

2050M

Tier 4A (interim)

Crawler Dozer

PIN NCDC25000 and above; PIN NDDC25000 and above
PIN NEDC20000 and above; PIN NFDC20000 and above

SERVICE MANUAL

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Link Product / Engine

Product	Market Product	Engine
2050M Long Track (LT), Power Angle Tilt (PAT) Blade [NCDC25000 -]	North America	F4HFE613J*A007
2050M Long Track (LT), Power Angle Tilt (PAT) Blade [NDDC25000 -]	North America	F4HFE613J*A007
2050M Long Track (LT), Power Angle Tilt (PAT) Blade [NEDC20000 -]	North America	F4HFE613J*A007
2050M Long Track (LT), Power Angle Tilt (PAT) Blade [NFDC20000 -]	North America	F4HFE613J*A007
2050M Long Track (LT), Bulldozer (BD) Blade [NCDC25000 -]	North America	F4HFE613J*A007
2050M Long Track (LT), Bulldozer (BD) Blade [NDDC25000 -]	North America	F4HFE613J*A007
2050M Long Track (LT), Bulldozer (BD) Blade [NEDC20000 -]	North America	F4HFE613J*A007
2050M Long Track (LT), Bulldozer (BD) Blade [NFDC20000 -]	North America	F4HFE613J*A007
2050M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NCDC25000 -]	North America	F4HFE613J*A007
2050M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NDDC25000 -]	North America	F4HFE613J*A007
2050M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NEDC20000 -]	North America	F4HFE613J*A007
2050M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NFDC20000 -]	North America	F4HFE613J*A007
2050M Wide Track (WT) / Low Ground Pressure (LGP), Power Angle Tilt (PAT) Blade [NCDC25000 -]	North America	F4HFE613J*A007
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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

NA

Personal safety



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

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

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

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

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

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

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

Machine safety

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

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

Information

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

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

Safety rules - Personal safety

2050M

NA

General safety rules

Use caution when you operate the machine on slopes. Raised equipment, full tanks and other loads will change the center of gravity of the machine. The machine can tip or roll over when near ditches and embankments or uneven surfaces.

Never permit anyone other than the operator to ride on the machine.

Never operate the machine under the influence of alcohol or drugs, or while you are otherwise impaired.

When digging or using ground-engaging attachments, be aware of buried cables. Contact local utilities to determine the locations of services.

Pay attention to overhead power lines and hanging obstacles. High voltage lines may require significant clearance for safety.

Hydraulic oil or diesel fuel leaking under pressure can penetrate the skin, causing serious injury or infection.

- DO NOT use your hand to check for leaks. Use a piece of cardboard or paper.
- Stop the engine, remove the key, and relieve the pressure before you connect or disconnect fluid lines.
- Make sure that all components are in good condition. Tighten all connections before you start the engine or pressurize the system.
- If hydraulic fluid or diesel fuel penetrates the skin, seek medical attention immediately.
- Continuous long term contact with hydraulic fluid may cause skin cancer. Avoid long term contact and wash the skin promptly with soap and water.

Keep clear of moving parts. Loose clothing, jewelry, watches, long hair, and other loose or hanging items can become entangled in moving parts.

Wear protective equipment when appropriate.

DO NOT attempt to remove material from any part of the machine while it is being operated or while components are in motion.

Make sure that all guards and shields are in good condition and properly installed before you operate the machine. Never operate the machine with shields removed. Always close access doors or panels before you operate the machine.

Dirty or slippery steps, ladders, walkways, and platforms can cause falls. Make sure these surfaces remain clean and clear of debris.

A person or pet within the operating area of a machine can be struck or crushed by the machine or its equipment. DO NOT allow anyone to enter the work area.

Raised equipment and/or loads can fall unexpectedly and crush persons underneath. Never allow anyone to enter the area underneath raised equipment during operation.

Never operate the engine in enclosed spaces as harmful exhaust gases may build up.

Before you start the machine, be sure that all controls are in neutral or park lock position.

Start the engine only from the operator's seat. If you bypass the safety start switch, the engine can start with the transmission in gear. Do not connect or short across terminals on the starter solenoid. Attach jumper cables as described in the manual. Starting in gear may cause death or serious injury.

Always keep windows, mirrors, and all lighting clean to provide the best possible visibility while you operate the machine.

Operate controls only when seated in the operator's seat, except for those controls expressly intended for use from other locations.

Before you leave the machine:

1. Park the machine on a firm, level surface.
2. Put all controls in neutral or park lock position.
3. Engage the parking brake. Use wheel chocks if required.
4. Lower all hydraulic equipment — Implements, header, etc.
5. Turn off the engine and remove the key.

When, due to exceptional circumstances, you would decide to keep the engine running after you leave the operator's station, then you must follow these precautions:

1. Bring the engine to low idle speed.
2. Disengage all drive systems.

3. **⚠ WARNING**

Some components may continue to run down after disengaging drive systems.

