1650M
Tier 4
Crawler Dozer

PIN NCDC16500 and above
PIN NDDC16500 and above
PIN NEDC16000 and above
PIN NFDC16000 and above

OPERATOR'S MANUAL

Part number 47713494
2nd edition English
April 2015
Replaces part number 84512743

CASE CONSTRUCTION

Product identification

Model, Product Identification Number (PIN), and year of manufacture

Record the machine Product Identification Number (PIN) and additional machine information including the model and the component serial numbers in the spaces below. Always supply this information to your dealer when you order parts, obtain information, or require assistance. Keep a record of these numbers and your Manufacturer's Statement of Origin in a safe place. If the machine is stolen, report the numbers to your local law enforcement agency.

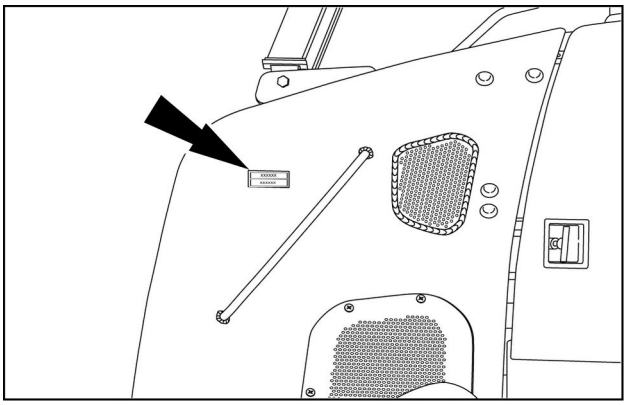
Machine identification

Model name

Product Identification Number (PIN)

Model year

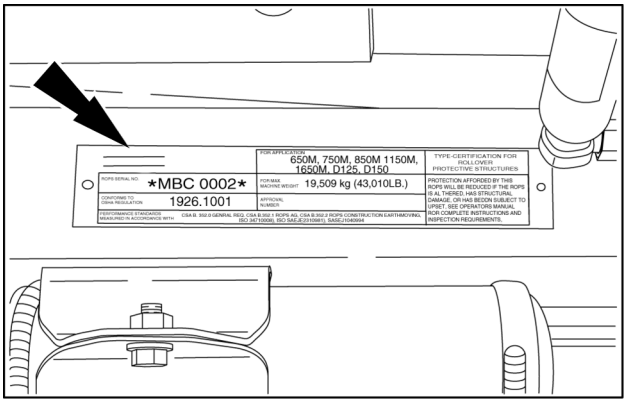
The PIN plate is located on the left-hand side of the machine in front of the engine access door.



RAPH12DOZ0131AA 1

Roll-Over Protective Structure (ROPS)

The ROPS serial number plate is located in the left-hand rear access compartment.

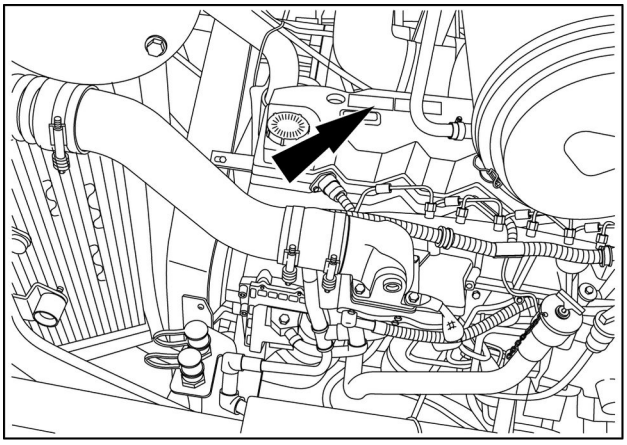


RAIL15DOZ0015AA 2

Engine make and model

Engine serial number

The serial number plate is on the engine valve cover.



RAIL12DOZ035AA 3

California Emission Control Warranty Statement

The California Air Resources Board and FPT Industrial S.p.A. are pleased to explain the emission control system warranty on your 2014 engine. In California, new heavy-duty off-road engines must be designed, built and equipped to meet the State's stringent anti-smog standards. FPT Industrial S.p.A. must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the fuel injection system and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, FPT Industrial S.p.A. will repair your heavy-duty off-road engine at no cost to you including diagnosis, parts and labor.

MANUFACTURER'S WARRANTY COVERAGE:

The 2014 and later heavy-duty off-road engines are warranted for 5 years or 3000 hours, whichever comes first. If any emission-related part on your engine is defective, the part will be repaired or replaced by FPT Industrial S.p.A.

OWNER'S WARRANTY RESPONSIBILITIES:

- As the off-road engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. FPT Industrial S.p.A. recommends that you retain all receipts covering maintenance on your off-road engine, but FPT Industrial S.p.A. cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.
- As the off-road engine owner, you should however be aware that FPT Industrial S.p.A. may deny you warranty coverage if your off-road engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.
- Your engine is designed to operate on (fuel) only. Use of any other fuel may result in your engine no longer operating in compliance with California's emissions requirements.
- You are responsible for initiating the warranty process. The ARB suggests that you present your off-road engine to a FPT Industrial S.p.A. dealer as soon as a problem exists. The warranty repairs should be completed by the dealer as expeditiously as possible.

If you have any questions regarding your warranty rights and responsibilities, you should contact Technical Service at 630-917-0759.

CALIFORNIA EMISSION CONTROL WARRANTY PARTS LIST

Fuel injection system:

- Fuel injection pump
- Fuel injectors
- Fuel injection lines

Air induction system:

- Intake manifold
- Turbocharger system (includes exhaust manifold)
- Charge air cooler

Positive Crankcase Ventilation (PCV) system (if applicable)

- PCV valve
- Oil fill cap

Exhaust after treatment Devices (if applicable)

- Diesel Oxidation Catalyst (DOC)
- Diesel Particulate Filter (DPF)
- Selective Catalytic Reduction (SCR)
- Diesel Exhaust Fluid (DEF) tank and dispensing systems

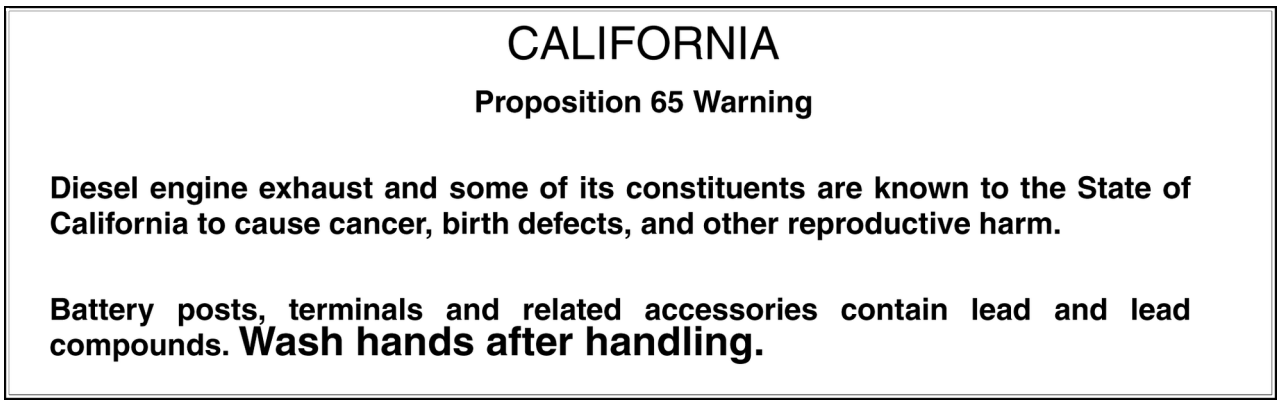
Exhaust Gas Recirculation Systems (EGR)

- EGR valve assembly
- EGR cooler

Cold Start Enrichment Systems

Electronic Control Units, Sensors, Solenoids, and Wiring harnesses used in above systems

Safety rules — California Proposition 65 Warning



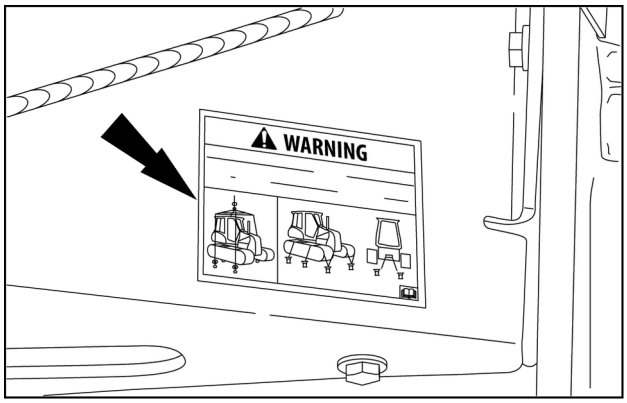
RCIL08CCH001EAA 1

California Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

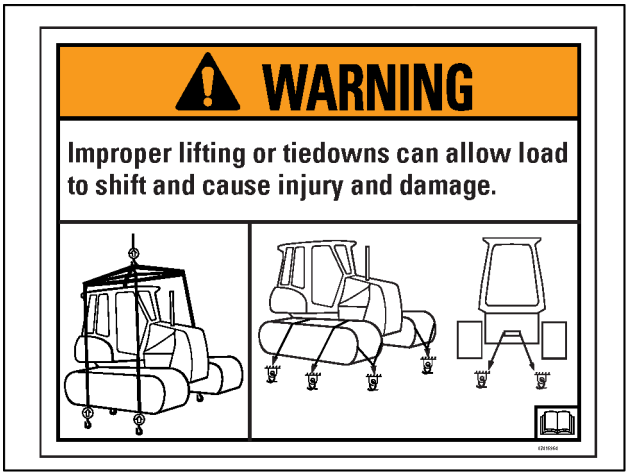
Battery posts, terminals and related accessories contain lead and lead compounds. Wash hands after handling.

