

I 650M **Stage IIIB** **Crawler Dozer**

*PIN NCDCI 6500 and above; PIN NDDCI 6500 and above;
PIN NEDCI 6000 and above; PIN NFDCI 6000 and above*

SERVICE MANUAL

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CASE
CONSTRUCTION



SERVICE MANUAL

1650M Extra Long Track (XLT), Bulldozer (BD) Blade [NCDC16500 -], 1650M Extra Long Track (XLT), Bulldozer (BD) Blade [NDDC16500 -], 1650M Extra Long Track (XLT), Bulldozer (BD) Blade [NEDC16000 -], 1650M Extra Long Track (XLT), Bulldozer (BD) Blade [NFDC16000 -], 1650M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NCDC16500 -], 1650M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NDDC16500 -], 1650M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NEDC16000 -], 1650M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NFDC16000 -], 1650M Wide Track (WT) / Low Ground Pressure (LGP), Power Angle Tilt (PAT) Blade [NCDC16500 -], 1650M Wide Track (WT) / Low Ground Pressure (LGP), Power Angle Tilt (PAT) Blade [NDDC16500 -], 1650M Wide Track (WT) / Low Ground Pressure (LGP), Power Angle Tilt (PAT) Blade [NEDC16000 -], 1650M Wide Track (WT) / Low Ground Pressure (LGP), Power Angle Tilt (PAT) Blade [NFDC16000 -]

Link Product / Engine

| Product | Market Product | Engine |
|---|-----------------------|----------------|
| 1650M Extra Long Track (XLT), Bulldozer (BD) Blade [NCDC16500 -] | Europe | F4HFE6132*A004 |
| 1650M Extra Long Track (XLT), Bulldozer (BD) Blade [NDDC16500 -] | Europe | F4HFE6132*A004 |
| 1650M Extra Long Track (XLT), Bulldozer (BD) Blade [NEDC16000 -] | Europe | F4HFE6132*A004 |
| 1650M Extra Long Track (XLT), Bulldozer (BD) Blade [NFDC16000 -] | Europe | F4HFE6132*A004 |
| 1650M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NCDC16500 -] | Europe | F4HFE6132*A004 |
| 1650M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NDDC16500 -] | Europe | F4HFE6132*A004 |
| 1650M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NEDC16000 -] | Europe | F4HFE6132*A004 |
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INTRODUCTION

Foreword - Important notice regarding equipment servicing

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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

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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 - Ecology and the environment

1650M

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Soil, air, and water quality is important for all industries and life in general. When legislation does not yet rule the treatment of some of the substances that advanced technology requires, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation. Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances.

Helpful hints

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- The air-conditioning system contains gases that should not be released into the atmosphere. Consult an air-conditioning specialist or use a special extractor to recharge the system properly.
- Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding. Penetrating weld splatter may burn a hole or weaken hoses, allowing the loss of oils, coolant, etc.

Battery recycling

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. CASE CONSTRUCTION strongly recommends that you return all used batteries to a CASE CONSTRUCTION dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.



Mandatory battery recycling

NOTE: *The following requirements are mandatory in Brazil.*

Batteries are made of lead plates and a sulfuric acid solution. Because batteries contain heavy metals such as lead, CONAMA Resolution 401/2008 requires you to return all used batteries to the battery dealer when you replace any batteries. Do not dispose of batteries in your household garbage.

Points of sale are obliged to:

- Accept the return of your used batteries
- Store the returned batteries in a suitable location
- Send the returned batteries to the battery manufacturer for recycling

Safety rules

1650M

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General safety rules

Use caution when operating 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, drugs, or while 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 engine, remove key and relieve the pressure before connecting or disconnecting fluid lines.
- Make sure all components are in good condition and tighten all connections before starting the engine or pressurizing 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 components are in motion.

Make sure all guards and shields are in good condition and properly installed before operating the machine. Never operate the machine with shields removed. Always close access doors or panels before operating 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 engine in enclosed spaces as harmful exhaust gases may build up.

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

Start the engine only from the operator's seat. If the safety start switch is bypassed, 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, all lighting, and Slow Moving Vehicle (SMV) emblem clean to provide the best possible visibility while operating the machine.

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

Before leaving the machine:

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

When, due to exceptional circumstances, you would decide to keep the engine running after leaving the operator's station, then the following precautions must be followed:

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.**

W0113A

Shift the transmission into neutral.

4. Apply the parking brake.

⚠ General maintenance safety ⚠

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

Service machine on a firm level surface.

Install guards and shields after servicing 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 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 securely supported.

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

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

Stop the engine, remove key and relieve pressure before disconnecting or connecting fluid lines.

Stop the engine and remove key before disconnecting or connecting electrical connections.

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

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

Engine, transmission, exhaust components, and hydraulic lines may become hot during operation. Take care when servicing such components. Allow surfaces to cool before handling or disconnecting hot components. Wear protective equipment when appropriate.

