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## Service Information Bulletin

SUBJECT	DATE
Contaminated Fluids Diagnostic Tests	March 2017

### Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0193	GHG17 Medium Duty	Checking Diesel Exhaust Fluid Quality - GHG17	These are new sections.
		GHG17 Perform Performance Check - Low Temperature ATD	
		Diesel Oxidation Catalyst Face Cleaning	



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## 2 Checking Diesel Exhaust Fluid Quality

To determine if the Diesel Exhaust Fluid (DEF) quality is correct, you will need to use the refractometer W060589009101 in tool kit W060589001900 (DEF Test Kit). Retrieve a sample of DEF from the DEF tank, taking the sample at the highest level. Put two to three drops on the refractometer and check the concentration level. Good quality DEF should read between 31.8 to 33.2. If the reading is within specification, then the next sample should be taken at the metering unit. Disconnect the inlet to the dosing unit and place the line in the graduated cylinder and then start an ADS Self-Check service routine to collect another sample of DEF. Retest fluid again.

### Checking for Contaminated Diesel Exhaust Fluid

To determine if the Diesel Exhaust Fluid (DEF) has been contaminated, multiple things will need to be checked: color, smell and the use of test strips.



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### Color

Diesel fuel and oil will float on the top of DEF after letting it set.

- Light blue exposed to copper or brass
- Rusty color exposed to steel or galvanized steel

### SMELL

DEF can have a slight ammonia smell.

### Checking for Diesel Fuel/Oil In Diesel Exhaust Fluid

If diesel fuel or oil is suspected to be in the Diesel Exhaust Fluid (DEF), use tests strips A0005850202 and see if they change color when exposed to DEF. If diesel fuel or oil is found in the DEF, the complete DEF system will need to be replaced.

### 3 GHG17 Perform Performance Check - Low Temperature ATD

The Low Temperature ATD service routine was developed to help diagnose Aftertreatment issues. The routine will help diagnose temperature sensor drift issues. The service routine is not a Parked Regeneration. The routine will look similar to a Parked Regeneration but there will be **NO** HC dosing during this routine. The routine needs to be manually started, and will automatically stop after 30 minutes. DiagnosticLink<sup>®</sup> will automatically turn off HC dosing during this routine.

To run the routine:

1. Navigate to the DPF System panel under Service Routines. Open the drop-down window and select the Perform Performance Check - Low Temp ATD.

The screenshot displays the DiagnosticLink interface for a vehicle (M2/C2-Truck, Engine: DDEC16-DD5). The 'Service Routines' panel is active, showing various system parameters and a dropdown menu for 'Perform Performance Check - Low Temp ATD'. The dropdown menu is open, highlighting the selected option. A red box highlights the 'Perform Performance Check - Low Temp ATD' option in the dropdown. A red error message is visible: 'Perform Parked Regeneration: Procedure cannot start: Engine Speed is not valid'.

Instrument	Value	Units	Minimum	Maximum	Description
ADS: Vehicle Check Status	true				
DSL: Parking Brake	closed, Sho				_01.4-Parkir
DSL: Neutral Switch	closed, gear				_06.0-Neutr
Clutch Switch	NA				
DSL: DPF Regen Switch Status	open				_08.4-DPF R

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#### WARNING: PERSONAL INJURY

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

- Always start and operate an engine in a well ventilated area.
- If operating an engine in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system or emission control system.