WARNING — Crush hazard



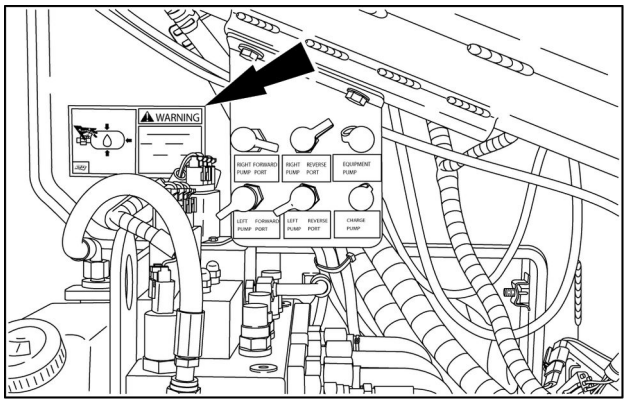
RAPH12DOZ0062AA 14

This WARNING safety sign is located on the right side of the machine above the tracks.
WARNING — Improper lifting or tiedowns can allow load to shift and cause injury or damage. Failure to comply with this warning could result in death or serious injury.
English safety sign number: 87416964



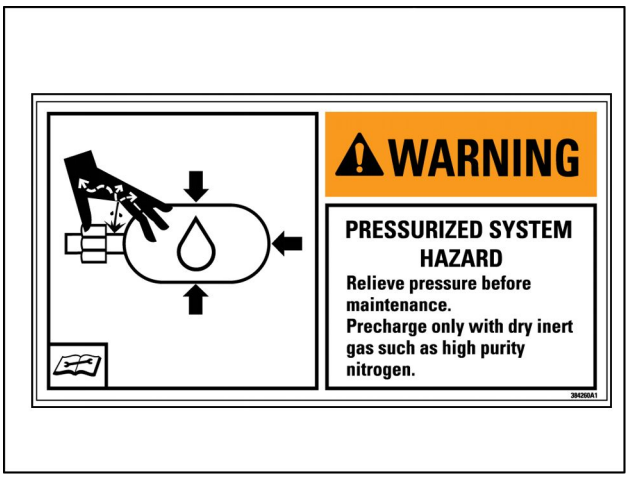
87416964 15

WARNING — Pressurized system hazard



RAPH12DOZ0059AA 16

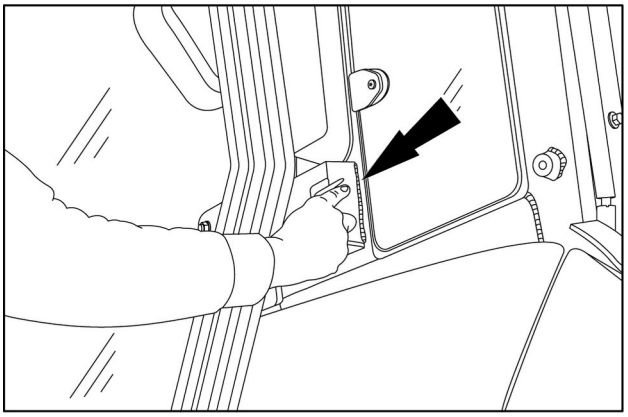
This WARNING safety sign is located inside the right rear service compartment.
WARNING — Pressurized system hazard. Relieve pressure before maintenance. Precharge only with dry inert gas such as high purity nitrogen. Failure to comply with this warning could result in death or serious injury.
English safety sign number: 384260A1
French safety sign number: 328903A1
Spanish safety sign number: 328903A1



384260A1 17

Exterior door latch

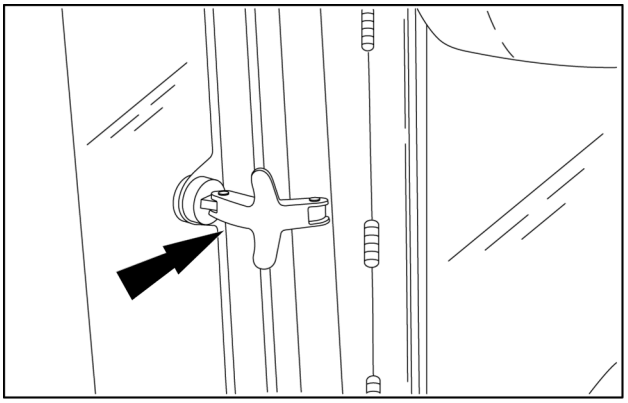
Push the lever down to unlatch the cab door from the open and locked position.



RAIL12DOZ0173AA 7

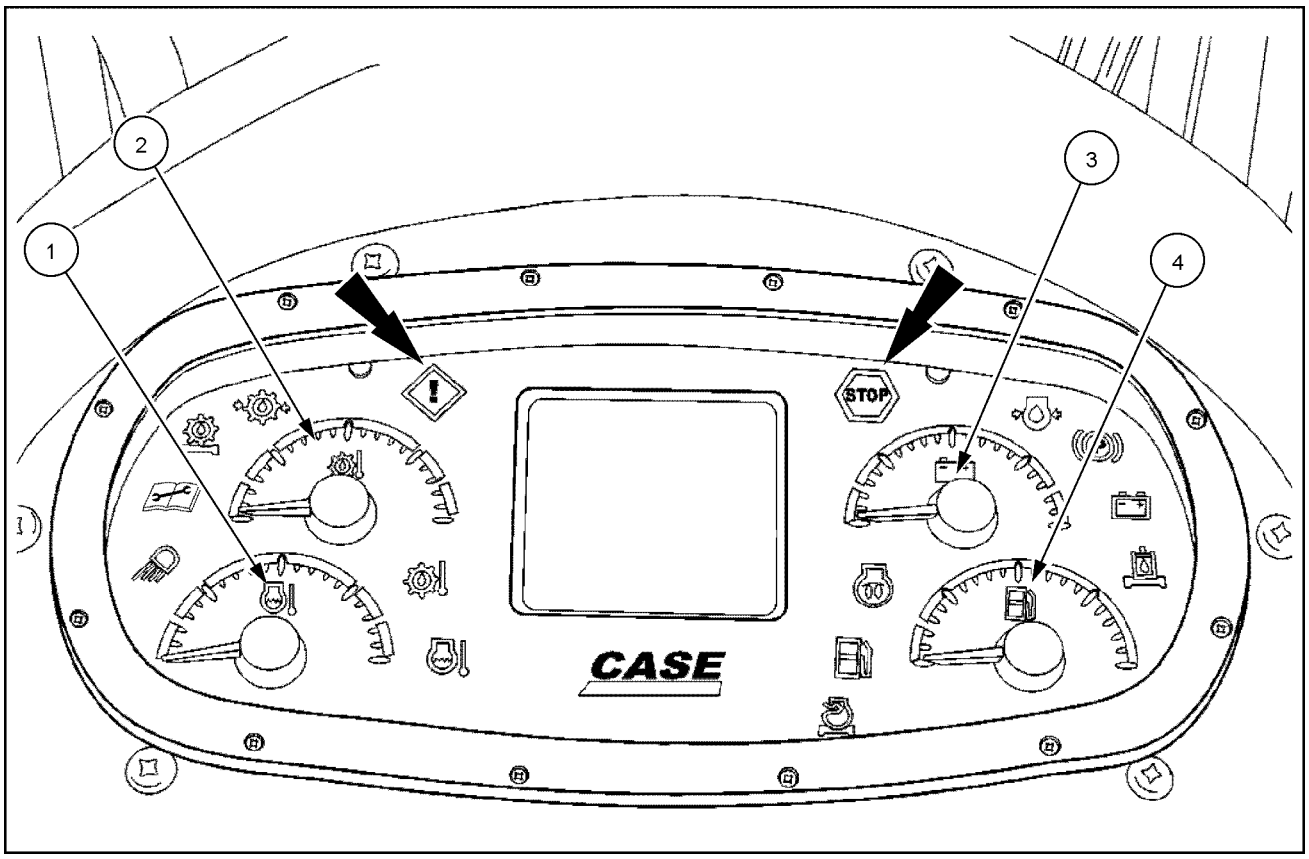
Window latch

Rear side cab windows can be opened. Use the latch to open windows. Pull the latch towards the window to open.



RAPH12DOZ0107AA 8

Status and warning icons



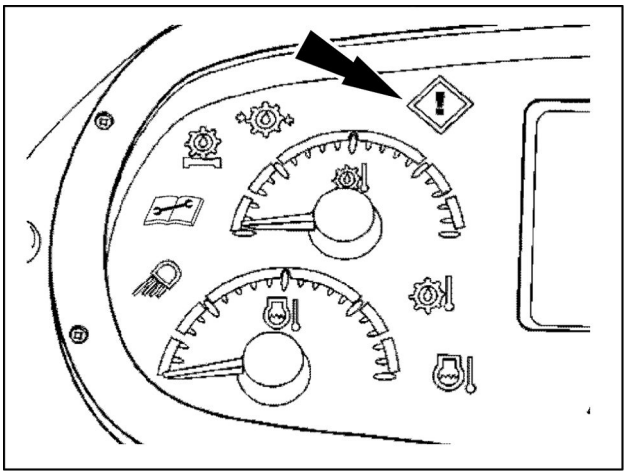
RAPH12DOZ0136FA 1

Non-critical warnings

When a fault occurs, an audible alarm may sound and the caution master indicator will be yellow. The caution message will be displayed in the message area. If this occurs, return the machine to a service position, and turn the engine off. Take corrective action to help avoid expensive repairs.

