AUSTOFT 9900
Sugar Cane Harvester

SERVICE MANUAL

Part number 51683486
English
February 2021

CASE IH AGRICULTURE

SERVICE MANUAL

AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9000 FPT engine Cursor 11, Tier 2, AUSTOFT 9000 FPT engine Cursor 11, Tier 2, AUSTOFT 9000 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -], AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9000 FPT engine Cursor 11, Tier 2, AUSTOFT 9000 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR), AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971], AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -], AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9900 Motor FPT Cursor 11, Tier 2, AUSTOFT 9900 Motor FPT Cursor 11, Tier 2 [YLPA04972 -], AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971], AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -], AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9900 Motor FPT Cursor 11, Tier 2, AUSTOFT 9900 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR), AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), double alternated, AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), dual row

51683486 26/02/2021

EN

Link Product / Engine

Product	Market Product	Engine
AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	Europe	F3GGE613B*V001
AUSTOFT 9000 FPT engine Cursor 11, Tier 2	Middle East Africa	F3GFA613B*E001
AUSTOFT 9000 FPT engine Cursor 11, Tier 2	Australia New Zealand	F3GFA613B*E001
AUSTOFT 9000 FPT engine Cursor 11, Tier 2	Asia Pacific	F3GFA613B*E001
AUSTOFT 9000 FPT engine Cursor 11, Tier 2	Latin America	F3GFA613B*E001
AUSTOFT 9000 Motor FPT Cursor 11, Tier 3, Catalisador de redução seletiva leve (SCRL) [YLPA04972 -]	Latin America	F3GFE613A*H001
AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	Latin America	F3GGE613B*V001
AUSTOFT 9000 FPT engine Cursor 11, Tier 2	North America	F3GFA613B*E001
AUSTOFT 9000 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	North America	F3GGE613B*V001
AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	Australia New Zealand	F3GGE613B*V001
AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	Middle East Africa	F3GGE613B*V001
AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	Asia Pacific	F3GGE613B*V001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Catalisador de redução seletiva leve (SCRL) [YLPA04800 - YLPA04971]	North America	F3GFE613A*H002
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Catalisador de redução seletiva leve (SCRL) [YLPA04972 -]	North America	F3GFE613A*H002
AUSTOFT 9900 Motor FPT Cursor 11, Tier 4B (final) (Stage V), Catalisador de redução seletiva (SCR)	Europe	F3GGE613B*V001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2	Middle East Africa	F3GFA613B*E001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2	Asia Pacific	F3GFA613B*E001

Product	Market Product	Engine
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2	Australia New Zealand	F3GFA613B*E001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2 [YLPA04972 -]	Latin America	F3GFA613B*E001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Catalisador de redução seletiva leve (SCRL) [YLPA04800 - YLPA04971]	Latin America	F3GFE613A*H001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Catalisador de redução seletiva leve (SCRL) [YLPA04972 -]	Latin America	F3GFE613A*H001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 4B (final) (Stage V), Catalisador de redução seletiva (SCR)	Latin America	F3GGE613B*V001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2	North America	F3GFA613B*E001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 4B (final) (Stage V), Catalisador de redução seletiva (SCR)	North America	F3GGE613B*V001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 4B (final) (Stage V), Catalisador de redução seletiva (SCR)	Australia New Zealand	F3GGE613B*V001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 4B (final) (Stage V), Catalisador de redução seletiva (SCR)	Middle East Africa	F3GGE613B*V001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 4B (final) (Stage V), Catalisador de redução seletiva (SCR)	Asia Pacific	F3GGE613B*V001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Catalisador de redução seletiva leve (SCRL), Duplo alternado	Latin America	F3GFE613A*H001
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Catalisador de redução seletiva leve (SCRL), Duas linhas	Latin America	F3GFE613A*H001

Contents

INTRODUCTION

Contents

INTRODUCTION

(*) See content for specific models

Safety rules - Side safety locks

AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 2	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9000 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2 [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2	---
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	---
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), double alternated	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	---

⚠ CAUTION

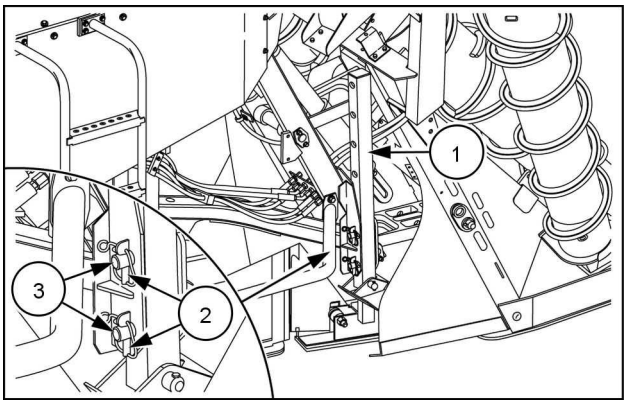
Heavy object!
The component is heavy. Use care not to drop the component when installing, removing, or handling. Failure to comply could result in minor or moderate injury.

C0095A

When you perform any maintenance procedures on the harvester, it is mandatory that you use the side safety locks **(1)**, as per the instructions below.

1. With the machine parked on a level and firm surface, use the hydraulic suspension control to suspend the machine at the desired height.
2. Hold the lock **(1)** with one hand. Then remove the cotter pins **(2)** and the pins **(3)**.

   ATTENTION: *Be careful not to accidentally drop the locks **(1)** when you remove the pins **(3)**.*



SOIL19SC00081AA 1

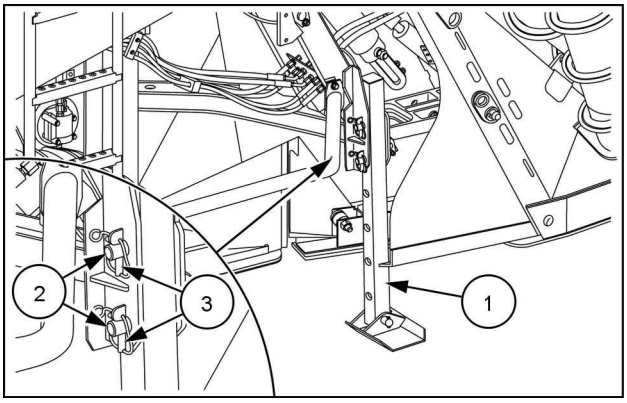
3. Lower the locks **(1)** to the ground.
4. Install the pins **(2)** and the cotter pins **(3)**.

   NOTE: *On ground that is wet and/or not compacted, the locks **(1)** may sink and cause the harvester to lower. Look for a proper location to safely support the locks.*

   ATTENTION: *Before you go under the harvester, always make sure that the pins **(2)** are properly installed in the holes of the locks **(1)**.*

   NOTE: *Before you operate the harvester, always check that the locks **(1)** are properly retracted and locked, as shown in Figure **1**.*

5. Use the hydraulic suspension control to fully lower the machine.



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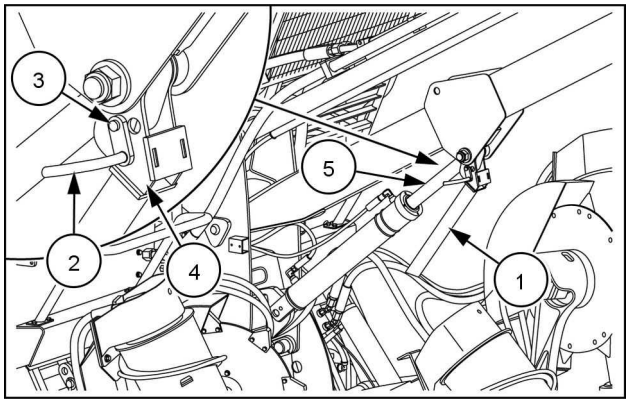
Safety rules - Topper safety lock

AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 2	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9000 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2 [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2	---
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	---
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), dual row	
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), double alternated	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	---

When you perform any maintenance procedures on the harvester, and more specifically on the line dividers and the front rollers, it is essential that you use the safety lock **(1)** on the topper if you need to raise the topper to perform the procedure.

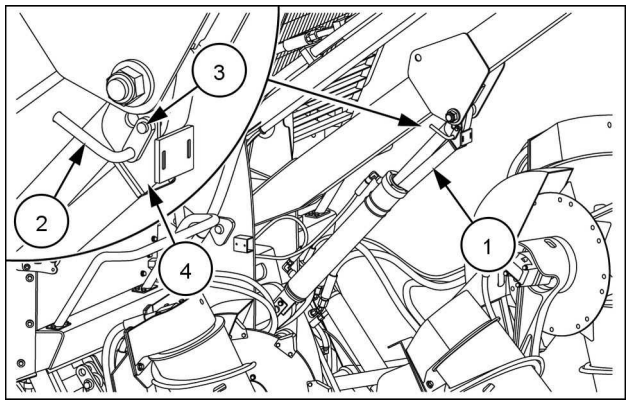
1. With the machine parked on a flat and level surface, completely suspend the topper.
2. Pull the handle **(2)** all the way to unseat the lock pin **(3)** from the rear hole of the cradle **(4)**.
3. Fit the lock **(1)** over the lift cylinder rod **(5)**. See Figure **2**.



SOIL19SC00127AA 1

4. With the latch **(1)** in the position shown, turn the handle **(2)** slightly upward and release the handle to seat the lock pin **(3)** in the front hole of the cradle **(4)**.

   ATTENTION: *Before you go underneath the suspended topper, always check that the lock **(1)** is properly positioned and secured.*
5. To lower the topper, secure the lock **(1)** in the operating position, as shown in Figure **1**.



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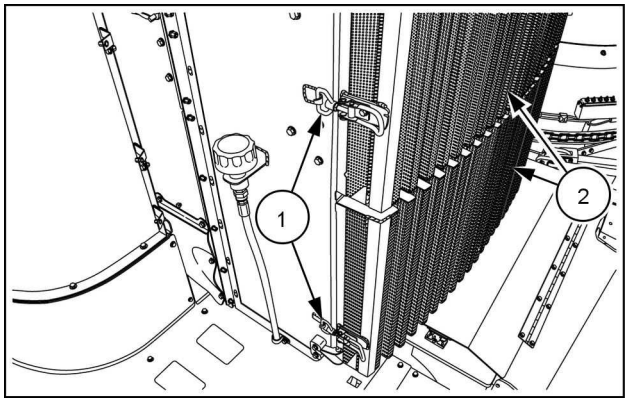
Safety rules - Safety locks of the radiator compartment doors

AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 2	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9000 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2 [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2	---
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	---
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), dual row	
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), double alternated	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	---

When you perform any service or maintenance on the radiators compartment, use of the safety locks on the door support cylinders is mandatory, as per the instructions below.

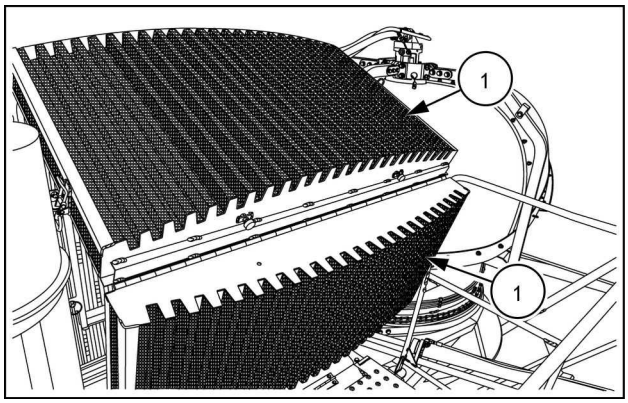
Left-hand door of the compartment

1. Release the locks **(1)** on both sides of the folding door **(2)**.



PIIL19SC00640AA 1

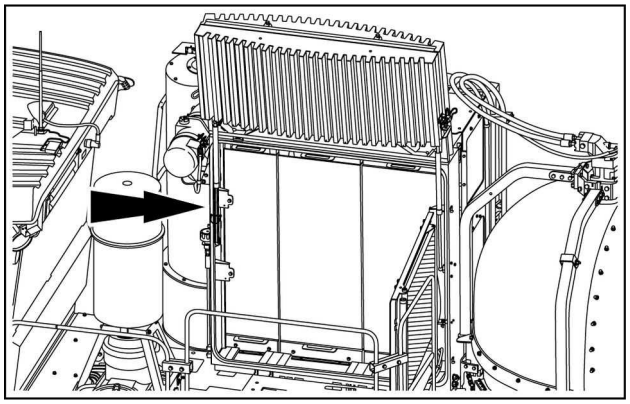
2. Tilt the folding door **(1)** all the way.



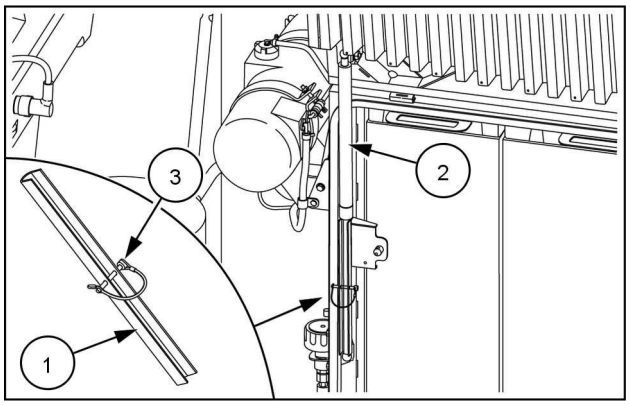
PIIL19SC00643AA 2

3. Install the safety chute **(1)** into the left-hand cylinder rod **(2)**.
4. Install the lock pin **(3)**.

   NOTE: *After you have closed the folding door, always apply the side locks.*



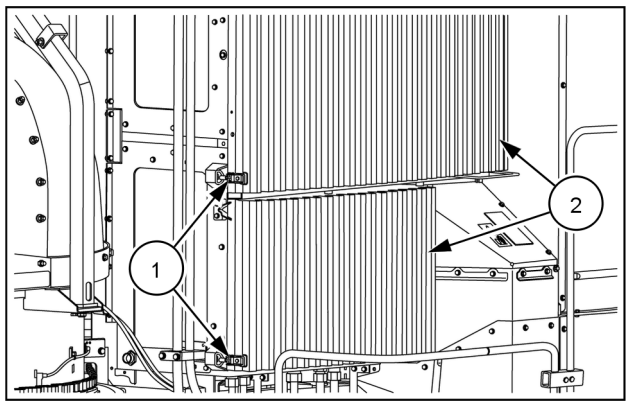
SOIL19SC00157AA 3



SOIL19SC00158AA 4

Right-hand door of the compartment

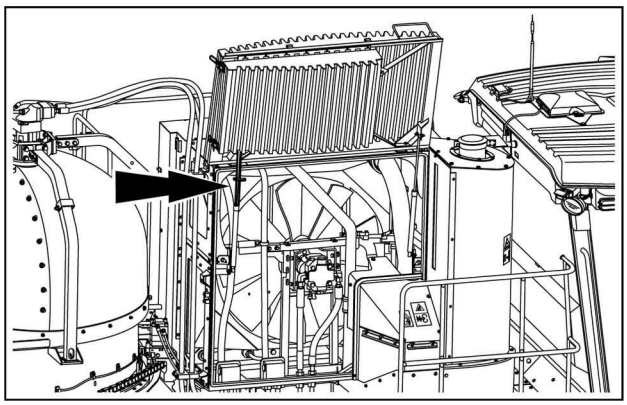
1. Loosen the side latches **(1)**.
2. Tilt the folding door **(2)** all the way.



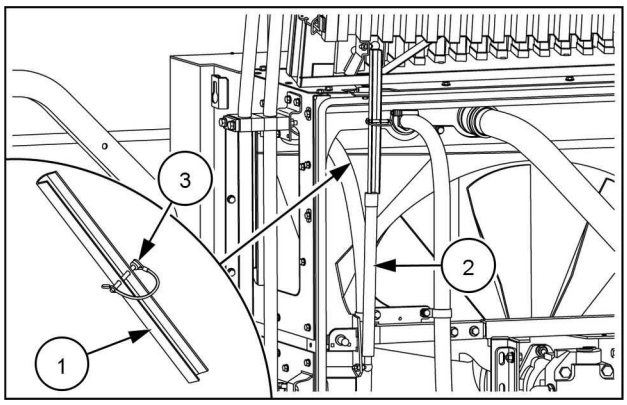
SOIL19SC00159AA 5

3. Install the safety chute **(1)** into the left-hand cylinder rod **(2)**.
4. Install the lock pin **(3)**.

   NOTE: *After you have closed the folding door, always apply the side locks.*



SOIL19SC00160AA 6



SOIL19SC00161AA 7

Safety rules - Internal grips of the engine compartment

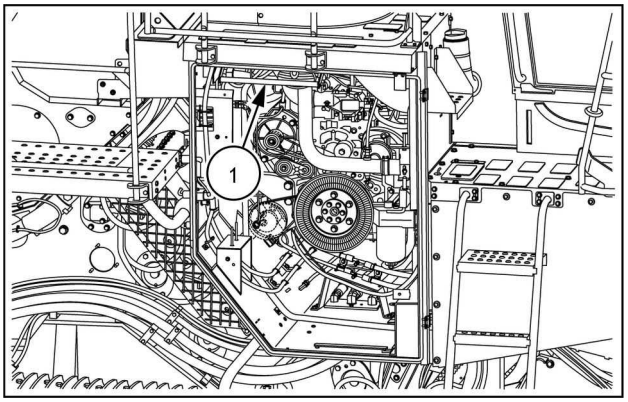
AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 2	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9000 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2 [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2	---
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	---
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), dual row	
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), double alternated	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	---

The harvester is equipped with three gripper teeth **(1)** on the engine compartment, as identified below.

