JOHN DEERE

Thank You for Purchasing a John Deere Product

We appreciate having you as a customer and wish you many years of safe and satisfied use of your machine.

MX00654,000020B-19-20170510

Using Your Operator’s Manual

Read this operator’s manual, watch the safety video, and review the safety signs on your machine before use. They all contain important safety information and operating instructions that must be followed to help keep you and others safe. Be sure everyone who uses the machine has read the manual, reviewed the safety signs, and knows how to use the machine safely and properly.

Your machine was designed and built to be operated in accordance with all the safe operating instructions. Since it was designed to cut grass, it can amputate hands and feet and throw objects. If you do not follow safety instructions, serious injury or death can occur.

This operator manual is organized in sections to help you find information quickly. You can use this manual to find answers to many of your operating and servicing questions. An index at the end of this book helps you find needed information quickly. Contact your dealer if this manual does not answer your questions.

Before using your machine:

- Know how to operate the machine. The Operating Controls section helps you understand the controls of your machine and what they do.
- Prepare your machine and the mowing area by performing required daily checks outlined in the General Instructions section.
- Follow instructions in the Preventing Injuries section, especially related to:
    - Keeping children safe by following instructions in the Protect Children section.
    - Avoiding injury on slopes and near terrain hazards by following instructions in the Operating on Slopes and Near Terrain Hazards section.
    - Follow the instructions in the Avoid Thrown Objects section and keep all guards in place, including discharge chute.
    - Cleaning machine during use and before storing as outlined in the Prevent Fires section.
- Understand how to service and inspect your machine.

If you do not understand the instructions or have questions, contact your dealer.

The machine shown in this manual can differ slightly from your machine.

RIGHT-HAND and LEFT-HAND sides are determined by facing in the direction that the machine travels when going forward. When you see a broken line (------), the item referenced is hidden from view.

Before delivering this machine, your dealer performed a predelivery inspection to ensure best performance.

This manual is an important part of your machine. Keep this manual with the machine when you sell it.

OUO2005,000078D-19-20200211

Spark Arrestor

The California Public Resources Code, Section 4442.5 provides as follows:

No person shall sell, offer for sale, lease, or rent to any person any internal combustion engine subject to Section 4442 or 4443, and not subject to Section 13005 of the Health and Safety Code, unless the person provides a written notice to the purchaser or bailee, at the time of sale or at the time of entering into the lease or rental contract, stating that it is a violation of Section 4442 or 4443 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land unless the engine is equipped with a spark arrestor, as defined in Section 4442, maintained in effective working order or the engine is constructed, equipped, and maintained for the prevention of fire pursuant to Section 4443. Cal. Pub. Res. Code 4442.5. Other states or jurisdictions may have similar laws. A spark arrestor for your machine may be available from your authorized dealer. An installed spark arrestor must be maintained in good working order by the operator.

OUO2005,00006F6-19-20190519

Special Messages

Your manual contains special messages to bring attention to potential safety concerns and machine damage, as well as helpful operating and servicing information. Please read all the information carefully to avoid injury and machine damage.

CAUTION:
Avoid injury! This symbol and text highlight potential hazards or death to the operator or bystanders that may occur if the hazards or procedures are ignored.

IMPORTANT:

Avoid damage! This text is used to tell the operator of actions or conditions that might result in damage to the machine.

NOTE:
General information is given throughout the manual that may help the operator in the operation or service of the machine.

MX00654,000020D-19-20170605

Required Emission-Related Information

Service Provider

-: Required Emission-Related Information

A repair shop or person of the owner's choosing may maintain, replace, or repair emission control devices and systems with original or equivalent replacement parts. However, warranty, recall, and all other services paid for by John Deere must be performed at an authorized John Deere service center.

DX,EMISSIONS,REQINFO-19-20231208

Parts

We recommend John Deere quality parts and lubricants, available at your John Deere dealer.

When you order parts, your John Deere dealer needs the serial number or product identification number (PIN) for your machine or attachment. These are the numbers that you recorded in the Product Identification section of this manual.

Order Service Parts Online

Visithttps://partscatalog.deere.com/jdrc/for your Internet connection to parts ordering and information.

TC00531,00000E9-19-20230614

Service Literature

If you would like to purchase a copy of the Parts Catalog or Technical Manual for this machine, visit The John Deere Technical Information Store at:

https://techpubs.deere.com/ ()

or call:

- **U.S. & Canada:** 1-800-522-7448.
- **All Other Regions:** Your John Deere dealer.

TH84124,0000199-19-20220629

Record Identification Numbers

Zero Turn Mowers

PIN (060001-)

When you contact an Authorized Service Center for information on servicing, always provide the product model and identification numbers.

Locate the model and serial number for the machine, engine, and transmission/transaxle of your machine and record the information in the spaces provided as follows.

DATE OF PURCHASE:

_____

DEALER NAME:

_____

DEALER PHONE:

_____

MX101417-UN: Product ID

Product Identification Number (A):

— — — — — — — — — — — — — — — — —

Engine Serial Number:

All - On engine blower housing

— — — — — — — — — — — — — — — — —

Transaxle Serial Numbers:

S/N tag on the forward side of each transaxle housing

LEFT SIDE:

— — — — — — — — — — — — — — — — —

RIGHT SIDE:

— — — — — — — — — — — — — — — — —

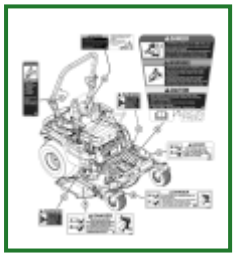
SB31882,00003EA-19-20210528

Register Your Product and Warranty Online

To register your product through the Internet, simply go towww.JohnDeereWarrantyRegistration.com () . Completing the information, either online or with the product warranty card, will ensure that your product will receive all post sales, service, and important product information.

MP47322,00F45FF-19-20220517

Safety Label Location



MX101343-UN: Z515E, Z530M, Z530R, and Z545R

LEGEND:

A - WARNING - UC27013

B - CAUTION - UC26988

C - WARNING - M156577

D - DANGER, CAUTION, WARNING - UC22274

E - DANGER - M118610

F - DANGER - M156388

G - DANGER - M139128

SB31882,00003AC-19-20200616

Understanding the Machine Safety Labels

MXAL42363-UN: Warning

The machine safety labels shown in this section are placed in important areas on your machine to draw attention to potential safety hazards. DANGER or WARNING safety labels are located near specific hazards.

The operator’s manual also explains any potential safety hazards whenever necessary in special safety messages that are identified with the word, CAUTION, and the safety-alert symbol.

On your machine safety labels, the words DANGER, WARNING, and CAUTION are used with this safety-alert symbol. DANGER identifies the most serious hazards:

- DANGER; The signal word DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- WARNING; The signal word WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- CAUTION; The signal word CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. CAUTION may also be used to alert against unsafe practices associated with events which could lead to personal injury.

Replace missing or damaged safety labels. Use this operator’s manual for correct safety label placement.

There can be more safety information contained on parts and components sourced from suppliers that is not reproduced in this operator’s manual.

French or Spanish Safety Labels and Operator’s Manual

Operator’s manuals and safety labels with content in French or Spanish are available for this machine through authorized John Deere dealers. See your John Deere dealer.

NOTE:
Both text and no-text labels are shown. Your machine is only equipped with one of these types of labels.

MP47322,00F4601-19-20230221

WARNING

MX101380-UN: Avoid Crushing

Avoid Crushing

- Keep protective structure in raised position
- Do not jump if machine tips
- Use seat belt

When protective structure must be down:

- DO NOT use seat belt
- Drive with extra care

SB31882,00003C1-19-20200616

WARNING

MXAL42769-UN: Loaded Spring Warning

To avoid injury from loaded spring, read operator’s manual before changing attachments.

TH84124,000017E-19-20161028

DANGER

MX101349-UN: Danger

ROTATING BLADES CUT OFF ARMS AND LEGS

- Do not mow when children or others are around.
- Do not mow in reverse.
- Look down and behind before and while backing.
- Look in the direction the machine is traveling.
- Never carry children even while blades are off.

SB31882,00003AE-19-20200317

WARNING

MX101350-UN: Warning

AVOID INJURY OR DEATH FROM ROLLOVER

- Do not drive where the machine could slip or tip, on steep slopes, near water, or drop-offs.
- Drive across slopes, not up and down.
- If machine loses traction on a slope, stop blades, and proceed slowly off slope.
- Avoid sudden starts, turns, and stops.

SB31882,00003B0-19-20200317

CAUTION

MX101351-UN: Caution

Read operator’s manual and watch safety video.

Keep safety devices (guards, shields, and switches) in place and working.

Pick up objects that can be thrown by blades.

When leaving machine:

- Stop engine.

- Set park brake.

- Remove key.

SB31882,00003AF-19-20200604

DANGER

MXT008504-UN: Rotating Blade

ROTATING BLADE

Do not put hands or feet under or into mower when engine is running.

TH84124,00000CB-19-20161101

DANGER

To avoid injury from rotating blades and thrown objects:

Keep hands and feet away from rotating blades. Keep bystanders a safe distance away. Do not operate mower without discharge chute or entire grass catcher in place.

TH84124,000017F-19-20230901

DANGER

MXT008505-UN: Danger Label

ROTATING BLADE

DO NOT PUT HANDS OR FEET UNDER OR INTO MOWER WHEN ENGINE IS RUNNING.

THROWN OBJECTS

BEFORE MOWING, CLEAR AREA OF OBJECTS THAT MAY BE THROWN BY BLADE.

DO NOT OPERATE MOWER WITHOUT DISCHARGE CHUTE OR ENTIRE GRASS CATCHER IN PLACE.

TH84124,0000162-19-20161101

Safety Label Location

MX101528-UN: Z515E, Z530M, Z530R, and Z545R

LEGEND:

A - WARNING - UC27008

B - CAUTION - UC26989

C - DANGER, WARNING, CAUTION - UC25540

D - WARNING - M146611

E - DANGER - M118041

F - DANGER - M118040

G - DANGER - M138631

H - DANGER - M136436

SB31882,00003AD-19-20200713

Understanding the Machine Safety Labels without Text

TCT005498-UN: Safety alert symbol

The machine safety labels shown in this section are placed in important areas on your machine to draw attention to potential safety hazards.

On your machine safety labels, the words DANGER, WARNING, and CAUTION are used with this safety-alert symbol. DANGER identifies the most serious hazards.

MX00654,0000389-19-20230109

Avoid Injury from Crushing

MX101381-UN: Avoid Crushing

Avoid Crushing

- Keep protective structure in raised position
- Do not jump if machine tips
- Use seat belt

When protective structure must be down:

- DO NOT use seat belt
- Drive with extra care

SB31882,00003C2-19-20200604

Avoid Injury from Loaded Spring

MXAL42777-UN: Pinch Point

- Keep fingers and hands away from pinch point.
- Read operator’s manual.

MX00654,000038C-19-20190424

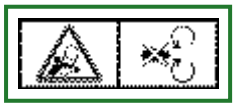
Avoid Injury from Equipment Fires

MXT018019-UN: Avoid Equipment Fires

- Avoid equipment fires.
- Accumulation of grass, leaves, and debris on or near hot or moving parts can cause a fire.
- Inspect and clean the entire machine before, during and after use.
- Shut off engine and allow machine to cool before cleaning.
- Carefully read operator’s manual Machine Cleanout section for details.

MX00654,0000390-19-20200330

Avoid Injury from Getting Caught in Belts



MXT018017-UN: Avoid Injury From Belt Entanglement

- Stay clear of moving belts.
- Do not operate machine without shields in place.

MX00654,0000391-19-20190424

Avoid Injury from Rotating Blades

MXT018016-UN: Avoid Injury From Rotating Blades

- Do not put hands or feet under or into mower when engine is running.
- Do not operate mower without discharge chute/deflector or entire grass catcher in place.

MX00654,0000392-19-20190424

Read Operator’s Manual

MX101345-UN: Read Operator's Manual

- This operator’s manual contains important information necessary for safe machine operation.
- Carefully read operator’s manual before operating machine or attachment. Observe all safety rules to avoid accidents.

SB31882,00003B1-19-20200318

Avoid Injury from Thrown Objects

MX101346-UN: Avoid Injury from Thrown Objects

- Keep a safe distance from the machine as long as the engine is running.

SB31882,00003B2-19-20200318

Keep Children Away from Mower

MX101347-UN: Keep Children Away from Mower

- Mower can cause dismemberment or death.
- Stay a safe distance from the machine.
- Make sure that children stay clear of mower at all times when the engine is running.

SB31882,00003B3-19-20200318

Avoid Serious Injury or Death from Tipping

MX101348-UN: Avoid Injury from Tipping

- Do not drive where machine could slip, tip, or rollover.
- In some configurations, do not drive or operate on a slope of more than 10 degrees.
- Refer to Operating on Slopes for more information.

SB31882,00003B4-19-20200528

Use Your Mower Safely

General Instructions

- Read this operator’s manual, watch the safety video, and review the safety signs on your machine before use. They all contain important safety information and operating instructions that must be followed to help keep you and others safe. Be sure everyone who uses the machine has read the manual, reviewed the safety signs, and knows how to use the machine safely and properly.
- Age, physical ability, and mental capacity can be factors in equipment-related injuries. Operators must be mentally and physically capable of operating the machine properly and safely. Never allow a child to operate the machine.
- Do not operate the machine while under the influence of alcohol or drugs or when distracted or fatigued. Proper operation requires your full attention.
- Always wear eye protection, hearing protection, close-fitting clothing, and substantial footwear while operating the machine. Never operate while wearing sandals or when barefoot.
- Do not wear radio or music headphones. Both safe operation and service require your full attention.
- Never tamper with safety devices.
- Operate the machine only in daylight or good artificial light.
- Only operate the engine in well-ventilated areas. Exhaust gasses contain carbon monoxide, a deadly poison.
- Never leave a running machine unattended.
- Look both ways when approaching roadways and use caution when turning around on public roadways. You can be struck by a vehicle and suffer serious injury or death.

Before Using Your Machine

- Know how to operate the machine. The Operating Controls section helps you understand the controls of your machine and what they do.
- Prepare your machine and the mowing area by performing required daily checks outlined in the General Instructions section.
- Follow instructions in the Preventing Injuries section, especially related to:
  - Keeping children safe by following instructions in the Protect Children section.
  - Avoiding injury on slopes and near terrain hazards by following instructions in the Operating on Slopes and Near Terrain Hazards section.
  - Follow the instructions in the Avoid Thrown Objects section, and keep all guards in place, including discharge chute.
  - Cleaning machine during use and before storing as outlined in the Prevent Fires section.
- Understand how to service and inspect your machine.

Inspection and Daily Checklist

- Inspect machine before you operate. Be sure that hardware is tight, and all guards and shields are in good condition and fastened in place. Make all necessary adjustments before you operate. Repair or replace damaged, badly worn, or missing parts.
- Visually inspect that mower blades, blade bolts, and the mower assembly are not worn or damaged. To prevent machine damage, replace worn or damaged blades and bolts in sets.
- Make sure that the fuel cap and air cleaner are in place before starting engine.

Fuel

- Use care when handling fuel. Fuel is flammable and fuel vapors can be explosive. Do not smoke when handling fuel. Only use an approved fuel container. Clean up spilled fuel immediately.
- Check fuel lines, tank, cap, and fittings frequently for cracks or leaks. Replace if necessary.

Check the Mowing Area

- Keep bystanders and pets out of the mowing area.
- Clear the area of objects such as rocks, wire, or toys, which can be thrown by the blades. Remove low-hanging branches or other obstacles, which can interfere with your travel path.
- Study the mowing area. Set up a safe mowing path. Do not mow where traction or stability is doubtful.
- Slopes and terrain hazards are major factors related to loss-of-control and tipover accidents. Operation on slopes and near terrain hazards requires extra caution. Follow instructions in the Operating on Slopes and Near Terrain Hazards section.

Weights and Attachments

- Some attachments require ballast weights. Follow recommendations for wheel weights or counterweights.

- Use only accessories and attachments approved by John Deere.
- If you do not understand the instructions or have questions, contact your dealer.

OUO2005,0000784-19-20200309

Preventing Injuries

Protect Children

MXT005340-UN: Protect children warning symbol

- Children can be killed or seriously injured by riding mowers when operators do not follow safe operating practices.
- Do not mow in reverse. Operating with the mower engaged while backing up is discouraged.
- Never give children a ride on a mower or in a cart behind the mower, even when the blades are off. They can fall off and be run over or cut by the mower blades. Children can interfere with mower operation. Children who have been given rides in the past can suddenly appear in the mowing area for another ride. If you are not aware, they can be run over or backed over by the mower.
- Children are often attracted to lawn mowers and mowing activities, especially if they have been given rides before. They do not know if the blades are rotating or understand that they can be killed or seriously injured even if the blades are not rotating.
- Keep children indoors and out of the mowing area when the mower is being operated. Keep children under the watchful eye of a responsible adult, other than the operator. If there is not a responsible adult to ensure that children stay indoors, DO NOT mow.
- Be alert to the presence of children or others. Turn off the mower blades and stop the machine if someone enters the mowing area.
- Look in the direction the machine is traveling. Before and while backing, turn off the mower blades and look down and behind the machine carefully, especially for children.
- Use extreme care when approaching objects that block your view, such as blind corners, shrubs, or trees, especially while backing. They can hide a child.

Avoid Thrown Objects

- Clear the mowing area of all bystanders when using this machine. Thrown objects could cause serious injury or death.
- Clear the area of objects such as rocks, wire, or toys, which can be thrown by the blades.
- Never direct discharged material toward anyone.
- Avoid discharging material against a wall or obstruction such as a fence or retaining wall. Material can ricochet towards the operator.

- Avoid discharging material towards a street or roadway.
- Stop the blades when crossing gravel surfaces.

OUO2005,000078C-19-20200215

Operating on Slopes and Near Terrain Hazards

- Slopes are a major factor related to loss-of-control and tip-over accidents, which can result in serious injury or death. Use caution and common sense when operating on slopes.
- If you feel uneasy on a slope, do not mow or operate the machine on it.
- Mow across slopes, not up and down.
- Watch for holes, ruts, bumps, rocks, or other hidden objects. Tall grass can hide obstacles.
- Drive slowly so you do not have to stop while on a slope.
- Do not mow on wet grass. Tires can slip on wet grass even if the brakes are working normally.
- Keep all movement on slopes slow and gradual. Do not make sudden changes in speed or direction, which can cause the ride-on mower to roll over.
- If the tires lose traction, disengage the PTO and proceed slowly and carefully off the slope.
- Do not shift to neutral and coast downhill.

Identify Safe Slopes

- Before using your machine, measure slopes of all mowing areas to determine which slopes are safe for mowing with a ride-on mower. Use good judgment and common sense when performing this survey.

Measuring Slopes

- Suggested method 1: Lay a straight piece of sturdy lumber 1.2 m (4 ft) long on the slope and measure the angle with an angle gauge or protractor level.
- Suggested method 2: Refer to the slope gauge provided at the end of the manual.

Slope Limits

- Exceeding the recommended maximum slope angle increases the risk of rollover accidents that can result in serious injury or death.
- 

  GX100108-UN: 13 Degree Slope

  Never mow or operate this ride-on mower on slope angles greater than 13° with ride-on mower in its basic configuration. The basic configuration is the ride-on mower with a mower deck and no other attachments. (A 13° slope is a slope that rises 1.4 m [4.6 ft] over a horizontal distance of 6.1 m [20 ft].)

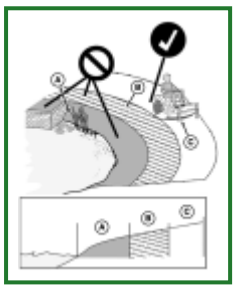
- 

GX100111-UN: 10 Degree Slope

Attachments such as material collection systems, weather enclosures, or other attachments increase the risk of a rollover. When using attachments, never mow or operate this ride-on mower on slope angles greater than 10°. (A 10° slope is a slope that rises 1 m [3.5 ft] over a horizontal distance of 6.1 m [20 ft].)

- The risk of rollover is low on slopes of 10° or less. As the slope angle increases to the recommended maximum, the risk increases to a medium level.

