

# SERVICE MANUAL

**L230**

**Tier 4B (final)**

**200 Series Skid Steer Loader**

*PIN NFM483191 and above*

**C238**

**Tier 4B (final)**

**200 Series Compact Track Loader**

*PIN NFM470756 and above*

ENGINE - 10

POWER COUPLING - 19

FRONT AXLE SYSTEM - 25

REAR AXLE SYSTEM - 27

HYDROSTATIC DRIVE - 29

BRAKES AND CONTROLS - 33

**Part number 47899776**

1<sup>st</sup> edition English

June 2015



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(\*) See content for specific models

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## Foreword - Important notice regarding equipment servicing

C238	
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All repair and maintenance work listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given, and using, whenever possible, the special tools.

Anyone who performs repair and maintenance operations without complying with the procedures provided herein shall be responsible for any subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages caused by parts and/or components not approved by the manufacturer, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer. In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages caused by parts and/or components not approved by the manufacturer.

The manufacturer reserves the right to make improvements in design and changes in specifications at any time without notice and without incurring any obligation to install them on units previously sold. Specifications, descriptions, and illustrative material herein are as accurate as known at time of publication but are subject to change without notice.

In case of questions, refer to your NEW HOLLAND CONSTRUCTION Sales and Service Networks.

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## Safety rules

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### 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.

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## Safety rules - Personal safety

C238	
L230	

**Carefully study these precautions, and those included in the external attachment operators manual, and insist that they be followed by those working with and for you.**

1. Thoroughly read and understand this manual and the attachment Operator's Manual before operating this or any other equipment.
2. Be sure all people and pets are clear of the machine before starting. Sound the horn, if equipped, three times before starting engine.
3. Only the operator should be on the machine when in operation. Never allow anyone to climb on to the machine while it is in motion. If the machine is equipped with an Instructors Seat, this must only be used for training purposes. Passengers must not be allowed to use the Instructors Seat.
4. Keep all shields in place. Never work around the machine or any of the attachments while wearing loose clothing that might catch on moving parts.
5. Observe the following precautions whenever lubricating the machine or making adjustments.
  - Disengage all clutching levers or switches.
  - Lower the attachment, if equipped, to the ground or raise the attachment completely and engage the cylinder safety locks. Completing these actions will prevent the attachment from lowering unexpectedly.
  - Engage the parking brake.
  - Shut off the engine and remove the key.
  - Wait for all machine movement to stop before leaving the operators platform.
6. Always keep the machine in gear while travelling downhill.
7. The machine should always be equipped with sufficient front or rear axle weight for safe operation.
8. Under some field conditions, more weight may be required at the front or rear axle for adequate stability. This is especially important when operating in hilly conditions or/when using heavy attachments.
9. Always lower the attachment, shut off the engine, set the parking brake, engage the transmission gears, remove the key and wait for all machine movement to stop before leaving the operators platform.
10. If the attachment or machine should become obstructed or plugged; set the parking brake, shut off the engine and remove the key, engage the transmission gears, wait for all machine or attachment motion to come to a stop, before leaving the operators platform to removing the obstruction or plug.
11. Never disconnect or make any adjustments to the hydraulic system unless the machine and/or the attachment is lowered to the ground or the safety lock(s) is in the engaged position.
12. Use of the flashing lights is highly recommended when operating on a public road.
13. When transporting on a road or highway, use accessory lights and devices for adequate warning to the operators of other vehicles. In this regard, check local government regulations. Various safety lights and devices are available from your NEW HOLLAND CONSTRUCTION dealer.
14. Practice safety 365 days a year.
15. Keep all your equipment in safe operating condition.
16. Keep all guards and safety devices in place.
17. Always set the parking brake, shut off the engine and remove the key, engage the transmission gears, wait for all machine or attachment motion to come to a stop, before leaving the operators platform to service the machine and attachment.
18. Remember: A careful operator is the best insurance against an accident.
19. Extreme care should be taken in keeping hands and clothing away from moving parts.

## Safety rules - Ecology and the environment

C238	
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Soil, air, and water quality is important for all industries and life in general. When legislation does not yet rule the treatment of some of the substances that advanced technology requires, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation. Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances.

### Helpful hints

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- The air-conditioning system contains gases that should not be released into the atmosphere. Consult an air-conditioning specialist or use a special extractor to recharge the system properly.
- Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding. Penetrating weld splatter may burn a hole or weaken hoses, allowing the loss of oils, coolant, etc.

### Battery recycling

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. NEW HOLLAND CONSTRUCTION strongly recommends that you return all used batteries to a NEW HOLLAND CONSTRUCTION dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.



### Mandatory battery recycling

**NOTE:** *The following requirements are mandatory in Brazil.*

Batteries are made of lead plates and a sulfuric acid solution. Because batteries contain heavy metals such as lead, CONAMA Resolution 401/2008 requires you to return all used batteries to the battery dealer when you replace any batteries. Do not dispose of batteries in your household garbage.

