

2050M
Tier 2
Crawler Dozer
PIN NGC109000 and above

SERVICE MANUAL

Part number 48048572
1st edition English
April 2017





SERVICE MANUAL

**2050M Bulldozer (BD) Blade, Extra Long Track (XLT) - Tier 2 [NGC109000 -],
2050M Bulldozer (BD) Blade, Long Track (LT) - Tier 2 [NGC109000 -], 2050M
Bulldozer (BD) Blade, Low Ground Pressure (LGP) - Tier 2 [NGC109000 -],
2050M Power Angle Tilt (PAT) Blade, Low Ground Pressure (LGP) - Tier 2
[NGC109000 -], 2050M Power Angle Tilt (PAT) Blade, Long Track (LT) - Tier
2 [NGC109000 -], 2050M Power Angler Tilt (PAT) Blade, Extra Long Track
(XLT) - Tier 2 [NGC109000 -]**

Link Product / Engine

Product	Market Product	Engine
2050M Power Angle Tilt (PAT) Blade, Long Track (LT) - Tier 2 [NGC109000 -]	Asia Pacific	F4HFA613N*E002
2050M Power Angle Tilt (PAT) Blade, Long Track (LT) - Tier 2 [NGC109000 -]	Latin America	F4HFA613N*E002
2050M Power Angle Tilt (PAT) Blade, Long Track (LT) - Tier 2 [NGC109000 -]	Middle East Africa	F4HFA613N*E002
2050M Power Angle Tilt (PAT) Blade, Long Track (LT) - Tier 2 [NGC109000 -]	Australia New Zealand	F4HFA613N*E002
2050M Bulldozer (BD) Blade, Long Track (LT) - Tier 2 [NGC109000 -]	Australia New Zealand	F4HFA613N*E002
2050M Bulldozer (BD) Blade, Long Track (LT) - Tier 2 [NGC109000 -]	Middle East Africa	F4HFA613N*E002
2050M Bulldozer (BD) Blade, Long Track (LT) - Tier 2 [NGC109000 -]	Asia Pacific	F4HFA613N*E002
2050M Bulldozer (BD) Blade, Long Track (LT) - Tier 2 [NGC109000 -]	Latin America	F4HFA613N*E002
2050M Power Angler Tilt (PAT) Blade, Extra Long Track (XLT) - Tier 2 [NGC109000 -]	Asia Pacific	F4HFA613N*E002
2050M Power Angler Tilt (PAT) Blade, Extra Long Track (XLT) - Tier 2 [NGC109000 -]	Australia New Zealand	F4HFA613N*E002
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2050M Bulldozer (BD) Blade, Extra Long Track (XLT) - Tier 2 [NGC109000 -]	Latin America	F4HFA613N*E002

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Product	Market Product	Engine
2050M Bulldozer (BD) Blade, Extra Long Track (XLT) - Tier 2 [NGC109000 -]	Australia New Zealand	F4HFA613N*E002
2050M Bulldozer (BD) Blade, Extra Long Track (XLT) - Tier 2 [NGC109000 -]	Asia Pacific	F4HFA613N*E002
2050M Bulldozer (BD) Blade, Extra Long Track (XLT) - Tier 2 [NGC109000 -]	Middle East Africa	F4HFA613N*E002
2050M Bulldozer (BD) Blade, Low Ground Pressure (LGP) - Tier 2 [NGC109000 -]	Asia Pacific	F4HFA613N*E002
2050M Bulldozer (BD) Blade, Low Ground Pressure (LGP) - Tier 2 [NGC109000 -]	Latin America	F4HFA613N*E002
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2050M Bulldozer (BD) Blade, Low Ground Pressure (LGP) - Tier 2 [NGC109000 -]	Middle East Africa	F4HFA613N*E002

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INTRODUCTION

Foreword - Important notice regarding equipment servicing

2050M

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

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

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

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

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

Safety rules

2050M

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Personal safety





This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

 DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

 WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

 CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: Notice indicates a situation that, if not avoided, could result in machine or property damage.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: Note indicates additional information that clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

Safety rules - Personal safety

2050M

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General maintenance safety

Keep the area used for servicing the machine clean and dry. Clean up spilled fluids.

Service the machine on a firm, level surface.

Install guards and shields after you service the machine.

Close all access doors and install all panels after servicing the machine.

Do not attempt to clean, lubricate, clear obstructions, or make adjustments to the machine while it is in motion or while the engine is running.

Always make sure that working area is clear of tools, parts, other persons and pets before you start operating the machine.

Unsupported hydraulic cylinders can lose pressure and drop the equipment, causing a crushing hazard. Do not leave equipment in a raised position while parked or during service, unless the equipment is securely supported.

Jack or lift the machine only at jack or lift points indicated in this manual.

Incorrect towing procedures can cause accidents. When you tow a disabled machine follow the procedure in this manual. Use only rigid tow bars.

Stop the engine, remove the key, and relieve pressure before you connect or disconnect fluid lines.

Stop the engine and remove the key before you connect or disconnect electrical connections.

Scalding can result from incorrect removal of coolant caps. Cooling systems operate under pressure. Hot coolant can spray out if you remove a cap while the system is hot. Allow the system to cool before you remove the cap. When you remove the cap, turn it slowly to allow pressure to escape before you completely remove the cap.

Replace damaged or worn tubes, hoses, electrical wiring, etc.

The engine, transmission, exhaust components, and hydraulic lines may become hot during operation. Take care when you service such components. Allow surfaces to cool before you handle or disconnect hot components. Wear protective equipment when appropriate.

When welding, follow the instructions in the manual. Always disconnect the battery before you weld on the machine. Always wash your hands after you handle battery components.

General battery safety

Always wear eye protection when you work with batteries.

Do not create sparks or have open flame near a battery.

Ventilate the area when you charge a battery or use a battery in an enclosed area.