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



SERVICE MANUAL

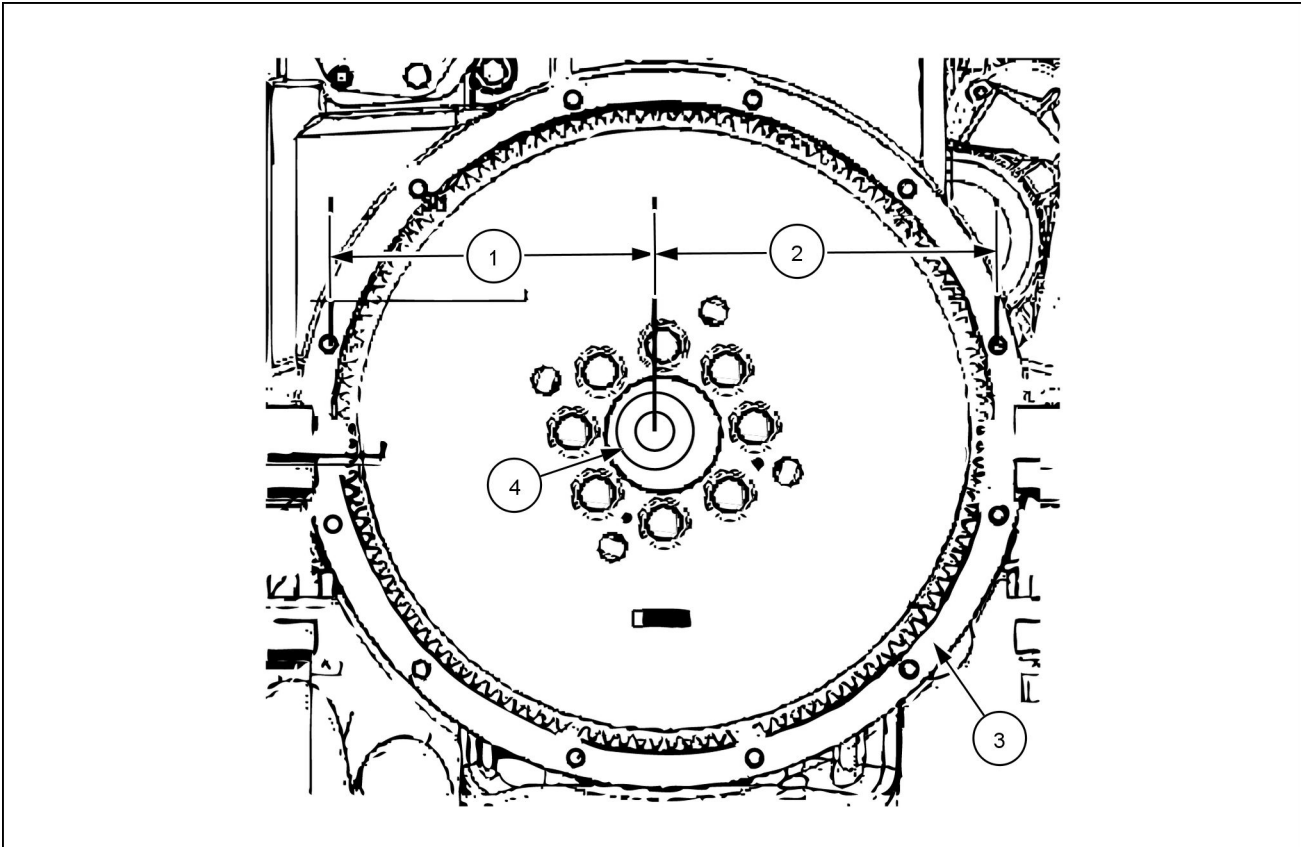
Engine

1650M Extra Long Track (XLT), Bulldozer (BD) Blade [NCDC16500 -], 1650M Extra Long Track (XLT), Bulldozer (BD) Blade [NDDC16500 -], 1650M Extra Long Track (XLT), Bulldozer (BD) Blade [NEDC16000 -], 1650M Extra Long Track (XLT), Bulldozer (BD) Blade [NFDC16000 -], 1650M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NCDC16500 -], 1650M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NDDC16500 -], 1650M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NEDC16000 -], 1650M Extra Long Track (XLT), Power Angle Tilt (PAT) Blade [NFDC16000 -], 1650M Wide Track (WT) / Low Ground Pressure (LGP), Power Angle Tilt (PAT) Blade [NCDC16500 -], 1650M Wide Track (WT) / Low Ground Pressure (LGP), Power Angle Tilt (PAT) Blade [NDDC16500 -], 1650M Wide Track (WT) / Low Ground Pressure (LGP), Power Angle Tilt (PAT) Blade [NEDC16000 -], 1650M Wide Track (WT) / Low Ground Pressure (LGP), Power Angle Tilt (PAT) Blade [NFDC16000 -]

Engine - Assemble - Driveshaft alignment, engine and tandem pumps

1650M

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RAIL13DOZ1485FA 1

| Item | Description |
|------|----------------------------------|
| 1 | Shaft center to center 9:30 hole |
| 2 | Shaft center to center 2:30 hole |
| 3 | Flywheel housing |
| 4 | Pump shaft |

NOTE: All instructions specified are from the perspective of someone sitting in the operator's seat, facing the blade.

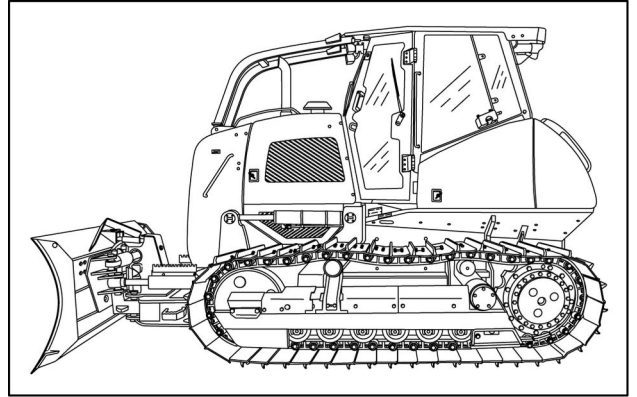
1. Angle of the driveshaft is **4.85 °**.
2. Coming off the pump shaft centerline, the driveshaft is angled up **4.07 °** and to the left **2.63 °**.
3. The distance from the flywheel housing to the pump mounting bracket is **176.00 mm (6.93 in)**

Air cleaner - Remove

1650M

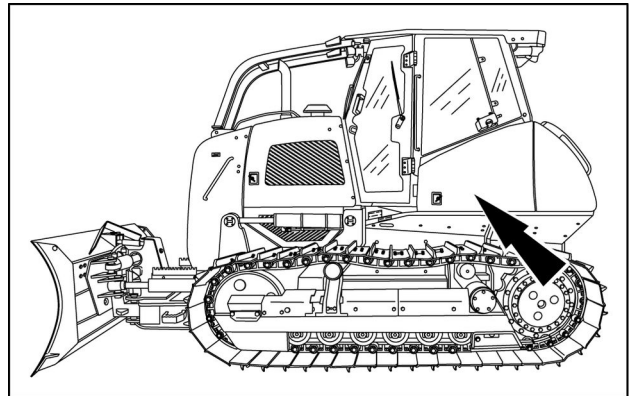
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1. Park the machine on a firm level surface.



