

**I02IF  
I12IF  
Stage IV  
Wheel Loader**

**SERVICE MANUAL**

Part number 47924630

English

November 2015

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**CASE**  
CONSTRUCTION



## **SERVICE MANUAL**

**1021F XR  
1021F ZBAR  
1121F XR  
1121F ZBAR**

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## **INTRODUCTION**

## Safety rules


### Personal safety





This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

 DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

 WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

 CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

**FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.**

### Machine safety

**NOTICE:** Notice indicates a situation that, if not avoided, could result in machine or property damage.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

### Information

**NOTE:** Note indicates additional information that clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

## Personal safety

Carefully read this Manual before proceeding with maintenance, repairs, refuelling or other machine operations.

Repairs have to be carried out only by authorized and instructed staff; specific precautions have to be taken when grinding, welding or when using mallets or heavy hammers.

Non-authorized persons are not allowed to repair or carry out maintenance on this machine. Do not carry out any work on the equipment without prior authorization.

Ask your employer about the safety instructions in force and safety equipment.

Nobody should be allowed in the cab during machine maintenance unless he is a qualified operator helping with the maintenance work.

If it is necessary to move the equipment to carry out repairs or maintenance, do not lift or lower the equipment from any other position than the operator's seat.

Never carry out any operation on the machine when the engine is running, except when specifically indicated.

Stop the engine and ensure that all pressure is relieved from hydraulic circuits before removing caps, covers, valves, etc.

All repair and maintenance operations should be carried out with the greatest care and attention.

Service stairs and platforms used in a workshop or in the field should be built in compliance with the safety rules in force.

Any functional disorders, especially those affecting the safety of the machine, should therefore be rectified immediately.

### **⚠ DANGER**

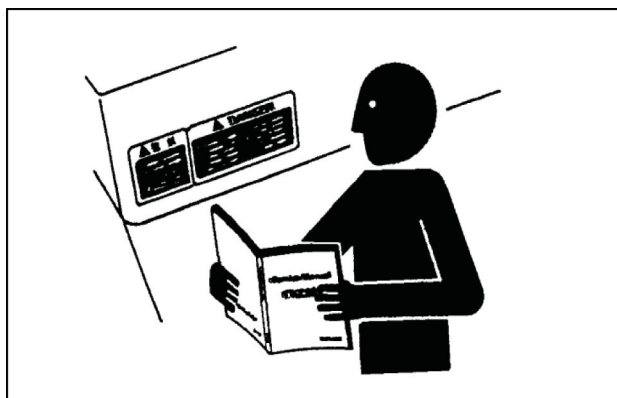
**Unexpected movement!**

**Make sure parking brake is applied. Secure machine with wheel chocks.**

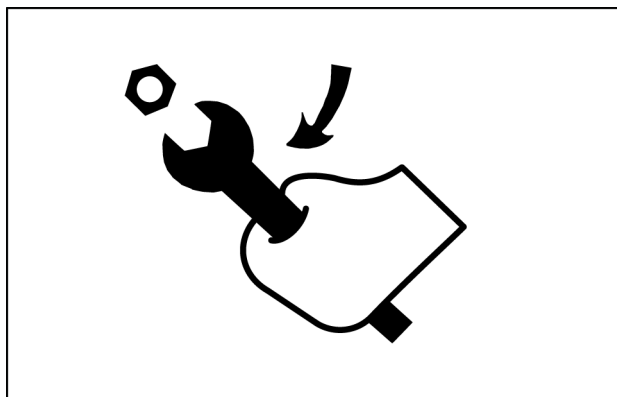
**Failure to comply will result in death or serious injury.**

D0013A

Before performing any work on the machine, attach a maintenance in progress tag. This tag can be applied on the left-hand control lever, safety lever or cab door.



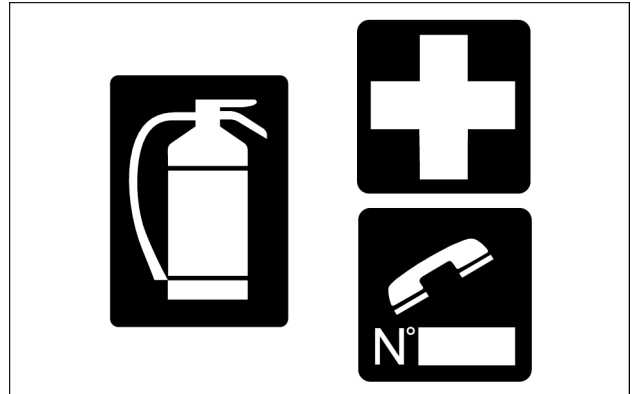
TULI12WEX2004AA 1



TULI12WEX2005AA 2

## Emergency

Be prepared for emergencies. Always keep a fire extinguisher and first aid kit readily available. Ensure that the fire extinguisher is serviced in accordance with the manufacturer's instructions.



SML12WEX0174AA 3

## Equipment

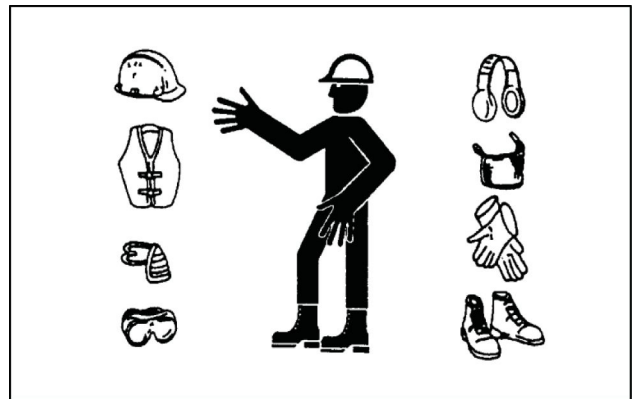
Wear close fitting clothing and safety equipment appropriate for the job:

- Safety helmet
- Safety shoes
- Heavy gloves
- Reflective clothing
- Wet weather clothing

If working conditions require, the following personal safety equipment should be on hand:

- Respirators (or dust proof masks)
- Ear plugs or acoustic ears protections
- Goggles with lateral shield or masks for eye protection

Do not wear rings, wristwatches, jewelry, unbuttoned or flapping clothing such as ties, torn clothes, scarves, open jackets or shirts with open zips which could get caught into moving parts.



TULI12WEX2008AA 4

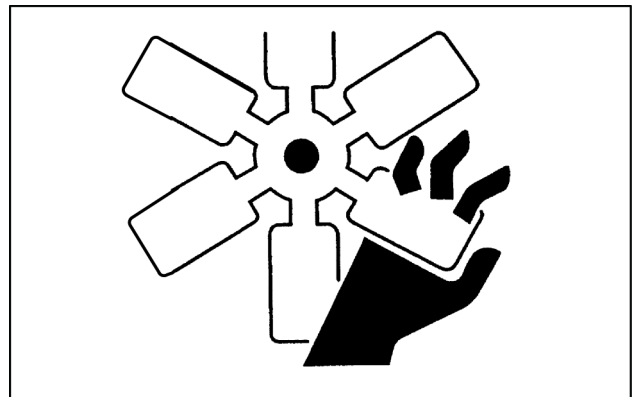
## Engine - Radiator

Never leave the engine running in enclosed spaces without proper ventilation which is able to evacuate toxic exhaust gases- Keep the exhaust manifold and tube free from combustible materials.