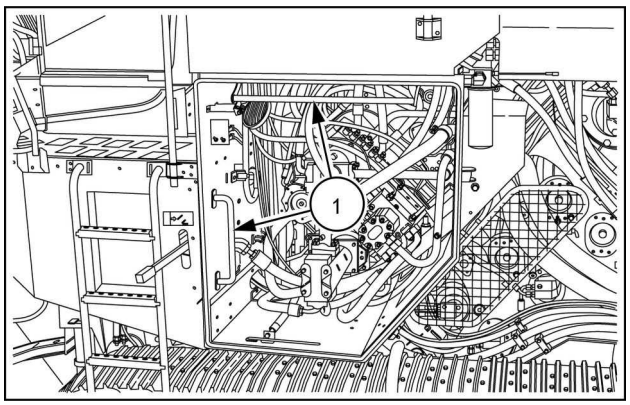
Whenever you perform a procedure inside the engine compartment, try to support yourself by holding on the grips **(1)**.

ATTENTION: *To prevent the risk of burns, cuts, or accidental disconnections, do not hold onto the hydraulic hoses or other components of the assembly. To do so may result in accidents with minor or moderate injury.*

- Figure **1** – Engine compartment on the right-hand side of the machine.
- Figure **2** – Pumps compartment on the left-hand side of the machine.



SOIL19SC00344AA 1



SOIL19SC00119AA 2

Safety rules - Safety anchor points

AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 2	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9000 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2 [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2	---
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	---
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), dual row	
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), double alternated	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	---

⚠ WARNING

Fall hazard!
Clean the steps and access handles to remove all traces of grease, oil, mud, and ice (in winter).
Failure to comply could result in death or serious injury.

W0139A

⚠ WARNING

Fall hazard!
Take correct measures to make sure steps, ladders, and platforms remain clean and clear of debris or foreign substances.
Failure to comply could result in death or serious injury.

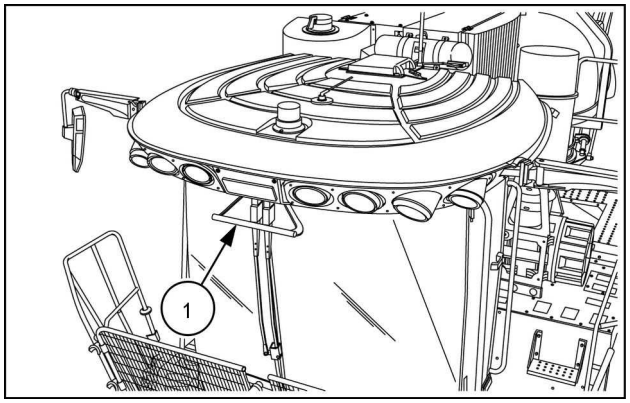
W1183A

ATTENTION: *Before you perform any maintenance work on the highest parts of the harvester, such as the cab and the primary extractor hood, check and familiarize yourself with the following safety anchor points, to which you can attach safety straps when you get on and off of the machine.*

The harvester is equipped with various safety anchor points, which should be used when you perform adjustments or maintenance on the highest parts of the machine, in order to prevent falls and personal injury.

Identification, location, and function of the available anchor points:

- Cab front support handle **(1)**: This can be used as grip or to secure cables or straps with a hook, for work at the top of the cab, such as changing bulbs.
- Eye bolts **(2)** on the side shields: For the attachment of cables or straps with a hook.



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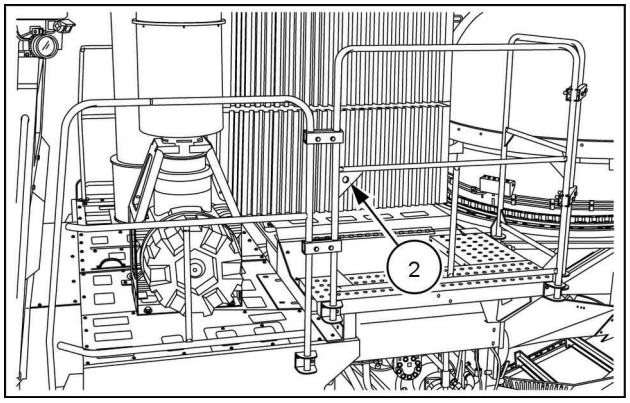

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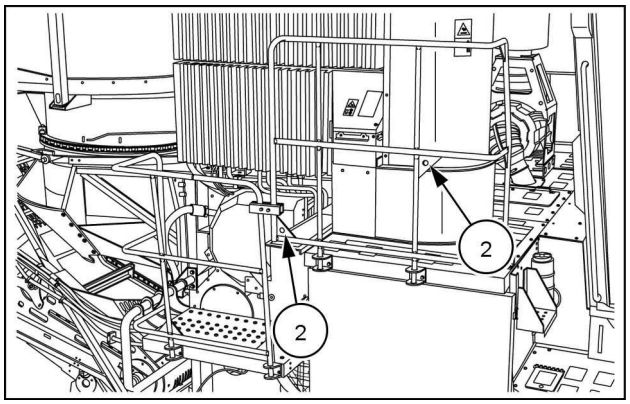


SOIL19SC00077AA 3

- Handles **(3)** on the hood frame: For the attachment of cables or straps with a hook, for work at the top of the hood, such as checking the primary extractor hydraulic drive motor.

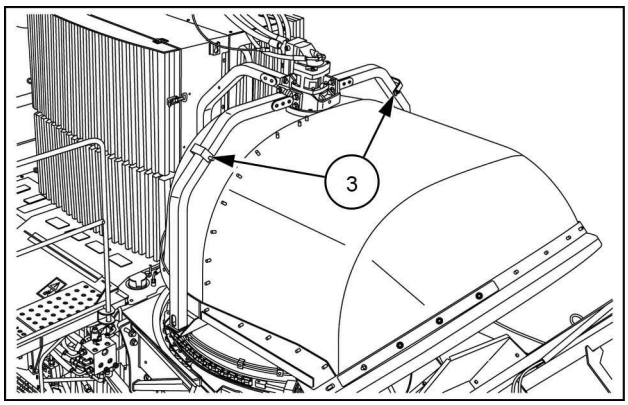
  NOTE: *Laws that govern work at heights vary by country, so seek the necessary guidance from regulatory agencies. If there is a specific regulation at the state level, or even at the municipal level, follow this regulation the same way.*

  NOTE: *The owner of the machine is responsible for providing operators and mechanics with the necessary safety guidelines on work at heights, through execution of a training program.*

  NOTE: *The owner must provide operators and mechanics with all necessary PPE, as required by the regulations in effect, such as: seat belt, cables, straps, life line, helmets, etc. It is also the owner's responsibility to supervise the correct use of these safety features.*

  NOTE: *Operators and mechanics are responsible for correctly using the proper PPEs, in accordance with the guidelines of the regulations in effect.*

  ATTENTION: *Only use safety devices in perfect working condition, free of damage.*



SOIL19SC00078AA 4

Safety rules - Battery master switch

AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 2	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9000 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2 [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2	---
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971]	
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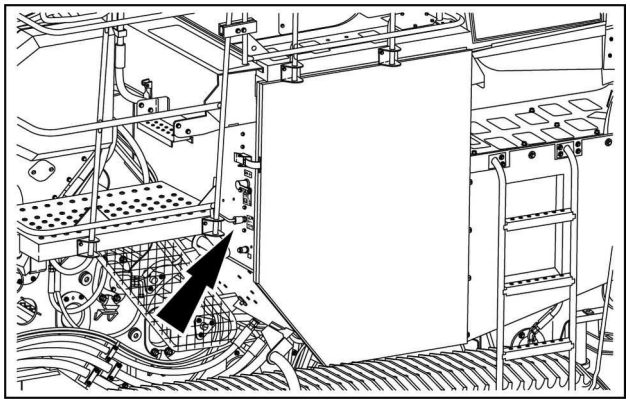
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), dual row	
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), double alternated	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	---

The harvester is equipped with a battery master switch, located next to the battery compartment on the right-hand side of the machine (see arrow).

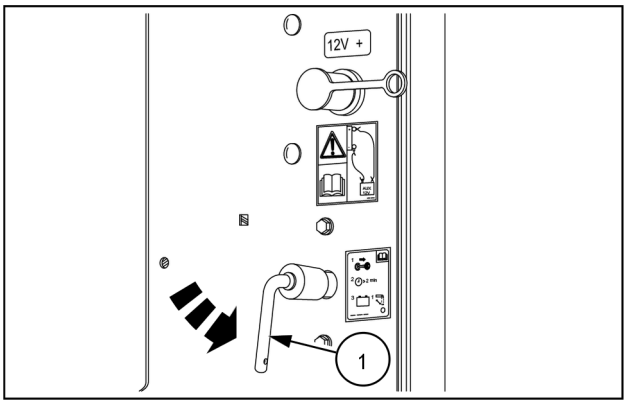
NOTICE: *When you perform any electrical welding work on the frame or on the components of the machine, first disconnect the battery cables. Always disconnect the negative (-) cable first. When you reconnect the battery cables, always connect the positive (+) cable first. Whenever possible, remove the part and weld it away from the machine.*



SOIL19SC00299AA 1

1. Shut down the engine. Remove the key from the ignition.
2. Wait at least **2 min**.

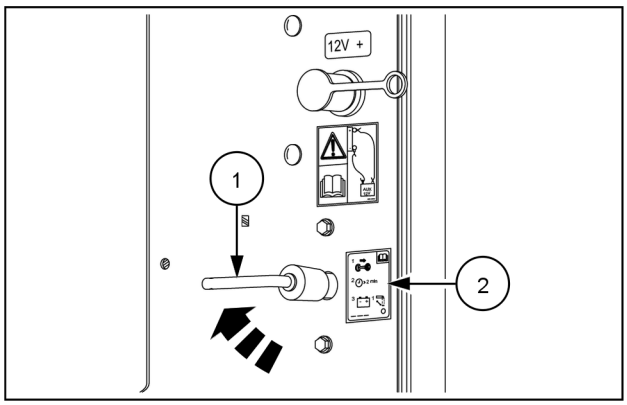
   NOTICE: *The recommendation to wait at least **2 min** before turning off the main switch of the batteries is even more important for machines equipped with Tier 3 and Stage V engines, which have an exhaust gas treatment system with injection of **DEF/ADBLUE®/ ARLA 32**.*
   *When you shut down the engine, the supply module of the Selective Catalytic Reduction (SCR) system starts the reverse to remove the **DEF/ADBLUE®/ ARLA 32** from the circuit and drive it to the tank, a process that takes approximately **2 min**. If fluid remains in the circuit, this may bring about two serious consequences:*
   1 – Crystallization of the fluid, which can cause clogging of the lines of the circuit, which in turn may damage the power module and the injector mounted in the exhaust pipe.
   2 – Expansion of the fluid, which can lead to rupture of the hoses.
   Therefore, never stop the reversal process.
3. Turn the handle **(1)** downward (position “0”), to shut down the electrical power system of the machine.



SOIL19SC00301AA 2

4. Turn the handle **(1)** upward (position “1”), to turn on the electrical power system of the machine.

   NOTE: *The decal* ***(2)*** *simplifies the steps in this procedure.*



SOIL19SC00300AA 3

Torque - Minimum tightening torques for normal assembly

METRIC NON-FLANGED HARDWARE

NOM. SIZE	CLASS 8.8 BOLT and CLASS 8 NUT		CLASS 10.9 BOLT and CLASS 10 NUT		LOCKNUT CL.8 W/CL8.8 BOLT	LOCKNUT CL.10 W/CL10.9 BOLT
	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr		
M4	2.2 N·m (19 lb in)	2.9 N·m (26 lb in)	3.2 N·m (28 lb in)	4.2 N·m (37 lb in)	2 N·m (18 lb in)	2.9 N·m (26 lb in)
M5	4.5 N·m (40 lb in)	5.9 N·m (52 lb in)	6.4 N·m (57 lb in)	8.5 N·m (75 lb in)	4 N·m (36 lb in)	5.8 N·m (51 lb in)
M6	7.5 N·m (66 lb in)	10 N·m (89 lb in)	11 N·m (96 lb in)	15 N·m (128 lb in)	6.8 N·m (60 lb in)	10 N·m (89 lb in)
M8	18 N·m (163 lb in)	25 N·m (217 lb in)	26 N·m (234 lb in)	35 N·m (311 lb in)	17 N·m (151 lb in)	24 N·m (212 lb in)
M10	37 N·m (27 lb ft)	49 N·m (36 lb ft)	52 N·m (38 lb ft)	70 N·m (51 lb ft)	33 N·m (25 lb ft)	48 N·m (35 lb ft)
M12	64 N·m (47 lb ft)	85 N·m (63 lb ft)	91 N·m (67 lb ft)	121 N·m (90 lb ft)	58 N·m (43 lb ft)	83 N·m (61 lb ft)
M16	158 N·m (116 lb ft)	210 N·m (155 lb ft)	225 N·m (166 lb ft)	301 N·m (222 lb ft)	143 N·m (106 lb ft)	205 N·m (151 lb ft)
M20	319 N·m (235 lb ft)	425 N·m (313 lb ft)	440 N·m (325 lb ft)	587 N·m (433 lb ft)	290 N·m (214 lb ft)	400 N·m (295 lb ft)
M24	551 N·m (410 lb ft)	735 N·m (500 lb ft)	762 N·m (560 lb ft)	1016 N·m (750 lb ft)	501 N·m (370 lb ft)	693 N·m (510 lb ft)

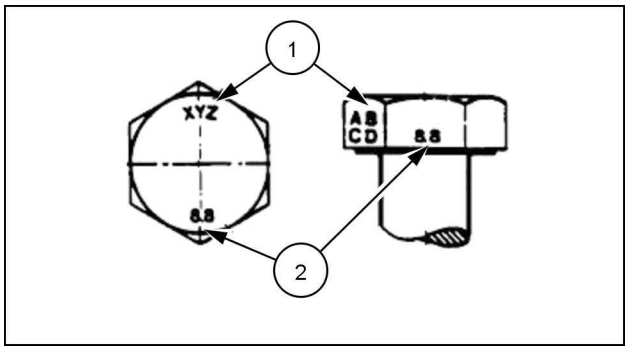
NOTE: *M4 through M8 hardware torque specifications are shown in pound-inches. M10 through M24 hardware torque specifications are shown in pound-feet.*

METRIC FLANGED HARDWARE

NOM. SIZE	CLASS 8.8 BOLT and CLASS 8 NUT		CLASS 10.9 BOLT and CLASS 10 NUT		LOCKNUT CL.8 W/CL8.8 BOLT	LOCKNUT CL.10 W/CL10.9 BOLT
	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr		
M4	2.4 N·m (21 lb in)	3.2 N·m (28 lb in)	3.5 N·m (31 lb in)	4.6 N·m (41 lb in)	2.2 N·m (19 lb in)	3.1 N·m (27 lb in)
M5	4.9 N·m (43 lb in)	6.5 N·m (58 lb in)	7.0 N·m (62 lb in)	9.4 N·m (83 lb in)	4.4 N·m (39 lb in)	6.4 N·m (57 lb in)
M6	8.3 N·m (73 lb in)	11 N·m (96 lb in)	12 N·m (105 lb in)	16 N·m (141 lb in)	7.5 N·m (66 lb in)	11 N·m (96 lb in)
M8	20 N·m (179 lb in)	27 N·m (240 lb in)	29 N·m (257 lb in)	39 N·m (343 lb in)	18 N·m (163 lb in)	27 N·m (240 lb in)
M10	40 N·m (30 lb ft)	54 N·m (40 lb ft)	57 N·m (42 lb ft)	77 N·m (56 lb ft)	37 N·m (27 lb ft)	53 N·m (39 lb ft)
M12	70 N·m (52 lb ft)	93 N·m (69 lb ft)	100 N·m (74 lb ft)	134 N·m (98 lb ft)	63 N·m (47 lb ft)	91 N·m (67 lb ft)
M16	174 N·m (128 lb ft)	231 N·m (171 lb ft)	248 N·m (183 lb ft)	331 N·m (244 lb ft)	158 N·m (116 lb ft)	226 N·m (167 lb ft)
M20	350 N·m (259 lb ft)	467 N·m (345 lb ft)	484 N·m (357 lb ft)	645 N·m (476 lb ft)	318 N·m (235 lb ft)	440 N·m (325 lb ft)
M24	607 N·m (447 lb ft)	809 N·m (597 lb ft)	838 N·m (618 lb ft)	1118 N·m (824 lb ft)	552 N·m (407 lb ft)	

IDENTIFICATION

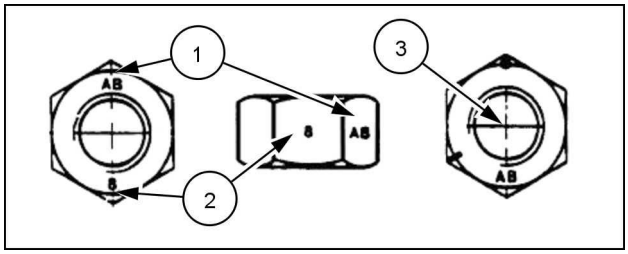
Metric Hex head and carriage bolts, classes 5.6 and up



20083680 1

1. Manufacturer's Identification
2. Property Class

Metric Hex nuts and locknuts, classes 05 and up



20083681 2

1. Manufacturer's Identification
2. Property Class
3. Clock Marking of Property Class and Manufacturer's Identification (Optional), i.e. marks **60°** apart indicate Class 10 properties, and marks **120°** apart indicate Class 8.

