

# SERVICE MANUAL

**W130D**  
**W170D**  
**Tier 2**  
Wheel Loader

Part number 48083744

English  
July 2018





# **SERVICE MANUAL**

**W130 D ZBAR, NEW CAB - EH, TIER2  
W170 D ZBAR, NEW CAB - EH, TIER2**

# Link Product / Engine

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<b>Product</b>	<b>Market Product</b>	<b>Engine</b>
W130 D ZBAR, NEW CAB - EH, TIER2	Middle East Africa	F4HFE613W*B002
W130 D ZBAR, NEW CAB - EH, TIER2	Australia New Zealand	F4HFE613W*B002
W130 D ZBAR, NEW CAB - EH, TIER2	Asia Pacific	F4HFE613W*B002
W130 D ZBAR, NEW CAB - EH, TIER2	Latin America	F4HFE613W*B002
W170 D ZBAR, NEW CAB - EH, TIER2	Latin America	F4HFA613F*E002
W170 D ZBAR, NEW CAB - EH, TIER2	Middle East Africa	F4HFA613F*E002

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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**

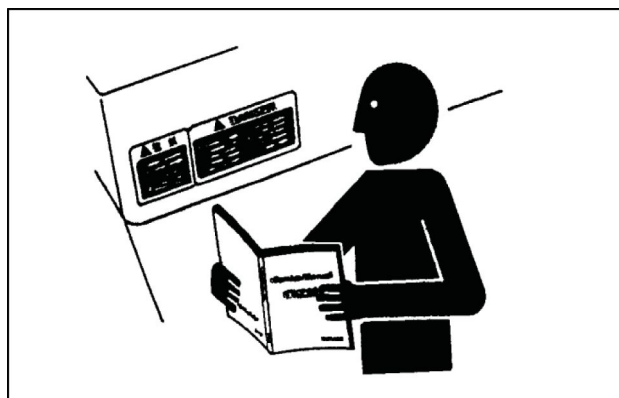
**Unexpected movement!**

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

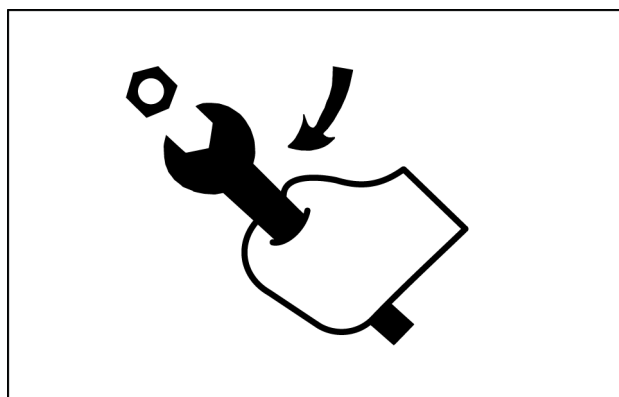
**Failure to comply will result in death or serious injury.**

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.



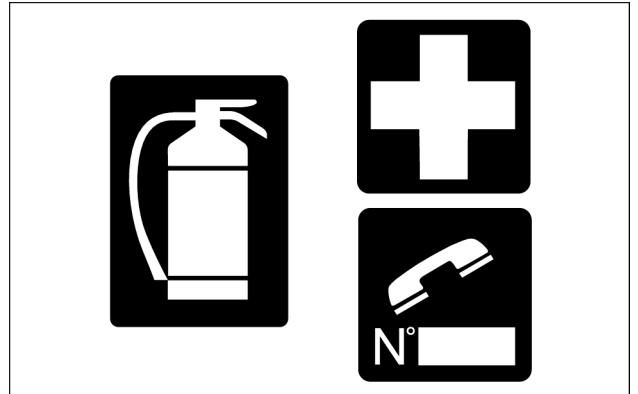
TULI12WEX2004AA 1



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.