Do not refuel with the engine running, especially if hot, as this increases fire hazard in case of fuel spillage.

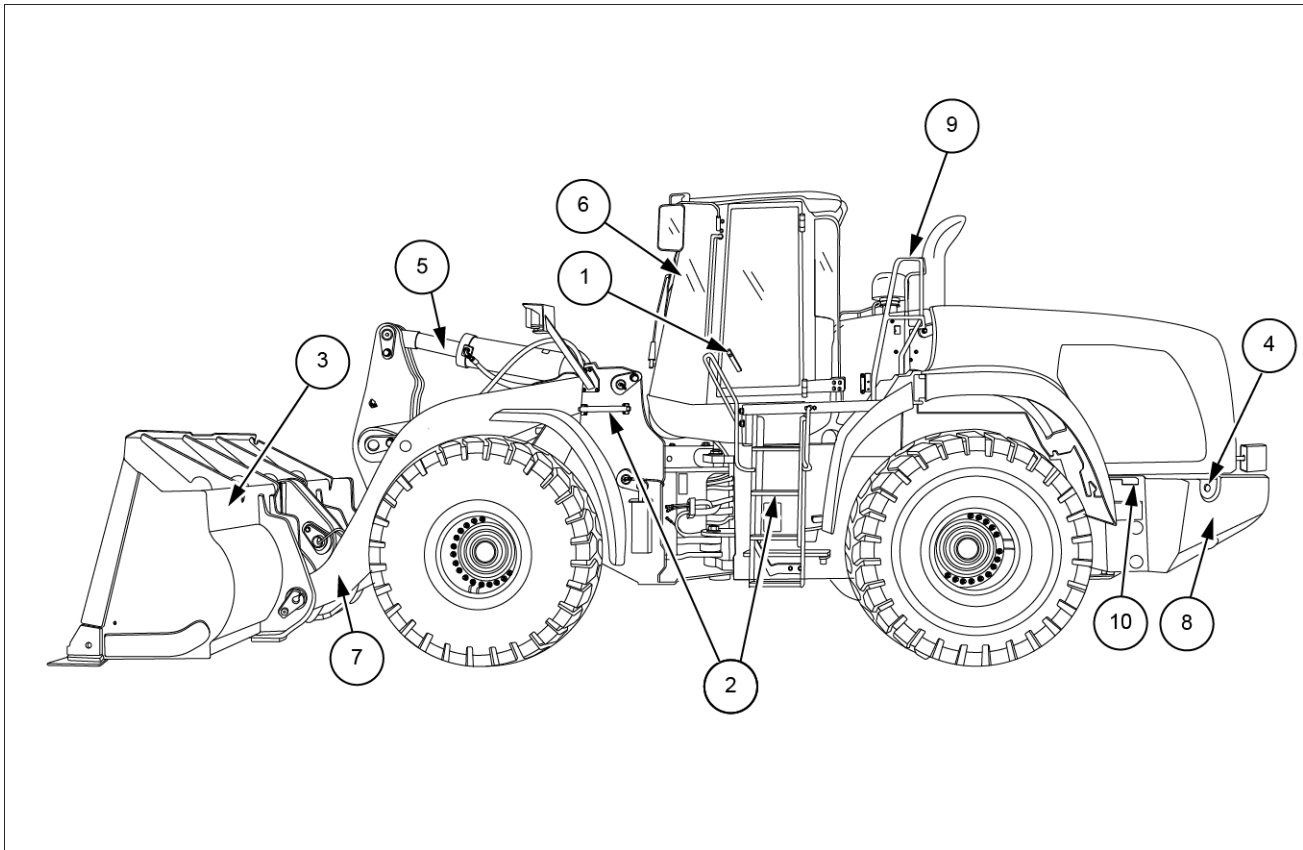
Never attempt to check or adjust the belts when the engine is running.

Never lubricate the machine with the engine running.



