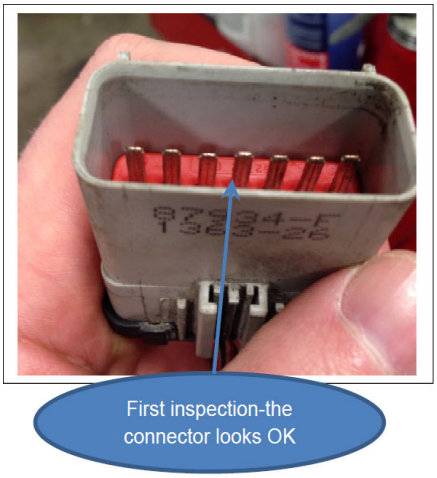
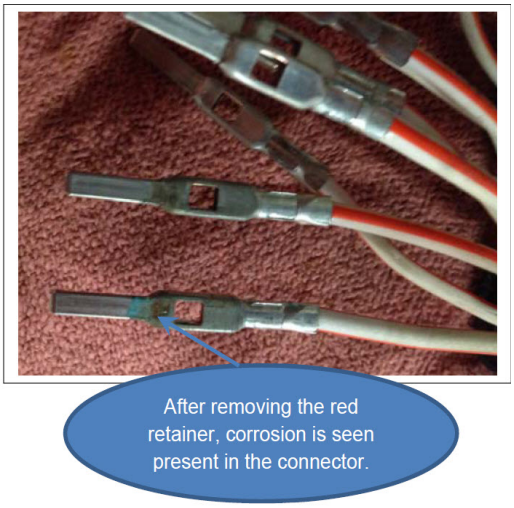
(Back Office Only) Mack Chassis - Diagnosing The Aftertreatment Control Module DTCs P202D, P208E, P20E8 - OBD13 (Commonly Model Year 2014); Newer Chassis AFTER Reviewing Other Solutions

Internal Content

This solution should only be used for initial checks for OBD13 chassis. For all newer chassis, this solution should not be followed unless the other solutions pertaining to the correct emission level have been followed **first** with no fault found.

1. Inspect the electrical circuit connections between the ACM and the DEF pump at the DEF pump connector, ACM connector, and FCUT connector. Pay special attention to the FCUT connector. A minor amount of oxidation or corrosion will cause these DTCs.





If any corrosion is found in the FCUT connector, replace terminals on the front chassis harness and urea tank harness as required.

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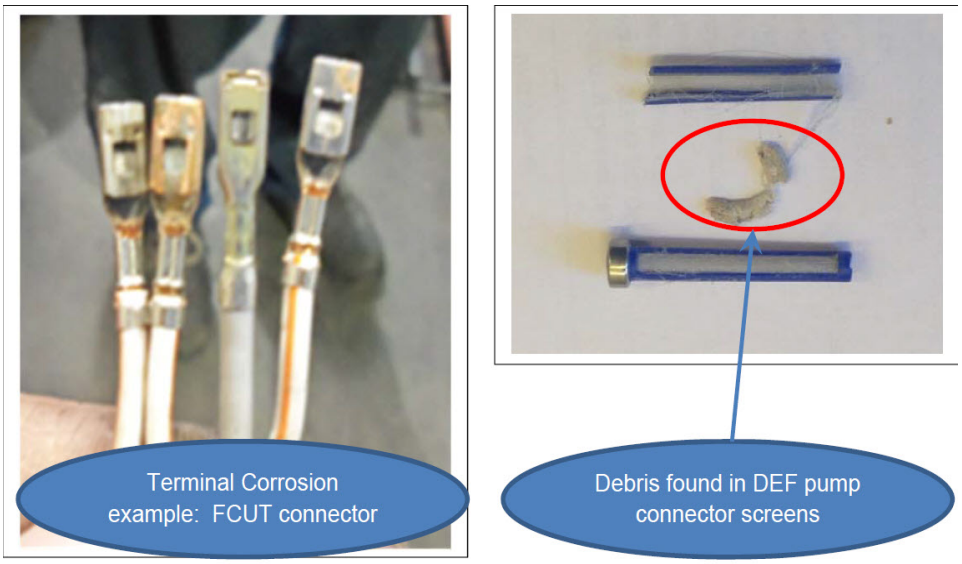

2. Inspect DEF system for contamination and clean as required. Debris can build up in the filter screens under normal operation and remain trapped in the system due to the reversion cycle at key off**.**

NOTE: If at any point a failure is found the root should should be diagnosed from that point. No further step should be completed until the problem has been verified.

· Remove all of the DEF fluid lines and flush out with compressed air and water.

· Remove the Inlet and backflow connectors and inspect the filter screens for debris and replace as required. Reference Impact 2589-11-02-05 Aftertreatment Diesel Exhaust Fluid (DEF) Contamination Flush

· Remove the level sensor / sending unit from the DEF tank. If contamination is found in the tank, the pickup filter must be replaced with the latest updated part number in Impact. The tank must be completely flushed.

· When re-priming the system with fresh DEF, remove the fluid connector from the DEF doser and place into a container, start the engine and allow a small amount of fresh fluid to purge.

· Verify that the DEF line connectors have a secure seal on the tube ends when reconnecting the lines.

