How to Check the DPF Status of a Used Construction Machine

Before purchasing a used construction machine, it's critical to check the status of its Diesel Particulate Filter (DPF). This filter plays a key role in meeting modern emissions regulations and avoiding costly repairs. In this newsletter, we explain what a DPF is, why it matters, how to check its condition, and how to spot illegal modifications.

What Is a DPF in a Construction Machine?

A Diesel Particulate Filter (DPF) is a component in the exhaust system that traps and removes soot (particulate matter) from the engine's exhaust gases. It helps the machine meet emission standards such as Tier 4, Stage IV, and Stage V. A DPF reduces black smoke and harmful particles like PM10 and PM2.5, making the machine cleaner and more environmentally compliant.

Why You Should Check the DPF Before Purchase

Replacing a DPF in a large machine can be extremely expensive. For a mid-size machine like a 20–30 ton excavator, costs range from $5,000 to $10,000. For larger equipment such as a 40+ ton excavator, dozer, or loader, DPF replacement can exceed $25,000. These high costs make it essential to evaluate the DPF before finalizing any purchase.

How to Check the DPF Status

1. **Check the Machine's Display or Diagnostic Menu**
   Most modern machines from brands like Caterpillar, Komatsu, Volvo, Hitachi, and John Deere feature onboard monitoring systems. You can access information such as the DPF soot level, regeneration status, and any fault codes by navigating through the operator's display or service menu.

2. **Use a Diagnostic Tool**
   Use an OEM or compatible diagnostic tool to retrieve detailed DPF data. Examples include:

   - Caterpillar: CAT ET
   - Volvo CE: VCADS or Tech Tool
   - Komatsu: Diagmaster
   - John Deere: Service ADVISOR

ECM Serial Number	17167051QU
Software Group Part Number	5296540-00
Software Group Release Date	MAR17
Software Group Description	AFT_T4F_C9.3_HWA

Logged Diagnostic Codes [Diagnostic Clock = 12816 hours] - Engine #1

Code	Description	Occ.
168- 4	Electrical System Voltage : Voltage Below Normal	12
3820- 4	Aftertreatment #1 DEF Controller #1 : Voltage Below Normal	1
5856- 9	SAE J1939 Data Link #3 : Abnormal Update Rate	13

Logged Event Codes [Diagnostic Clock = 12816 hours] - Engine #1 Afte

Code	Description	Occ.
E114 (1)	Aftertreatment #1 DEF Dosing Unit #1 Input Lines Not Purged	4
E1050 (2)	High Aftertreatment #1 Fuel Pressure #1	1
E1466 (1)	Operator Forced Shutdown with High Exhaust Temperature	1

Active Diagnostic Codes - Engine #1 Aftertreatment Controller

Code	Description
No Active Diagnostic Codes	

Active Event Codes - Engine #1 Aftertreatment Controller

Code	Description
E1050 (2)	High Aftertreatment #1 Fuel Pressure #1

These tools help you check soot and ash levels, regen history, differential pressure, and error codes.

3. **Inspect Maintenance Records**
   Ask for documentation of the DPF's maintenance history. Look for the date of the last cleaning or replacement, regen frequency, and any past DPF-related errors. Machines that require frequent forced regenerations may have underlying issues.

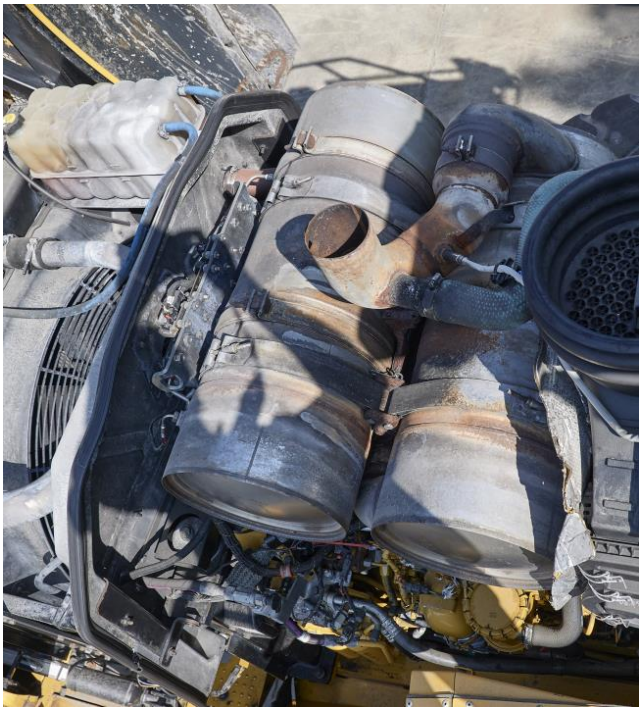
4. **Conduct a Physical Inspection**
   Check for signs of soot buildup around the exhaust. Listen for active regeneration (higher idle RPM or hotter exhaust). Examine whether any emissions components have been removed or tampered with.

5. **Watch for Warning Signs**
   Be alert to frequent or failed regenerations, loss of power, poor fuel efficiency, engine warning lights, and error codes such as P2463 or P2002. These signs may indicate a clogged or malfunctioning DPF.

Pro Tip:
Before replacing a DPF, confirm it is actually at the end of its life. In many cases, a forced regeneration or professional cleaning can resolve the issue for far less money.

Cleaning Instead of Replacing
If the DPF is still structurally sound, you can clean it instead of replacing it. Cleaning (ash removal) typically costs between $600 and $1,500 depending on size and method. Most filters can be cleaned multiple times, with service intervals ranging from 2,000 to 4,500 operating hours.

How to Detect an Illegally Removed DPF



1. **Visual Inspection**
   Look for welding marks or cuts on the DPF casing. Check that all DPF sensors and wiring are present and intact. Missing or damaged sensors may signal tampering.
   Examine the engine control software if possible. Unauthorized software modifications may hide the fact that the DPF has been removed.

2. **Warning Lights and Error Codes**
   A DPF warning light may indicate the system isn't functioning properly. Read the ECU for stored error codes related to the DPF or its sensors. These codes can offer clues about illegal removal or system failures.

3. **Emissions Testing**
   Roadside or formal emissions testing can detect high particulate emissions caused by a missing or faulty DPF. Machines without functioning filters are likely to fail.

Is It Illegal to Remove the DPF?
Yes. In most regions, removing the DPF from a construction machine violates emissions regulations. Authorities may issue fines, penalties, or impound the machine. Operating a tampered machine also poses a risk for the buyer if discovered during inspections or audits.

Which emission status can a construction machine reach with a DPF exhaust filter system?

A construction machine equipped with a DPF (Diesel Particulate Filter) can typically meet the following emission standards, depending on the full exhaust aftertreatment system it is paired with:

A construction machine with a DPF can meet:

- **Stage IIIB or Tier 4i** when paired with EGR/DOC
- **Tier 4 Final or Stage IV** when paired with SCR and DOC
- **Stage V (EU)** only when DPF is combined with DOC, SCR, and sometimes ASC

Let Mevas Inspect the Machine for You

When Mevas Heavy Equipment Inspectors evaluate a used construction machine, they inspect the exhaust system and check for DPF-related error messages. Our inspectors identify signs of modification or tampering and include these findings in the final report. This inspection offers peace of mind and costs significantly less than replacing a faulty DPF system.

Before you import or purchase a machine, let Mevas help you avoid costly surprises.

This article is also available on our website. Please visit https://mevas.net/dpf for more info.