INCH NON-FLANGED HARDWARE

NOMINAL SIZE	SAE GRADE 5 BOLT and NUT		SAE GRADE 8 BOLT and NUT		LOCKNUT GrB W/ Gr5 BOLT	LOCKNUT GrC W/ Gr8 BOLT
	UN-PLATED or PLATED SILVER	PLATED W/ZnCr GOLD	UN-PLATED or PLATED SILVER	PLATED W/ZnCr GOLD		
1/4	**8 N·m (71 lb in)**	**11 N·m (97 lb in)**	**12 N·m (106 lb in)**	**16 N·m (142 lb in)**	**8.5 N·m (75 lb in)**	**12.2 N·m (109 lb in)**
5/16	**17 N·m (150 lb in)**	**23 N·m (204 lb in)**	**24 N·m (212 lb in)**	**32 N·m (283 lb in)**	**17.5 N·m (155 lb in)**	**25 N·m (220 lb in)**
3/8	**30 N·m (22 lb ft)**	**40 N·m (30 lb ft)**	**43 N·m (31 lb ft)**	**57 N·m (42 lb ft)**	**31 N·m (23 lb ft)**	**44 N·m (33 lb ft)**
7/16	**48 N·m (36 lb ft)**	**65 N·m (48 lb ft)**	**68 N·m (50 lb ft)**	**91 N·m (67 lb ft)**	**50 N·m (37 lb ft)**	**71 N·m (53 lb ft)**
1/2	**74 N·m (54 lb ft)**	**98 N·m (73 lb ft)**	**104 N·m (77 lb ft)**	**139 N·m (103 lb ft)**	**76 N·m (56 lb ft)**	**108 N·m (80 lb ft)**
9/16	**107 N·m (79 lb ft)**	**142 N·m (105 lb ft)**	**150 N·m (111 lb ft)**	**201 N·m (148 lb ft)**	**111 N·m (82 lb ft)**	**156 N·m (115 lb ft)**
5/8	**147 N·m (108 lb ft)**	**196 N·m (145 lb ft)**	**208 N·m (153 lb ft)**	**277 N·m (204 lb ft)**	**153 N·m (113 lb ft)**	**215 N·m (159 lb ft)**
3/4	**261 N·m (193 lb ft)**	**348 N·m (257 lb ft)**	**369 N·m (272 lb ft)**	**491 N·m (362 lb ft)**	**271 N·m (200 lb ft)**	**383 N·m (282 lb ft)**
7/8	**420 N·m (310 lb ft)**	**561 N·m (413 lb ft)**	**594 N·m (438 lb ft)**	**791 N·m (584 lb ft)**	**437 N·m (323 lb ft)**	**617 N·m (455 lb ft)**
1	**630 N·m (465 lb ft)**	**841 N·m (620 lb ft)**	**890 N·m (656 lb ft)**	**1187 N·m (875 lb ft)**	**654 N·m (483 lb ft)**	**924 N·m (681 lb ft)**

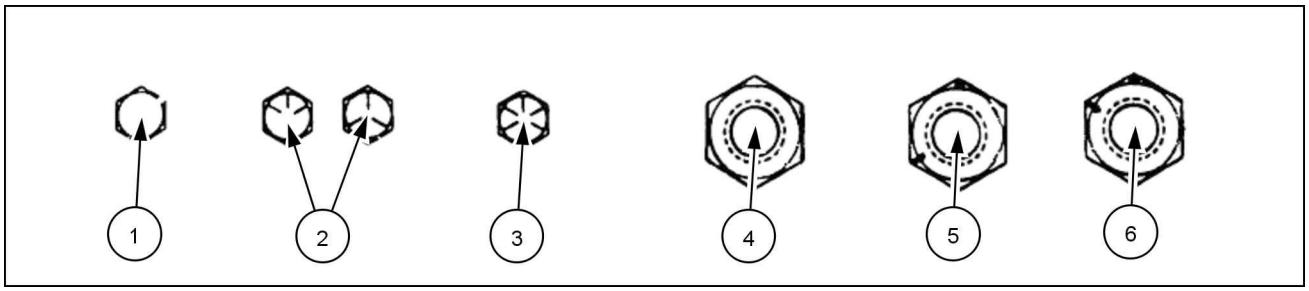
NOTE: *For Imperial Units,* ***1/4 in*** *and* ***5/16 in*** *hardware torque specifications are shown in pound-inches.* ***3/8 in*** *through* ***1 in*** *hardware torque specifications are shown in pound-feet.*

INCH FLANGED HARDWARE

NOM-INAL SIZE	SAE GRADE 5 BOLT and NUT		SAE GRADE 8 BOLT and NUT		LOCKNUT GrF W/ Gr5 BOLT	LOCKNUT GrG W/ Gr8 BOLT
	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD	UNPLATED or PLATED SILVER	PLATED W/ZnCr GOLD		
1/4	**9 N·m (80 lb in)**	**12 N·m (106 lb in)**	**13 N·m (115 lb in)**	**17 N·m (150 lb in)**	**8 N·m (71 lb in)**	**12 N·m (106 lb in)**
5/16	**19 N·m (168 lb in)**	**25 N·m (221 lb in)**	**26 N·m (230 lb in)**	**35 N·m (310 lb in)**	**17 N·m (150 lb in)**	**24 N·m (212 lb in)**
3/8	**33 N·m (25 lb ft)**	**44 N·m (33 lb ft)**	**47 N·m (35 lb ft)**	**63 N·m (46 lb ft)**	**30 N·m (22 lb ft)**	**43 N·m (32 lb ft)**
7/16	**53 N·m (39 lb ft)**	**71 N·m (52 lb ft)**	**75 N·m (55 lb ft)**	**100 N·m (74 lb ft)**	**48 N·m (35 lb ft)**	**68 N·m (50 lb ft)**
1/2	**81 N·m (60 lb ft)**	**108 N·m (80 lb ft)**	**115 N·m (85 lb ft)**	**153 N·m (113 lb ft)**	**74 N·m (55 lb ft)**	**104 N·m (77 lb ft)**
9/16	**117 N·m (86 lb ft)**	**156 N·m (115 lb ft)**	**165 N·m (122 lb ft)**	**221 N·m (163 lb ft)**	**106 N·m (78 lb ft)**	**157 N·m (116 lb ft)**
5/8	**162 N·m (119 lb ft)**	**216 N·m (159 lb ft)**	**228 N·m (168 lb ft)**	**304 N·m (225 lb ft)**	**147 N·m (108 lb ft)**	**207 N·m (153 lb ft)**
3/4	**287 N·m (212 lb ft)**	**383 N·m (282 lb ft)**	**405 N·m (299 lb ft)**	**541 N·m (399 lb ft)**	**261 N·m (193 lb ft)**	**369 N·m (272 lb ft)**
7/8	**462 N·m (341 lb ft)**	**617 N·m (455 lb ft)**	**653 N·m (482 lb ft)**	**871 N·m (642 lb ft)**	**421 N·m (311 lb ft)**	**594 N·m (438 lb ft)**
1	**693 N·m (512 lb ft)**	**925 N·m (682 lb ft)**	**979 N·m (722 lb ft)**	**1305 N·m (963 lb ft)**	**631 N·m (465 lb ft)**	**890 N·m (656 lb ft)**

IDENTIFICATION

Inch Bolts and free-spinning nuts

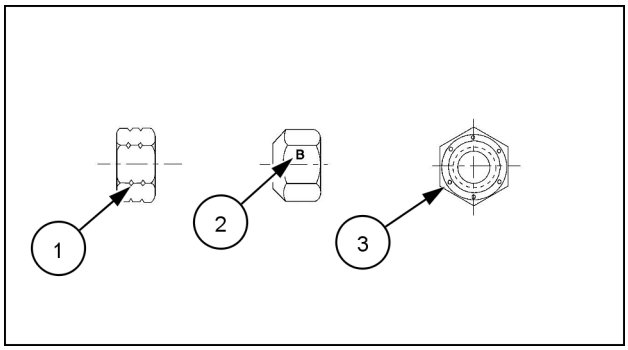


20083682 3

Grade Marking Examples

SAE Grade Identification			
1	Grade 2 - No Marks	4	Grade 2 Nut - No Marks
2	Grade 5 - Three Marks	5	Grade 5 Nut - Marks **120°** Apart
3	Grade 8 - Five Marks	6	Grade 8 Nut - Marks **60°** Apart

Inch Lock Nuts, All Metal (Three optional methods)



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Grade Identification

Grade	Corner Marking Method (1)	Flats Marking Method (2)	Clock Marking Method (3)
Grade A	No Notches	No Mark	No Marks
Grade B	One Circumferential Notch	Letter B	Three Marks
Grade C	Two Circumferential Notches	Letter C	Six Marks

Torque - Standard torque data for hydraulic connections

General information

- Hydraulic connections require a minimum assembly torque in order to provide zero leakage at rated pressure with adequate fatigue resistance. Over-torquing of a hydraulic connection can also lead to leakage or failure. For some connections, CASE IH requires a different torque value than is listed in the ISO and SAE standards.
- The torque values in this document should be used whenever possible or applicable.

  NOTICE: *Always follow the instructions in this manual for specific torque values when you service components. The information in this section is for general guidance only when a procedure contains no specific torque value.*

Tolerance

- The tolerance for all torque values is ± **10%**. This tolerance must include all assembly variation, not only the torque wrench repeatability.

Lubrication

Application of grease or other lubricants to hydraulic connectors should be avoided. If clean hydraulic oil is already on the connection, it is not required to remove the oil. Generally, application of grease:

- May cause a significant change in the torque required to properly tighten the connection.
- May reduce the connection's resistance to vibration.
- Excessive grease may displace an elastomer seal during tightening.
- Grease extrusion when connection is tightened may be mistaken for leakage.

CASE IH products generally use O-Ring Boss (ORB) connectors that have Teflon™-coated O-rings, eliminating the need for O-ring lubrication during installation. For connections which are made into aluminum manifolds or with stainless steel connectors, it may be required to apply a lubricant to prevent galling.

Use of **LOCTITE®** and other thread-locking compounds is prohibited. These compounds:

- May cause a significant change in the torque required to properly tighten the connections.
- Reduce the serviceability of the joint.
- May prevent the O-ring from properly sealing if the compound gets on the O-ring.

Torque values for metric O-Ring Boss (ORB) port connections

	S-Series *		L-Series **	
Metric thread	**Ferrous N·m (lb ft) ± 10%**	**Non-Ferrous N·m (lb ft) ± 10%**	**Ferrous N·m (lb ft) ± 10%**	**Non-Ferrous N·m (lb ft) ± 10%**
M8 x 1	10.5 (7.7)	6.3 (4.6)	8.5 (6.3)	5 (3.7)
M10 x 1	21 (15.5)	12.5 (9.2)	15.5 (11.4)	9.3 (6.9)
M12 x 1.5	37 (27.3)	22 (16.2)	27 (19.9)	16 (11.8)
M14 x 1.5	47 (34.7)	28 (20.7)	37 (27.3)	22 (16.2)
M16 x 1.5	58 (42.8)	35 (25.8)	42 (31)	25 (18.4)
M18 x 1.5	74 (54.6)	44 (32.5)	47 (34.7)	28 (20.7)
M22 x 1.5	105 (77.4)	63 (46.5)	63 (46.5)	38 (28)
M27 x 2	178 (131.3)	107 (78.9)	105 (77.4)	63 (46.5)
M30 x 2	225 (166)	135 (99.6)	136 (100.3)	82 (60.5)
M33 x 2	325 (239.7)	195 (143.8)	168 (123.9)	101 (74.5)
M42 x 2	345 (254.5)	207 (152.7)	220 (162.3)	132 (97.4)
M48 x 2	440 (324.5)	264 (194.7)	273 (201.4)	164 (121)
M60 x 2	525 (387.2)	315 (232.3)	330 (243.4)	198 (146)

* S-Series connectors are used with O-Ring Face Seals (ORFS).

** L-Series connectors are used with **37°** flare.

Torque values for metric O-Ring Boss (ORB) port plugs

	Ferrous		Non-ferrous
Metric thread	**Internal hex N·m (lb ft) ± 10%**	**External hex N·m (lb ft) ± 10%**	**N·m (lb ft) ± 10%**
M8 x 1	8.5 (6.3)	10.5 (7.7)	6.3 (4.6)
M10 x 1	16 (11.8)	21 (15.5)	12.5 (9.2)
M12 x 1.5	23 (17)	37 (27.3)	22 (16.2)
M14 x 1.5	47 (34.7)	47 (34.7)	28 (20.7)
M16 x 1.5	58 (42.8)	58 (42.8)	35 (25.8)
M18 x 1.5	74 (54.6)	74 (54.6)	44 (32.5)
M22 x 1.5	105 (77.4)	105 (77.4)	63 (46.5)
M27 x 2	178 (131.3)	178 (131.3)	107 (78.9)
M30 x 2	225 (166)	225 (166)	135 (99.6)
M33 x 2	325 (239.7)	325 (239.7)	195 (143.8)
M42 x 2	345 (254.5)	345 (254.5)	207 (152.7)
M48 x 2	440 (324.5)	440 (324.5)	264 (194.7)
M60 x 2	525 (387.2)	525 (387.2)	315 (232.3)

Torque values for port connections (British Standard Pipe Parallel (BSPP) thread ports and stud ends)

	Metric tube Outside Diameter (OD) mm (in)		Ferrous		Non-Ferrous	
BSPP thread G- Gas; A- medium coarse threads	**S-Series ***	**L-Series ****	**S-Series N·m (lb ft) ± 10%**	**L-Series N·m (lb ft) ± 10%**	**S-Series N·m (lb ft) ± 10%**	**L-Series N·m (lb ft) ± 10%**
G 1/8 A	–	6 (0.236)	–	21 (15.5)	–	12.5 (9.2)
G 1/4 A	6 (0.236) or 8 (0.315)	8 (0.315) or 10 (0.394)	63 (46.5)	53 (39.1)	38 (28)	32 (23.6)
G 3/8 A	10 (0.394) or 12 (0.472)	12 (0.472)	95 (70.1)	84 (62)	57 (42)	50 (36.9)
G 1/2 A	16 (0.630)	15 (0.591) or 18 (0.709)	136 (100.3)	105 (77.4)	82 (60.5)	63 (46.5)
G 3/4 A	20 (0.787)	22 (0.866)	210 (154.9)	210 (154.9)	126 (92.9)	126 (92.9)
G 1 A	25 (0.984)	28 (1.102)	400 (295)	400 (295)	240 (177)	240 (177)
G 1 1/4 A	30 (1.181)	35 (1.378)	525 (387.2)	525 (387.2)	315 (232.3)	315 (232.3)
G 1 1/2 A	38 (1.496)	42 (1.654)	660 (486.8)	660 (486.8)	396 (292.1)	396 (292.1)

* S-Series connectors are used with O-Ring Face Seals (ORFS).