#### WARNING: PERSONAL INJURY

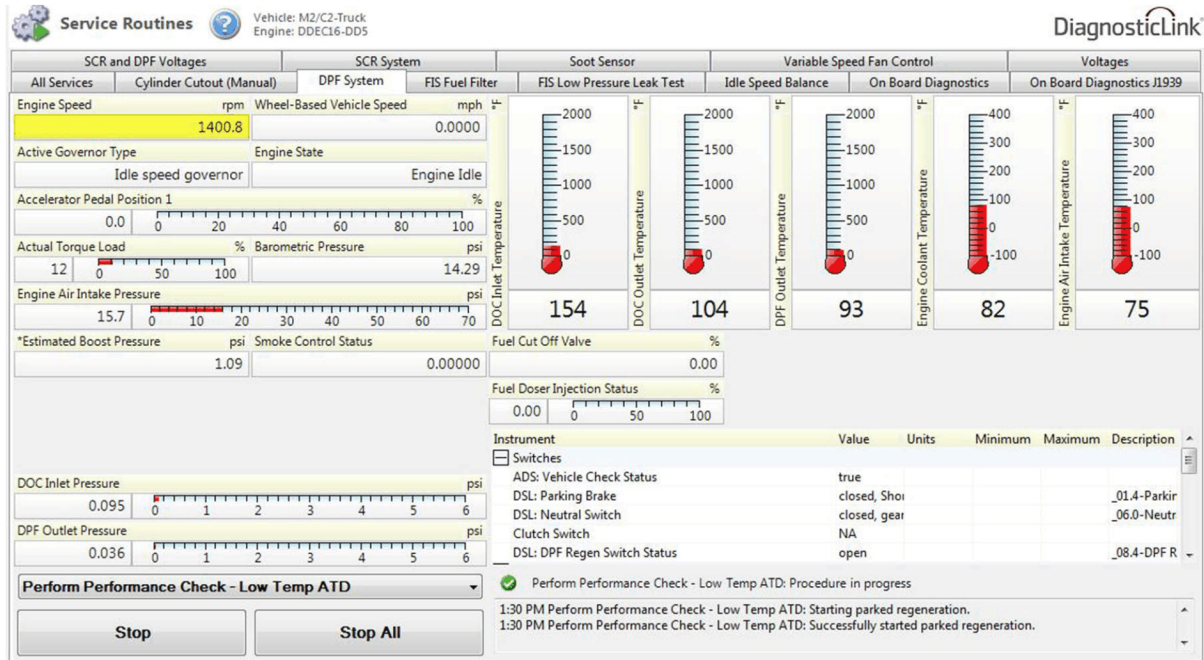
To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.



**WARNING: ENGINE EXHAUST**

To avoid injury from inhaling engine exhaust, always operate the engine in a well-ventilated area. Engine exhaust is toxic.

2. Start the engine. Click the start service routine button. The engine speed will increase to 1400 rpm at the beginning of the service routine.



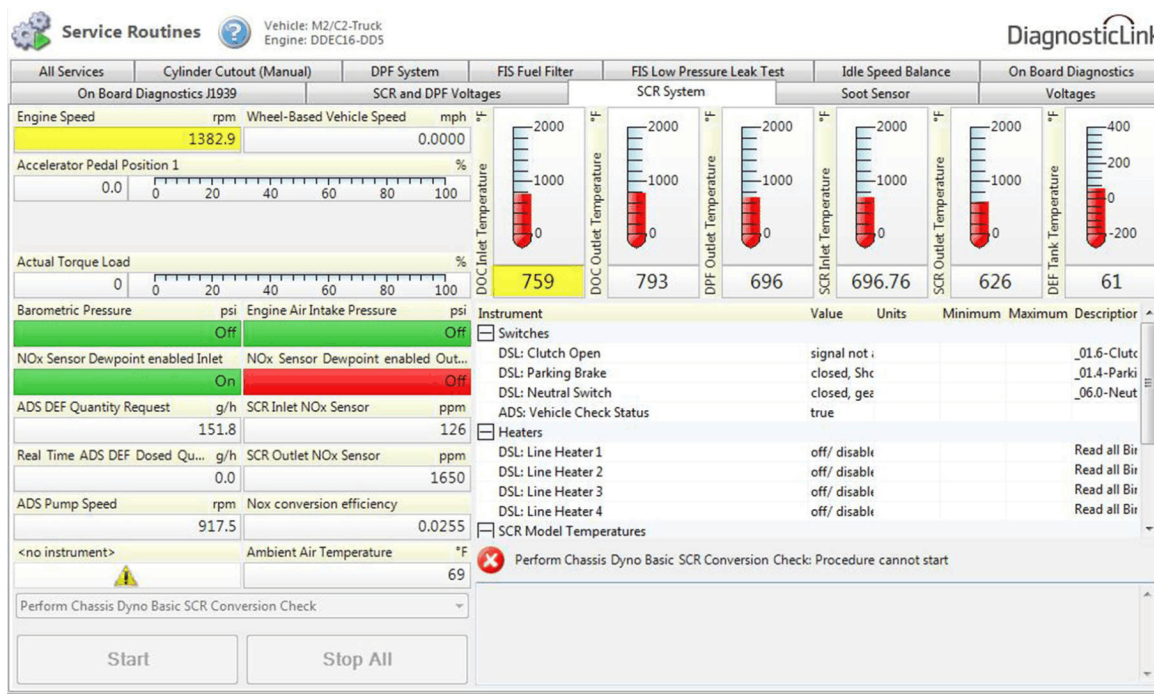
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3. The system will continue to warm up. Once the DOC inlet temperature reaches 270°C (518°F), the HC dosing system will turn on. The HC dosing system will perform its safety check with no HC dosing. The Fuel Doser Injection Status (in yellow) will stay at 0% for the remainder of the routine.



