Special Bulletin SP18-39D

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11.2018		**6**	**1(45)**

Revision: D	**Procedure updated. Additional tools depicted**	03/22/2022

SCR CONVERTER REPLACEMENT - AFTERTREATMENT SYSTEM

Prevost vehicles & B13R (9700 us/can)

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DESCRIPTION

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

MODEL YEAR(S) and VEHICLES involved

NOTICE TO SERVICE CENTERS *Verify vehicle eligibility by checking warranty bulletin status with **SAP** or via **ONLINE WARRANTY SYSTEM** available on Service / Warranty tab of Prevost's website.*	
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.	

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

scissor lift – mobile platform

electric winch

swivel hook for fork lift
Vestil LM-HP6-S Swivel Lift Master Hook Plate, 24" Width, 6” Height, 6000 lbs Capacity

Oberg tilt lift 2,000 lbs. Capacity – special lifting tool available in Service Centers
use with half-inch ratchet or half-inch breaker bar

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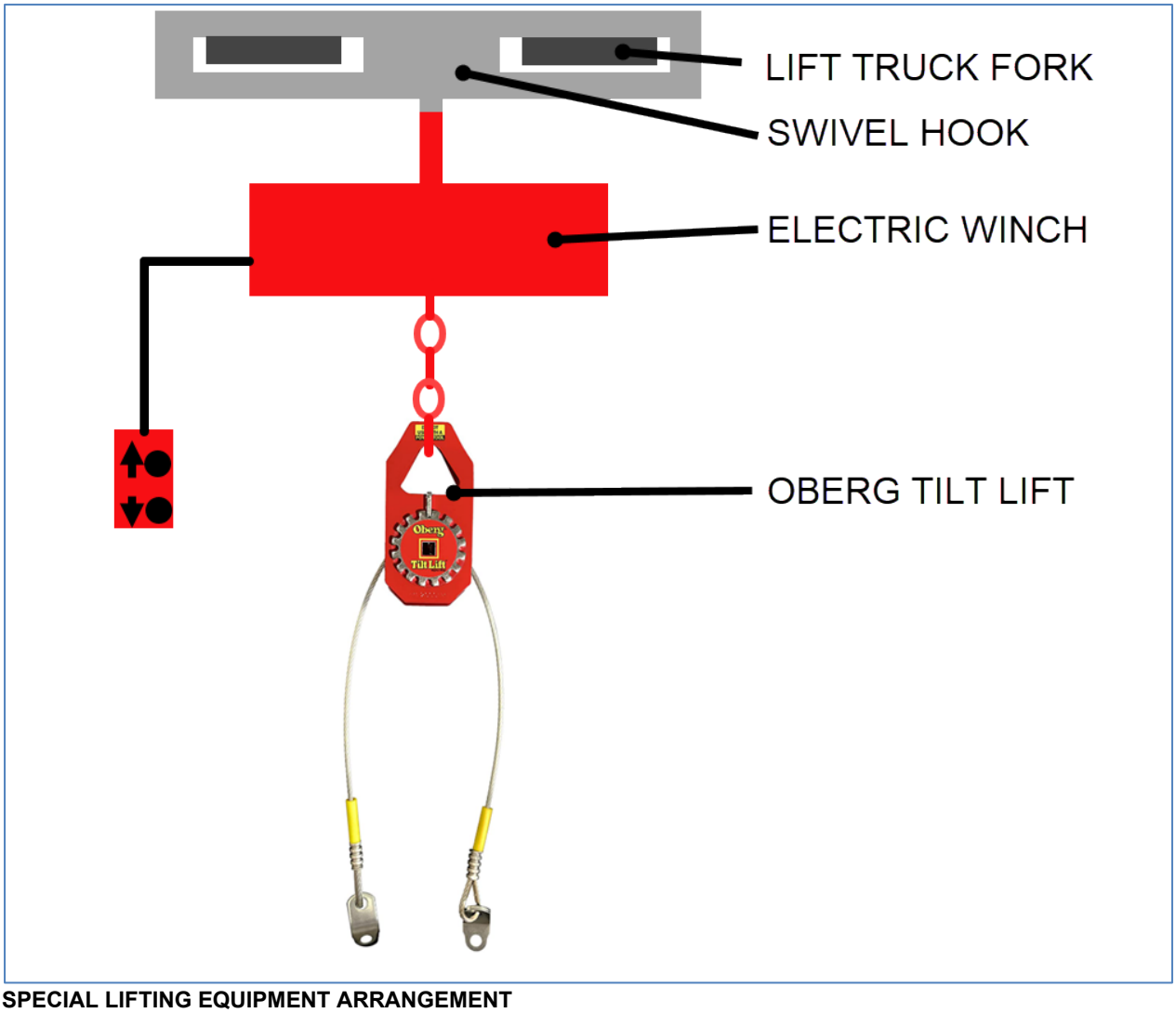
 fork lift truck	 JCHL Soft Loop Tie Down	



SPECIAL LIFTING EQUIPMENT ARRANGEMENT

SAFETY PRECAUTIONS

- Eye protection should always be worn when working in a shop.
- Rules for Personal Protection Equipment should always be respected. Wear your PPE including but not limited to the following:

Part 1- H3 SERIES AND X3 SERIES VEHICLES

PROCEDURE

DANGER

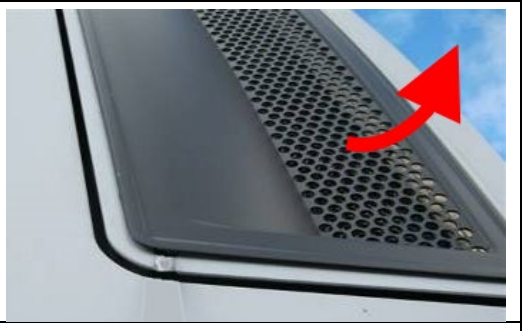
Park vehicle safely, apply parking brake, stop the engine. Prior to working on the vehicle, set the ignition switch to the OFF position and trip the main circuit breakers equipped with a trip button. On the Commuter type vehicles, set the battery master switch (master cut-out) to the OFF position.

Lockout & Tag out (LOTO) must be performed during set-up, maintenance or repair activities. Refer to your local procedure for detailed information regarding the control of hazardous energy.

PRELIMINARY STEPS

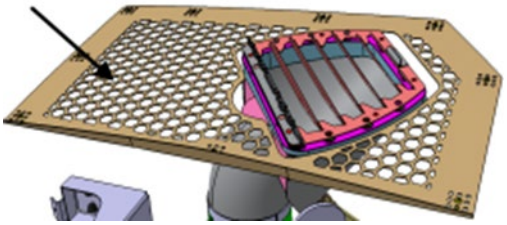
1. Open the engine compartment door and the SCR converter access door.

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

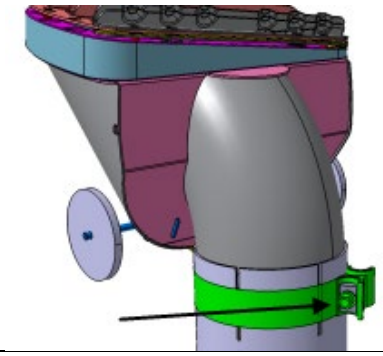


3. The SCR converter is heavy, huge and the free space in the opening is limited. Do whatever is necessary to protect the fiberglass and the paint around the opening giving access to the SCR. Using adhesive tape, place pieces of cardboard around the area.

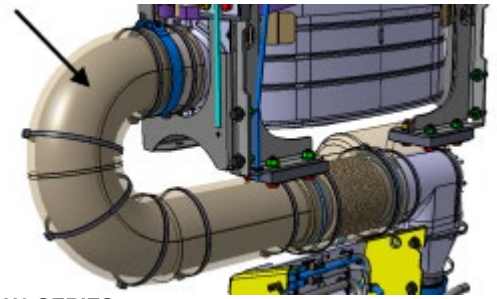
4. Remove the SCR overhead ventilation grille.



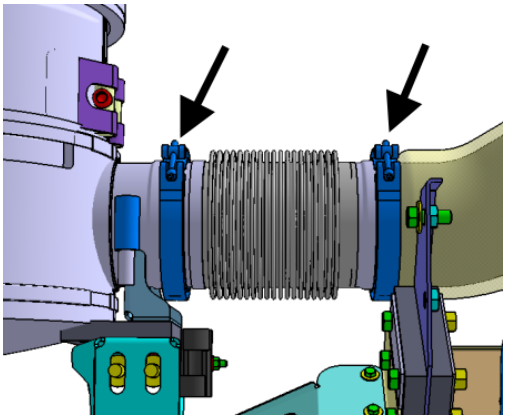
5. Loosen the clamp and then remove the diffuser assembly with the drain tube attached.



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.



