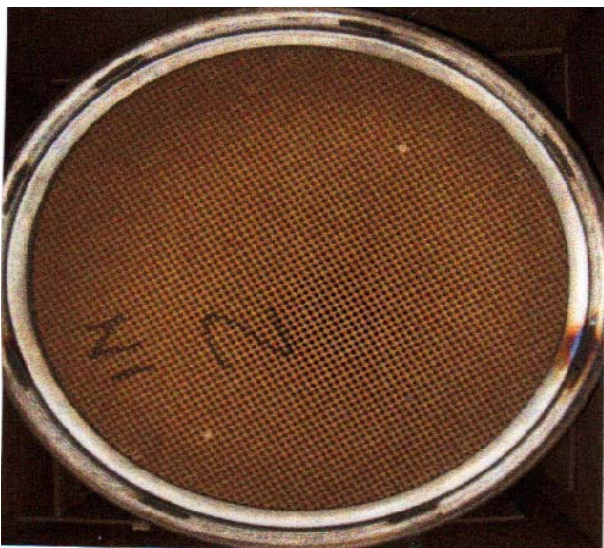


Black holes. If DPF has more than 20 black holes on the outlet side.



Normal filters that are acceptable for cleaning.

Outlet side is clean with a white to tan appearance



Inlet side is black with normal soot accumulation



**Step 2: PIN Gauge Testing**

The purpose of PIN gauge testing of the DPF is to identify internal melting of the DPF core. Filters that do not pass this test require replacement.

**NOTE:** Do not force the PIN Gauge into the filter or push the gauge past the maximum depth mark. Otherwise damage to the DPF filter will occur.

## PIN Gauge Testing Continued:

### Make a PIN Gauge

1. Acquire a straight piece of 0.035" O.D. straight welding rod at least 12 inches in length or 2 inches longer than the DPF filter.
2. Smooth or round the ends of the rod to prevent damage to the DPF core.
3. Measure from one end of the rod 7.25 inches and mark a point. This is the maximum depth the gauge should be inserted into the DPF filter.

### PIN Gauge Testing

1. Stand the filter on a clean surface with the outlet side facing up.
2. Starting at the 12 o'clock position approximately 1½ inches from the outside edge, drop the PIN gauge into one of the cells. Note how far the PIN drops into the cell. (Figure 1- A Below check 12 cells total)
3. Continue checking in a clockwise circular path.
4. Perform the same step above half way from the center to the edge of the filter in a circular pattern. Measure the depth on each cell. (Figure 1 - B Below check 6 cells total)
5. Last step check the center of the filter. (Figure 1 - C Below check 4 cells total)
6. A total of 20 cells will be checked. 12 outer - 6 middle - 4 center.

**NOTE:** When the DPF filter is melted inside, the cells usually close off and the PIN gauge will not drop fully into the cell. The damaged area will be within the first 6 inches.

If any of the cells the PIN gauge does not drop to the maximum depth mark on the gauge the filter has internal damage and must be replaced.

Pin Gauge Testing



Testing Pattern

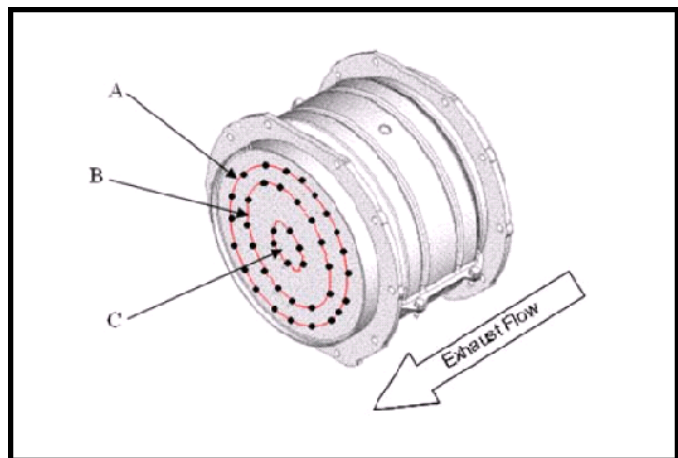


Figure 1

### Step 3: Stage 1 Pneumatic Cleaning:

Perform the first stage pneumatic cleaning of the DPF. Follow the equipment manufacturers guidelines for cleaning and testing procedures. This will remove the majority of the ash and soot accumulation for flow testing. If the DPF filter fails flow testing, record the results and then retest again after thermal cleaning.

Back Pressure Specifications:

<b>GH7</b>	0.9kpa	by 10.0m <sup>3</sup> /min
<b>J08</b>	24.5kpa	by 40.2m <sup>3</sup> /min

If the DPF filter passed the initial flow test, then visually inspect the filter for indications of soot that has passed through the DPF during the pneumatic cleaning process. Replace any filter that has evidence of soot bypassing the filter core.



