

**OPTUM® 270 CVX
OPTUM® 300 CVX
TIER 4B (FINAL)
Tractor**

PIN ZFEM50001 and above

SERVICE MANUAL

Part number 48193160

English

November 2017

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CASE II
AGRICULTURE

Link Product / Engine

Product	Market Product	Engine
OPTUM® 270 CVX - [ZFEM50001 - ZGEM50841]	Middle East Africa	F4DFE617M*B001
OPTUM® 270 CVX - [ZGEM50842 - ZGEM51829]	Middle East Africa	F4DFE617M*B001
OPTUM® 270 CVX - [ZGEM51830 -]	Middle East Africa	F4DFE617M*B001
OPTUM® 300 CVX - [ZFEM50001 - ZGEM50841]	Middle East Africa	F4DFE617L*B002
OPTUM® 300 CVX - [ZGEM50842 - ZGEM51829]	Middle East Africa	F4DFE617L*B002
OPTUM® 300 CVX - [ZGEM51830 -]	Middle East Africa	F4DFE617L*B002

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INTRODUCTION

Foreword - How to use and navigate through this manual

This manual has been produced by a new technical information system. This new system is designed to deliver technical information electronically through web delivery (eTIM), DVD, and paper manuals. A coding system called SAP has been developed to link the technical information to other Product Support functions, e.g., Warranty.

Technical information is written to support the maintenance and service of the functions or systems on a customer's machine. When a customer has a concern on their machine it is usually because a function or system on their machine is not working at all, is not working efficiently, or is not responding correctly to their commands. When you refer to the technical information in this manual to resolve that customer's concern, you will find all the information classified using the SAP coding, according to the functions or systems on that machine. Once you have located the technical information for that function or system, you will then find all the mechanical, electrical or hydraulic devices, components, assemblies, and sub assemblies for that function or system. You will also find all the types of information that have been written for that function or system: the technical data (specifications), the functional data (how it works), the diagnostic data (fault codes and troubleshooting), and the service data (remove, install adjust, etc.).

By integrating SAP coding into technical information, you will be able to search and retrieve just the right piece of technical information you need to resolve that customer's concern on his machine. This is made possible by attaching 3 categories to each piece of technical information during the authoring process.

The first category is the Location, the second category is the Information Type and the third category is the Product:

- LOCATION - the component or function on the machine, that the piece of technical information is going to describe (e.g., Fuel tank).
- INFORMATION TYPE - the piece of technical information that has been written for a particular component or function on the machine (e.g., Capacity would be a type of Technical Data describing the amount of fuel held by the fuel tank).
- PRODUCT - the model for which the piece of technical information is written.

Every piece of technical information will have those three categories attached to it. You will be able to use any combination of those categories to find the right piece of technical information you need to resolve that customer's concern on their machine.

That information could be:

- the procedure for how to remove the cylinder head
- a table of specifications for a hydraulic pump
- a fault code
- a troubleshooting table
- a special tool

Manual content

This manual is divided into Sections. Each Section is then divided into Chapters. Contents pages are included at the beginning of the manual, then inside every Section and inside every Chapter. An alphabetical Index is included at the end of each Chapter. Page number references are included for every piece of technical information listed in the Chapter Contents or Chapter Index.

Each Chapter is divided into four Information types:

- Technical Data (specifications) for all the mechanical, electrical or hydraulic devices, components, assemblies or sub-assemblies.
- Functional Data (how it works) for all the mechanical, electrical or hydraulic devices, components, assemblies or sub-assemblies.
- Diagnostic Data (fault codes, electrical and hydraulic troubleshooting) for all the mechanical, electrical or hydraulic devices, components, assemblies or sub-assemblies.
- Service Data (remove disassemble, assemble, install) for all the mechanical, electrical or hydraulic devices, components, assemblies or sub-assemblies.

Sections

Sections are grouped according to the main functions or a systems on the machine. Each Section is identified by a number (00, 35, 55, etc.). The Sections included in the manual will depend on the type and function of the machine that the manual is written for. Each Section has a Contents page listed in alphabetic/numeric order. This table illustrates which Sections could be included in a manual for a particular product.

SECTION	PRODUCT				
	Tractors				
	Vehicles with working arms: backhoes, excavators, skid steers,				
	Combines, forage harvesters, balers,				
	Seeding, planting, floating, spraying equipment,				
	Mounted equipment and tools,				
00 - Maintenance	X	X	X	X	X
05 - Machine completion and equipment	X	X	X	X	X
10 - Engine	X	X	X	X	
14 - Main gearbox and drive	X	X	X	X	
18 - Clutch	X	X	X		
21 - Transmission	X	X	X	X	
23 - Four wheel drive (4WD) system	X	X	X	X	
25 - Front axle system	X	X	X	X	
27 - Rear axle system	X	X	X	X	
29 - Hydrostatic drive	X	X	X	X	
31 - Power Take-Off (PTO)	X		X		
33 - Brakes and controls	X	X	X	X	
35 - Hydraulic systems	X	X	X	X	
36 - Pneumatic system	X	X	X	X	
37 - Hitches, drawbars and implement couplings	X		X	X	
39 - Frames and ballasting	X	X	X	X	X
41 - Steering	X	X	X	X	
44 - Wheels	X	X	X	X	
46 - Steering clutches					
48 - Tracks and track suspension	X	X	X		
50 - Cab climate control	X	X	X	X	
55 - Electrical systems	X	X	X	X	X
56 - Grape harvester shaking					
58 - Attachments/headers			X		
60 - Product feeding			X		

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61 - Metering system				X	
62 - Pressing - Bale formation			X		
63 - Chemical applicators				X	
64 - Chopping			X		
66 - Threshing			X		
68 - Tying/Wrapping/Twisting			X		
69 - Bale wagons					
70 - Ejection			X		
71 - Lubrication system	X	X	X	X	X
72 - Separation			X		
73 - Residue handling			X		
74 - Cleaning			X		
75 - Soil preparation/Finishing					
76 - Secondary cleaning / Destemmer					
77 - Seeding				X	
78 - Spraying				X	
79 - Planting				X	
80 - Crop storage / Unloading			X		
82 - Front loader and bucket	X	X			
83 - Telescopic single arm	X	X			
84 - Booms, dippers and buckets	X	X			
86 - Dozer blade and arm	X	X			
88 - Accessories	X	X	X	X	X
89 - Tools	X	X	X	X	X
90 - Platform, cab, bodywork and decals	X	X	X	X	

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Engine - 10

Engine and crankcase - 001

OPTUM® 270 CVX - [ZFEM50001 - ZGEM50841], OPTUM® 270 CVX - [ZGEM50842 - ZGEM51829], OPTUM® 270 CVX - [ZGEM51830 -], OPTUM® 300 CVX - [ZFEM50001 - ZGEM50841], OPTUM® 300 CVX - [ZGEM50842 - ZGEM51829], OPTUM® 300 CVX - [ZGEM51830 -]

Engine - Remove

Prior operation:

Separate the front axle and front frame from the engine, see **Front frame - Remove (39.100)**.