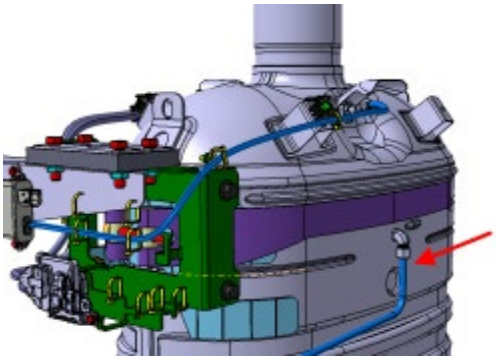
H3 SERIES



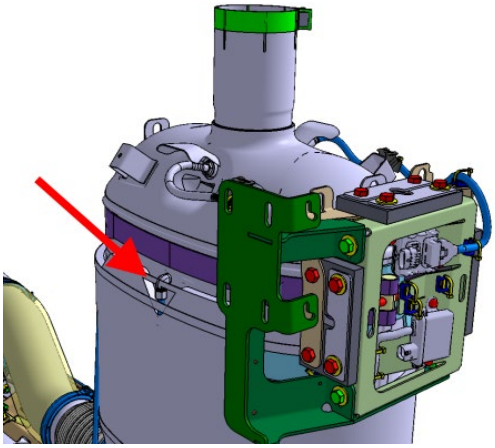
X3 SERIES

SCR CONVERTER REMOVAL

7. Disconnect the SCR converter drain tube

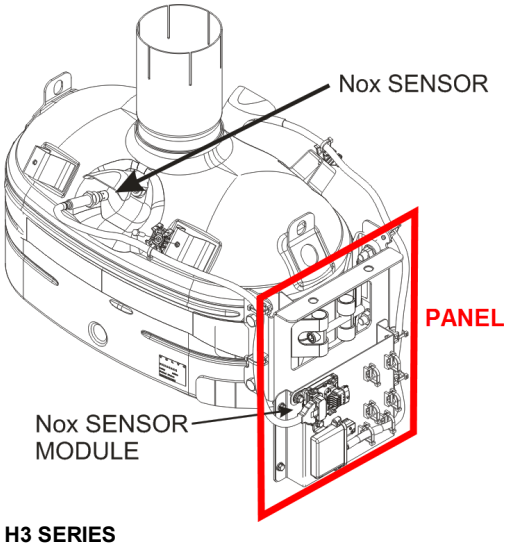


H3 SERIES

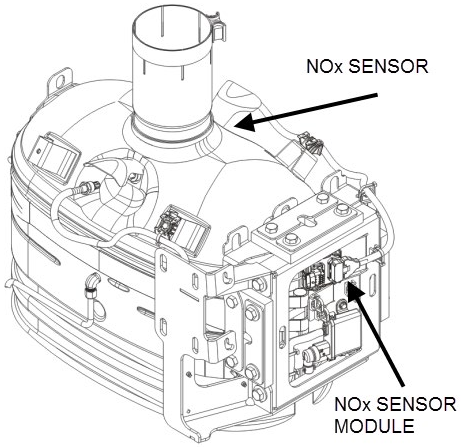


X3 SERIES

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



H3 SERIES

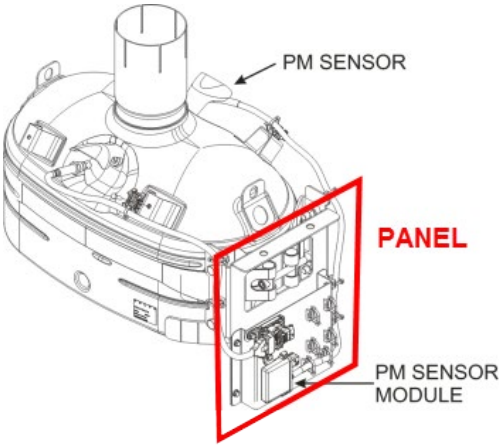


X3 SERIES

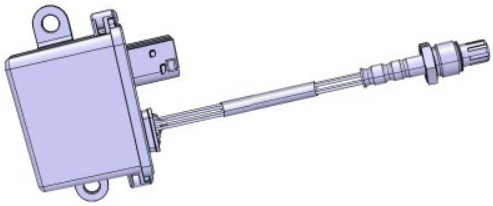
9. Unscrew the PM (particulate matter) sensor from the SCR converter.
10. Secure the PM sensor and harness next to the PM sensor module on the panel.

Handle the PM sensor with care as it has fragile ceramic part that can be damaged by a slight impact

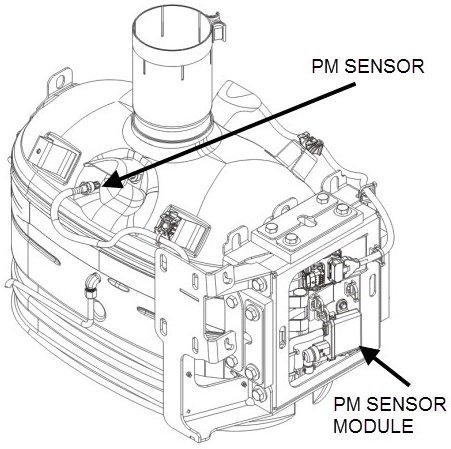
<u>Save the PM sensor for reuse</u>



H3 SERIES

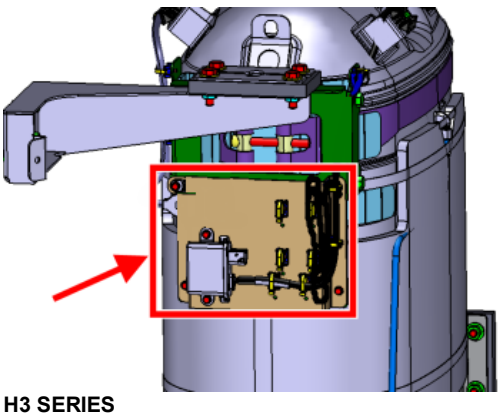


PM SENSOR



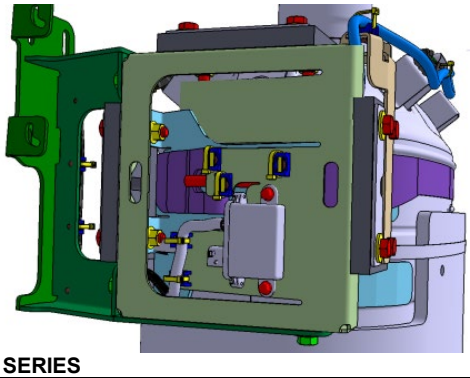
X3 SERIES

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



H3 SERIES

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



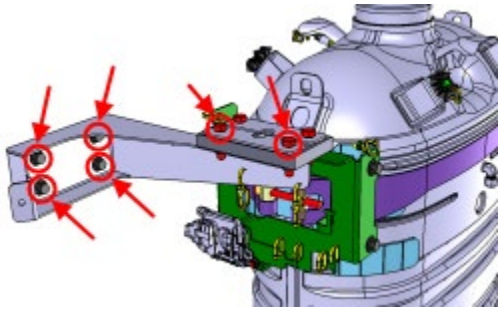
X3 SERIES

13. Install special lifting equipment (see SPECIAL EQUIPMENT REQUIRED) to the lifting eyelets of the SCR converter.

See the image on the right and refer to SPECIAL EQUIPMENT REQUIRED

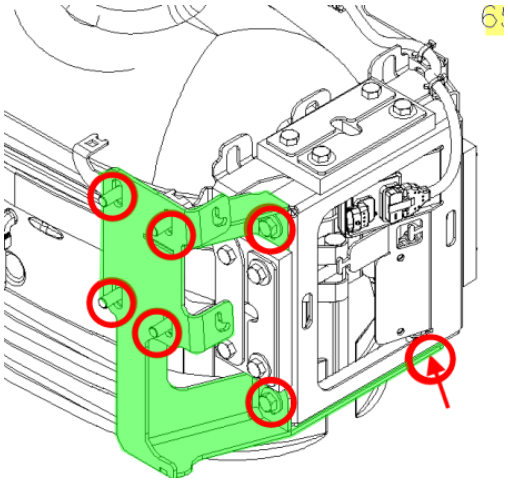
14. With the lifting equipment, support the weight of the SCR converter.

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



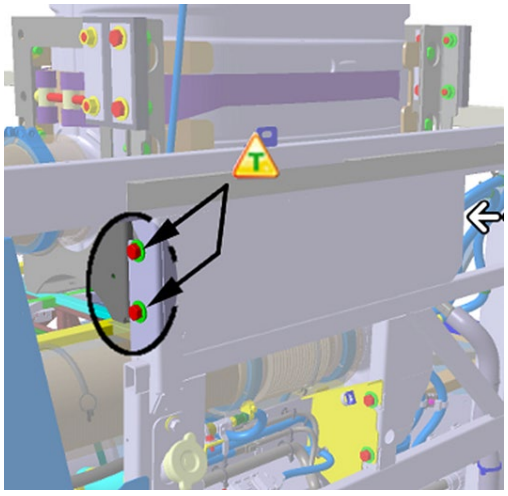
H3 SERIES

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



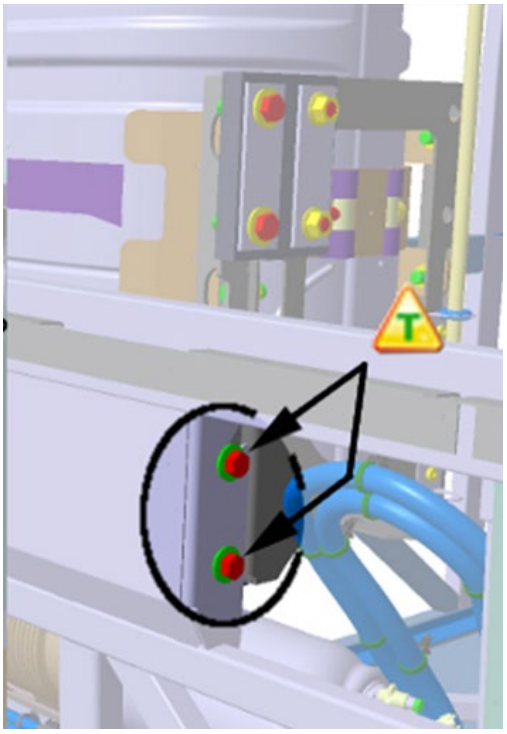
X3 SERIES

17. **H3 SERIES -** Thread the upper bolt out about 1/4″.
18. **H3 SERIES -** Remove the lower bolt.



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

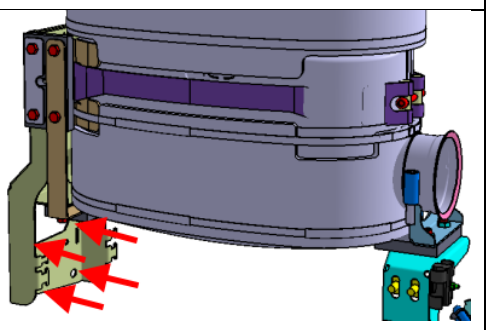
19. **H3 SERIES -** Thread the upper bolt out about 1/4 in.
20. **H3 SERIES -** Remove the lower bolt.



