

S100, S110, S120, S130, S140, S160, S170, and S180 Tractors

(Serial No. 010001- -)



JOHN DEERE

OPERATOR'S MANUAL

100 Series Lawn Tractors

OMUC22642 ISSUE H0 (ENGLISH)

CALIFORNIA

Proposition 65 Warning

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

If this product contains a gasoline engine:

WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The State of California requires the above two warnings.

Additional Proposition 65 Warnings can be found in this manual.

John Deere Power Products

North American Edition
PRINTED IN U.S.A.



Introduction

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-19-10MAY17

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.

OUC02005,000078D-19-11FEB20

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-19-05JUN17

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

Visit <http://JDParts.deere.com> for your Internet connection to parts ordering and information.

TC00531,00000E9-19-06MAR15

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.

TH84124,0000199-19-05FEB20

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.

OUC02005,00006F6-19-19MAY19

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Product Identification

Record Identification Numbers

Lawn Tractors

S100, S110, S120, S130, S140, S160, S170, S180

PIN (010001—)

If you need to contact an authorized service center for information on servicing, always provide the product model and identification numbers.

You need to locate the product identification number (PIN) for the machine and engine serial number. Record the information in the following spaces:

DATE OF PURCHASE:

DEALER NAME:

DEALER PHONE:

PRODUCT IDENTIFICATION NUMBER:

ENGINE SERIAL NUMBER:

Machine Product Identification Number Location



Located on Left Side of Frame

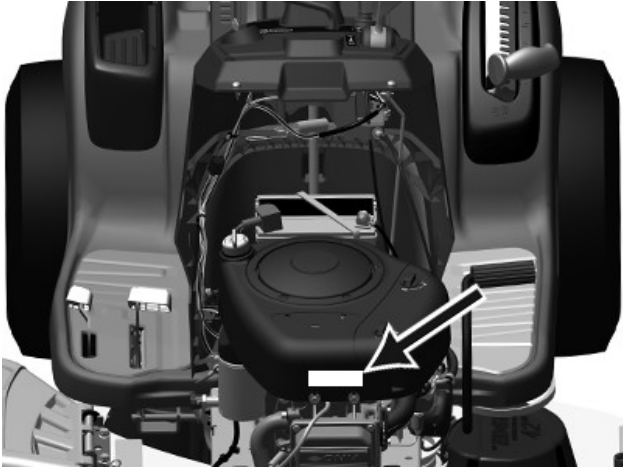
APY33773—UN—06APR20

Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

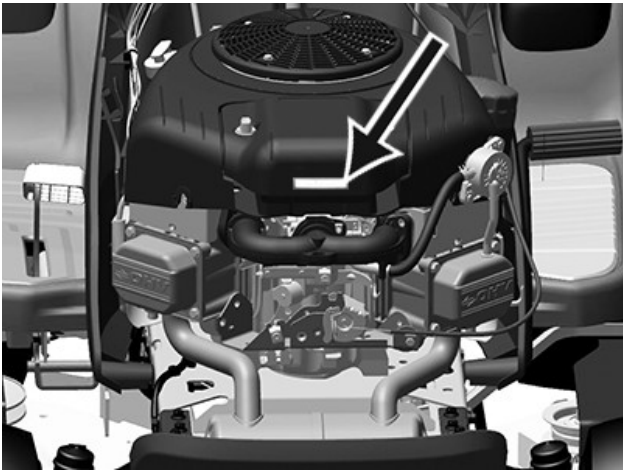
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Moline, Illinois
All rights reserved.

Product Identification

Engine Serial Number Location



APY36194—UN—10JUL20



V-Twin Engines

APY33771—UN—06APR20

SR99263.00002E8-19-06JUL20

Register Your Product and Warranty Online

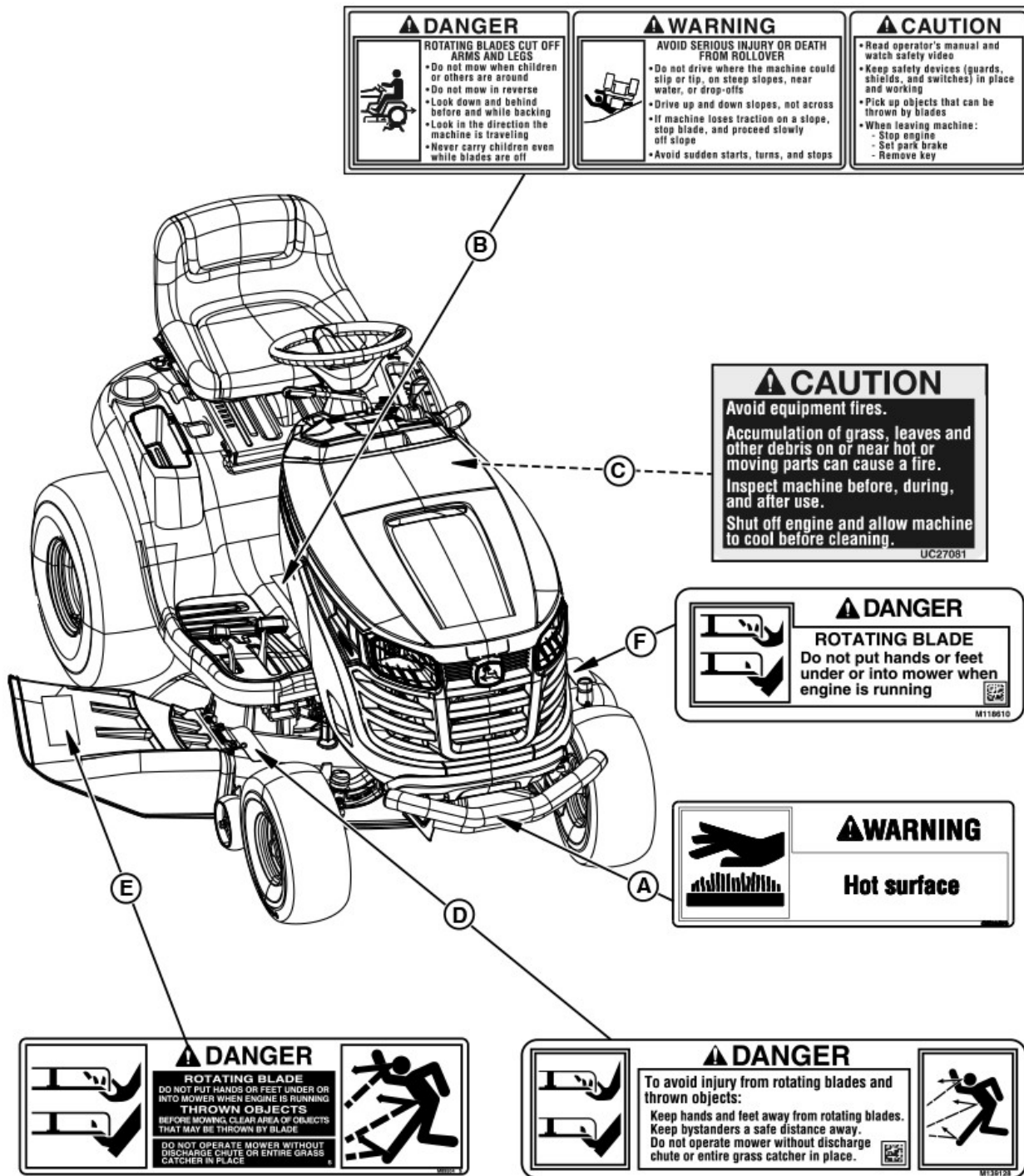
To register your product through the Internet, simply go to www.JohnDeereWarrantyRegistration.com. Completing the information, either online or with the product warranty card, will ensure that your product will receive all post sales, service, and important product information.

MP47322.00F45FF-19-05JUN17

Safety Labels with Text

Safety Labels with Text

Safety Label Location



A—WARNING— GX23479
B—DANGER/WARNING/CAUTION — UC22512
C—CAUTION— UC27081

D—DANGER — M139128
E—DANGER — M89504
F—DANGER — M118610

APY36141—UN—24JUL20

MG39705.00004A3-19-25JUN20

Safety Labels with Text

Understanding the Machine Safety Labels



MXAL42363—UN—22MAY13

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.

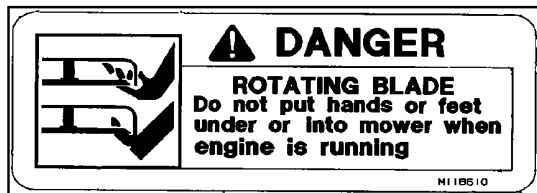
French or Spanish Safety Labels and Operator's Manual

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.

MP47322.00F4601-19-24APR19

DANGER



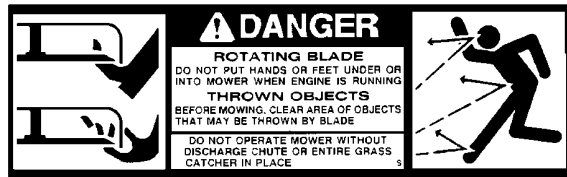
GXAL41947—UN—04MAR13

ROTATING BLADE

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

OUC02004.0000BAF-19-28FEB15

DANGER



GXAL41948—UN—04MAR13

ROTATING BLADE

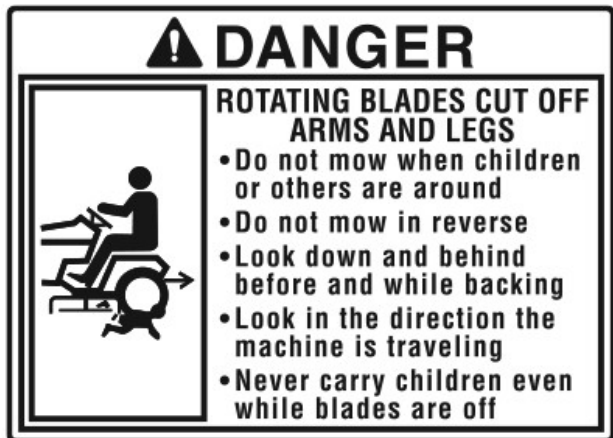
- Do not put hands or feet under or into mower when engine is running.

