

Date	Expiration	Release	Page
11.2018	11.2020	1	1(37)

Revision: A **STEP 67 ADDED. A DATA RESET MUST BE PERFORMED** 2018-12-10

SCR CONVERTER REPLACEMENT - AFTERTREATMENT SYSTEM

Prevost vehicles

B13R (9700 us/can)

DESCRIPTION

This special bulletin is the continuity of Special Bulletin SP18-35. Only if authorized, perform the replacement of the SCR tank.

MODEL YEAR(S) AND VEHICLES INVOLVED

<i>NOTICE TO SERVICE CENTERS</i>	
<i>Verify vehicle eligibility by checking warranty bulletin status with SAP or via ONLINE WARRANTY SYSTEM available on Service / Warranty tab of Prevost's website.</i>	
Specific GHG17 & OBD18 compliant vehicles	
This bulletin does not necessarily apply to all the above-mentioned vehicles, some vehicles may have been modified before delivery.	

Special Bulletin

SP18-39A

Date	Expiration	Release	Page
11.2018	11.2020	1	2(37)

MATERIAL NEEDED

Order kit **SP18-39** which includes the following parts:

Part No.	Description	Qty
500952	SCREW, TAPPING BDG PH SS #8X1/2	12
504637	CABLE TIE, NYLON BLK	12
540067	EXHAUST CLAMP 5"	1
21021850	CLAMP, V-BAND 5-INCH	2
21095726	GASKET EXHAUST PIPE V-BAND JOINT, 5-INCH	2
22303390	NOx SENSOR, PRE	1
22303391	NOx SENSOR, POST	1
22998036	TIE, STAINLESS STEEL	4
23190006	SCR CONVERTER	1

NOTE

Material can be obtained through regular channels.

SPECIAL EQUIPMENT REQUIRED



Date	Expiration	Release	Page
11.2018	11.2020	1	3(37)

Part 1- H3 SERIES AND X3 SERIES VEHICLES

Date	Expiration	Release	Page
11.2018	11.2020	1	4(37)

PROCEDURE



DANGER

Park vehicle safely, apply parking brake, stop the engine. Prior to working on the vehicle, set the ignition switch to the OFF position and trip the main circuit breakers equipped with a trip button. On Commuter type vehicles, set the battery master switch (master cut-out) to the OFF position.

PRELIMINARY STEPS

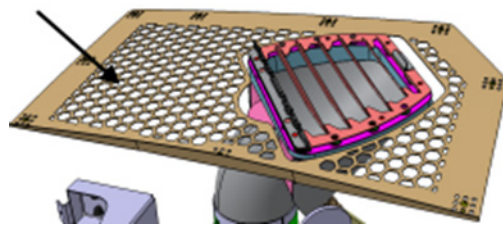
1. Open the engine compartment door and the SCR converter access door.

2. Remove the SCR converter access door. Doing so will allow extraction of the SCR converter out of its compartment.

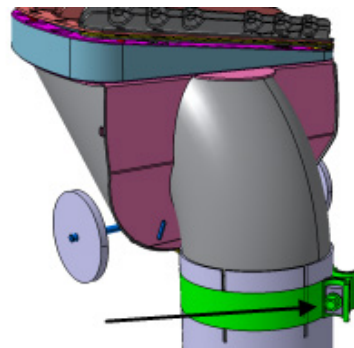


3. The SCR converter is heavy, huge and the free space in the opening is limited. Do whatever is necessary to protect the fiberglass and the paint around the opening giving access to the SCR. Using adhesive tape, place pieces of cardboard around the area.

4. Remove the SCR overhead ventilation grille.

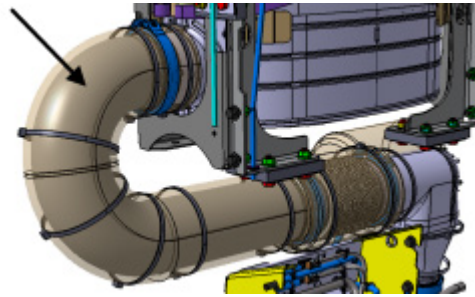


5. Loosen the clamp and then remove the diffuser assembly with the drain tube attached.

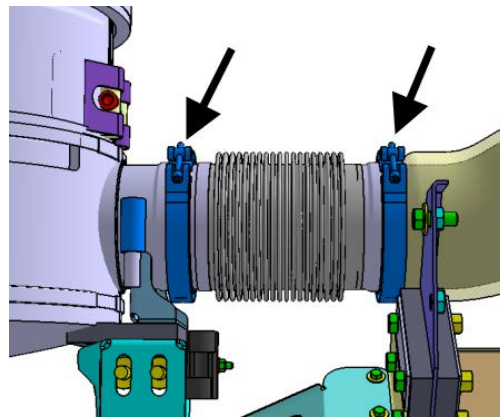


Date	Expiration	Release	Page
11.2018	11.2020	1	5(37)

6. Support the exhaust pipe between the SCR and the flexible section. Remove the insulating blanket around the pipe and then remove the two V-band clamps securing the exhaust pipe. Move the exhaust pipe to clear it from the SCR converter compartment.



H3 SERIES

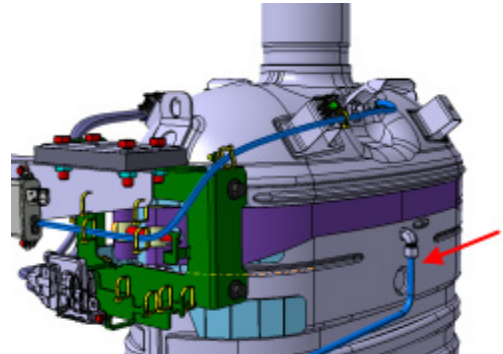


X3 SERIES

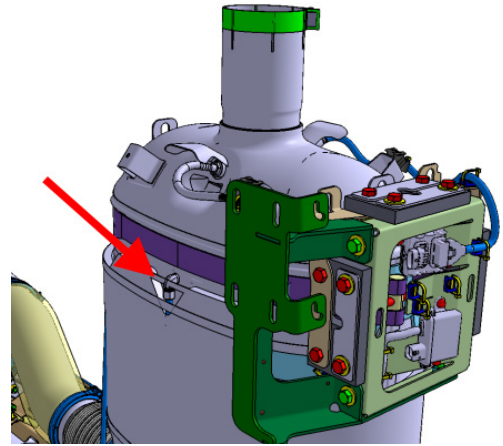
Date	Expiration	Release	Page
11.2018	11.2020	1	6(37)

SCR CONVERTER REMOVAL

7. Disconnect the SCR converter drain tube



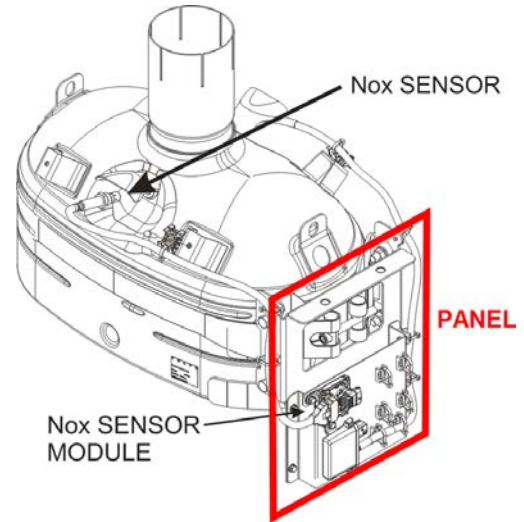
H3 SERIES



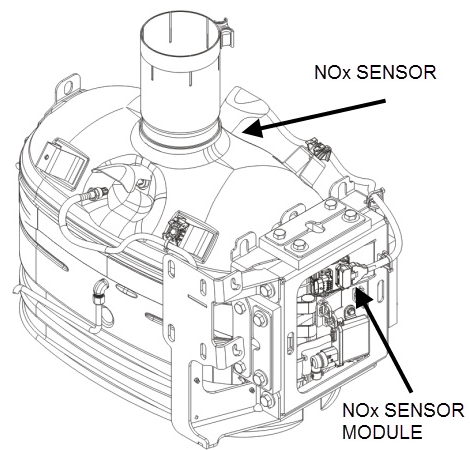
X3 SERIES

Date	Expiration	Release	Page
11.2018	11.2020	1	7(37)

8. Unscrew and remove the NOx sensor and module. Return the NOx sensor with the defective SCR converter to Prevost.



H3 SERIES

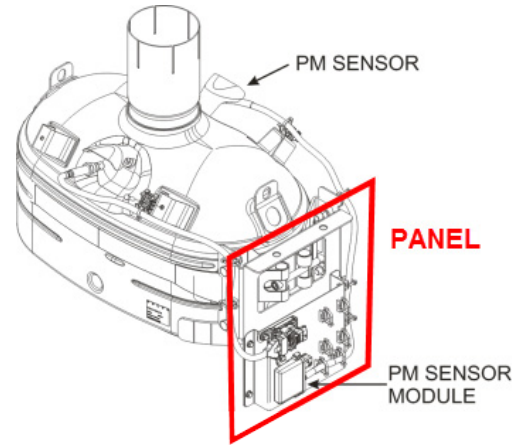


X3 SERIES

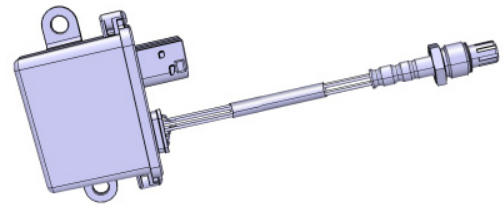
Date	Expiration	Release	Page
11.2018	11.2020	1	8(37)

9. Unscrew the PM (particulate matter) sensor from the SCR converter.
10. Secure the PM sensor and harness next to the PM sensor module on the panel.