Points of sale are obliged to:

- Accept the return of your used batteries
- Store the returned batteries in a suitable location
- Send the returned batteries to the battery manufacturer for recycling



# **SERVICE MANUAL**

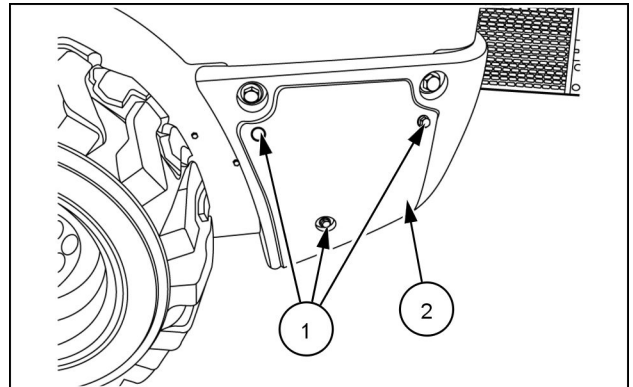
## **Engine**

**C238 TIER 4B (FINAL) [NFM470756 - ]**  
**L230 TIER 4B (FINAL) [NFM483191 - ]**

## Engine - Drain fluid

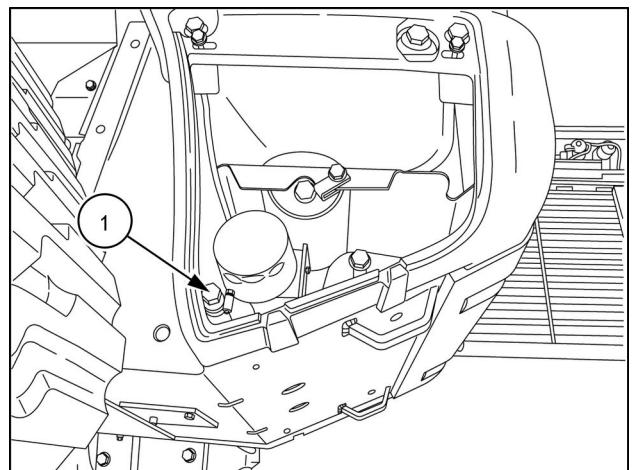
C238 TIER 4B (FINAL) [NFM470756 - ]	NA
L230 TIER 4B (FINAL) [NFM483191 - ]	NA

1. Remove the access cover (2) by removing the mounting bolts (1).



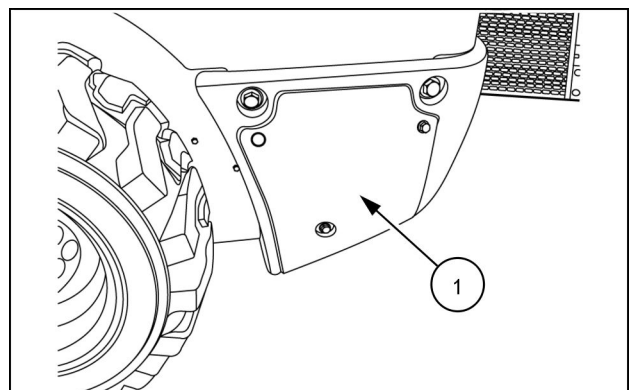
931001637 1

2. Remove the drain plug (1).
3. When the oil has drained from the engine, install the drain plug (1). Torque the drain plug (1) to **68 - 82 N·m (50 - 60 lb ft)**.



RAIL14SSL0709AA 2

4. Install the access cover (1).



931001637 3

## Engine - Remove

C238 TIER 4B (FINAL) [NFM470756 - ]	NA
L230 TIER 4B (FINAL) [NFM483191 - ]	NA

### **⚠ WARNING**

**Avoid injury! Always do the following before lubricating, maintaining, or servicing the machine.**

1. Disengage all drives.
2. Engage parking brake.
3. Lower all attachments to the ground, or raise and engage all safety locks.
4. Shut off engine.
5. Remove key from key switch.
6. Switch off battery key, if installed.
7. Wait for all machine movement to stop.

Failure to comply could result in death or serious injury.

W0047A

### **⚠ WARNING**

**Fire hazard!**

**When handling diesel fuel, observe the following precautions:**

1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.

Failure to comply could result in death or serious injury.

W0099A

### **⚠ WARNING**

**Escaping fluid!**

Hydraulic fluid or diesel fuel leaking under pressure can penetrate the skin and cause infection or other injury. To prevent personal injury: Relieve all pressure before disconnecting fluid lines or performing work on the hydraulic system. Before applying pressure, make sure all connections are tight and all components are in good condition. Never use your hand to check for suspected leaks under pressure. Use a piece of cardboard or wood for this purpose. If injured by leaking fluid, see your doctor immediately.

Failure to comply could result in death or serious injury.