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.

OUC02004.0000BB0-19-28FEB15

DANGER



APY36142—UN—24JUL20

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
- Never carry children even with blades off

MG39705.00004A4-19-26JUN20

Safety Labels with Text

WARNING



APY36143—UN—24JUL20

AVOID SERIOUS INJURY OR DEATH FROM ROLLOVER

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

MG39705.00004A5-19-24JUL20

CAUTION



APY36144—UN—10JUL20

- 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

MG39705.00004A6-19-26JUN20

Avoid Injury From Hot Surface



GXAL41952—UN—04MAR13

WARNING

- Hot surface

OUO2004.0000BB3-19-28FEB15

CAUTION



APY36145—UN—10JUL20

Avoid equipment fires

Accumulation of grass, leaves and other debris on or near hot or moving parts can cause a fire

Inspect machine before, during, and after use

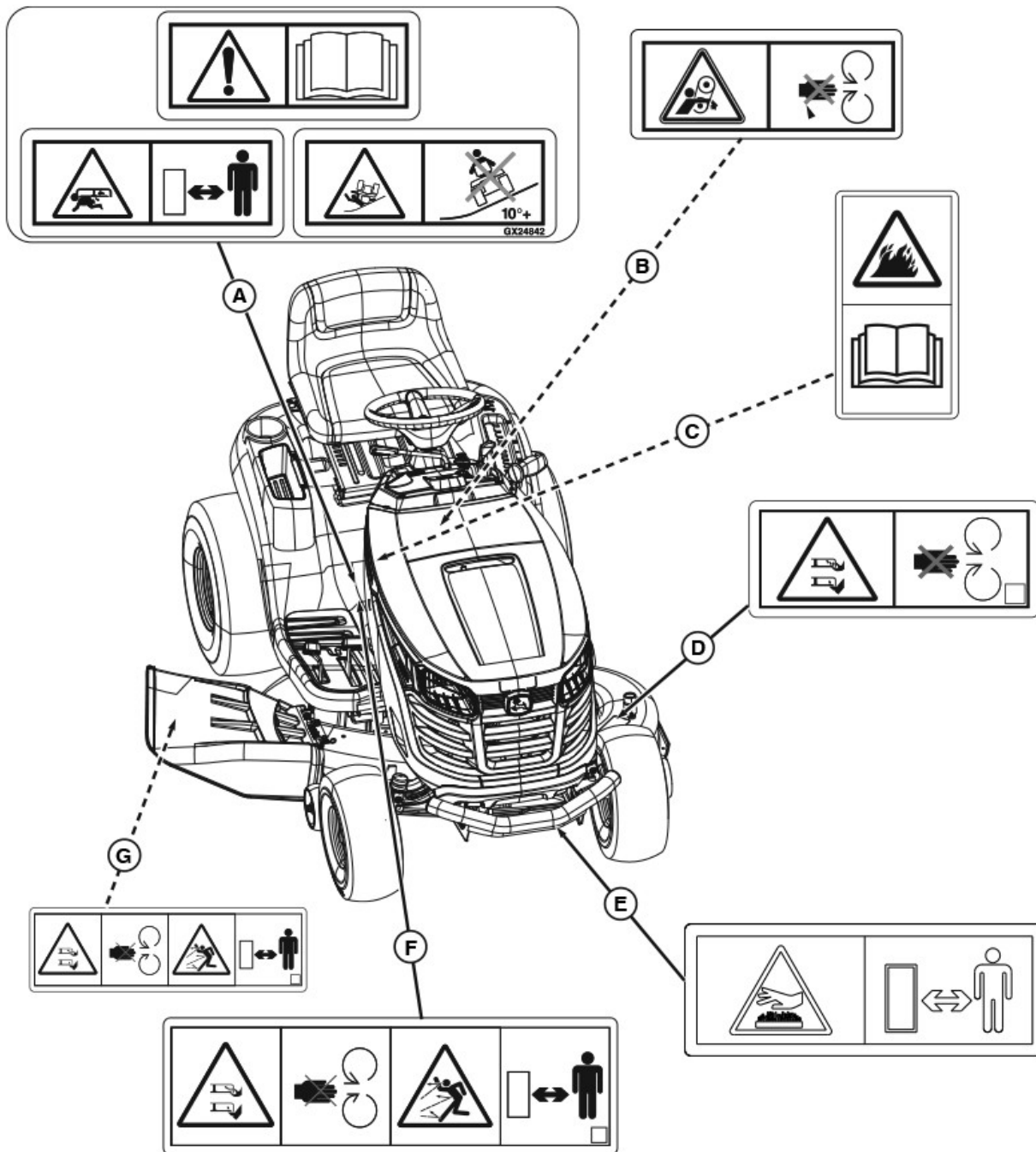
Shut off engine and allow machine to cool before cleaning

MG39705.00004A7-19-26JUN20

Safety Labels without Text

Safety Labels without Text

Safety Label Location



A— Read OM, Keep Children Away from Mower; Avoid Injury from Tipping — GX24842
 B— Avoid Injury from Getting Caught in Belt — M136436
 C— Avoid Injury from Equipment Fires — GX24503

D— Avoid Injury from Rotating Blades — M118041
 E— Avoid Injury from Hot Surfaces — GX25568
 F— Avoid Injury from Rotating Blades and Thrown Objects — M148522
 G— Avoid Injury from Rotating Blades and Thrown Objects — M118040

APY31470—UN—24JUL20

VS70618,0000805-19-03JUL20

Safety Labels without Text

Understanding the Machine Safety Labels without Text



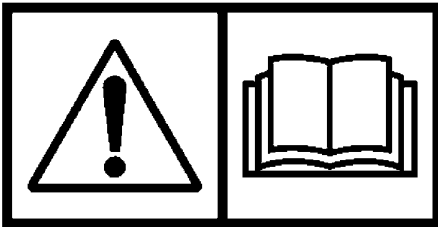
TCT005498—UN—11SEP12

At several important places on this machine, safety signs are affixed which signify potential danger. The hazard is identified by a pictorial in a warning triangle. An adjacent pictorial provides information on how to avoid personal injury. These safety signs, their placement on the machine, and a brief explanatory text are shown in this Safety section.

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

MX00654.0000389-19-21JUN18

Read Operator's Manual

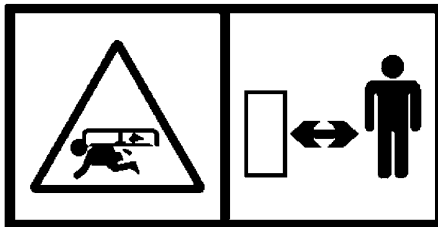


MXAL42776—UN—09APR13

- 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.

MX00654.000038B-19-01APR19

Keep Children Away from Mower

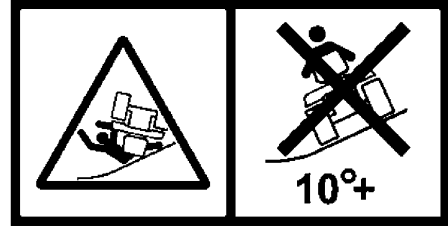


MXAL42778—UN—09APR13

- 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.

MX00654.000038D-19-01APR19

Avoid Serious Injury or Death from Tipping

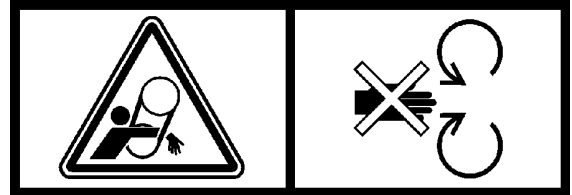


MXAL42779—UN—09APR13

- 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 the Operating on Slopes section for more information.

MX00654.000038E-19-01APR19

Avoid Injury from Getting Caught in Belts



MXTO18017—UN—03MAY16

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

MX00654.0000391-19-24APR19

Safety

Avoid Injury from Equipment Fires

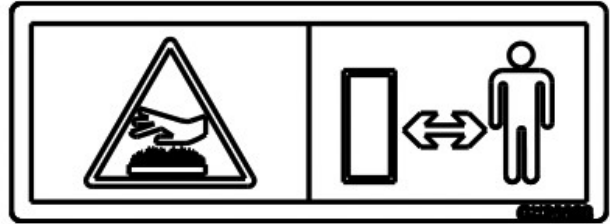


APY36195—UN—10JUL20

- 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.

MG39705.00004B6-19-06JUL20

Avoid Injury from Hot Surfaces



APY36196—UN—10JUL20

- Keep away from hot surfaces.

MG39705.00004B7-19-06JUL20

Avoid Injury from Rotating Blades and Thrown Objects

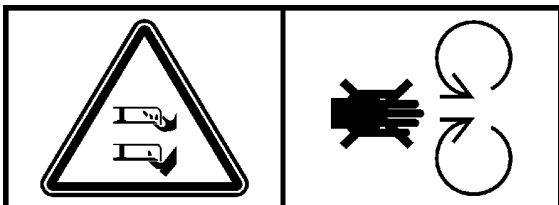


APY36197—UN—10JUL20

Avoid injury from rotating blade and thrown objects. Do not operate blower without entire grass catcher in place. Shut engine off before unlogging or servicing.

MG39705.00004B8-19-06JUL20

Avoid Injury from Rotating Blades



MXT018016—UN—03MAY16

- 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.