Prior operation:

Remove the left-hand fuel tank, see **Fuel tank - Remove (10.216)**.

Prior operation:

Remove the selective catalytic reduction (SRC) muffler, see **Selective Catalytic Reduction (SCR) muffler and catalyst - Remove (10.500)**.

Prior operation:

Remove the engine hood, see **Hood - Remove (90.100)**.

⚠ 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

⚠ WARNING

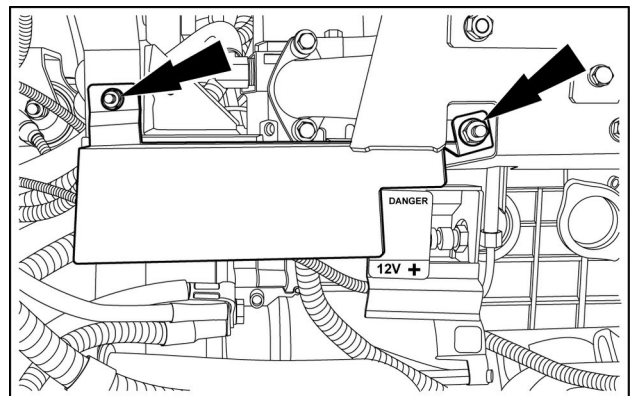
Avoid injury!

Handle all parts carefully. Do not place your hands or fingers between parts. Use Personal Protective Equipment (PPE) as indicated in this manual, including protective goggles, gloves, and safety footwear.

Failure to comply could result in death or serious injury.

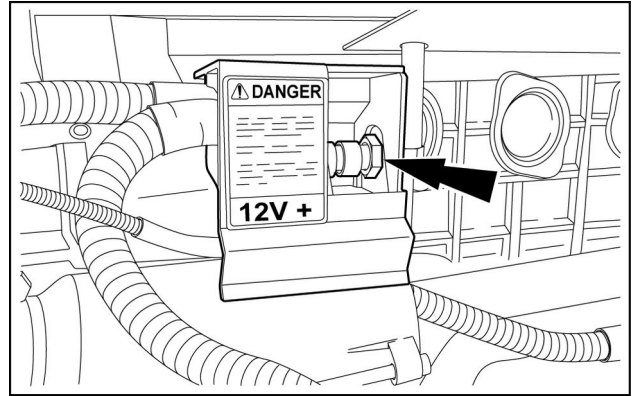
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1. Remove the starter motor shield.



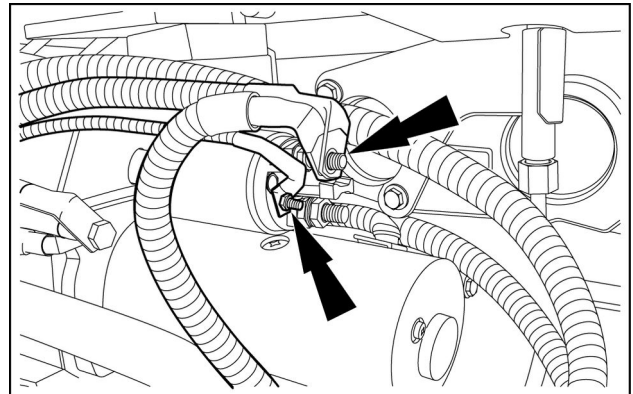
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2. Remove the positive cable cover.



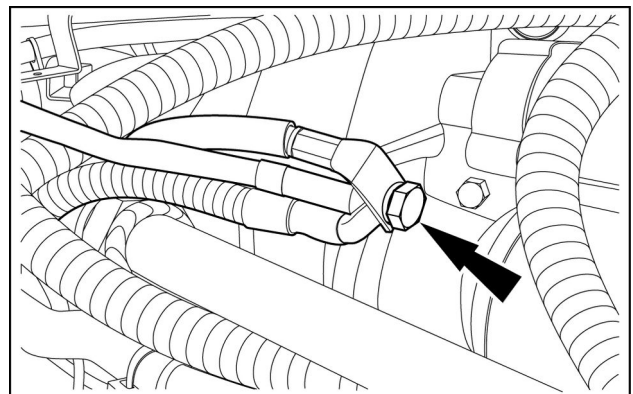
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3. Disconnect the positive connectors.



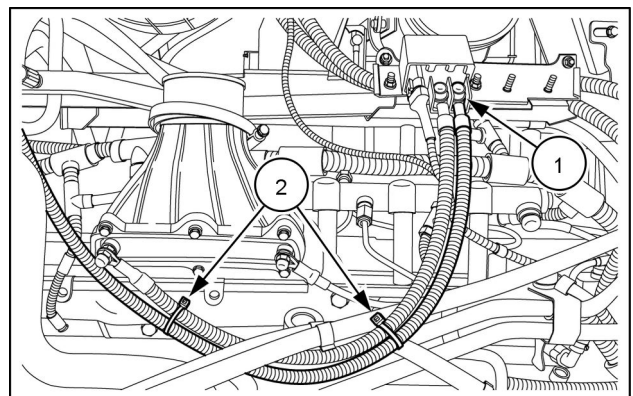
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4. Disconnect the ground connectors.



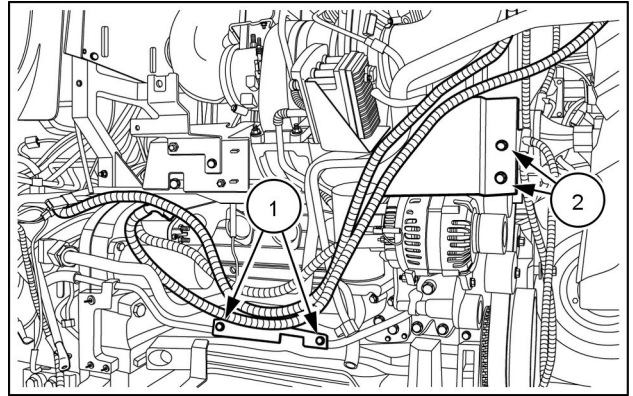
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5. • Disconnect the grid heater relay electrical connector (1).
• Cut the cable ties (2).