Caution master indicator (Yellow-Non-critical)

The caution master indicator is a non-critical warning display. See the non-critical warning chart. When the caution master indicator is ON, change the operating method, schedule a shutdown for maintenance, or if the condition persists, contact your dealer. The non-critical warning table lists warning displays that may appear on the instrument cluster and the corrective action required.



RAPH12DOZ0138AA 2

SCR system technical faults, failures, and engine power loss levels

Visual display warning	Indicator light	Indicator light status	Audible alarm	Description
DEF/AdBlue Injection Failed Torque Limited”		Active	Active	SCR fault/failure detected. Up to **25 %** torque reduction within **25 min** of engine running time. Contact your local authorized dealer for repair.
DEF/AdBlue Injection Failed Power Limited”		Active	Active	SCR fault/failure detected **90 min** after the initial warning Up to **65 %** torque reduction and **40 %** engine speed reduction within **40 min** of engine running time. Contact your local authorized dealer for repair.
DEF/AdBlue Injection Failed Power Limited”		Active	Active	SCR fault/failure detected **240 min** after the initial warning. Engine speed reduced to low idle within **30 min** of engine running time. Contact your local authorized dealer for repair.
DEF/AdBlue Injection Failed Power Limited”		Active	Active	Emergency re-start is active. No engine power loss. Engine will be reduced to low idle after **30 s** of continued operation. Contact your local authorized dealer for repair.

Resetting the Selective Catalytic Reduction (SCR) system

For DEF/AdBlue® storage tank fluid level faults, failures that can cause engine power loss:

- The DEF/AdBlue® tank level must be raised above **15 %** total volume.
- The key switch must be cycled to the Off position or throttle returned to low idle position.

For DEF/AdBlue® quality and SCR system technical faults, failures that can cause engine power loss:

- To fully reset the system, the component/failure causing the fault must be repaired or replaced.
- Switching off the engine will reset the system and the engine will restart at full power.
- If the same failure is re-detected within **40 h** of engine operation, the last active engine power loss level will be activated.
- If the same failure is detected three consecutive times within **40 h** of engine operation, maximum engine power loss will remain active after engine restart until the system is repaired.
- Please contact your authorized CASE CONSTRUCTION dealer for service.

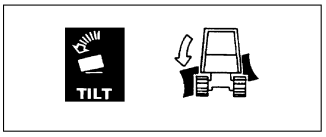
Emergency re-start

NOTE: *Emergency re-starts are only enabled after the engine has been commanded to low idle.*

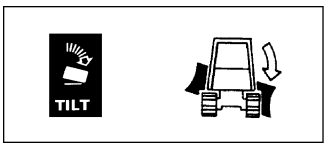
If full power loss is experienced, it may be impossible for the machine to move under its own power. Emergency re-starts are available to provide the capability to move the machine.

- Allows **30 s** of operation without power loss.
- After **30 s**, the engine is automatically reduced to low idle speed.
- There is no limit to the number of emergency re-starts

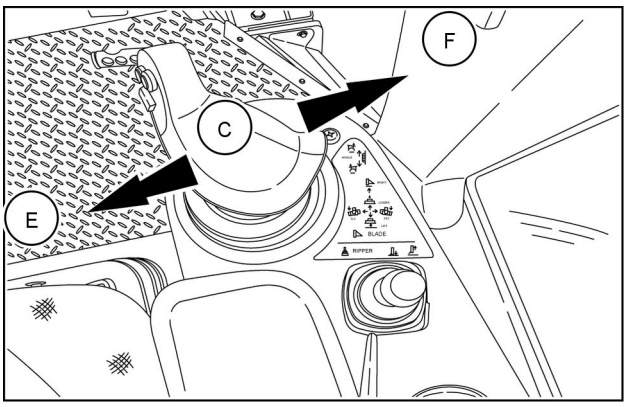
Tilt



Move the control lever to the left **(E)** to tilt the blade to the left.

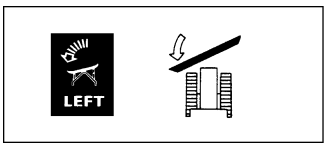


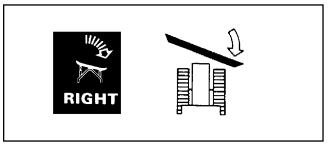
Move the control lever to the right **(F)** to tilt the blade to the right.
The blade will stop moving when the control lever is in the HOLD **(C)** position. When released, the control lever will return automatically to the HOLD position.



RAPH12DOZ0081AA 4

Angling the blade



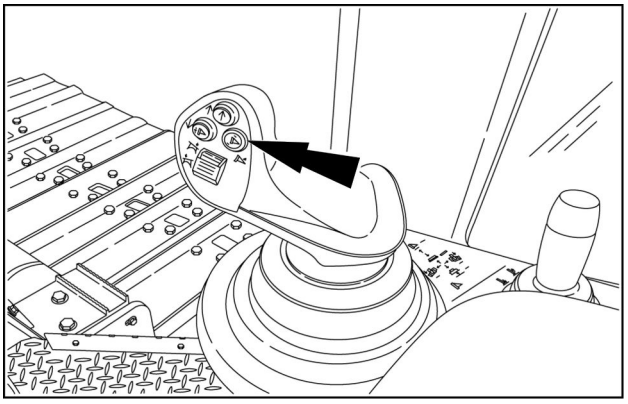


Change the angle of the blade from side to side by moving the thumb wheel located on the face of the joystick.

RAPH12DOZ0082AA 5

Blade shake

A blade shake feature is located on the face of the right hand joystick. When blade shake is engaged, the machine will automatically move the tilt of the blade to shake the blade. Press and hold the blade shake momentary button, and the blade will shake at a vigorous frequency until released or approximately three seconds. Leveling must be off to engage the blade shake feature.



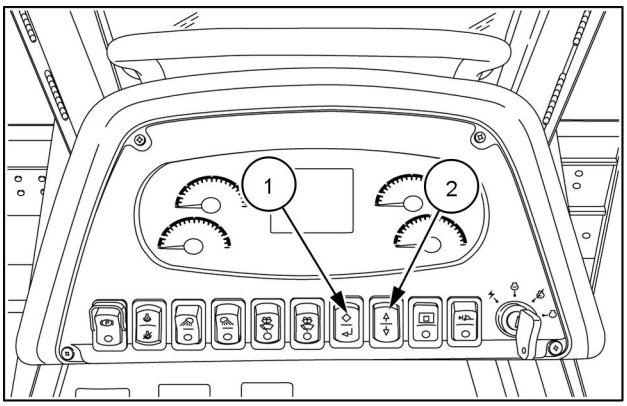
RAPH12DOZ0082AA 6

DISPLAY

Navigating the multi-function display screen

Navigation through the Liquid Crystal Display (LCD) multi-function display screens

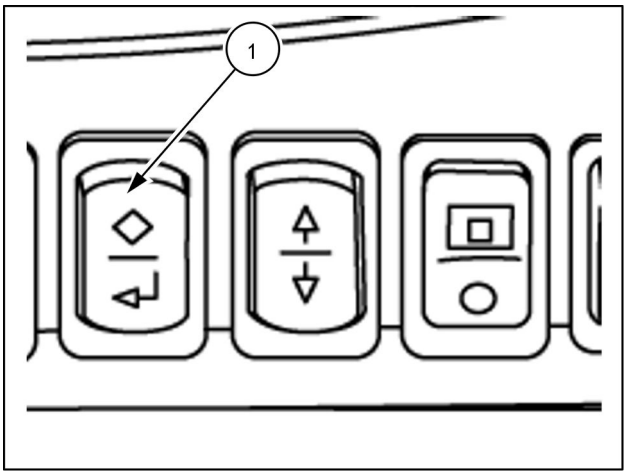
The enter/escape switch **(1)** and the up/down arrow switch **(2)** are located on the front console.
Use the appropriate switch to move from one screen to another, choose various selections, monitor the machine functions, and retrieve information.



RAPH12DOZ0076AA 1

Use the enter/escape switch **(1)** to enter selections or return to the previous menu or main screen. Push the top of the switch to escape. Push the bottom of the switch to enter/confirm.

All selections made with the computerized technology are essentially programmed in the same manner.

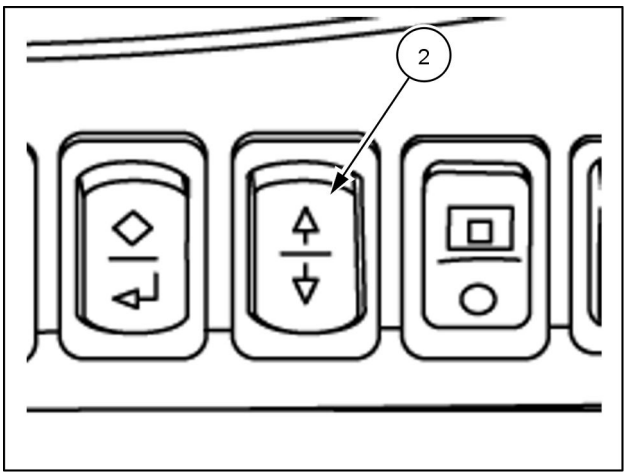


RAIL12DOZ0225AA 2

Use the arrow switch **(2)** to scroll to the desired selection. Press the top of the switch to scroll up. Press the bottom of the switch to scroll down.