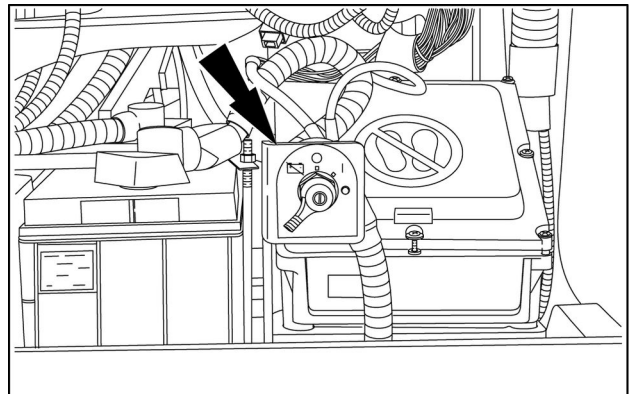
RAIL12DOZ0403AA 1

2. Lower the blade and the ripper tool (if so equipped).
3. Engage the parking brake and turn the ignition key to the OFF position.
4. Locate the battery master disconnect switch behind the panel on the left side of the cab.



RAIL12DOZ0403AA 2

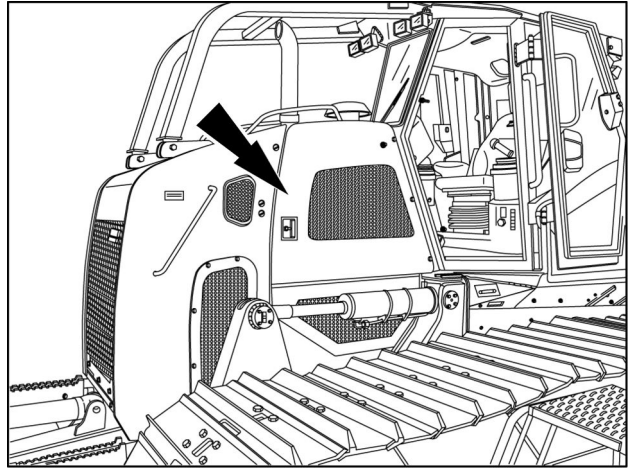
5. Switch the master battery disconnect switch to the OFF position.



RAPH12DOZ0044AA 3

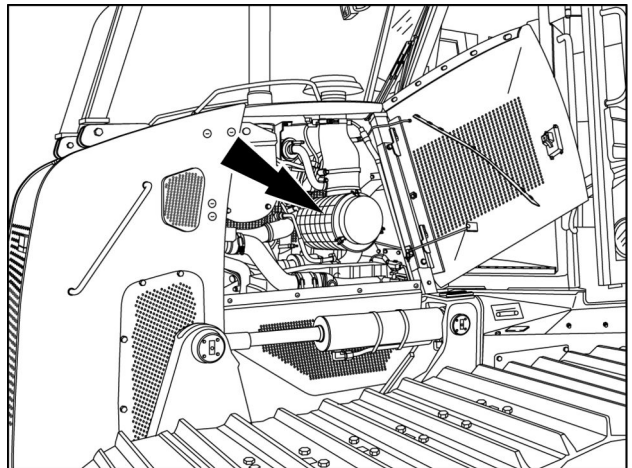
NOTE: Wait 90 seconds after engine shutdown before turning off battery disconnect. After engine shutdown, the Selective Catalytic Reduction (SCR) system does a purge cycle and the supply module continues to run.