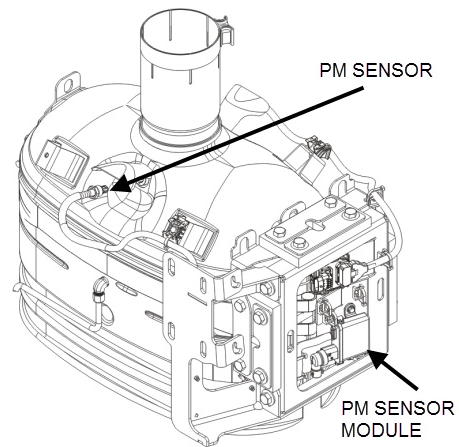
Keep the PM sensor for reuse



H3 SERIES

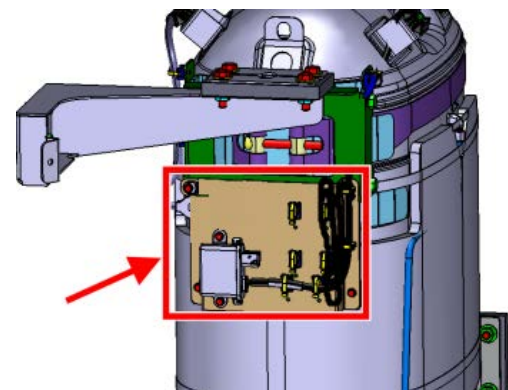


PM SENSOR



X3 SERIES

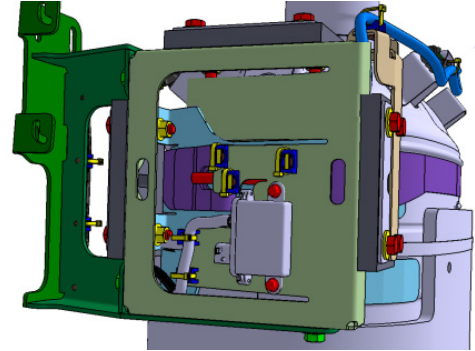
11. **H3 SERIES** - Remove the module panel and put aside.



H3 SERIES

Date	Expiration	Release	Page
11.2018	11.2020	1	9(37)

12. **X3 SERIES** - Remove the module panel and put aside.



X3 SERIES

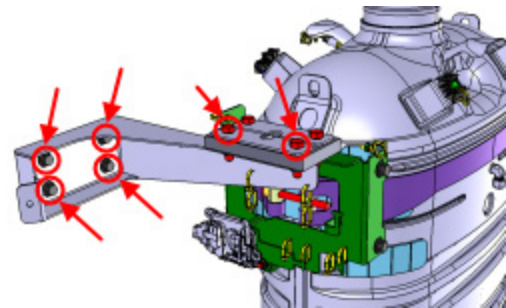
13. Install an appropriate lifting device to the lifting eyelets of the SCR converter.

See the image on the right for an example of what should be used ideally

14. With the lifting device, support the weight of the SCR converter.



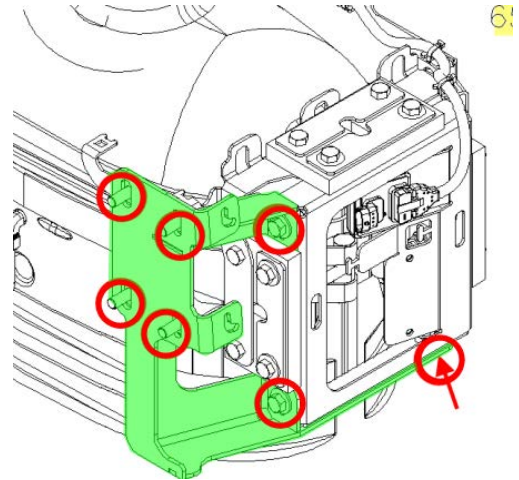
15. **H3 SERIES** - Remove the upper mounting bracket. Unscrew and remove six bolts identified on the image.



H3 SERIES

Date	Expiration	Release	Page
11.2018	11.2020	1	10(37)

16. **X3 SERIES** - Remove the upper mounting bracket. Unscrew and remove seven bolts identified on the image.



X3 SERIES

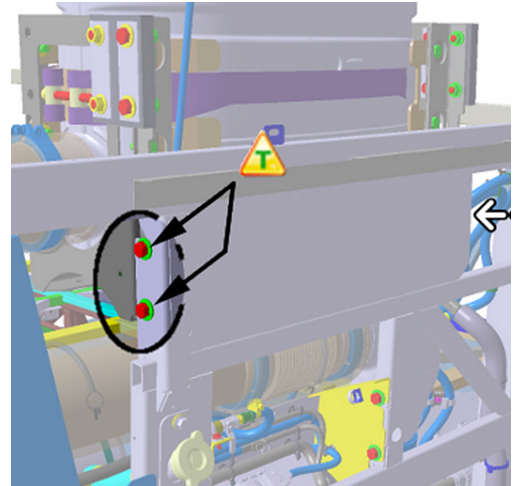
17. **H3 SERIES** - To give as much clearance as possible, remove the insulating blanket pieces from the SCR converter. This is necessary; otherwise, the SCR converter will not pass through the opening.



H3 SERIES

18. **H3 SERIES** - Thread the upper bolt out about 1/4".

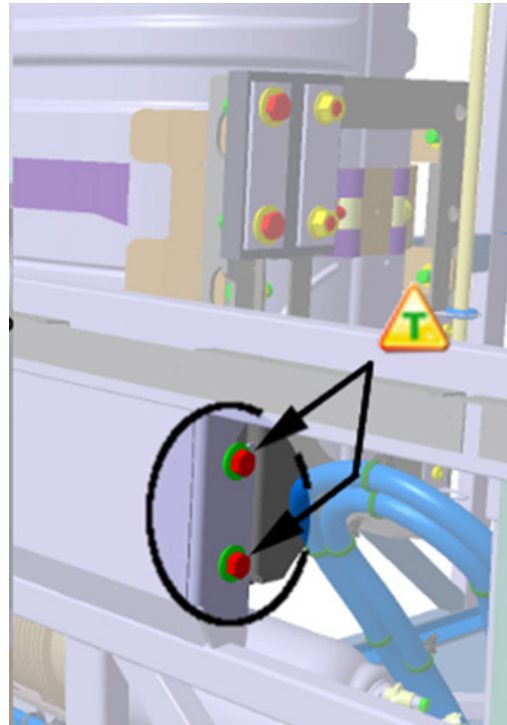
19. **H3 SERIES** - Remove the lower bolt.



H3 SERIES - BOLTS SECURING THE SCR CONVERTER TO THE CHASSIS - STREET SIDE

Date	Expiration	Release	Page
11.2018	11.2020	1	11(37)

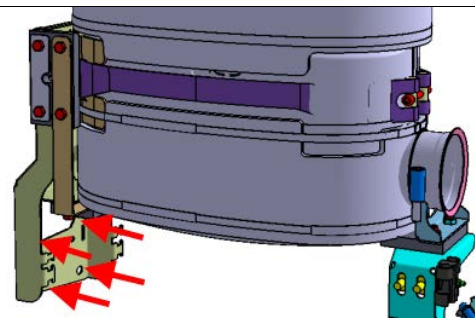
- 20. **H3 SERIES** - Thread the upper bolt out about 1/4 in.
- 21. **H3 SERIES** - Remove the lower bolt.



H3 SERIES - BOLTS SECURING THE SCR CONVERTER TO THE CHASSIS - CURB SIDE

- 22. **H3 SERIES** - Using the lifting device, lift the SCR converter a few inches so it will disengage from the fixing points at the bottom.

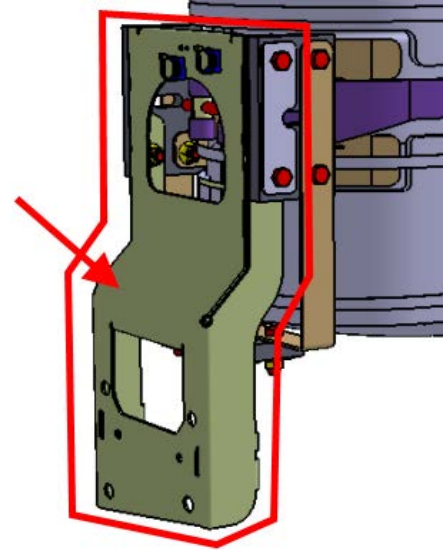
- 23. **X3 SERIES** – Unbolt the lower support bracket from the chassis (4 bolts).