3. If the above actions do not resolve the complaint, proceed with the ble Guided Diagnostics. Terminal Corrosion example: FCUT connector Debris found in DEF pump connector screens

Tags

p100000 p208e00 p20e892 k16925952

p1000-00 p208e-00 p20e8-92 mack

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25950-2 Aftertreatment Diesel Exhaust Fluid (DEF) Contamination Flush

You must read and understand the precautions and guidelines in Service Information, Function Group 20, "Engine Safety Practices" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

Caution

You must use approved aftertreatment DEF in the aftertreatment SCR system. Do not use DEF that is not approved, because it could damage the aftertreatment system permanently, decrease engine output and possibly damage other engine components.

Proper diesel exhaust fluid (DEF) is required for correct operation of the selective catalyst reduction (SCR) aftertreatment system. If a fluid other than DEF is used in the system, or if DEF in the tank should become contaminated with another material, evaluation, cleaning and testing of the DEF system must be performed to ensure returning the system to proper operation.

The aftertreatment on-board diagnostic system monitors for SCR system tampering and DEF dilution, and will provide driver warnings, with possible torque and road speed limiting if the issue is not addressed. The warnings may be the result of a contaminated DEF system.

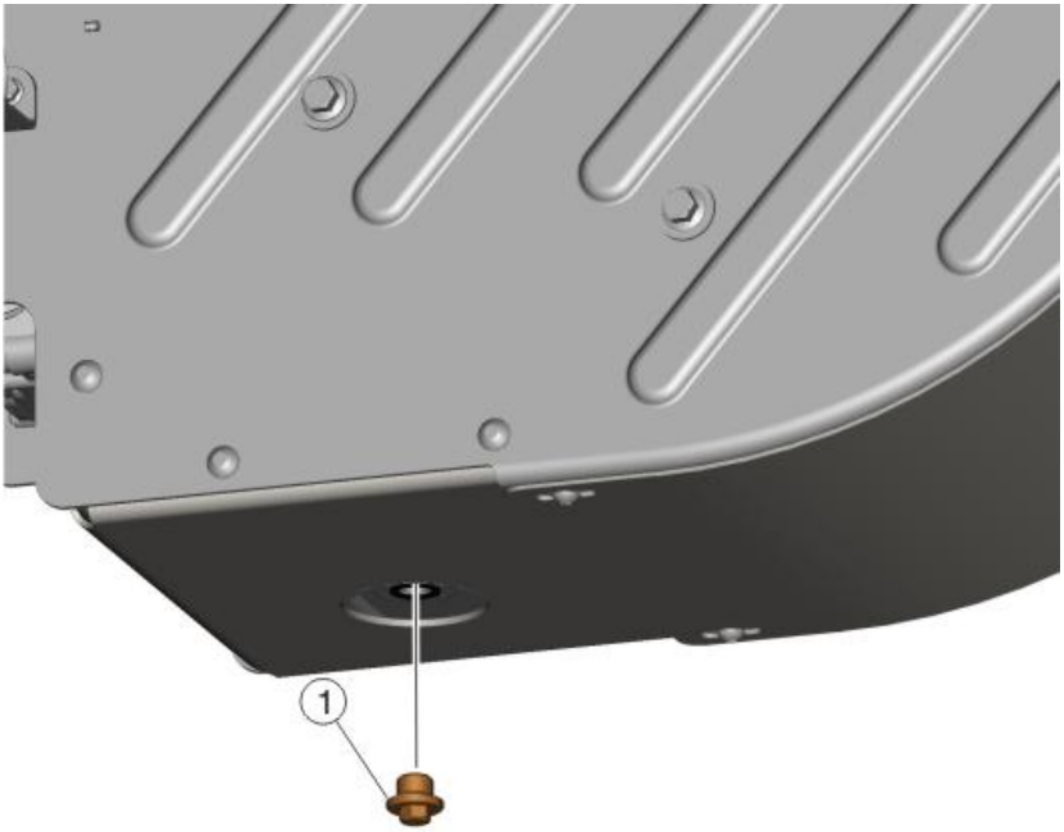
This document is not intended to cover cleaning and/or component replacement procedures for all possible DEF contaminants. Instead, general guidelines will be covered here for what inspections should be made and what steps should be taken in the event the DEF in the tank is compromised. The technician is expected to use sound judgement and knowledge of the DEF dosing system to determine if components can be cleaned or will require replacement based on the type of contaminant in the system and what, if any, damage is seen.

Address all aftertreatment related diagnostic trouble codes (DTC) before continuing with this procedure.

Inspection

Note: Perform this procedure if DEF contamination is suspected, if a DEF quality DTC has been set, or if sent here by Guided Diagnostics.

1



1. DEF Tank Drain Plug

Put a suitable clean container under the diesel exhaust fluid (DEF) tank. Remove the DEF tank drain plug. Remove at least 230 ml (8 oz) into clean container. Install the drain plug.

2

Compare the DEF sample removed from the DEF tank to a known good sample. Is the DEF clear with a slight ammonia odor and free from visible particulate matter contamination?