Make sure all drive systems are fully disengaged.

Failure to comply could result in death or serious injury.

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Shift the transmission into neutral.

4. Apply the parking brake.

⚠ 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.

Fire and explosion prevention

Fuel or oil that is leaked or spilled on hot surfaces or electrical components can cause a fire.

Crop materials, trash, debris, bird nests, or flammable material can ignite on hot surfaces.

Always have a fire extinguisher on or near the machine.

Make sure that the fire extinguisher(s) is maintained and serviced according to the manufacturer's instructions.

At least once each day and at the end of the day, remove all trash and debris from the machine especially around hot components such as the engine, transmission, exhaust, battery, etc. More frequent cleaning of your machine may be necessary depending on the operating environment and conditions.

At least once each day, remove debris accumulation around moving components such as bearings, pulleys, belts, gears, cleaning fans, etc. More frequent cleaning of your machine may be necessary depending on the operating environment and conditions.

Inspect the electrical system for loose connections and frayed insulation. Repair or replace loose or damaged parts.

Do not store oily rags or other flammable material on the machine.

Do not weld or flame cut any items that contain flammable material. Clean items thoroughly with non-flammable solvents before welding or flame-cutting.

Do not expose the machine to flames, burning brush, or explosives.

Promptly investigate any unusual smells or odors that may occur during operation of the machine.

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.



SERVICE MANUAL

Engine

**2050M Extended Long Track (XLT), Bulldozer (BD) Blade [NCDC25000 -] ,
2050M Extended Long Track (XLT), Bulldozer (BD) Blade [NDDC25000 -] ,
2050M Extended Long Track (XLT), Bulldozer (BD) Blade [NEDC20000 -] ,
2050M Extended Long Track (XLT), Bulldozer (BD) Blade [NFDC20000 -] ,
2050M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NCDC25000 -] ,
2050M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NDDC25000 -] ,
2050M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NEDC20000 -] ,
2050M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NFDC20000 -] ,
2050M Long Track (LT), Bulldozer (BD) Blade [NCDC25000 -] , 2050M
Long Track (LT), Bulldozer (BD) Blade [NDDC25000 -] , 2050M Long Track
(LT), Bulldozer (BD) Blade [NEDC20000 -] , 2050M Long Track (LT), Bulldozer
(BD) Blade [NFDC20000 -] , 2050M Long Track (LT), Power Angle Tilt (PAT)
Blade [NCDC25000 -] , 2050M Long Track (LT), Power Angle Tilt (PAT) Blade
[NDDC25000 -] , 2050M Long Track (LT), Power Angle Tilt (PAT) Blade
[NEDC20000 -] , 2050M Long Track (LT), Power Angle Tilt (PAT) Blade
[NFDC20000 -] , 2050M Wide Track (WT) / Low Ground Pressure (LGP),
Bulldozer (BD) Blade [NCDC25000 -] , 2050M Wide Track (WT) / Low Ground
Pressure (LGP), Bulldozer (BD) Blade [NDDC25000 -] , 2050M Wide Track
(WT) / Low Ground Pressure (LGP), Bulldozer (BD) Blade [NEDC20000 -] ,
2050M Wide Track (WT) / Low Ground Pressure (LGP), Bulldozer (BD) Blade
[NFDC20000 -] , 2050M Wide Track (WT) / Low Ground Pressure (LGP),
Power Angle Tilt (PAT) Blade [NCDC25000 -] , 2050M Wide Track (WT) / Low
Ground Pressure (LGP), Power Angle Tilt (PAT) Blade [NDDC25000 -] , 2050M
Wide Track (WT) / Low Ground Pressure (LGP), Power Angle Tilt (PAT) Blade
[NEDC20000 -] , 2050M Wide Track (WT) / Low Ground Pressure (LGP),
Power Angle Tilt (PAT) Blade [NFDC20000 -]**

Engine - Remove

2050M

NA

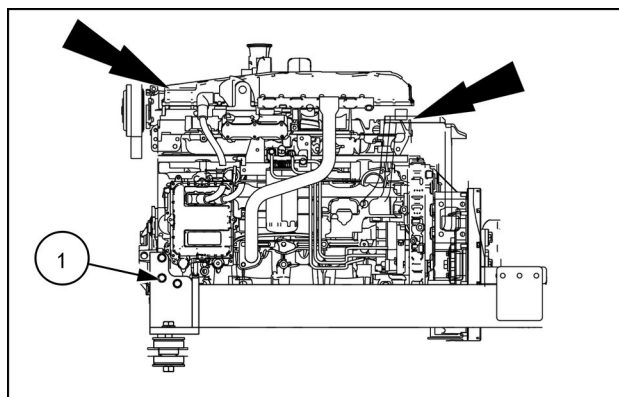
Prior operation:

Frame - Remove (39.100)

