NON COMPLIANCE RECALL

Volvo Trucks North America Greensboro, NC USA



Date Number Release Page 11.2019 EC0020C 01 1/16

Analysis & SCR Hardware Replacement - 2 box VN, VHD

# NON COMPLIANCE RECALL INFORMATION

(November 2019)

Volvo has determined that certain model year 2017-2018 D11/D13 model engines may be equipped with an improperly functioning SCR (Selective Catalytic Reduction) system due to Low NOx Conversion Efficiency DTC (Diagnostic Trouble Code), which may cause a loss of catalyst performance that violates Federal and California standards and regulations. The root cause is that water is chemically bonding and deactivating the catalyst during extended low temperature operation followed by high temperature operation.

This issue is to be addressed by updating ECM software, inspecting DEF system, running Tech Tool function "Exhaust Aftertreatment System Analysis", replacing the SCR System with one containing an improved hybrid catalyst, and returning the SCR as instructed.

Follow the procedure outlined in this document.

# VEHICLES AFFECTED

Certain Volvo North America vehicles manufactured between March 9th, 2017 and March 9th, 2017.

## **VEHICLE QUANTITY**

There are 1 vehicles affected by this recall (1 Canada).

# Material Needed

## **REQUIRED PARTS:**

Order parts through standard Parts Distribution Center (PDC) process.

		Parts List	
Item	Part Number	Description	Qty
1	23190004	Muffler Hybrid SCR 2-Box Bottom	1
2	21021850	V-Clamp	1
2	21095726	Gasket	1
4	22998036	Strap	4
5	85152363	Decal (Campaign Completion Decal) <b>NOTE</b> : N/A if previously installed on truck	1
6	N/A	Vehicle Emissions Recall – Proof of Correction Certificate US-CAN (EN) <b>NOTE</b> : See last page of recall for this form	1

## **REQUIRED TOOLS**

- Tech Tool (TT) version 2.7.75 or higher
- Vocom (one of the following 16 Pin cables) 88890304, 88890253, or 88894001
- Vocom Communication Interface 88890300, or 88894000
- Vocom USB Cable 88890313
- Refractometer 88890105
- Litmus paper 88890110

#### NOTE

Using other interfaces may affect programming speed.

#### NOTE

Ensure TT version 2.7.75 or higher is used for complete TT functionality. Earlier versions of TT will not have functions for the following steps to complete this recall. Check Tech Tool version by clicking on Help tab and then click on "About Tech Tool".

# **Repair – All Volvo VN and VHD Chassis configurations.**

	Repair Index	
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## UPDATE SOFTWARE

You must read and understand the precautions and guidelines in Service Information, group 30, "General Safety Practices, Electrical" before performing this procedure. If you are not properly trained and certified in this procedure, ask your supervisor for training before you perform it.

**NOTE:** Information is subject to change without notice. Illustrations are used for reference only and can differ slightly from the actual vehicle being serviced. However, key components addressed in this information are represented as accurately as possible.

# ⚠

Do not attempt to repair or service this vehicle without having sufficient training, the correct service literature and the proper tools. Failure to follow this could make the vehicle unsafe and lead to serious personal injury or death.

- 1. Park the vehicle on a flat and level surface.
- 2. Apply the parking brake.
- 3. Place the transmission in neutral or park.
- 4. Install the wheel chocks.



- 5. Using Tech Tool (TT), connect to the vehicle
- 6. Update EMS Software to Part Number 23766686.
- 7. Note: Follow the on screen prompts until the programming is complete.
- 8. Disconnect the vehicle from Tech Tool (TT)

# **INSPECT, DEF**

#### NOTE

Record values for steps 9 through 11 and steps 22 through 24 on the "DEF Inspection Check List" found page 15. This sheet will need to be saved and uploaded to UCHP with the claim information.

- 9. Inspect DEF Quality using a Refractometer (P/N 88890105). Record Value.
- 10. Inspect DEF Quality using a Litmus Paper (P/N 88890110). Circle "Pass" or "Fail".
- 11. Inspect DEF Tank for contamination of any dirt, debris, coolant, water fuel, oil etc. Circle answer "Yes" or "No".

#### NOTE

If contaminates are found, continue with recall procedures. Once recall is completed consult with customers for repair of the contaminated DEF system.

# EXHAUST AFTERTREATMENT SYSTEM ANALYSIS

#### NOTE

Regardless of results from Exhaust Aftertreament System Analysis, if the test aborts before completing, or if the test fails to progress to next step for 15 minutes continue to step 21 of this recall.

#### NOTE

Before continuing ensure TT version 2.7.75 or higher is used for complete TT functionality and the ECM Software is updated to 23766686. In addition, TT may require to be restarted and a new work session opened for the "Exhaust Aftertreatment System Analysis" to function.