W0178A

### **⚠ WARNING**

**Heavy objects!**

Lift and handle all heavy components using lifting equipment with adequate capacity. Always support units or parts with suitable slings or hooks. Make sure the work area is clear of all bystanders.

Failure to comply could result in death or serious injury.

W0398A

**Prior operation:**

Tilt the ROPS.

**Prior operation:**

Disconnect the battery.

**Prior operation:**

Drain the coolant.

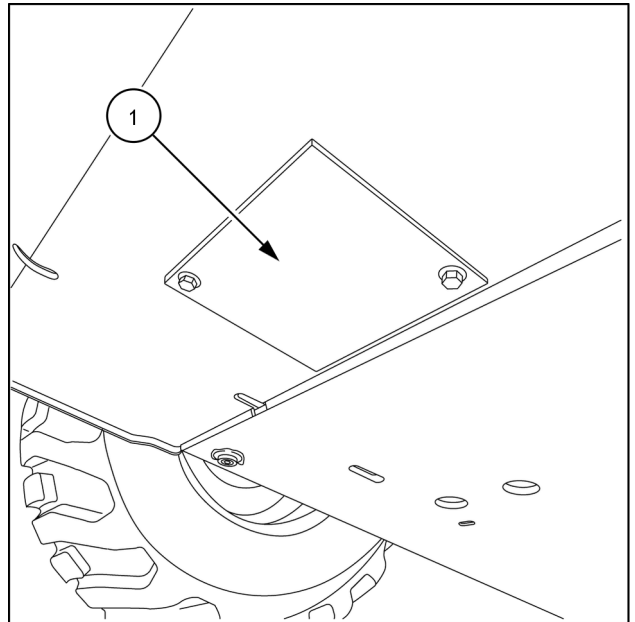
**Prior operation:**

Drain the engine oil.

**Prior operation:**

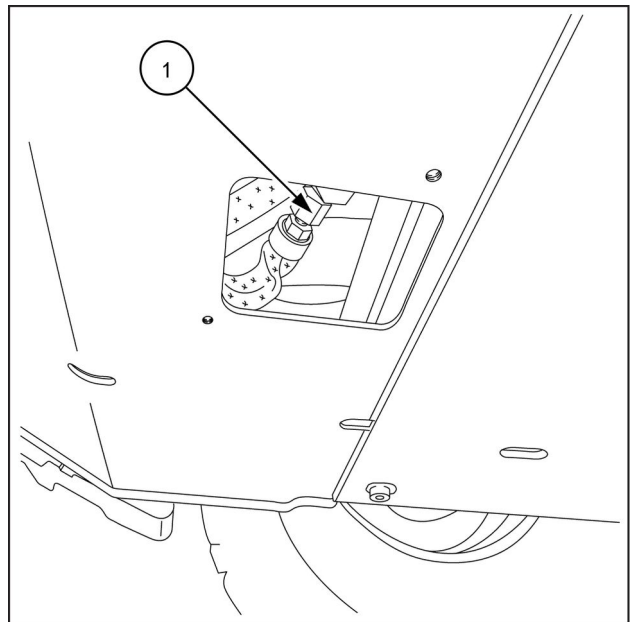
Evacuate the A/C system (if equipped).

1. Remove the access plate **(1)** for the engine oil pan from the rear of the chassis.



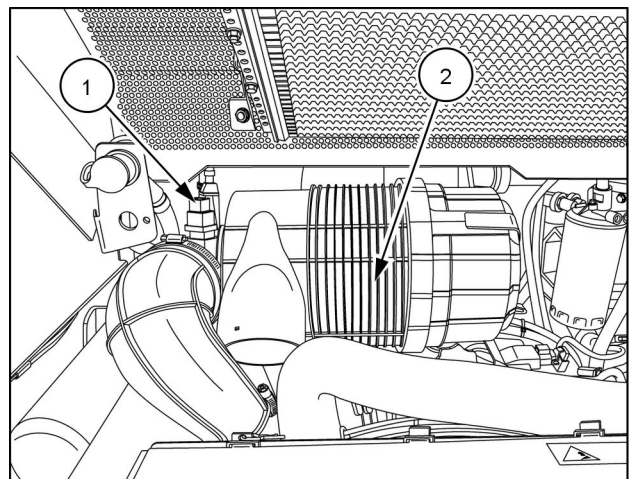
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2. Disconnect the hose **(1)** for the oil drain plug from the engine oil pan.



