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Title: 2010 MaxxForce DT/9/10 Aftertreatment Service

Applies To: 2010 MaxxForce DT/9/10

DESCRIPTION

A properly operating aftertreatment system requires little manual intervention from the operator. DPF Lamps that are illuminated may indicate a problematic drive cycle or an extended idle condition that may not be conducive to transparent DPF regenerations. These illuminated lamps may also be the result of a previous or current upstream engine system concern.

NOTE:
 Removal of the DOC or DPF for inspection purposes should not be performed until diagnostics require it.

TRIAGE

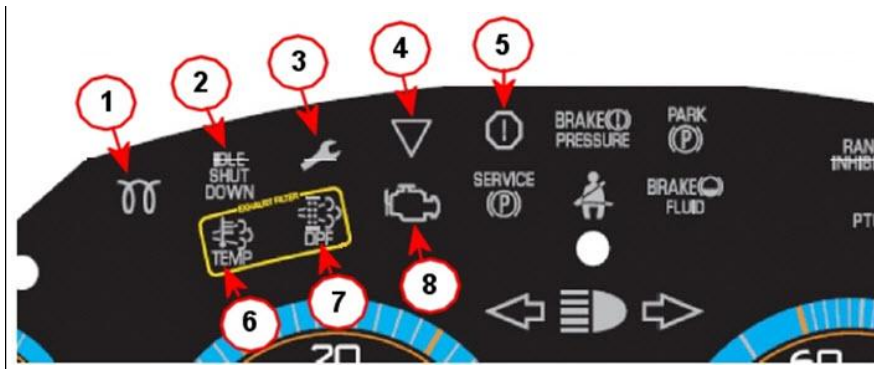
- Check the vehicle service history (Warranty and Case Files).
- Record all active and inactive diagnostic trouble codes(DTCs); Record SPN and FMI of active and inactive DTCs.
- Record the current calibration and check the vehicle calibration scorecard to determine if an updated calibration is available.
- Check for any open campaigns applicable to this repair and update per campaign.




CUSTOMER QUESTIONNAIRE







1. Can you explain when the vehicle experiences the problem?
 - For instance: Is it at idle, under load or is there anything unique about the circumstances?
2. Check the status of the INHIBIT switch (when equipped). Position should be OFF.
3. Ask the driver if a parked REGENERATION was attempted and what was the result?
4. Did any lights such as the 'Check Engine Light' or 'DPF Lamp' show up on the dash? If so, what lamps were ON?
5. Did the problem just start or has it been getting worse over time?
6. Has any work been done recently to the engine or chassis?
7. Has the vehicle been in for the same problem before? If we rode with you, how would you duplicate the problem?
8. Record the percentage of time the vehicle is spending at idle.
9. Record the percentage of time the vehicle is in PTO operation.
10. Does the vehicle exhibit any of the following symptoms?
 - Visible black smoke
 - Gray smoke / faint black smoke
 - Aftertreatment lamps illuminated

GENERAL INFORMATION

Dash Identification (Only Lamps 5, 6 and 7 will be discussed in this article):







Lamp ID	Lamp Name	Description
5	 Stop Engine	Illuminates Red Used in conjunction with other Warning Lights or General Text and Warning Messages to indicate a red STOP alert. This alert may be an indication of a serious problem has occurred. The Engine may derate or Shutdown soon. Pull the vehicle safely off the roadway, turn on flashers, set park brake, place warning and Shut Off the engine. Seek service immediately.
6	 High Exhaust Temperature (HEST)	Illuminates Yellow when exhaust system components are operating under normal conditions and exhaust gases are at high temperatures . This is normal operation when the aftertreatment system is in active or passive regeneration.
7	 Diesel Particulate Filter (DPF)	Yellow (Solid or Flashing) to indicate the need to regenerate the Diesel Particulate Filter. Operators should follow the instructions on the Sun Visor Decal.