Disconnect the negative (-) terminal first and reconnect the negative (-) terminal last.

When you weld on the machine, disconnect both terminals of the battery.

Do not weld, grind, or smoke near a battery.

When you use auxiliary batteries or connect jumper cables to start the engine, use the procedure shown in the operator's manual. Do not short across terminals.

Follow the manufacturer's instructions when you store and handle batteries.

Battery post, terminals, and related accessories contain lead and lead compounds. Wash hands after handling. This is a California Proposition 65 warning.

Battery acid causes burns. Batteries contain sulfuric acid. Avoid contact with skin, eyes, or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.

Keep out of reach of children and other unauthorized persons.

Air-conditioning system

The air-conditioning system is under high pressure. Do not disconnect any lines. The release of high pressure can cause serious injury.

The air-conditioning system contains gases that are harmful to the environment when released into the atmosphere. Do not attempt to service or repair the system.

Only trained service technicians can service, repair, or recharge the air-conditioning system.

Personal Protective Equipment (PPE)

Wear Personal Protective Equipment (PPE) such as hard hat, eye protection, heavy gloves, hearing protection, protective clothing, etc.

Do Not Operate tag

Before you start servicing the machine, attach a 'Do Not Operate' warning tag to the machine in an area that will be visible.



SERVICE MANUAL

Engine

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(XLT) - Tier 2 [NGC109000 -]**

Engine - Remove

2050M

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⚠ WARNING

Heavy parts!
Support designated component(s) with adequate lifting equipment.
Failure to comply could result in death or serious injury.

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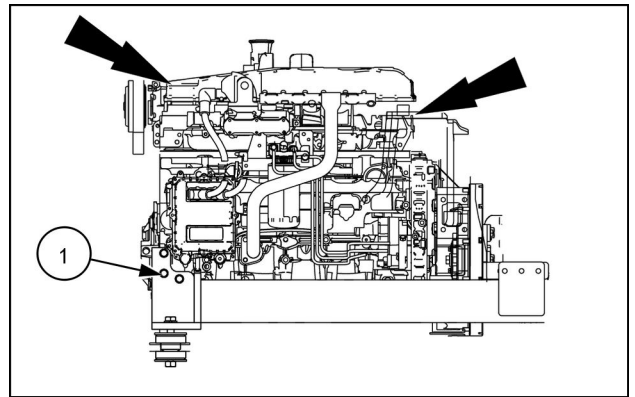
Prior operation:

Frame - Remove (39.100)

NOTICE: The engine weighs approximately **631 kg (1391 lb)**. Use appropriate lifting equipment to prevent personal injury or property damage.

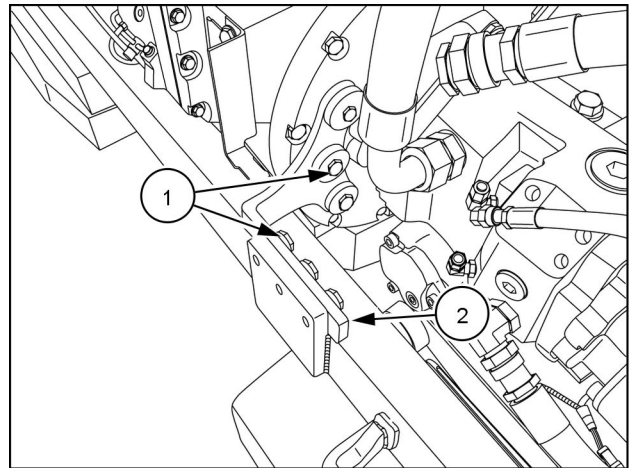
NOTICE: The engine must be balanced as shown, or personal injury or property damage will occur.

1. Attach an appropriate lifting device to the engine lift points.
2. Support the front of the hydraulic pump stack with an appropriate lifting device or stand.
3. Remove the bolts and washers **(1)** from the right front engine-to-frame cradle mount and the left front engine-to-frame cradle mount.



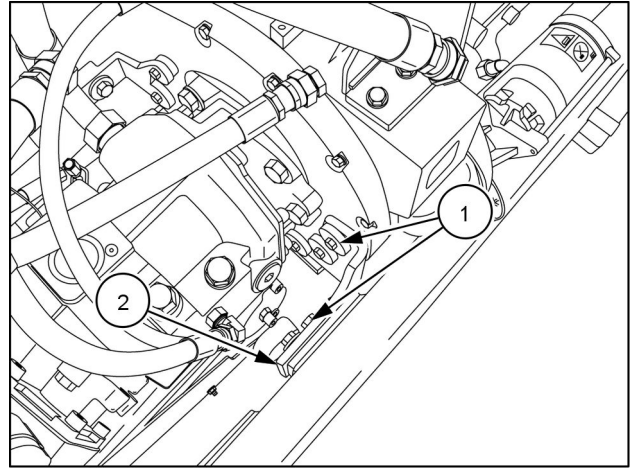
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4. Remove the mounting bolts and washers **(1)** from the left side engine-to-frame cradle mounting bracket **(2)**. Remove the mounting bracket.



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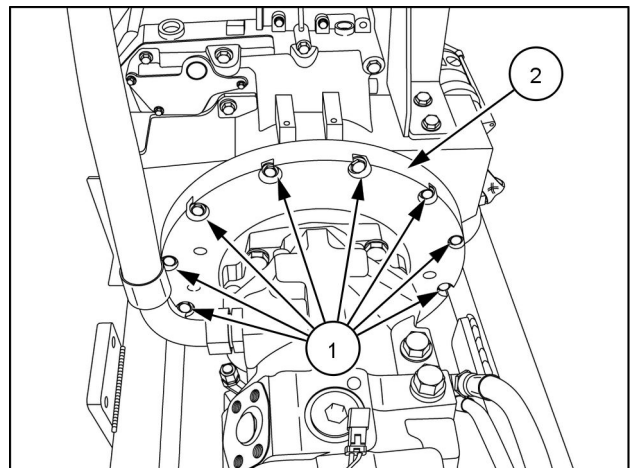
5. Remove the mounting bolts and washers (1) from the right side engine-to-frame cradle mounting bracket (2). Remove the bracket.



