

SERVICE MANUAL

L223 / L225 / L230

Tier 4A

200 Series Skid Steer Loader

*L223 PIN NDM474381 and above; L225 PIN NDM461085 and above;
L230 PIN NCM449907 and above*

C232 / C238

Tier 4A

200 Series Compact Track Loader

C232 PIN NDM451672 and above; C238 PIN NCM425510 and above

Part number 47540694

English

April 2014

Replaces part number 47465733



Link Product / Engine

Product	Market Product	Engine
C232 TIER 4 [NDM451672 -]	North America	F5HFL413H*A001
C238 TIER 4 [NCM425510 -]	North America	F5HFL413L*A001
L223 TIER 4 [NDM474381 -]	North America	F5HFL463A*F001
L225 TIER 4 [NDM461085 -]	North America	F5HFL413H*A001
L230 TIER 4 [NCM449907 -]	North America	F5HFL413L*A001

Contents

INTRODUCTION

Engine.....	10
[10.001] Engine and crankcase	10.1
[10.216] Fuel tanks	10.2
[10.310] Aftercooler.....	10.3
[10.400] Engine cooling system	10.4
[10.414] Fan and drive	10.5
[10.501] Exhaust Gas Recirculation (EGR) - Diesel Particulate Filter (DPF) exhaust treatment	10.6
Front axle system	25
[25.450] Chain drive system.....	25.1
Rear axle system.....	27
[27.650] Chain drive system	27.1
Hydrostatic drive.....	29
[29.202] Hydrostatic transmission	29.1
[29.134] Two-speed assembly.....	29.2
[29.200] Mechanical control	29.3
[29.218] Pump and motor components.....	29.4
Brakes and controls	33
[33.110] Parking brake or parking lock	33.1
Hydraulic systems.....	35
[35.000] Hydraulic systems.....	35.1
[35.104] Fixed displacement pump.....	35.2
[35.128] Auxiliary hydraulic function control	35.3
[35.300] Reservoir, cooler, and filters.....	35.4
[35.350] Safety and main relief valves	35.5

<https://www.ebooklibonline.com>

Hello dear friend!

Thank you very much for reading.

Enter the link into your browser.

The full manual is available for immediate download.

<https://www.ebooklibonline.com>

[35.359] Main control valve	35.6
[35.600] High flow hydraulics	35.7
[35.701] Front loader arm hydraulic system	35.8
[35.723] Front loader bucket hydraulic system	35.9
[35.724] Front loader hydraulic system control	35.10
[35.734] Tool quick coupler hydraulic system	35.11
Frames and ballasting	39
[39.140] Ballasts and supports	39.1
Wheels	44
[44.511] Front wheels	44.1
[44.520] Rear wheels	44.2
Tracks and track suspension	48
[48.100] Tracks	48.1
[48.130] Track frame and driving wheels	48.2
[48.134] Track tension units	48.3
[48.138] Track rollers	48.4
Cab climate control	50
[50.100] Heating	50.1
[50.200] Air conditioning	50.2
Electrical systems	55
[55.000] Electrical system	55.1
[55.010] Fuel injection system	55.2
[55.011] Fuel tank system	55.3
[55.012] Engine cooling system	55.4
[55.014] Engine intake and exhaust system	55.5
[55.015] Engine control system	55.6
[55.019] Hydrostatic drive control system	55.7
[55.031] Parking brake electrical system	55.8

[55.036] Hydraulic system control	55.9
[55.050] Heating, Ventilation, and Air-Conditioning (HVAC) control system.....	55.10
[55.100] Harnesses and connectors.....	55.11
[55.302] Battery.....	55.12
[55.404] External lighting	55.13
[55.512] Cab controls.....	55.14
[55.525] Cab engine controls.....	55.15
[55.DTC] FAULT CODES.....	55.16
Front loader and bucket.....	82
[82.100] Arm.....	82.1
[82.300] Bucket.....	82.2
Platform, cab, bodywork, and decals	90
[90.154] Cab doors and hatches	90.1



INTRODUCTION

Foreword - Important notice regarding equipment servicing

C232	NA
C238	NA
L223 TIER 4 [NDM474381 -]	NA
L225	NA
L230	NA

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 information in this manual is up-to-date at the date of the publication. It is the policy of the manufacturer for continuous improvement. Some information could not be updated due to modifications of a technical or commercial type, or changes to the laws and regulations of different countries.