- 12. Start the PC and open Tech Tool (TT).
- 13. Connect the interface to PC and vehicle. Ignition switch needs to be in the "on" position.
- 14. Perform identification and connection dialog.



From the "Test" tab, select "2589-08-03-18 Exhaust Aftertreatment System Analysis" and then select "Start".







Verify the manual conditions are met, check the "Confirmed" box, and the select "Continue".

roduct Product History Diagnose Test Calibrate Program	
Start	2589-08-03-18 Exhaust Aftertreatment System Analysis Internation ++ Canditions ++ Execution ++ Result  + Internation
Percentage completed (0 - 190%)	Action      A
* Secondary Parameters	Desetect which subtent exit to run     Attentionatment hydrocarbon injection (AHE) system     Hox sensors     DEF doxing system     SCR efficiency
	Ignition Key ON and Englies OFF 1. Read out the status of the operating conditions 2. Check that all signals and values are stable and without admortrial destations 3. Check that all signals are displaying realistic values according to the actual conditions Start the englies and led it idle.

18. 🚥

Uncheck "Aftertreament Hydrocarbon Injection (AHI) System Box, and select "Start" on the upper left side of the screen.

NOx	Current lest status
2.000 (780	$\psi$ . Test phases are based on which subtest have been selected; test phases 1 -7 are used if all subtests have been selected.
C00	Attertreatment hydrocarbon injection (AHI) system (Phase: 1)
1.000	NOx sensors (Phases: 1, 2.6.3)
750 750	DEF dosing system (Phases: 1 & 4)
	SCR efficiency (Phases: 1, 5, 6 & 7)
0 11.06 10.17 10.25 10.30 10.46 10.5 10.86 10.87 10.25 10.80 10.86 144	O Indicates which test phase is currently active
innel 	1) Heating EATS - During this phase of the last sequence, the Exhaust Attertreatment System (EATS) will be heated. This is done so that it is possible to start the NOx sensors safety without recomport prem to harmful monotane, and is ensue that the subvive catality credit-cont catality is completely emplete. The heating phase will finish when the temperature has been reached and the NOx sensors are started a
SOR	
SCR 100 100 100 100 100 100 100 100 100 10	2) NOx sensor high level evaluation - The engine will be set in a mode where high NOx is produced, average readings from the triest and outlet sensor will be recorded and evaluated after the low NOx sensor evaluation. If the difference between the average sensor readings exceeds pre-determined limits, the response and recommended actions will be digraphed in the Preside I are determined.

Wait for test to go through all phases of the operation. Note the blue indicator on the right will move through each phase.

Product Product History	Diagnose Test Calibrate Program Impa			
Test result				
	All Response	+ AH system values		
		* NOx inlet sensor values		
	ROS and Trapping	NOs	High	Low
		Average Intel	649 ppm	187 ppm
	Million and Mark International	MIN threshold	500 ppm	50 ppm
		MAR threshold	1500 ppm	600 ppm
		Average difference	14 ppm	0 ppm
	DEF dening system	AAA dihararaa	noo ppm	so ppm
	SCR efficiency	<ul> <li>NUX COURT SENSOR VALUES</li> </ul>		
		Net as	ingly .	107.000
		Mill Transferred	500 ppm	Sil sense
Reference		MAX Resolut	1600 mmm	800 com
	1000000	Aware diverse	M nom	0 ppm
lcon	Description	MAX difference	100 (001	60 ppm
0	ok <sup>Le</sup>			T
•	Testfailed			

Once the test is complete, results will populate. **<u>Regardless of results</u>** select continue. Return to the main screen in TT and select "Finish Work".

20. You may now disconnect the interface from PC and vehicle. Turn ignition off. For More Information on the TT Function Visit: http://www.premiumtechtool.com

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# SCR REPLACEMENT

21. Follow standard repair instructions and parts list per model key listed below (Ref. Image #1).

	Operation ID	
Model	Repair Operation	Repair Identity
VN/VHD	2586-03-02-01	138454144



Image #1- 2-Box Selective Catalytic Reduction (SCR)

# INSPECTION, SCR CRYSTALLIZATION

#### NOTE

Record values for steps 9 through 11 and steps 22 through 24 on the "DEF Inspection Check List" found page 15. This sheet will need to be saved and uploaded to UCHP with the claim information.