Operating Near Terrain Hazards



GX100105-UN: Operating Near Terrain Hazards

- Terrain hazards such as ditches and drop offs are a factor related to loss-of-control and tip-over accidents, which can result in serious injury or death. Use caution and common sense when operating near terrain hazards.
- Do not mow or operate the machine in areas adjacent to hazards that can cause the machine to roll over. If a wheel goes over an edge or if the edge breaks away, the machine can suddenly lose traction, slide, and/or roll over.
- Hazards (A) include but are not limited to ditches, drop-offs, embankments, or areas near bodies of water.
- Maintain a buffer area (B) at least as wide as the machine between hazards (A) and the mowing area (C). Do not mow or operate the machine in the hazard area or buffer area.
- Only mow or operate in the mowing area (C). Do not exceed the recommended slope operating angle. Refer to the Slope Limits section.

OUO2005,000078A-19-20200309

Use Seat Belt Properly

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TCAL42361-UN: Use Seat Belt Properly

Use a seat belt when operating with the folding Roll-Over Protective Structure (ROPS) in the raised position to minimize chance of injury from an accident, such as an overturn.

- Do not use a seat belt when operating with the folding ROPS in the folded position. Return the folding ROPS to the raised position as soon as possible.
- Never modify, disassemble or attempt to repair the seat belt.
- Replace entire seat belt if mounting hardware, buckle, belt, or retractor show signs of damage.
- Inspect seat belt and mounting hardware at least once a year. Look for signs of loose hardware or belt damage, such as cuts, fraying, extreme or unusual wear, discoloration, or abrasion. Replace only with John Deere-approved replacement parts.
- Layers of heavy clothing can interfere with proper positioning of the seat belt and can reduce the effectiveness of the seat belt.

SB31882,000049F-19-20200709

Rollover Protection System (ROPS) - Use and Maintenance

- Conforms to ISO21299:2009 for energy absorbing ROPS requirements.
- Never operate the machine without the ROPS installed.
- DO NOT remove the ROPS.
- The ROPS is an integral and effective safety device. Keep a folding ROPS in the raised and locked position and use the seat belt when operating the machine.
- Lower a folding ROPS temporarily only when necessary. Do not wear the seat belt when folded down.
- Be aware there is no rollover protection when a folded ROPS is in the down position.
- Be certain that the seat belt can be released quickly in the event of an emergency.
- Check the area to be mowed and never fold down a folding ROPS in areas where there are slopes, drop offs, ditches, or embankments or bodies of water.
- Check carefully for overhead clearances (that is, branches, doorways, electrical wires) before driving under any objects and do not contact them.
- Keep the ROPS in safe operating condition by periodically thoroughly inspecting for damage and keeping all mounting hardware tight. Make certain all parts of the ROPS are installed correctly if the ROPS structure is loosened or removed for any reason. All ROPS hardware should be tightened to the proper torque.
- Replace a damaged ROPS. Do not repair or revise. The protection provided by the ROPS will be impaired if the ROPS is subjected to structural damage, is involved in an overturn incident, or is in any way altered by welding, bending, drilling, or cutting. It must be replaced to maintain the manufacturer’s certification of the structure
- Any alteration of ROPS must be approved by manufacturer.
- The seat is part of the ROPS safety zone. Replace only with a John Deere-approved seat.

MX00654,0000200-19-20200408

Prevent Fires

TS227-UN: Prevent Fires

- Do not mow tall, dry grass or through piles of leaves. Combustible materials can contact hot components and increase the risk of fire.
- Debris can build up anywhere on the machine, especially on horizontal surfaces. While using your machine, periodically check for and remove debris, especially in dry or heavy debris conditions, such as when collecting leaves.
- After operating, completely remove any combustible materials from equipment before storing. Use compressed air, a leaf blower, or water to keep the machine clean.
- Allow machine to cool in an open area before storing. Do not park machine near flammable materials, such as straw, mulch, cloth, or chemicals. Do not park near an open flame or other sources of ignition, such as a water heater or furnace.
- Excess lubrication or fuel/oil leaks or spills on the machine can also provide collection sites for debris. Promptly cleaning up spills and repairing leaks reduces the potential for debris collection.
- Refer to the Machine Cleanout section for more information on checking for debris buildup and locations to inspect.
- Always park the machine safely before cleaning or servicing a machine. See the Parking Safely section.

OUO2005,0000787-19-20200215

Parking Safely

Always apply the park brake and remove the key or key pin before leaving the machine unattended. Children or others may attempt to move or operate an unattended machine.

- Bring the machine to stop on a level surface.
- Disengage mower blades or other attachments.
- Lower attachments to the ground.
- Apply the park brake.
- Shut the machine OFF.
- Remove the key or key pin.
- Wait for all moving parts to stop before you leave the seat.
- Disconnect battery before maintenance.

OUO2005,0000788-19-20230412

Additional Safety Information

Towing Loads Safely

- Stopping distance increases with speed and weight of towed load. Travel slowly and allow extra time and distance to stop.
- Total towed weight must not exceed Towing Capacity stated in Specifications of this manual.
- Excessive towed load can cause loss of traction and loss of control on slopes. Reduce towed weight when operating on slopes.
- Never allow children or others in or on towed equipment.
- Use only approved hitches. Tow only with a machine that has a hitch designed for towing. Do not attach towed equipment except at the approved hitch point.
- Towed equipment increases the risk of rollover on slopes. Refer to the Operating on Slopes and Near Terrain Hazards section for more information.
- Do not turn sharply. Use additional caution when turning or operating on adverse surface conditions. Use care when reversing.

Safe Transportation

Follow instructions in the Transporting Machine on Trailer section.

- Use a full-width loading ramp at least 30 cm (12 in) wider than the machine, never two separate ramps.

Service and Maintenance

- Proper service and maintenance of the machine is essential.
- Keep all parts in good condition, keep all nuts and bolts tight, and repair any damage immediately. Stop and inspect the machine immediately if you strike an object.
- Ensure that all safety devices, discharge chute, and grass catcher components are in good condition and replace when necessary.
- Understand service procedures thoroughly before working on the machine. If you do not understand the service procedures or are uncomfortable working in your machine, contact your servicing dealer.
- Disconnect the battery or all spark plug wires before servicing the machine. Disconnect negative terminal first and positive last. Install positive terminal first and negative last.
- Some components could have stored energy in springs or hydraulic components. Servicing procedures described in the Service section describe how to perform service and maintenance tasks safely.
- Support any machine elements that must be raised for service work. Use jack stands or service locks to support components when needed.

Disposing of Waste Products and Chemicals

- Waste products, such as used oil, fuel, coolant, brake fluid, and batteries can harm the environment and people.

- Do not use beverage containers for waste fluids – someone can mistakenly drink from them.
- A Safety Data Sheet (SDS) provides specific details on chemical products: Physical and health hazards, safety procedures, and emergency response techniques. The seller of the chemical products used with your machine is responsible for providing the SDS for that product.
- To learn how to recycle or properly dispose of waste products generated from service, see your local recycling center or authorized dealer. If you wish to discard the machine, contact your local recycling center or authorized dealer.

OUO2005,0000789-19-20200215

General Cleaning Guidelines

Machine must be inspected periodically throughout the day. Buildup of debris must be removed to ensure proper machine function and to reduce the risk of fire. Frequency of these inspections and cleanings vary depending on a number of factors including operating conditions, machine configuration, operating speeds, and weather conditions. Inspections and cleanings may be required multiple times throughout the day particularly in dry, hot, and windy conditions.

IMPORTANT:
Avoid fire! Regular and thorough cleaning of machine combined with other routine maintenance procedures listed in the Operator's Manual greatly reduce the risk of fire, downtime, and improve machine performance.

Besides proper maintenance the condition of the material being handled is the most significant factor contributing to fires. Dry, light, and fluffy materials that can create a dust cloud are the most likely to catch fire. Debris can accumulate in various areas especially on horizontal surfaces. Conditions such as wind speed and direction can change where the material accumulates. Be aware of these changing conditions and adjust your cleaning schedule and practices to ensure proper machine function and to reduce the risk of fire.

Always follow all safety procedures posted on the machine and in the Operator's Manual. Before carrying out any inspection or cleaning, always park machine safely. (See Parking Safely in the Safety Section).

The entire machine should be inspected, with extra attention given to the areas noted below.

OUMX068,0001043-19-20211103

Cleanout Areas

NOTE:
Also see machine Service Label.

Primary areas that must be inspected and cleaned on the machine include:

1. 

   GXT003036-UN: Engine Area

   Muffler components (A):
   - Exhaust Manifold
   - Muffler Pipes
   - Muffler
   - Muffler Shield
2. Engine cooling fins (B) and oil cooler (if equipped.)
3. Engine screen guard (C) (See Cleaning Engine Screen Guard in the Service Engine section.)
4. 

   MX101530-UN: .

   Top of the mower deck, under shields (D), including spindle and belt area (E).

   MX101531-UN: .
5. 

   MX101529-UN: .

   On or near transaxles (F) and belt drives and fins.
6. 

MX101421-UN: Battery and Fuse Box

Under the seat and near fuse block (G), including the battery (H) and wiring harness.

SB31882,00003EB-19-20200819

Operator’s Station Controls

Z515E Operator’s Controls

MX101516-UN: Z515E Operator Controls

LEGEND:

A - Park Brake Lever

B - Left Motion Control Lever

C - Right Motion Control Lever

D - Deck Height Pin Tool

E - Mower Deck Lift Lever

F - Mower Deck Lift Pedal

G - Choke Lever

H - Mower Engagement Button

I - Key Switch

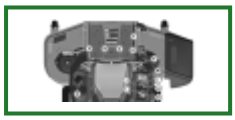
J - LED Light Switch (if equipped)

K - Fuel Tank Cap

L - Hourmeter/ MowerPlus™ Fuel Display (if equipped)

M - Throttle Control Lever

Z530M and Z530R Operator’s Controls



MX101339-UN: Z530M and Z530R Operator’s Controls

LEGEND:

A - Park Brake Lever

B - Left Motion Control Lever

C - Right Motion Control Lever

D - Deck Height Pin Tool

E - Mower Deck Lift Lever

F - Mower Deck Lift Pedal

G - Choke Lever

H - Mower Engagement Button

I - Key Switch

J - LED Light Switch (if equipped)

K - Fuel Tank Cap

L - Throttle Control Lever

M - Operator’s Display Unit or MowerPlus™ Fuel Display

Z545R Operator’s Controls

MX101443-UN: Z545R Operator’s Controls

LEGEND:

A - Park Brake Lever

B - Left Motion Control Lever

C - Right Motion Control Lever

D - Deck Height Pin Tool

E - Mower Deck Lift Lever

F - Mower Deck Lift Pedal

G - Electronic Throttle Controller

H - Mower Engagement Button

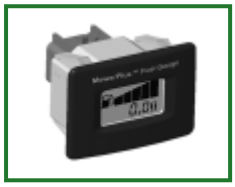
I - Key Switch

J - LED Light Switch

K - Fuel Tank Cap

L - Operator’s Display Unit

Display Unit



MG512222-UN: Operator's Display Unit (Z515E and Z530M)

MX101517-UN: Operator's Display Unit (Z530R and Z545R)

MG512223-UN: Operator's Display Unit (Z530R and Z545R)

Z545R Electronic Throttle Controller

MX101518-UN: Electronic Throttle Controller

MowerPlus is a trademark of Deere & Company SB31882,0000475-19-20220516

Daily Operating Checklist

Check engine oil.

Clean muffler area, air intake screens, and mower deck.

Check brake system.

Check fuel level.

Check under the machine for leaks.

Check safety interlock system.

Check tire pressures.

Check oil level in both transmissions.

Check mulch control open/close operation (if equipped).

Clean mower deck using the washout port after use.

SB31882,00003CD-19-20200521

Avoid Damage to Plastic and Painted Surfaces

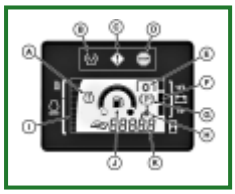
- Do not wipe plastic parts until they are rinsed first. Using a dry cloth causes scratches.
- Insect repellent spray damages plastic and painted surfaces. Do not spray insect repellent near machine.
- Be careful not to spill fuel on the machine. Fuel damages surfaces. Wipe up spilled fuel immediately.

MP47322,00F4630-19-20221202

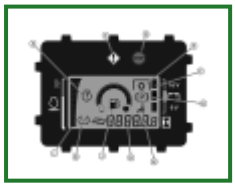
Using Operator’s Display Unit (If Equipped)

Operator’s Display Unit

The R-Series machines are equipped with an electronic operator's display unit.



MX101455-UN: Operator's Display Unit (Z530R and Z545R)



MG512224-UN: Operator's Display Unit (Z530R and Z545R)

LEGEND:

A - Engine Diagnostic Indicator

B - Motion Control Levers Neutral Position Indicator

C - Warning Indicator

D - STOP Machine Indicator

E - Mower Engagement Indicator

F - Voltage Indicator

G - Park Brake Indicator

H - operator's Seat Indicator

I - Throttle Indicator

J - Fuel Level Indicator

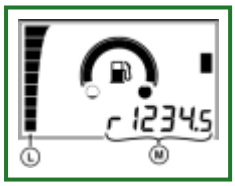
K - Hour meter

-: .

A	Light indicates an engine diagnostic problem. Service is required. Contact your John Deere Dealer.
B	Light alerts the operator to return control levers to the neutral position.
C	Light indicates a significant WARNING. Stop the machine.
D	Light alerts the operator to STOP the machine immediately.
E	Light indicates that the mower blades are engaged.
F	Displays the current voltage range.
G	Light indicates that the park brake is engaged.
H	Light indicates that the operator is seated.
I	Displays the current engine throttle range.
J	Displays the current fuel level.
K	Displays the current operating hours.

Numeric RPM Display

Any R-Series machine with an operator's display unit can display the engine RPM numerically.



MX101508-UN: RPM Displays

LEGEND:

L - Graphic Display of Engine Speed M - Numeric Display of RPM

To display the RPM numerically:

- Cycle the control levers out five times within the first three seconds after the key switch is ON..

> **NOTE:**
> **Once enabled, the hour meter will display the engine RPM (M) numerically. This feature will remain active until the next cycling of the control levers or the key switch.**

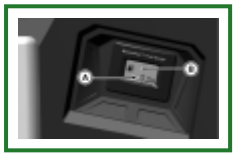
SB31882,00003FD-19-20211102

Using the Hour Meter and MowerPlus Fuel Gauge (If Equipped)

Hour Meter

- The hour meter shows the number of hours the engine has run. The hour meter does not accumulate hours with the engine off when the key is in the run position. Use the hour meter to determine when your machine has reached the recommended service intervals.
- Turn the key to STOP position when not using the machine.
- Hour meter cannot be reset.

MowerPlus™ Fuel Gauge (If Equipped)



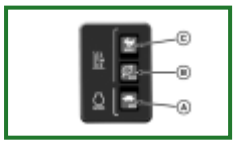
MX101410-UN: MowerPlus Fuel Gauge

- The hour meter (A) shows the number of hours the engine has run. The hour meter is always active and cannot be reset.
- The fuel level (B) is indicated by the graph of five segments in increasing height. When the fuel tank has emptied to approximately 20%, the last segment flashes indicating approximately 30 minutes of fuel remaining.

MowerPlus is a trademark of Deere & Company SB31882,00003B5-19-20200608

Using Electronic Throttle Control (If Equipped)

Model Z545R is equipped with an electronic throttle control. This three push-button controller replaces the manual throttle and choke levers.



MX101456-UN: Electronic Throttle Controller

LEGEND:

A - MIN - Minimum Throttle

B - ECO - Economy Throttle

C - MAX - Maximum Throttle

-: .

A	Select MINIMUM throttle when starting the engine and maneuvering the machine when the mower blades are not engaged. Do not engage the mower blades in this mode.
B	Select ECONOMY throttle for efficient operation in less demanding mowing conditions.
C	Select MAXIMUM throttle for best results in more demanding mowing conditions.

Custom RPM Mode

The operator can program a custom RPM setting. This setting will be stored in memory for use later or until the setting is overwritten.

To program a custom engine speed setpoint:

- 

  MX101511-UN: Max or Min

  Press and hold MAX or MIN button on keypad.

To Adjust the Engine Speed Up or Down:

- 

  MX101511-UN: Max or Min

  Press MAX or MIN button on keypad.

To return to the default display mode:

- 

  MX101510-UN: Eco

  Press and hold ECO button.
  At any time during operation, press and hold ECO to return to the programmed engine speed.

SB31882,00003FC-19-20200611

Mounting and Dismounting Machine

MX101356-UN: Mounting and dismounting

- Park machine safely. (See Parking Safely in the Safety section.)

- Mount and dismount the machine from the front. If equipped, deck grip step is an optional mounting and dismounting path.
- Keep all surfaces used for mounting and dismounting clean and free of debris.

SB31882,00003BA-19-20200616

Adjusting Seat

E-Series Seat

1. 

   MX101454-UN: ROPS Not Shown

   Slide lever (A) sideways to the left.
2. Slide seat forward or rearward to the desired position.
3. Release lever.

M- and R-Series Seat with ComfortGlide

1. 

   MX101420-UN: ROPS Not Shown

   Slide lever sideways to the left (A).
2. Slide seat forward or rearward to the desired position.
3. Release lever to center position.
4. Slide lever sideways to the right for ComfortGlide feature.

SB31882,00003BB-19-20200605

Adjusting Armrests

NOTE:
Each armrest can be raised or lowered in 5 degree increments from the horizontal position.

1. 

MX101419-UN: R-Series Shown

Raise each armrest (A).

2. Turn adjustment thumbscrew (B) clockwise to lower armrest and counterclockwise to raise armrest.

SB31882,00003BC-19-20200512

Adjusting Motion Control Levers

1. Park machine safely. (See Parking Safely in the Safety section.)

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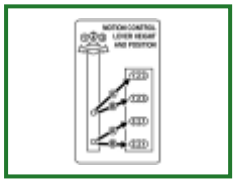
2. 

GXT002159-UN: Motion Control Lever Adjustment

To adjust motion control lever height, refer to the operator instruction label on the machine front panel and the instructions that follow.

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3. 

MX101358-UN: Control lever adjustments

Remove two bolts and nuts and raise each control lever to the highest position first. If uncomfortable, adjust accordingly for the operator.

- For highest lever position, use holes (A).
- For lowest lever position, use holes (B).

4. You can also adjust each motion control lever slightly forward or rearward within slotted holes.

SB31882,00003BD-19-20200623

Adjusting Cutting Height

Cutting height can be adjusted from approximately 25—100 mm (1—4 in). When mower deck is in transport position cutting height is approximately 100 mm (4 in).

1. 

MX101389-UN: Z500 Series

Raise mower deck:

- Push down on lift pedal (A) and lock in the raised position (transport). When in the transport position, the lever (B) is raised over the styling.

2. Insert the deck height pin tool (C) in the proper hole for the desired height of cut.
3. Lower mower deck:
   - Push down on lift pedal (A) and then push down on lever (B), release lift pedal rearward until the deck achieves the selected height.

SB31882,00003BE-19-20200608

Adjusting Mower Wheels

1. **CAUTION:**
Avoid injury! Rotating blades are dangerous. Before adjusting or servicing mower:

• Disconnect spark plug wires or battery negative (-) cable to prevent engine from starting accidentally.

• Always wear gloves when handling mower blades or working near blades.

IMPORTANT:
Avoid damage! If the mower deck wheels are adjusted incorrectly, the mower deck can be damaged.

• Wheels must not ride on ground supporting mower weight.

• Check wheel adjustment each time cutting height is changed.

Park machine safely on a level surface. (See Parking Safely in the Safety section.)

2. Inflate tires to correct pressure.
3. Press the mower deck lift pedal, and lock in the transport position.
4. Adjust mower deck wheels to correct height:

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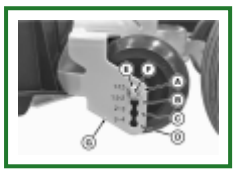


MX101461-UN: Mower Wheel

-: Deck Height Settings

Position 1 (A)	25—38 mm (1—1-1/2 in) Height of Cut
Position 2 (B)	38—50 mm (1-1/2—2 in) Height of Cut
Position 3 (C)	50—76 mm (2—3 in) Height of Cut
Position 4 (D)	76—101 mm (3—4 in) Height of Cut

- Remove nut (E). Pull the carriage bolt (F) out until end of bolt clears the outer wall of the depth gauge wheel bracket (G). Slide the bolt and wheel assembly to the desired position. Push the bolt back through the outer wall of bracket. Install nut (E) and tighten to specification.

Item	Measurement	Specification
Mower Wheel Nut	Torque	24 N·m (18 lb·ft)

NOTE:
The onboard tool with 13 mm wrench is located in the styling tool box area.