X3 SERIES

Date	Expiration	Release	Page
11.2018	11.2020	1	12(37)

24. **X3 SERIES** – Lift the SCR converter and then remove the lower support bracket to ease removal of the SCR converter.



X3 SERIES

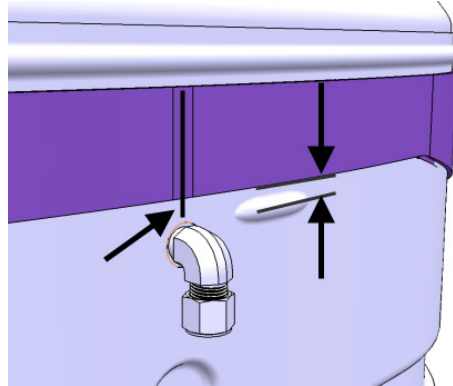
25. While proceeding with great care, take the SCR converter out of the compartment through the L.H. side opening. The SCR converter is heavy. Proceed with the help of a coworker.

Date	Expiration	Release	Page
11.2018	11.2020	1	13(37)

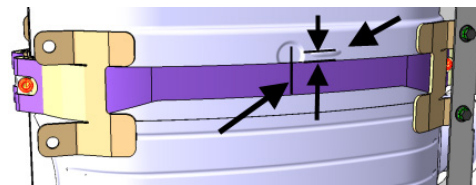
TAKE THE STRAPS AND BRACKETS APART FROM THE DEFECTIVE SCR CONVERTER

It is IMPORTANT to take all the necessary precautions in order to ease the installation of the straps and brackets on the replacement SCR converter. It is very important to position the straps and the mounting brackets as much as possible like they were positioned on the defective SCR converter. Doing so will greatly facilitate the installation of the SCT in the compartment.

It is highly recommended to measure and/or mark the position of the straps on the defective SCR converter in order to have references for positioning the straps on the new installation.



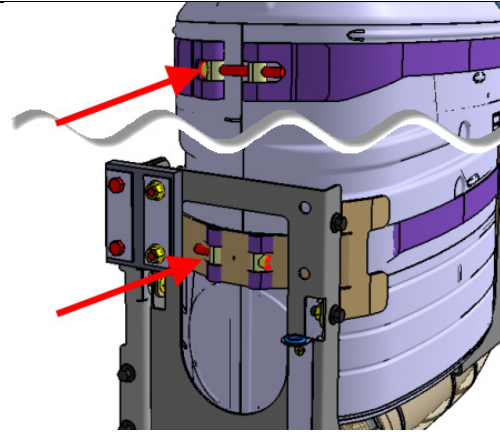
ON THE STRAP, DRAW A LINE CENTERED WITH THE DRAIN FITTING. MEASURE THE UPPER STRAP POSITION IN RELATION TO THE EMBOSS



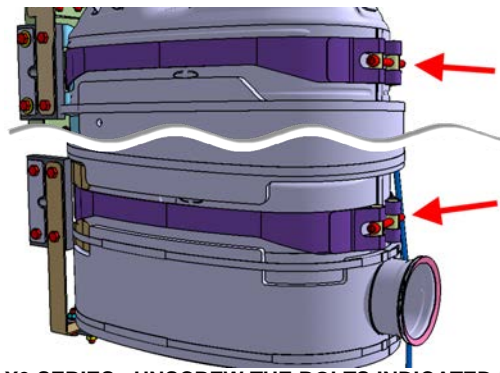
ON THE STRAP, DRAW A LINE CENTERED WITH CIRCULAR EMBOSS. MEASURE THE LOWER STRAP POSITION IN RELATION TO THE EMBOSS

Date	Expiration	Release	Page
11.2018	11.2020	1	14(37)

26. Remove the mounting straps and brackets from the SCR converter. Unscrew the bolts identified by the arrows.



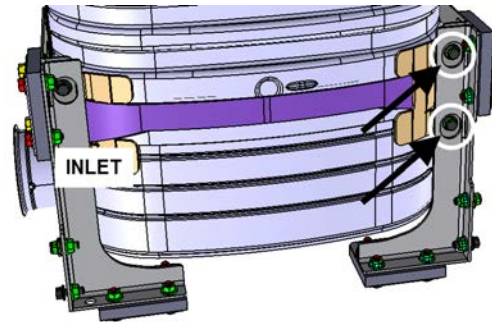
H3 SERIES - UNSCREW THE BOLTS INDICATED BY THE ARROWS



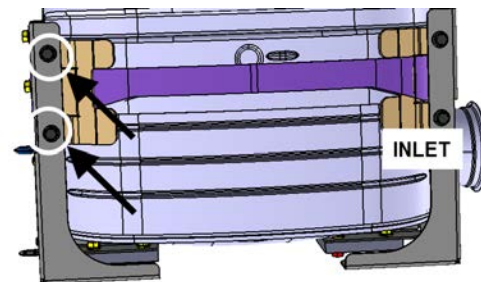
X3 SERIES - UNSCREW THE BOLTS INDICATED BY THE ARROWS

Date	Expiration	Release	Page
11.2018	11.2020	1	15(37)

27. **H3 SERIES** - Take the R.H. side lower bracket apart from the SCR converter.



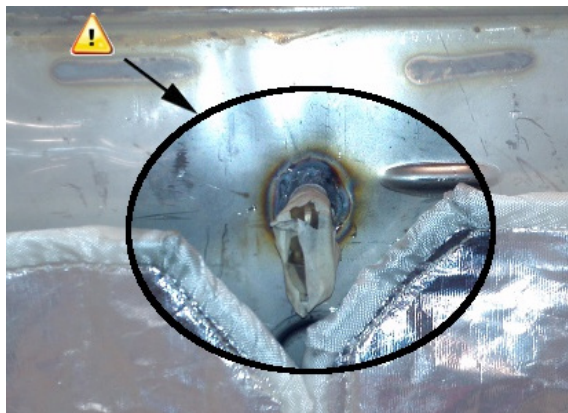
H3 SERIES - UNSCREW THE TWO BOLTS INDICATED BY THE ARROWS



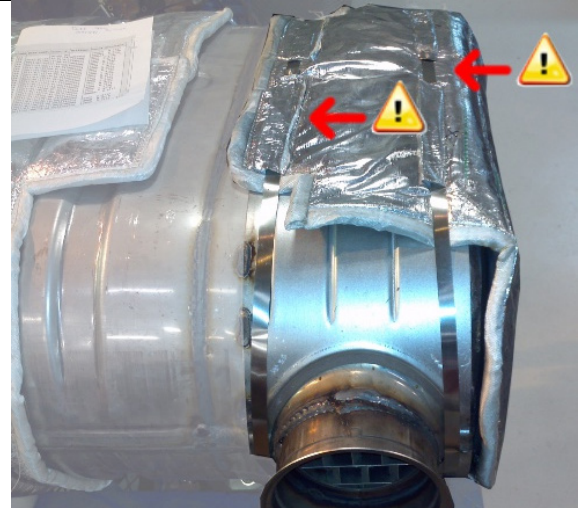
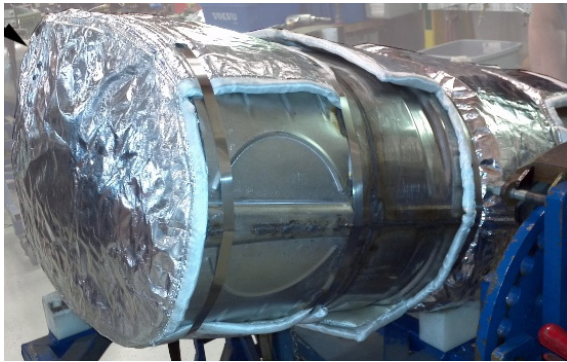
H3 SERIES - UNSCREW THE TWO BOLTS INDICATED BY THE ARROWS

28. **X3 SERIES** - Install the insulating blankets recovered from the defective SCR converter. Secure with stainless steel ties.

IMPORTANT: Make sure that the « V » clearance and the round clearance of the insulation blanket are placed at the drain fitting and the stud found on the SCR converter respectively.