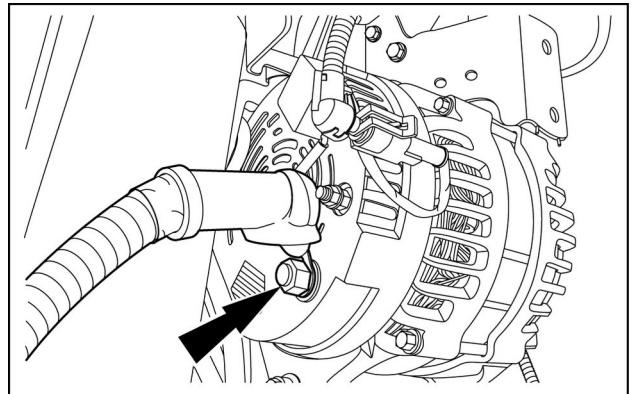
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6. • Detach the wiring harness retaining bracket (1).
• Detach the fuse box (2).



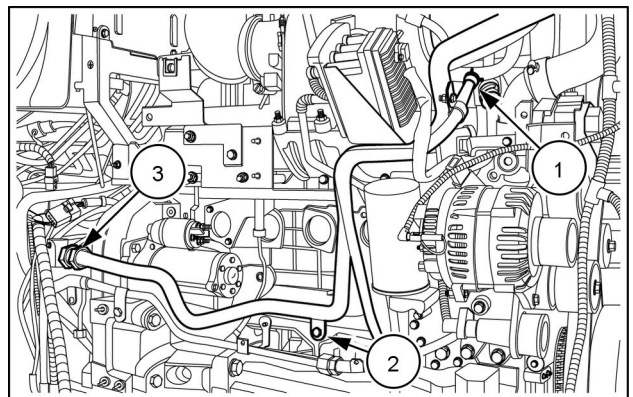
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7. Disconnect the alternator positive cable.



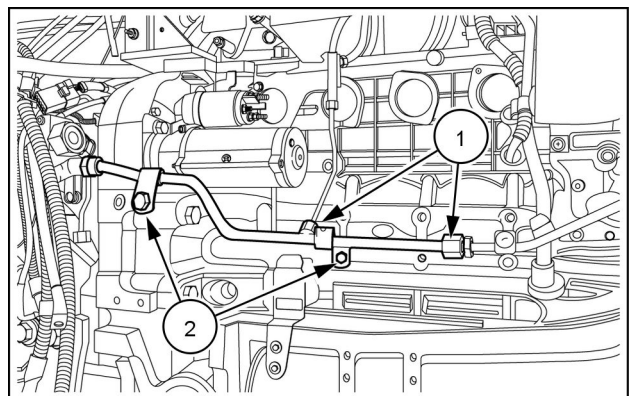
BAIL15TR00880AA 7

8. • Disconnect the compressor coolant hose (1).
• Detach the oil cooler pipe retaining bracket (2).
• Disconnect the oil cooler pipe (3).



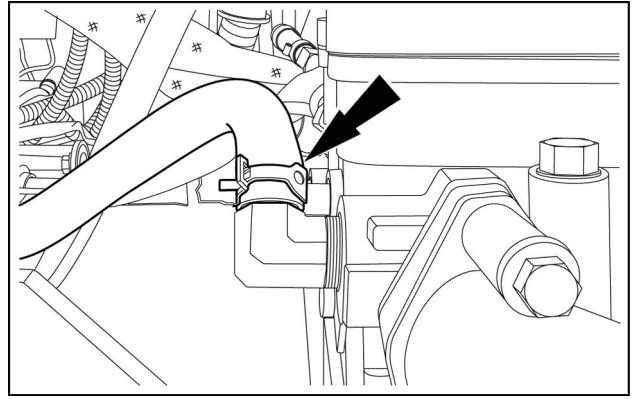
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9. 1. Disconnect the coolant pipe connectors (1).
2. Detach the coolant pipe retaining brackets (2).



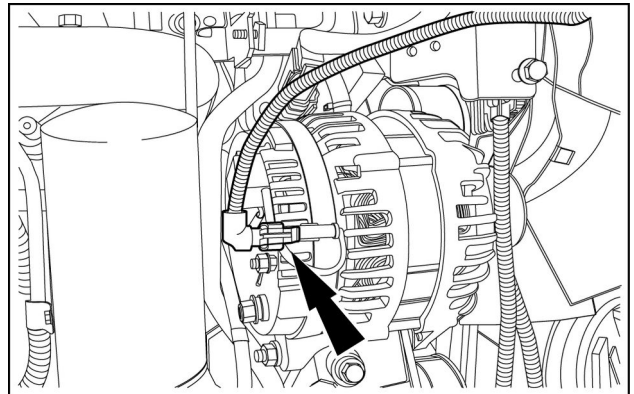
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10. Disconnect the coolant hose from the rear of the cylinder head.



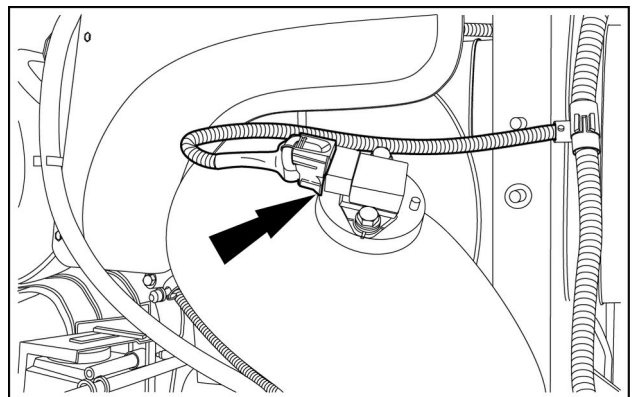
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11. Disconnect the alternator electrical connector.