SB31882,00003C7-19-20200616

Testing Safety Systems

MXAL42804-UN: Warning

CAUTION:
Avoid injury! Engine exhaust fumes contain carbon monoxide and can cause serious illness or death.

Do not run an engine in an enclosed area, such as a garage, even with doors or windows opened.

Move the machine to an outside area before running the engine.

The safety systems installed on your machine should be checked before each machine use. Be sure that you have read the machine operator manual and are familiar with the operation of the machine before performing these safety system checks.

Use the following checkout procedures to check for normal operation of machine.

If there is a malfunction during one of these procedures, do not operate machine. **See your authorized dealer for service.**

Perform these tests in a clear open area. Keep bystanders away.

MP47322,00F4637-19-20220607

Testing Park Brake Switch

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Sit on seat.
3. Unlock the park brake.
4. Try to start engine.

Result: Engine must not turn over. If engine turns over, there is a problem with your safety interlock circuit.

MP47322,00F4638-19-20190409

Testing Park Brake

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Lock the park brake.
3. Engage bypass valve control.

4. Try to push machine manually.

Result: Park brake must prevent machine from moving. If machine moves, see your authorized dealer for service.

> **NOTE:**
> **When testing is complete, disengage bypass valve control prior to returning machine to service.**

TH84124,0000115-19-20140519

Testing Mower Engagement (PTO) Switch

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Sit on seat.
3. Lock the park brake.
4. Engage the mower.
5. Try to start engine.

Result: Engine must not crank. If engine cranks, there is a problem with your safety interlock circuit.

MP47322,00F463A-19-20130327

Testing Seat Switch (E- and M-Series)

1. Park machine safely. (See Parking Safely in the Safety Section.)
2. First test:
    a. Lock park brake.
    b. Start engine.
    c. Move throttle control up to maximum engine speed.
    d. Engage mower.
    e. Raise up off seat. Do not get off machine.

    Result: Engine and mower blades should stop. If engine and mower blades do not stop, there is a problem with your safety interlock circuit.

3. Second test:
    a. Disengage mower.
    b. Start engine.
    c. Unlock park brake.
    d. Raise up off seat. Do not get off machine.

    Result: Engine should stop. If engine does not stop, there is a problem with your safety interlock circuit.

4. Third test:
    a. Lock park brake.
    b. Disengage mower.
    c. Start engine.
    d. Raise up off seat. Do not get off machine.

    Result: Engine should continue to run. If engine stops, there is a problem with your safety interlock circuit.

SB31882,0000476-19-20200626

Testing Seat Switch (R-Series)

1. Park machine safely. (See Parking Safely in the Safety Section.)
2. First test:
    a. Lock park brake.
    b. Start engine.
    c. Move throttle control up to maximum engine speed.
    d. Engage mower.
    e. Raise up off seat. Do not get off machine.

    Result: PTO will disengage and the mower blades should stop. The engine will NOT stop. If the mower blades do not stop, there is a problem with your safety interlock circuit.

3. Second test:
    a. Disengage mower.
    b. Start engine.
    c. Unlock park brake.
    d. Raise up off seat. Do not get off machine.

    Result: Engine should stop. If engine does not stop, there is a problem with your safety interlock circuit.

4. Third test:
    a. Lock park brake.
    b. Disengage mower.
    c. Start engine.
    d. Raise up off seat. Do not get off machine.

    Result: Engine should continue to run. If engine stops, there is a problem with your safety interlock circuit.

SB31882,0000477-19-20200626

Testing Motion Control Lever Switch

1. Park machine safely. (See Parking Safely in the SAFETY Section.)
2. Sit on seat.
3. First test:
    a. With the park brake locked, start engine.
    b. Move right motion control lever inward.

    Result: Engine should stop. If engine does not stop, there is a problem with your safety interlock circuit.

4. Second test:
    a. Start engine.
    b. Release park brake.

c. Move right motion control lever inward.

Result: Engine should continue to run. If engine stops, there is a problem with your safety interlock circuit.

5. Repeat first and second test using left motion control lever.

MP47322,00F463C-19-20130319

Using Seat Belt

CAUTION:
Avoid injury! Always wear seat belt when operating machine with folding protective structure in upright position. Do not jump from machine if machine tips.

If protective structure must be folded to operate in a low clearance area, do NOT use seat belt. Raise protective structure and use seat belt as soon as conditions permit.

MX101388-UN: Z5 Seat Belt

1. Sit on the operator seat.
2. Pull out seat belt buckle (A) and stretch across your lap in one nonstop motion.
3. Insert seat belt buckle into latch (B) until it locks.
4. To release seat belt, press button (C) until buckle comes out of latch.

SB31882,00003C8-19-20200503

Raising and Lowering the ROPS

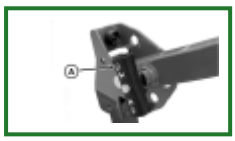
CAUTION:
Avoid injury! Always wear seat belt when operating machine with the ROPS in the raised position. Do not jump from machine if machine tips.

If the ROPS must be folded to operate in a low clearance area, do NOT use seat belt. Raise the ROPS and use seat belt as soon as conditions permit.

⚠ CAUTION:
Avoid injury! Fingers and hands can be pinched or crushed. Be aware of potential pinch points and keep hands away.

Raising the ROPS

1. Park machine safely. (See Parking Safely in the Safety section.)

2. 

MX101473-UN: ROPS Handle

On either side of the ROPS, pull the handle (A) outward to release the pin. Rotate the handle 90° to keep the pin disengaged.

3. On the opposite side, grab hold of the upper ROPS. With the other hand, pull the handle (A) outward to release the pin. Rotate the handle 90° to keep the pin disengaged.

4. 

MX101471-UN: ROPS Handle

Push the upper ROPS forward to the desired position.

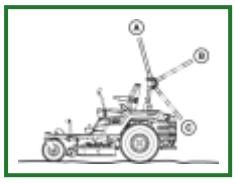
NOTE:
When returning the ROPS to the fully raised position, press the ROPS forward slightly to compress the bumper (B) and get the pin to latch in the raised position.

5. Rotate the handle (A) back to the locked position. Ensure that the pin is fully engaged in the ROPS.

6. Repeat for the other side of the ROPS.

Lowering the ROPS to the Fully Lowered Position

For use in low clearance areas.

1. 

MX101408-UN: Intermediate & Lowered Positions

LEGEND:

A - Raised Position

B - Intermediate Position

C - Fully Lowered Position

Park machine safely. (See Parking Safely in the Safety section.)

---

2. 

MX101442-UN: ROPS Handle

On either side of the ROPS, push the upper ROPS forward slightly to compress bumper (E) and then pull the handle (D) outward to release the pin. Rotate the handle 90° to keep the pin disengaged.

3. On the opposite side, grab hold of the upper ROPS. With the other hand, push the upper ROPS forward slightly to compress the bumper (E) and then pull the handle (D) outward to release the pin. Rotate the handle 90° to keep the pin disengaged.

4. Pull the upper ROPS rearward to the fully lowered position (C).

5. Rotate the handle back to the locked position. Ensure that the pin is fully engaged in the ROPS.

6. Repeat for the other side of the ROPS.

Lowering the ROPS to the Intermediate Position

For use with Material Collection System in low clearance areas.

NOTE:
When a Material Collection System attachment is installed, the ROPS cannot be fully lowered. If the ROPS must be lowered, place it into the intermediate position.

1. 

MX101385-UN: Raised and Intermediate Positions

LEGEND:

A - Raised Position B - Intermediate Position

Park machine safely. (See Parking Safely in the Safety section.)

2. 

MX101441-UN: ROPS Handle

On either side of the ROPS, push the upper ROPS forward slightly to compress bumper (D) and then pull the handle (C) outward to release the pin. Rotate the handle 90° to keep the pin disengaged.

3. On the opposite side, grab hold of the upper ROPS. With the other hand, push the upper ROPS forward slightly to compress the bumper (D) and then pull the handle (C) outward to release the pin. Rotate the handle 90° to keep the pin disengaged.
4. Pull the upper ROPS rearward to the intermediate position (B).
5. Rotate the handle back to the locked position. Ensure that the pin is fully engaged in the ROPS.
6. Repeat for the other side of the ROPS.

SB31882,00003C9-19-20200514

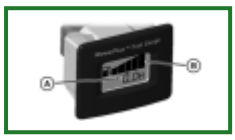
Checking Fuel Level

Sight Window

MX101507-UN: Sight Window

The fuel level sight window (A) shows the amount of fuel in the fuel tank. The fuel level sight window is located between the seat and the mower deck foot plate.

MowerPlus™ Fuel Gauge (If Equipped)



MX101399-UN: MowerPlus™ Fuel Gauge

- The hour meter (A) shows the number of hours the engine has run. The hour meter is always active and cannot be reset.
- The fuel level (B) is indicated by the graph of five segments in increasing height. When the fuel tank has emptied to approximately 20%, the last segment will flash indicating approximately 30 minutes of fuel remaining.

MowerPlus is a trademark of Deere & Company SB31882,00003DB-19-20200612

Using Park Brake

CAUTION:
Avoid injury! Children or bystanders may attempt to move or operate an unattended machine.

Always lock the park brake and remove the key before leaving the machine unattended.

Setting Park Brake

1. Raise park brake lever to lock park brake.

Releasing Park Brake

1. Lower park brake lever to unlock park brake.

TH84124,000024A-19-20160725

Using Key Switch

MX101440-UN: Key Switch

A - STOP (off) position - With key in the STOP position, all switched power is off and engine should not run.

B - Run (on) position - Turn key from STOP to this position, and all switched power circuits will be on.

C - Start position - Turn key to start position to crank the engine. Release key after engine has started and it will automatically return to the on position. The engine will continue to run.

SB31882,00003DD-19-20200522

Using Mower Engagement Switch

- To Engage Mower - Pull mower engagement knob up.
- To Disengage Mower - Push mower engagement knob down.

MP47322,00F463F-19-20130315

Using the Motion Control Levers

CAUTION:
Avoid injury! Learn use of the motion control levers and practice at half throttle until becoming proficient and comfortable with the operation of the machine.

Do not move motion control levers from forward to reverse or reverse to forward position rapidly. Sudden direction changes could cause loss of control or damage the machine.

Before using the machine, become familiar with the motion control levers and how they respond. It is essential to know how the machine accelerates, steers, and stops.

The functions of the motion control levers are:

- Dual function neutral position.
- Steering.

- Acceleration.
- Braking.

Start/Shutdown Position

- 

  MX101390-UN: Start Position

  Motion control levers must be in the start/shutdown position (A) and the park brake locked (B) to start the engine.
- Forward and reverse movement of the motion control levers is prevented when levers are moved to the start/shutdown position.
- Operator can exit mower with the engine running when the mower engagement switch is disengaged, the motion control levers are in the start/shutdown position and the park brake is locked.
- Motion control levers must be in the start/shutdown position to safely enter and exit the operator seat.

Neutral Position

- 

  MX101391-UN: Neutral Position

  Machine speed, motion, and direction can be controlled when the engine is running, motion control levers are in the neutral position (C), and the park brake is unlocked (D).
- To stop the machine for an emergency, move the motion control levers quickly back to the neutral position.

Forward and Reverse Travel

Straight forward and reverse travel takes practice. If the machine does not track in a straight line when going forward or reverse, the tracking will require adjusting.

1. Move throttle control to the mow position, full throttle.

   NOTE:
   For Z545R: Select the MAX push-button on the electronic throttle controller.

2. Unlock park brake.

3. Move both motion control levers from the start/shutdown position inward to the neutral position.
4. Move the motion control levers forward to begin forward travel.
5. Move the motion control levers rearward to begin reverse travel.
6. To stop travel, move motion control levers back to the neutral position.

Forward Travel

1. 

MX101392-UN: Forward Travel

Gradually move both motion control levers evenly forward (A) from neutral. To speed up, move the levers farther forward. To slow down smoothly, slowly move the levers toward neutral.

Reverse Travel

1. 

MX101393-UN: Reverse Travel

Look down and behind, then gradually move both motion control levers evenly rearward (B) from neutral. To speed up, move the levers farther rearward. To slow down smoothly, slowly move the levers toward neutral.

Left Turn

1. 

MX101394-UN: Gradual Left Turn

To turn slightly to the left, push right control lever (C) farther forward than the left control lever (D).

2.

MX101395-UN: Sharp Left Turn

To turn sharply to the left, push right control lever (C) forward and pull left control lever (D) rearward at the same time.

Right Turn

1.

MX101382-UN: Gradual Right Turn

To turn slightly to the right, push left control lever (D) farther forward than the right control lever (C).

2.

MX101383-UN: Sharp Right Turn

To turn sharply to the right, push left control lever (D) forward and pull right control lever (C) rearward at the same time.

SB31882,00003CA-19-20200626

Starting the Engine

Z515E, Z530M, and Z530R

CAUTION:
Avoid injury! Engine exhaust fumes contain carbon monoxide and can cause serious illness or death.

Do not run an engine in an enclosed area, such as a garage, even with doors or windows opened.

Move the machine to an outside area before running the engine.

1. Sit on the operator seat.

2. Lock park brake.
3. Push the mower engagement knob down to disengage the mower.
4. Set both motion control levers to the start/shutdown position.
5. Move throttle control to set engine speed:
   - **Cold start:** Set throttle control to the start position, full throttle. Use the choke control as necessary (if equipped).
   - **Warm start:** Set throttle control to the mow position, full throttle.
6. **IMPORTANT:**
   Avoid damage! Starter may be damaged if starter is operated for more than 20 seconds at a time:
   - **Wait 2 minutes before trying again if engine does not start.**

   Turn key switch to the start position.
7. After engine starts, release key switch to the run position, disengage the choke control (if equipped), and move throttle to mow position, full throttle.
8. **IMPORTANT:**
   Avoid damage! Unnecessary engine idling may cause engine damage. Excessive idling can cause engine overheating, carbon buildup, and poor performance.

   Allow the engine to warm up for 20 seconds.
9. Release park brake.
10. Set both motion control levers to the neutral position.

Z545R with Electronic Throttle Control

CAUTION:
Avoid injury! Engine exhaust fumes contain carbon monoxide and can cause serious illness or death.

Do not run an engine in an enclosed area, such as a garage, even with doors or windows opened.

Move the machine to an outside area before running the engine.

1. Sit on the operator seat.
2. Lock park brake.
3. Push the mower engagement knob down to disengage the mower.
4. Set both motion control levers to the start/shutdown position.
5. **IMPORTANT:**
   Avoid damage! Starter may be damaged if starter is operated for more than 20 seconds at a time:
   - **Wait two minutes before trying again if engine does not start.**

   Turn key switch to the start position.
6. After engine starts, release key switch to the run position.
7. **IMPORTANT:**
   Avoid damage! Unnecessary engine idling may cause engine damage. Excessive idling can cause engine overheating, carbon buildup, and poor performance.

   Allow the engine to warm up for 20 seconds.
8. Release park brake.
9. Set both motion control levers to the neutral position.

SB31882,00003DE-19-20200608

Engaging Mower

Z515E, Z530M, Z530R

1. **CAUTION:**
   Avoid injury! Clear mowing area of all bystanders when operating this machine. Thrown objects could cause serious injury or death.

   Keep hands and feet away from blades and discharge opening.

Do not mow in reverse unless absolutely necessary.

Adjust mower to desired cutting height.

2. Start engine.
3. Release park brake.
4. Move both motion control levers to the neutral position.
5. Set throttle control to the RUN position, full throttle.
6. **NOTE:**
   For smoother engagement, deck can be engaged at transport position and then lowered to desired cut height.

   Pull mower engagement switch up to engage mower.
7. **NOTE:**
   The travel speed and turn rate varies with the amount that the control levers are moved.

   Push motion control levers forward slowly. Mow at a safe travel speed.

Z545R with Electronic Throttle Control

1. **CAUTION:**
   Avoid injury! Clear mowing area of all bystanders when operating this machine. Thrown objects could cause serious injury or death.

   Keep hands and feet away from blades and discharge opening.

   Do not mow in reverse unless absolutely necessary.

   Adjust mower to desired cutting height.
2. Start engine.
3. Release park brake.
4. Move both motion control levers to the neutral position.
5. Select either ECO or MAX button on the Push Button Controller.

6. **NOTE:**
For smoother engagement, deck can be engaged at transport position and then lowered to desired cut height.

   Pull mower engagement switch up to engage mower.

7. **NOTE:**
The travel speed and turn rate will vary with the amount that the control levers are moved.

   Push motion control levers forward slowly. Mow at a safe travel speed.

SB31882,00003F2-19-20200608

Stopping the Engine

1. Stop machine on a level surface, not on a slope.
2. Push the mower engagement switch down to disengage mower.
3. Move the motion control levers to the start/shutdown position.
4. Lock park brake.
5. Move throttle control to the shutdown position.

   NOTE:
   For Model Z545R, select MIN throttle setting on the electronic throttle controller.

6. Allow the engine to cool down for 20 seconds.
7. Turn ignition key to STOP (off) position.
8. **CAUTION:**
   Avoid injury! Children or bystanders may attempt to move or operate an unattended machine.

   Always lock the park brake and remove the key before leaving the machine unattended.

   Remove key.

SB31882,00003F3-19-20200608

Unplugging Mower

CAUTION:
Avoid injury! Do not attempt to unplug attachment with machine running.

Rotating blades are dangerous. Shut off the engine and remove the key before getting off the seat to inspect the machine and attachment.

Thrown objects can cause serious injury. Make sure that all machine parts are stopped before raising hopper top or removing chutes.

1. Park machine safely. Wait for all moving parts to stop before you leave the operator’s station to inspect machine.
2. Check under mower deck and discharge chute for debris.
3. Clear all debris before using mower.
4. If plugging occurs, switch to open mode to allow some grass to discharge.

OUO2004,0000AF8-19-20210129

Using Headlights (If Equipped)

MX101409-UN: Headlight Switch

Ignition key switch must be in the RUN position to operate the lights. If the ignition key switch is in the RUN position and the engine is not running, the battery will discharge if the lights are allowed to remain on for an extended period.

- Press top of the light switch (A) to turn on headlights.

NOTE:
Be sure to turn off lights and turn the ignition key switch to STOP position, or lights will discharge battery.

- Press bottom of the light switch to turn off headlights.

SB31882,00003E6-19-20200608

Moving Machine by Hand

CAUTION:
Avoid injury! When the bypass valve is open, the machine has unrestricted motion.

• Do not open the bypass valve when the machine is stopped on an incline to prevent it from going downhill out of control.

IMPORTANT:
Avoid damage! Transmission damage may occur if the machine is towed or moved incorrectly:

• Move the machine by hand only.

• Do not use another vehicle to move machine.

• Do not tow machine.

When the machine must be moved without starting the engine, use the bypass valves:

NOTE:
Do not operate bypass control levers while machine is running. Do not operate the machine with controls in bypass position.

1. 

MX101460-UN: LH Bypass Lever Shown (RH opposite)

Rotate both bypass levers (A) inward until the lever hits a stop.

2. Release park brake.
3. Push machine to desired location and lock park brake.
4. Rotate both bypass levers (A) outward to the disengaged position.

SB31882,0000400-19-20200617

Unplugging Mower, Bagger, or Material Collection System

CAUTION:
Avoid injury! Do not attempt to unplug attachment with the machine running.

- **Rotating blades are dangerous. Shut off the engine and remove the key before getting off the seat to inspect the machine and attachment.**
- **Thrown objects can cause serious injury. Make sure that all machine parts are stopped before raising hopper top or removing chutes.**

Checking for Plugging While Driving

If grass builds up in the front of the mower discharge chute, check for plugged chute or problems with blower assembly (if equipped).

If there is a trail of clippings behind mower or clippings blow to the side, check for plugged chute, full collector bags, or problems with blower assembly.

Removing Debris from Inspection Points:

CAUTION:
Avoid injury! Do not use hands or feet to clear plugged mower deck or blower assembly. Stored energy can cause blades to rotate.

1. Park machine safely. Wait for all moving parts to stop before getting off to inspect machine.
2. Open hopper cover. Check chute outlet.
3. Remove chute from the mower deck or blower assembly. Check chute inlet.
4. Check under the mower deck for debris.

MP47322,00F4646-19-20200710

Using Wash Port to Clean Mower Deck

NOTE:

Follow this procedure after each use to prevent buildup and remove corrosive lawn chemicals.

1. Park machine safely. (See Parking Safely in the Safety section).

2. 