** L-Series connectors are used with **37°** flare.

Torque values for metric port connections (Metric face-seal ports and stud ends)

	Metric tube Outside Diameter (OD) mm (in)		Ferrous		Non-Ferrous	
Metric thread	**S-Series ***	**L-Series ****	**S-Series N·m (lb ft) ± 10%**	**L-Series N·m (lb ft) ± 10%**	**S-Series N·m (lb ft) ± 10%**	**L-Series N·m (lb ft) ± 10%**
M10 x 1	–	4 (0.157)	–	21 (15.5)	–	12.5 (9.2)
M12 x 1.5	4 (0.157)	6 (0.236)	47 (34.7)	32 (23.6)	28 (20.7)	19 (14)
M14 x 1.5	5 (0.197)	7 (0.276)	63 (46.5)	53 (39.1)	38 (28)	32 (23.6)
M16 x 1.5	7 (0.276)	9 (0.354)	84 (62)	63 (46.5)	50 (36.9)	38 (28)
M18 x 1.5	8 (0.315)	11 (0.433)	105 (77.4)	84 (62)	63 (46.5)	50 (36.9)
M20 x 1.5	10 (0.394)	–	147 (108.4)	–	88 (64.9)	–
M22 x 1.5	12 (0.472)	14 (0.551)	158 (116.5)	147 (108.4)	95 (70.1)	88 (64.9)
M26 x 1.5	–	18 (0.709)	–	210 (154.9)	–	126 (92.9)
M27 x 1.2	16 (0.630)	–	210 (154.9)		126 (92.9)	–
M33 x 2	20 (0.787)	23 (0.906)	400 (295)	400 (295)	240 (177)	240 (177)
M42 x 2	25 (0.984)	30 (1.181)	525 (387.2)	525 (387.2)	315 (232.3)	315 (232.3)
M48 x 2	32 (1.260)	36 (1.417)	630 (464.7)	630 (464.7)	396 (292.1)	396 (292.1)

* S-Series connectors are used with O-Ring Face Seals (ORFS).

** L-Series connectors are used with **37°** flare.

Torque values for Inch O-Ring Boss (ORB) port non-adjustable connections

			S-Series *		L-Series **	
SAE dash size	UN/UNF thread size	Inch tube OD mm (in)	Ferrous N·m (lb ft) ± 10%	Non-Ferrous N·m (lb ft) ± 10%	Ferrous N·m (lb ft) ± 10%	Non-Ferrous N·m (lb ft) ± 10%
2	5/16-24	3.18 (0.125)	–	–	8.5 (6.3)	5 (3.7)
3	3/8-24	4.76 (0.187)	15.5 (11.4)	9.3 (6.9)	10.5 (7.7)	6.3 (4.6)
4	7/16-20	6.35 (0.250)	37 (27.3)	22 (16.2)	19 (14)	11.5 (8.5)
5	1/2-20	7.94 (0.313)	42 (31)	25 (18.4)	26 (19.2)	15.5 (11.4)
6	9/16-18	9.52 (0.375)	47 (34.7)	28 (20.7)	32 (23.6)	19 (14)
8	3/4-16	12.7 (0.500)	89 (65.6)	53 (39.1)	53 (39.1)	32 (23.6)
10	7/8-14	15.88 (0.625)	121 (89.2)	73 (53.8)	63 (46.5)	38 (28)
12	1-1/16-12	19.05 (0.750)	178 (131.3)	107 (78.9)	100 (73.8)	60 (44.3)
14	1-3/16-12	22.22 (0.875)	225 (166)	135 (99.6)	131 (96.6)	79 (58.3)
16	1-5/16-12	25.4 (1.000)	283 (208.7)	170 (125.4)	156 (115.1)	94 (69.3)
20	1-5/8-12	31.75 (1.250)	300 (221.3)	180 (132.8)	210 (154.9)	126 (92.9)
24	1-7/8-12	38.1 (1.500)	388 (286.2)	233 (171.9)	220 (162.3)	132 (97.4)
32	2-1/2-12	50.8 (2.000)	388 (286.2)	233 (171.9)	315 (232.3)	189 (139.4)

* S-Series connectors are used with O-Ring Face Seals (ORFS).

** L-Series connectors are used with **37°** flare.

Torque values for inch O-Ring Boss (ORB) port adjustable connections

			S-Series *		L-Series **	
SAE dash size	UN/UNF thread size	Inch tube OD mm (in)	Ferrous N·m (lb ft) ± 10%	Non-Ferrous N·m (lb ft) ± 10%	Ferrous N·m (lb ft) ± 10%	Non-Ferrous N·m (lb ft) ± 10%
2	5/16-24	3.18 (0.125)	–	–	8.5 (6.3)	5 (3.7)
3	3/8-24	4.76 (0.187)	10.5 (7.7)	9.3 (6.9)	10.5 (7.7)	6.3 (4.6)
4	7/16-20	6.35 (0.250)	21 (15.5)	21 (15.5)	19 (14)	11.5 (8.5)
5	1/2-20	7.94 (0.313)	42 (31)	25 (18.4)	26 (19.2)	15.5 (11.4)
6	9/16-18	9.52 (0.375)	47 (34.7)	28 (20.7)	32 (23.6)	19 (14)
8	3/4-16	12.7 (0.500)	89 (65.6)	53 (39.1)	53 (39.1)	32 (23.6)
10	7/8-14	15.88 (0.625)	121 (89.2)	73 (53.8)	63 (46.5)	38 (28)
12	1-1/16-12	19.05 (0.750)	178 (131.3)	107 (78.9)	100 (73.8)	60 (44.3)
14	1-3/16-12	22.22 (0.875)	225 (166)	135 (99.6)	131 (96.6)	79 (58.3)
16	1-5/16-12	25.4 (1.000)	285 (210.2)	170 (125.4)	156 (115.1)	94 (69.3)
20	1-5/8-12	31.75 (1.250)	300 (221.3)	180 (132.8)	210 (154.9)	126 (92.9)
24	1-7/8-12	38.1 (1.500)	388 (286.2)	233 (171.9)	220 (162.3)	132 (97.4)
32	2-1/2-12	50.8 (2.000)	388 (286.2)	233 (171.9)	315 (232.3)	189 (139.4)

* S-Series connectors are used with O-Ring Face Seals (ORFS).

** L-Series connectors are used with **37°** flare.

Torque values for inch O-Ring Boss (ORB) port plugs

		Ferrous		Non-Ferrous
SAE dash size	UN/UNF thread size	Internal hex N·m (lb ft) ± 10%	External hex N·m (lb ft) ± 10%	N·m (lb ft) ± 10%
2	5/16-24	7.5 (5.5)	12.5 (9.2)	7.5 (5.5)
3	3/8-24	14.5 (10.7)	21 (15.5)	12.5 (9.2)
4	7/16-20	21 (15.5)	37 (27.3)	22 (16.2)
5	1/2-20	28 (20.7)	42 (31)	25 (18.4)
6	9/16-18	47 (34.7)	47 (34.7)	28 (20.7)
8	3/4-16	89 (65.6)	89 (65.6)	53 (39.1)
10	7/8-14	116 (85.6)	116 (85.6)	70 (51.6)
12	1-1/16-12	176 (129.8)	176 (129.8)	106 (78.2)
14	1-3/16-12	247 (182.2)	247 (182.2)	148 (109.2)
16	1-5/16-12	284 (209.5)	284 (209.5)	170 (125.4)
20	1-5/8-12	357 (263.3)	357 (263.3)	214 (157.8)
24	1-7/8-12	441 (325.3)	441 (325.3)	265 (195.5)
32	2-1/2-12	536 (395.3)	536 (395.3)	322 (237.5)

Torque values for four-bolt flange connections (Metric Screws, Class 10.9)

Metric size mm	Imperial size in	Screw code 61	Code 61 N·m (lb ft) ± 10%	Screw code 62	Code 62 N·m (lb ft) ± 10%
13	1/2	M8 x 1.25	34 (25.1)	M8 x 1.25	34 (25.1)
19	3/4	M10 x 1.5	74 (54.6)	M10 x 1.5	74 (54.6)
25	1	M10 x 1.5	74 (54.6)	M12 x 1.75	137 (101)
32	1-1/4	M10 x 1.5	74 (54.6)	M12 x 1.75	137 (101)
				M14 x 1.5	189 (139.4)
38	1-1/2	M12 x 1.75	137 (101)	M16 x 2	310 (228.6)
51	2	M12 x 1.75	137 (101)	M20 x 2.5	575 (424.1)
64	2-1/2	M12 x 1.75	137 (101)	M24 x 3	575 (424.1)
76	3	M16 x 2	310 (228.6)	M30 x 3.5	680 (501.5)
89	3-1/2	M16 x 2	310 (228.6)	–	–
102	4	M16 x 2	310 (228.6)	–	–
127	5	M16 x 2	310 (228.6)	–	–

Torque values for four-bolt flange connections (Metric Screws, Class 8.8)

Metric size mm	Imperial size in	Screw code 61	Code 61 N·m (lb ft) ± 10%	Screw code 62	Code 62 N·m (lb ft) ± 10%
13	1/2	M8 x 1.25	29 (21.4)	M8 x 1.25	29 (21.4)
19	3/4	M10 x 1.5	57(42)	M10 x 1.5	57(42)
25	1	M10 x 1.5	57(42)	M12 x 1.75	100 (73.8)
32	1-1/4	M10 x 1.5	57(42)	M12 x 1.75	100 (73.8)
				M14 x 1.5	160 (118)
38	1-1/2	M12 x 1.75	100 (73.8)	M16 x 2	250 (184.4)
51	2	M12 x 1.75	100 (73.8)	M20 x 2.5	500 (368.8)
64	2-1/2	M12 x 1.75	100 (73.8)	M24 x 3	575 (424.1)
76	3	M16 x 2	250 (184.4)	M30 x 3.5	680 (501.5)
89	3-1/2	M16 x 2	250 (184.4)	–	–
102	4	M16 x 2	250 (184.4)	–	–
127	5	M16 x 2	250 (184.4)	–	–

Torque values for four-bolt flange connections (Inch Screws, Grade 8)

Metric size mm	Imperial size in	Screw code 61	Code 61 N·m (lb ft) ± 10%	Screw code 62	Code 62 N·m (lb ft) ± 10%
13	1/2	5/16-18	34 (25.1)	5/16-18	34 (25.1)
19	3/4	3/8-16	63 (46.5)	3/8-16	63 (46.5)
25	1	3/8-16	63 (46.5)	7/16-14	97 (71.5)
32	1-1/4	7/16-14	97 (71.5)	1/2-13	158 (116.5)
38	1-1/2	1/2-13	158 (116.5)	5/8-11	310 (228.6)
51	2	1/2-13	158 (116.5)	3/4-10	473 (348.9)
64	2-1/2	1/2-13	158 (116.5)	–	–
76	3	5/8-11	310 (228.6)	–	–
89	3-1/2	5/8-11	310 (228.6)	–	–
102	4	5/8-11	310 (228.6)	–	–
127	5	5/8-11	310 (228.6)	–	–

Tapered thread connection tightening

British Standard Pipe Taper (BSPT) thread size (inch)	National Pipe Thread Fuel (NPTF) thread size (inch)	Turns from finger tight
1/8-28	1/8-27	2 - 3
1/4-19	1/4-18	2 - 3
3/8-19	3/8-18	2 - 3
1/2-14	1/2-14	2 - 3
3/4-14	3/4-14	2 - 3
1-11	1-11 1/2	1.5 - 2.5
1-1/4-11	1-1/4-11 1/2	1.5 - 2.5
1-1/2-11	1-1/2-11 1/2	1.5 - 2.5
2-11	2-11 1/2	1.5 - 2.5

Torque values for banjo bolt connections (Copper washer style)

Bolt thread (metric)	Hex size (mm)	Torque N·m (lb ft) ± 10%
M8 x 1.25	13	13 (9.6)
M10 x 1.25	17	16 (11.8)
M12 x 1.5	17	40 (29.5)
M14 x 1.5	19	45 (33.2)
M16 x 1.5	22	48 (35.4)
M18 x 1.5	24	50 (36.9)
M20 x 1.5	27	73 (53.8)
M22 x 1.5	32	73 (53.8)
M24 x 1.5	32	73 (53.8)

Torque values for O-Ring Face Seals (ORFS) connections

SAE dash size	UN/UNF thread size	Inch tube OD (mm)	Metric tube OD (mm)	Hex size (mm) (Reference only)	* Swivel nut torque N·m (lb ft) ± 10%	** Swivel nut torque N·m (lb ft) ± 10%
4	9/16-18	6.35	6	17	27 (19.9)	27 (19.9)
5	5/8-18	7.94	8	19	34 (25.1)	34 (25.1)
6	11/16-16	9.52	10	22	44 (32.5)	44 (32.5)
8	13/16-16	12.7	12	24	65 (47.9)	65 (47.9)
10	1-14	15.88	16	30	100 (73.8)	100 (73.8)
12	1-3/16-12	19.05	20	36	150 (110.6)	131 (96.6)
14	1-5/16-12	22.23	22	41	163 (120.2)	131 (96.6)
16	1-7/16-12	25.4	25	41	210 (154.9) ***	131 (96.9)
20	1-11/16-12	31.75	30	50	280 (206.5) ***	178 (131.3)
24	2-12	38.1	38	60	375 (276.6) ***	210 (154.9)

* High/Medium-pressure applications > **50 bar** (**725 psi**).

** Low-pressure applications < **50 bar** (**725 psi**).

*** It is recommended to use a four-bolt flange connection instead of O-Ring Face Seals (ORFS) sizes "16" and up.

Torque values for 37° flare connections - Joint Industry Council (JIC)

SAE dash size	UN/UNF thread size	Metric tube OD (mm)	Inch tube OD (mm)	Swivel nut torque N·m (lb ft) ± 10%
2	5/16-24	–	3.18	8.25 (6.1)
3	3/8-24	–	4.76	11.5 (8.5)
4	7/16-20	6	6.35	15.5 (11.4)
5	1/2-20	8	7.94	20 (14.8)
6	9/16-18	10	9.52	25 (18.4)
8	3/4-16	12	12.7	52 (38.4)
10	7/8-14	16	15.88	81 (59.7)
12	1-1/16-12	20	19.05	112 (82.6)
14	1-3/16-12	–	22.22	133 (98.1)
16	1-5/16-12	25	25.4	155 (114.3)
20	1-5/8-12	30/32	31.75	180 (132.8)
24	1-7/8-12	38	38.1	225 (166)
32	2-1/2-12	50	50.8	348 (256.7)

Torque values for 30° flare, 60° cone connections

Nominal size (mm)	British Standard Pipe Parallel (BSPP) thread size	Hex size (mm)	Swivel nut torque N·m (lb ft) ± 10%
5, 6, 6.3	G 1/4	17	25 (18.4)
8, 9, 10	G 3/8	19	34 (25.1)
12, 12.5	G 1/2	22	64 (47.2)
15, 16, 19	G 3/4	30	132 (97.4)
25	G 1	36	196 (144.6)
31.5, 32	G 1-1/4	46	225 (166)
38	G 1-1/2	50	255 (188.1)
50, 51	G 2	65	316 (223.1)

Consumables

AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 2	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9000 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2 [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2	---
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	---
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), dual row	
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), double alternated	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	---

System	Volume	Recommended fluid	International specification
Engine (with filter change)	**26 L** (**7 US gal**)	**SAE 15W-40; API CI-4; ACEA E7**	API CI-4, CES 20078, ACEA E7
Fuel tank	**640 L** (**169 US gal**)	Diesel fuel (S10 and S500) or biodiesel fuel ***NOTE:*** *For Stage V engine, only S10 diesel.*	-
Fuel system additive	**6.4 L** (**1.7 US gal**)	-	-
Exhaust gas treatment system	**70 L** (**18 US gal**)	**DIESEL EXHAUST FLUID (DEF)/ADBLUE®**	-
Cooling system	**50 L** (**13 US gal**)	* **50%** demineralized water * / **50% HEAVY-DUTY IAT COOLANT (CONCENTRATE), ASTM D6210**	OAT Glycol ASTM D3306
Air-conditioning system Refrigerant Compressor oil	**1.7 kg** **0.22 L** (**0.06 US gal**)	**REFRIGERANT HFC-134A** **SP-15, VG 68**	HFC-134a
Windscreen washer reservoir	**9 L** (**2 US gal**)	Clean water with no additives	-
Hydraulic system (upper and lower tanks)	**500 L** (**132 US gal**)	**ANTI-WEAR (AW) MONOGRADE ISO VG 68**	-
Pump drive gear box	**3.5 L** (**0.9 US gal**)	**SAE 10W-30, API GL 4, ISO VG 68 (UTTO)**	-
Chopper gearbox	**7.5 L** (**2.0 US gal**)	**SAE 85W-140, API GL 5, EXTREME PRESSURE (EP)**	-
Wheel hub reducer (per unit)	**3.6 L** (**1.0 US gal**)	**SAE 85W-140, API GL 5, EXTREME PRESSURE (EP)**	-
Base cutter drive gearbox	**9.5 L** (**2.5 US gal**)	**SAE 85W-140, API GL 5, EXTREME PRESSURE (EP)**	-
Grease fittings	As required	**NLGI 2, LITHIUM SOAP GREASE, EXTREME PRESSURE (EP), ANTI-WEAR**	NLG1 2-251 EP-M
FRM roller bearing journals (per unit)	**15 g**	**NLGI 2, LITHIUM SOAP GREASE, EXTREME PRESSURE (EP), ANTI-WEAR**	NLG1 2-251 EP-M