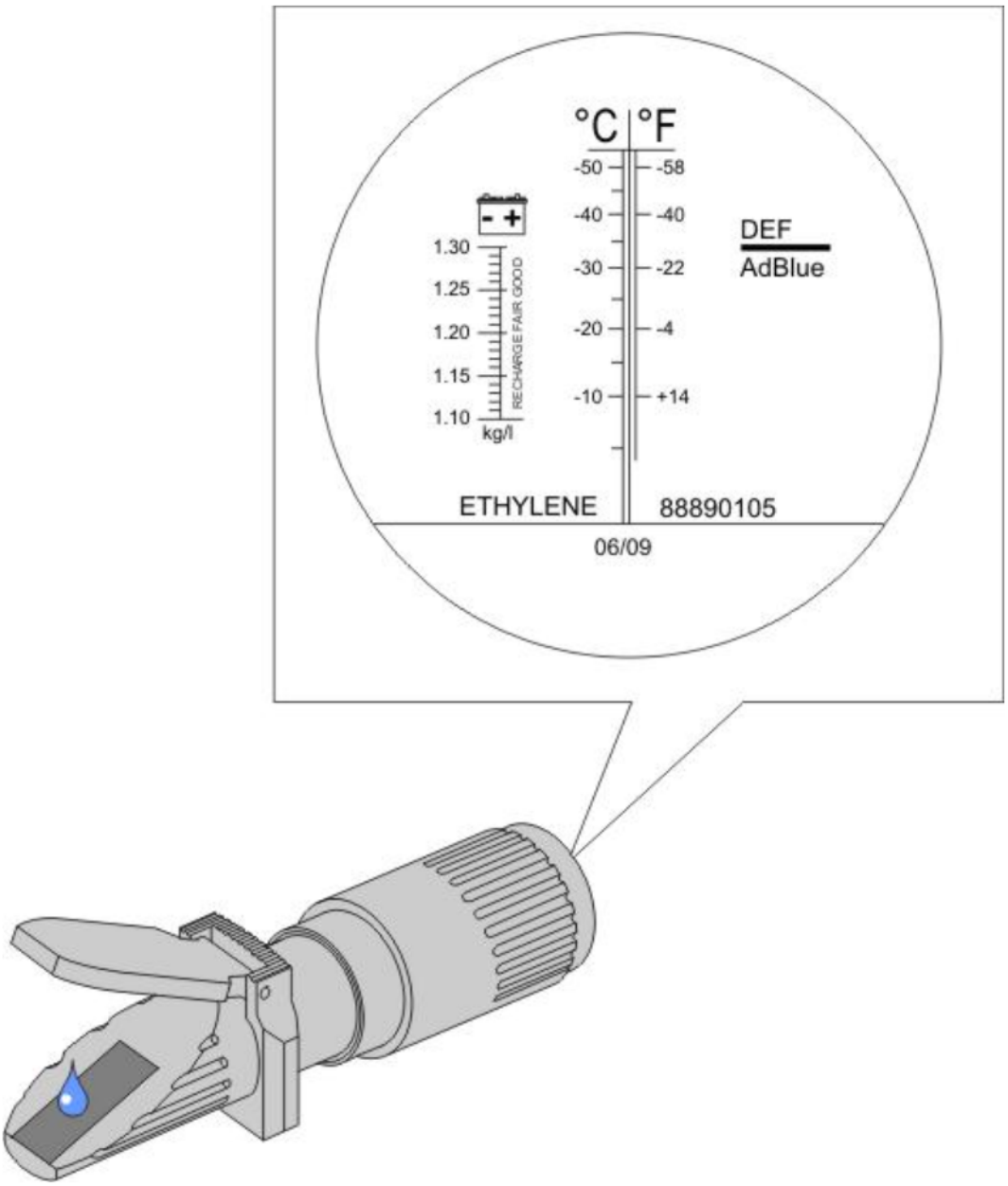
Note: Shining a light through the side of the container can help illuminate fibers and particles.

- No: DEF is contaminated. Proceed to Cleaning.

  Note: Green, orange or red DEF can indicate coolant. Blue could be windshield washer fluid.

- Yes: Proceed to the next Step.

3



Apply a drop of DEF on the viewer of the refractometer. If the level is above the word “DEF” or below the word “AdBlue” the DEF is contaminated. If no level is shown, it may indicate chemical residue, such as pure water or diesel fuel. Is the DEF of proper concentration?

- No: DEF is contaminated. Proceed to Cleaning.
- Yes: Proceed to the next Step.

Special tools: 88890105

4

Check for hydrocarbon contamination using test paper. The paper will turn dark blue if there is hydrocarbon contamination and stay light blue if there is not. Is there evidence of contamination?

- No: Proceed to the next Step.
- Yes: DEF is contaminated. Proceed to Cleaning.