22. Inspect DEF Dosing Valve for excessive crystallized DEF – Circle found condition

- 23. Inspect SCR Diffuser Pipe for excessive crystallized DEF Circle found condition
- 24. Inspect SCR Inlet for excessive crystallized DEF Circle found condition

### SCR RETURN PROCESS

\*\*\*The UCHP Claim (part return) will be arriving in your "MI Tab" within no later than 7 days after crediting. Please follow the below shipping instructions on the UCHP shipping documents\*\*\*

25. Ensure all plugs and caps supplied with the new SCR are reused and installed on returned part. Securely band SCR to Pallet.

**NOTE** All SCR openings must be sealed to eliminate contamination. If plugs and caps are damaged use a water proof tape to cover the openings.



26. Record failed SCR Part Number, Serial number to enter into UCHP Claim



27. Enter Failed SCR Serial Number in UCHP Claim for the Failed/Casual Part & New Part.

Claim job inf	formation Labour	Material Other costs Remarks History	OHIOD		
Causal part			UIDSCR		
Prefix	Part number	Description		Func. gr	oup Serial number
VO	12345678	MUFFLER		2586	111111111111
Rep	olaced O Repaired		New SCR	_	
New Prefix	Part number	Description			Serial number
O VO	87654321				9999999999999
Add row	Copy row			-	

28. Attach TMAC return label per normal process to return shipment.

## LABEL & CERTIFICATE

#### NOTE

A campaign completion label (part number 85152363) needs to be installed on truck if not previously installed. To signify the campaign has been completed, use a permanent marker (Such as a Sharpe ®) to write the recall number, completion date (MM/DD/YYYY) and dealer code on the label. The label is to be applied to the inside of the passenger door as shown in the illustrations below



Label Placement- Conventional Chassis Configuration

Date 11.2019

NOTE

A Vehicle Emissions Recall – Proof of Correction Certificate is provided on last page of this recall. See the example below. Fill in the appropriate information for your records and provide a copy to the customer.

		Vehicle E	missions Reca	all - Proof of Correction
License Number	Make	Year Model	Year Model	Vehicle Identification Number
Manufacture	n	Recall	Number:	
The above de Related Reca	escribed III that is	vehicle has t listed above	been repaired	, modified to address the Emissions
Dealer's	Т	Addres	s, City, State	é.
Dealer's Au X Return this co	thorize	d Signature	when require	ed - otherwise retain for your records.

#### REIMBURSEMENT

This repair is covered by an authorized Non Compliance Recall Cam obtained through the normal claim handling process.	paign. Reimbursement is
	UCHP Reimbursement
Claim Type (used only when uploading from the Dealer Business System)	40
Recall Status	
Vehicle repaired per instructions	1-Modified per instructions
Labor Codes	
Primary Labor Code:	2586-03-02-01
Aftertreatment Selective catalytic Reduction (SCR) Catalyst,	Models VN and VHD
Replacement	2.6 hrs
Exhaust Aftertreatment System Analysis & DEF Inspection	2589-08-03-18
	1.0
Program Engine Electronic Control Unit	2840-22-03-01
	0.5
Causal Part	22058301
Authorization Number	M0070

**Note:** Dealers are to perform Non Compliance Recall on all subject vehicles at no charge to the vehicle owner regardless of mileage, age of vehicle or ownership (original purchaser or subsequent purchasers). Whenever vehicles are subject to a Non Compliance Recall are brought to your dealership for service, or taken into your dealership vehicle inventory, it is strongly recommended that every effort be made to perform the recall correction before the vehicle is sold or released to the owner.

Step	Inspection Check List	Data Input
<b>*</b>	Inspect DEF Quality using Refractometer (P/N - 88890105) and Record Value	VALUE
2	Inspect DEF Quality using litmus paper (P/N - 88890110) and Circle Pass or Fail	PASS / FAIL
3	Inspect DEF Tank for contamination of any clirt, debris, coolant, water, fuel, oil, etc Contamination found, circle answer	YES / NO
4	With SCR Removed - Inspect DEF dosing valve for excessive crystallized DEF - Circle found Condition	NONE / MINIMAL / MODERATE / SEVERE
5	With SCR Removed - Inspect SCR Diffuser Pipe for excessive crystallized DEF - Circle found condition	NONE / MINIMAL / MODERATE / SEVERE
9	With SCR Removed - Inspect SCR Inlet for excessive crystallized DEF - Circle found condition	NONE / MINIMAL / MODERATE / SEVERE

		Vehicle Err	nissions Recal	I - Proof of Correction
License Number	Make	Year Model	Year Model	Vehicle Identification Number
Manufacture	12	Recall h	Number:	
The above de Related Reca	scribed II that is	l vehicle has b∈ s listed above.	een repaired,	modified to address the Emissions
Dealer's	8	Address	s, City, State	
Dealer's Auf X	thorize	d Signature		
Return this ce	ertificate	to DMV only v	when require	d - otherwise retain for your records.