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

Safety rules

C232	NA
C238	NA
L223 TIER 4 [NDM474381 -]	NA
L225	NA
L230	NA

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.

Safety rules - Personal safety

C232	NA
C238	NA
L223	NA
L225	NA
L230	NA

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.



SERVICE MANUAL

Engine

C232 TIER 4 [NDM451672 -]
C238 TIER 4 [NCM425510 -]
L223 TIER 4 [NDM474381 -]
L225 TIER 4 [NDM461085 -]
L230 TIER 4 [NCM449907 -]

Engine - Remove

C232 TIER 4 [NDM451672 -]	NA Mechanical hydraulic controls
C238 TIER 4 [NCM425510 -]	NA Mechanical hydraulic controls
L225 TIER 4 [NDM461085 -]	NA Mechanical hydraulic controls
L230 TIER 4 [NCM449907 -]	NA Mechanical hydraulic controls

⚠ 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. See **Battery - Disconnect (55.302)**.

Prior operation:

Drain the coolant. See **Radiator - Drain fluid (10.400)**.

Prior operation:

Drain the engine oil.

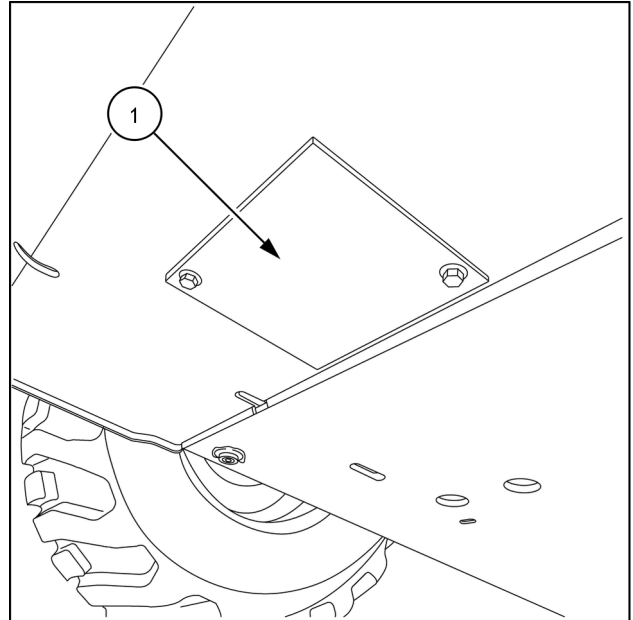
Prior operation:

Remove the rear engine access door. See **Engine inspection door - Remove (90.102)**.

Prior operation:

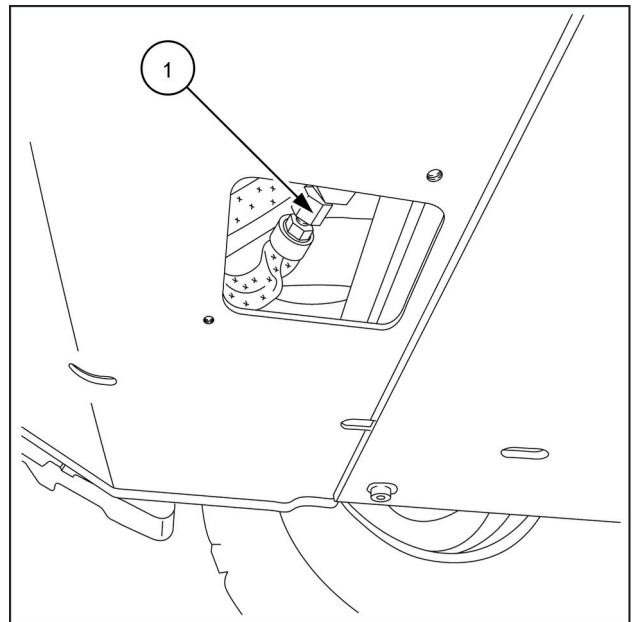
Evacuate the A/C system (if equipped). See **Air conditioning - Evacuate (50.200)**.