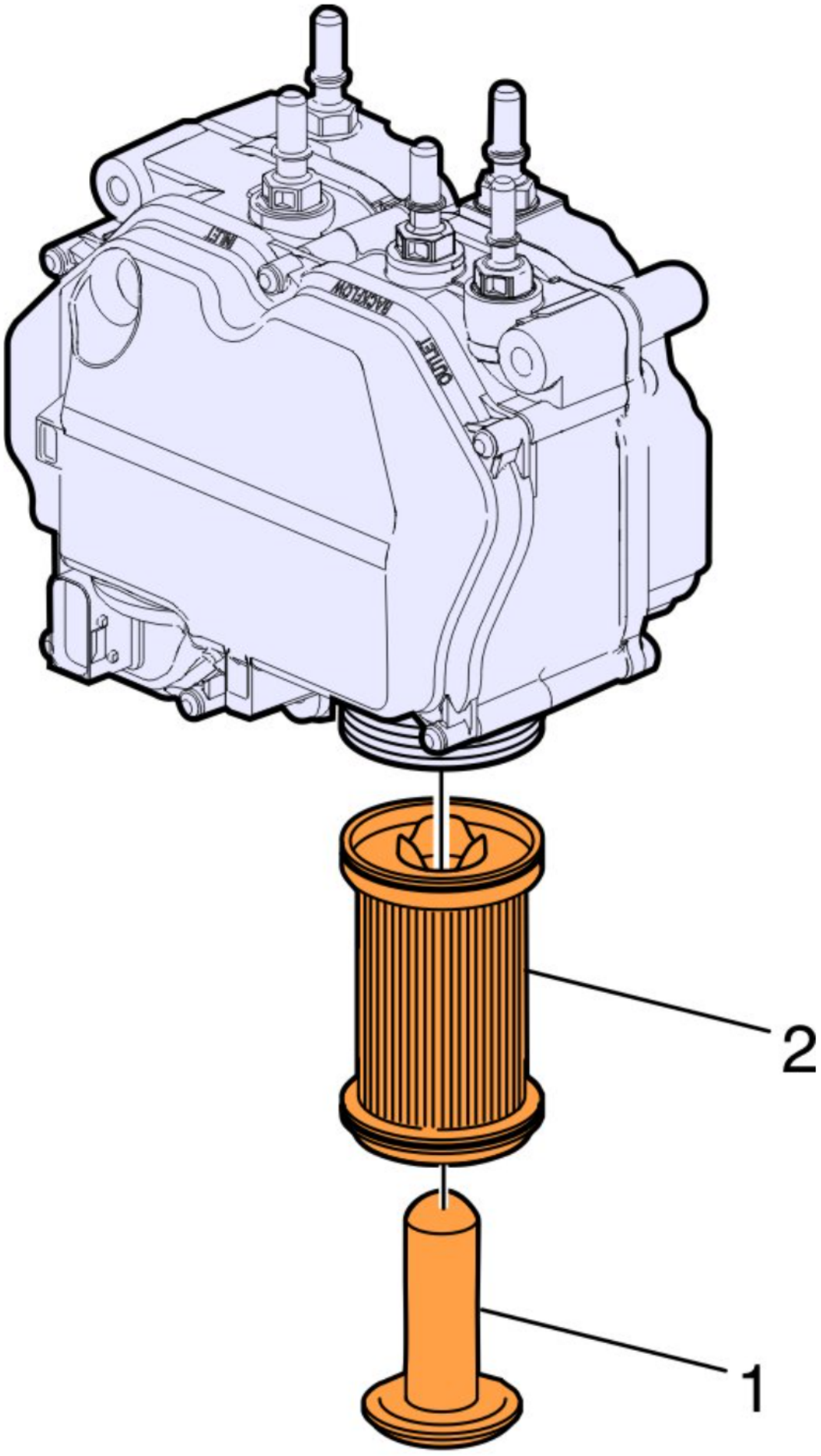
Special tools: 88890110

5

Allow sample to sit 30 minutes. Is there fluid separation or excessive particle contamination in the bottom?