**Step 3: Stage 1 Pneumatic Cleaning Continued:**

Examples of DPF Filters after Stage 1 Cleaning. These filters are acceptable

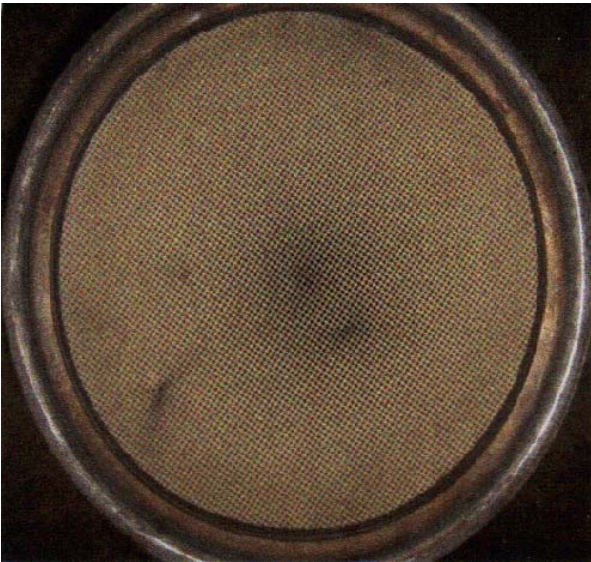
Outlet has a brown / tan appearance



Inlet has an even gray appearance



Outlet has a brown / tan appearance.  
This filter has 3 black holes and is acceptable



Inlet has an uneven gray appearance from thermal heat. The dark areas are minimal and acceptable.



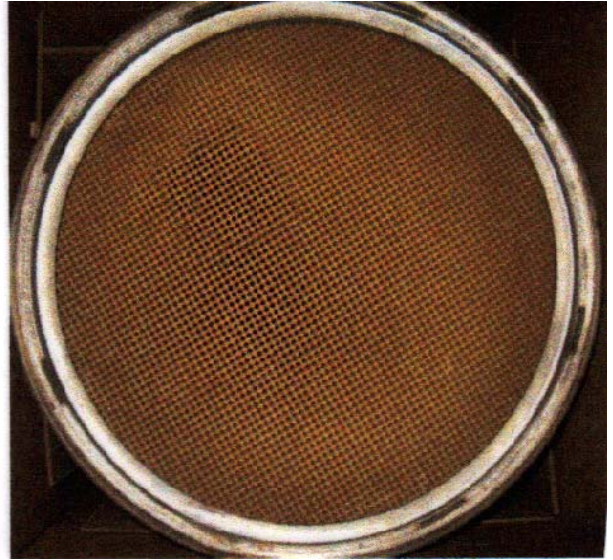
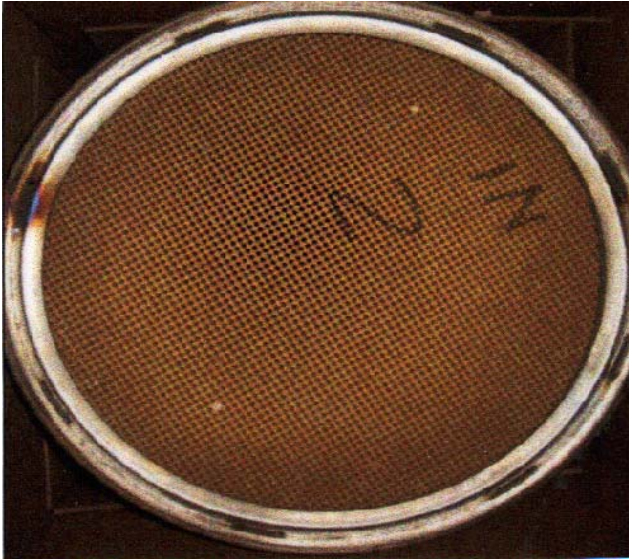
**Step 4: Thermal Cleaning and second pneumatic cleaning**

Thermal cleaning will increase the DPF temperature to a high temperature to turn any residual soot into ash that can be removed with the second pneumatic cleaning process. Upon completion of thermal cleaning a second flow test is performed and a final visual inspection.

**Step 4: Thermal Cleaning and second pneumatic cleaning continued:**

Example of DPF filter after thermal cleaning.

Both inlet and outlet sides are completely free of any residual soot and are nearly new in appearance.



**Warranty Information:**

Dealers may claim DPF cleaning and inspection on vehicles covered under the New UD Base Vehicle Limited Warranty or Gaseous Emission Control System Warranty. In cases where the DPF has failed the flow test after Stage 2 thermal cleaning, dealers will be required to submit all supporting documentation with flow test readings, along with initial visual inspection and PIN gauge test results that were performed prior to cleaning. (See attached DPF worksheet to record inspection results)

**NOTE:** Claims for multiple Stage 1 pneumatic cleaning without the Thermal cleaning procedure will not be accepted.

**The Information contained in this bulletin should not be interpreted as the basis for a warranty claim.**



# DIESEL PARTICULATE FILTER (DPF) WORKSHEET

Date: \_\_\_\_\_ Mileage: \_\_\_\_\_  
 VIN: \_\_\_\_\_ Delivery Date: \_\_\_\_\_  
 Dealer Code: \_\_\_\_\_ Pass / Fail            Y    N

**Before Cleaning Visual Inspection:**

**DPF Inlet (Dirty side)**

Light Tan	Light Brown	White	Light Gray	Black	Oily
Tan	Brown	White & Gray	Gray	Black & Gray	Wet to Touch
Mottled Tan	Mottled Brown	White & Black	Mottled Gray		Dripping
Dark Tan	Dark Brown		Dark Gray		Seeping

**DPF Outlet (Clean side)**

Light Tan	Light Brown	White	Light Gray	Black	Oily
Tan	Brown	White & Gray	Gray	Black & Gray	Wet to Touch
Mottled Tan	Mottled Brown	White & Black	Mottled Gray		Dripping
Dark Tan	Dark Brown		Dark Gray		Seeping

Black Holes: \_\_\_\_\_  
 Cracks: \_\_\_\_\_  
 Comments: \_\_\_\_\_

**PIN Gauge Test - Depth inches**

	Outer Ring	Middle Ring	Center
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