DPF Lamp	Level	Condition	Codes	Warranty Coverage
 Solid	Level 1	Exhaust Filter regeneration is required.	SPN 3719 FMI 15	No – customer responsibility unless related to upstream engine system concern.
 Flashing	Level 2	Exhaust Filter is full; Parked Regen is required.	SPN 3719 FMI 16	No – customer responsibility unless related to upstream engine system concern.
 and  Flashing Alarm	Level 3	Exhaust Filter is full; Engine Performance is limited.	SPN 3719 FMI 0	No – customer responsibility unless related to upstream engine system concern.
 Shutdown		A serious problem has occurred.	SPN 3936	Yes – Normal Warranty coverage
 TEMP		Exhaust System is HOT	None	No - Normal Operation

VISOR STICKER

EMISSION SYSTEM INSTRUCTIONS

 Level 1	 Level 2	 Level 3	 Exhaust System Temperature is HOT
Exhaust filter regeneration required. Drive on highway at highway speeds OR start *Parked Regeneration to prevent loss of engine power.	Exhaust filter is full. Pull vehicle safely off roadway and start *Parked Regeneration to prevent loss of engine power.	Exhaust filter is full. Engine performance LIMITED. WARNING: Pull vehicle safely off roadway and start *Parked Regeneration to prevent engine stopping.	WARNING: Exhaust components are operating under normal conditions and exhaust gases are at extremely high temperatures. When stationary, keep away from people and flammable materials, vapors, or structures or STOP ENGINE

* See Operator's Manual for Further Details

WARNING:
When performing *Parked Regeneration, make certain vehicle is safely off roadway and exhaust system is away from people, or any flammable materials, vapors, or structures. Parked Regeneration may increase engine speed.

WARNING:
Failure to follow these instructions may result in a loss of engine power, vehicle speed, increased exhaust temperatures, and may cause an accident or fire resulting in property damage, personal injury, or death.

!

A serious problem has occurred. Engine may SHUTDOWN soon. Pull vehicle safely off roadway, turn on flashers, set park brake, place warning devices, and STOP ENGINE. Seek service immediately.

DIAGNOSTIC PROCEDURE

1. Diagnose and repair any active or inactive fault codes before troubleshooting SPN 3719 FMI 16, SPN 3719 FMI 0, 3719 FMI 15, and 3936 FMI 0.
 - Codes other than the above mentioned; can be the root cause for the aftertreatment concerns and need to be repaired before proceeding to Step 2.
2. Perform a snap acceleration of the engine from idle to high idle (100% APS). Repeat this step several times while watching for black smoke coming out of the exhaust outlet pipe.
 - a. If black smoke is seen repeatedly:
 - Drop the DOC/DPF and inspect. Upload pictures of the inlet and outlets of both parts into the Case file. A case file is required for Aftertreatment component replacement under warranty.
 - b. If black smoke is not seen during Step 2, proceed to Step 3.



Please take a picture of the outlet of the DPF as shown above. Open an iApprove case file to replace DPF if this is discovered.

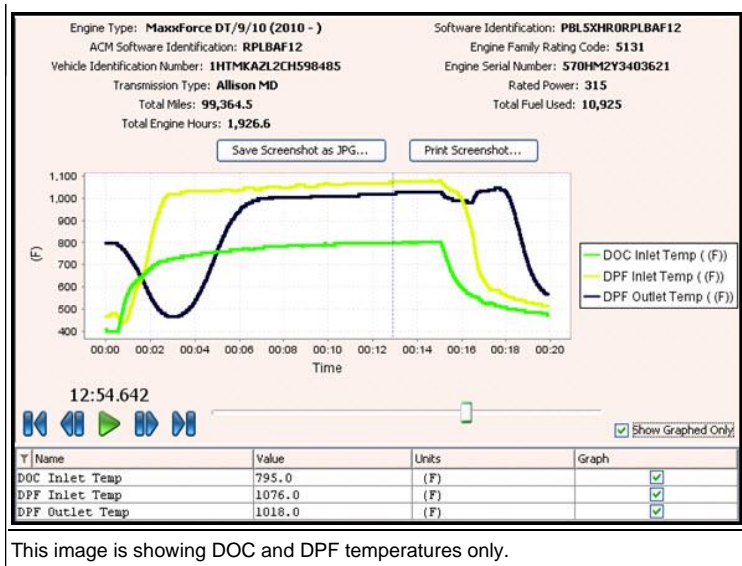
3. Perform Onboard Filter Cleanliness Test (OBFCT) using Service Maxx.
 - Record a Performance Session while OBFCT is running.
 - Performance of the OBFCT can be observed live while the test is running and can be replayed later for review.
4. Please [CLICK HERE](#) to play an example of an OBFCT signal playback in ServiceMaxx.
 - a. Observe exhaust gas temperatures from DOC Inlet Temperature, DPF Inlet Temperature and DPF Outlet Temperature.
 - Refer to Table 1 (below) with ranges.
 - b. If DPF Soot Load is at an elevated level (7+), perform 1 additional OBFCT.
 - Watch for temperatures to raise (please note that during high soot load levels the DOC and DPF temperatures will be lower than normally expected to prevent cracking of the filter).
 - Additional OBFCT's may be required to reduce soot load and turn off the DPF lamp.
 - c. Do not continue OBFCT's if:
 - Other DTCs trigger during testing.
 - Exhaust temperatures do not increase enough to enter into a dosing (Active) regeneration.
 - Soot Load level is low enough to remove all DPF overload lamp levels.
5. Replay OBFCT using Service Maxx and observe Aftertreatment temperatures and diagnostic trouble codes.
 - The replay of the snapshot can be used to observe temperatures and other parameters that could abort the OBFCT.
 - Refer to [DTC diagnostic](#) information.
 - If the values below are met the OBFCT was good and no further diagnosis is necessary.