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

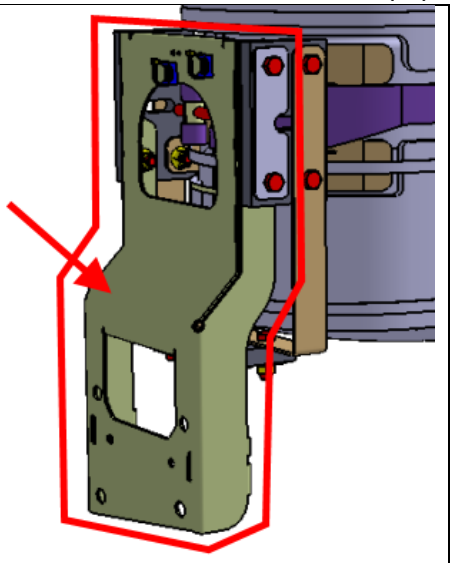
21. **H3 SERIES -** Using the lifting device, lift the SCR converter a few inches so it will disengage from the fixing points at the bottom.

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



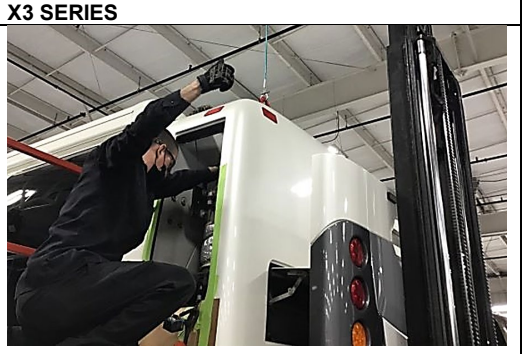
X3 SERIES

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



X3 SERIES

24. 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 co-worker.



CAUTION

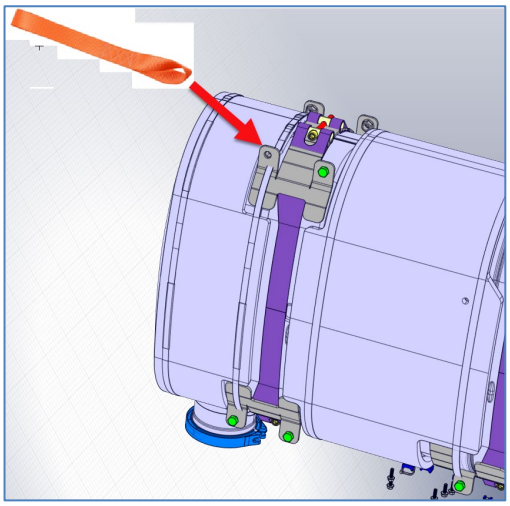
RISK OF INJURY

Make sure the electric winch cannot be activated inadvertently. The person who extracts the SCR should not be in possession of the remote control.

CAUTION

RISK OF INJURY

The SCR lifting eyes can have very sharp edges. Be sure to use the JCHL soft loop tie downs when lifting and tilting the lower part of the SCR out of the compartment.

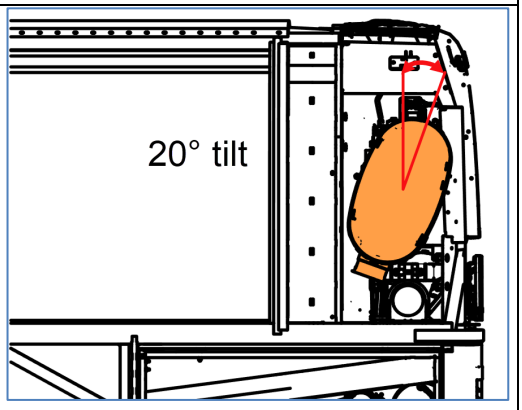


Use the JCHL soft loop lifting straps to pull the SCR from the compartment

Once the bottom of SCR is lifted high enough to clear the opening, unhook the farmost lifting eye, this will

allow the outside bottom of the SCR to tilt out of the opening. Please note that the Oberg lifting tool should be locked in place.

25. To extract the SCR from the compartment, tilt the SCR clockwise 20° to increase clearance for the NOx sensor mounting point.

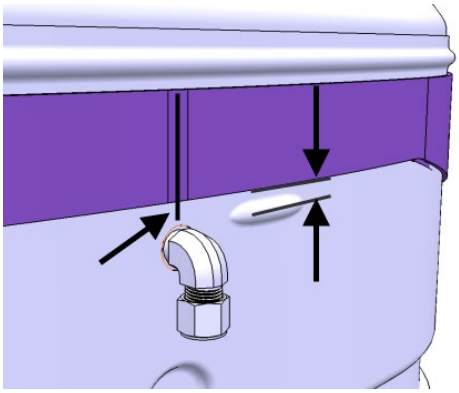


26. Once secured on the work platform, reattach the lift hoist and safely lift the SCR to the ground.

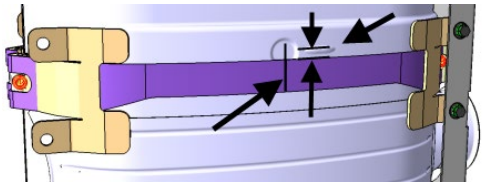
TAKE THE STRAPS AND BRACKETS APART FROM THE DEFECTIVE SCR CONVERTER

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.



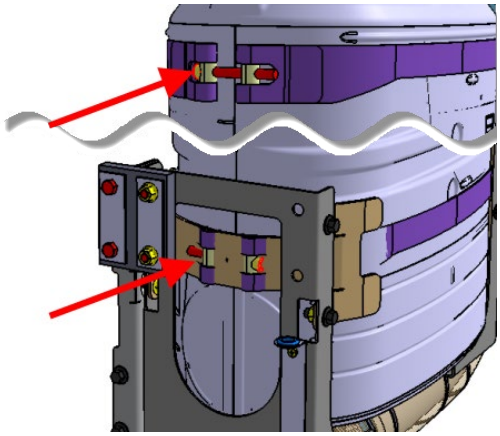
ON THE STRAP, DRAW A LINE CENTERED WITH THE DRAIN FITTING. MEASURE THE UPPER STRAP POSITION IN RELATION TO THE EMBOSS



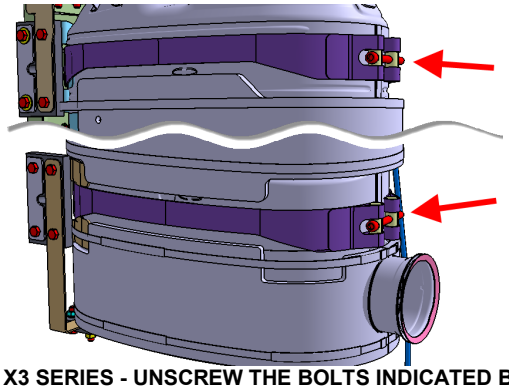
ON THE STRAP, DRAW A LINE CENTERED WITH CIRCULAR EMBOSS. MEASURE THE LOWER STRAP POSITION IN RELATION TO THE EMBOSS

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

wear cut resistant protection gloves when removing mounting straps

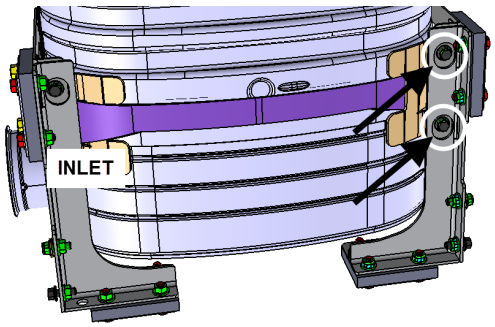


H3 SERIES - UNSCREW THE BOLTS INDICATED BY THE ARROWS

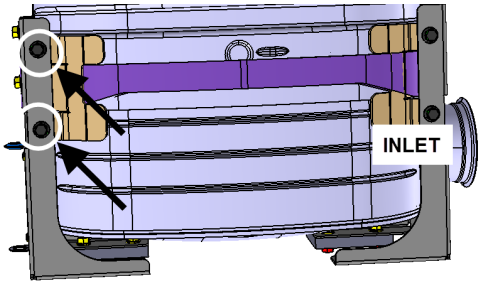


X3 SERIES - UNSCREW THE BOLTS INDICATED BY THE ARROWS

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



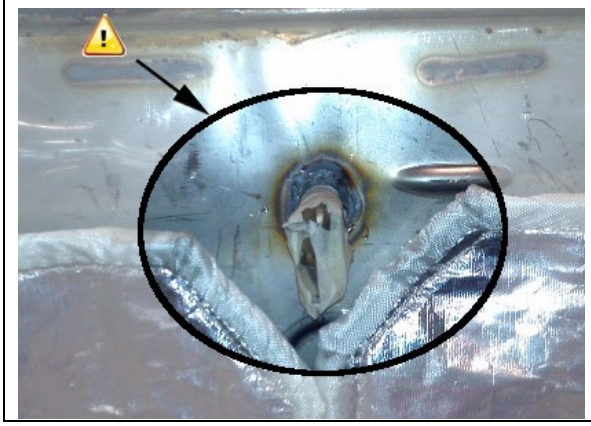
H3 SERIES - UNSCREW THE TWO BOLTS INDICATED BY THE ARROWS

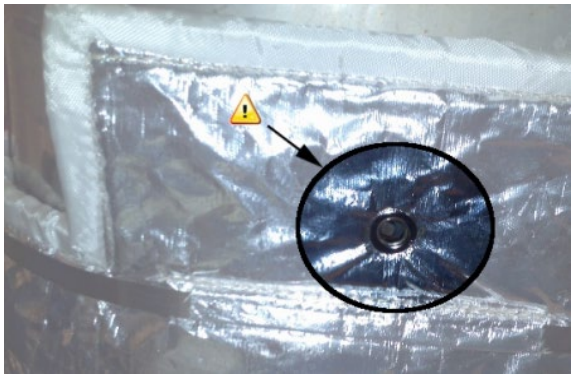


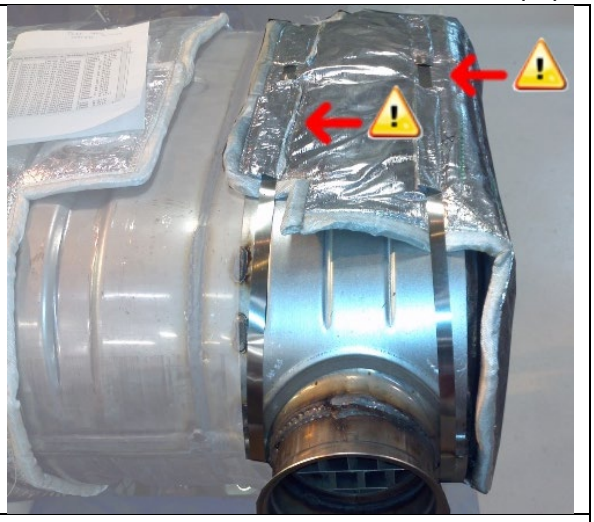
H3 SERIES - UNSCREW THE TWO BOLTS INDICATED BY THE ARROWS

29. **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.