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

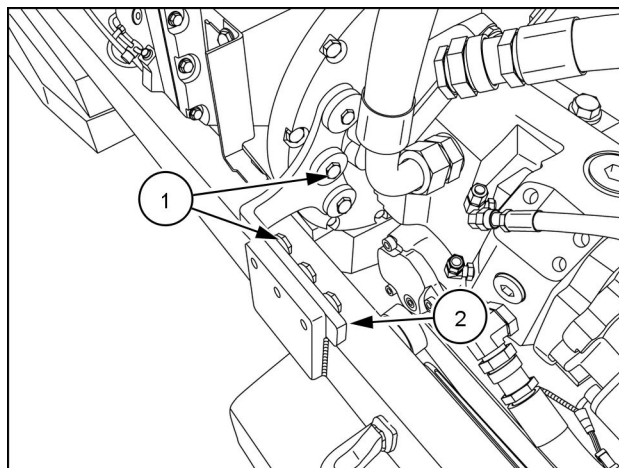
NOTICE: The engine must be balanced as shown, or personal injury or property damage will occur.

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.



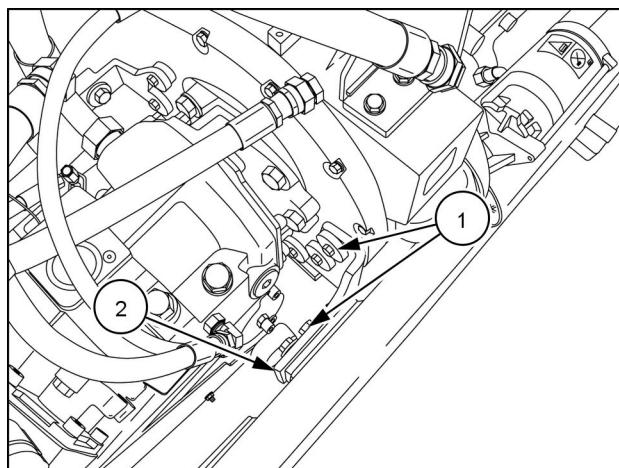
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4. Remove the mounting bolts and washers **(1)** from the left side engine-to-frame cradle mounting bracket **(2)**. Remove the mounting bracket.



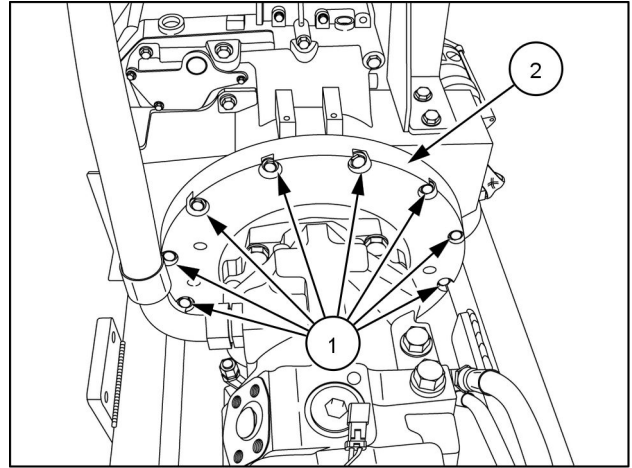
RAIL14DOZ0209AA 2

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



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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 drive pump stack, and remove the engine from the frame cradle.



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8. Remove the tandem pump flexible coupling assembly from the flywheel.

Next operation:

Engine - Install (10.001)

Engine - Install

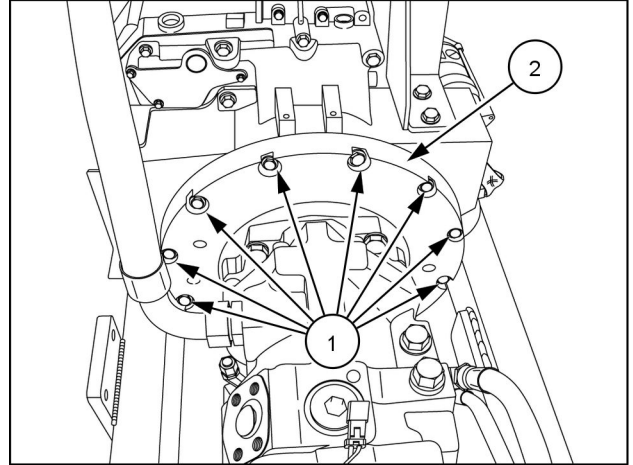
2050M

NA

Prior operation:

Engine - Remove (10.001)

1. Attach the tandem pump flexible coupling assembly to the flywheel. Torque the bolts to **41 - 50 N·m (30 - 37 lb ft)**
2. Slowly lower the engine into the frame cradle and connect the engine to the hydrostatic drive pump stack.
3. Install the 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)**.