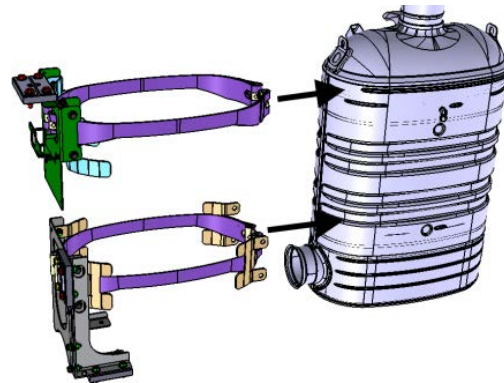


Date	Expiration	Release	Page
11.2018	11.2020	1	16(37)



29. Install the straps and brackets on the new SCR converter.

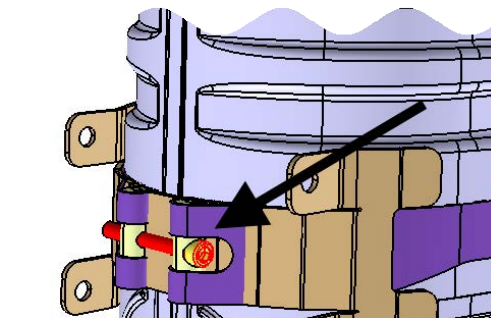
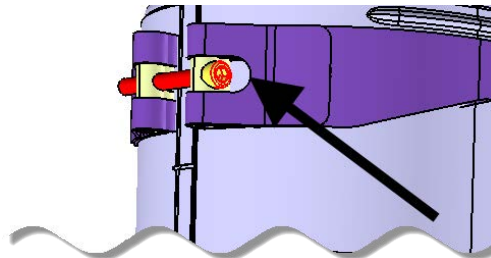
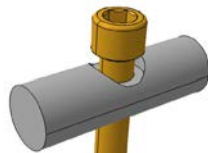
Install the brackets exactly as on the defective SCR



(H3 Series shown)

30. Tighten the bolts just enough to hold the straps in place while allowing movement for position adjustment.

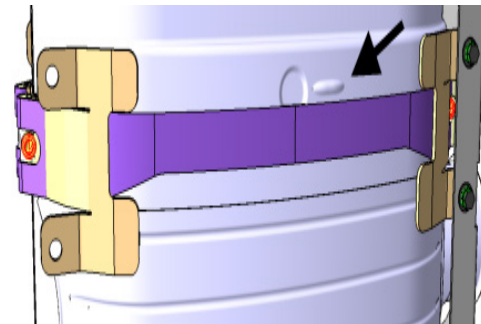
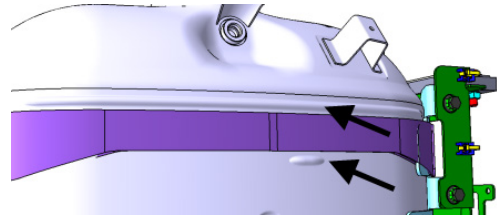
Caution : The bolt head must go into the chamfered hole



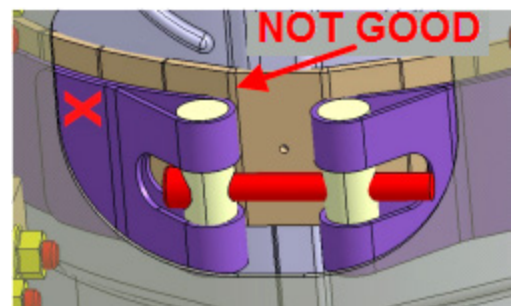
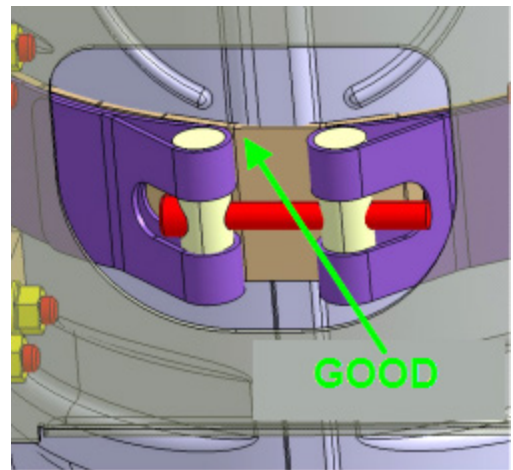
BOLT WITH THE HEAD ON THE PROPER SIDE (OPPOSITE SIDE OF THE DRAIN TUBE FITTING)

Date	Expiration	Release	Page
11.2018	11.2020	1	17(37)

31. Adjust the straps position in reference to the emboss.



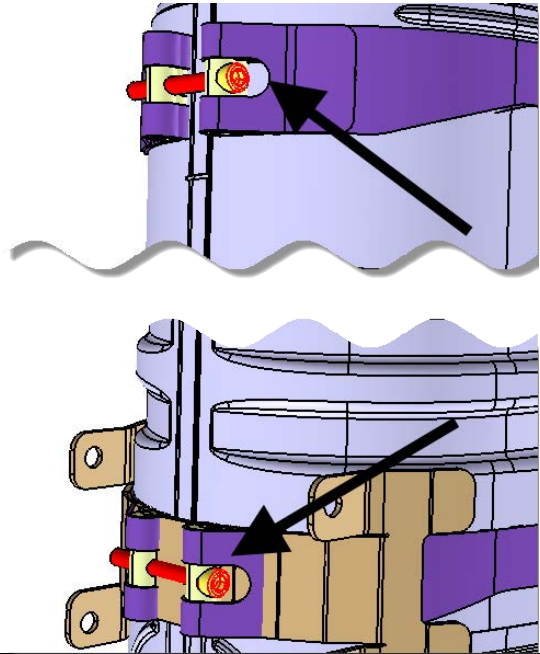
32. **H3 SERIES** - Prior final tightening, make sure that each strap is properly centered on its respective bracket.



Date	Expiration	Release	Page
11.2018	11.2020	1	18(37)

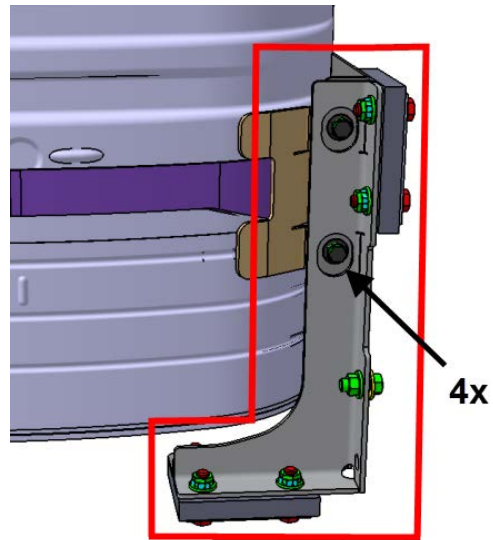
33. Once properly positioned, apply final torque to the strap bolts.

FINAL TORQUE: 30-37 lbf-ft



34. **H3 SERIES** - Install the R.H. side lower bracket and tighten the bolts (4x) to proper torque.

FINAL TORQUE: 48 lbf-ft



H3 SERIES

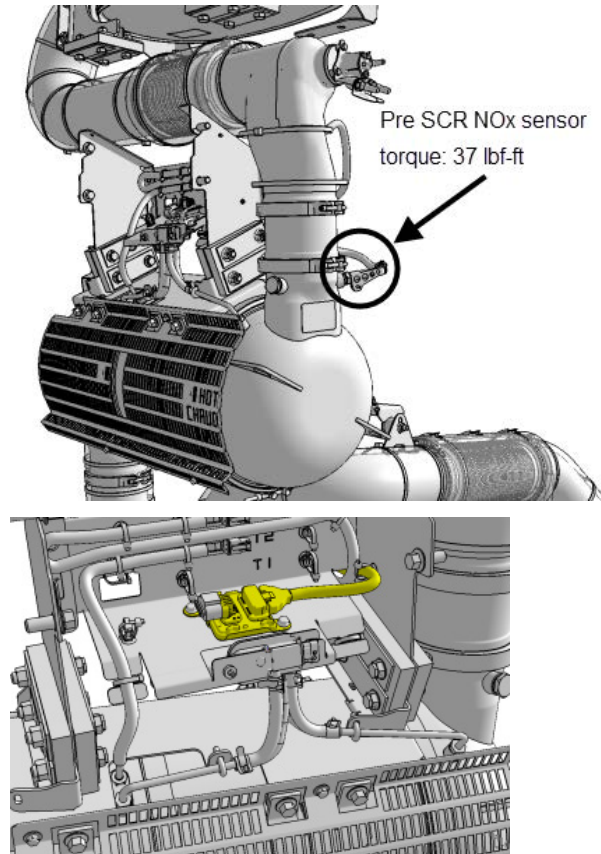
Date	Expiration	Release	Page
11.2018	11.2020	1	19(37)

INSTALL THE PRE-SCR NOx SENSOR

35. Apply anti-seize compound on the NOx sensor threads and then fix onto the DPF outlet. Secure the harness using nylon ties.

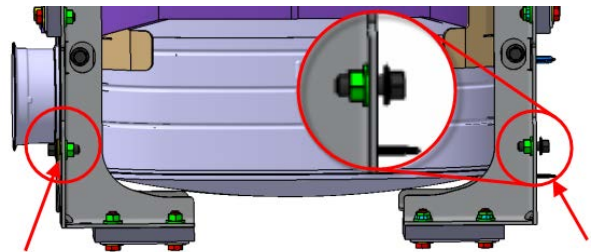
NOx sensor torque: 37 lbf-ft

Return the old NOx sensor with the SCR converter to Prevost



REINSTALL THE SCR CONVERTER IN ITS COMPARTMENT

36. **H3 SERIES** - Make sure that there is a gap of about 1/2" between the washer pressed against the bolt head and the bracket surface where indicated on the image at right (2 bolts).