TULI12WEX2009AA 5

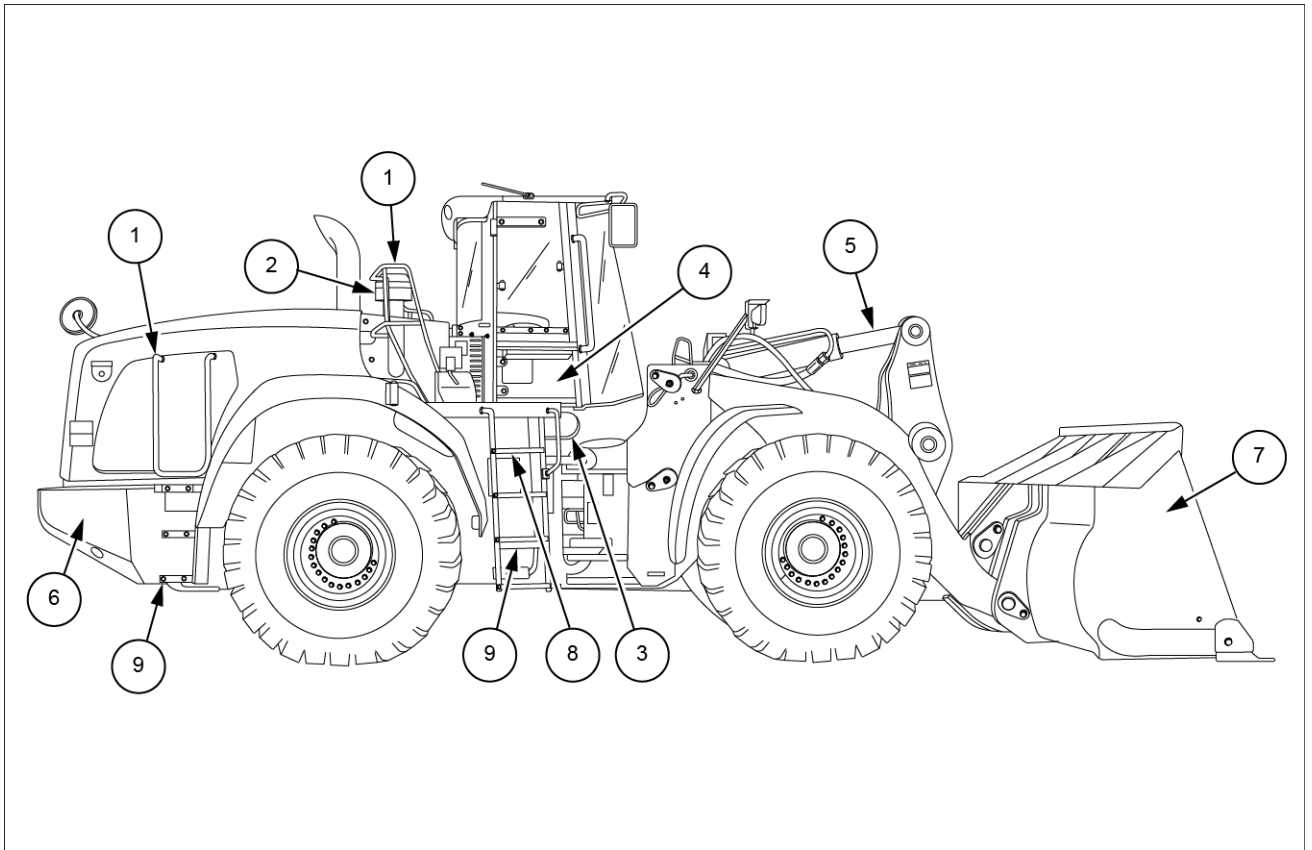
## Product identification



LEIL15WHL0732FB 1

- |   |   |
|---|---|
| 1. Cab door and hand holds                            | 6. Roll Over Protection System (ROPS) cab |
| 2. Steps  | 7. Loader lift arms                       |
| 3. Bucket (Z-bar version)                             | 8. Battery access                         |
| 4. Electric disconnect and optional battery jump post | 9. Hand rails                             |
| 5. Bucket cylinder                                    | 10. Fuel/ <b>DEF/AdBLUE®</b> fill tanks   |

## INTRODUCTION



LEIL15WHL0731FB 2

- |                          |                                |
|--------------------------|--------------------------------|
| 1. Hand rails            | 6. Battery access              |
| 2. Precleaner            | 7. Bucket (Z-bar version)      |
| 3. Cab air filter access | 8. Windshield washer reservoir |
| 4. Fuse access door      | 9. Steps                       |
| 5. Bucket cylinder       |                                |



# **SERVICE MANUAL**

## **Engine**

**1021F XR  
1021F ZBAR  
1121F XR  
1121F ZBAR**

## Engine - General specification

1021F XR	WE
1021F ZBAR	WE

Engine with 4 Speed Transmission	
A. Low idle	<b>870-930 RPM</b>
Alternate low idle	<b>670-730 RPM</b>
Alternate Accelerated Idle	<b>1270-1330 RPM</b>
B. Maximum No Load RPM	<b>2217-2267 RPM</b>
C. Converter Stall (manual 3 rd gear or higher)	<b>2000-2150 RPM</b>
D. Hydraulic Stall	<b>1885-2195 RPM</b>
E. Converter & Hydraulic Stall	<b>1487-1797 RPM</b>
Temperature of the torque converter oil	<b>82 - 104 °C (180 - 219 °F)</b>
Temperature of the hydraulic oil	<b>54 - 57 °C (129 - 135 °F)</b>

**NOTE:** hydraulic Stall and Converter & Hydraulic Stall RPM values are read while the lift arms are rising with the bucket held rolled back and the engine at Wide Open Throttle (WOT) in max power mode.

## Engine - General specification

1121F XR	WE
1121F ZBAR	WE

Engine with 4 Speed Transmission	
A. Low idle	<b>870-930 RPM</b>
Alternate low idle	<b>670-730 RPM</b>
Alternate Accelerated Idle	<b>1270-1330 RPM</b>
B. Maximum No Load RPM	<b>2239-2289 RPM</b>
C. Converter Stall	<b>1937-2087 RPM</b>
D. Hydraulic Stall	<b>1885-2195 RPM</b>
E. Converter & Hydraulic Stall	<b>1487-1797 RPM</b>
Temperature of the torque converter oil	<b>82 - 104 °C (180 - 219 °F)</b>
Temperature of the hydraulic oil	<b>54 - 57 °C (129 - 135 °F)</b>

**NOTE:** hydraulic Stall and Converter & Hydraulic Stall RPM values are read while the lift arms are rising with the bucket held rolled back and the engine at Wide Open Throttle (WOT) in max power mode.

## Engine - General specification – Engine Service Manual

The table below lists the part numbers of the FPT Engines F2CFE614H (1021F) and F2CFE614F (1121F) Service Manual. The part numbers of the European languages related to this manual are reported. See the Engine Service Manual for more details about the engine overhaul.

Language	Engine Service Manual P/N
English	47606172
French	47606175
German	47606176
Italian	47606177
Spanish	47606180

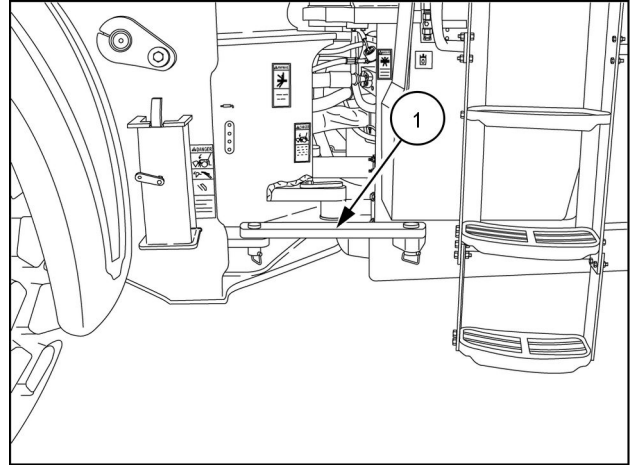
## Engine - Remove

### Prior operation:

#### Engine hood - Remove (90.105)

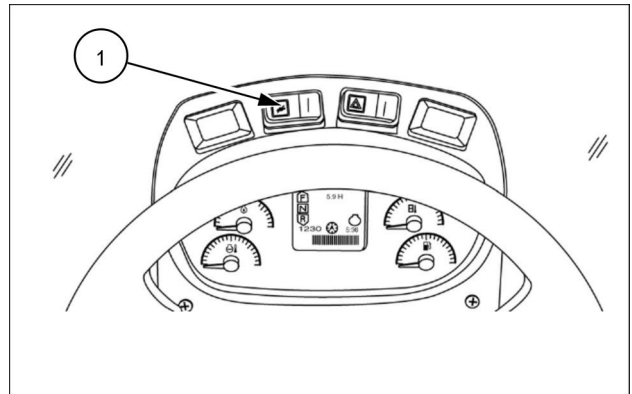
**NOTE:** emissions sensors mounted in the exhaust stream are sensitive to extreme vibrations. Use of tools that generate extreme vibrations, such as impact wrenches and hammers, will result in damage to emission sensors. Avoid using these tools during any service procedure in close proximity of emission sensors. If the use of these tools cannot be avoided, remove the sensors using extreme caution prior to performing any service procedure.

1. Park the machine on a level surface and lower the bucket to the ground. Put the articulation lock (1) in LOCKED position.