System	Volume	Recommended fluid	International specification
Engine (with filter change)	**26 L** (**7 US gal**)	**SAE 15W-40; API CI-4; ACEA E7**	API CI-4, CES 20078, ACEA E7
Fuel tank	**640 L** (**169 US gal**)	Diesel fuel (S10 and S500) or biodiesel fuel ***NOTE:*** *For Stage V engine, only S10 diesel.*	-
Fuel system additive	**6.4 L** (**1.7 US gal**)	-	-
Exhaust gas treatment system	**70 L** (**18 US gal**)	**DIESEL EXHAUST FLUID (DEF)/ADBLUE®**	-
Cooling system	**50 L** (**13 US gal**)	* **50%** demineralized water * / **50% HEAVY-DUTY IAT COOLANT (CONCENTRATE), ASTM D6210**	OAT Glycol ASTM D3306
Air-conditioning system Refrigerant Compressor oil	**1.7 kg** **0.22 L** (**0.06 US gal**)	**REFRIGERANT HFC-134A** **SP-15, VG 68**	HFC-134a
Windscreen washer reservoir	**9 L** (**2 US gal**)	Clean water with no additives	-
Hydraulic system (upper and lower tanks)	**500 L** (**132 US gal**)	**ANTI-WEAR (AW) MONOGRADE ISO VG 68**	-
Pump drive gear box	**3.5 L** (**0.9 US gal**)	**SAE 10W-30, API GL 4, ISO VG 68 (UTTO)**	-
Chopper gearbox	**7.5 L** (**2.0 US gal**)	**SAE 85W-140, API GL 5, EXTREME PRESSURE (EP)**	-
Wheel hub reducer (per unit)	**3.6 L** (**1.0 US gal**)	**SAE 85W-140, API GL 5, EXTREME PRESSURE (EP)**	-
Base cutter drive gearbox	**13.5 L** (**3.6 US gal**)	**SAE 85W-140, API GL 5, EXTREME PRESSURE (EP)**	-
Grease fittings	As required	**NLGI 2, LITHIUM SOAP GREASE, EXTREME PRESSURE (EP), ANTI-WEAR**	NLG1 2-251 EP-M
FRM roller bearing journals (per unit)	**15 g**	**NLGI 2, LITHIUM SOAP GREASE, EXTREME PRESSURE (EP), ANTI-WEAR**	NLG1 2-251 EP-M

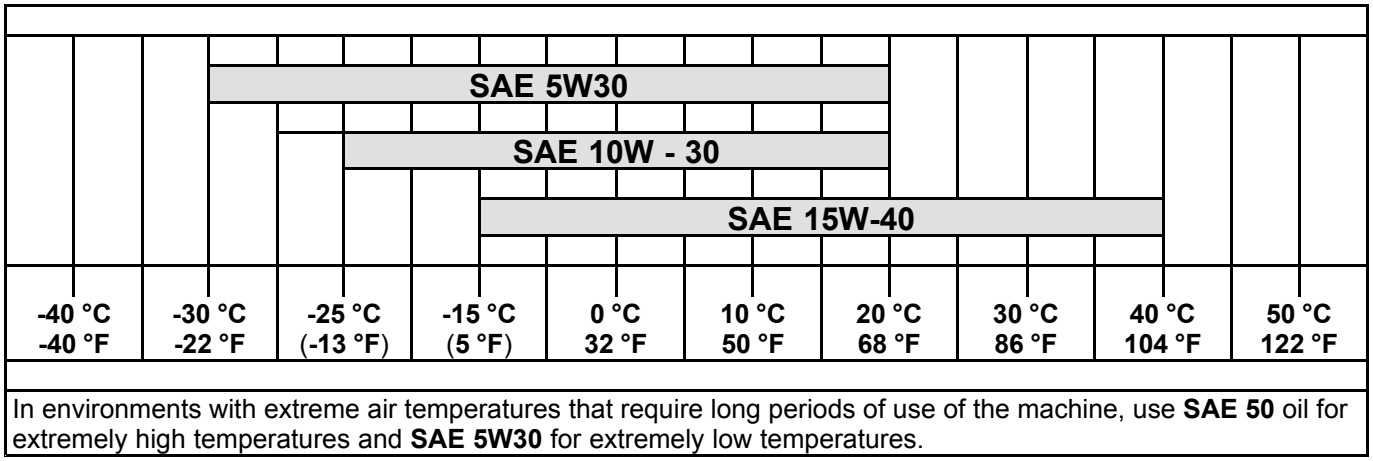
System	Volume	Recommended fluid	International specification
Engine (with filter change)	**26 L** (**7 US gal**)	**SAE 15W-40; API CI-4; ACEA E7**	API CI-4, CES 20078, ACEA E7
Fuel tank	**640 L** (**169 US gal**)	Diesel fuel (S10 and S500) or biodiesel fuel ***NOTE:*** *For Stage V engine, only S10 diesel.*	-
Fuel system additive	**6.4 L** (**1.7 US gal**)	-	-
Exhaust gas treatment system	**70 L** (**18 US gal**)	**DIESEL EXHAUST FLUID (DEF)/ADBLUE®**	-
Cooling system	**50 L** (**13 US gal**)	* **50%** demineralized water * / **50% HEAVY-DUTY IAT COOLANT (CONCENTRATE), ASTM D6210**	OAT Glycol ASTM D3306
Air-conditioning system Refrigerant Compressor oil	**1.7 kg** **0.22 L** (**0.06 US gal**)	**REFRIGERANT HFC-134A** **SP-15, VG 68**	HFC-134a
Windscreen washer reservoir	**9 L** (**2 US gal**)	Clean water with no additives	-
Hydraulic system (upper and lower tanks)	**500 L** (**132 US gal**)	**ANTI-WEAR (AW) MONOGRADE ISO VG 68**	-
Pump drive gear box	**3.5 L** (**0.9 US gal**)	**SAE 10W-30, API GL 4, ISO VG 68 (UTTO)**	-
Chopper gearbox	**7.5 L** (**2.0 US gal**)	**SAE 85W-140, API GL 5, EXTREME PRESSURE (EP)**	-

System	Volume	Recommended fluid	International specification
Wheel hub reducer (per unit)	**3.6 L** (**1.0 US gal**)	**SAE 85W-140, API GL 5, EXTREME PRESSURE (EP)**	-
Base cutter drive gearbox	**11.9 L** (**3.1 US gal**)	**SAE 85W-140, API GL 5, EXTREME PRESSURE (EP)**	-
Grease fittings	As required	**NLGI 2, LITHIUM SOAP GREASE, EXTREME PRESSURE (EP), ANTI-WEAR**	NLG1 2-251 EP-M
FRM roller bearing journals (per unit)	**15 g**	**NLGI 2, LITHIUM SOAP GREASE, EXTREME PRESSURE (EP), ANTI-WEAR**	NLG1 2-251 EP-M

* If demineralized water is not available, the water must have the following features:

Solids	Chlorine	Sulfates	pH
340 ppm	**40 ppm**	**100 ppm**	5,5 - 9,0

The correct engine oil viscosity grade is dependent upon ambient temperature. See the table below for the recommended viscosity at different ambient air temperature ranges.



In environments with extreme air temperatures that require long periods of use of the machine, use **SAE 50** oil for extremely high temperatures and **SAE 5W30** for extremely low temperatures.

SERVICE MANUAL

Engine

AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9000 FPT engine Cursor 11, Tier 2, AUSTOFT 9000 FPT engine Cursor 11, Tier 2, AUSTOFT 9000 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -], AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9000 FPT engine Cursor 11, Tier 2, AUSTOFT 9000 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR), AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971], AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -], AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9900 Motor FPT Cursor 11, Tier 2, AUSTOFT 9900 Motor FPT Cursor 11, Tier 2 [YLPA04972 -], AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971], AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -], AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9900 Motor FPT Cursor 11, Tier 2, AUSTOFT 9900 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR), AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), double alternated, AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), dual row

Contents

Engine - 10

Engine - 10

Engine and crankcase - 001

AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9000 FPT engine Cursor 11, Tier 2, AUSTOFT 9000 FPT engine Cursor 11, Tier 2, AUSTOFT 9000 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -], AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9000 FPT engine Cursor 11, Tier 2, AUSTOFT 9000 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR), AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971], AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -], AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9900 Motor FPT Cursor 11, Tier 2, AUSTOFT 9900 Motor FPT Cursor 11, Tier 2 [YLPA04972 -], AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971], AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic

Reduction Light (SCRL) [YLPA04972 -], AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9900 Motor FPT Cursor 11, Tier 2, AUSTOFT 9900 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR), AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR), AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), double alternated, AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), dual row

Contents

Engine - 10

Engine and crankcase - 001

(*) See content for specific models

Engine - General specification

AUSTOFT 9000 FPT engine Cursor 11, Tier 2	--- ---
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2 [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2	---
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971]	

Version	FPT Cursor 11 Tier 2
Manufacturer	FPT - Fiat Powertrain Technologies
Series	Cursor 11 Electronic
Model	F3GFA613B*E001
Fuel	Diesel fuel
Emission of sulfur	Maximum **500 mg/kg** (S500)
Biodiesel	B20 ASTM D7467 B20 EN 16709
Loop	Diesel 4-stroke
Feed	Turbocharged with intercooler
Turbo charger	Garrett GT45 (equipped with Waste Gate and water cooled)
Injection	Direct
Injection system	Common Rail
Electronics panel	MD-1
Number of rolls	6 In-line
Internal diameter of cylinders	**128 mm**
Piston stroke	**144 mm**
Cylinder displacement	**11.12 cm³** (**11 L**)
Compression Ratio	15.7 - 17.3 : 1
Injection order	1 - 4 - 2 - 6 - 3 - 5
Fuel pump	Bosch CP5 22/2
Injectors	Bosch CRIN3-22 1100 ccm
Rated Power	**310 kW @ 1800 RPM**
Peak power	**343 kW @ 1700 RPM**
Maximum torque	**2082 N·m** (**1536 lb ft**)@ **1500 RPM**
Rotation: Idle Intermediate High	 **600 RPM** **800 – 1500 RPM** **1600 RPM** (Smart Cruise on)/ **1800 RPM** (Smart Cruise off)
Direction of rotation (flywheel side)	Counter-clockwise
Fuel filtration	Primary element (sediment pre-filter) Secondary element
Air intake filtration	Primary (outer) element Secondary (inner) element
Lubrication	Forced by gear pump, with oil filter and crankcase ventilation filter
Cooling	By centrifugal pump, thermostat for adjustment, fan and radiator
Peripheral, driven by Poly V belt	Water pump and alternator
Dimensions: Longitudinal Transverse Height	 **1286 mm** **1004 mm** **1180 mm**
Weight (Dry, without starter motor, alternator, compressor, and fuel filter)	**1190 kg**

Engine - General specification

AUSTOFT 9000 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	---
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), dual row	
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), double alternated	

Version	FPT Cursor 11 Tier 3
Manufacturer	FPT - Fiat Powertrain Technologies
Series	Cursor 11 Electronic
Model	F3GFE613A*H001
Fuel	Diesel fuel
Emission of sulfur	Maximum **500 mg/kg** (S500)
Emissions treatment system	SCR
Biodiesel	B20 ASTM D7467 B20 EN 16709
Loop	Diesel 4-stroke
Feed	Turbocharged with intercooler
Turbo charger	Garrett GT45 (equipped with Waste Gate and water cooled)
Injection	Direct
Injection system	Common Rail
Electronics panel	MD-1
Number of rolls	6 In-line
Internal diameter of cylinders	**128 mm**
Piston stroke	**144 mm**
Cylinder displacement	**11.12 cm³** (**11 L**)
Compression Ratio	15.7 - 17.3 : 1
Injection order	1 - 4 - 2 - 6 - 3 - 5
Fuel pump	Bosch CP5 22/2
Injectors	Bosch CRIN3-22 1100 ccm
Rated Power	**310 kW @ 1800 RPM**
Peak power	**343 kW @ 1700 RPM**
Maximum torque	**2082 N·m** (**1536 lb ft**)**@ 1500 RPM**
Rotation: Idle Intermediate High	 **600 RPM** **800 – 1500 RPM** **1600 RPM** (Smart Cruise on)/ **1800 RPM** (Smart Cruise off)
Direction of rotation (flywheel side)	Counter-clockwise
Fuel filtration	Primary element (sediment pre-filter) Secondary element
Air intake filtration	Primary (outer) element Secondary (inner) element
Lubrication	Forced by gear pump, with oil filter and crankcase ventilation filter
Cooling	By centrifugal pump, thermostat for adjustment, fan and radiator
Peripheral, driven by Poly V belt	Water pump and alternator
Dimensions: Longitudinal Transverse Height	 **1286 mm** **1004 mm** **1180 mm**
Weight (Dry, without starter motor, alternator, compressor, and fuel filter)	**1190 kg**

Engine - General specification

AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	---

Version	FPT Cursor 11 Stage V
Manufacturer	FPT - Fiat Powertrain Technologies
Series	Cursor 11 Electronic
Model	F3GGE613B*V001
Fuel	Diesel fuel
Emission of sulfur	Maximum **10 mg/kg** (S10)
Emissions treatment system	DOC/SCRoF/SCR/CUC
Biodiesel	B5 ASTM D975 B7 EN 590
Loop	Diesel 4-stroke
Feed	Turbocharged with intercooler
Turbo charger	Garrett GT45 (equipped with Waste Gate and water cooled)
Injection	Direct
Injection system	Common Rail
Electronics panel	MD-1
Number of rolls	6 In-line
Internal diameter of cylinders	**128 mm**
Piston stroke	**144 mm**
Cylinder displacement	**11.12 cm³** (**11 L**)
Compression Ratio	15.7 - 17.3 : 1
Injection order	1 - 4 - 2 - 6 - 3 - 5
Fuel pump	Bosch CP5 22/2
Injectors	Bosch CRIN3-22 1200 ccm
Rated Power	**310 kW @ 1800 RPM**
Peak power	**343 kW @ 1700 RPM**
Maximum torque	**2082 N·m** (**1536 lb ft**)@ **1500 RPM**
Rotation: Idle Intermediate High	 **600 RPM** **800 – 1500 RPM** **1600 RPM** (Smart Cruise on)/ **1800 RPM** (Smart Cruise off)
Direction of rotation (flywheel side)	Counter-clockwise
Fuel filtration	Primary element (sediment pre-filter) Secondary element
Air intake filtration	Primary (outer) element Secondary (inner) element
Lubrication	Forced by gear pump, with oil filter and crankcase ventilation filter
Cooling	By centrifugal pump, thermostat for adjustment, fan and radiator
Peripheral, driven by Poly V belt	Water pump and alternator
Dimensions: Longitudinal Transverse Height	 **1286 mm** **1004 mm** **1180 mm**
Weight (Dry, without starter motor, alternator, compressor, and fuel filter)	**1190 kg**

Engine - Remove

AUSTOFT 9000 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 2	--- ---
AUSTOFT 9000 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9000 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2 [YLPA04972 -]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 2	---
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04800 - YLPA04971]	
AUSTOFT 9900 Motor FPT Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL) [YLPA04972 -]	---
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), dual row	
AUSTOFT 9900 FPT engine Cursor 11, Tier 3, Selective Catalytic Reduction Light (SCRL), double alternated	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Tier 4B (final) (Stage V), Selective Catalytic Reduction (SCR)	
AUSTOFT 9900 FPT engine Cursor 11, Stage V, Selective Catalytic Reduction (SCR)	---

⚠ WARNING

Overturning hazard!
Always try to park the machine on firm level ground. Avoid parking on slopes. Block the wheels in both directions.
Failure to comply could result in death or serious injury.