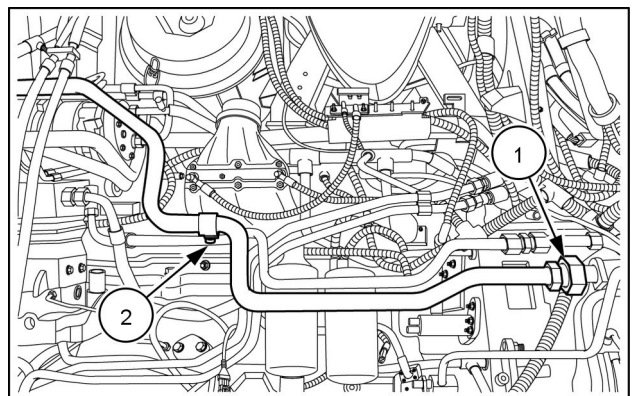
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12. Disconnect the air intake sensor electrical connector.



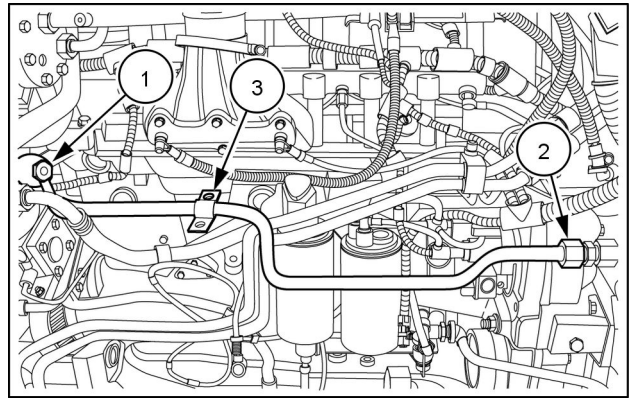
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13. Remove the left-hand oil cooler pipe:
 - A. Disconnect the hydraulic pipe (1).
 - B. Detach the hydraulic pipe retaining bracket (2).



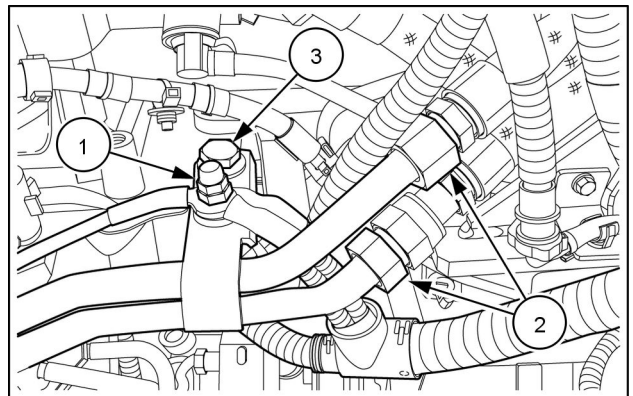
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14. Remove the air compressor outlet pipe:
- A. Disconnect the air compressor banjo connector **(1)**.
 - B. Disconnect the in-line connector **(2)**.
 - C. Detach the pipe retaining bracket **(3)**.



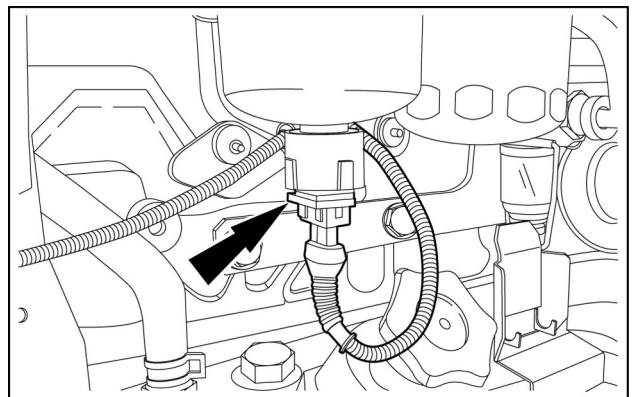
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15. 1. Disconnect the ground connections **(1)**.
2. Disconnect the steering motor hoses **(2)**.
3. Detach the steering pipe retaining bracket **(3)**.



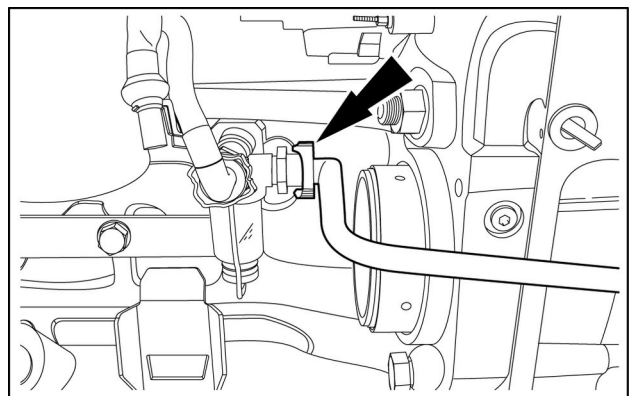
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16. Disconnect the water in fuel sensor electrical connector.



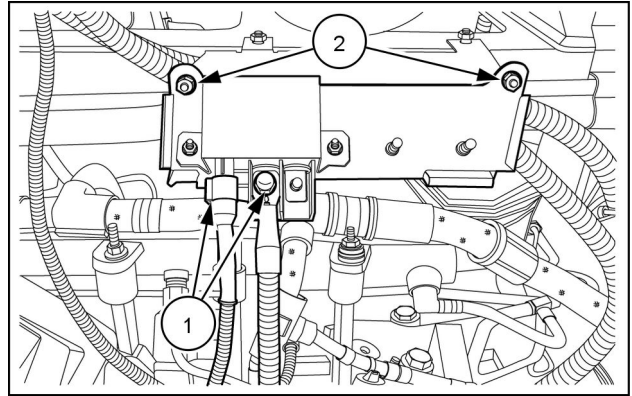
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17. Disconnect the fuel line from the water trap.



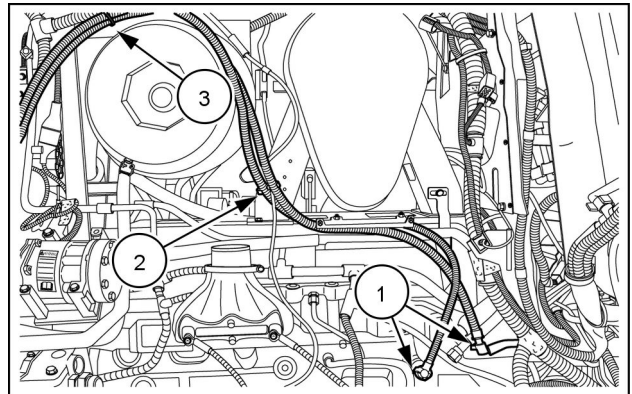
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18. 1. Disconnect the grid heater relay electrical connectors (1).
2. Detach the grid heater relay bracket (2).