After Treatment Guidelines for Actuators and Sensors during OBFCT:

TABLE 1	
DOC Inlet minimum operating temperature 500F (260C)	DPF Inlet operating range 900 - 1250F (482 - 676C)
DPF Outlet operating range 900 - 1250F (482 - 676C)	

Representative Aftertreatment Replay of a Properly Performing OBFCT:



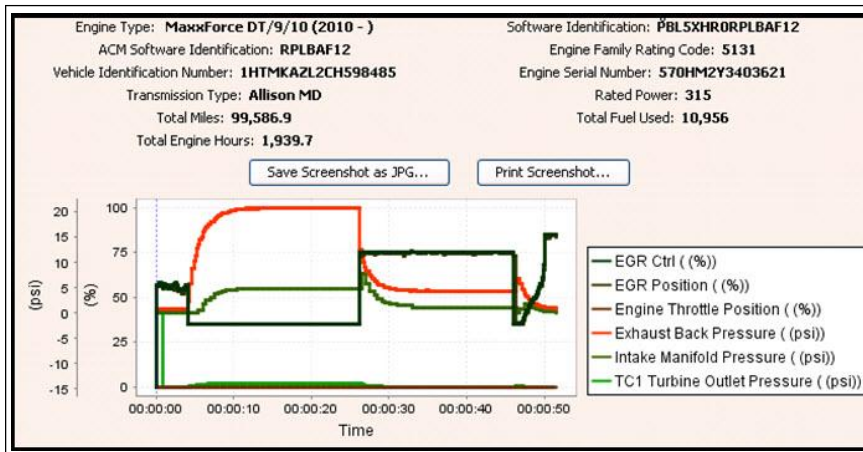


This image is showing DOC and DPF temperatures only.

- If the OBFCT aborted and temp values were not met, perform an AMT (air management test) and collect a snapshot using the performance session.

I-6 Air Management Test (AMT)

During an AMT, MAF average values are compared with the EGR Valve open and closed. As you can see in the graph below, EGR position is commanded and based on this you may see the Intake Manifold and Exhaust back pressures change. The test will only look for proper operation of the EGR Valve.



- If there is an issue with the EGR valve, the fault that will appear from the AMT test will be SPN2659 FMI20 (KOER AMT – EGR test failure). Also, attach the snapshot to the case file for Tech Services to review.

6. After the repairs are completed, return to Step 3 and run the OBFCT.
 - a. After successfully performing an OBFCT, proceed to Step 7.
7. Perform the following:
 - a. Complete all open AFC's.
 - b. Clear DTCs.

RELATED INFORMATION

1. Maintenance:
 - a. Steps to take after DPF cleaning or replacement (enables ECM to recognize new or cleaned part).
 - Change ServiceMaxx ID 95171 (CDPF Reset Request) = YES
 - **NOTE:** Should reset value to 0 and this is for new or cleaned DPF's **ONLY**.