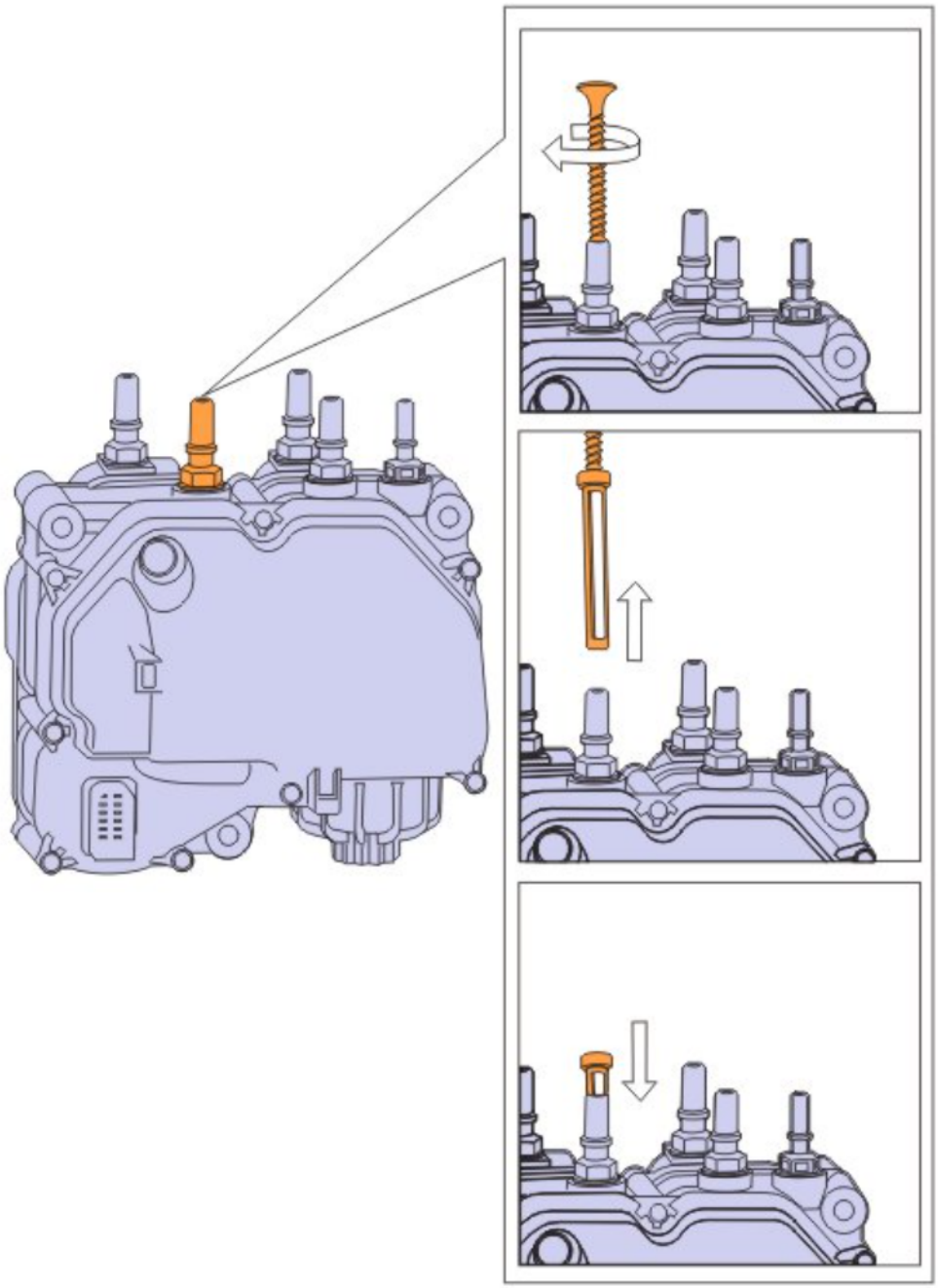
- No: Proceed to the next Step.
- Yes: DEF is contaminated. Proceed to Cleaning.

6



DEF Pump Filter

1. Equalizer
2. Filter Element



DEF Pump Inlet Filter

Remove main DEF pump and inlet filters. Refer to Function Group 258. Inspect for debris or contaminants. Are debris or contaminants present on the filters?

- No: Replace DEF filters and proceed to next step.
- Yes: Install new filters and proceed to Cleaning. Do not run the vehicle or perform any other testing until the clean procedure is complete.