RCPH11WHL039AAH 1

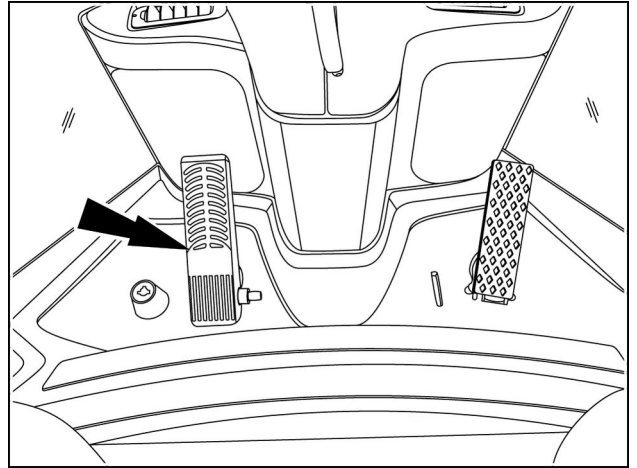
2. Place the pilot control switch (1) in the normal operation position.



LEIL15WHL1167AA 2

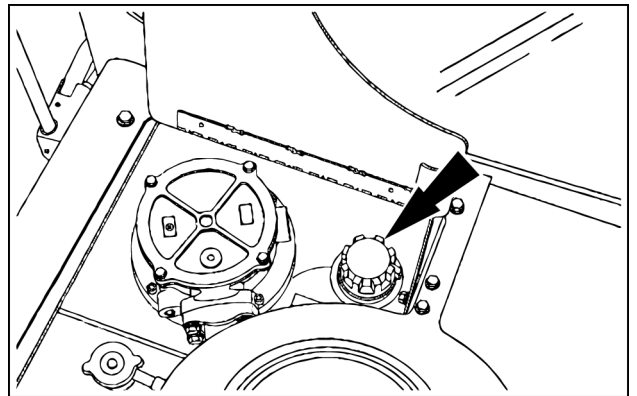
3. Move the loader hydraulic control handle to the raise and lower position in order to release any hydraulic pressure in the lift circuit.
4. Move the loader control handle in and out of the tilt position several times, this will relieve any pressure in the pilot accumulator.
5. Release the pressure in the ride control accumulator with the bleeder valve in the ride control valve load travel stabilizer.

6. Actuate the brake pedal several times to discharge brake accumulators.



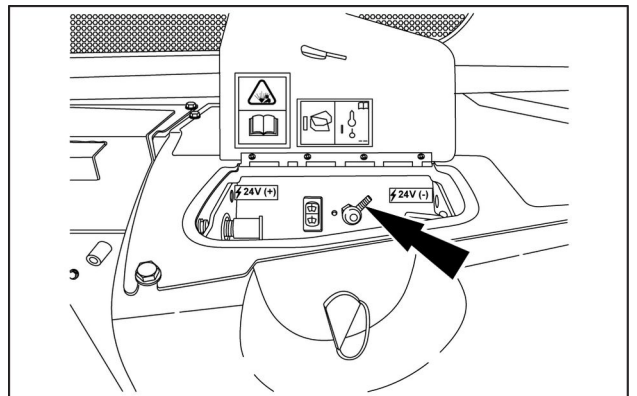
RCPH10WHL435AAH 3

7. Slowly loosen the filler cap on the hydraulic oil tank to release air pressure.



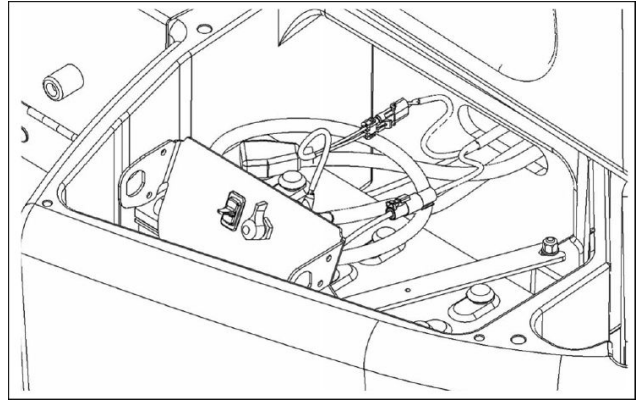
LEIL15WHL0825AA 4

8. Locate the master disconnect switch in the battery box. Put the master disconnect switch in the OFF position.

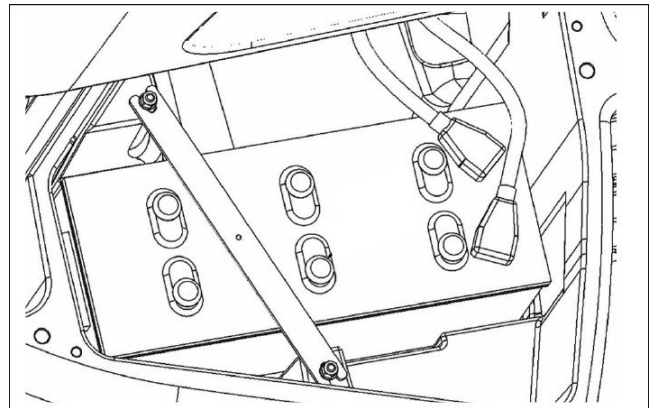


LEIL15WHL0663AA 5

9. Loosen and remove the bolts that hold the battery cover in place on both the left-hand and right-hand rear of the machine.  
Disconnect the battery cable from the battery.



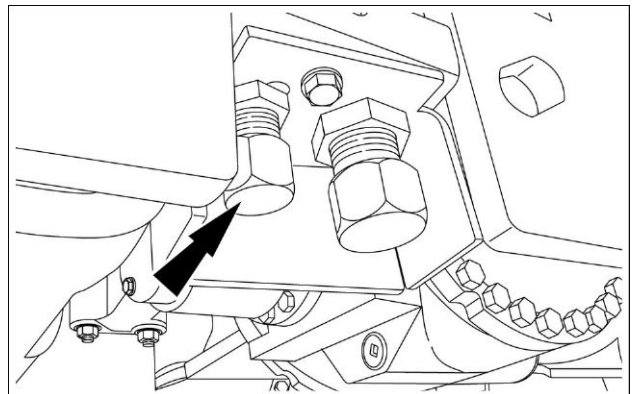
LEIL15WHL1488AB 6



LEIL15WHL1489AA 7

10. Open the access cover.  
Place a suitable container below radiator drain, remove the radiator cap and coolant drain plug (arrow) to drain the engine coolant. Reinstall the drain plug and radiator cap after the coolant has drained.

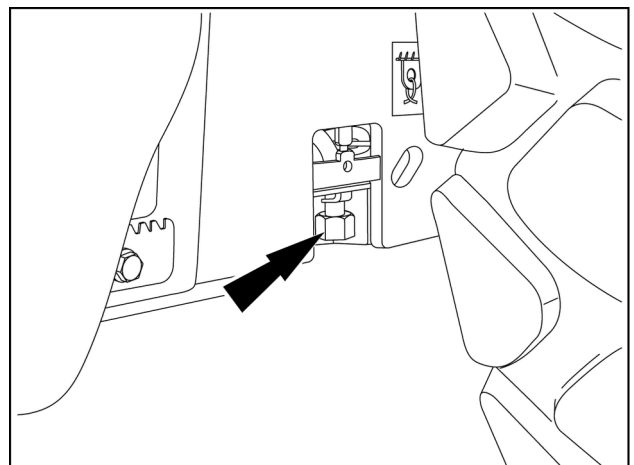
**NOTE:** see machine specifications for cooling system volume.