SMIL12WEX0174AA 3

## Equipment

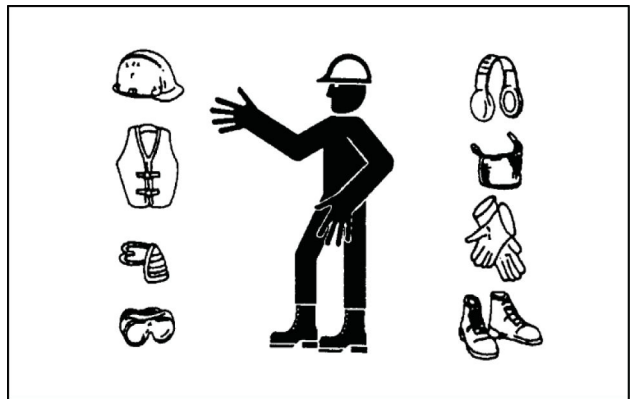
Wear close fitting clothing and safety equipment appropriate for the job:

- 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

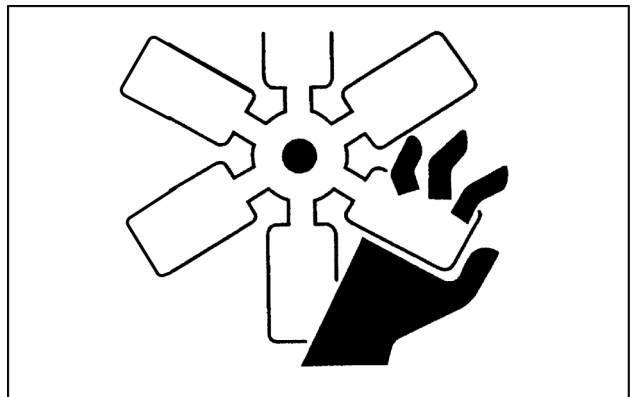
## Engine - Radiator

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



# **SERVICE MANUAL**

## **Engine**

**W130 D ZBAR, NEW CAB - EH, TIER2  
W170 D ZBAR, NEW CAB - EH, TIER2**

## Engine - General specification

W130 D ZBAR, NEW CAB - EH, TIER2 | ANZ --- APAC --- LA --- MEA

Engine with 4 Speed Transmission	
A. Low idle	<b>870 RPM to 930 RPM</b>
Alternate low idle	<b>670 RPM to 730 RPM</b>
Alternate accelerated idle	<b>1270 RPM to 1330 RPM</b>
Working idle (setting from factory)	<b>870 RPM to 930 RPM</b>
B. Maximum No Load RPM	<b>2095 RPM to 2225 RPM</b>
C. Converter Stall	<b>1975 RPM to 2125 RPM</b>
D. Hydraulic Stall	<b>1895 RPM to 2205 RPM</b>
E. Converter & Hydraulic Stall	<b>1455 RPM to 1765 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 with transmission in manual mode and in 3rd gear.

## Engine - General specification

W170 D ZBAR, NEW CAB - EH, TIER2 | ANZ --- APAC --- LA --- MEA

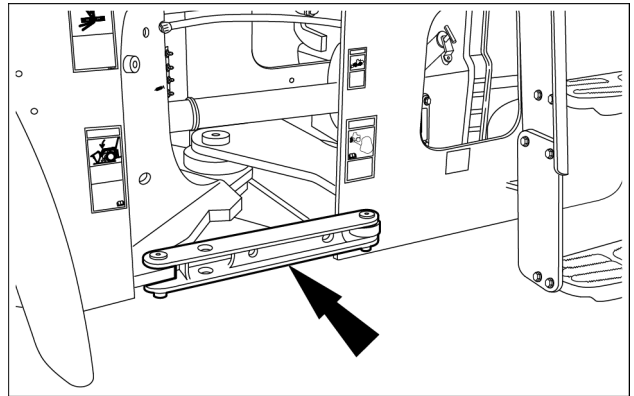
Engine with 4 Speed Transmission	
A. Low idle	<b>870 RPM to 930 RPM</b>
Alternate low idle	<b>670 RPM to 730 RPM</b>
Alternate accelerated idle	<b>1270 RPM to 1330 RPM</b>
Working idle (setting from factory)	<b>870 RPM to 930 RPM</b>
B. Maximum No Load RPM	<b>2100 RPM to 2185 RPM</b>
C. Converter Stall	<b>1893 RPM to 2093 RPM</b>
D. Hydraulic Stall	<b>1923 RPM to 2123 RPM</b>
E. Converter & Hydraulic Stall	<b>1500 RPM to 1700 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>