Follow any screen prompts when given and use the enter/confirm switch to enter the selection. Use the escape switch to return to the main menu. This will lock the chosen selection into memory.

NOTE: *Arrows on the screen will indicate if selections are up or down from the current selection.*

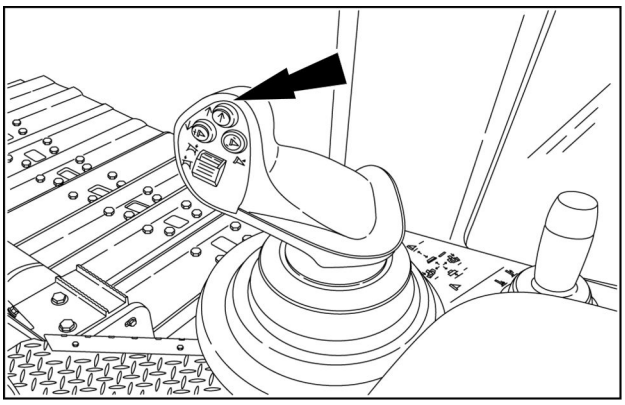


RAIL12DOZ0225AA 3

Right-hand control lever

Joystick multi-screen control

- The mult-display screen can also be accessed with the right hand joystick. This will allow the operator to access info screens and trip screens without removing his hands from the joysticks.



RAPH12DOZ0082AA 1

MOVING THE UNIT

Operating the machine

Crawler operation

⚠ WARNING

Equipment failure could cause accident or injury!
Before operating the machine, check for correct operation of steering, brakes, hydraulic controls, instruments, and safety equipment. Make sure the transmission control lever is in the neutral position. Make all adjustments before operating the machine.
Failure to comply could result in death or serious injury.

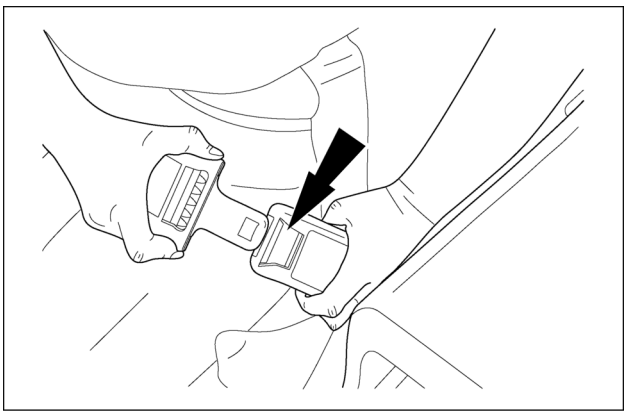
W0204A

⚠ WARNING

IMPROPER OPERATION OF THIS MACHINE CAN CAUSE DEATH OR SERIOUS INJURY.
MAKE SURE THAT EVERY OPERATOR:
-learns and practices the safe use of machine controls in a safe, clear area before operating the machine on a job site.
-clears the work area of all bystanders.
-observes pertinent laws and regulations.
-follows the instructions in this operator's manual.
Failure to comply could result in death or serious injury.

W0189A

1. Adjust the seat, and fasten your seat belt. Make sure that you can fully depress the deceleration or transmission pedal when your back is against the seat backrest.

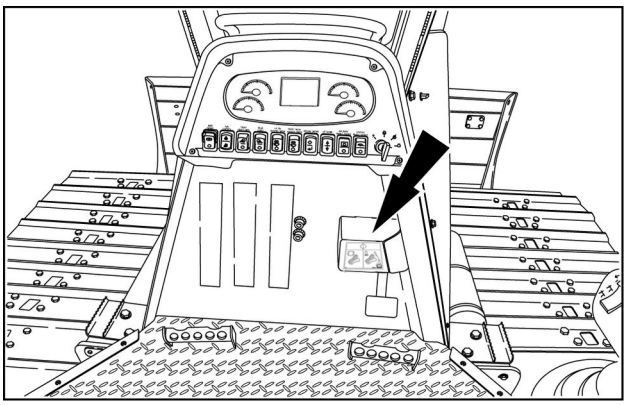


RCIL10CWL083FAL 1

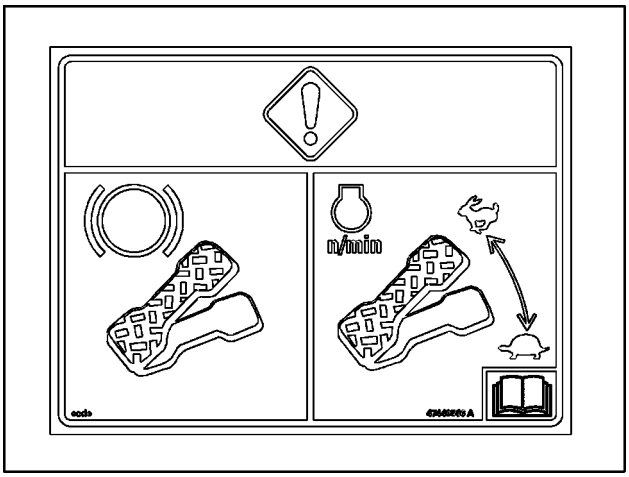
Deceleration or transmission pedal

The machine features a dual function deceleration or transmission pedal. The transmission (Trans) pedal is the default feature. Use the deceleration pedal to slow or stop the vehicle for precision grading. The deceleration pedal reduces the throttle setting as it is depressed. The deceleration pedal works in any direction. The function of the pedal can be changed through the multi-function display. See complete multi-function display instructions and changing the pedal functions in this chapter on page **4-14** .

NOTICE: *See the deceleration/transmission safety sign located above the pedal and in the safety section in this manual.*



RAIL13DOZ1264AA 1

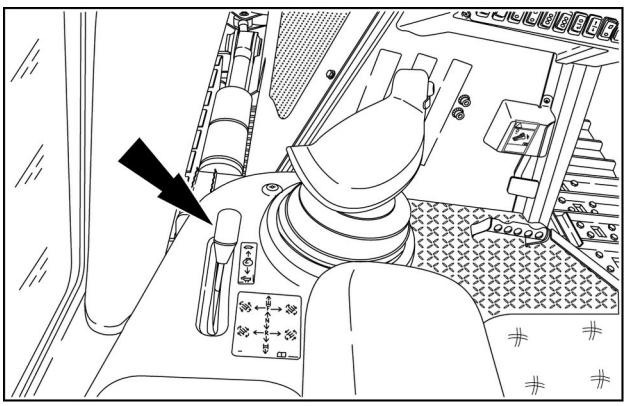


47449566 2

Throttle speed lever

1. Pull the throttle speed lever back to increase the engine speed.
2. Push the throttle speed lever forward to decrease the engine speed.

NOTICE: *Run the engine at low idle for a few minutes before turning the engine off. Always shut the engine down with the throttle at its lowest setting to keep from damaging the turbocharger.*



RAPH12DOZ0080AA 3

Transporting by truck or trailer

⚠ WARNING

Driving hazard!
Know all rules, regulations, laws, and required safety equipment for transporting or operating this machine on a road or highway. See your dealer to obtain a rotating beacon, backup alarm, Slow Moving Vehicle (SMV) emblem, and other safety equipment.
Failure to comply could result in death or serious injury.

W0154A

⚠ WARNING

Transport hazard!
The machine can slip or fall from a ramp or trailer. Make sure the ramp and trailer are not slippery. Remove all oil, grease, ice, etc. Move the machine on or off the trailer with machine centered on the trailer or ramp.
Failure to comply could result in death or serious injury.

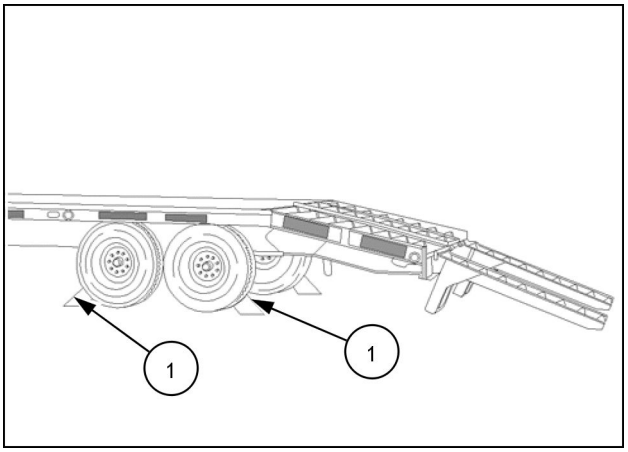
W0152A

Transporting the machine by truck or trailer

NOTICE: *Make certain the truck and trailer are adequate for the machine. The truck, trailer, and machine must be equipped with the correct safety equipment for transport. Wide load escorts may be required for some machines. Remove all dirt, mud, snow, ice, oil, or grease from the trailer and ramp before loading or unloading the machine.*

Make sure you know the safety rules and regulations before transporting the machine. You must know the rules or laws for transportation and safety that are used in each area that you will be in. Make sure that the truck and machine are equipped with the correct safety equipment. Use care when loading a machine.