1. Remove engine oil pan access plate **(1)**.



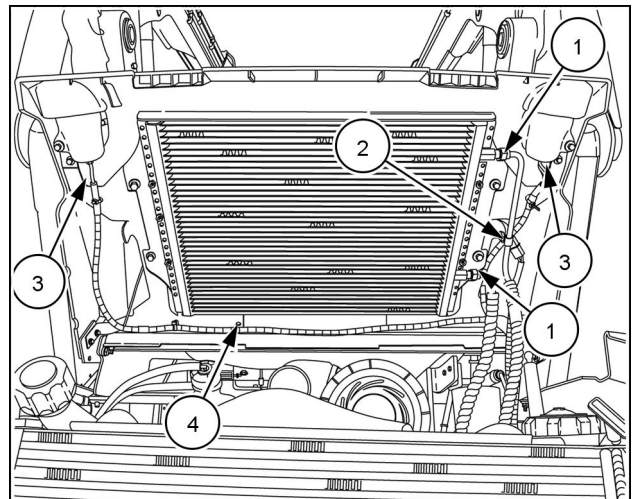
RAPH12SSL0233AA 1

2. Disconnect the remote engine oil filter line **(1)** from the engine oil pan.



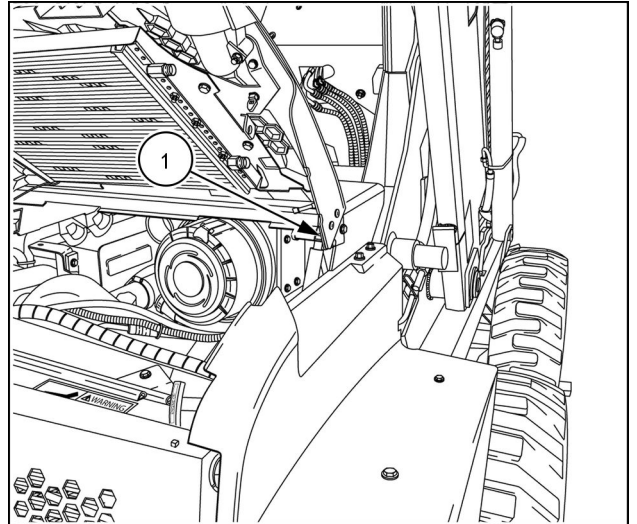
RAPH12SSL0232AA 2

3. Disconnect the tail lights **(3)** and disconnect the tail light electrical harness **(4)** from the engine hood. If equipped with A/C, disconnect the A/C lines **(1)** from the condenser. Disconnect the fan motor electrical connector **(2)**.