Engine with 5 Speed Transmission	
A. Low idle	<b>870 RPM to 930 RPM</b>
Alternate low idle	<b>670 RPM to 730 RPM</b>
Alternate accelerated idle	<b>1270 RPM to 1330 RPM</b>
Working idle (setting from factory)	<b>870 RPM to 930 RPM</b>
B. Maximum No Load RPM	<b>2100 RPM to 2185 RPM</b>
C. Converter Stall	<b>1748 RPM to 1948 RPM</b>
D. Hydraulic Stall	<b>1987 RPM to 2187 RPM</b>
E. Converter & Hydraulic Stall	<b>1413 RPM to 1613 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 with transmission in manual mode and in 3rd gear.

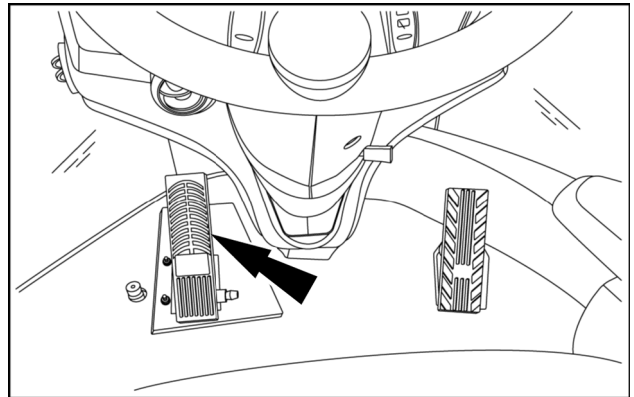
## Engine - Remove

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



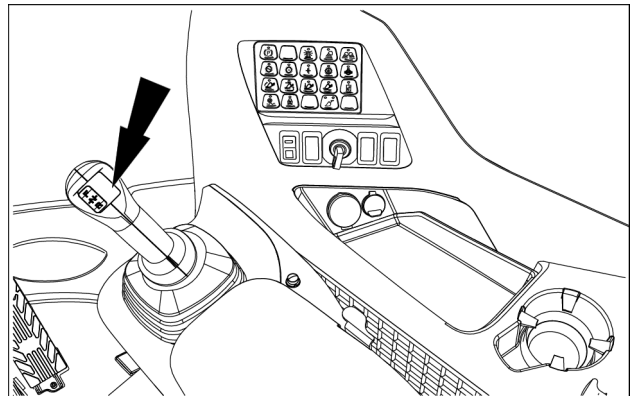
LEIL16WHL0048AB 1

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



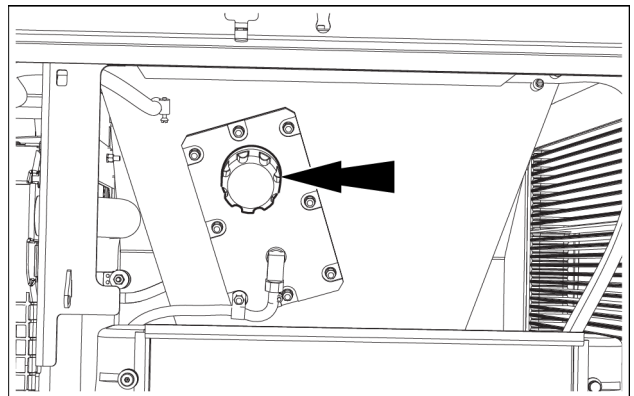
LEIL15WHL0564AA 2

3. Put the key switch to ON position. Press the hydraulic functions lock-out button to unlock all hydraulic functions. Move the control lever(s) back and forth at least 30 times to release any pressure from the hydraulic circuit. Put the key switch to OFF position.