W0051A

⚠ 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

⚠ CAUTION

Burn hazard!
Always wear heat-resistant protective gloves when handling heated parts.
Failure to comply could result in minor or moderate injury.

C0047A

⚠ CAUTION

Heavy object!
The component is heavy. Use care not to drop the component when installing, removing, or handling.
Failure to comply could result in minor or moderate injury.

C0095A

⚠ 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

Heavy object!
The following instruction requires two people.
Failure to comply could result in death or serious injury.

W1270A

Prior operation:
Air conditioning - Recover (50.200)
Prior operation:
Safety rules - Battery master switch (turn off the switch)
Prior operation:
Radiator - Drain fluid - Cooling system (10.400)
Prior operation:
Engine oil pan - Drain fluid (10.102)
Prior operation:
Pump-drive gearbox - Remove (19.121) (valid for condition “C”)
Prior operation:
Pump-drive gearbox - Remove (19.121) (valid for condition “C”)

The motor can be removed from the machine under three different conditions. However, most of the removal steps are the same for all of these conditions. Basically, is a matter of determining whether the gearbox and the hydraulic pumps driven by the motor will be removed before or after removal of the motor.

A. Removal of the motor together with the gearbox and the hydraulic pumps: The prerequisite for this situation is the disconnection of all hoses and electrical connectors from the pumps.

B. Removal of the motor together with the gearbox: The prerequisite for this situation is the removal of all the hydraulic pumps, as per the instructions throughout this literature.

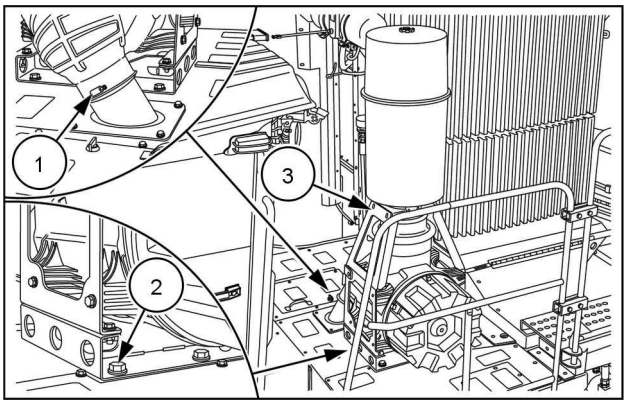
NOTE: *In this situation, pump-by-pump removal is not necessary, that is: In case of coupled pumps (tandem assembly), remove the complete set by loosening only the pump attached directly to the gearbox.*

C. Removal of the motor alone: The prerequisite for this situation is the removal of all the hydraulic pumps and the gearbox, as per the instructions throughout this literature.

NOTE: *The following procedure will be shown and described based on condition “C.”*

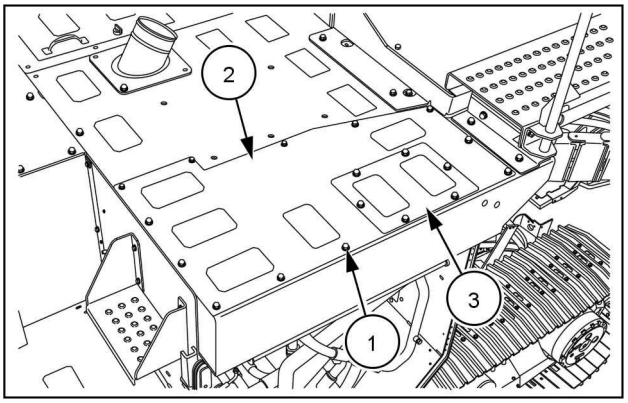
NOTE: *Due to the large quantities of removals that will be carried out, organize and store all the bolts, washers, nuts, clamps, pins, and other hardware, next to the respective components removed.*

1. Park the harvester on a flat, level surface.
2. Apply the parking brake.
3. Shut down the engine. Remove the key from the ignition.
4. Loosen the clamp **(1)**.
5. Remove the bolts **(2)**.
6. With the aid of a suitable lift device, remove the complete air filtration assembly **(3)**.



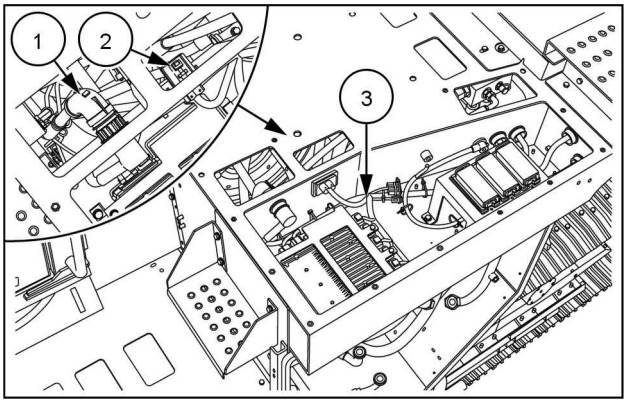
SOIL19SC00238AA 1

7. Remove the bolts **(1)**.
8. Remove the panel **(2)** along with the cover **(3)**.



SOIL19SC00239AA 2

9. Disconnect the connectors **(1)** and **(2)** of the wiring harness **(3)**.

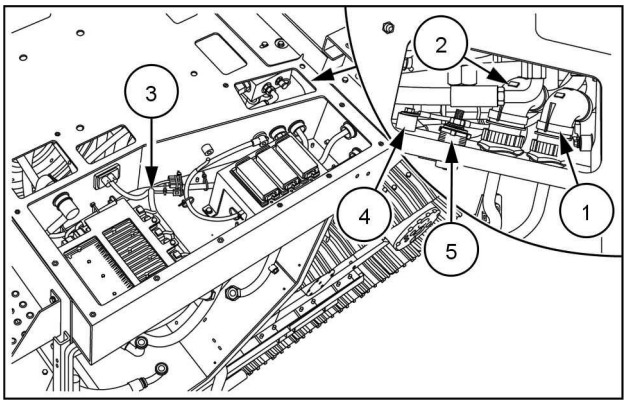


SOIL19SC00240AA 3

10. Disconnect the connectors **(1)** and **(2)** of the wiring harness **(3)**.

NOTE: *Label the electrical connectors for subsequent reconnection.*

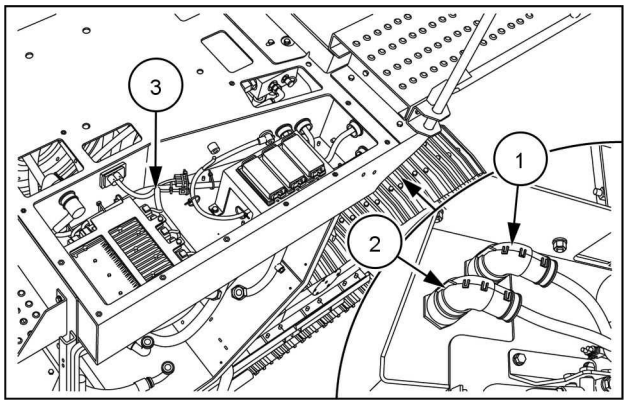
11. Label and disconnect the cables attached to the ground terminals **(4)** and **(5)**.



SOIL19SC00241AA 4

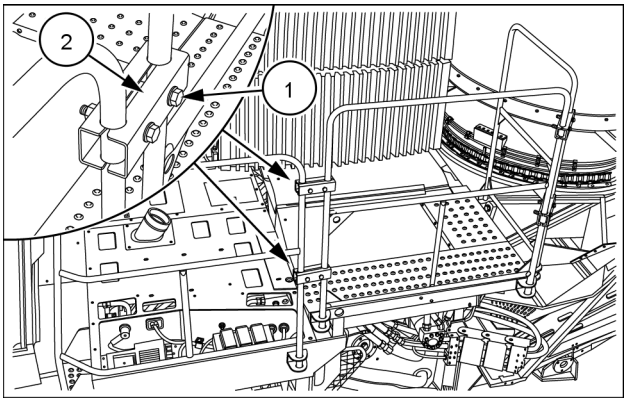
12. Disconnect the connectors **(1)** and **(2)** of the wiring harness **(3)**.

NOTE: *Label the electrical connectors for subsequent re-connection.*



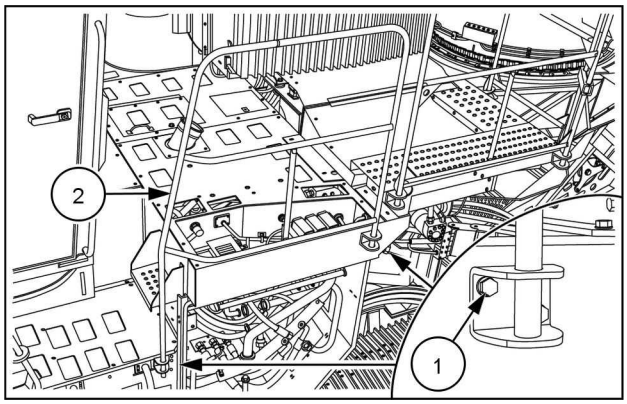
SOIL19SC00242AA 5

13. Remove the bolts **(1)**, loosening the joint clamps **(2)**.



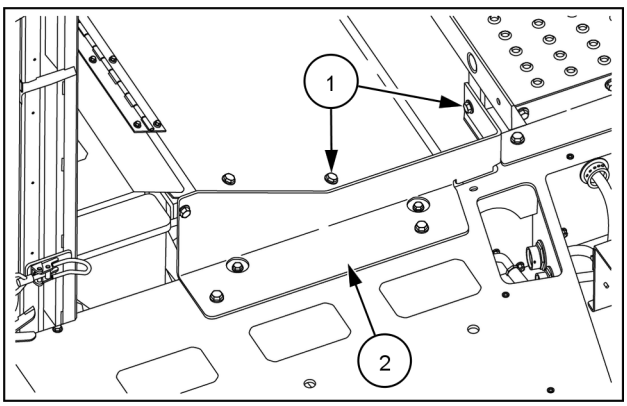
SOIL19SC00243AA 6

14. Remove the bolts **(1)** and the guard rail **(2)**.



SOIL19SC00244AA 7

15. Remove the six bolts **(1)** and the cradle **(2)**.

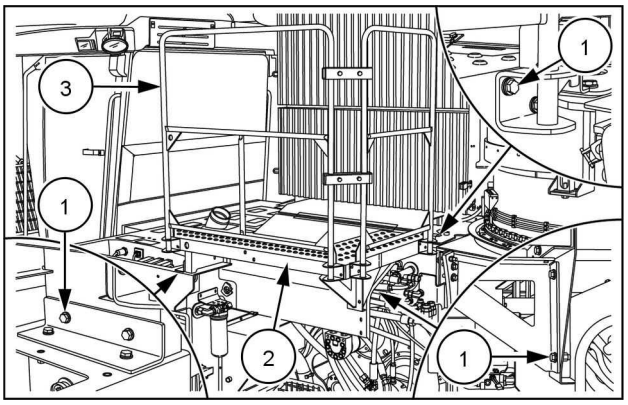


SOIL19SC00245AA 8

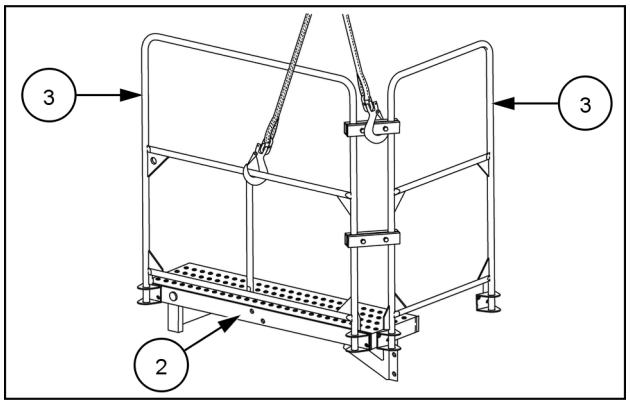
16. Remove the bolts **(1)** on the three fixing points indicated.

NOTE: *There are eight bolts in total.*

17. With the aid of a suitable lift device, remove the header **(2)** together with the guard rails **(3)**.

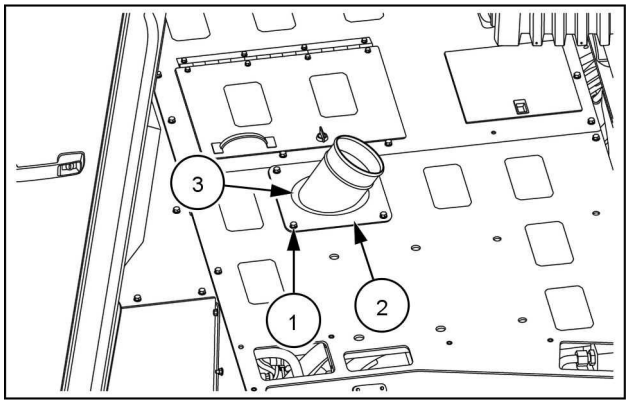


SOIL19SC00246AA 9



SOIL19SC00247AA 10

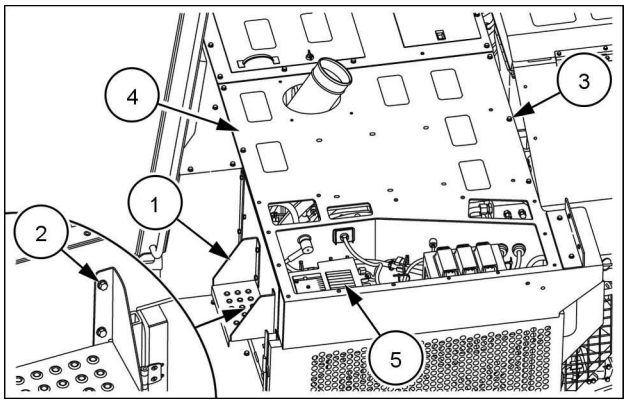
18. Remove the bolts **(1)**.
19. Remove the trim **(2)** and the seal **(3)**.



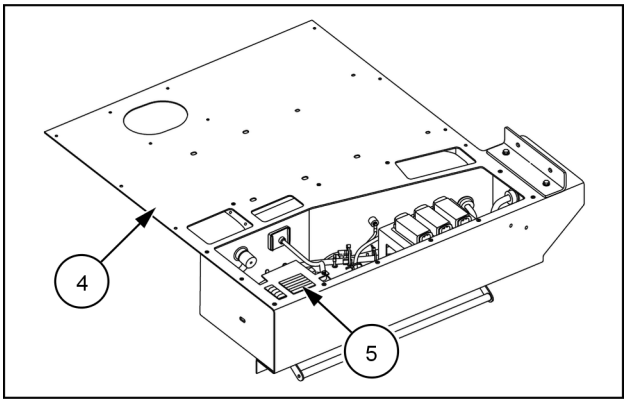
SOIL19SC00248AA 11

20. On the step **(1)**, remove only the top right-hand bolt **(2)**.
21. Remove the remaining bolts **(3)** from the panel **(4)**.
22. Remove the panel **(4)** along with the electronic module **(5)** and other components, with the help of an assistant.