6. Open the left hand side engine compartment access door.



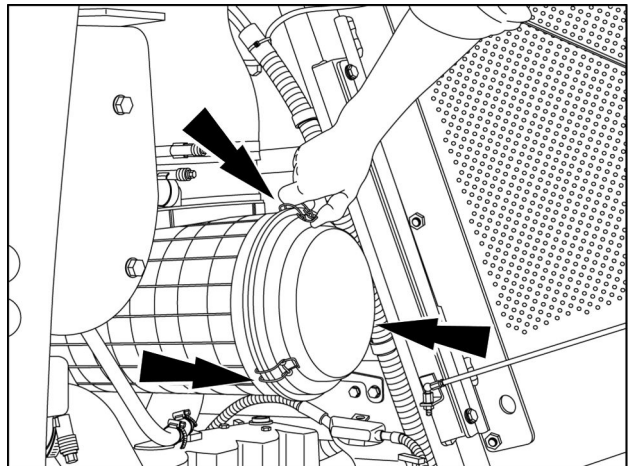
RAIL12DOZ0832BA 4

7. Locate the engine air intake filter housing.



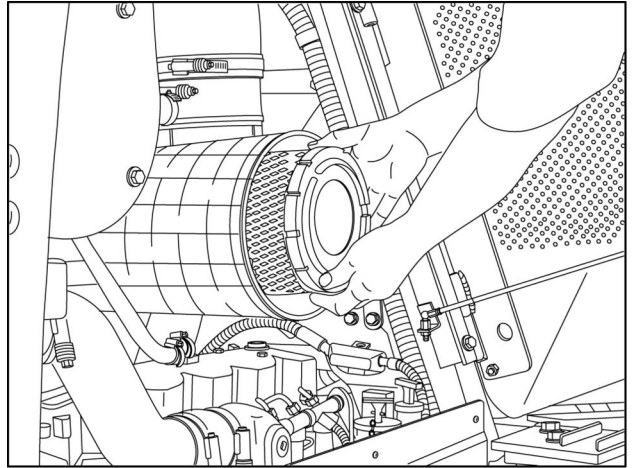
RAIL12DOZ0833BA 5

8. Release the retaining clips and remove the engine air intake filter housing cover.



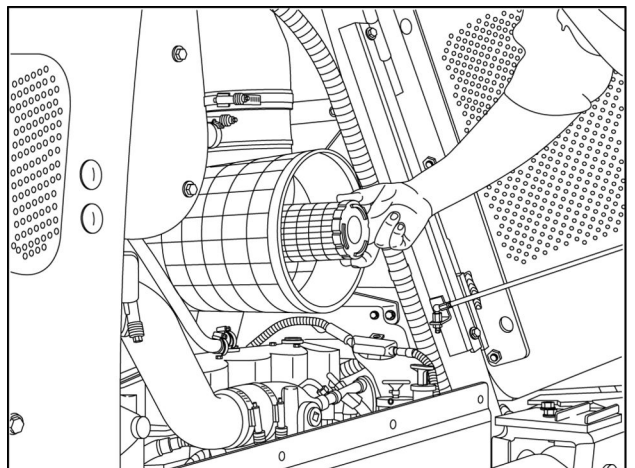
RAIL12DOZ0834BA 6

9. Remove the primary air filter element.



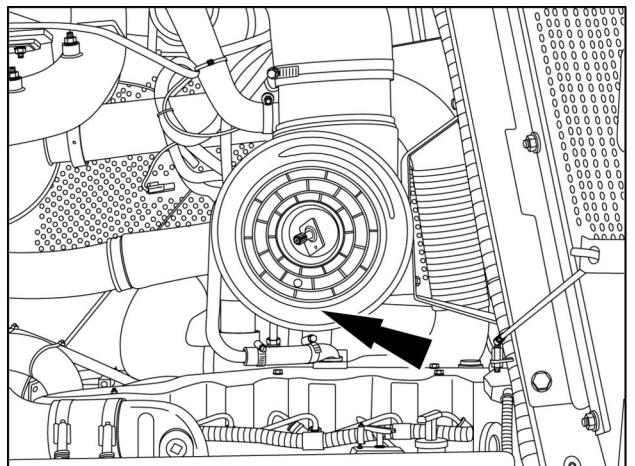
RAIL12DOZ0835BA 7

10. Remove the secondary air filter element.



RAIL12DOZ0837BA 8

11. Remove any additional debris from inside the engine air intake filter housing before installing the air filter elements.



RAIL12DOZ0839BA 9

Next operation:
Air cleaner - Install (10.202)

Air cleaner - Install

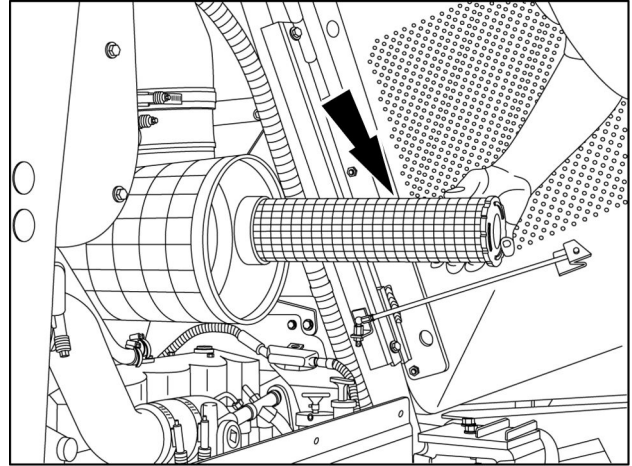
1650M

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Prior operation:

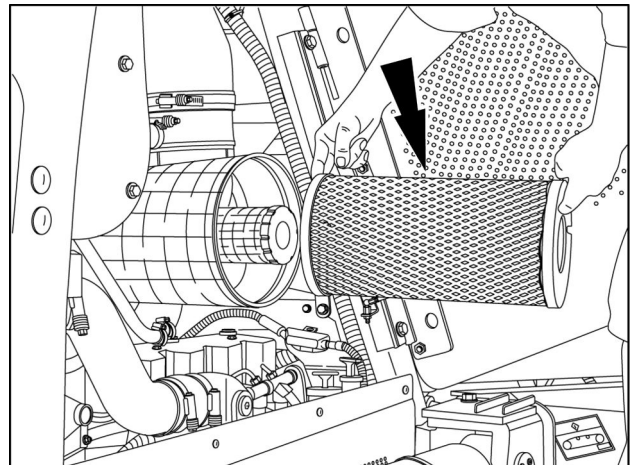
Air cleaner - Remove (10.202)

1. Install the secondary air filter element into the air filter housing.



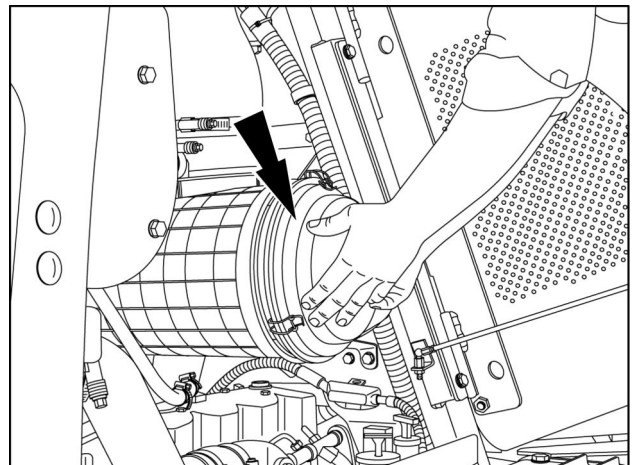
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2. Install the primary air filter element into the air filter housing.



RAIL12DOZ0836BA 2

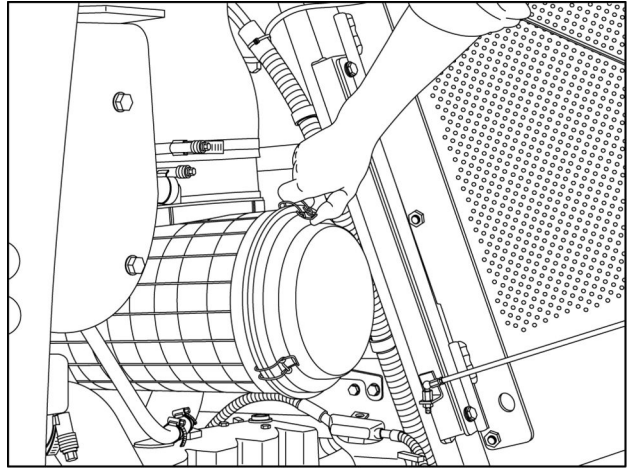
3. Attach the engine air intake filter housing cover.



RAIL12DOZ0840BA 3

Engine - Air cleaners and lines

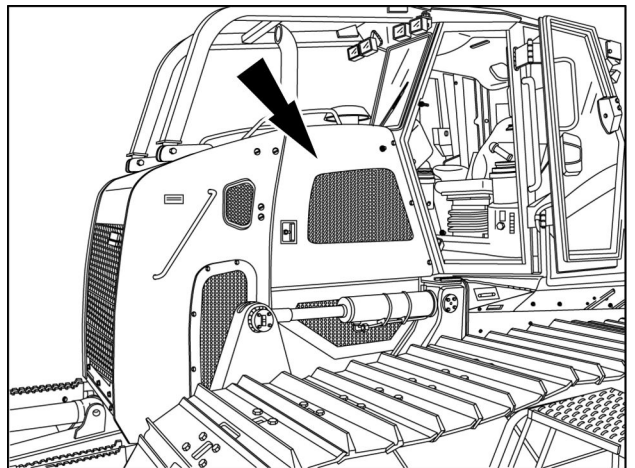
- Secure the retaining clips which hold the engine air intake filter housing cover in place.