MX00654.0000392-19-24APR19

Safety

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

Safety

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

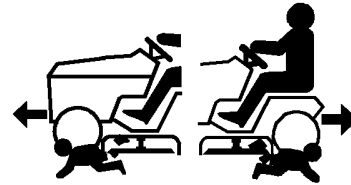
- Some attachments require ballast weights. Follow recommendations for wheel weights or counterweights.
- Use only accessories and attachments approved by John Deere.

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

OUC2005.0000784-19-09MAR20

Preventing Injuries

Protect Children



MXAL41929—UN—18FEB13

- 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.

OUC2005.0000783-19-15FEB20

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 up and down slopes, not across.
- Watch for holes, ruts, bumps, rocks, or other hidden objects. Tall grass can hide obstacles.

Safety

- 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

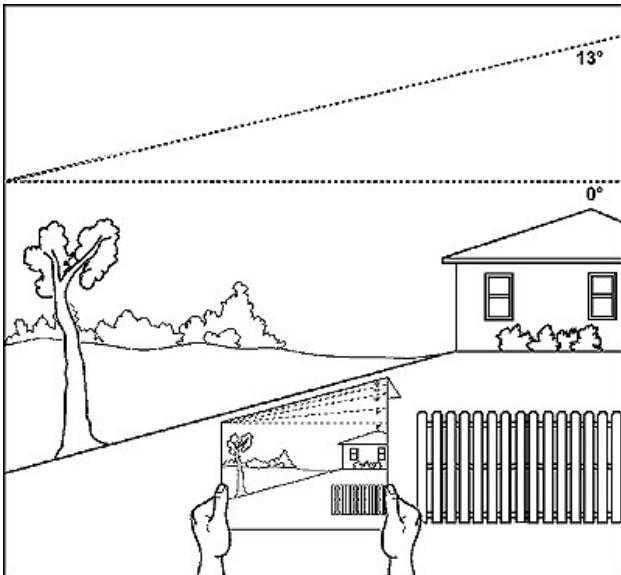
- Before using your machine, measure slopes of all mowing areas to determine which slopes are safe for mowing with a ride-on mower. Use good judgment and common sense when performing this survey.

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.

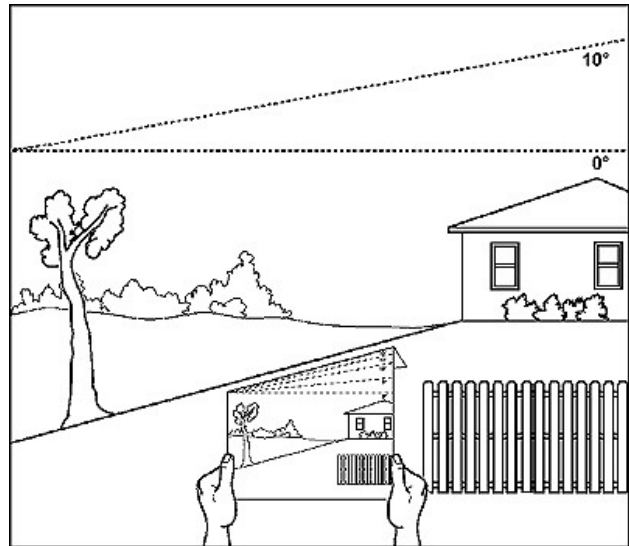
Slope Limits

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



GX100108—UN—14FEB20

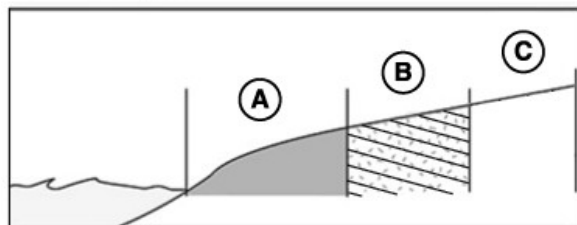
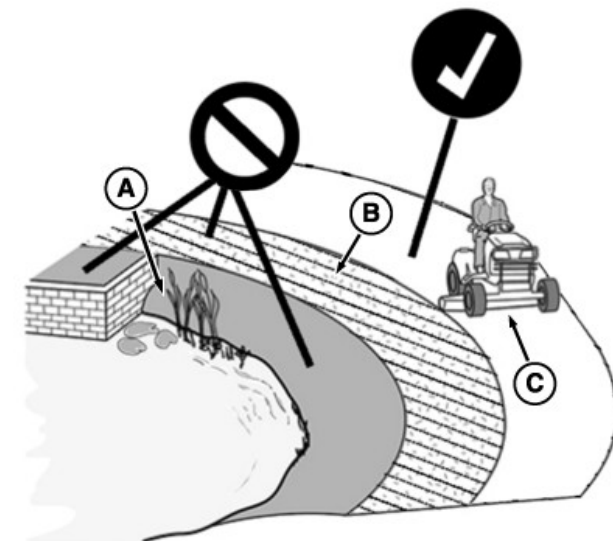
- Never mow or operate this ride-on mower on slope angles greater than 13° with ride-on mower in its basic configuration. The basic configuration is the ride-on mower with a mower deck and no other attachments. (A 13° slope is a slope that rises 1.4 m [4.6 ft] over a horizontal distance of 6.1 m [20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



GX100111—UN—19FEB20

- 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



GX100106—UN—01FEB20

- 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

Safety

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.

OUO2005.0000785-19-09MAR20

Prevent Fires



TS227—UN—15APR13

- 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.

OUO2005.0000787-19-15FEB20

Parking Safely

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

- Stop the machine on a level surface.
- Disengage mower blades or other attachments.
- Lower attachments to the ground.
- Apply the park brake.
- Stop the engine.
- Remove the key.
- Wait for engine and all moving parts to stop before you leave the seat.

OUO2005.0000788-19-15FEB20

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.

OUO2005.0000789-19-15FEB20

Machine Cleanout

Machine Cleanout

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 damage! 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.

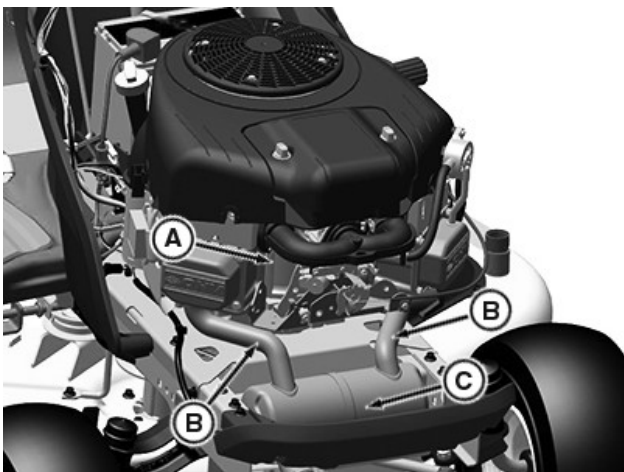
Always follow all safety procedures posted on the machine and in the Operator's Manual. Before carrying out any inspection or cleaning, always shut OFF engine, set park brake, and remove key.

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

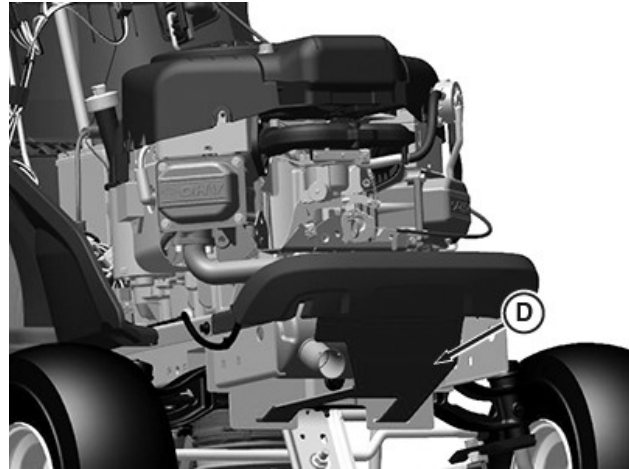
SR99263.000028F-19-15APR20

Cleanout Areas

Primary areas that must be inspected and cleaned on the machine include (see Safety Label section):