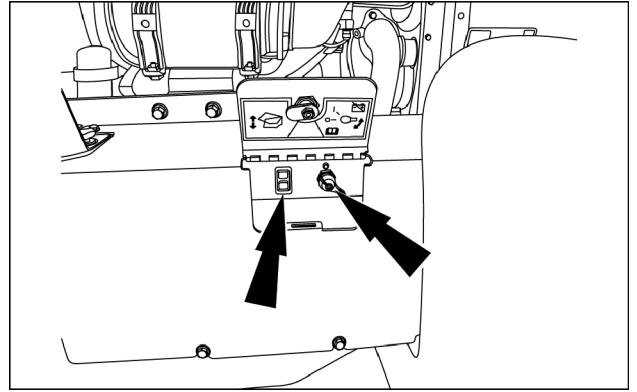
LEIL16WHL1286AA 3

4. Raise the grill located above the cooler box just behind the cab. Then slowly loosen the hydraulic reservoir filler cap to release pressure in the reservoir.



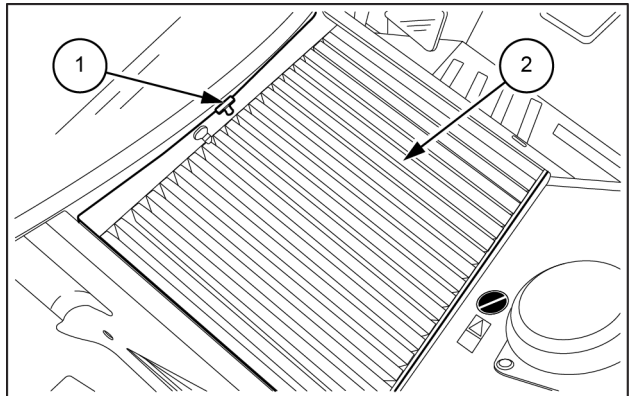
LEIL17WHL0028AB 4

5. Locate the timed disconnect switch and hood raise switch in the battery box. Raise the engine hood and put the timed disconnect switch to OFF position.



RCPH10WHL106AAH 5

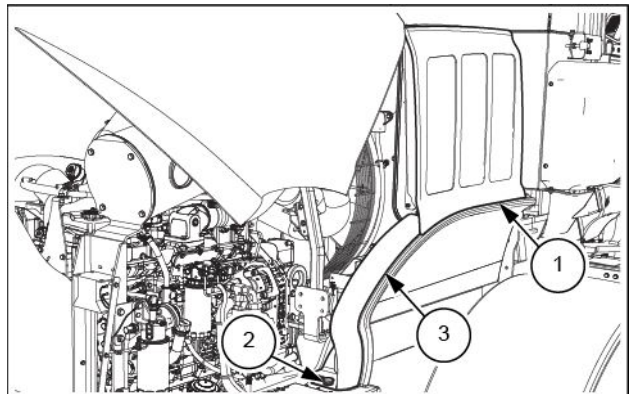
6. Unhook the rubber T-handle (1) and raise the upper panel (2). Make sure that the security levers are blocked.



LEIL13WHL0137AB 6

7. Raise the right-hand and left-hand side panels (1). Then remove the thumb screws (2) and inner fender panels (3).

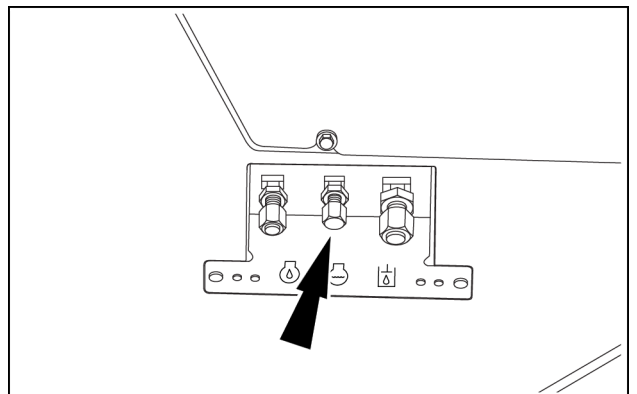
**NOTE:** right-hand side of the machine is shown. The operation is similar for the left-hand side.