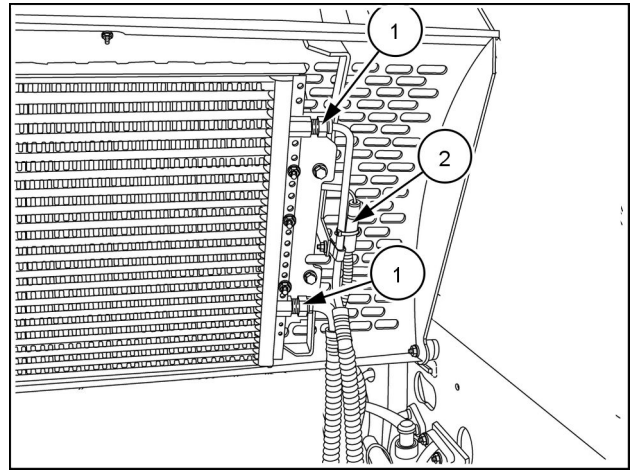
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3. Lift the tilting hood.
4. Disconnect the restriction sensor **(1)** for the air filter from the air cleaner assembly.
5. Detach the air cleaner assembly **(2)** from the rear deck.



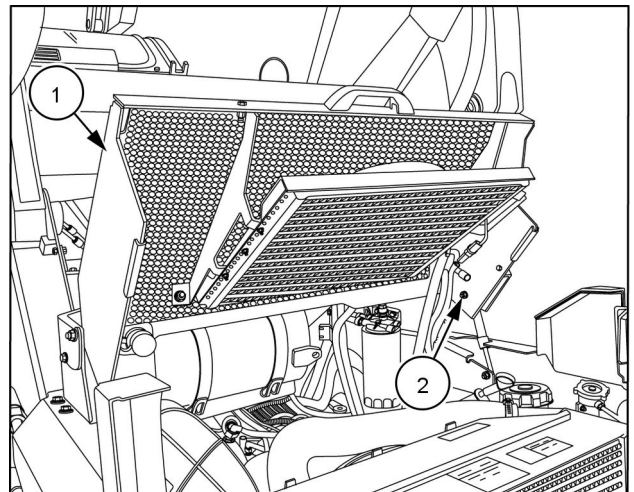
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6. If your machine is equipped with A/C, disconnect the lines **(1)** from the A/C condenser.
7. Disconnect the condenser fan **(2)**.



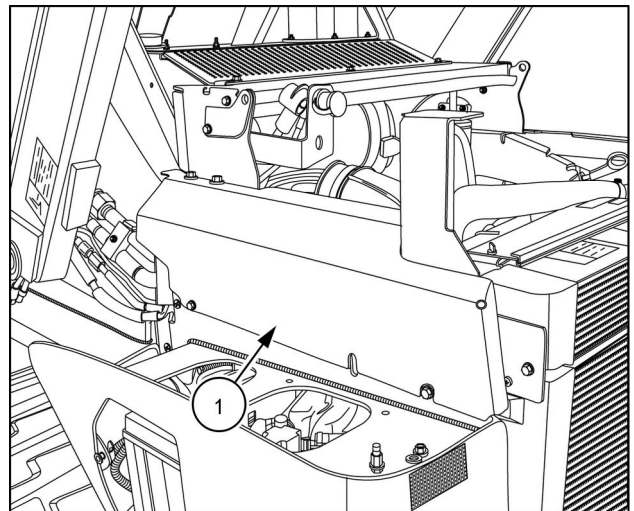
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8. Detach the hood strut **(2)** from the tilting hood **(1)**.
9. Remove the tilting hood **(1)** from the rear deck.



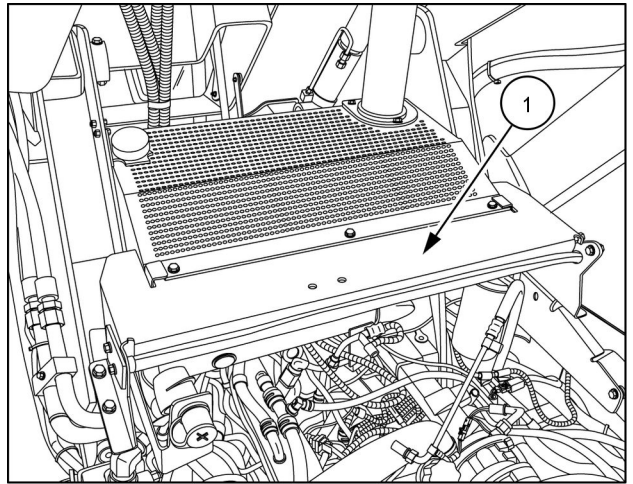
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10. Remove the left-hand panel **(1)** from the chassis.
11. Repeat step 10 on the right-hand panel.



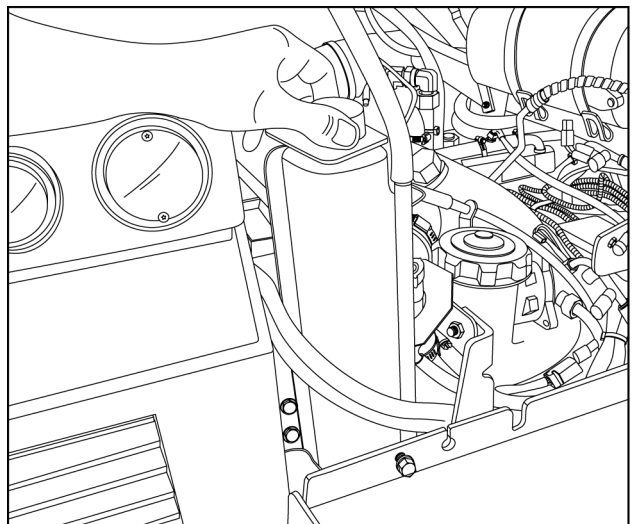
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12. Remove the rear deck (1) from the chassis.