MX101450-UN: Wash Port

Attach quick-coupler to a garden hose.

3. Attach garden hose with the quick-coupler to wash port (A) on the mower deck.
4. Turn on water.
5. Start engine.
6. Run at full throttle.

NOTE:
Model Z545R: Select MAX on electronic throttle controller.

7. Engage mower blades.
8. Flush water under the mower deck for approximately one minute.
9. Disengage mower blades.
10. Stop engine.
11. Turn off water and remove garden hose and quick-coupler from the wash port.

SB31882,00003F7-19-20200522

Transporting Machine on Trailer

NOTE:
Trailer capacity must exceed combined machine weight and attachment weight. (See Specifications section in the operator’s manual).

Be sure that trailer has all the necessary lights and signs required by law.

CAUTION:
Avoid injury! Use extra care when loading or unloading the machine onto a trailer or truck. Machine wheels can go off the ramp or trailer, causing the machine to tip over.

• To load, back slowly and in a straight line. Keep wheels away from drop-offs and edges.

• Do not use two separate loading ramps. Use a full width loading ramp at least 30 cm (12 in) wider than machine to keep caster wheels from going off the ramp edge.

• Use a trailer with sides.

1. Park trailer on a level surface.
2. Raise mower deck before driving machine onto trailer.

3. 

MXAL42817-UN: Back machine onto trailer.

Back machine onto heavy-duty trailer with a full-width ramp.

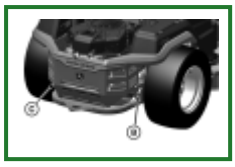
4. Lower the mower deck completely.
5. Lock park brake.
6. Turn off machine and remove key.

7. 

MX101658-UN: Front Tie-down Locations

Fasten to the front corners (A) or over top of the foot platform to the trailer with heavy-duty straps, chains, or cables. Straps must be directed forward, down, and outward from machine.

8.



MX101463-UN: Rear Tie-down Locations

Fasten rear of the machine at slots on each side of frame (B - right, C - left) to the trailer with heavy-duty straps, chains, or cables. Straps must be directed rearward, down, and outward from machine.

SB31882,00003F8-19-20200904

Transporting Material Collection System (If Equipped)

If the material collection system is left on the machine during transport, follow these guidelines when trailering the unit:

- Empty the cloth bags and remove them from the hopper. Full bags add extra weight which can overstress the hopper frame on rough roads. At road travel speeds, wind can cause premature wear of the cloth bags.
- Make sure that the hopper cover is latched securely to the hopper frame.
- If the unit is transported over long distances or at high speeds, remove the rear bagger or power flow chute before transport.

TH84124,000020A-19-20190410

Towing Loads

IMPORTANT:
Avoid damage! Towing excessive trailer loads can stress drivetrain components. To avoid damage to drivetrain components, use the following guidelines.

- Do not exceed maximum towing capacity of 113.4 kg (250 lbs).
- Do not exceed maximum tongue weight of 45.4 kg (100 lbs).
- Always run tractor at full throttle when towing loads.
- Avoid inclines greater than a 10 degree slope while towing to avoid damage to the pulling machine. Use the Slope Guide located in this operator’s manual to ensure proper machine towing operation. See Operating on Slopes in the Safety section for additional information.
- Avoid making tight turns. Make wide turns to avoid jack-knifing.
- Travel slowly and allow extra stopping distance.

SB31882,0000444-19-20221202

Mowing Tips

- Mow grass with throttle control in the full fast / mow position.

> **NOTE:**
> **For Z545R - select ECO or MAX on electronic throttle controller.**

- Mow grass when it is dry.
- Keep mower deck and discharge chute clean.
- Mow with sharp blades.
- Properly level mower deck for a smooth cut.
- Mow grass frequently.
- Use a travel speed that fits the conditions:
  - Mow tall or wet grass twice. With the first pass, cut grass halfway to the desired height. With the second pass, cut to the desired height.
  - Travel slowly when mowing tall or thick grass.
  - Avoid damaging grass by slipping or skidding machine drive wheels. Practice smooth control lever movements.
  - When performing sharp turns, do not allow the inside machine drive wheel to stop and twist on grass.

SB31882,0000401-19-20200629

Blade Choices

Several types of blades are available for ZTrak Z500 series mowers:

- Side discharge blades. These blades are designed for optimal performance when side discharging and are installed on Z500 series mowers when shipped from the factory.
- Mulching blades. These blades are designed for optimal performance when used with a mulch cover or mulch plug installed.

SB31882,0000478-19-20200608

Servicing Your Machine

> **IMPORTANT:**
> **Avoid damage!**
>
> **Operating in extreme conditions may require more frequent service intervals:**
>
> - **Engine components may become dirty or plugged when operating in extreme heat, dust or other severe conditions.**

- **Engine oil can degrade if machine is operated constantly at slow or low engine speeds or for frequent short periods of time.**

High-pressure washing can cause damage to machine components. It is recommended that your vehicle be washed by hand or with a garden hose using mild soap.

Avoid spraying water with any great force near or into the following places:

- **Air intake**
- **Electrical connections (including battery compartment)**
- **Wheel bearings**
- **Radiator (if equipped)**
- **Warning labels**
- **Other labels**
- **Ignition switch**
- **Instrument panel (gauges and switches)**
- **Breather/tube vents**
- **Mower spindles**
- **Mower idler bearings**
- **Transmission cooling fans**

Please use the following timetables to perform routine maintenance on your machine.

Park the vehicle safely. (See Park Safely in the SAFETY Section.)

SU68010,0000095-19-20180523

Service Intervals

Every 8 Hours or Daily

- Clean muffler area.
- Clean air intake screens.
- Clean mower deck.
- Clean mower deck using washout port.

Every 50 Hours or Annually (Whichever Comes First)

- Change engine oil. (Service more frequently under dusty conditions.)
- Replace engine oil filter. (Service more frequently under dusty conditions.)
- Lubricate mower deck spindles.
- Lubricate mower idler arm. (All decks except 42A)
- Check mower deck level. Level if necessary.

Every 100 Hours or Annually (Whichever Comes First)

- Replace spark plugs.

- Replace air filter element(s). (Service more frequently under dusty conditions.)
- Replace fuel filter.
- Check mower belt. Replace if necessary.
- Sharpen / replace mower blades.
- Clean underside of deck.
- Check tire pressure.
- Clean engine cooling fins.
- If there is debris that cannot be blown out, remove blower housing for complete cleaning.

Every 200 Hours

- Check / adjust engine valve clearance. See your John Deere dealer for this service.

SB31882,00003B7-19-20200528

Grease

> **IMPORTANT:**
> **Avoid damage! Use recommended John Deere greases to avoid component failure and premature wear.**

The following grease is recommended for service:

- John Deere Multi-Purpose HD Lithium Complex Grease
- Grease-Gard™ Premium Plus

Not all grease types are compatible; John Deere does not recommend mixing greases. If using any product other than the recommended grease in service, purge any remaining grease from the system before application. If not practical, grease twice as often until all old grease is purged from the system.

OUMX068,0000642-19-20210420

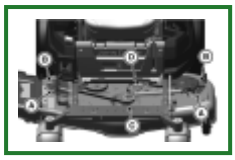
Lubricating Mower Deck Spindles

> **NOTE:**
> **Removal of belt shields is not necessary to lubricate the spindles.**

1. Remove the foot plate. (See Service Mower section for Removing and Installing Mower Deck Foot Plate.)

2. Lubricate each mower deck spindle with two pumps of grease at specified intervals as indicated:

48A, 54A, and 60A Mower Decks

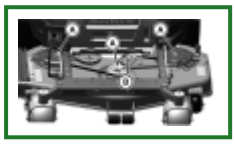
- 

MX101413-UN: 48A Deck Shown

Raise spindle cover (A) and lubricate spindle grease fitting (B).

- Raise opposite spindle cover and lubricate spindle grease fitting.
- Lubricate the center spindle grease fitting (C).
- Lubricate the idler arm (D).

48HC, 54HC, and 60HC Mower Deck

- 

MX101414-UN: 48HC Shown. 54HC and 60HC Similar

Lubricate three spindle grease fittings (A).

> **NOTE:**
> **For 48HC, it may be necessary to raise deck to transport height to rotate idler arm for grease access to center spindle.**

- Lubricate the grease fitting (B) on the idler arm.

SB31882,00003E7-19-20200420

Emissions Service Information

Within the warranty period, John Deere will reimburse reasonable service costs incurred at service providers outside the John Deere authorized network only in an unsafe, emergency condition if an authorized John Deere dealer is not available and the failure does not arise from the owner’s misuse or failure to perform required maintenance. An emergency situation exists under this section if, after 30 days, the authorized John Deere network is unable to perform the repairs or source replacement parts.

Emission Control System Certification Label

> **NOTE:**
> **Tampering with emission controls and components by unauthorized personnel may result in severe fines or penalties. Emission controls and components can only be adjusted by EPA and/or CARB authorized service centers. Contact your John Deere Retailer concerning emission controls and component questions.**

The presence of an emissions label signifies that the engine has been certified with the United States Environmental Protection Agency (EPA) and/or California Air Resources Board (CARB).

The emissions warranty applies only to those engines marketed by John Deere that have been certified by the EPA and/or CARB; and used in the United States and Canada in off-road mobile equipment.

Altitude Adjustment (Gasoline or Propane Converted Engines Only)

If your engine features a carburetor it is calibrated by the engine manufacturer and is not adjustable.

If your engine is operated at altitudes below 610 m (2,000 ft.), a high altitude carburetor jet kit is not required. If your engine is operated at altitudes above 610 m (2,000 ft.), a high altitude carburetor jet kit may be required for proper engine performance and emissions control. Operating the engine with the wrong carburetor configuration at a given altitude may increase the engine's emissions and decrease fuel efficiency and performance.

See a qualified service provider for details on jet kit requirements for your specific product.

TC00531,00000EC-19-20240103

Avoid Fumes

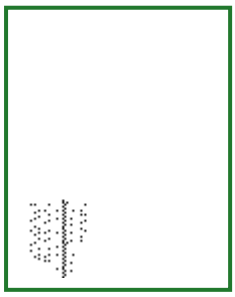
CAUTION:
Avoid injury! Engine exhaust fumes contain carbon monoxide and can cause serious illness or death.

Do not run an engine in an enclosed area, such as a garage, even with doors or windows opened.

Move the machine to an outside area before running the engine.

MP47322,00F4652-19-20150113

Gasoline Engine Oil



TS1744-UN: Oil Viscosities for Air Temperature Ranges

Use oil viscosity based on the expected air temperature range during the period between oil changes.

Using single viscosity grade oils such as SAE 30 or SAE 40 can reduce oil consumption in air cooled engines.

The following oils are approved:

- John Deere Plus-50™ II
- John Deere Turf-Gard™

Other oils may be used if they meet one or more of the following:

- ILSAC GF-6A
- API Service Category SP
- API Service Category SN
- API Service Category SM
- API Service Category SL
- API Service Category SJ
- ACEA Oil Sequence A3/B3
- ACEA Oil Sequence A3/B4
- ACEA Oil Sequence A5/B5
- ACEA Oil Sequence C5
- ACEA Oil Sequence C4
- ACEA Oil Sequence C3
- ACEA Oil Sequence C2
- ACEA Oil Sequence C1

Plus-50 is a trademark of Deere & Company
Turf-Gard is a trademark of Deere & Company

DX,ENOIL2-19-20200715

Checking Engine Oil Level

IMPORTANT:
Avoid damage! Failure to check the oil level regularly could lead to engine problems if oil level is out of the operating range:

• Check oil level before operating.

• Check oil level when the engine is cold and not running.

• Keep oil level between the dipstick marks.

• Shut off engine before adding oil.

NOTE:
Check oil twice a day if you run engine over 4 hours in a day.

Make sure that engine is cold when checking engine oil level.

Z515E

1. Park machine safely. (See Parking Safely in the Safety section.)

2. **IMPORTANT:**
   Avoid damage! Dirt and contamination can enter engine when checking oil level. Clean area around dipstick before loosening or removing.

   Clean area around the dipstick to prevent debris from falling into crankcase.

3. 

   MX101643-UN: Z515E Shown

   To check oil level on dipstick:

   a. Remove dipstick (A). Wipe with clean cloth.

   b. Install and tighten the dipstick.

   c. Remove dipstick.

   d. Check oil level on dipstick. Oil must be between ADD and FULL marks.

4. If oil level is low, add oil to bring oil level no higher than FULL mark on dipstick. Do not overfill.

5. Install and tighten the dipstick.

Z530M, Z530R, and Z545R

1. Park machine safely. (See Parking Safely in the Safety section.)

2. **IMPORTANT:**
   Avoid damage! Dirt and contamination can enter engine when checking oil level. Clean area around dipstick before loosening or removing.

   Clean area around the dipstick to prevent debris from falling into crankcase.

3. 

MX101426-UN: Model Z530 shown. Z545 is similar.

To check oil level on dipstick:

a. Remove dipstick (A). Wipe with clean cloth.

b. Insert the dipstick fully in tube, but do not tighten.

c. Remove dipstick.

d. Check oil level on dipstick. Oil must be between ADD and FULL marks.

4. If oil level is low, add oil to bring oil level no higher than FULL mark on dipstick. Do not overfill.

5. Install and tighten the dipstick.

SB31882,00003ED-19-20200826

Changing Engine Oil and Filter

IMPORTANT:
Avoid damage! Operating in extreme conditions require more frequent service intervals:

• Engine components become dirty or plugged when operating in extreme heat, dust, or other severe conditions.

• Engine oil can degrade if machine is operated constantly at slow or low engine speeds or for frequent short periods of time.

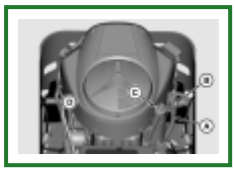
Z515E

1. Run engine to warm oil.

2. Park machine safely on a level surface. (See Parking Safely in the Safety section.)

3. **IMPORTANT:**

Avoid damage! Dirt and contamination can enter engine when checking oil level. Clean area around dipstick before loosening or removing.



MX101644-UN: Z515E Shown

Clean area around the dipstick to prevent debris from falling into crankcase.

4. Disconnect oil drain hose (A) from the side of the engine and lower hose, routing the oil drain hose down through the opening behind the transmission oil reservoir. Ensure that the drain valve will not drain onto the transmission housing, transmission fan, and frame.

5. Loosen dipstick (C). Remove the oil drain cap (B) and drain the oil into an approved container until the oil has drained completely.

6. Wipe dirt from around the oil filter (D). Place a drain pan under the oil filter and remove filter.

7. Put a light coat of fresh, clean oil on the new filter gasket.

8. Install replacement oil filter by turning oil filter to the right (clockwise) until the rubber gasket contacts filter base. Tighten filter an additional one-half turn.

9. After oil has drained, install the drain cap (B).

10. Attach drain hose assembly (A) to side of engine.

11. Add oil no higher than FULL mark on dipstick. Begin with per specification; do not overfill.

Item	Measurement	Specification
Z515E Engine Oil	Capacity	1.9 L (2.0 qt)

12. Tighten dipstick.

13. Start and run engine at idle to check for leaks. Stop engine. Fix any leaks before operating.

14. Check oil level. Add oil if necessary.

Z530M and Z530R

1. Run engine to warm oil.
2. Park machine safely on a level surface. (See Parking Safely in the Safety section.)
3. **IMPORTANT:**
   Avoid damage! Dirt and contamination can enter engine when checking oil level. Clean area around dipstick before loosening or removing.

   Clean area around the dipstick to prevent debris from falling into crankcase.

---

4. 

   MX101429-UN: Kawasaki Engine

   Disconnect oil drain hose from the side of the engine and lower hose, routing the oil drain hose down through the opening behind the transmission oil reservoir. Ensure that the drain valve will not drain onto the transmission housing, transmission fan, and frame.
5. Loosen dipstick (A). Remove the oil drain cap (B) and drain the oil into an approved container until the oil has drained completely.
6. Wipe dirt from around the oil filter (C). Place a drain pan under the oil filter and remove filter.
7. Put a light coat of fresh, clean oil on the new filter gasket.

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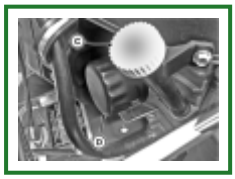
8. 

   MX101430-UN: Kawasaki Engine

   Install replacement oil filter by turning oil filter to the right (clockwise) until the rubber gasket contacts filter base. Tighten filter an additional one-half turn.
9. After oil has drained, install the drain cap (B).

10. Attach drain hose assembly to side of engine.

11. Add oil no higher than FULL mark on dipstick. Begin with per specification; do not overfill.

Item	Measurement	Specification
Z530 Engine Oil	Capacity	2.1 L (2.2 qt)

12. Tighten dipstick.

13. Start and run engine at idle to check for leaks. Stop engine. Fix any leaks before operating.

14. Check oil level. Add oil if necessary.

Z545R

1. Run engine to warm oil.

2. Park machine safely on a level surface. (See Parking Safely in the Safety section.)

3. **IMPORTANT:**
   Avoid damage! Dirt and contamination can enter engine when checking oil level. Clean area around dipstick before loosening or removing.

   Clean area around the dipstick to prevent debris from falling into crankcase.

4. 

   MX101431-UN: Briggs & Stratton Engine

   Disconnect oil drain hose (B) from the side of the engine and lower hose, routing the oil drain hose down through the opening behind the transmission oil reservoir. Ensure that the drain valve will not drain onto the transmission housing, transmission fan, and frame.

5. Loosen dipstick (A). Remove the oil drain cap (B) and drain the oil into an approved container until the oil has drained completely.

6. Wipe dirt from around the oil filter. Place a drain pan under the oil filter and remove filter.

7. Put a light coat of fresh, clean oil on the new filter gasket.
8. Install replacement oil filter by turning oil filter to the right (clockwise) until the rubber gasket contacts filter base. Tighten filter an additional one-half turn.
9. After oil has drained, install the drain cap (B).
10. Attach drain hose assembly to side of engine.
11. Add oil no higher than FULL mark on dipstick. Begin with per specification; do not overfill.

Item	Measurement	Specification
Z545R Engine Oil	Capacity	1.9 L (2.0 qt)

12. Tighten dipstick.
13. Start and run engine at idle to check for leaks. Stop engine. Fix any leaks before operating.
14. Check oil level. Add oil if necessary.

SB31882,00003EE-19-20200826

Cleaning Engine Screen Guard

Z515E

The Z515E engine has a removable guard over the rotating flywheel cover at the top of the engine. The guard should be removed to check for and remove any debris daily in conjunction with checking the engine oil level.

1. 

MX101645-UN: Z515E Engine

Locate rotating screen (A) at the top of the engine, and the two retaining tabs (B) and lift off guard (A).

2. Remove screw (C) (if equipped). Push in on the two retaining tabs (B) and lift off guard (A).
3. Clean guard and flywheel cover of debris.

4. Install guard after cleaning.

Z530M and Z530R

1. 

MX101434-UN: Kawasaki Engine

Raise three push retainers (A) and lift the screen guard (B) from engine.

2. Remove debris from inside and outside of the screen guard.

3. After cleaning, secure screen guard in place with three push retainers.

Z545R

1. 

MX101435-UN: Briggs & Stratton Engine

Remove four screws (A) and screen guard (B) from engine.

2. Remove debris from inside and outside of the screen guard.

3. After cleaning, secure screen guard in place with four screws.

SB31882,00003F1-19-20200826

Cleaning Engine Shroud

⚠ CAUTION:
Avoid injury! Compressed air can cause debris to fly a long distance.

• Clear work area of bystanders.

• Wear eye protection when using compressed air for cleaning purposes.

• Reduce compressed air pressure to 210 kPa (2.1 bar) (30 psi).

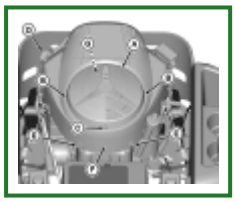
IMPORTANT:

Avoid damage! An obstructed air intake screen can cause engine damage due to overheating. Keep air intake screens and other external surfaces of the engine, including cooling fins, clean at all times to allow adequate air intake.

⚠ CAUTION:
Avoid injury! Touching hot surfaces can burn skin. The engine, components, and fluids are hot if the engine has been running. Allow the engine to cool before servicing or working near the engine and components.