LEIL17WHL0027AB 7

8. Place a suitable container below the radiator drain plug, remove the radiator cap and the radiator drain plug to drain the engine coolant. Then reinstall the radiator drain plug and the radiator cap after coolant has drained.

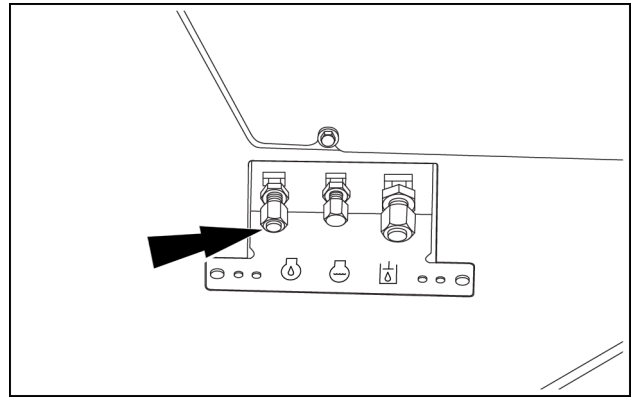
**NOTE:** see machine specifications for cooling system volume.



LEIL16WHL0198AA 8

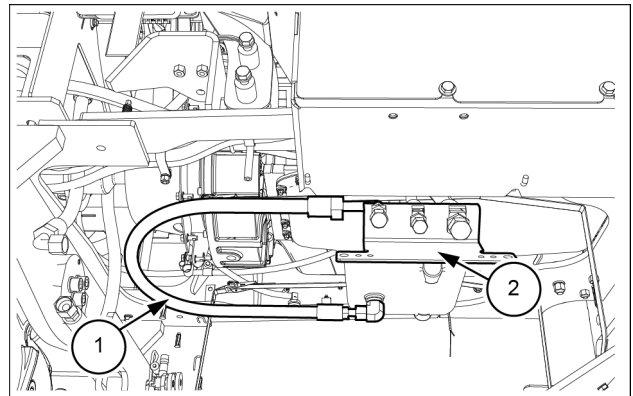
- Place a suitable container below the engine oil drain plug. Remove the engine oil drain plug and drain oil into container. Then reinstall the engine oil drain plug.

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



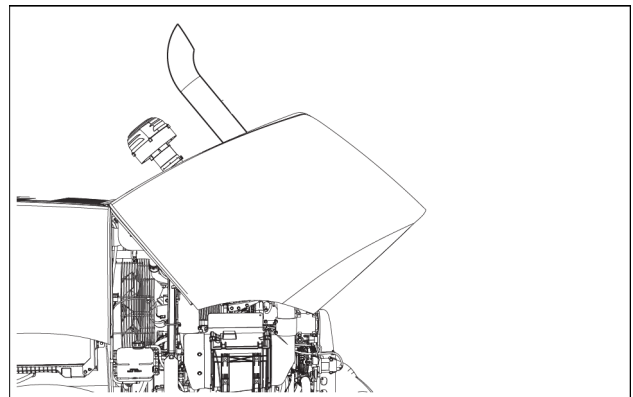
LEIL16WHL0198AA 9

- Remove the drain hose (1) from the frame bracket (2).



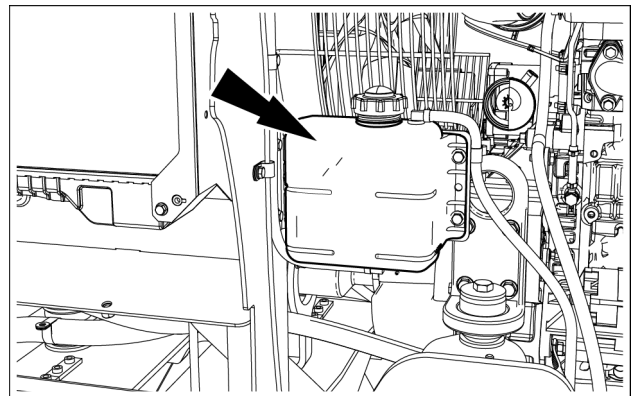
LEIL16WHL1250AB 10

- Remove the engine hood (refer to **Engine hood - Remove (90.105)**).



