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TO: Service Locations

FROM: Service Systems Development

SUBJECT: **DPF Filter Ash Measurement for EPA07 Series 60, MBE 4000, DD13, DD15 Engines**

ISSUE

The purpose of this document is to provide some level of guidance in determining remaining ash levels in filters before and after alternate cleaning processes are employed; Detroit has not fully evaluated all of these processes, but is providing these basic cleaning alternatives.

PROCEDURE

Option A:

Reuse of existing filter with measured ash level that is below an acceptable level as determined using the measurement procedure detailed in this publication.

Option B: (Recommended)

Replace existing filter with a filter cleaned using Detroit Engines proprietary reliabilt® cleaning process.

Option C:

Use an aftermarket filter cleaning device to remove ash from the DPF.

NOTE:

Although Detroit has not fully evaluated every Diesel Particulate Filter cleaning machine or process on the market, it has been the company's experience that air cleaning the filter does not consistently achieve a uniform removal of ash across the filter. Therefore, the recommended maximum ash measurement after air cleaning is included in this publication to provide guidance for filter reuse after any type of cleaning.

All EPA07 filters are the same length (15 inches); when the ash level in the filter reaches three inches, it is considered full.

ASH MEASUREMENT PROCEDURE:

TOOLS REQUIRED

- **Depth Gauge**
 - Multipurpose Stainless Steel Wire
 - 0.039" diameter x 24" length
 - 18.25 AWG gauge
 - McMaster-Carr P/N: 8908K75 - \$31.97 per 100 pack

NOTE: If wire gauge gets bent, dispose of and replace. If any force is applied to move the wire in the cell, it will provide a false measurement.

- **Measuring Device:** Ruler, tape measure, etc.

INSTRUCTIONS

NOTE: A Parked Regeneration must be performed prior to measurements being taken.

1. **Allow filter to cool completely.**
2. **Set filter on bench with the inlet side facing up.**
Identified by an arrow on the side of the DPF can, the inlet side is the end the arrow points away from. (Fig. 1)

Inlet Side



Fig. 1

3. **Using the wire depth gauge, drop (DO NOT FORCE) the gauge into 10 randomly selected cells using a circular pattern. Allow gauge to drop freely (DO NOT FORCE).** (Fig. 2)

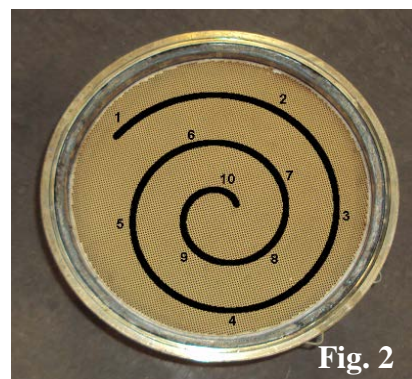


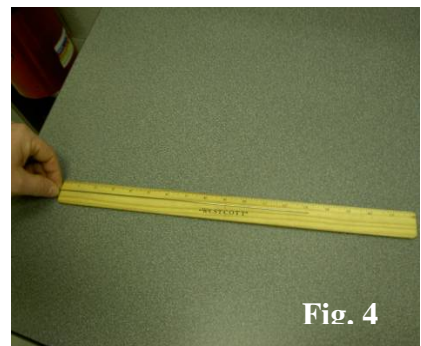
Fig. 2

4. **Once travel of the wire gauge has ended, slightly tap on the side of the wire depth gauge using the index finger to verify it has reached maximum depth.** (Once again, **DO NOT FORCE** the gauge in a downward movement.)

5. Pinch the wire_gauge using the thumb and the forefinger at the very top edge of the substrate brick and remove gauge. (Fig. 3)



6. Using a tape measure or other measuring device, measure the distance from the end of the gauge to the fingernail of the forefinger to the nearest 1/8" and record. (Fig. 4)



The table below can be used to estimate how much ash is in a given filter before or after cleaning:

DPF Ash Depth Conversion Chart

	Column A	Column B	Column C
	Particulate Filter Length	Particulate Filter Measured Depth	Actual Ash Volume
<i>Example</i>	<i>15.0</i>	<i>13.750</i>	<i>1.250</i> <i>column A – column B =</i> <i>column C</i>
Measurement 1			
Measurement 2			
Measurement 3			
Measurement 4			
Measurement 5			
Measurement 6			
Measurement 7			
Measurement 8			
Measurement 9			
Measurement 10			
Column C Total			
Calculated Average Calculated average equals column C total divided by 10			

If calculated average ash depth is 1.5 inches or **less**, the filter does not need to be cleaned and can be reinstalled and the ash accumulator reset.

If calculated average is **greater** than 1.5 inches, the filter must be cleaned using either the Detroit recommended process or an alternate process.

Frequently Asked Questions:

What is a full filter and when does it need cleaning?

Detroit particulate filters are considered “full” when the ash level has reached a predetermined level in the cells. Refer to the Filter Identification Chart in this document for filter identification and “Full” filter specifications.

What is a clean filter?

Any filter with less than 0.5 inches of ash is considered a clean filter.

How do I clean the filter?

Presently, the Detroit proprietary reliabilt® cleaning process is the only process that has been approved by Detroit Diesel Corporation.

A number of alternate cleaning system manufacturers have developed their own processes based on the designs of their respective cleaning equipment. To help reduce the risk of filter damage while cleaning, be sure to follow the appropriate cleaning equipment manufacturer's recommendations for equipment use. Detroit does not assume any liability or risk associated with the use of non-company-approved cleaning processes.

How do I test the filter to determine if it is clean?

Alternate cleaning methods in the market today have highly variable results and Detroit recommends checking the ash level in a minimum of 10 cells and averaging the results to determine amount of ash remaining in the filter. Cells checked should include all areas of the filter including the center, middle and outer area of the filter.

A filter cleaned using an alternate cleaning process must have less than 1.5 inches of ash remaining in the cells if it is to be re-used on an engine. Failure to meet this criterion will increase the risk of filter damage. The 1.5 inch level is considered minimum acceptance criteria. Follow the measurement procedure detailed in this publication.

When do I reset the ash accumulators?

Ash accumulators can be reset when installing a new filter, replacement filter or a filter cleaned to .5" of ash or less. Additionally, a filter that has been removed, inspected and contains less than 1.5 inches of accumulated ash can be reinstalled and the ash accumulator reset.

If the accumulator is reset on a filter that does not meet the above criteria, there will be no accurate warning lamps for driver notification for the next change/clean interval. Since Detroit does not approve of DPF alternate cleaning methods, it is the customer's responsibility to determine the next mileage point at which to conduct a filter cleaning. Failure to perform a filter cleaning may result in an over-full filter. Over-full filters are more prone to localized high heat and cracking. Also higher-than-normal engine back pressure will be experienced with a negative impact on performance and fuel economy.

How do I reset the ash accumulators?

The ash accumulators must be set using DiagnosticLink™ tool.

ADDITIONAL INFORMATION

It is important to note that this procedure is being released to address Detroit's reliable filter availability issues. Detroit's filter design, cleaning intervals and cleaning process have been designed as a comprehensive maintenance package. The reliable cleaning process ensures ash levels are less than 1/8 in. after cleaning. This requirement ensures that filters are able to provide consistent performance throughout the lifecycle and avoid costly damage to both the filter and engine that can result from improper maintenance.

Detroit is committed to providing industry leading technology and continuously strives to lower overall operating costs for our customers. As we continue to learn and develop this technology, we will work with our customers to educate and enhance our offerings.

CONTACT INFORMATION

For more information regarding the advantages of the Detroit proprietary filter cleaning process, contact your local Detroit service provider.