RAIL14DOZ0202AA 3

6. Remove the mounting bolts and washers (1) from the engine-to-pump stack adapter plate (2).
7. Slowly move the engine forward to separate it from the hydrostatic pump drive stack, and remove the engine from the frame cradle.

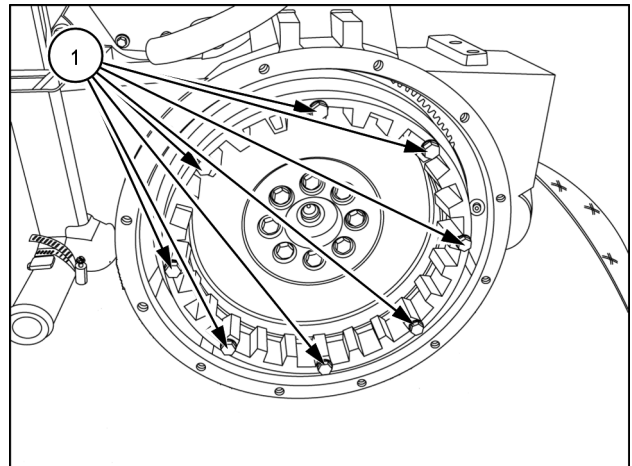
NOTE: Pull the engine straight forward horizontally by hand only from the hydraulic pump stack until the rubber coupler teeth clear the mating ring attached to the flywheel.



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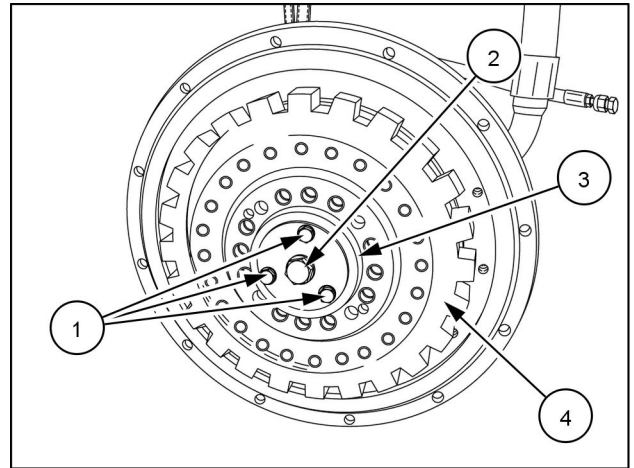
8. Remove the eight bolts (1) that secure the tandem pump flexible coupling mating ring to the engine flywheel and remove the mating ring.

NOTICE: Replace the flexible coupler when either the engine or hydrostatic pump stack are removed from the machine. The coupler is a flexible, rubber based component that could be damaged by excessive heat, excessive shock loading, unintended vibrations, or if soaked in oil. The coupler is in place to protect the integrity of the engine and pumps. Damage to coupler may not be visible.



RAIL16DOZ0008AA 5

9. Remove the mounting bolts (1) and (2) from the left hydrostatic drive pump hub and spline (3).
10. Remove the flexible coupling drive gear (4) from the hydrostatic drive pump hub and spline.



RAIL14DOZ0283AA 6

Next operation:
Engine - Install (10.001)

Engine - Install

2050M

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⚠ WARNING

Heavy parts!
Support designated component(s) with adequate lifting equipment.
Failure to comply could result in death or serious injury.

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Prior operation:

Engine - Remove (10.001)

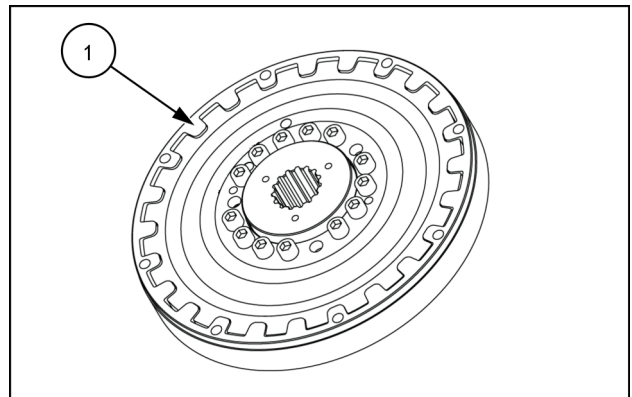
Prior operation:

Clean threads of oil, dirt, and preservatives prior to assembly.

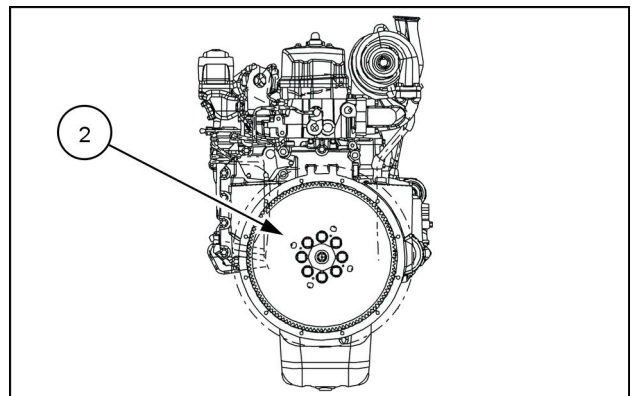
NOTICE: Replace the flexible coupler when either the engine or hydrostatic pump stack are removed from the machine. The coupler is a flexible, rubber based component that could be damaged by excessive heat, excessive shock loading, or unintended vibrations. The coupler is in place to protect the integrity of the engine and pumps. Damage to coupler may not be visible.

NOTE: Clean and inspect all hardware that is to be reused.