LEIL15WHL0719AB 8

11. Open the access cover.  
Place a suitable container below the engine oil drain. Remove the drain plug and drain the oil into the container. Reinstall drain plug.

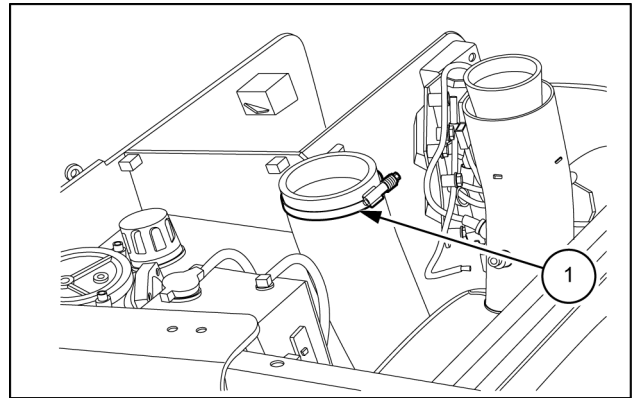
**NOTE:** see machine specifications for engine oil sump volume.



RCPH11WHL104AAH 9

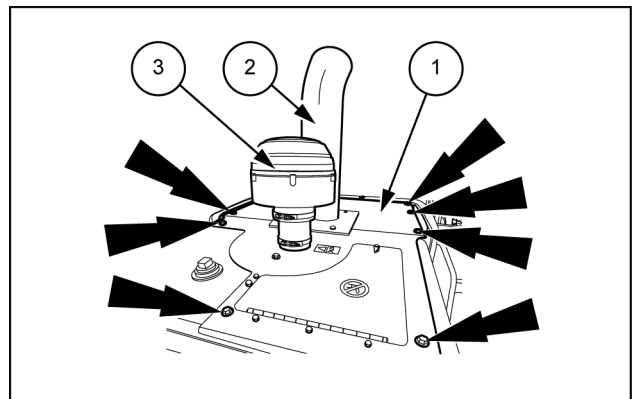
12. Loosen the hose clamp **(1)** on the air intake hose under the air inlet engine hood.

**NOTICE:** for clarity the engine hood compartment top cover is not shown in the figure.



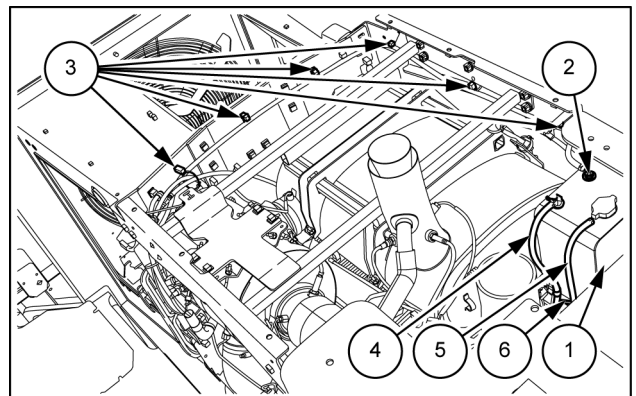
LEIL15WHL0673AB 10

13. Remove the mounting bolts (arrows) from engine compartment top cover **(1)**.
14. Attach a suitable lifting device and lift strap to the engine compartment cover and exhaust stack. Carefully remove the cover **(1)**, the exhaust stack **(2)** and the precleaner **(3)** as an assembly.



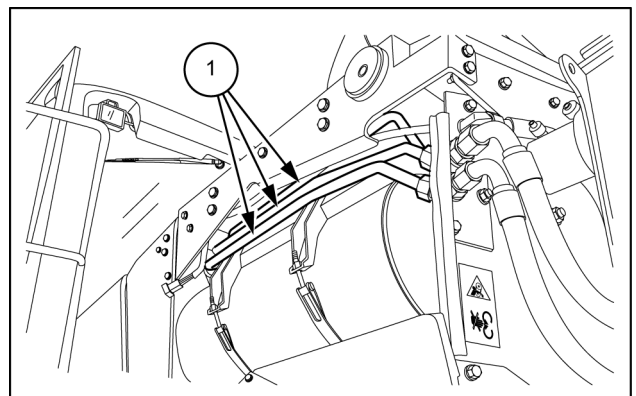
LEIL15WHL0679AB 11

15. Disconnect the deaeration tank overflow hose **(2)** from the coolant tank **(1)**. Remove the P-clamps **(3)** that secure the overflow hose **(2)** to the wall and brackets. Tag and remove the overflow hose **(2)** from the engine and engine wall. Disconnect the hoses **(4)**, **(5)** and **(6)** from the coolant tank **(1)**.