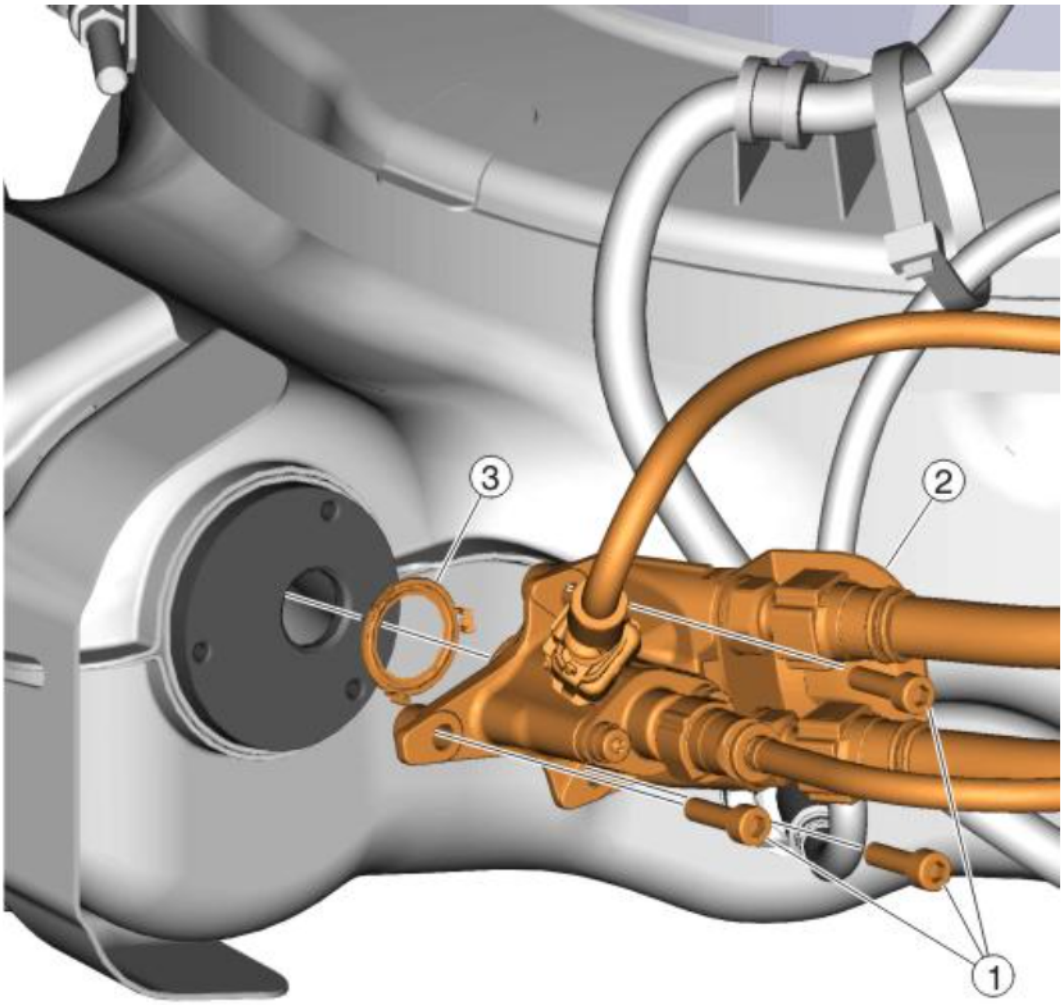
7

Inspect DEF lines between DEF tank and pump, and between pump and DEF dosing valve for kinks and restrictions.

Any issues found?

- No: Proceed to the next Step.
- Yes: Repair or replace lines as necessary. Proceed to the next Step.

8



1. Fasteners
2. Aftertreatment DEF Dosing Valve
3. Gasket

Remove the aftertreatment diesel exhaust fluid (DEF) dosing valve from the SCR inlet pipe. Refer to Function Group 258.

9

Using Premium Tech Tool (PTT) SCR System Test 2589-08-03-05, perform Dosing Test 3. Is volume test within specification?

- No: Use PTT to follow Guided Diagnostics procedure(s).
- Yes: System is not contaminated. Using new fasteners, install the DEF dosing valve on the SCR inlet pipe. Tighten the fasteners to specification, refer to Function Group 20. Use PTT to follow Guided Diagnostics procedure(s).

Cleaning

Caution

Do not spill aftertreatment DEF onto exposed connectors when you disconnect hoses and components. If you spill DEF on an unprotected connector, you must replace the connector immediately. DEF is highly corrosive to metal, particularly copper and aluminum. Do not try to clean DEF off of the connectors with water or compressed air. They are ineffective because DEF quickly oxidizes metal and creeps into the wiring.

Caution

You must use approved aftertreatment DEF in the aftertreatment SCR system. Do not use DEF that is not approved, because it could damage the aftertreatment system permanently, decrease engine output and possibly damage other engine components.

Caution

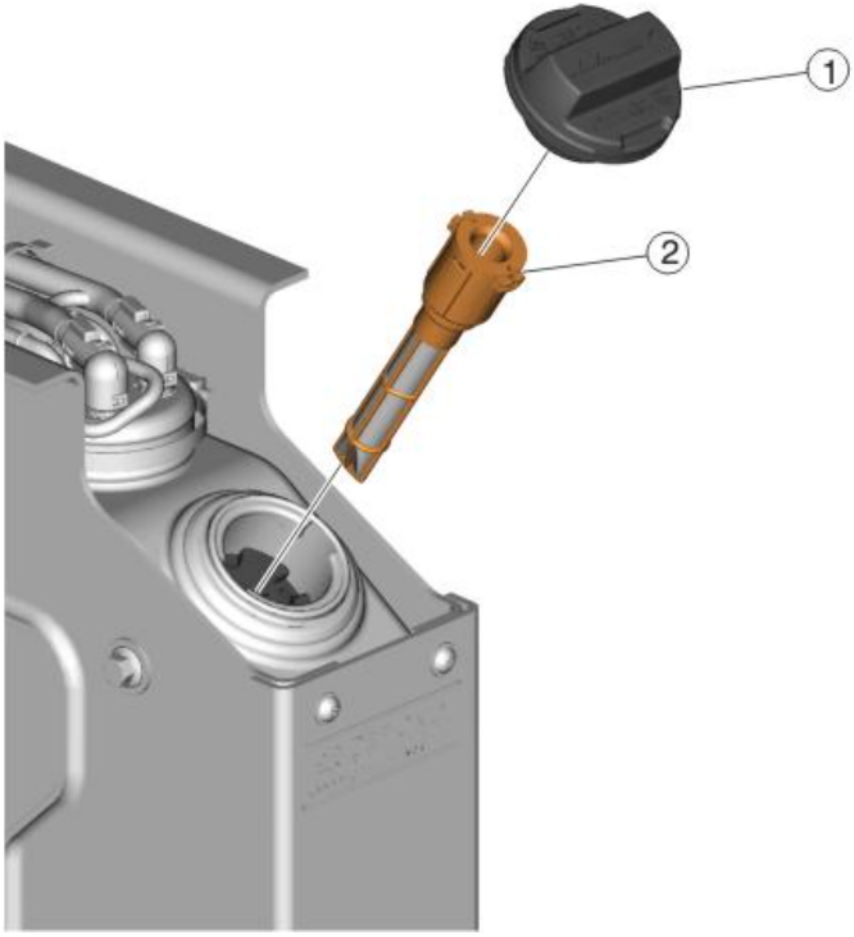
Do not use any type of chemical, detergents or soap to clean or flush the DEF tank or components. Cleaning agents may cause damage to some components if not completely flushed and/or removed from the system before use.