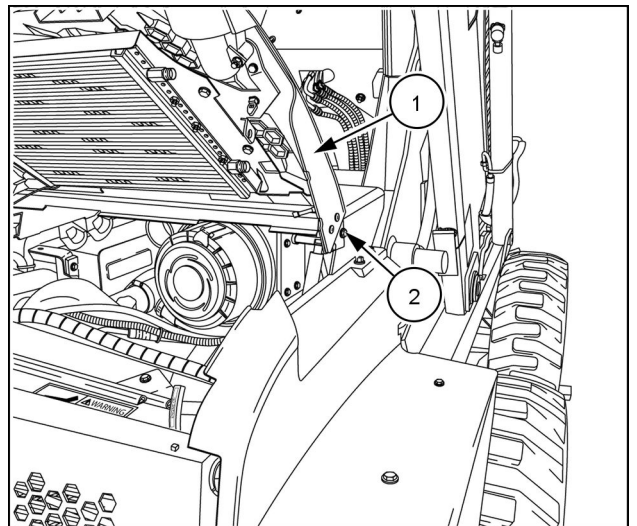
RAPH12SSL0237AA 3

4. Support the engine hood with a suitable lifting device. Disconnect the engine hood strut (1).



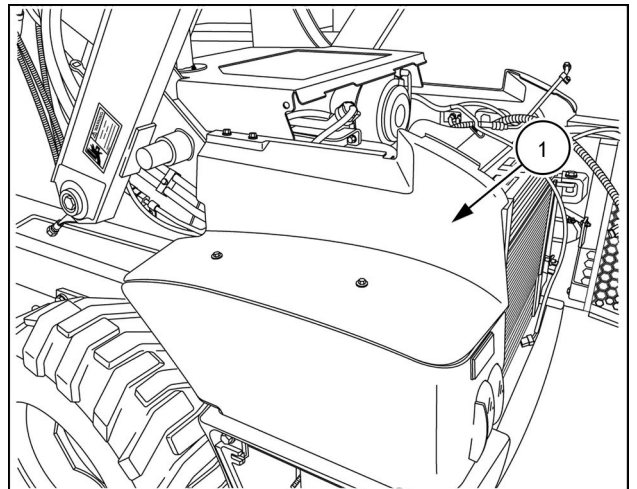
RAPH12SSL0236AA 4

5. Remove the mounting hardware (2), and remove the engine hood (1).



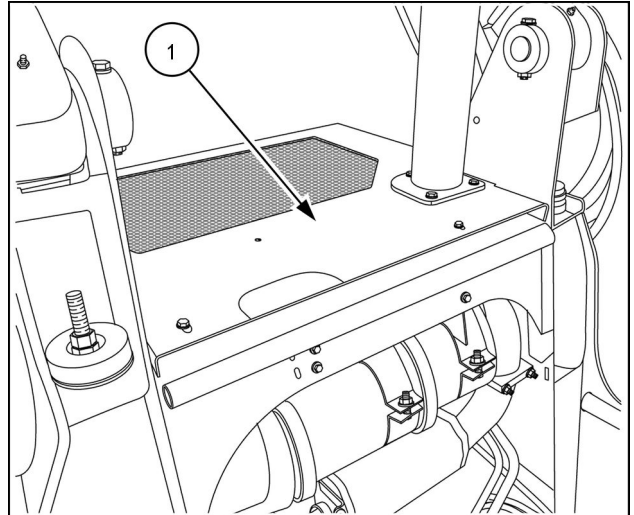
RAPH12SSL0236AA 5

6. Remove the fenders (1).



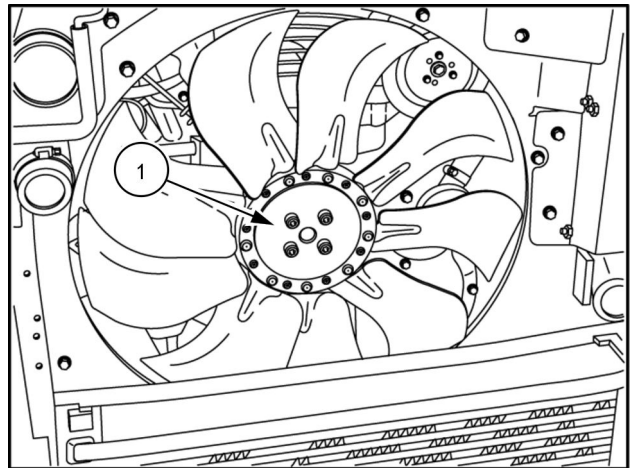
RAPH12SSL0235AA 6

7. Remove the engine cover (1).



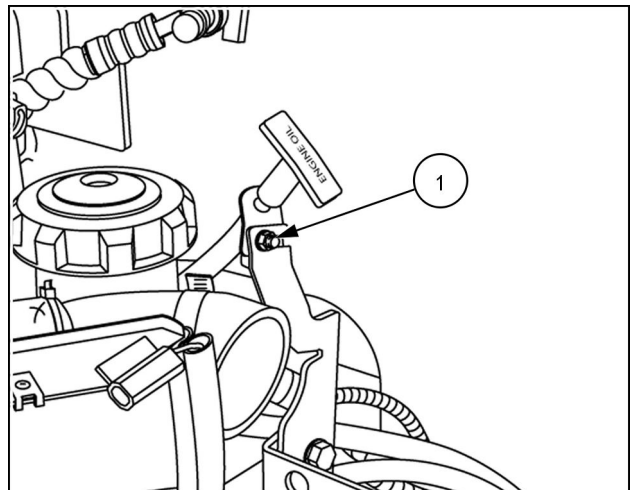
RAPH12SSL0234AA 7

8. Remove the air cooler. See **Aftercooler - Remove (10.310)**.
9. Remove the radiator. See **Radiator - Remove (10.400)**.
10. Remove the radiator fan (1).