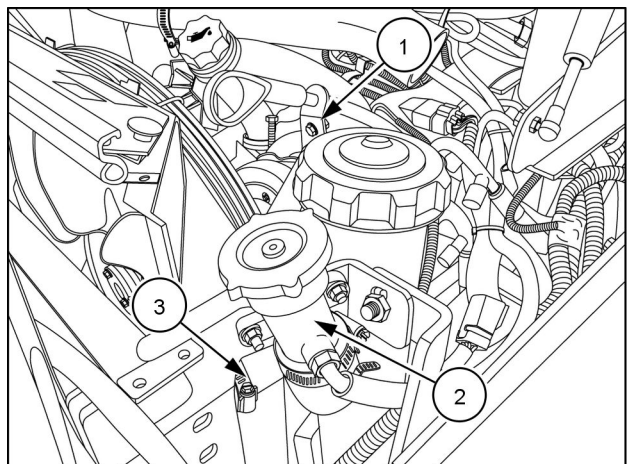
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13. Unbolt the retainer, and remove the overflow container.



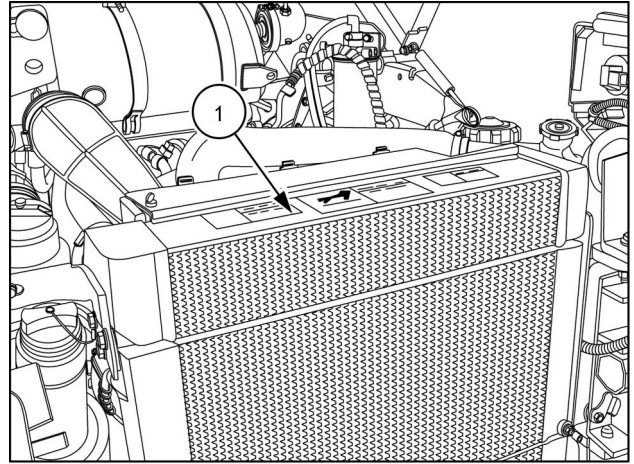
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14. Detach the mount (1) for the oil dipstick tube from the shroud.  
15. Remove the hose (3) from the filler neck (2).  
16. Remove the filler neck (2).



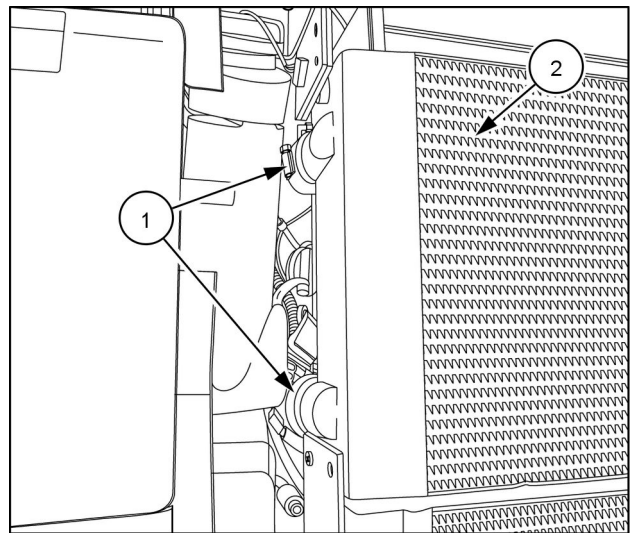
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17. Remove the air cooler (1) from the shroud.



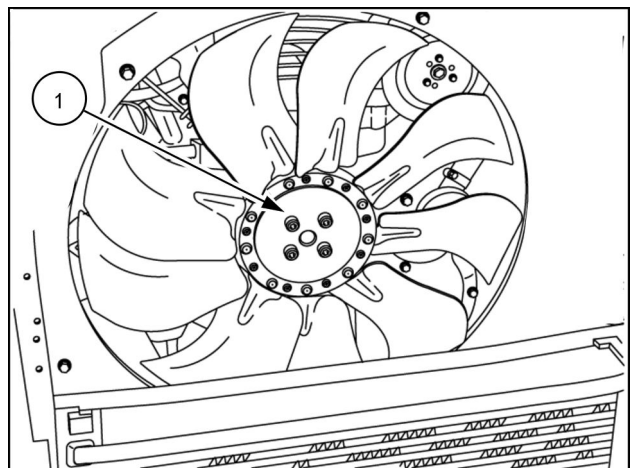
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18. Detach the radiator hoses (1) from the radiator (2).  
19. Remove the radiator (2) from the shroud.