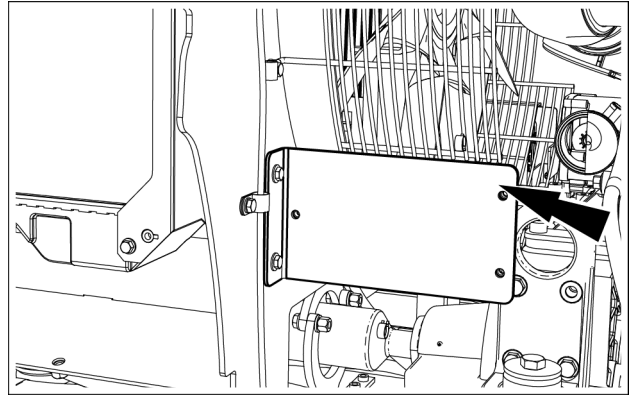
LEIL17WHL0026AB 11

- Remove the overflow tank of the engine coolant.



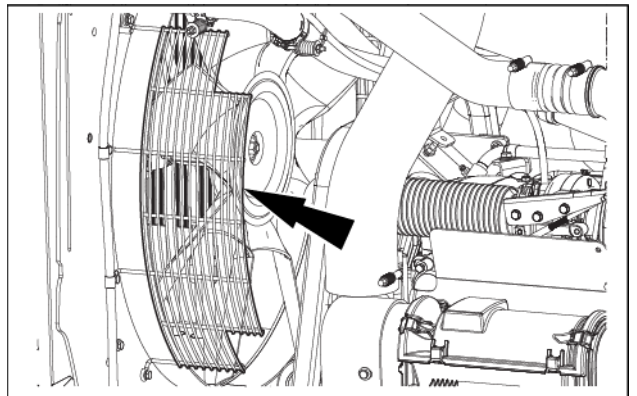
LEIL16WHL0574AB 12

13. Remove the support bracket of the engine coolant overflow tank.



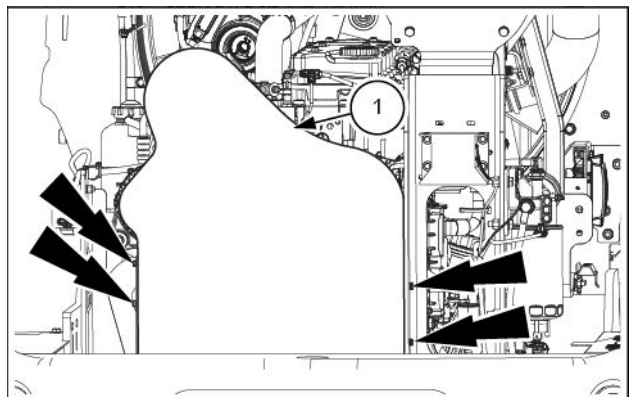
LEIL16WHL0575AB 13

14. Remove the cooling fan guard.



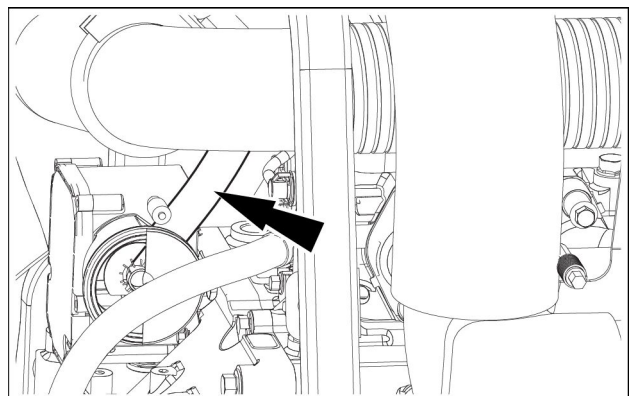
LEIL17WHL0137AB 14

15. Loosen the four bolts to remove the engine guard (1).



LEIL17WHL0118AB 15

16. Disconnect the crankcase vent hose from the engine.



LEIL17WHL0136AB 16



**Suggest:**

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

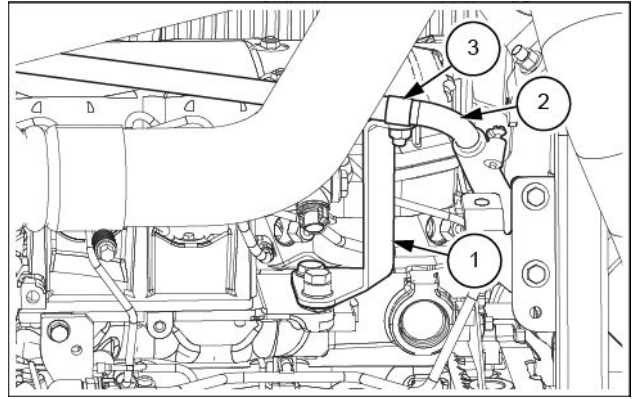
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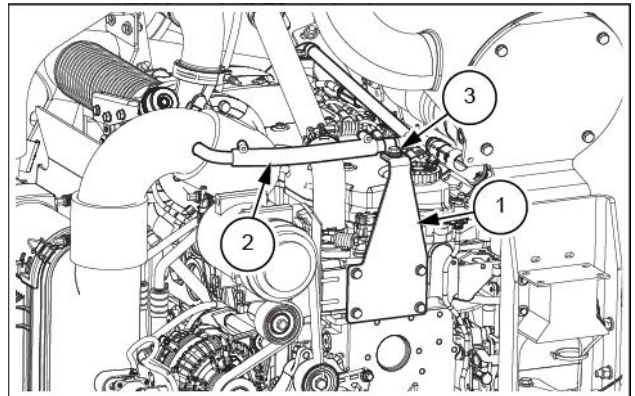