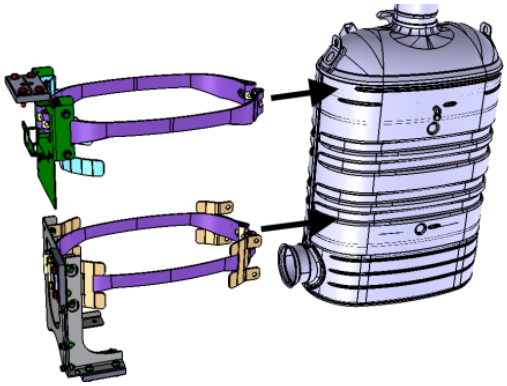






30. Install the straps and brackets on the new SCR converter.

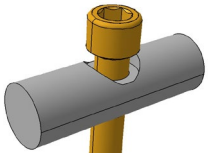
Install the brackets exactly as on the defective SCR

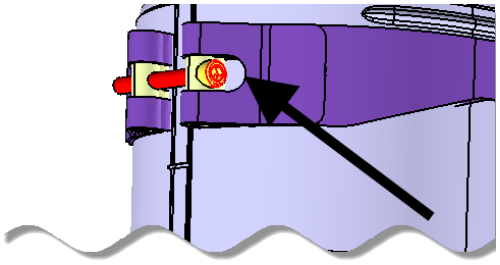


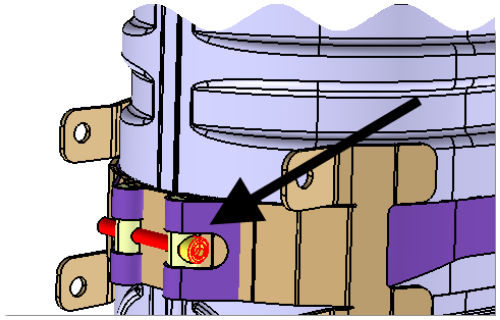
(H3 Series shown)

31. 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**

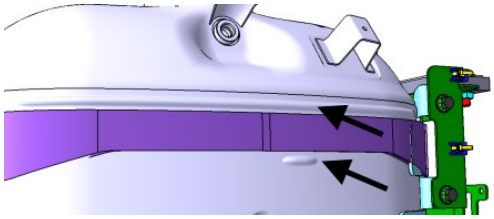


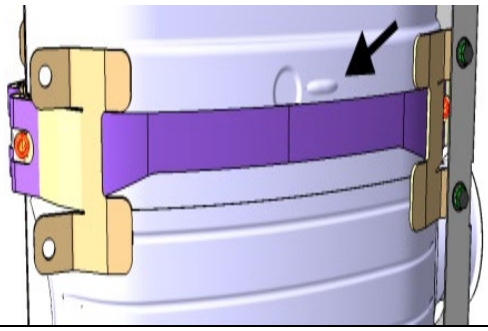




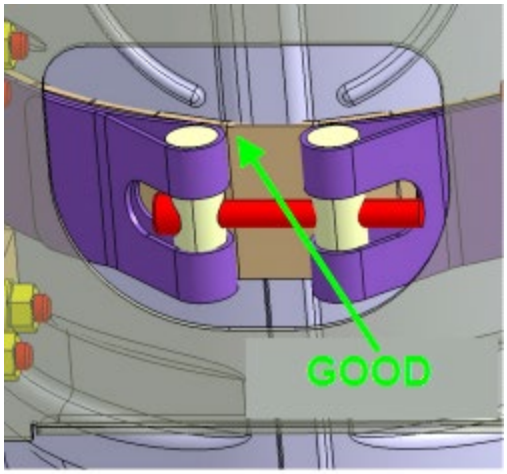
BOLT WITH THE HEAD ON THE PROPER SIDE (OPPOSITE SIDE OF THE DRAIN TUBE FITTING)

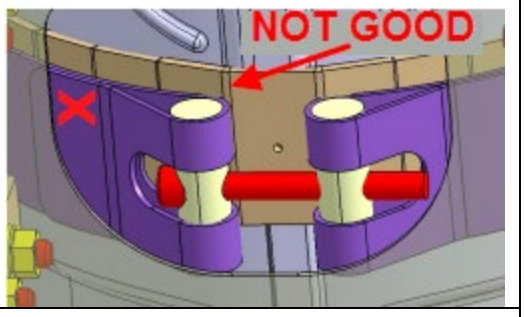
32. Adjust the straps position in reference to the emboss.





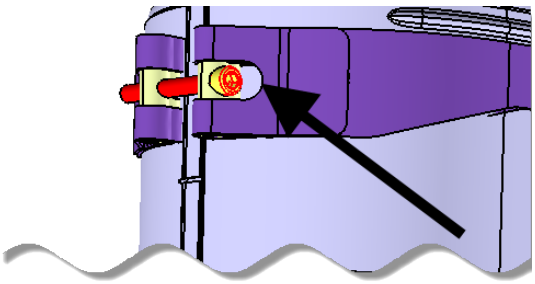
33. **H3 SERIES -** Prior final tightening, make sure that each strap is properly <u>centered</u> on its respective bracket.

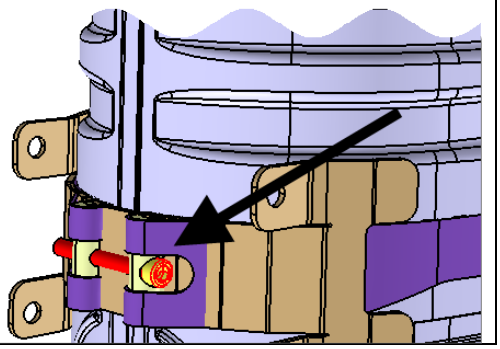




34. Once properly positioned, apply final torque to the strap bolts.

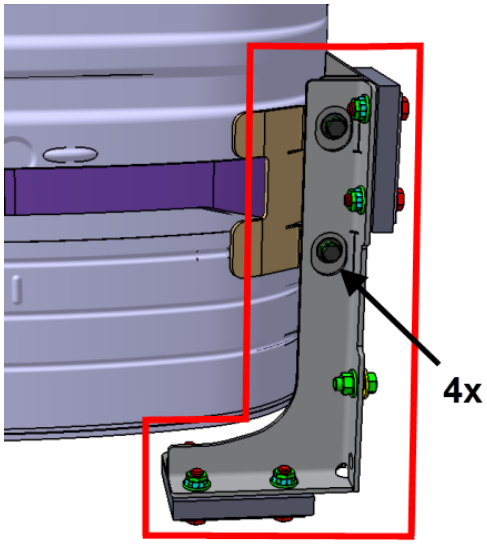
FINAL TORQUE: 30-37 lbf-ft





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

FINAL TORQUE: 48 lbf-ft



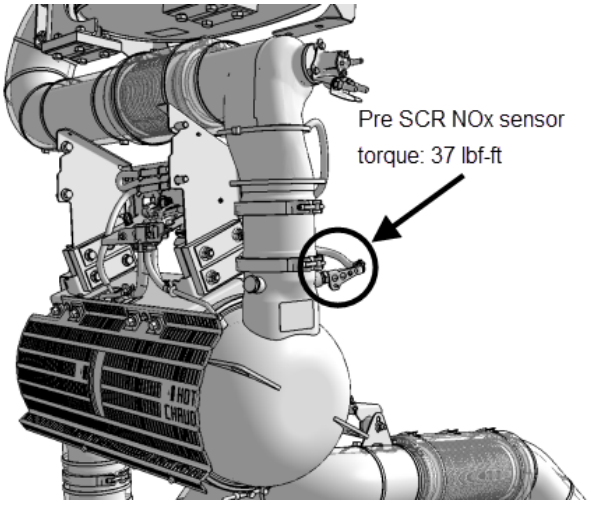
H3 SERIES

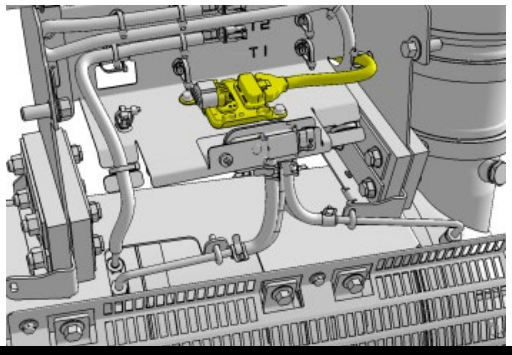
INSTALL THE PRE-SCR NOx SENSOR

36. 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

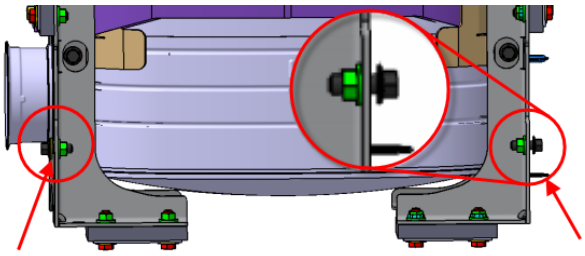
Return the old NOx sensor with the SCR converter to Prevost





REINSTALL THE SCR CONVERTER IN ITS COMPARTMENT

37. **H3 SERIES -** Make sure that there is a 1/2″ gap between the washer pressed against the bolt head and the bracket surface as shown on the image at right (2 bolts).