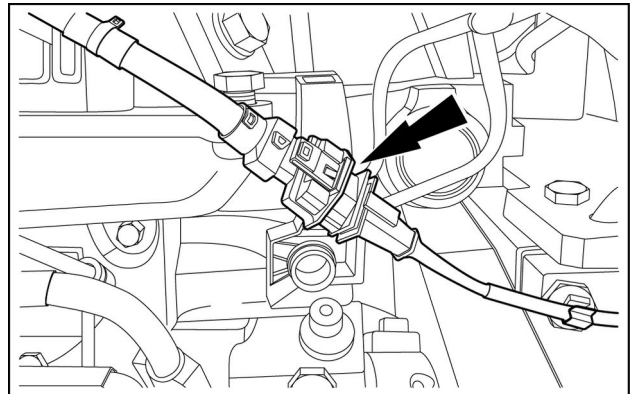
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19. Remove the fuel lines:
 - Disconnect the in-line connectors (1).
 - Detach the fuel lines from the clips (2).
 - Cut the cable tie (3).



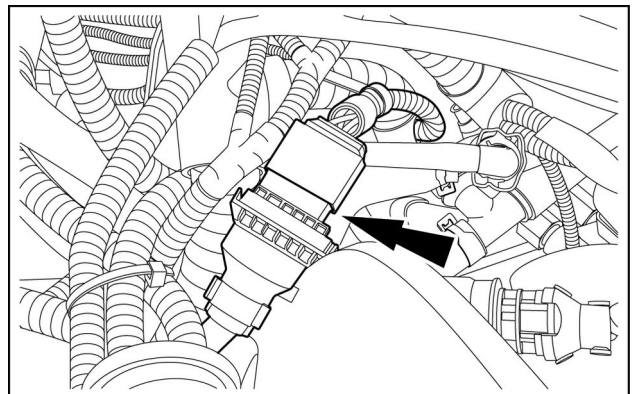
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20. Disconnect the flywheel speed sensor electrical connector.



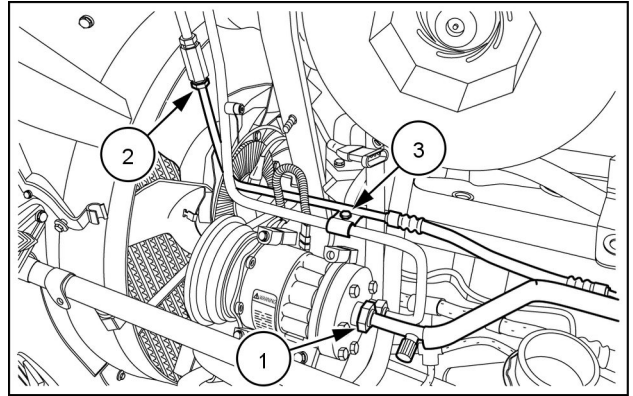
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21. Disconnect the engine wiring harness in-line electrical connector.



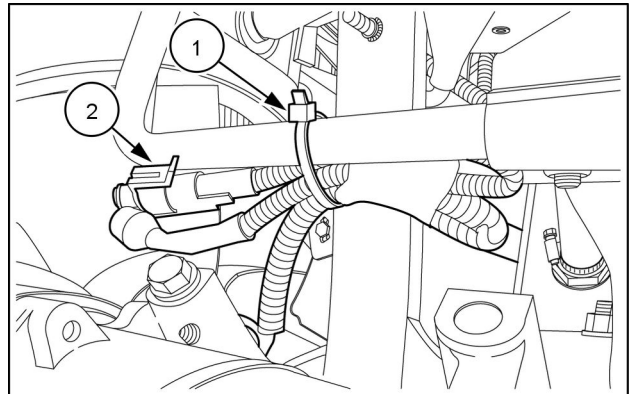
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22. 1. Disconnect the A/C compressor return pipe (1).
2. Disconnect the A/C high pressure pipe in-line connector (2).
3. Detach the A/C pipe retaining bracket (3).



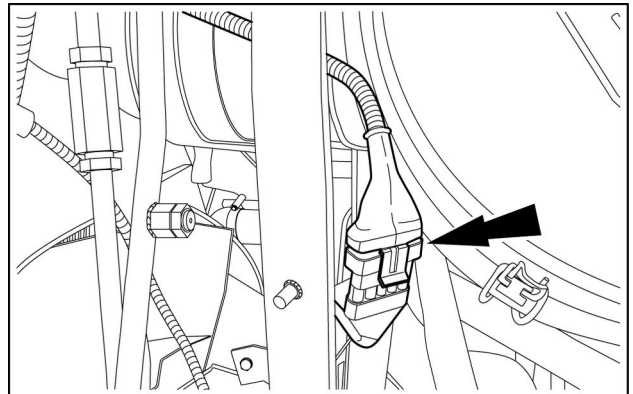
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23. 1. Cut the cable tie (1).
2. Disconnect the A/C compressor clutch electrical connector (2).



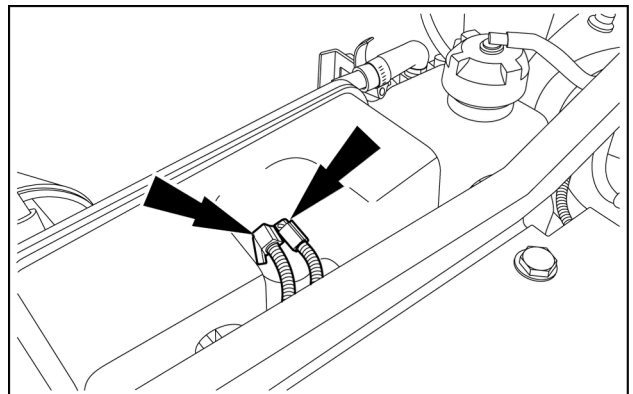
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24. Disconnect the viscous fan electrical connector.