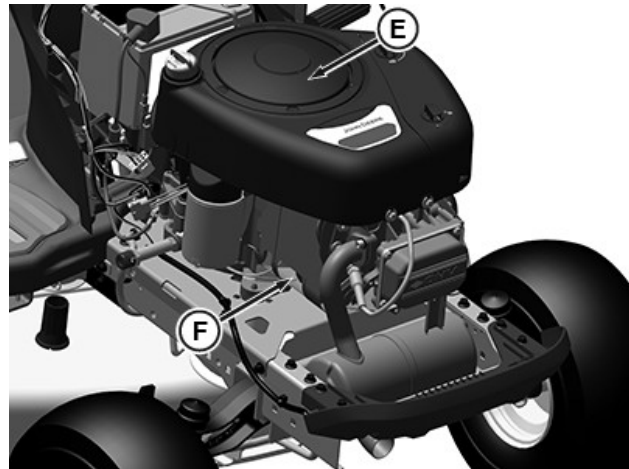


APY33760—UN—26MAR20



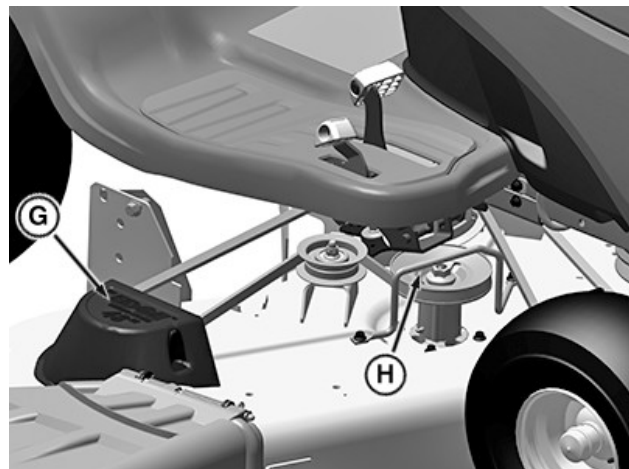
APY33761—UN—26MAR20

1. Exhaust manifold (A), muffler pipe (B), muffler (C), and muffler shield (D).



APY36199—UN—28JUL20

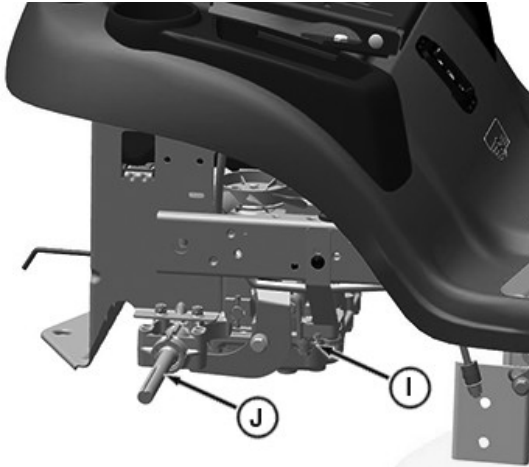
2. Engine intake screens (E), cooling fins (F), and oil cooler (if equipped).



PY43269—UN—29MAY17

3. Top of mower deck, under shields (G), including spindle (H) and belt areas.

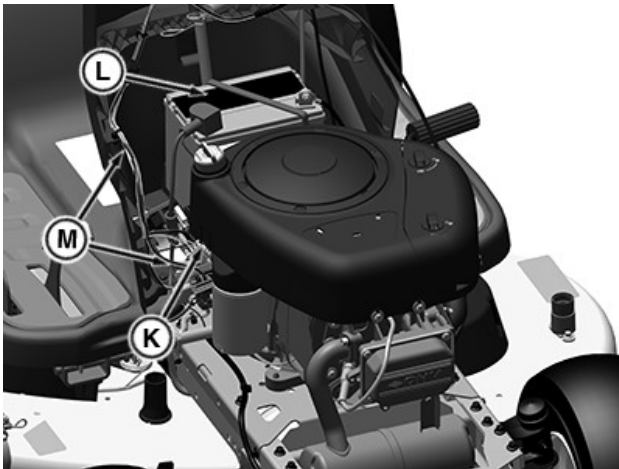
Machine Cleanout



Shown with Wheel Removed

APY36511—UN—14MAY20

4. On or near transmission (I) and driveline (J).



APY36151—UN—10JUL20

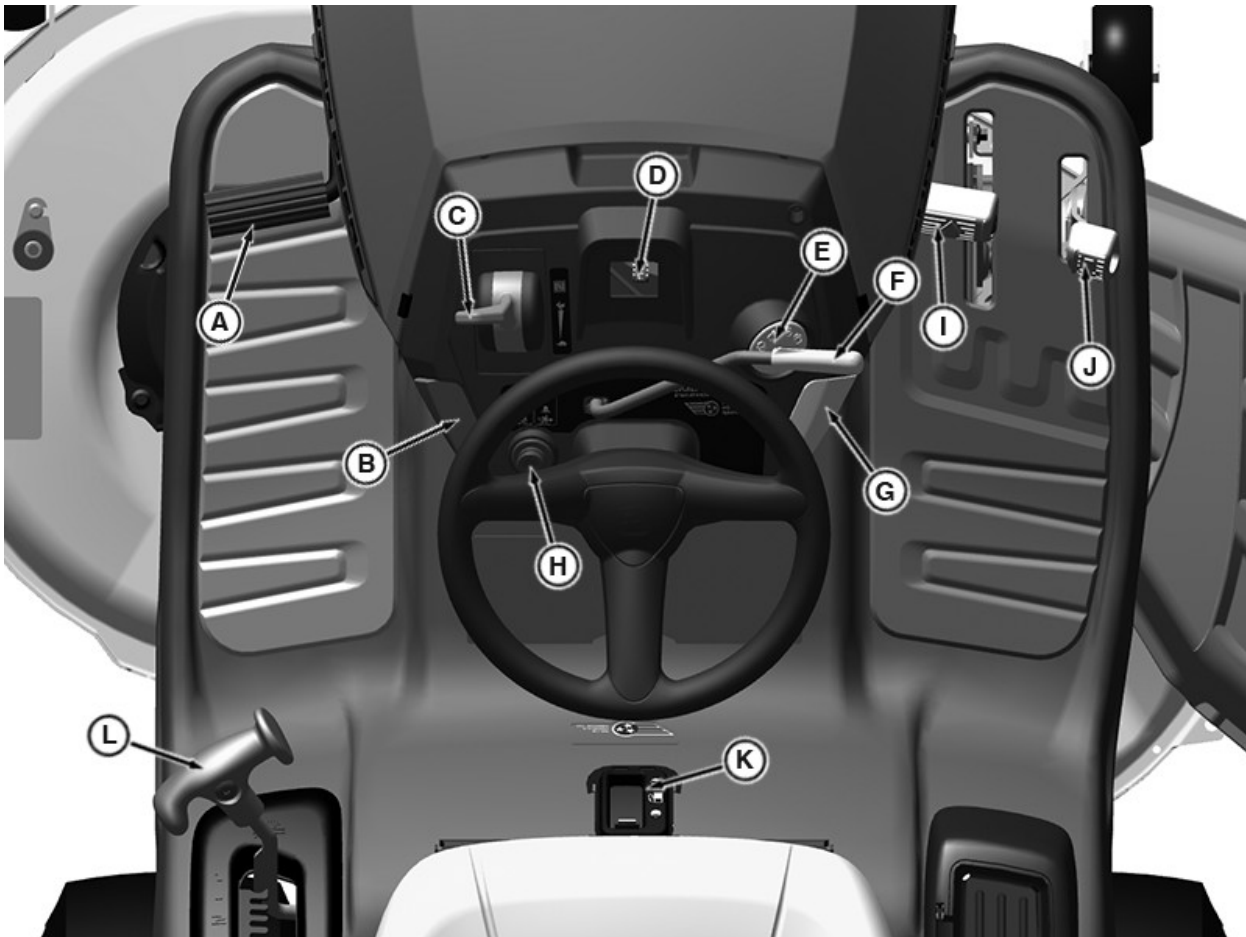
5. Under left side panel near fuse block (K) and all wiring, including the battery (L) and related wiring harnesses (M).

SR99263,00002FA-19-28JUL20

Operating Controls

Operating Controls

Operator's Station Controls "Models S100, S110, and S120"



Model S110 is Shown.

APY33757—UN—24JUL20

A—Brake Pedal
B—Park Brake Lock Lever
C—Throttle/Choke Lever
D—Hourmeter/MowerPlus™ Fuel Gauge (If Equipped)
E—Key Switch
F—Attachment Engagement Lever

G—Cruise Control Lever (If Equipped)
H—Reverse Implement Option (RIO) Switch
I—Forward Travel Pedal
J—Reverse Travel Pedal
K—Cover/Fuel Level Window (If Equipped)
L—Attachment Lift Lever

MG39705.00004D7-19-24JUL20

MowerPlus is a trademark of Deere & Company

Operating

Operator's Station Controls "Models S130, S140, S160, S170, and S180"



Model S180 is Shown.

APY36152—UN—24JUL20

A—Brake Pedal
B—Park Brake Lock Lever
C—Throttle/Choke Lever
D—Reverse Implement Option (RIO) Switch
E—Hourmeter/MowerPlus™ Fuel Gauge (If Equipped)
F—Key Switch

G—Cruise Control Lever (If Equipped)
H—Attachment Engagement Switch
I—Forward Travel Pedal
J—Reverse Travel Pedal
K—Cover/Fuel Level Window (If Equipped)
L—Attachment Lift Lever

MG39705.00004D8-19-24JUL20

Operating

Daily Operating Checklist

- Check/test safety systems.
- Check tire pressure and brakes.

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

- Check fuel level. (See Service Miscellaneous section, using proper fuel and stabilizer.)
- Check engine oil level.
- Remove grass and debris from engine compartment and muffler area, and on top of mower deck, before and after operating machine.
- Clean air intake screen.
- Check below machine for fluid leaks.

- Check/tighten any loose hardware.

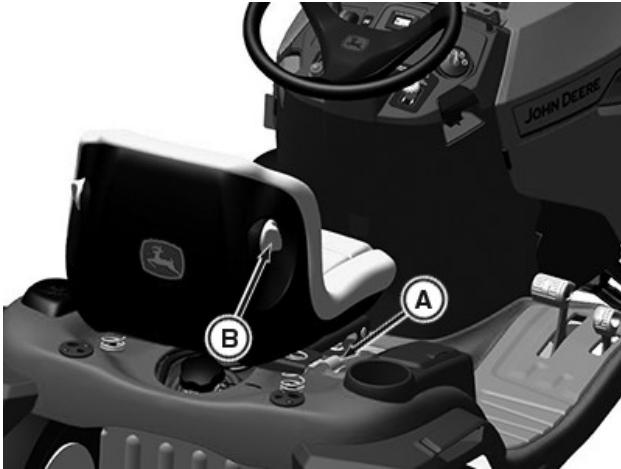
SR99263,0000293-19-15APR20

Adjusting Seat

1. Sit on seat.

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Operating



APY34636—UN—06APR20

2. Lift up on (A) on right side of seat.
3. Lean forward and slide seat forward or rearward to desired position. Do not lean back on top of seat to push rearward.
4. Release seat adjustment lever to lock in position.