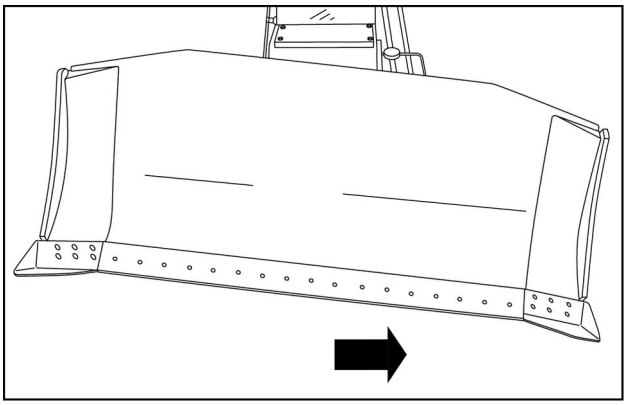
1. Put a block on both sides of the trailer wheels.
2. Move the crawler slowly onto the trailer. Place the direction control lever in the neutral position.
3. Lower the blade and ripper, if equipped, to the trailer.
4. Engage the parking brake.
5. Stop the engine, remove the key, and lock all access doors.



RCIL10CWL015AAL 1

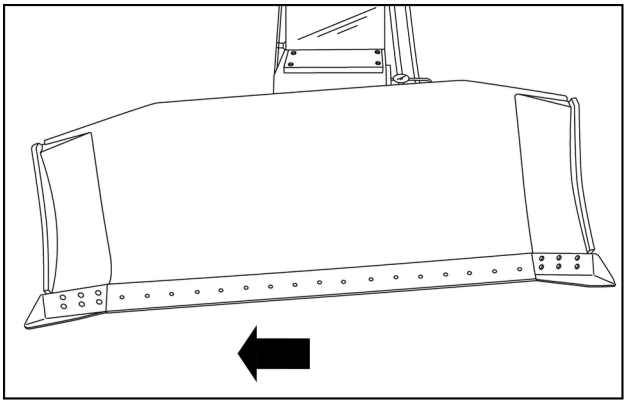
5. Tilt the blade fully to the left. Read and note the gauge information.

NOTE: *Adjust the pitch link in or out to get a starting angle of about* ***7.0 °****.*



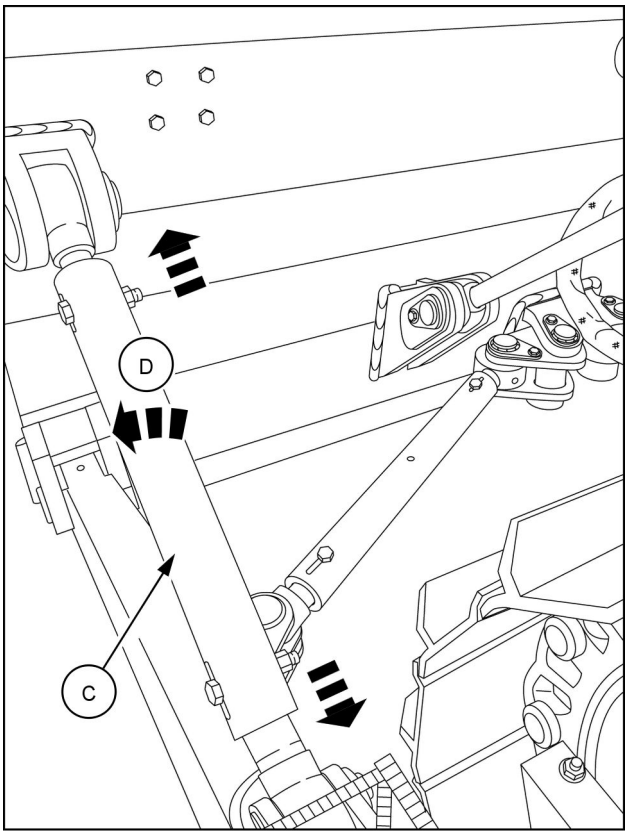
RAIL14DOZ0527AA 4

6. Tilt the blade fully to the right. Read and note the gauge information.



RAIL14DOZ0528AA 5

7. If the left-hand tilt angle is larger, adjust the pitch link **(C)** OUT (1/2 turn) **(D)**.



RAIL14DOZ0529AA 6

Packing

Packing materials are materials that stick to or pack around the moving components. Tracks must be adjusted as often as required when working in this type of soil condition.

Packing materials cause a mismatch between components, particularly between the chain and sprocket. The packing materials tighten the chain causing increased stress and strain on links, pins, bushings, and the contact surfaces between mating parts. As mismatch occurs due to packing in the sprocket root, each track bushing rides higher in the sprocket. This condition causes rapid and severe forward and reverse wear, and a chain to sprocket “jumping” that is indicated by a loud “banging” and/or “popping” noise. This results in high impact loads that cause additional wear and cracking.

Packing conditions can also stop rollers from turning. When this happens, the track chain slides over that spot on the roller causing a flat spot. Packing materials increase the abrasive effect of most material by not allowing the material to escape. Wear will be accelerated.

When a packing problem continues, install relieved track sprockets.

Intermittent packing can also occur between some of the sprocket teeth. Intermittent packing can cause the track to tightened and release rapidly. This will cause the recoil spring to compress and release. A loud “banging” noise will result.

Extreme reverse loading

Extreme reverse loading occurs when the machine backs uphill. The top of both track chains become tight, compressing the recoil springs. When the machine is driven forward, a loud “banging” noise may occur as one or both recoil springs release.

Track Shoes

The shoes must provide adequate traction and flotation, but should be no wider than necessary. Flotation is the ability to stay on the surface of soft ground or mud. Correct flotation occurs when the grousers penetrate fully into the ground without letting the track shoes go below the surface.

Track shoes that are too wide can have a damaging effect on many of the undercarriage components. The middle of the track shoe is fastened to the track links, and the links act as a fulcrum and must absorb or transmit any leverage or twisting forces that occur as the machine moves over uneven or rocky terrain. All of the other components (sprockets, track rollers and idlers) resist and restrict the twisting forces of the links. This results in wear and damage caused by the twisting action. The twisting action can also damage the links, pins, bushings, and track plate mounting hardware.

Wide track shoes effects:

1. Resistance to turning - results in wear on the shoe corners and twists the track chain.
2. Bending, cracking or breaking the track shoes, shoe hardware and links.
3. Constant problems with loose shoe hardware that makes the bolt holes larger.
4. Increased wear on links, roller flanges and idler flanges caused by a constant twisting of the track chain.
5. Decreased pin and bushing life or decreased link life due to elongated pin and bushing bores. This is a result of the twisted links.
6. Possible loss of lubricant in the Lubricated Track pins. This will result in early pin and bushing wear.

Partially controlled wear factors

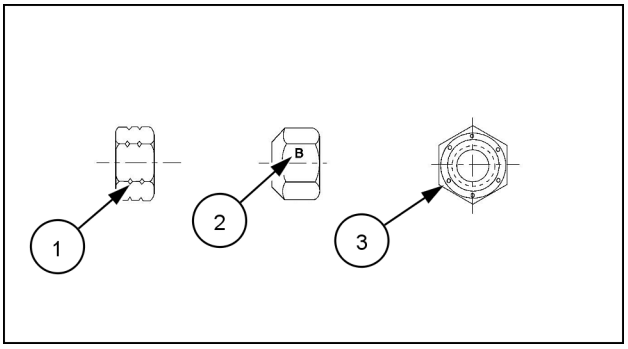
Speed

Unnecessary speed can cause a higher wear rate on pins, bushings and sprockets. The faster the speed, the faster the wear rate. High reverse speed accelerates bushing and sprocket wear. Reverse speeds are faster than forward speeds. Wear rate is a function of speed and distance traveled not just hours worked.

Inch locknuts, all metal (three optional methods)

Grade Identification

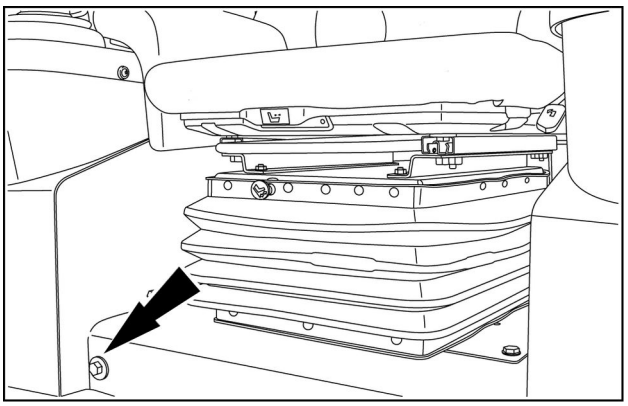
Grade	Corner Marking Method (1)	Flats Marking Method (2)	Clock Marking Method (3)
Grade A	No Notches	No Mark	No Marks
Grade B	One Circumferential Notch	Letter B	Three Marks
Grade C	Two Circumferential Notches	Letter C	Six Marks



20090268 4

NOTE: *The seat will automatically spring upward and towards the back of the cab.*