Z515E

1. Park machine safely. (See Parking Safely in the Safety Section.)
2. Clean the air intake screen and external engine surfaces.
3. Locate the rotating screen guard (A) at the top of the engine, and the two retaining tabs (B), embossed with a finger symbol. Remove the screw at the front of the screen guard (if equipped).

4. 

GXT002522-UN: Z515E Engine

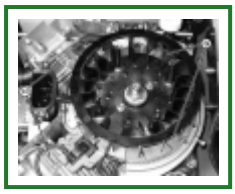
Push in on two retaining tabs and lift off guard (A).

5. Clean guard and flywheel cover of debris.

IMPORTANT:
Be careful to maintain position of fuel pump assembly (D) and clips (E), and fuel line. Also any other attached components when removing parts from side of engine.

6. Remove bolts and engine shroud (C).
7. Remove four bolts and rotating screen (F).

8.



MXAL47082-UN: Clean Areas Shown

Clean debris from:

- Fan areas (G)
- Cylinder head cooling fins (H)
- Engine cooling fins
- Area between engine and frame

9. Install rotating screen with four bolts.

IMPORTANT:
Engine shroud must be assembled so that slots in the shroud align with the ridge in the air intake and mating surfaces along the sides of the engine. Failure to assemble correctly will prevent the air filter from sealing and cause engine damage.

10. Install shroud and hardware.

Z530M and Z530R

1. Park machine safely. (See Parking Safely in the Safety Section.)
2. Clean the external engine surfaces.
3. Lift air cleaner cover and remove air cleaner element. (See Checking and Cleaning Air Filter Element.)

4.

MX101434-UN: Remove top screen

Remove three screws (B) and flywheel screen (A) from engine.

5. Clean debris from flywheel area.

6.

MX101439-UN: Engine Shroud

Remove six screws (C) and engine shroud (D).

7. Clean debris from:

   - Fan area
   - Cylinder head cooling fins
   - Engine cooling fins
   - Area between engine and frame

8. Install engine shroud with six screws.

9. Install flywheel screen with three screws and tighten to specification.

Item	Measurement	Specification
Flywheel Screen Screw	Torque	3.0 N·m (27 lb·in)

10.

MX101464-UN: Air Cleaner

Position the air filter (E) onto the intake tube (F).

11. Tighten thumbscrew (G) to ensure a proper seal.

12. Lower the air cleaner cover (H) and snap into the closed position.

Z545R

1. Park machine safely. (See Parking Safely in the Safety Section.)

2. Clean the external engine surfaces.

NOTE:
The engine shroud itself does not need to be removed entirely.

3. 

MX101435-UN: Flywheel Cover

Remove four screws (A) and the flywheel cover.

4. Clean debris from the flywheel area.

5. Remove air cleaner cover and air cleaner element. (See Checking and Cleaning Air Filter Element.)

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6. 

MX101465-UN: Side covers

Remove two screws (B) from the engine shroud.

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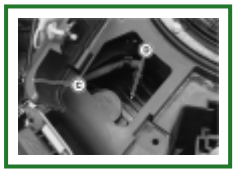
7. 

MX101466-UN: Access to Cooling Fins

Open access cover (C) and clean debris from engine cooling fins (D).

8. Repeat on the opposite side.

9. Clean any debris in the area between the engine and the frame.

10. Close both access covers and secure with screws.

11. Close air cleaner cover and secure with two knobs.

12. Install flywheel cover and secure with four screws.

SB31882,00003F0-19-20200903

Checking and Cleaning Air Cleaner Element

Z515E

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Let engine cool.
3. Clean dirt and debris from the air cleaner cover (A).

4. 

GXT002412-UN: Z515E Engine

Loosen two knobs (B) to remove cover (B).

5. **IMPORTANT:**
Avoid damage! To prevent engine damage, do not allow any foreign objects to fall into the carburetor air intake.

NOTE:
During filter cartridge removal, any material or foreign object that enters the air intake must be removed before replacement of the cartridge.

MXAL47088-UN: Z515E Engine

Lift out filter cartridge (C) and inspect it for damage.

6. **IMPORTANT:**
Avoid damage! Dirt and debris can enter the engine through a damaged filter element:

• Do not wash paper element.

• Do not attempt to clean paper element by tapping against another object.

• Do not use pressurized air to clean element.

• Replace element only if it is dirty, damaged, or the seal is cracked.

Inspect the foam precleaner without removing it. If the foam precleaner is dirty:

a. Carefully remove it from the filter.

b. Wash the foam precleaner in a solution of warm water and liquid detergent.

c. **NOTE:**
Do not put engine oil on the foam precleaner.

Rinse foam precleaner thoroughly. Squeeze out excess water in a dry cloth until foam is dry.

d. Replace the foam precleaner if damaged or missing.

7. Inspect the paper filter element. Replace the filter element if damaged or dirty.

8. Carefully clean the base of air cleaner. Prevent any dirt from falling into carburetor or air intake tube.

9. Install the foam precleaner (D) with the mesh side up on paper filter element. Position air filter in the air filter base. Ensure that the cartridge is sealed properly.

10. Install air cleaner cover and tighten knobs. Do not overtighten.

Z530M and Z530R

1. Park machine safely. (See Parking Safely in the Safety section.)

2. Let engine cool.

3. Clean dirt and debris from the air cleaner cover.

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4. 

MX101425-UN: Kawasaki Air Cleaner

Lift air cleaner cover (A).

5. Loosen thumbscrew (B).

6. Remove air cleaner (C) and inspect it for damage.
7. Inspect paper filter element. Replace the filter element if damaged or dirty.
8. Clean the base of air cleaner carefully. Prevent any dirt from falling into carburetor or air intake tube.
9. Position the air filter onto the intake tube.
10. Tighten thumbscrew to ensure a proper seal.
11. Lower the air cleaner cover and snap into the closed position.

Z545R

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Let engine cool.
3. Clean dirt and debris from the air cleaner cover.

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4. 

MX101432-UN: Briggs & Stratton Air Cleaner Cover

Loosen two knobs (A) and remove the air cleaner cover (B).

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5. 

MX101433-UN: Briggs & Stratton Air Cleaner

Remove the air cleaner and inspect it for damage.

IMPORTANT:
Avoid damage! Dirt and debris can enter the engine through a damaged filter element:

• Do not wash paper element.

• Do not attempt to clean paper element by tapping against another object.

• Do not use pressurized air to clean element.

• Replace element only if it is dirty, damaged or the seal is cracked.

6. Inspect the foam precleaner without removing it. If the foam precleaner is dirty:
   a. Remove it from the filter carefully.
   b. Wash the foam precleaner in a solution of warm water and liquid detergent.
   c. **NOTE:**
      Do not put engine oil on a foam precleaner.

      Rinse foam precleaner thoroughly. Squeeze out excess water in a dry cloth until foam is dry.
   d. Replace the foam precleaner if damaged or missing.
7. Inspect the paper filter element. Replace the filter element if damaged or dirty.
8. Clean the base of air cleaner carefully. Prevent any dirt from falling into carburetor or air intake tube.
9. Install foam precleaner with the mesh side up on paper filter element. Position air filter in the air filter base. Ensure that the cartridge is sealed properly.
10. Install air cleaner cover and tighten two knobs to secure cover in place.

SB31882,00003EF-19-20200820

Checking Spark Plug

1. **CAUTION:**
   Avoid injury! Touching hot surfaces can burn skin. The engine, components, and fluids are hot if the engine has been running. Allow the engine to cool before servicing or working near the engine and components.

   Park machine safely (See Parking Safely in the Safety section.)

2. 

GXT002413-UN: Standard Twin Cylinder Engine Shown

Disconnect spark plug wires (A). For twin cylinder engines, there is a spark plug on each side of engine.

3. Remove each spark plug.

4. Clean spark plug carefully with a wire brush.

5. Inspect the spark plug for:

   - Cracked porcelain.
   - Pitted or damaged electrodes.
   - Other wear or damage.

6. **NOTE:**
   In Canada, replace the spark plug with a resistor plug only.

   Replace spark plugs as necessary.

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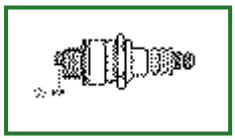
7. 

MXAL47092-UN: Check plug gap with a wire feeler gauge.

Check plug gap (C) with a wire feeler gauge. To change gap, move the outer electrode. Gap must be set to specification.

Item	Measurement	Specification
Z515E Spark Plug	Gap	0.76 mm (0.030 in)

Item	Measurement	Specification
Z530M, Z530R, Z545R Spark Plugs	Gap	0.75 mm (0.029 in)

8. Install spark plugs and tighten to specification.

Item	Measurement	Specification
Z515E, Z530M, Z530R, Z545R Spark Plugs	Torque	20 N·m (14.75 lb·ft)

9. Connect spark plug wires.

SB31882,0000402-19-20200821

Replacing Fuel Filter

CAUTION:
Avoid injury! Fuel vapors are explosive and flammable:

- **Do not smoke while handling fuel.**
- **Keep fuel away from flames or sparks.**
- **Shut off engine before servicing.**
- **Allow the engine to cool before servicing.**
- **Work in a well-ventilated area.**
- **Clean up spilled fuel immediately.**

NOTE:
Change filter when fuel is low.

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Let engine cool.
3. Raise operator’s seat if necessary.
4. Put a drain pan under the fuel filter.

5. 

MX101641-UN: Fuel Filter

Slide hose clamps on both sides of the fuel filter (A) away from the fuel filter ends using pliers.

6. Disconnect hoses from the filter.

7. **IMPORTANT:**

Avoid damage! Incorrect installation of the fuel filter may cause engine damage. Install the filter with the arrow pointing in the direction of fuel flow (towards the engine) for proper operation.

Connect hoses to a new filter making sure that the filter arrow is pointing in the direction of the fuel flow.

8. Install clamps and check for leaks.

SB31882,0000403-19-20200904

Spark Arrestor Maintenance (If Equipped)

Spark arrestor assemblies include a screen element that should be inspected and cleaned periodically. Visually inspect the screen for tears, broken wires, or loose welds. Replace the spark arrestor assembly if any of these conditions exist. If the screen is determined to be in good condition, proceed with cleaning the screen by brushing away loose dirt or carbon using a brush.

RM87422,00002DA-19-20170705

Cleaning Spark Arrestor

Z515E, Z530M, Z530R

1. 

MX101642-UN: Remove push retainers

Remove two push retainers (A) from the machine.

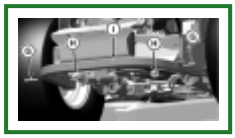
2. 

MX101479-UN: Remove Hardware

Remove two bolts (B), washers (C), carriage bolts (D), and lock nuts (E) from the engine guard (F).

3. Repeat for the opposite side.

4. Remove the engine guard.

5. 

MX101502-UN: Frame Tube

Remove two carriage bolts (G) and lock nuts (H) on each side of the frame tube.

6. Remove the frame tube (I).

7. 

MX101477-UN: Heat Shield

Remove the heat shield (J).

8. 

MX101478-UN: Spark Arrest Cover

Remove six screws (K) securing spark arrestor cover (L) to the muffler (M).

9. Visually inspect the screen for tears, broken wires, or loose welds. Replace the spark arrestor assembly if any of these conditions exist.

10. If the screen is in good condition, brush away any loose debris using a wire brush.

11. Install the spark arrestor and cover on muffler and secure in place with six screws.

> **NOTE:**
> **If the muffler sustains damage during the removal or installation process, replace muffler.**

12. Install heat shield.

13. Install the frame tube and secure with four carriage bolts and lock nuts.
14. Install engine guard and secure in place.
15. Install two push retainers to fenders.

Z545R

1. 

MX101503-UN: Z545R Muffler

Remove blunt nose screw and the spark arrestor from the end of exhaust pipe (A).

> **NOTE:**
> **Observe direction of arrestor inside exhaust pipe for reassembly.**

2. Visually inspect the screen for tears, broken wires, or loose welds. Replace the spark arrestor assembly if any of these conditions exist.
3. If the screen is in good condition, brush away any loose debris using a wire brush.

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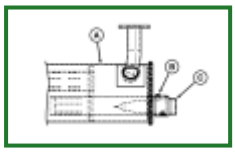
4. 

MX101504-UN: Spark Arrestor Installation

Install the spark arrestor (C) on the exhaust pipe with blunt nose screw (B).

> **NOTE:**
> **If the muffler sustains damage during the removal or installation process, replace muffler.**

SB31882,0000404-19-20200820

Transaxle Oil

The transaxles are filled at the factory. Do not mix oil types.

The following oil is preferred:

- JD Hy-Gard™

NOTE:
Use 10W-30 oil, if Hy-Gard™ is unavailable

Hy-Gard is a trademark of Deere & Company SR99263,00000A8-19-20220516

Checking Transaxle Oil Level

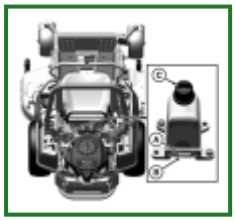
1. Park machine safely on a level surface. (See Parking Safely in the Safety section.)
2. **IMPORTANT:**
   Avoid damage! Hot hydraulic oil will expand and show incorrect oil level. Check oil level:

   • When oil is cold.

   • With engine not running.

   Allow machine to cool.

3. **IMPORTANT:**
   Avoid damage! Contamination can damage the hydraulic system. Clean thoroughly around reservoir fill cap before opening.



MX101520-UN: Reservoirs

Locate the left-hand and right-hand reservoirs at the rear of the machine. Each transmission has its own reservoir.

4. The reservoirs have two marks, FULL (A) and ADD (B). Check level with fluid cold.
5. If oil level is below the ADD line (B), clean area around reservoir cap and remove cap (C).

6. Remove foam insert.
7. Add oil until level is at FULL mark (A) on reservoir.
8. Install foam insert.
9. Install cap (C).
10. Start engine.
11. Operate machine forward and in reverse several times.
12. Park machine safely on a level surface. (See Parking Safely in the Safety section.)
13. Wait for hydraulic oil to cool.
14. Check oil level again. Add oil if necessary.

TH84124,00001FB-19-20200629

Changing Transaxle Oil and Filter

The transaxles on these models require no oil and filter changes. The oil level must be maintained at the FULL line on the reservoir.

MG39705,000020B-19-20190716

Checking and Adjusting Neutral Creep

Check neutral creep with the engine running, motion control levers in the start/shutdown position, park brake off, and machine on level ground.

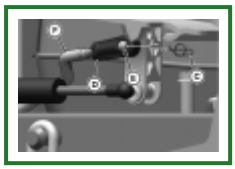
If the machine creeps forward or reverses while motion control levers are in the start/shutdown position, adjust the motion control linkages:

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Remove style panel (A) for better access to adjustment components (if desired). (See Removing and Installing Style Cover in the Service Miscellaneous section.)

3. 

MX101524-UN: Right Side

On the linkage side needing adjustment (right side shown), remove spring locking clip (C) and rod end (D) from pivot pin (E).

4. 

MX101457-UN: Adjustment

Turn rod end (D) on rod (F) clockwise to decrease forward creep and counterclockwise to decrease reverse creep.

5. Repeat procedure, as necessary, on the opposite side. Install rod ends back onto arms and secure with spring locking clips.

SB31882,00003FE-19-20200629

Adjusting Tracking

If the machine does not track in a straight line while going in full forward position, the tracking requires adjustment.

1. Park machine safely. (See Parking Safely in the Safety section.)

2. 

MX101452-UN: Tool

Acquire the onboard tool (A) with 13 mm wrench.

3. 

MX101451-UN: Tracking Bolts

Adjust the tracking using the 13 mm socket of the onboard tool (A) as follows:

- **NOTE:**

Tracking bolts limit top forward speed. If both levers hit against the tracking bolts, turn both bolts counterclockwise equal amounts until only one bolt contacts the lever. This will achieve maximum forward speed.

If machine tracks to the left, turn tracking bolt (B) clockwise.

- If machine tracks to the right, turn tracking bolt (C) clockwise.

SB31882,00003F9-19-20200629

Cleaning Transaxle Cooling Fans

CAUTION:
Avoid injury! Compressed air can cause debris to fly a long distance.

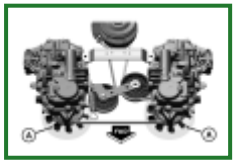
• Clear work area of bystanders.

• Wear eye protection when using compressed air for cleaning purposes.

• Reduce compressed air pressure to 210 kPa (2.1 bar) (30 psi).

IMPORTANT:
Avoid damage! To ensure proper cooling, keep the transaxle cooling fins and surrounding area clean at all times. Operating the transaxle with obstructed cooling fins could cause damage due to overheating.

1. Park machine safely. (See Parking Safely in the Safety section.)

2. 

MX101445-UN: Cooling Fans

Clean transaxle fan fins (A) and around exterior of each fan with a rag, brush, or compressed air.

SB31882,00003FA-19-20200617

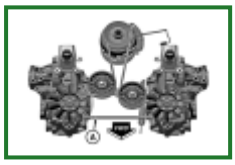
Checking and Replacing Transaxle/Transmission Drive Belt

CAUTION:
Avoid injury! Entanglement in a belt or sheave can cause serious injury. Stop engine and wait for all moving parts to stop.

NOTE:
The transmission drive belts are self-adjusted using a spring tensioner and do not require a tension adjustment.

Checking Transaxle/Transmission Drive Belt

1. Park machine safely. (See Parking Safely in the Safety section.)

2. 

MX101446-UN: Inspect Drive Belt

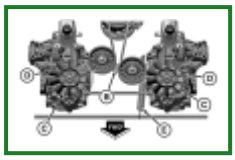
Inspect drive belt (A) for excessive wear, damage, or stretching while in position on all machine sheaves.

Replacing Transaxle/Transmission Drive Belt

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Remove style panel. (See Removing and Installing Style Cover in the Service Miscellaneous section.)
3. Remove mower deck.
4. Disconnect electric clutch wiring connector from the main wiring harness connector.

5. **CAUTION:**

Avoid injury! Components are installed under spring tension. Wear eye protection and use proper tools when installing and removing components with spring tension.



MX101447-UN: Drive Belt and Components

Insert 3/8 inch ratchet into the hole in the idler arm (B) and rotate the spring-loaded idler arm to relieve belt tension. Work belt off the transmission sheaves (C) and over the top of the cooler fans (D).

6. Remove belt from drive sheave on engine.
7. Disconnect spring (E) from rockshaft
8. Remove belt from underneath the machine.

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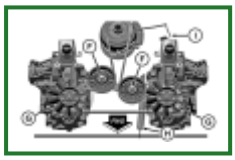
9. 

MX101448-UN: Route Drive Belt

Position replacement belt around drive sheave on engine and route belt through idler sheaves (F).

10. Route belt on transmission sheaves (G) and tension belt by attaching spring (H) to rockshaft.
11. Insert the clutch wiring connector (I) to the main wiring harness.
12. Install mower deck.
13. Install style cover.

SB31882,00003FB-19-20200617

Mower Deck Identification

Mower decks in the following instructions are identified by a code designation. The codes are as follows:

-: Mower deck identification.

Code	Description
48A	48 inch Accel Deep™
48HC	48 inch Edge™ High Capacity
54A	54 inch Accel Deep™
54HC	54 inch Edge™ High Capacity
60A	60 inch Accel Deep™
60HC	60 inch Edge™ High Capacity

Accel Deep is a trademark of Deere & Company
Edge is a trademark of Deere & Company

SB31882,0000405-19-20200504

Checking and Adjusting Mower Level

1. **CAUTION:**
Avoid injury! Rotating blades are dangerous. Before adjusting or servicing mower:

• Disconnect spark plug wires or battery negative (-) cable to prevent engine from starting accidentally.

• Always wear gloves when handling mower blades or working near blades.

NOTE:
Mower deck wheels should not contact the ground when leveling the deck.

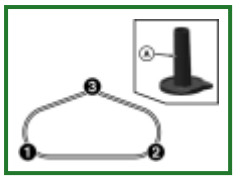
Park machine safely on a flat surface. (See Parking Safely in the Safety section.)

2. Ensure that the front and rear tires are inflated to the specified pressure.

Item	Measurement	Specification
Front Tire	Pressure	103 kPa (15 psi)
Rear Tire	Pressure	69 kPa (10 psi)

3. Position the caster wheels to the forward driving position.

Quick Leveling Method



MX101364-UN: Quick Leveling Method

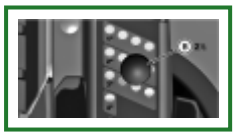
The quick leveling method measures at three points of the mower deck using the deck leveling gauge (A).

-: .