NOTICE: *Lift the panel **(4)** carefully, because there is an electrical wiring harness attached from underneath the panel. Cut the plastic straps that secure this electrical wiring harness.*

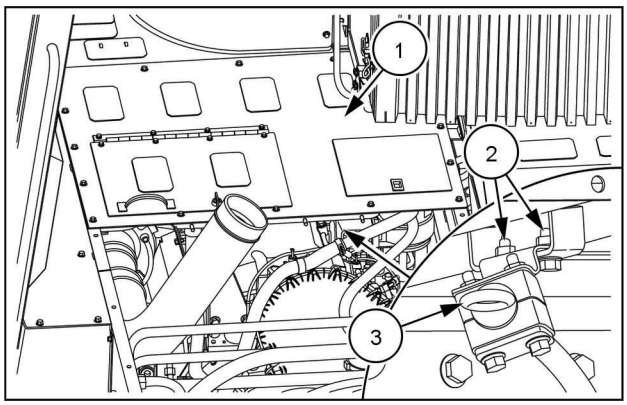


SOIL19SC00249AA 12



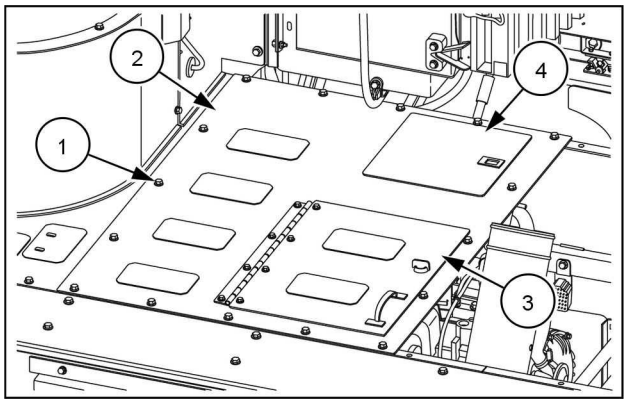
SOIL19SC00250AA 13

23. From the bottom of the panel **(1)**, remove the bolts **(2)** to release the oil dipstick cradle **(3)**.



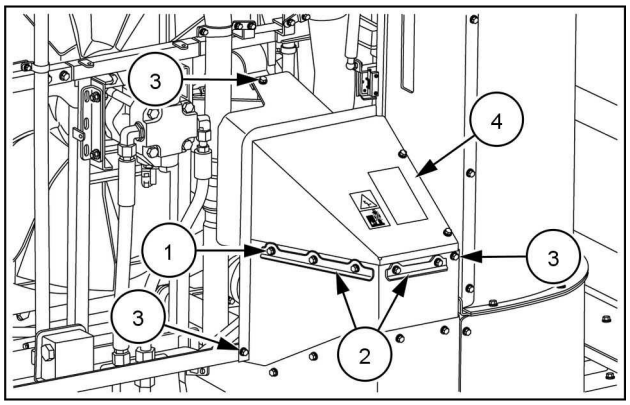
SOIL19SC00251AA 14

24. Remove the bolts **(1)**.
25. Remove the panel **(2)** together with the door **(3)** and the cover **(4)**, with the aid of an assistant.



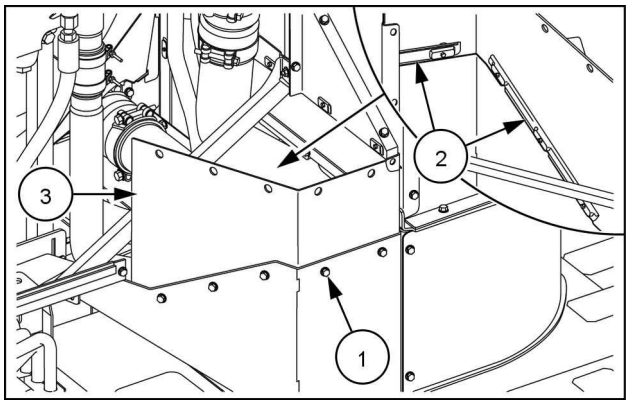
SOIL19SC00252AA 15

26. Tilt the right-hand and left-hand doors of the radiator compartment. Install the safety locks on the cylinders, as per the instructions on page **Safety rules - Safety locks of the radiator compartment doors**.
27. Remove the bolts **(1)** and the union washers **(2)**.
28. Remove the five bolts **(3)** and the cover **(4)**.



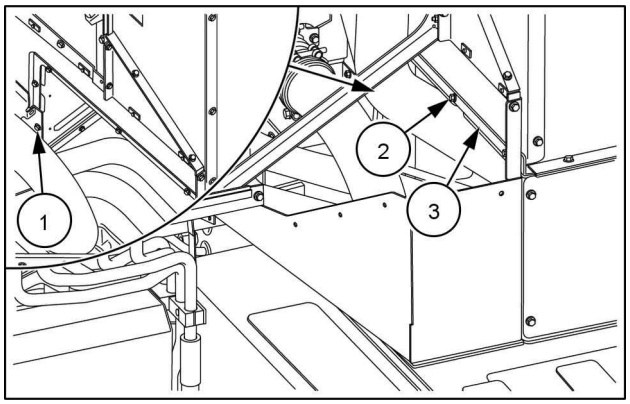
SOIL19SC00162AA 16

29. Remove the bolts **(1)** and the union washers **(2)**.
30. Remove the rubber seal **(3)**.



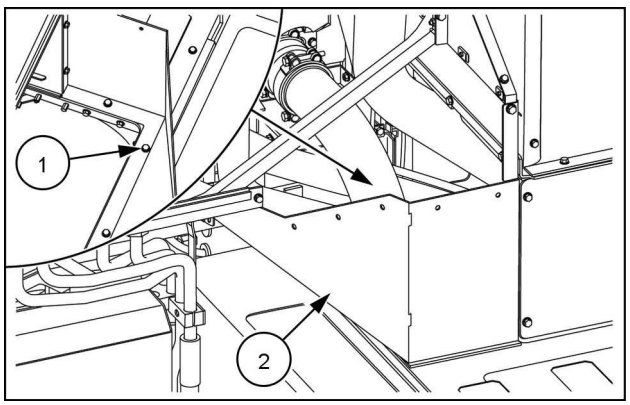
SOIL19SC00192AA 17

31. Remove the lower bolt **(1)**.
32. Remove the bolts **(2)** and the trim **(3)**.



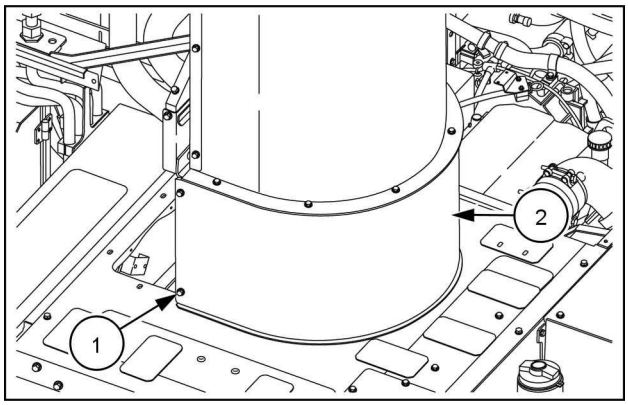
SOIL19SC00295AA 18

33. Remove the bolts **(1)** and funnel **(2)**.



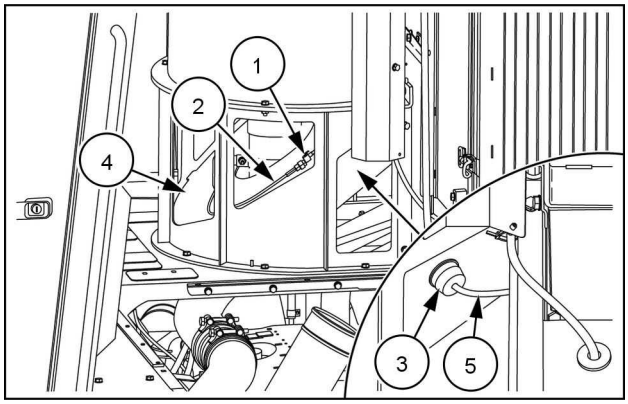
SOIL19SC00193AA 19

34. Remove the side bolts **(1)** and the bottom cover **(2)**.



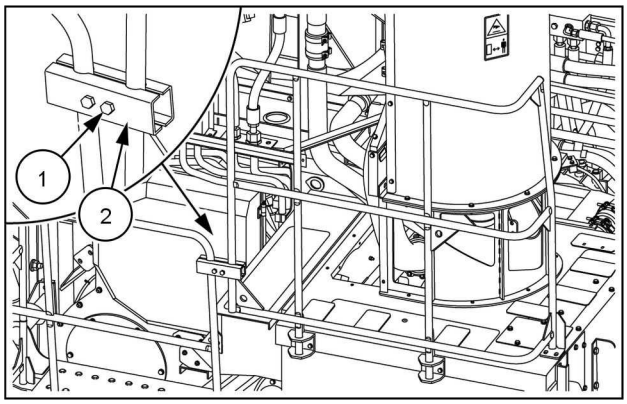
SOIL19SC00254AA 20

35. Disconnect the connector **(1)** from the electrical wiring harness **(2)**.
36. Remove the eyelets **(3)** from the plate **(4)**.
37. Remove the branching of the electrical wiring harness **(5)** from the eyelets **(3)**.
38. Pull the branching of the electrical wiring harness **(5)** out of plate **(4)**.



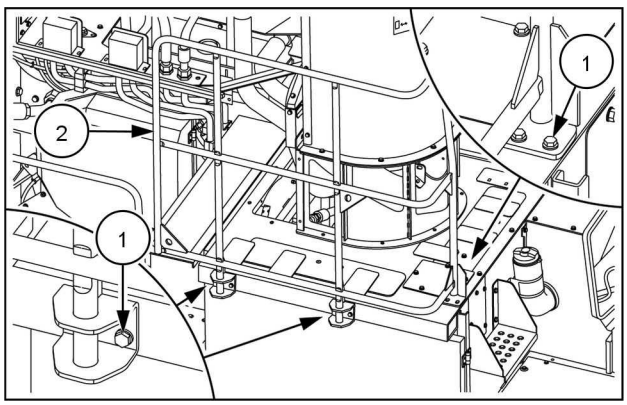
SOIL19SC00255AA 21

39. Remove the bolts **(1)**, loosening the joint clamps **(2)**.



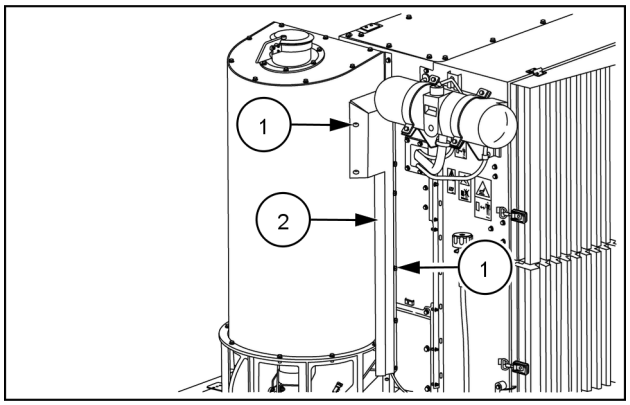
SOIL19SC00256AA 22

40. Remove the bolts **(1)** and the guard rail **(2)**.



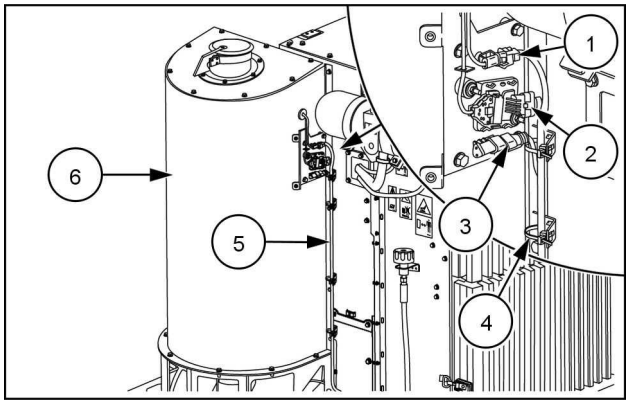
SOIL19SC00257AA 23

41. Remove the bolts **(1)** and the chute **(2)**.



SOIL19SC00258AA 24

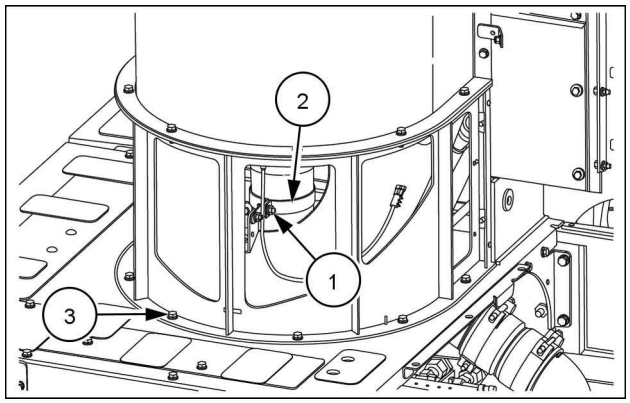
42. Disconnect the electrical connectors **(1)**, **(2)**, and **(3)**.
43. Cut the plastic straps **(4)** that secure the electrical wiring harness **(5)** on the central cover **(6)**.



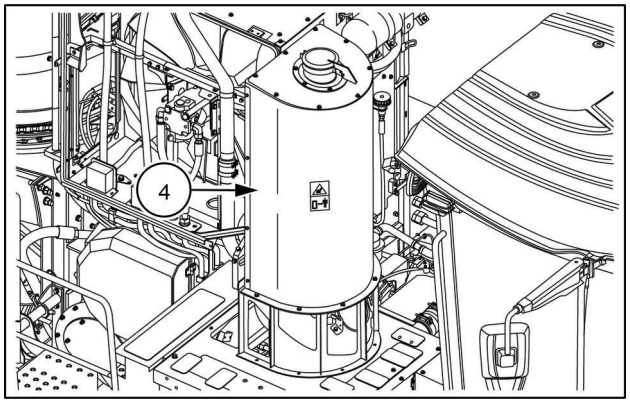
SOIL19SC00259AA 25

44. Remove the bolt **(1)**, loosening the muffler assembly from the clamp **(2)** assembled on engine exhaust pipe.
45. Remove the bottom bolts **(3)**.
46. With the aid of a suitable lift device, remove the complete muffler assembly **(4)**.

ATTENTION: *Since this component has a tall, heavy frame, use extra care when you secure the lift straps, in order to avoid tipping the assembly during movement.*