1. Apply **LOCTITE® 242®** to the eight bolts, and mount the new tandem pump flexible coupling mating ring (1) to the engine flywheel (2).

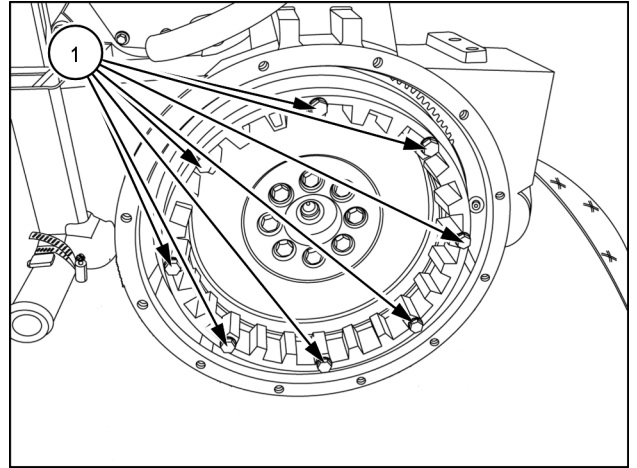


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RAIL16DOZ0004AA 2

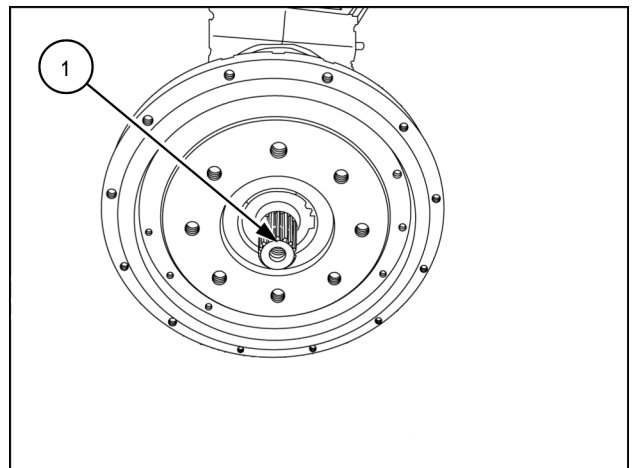
2. Torque the bolts (1) to **41 – 50 N·m (30 – 37 lb ft)**



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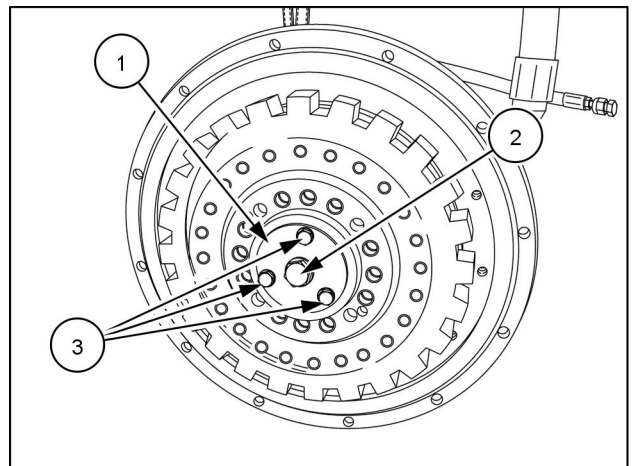
3. Install the new coupler hub onto the left hydrostatic drive pump shaft (1).

NOTE: Use new hardware to secure the new coupler hub to the hydrostatic drive pump shaft.



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4. Apply **LOCTITE® 242®** to all of the new bolts, then secure the new coupler hub to the left hydrostatic drive pump shaft with the new flexible coupler stop (1), center bolt and washer (2) and the three bolts and washers (3).
5. Torque the outside bolts (3) to **27 – 35 N·m (20 – 26 lb ft)** and the center bolt (2) to **136 – 156 N·m (100 – 115 lb ft)**.

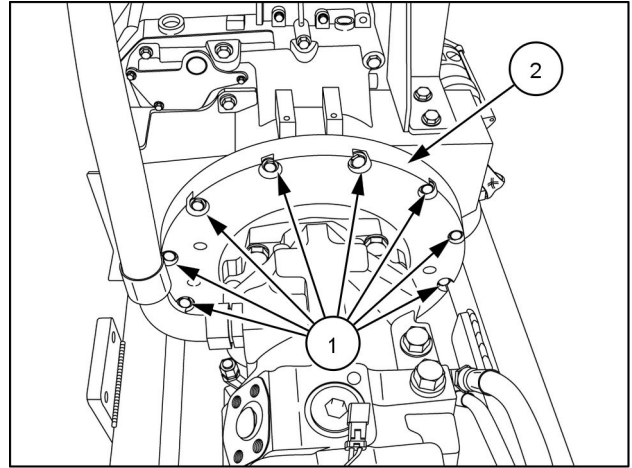


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6. Slowly lower the engine into the frame cradle and connect the engine to the hydrostatic drive pump stack.

NOTE: Push the engine straight backward horizontally by hand only into the hydraulic pump stack until the rubber coupler teeth mesh with the mating ring attached to the flywheel.

7. Clean and apply **LOCTITE® 242®** to all of the bolts.
8. Install the twelve mounting bolts and washers (1) into the engine-to-pump stack adapter plate (2). Torque the bolts to **46 – 62 N·m (34 – 46 lb ft)**.

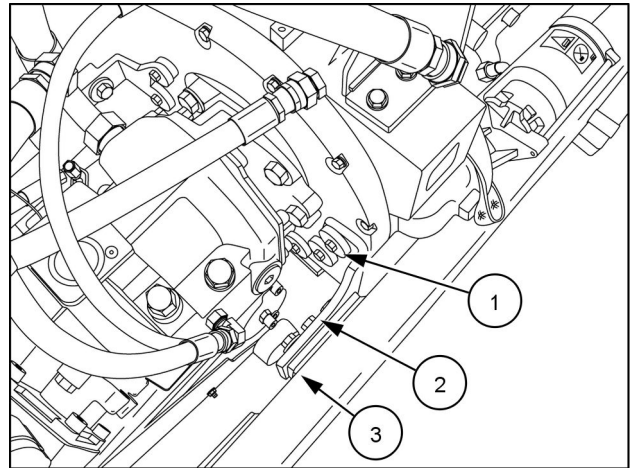


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9. Use a level and verify that the engine mounting frame cradle is sitting on a level surface out of the machine.