Adjusting Point 1	Located on the left rear deck trim
Adjusting Point 2	Located on the right rear deck trim
Adjusting Point 3	Located on the front deck hanger bracket

NOTE:
The deck leveling gauge (A) is stored in the tool box.

MX101363-UN: Location of Leveling Gauge

1. 

   MX101379-UN: Magnetic Pin

   Insert the magnetic pin (B) at the 2-1/2 inch hole and lower the deck. Once the deck is adjusted at the 2-1/2 inch cutting height position, it is level and calibrated for all other cut height positions.

2. Adjust the mower deck wheels as necessary so they do not contact the ground surface.

3. Remove the deck leveling gauge (A) from the tool box area.

4. Adjust mower deck side-to-side level:

   NOTE:
   Decks have a raised weld (C) for side-to-side measurement.

a.

MX101366-UN: Adjusting Point 1

Start by using the deck leveling gauge (A) to check the height between the ground and the deck rim at adjusting point 1 (rear left). The gauge should just slip under the deck rim.

b. If adjustments are necessary on the rear left deck rim area, turn rear nuts (D) clockwise to raise the mower deck or counterclockwise to lower the mower deck until the leveling gauge (A) just slips under adjusting point 1.

c. Repeat procedure on the rear right side of the deck for adjusting point 2.

> **NOTE:**
> **If an adjustment of more than 3 mm (1/8 inch) is required, adjust both points alternately. A large adjustment on one side can move the other side in the opposite direction.**

d. Repeat steps 4b and 4c as necessary.

> **NOTE:**
> **To avoid hardware from loosening during operation, ensure that bottom of the lock nut is engaged on the threaded fitting.**

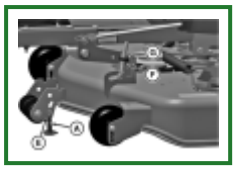
5. Adjust the mower deck front-to-back level:

> **NOTE:**
> **Adjustment point 3 has a flat bottom of the front deck hanger bracket (E).**

a. Use leveling gauge (A) to check the height between the floor and front deck hanger bracket (E) at adjusting point 3. The gauge should just slip under the bracket.

> **NOTE:**
> **For deck 48A, place the gauge (A) between the floor and front lip of the deck shell.**

b.



MX101367-UN: Adjusting Point 3

If adjustments are necessary, loosen lower nut (F) on both sides of the deck. Turn the top nut (G) equally on each side of deck (starting with the front left) clockwise to raise front of mower or counterclockwise to lower front of mower until gauge just slips under adjustment point 3. Tighten lower nuts after adjustment is complete and verify that four corners have some tension.

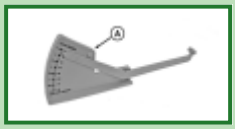
NOTE:
The front will lift a few millimeters when the jam nuts are tightened on the trunnion.

NOTE:
Before storing gauge, verify that deck latches in transport position. If it does not latch, return to adjustment points 1 and 2 and turn both rear adjusting nuts counterclockwise equally to lower rear of deck until deck latch engages.

6. Return deck leveling gauge to the stored position in the tool box.

Optional Leveling Method

NOTE:



MX101362-UN: Deck Leveling Gauge (PN: AM130907)

An optional mower deck leveling gauge (AM130907) (A) is available from your John Deere dealer. It allows for precise mower deck leveling by measuring mower deck level at the blade tips. This method can be used with all mower decks.

CAUTION:
Avoid injury! Rotating blades are dangerous. Before adjusting or servicing mower:

• Disconnect spark plug wires or battery negative (-) cable to prevent engine from starting accidentally.

• Always wear gloves when handling mower blades or working near blades.

NOTE:
Mower deck wheels should not contact the ground when leveling the deck.

1. Park the machine safely on a flat surface. (See Parking Safely in the Safety section).

2. Ensure that the front and rear tires are inflated to the specified pressure.

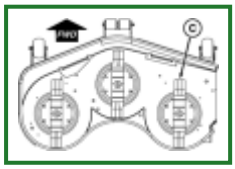
Item	Measurement	Specification
Front Tire	Pressure	103 kPa (15 psi)
Rear Tire	Pressure	69 kPa (10 psi)

3. Position the caster wheels to the forward driving position.

4. 

MX101379-UN: Insert Pin

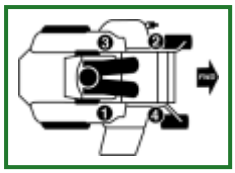
Insert magnetic pin (B) at the 2-1/2 inch hole and lower the deck. Once deck is adjusted at the 2-1/2 inch cutting height position, then it is level and calibrated for all other cut height positions.

5. 

MX101368-UN: Position Blade

Measure the mower level (front-to-rear). Turn the right blade (C), so the blade tip points straight forward.

6.



MX101369-UN: Order and Location of Adjustment Points

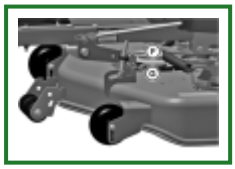
Start checking that the rear right blade tip is between 2-5/8—2-3/4 inches to the ground. If adjustment is necessary, turn the rear nut (E) clockwise to raise the mower deck or counterclockwise to lower the mower deck until the blade tip measurement is between 2-5/8—2-3/4 inches.

NOTE:
To avoid hardware from loosening during operation, ensure that bottom of the lock nut is engaged on the threaded fitting.

7.

MX101370-UN: Right Rear Hanger Bracket

Check that the front left blade tip is at 2-1/2 inches. If adjustment is needed, loosen lower nut (G) on the front left J rod. Turn top nut (F) clockwise to raise front of mower or counterclockwise to lower it until the distance between the lower tip of the blade to the ground is 2-1/2 inches. Tighten lower nuts after adjustment is complete.



MX101371-UN: Adjustment Point 2 - Front Left

NOTE:
The front will lift a few millimeters when the jam nuts are tightened on the trunnion.

8.

MX101372-UN: Adjustment Point 3 - Rear Left

Check that the rear left blade is between 2-5/8—2-3/4 inches. If adjustment is necessary, turn the rear nut (H) clockwise to raise the mower deck or counterclockwise to lower the mower deck until the blade tip measurement is between 2-5/8—2-3/4 inches.

NOTE:
To avoid hardware from loosening during operation, ensure that bottom of the lock nut is engaged on the threaded fitting.

9.

MX101373-UN: Adjustment Point 4 - Front Right

Check that the front right blade is at 2-1/2 inches. If adjustment is needed, loosen lower nut (I) on the front right J rod. Turn top nut (J) clockwise to raise front of mower or counterclockwise to lower it until the distance between the lower tip of the blade to the ground is 2-1/2 inches. Tighten lower nuts after adjustment is complete.

NOTE:
The front will lift a few millimeters when the jam nuts are tightened on the trunnion.

10. Verify that all four corners have some tension.

NOTE:
Verify that deck latches in transport position. If it does not latch, turn both rear adjusting nuts counterclockwise equally to lower rear of deck until deck latch engages.

SB31882,00003BF-19-20200617

Removing and Installing Mower Deck Foot Plate

CAUTION:
Avoid injury! Always operate the mower with the foot plate installed. Operating with the foot plate removed can cause serious injury.

Removing Foot Plate

1. Park machine safely. (See Parking Safely in the Safety section.)

2. 

MX101468-UN: Foot Plate

Lift the front end of the foot plate (A) upward as shown.

3. Using both hands, pull the foot plate out of the two openings (B) in the frame.

Installing Foot Plate

1. Using both hands, position the foot plate (A) into the two openings (B) in the frame.

2. Lower the foot plate until it rests securely in place.

SB31882,0000406-19-20200504

Removing Mower Deck

1. Park machine safely. (See Parking Safely in the Safety section.)

2. Allow engine and muffler to cool completely.

3. **CAUTION:**
Avoid injury! Rotating blades are dangerous. Before adjusting or servicing mower:

• Disconnect spark plug wires or battery negative (-) cable to prevent engine from starting accidentally.

• Always wear gloves when handling mower blades or working near blades.

Press the mower lift pedal (A) to raise mower deck to the transport lock position.

4. 

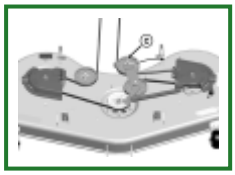
MX101449-UN: Lift mower

Temporarily remove the pin tool (B) and install the pin tool at the 2.75 inch hole to lock the mower deck in the lowered position. Pull the pedal rearward to allow insert of the pin at 2.75 inch hole if needed.

5. Lift rear of the mower deck and slide a 2x4 under it.

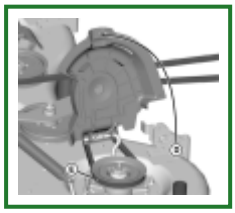
6. Disconnect mower drive belt:

⚠ CAUTION:
Avoid injury! Component is spring-assisted and under tension. Injury can occur if spring-assisted component is released suddenly.

- 

GXT002516-UN: Mower deck shown removed from machine for better view.

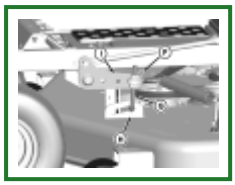
From the left side of machine, insert a 3/8 inch ratchet into the square hole (C) in the tension arm and pull clockwise and hold to release tension on the belt.

- 

GXT002519-UN: Mower deck shown removed from machine for better view.

Raise left spindle cover (D) and remove belt (E) from spindle.

- Remove belt from clutch sheave.

7. 

GXT002429-UN: Mower deck shown.

Remove locking clip (F) from the front draft link (G) and remove draft link from the mower deck bracket (H) and draft bracket (I). Repeat on the opposite side.

8. 

MX101521-UN: Remove spring clip and pin

Remove spring clip (N) and pin (O) from each side of the rear hanger bracket.

9. Rotate front caster wheels to maximize clearance.

10. Slide mower out from under the machine, move pedal to keep the lift bracketry out of the way (if needed).

    - Do not operate the machine without the mower deck: Machine may become unstable without the mower deck attached. Move machine only by hand. (See Moving Machine by Hand in Operating section.)

SB31882,00003F4-19-20200629

Installing Mower Deck

1. Park machine safely. (See Parking Safely in the Safety section.)

2. Allow engine and muffler to cool completely.

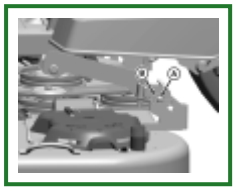
3. **CAUTION:**
Avoid injury! Rotating blades are dangerous. Before adjusting or servicing mower:

• Disconnect spark plug wires or battery negative (-) cable to prevent engine from starting accidentally.

• Always wear gloves when handling mower blades or working near blades.

Slide mower deck under the machine, move pedal to keep lift bracketry out of the way (if needed).

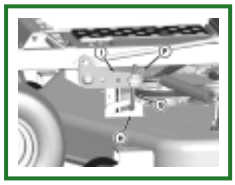
4.



GXT002432-UN: Install pin and spring.

Install the pin (A) and spring clip (B) onto each side of the rear mower bracket.

5.

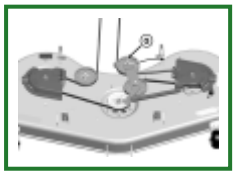


GXT002429-UN: Install draft rod.

Install front hanger rod (G) onto the mower deck brackets (H) and onto draft brackets (I). Secure each stud end with locking clip (F).

6.

⚠ CAUTION:
Avoid injury! Component is spring-assisted and under tension. Injury can occur if spring-assisted component is released suddenly.



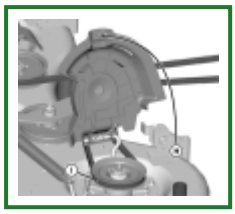
GXT002218-UN: 48A shown.

Connect mower drive belt:

- Install belt onto the engine sheave.
- **IMPORTANT:**

Avoid damage! Failure to install belt properly on left and right spindle sheaves may result in belt damage. Ensure proper installation of the belt on spindle sheaves.

Insert 3/8 inch ratchet onto the square hole (G) in the tension arm. Rotate arm clockwise and hold to release spring tension on idler sheave.

- 

GXT002520-UN: 48A shown.

Lift left spindle cover (H) and install mower belt (I) onto left spindle sheave. Release spindle cover and tension arm.

- Flip up left and right spindle covers to check that belt is correctly routed on all sheaves.

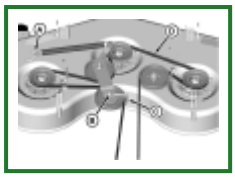
SB31882,00003F5-19-20200616

Replacing Mower Drive Belt

NOTE:
The following procedure is for the 48HC mower deck. All mower decks listed use a similar configuration of sheaves.

1. Park machine safely. (See Parking Safely in Safety section.)
2. Allow engine and muffler to cool completely.
3. Remove mower deck.

4. **CAUTION:**
Avoid injury! Components are installed under spring tension. Wear eye protection and use proper tools when installing and removing components with spring tension.



GXT002808-UN: Remove belt

Remove deck drive belt as follows:

a. Remove spring from spring hook (A) on deck.

b. Remove nut (B) on the tension sheave and lower bolt to remove guide (C). Remove belt (D) from all sheaves.

5. Inspect belt for wear or damage; replace as necessary.

6. Clean top surface of the mower deck and sheaves.

7. **IMPORTANT:**
Avoid damage! Failure to seat the belt properly on sheaves results in belt damage.

Install belt on the mower deck as shown.

8. Make sure belt guide (C) is indexed as shown, and tighten nut (B) to specification.

Item	Measurement	Specification
Sheave Nut	Torque	47 N·m (35 lb·ft)

9. Install spring on spring hook (E) on deck.

10. Install mower deck.

SB31882,00003F6-19-20200609

Checking for Bent Mower Blades

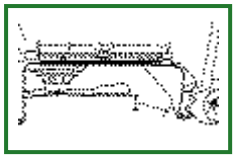
1. **CAUTION:**
Avoid Injury! Blades are sharp. Always wear gloves when handling blades or working near blades.

Replace blades if defective. Never straighten or weld them.

Park machine safely. (See Parking Safely in the Safety section.)

2. Raise mower deck to highest position to access blades.

3.



MXAL42867-UN: Mower deck with side discharge used for illustration

Measure distance (A) between blade tip and flat ground surface.

4. Rotate blade 180° and measure distance between other blade tip and flat ground surface.

5. Install new blade if the difference between the two measurements is more than 3 mm (1/8 in).

6. Repeat for all blades.

MP47322,00F466C-19-20230112

Servicing Mower Blades

CAUTION:
Avoid injury! Rotating blades are dangerous. Before adjusting or servicing mower:

• Disconnect spark plug wires or battery negative (-) cable to prevent engine from starting accidentally.

• Always wear gloves when handling mower blades or working near blades.

Removing Mower Blades

1. Park machine safely. (See Parking Safely in the Safety section.)

2. Raise mower deck to gain access to mower blades. If necessary, remove mower deck.

3. Block mower blade with a piece of wood to prevent it from spinning.

4.

MXAL47131-UN: Z500 Series deck shown

Loosen and remove the bolt (A), washer (B), and blade (C).

5. Inspect blades; sharpen, balance, or replace blades as necessary.

Installing Mower Blades

1. Make sure the deflector cup (D) is seated properly between the mower spindle and blade.
2. Position mower blade (C) with the cutting edge toward ground onto mower spindle.
3. Install washer (B), with the cupped side towards blade, and install bolt (A) to secure the blade onto spindle shaft.
4. Block mower blade with a piece of wood to prevent spinning and tighten bolt to specification.

Item	Measurement	Specification
Mower Blade Bolt	Torque	68 N·m (50 lb·ft)

SB31882,0000479-19-20200610

Electrical

WARNING: Avoid injury! Battery posts, terminals and related accessories contain lead and lead components, chemicals known to the State of California to cause cancer and reproductive harm. **Wash hands after handling.**

MP47322,00F466E-19-20230112

Service the Battery Safely

MXAL42869-UN: Warning

CAUTION:
Avoid injury! The battery produces a flammable and explosive gas.

To prevent the battery from exploding:

- **Do not smoke or have open flame near battery.**
- **Wear eye protection and gloves.**
- **Do not allow direct metal contact across battery posts.**
- **Remove negative cable first when disconnecting.**
- **Install negative cable last when connecting.**

- **Always route battery cables away from battery posts.**

MX52301,000102B-19-20160912

Removing and Installing the Battery

Removing

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Rotate operator seat forward.
3. Remove battery compartment cover.

4. 

MX101453-UN: Battery Cables

Disconnect negative (-) battery cable (A).

5. Push red cover (B) away from positive (+) battery terminal and remove cable (C) from battery.
6. Remove battery.

Installing

1. Place battery into the battery tray as shown.
2. Connect positive (+) cable to battery first, then negative (-) cable.
3. Apply general-purpose grease or silicone spray to terminals to help prevent corrosion.
4. Slide red cover over the positive battery terminal.
5. Install battery compartment cover.
6. Lower operator seat.

SB31882,0000407-19-20200511

Cleaning Battery and Terminals

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Disconnect and remove battery.
3. Wash battery with solution of four tablespoons of baking soda to one gallon of water. Be careful not to get the soda solution into the cells.
4. Rinse the battery with plain water and dry.
5. Clean terminals and battery cable ends with wire brush until bright.
6. Install battery.
7. Attach cables to battery terminals, beginning with the positive cable, using washers and nuts.
8. Apply general-purpose grease or silicone spray to terminals to help prevent corrosion.

SU68010,000010C-19-20180717

Use Booster Battery

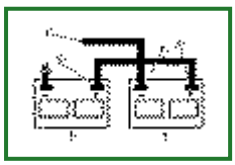
CAUTION:
Avoid injury! The battery produces a flammable and explosive gas.

To prevent the battery from exploding:

- **Do not smoke or have open flame near battery.**
- **Wear eye protection and gloves.**
- **Do not jump-start or charge a frozen battery. Warm battery to:**

Item	Measurement	Specification
Battery	Temperature	16°C (60°F)

- **Do not connect the negative (-) booster cable to the negative (-) terminal of the discharged battery. Connect at a good ground location away from the discharged battery.**



MXAL42872-UN: Battery Booster Connection

LEGEND:

A - Booster Battery
B - Disabled Vehicle Battery
C - Positive (+) Post
D - Positive (+) Post
E - Negative (-) Post
F - Negative (-) Booster Cable End

1. Connect positive (+) booster cable to booster battery (A) positive (+) post (C).
2. Connect the other end of positive (+) booster cable to the disabled vehicle battery (B) positive (+) post (D).
3. Connect negative (–) booster cable to booster battery negative (–) post (E).
4. **IMPORTANT:**
   Avoid damage! Electric charges from the booster battery damages machine components. Do not install negative booster cable to machine frame. Install only to the engine block.

   Install negative booster cable away from moving parts in the engine compartment, such as belts and fan blades.

   Connect the other end (F) of negative (–) booster cable to a metal part of the disabled machine engine block away from battery.
5. Start the engine of the disabled machine and run machine for several minutes.
6. Carefully disconnect the booster cables in the exact reverse order: negative cable first and then the positive cable.

MP47322,00F4672-19-20230810

Replacing Fuses

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Raise the operator seat.

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3. 

   MX101470-UN: Battery Compartment

   Remove the battery compartment cover.

4. Refer to the service label for fuse circuit identification and location.
5. Remove the fuse block cover (A).
6. Remove the fuse and visually inspect the metal strip in the fuse window. Discard fuse if strip is broken.

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7. 

MX101469-UN: Fuse block

Select a new fuse with the matching amp rating.

> **IMPORTANT:**
> **Avoid fire! Do not replace a fuse with a higher rated amp rating than specified.**

8. Push the fuse into correct socket.
9. Install the fuse block cover.
10. Lower the operator seat.

SB31882,0000408-19-20200504

Use Proper Fuel and Stabilizer

> **IMPORTANT:**
> **Avoid damage! Using stale, contaminated, or improper fuel result in engine and fuel system damage. Repairs caused by stale, contaminated, or improper fuel are not covered by warranty.**

Use regular grade unleaded fuel with an octane rating of 87 octane or higher. Fuel blends containing up to 10% ethanol or up to 15% MTBE reformulated fuel are acceptable. Do not use fuel or additives containing methanol as engine damage can occur.

Always use fresh, clean fuel that is purchased in a quantity that can be used within approximately 30 days. Fuel stabilizer should always be added to the fuel each time fuel is purchased. Add stabilizer before filling the fuel container to insure proper mixing.

Such practice helps prevent engine performance problems and allows fuel storage in the machine all year without draining.