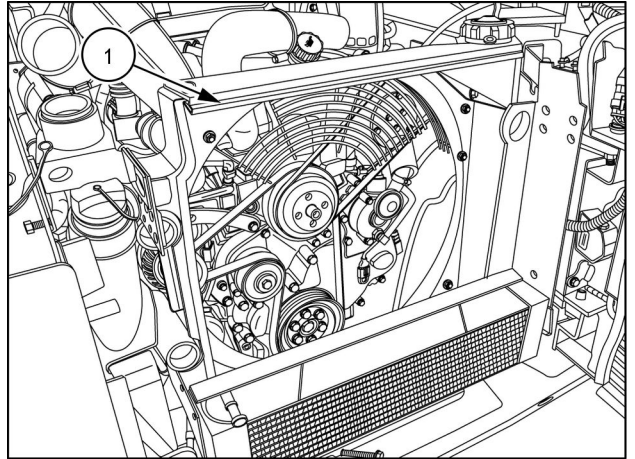
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20. Remove the fan (1).



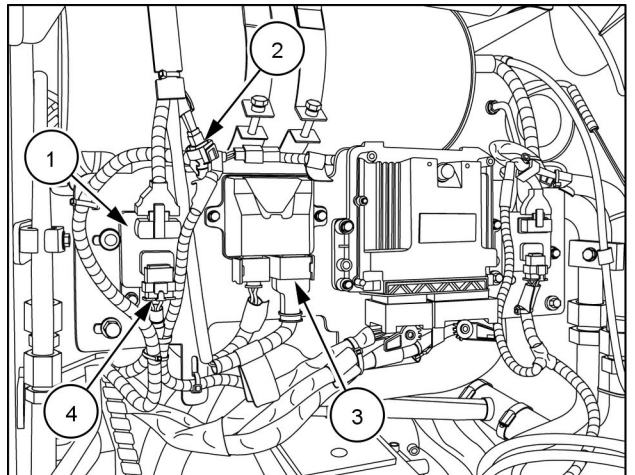
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21. Remove the shroud (1).



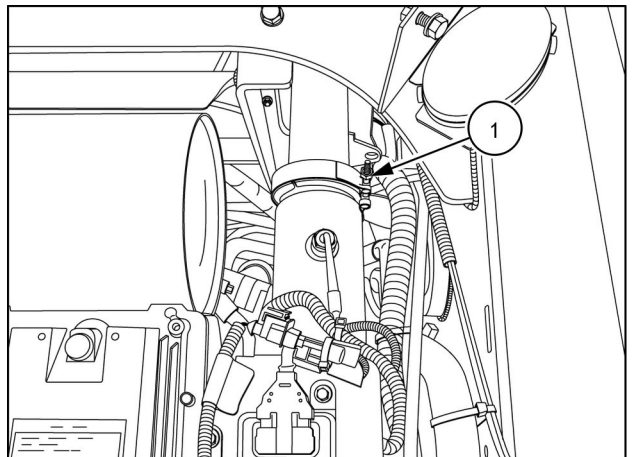
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22. Disconnect the NOx module (4), NH3 module (3), and temperature sensor (2).
23. Remove any wire ties, P-clamps, and retainers that are securing these wires.
24. Detach the NOx module (1) from the bracket for the control modules.



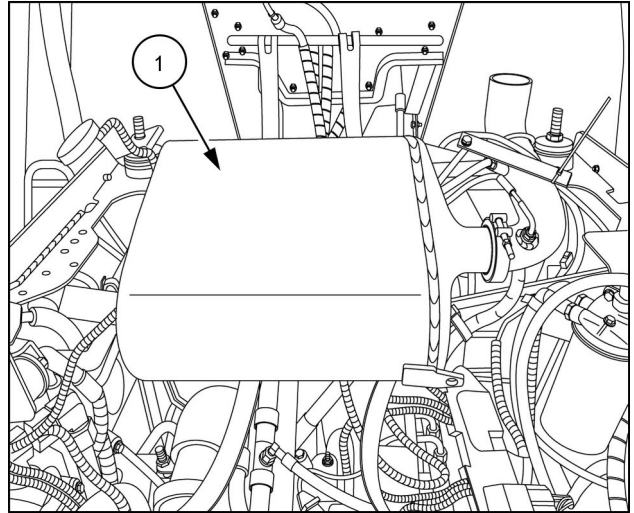
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25. Remove the exhaust clamp (1).