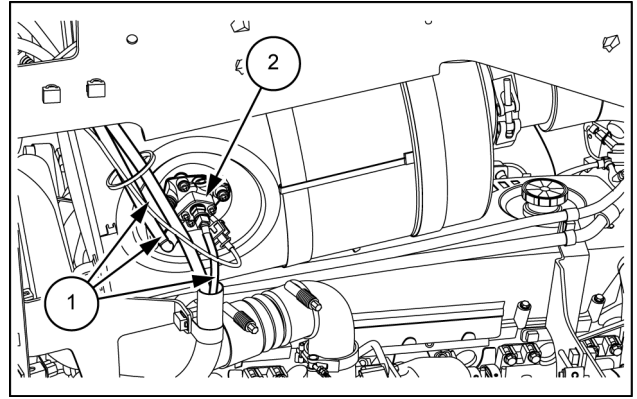
LEIL15WHL0667AB 12

16. Remove the hydraulic oil lines **(1)** and the related fittings.



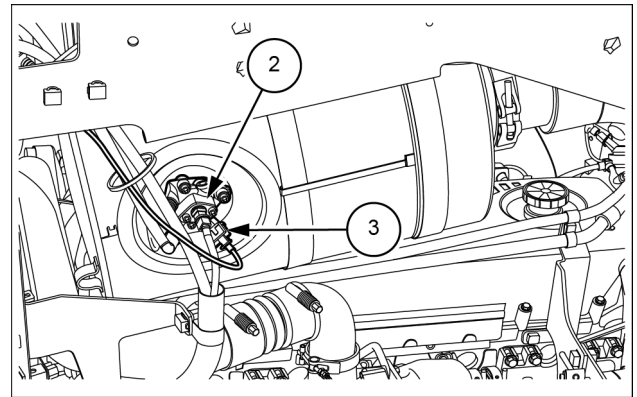
LEIL15WHL0682AB 13

17. Disconnect the hoses (1) from the Dosing Module (2).



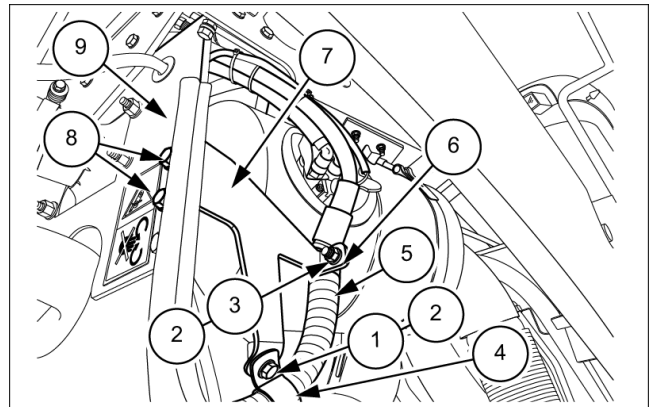
LEIL15WHL0675AB 14

18. Disconnect the electrical connector (3) from the Dosing Module (2).



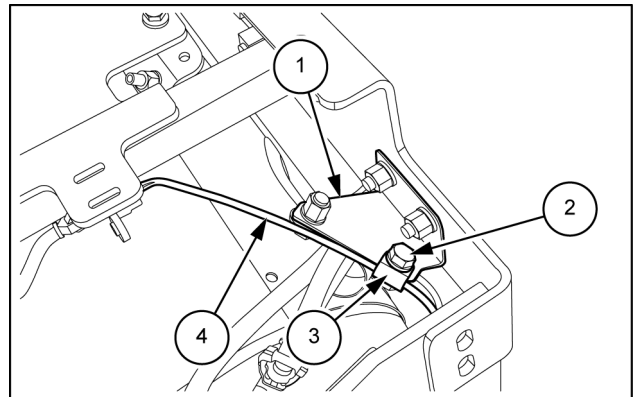
LEIL15WHL0821AB 15

19. Remove the two bolts (1), the four washers (2), and the two nuts (3) to separate the P-clamps (4) and (6) from the bracket (8). Remove the P-clamps (4) and (6) from the DEF/AdBLUE® bundle (5).
20. Remove the two bolts (8) with related washers and the nuts to separate the bracket (7) from the engine wall (9).



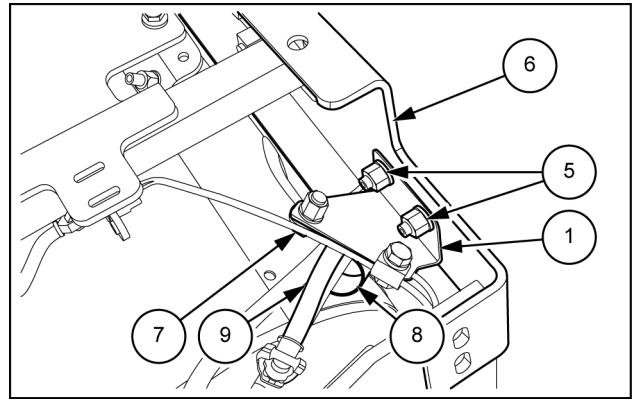
LEIL15WHL0812AB 16

21. Remove the bolt (2) and the related washers and nut to separate the P-clamp (3) from the bracket (1). Remove the P-clamp (3) from the sensors wiring harness (4).



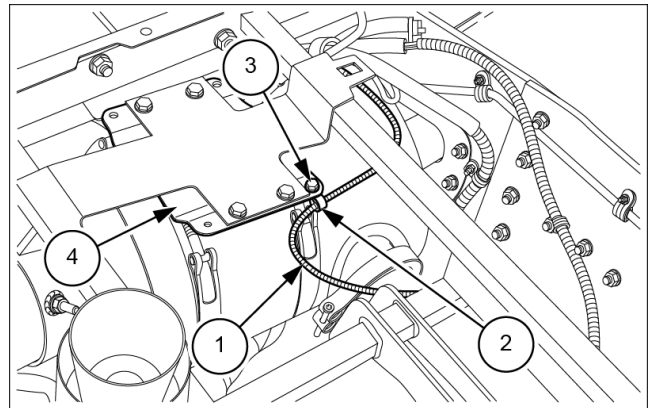
LEIL15WHL0822AB 17

22. Remove the two bolts (5) and the related washers and nuts to separate the bracket (1) from the support (6).
23. Remove the bolt (7) and the related washers and nut to separate the P-clamp (8) from the DEF/AdBLUE® bundle (9).



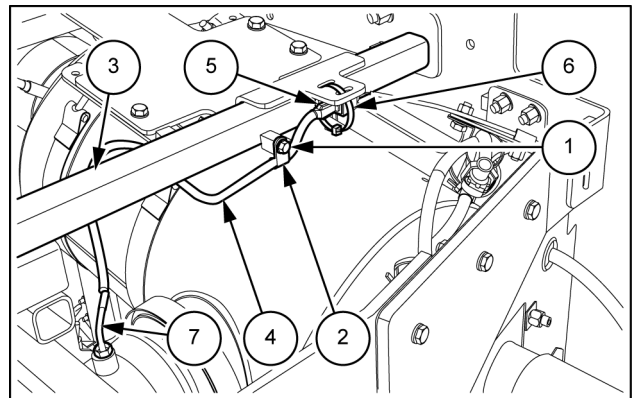
LEIL15WHL0823AB 18

24. Loosen the bolt (3). Remove the P-clamp (2) that secure the sensor wiring harness (1) of the inlet temperature sensor to the DOC mounting plate (4).



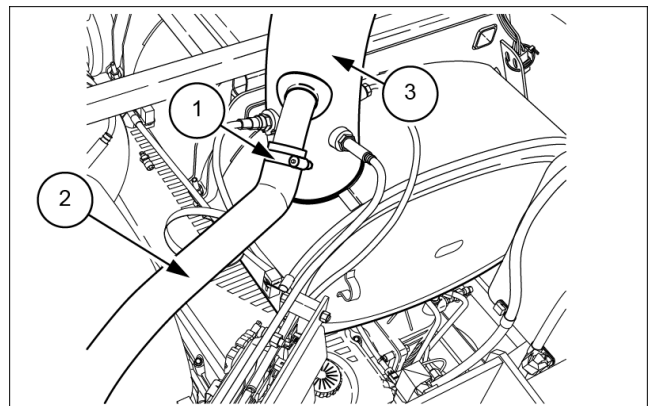
LEIL15WHL1312AB 19

25. Loosen the bolt (1) and remove the P-clamp (2) from the supply module support (3).
26. Remove the P-clamp (2) from the temperature sensor (DOC to SCR) wire (4). Cut the tie strap (6).
27. Disconnect the sensor from the sensors wiring harness (5). Loosen the hexagonal nut of the temperature sensor (7) (DOC to SCR). Remove the temperature sensor (7)