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- Once the DOC inlet temperature reaches 400°C (750°F), the engine speed will begin to drop to as low as 1330 rpm.



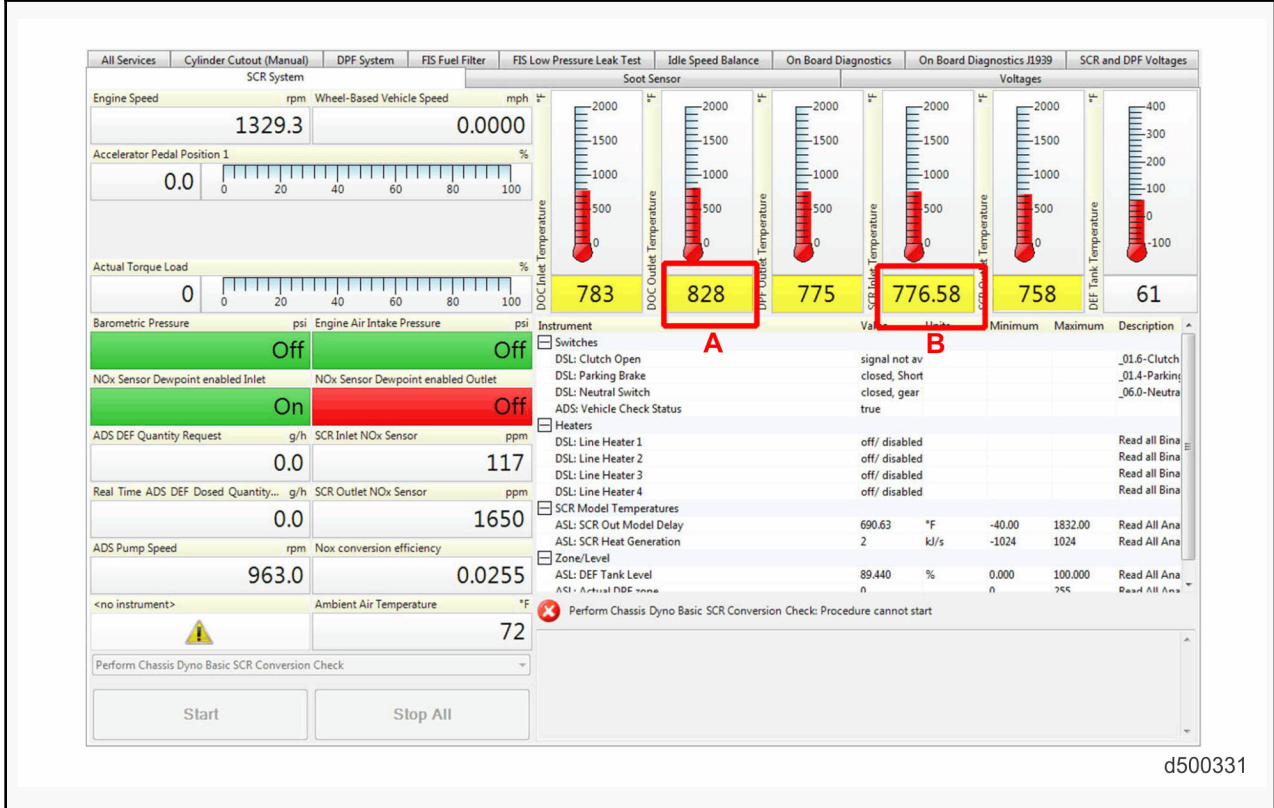
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- Navigate to the SCR Service Routines Panel. The DOC Inlet, DOC Outlet, DPF Outlet, SCR Inlet (calculated value based on DPF outlet and SCR outlet on the 1-BOX) and SCR Outlet temperatures should stabilize in the mid-to-upper 375°C (700°F) range.