ID	Name	Value	Units	Units	Watched
7021	Auxiliary Engine Speed Control - Disable DP With Parking Brake Released	XXXXXXXXXX			
7020	Auxiliary Engine Speed Control - Disable DP With Service Brake	XXXXXXXXXX			
7024	Auxiliary Engine Speed Control - Disable DP With Vehicle Speed	XXXXXXXXXX			
7026	Auxiliary Engine Speed Control - Enable ABS Override	Enable			
7021	Auxiliary Engine Speed Control - Enable DP Override	None			
7001	Auxiliary Engine Speed Control - In Cab Mode	Disable			
7003	Auxiliary Engine Speed Control - In Cab Operation Interface	Disable			
7004	Auxiliary Engine Speed Control - In Cab Mode	Disable			
7001	Auxiliary Engine Speed Control - Maximum Vehicle Speed	XXXXXXXXXX	MPH		
7001	Auxiliary Engine Speed Control - Mode	XXXXXXXXXX	MPH		
7001	Auxiliary Engine Speed Control - Permit Engine Speed 1 (Hot)	XXXXXXXXXX	MPH		
7004	Auxiliary Engine Speed Control - Permit Engine Speed 2 (Normal)	XXXXXXXXXX	MPH		
7004	Auxiliary Engine Speed Control - Permit Engine Speed 3	XXXXXXXXXX	MPH		
7004	Auxiliary Engine Speed Control - Permit Engine Speed 4	XXXXXXXXXX	MPH		
7004	Auxiliary Engine Speed Control - Permit Engine Speed 5	XXXXXXXXXX	MPH		
7004	Auxiliary Engine Speed Control - Permit Engine Speed 6	XXXXXXXXXX	MPH		
7001	Auxiliary Engine Speed Control - Pump Stop	XXXXXXXXXX	MPH		
7004	Auxiliary Engine Speed Control - Remote Inhib Enable	XXXXXXXXXX			
7003	Auxiliary Engine Speed Control - Return to Zero	XXXXXXXXXX			
7003	Auxiliary Engine Speed Control - SST Enable	XXXXXXXXXX			
8001	Stumble Signal Processing Mode	Disable the MIL11 to activate...			
8001	Stumble Signal Processing Mode	DPF (DPO/DMC) Feature enabled			
8001	Stumble Signal Processing Mode	XXXXXXXXXX			
8001	Change Oil Lamp Activation Time	XXXXXXXXXX			
8001	Change Oil Lamp Always On	XXXXXXXXXX			
8001	Change Ambient Protection Enable	XXXXXXXXXX			

b. DPF ash cleaning interval chart.

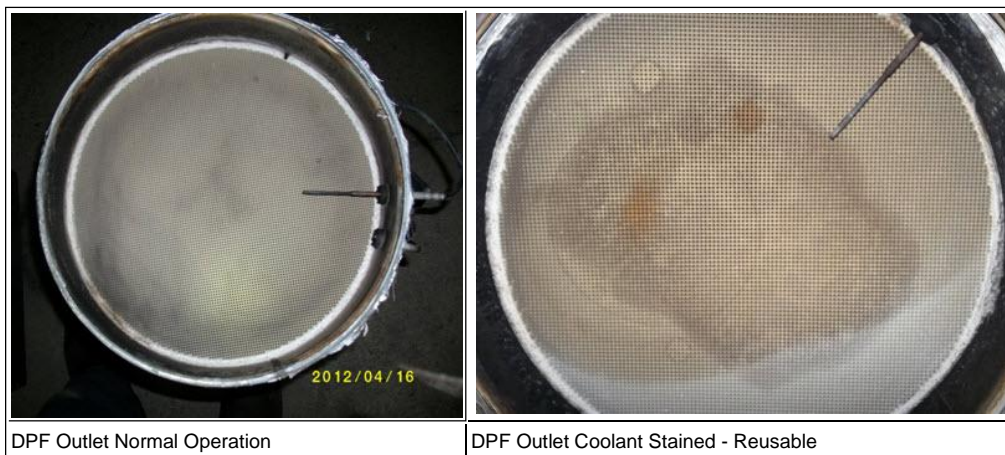
- Service Operation interval – Whichever comes first: Kilometers/miles, months, years, hours