1

Are any of the following contaminants known to be in the system in significant quantity (approximately greater than 20% by volume), or is the contaminant unknown? Contaminants: diesel fuel, biodiesel, oils/grease, solvents, acidic cleaners.

- No: Proceed to next step.
- Yes: System Replacement is required. Replace DEF tank, sending unit, DEF hoses, DEF pump, DEF doser, and all filters. Refer to Impact for component replacement procedures. Once the system is assembled, perform PTT SCR Systems Test, Start-up Test to verify proper system function. Inspect for leaks. Perform PTT SCR DEF, Crystal Sublimation (2585-11-03-03). Check for and clear any diagnostic trouble codes.

2



1. DEF Tank Cap
2. DEF Tank Filler Neck and Screen

Remove the DEF tank filler neck and screen. Replace the screen if damaged, debris exists or if contaminated with anything other than DEF; such as oil.

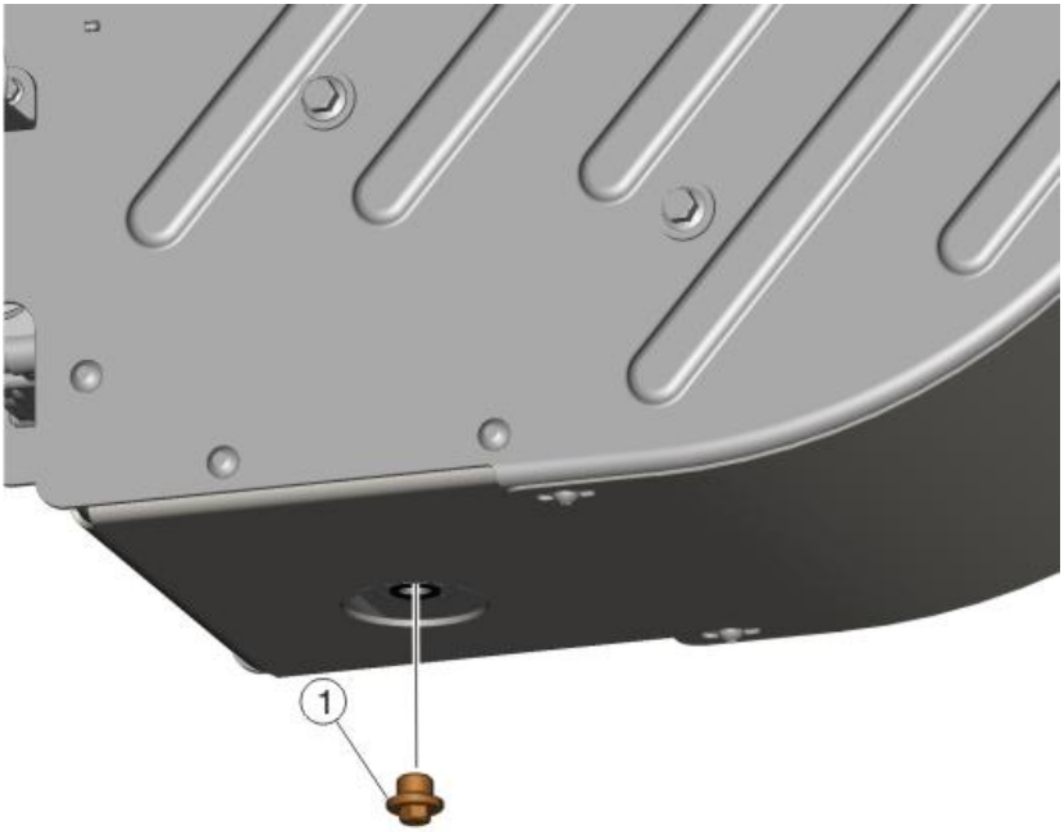
3

Place the filler cap in hot water for at least 2 minutes, then rinse and allow to air dry.

4

Place a suitable container under DEF tank.

5



1. DEF Tank Drain Plug

Remove DEF tank drain plug.