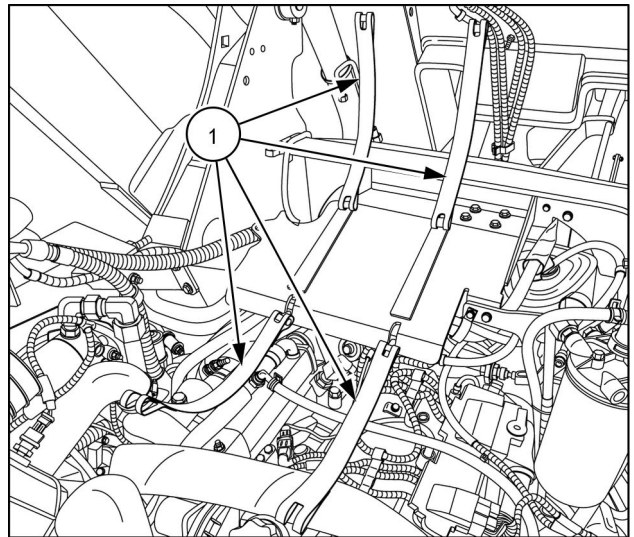
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26. Disconnect the selective catalytic reduction (SCR) muffler (1) from the muffler mounting bracket. Save the hardware for reuse.
27. Remove the SCR muffler (1).



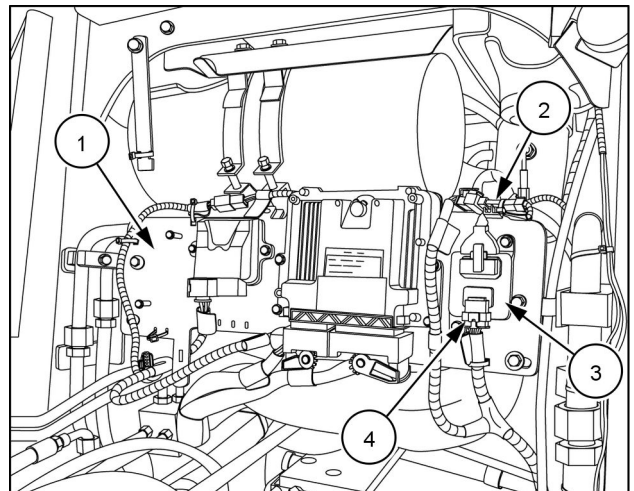
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28. Remove the retaining straps (1) for the SCR muffler.



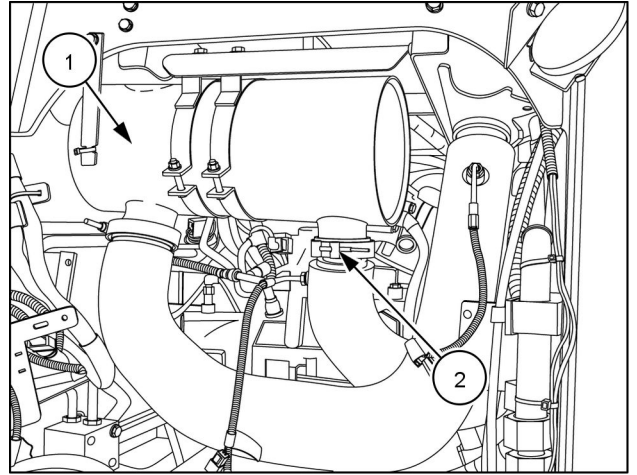
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29. Disconnect the NOx module (4) and the temperature sensor (2).
30. Remove any wire ties, P-clamps, and retainers that are securing these wires.
31. Detach the control module (3) for the NOx sensor from the bracket (1) for control modules.
32. Detach the bracket (1) for the control modules from the chassis.



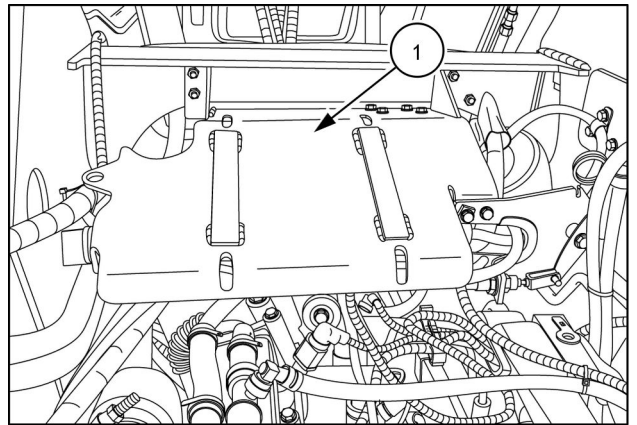
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33. Remove the exhaust clamp **(2)**.
34. Detach the diesel oxidation catalyst (DOC) muffler **(1)** from the muffler mounting bracket.