**Table 1.**

A = This illustrates a drifted high DOC outlet temperature sensor.

B = Reminder: SCR inlet temperatures are calculated from DPF outlet and SCR outlet temperatures.



- Once the temperatures stabilize (which should occur within 25 minutes into the service routine), compare all temperature sensor values. They should read within 27°C (45°F) of each other. If the values are outside the 27°C (45°F) range, the temperature sensor has possibly drifted high or low.
- The service routine will automatically stop after 30 minutes.

## 4 Diesel Oxidation Catalyst Face Cleaning

The Diesel Oxidation Catalyst (DOC) Face Plug Cleaning service routine can be run to unclog the front face of the Diesel Oxidation Catalysts. It can be used on a 1-BOX™ emissions package or 2-Box (2V2) option.

Before performing this service routine, find the cause of the DOC plugging and correct it. Typical causes are vehicle duty cycles that are stop-and-go, excessive idle time, stationary PTO operation, or a hardware issue with the engine or vehicle. Perform the "ATD Checklist" to review these items and correct them before running this service routine.

The following engine conditions must be met before this routine can be performed:

- Engine is at base idle speed

**NOTICE:** Do not run the service routine if the DOC inlet pressure is greater than 20 kPa (2.9 psi). If the pressure is above that, use the DOC air cleaning tool P/N: W470589239100. Refer to section "Diesel Oxidation Catalyst Air Cleaning". This is to protect the engine and turbocharger from excessive exhaust temperatures.

This service routine will run for approximately 4 hours and 45 minutes. You **MUST** remain with the vehicle for the entire procedure.

If possible and safe to do so, warm up the engine to operating temperature before running the service routine.

To improve the chances of a successful procedure, engine load needs to be as low as possible. Turn off all unnecessary accessories in the truck such as the air conditioner, extra lighting, PTO, etc. Note that setting the HVAC system on Defrost typically turns on the air conditioner, so turn off the HVAC system or select a different setting.

Check as follows:



### WARNING: PERSONAL INJURY

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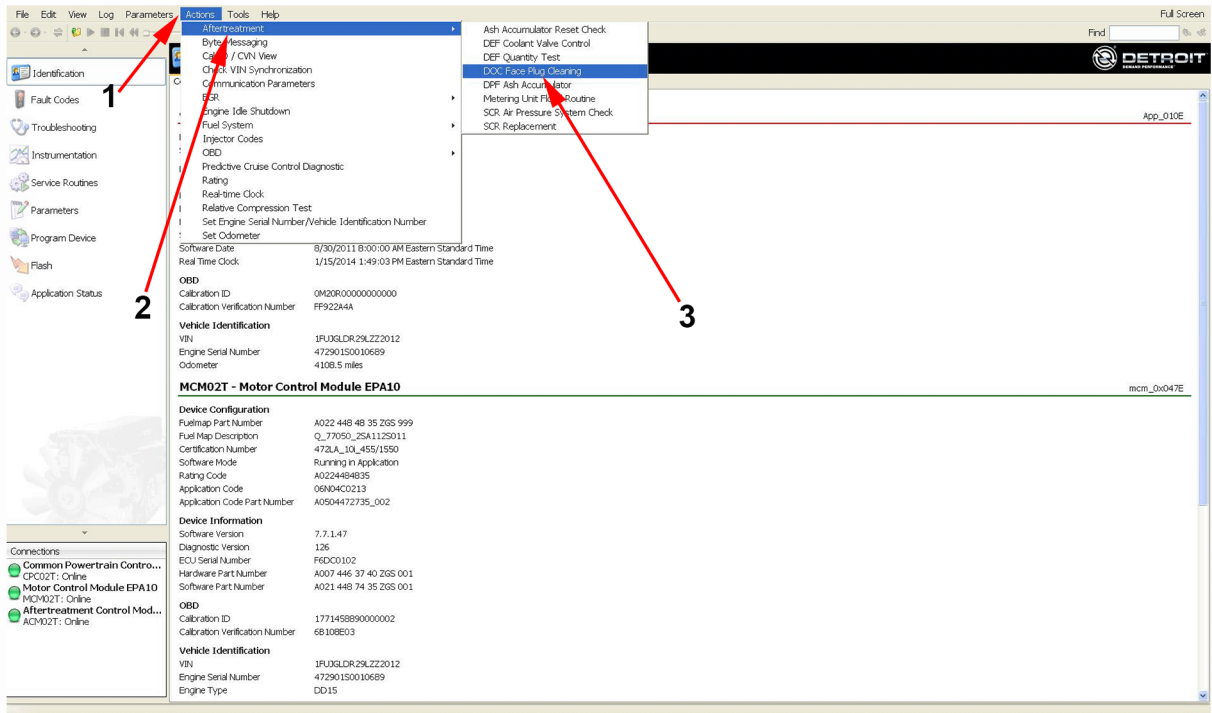
- Always start and operate an engine in a well ventilated area.
- If operating an engine in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system or emission control system.



### WARNING: PERSONAL INJURY

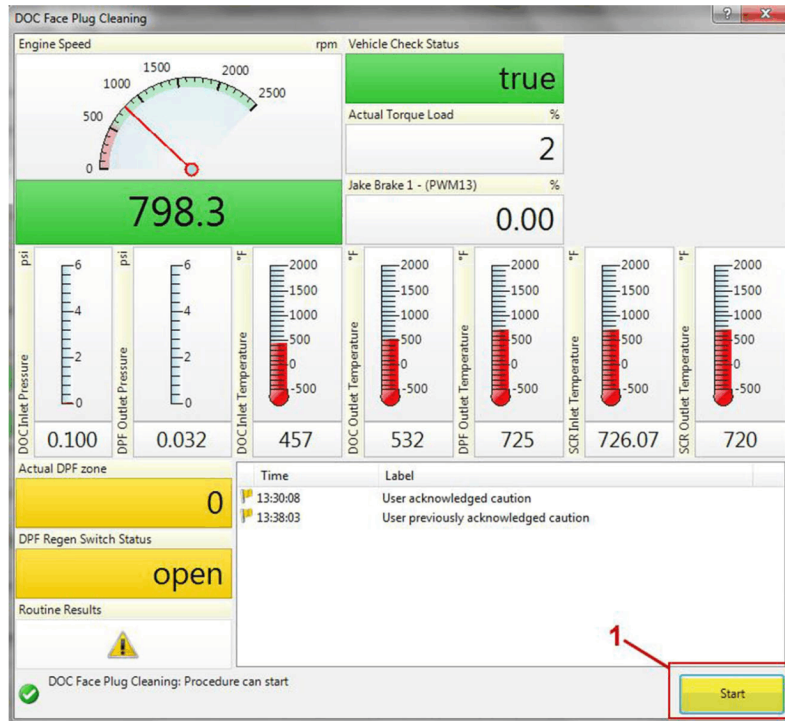
To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.