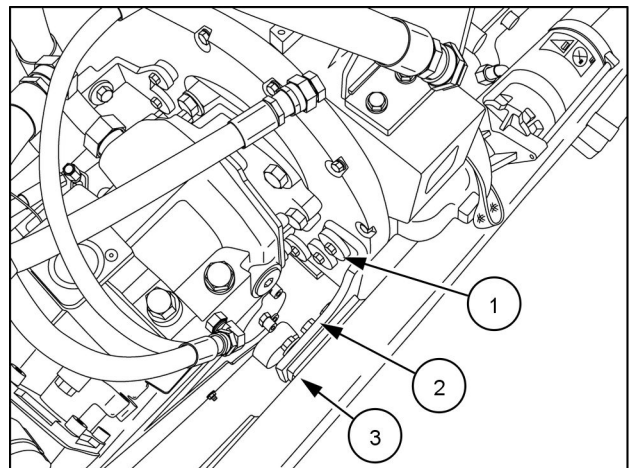


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4. Use a level and verify that the engine mounting frame cradle is sitting on a level surface.

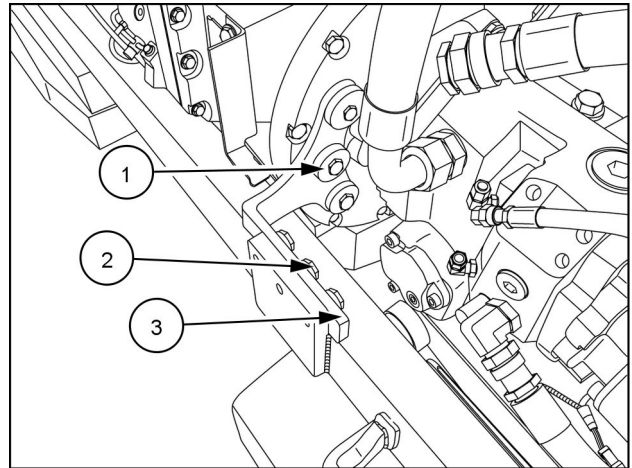
NOTE: Before applying the torque to the mid engine-to-frame cradle mount bracket bolts and the front engine-to-mount frame cradle bolts to their final specification, make sure that the frame cradle is level.

5. 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**).



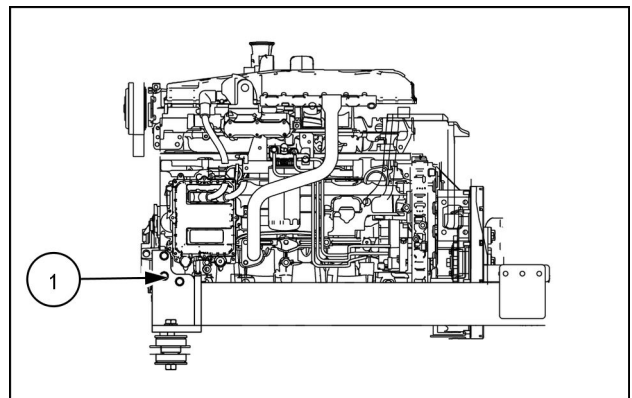
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6. Install the left side engine-to-frame cradle mounting bracket. Apply **LOCTITE® 242®** to the engine-to-frame cradle mounting bracket bolts. Torque the three bolts **(1) 91 - 123 N·m (67 - 91 lb ft)** to the adapter plate, and the three bolts **(2)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



RAIL14DOZ0209AA 3

7. 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 4

8. Remove the support from the hydraulic pump stack.
Remove the lifting device from the engine.

Next operation:
Frame - Install (39.100)

Fuel tank - Drain fluid - Fuel tank sediment

2050M

NA

⚠ 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.

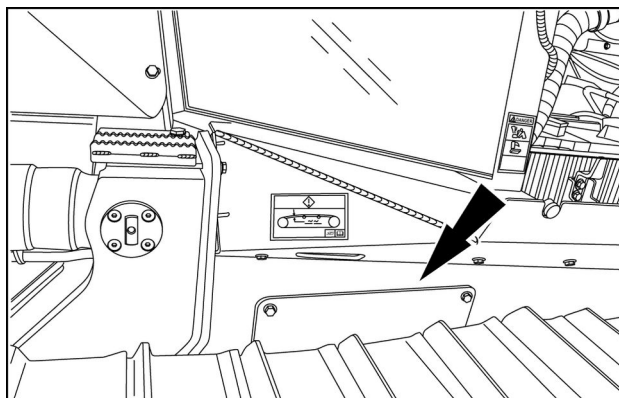
Failure to comply could result in death or serious injury.

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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.