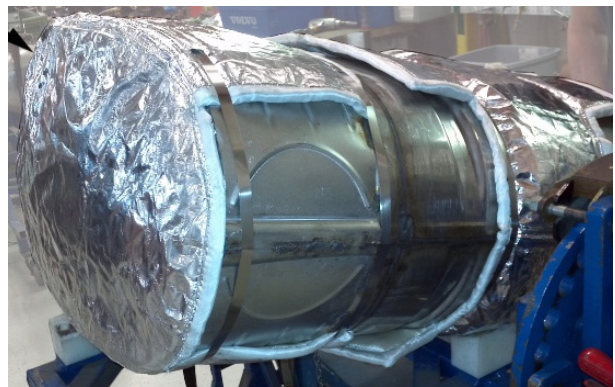
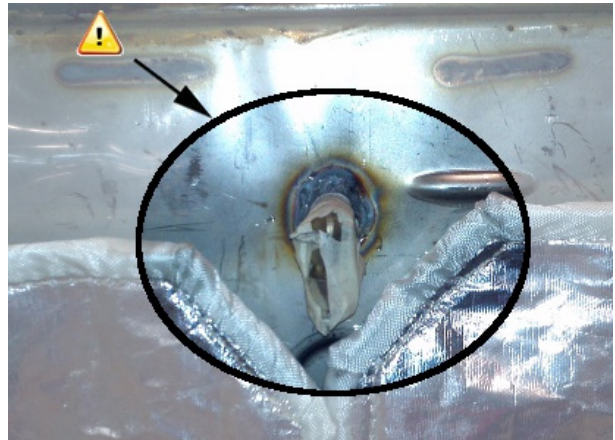
H3 SERIES - LOWER BRACKETS

37. While proceeding with great care, insert the SCR converter in the compartment through the opening using the lifting device. The SCR converter is heavy. Proceed with the help of a coworker. **DO NOT** place the SCR converter in final position yet.

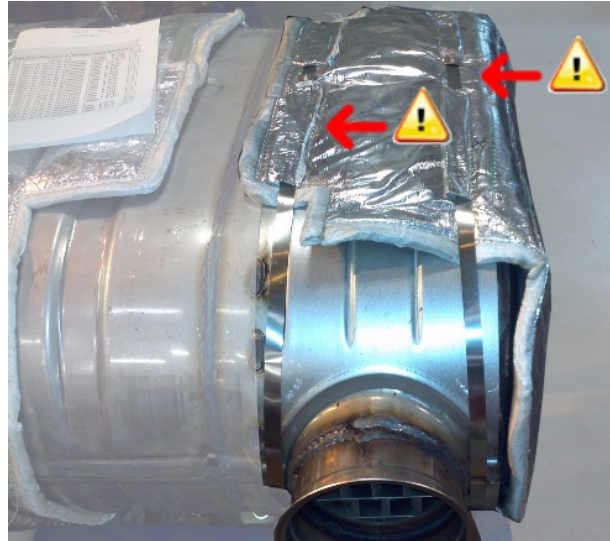
Date	Expiration	Release	Page
11.2018	11.2020	1	20(37)

38. **H3 SERIES** - Install the upper and lower insulating blankets recovered from the defective SCR converter. Secure with stainless steel ties.

IMPORTANT: Make sure that the « V » clearance and the round clearance of the insulation blanket are placed at the drain fitting and the stud found on the SCR converter respectively.

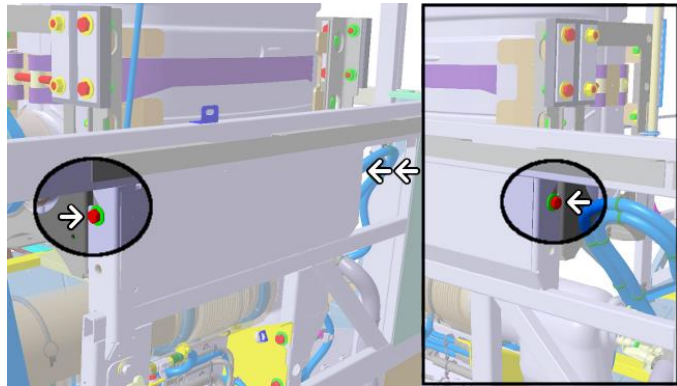


Date	Expiration	Release	Page
11.2018	11.2020	1	21(37)



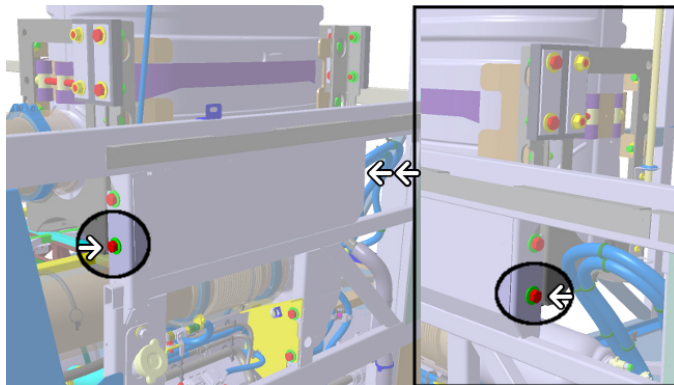
39. **H3 SERIES** - Install the SCR converter in final position. Rest the SCR converter at the fixing points on the chassis with the two upper bolts secured to both lower brackets.

40. **H3 SERIES** - Tighten the two bolts to a firm feel.



H3 SERIES

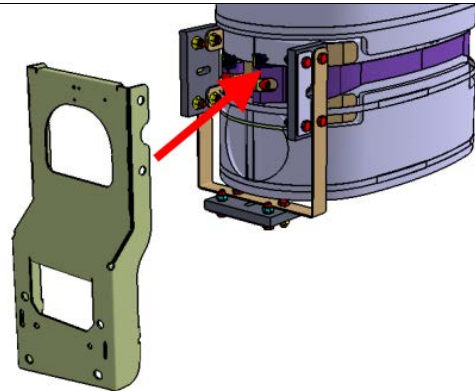
41. **H3 SERIES** - Thread in and tighten the two lower bolts to a firm feel.



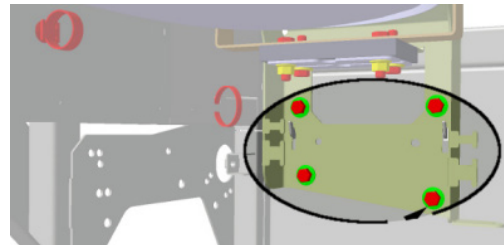
H3 SERIES

Date	Expiration	Release	Page
11.2018	11.2020	1	22(37)

- 42. **X3 SERIES** – Reinstall the lower support bracket on the SCR converter.
- 43. **X3 SERIES** – Fasten the lower support to the vehicle chassis.



X3 SERIES



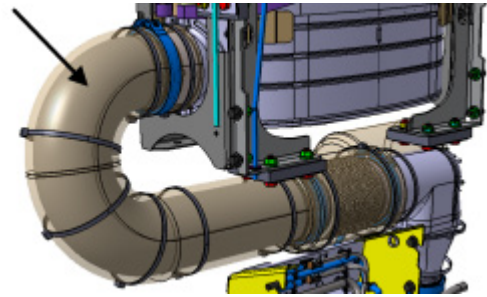
Date	Expiration	Release	Page
11.2018	11.2020	1	23(37)

REINSTALL THE EXHAUST PIPE AND INSULATING BLANKET

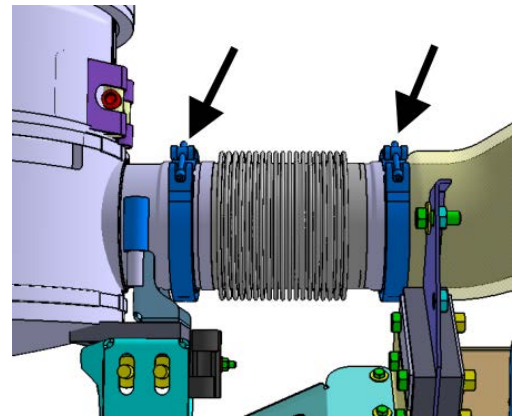
44. Clean the sealing surfaces between the after-treatment SCR converter inlet, the exhaust pipe and the flexible section.
45. Using a new gasket, position the pipe to the after-treatment SCR converter and install a new V-band clamp. Tighten the V-band clamp to specification. Proceed similarly with the other end of the exhaust pipe.