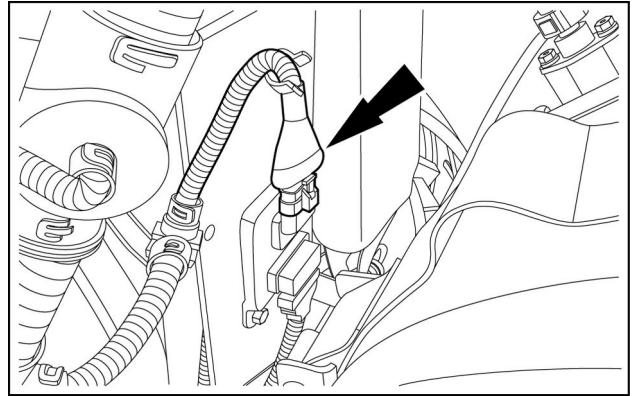
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25. Disconnect the coolant expansion tank electrical connectors.



BAIL15TR00894AA 25

26. Disconnect the NO_x sensor module electrical connector.



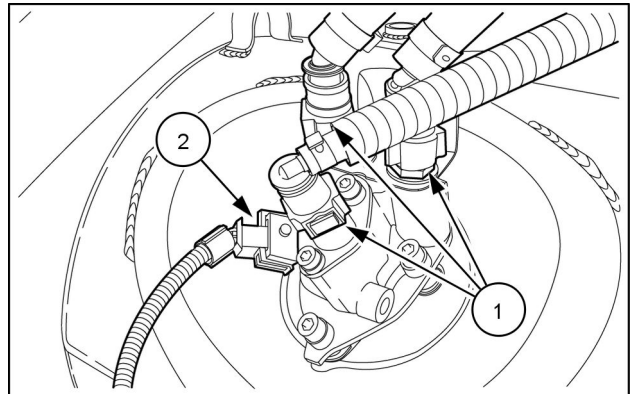
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27. 1. Disconnect the **DIESEL EXHAUST FLUID (DEF)/ AdBLUE®** dosing module lines (1).

NOTE: Seal all openings with clean blanking plugs.

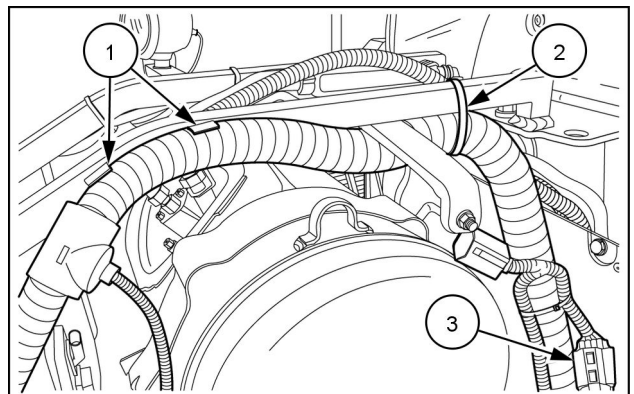
2. Disconnect the **DEF/AdBLUE®** dosing module electrical connector (2).

NOTICE: Avoid **DEF/AdBLUE®** contamination of the electrical connector by disconnecting the **DEF/AdBLUE®** connectors first.



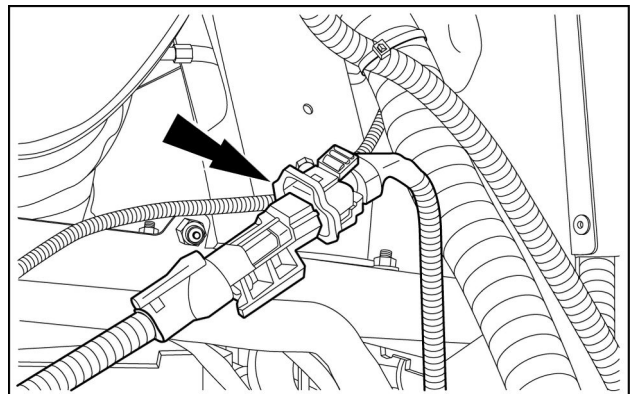
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28. • Detach the wiring harness (1).
• Cut the cable tie (2).
• Disconnect the in-line electrical connector (3).



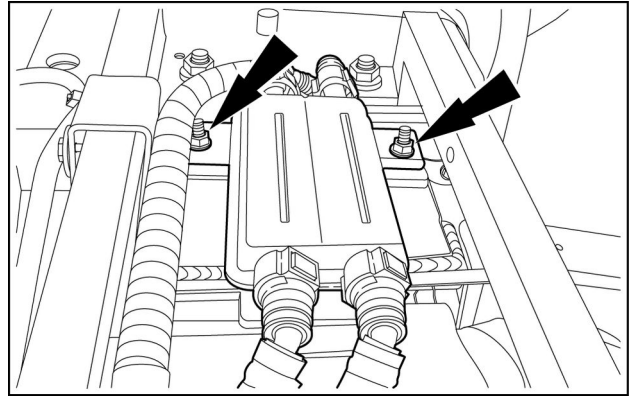
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29. Disconnect the Diesel Oxidation Catalyst (DOC) temperature sensor electrical connector.



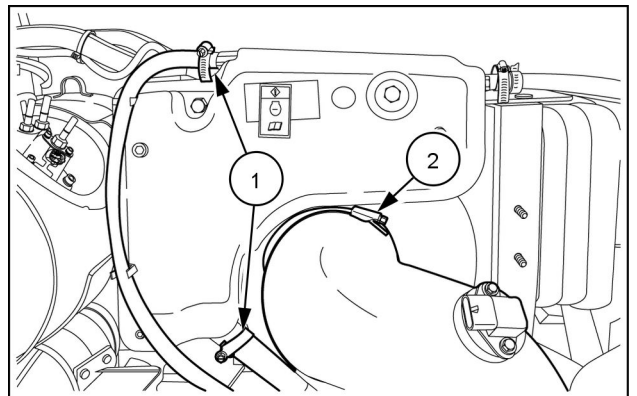
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30. Detach the reservoir mounting bracket.



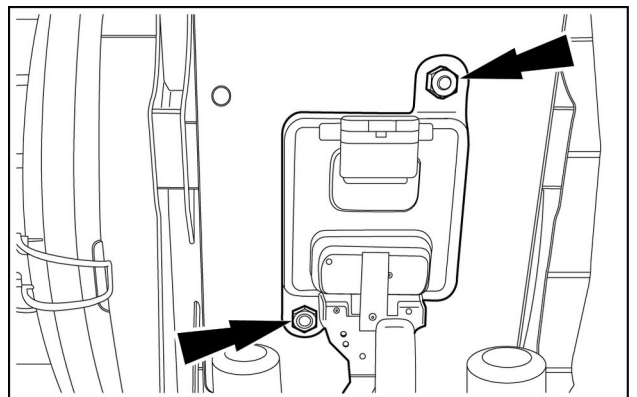
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31. • Disconnect the coolant expansion tank hoses (1).
• Disconnect the air filter outlet pipe (2).