Lumbar Seat Adjustment (If Equipped)

- Turn lumbar seat adjustment dials (B) on either side of seat to adjust firmness of seat.

SR99263,0000314-19-30JUN20

Adjusting Cutting Height

Cutting height is adjusted from approximately 25—100 mm (1—4 in.) in 6.4 mm (1/4 in.) increments. When mower deck is in transport position, cutting height is approximately 100 mm (4 in.).

Detents allow the adjustment lever to be positioned at each indicated mower setting, as well as the mid-point between each setting.

Mower Setting	Approximate Cutting Height
1	25 mm (1 in.)
–	32 mm (1-1/4 in.)
–	38 mm (1-1/2 in.)
2	50 mm (2 in.)
–	57 mm (2-1/4 in.)
–	65 mm (2-1/2 in.)
–	70 mm (2-3/4 in.)
3	75 mm (3 in.)
–	83 mm (3-1/4 in.)
–	90 mm (3-1/2 in.)
–	95 mm (3-3/4 in.)
4 (Transport)	100 mm (4 in.)

1. Put attachment lift lever into the slot near desired cutting height.
2. Adjust mower deck wheels.

Transporting or Getting On and Off Machine

- Pull attachment lift lever all the way back to transport position or 100 mm (4 in.) cutting height.

JS86122,00003BF-19-12AUG14

Checking and Adjusting Mower Deck Level

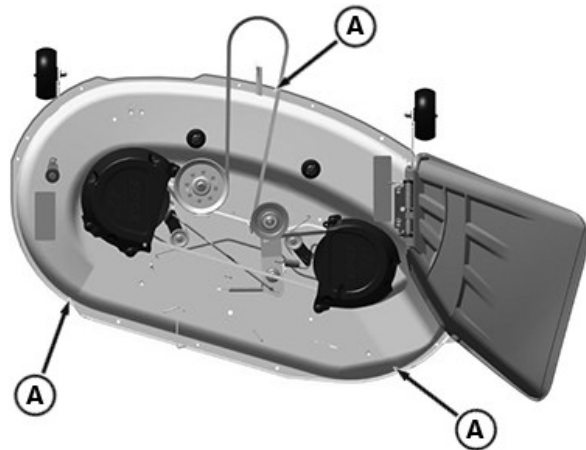
CAUTION: Avoid injury! Rotating blades are dangerous. Before adjusting or servicing mower:

- 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 mower deck.

Method One

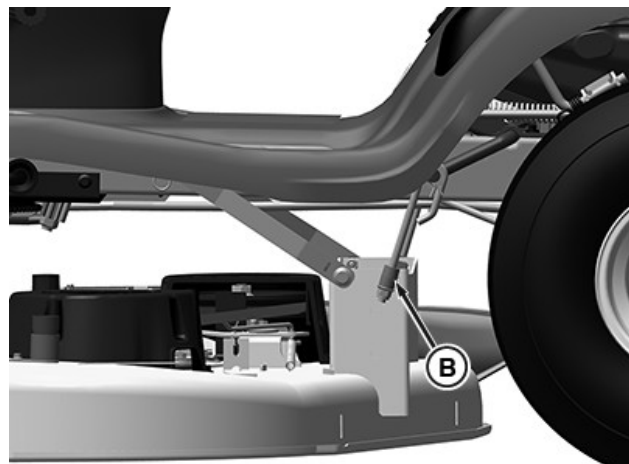
1. Make sure machine is on a flat, level surface.
2. Park machine safely. (See Parking Safely in the Safety section.)
3. Check that tires are inflated to correct tire pressure. Tire pressure is marked on the side of the tire.
4. Raise deck to highest position.



APY18570—UN—10JUL20

42 in (107 cm) Mower Deck is Shown.

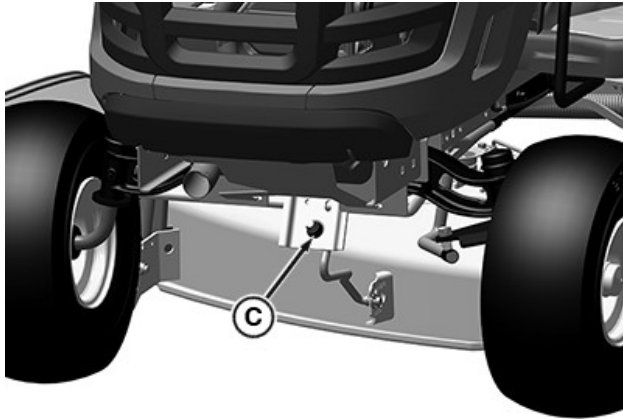
5. Place three short 51 mm (2 in) blocks of wood under the edges (A) of the mower deck.
6. Lower mower deck to the 63 mm (2.5 in) cutting height position. For S130 models, lower deck to 57 mm (2-1/4 in) cutting height position.
7. Check that the mower deck is level and lightly touching each of the three wooden blocks.



APY36153—UN—24JUL20

- If the rear of the mower deck is not touching the rear blocks, or is sitting heavily on the blocks, adjust the rear lift links by turning the leveling nut (B) on each lift link. The blocks should be able to easily slide in and out beneath the mower deck when the mower deck is correctly adjusted.

Operating



APY36154—UN—10JUL20

42 in (107 cm) Mower Deck is Shown.

- If the front of the mower deck is not lightly touching the front block, adjust the front draft arm by turning the nut (C).
8. Raise the cutting height to the next highest position and remove the three wooden blocks.
 9. Turn the nut (C) on the front draft arm counterclockwise 1-2 full turns so that the front of the deck is 3-6 mm (1/8-1/4 in) lower than the rear. This adjustment prevents “double cutting,” which wastes horsepower and causes brown grass tips.

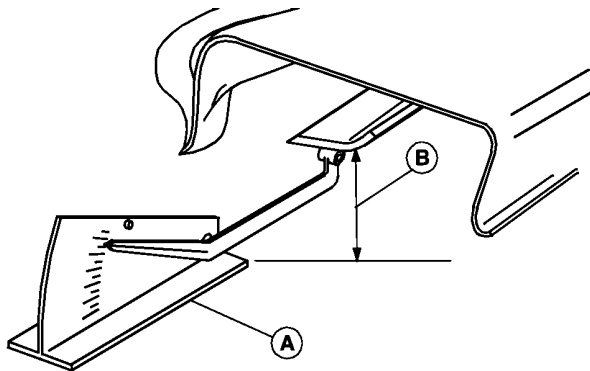
Specification

Mower Deck, Front-to-Back—Height. 1/8-1/4 in (3-6 mm)

Method Two

NOTE: An optional mower deck leveling gauge (AM130907) is available from your John Deere dealer. It allows for precision mower deck leveling by measuring mower deck level at the blade tips.

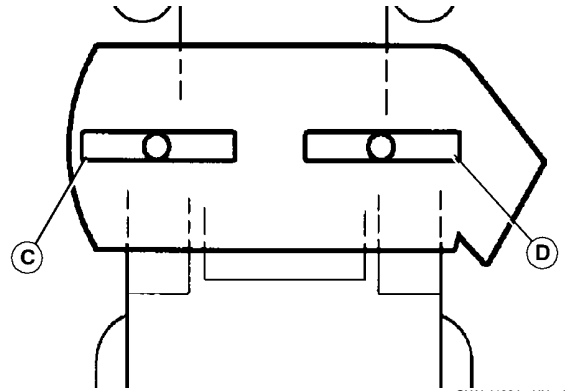
1. Make sure that machine is on a flat, level surface.
2. Park machine safely. (See Parking Safely in the Safety section.)
3. Inflate tires to the correct pressure.
4. Move mower lift handle to preferred cutting height.
5. Measure mower deck level (side-to-side).



GXAL41983—UN—04MAR13

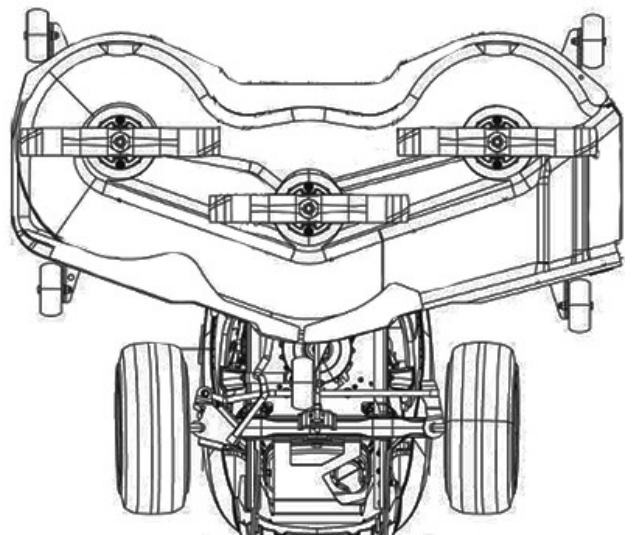
A convenient Leveling Gauge (A) (AM130907) is available from your Dealer

- a. Position mower blades as follows and measure from each outside blade tip (B) to the level surface.



GXAL41984—UN—04MAR13

Two Blade Deck is Shown.



APY08950—UN—17JUL18

Three Blade Deck is Shown.