Gasket, qty: 2

V-band clamp, qty: 2 (torque=100 lbf-in)

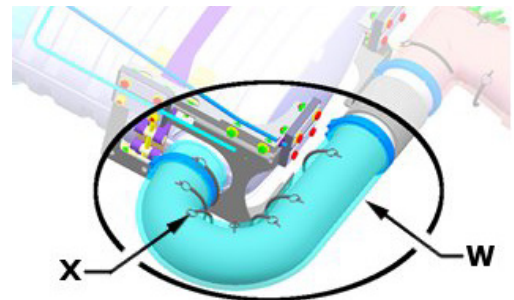


H3 SERIES

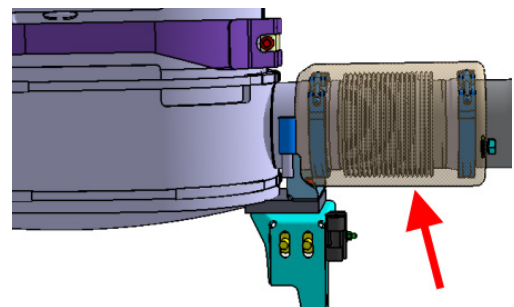


X3 SERIES

46. Reinstall the insulating blanket.



H3 SERIES



X3 SERIES

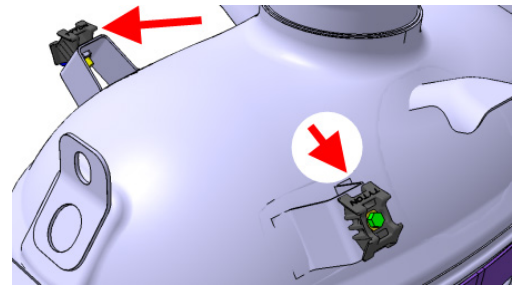
Date	Expiration	Release	Page
11.2018	11.2020	1	24(37)



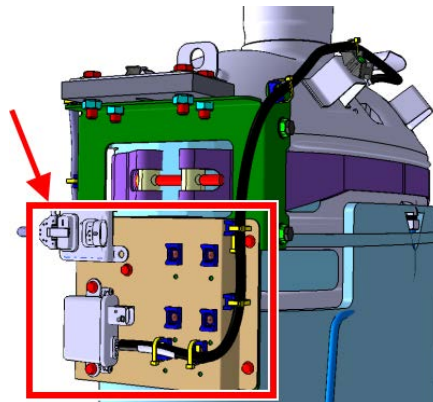
X3 SERIES

INSTALLATION OF THE PM SENSOR

47. Recover the two harness mounts on the defective SCR converter and install them on the replacement SCR converter.

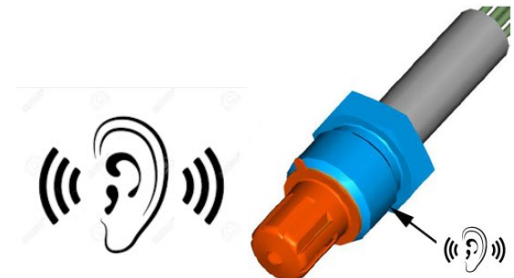


48. **H3 SERIES** – Reinstall the sensor module panel.



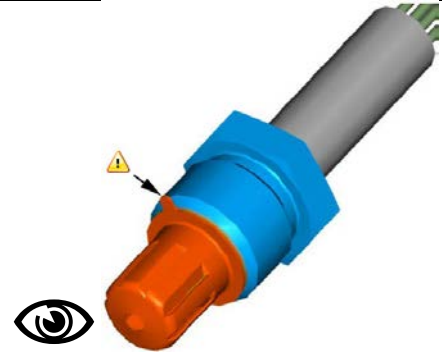
H3 SERIES

49. **Installation of the PM sensor.** Before installing the PM Sensor, shake the sensor close to your ear to detect a broken ceramic noise. If there is a sound of broken ceramic, reject the PM Sensor, it is defective. Install a PM sensor in good condition.



Date	Expiration	Release	Page
11.2018	11.2020	1	25(37)

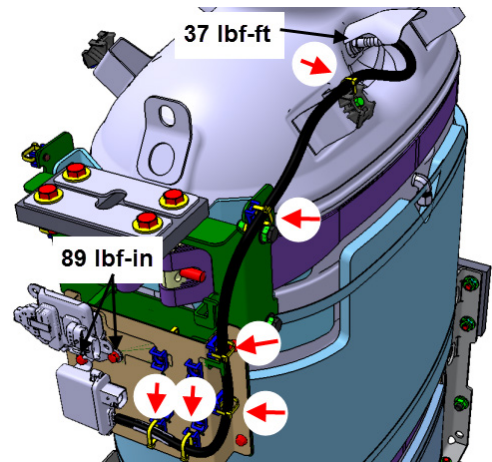
50. Before connecting the PM Sensor, make sure you align the keying tab with the orientation slot in the mating boss.



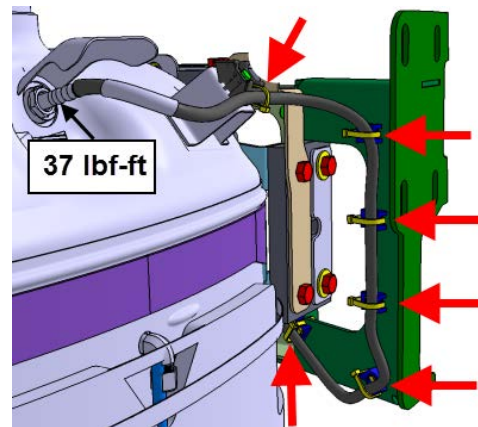
51. Install the PM sensor and secure the harness as shown using nylon ties.

PM sensor torque: 37 lbf-ft

PM sensor module: 89 lbf-in

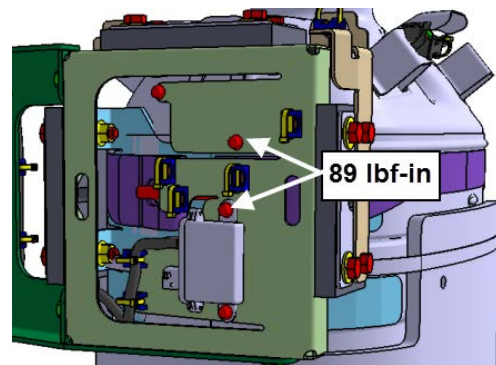


H3 SERIES



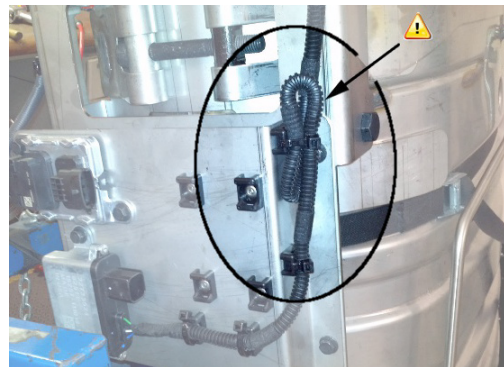
X3 SERIES

Date	Expiration	Release	Page
11.2018	11.2020	1	26(37)



X3 SERIES

52. **H3 SERIES** – Take up the extra length of the PM sensor harness shown on the image and secure to a nylon tie mount.



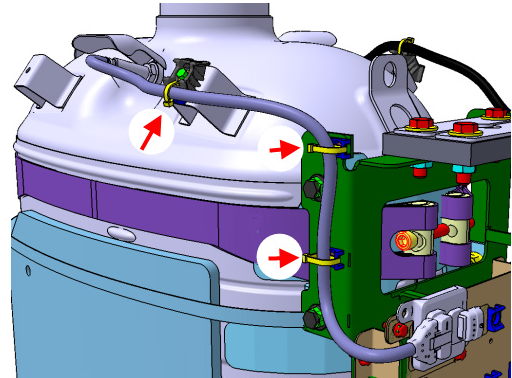
H3 SERIES

Date	Expiration	Release	Page
11.2018	11.2020	1	27(37)

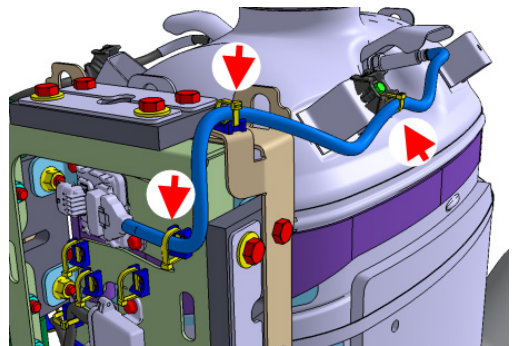
INSTALL THE POST-SCR NOx SENSOR

53. Apply anti-seize compound on the NOx sensor threads and then fix onto the SCR converter. Secure the harness as shown using nylon ties.