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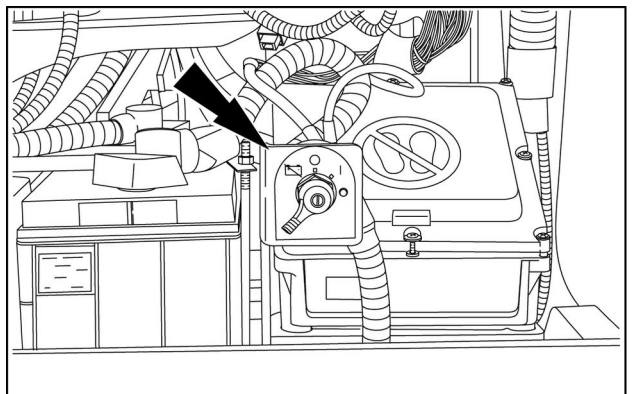
NOTE: Make sure that the engine air intake filter housing and forms a tight seal with the cover.

- Close the left side engine compartment panel and secure it with the latch.



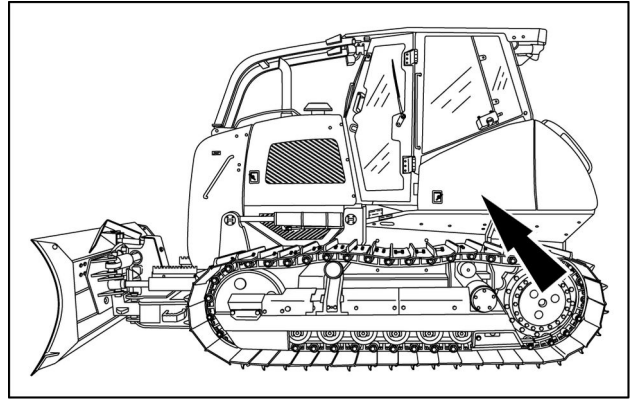
RAIL12DOZ0832BA 5

- Switch the master battery disconnect switch to the ON position.



RAPH12DOZ0044AA 6

7. Close the panel on the left side of the machine below the cab and secure the latch.



RAIL12DOZ0403AA 7

8. Start the engine and confirm normal operations. Remove any fault codes from the system.

Fuel filters - Replace

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⚠ WARNING

Fire hazard!

When handling diesel fuel, observe the following precautions:

1. Do not smoke.
2. Never fill the tank when the engine is running.
3. Wipe up spilled fuel immediately.

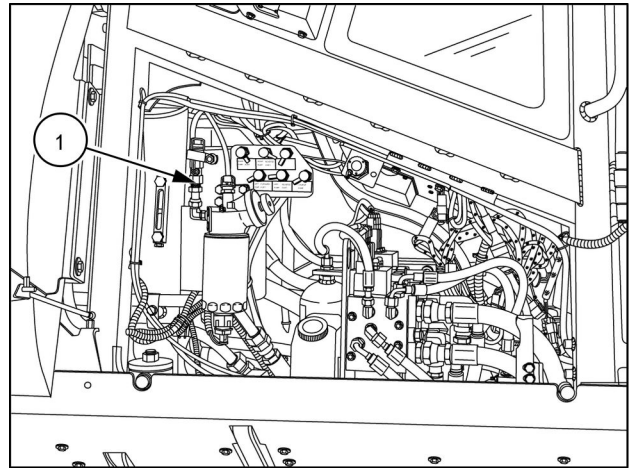
Failure to comply could result in death or serious injury.

W0099A

Prior operation:

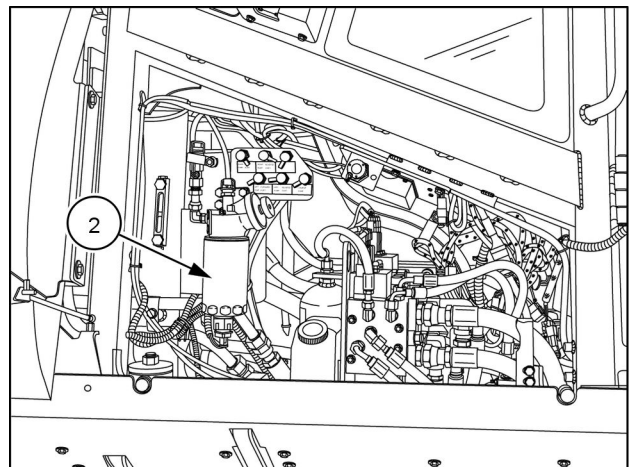
Keep all unauthorized personnel clear of the area. Park the machine on level ground, in neutral with the parking brake applied, and the attachment lowered to the ground, turn off the engine, remove the key, and verify that engine components have cooled or avoid contact. Make sure that all residual pressure is relieved from circuits before beginning maintenance.

1. Locate the fuel filter in the right rear access compartment. Close the fuel shut off valve (1) to prevent fuel leakage.
2. Clean the fuel filter head, the outside of the fuel filter, and remove any dirt and debris around the area that might contaminate the system.



RAIL13DOZ1594AA 1

3. Turn the fuel filter (2) counterclockwise and remove. Capture any fuel remaining in the lines or the fuel filter, and discard properly.
4. Apply a thin layer of clean oil to the gasket on the new fuel filter.
5. Install the filter. Use your hands to tighten the fuel filter 1/2 to 3/4 turn after the fuel filter makes contact with the filter head.
6. Open the fuel shut off valve. Check for leaks.

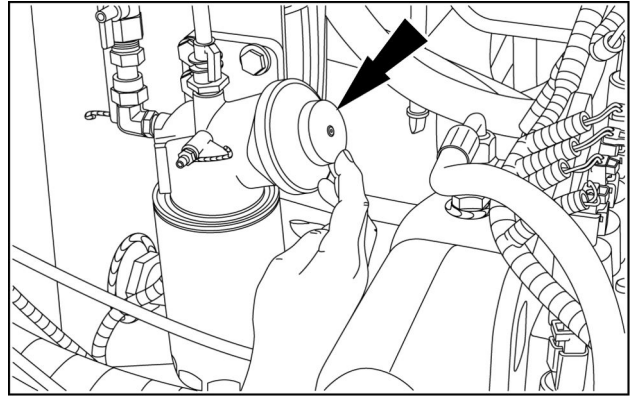


RAIL13DOZ1594AA 2

NOTICE: Never use a filter wrench to tighten a new fuel filter on install.