EPA 2010 Emissions CI-4 Oil	EPA 2010 Emissions CJ-4 Oil
240,000 km (150,000 mi)	322,000 km (200,000 mi)
22 months, or 4,500 hours	30 months, or 6,000 hours

2. DPF:

- Service guidelines:
 - If DPF Soot Load is at an elevated level (7+), perform 1 additional OBFCT.
 - Watch for temperatures to raise (please note that during high soot load levels the DOC and DPF temperatures will be lower than normally expected to prevent cracking of the filter).
 - Additional OBFCT's may be required to reduce soot load and turn off the DPF lamp.
- Do not continue OBFCT's if:
 - Other DTC's trigger during testing.
 - Exhaust temperatures do not increase enough to enter into a dosing (Active) regeneration.
 - Soot Load level is low enough to remove all DPF overload lamp levels.
- DPF face plugging can be traced to the following concerns:
 - Air Management System
 - Fuel System
 - Drive cycle / load factor
 - Vehicle application

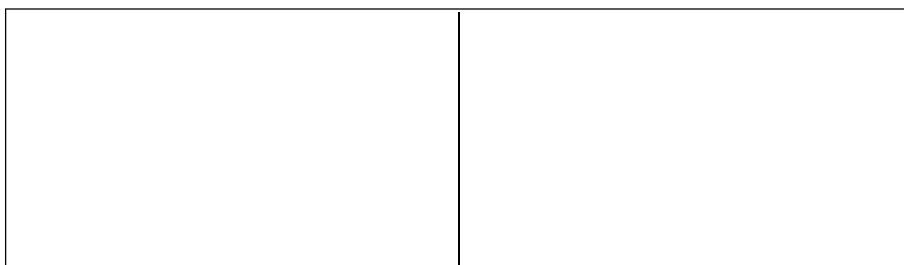
* Please Refer to: [FSX DPF Reuse Guidelines.pdf](#)



3. Oil Ingestion -- Open an iApprove Case File if:

- DPFs have been subject to oil contamination.
- DPFs that are saturated with oil, see [FSX oil contamination safety letter](#).

DO NOT ATTEMPT TO RUN AN OBFCT OR CLEAN THE DPF





DPF Outlet - Oil Contaminated



DPF Outlet Coolant - Oil Contaminated

4. Damaged DPF - Open an iApprove Case File if:
- External canister damaged (canister or sealing damage).
 - Media damage due to over fueling.



Media Damage from Over Fueling

5. DPF Face Plugging:
- Normal operation.
 - A face plugged DPF can be cleaned with OBFCT. Only use a cleaning machine if the engine does not start.



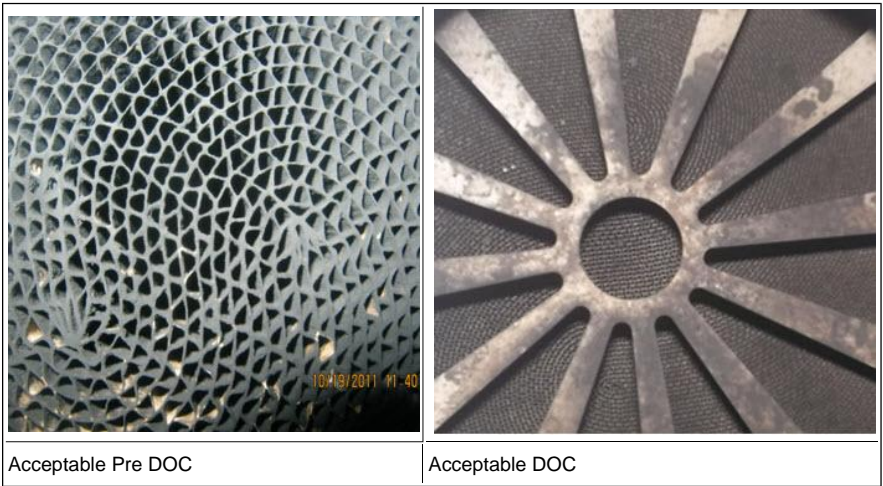
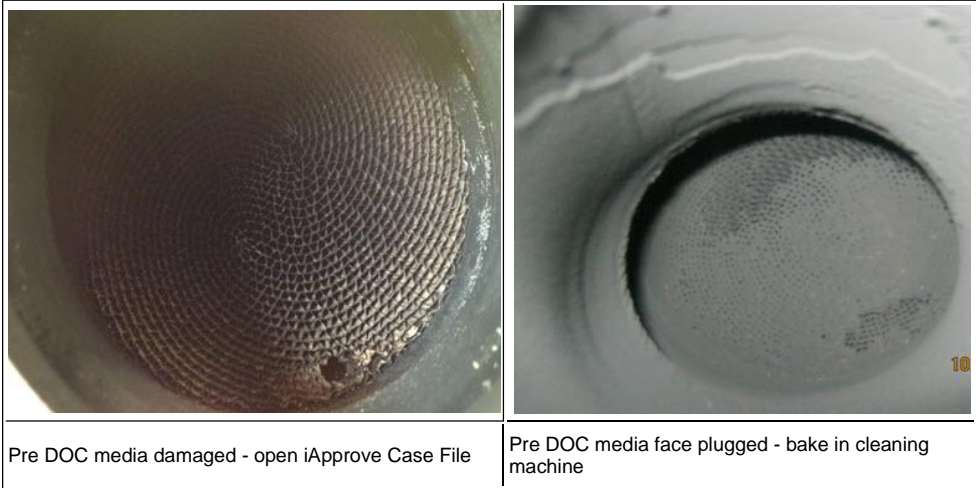
Normal Operation