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17. Remove the clamps **(3)** that secure the crankcase vent hose **(2)** to the brackets **(1)**. Remove the brackets **(1)** from the engine.

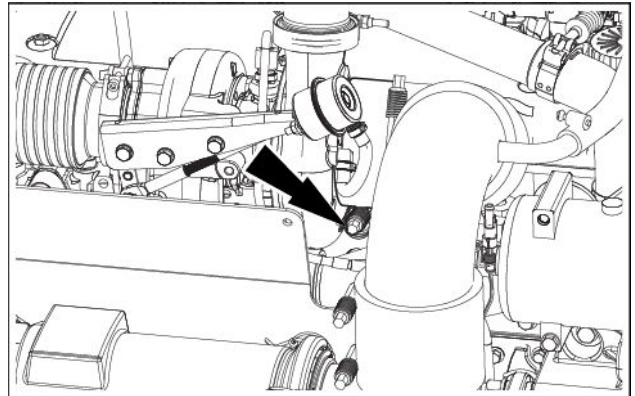


LEIL17WHL0133AB 17



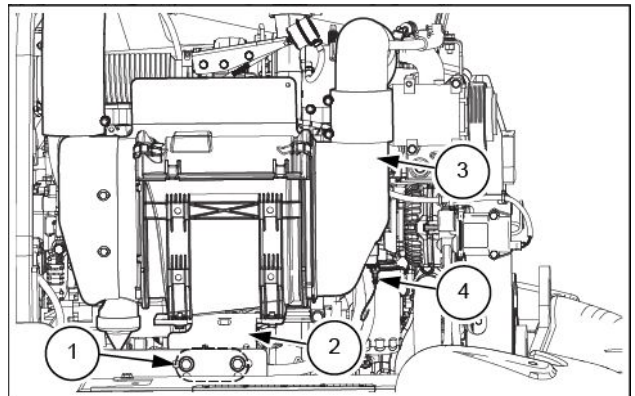
LEIL17WHL0119AB 18

18. Remove the clamp to disconnect the air cleaner from the engine.



LEIL17WHL0135AB 19

19. Tag and disconnect the AFS2 connector **(4)** from the air cleaner **(3)**. Remove the hardware **(1)** to unfix the air cleaner support bracket **(2)** from the rear chassis. Remove the air cleaner assembly from the machine.



LEIL17WHL0120AB 20

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