7. While holding the seat down, remove the bolts from each side of the lower front seat frame (one per side).



RAPH12DOZ0075AA 4

MAINTENANCE CHART

Maintenance chart

Maintenance action	Check	Grease	Cleaning	Change fluid	Test	Drain fluid	Replace	Page no.
Daily inspection								
General	x							**7-27**
Every 10 hours								
Engine oil	x							**7-31**
Engine coolant	x							**7-32**
Hydraulic oil	x							**7-34**
Grease points		x						**7-35**
Bulldozer blade (optional) grease points		x						**7-40**
Initial 20 hours								
Track shoe bolt torque	x							**7-44**
Every 50 hours								
Fuel pre-filter - Drain condensation			x					**7-45**
Initial 100 hours								
Change engine oil and filter (Initial)				x				**7-46**
Replace hydraulic oil filters (Initial)					x			**7-49**
Fuel filter (Initial)			x					**7-51**
Clean in-line Diesel Exhaust Fluid (DEF) supply filter (Initial)			x					**7-53**
Track tension (Initial)	x							**7-55**
Final drive oil (initial)						x		**7-57**
Final drive oil - sample							x	**7-59**
Every 500 hours								
Change engine oil and filter				x				**7-61**
Fuel filters					x			**7-64**
Battery electrolyte level	x							**7-66**
Final drive oil - sample							x	**7-59**
Every 1000 hours								
Fuel tank cap			x					**7-69**
Fuel tank sediment						x		**7-71**
Hydraulic reservoir breather			x					**7-73**
Final drive oil						x		**7-75**
Final drive oil - sample							x	**7-59**
Drive shaft slip spline		x						**7-79**
Every 1500 hours								
Drive belt					x			**7-80**
Clean in-line Diesel Exhaust Fluid (DEF) supply filter	x							**7-82**
Engine breather filter and valve clearance					x			**7-84**
Final drive oil - sample							x	**7-59**
Every 2000 hours								
Engine coolant				x				**7-87**
Hydraulic and hydrostatic drive filter and fluid					x			**7-90**
Reservoir suction screen			x					**7-93**
Engine air filters					x			**7-94**
Final drive oil - sample							x	**7-59**
As required								
Track tension	x							**7-99**
Roll Over Protective Structure (ROPS)	x							**7-101**
Cab air filter - Recirculation filter					x			**7-104**

Grease points

⚠ WARNING

Improper operation or service of this machine can result in an accident.
Read and understand the SAFETY INFORMATION Section before you perform any maintenance, service, or repairs. Read and understand the specific service procedures for the components you plan to work with before you start servicing the machine.
Failure to comply could result in death or serious injury.

W0138A

⚠ WARNING

Avoid injury! Always do the following before lubricating, maintaining, or servicing the machine.
1. **Disengage all drives.**
2. **Engage parking brake.**
3. **Lower all attachments to the ground, or raise and engage all safety locks.**
4. **Shut off engine.**
5. **Remove key from key switch.**
6. **Switch off battery key, if installed.**
7. **Wait for all machine movement to stop.**

Failure to comply could result in death or serious injury.

W0047A

Lubricate the machine and attachments with **TUTELA MOLY GREASE GR-75** when the hour meter registers 10 hours of operation and every 10 hours thereafter. Lubricate more frequently if conditions so require.

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.

Clean around the area to be greased before service.

NOTE: *In severe conditions, such as immersion in water, it may be necessary to grease more frequently.*

Every 50 hours

Fuel pre-filter - Drain condensation

⚠ WARNING

Fuel vapors are explosive and flammable.
Do not smoke while handling fuel. Keep fuel away from flames or sparks. Shut off engine and remove key before servicing. Always work in a well-ventilated area. Clean up spilled fuel immediately. Failure to comply could result in death or serious injury.

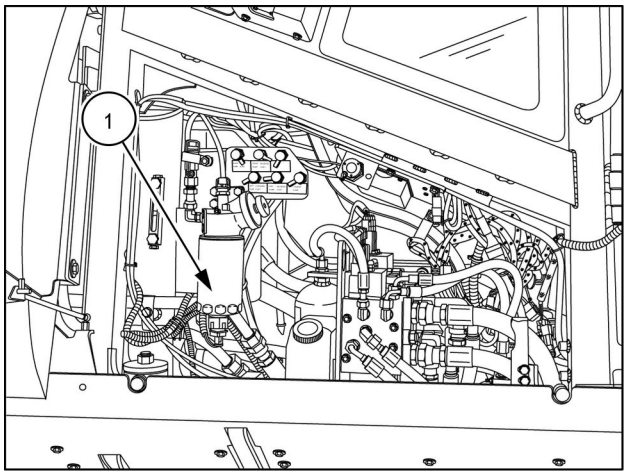
W0904A

Drain water and sediment from the fuel filter every 50 hours and every 50 thereafter or more often if conditions so require or if fuel quality is poor.

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.

Drain fuel filter condensation

1. Locate the fuel filter **(1)** on the right side of the machine.
2. Open the drain valve on the bottom of the fuel filter by turning counterclockwise two or three turns.
3. Drain the water and/or contaminants from the fuel pre-filter into a suitable container until clean fuel flows. Do not allow fuel to spill on engine or ground.
4. Tighten the drain valve only finger tight, turning clockwise.
5. Check for leaks.



RAIL13DOZ1594AA 1

Track tension (Initial)

⚠ WARNING

Pressurized fluid can penetrate the skin and cause severe injuries.
The grease in the track tensioning mechanism is under high pressure. Keep face and body away from grease nipple. Never loosen the grease nipple more than one complete turn.
Failure to comply could result in death or serious injury.

W0959A

Clean the tracks and undercarriage as required or at the end of the work shift. Park the machine on a level surface to prevent distortion of the track seals. If the temperature is cold, park the machine on a surface that will not freeze to the track shoes.

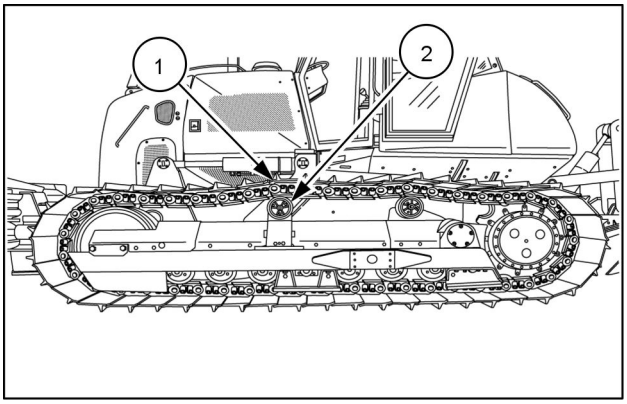
Check the track tension at 100 hours when the machine is new during the initial run-in period or if the track has been replaced. Check the track tension frequently when you operate. Check the track tension more often when working in extreme conditions. When material packs and collects on the undercarriage parts the tracks may become too tight.

Correct track adjustment will help control undercarriage wear. Maintain correct track tension.

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, and remove the key. Make sure that all residual pressure is relieved from circuits before beginning maintenance.

Track tension check

1. In a straight path, move the machine backward the length of the track, and then forward the length of the track. This will ensure that the bottom of the track is tight. Do not use the brakes to stop the machine.
2. Slowly stop the machine so that a pin **(1)** in the track chain is over the front carrier roller **(2)** — the roller nearest the front idler.
3. Park the machine on level ground, in neutral with the parking brake applied.
4. Lower the attachment to the ground.
5. Turn off the engine, and remove the key.
6. Stand on the tracks between the front and rear carrier rollers, and then between the front idler and the front carrier roller.
7. Place a straightedge over the track, and measure the track deflection (sag) midway between the front carrier roller and the idler wheel.
8. Then place a straight edge over the track, and measure the track deflection (sag) midway between the two carrier rollers.
9. Average the two measurements and adjust the track to average between **44.50 - 58.00 mm** (**1.75 - 2.25 in**).



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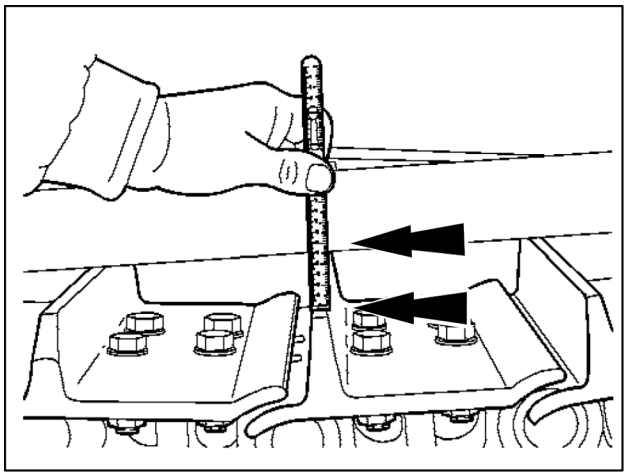
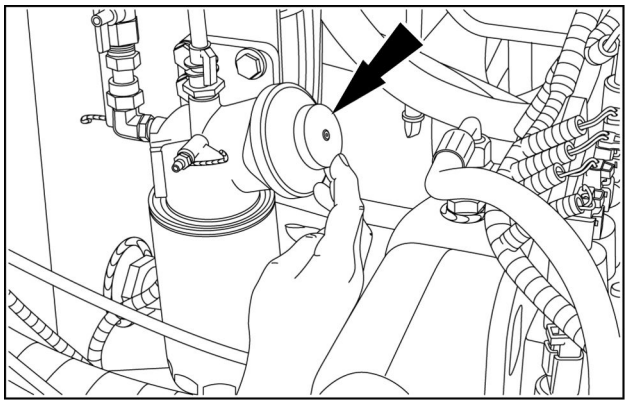


RAIL12DOZ0384AA 2

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

Final drive oil

⚠ CAUTION

Burn hazard!
Wait for all components to cool before performing any operation.
Failure to comply could result in minor or moderate injury.

C0053A

⚠ 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.