NOx sensor torque: 37 lbf-ft



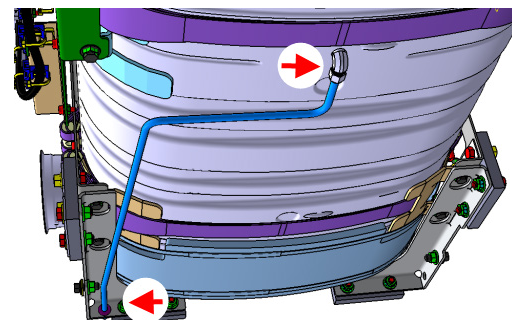
H3 SERIES



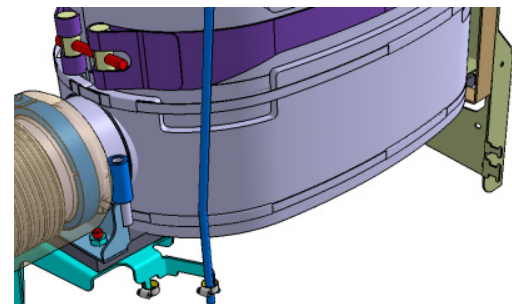
X3 SERIES

REINSTALL THE SCR CONVERTER DRAIN TUBE

54. Insert the tube into the fitting and then tighten firmly.



H3 SERIES

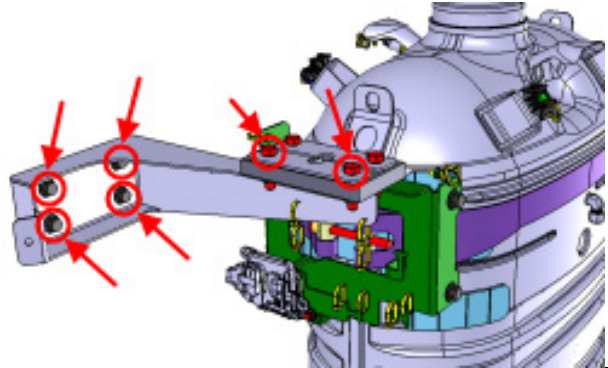


X3 SERIES

Date	Expiration	Release	Page
11.2018	11.2020	1	28(37)

REINSTALLING THE "L" SHAPE BRACKET

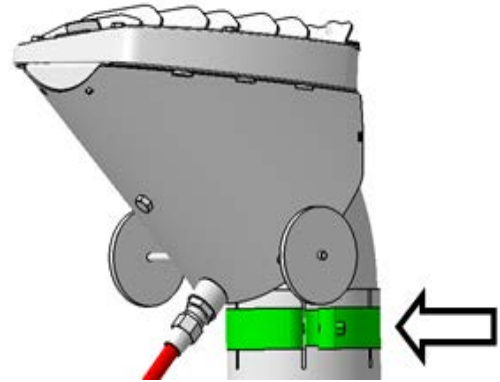
55. **H3 SERIES** – Reinstall the upper mounting bracket.



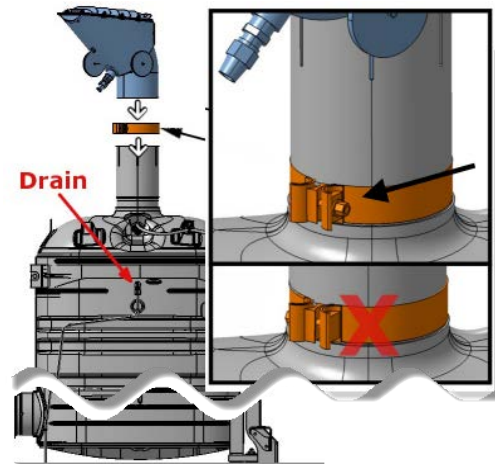
Date	Expiration	Release	Page
11.2018	11.2020	1	29(37)

DIFFUSER ASSEMBLY AND GRILLE INSTALLATION

56. Slide the diffuser assembly on the SCR converter tube.
Do not tighten at this moment.



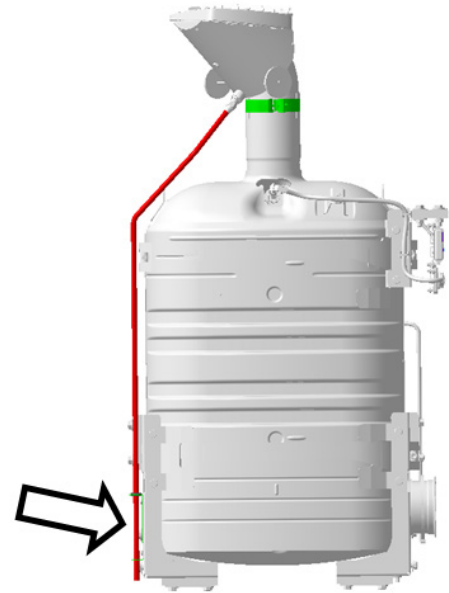
H3 SERIES – NUT ON THIS SIDE



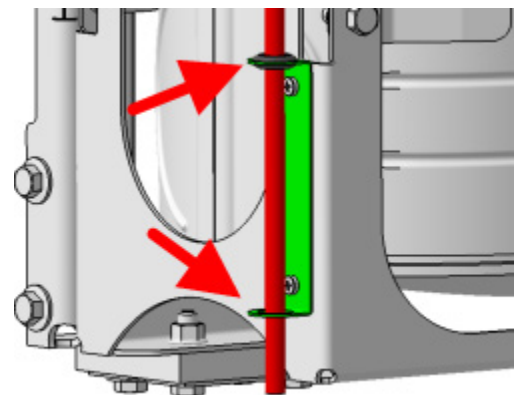
X3 SERIES – NUT ON THIS SIDE

Date	Expiration	Release	Page
11.2018	11.2020	1	30(37)

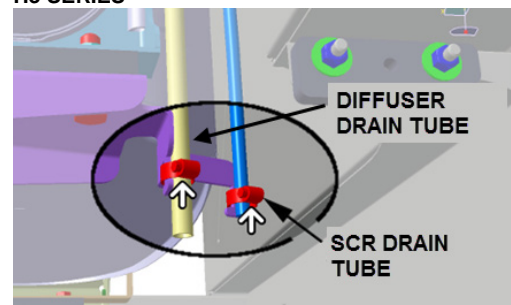
57. Install the drain tube.



58. Insert the drain tube in the drain tube guide.



H3 SERIES

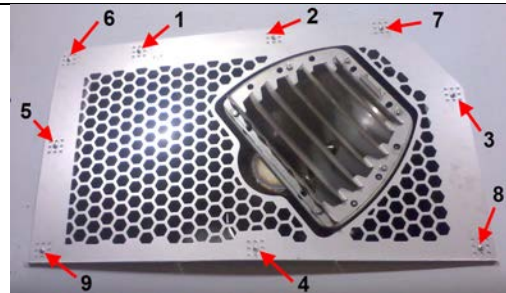


X3 SERIES

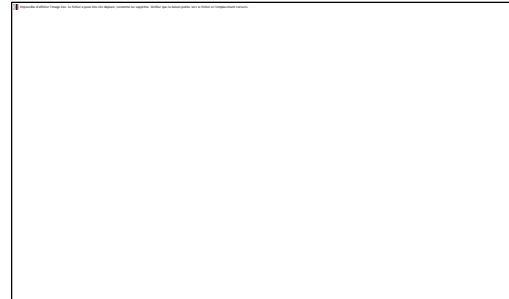
Date	Expiration	Release	Page
11.2018	11.2020	1	31(37)

59. Install the SCR converter compartment grille on the top of the coach. Tighten the screw in the order shown on the image.

#500952 tapping screw #8x1/2 SS

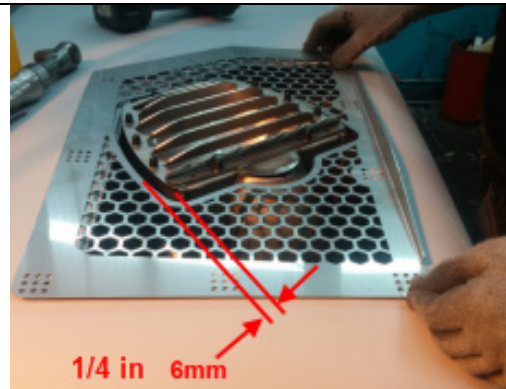


H3 SERIES



X3 SERIES

60. Adjust the spacing between the diffuser assembly and the grille. The minimum spacing should be 1/4" (6 mm).



61. Adjust the diffuser assembly height above the grille. The edge height should be 1/8" to 1/4" (3 mm to 6 mm) at the diffuser corner shown on the image while the edge height should be 1/8" to 1/2" (3 mm to 12 mm) at the outer edge for the rest of the periphery.