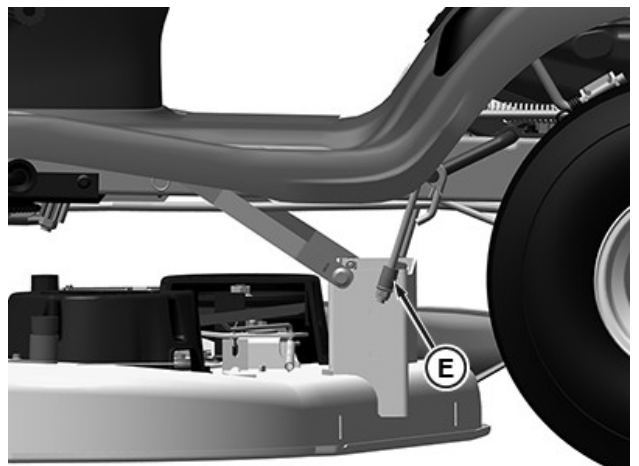
- b. Turn left blade (C) as shown. Hold drive belt and turn right blade (D) as shown. Take measurement for both blades.

The difference between blade measurements must not be more than specified distance.

Specification

Mower Deck Blade Outside Tips to Ground

(Difference)—Distance. 1/8 in (3 mm)



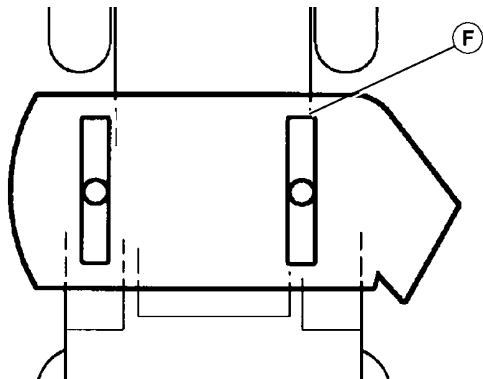
APY36155—UN—24JUL20

Operating

- c. Adjust mower deck level, if necessary, by turning rear nuts (E) clockwise to raise the side of the mower deck or counterclockwise to lower the mower deck.

NOTE: Bottom of wheels should be approximately 3-13 mm (1/8-1/2 in.) from the ground.

6. Measure mower level (front-to-rear).



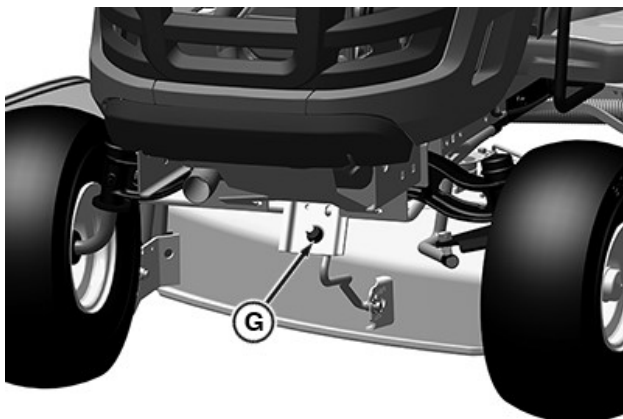
GXAL41986—UN—04MAR13

- a. Turn right blade (F) so blade tip points straight forward.
- b. Measure from blade tip to the surface. Take measurement for both blades.

The front blade tip must be specified distance lower than rear blade tip.

Specification

Mower Deck Blade Outside Tips to Ground (Difference)—Distance..... 3–6 mm (1/8 -1/4 in)



APY36156—UN—10JUL20

42 in (107 cm) Mower Deck is Shown.

- c. Adjust mower deck level, if necessary, by turning the nut (G) counterclockwise to lower the front of deck or clockwise to raise front of deck.

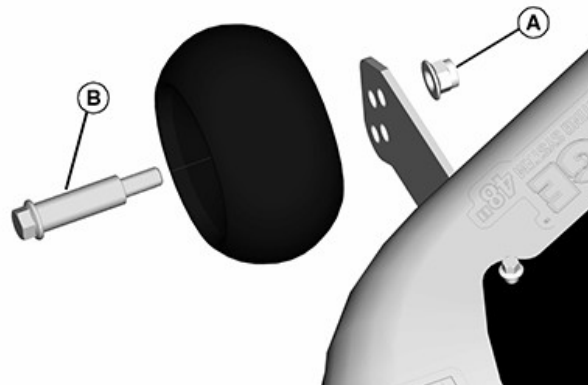
SR99263,00002EA-19-28JUL20

Adjusting Mower Deck Wheels

IMPORTANT: The mower deck can be damaged if mower wheels are adjusted wrong:

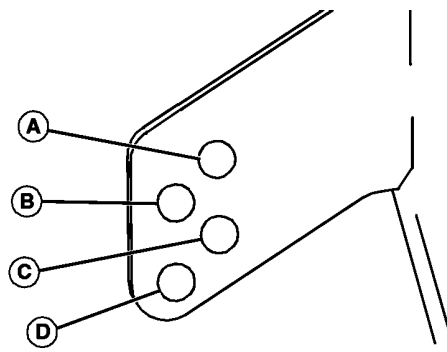
- Bottom of wheels should be approximately 3 to 13 mm (1/8 to 1/2 in) from the ground.
- If mowing at 75 mm (3 in) height of cut or higher set the anti-scalp wheels in their lowest position

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Inflate tires to the correct pressure.
3. Lower mower deck to the desired mowing position.



GXAL41988—UN—04MAR13

4. Check each mower wheel position. Remove nut (A) and bolt (B), and move mower wheel to proper hole.



GXAL41989—UN—04MAR13

- A—38 mm (1.5-in.) or less
- B—51 mm (2-in.)
- C—64 mm (2.5-in.)
- D—76 mm (3-in.) and above

5. Install bolts and nuts to lock wheels in position. Tighten nuts to specifications.

Specification

Mower Deck Wheel Nut—Torque..... 25 lb-ft (34 N·m)

JS86122,0000312-19-11JUL14

Testing Safety Systems



MXAL42804—UN—09APR13

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

Operating

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's 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.

SR99263,0000296-19-15APR20

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.

MP47322,00F4638-19-09APR19


Testing Park Brake

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Lock the park brake.
3. Pull out on bypass control valve rod to engage.
4. Try to push machine manually.

Result: Park brake must prevent machine from moving. If machine moves, the park brake requires adjustment.

SR99263,0000318-19-06APR20

Testing Attachment Engagement Switch or Lever

 **CAUTION: Avoid injury! The mower blades should stop in approximately five seconds when the mower or PTO is disengaged.**

If you believe that your blades may not be stopping in that period of time, take your machine to your authorized dealer where they can safely check and service your machine.

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Sit on seat.
3. Lock the park brake.
4. Engage mower:
 - On models with electric attachment engagement switch, pull up switch.
 - On models with mechanical attachment engagement lever, push lever forward.

5. Try to start engine.

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

SR99263,0000299-19-03APR20

Testing Seat Switch

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

2. First test:
 - a. Lock park brake.
 - b. Start engine.
 - c. Move throttle lever 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.

MP47322,00F463B-19-19MAR13

Testing Reverse Implement Option (RIO)

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Start engine.
3. Engage attachment engagement switch or lever to start attachment.

 **CAUTION: Avoid injury! Rotating blades are dangerous. Children or bystanders may be injured by runover and rotating blades.**

Before backing up, carefully check the area around the machine.

4. Look behind the vehicle to be sure that there are no bystanders.
5. Begin reverse travel by depressing reverse pedal.

Result: Attachment and engine should stop operation. If attachment or engine continues to operate as machine begins travel in reverse, do not continue to operate machine. If Engine or attachment continues to operate in reverse, then contact an authorized service center.

SR99263,000029A-19-16JUL20

Using the 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.

Locking Park Brake:

1. Push and hold brake pedal down.
2. Pull park brake lever up to lock park brake.
3. Release brake pedal. Pedal should stay down and park brake lever should stay locked.

Operating

Unlocking Park Brake:

1. Push and hold brake pedal down.
2. Push park brake lever down to unlock park brake.
3. Release brake pedal.

SR99263,000029B-19-03APR20

Checking Fuel Level (If Equipped)



APY36157—UN—10JUL20

Check fuel level in fuel tank (A).

MG39705,00004AA-19-30JUN20

Using Hourmeter and MowerPlus™ Fuel Gauge (If Equipped)

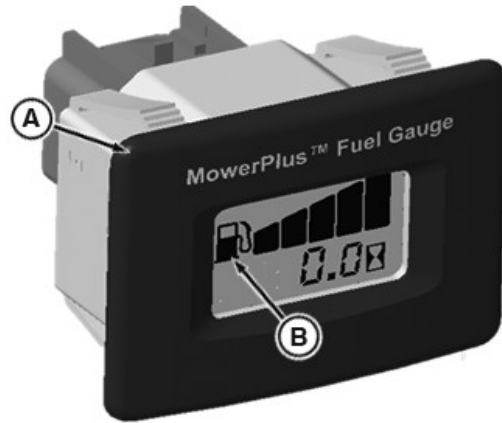
Using Hourmeter



APY36158—UN—10JUL20

1. The hour meter (A) shows the number of hours the engine has run.
2. Follow the service timetable on the maintenance schedule located under the hood and centered toward the rear of the machine. For specific service procedures, see the Service section of this manual.
3. The hour meter cannot be reset.
4. The hour meter display will always be on.
5. The decimal point flashes while the hour meter is accumulating time.

Using MowerPlus™ Fuel Gauge (If Equipped)

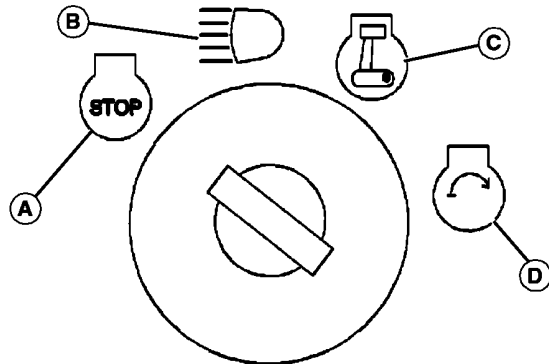


APY33785—UN—24JUL20

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

MG39705,00004AB-19-27JUL20

Using Key Switch and Headlights



GXAL41992—UN—04MAR13

- A—STOP Position
- B—HEADLIGHTS ON Position
- C—RUN Position
- D—START Position

Engine Off

NOTE: Headlights will drain the battery rapidly if key switch is left in headlights on position (B) with the engine off.