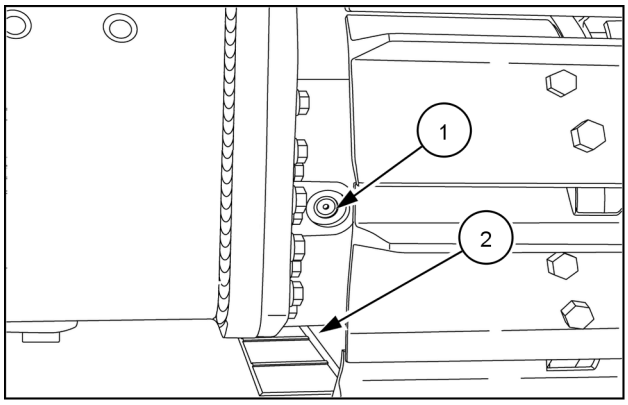
W0371A

Change the oil in the final drive and the planetary drive when the hour meter registers 1000 hours. Change the oil every 1000 hours thereafter or more often if conditions so require.

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. The machine should be parked to make the drains correctly accessible (see the illustrations).

Service specifications	
Type of oil	**CASE AKCELA GEAR 135 H EP 85W-140**
Capacity (each side)	**14.2 l** (**15 US qt**)

1. Clean the area around the final drive fill/check and drain plugs. The drain plugs are located under the housing.
2. Clean the area around the planetary drive plugs.



RAIL13DOZ1269AA 1

NOTE: *The final drive and planetary share the same oil. Complete the draining process for both the final drive and planetary simultaneously.*

3. Remove the final drive fill/check plug **(1)** slowly.

Final drive oil - sample

⚠ CAUTION

Burn hazard!
Wait for all components to cool before performing any operation.
Failure to comply could result in minor or moderate injury.

C0053A

⚠ WARNING

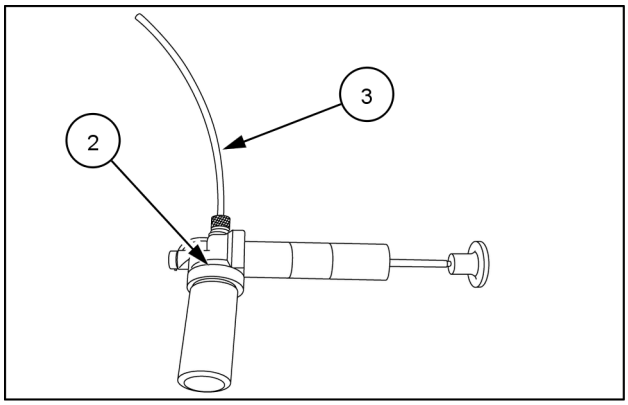
Chemical hazard!
When handling fuel, lubricants, and other service chemicals, follow the manufacturer's instructions. Wear Personal Protective Equipment (PPE) as instructed. Do not smoke or use open flame. Collect fluids in proper containers. Obey all local and environmental regulations when disposing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

W0371A

Drain a sample of the oil in the final drive when the hour meter registers 100 hours when the machine is new during the initial run-in period. Contact your authorized dealer for assistance with this procedure. Repeat this procedure at 500 hours, 1,000 hours, 1,500 hours, and at 2,000 hours.

Pull the oil sample from the reservoir. This method has the potential for contaminants to enter the sample tube as you insert the sample tube into the reservoir. This method should only be used when fluid line sampling is not possible.

1. Clean the external surfaces of the sampler **(2)** with solvent.
2. Remove the cap of a sample bottle and attach the sample bottle to the cap of the sampler **(2)**.
3. Use the sampler **(2)** to draw approximately **50 - 100 mL** (**2 - 3 US fl oz**) of filtered solvent through the sampler line **(3)** into the attached sample bottle.
4. Remove the sample bottle from the sampler and discard the solvent.
5. Make sure that the sample bottle is dry. Attach the sample bottle to the cap of the sampler **(2)**.

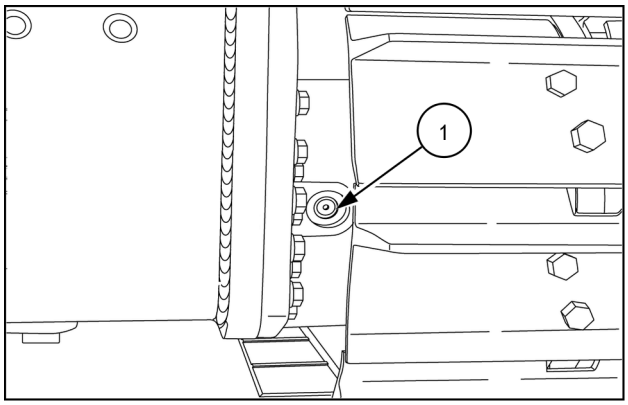


RAIL14DOZ0494AA 1

6. Clean the areas around the final drive fill/check plug **(1)**.
7. Slowly remove the final drive fill/check plug **(1)**.
8. Insert the sampler line **(3)** into the into the opening of the final drive fill/check plug **(1)** to a depth of 1/2 of the fluid height.

NOTE: *If possible, avoid contact with the side walls.*

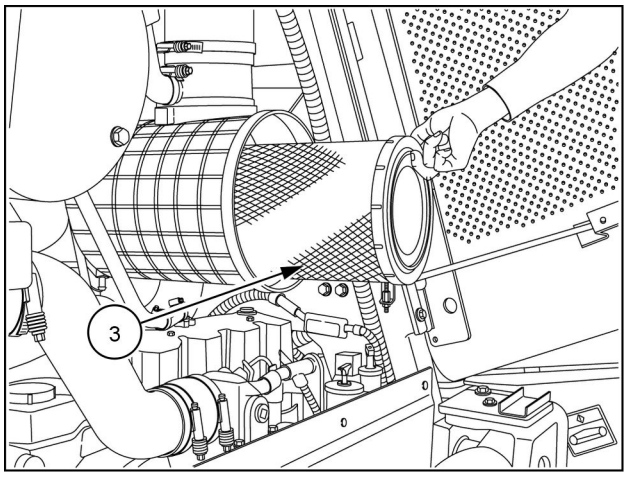
9. Draw approximately **50 - 100 mL** (**2 - 3 US fl oz**) of fluid from the reservoir.
10. Remove the sample bottle from the sampler **(2)** and discard the fluid.



RAIL13DOZ1269AA 2

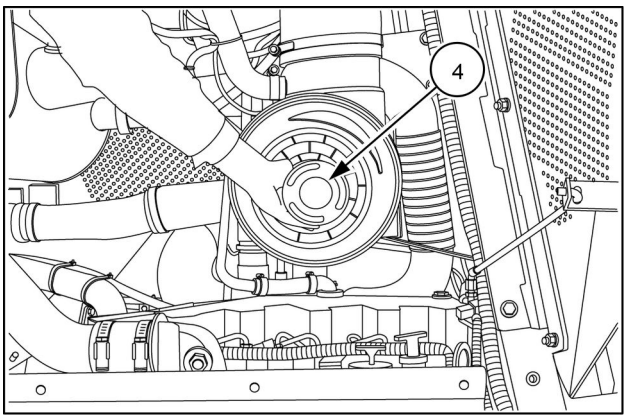
NOTE: *Its purpose is only to flush the sample components.*

4. Remove the primary air filter **(3)**.



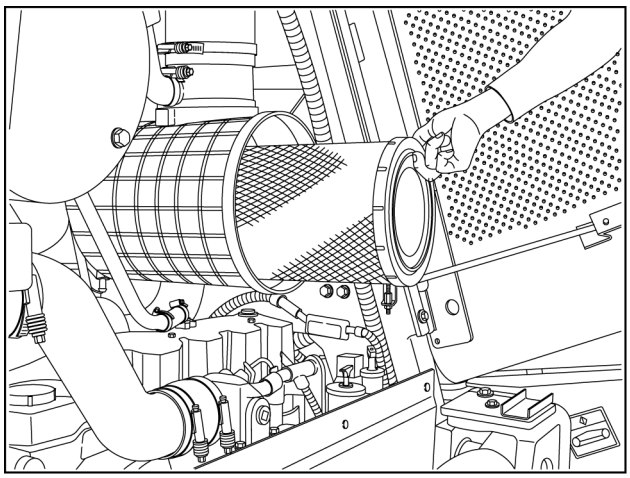
RAIL12DOZ0169AA 4

5. Remove the secondary filter **(4)**.
6. Wipe the inside of the air filter housing to clean any dirt and debris away before installing the new filters.



RAIL12DOZ0170AA 5

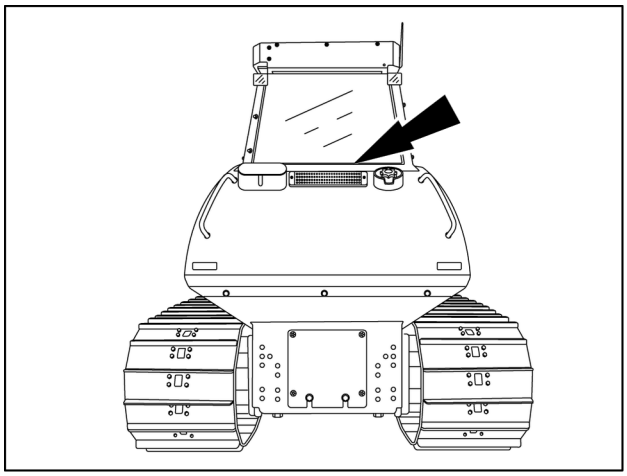
7. Install the new secondary air filter. DO NOT clean the secondary air filter. You must replace the secondary air filter.
8. Install the new primary air filter, making certain it seats properly.