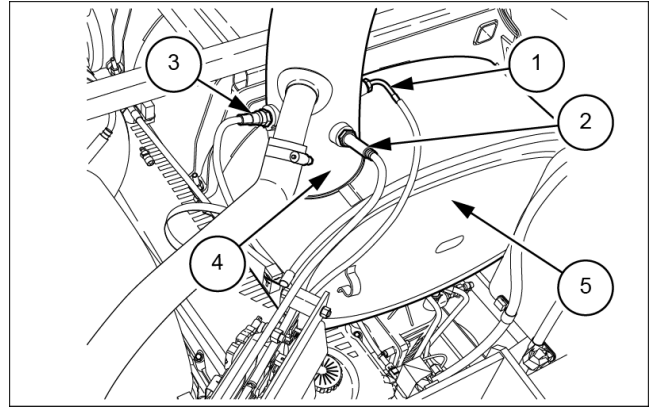
LEIL15WHL0824AB 20

28. Loosen the P-clamp (1) of the air intake aspirator engine hose (2). Disconnect the air intake aspirator engine hose (2) from the outlet of the Selective Catalytic Reduction (SCR) (3).



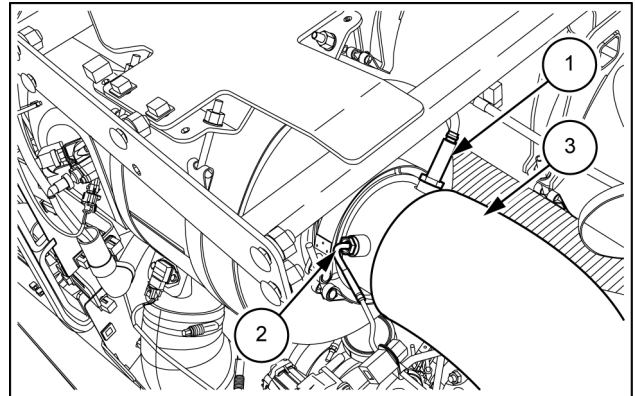
LEIL15WHL0811AB 21

29. Loosen the hexagonal nut of the outlet temperature sensor (1).  
Loosen the hexagonal nut of outlet the Nitrogen Oxides (NOx) sensor (2).  
Loosen the hexagonal nut of the ammonia (NH3) sensor (3).  
Remove any straps holding the sensor wiring harness to the others. Disconnect the temperature sensor (1), NOx, sensor (2) and the NH3 (3) sensor from the outlet (4) of the Selective Catalytic Reduction (SCR) (5).



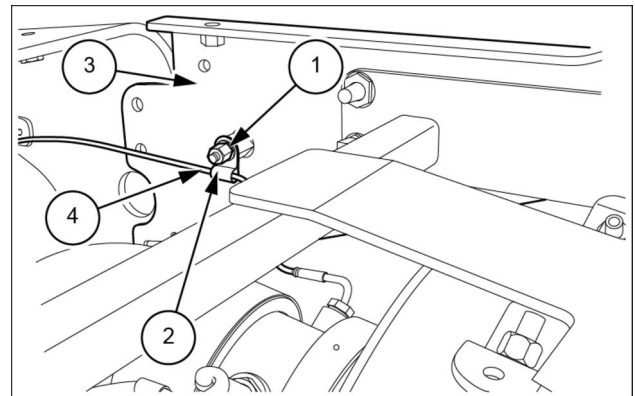
LEIL15WHL0672AB 22

30. Locate the inlet temperature sensor (1) and the inlet NOx sensor (2) on the inlet of the Diesel Oxidation Catalyst (DOC) (3).  
Loosen the hexagonal nut of the inlet temperature sensor (1) and the inlet NOx sensor (2).  
Disconnect the sensors (1) and (2) from the inlet of the Diesel Oxidation Catalyst (DOC) (3).



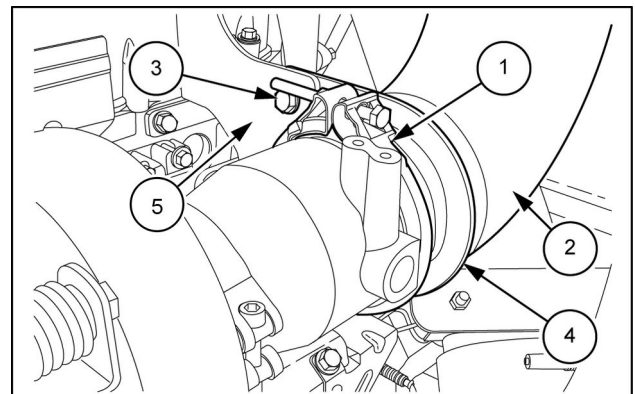
LEIL15WHL0671AB 23

31. Loosen the hexagonal nut (1), with related washer, spacer, and bolt. Separate the P-clamp (2) that secure the wiring harness (4) of the DOC inlet temperature sensor from the support bracket (3).



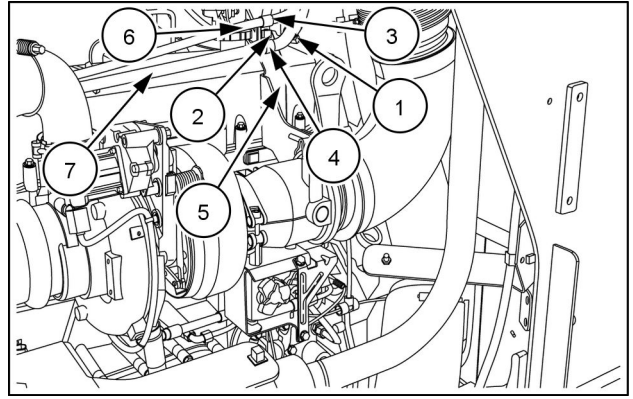
LEIL15WHL1141AB 24

32. Remove the two bolts (3) and the related washers and nuts to separate the exhaust support bracket (5) from the U-clamp (4).  
33. Remove the clamp (1) from the inlet Diesel Oxidation Catalyst (DOC) pipe (2).  
Discard the gasket.