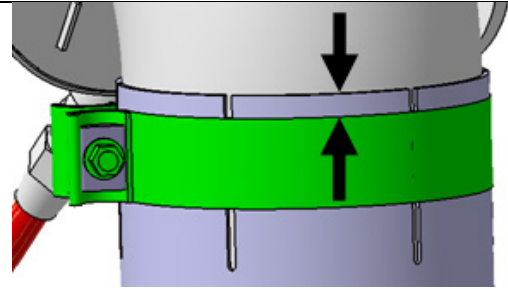
Date	Expiration	Release	Page
11.2018	11.2020	1	32(37)

62. Slide the diffuser clamp close to the top of the SCR converter outlet tube.

Measurement:

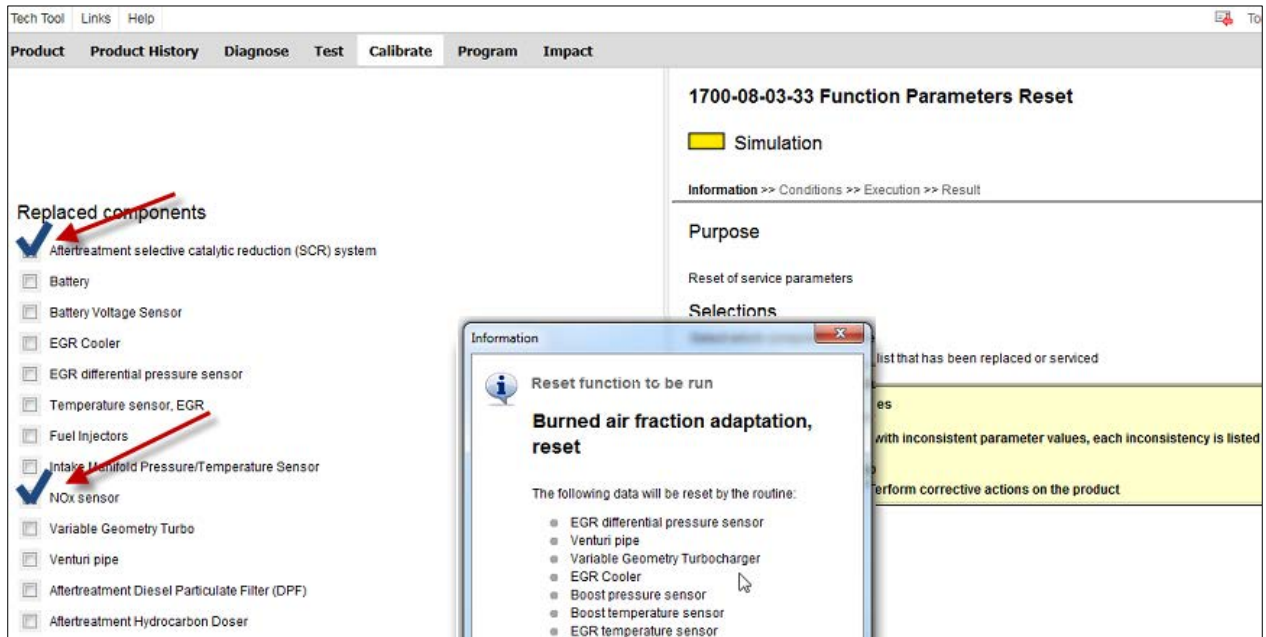
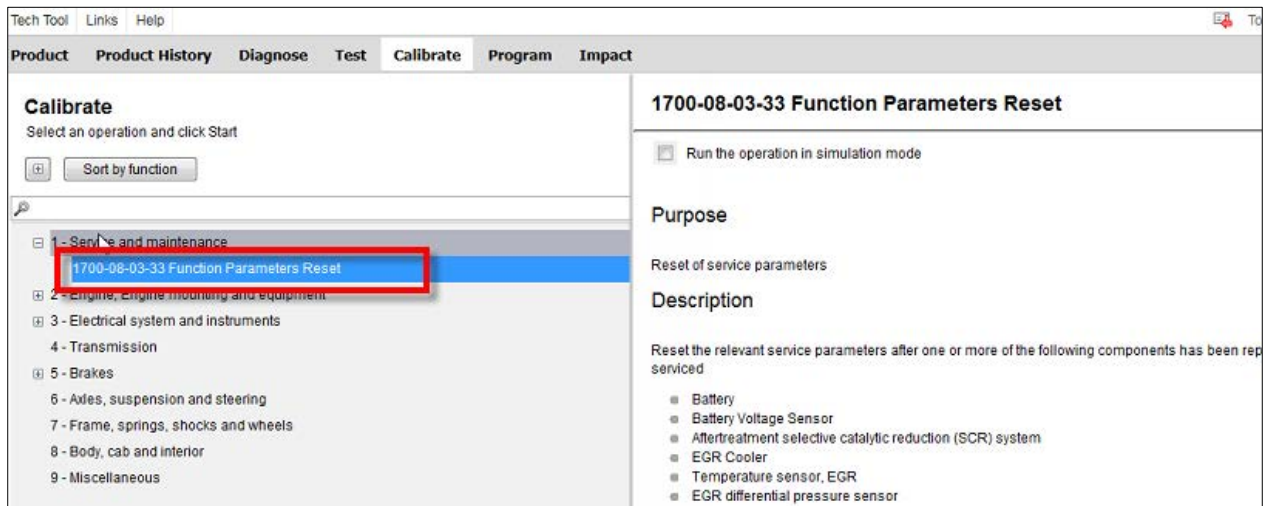
between 1/8" to 1/2" (2 mm to 12 mm)

63. Tighten the clamp.



FINAL STEPS

64. Reconnect all previously removed cables to the negative (ground) battery terminals if applicable.
65. Start the engine and check for leaks of the exhaust system and proper operation.
66. Check for diagnostic troubleshooting code related to the after-treatment system, in particular, the PM sensor and NOx sensor.
67. Using TechTool, perform a Data Reset of the components that were replaced (refer to the two following images).



Special Bulletin

SP18-39A

Date	Expiration	Release	Page
11.2018	11.2020	1	34(37)

Date	Expiration	Release	Page
11.2018	11.2020	1	35(37)

Part 2- VOLVO 9700 VEHICLES

You will find in Part 1 of this bulletin, useful information such as the diffuser removal/installation procedure, strap installation, SCR converter insulating blanket installations, NOx sensor installation, among others.

In complement to Part 1, please refer to the document listed below, available on **Impact**.

IDENTITY	ID/OPERATION	TITLE
129601506	2586-03-02-01	Aftertreatment Selective Catalytic Reduction (SCR) Catalyst,Replacement

FINAL STEPS

1. Reconnect all previously removed cables to the negative (ground) battery terminals if applicable.
2. Start the engine and check for leaks of the exhaust system and proper operation.
3. Check for diagnostic troubleshooting code related to the after-treatment system, in particular, the PM sensor and NOx sensor.
4. Using TechTool, perform a Data Reset of the components that were replaced (refer to the two following images).

The screenshot shows the TechTool software interface. The 'Calibrate' tab is selected, and the '1700-08-03-33 Function Parameters Reset' operation is highlighted in the left-hand menu. The right-hand pane displays the details for this operation, including its purpose and description.

1700-08-03-33 Function Parameters Reset

Run the operation in simulation mode

Purpose
Reset of service parameters

Description
Reset the relevant service parameters after one or more of the following components has been repaired or serviced

- Battery
- Battery Voltage Sensor
- Aftertreatment selective catalytic reduction (SCR) system
- EGR Cooler
- Temperature sensor, EGR
- EGR differential pressure sensor

Date Expiration Release Page
11.2018 11.2020 1 36(37)

The screenshot displays a software interface with a menu bar (Tech Tool, Links, Help) and a main menu (Product, Product History, Diagnose, Test, Calibrate, Program, Impact). The 'Calibrate' tab is active, showing a '1700-08-03-33 Function Parameters Reset' window. This window includes a 'Simulation' checkbox, 'Information' (Conditions, Execution, Result), 'Purpose' (Reset of service parameters), and 'Selections' (list that has been replaced or serviced). A yellow highlight is present under the 'Selections' section with the text: 'with inconsistent parameter values, each inconsistency is listed' and 'perform corrective actions on the product'. A 'Replaced components' list on the left includes: Aftertreatment selective catalytic reduction (SCR) system, Battery, Battery Voltage Sensor, EGR Cooler, EGR differential pressure sensor, Temperature sensor, EGR, Fuel Injectors, Intake Manifold Pressure/Temperature Sensor, NOx sensor, Variable Geometry Turbo, Venturi pipe, Aftertreatment Diesel Particulate Filter (DPF), and Aftertreatment Hydrocarbon Doser. A dialog box titled 'Reset function to be run' is overlaid, showing 'Burned air fraction adaptation, reset' and a list of data to be reset: EGR differential pressure sensor, Venturi pipe, Variable Geometry Turbocharger, EGR Cooler, Boost pressure sensor, Boost temperature sensor, and EGR temperature sensor.

Date	Expiration	Release	Page
11.2018	11.2020	1	37(37)

PARTS / WASTE DISPOSAL

Return the defective SCR converter to Prevest.

ESTIMATED TIME

The time required to perform this special bulletin is approximately:

Prevest vehicles	10 hours
Volvo 9700	3 hours

OTHER

VBC Bulletin	N/A
Fail Code	04.04-1
Defect Code	09
Syst. Count	B
Causal Part	21970125

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