Removing air from the fuel system

1. Remove air from the fuel system after changing the fuel filter. Removing air from the fuel system may also be necessary if the machine runs out of fuel, if the fuel system has been serviced, or if the machine has been in storage.
2. Make certain that the fuel tank shutoff is in the ON position.
3. Loosen the air bleed screw one or two turns.
4. Operate the hand primer until no air bubbles flow from around the air bleed screw.
5. Tighten the air bleed screw.
6. Start the engine, and check for leaks.



RAPH12DOZ0056AA 3

Fuel tank - Remove

1650M

WE

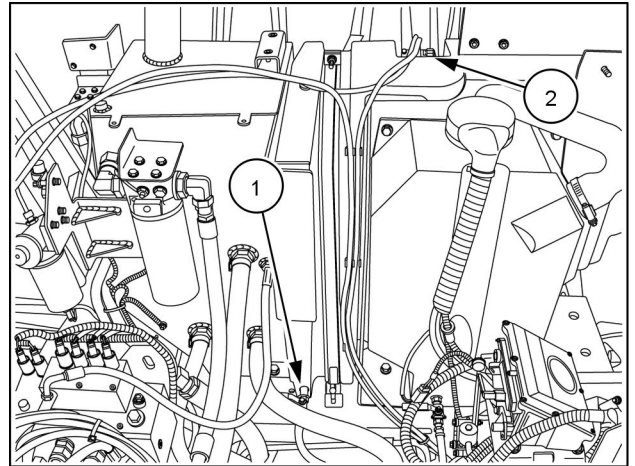
1. Park machine on a firm, level surface.
2. Lower all equipment to the ground.
3. Engage parking brake and shut engine off.
4. Relieve system of hydraulic pressure by actuating all hydraulic functions. Remove key when complete.

NOTE: Wait 90 seconds after engine shutdown before turning master battery disconnect switch OFF. After engine shutdown, the Selective Catalytic Reduction (SCR) system module continues to run and conducts a purge cycle.

5. Turn master battery disconnect switch to the OFF position.
6. Remove cab from machine. See **Cab and platform - Remove (90.150)**.
7. Remove DEF/AdBlue tank. See **Diesel Exhaust Fluid (DEF)/AdBlue® tank - Remove (10.500)**.
8. Drain fuel tank.
9. Remove fuel drain hose (1).

NOTE: DEF/AdBlue tank shown installed.

10. Remove fuel hoses and electrical connectors (2) from top of fuel tank.

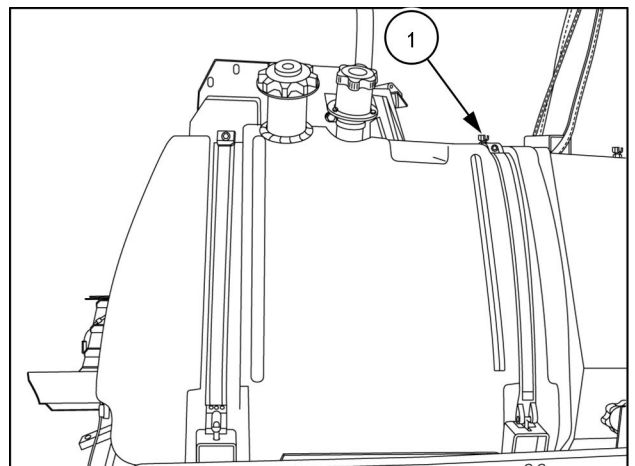


RAIL12DOZ0731BA 1

NOTICE: Fuel tank weighs approximately 91 kg (200 lb). Use proper lifting equipment to prevent personal injury or property damage.

11. Attach an appropriate lifting device to fuel tank.
12. Remove fuel tank strap (1) and remove fuel tank.

NOTE: DEF/AdBlue tank shown installed.



RAIL12DOZ0735BA 2

13. Repair or replace components as necessary.

Fuel tank - Install

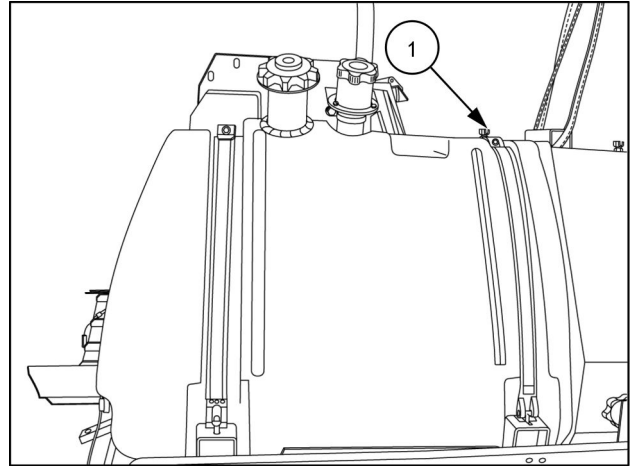
1650M

WE

NOTICE: Fuel tank weighs approximately **91 kg (200 lb)** empty. Use proper lifting equipment to prevent personal injury or property damage.

1. Attach an appropriate lifting device to fuel tank.
2. Place fuel tank in machine.
3. Install fuel tank strap (1).

NOTE: DEF/AdBlue tank shown installed.

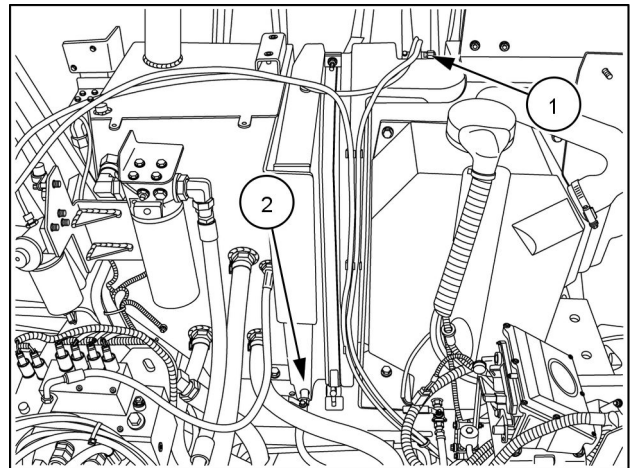


RAIL12DOZ0735BA 1

4. Remove lifting device from fuel tank.
5. Install fuel hoses and electrical connectors (1) to top of fuel tank.

NOTE: DEF/AdBlue tank shown installed.