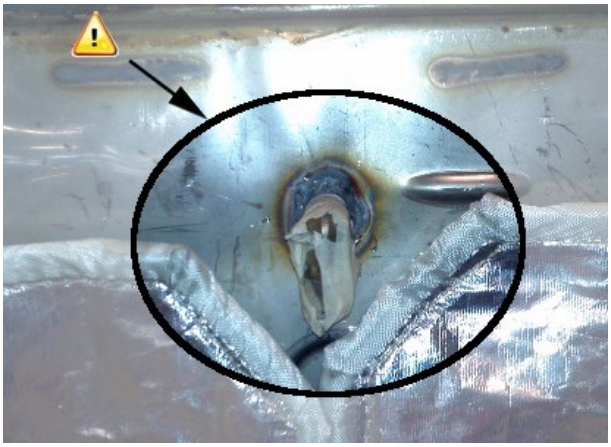


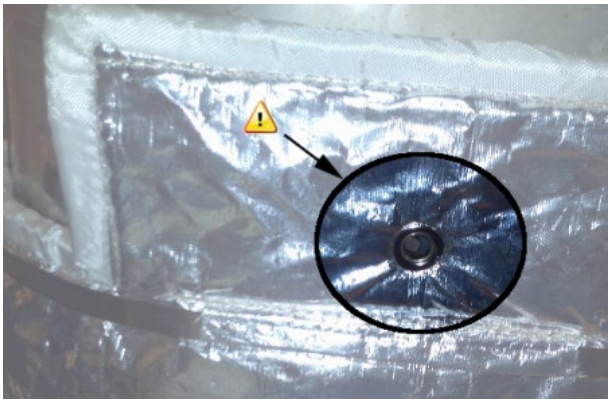
H3 SERIES - LOWER BRACKETS

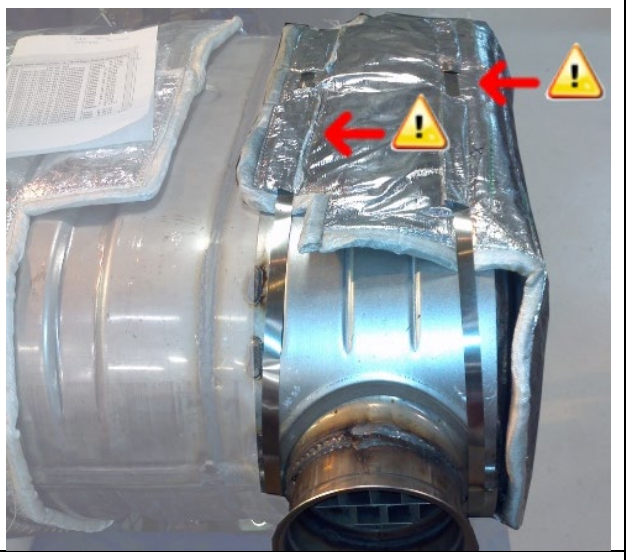
38. While proceeding with great care, insert the SCR converter in the compartment through the opening using the lifting equipment. Use the same process as when performing the extraction of the SCR. The SCR converter is heavy. Proceed with the help of a co-worker. DO NOT place the SCR converter in final position yet.

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

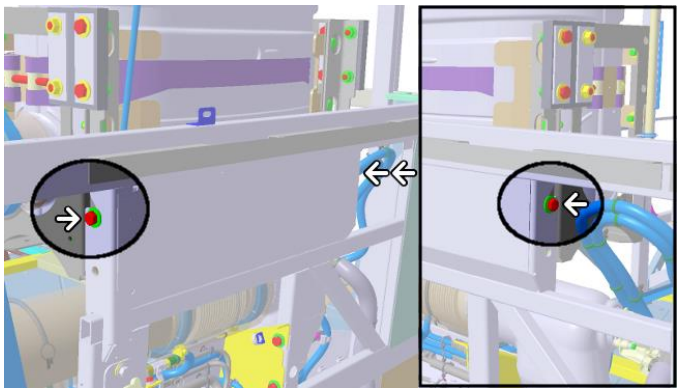
IMPORTANT: Make sure that the **« V »** clearance and the round clearance of the insulation blanket are placed at the drain fitting and the stud found on the SCR converter respectively.





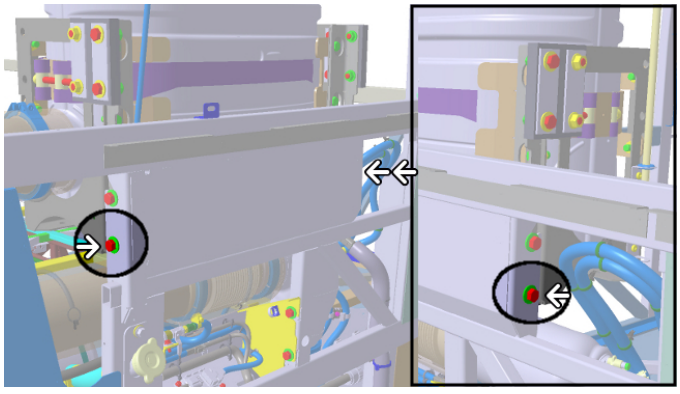


40. **H3 SERIES -** Install the SCR converter in final position. Rest the SCR converter at the fixing points on the chassis with the two upper bolts secured to both lower brackets.
41. **H3 SERIES -** Tighten the two bolts to a firm feel.



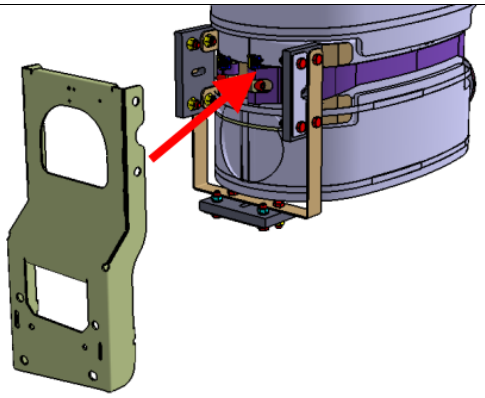
H3 SERIES

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

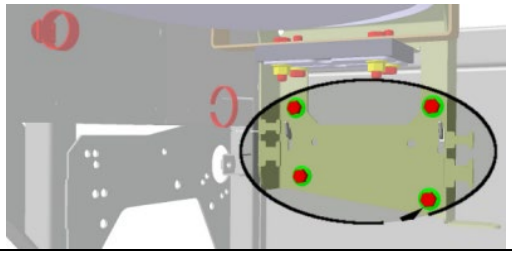


H3 SERIES

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



X3 SERIES

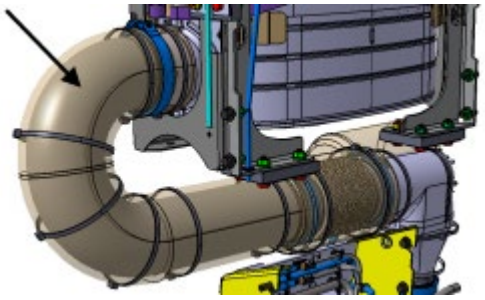


REINSTALL THE EXHAUST PIPE AND INSULATING BLANKET

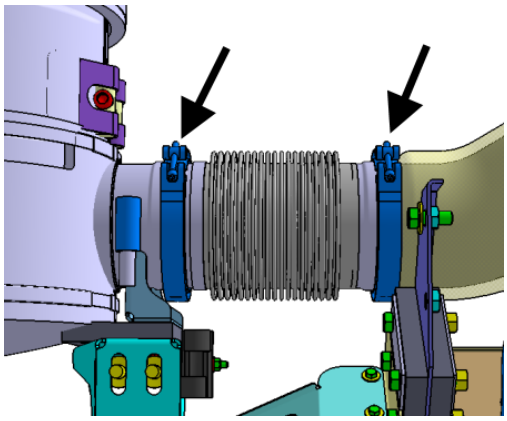
45. Clean the sealing surfaces between the after-treatment SCR converter inlet, the exhaust pipe and the flexible section.
46. Using a new gasket, position the pipe to the after-treatment SCR converter and install a new V-band clamp. Tighten the V-band clamp to specification. Proceed similarly with the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

    Gasket, qty: 2

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

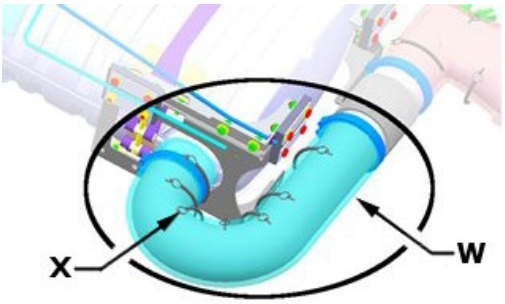


H3 SERIES

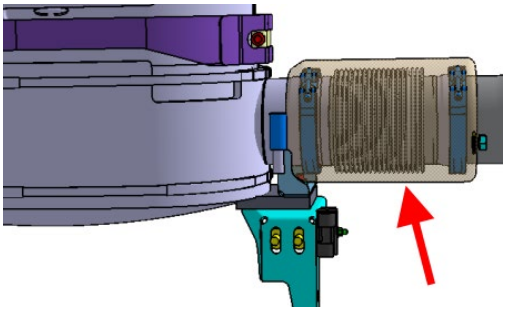


X3 SERIES

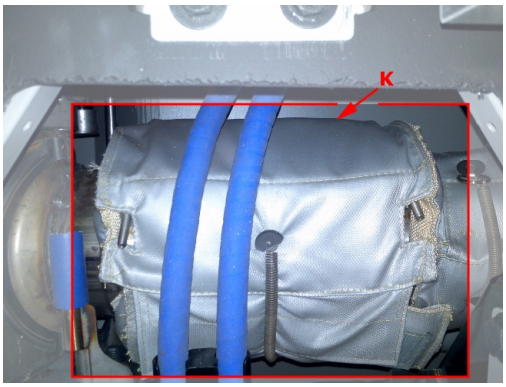
47. Reinstall the insulating blanket.