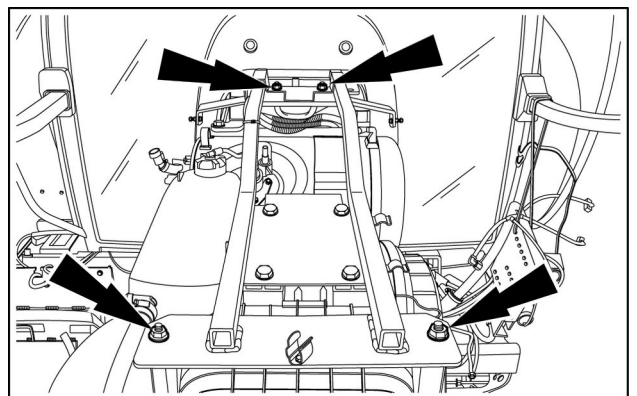
BAIL15TR00966AA 31

32. Detach the NO_x module.



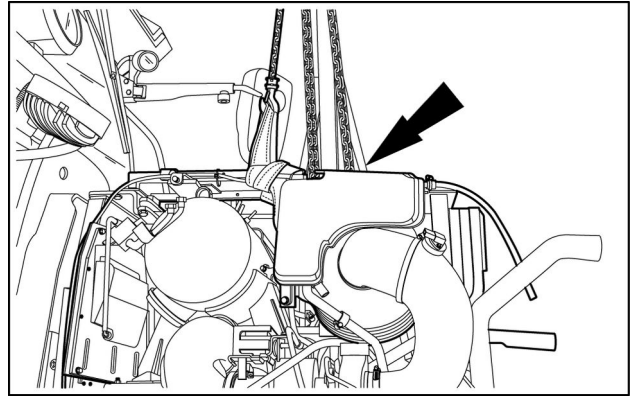
BAIL15TR00969AA 32

33. Remove the air filter frame retaining nuts.



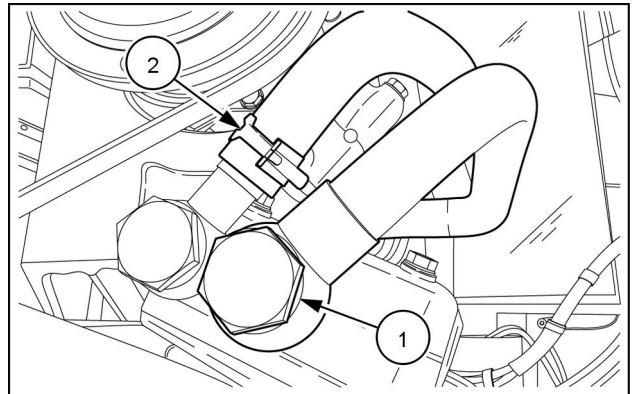
BAIL15TR00967AA 33

34. Using suitable lifting equipment, remove the air filter and frame.



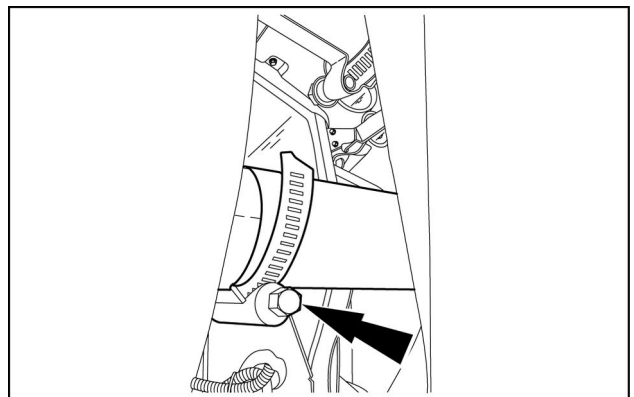
BAIL15TR00968AA 34

35. • Disconnect the air compressor banjo connector (1).
• Disconnect the air compressor coolant hose (2).