Store fuel in plastic containers to reduce condensation. Make sure that the cap on the fuel container is tight to reduce fuel contamination and evaporation. For best fuel storage life, use a self-sealing gas can.

Fuel is blended to give best seasonal performance. To avoid engine performance problems such as hard starting or vapor lock, use in-season fuel. Use fuel during warm weather that was purchased during that season, and use fuel during cold weather that was purchased during that season.

Fuel can become stale in machines with engines that are used seasonally or infrequently during a season. Stale fuel can produce varnish and plug carburetor or EFI components which can affect engine performance.

Keep fuel storage container tightly covered and in a cool area out of direct sunlight. Fuel can break down and degrade if not sealed properly or exposed to sun and heat.

Condensation may collect in the fuel tank because of a variety of operating or environmental conditions and, over time, may affect your machine’s operation. Fill machine fuel tank at the end of the day.

MP47322,00F4674-19-20230817

Fill Fuel Tank

CAUTION:
Avoid injury! Fuel vapors are explosive and flammable:

- **Shut engine off before filling fuel tank.**
- **Allow engine to cool before refueling.**
- **Do not smoke while handling fuel.**
- **Keep fuel away from flames or sparks.**
- **Fill fuel tank outdoors or in ventilated area.**
- **Clean up spilled fuel immediately.**
- **Prevent static electric discharge by using a clean, approved, non metal container.**

IMPORTANT:
Avoid damage! Dirt and water in fuel causes engine damage:

- **Clean dirt and debris from the fuel tank opening.**
- **Use clean, fresh, stabilized fuel.**
- **Fill the fuel tank at the end of operation each day to prevent condensation and freezing during cold weather.**

- **If using a funnel, make sure it is plastic and has no screen or filter.**

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Allow engine to cool.
3. Remove any debris from area around fuel tank cap.
4. Remove fuel tank cap slowly to allow any pressure built up in tank to escape.
5. Fill fuel tank only to bottom of filler neck. Do not overfill.
6. **NOTE:**
   On some models, the fuel tank cap will click when it is tight.

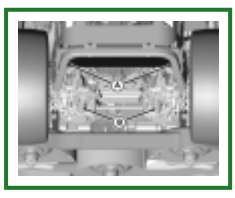
   Install fuel tank cap and turn cap until it is tight.

MP47322,00F4675-19-20230810

Lifting Machine

1. Park machine safely. (See Parking Safely in the Safety section.)
2. **CAUTION:**
   Avoid injury! The machine can fall or slip from an unsafe lifting device or supports.
   - **Use a safe lifting device rated for the load to be lifted.**
   - **Lower machine onto jack stands or other stable supports and block wheels before servicing.**

   NOTE:
   Remove any material collection system attachments before lifting the machine.



GXT002211-UN: Transaxle Locations

Safely lift rear of the machine frame points (A). Place jack stands or other stable supports onto transaxle locations (B).

3. 

MX101505-UN: Frame Points

Safely lift front of the machine at the machine frame point (C). Place jack stands or other stable supports onto the machine frame locations (D).

4. If only lifting front of machine, block rear wheels remaining on ground to avoid movement of the machine.

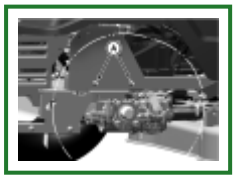
5. To lower the machine, lift front and/or rear of machine, and remove jack stands or supports. Lower the machine.

SB31882,000040B-19-20200511

Checking ROPS Hardware

1. Park machine safely. (See Parking Safely in the Safety section.)

2. **NOTE:**
When tightening ROPS hardware, tighten the nut side and not the bolt head side.

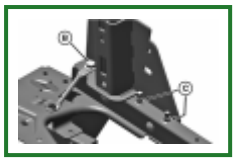


MX101397-UN: ROPS Hardware

Tighten two nuts (A) on each side of ROPS to specification.

Item	Measurement	Specification
ROPS Flange Nut (A)	Torque	51.5 ±10 N·m (38 ±7 lb·ft)

3.



MX101525-UN: ROPS Hardware

Tighten one screw (B) on each side of ROPS to specification.

Item	Measurement	Specification
ROPS Cap Screw (B)	Torque	135 ±25 N·m (100 ±18 lb·ft)

4. Tighten two nuts (C) on each side of ROPS to specification.

Item	Measurement	Specification
ROPS Flange Nut (C)	Torque	51.5 ±10 N·m (38 ±7 lb·ft)

5.

MX101526-UN: ROPS Hardware

Tighten one nut (D) on each side of ROPS to specification.

Item	Measurement	Specification
ROPS Flange Nut (D)	Torque	135 ±25 N·m (100 ±18 lb·ft)

6. Tighten one nut (E) on each side of ROPS to specification.

Item	Measurement	Specification
ROPS Flange Nut (E)	Torque	34 ±7 N·m (25 ±5 lb·ft)

SB31882,00003CB-19-20200612

Checking Tire Pressure

CAUTION:
Avoid injury! Explosive separation of tire and rim parts is possible when they are serviced incorrectly:

- **Do not attempt to mount a tire without the proper equipment and experience to perform the job.**

- **Make sure that all tires are inflated to the recommended pressure, especially when operating on slopes. Low pressure can cause machine to become unstable on slopes.**
- **Do not weld or heat a wheel and tire assembly. Heat can cause an increase in air pressure resulting in an explosion. Welding can structurally weaken or deform the wheel.**
- **Do not stand in front or over the tire assembly when inflating. Use a clip-on chuck and extension hose long enough to allow you to stand to one side.**

1. Check tires for damage.
2. Check tire pressure with an accurate low-pressure gauge.
3. A lower pressure will improve traction and performance depending on turf conditions or if transport areas have steep inclines.
4. Add or remove air to meet specified tire pressure. (See Specifications section for recommended tire pressures.)

MP47322,00F4677-19-20200610

Removing and Installing Wheel Assembly

Removing

1. Park machine safely. (See Parking Safely in the Safety section.)
2. **CAUTION:**
   Avoid injury! The machine can fall or slip from an unsafe lifting device or supports.
   - **Use a safe lifting device rated for the load to be lifted.**
   - **Lower machine onto jack stands or other stable supports and block wheels before servicing.**

   IMPORTANT:
   Avoid damage! Place jack stands under frame, not under transmission or engine, when raising or supporting machine.

   Raise machine with a safe lifting device and lower machine onto jack stands or other stable supports. Block wheels remaining on the ground to prevent machine movement.

3. 

MXAL42875-UN: Wheel Nuts

Remove the wheel nuts (A).

4. Remove the wheel assembly.

5. **CAUTION:**
Avoid injury! Explosive separation of tire and rim parts is possible when they are serviced incorrectly:

- **Do not attempt to mount a tire without the proper equipment and experience to perform the job.**

Take wheel assembly to an authorized service dealer for repairs.

Installing

1. Install wheel assembly with valve stem to the outside.
2. Tighten wheel nuts evenly in alternating sequence until snug.
3. Lower machine completely to the ground.
4. Tighten wheel nuts to specification.

Item	Measurement	Specification
Wheel Nuts	Torque	102 N·m (75 lb.-ft.)

MP47322,00F4678-19-20150526

Removing and Installing Front Caster Wheels

Disassembly:

1. Park machine safely. (See Parking Safely in the Safety section.)

2. **CAUTION:**
Avoid injury! The machine can fall or slip from an unsafe lifting device or supports.

- **Use a safe lifting device rated for the load to be lifted.**
- **Lower machine onto jack stands or other stable supports and block wheels before servicing.**

NOTE:
Before lifting the machine, remove all attachments..

Jack up the front of machine and place on safety stands.

3. 

MX101459-UN: Cap and bolt

Support caster assembly and remove flange bolt (A) and cap (B).

4. Remove caster from the machine.

5. 

MXAL47138-UN: Inspect bearings at top and bottom of frame

Inspect bearings (C) at top and bottom of frame. Replace worn or damaged bearings.

NOTE:
Inner race extends above the outer race.

6. 

MXAL47139-UN: Remove nut and pull bolt out of caster.

Remove nut (D) and pull bolt out of caster.

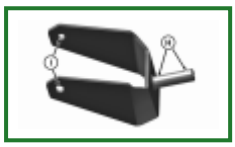
7. Remove wheel assembly (E).

8.

MXAL47140-UN: Remove shield and bearing.

Remove shield (F) and bearing (G). Inspect shields, wheel, and bearings for wear or damage. Replace worn or damaged parts.

9.



MX101527-UN: Visually inspect for wear or damage

Inspect bearing wear areas (H) and bolt holes (I) for wear or damage. Replace if necessary.

Assembly

- Apply grease to the caster shaft and bolt.
- Assemble in the reverse order of disassembly.
- Tighten caster locknut and bolt to specification.

Item	Measurement	Specification
Caster Locknut	Torque	47 N·m (35 lb·ft)

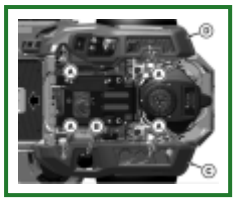
- Tighten flange bolt securing yoke to specification.

Item	Measurement	Specification
Flange Bolt	Torque	47 N·m (35 lb·ft)

SB31882,00003FF-19-20200622

Removing and Installing Side Style Covers

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Move each of the motion control levers inward.
3. Raise the seat and rotate forward.

4. 

MX101506-UN: ROPS Not Shown For Clarity

Remove three push retainers (A) from the left-hand style cover (C).

5. Remove fuel tank cap (B).
6. Lift the left-hand style cover (C) from the machine and immediately install the fuel cap (B).
7. Remove three push retainers (A) from the right-hand style cover (D).
8. Lift the right-hand style cover (D) from the machine.
9. Repeat steps in reverse order to install style covers on the machine.

SB31882,000040C-19-20200706

Cleaning and Repairing Metal Surfaces

Cleaning:

Follow automotive practices to care for your vehicle’s painted metal surfaces. Use a high-quality automotive wax regularly to maintain the factory look of your vehicle’s painted surfaces.

Repairing Minor Scratches (surface scratch):

1. Clean area to be repaired thoroughly.
2. **IMPORTANT:**
   Avoid damage! Do not use rubbing compound on painted surfaces.

   Use automotive polishing compound to remove surface scratches.
3. Apply wax to entire surface.

Repairing Deep Scratches (bare metal or primer showing):

1. Clean area to be repaired with rubbing alcohol or mineral spirits.
2. Use paint stick with factory-matched colors available from your authorized dealer to fill scratches. Follow directions included on paint stick for use and for drying.

3. Smooth out surface using an automotive polishing compound. Do not use power buffer.

4. Apply wax to surface.

MP47322,00F467A-19-20210920

Using Troubleshoot Chart

-: Troubleshooting Chart

If you are experiencing a problem that is not listed in this chart, see your Technical Manual or authorized dealer for service.

MP47322,00F467B-19-20230803

Engine

-: Engine

IF	CHECK
Poor Engine Performance	Dirt in fuel system or fuel is old. Replace fuel with fresh stabilized fuel. Obtain fuel from another supplier before suspecting machine problems. Suppliers blend fuels differently and changing suppliers will generally solve any performance problems Fuel blended with alcohol or ether may contribute to performance problems by causing gum and varnish deposits, especially if fuel is stored for several weeks or more. Obtain fresh fuel.
Engine Will Not Start - No Crank	Park brake not locked. Motion control levers not in outward position. Mower is engaged. Defective brake, mower engagement, or key switch. Electrical problem - See Electrical Troubleshooting Section
Engine Cranks But Will Not Start	Spark plug wire is loose or disconnected. Improper fuel. Plugged fuel filter. Electrical problem - See Electrical Troubleshooting Section

IF	CHECK
Engine Is Hard To Start	Carburetor is not adjusted properly or dirty. Choke not fully closing. Plugged fuel filter. Faulty spark plug. Stale or improper fuel. Loose or corroded electrical connections. Engine oil viscosity.
Engine Runs Unevenly	Cooling fins plugged. Loose electrical connections. Choke or throttle cable sticking. Choke not fully open. Fuel line or fuel filter plugged. Stale or dirty fuel. Improper fuel. Air cleaner element plugged.
Engine Misses Under Load	Faulty spark plug. Stale or dirty fuel. Plugged fuel filter.
Engine Vapor Locks	Fuel tank vent plugged. Dirt in fuel filter. Cooling fins plugged. Loose hose connection at fuel filter or fuel pump.
Engine Overheats	Engine air intake screen plugged. Cooling fins plugged. Engine oil low or too high. Engine operated too long at a slow idle speed.

IF	CHECK
Engine Will Not Idle	Spark plug not gapped correctly. Faulty spark plug. Operator raising off the seat.
Engine Knocks	Stale or low octane fuel. Engine overloaded. Low engine speed. Oil level low.
Engine Stops Or Misses When Operating On Hillsides	Fuel tank less than half full of fuel. Operator raising off of the seat.
Engine Backfires	Faulty spark plug. Operator raising off of the seat.
Engine Loses Power	Engine overheating. Too much oil in engine. Dirty air cleaner. Faulty spark plug. Travel speed is too fast for conditions. Improper fuel.
Excessive Fuel Consumption	Choke is not fully open.
Black Exhaust Smoke	Air filter is dirty or oil soaked.

TH84124,0000252-19-20150716

Electrical

-: Troubleshooting Electrical

IF	CHECK
Starter Does Not Work Or Will Not Turn Engine	Park brake not locked. Mower is engaged. Battery terminals are corroded. Battery not charged. Motion control levers not in Start/Shutdown position. Blown fuse. Defective key switch
Battery Will Not Charge	Dead cell in the battery. Blown charging fuse. Battery cables and terminals are dirty. Low engine speed or excessive idling.
Lights Do Not Work	Light plug disconnected. Loose or burned out bulb. Blown headlight fuse.

MP47322,00F467D-19-20130315

Machine

-: Troubleshooting Machine

IF	CHECK
Machine Vibrates Too Much Or Rattles Excessively	Attachment drive belts worn or damaged. Mower blades not balanced. Traction drive belt damaged or worn. Dirt on drive sheaves.
Machine Will Not Move With Engine Running	Transmission hydraulic oil level low. Transmission belt broke. Bypass valve levers are engaged.

IF	CHECK
Machine Moves With Engine Running And Hydrostatic Control In Neutral	Linkage out of adjustment. Transmission neutral out of adjustment.
Mower Lift Will Not Latch in Transport	Ensure linkage is adjusted correctly and is not loose or binding. Loosen all four corners to drop the deck when it is at 2-1/2 inch height-of-cut. Re-level using Optional Leveling Procedure.
Front of machine squeaks while driving	Lubricate mower front draft rod at front and rear pivot points.

MP47322,00F467E-19-20200706

Mower

-: Troubleshooting Mower

IF	CHECK
Discharge Chute Plugged	Travel speed too fast. Grass too long. Grass too wet. Engine rpm not at mow position. Restricted air flow. Belt installed incorrectly. Adjust cutting height to remove only 1/3 of grass at a time.
Patches Of Grass Uncut	Travel speed too fast. Engine rpm not at mow position. Mower deck needs cleaning.
Belt Slipping	Debris in sheaves. Worn belt. Belt tension is incorrect.

IF	CHECK
Too Much Vibration	Debris on mower deck or in sheaves. Damaged drive belt. Damaged sheaves or sheaves out of alignment. Blades out of balance.
Front Tires Vibrate	Set front tire pressure to recommended specification. If vibration continues, reduce tire pressure by 1 psi until vibration stops.
Blades Scalping Grass	Cutting too low. Mower wheels not adjusted correctly. Turning speed too fast. Ridges in terrain. Rough or uneven terrain. Low tire pressure.
Mower Loads Down Tractor	Engine rpm too low. Travel speed too fast. Debris wrapped around mower spindles. Adjust cutting height to remove only 1/3 of grass at a time.
Uneven Cut	Mower deck not leveled properly. Travel speed too fast. Blades dull. Mower wheels not adjusted correctly. Tire pressure unequal. Adjust cutting height to remove only 1/3 of grass at a time.
Excessive Clippings are Expelled from Front of Mower Deck	Conditions may be too dry or terrain too uneven to provide good seal between front of deck and grass. Visithttp://JDParts.deere.com () or contact dealer to purchase dry condition kit.

SB31882,000047A-19-20220517

Storing Safety

CAUTION:
Avoid injury! Fuel vapors are explosive and flammable.

Engine exhaust fumes contain carbon monoxide and cause serious illness or death:

- **Run the engine only long enough to move the machine to or from storage.**
- **If a machine is stored before allowing it to cool, machine fires and structure fires can occur. Fires can occur if debris is not removed from around the engine and muffler, or if stored near combustible materials.**
- **Do not store vehicle with fuel in the tank inside a building where fumes reach an open flame or spark.**
- **Allow the engine to cool before storing the machine in any enclosure.**

MP47322,00F4680-19-20150506

Preparing Machine for Storage

1. Repair any worn or damaged parts. Replace parts if necessary. Tighten loose hardware.
2. To prevent rust, repair scratched or chipped metal surfaces.
3. Remove grass and debris from machine.
4. Clean under the rotary deck and remove grass and debris from inside chute and bagger, if applicable.
5. Wash the machine and apply wax to metal and plastic surfaces.
6. To dry belts and pulleys, run machine for five minutes.
7. To prevent rust, apply light coat of engine oil on pivot and wear points.
8. Lubricate grease points and check tire pressure.

MP47322,00F4681-19-20160713

Preparing Fuel and Engine For Storage

Fuel:

If you have been using “Stabilized Fuel,” add stabilized fuel to tank until the tank is full.

NOTE:
Filling the fuel tank reduces the amount of air in the fuel tank and helps reduce deterioration of fuel.

If you are not using “Stabilized Fuel”:

1. Park machine safely in a well-ventilated area. (See Parking Safely in the Safety section.)
2. **NOTE:**
   Try to anticipate the last time the machine will be used for the season so very little fuel is left in the fuel tank.

   Turn on engine and allow to run until it runs out of fuel.
3. turn key switch to the OFF position.
4. **IMPORTANT:**
   Avoid damage! Stale fuel can produce varnish and plug carburetor or injector components and affect engine performance.
   - **Add fuel conditioner or stabilizer to fresh fuel before filling tank.**

   Mix fresh fuel and fuel stabilizer in separate container. Follow stabilizer instructions for mixing.
5. Fill fuel tank with stabilized fuel.
6. Run engine for a few minutes to allow fuel mixture to circulate through carburetor on gas engine or fuel injectors on diesel engine.

Engine:

Engine storage procedure should be used when vehicle is not to be used for longer than 60 days.

1. Change engine oil and filter while engine is warm.
2. Service air filter if necessary.

3. Clean debris from engine air intake screen.
4. On gas engines:
   - Remove spark plugs. Put 30 mL (1 oz) of clean engine oil in cylinders.
   - Install spark plugs, but do not connect spark plug wires.
   - Crank the engine 5 or 6 times to allow oil to be distributed.
5. Clean the engine and engine compartment.
6. Remove battery.
7. Clean the battery and battery posts. Check the electrolyte level if your battery is not maintenance free.
8. Close fuel shutoff valve if your machine is equipped.
9. Store the battery in a cool, dry place where it will not freeze.
10. **NOTE:**
    The stored battery should be recharged every 90 days.

    Charge the battery.
11. **IMPORTANT:**
    Avoid damage! Prolonged exposure to sunlight could damage surfaces. Store machine inside or use a cover if stored outside.

    Store the vehicle in a dry, protected place. If vehicle is stored outside, put a waterproof cover over it.

SB31882,000048E-19-20200706

Removing Machine From Storage

1. Check tire pressure.
2. Check engine oil level.
3. Check battery electrolyte level if your battery is not maintenance free. Charge battery if necessary.
4. Install battery.

5. On gas engines: check spark plug gap. Install and tighten plugs to specified torque.

6. Lubricate all grease points.

7. Open fuel shut-off valve if your machine is equipped.

8. Run the engine 5 minutes without the mower or any attachments running to allow oil to be distributed throughout engine.