H3 SERIES



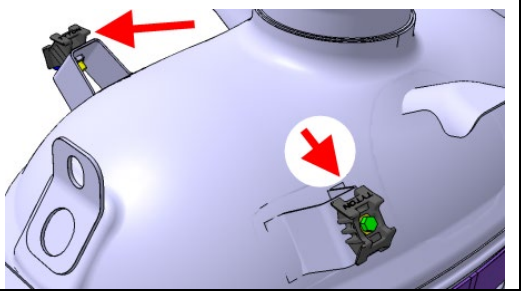
X3 SERIES



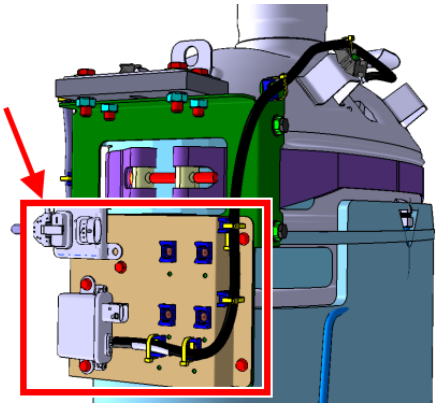
X3 SERIES

INSTALLATION OF THE PM SENSOR

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



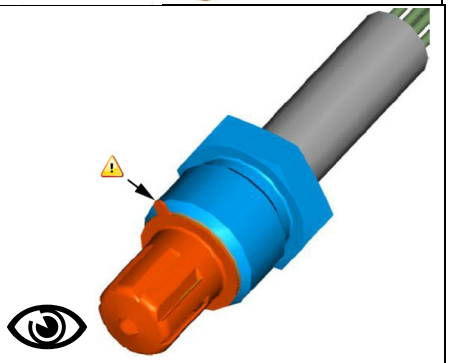
49. **H3 SERIES –** Reinstall the sensor module panel.



H3 SERIES

50. **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.

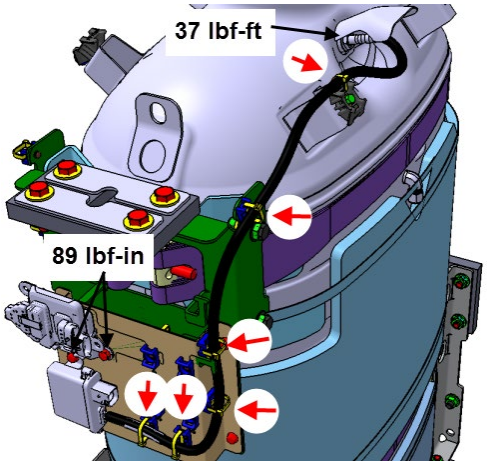
51. Before connecting the PM Sensor, make sure you align the keying tab with the orientation slot in the mating boss.



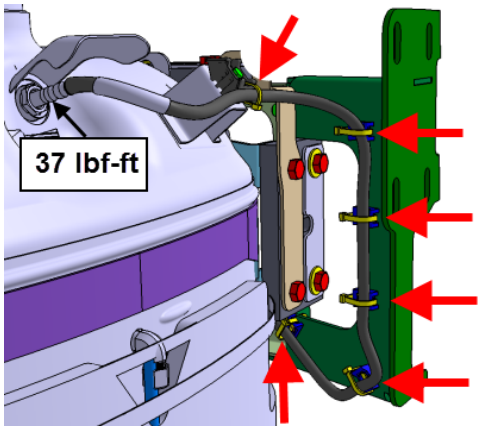
52. Install the PM sensor and secure the harness as shown using nylon ties.