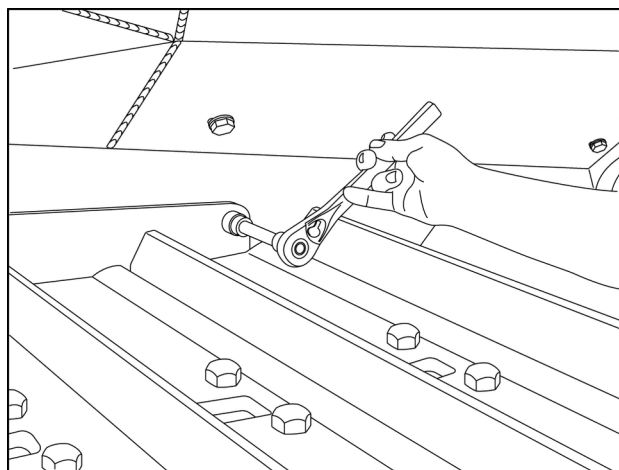
1. On machines with the environmental drain option, a fuel tank drain hose is supplied and located behind a bolt-on panel on the left side of the machine. Have a suitable container ready to collect the condensation and fuel. Dispose of the waste following local regulations.



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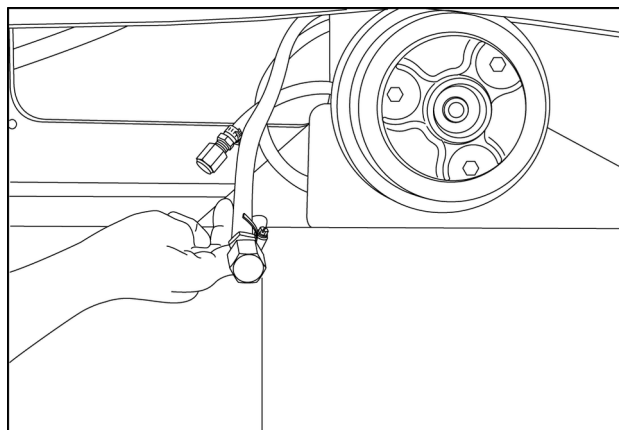
NOTE: On machines that are not equipped with the environmental drain option, connect a drain hose to the fuel tank drain valve. The drain valve is accessible through the right rear access panel or by removing the cab floor access panel and tilting back the operator's seat.

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.



RAIL12DOZ0412AA 3

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.

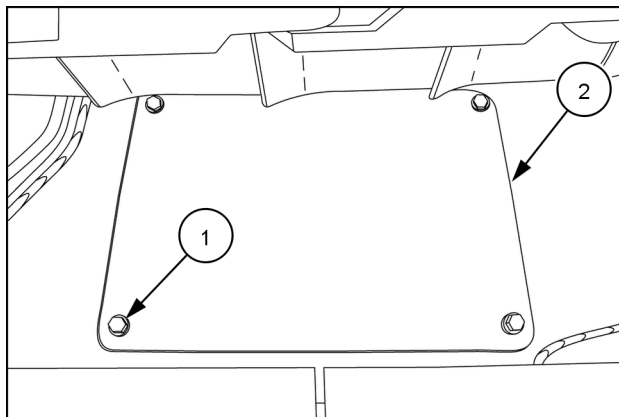
5. Turn the shut off valve to the closed position after only clean fuel is discharged. Replace the fitting on the hose.
6. Replace the hoses within the panel and wire tie, if necessary.
7. Check for leaks.
8. Replace the bolts and the cover panel.

Fuel tank - Remove

2050M

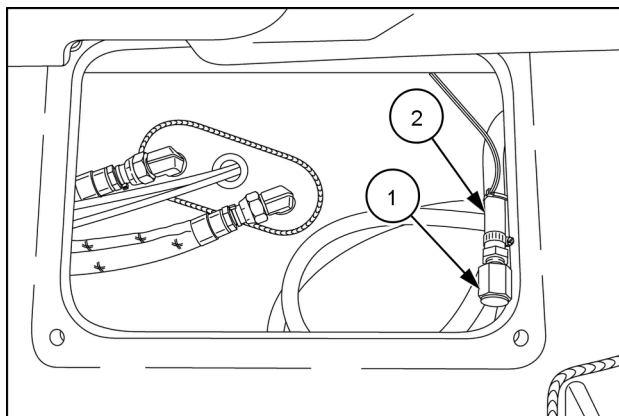
NA

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.