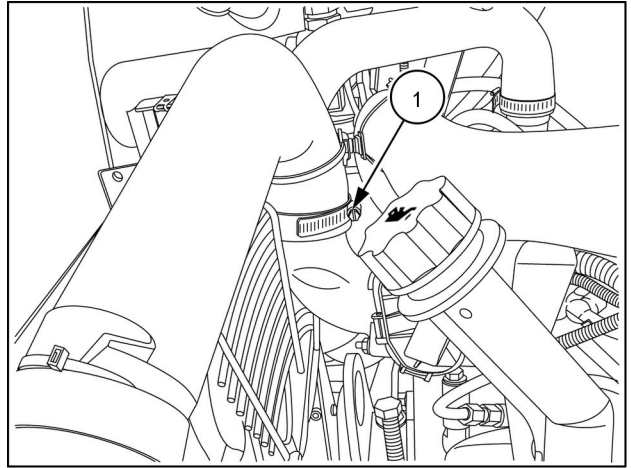
RAPH12SSL0062AA 8

11. Disconnect the dipstick tube (1) from the cooling package bracket assembly.



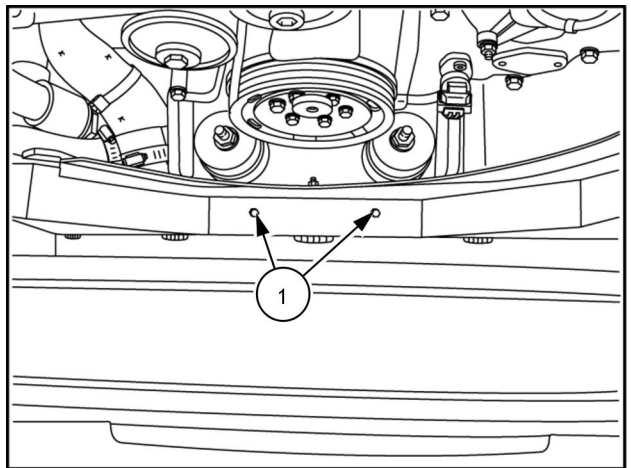
RAPH12SSL0276AA 9

12. Disconnect the intake tube for the air cooler (1).



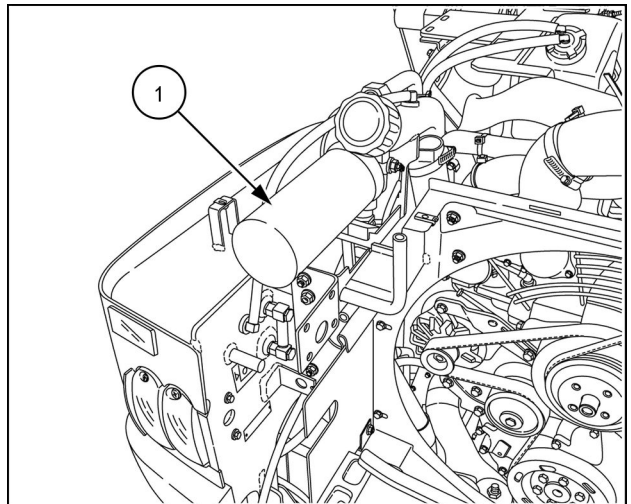
RAPH12SSL0265AA 10

13. Disconnect the lower radiator hose retainers (1) from the cooling package bracket assembly.



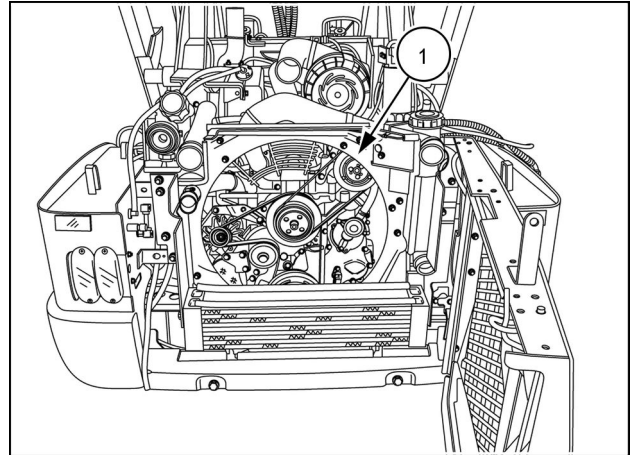
RAPH12SSL0060AA 11