PM sensor torque: 37 lbf-ft

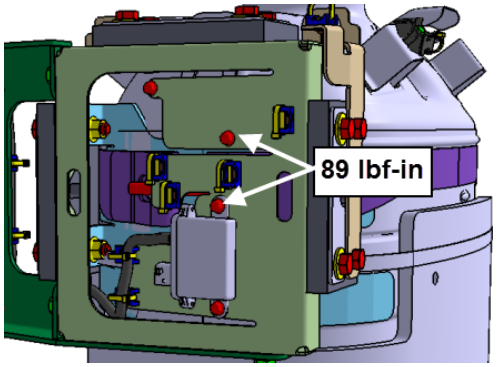
PM sensor module: 89 lbf-in



H3 SERIES

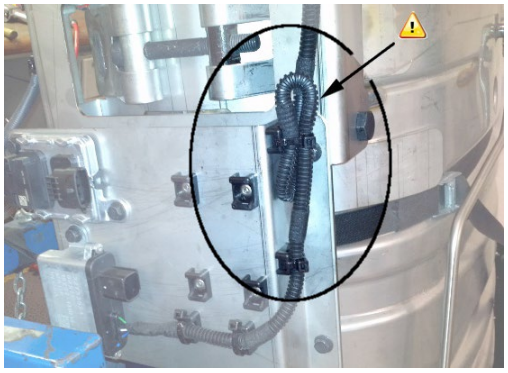


X3 SERIES



X3 SERIES

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

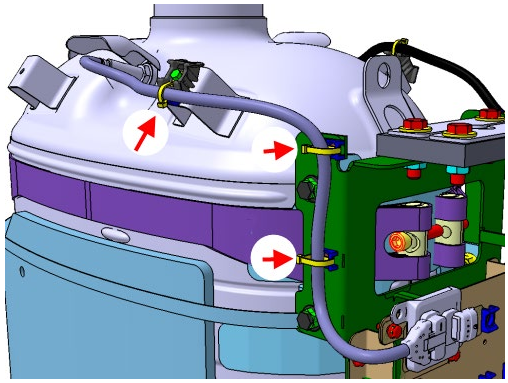


H3 SERIES

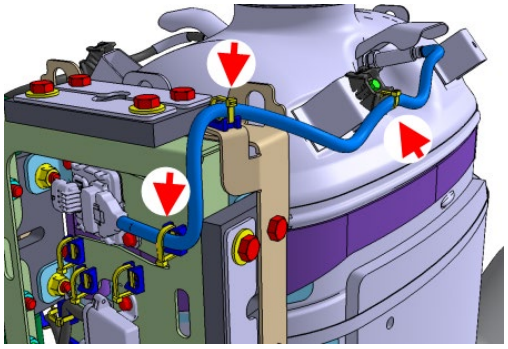
INSTALL THE POST-SCR NOx SENSOR

54. 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



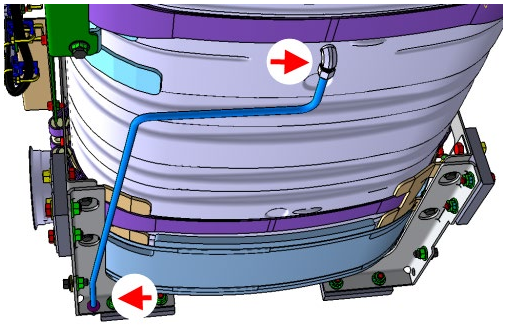
H3 SERIES



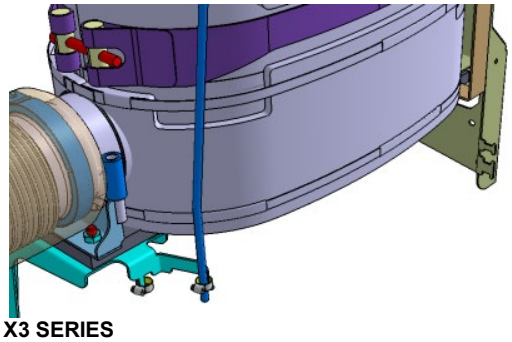
X3 SERIES

REINSTALL THE SCR CONVERTER DRAIN TUBE

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



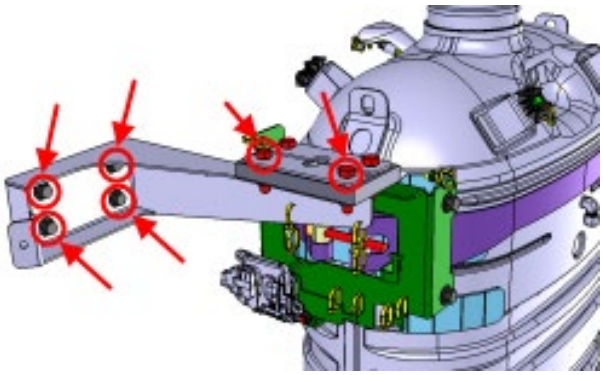
H3 SERIES



X3 SERIES

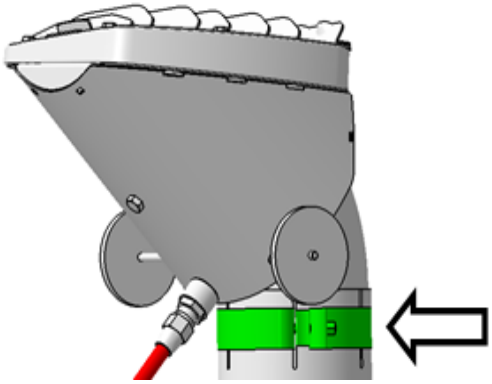
REINSTALLING THE “L” SHAPE BRACKET

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

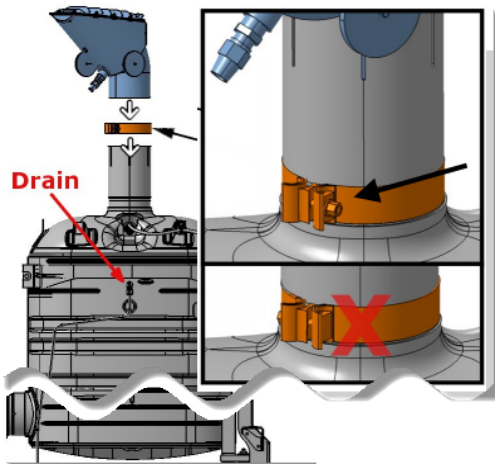


DIFFUSER ASSEMBLY AND GRILLE INSTALLATION

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

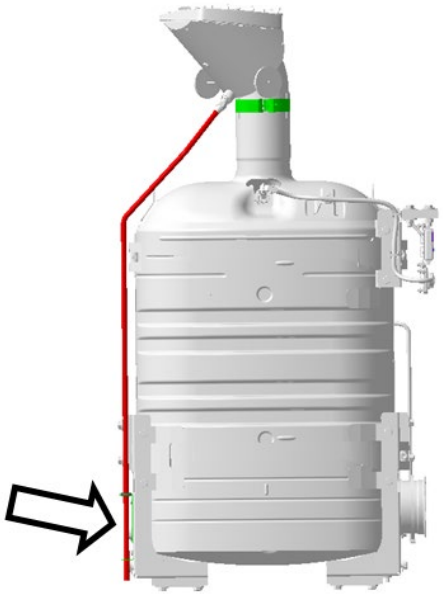


H3 SERIES – NUT ON THIS SIDE

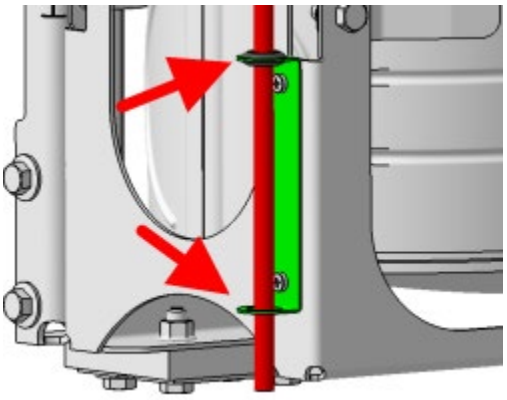


X3 SERIES – NUT ON THIS SIDE

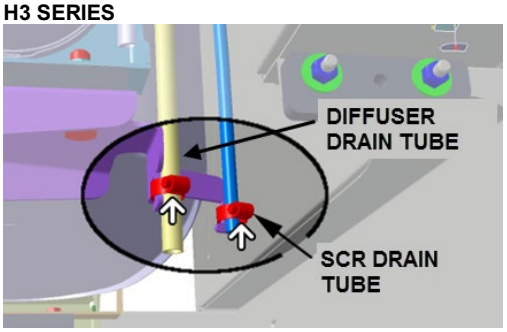
58. Install the drain tube.



59. Insert the drain tube in the drain tube guide.



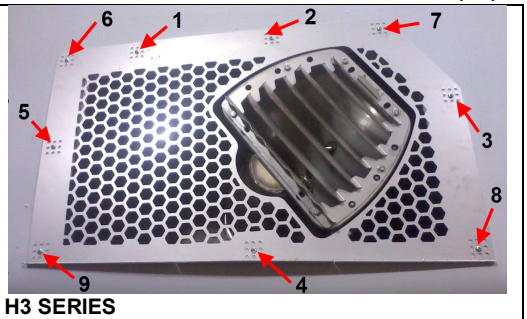
H3 SERIES



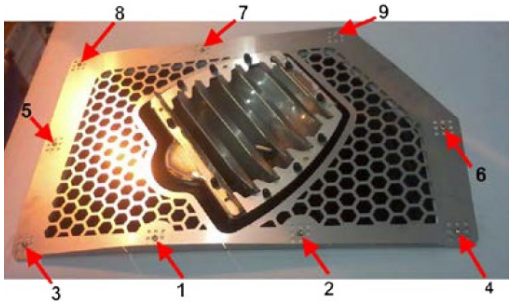
X3 SERIES

60. 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

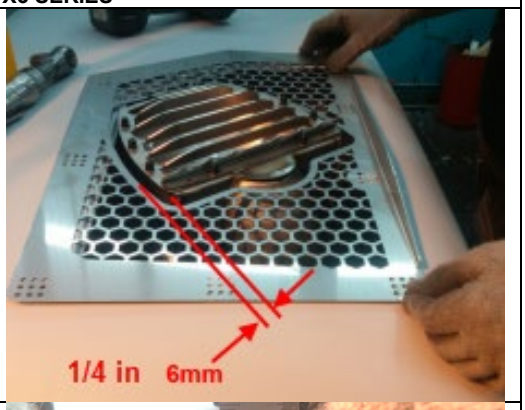


H3 SERIES

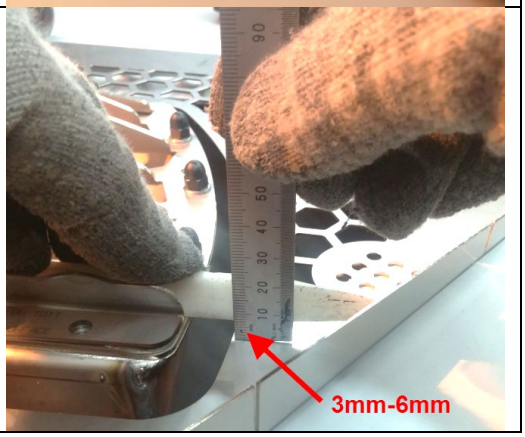


X3 SERIES

61. Adjust the spacing between the diffuser assembly and the grille. The minimum spacing should be ¼″ (6 mm).



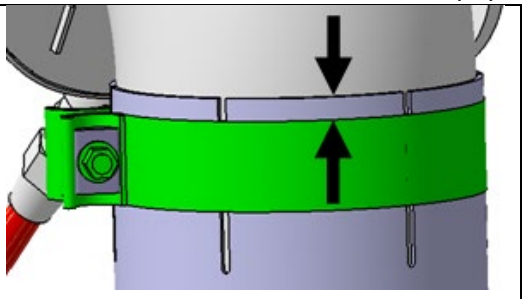
62. Adjust the diffuser assembly height above the grille. The edge height should be 1/8″ to 1/4″ (3 mm to 6 mm) <u>at the diffuser corner</u> shown on the image while the edge height should be 1/8″ to 1/2″ (3 mm to 12 mm) at the outer edge for the rest of the periphery.



63. 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)*

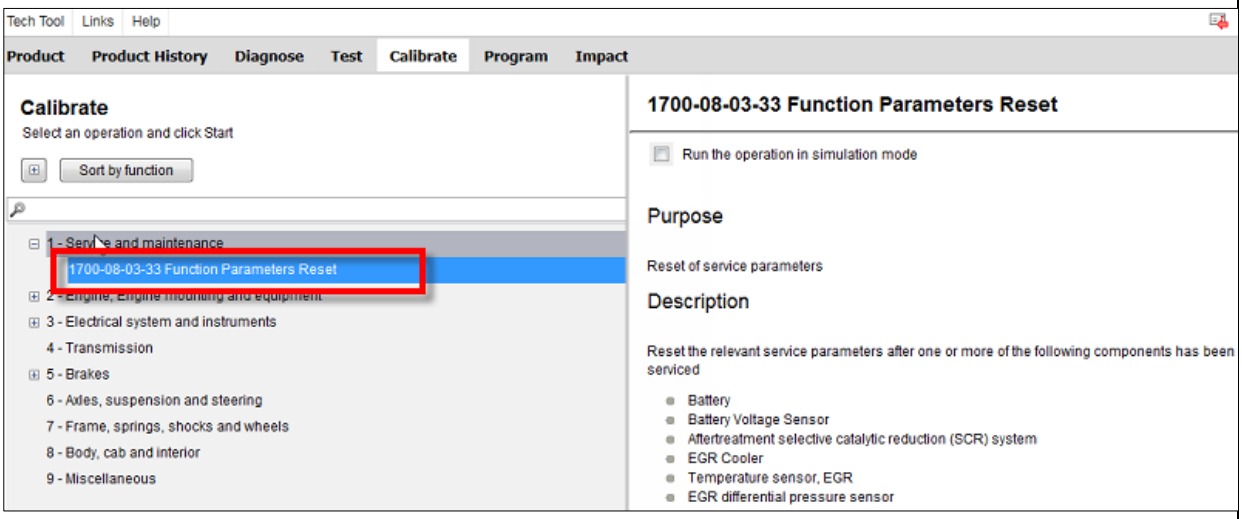
64. Tighten the clamp.