- To turn on headlights, turn the key switch to HEADLIGHTS ON position (B).
- To turn off headlights, turn the key switch to STOP position (A).

Engine On

- To turn on headlights, start engine, then turn key switch from RUN position (C) to HEADLIGHTS ON position (B).
- To turn off headlights, turn the key switch from HEADLIGHTS ON position (B) to RUN position (C).

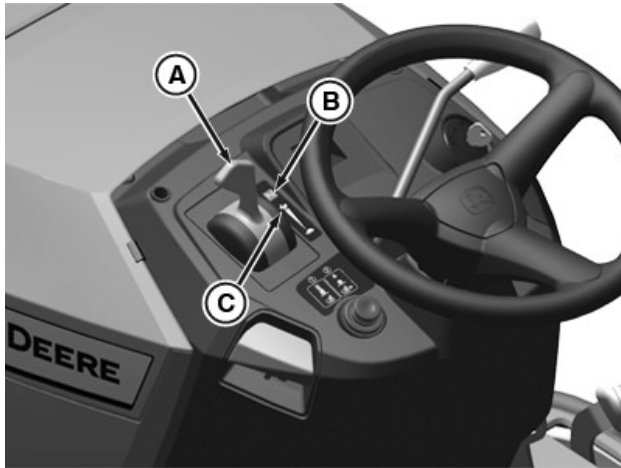
MX00654,000039A-19-25APR19

Starting the Engine

1. Operator must sit on the seat.

Operating

2. Disengage attachment engagement lever / switch. (See Engaging and Disengaging Mower in the Operating section.)
3. Fully depress the brake pedal.



4. Push throttle lever (A) forward to full throttle position (B).
5. Turn ignition to START (not more than 5 seconds).
6. If engine is cold:
 - Push throttle lever (A) into choke area (C) and hold.
 - Turn ignition to START (not more than 5 seconds).
 - Release choke to full throttle position.

NOTE: Run engine at full throttle when operating mower or other attachments.

SR99263,000029E-19-07JUL20

Idling the Engine

IMPORTANT: Unnecessary engine idling may cause engine or transmission damage. Excessive idling can cause engine overheating, carbon build-up, and poor performance.

Idling or low throttle operation while mowing, climbing hills, or towing could result in transmission overheating. Always operate at full throttle once the engine is warm.

Do not operate machine with hood open. Hood must be closed for proper engine cooling and exhaust.

- Engine is air cooled and needs a large volume of air to keep cool. Keep air intake screen on top of engine clean.
- Keep hood closed when engine is idling.

SR99263,0000039-19-10JUL18

Stopping the Engine

IMPORTANT: Avoid damage! Do not stop the engine by moving choke control to the choke position. Backfire, fire or engine damage can occur. Follow recommended procedure for stopping engine.

1. Let engine run at high throttle without load for a few seconds.
2. Turn key to STOP position. Engine will stop and headlights will turn off.
3. Remove key.
4. Lock the park brake.

SR99263,000029D-19-03APR20

Using Travel Controls on Hydrostatic Transmission

CAUTION: Avoid injury! Children or bystanders may be injured by runover and rotating blades. Before traveling forward or rearward:

- Carefully check the area around the machine.
- Disengage the mower before backing up.

Travel Forward

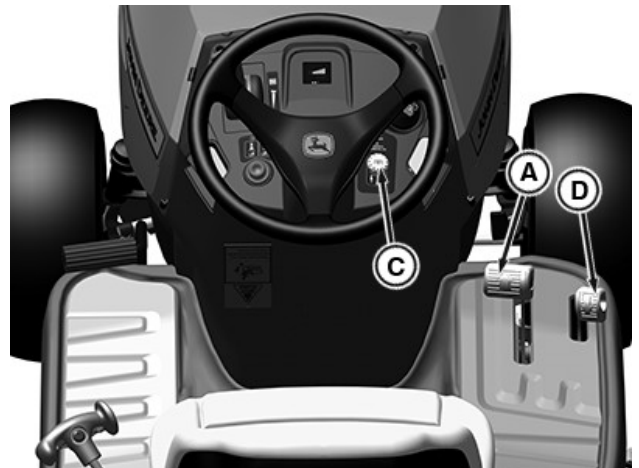


Tractor with PTO Lever

- Push down the forward travel pedal (A).

Travel in Reverse

NOTE: Any operating attachment and the engine stop as the reverse motion pedal is pressed with attachment engaged.



Tractor with PTO Switch

1. Disengage attachment:
 - On models with mechanical attachment engagement lever (B), pull lever back to the off position.
 - On models with electric attachment engagement switch, push switch in location (C) (not shown above) down to the off position.
2. Look behind the machine to be sure there are no bystanders nearby.
3. Slowly push down the reverse travel pedal (D).

Operating

Stopping

1. Remove foot from travel pedal.
2. Depress brake pedal.

Emergency Stopping

1. Remove foot from travel pedal.
2. Depress brake pedal.
3. Turn key switch to stop (Off) position. Do not release brake pedal until all moving parts have stopped.
4. If possible, lock the park brake.

SR99263,00002FF-19-01JUL20

Using The Reverse Implement Option (RIO)

CAUTION: Avoid injury! Children or bystanders may be injured by runover and rotating blades. Before traveling forward or rearward:

- Carefully check the area around the machine.
- Disengage the mower before backing up.

NOTE: Backing up while the mower is engaged is strongly discouraged. The Reverse Implement Option should be used only when operating another attachment or when the operator deems it necessary to reposition the machine with the mower engaged.

1. Stop forward travel.
2. Look behind the machine to be sure there are no bystanders.



APY36159—UN—10JUL20

3. Push and hold in the reverse implement switch (A) while depressing reverse pedal slightly.

NOTE: If the engine and mower stop while repositioning the machine, return the attachment engagement lever/switch to the off position. Start engine and engage mower. Begin again with Step 2.

4. Release the reverse implement switch (A) and reposition the machine as the machine begins to move rearward.
5. Resume forward travel. The mower should continue operating.
6. Repeat procedure to position the machine again.

SR99263,00002EB-19-01JUL20

Using Cruise Control (If Equipped)

CAUTION: Avoid injury! Do not use cruise control when going down hills. Machine speed will increase. Operate machine in a large, open area to learn how the cruise control works.

Use cruise control when you want to maintain travel speed without having to hold the forward travel pedal down. Cruise control operates only for forward travel.

Engage Cruise Control

1. Push forward pedal down until you reach desired travel speed.
2. Pull cruise control lever up and release forward pedal to lock the cruise control.

Disengage Cruise Control

- Depress brake pedal, tap on forward pedal or push cruise control lever down to the off position.

SR99263,00002EC-19-01JUL20

Engaging and Disengaging Mower

NOTE: Put attachment lift lever in transport position to transport machine or when parking machine.

1. Start engine and run at half speed for a couple of minutes to warm up.
2. Lower mower deck to desired cutting height position.

NOTE: Throttle lever should be at full throttle position before engaging mower to avoid stalling engine.

3. Push throttle lever up to the full throttle position.
4. Engage mower.
 - On models with electric attachment engagement switch: Pull up switch.
 - On models with mechanical attachment engagement lever: Push lever forward.

NOTE: The mower and engine stops as the reverse foot pedal is depressed.

5. Disengage mower blades before moving in reverse or stopping engine.
 - Machines with mechanical attachment engagement lever: Pull lever back.
 - Machines with electric attachment engagement switch: Push down switch.

SR99263,0000338-19-12MAY20

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).

Operating



GXAL41997—UN—04MAR13

2. Attach quick-coupler to garden hose.
3. Attach garden hose with quick-coupler to wash port (A) on the mower deck.
4. Turn on water.
5. Start engine.
6. Run at full throttle.
7. Engage mower blades.
8. Flush water under deck for approximately one minute.
9. Disengage mower blades.
10. Stop engine.
11. Turn off water and remove garden hose and quick-coupler from wash port.
12. Remove quick-coupler from garden hose and store for future use.

OUO1023,00001B0-19-01MAR13

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.

MP47322,00F4646-19-10JUL20

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 machine by hand only.
- Do not use another vehicle to move machine.
- Do not tow machine.

1. Unlock the park brake.



APY36161—UN—10JUL20

2. On hydrostatic models: Pull out on bypass valve control rod (A).
3. Push machine to desired location.

IMPORTANT: Avoid damage! Hydrostatic transmission might be damaged if the bypass valve control rod is not pushed back to operating position before attempting to start the engine. Do not start or operate the machine with the bypass valve control rod in the pulled-out position.

4. Push bypass valve control rod back in.
5. Lock the park brake.

MG39705,00004EE-19-28JUL20

Transporting Machine on Trailer

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

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

CAUTION: Avoid injury! Use extra care when loading or unloading the machine onto a trailer or truck.

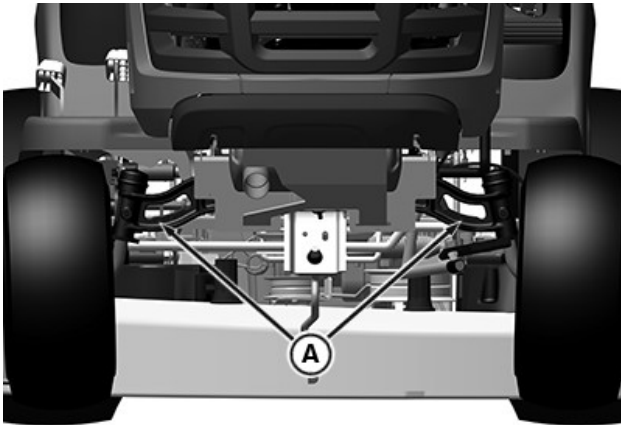
- Park trailer on a level surface.
- Use of a trailer with sides is recommended.
- Keep wheels away from drop-offs and edges.
- Back slowly and in a straight line.
- Close fuel shut-off valve, if your machine is equipped.
- Do not secure machine using optional bumper as this can dislodge during transport.