14. Remove the hydraulic oil filter (1).



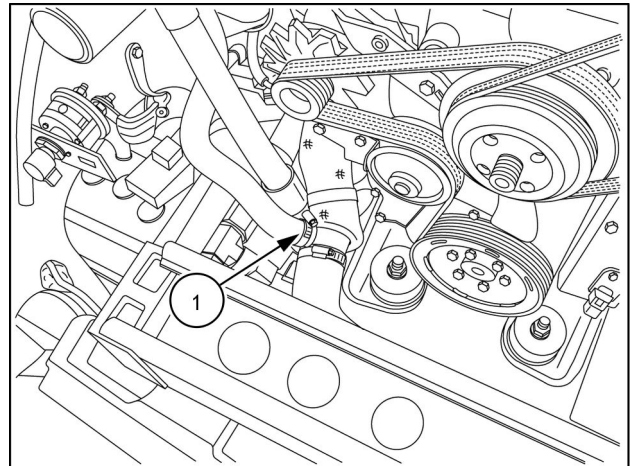
RAPH12SSL0227AA 12

15. Unbolt and remove the cooling package bracket assembly **(1)**.



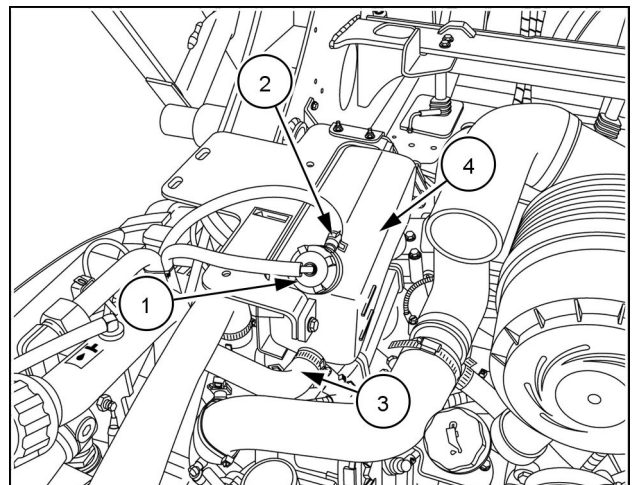
RAPH12SSL0228AA 13

16. Disconnect the overflow hose **(1)** from the lower radiator hose.



RAPH12SSL0059AA 14

17. Remove the deaeration tank cap **(1)**, and disconnect the overflow hose **(2)** and return hose **(3)**. Remove the deaeration tank assembly **(4)**.