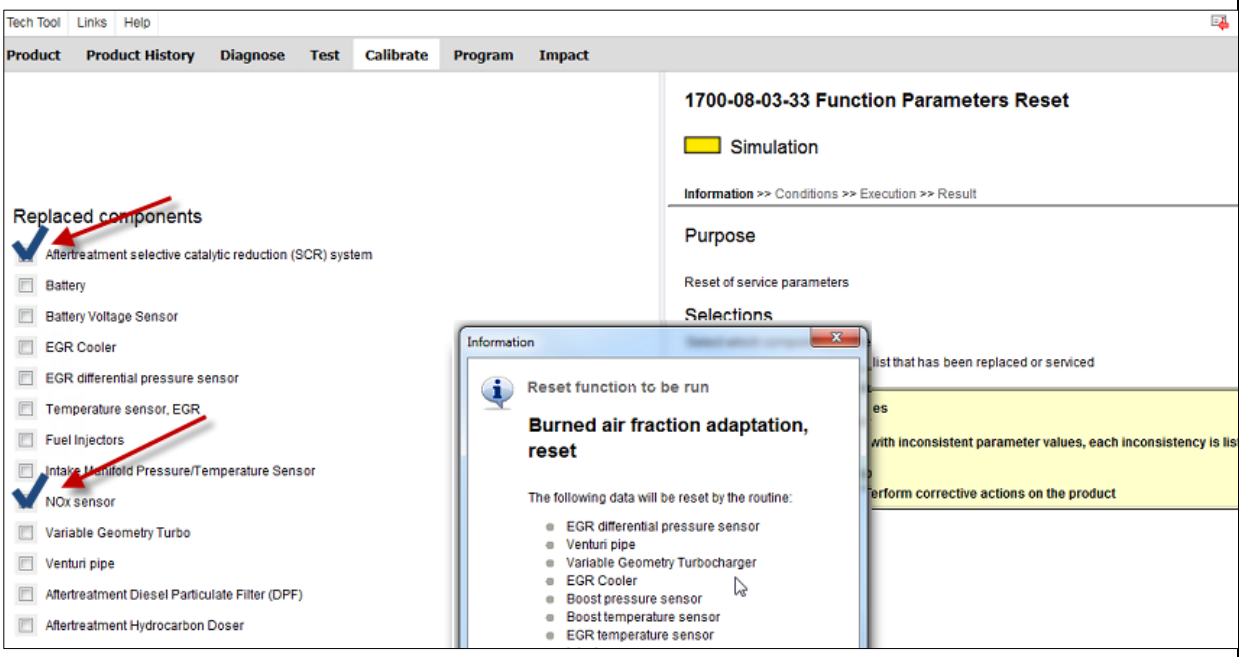


65. Reinstall the SCR converter compartment access hatch.

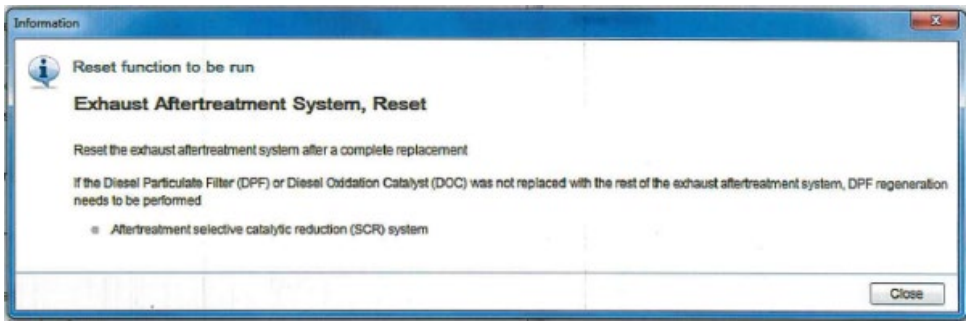
FINAL STEPS

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





70. **Disregard** the dialog box that requests DPF regeneration. Do not perform the regeneration.



PACKAGING FOR RETURN

71. Indicate serial number of <u>new SCR converter</u> and <u>removed SCR converter</u> on RO.

72. **Return the old SCR converter <u>using the packaging of the new unit</u>**.

If not possible, ideally use cardboard box where SCR converter is covered, capped (reuse caps) and protected from elements and damage during shipping.

Tag part with RO and VIN info.

Part 2- VOLVO 9700 VEHICLES

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 the Commuter type vehicles, set the battery master switch (master cut-out) to the OFF position.

Lockout & Tag out (LOTO) must be performed during set-up, maintenance or repair activities. Refer to your local procedure for detailed information regarding the control of hazardous energy.

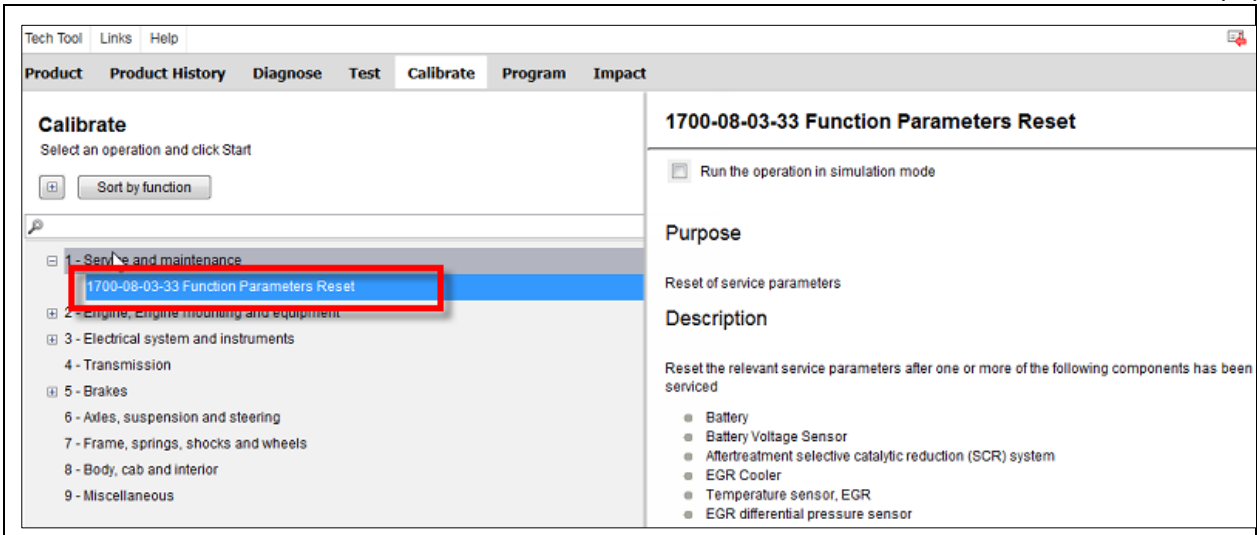
You will find in Part 1 of this bulletin, useful information such as the diffuser removal/installation procedure, strap installation, SCR converter insulating blanket installations, NOx sensor installation, among others.

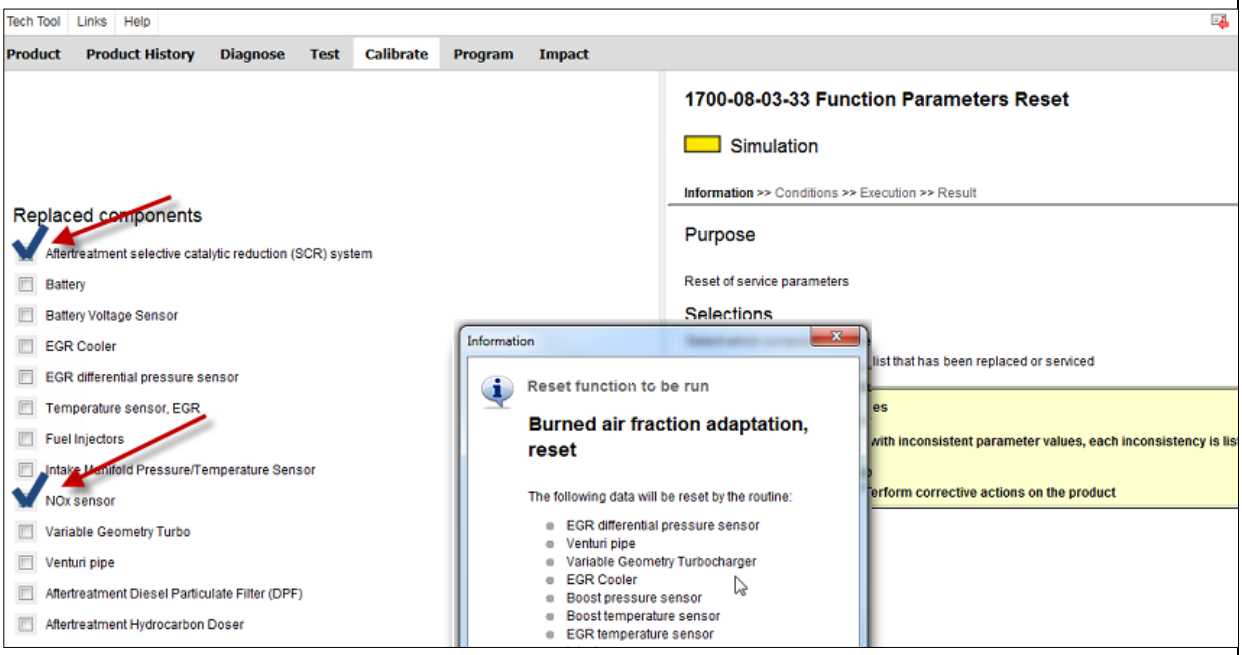
In complement to Part 1, please refer to the document listed below, available on **Impact**.

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

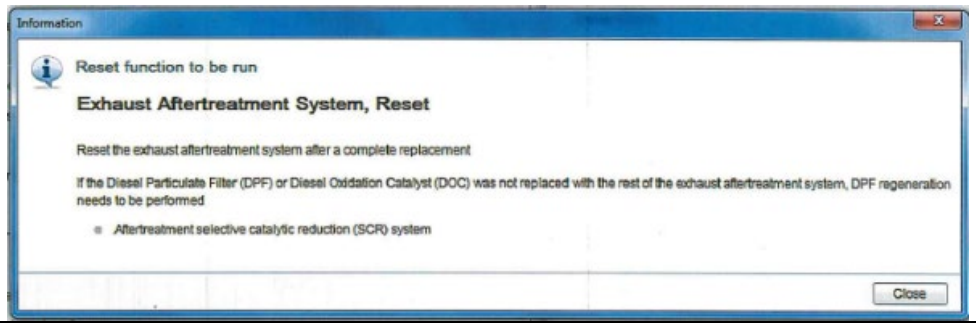
FINAL STEPS

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).





5. **Disregard** the dialog box that requests DPF regeneration. Do not perform the regeneration.



PACKAGING FOR RETURN

6. Indicate serial number of <u>new SCR converter</u> and <u>removed SCR converter</u> on RO.

7. **Return the old SCR converter <u>using the packaging of the new unit</u>.**

If not possible, ideally a cardboard box where SCR converter is covered, capped (reuse caps) and protected from elements.

Tag part with RO and VIN info.

PARTS / WASTE DISPOSAL

Return the defective SCR converter to Prevost.

ESTIMATED TIME

The time required to perform this special bulletin is approximately:

Prevost 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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