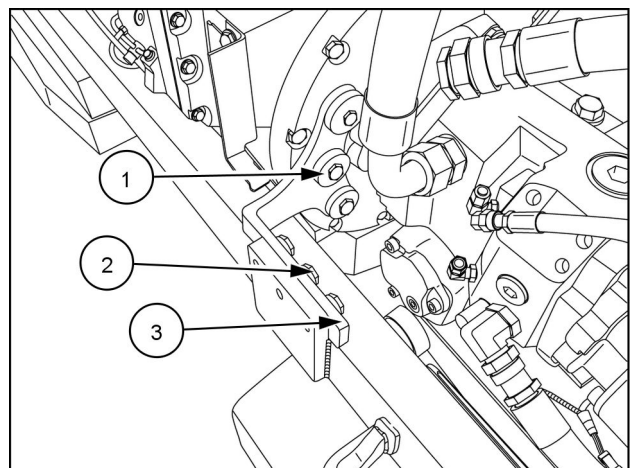
NOTE: Before applying the torque to the mid engine-to-frame cradle mount bracket bolts and the front engine-to-mount frame cradle bolts to their final specification, make sure that the frame cradle is level.

10. Install the right side engine-to-frame cradle mounting bracket. Apply **LOCTITE® 242®** to the engine-to-frame cradle mounting bracket bolts. Torque the three bolts (1) **91 – 123 N·m (67 – 91 lb ft)** to the adapter plate, and the three bolts (2) **225 – 305 N·m (166 – 225 lb ft)** to the right side engine-to-frame cradle mounting bracket (3).



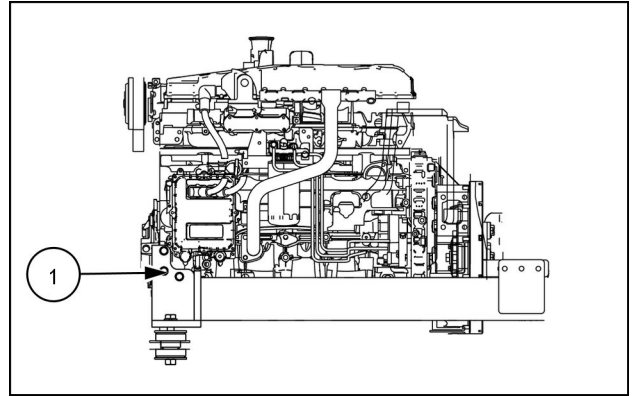
RAIL14DOZ0202AA 7

11. Install the left side engine-to-frame cradle mounting bracket. Apply **LOCTITE® 242®** to the engine-to-frame cradle mounting bracket bolts. Torque the three bolts (1) **91 – 123 N·m (67 – 91 lb ft)** to the adapter plate, and the three bolts (2) **225 – 305 N·m (166 – 225 lb ft)** to the left side engine-to-frame cradle mounting bracket (3).



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12. Install the bolts and washers **(1)** into the right front engine-to-frame cradle mount and the left front engine-to-frame cradle mount. Torque the bolts to **107 – 123 N·m (79 – 91 lb ft)**.



RAIL14DOZ0447AA 9

13. Remove the support from the hydraulic pump stack.
14. Remove the lifting device from the engine.

Next operation:
Frame - Install (39.100)

Fuel tank - Drain fluid - Fuel tank sediment

⚠ WARNING

Hot liquid under pressure!

Fuel in the high pressure fuel line is still under pressure immediately after you shut down the engine. Before performing any maintenance or inspection, wait for 2 minutes after engine shutdown to allow the pressure to drop.

Failure to comply could result in death or serious injury.

W0249A

⚠ WARNING

Chemical hazard!

When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing of chemicals.

Failure to comply could result in death or serious injury.

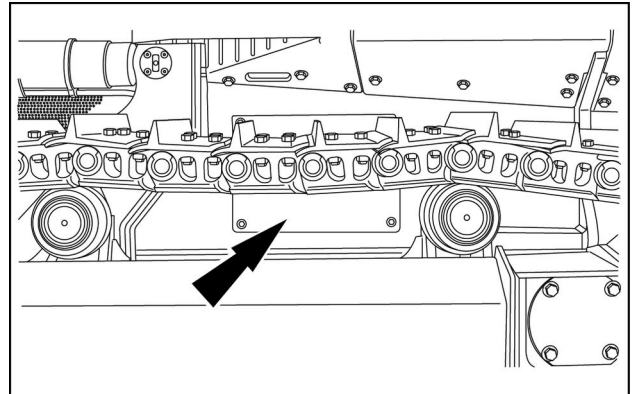
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Drain condensation and sediment from the fuel tank when the hour meter registers 1000 hours of operation and every 1000 hours thereafter. Drain more frequently if conditions so require. The fuel tank drain is located on the left side of the machine.

Prior operation:

Keep all unauthorized personnel clear of the area. Park the machine on level ground, in neutral with the parking brake applied, and the attachment lowered to the ground. Make sure that all residual pressure is relieved from circuits before beginning maintenance.