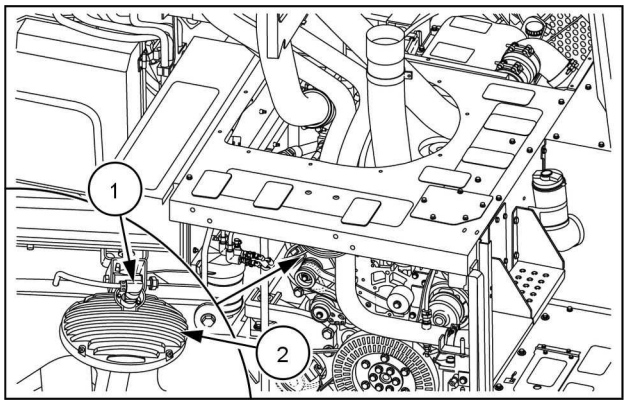


SOIL19SC00260AA 26



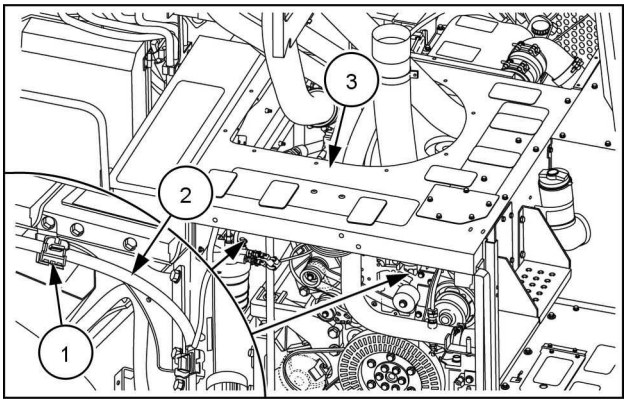
SOIL19SC00261AA 27

47. Inside the engine compartment, disconnect the connector **(1)** from the bulb **(2)**.



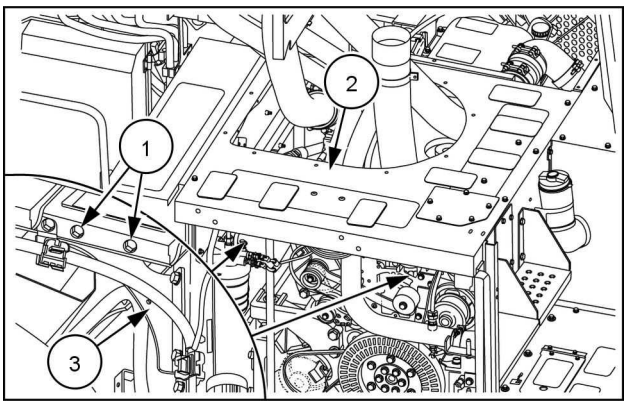
SOIL19SC00262AA 28

48. Open the two top clamps **(1)**. Loosen the electrical wiring harness **(2)** from the panel **(3)**.



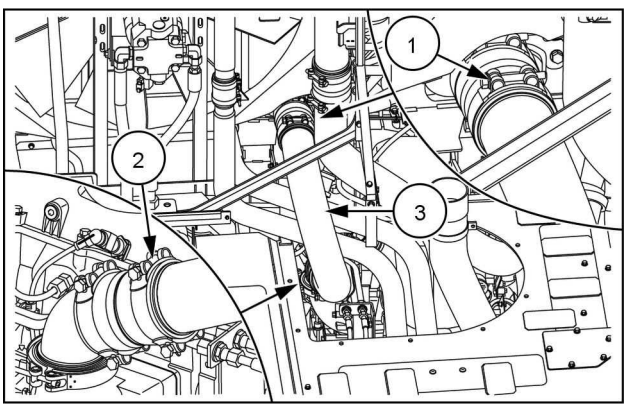
SOIL19SC00263AA 29

49. Remove the bolts **(1)** and remove the panel **(2)** from the four side cradles **(3)**.



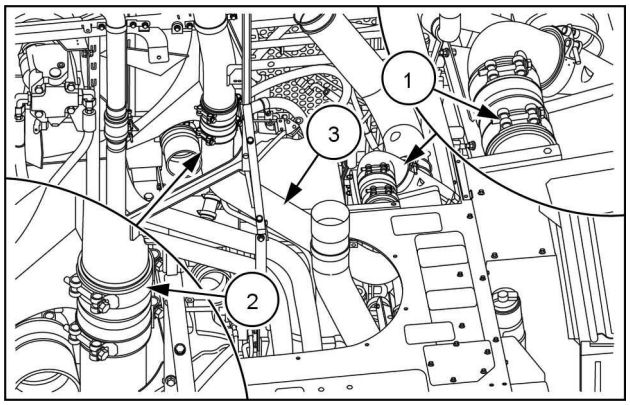
SOIL19SC00263AA 30

50. Loosen the clamps **(1)** and **(2)**, and then disconnect and remove the intercooler output tubing **(3)**.



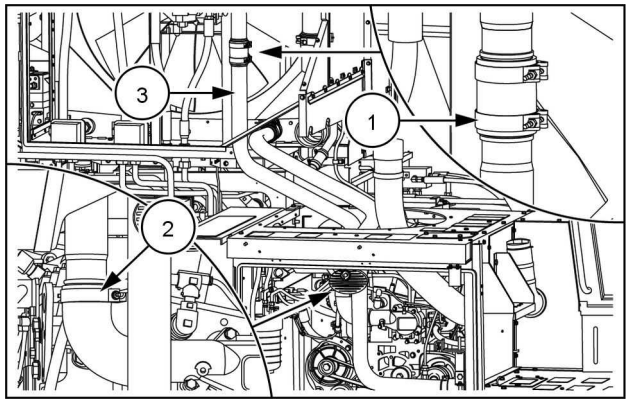
SOIL19SC00264AA 31

51. Loosen the clamps **(1)** and **(2)**, and then disconnect and remove the intercooler input tubing **(3)**.



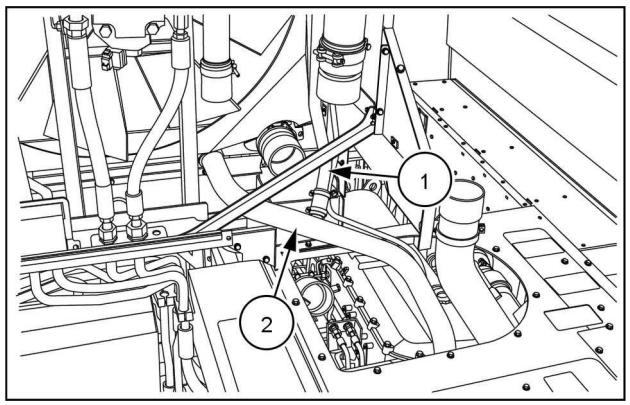
SOIL19SC00265AA 32

52. Loosen the clamps **(1)** and **(2)**, and then disconnect and remove the radiator input tubing **(3)**.



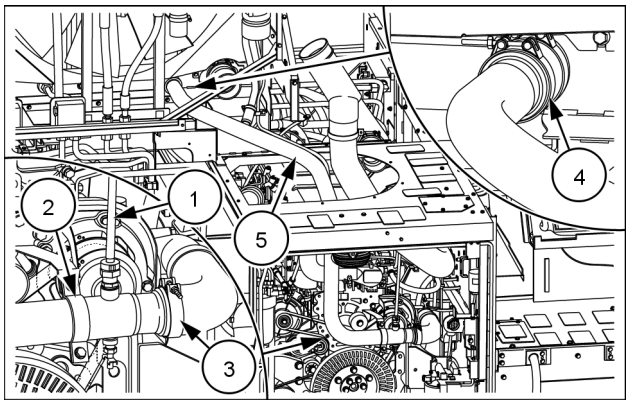
SOIL19SC00266AA 33

53. Disconnect the hose **(1)** from the radiator output tubing **(2)**.



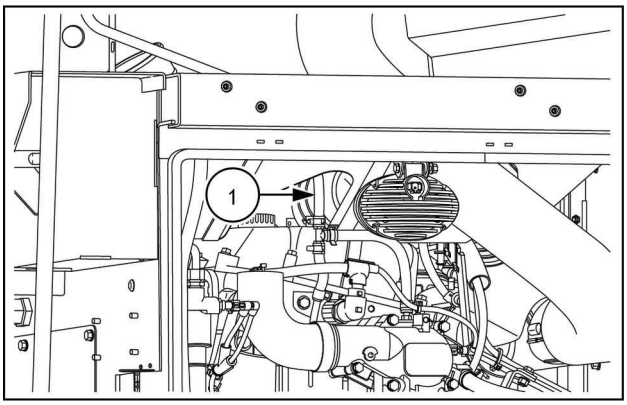
SOIL19SC00311AA 34

54. Disconnect the hose **(1)** from the urea injector.
55. Remove the clamp **(2)**.
56. Loosen the clamps **(3)** and **(4)**, and then disconnect and remove the radiator output tubing **(5)**.



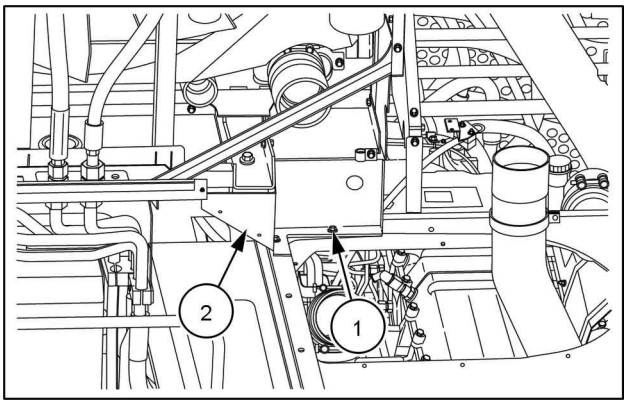
SOIL19SC00267AA 35

57. Disconnect the hose **(1)** from the expansion tank.



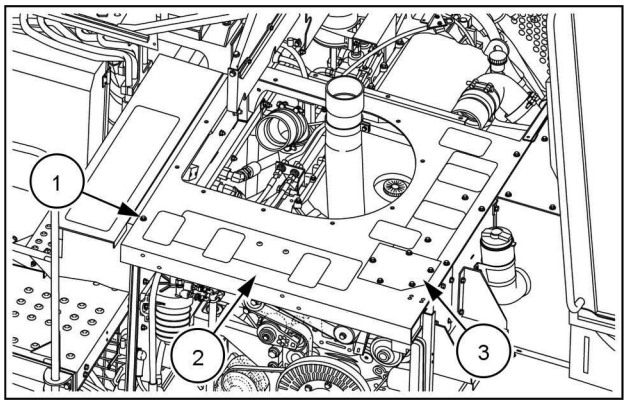
SOIL19SC00268AA 36

58. Remove the bolts **(1)** and the cover **(2)**.

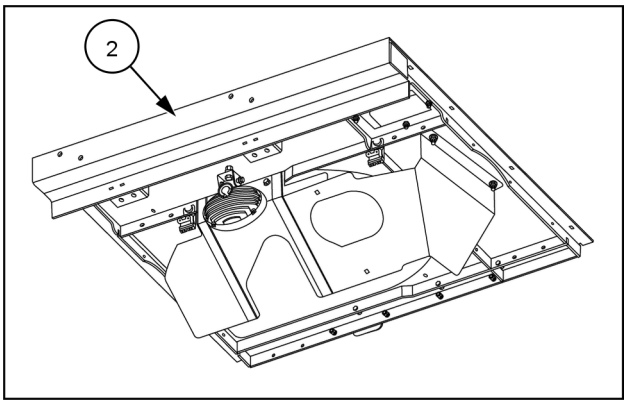


SOIL19SC00269AA 37

59. Remove the remaining bolts **(1)** from the panel **(2)**.
60. Remove the panel **(2)** along with the cover **(3)**, with the aid of an assistant.

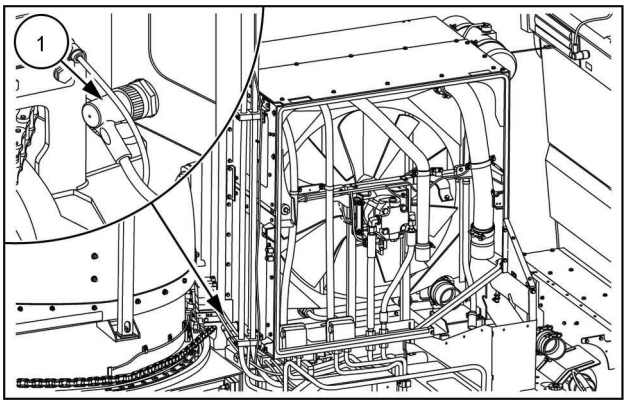


SOIL19SC00270AA 38



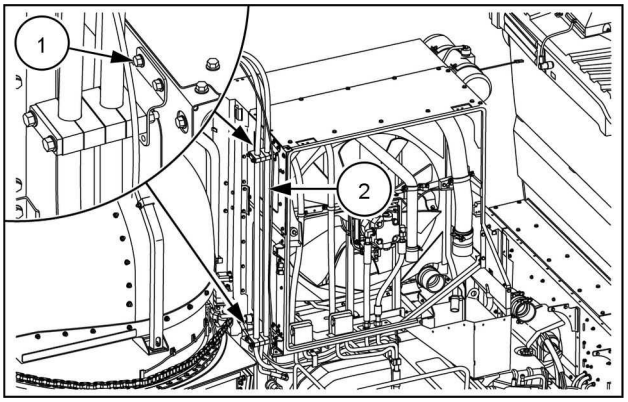
SOIL19SC00271AA 39

61. At the bottom of the radiator compartment, disconnect the electrical connector **(1)**.



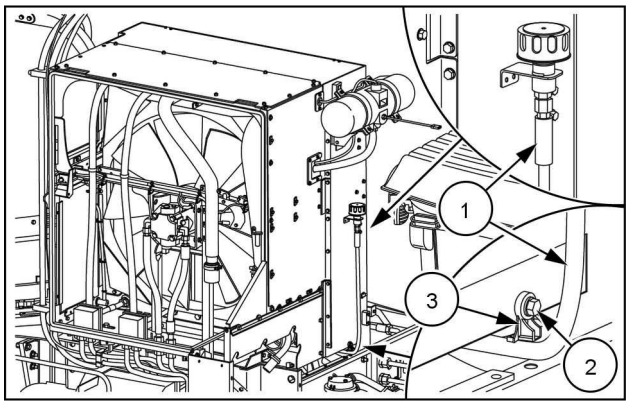
SOIL19SC00296AA 40

62. Remove the bolts **(1)**, loosening the retaining brackets of the hydraulic hoses **(2)** from the primary extractor assembly.



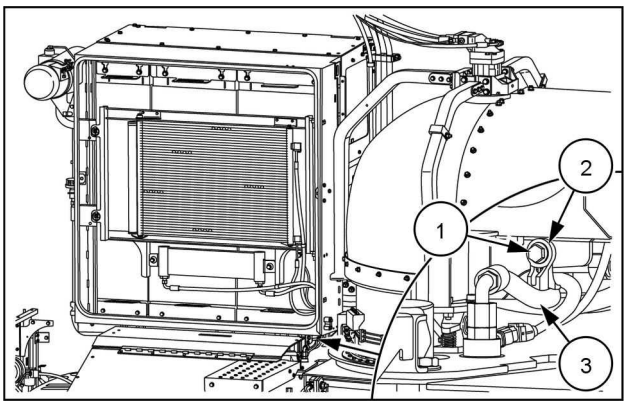
SOIL19SC00297AA 41

63. Disconnect the breather hose **(1)** from the hydraulic oil reservoir.
64. Remove the bolt **(2)**, loosening the cradle with clamp **(3)** that secures the hose **(1)**.



SOIL19SC00298AA 42

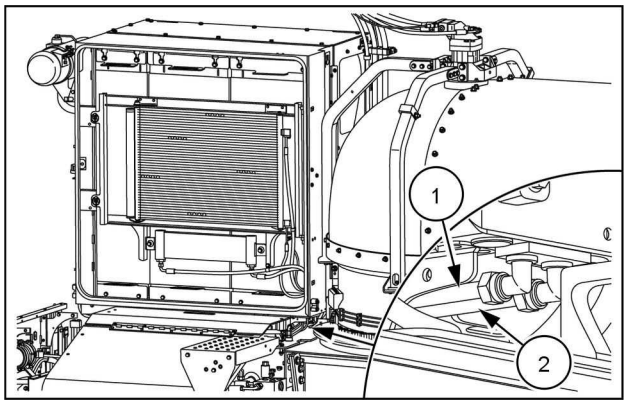
65. Remove the bolt **(1)**, loosening the cradle with clamp **(2)** that secures the breather hose **(3)**.



SOIL19SC00302AA 43

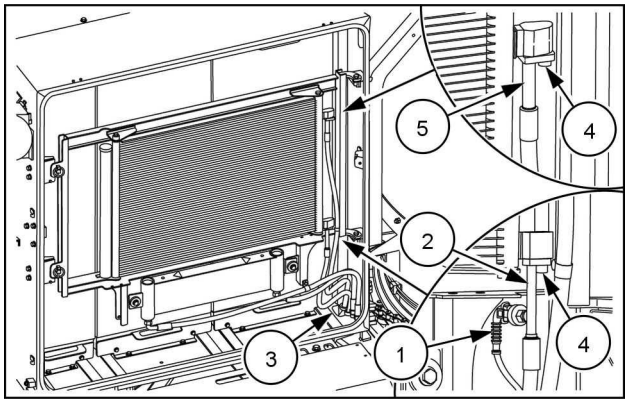
66. Disconnect the fuel lines **(1)** and **(2)**.

NOTE: *Clean up any spilled fuel.*



SOIL19SC00304AA 44

67. Disconnect the electrical connector **(1)** from the pressure switch mounted on the lines **(2)**.
68. Push the branching of the electrical wiring harness out of the opening **(3)**.
69. Remove the bolts **(4)** and disconnect the coolant gas lines **(2)** and **(5)**.

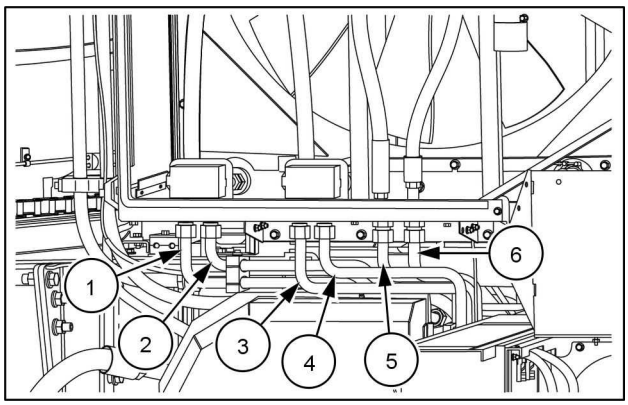


SOIL19SC00305AA 45

70. Completely loosen the hydraulic hose connections **(1)** to **(6)**.

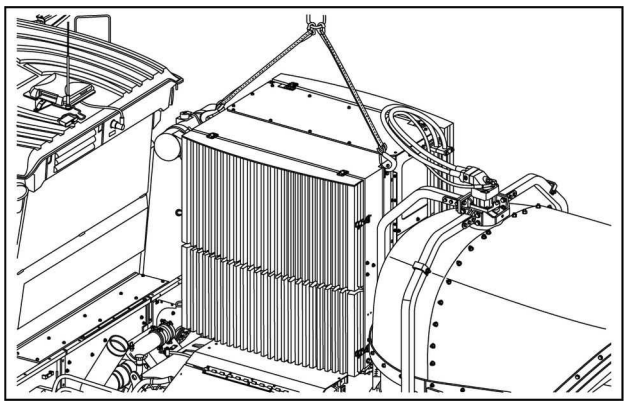
NOTE: *Clean any initial hydraulic oil spills.*

NOTE: *When the radiator compartment starts to be lifted by the lift device, position an adequate container underneath the radiator compartment, in order to collect more hydraulic oil.*



SOIL19SC00303AA 46

71. Attach lift straps to the eyebolts of the radiator compartment.
72. Activate the lift device to tension the lift straps.



SOIL19SC00308AA 47