6. Install fuel drain hose (2) to tank.



RAIL12DOZ0731BA 2

7. Install DEF/AdBlue tank. See **Diesel Exhaust Fluid (DEF)/AdBlue® tank - Install (10.500)**.
8. Install cab. See **Cab and platform - Install (90.150)**.

Engine oil filter - Replace

1650M

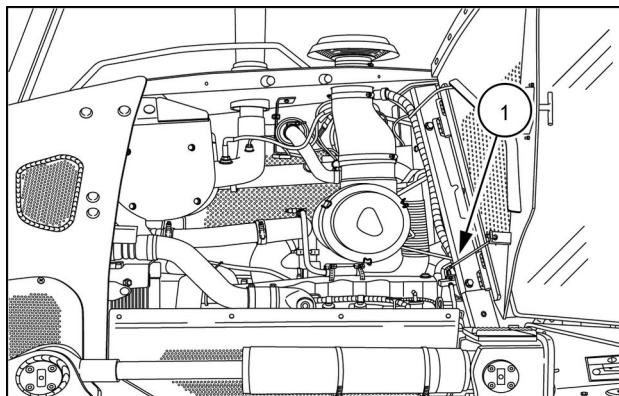
WE

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, turn off the engine, remove the key, and verify that engine components have cooled or avoid contact. Make sure that all residual pressure is relieved from circuits before beginning maintenance.

| Service specifications | |
|----------------------------------|---|
| Type of oil | CASE AKCELA UNITEK NO. 1™ SBL CJ-4 SAE 10W-40 |
| Capacity (with filter change) | 16.4 l (17.3 US qt) |
| Capacity (without filter change) | 15.6 l (16.5 US qt) |

1. Open the left-hand front and right-hand front access doors. Secure the access doors with the door struts (1).



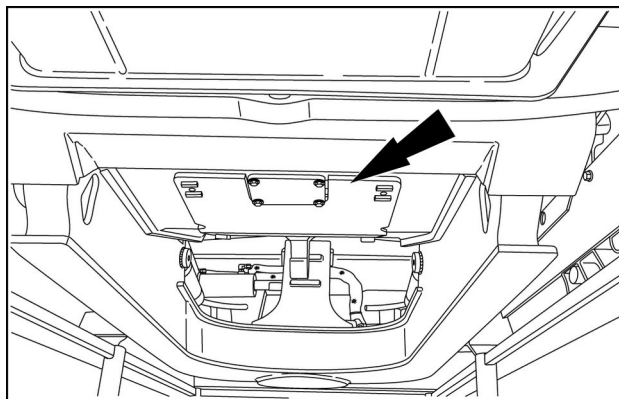
RAPH12DOZ0068AA 1

2. Remove the oil dipstick and the oil fill cap.

NOTE: Oil drains faster when the oil is warm (but not hot) and the oil dipstick and oil fill cap is removed.

3. Use a suitable container to collect the drained oil.

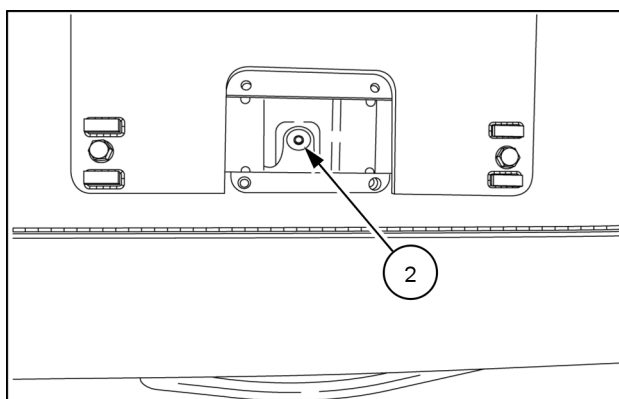
4. Remove the bolts and the engine oil access plate under the engine. Locate the oil drain plug.



RAPH12DOZ0095AA 2

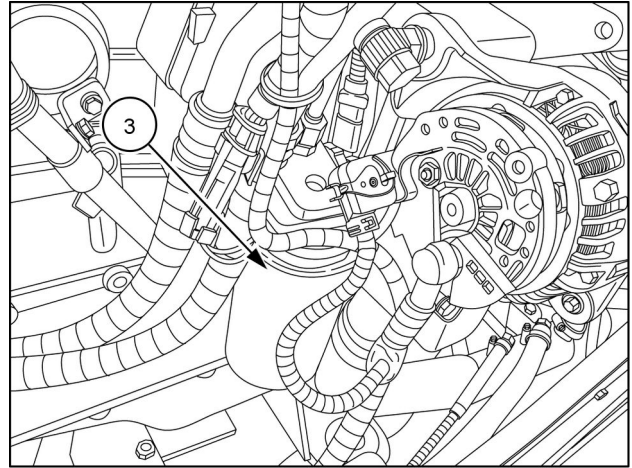
NOTE: If the machine is so equipped, and the special draining equipment is available, use the engine oil environmental drain located in the left side engine access door.

5. Remove the engine oil drain plug (2), and allow the oil to drain.



RAPH12DOZ0096AA 3

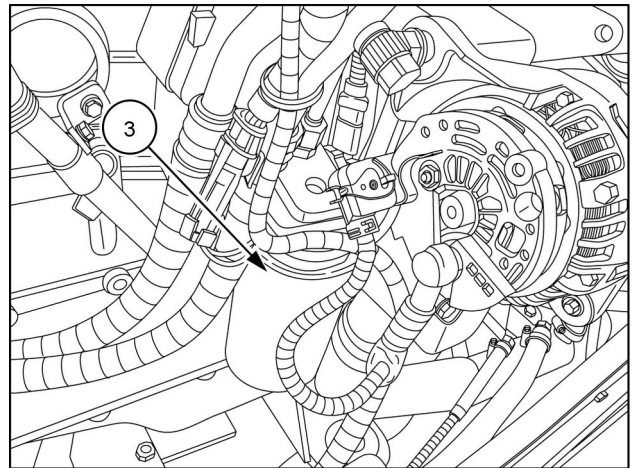
6. Locate the oil filter **(3)** in the right front engine compartment. Clean the area around the filter of dirt and debris.