1. Start the engine and allow it to idle at base (800 rpm) idle speed.
2. Connect DiagnosticLink®.
3. Navigate to the Actions menu (1) > Aftertreatment (2) > DOC Face Plug Cleaning (3).



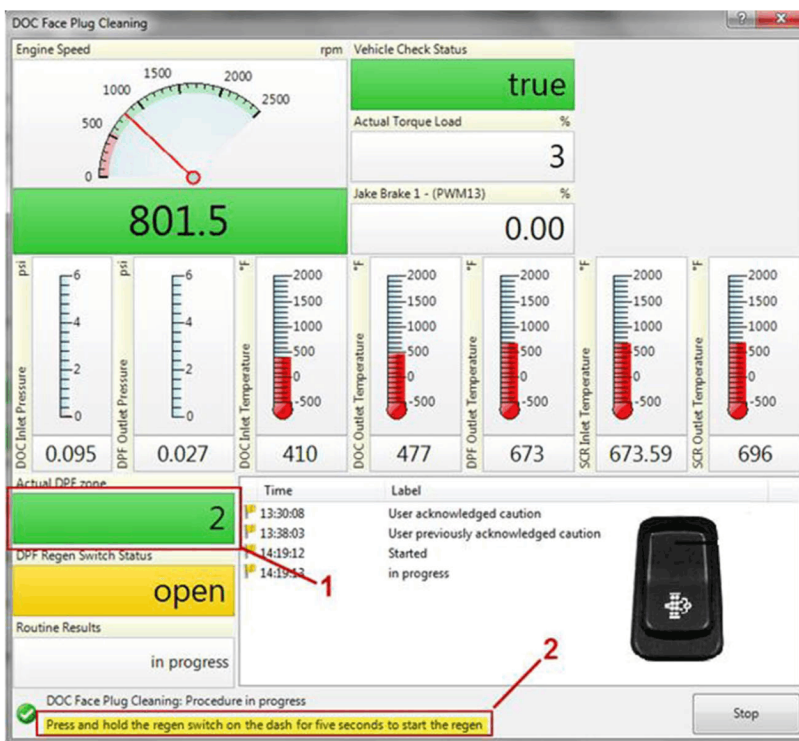
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4. Once the panel opens, click on the Start button (1) in the bottom right hand corner to start the routine.



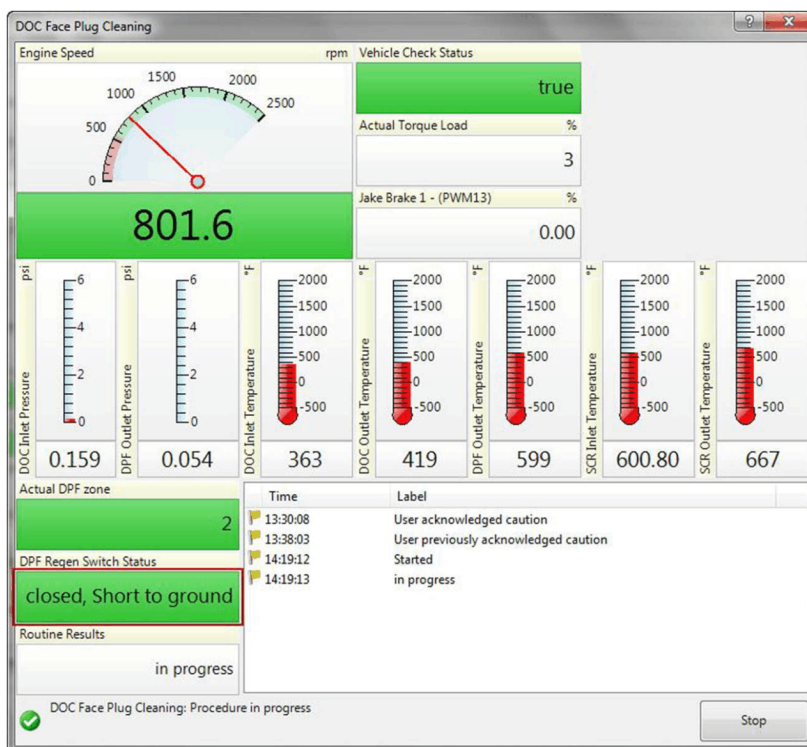
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5. Once the Start button is clicked 'On', the Actual DPF zone will shift from zero to zone 2 (1). See figure below.