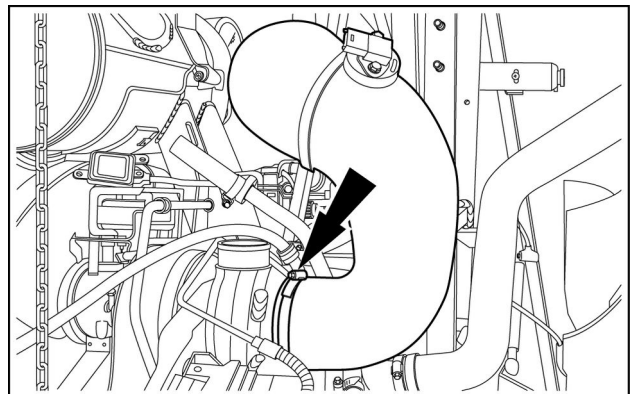
BAIL15TR00970AA 35

36. Disconnect the engine breather outlet hose.



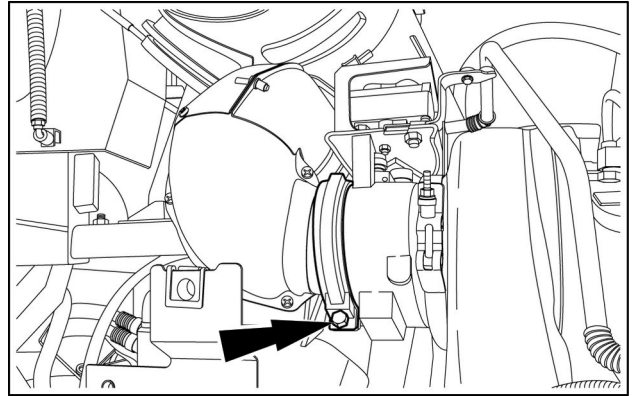
BAIL15TR00972AA 36

37. Remove the air intake pipe.



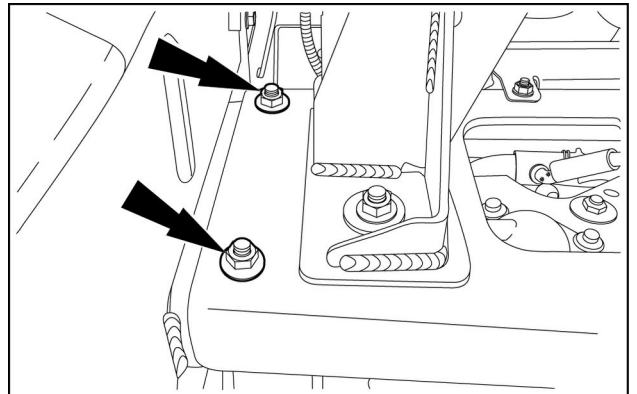
BAIL15TR00971AA 37

38. Disconnect the turbo outlet pipe.



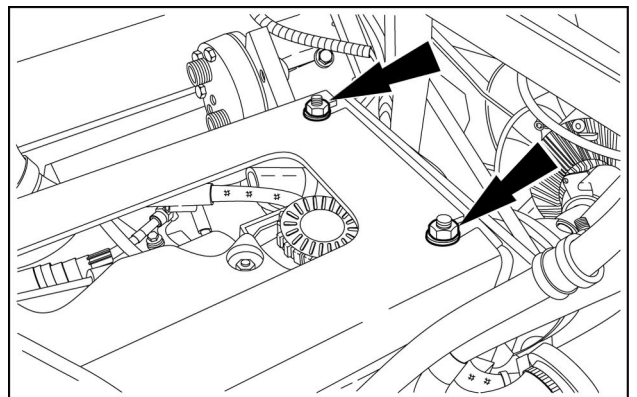
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39. Remove the engine upper frame rear retaining nuts.



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40. Remove the engine upper frame front retaining nuts.



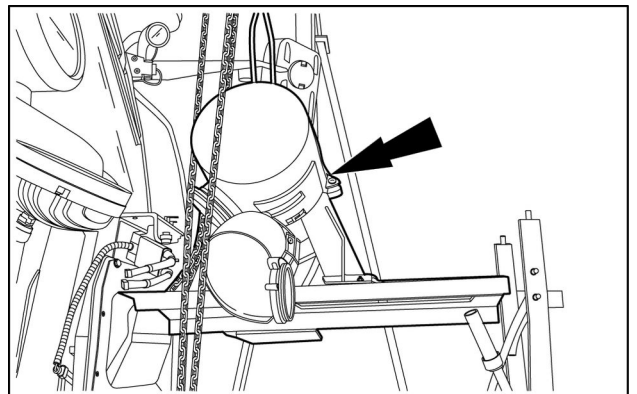
BAIL15TR00975AA 40

41. **⚠ WARNING**

Avoid injury!
The component is heavy. Removal/installation requires two persons or a lifting device.
Failure to comply could result in death or serious injury.

W1141A

Using suitable lifting equipment, remove the engine upper frame and DOC.



BAIL15TR00976AA 41



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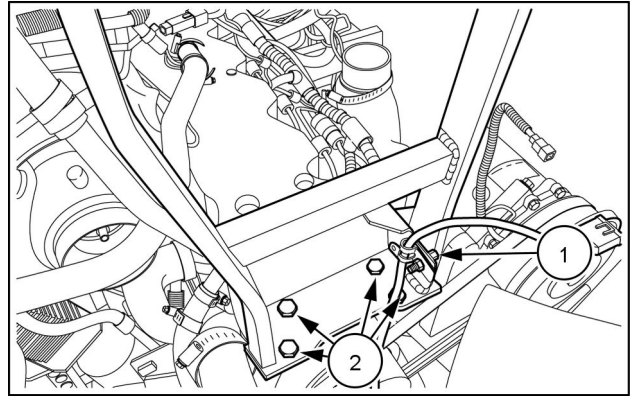
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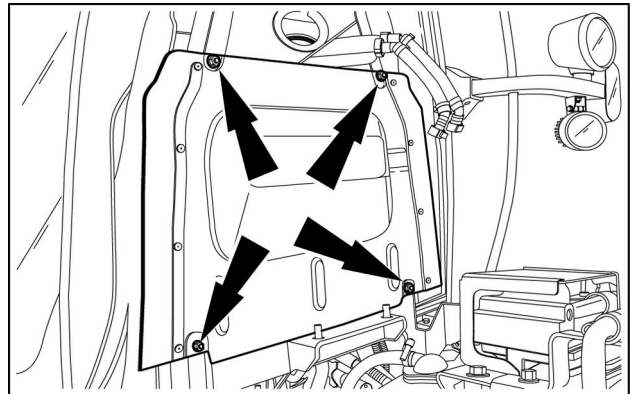
42. Remove the front frame:

- A. Detach the viscous fan wiring harness (1).
- B. Remove the front frame retaining bolts (2).



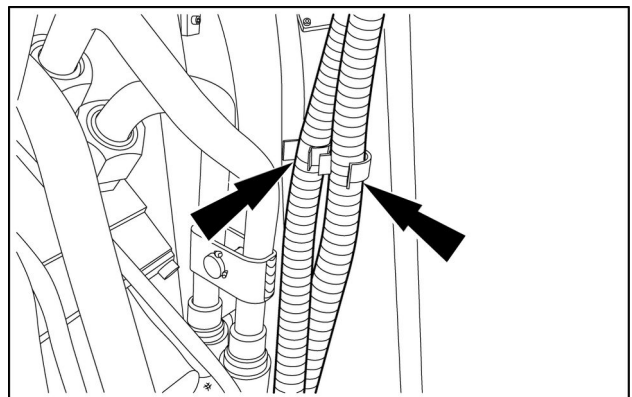
BAIL15TR00977AA 42

43. Remove the rear frame cover plate.



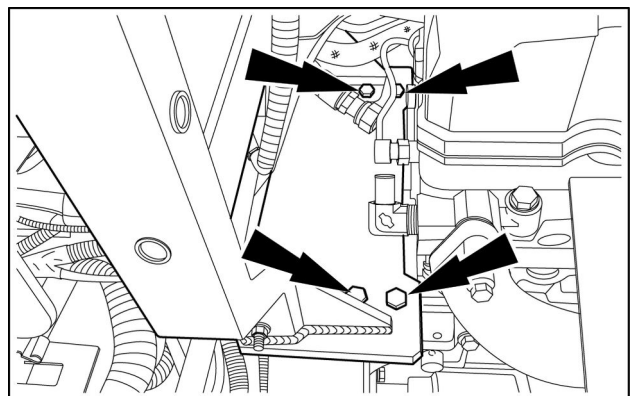
BAIL15TR00978AA 43

44. Detach the coolant hoses.



BAIL15TR00980AA 44

45. Remove the rear frame retaining bolts.



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