RAIL12DOZ0169AA 6

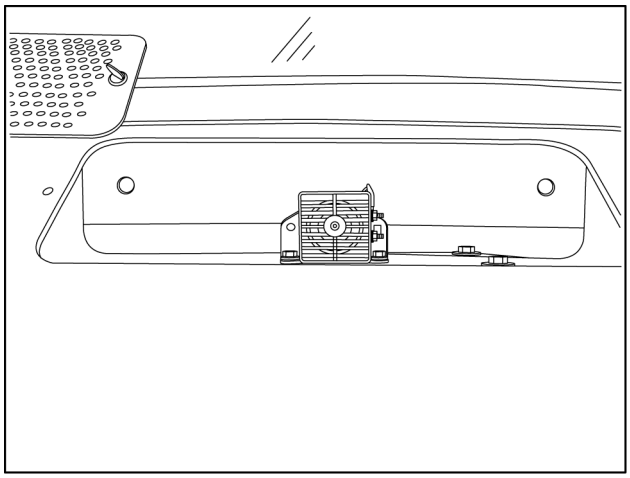
Cab air filter

1. Locate the cab air filter behind the operator’s compartment.
2. Remove the screws from the cab air filter cover, and remove the cab air filter cover.



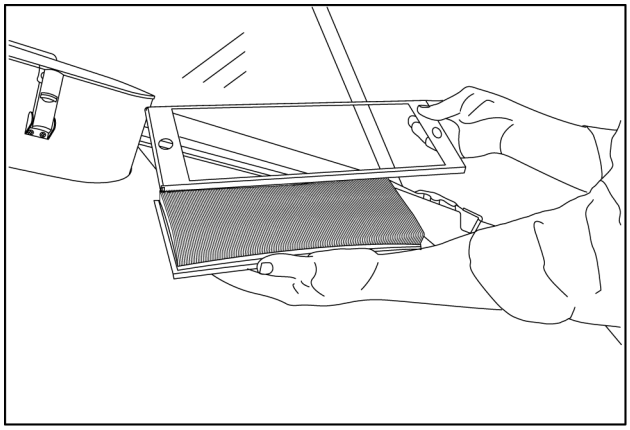
RAIL12DOZ0396AA 3

3. Remove the inner cover.
4. Remove the old filter and filter mounting bracket.
5. Wipe the inside of the cab air filter housing.



RAIL12DOZ0187AA 4

6. Replace the cab air filter with a new one, installing the filter into the cab air filter mounting bracket.
7. Replace inner air filter cover, tightening bolts securely.
8. Replace the outer metal cover and tighten screws.



RAIL12DOZ0186AA 5

Battery service

⚠ DANGER

Explosion hazard and/or run over hazard!
Read the procedure in the operator's manual before jump-start or service to avoid injury.
Failure to comply will result in death or serious injury.

D0149A

⚠ WARNING

Electrical shock hazard!
Do not reverse battery terminals. Connect positive cable ends to positive terminals (+) and negative cable ends to negative terminals (-).
Failure to comply could result in death or serious injury.

W0262A

⚠ WARNING

Improper operation or service of this machine can result in an accident.
Before working on any component(s) of the electrical circuit, put the starter switch key in the off (shut down) position. When disconnecting batteries, always disconnect the negative (-) cable first. When reconnecting batteries, always connect the negative (-) cable last.
Failure to comply could result in death or serious injury.

W0264A

⚠ WARNING

Hazardous chemicals!
Battery electrolyte contains sulfuric acid. Contact with skin and eyes could result in severe irritation and burns. Always wear splash-proof goggles and protective clothing (gloves and aprons). Wash hands after handling.
Failure to comply could result in death or serious injury.

W0006A

⚠ 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.
Failure to comply could result in death or serious injury.

W0111A

⚠ WARNING

Electrical shock hazard!
Before working on any part of the electrical system, disconnect the battery ground cable. Complete all electrical work before connecting the cable.
Failure to comply could result in death or serious injury.

W0129A

⚠ WARNING

Chemical hazard!
Battery posts, terminals, and related accessories contain lead and lead compounds. Wash hands after handling.
Failure to comply could result in death or serious injury.

W0349A

Key	Fuse function	Amperage
1-1	Radio	7.5 A
1-2	Power outlet	15A
1-3	Customer option 12V, always active	10 A
1-4	Dome Light	7.5 A
2-1	Front lights relay	24V - 35A
2-2	Front wiper relay	24V - 35A
2-3	Rear wiper relay	24V - 35A
2-4	Left wiper relay	24V - 35A
2-5	Front lights	15 A
2-6	Front / Rear wiper	15 A
2-7	Left /Right wiper	15 A
2-8	Park brake	7.5 A
2-9	Fan reverse	7.5 A
2-10	Implement enable / Up - Down / Enter - Escape / Cluster	7.5 A
2-11	Nox sensor relay	24V - 35A
2-12	Right wiper relay	24V - 35A
3-1	Vehicle safety relay	24V - 35A
3-2	Starter motor relay	24V - 35A
3-3	Fan reverse relay	24V - 35A
3-4	Winch control relay (optional)	24V - 35A
3-5	Horn relay	24V - 35A
3-6	A/C relay (optional)	24V - 35A
3-7	Condenser relay	24V - 35A
4-1	Leveling (optional)	7.5 A
4-2	Winch (optional)	20 A
4-3	Rear lights	10 A
4-4	Speed sensor	7.5 A
4-5	Cluster	5 A
4-6	Horn	7.5 A
4-7	Key switch	7.5 A
4-8	Start	15 A
4-9	Air seat /ROPS heat	15A
4-10	Urea	5 A
4-11	ECU 1	15 A
4-12	VF/2	5 A
4-13	VF/4	5 A
4-14	Converter	20 A
4-15	ECU 2	7.5 A
4-16	Customer option 24V, ACC	20 A
4-17	Winch IGN (optional)	20 A
4-18	UCM key on	5 A
4-19	VF/3	5 A
4–20	VF/6	5 A
4-21	LED	5 A
4-22	UCM live	5 A
4-23	Customer option 24V, always active	20 A
5-1	Laser leveling	30 A
5-2	A/C condenser	25 A
5-3	A/C fan	25 A
6	Accessory	24V - 50 A

Tractor Models			
	XLT	WT / LGP	
Number of track shoes per side	45	45	
Number of carrier rollers per side	2	2	
Number of track rollers per side	8	8	
Roller flange configuration from sprocket	SF,DF,SF,DF,SF,SF,DF,SF	SF,DF,SF,DF,SF,SF,DF,SF	
Carrier roller diameter	**171.5 mm** (**6.75 in**)	**171.5 mm** (**6.75 in**)	
Track roller rail diameter	**203.0 mm** (**7.99 in**)	**203.0 mm** (**7.99 in**)	
Idler rail diameter	**647.5 mm** (**25.49 in**)	**647.5 mm** (**25.49 in**)	
Length of track on ground model — CASE Lubricated Track (CLT)	**3049.5 mm** (**120.1 in**)	**3049.5 mm** (**120.1 in**)	
Length of track on ground model with optional CASE Extended Life Track (CELT)	**3025.8 mm** (**119.1 in**)	**3025.8 mm** (**119.1 in**)	
Track gauge	**1930.4 mm** (**76.0 in**)	**2184.4 mm** (**86.0 in**)	
Track shoe width options	**559 mm** (**22 in**)	**559 mm** (**22 in**)	WT
	610 mm (**24 in**)	**610 mm** (**24 in**)	WT
	—	**711 mm** (**28 in**)	WT
		812 mm (**32 in**)	LGP
		864 mm (**34 in**)	LGP

Tractor Models			
*** Area of track on ground (with CLT chain)	XLT	WT / LGP	
559 mm (**22 in**) **1 bar** track shoe	**34093 cm²** (**5284 in²**)	**34093 cm²** (**5284 in²**)	WT
610 mm (**24 in**) **1 bar** track shoe	**37204 cm²** (**5767 in²**)	**37204 cm²** (**5767 in²**)	WT
711 mm (**28 in**) **1 bar** track shoe	—	**43027 cm²** (**6669 in²**)	WT
813 mm (**32 in**) **1 bar** track shoe	—	**49524 cm²** (**7676 in²**)	LGP
864 mm (**34 in**) **1 bar** track shoe	—	**52695 cm²** (**8168 in²**)	LGP

****Ground Pressure:		Shoe width				
		22 in	**24 in**	**28 in**	**32 in**	**36 in**
XLT (**76 in** gauge / PAT **126 in** blade)		**45.90 kPa** (**6.66 psi**)	**42.50 kPa** (**6.16 psi**)	—	—	—
WT (**86 in** gauge / PAT **126 in** blade)		**47.80 kPa** (**6.93 psi**)	**44.30 kPa** (**6.43 psi**)	**38.20 kPa** (**5.54 psi**)	—	—
LGP (**86 in** gauge / PAT **158 in** blade)		—	—	—	—	**31.7 kPa** (**4.6 psi**)
LGP (**86 in** gauge / folding PAT blade)		—	—	—	**35.90 kPa** (**5.21 psi**)	—
*** Area of track on ground values for CLT — if unit is equipped with CELT, are on ground is 0.8% less.						
**** Ground pressure values for CLT — if unit is equipped with CELT, ground pressure is 0.1PSI greater.						