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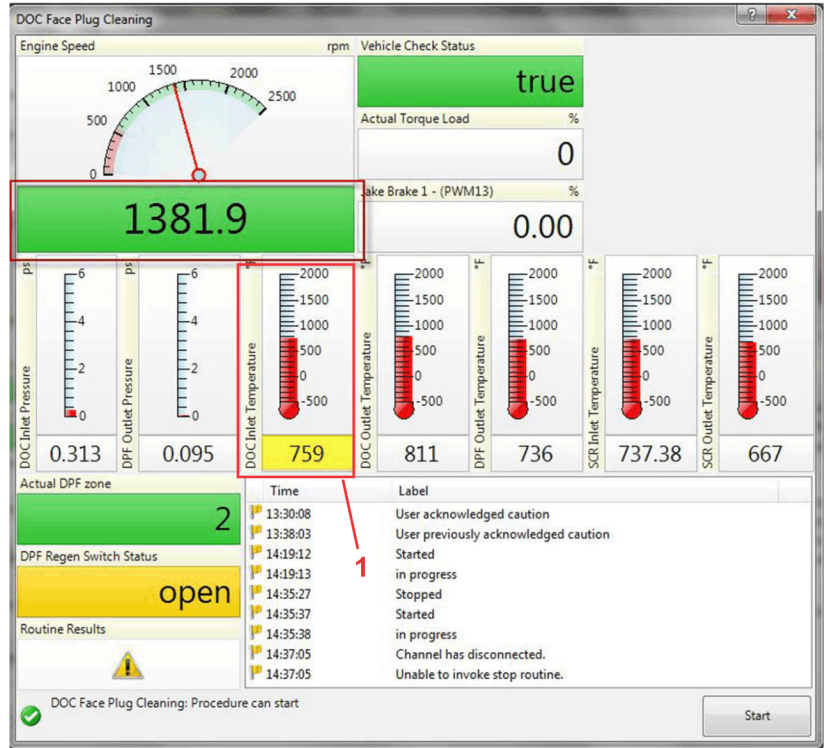
6. Read the dialog prompt message in the bottom left hand corner. Press and hold the regeneration dash switch located on the dash for five seconds (2). See figure above.
7. When the regeneration dash switch is depressed, the DPF Regen Switch Status Box will turn green.



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8. Once the switch has been depressed for five seconds, the engine rpm will ramp up to 1400 rpm.
9. Monitor DOC inlet temperature (1). The DOC inlet temperature should be greater than 400°C (750°F). Ambient temperature will have a large impact on DOC inlet temperature. If it is not above 400°C (750°F), block off part of the

radiator. Be careful that coolant temperature does not go high enough to cause a Check Engine Light. If 400°C (750°F) DOC inlet temperature is not reached, the service routine will abort.



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10. Once the DOC inlet temperature reaches 400°C (750°F), the engine rpm will vary between 1400 rpm and 1330 rpm.
11. After four hours of run time, a standard DPF Parked Regeneration will occur automatically. The Parked Regeneration process will take about 45 minutes.
12. After the DPF Parked Regeneration has completed, the engine will ramp down to 800 rpm to cool down.
13. The service routine is complete when engine returns to idle.

**NOTE:** A full DPF (end-of-life use) can replicate a plugged DOC; this may be an issue on higher mileage units.

14. Confirm the original complaint (noisy ATS, Check Engine Light, etc.) has been resolved and release the vehicle.