DPF face plugged – A face plugged DPF can be cleaned with OBFCT. Only use a cleaning machine if the engine does not start.

6. Pre DOC / DOC Service Guidelines:
- Pre DOC and DOC face plugging (indicated by poor OBFCT results) can only be cleaned by baking.
 - Do not use the DPF Pneumatic Cleaner on these components as damage may result. See DOC Damage as a Result of Improper Cleaning.
 - Pre DOC and DOC face plugging can be traced to the following concerns:
 - Air Management System
 - Fuel System
 - Drive cycle / load factor
 - Vehicle application
 - If no white smoke and no coolant loss is observed, the pre DOC and DOC are operating normally.

* See photos below of acceptable and not acceptable pre DOC / DOC components:



7. Cleaning Machine Locator:

- DPF Cleaning Tool Locator
- Navistar Dealer Cleaning Tool Locator – Select 'DPF Cleaning' under 'Show Advanced Options'.

8. AFI Service Guidelines:

- Refer to [IK1200753](#)
- Perform DSI de-aeration fuel bleeding procedure with Service Maxx to eliminate air from the AFI fuel supply line. This procedure should be performed anytime fuel system service is required including fuel filter service.

Repair Aftertreatment SRT Operations:

NOTE:

Use **ONLY** SRT operations that are required.

Procedure	Hours	SRT Code	Model
DOC Replace (Horizontal Mount)	1.2	A12-4902	All Models
DOC Replace (Vertical Mount)	1.3	A12-4904	All Models
DPF Replacement (Horizontal Mount, Under Cab)	0.8	A12-4930	7000
DPF Replacement (Horizontal Mount, Under Cab)	0.6	A12-4932	All Models non 7000
DPF Replacement (Vertical Mount)	0.9	A12-4934	All Models non 7000
AFI Replacement	1.5	E12-7559T	HC Bus
AFI Replacement	1.5	GY12-7559T	CE/ BE
AFI Replacement	1.6	KL12-7559T	4300, 4400
AFI Replacement	1.6	M12-7559T	7300, 7400, 7500
AFI Replacement	1.5	NH12-7559T	RE/ Motorhome
OBFCT	0.5	GY12-2235A	CE/ BE
OBFCT	0.5	I12-2235A	RE
OBFCT	0.5	KL12-2235A	4300, 4400
OBFCT	0.5	M12-2235A	7300, 7400, 7500

WARRANTY

Locating DPF serial number [IK1200272](#)

- Warranty Information:
 - [WPL2800080](#) - WPL 13-003G Warranty iApproval Requirements
 - [WPL2800021](#) - Diesel Particulate Filter (DPF) Cleaning Reimbursement WPL 11-002G
 - [WPL2800020](#) - Engine Emission Component Coverage WPL 11-003G
 - [IK0700031](#) - DPF cleaning or replacement warranty

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