RAPH12SSL0225AA 15



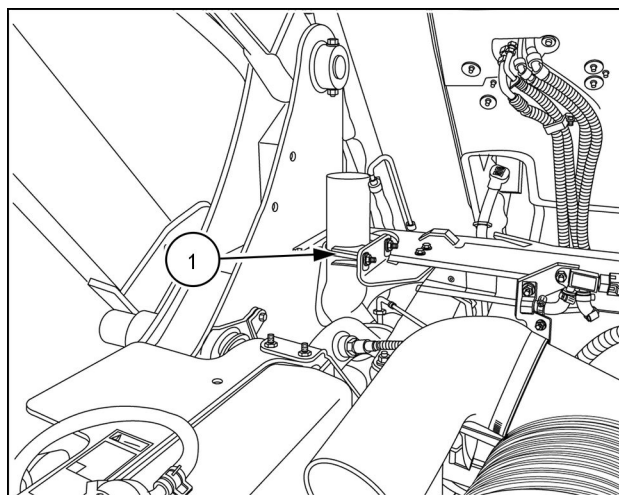
Suggest:

If the above button click is invalid.

Please download this document first, and then click the above link to download the complete manual.

Thank you so much for reading

18. Remove the U bolt **(1)** on the exhaust pipe.

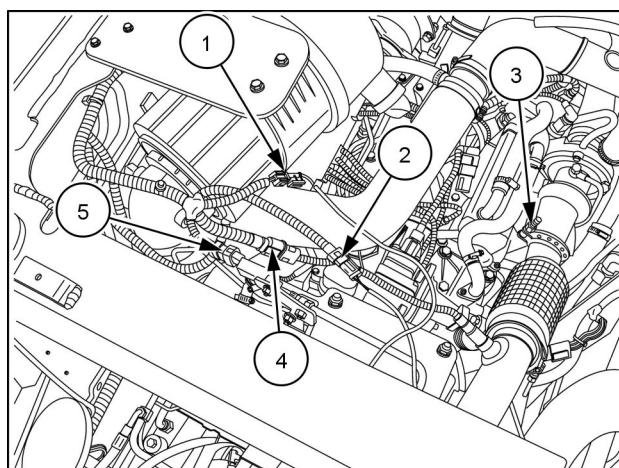


RAPH12SSL0226AA 16

19. Disconnect the following sensors:

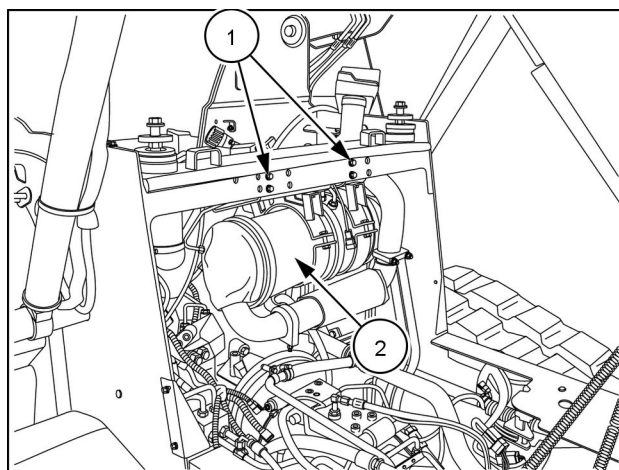
- Diesel particulate filter (DPF) inlet temperature sensor (exhaust gas temp sensor #2) **(1)**
- Diesel oxidation catalyst (DOC) inlet temperature sensor (exhaust gas temp sensor #1) **(2)**
- Heated exhaust gas oxygen sensor (lambda sensor) **(4)**
- DPF pressure sensor **(5)**

20. Remove the exhaust clamp **(3)**.



RAPH12SSL0071AA 17

21. Support the DPF assembly **(2)** with a suitable lifting device. Remove the mounting bolts **(1)**, and remove the DPF assembly **(2)**.



RAPH12SSL0070AA 18

<https://www.ebooklibonline.com>

Hello dear friend!

Thank you very much for reading.

Enter the link into your browser.

The full manual is available for immediate download.

<https://www.ebooklibonline.com>