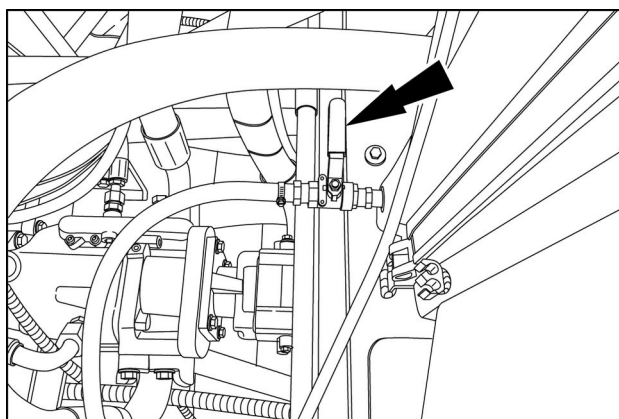
RAIL14DOZ0141AA 1

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



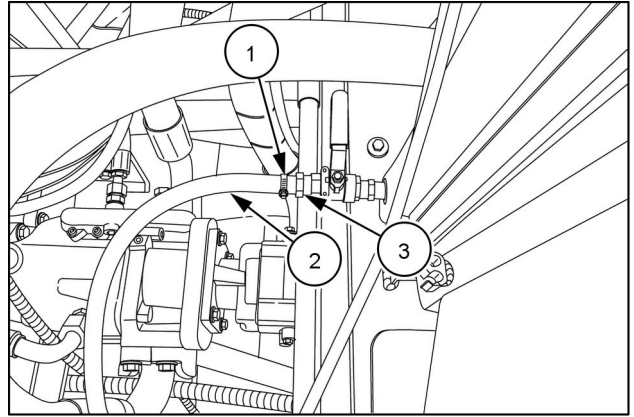
RAIL14DOZ0142AA 2

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



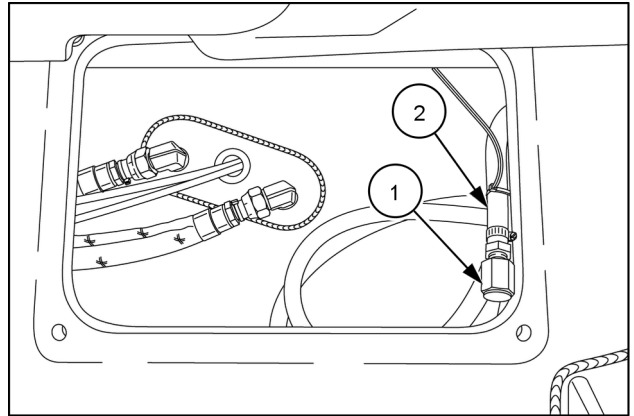
RAIL14DOZ0144AA 3

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



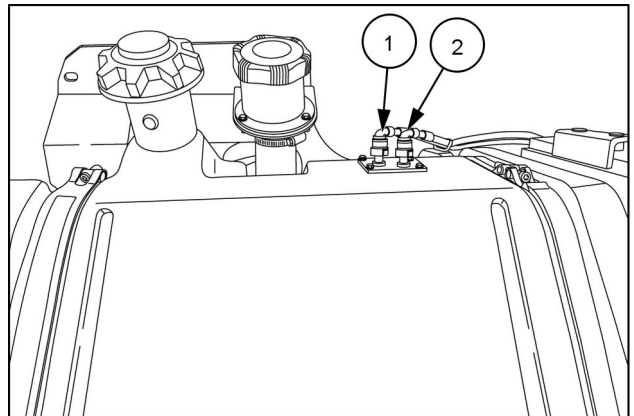
RAIL14DOZ0144AA 4

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



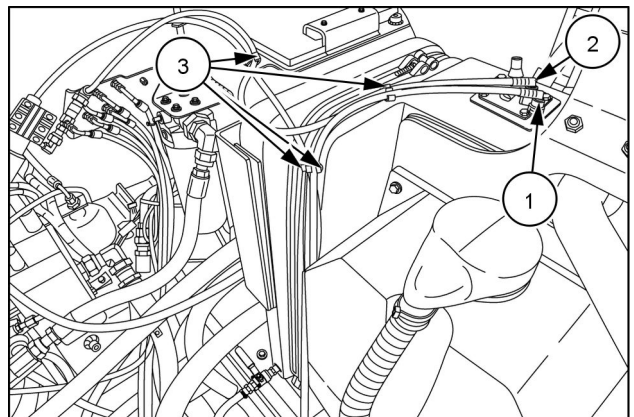
RAIL14DOZ0142AA 5

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.



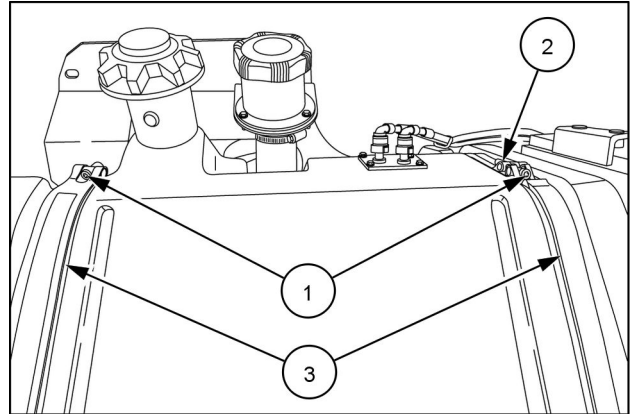
RAIL14DOZ0143AA 6

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.