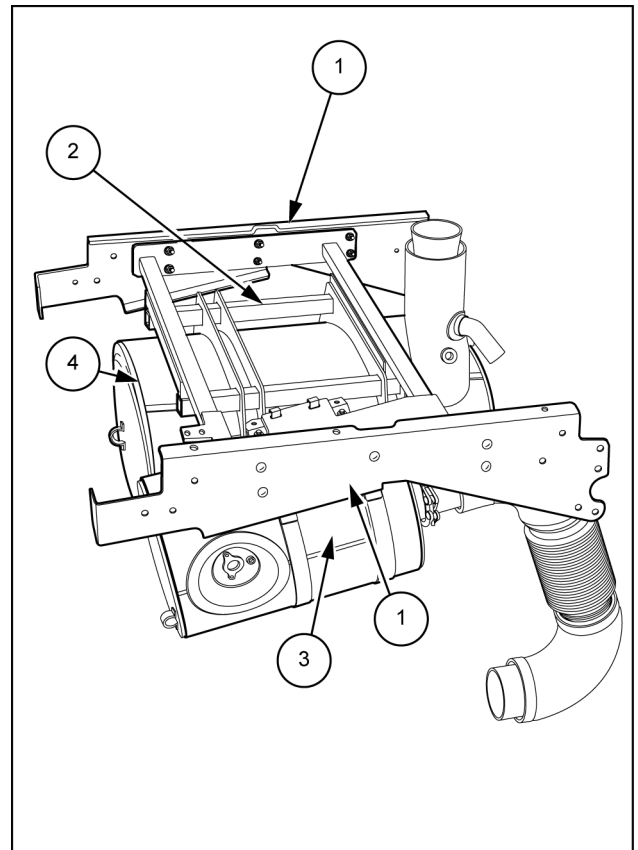
LEIL15WHL0826AB 25

34. Remove the P-clamp (1).  
Loosen the bolt (2) to separate the P-clamps (3) and (4) from the exhaust support bracket (5).  
Remove the P-clamps (3) and (4) from the hoses (6) and (7).



LEIL15WHL0831AA 26

35. Attach a suitable lifting strap on the brackets (hydraulic to cooling) (1) to support the muffler frame (2) with the Diesel Oxidation Catalyst (DOC) (3) and the Selective Catalytic Reduction muffler (SCR) (4).



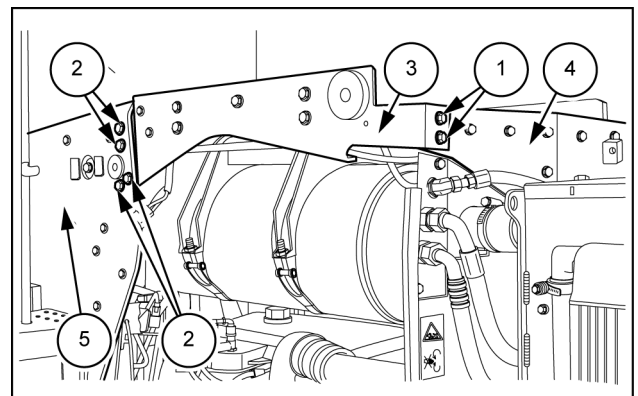
LEIL15WHL0836BB 27

36. Remove the two bolts (1) with related washers and nuts to separate the bracket (hydraulic to cooling) (3) from the engine wall (4).  
37. Remove the four bolts (2) with related washers and nuts to separate the bracket (hydraulic to cooling) (3) from the hydraulic tank (5).

**NOTE:** left-hand side of the machine is shown. The operations are similar for the right-hand side.

38. Remove the brackets (3), the muffler frame, the DOC and the SCR as an assembly.

**NOTE:** do not damage the muffler support during removal.



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**Suggest:**

**If the above button click is invalid.**

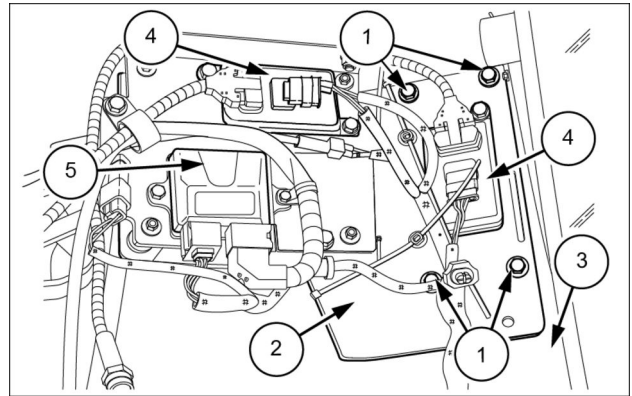
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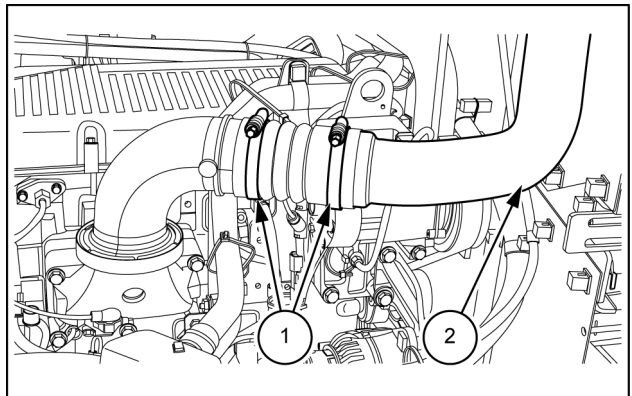
**Thank you so much for reading**

39. Loosen the bolts (1) to remove the sensor mounting bracket (2) with the two the NOx sensor modules (4) and the NH3 Electronic Control Unit (5) from the hydraulic tank (3).



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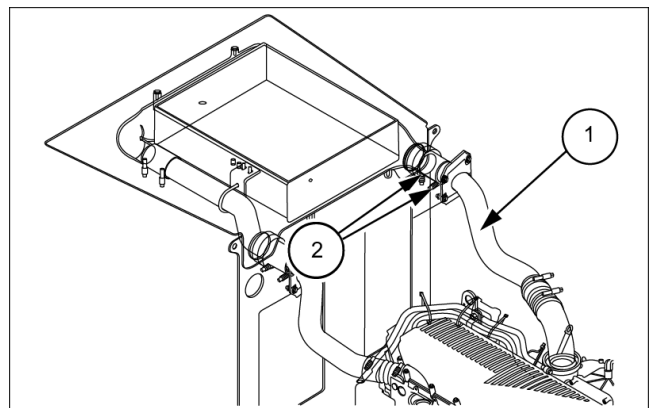
40. Loosen the two clamps (1) from the intercooler tube (2).



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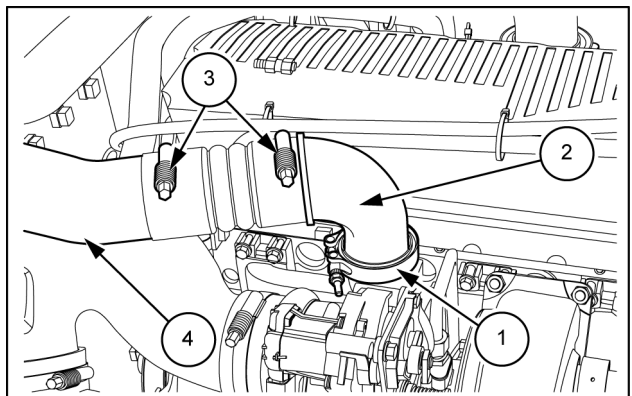
41. Loosen the clamps (2) from the intercooler tube (1). Remove the intercooler tube (1) through the engine wall.

**NOTE:** for clarity, the engine wall is not shown in the figure.



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42. Loosen the V-band clamp (1). Remove the O-ring and the air intake elbow (2) of the turbocharger. Loosen the clamps (3). Remove the air intake tube (4) of the turbocharger. Cover the turbocharger inlet to prevent debris entry.



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