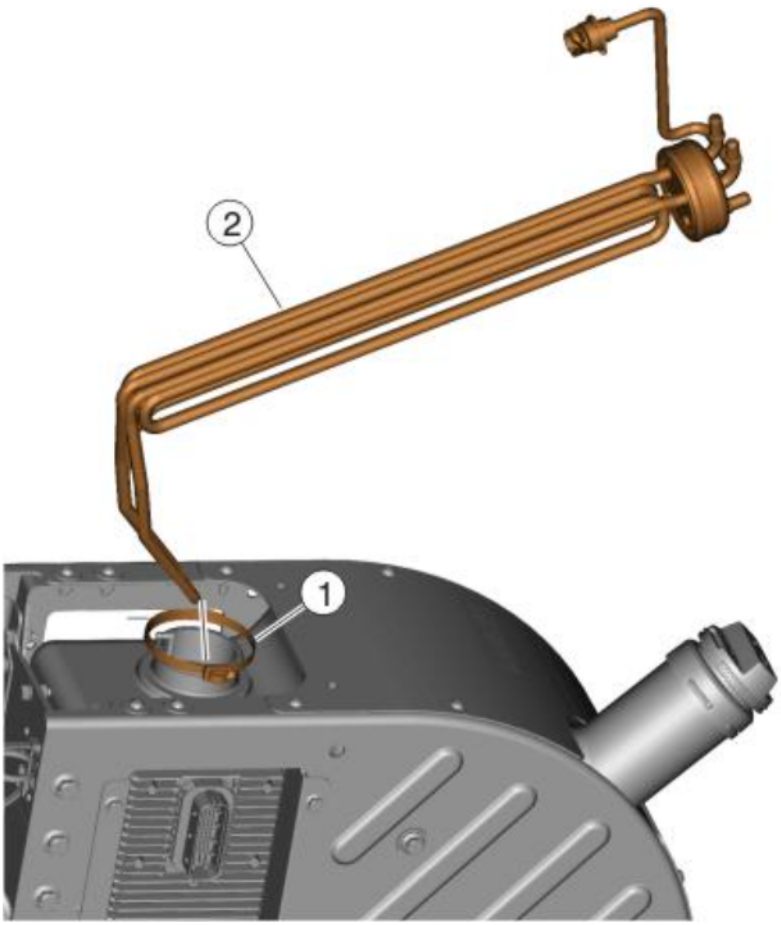
6

Drain all DEF from tank. Empty any remaining DEF and coolant from the DEF level sensor. Discard drained DEF according to local regulations.

7

Remove the DEF tank from the vehicle. Refer to Function Group 258.

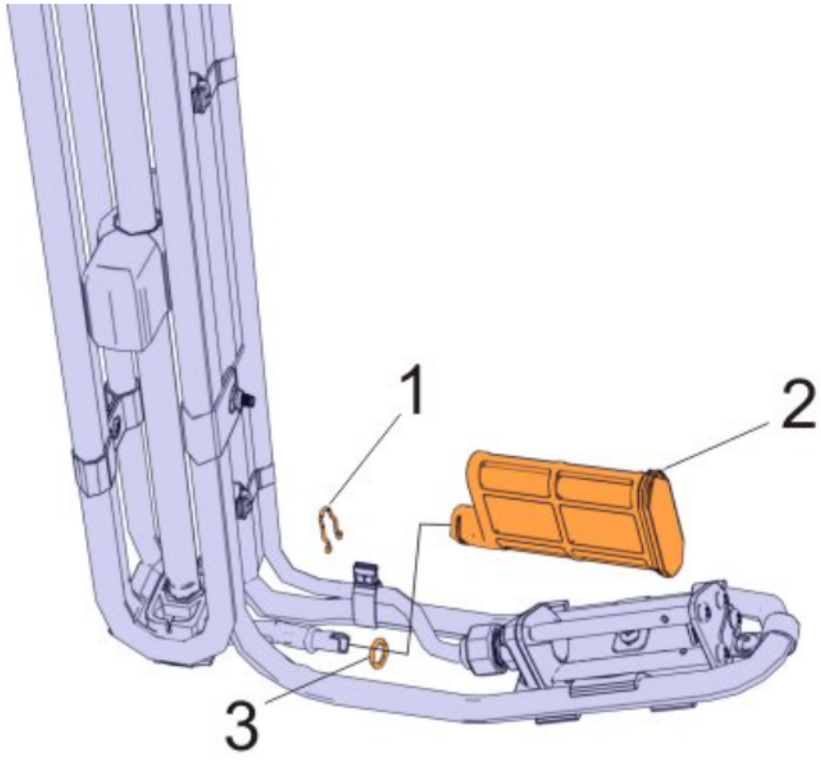
8



1. Clamp
2. Level Sensor

Remove the DEF tank level sensor from the tank. Refer to Function Group 258.

9



1. Retaining Clip
2. Filter
3. O-ring

Remove retaining clip from the level sensor filter.

10

Remove filter and O-ring from level sensor pickup tube.

Caution
Pull the filter straight off of the supply pipe to prevent damaging the guide pin in the filter.

11

Flush the DEF pickup tube with hot pressurized water.

12

Place new O-ring on level sensor pickup tube. Verify O-ring is not damaged after installing on pickup tube.

13

Place new filter onto the pickup tube. The groove in the filter neck should rest just behind the stop bulge on the pickup

tube.

14
Install retaining clip on the filter. The clip should be in the groove on the filter neck just behind the stop bulge on the pickup tube.

15
Check that the filter is secure on the pickup tube.

16
Flush all DEF hoses with hot pressurized water and replace if necessary.

17
Thoroughly flush the DEF tank with hot pressurized water through the filler neck. Thoroughly drain all water, debris and contaminants from the DEF tank.

Note: Do not use paper or cloth towels to remove water from tank.

18
Install DEF tank level sensor and drain plug. Install DEF tank on the vehicle.

19
Install the DEF tank filler neck and screen.

20
Fill the DEF tank with approximately 8 L (2 gal) of new VOLVO approved DEF.

Caution

Only fill the DEF tank with new VOLVO approved DEF. Do not reuse DEF, it will damage the aftertreatment system.

21
Start the engine and let idle approximately 2 minutes.

22
In PTT SCR Systems Test, run Start-up Test to verify proper system function. Inspect for leaks.

23
In PTT SCR Systems Test, run Dosing Test 3, and evaluate the volume of DEF collected to the specification in PTT. Is the volume collected within specification?

- No: Replace DEF pump and verify proper repair.
- Yes: Return vehicle to service.