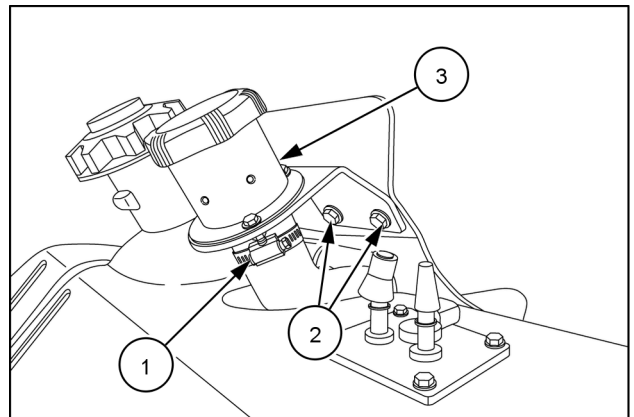
RAIL14DOZ0145AA 7

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).

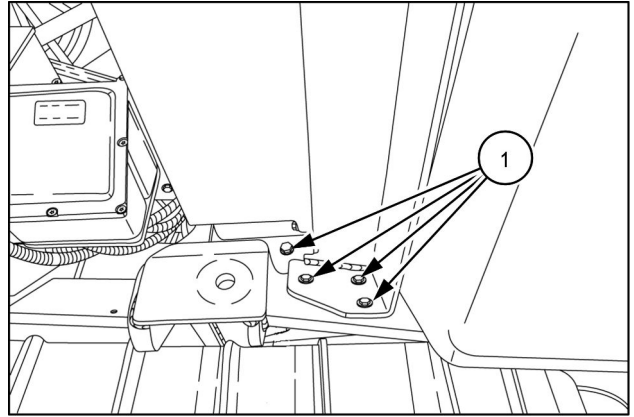


RAIL14DOZ0146AA 9

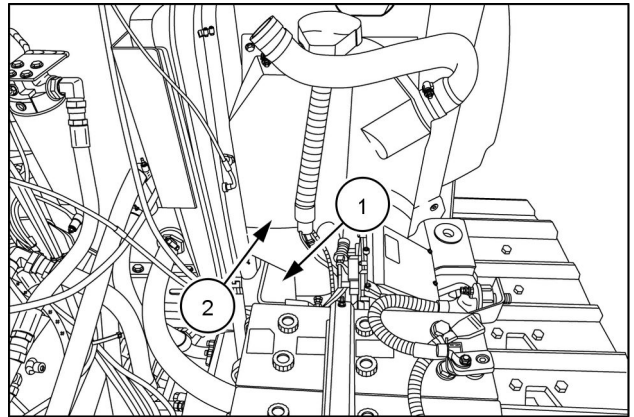
11. Remove the two DEF filler neck bolts and washers (2) and remove the DEF filler neck (3) from the machine. Close all openings.

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.

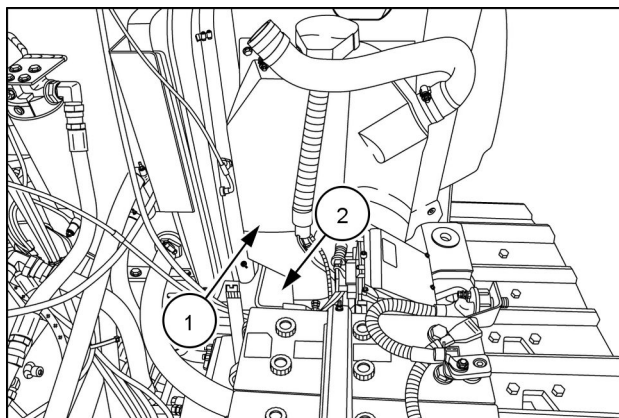
Fuel tank - Install

2050M

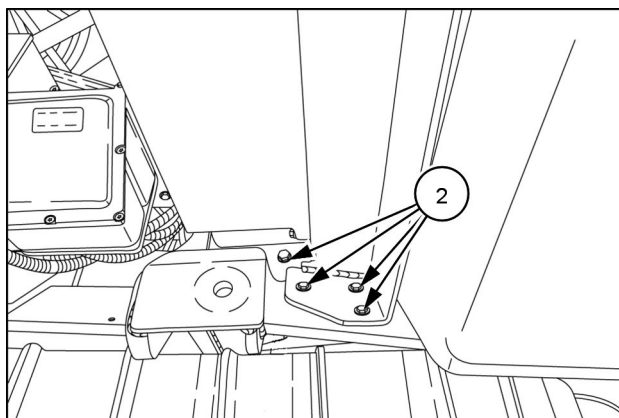
NA

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.