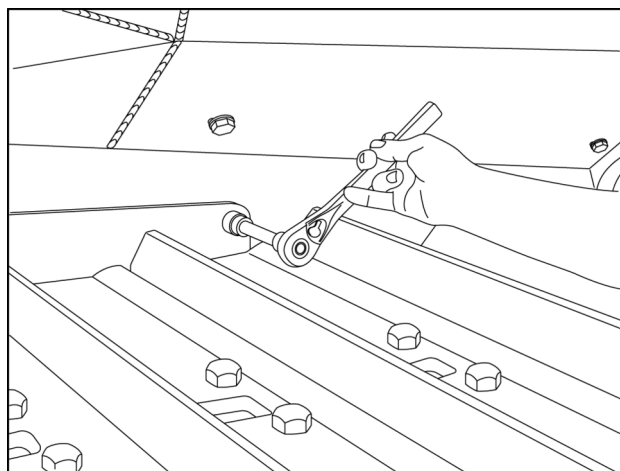
1. Locate the fuel tank drain hose behind the bolt-on panel on the left side of the machine.



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NOTE: On machines that are not equipped with the environmental drain option, connect a drain hose to the fuel tank drain valve. The drain valve is accessible through the right rear access panel or by removing the cab floor access panel and tilting back the operator's seat.

2. Remove the bolts and remove the panel.

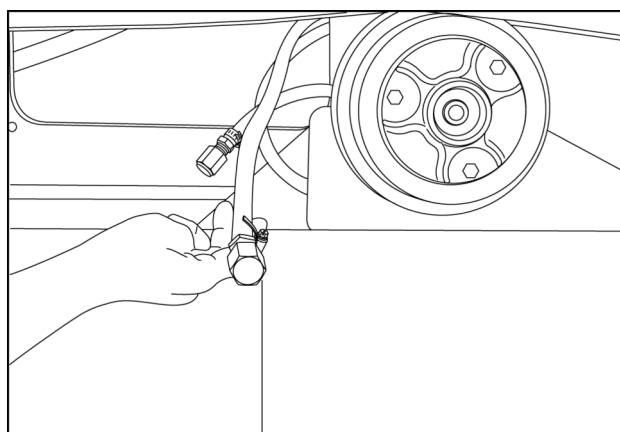


RAIL12DOZ0410AA 2

3. Pull the fuel tank drain hose forward, and remove the fitting.
4. Open the fuel shut off valve located on the fuel tank, and drain the water and sediment into a suitable container.

NOTE: The fuel tank shut off valve is accessible through the right rear access panel or by removing the cab floor access panel and tilting back the seat.

5. Dispose of the waste following local regulations.
6. Turn the shut off valve to the closed position after only clean fuel is discharged.
7. Replace the fitting on the hose.
8. Replace the hoses within the panel and wire tie, if necessary.
9. Check for leaks.
10. Replace the bolts and the cover panel.



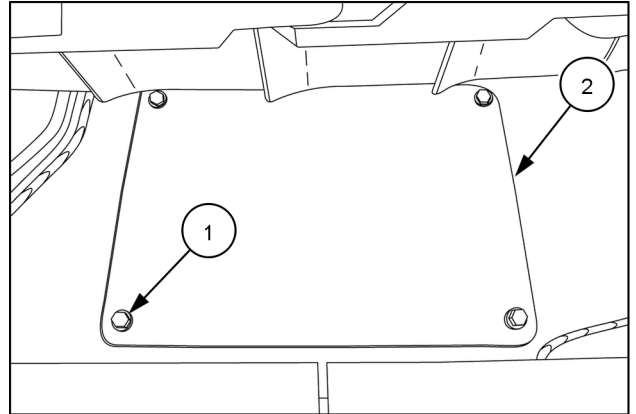
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Fuel tank - Remove

2050M

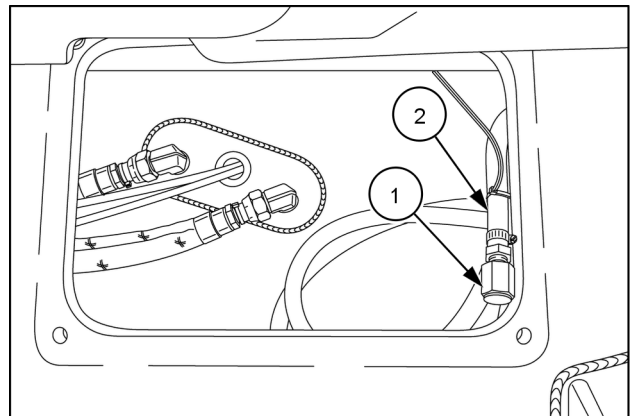
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1. Remove the cab from the machine. See **Cab - Remove (90.150)**.
2. Remove four bolts and washers **(1)** and remove the fuel / Diesel Exhaust Fluid (DEF) drain hose access panel **(2)** from the left side of the machine.



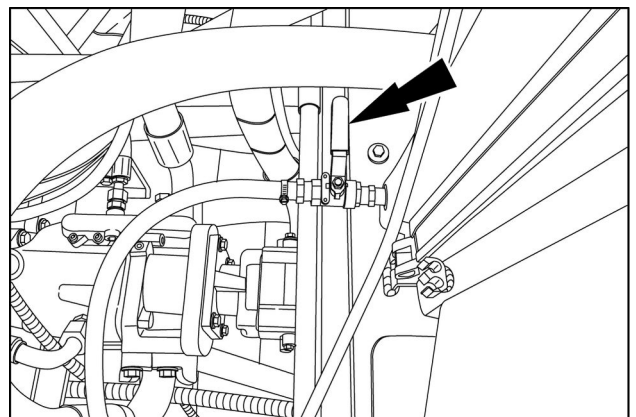
RAIL14DOZ0141AA 1

3. Remove the fuel tank drain hose cap **(1)** from the fuel tank drain hose **(2)**.



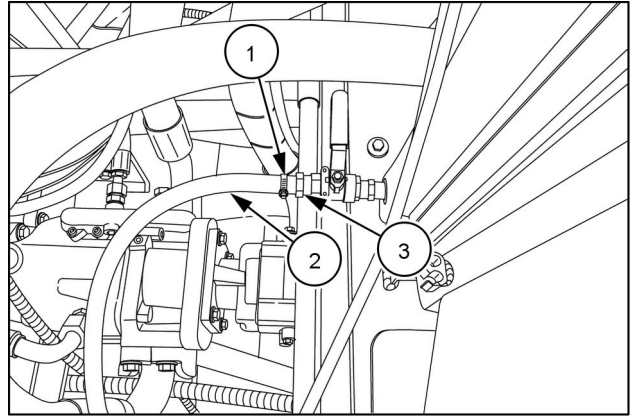
RAIL14DOZ0142AA 2

4. Open the fuel tank drain valve and drain the fuel into a suitable container for storage. Close the drain valve when complete.