RAIL12DOZ0192AA 4

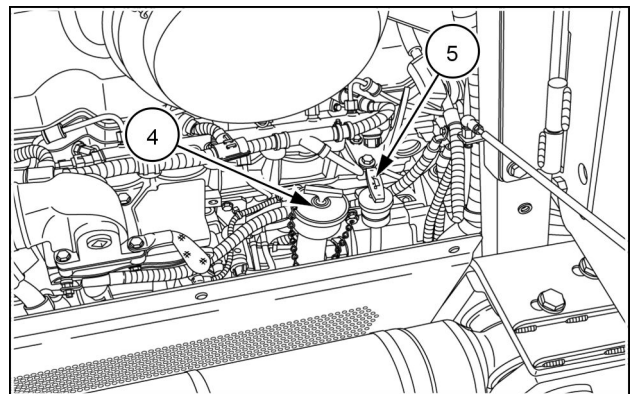
Replace oil filter

7. Turn the oil filter **(3)** housing counterclockwise to remove. Remove and discard the filter following local environmental and waste regulations.
8. Apply a thin layer of clean oil to the new filter gasket.
9. Turn the new oil filter onto the base until the gasket makes contact with the base, and then turn by hand an additional 3/4 turn. Never use a filter wrench to install a new filter.



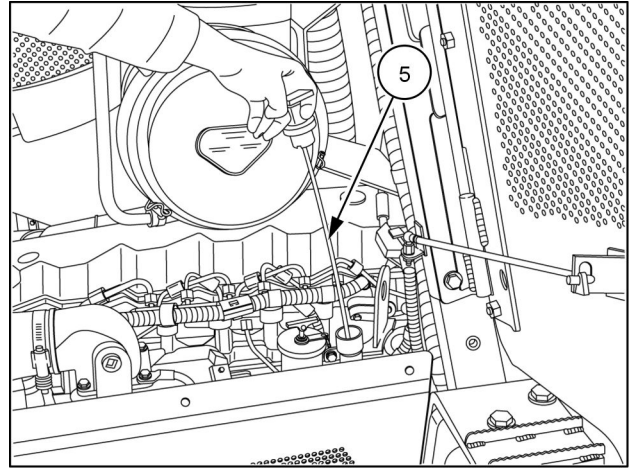
RAIL12DOZ0192AA 5

10. Close the oil drain.
11. Fill the engine with the proper amount of oil through the fill port **(4)**.
12. Start the engine and run at idle speed. Check the engine oil filter and remote drain for leaks.
13. After **2 min** stop the engine.
14. Wait for the engine oil to drain down for an accurate reading on the dipstick **(5)**.



RAPH12DOZ0069AA 6

15. Check the dipstick **(5)**, and add additional oil, if necessary.
16. Check for leaks around the filter and drain.
17. Secure the lower engine access plate.



RAIL12DOZ0171AA 7

NOTE: The oil flow rate can be improved if the oil is slightly warm and the oil fill cap or dipstick is removed from the engine while draining.



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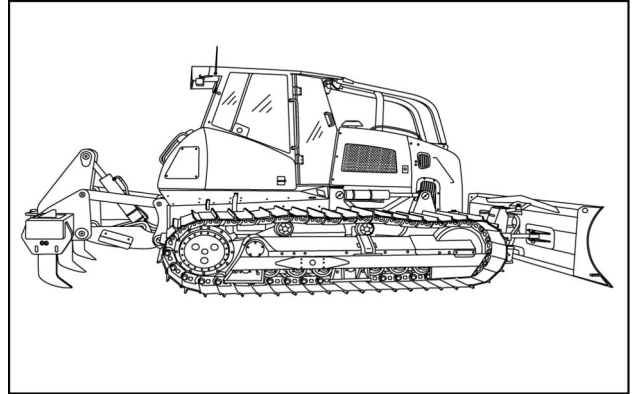
Thank you so much for reading

Crankcase ventilation system - Remove

1650M

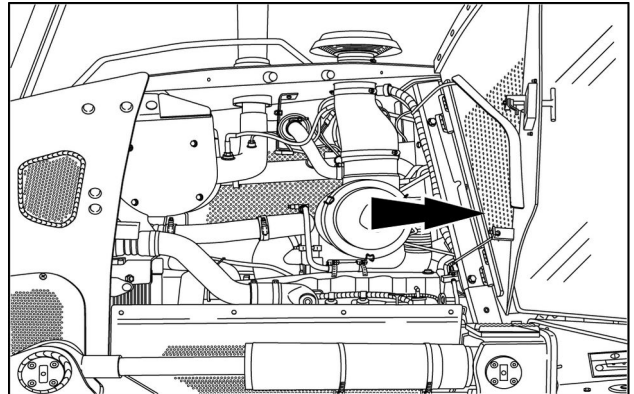
WE

1. Park the Dozer on level ground. Lower the blade to the ground and turn OFF the engine.



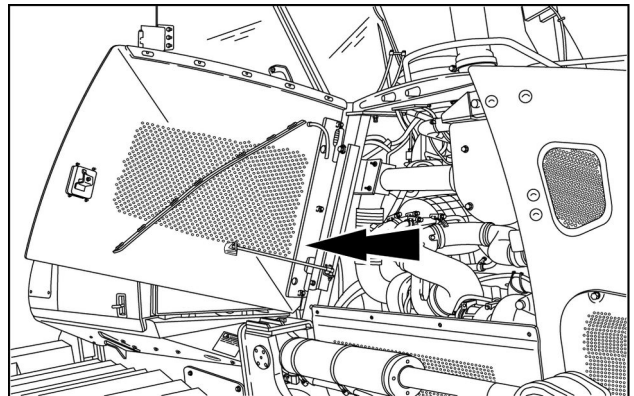
RAPH12DOZ0102AA 1

2. Turn the electrical power to OFF.
3. Remove the left side cover plate.



RAPH12DOZ0068AA 2

4. Remove the right side cover plate.



RAPH12DOZ0066AA 3

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