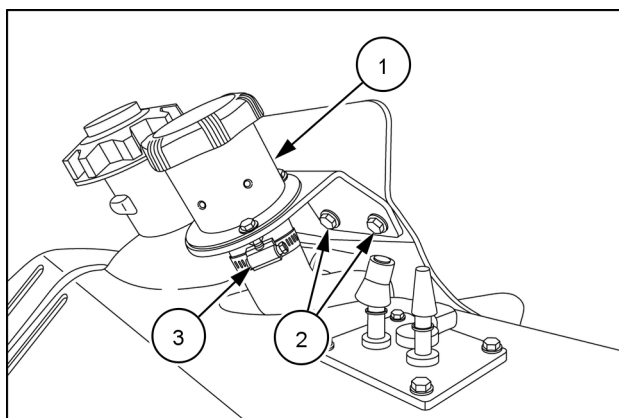


RAIL14DOZ0147AA 1



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).



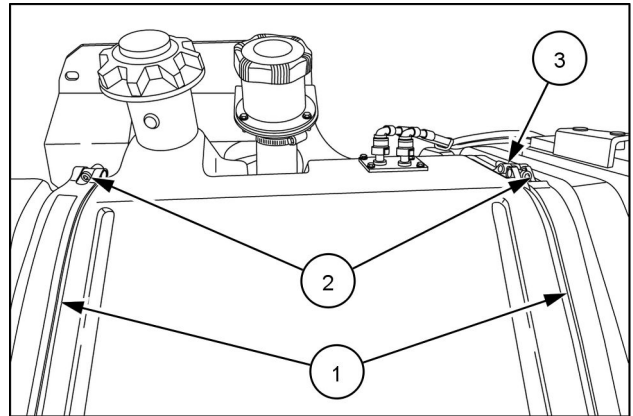
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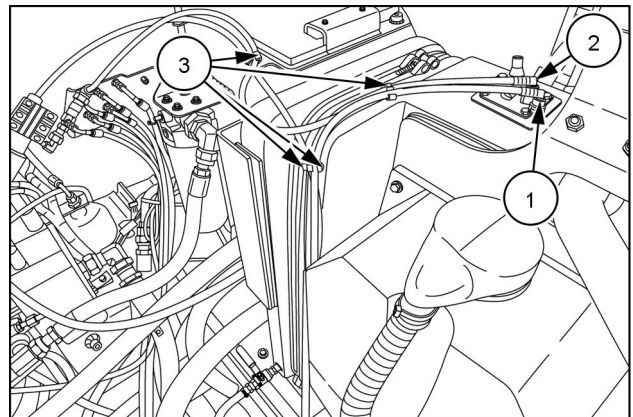
Thank you so much for reading

5. Install the fuel tank retaining straps **(1)** to the machine and secure with two retaining bolts **(2)** and one locknut **(3)**. Tighten the bolts.



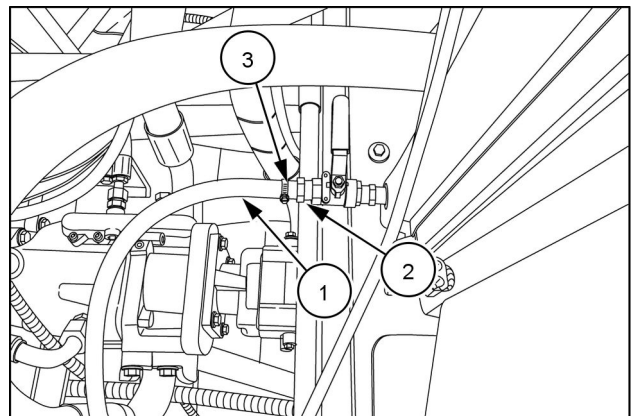
RAIL14DOZ0143AA 4

6. Install the fuel supply **(1)** and the fuel return **(2)** hoses into the four retaining clips **(3)**.



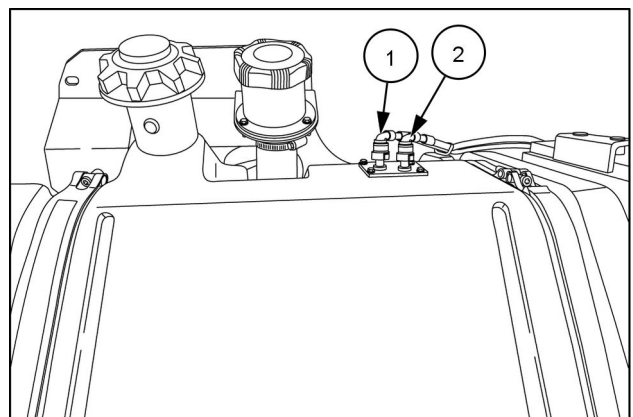
RAIL14DOZ0145AA 5

7. Connect the fuel drain hose **(1)** to the fuel drain valve **(2)** and tighten the clamp **(3)**.



RAIL14DOZ0144AA 6

8. Connect the fuel supply **(1)** and the fuel return **(2)** lines to the top of the fuel tank.



RAIL14DOZ0143AA 7

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