9. Be sure all shields and guards or deflectors are in place.

MP47322,00F4683-19-20230217

Engine

-: Engine

Z515E
Make.....Briggs & Stratton
Model Number.....44U877
Power Rating Information.....http://www.briggsandstratton.com/ ()
Bore.....79.25 mm (3.12 in)
Stroke.....73.40 mm (2.89 in)
Displacement.....724 cm3 (44.18 in³)
Cylinders.....V-Twin
Cycle.....Four
Valve Clearance (Cold).....0.10 - 0.15 mm (0.004 - 0.006 in)
Spark Plug Gap.....0.76 mm (0.030 in)
Spark Plug Torque.....20 N•m (14.75 lb·ft)
Z530M and Z530R
Make.....Kawasaki
Model Number.....FR730V
Power Rating Information.....https://www.kawasakienginesusa.com/ ()
Bore.....78 mm (3.070 in)

Stroke.....76 mm (2.992 in)
Displacement.....726 cm3 (44.3 in³)
Cylinders.....V-Twin
Cycle.....Four
Valve Clearance (Cold).....0.075 - 0.125 mm (0.002 - 0.005 in)
Spark Plug Gap.....0.75 mm (0.029 in)
Spark Plug Torque.....20 N•m (14.75 lb·ft)
Z545R
Make.....Briggs & Stratton
Model Number.....(EFI) 44X977
Power Rating Information.....http://www.briggsandstratton.com/ ()
Bore.....79.25 mm (3.12 in)
Stroke.....73.40 mm (2.89 in)
Displacement.....724 cm3 (44.18 in³)
Cylinders.....V-Twin
Cycle.....Four
Valve Clearance (Cold).....0.10 - 0.15 mm (0.004 - 0.006 in)
Spark Plug Gap.....0.75 mm (0.030 in)
Spark Plug Torque.....20 N•m (14.75 lb·ft)

SB31882,0000490-19-20220517

Drivetrain

-: Drivetrain

Transaxle Motors (Z515E, Z530M and Z530R).....Tuff Torq TZT7 U
Transaxle Motors (Z545R).....Tuff Torq TZT7 M
Number of Speeds.....Hydrostatic, Variable Speed

SB31882,0000491-19-20200821

Travel Speeds at Full Engine RPM

-: Travel speeds

Z515E and Z530M
Forward.....0-12.87 km/h (0-8.0 mph)
Reverse.....0-6.44 km/h (0-4.0 mph)
Z530R and Z545R
Forward.....0-14.48 km/h (0-9.0 mph)
Reverse.....0-7.24 km/h (0-4.5 mph)

SB31882,0000492-19-20200826

Electrical System

-: Electrical System

Battery Type.....12 Volt
Cold Cranking Capacity.....300 Amps

TH84124,0000201-19-20150611

Fuel System

-: Z515E, Z530M, Z530R

Fuel Types (Recommended):
.....Regular Grade 87 Octane Unleaded Fuel
.....Ethanol Blended Fuel (Up to 10%)
Fuel Filter.....Replaceable - paper element
Fuel Pump.....Pulse
Fuel Delivery.....Carburetor

-: Z545R

Fuel Types (Recommended):
.....Regular Grade 87 Octane Unleaded Fuel

.....Ethanol Blended Fuel (Up to 10%)
Fuel Filter.....Replaceable - paper element
Fuel Delivery.....Fuel Injection

SB31882,00003E9-19-20200610

Tires

-: Tires

Front (Z515E, Z530M, Z530R, Z545R).....13x6.50-6 (Ribbed)
Rear (Z515E, Z530M,).....22x9.5-10 (Turf)
Rear (Z530R, Z545R).....23x10.5-12 (Turf)
Inflation - Front.....103 kPa (15 psi)
Inflation - Rear.....69 kPa (10 psi)

SB31882,0000493-19-20210106

Capacities

-: Capacities

Crankcase with oil filter:
Z515E (Briggs & Stratton Engine).....1.9 L (2.0 qt)
Z530M, Z530R (Kawasaki Engine).....2.1 L (2.2 qt)
Z545R (Briggs & Stratton Engine).....1.9 L (2.0 qt)
Fuel Tank:
All models.....17 L (4.5 gal)
Oil Sump:
Z515E.....1.9 L (2.0 qt)
Z530M, Z530R.....2.0 L (2.1 qt)
Z545R.....1.9 L (2.0 qt)

Towing:
Towing Capacity (All Models).....113.39 kg (250 lb)
Maximum Tongue Load.....45.4 kg (100 lb)

SB31882,000048F-19-20210517

Dimensions

-: Dimensions

Z515E
Height.....1780 mm (70.1 in)
Width (48A Deck).....1587 mm (62.4 in)
Length.....1954 mm (76.9 in)
Weight (with 48A Deck).....340 kg (750 lb)
Z530M
Height.....1780 mm (70.1 in)
Width (with 48A Deck).....1587 mm (62.4 in)
Length.....1954 mm (76.9 in)
Weight (with 48A Deck).....353 kg (776 lb)
Z545R
Height.....1796 mm (70.7 in)
Width (with 48HC Deck).....1583 mm (62.3 in)
Length.....2080 mm (81.9 in)
Weight (with 48HC Deck).....379 kg (835 lb)

SB31882,0000494-19-20200821

Mower Decks

-: Mower decks

48A Mower (Z515E, Z530M)

Cutting Width.....1.22 m (48 in)
Blades-Rotary.....3
Blade Bolt Torque.....68 N•m (50 lb·ft)
Cutting Height (Approximately).....25—102 mm (1—4 in)
54A Mower (Z515E, Z530M)
Cutting Width.....1.37 m (54 in)
Blades-Rotary.....3
Blade Bolt Torque.....68 N•m (50 lb·ft)
Cutting Height (Approximately).....25 - 102 mm (1 - 4 in)
60A Mower (Z515E, Z530M)
Cutting Width.....1.52 m (60 in)
Blades-Rotary.....3
Blade Bolt Torque.....68 N•m (50 lb·ft)
Cutting Height (Approximately).....25—102 mm (1—4 in)
48HC High Capacity Mower (Z545R)
Cutting Width.....1.22 m (48 in)
Blades-Rotary.....3
Blade Bolt Torque.....68 N•m (50 lb·ft)
Cutting Height (Approximately).....25—102 mm (1—4 in)
54HC High Capacity Mower (Z545R)
Cutting Width.....1.37 m (54 in)
Blades-Rotary.....3
Blade Bolt Torque.....68 N•m (50 lb·ft)
Cutting Height (Approximately).....25—102 mm (1—4 in)
60HC High Capacity Mower (Z545R)
Cutting Width.....1.52 m (60 in)

Blades-Rotary.....3
Blade Bolt Torque.....68 N•m (50 lb·ft)
Cutting Height (Approximately).....25—102 mm (1—4 in)

SB31882,0000495-19-20200706

Recommended Lubricants

-: Recommended lubricants specification chart

Engine Oil.....TURF-GARD® OR PLUS-4®
Grease
.....GREASE-GARD™ Premium Plus
.....John Deere Multi-Purpose HD Lithium Complex Grease

(Specifications and design subject to change without notice.)

OUMX068,0000657-19-20140311

Product Warranty

John Deere offers a standard warranty on new John Deere products. For a copy of the product warranty statement or for details on the warranty terms and conditions for products purchased in the United States and Canada, please contact your local John Deere Dealer or utilize the following resources:

United States

Website:

http://www.deere.com/en_US/services_and_support/warranty/warranty.page ()

Toll Free: 1-800-537-8233

Dealer Locator:

http://dealerlocator.deere.com/servlet/country=US ()

Canada

Website (English):

http://www.deere.ca/en_CA/services_and_support/service_plans_warranties/service_plans ()

Website (French):

http://fr.deere.ca/en_CA/services_and_support/service_plans_warranties/service_plans_wa
()

Toll Free: 1-800-537-8233

Dealer Locator:

http://dealerlocator.deere.com/servlet/country=CA ()

Emission-related warranties are included in this Operator's Manual, and applicable if required by law or regulation.

For products purchased in a country other than the United States or Canada, please contact your local John Deere dealer for assistance.

MP47322,00F4690-19-20220601

California and U.S. EPA Emissions Control System Warranty Statement (Off-Road Gas Engines)

Your Warranty Rights and Obligations

The California Air Resources Board, John Deere, and the United States Environmental Protection Agency are pleased to explain the emissions control system's warranty on your model year 2021 or 2022 spark ignited off-road engine equipment. In California, new equipment that uses small or large (less than 1 liter) spark ignited off-road engines must be designed, built and equipped to meet the state's stringent anti-smog standards. John Deere must warrant the emissions control system on your spark ignited off-road engine equipment for the period listed below provided there has been no abuse, neglect or improper maintenance of your equipment leading to the failure of the evaporative emissions system.

Your emissions control system may include parts such as: carburetors or fuel-injection system, ignition system, catalytic converters, fuel tanks, valves, filters, clamps, connectors, fuel lines (for liquid fuel and fuel vapors) and other associated components. Also included may be hoses, belts, sensors and other emission-related assemblies.

Where a warrantable condition exists, John Deere will repair your spark ignited off-road engine equipment at no cost to you including diagnosis, parts and labor.

Manufacturer's Warranty Coverage

This emissions control system is warranted for two years for models S100, S110, S120, S130, S140, S150, S160, S170, S180, S220, Z335E, Z345M, Z345R, Z355E, Z355R, Z365R, Z375R, Z515E, Z545R, and three years for all other models referenced in this

operator’s manual. If any emissions related part on your equipment is defective, the part will be repaired or replaced by John Deere.

Owner’s Warranty Responsibilities

- As the spark ignited off-road engine equipment owner, you are responsible for the performance of the required maintenance listed in your Operator’s Manual. John Deere recommends that you retain all receipts covering maintenance on your spark ignited off-road engine equipment, but John Deere cannot deny warranty coverage solely for lack of receipts or for your failure to ensure the performance of all scheduled maintenance.
- As the spark ignited off-road engine equipment owner, you should be aware that John Deere may deny you warranty coverage if your spark ignited off-road engine equipment or a part has failed due to abuse, neglect, or improper maintenance or unapproved modifications.
- You are responsible for presenting your spark ignited off-road engine equipment to a John Deere Turf and Utility distribution center or service center as soon as a problem exists. The warranty repairs shall be completed in a reasonable amount of time, not to exceed 30 days. If you have a question about your emissions warranty coverage, how to make an emissions warranty claim or how to make arrangements for emissions-related authorized repairs, you should contact your John Deere Turf and Utility retailer, or the John Deere Customer Contact Center at 1-800-537-8233, or email John Deere from https://www.deere.com/en/our-company/contact-us/.

General Emissions Warranty Coverage

The warranty period begins on the date the equipment is delivered to an ultimate purchaser. John Deere warrants to the ultimate purchaser and each subsequent purchaser that the spark ignited off-road engine equipment is:

- Designed, built and equipped so as to conform to all applicable regulations adopted by the California Air Resources Board;
- Designed, built and equipped so as to conform at the time of sale to the ultimate purchaser with applicable U.S. Environmental Protection Agency regulations under 40 CFR Parts 1054 and 1060: and,
- Free from defects in materials and workmanship which cause such engine to fail to conform with applicable regulations for the Emissions Control System Warranty period provided herein.
- For owners located more than 100 miles from a John Deere authorized service center, John Deere will pay either for shipping costs to and from an authorized service center, provide for a service technician to come to the owner to make the warranty repair, or pay for the repair to be made at a local non-authorized service center. These provisions do not apply to Alaska, Hawaii, Arizona, Colorado, Idaho, Montana, Nebraska, Nevada, New Mexico, Oregon, Texas, Utah, and Wyoming.

Emissions Warranty Interpretation

- Any warranted part that is not scheduled for replacement as required by the maintenance instructions in the Operator’s Manual is warranted as provided herein. If any such part fails during the period of warranty coverage it will be repaired or

replaced by John Deere. Any such part repaired or replaced under warranty is warranted for the remaining warranty period.

- Any warranted part that is scheduled only for regular inspection in the maintenance instructions in the Operator’s Manual is warranted as provided herein. A statement in the Operator’s Manual to the effect of “repair or replace as necessary” does not reduce the period of warranty coverage. Any such part repaired or replaced under warranty is warranted for the remaining warranty period.
- Any warranted part that is scheduled for replacement as required maintenance in the Operator’s Manual is warranted for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part will be repaired or replaced by John Deere. Any such part repaired or replaced under warranty is warranted for the remainder of the period prior to the first scheduled replacement point for the part.
- Repair or replacement of any warranted part under the warranty will be performed at no charge to the owner at any authorized John Deere Turf and Utility retailer.
- The owner will not be charged for diagnostic labor which leads to the determination that a warranted part is defective, provided such work is performed by John Deere or an authorized John Deere service provider.
- John Deere will repair damages to other engine components proximately caused by a failure under warranty of any emissions-related warranted part.
- Add-on or modified parts that are not exempted by the California Air Resources Board may not be used. The use of any non-exempted add-on or modified parts will be grounds for disallowing a warranty claim. John Deere will not be liable to warrant failures of warranted parts caused by the use of a non-exempted add-on or modified part.

Emission Warranty Parts List

Coverage under this warranty includes, but is not limited to, the parts listed below (the emissions control system parts) to the extent these parts were on the engine and equipment purchased.

Fuel Metering System:

- Carburetor and internal parts (or fuel injection system)
- Air/fuel ratio feedback and control system
- Cold start enrichment system

Evaporative System:

- Fuel tank, fuel cap and tether
- Fuel hose, line, fittings, clamps
- Fuel pump, fuel shut-off valve
- Fuel vapor hoses, fittings
- Carbon canister
- Rollover/slant valve for fuel vapor control
- Purge and vent line

Air Induction System:

- Air cleaner
- Intake manifold

Ignition System:

- Spark plugs
- Magneto or electronic ignition system
- Spark advance/retard system
- Gaskets

Exhaust System:

- Exhaust manifold
- Catalyst muffler

Miscellaneous Items Used in Above Systems

- Valves and Switches: vacuum, temperature, position, check, time-sensitive
- Electronic controls
- Hoses, belts, connectors and assemblies

Limited Liability

a) The liability of John Deere under this Emissions Control System Warranty is limited solely to the remedying of defects in materials or workmanship. Except as otherwise expressly provided herein, this warranty does not cover inconvenience or loss of use of the non-road equipment or engine or transportation of the equipment or engine to or from the John Deere Turf and Utility retailer. John Deere shall not be liable for any other expense, loss, or damage, whether direct, incidental, consequential (except as listed above under “coverage”) or exemplary arising in connection with the sale or use of or inability to use the non-road equipment or engine for any other purpose.

b) No express emissions control system warranty is given by John Deere with respect to the equipment or engine except as specifically set forth in this document. Any emissions control system warranty implied by law, including any warranty of merchantability or fitness for a particular purpose, is expressly limited to the emissions control system warranty terms set forth in this document.

c) No dealer is authorized to modify this Federal, California and John Deere Emissions Control System Warranty.

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Tire Warranty

John Deere warranty applies for tires available through the John Deere parts system. For tires not available through the John Deere parts system, the tire manufacturer’s warranty applicable to your machine may not apply outside the U.S. (See your John Deere dealer for specific information.)

MX00654,0000314-19-20140821

Limited Battery Warranty For Factory Installed Batteries

NOTE:
Applicable in North America only. For complete machine warranty, reference a copy of the John Deere warranty statement. Contact your John Deere dealer to obtain a copy.

TO SECURE WARRANTY SERVICE

The purchaser must request warranty service from a John Deere dealer authorized to sell John Deere batteries, and present the battery to the dealer with the top cover plate codes intact.

FREE REPLACEMENT PERIOD

Any new battery which becomes unserviceable (not merely discharged) due to defects in material or workmanship within the FREE REPLACEMENT PERIOD will be replaced free of charge. Installation costs will be covered by warranty if the unserviceable battery was installed by a John Deere factory or dealer and the replacement battery is installed by a John Deere dealer.

PRO RATA ADJUSTMENT (batteries with letter code identification only)

Any new battery which becomes unserviceable (not merely discharged) due to defects in material or workmanship within the Pro Rata Warranty Period will be replaced upon payment of the battery’s current list price less a pro rata credit for unused months of service. The applicable adjustment period is determined from the Warranty Code printed at the top of the battery and table below. Installation costs are not covered after the battery warranty period has ended.

THIS WARRANTY DOES NOT COVER

A. Breakage of the container, cover, or terminals.

B. Depreciation or damage caused by lack of reasonable and necessary maintenance or by improper maintenance.

C. Transportation, mailing, or service call charges for warranty service.

D. Batteries that are merely discharged.

LIMITATION OF IMPLIED WARRANTIES AND PURCHASER’S REMEDIES

To the extent permitted by law, neither John Deere nor any company affiliated with it makes any warranties, representations, or promises as to the quality, performance or freedom from defect of the products covered by this warranty. IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, TO THE EXTENT APPLICABLE, SHALL BE LIMITED IN DURATION TO THE APPLICABLE ADJUSTMENT PERIOD SET FORTH HERE. THE PURCHASER'S ONLY REMEDIES IN CONNECTION WITH THE BREACH OR PERFORMANCE OF ANY WARRANTY ON JOHN DEERE BATTERIES ARE THOSE SET FORTH HERE. IN NO EVENT WILL THE DEALER, JOHN DEERE OR ANY COMPANY AFFILIATED WITH JOHN DEERE BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. (Note: Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages. So these limitations and exclusions may not apply to you.) This warranty gives you specific legal rights, and you may also have some rights which vary from state to state.

NO DEALER WARRANTY

The selling dealer makes no warranty of its own and the dealer has no authority to make any representation or promise on behalf of John Deere, or to modify the terms or limitations of this warranty in any way.

WARRANTY TERMS TABLE

NOTE:
If your battery is not labeled with a warranty code, it is a warranty code 6.

-: PRO RATA MONTHS OF ADJUSTMENT

Warranty Code	Free Replacement Period	Pro Rata Warranty Period
A	90 Days	40 Months
B	90 Days	36 Months
C	90 Days	24 Months
D	12 Months	48 Months
E	90 Days	12 Months
F	90 Days	60 Months
G	12 Months	60 Months
H	12 Months	60 Months
6	6 Months	0 Months
12	12 Months	0 Months

Warranty Code	Free Replacement Period	Pro Rata Warranty Period
18	18 Months	0 Months

OUMX068,0000504-19-20170510

John Deere Quality

John Deere equipment is more than just a purchase, it’s an investment in quality. That quality goes beyond our equipment to your John Deere dealer’s parts and service support. This support is needed to keep you a satisfied customer.

That’s why John Deere has initiated a process to handle your questions or problems, should they arise. The following three steps will help guide you through the process.

Step 1

Refer to your operator’s manual

A. It has many illustrations and detailed information on the safe and proper operation of your equipment.

B. It gives troubleshooting procedures, and specification information.

C. It gives ordering information for parts catalogs, service and technical manuals.

D. If your questions are not answered in the operator’s manual, then go to Step 2.

Step 2

Contact your dealer

A. Your John Deere dealer has the responsibility, authority, and ability to answer questions, resolve problems, and fulfill your parts and service needs.

B. First, discuss your questions or problems with your dealer’s trained parts and service staff.

C. If the parts and service people are unable to resolve your problem, see the dealership manager or owner.

D. If your questions or problems are not resolved by the dealer, then go to Step 3.

Step 3

Contact John Deere

A. Your John Deere dealer is the most efficient source in addressing any concern, but if you are not able to resolve your problem after checking your operator’s manual and contacting your dealer, contact John Deere for assistance.

B. For prompt, effective service, please have the following ready before you call:

- The name of the dealer with whom you’ve been working.
- Your equipment model number.
- Number of hours on machine (if applicable).
- Your serial number which you recorded on the inside front cover of this manual.
- If the problem is with an attachment, your attachment identification number.

C. Then call 1-800-537-8233 (United States and Canada) and our advisor will work with your dealer to investigate your concern. If you are outside the United States and Canada, visit the following website:

https://www.deere.com/en/global-country-selector/

Select your country and then click on the Contact Us link at the bottom of the page.

SP66632,00043A7-19-20230614

Record Service Dates

-: Service record chart

Oil Change	Oil Filter Change (If Equipped)	Lubricate Machine	Air Cleaner Element Check/Clean	Fuel Filter Change

OUO1082,00066CA-19-20170515

Slope Gauge Template

-: Directions

Hold up or copy this page and follow the directions below to use the Slope Gauge Template.

MXT013189-UN: Slope Gauge Template

-: Slope Gauge

Use this slope gauge to determine if a slope is too steep for safe operation. Do not operate your machine on a slope greater than what is recommended in your operator’s manual. See Operating on Slopes in the Safety section.

• Fold along the appropriate line (A) to match the recommended slope.

• Align this edge (B) with a vertical surface, a tree, building, fence pole, etc.

• Compare slope (C) with folded edge.

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