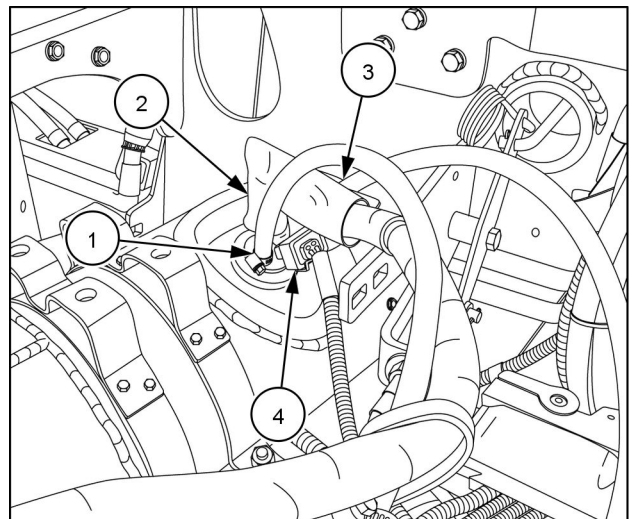
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35. Remove any wire ties, P-clamps, and retainers that are securing wires to the muffler mounting bracket.
36. Remove the muffler mounting bracket **(1)**.



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37. Disconnect the left coolant line **(1)** and right coolant line **(3)**.
38. Disconnect the DEF hose **(2)**.
39. Disconnect the injector **(4)**.
40. Remove the DOC muffler.



RAIL14SSL0785BA 21



**Suggest:**

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

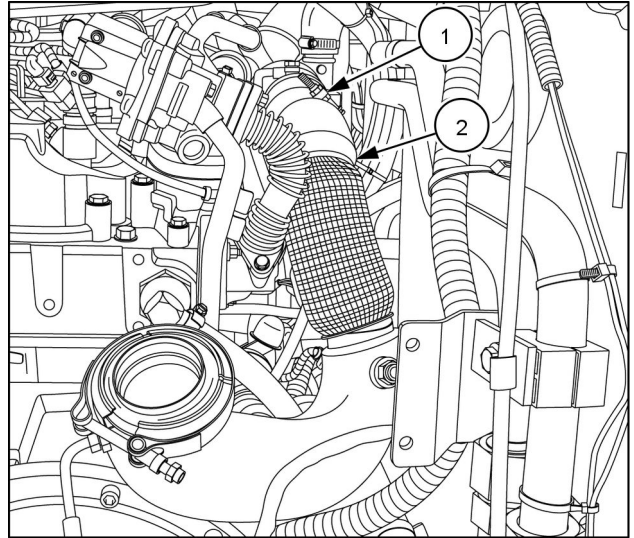
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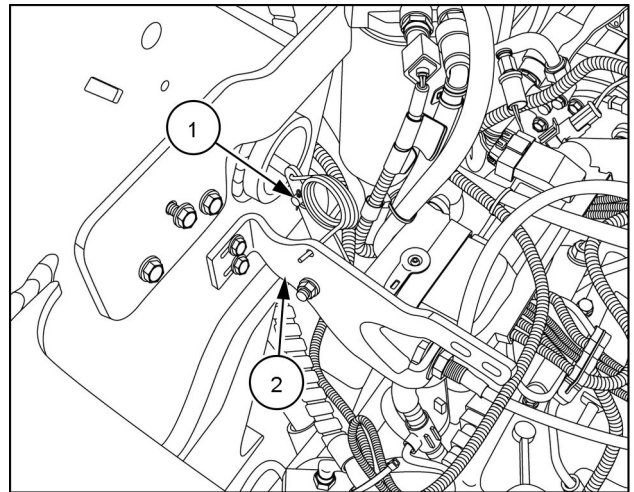
**Thank you so much for reading**

41. Remove the exhaust clamp **(1)**.
42. Remove the exhaust tube **(2)**.



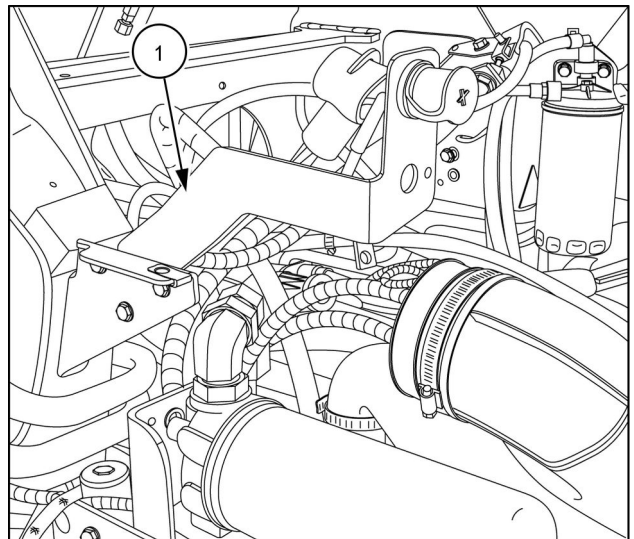
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43. Remove the cotter pin from the boom lock link **(1)**.
44. Detach the cable support bracket **(2)** from the chassis.



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45. Detach the switch mounting bracket **(1)** for the positive battery cable.



RAIL14SSL0782BA 24

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