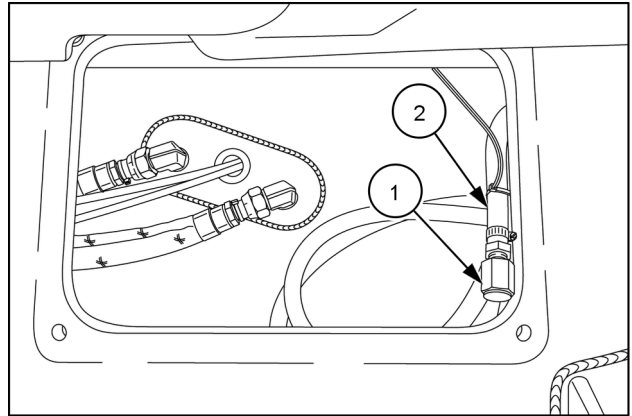
RAIL14DOZ0144AA 3

5. Loosen the drain hose clamp (1) and remove the drain hose (2) from the drain valve (3).



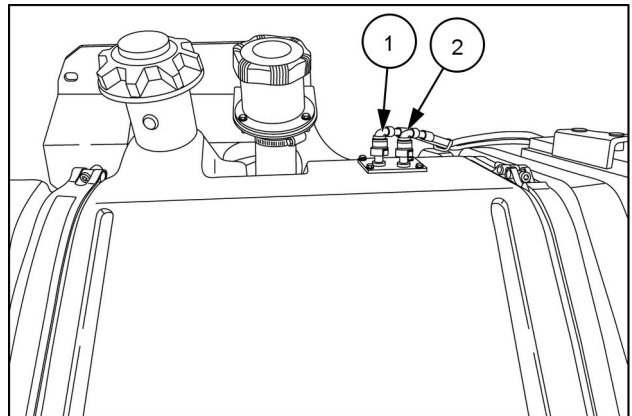
RAIL14DOZ0144AA 4

6. Install the fuel tank drain hose cap (1) to the fuel tank drain hose (2).



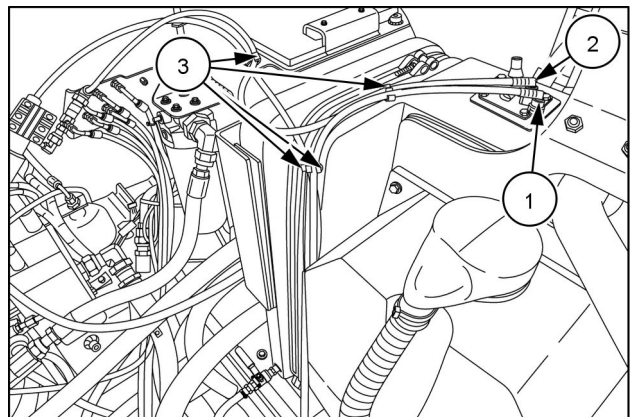
RAIL14DOZ0142AA 5

7. Tag and disconnect the fuel supply (1) and the fuel return (2) lines from the top of the fuel tank. Close all openings to prevent fuel loss or contamination.



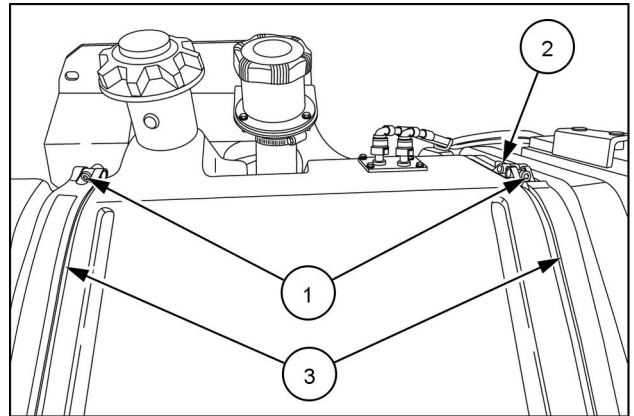
RAIL14DOZ0143AA 6

8. Remove the fuel supply (1) and the fuel return (2) hoses from the four retaining clips (3) at the top rear of the fuel tank.



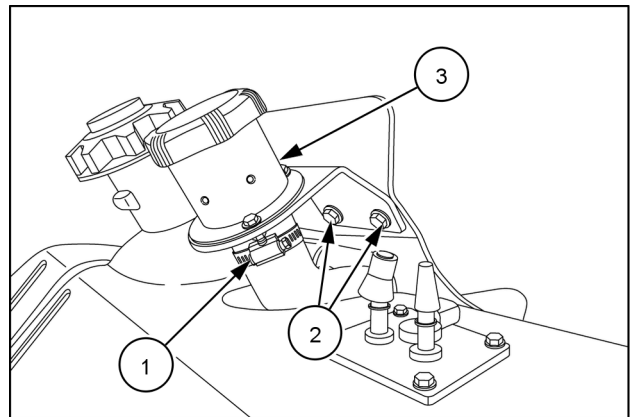
RAIL14DOZ0145AA 7

9. Remove the two fuel tank strap retaining bolts (1) and one locknut (2). Remove the fuel tank retaining straps (3) from the machine.



RAIL14DOZ0143AA 8

10. Loosen the DEF tank fill hose clamp (1).

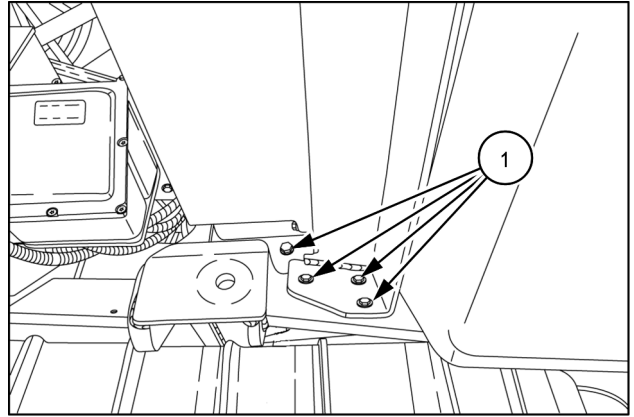


RAIL14DOZ0146AA 9

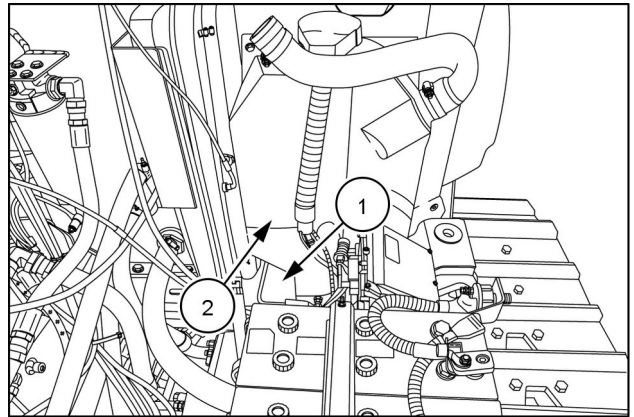
11. Remove the two DEF filler neck bolts and washers (2) and remove the DEF filler neck (3) from the machine. Close all openings.

NOTE: The DEF tank does not need to be removed from the machine, however, it must be moved forward to gain clearance for the fuel tank removal.

12. Remove the five DEF tank mounting bolts and washers (1). Slide the DEF tank (2) toward the front of machine.



RAIL14DOZ0148AA 10



RAIL14DOZ0147AA 11

NOTICE: The fuel tank weighs approximately **31.8 kg (70 lb)** when empty. Use appropriate lifting equipment to prevent personal injury or property damage.

13. With the aid of a helper, remove the fuel tank from the machine.
14. Repair or replace components as necessary.



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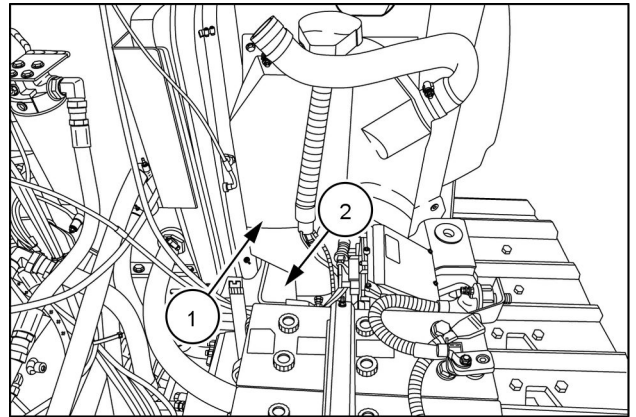
Fuel tank - Install

2050M

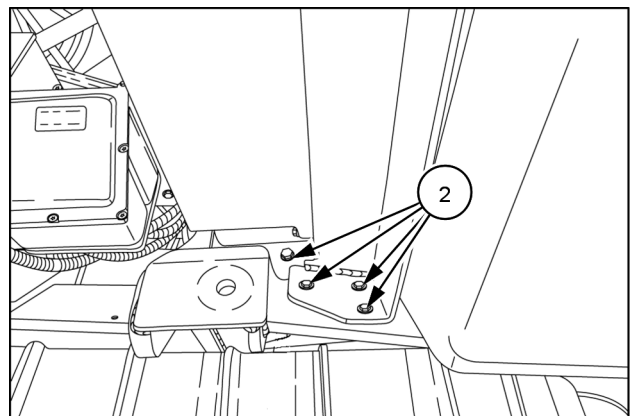
ANZ --- APAC --- LA --- MEA

NOTICE: The fuel tank weighs approximately **31.8 kg (70 lb)** when empty. Use appropriate lifting equipment to prevent personal injury or property damage.

1. With the aid of a helper, install the fuel tank to the machine.
2. Slide the DEF tank (1) rearward into position. Install five Diesel Exhaust Fluid (DEF) tank mounting bolts and washers (2). Tighten the bolts.

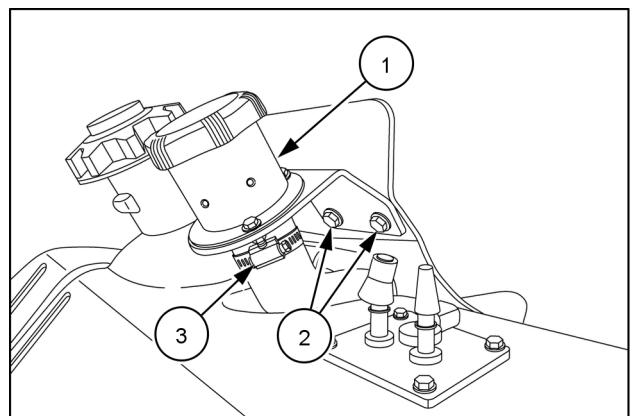


RAIL14DOZ0147AA 1



RAIL14DOZ0148AA 2

3. Install the DEF filler neck (1) to the machine with two mounting bolts and washers (2). Tighten the bolts.



RAIL14DOZ0146AA 3

4. Tighten the DEF fill hose clamp (3).

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