Operating

IMPORTANT: Avoid damage! Transporting a machine on a trailer or on a truck bed at high speeds can result in hood or engine cover raising and possibly coming off machine if not secured.

- Position machine on trailer so hood or engine cover opens from rear of trailer to prevent wind from blowing hood or cover open.
- Secure hood or engine cover with existing machine locks or latches.
- Secure hood or engine cover with tie down straps if no locks or latches exist.

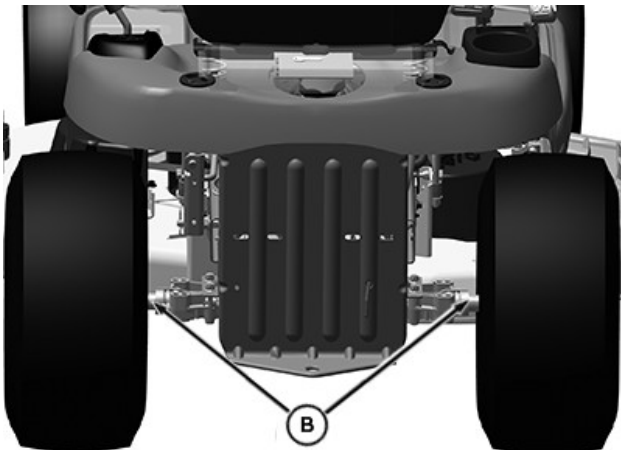
1. Park trailer on a level surface.
2. Raise mower deck, if installed, before driving machine onto trailer.
3. Drive machine onto heavy-duty trailer. Position machine on trailer so hood or engine cover will not raise in wind while being transported.
4. Lower mower deck completely.
5. Lock park brake.
6. Turn off machine and remove key.



APY36162—UN—10JUL20

7. Secure front of machine at both sides of the axle at points (A) to trailer with heavy-duty straps, chains, or cables. Straps must be directed down and outward from machine.

IMPORTANT: Avoid damage! Do not secure machine using transmission housing.



PY43279—UN—29MAY17

8. Secure rear of machine at both sides of the axle at points (B) to

trailer with heavy-duty straps, chains, or cables. Straps must be directed down and outward from machine.

9. Secure hood to prevent from lifting while driving.

SR99263,00002ED-19-02JUL20

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-19-10APR19

Using Weights

CAUTION: Avoid injury! The machine may become unstable when operating on slopes and/or with some attachments.

Use weights to improve stability when operating on slopes or using attachments.

Remove weights when not required.

IMPORTANT: Avoid damage! Never use liquid in tires or wheel weights as ballast. Transmission damage can occur.

When rear ballast is needed, use only the approved rear weight bracket and attaching weights.

NOTE: See your authorized dealer for recommended weights.

- Install front weights for added stability and steering control when you use equipment, such as the rear-mounted grass bagger.
- Install rear weights when using the snow blade or snowblower.
- Remove weights when not required.

MX00654,000039C-19-05JUL17

Using Tire Chains

IMPORTANT: Avoid damage! Do not use chains with mower deck.

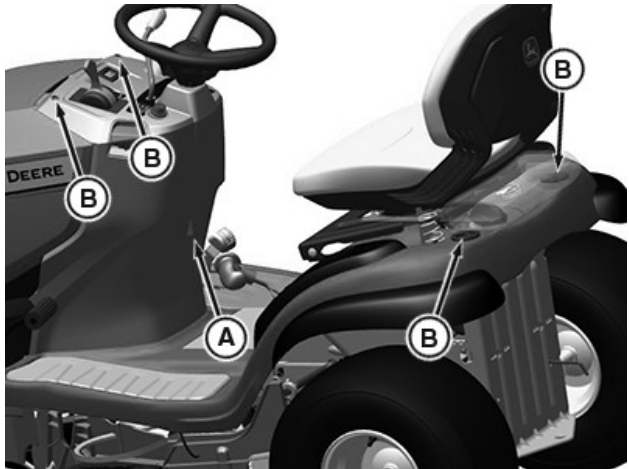
Tire chains are recommended for use with most front attachments. Remove tire chains before installing mower deck.

See your attachment operator's manual for tire chain recommendation. See your authorized dealer for the chains.

SR99263,0000150-19-24MAY19

Operating

Using Accessories



APY33751—UN—09APR20

Using the Power Port (If Equipped)

CAUTION: Avoid injury! Safe operation requires your full attention. Do not wear radio or music headphones while operating machine.

An electric power port (A) can be used for accessories. See your authorized dealer.

Using CargO Mount™ System

The front and rear CargO Mount™ system brackets (B) can be used for easy attachment of selected optional equipment.

Use John Deere approved optional equipment only. See your authorized service center for approved optional equipment.

SR99263,00002DD-19-15APR20

Choosing Mower Blades

Three types of mower blades are available to use with 100 series models.

- 3-N-1 blades. These are general purpose blades that are best suited for side-discharge operation, but can be used with a bagger attachment, or with a mulch cover installed. They are not designed for optimal performance when bagging or mulching.
- Bagger blades. These blades are designed for optimal performance when used with bagger attachments.
- Mulching blades. These blades are designed for optimal performance when used with a mulch cover installed.

MG39705,00004AC-19-02JUL20

Mowing Tips

The following recommendations will produce the best lawn cut quality and appearance:

- Keep mower blades sharp. Dull blades will tear grass; tips of grass will then turn brown.
- Cutting grass too short may kill grass and let weeds grow easily. The suggested finished cut height should be within specified height range.

Specification

Finished Cut Height Range—Height. 1.75 - 2.75 in. (44 - 70 mm)

- Adjust cutting height to remove only 1/3 of the grass at a time.
- Do not mow wet grass.
- Mow grass often. Short grass clippings will decay quickly.

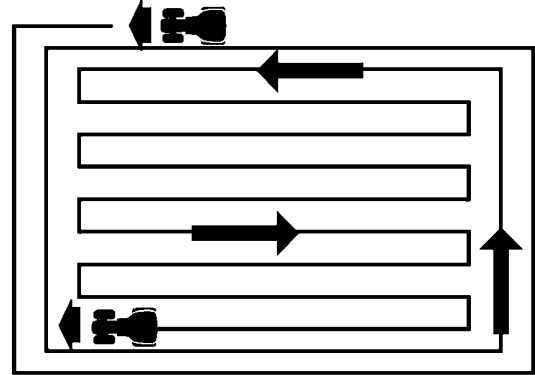
CargO Mount is a trademark of Deere & Company

- Mow with engine at full throttle.
- Adjust travel speed to match mowing conditions:
 - Travel at slow speed when you mow thick, tall grass, make sharp turns or trim around objects.
 - Travel at moderate speed when you mow thin grass.
- Use a different mowing pattern each time you mow. Overlap mowing paths by specified distance.

Specification

Overlap Mowing Paths—Distance. 50 - 100 mm (2 - 4 in.)

- Drive over ridges and through shallow ditches straight-on, not at an angle.



GXAL42003—UN—04MAR13

- Mow around the outside twice, then mow inside in straight passes. Best cut is achieved when mowing in a straight line.
- When mowing or mulching near pavement, overlap the pavement by 50 mm (2 in.) to allow clippings to dispense over grass.
- A thick layer of mulched leaves can prevent sunlight from getting to grass and smother it. Taller grass heights allow mulched leaves to dispense easier in lawn. Mulch leaves several times if needed.
- Use a thatcher in late spring or summer to pull up dead grass and aerate ground.
- For Mulching Mower: Shorter cut heights will provide better cut quality, but may leave noticeable clippings. Higher cut heights will reduce clippings, but cut quality may decline.

OOU1023,00001B8-19-01MAR13

Towing Loads

IMPORTANT: Avoid damage! Towing excessive trailer loads at full speeds for long distances and up slopes can stress drivetrain components. To avoid damage to drivetrain components, use the following guidelines.

- Total towed weight must not exceed combined weight of pulling machine, ballast, and operator. Use counterweights or wheel weights as described in an attachment or pulling machine operator's manual.
- When towing over 150 kg (350 lbs.), depress forward travel pedal no more than halfway to avoid transmission damage. Always run tractor at full throttle when towing loads.
- Avoid inclines greater than a 10 degrees 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 SAFETY, Operating on Slopes in this operator's manual for additional information.

IMPORTANT: Avoid damage! Always run tractor at full throttle when PTO is engaged and when towing loads.

RM87422,0000261-19-10JUL20

Service Intervals

Service Intervals

Servicing Your Machine

IMPORTANT: Avoid Damage! High-pressure washing can damage to machine components.

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.

Use the following timetables to perform routine maintenance on your machine.

Park the vehicle safely. (See the Safety section.)

OUMX068,000052F-19-12APR19

Service Intervals

Initial Service 8 Hours

- Lubricate mower spindles and pivot points.
- Check mower deck spindle brakes (Manual PTO)
- Lubricate front axle pivot and axle spindles.
- Lubricate front axle wheel bushings.

Every 25 Hours

- Lubricate mower spindles and pivot points.
- Lubricate front axle pivot and axle spindles.
- Lubricate front axle wheel bushings.

Yearly or Every 50 Hours (Whichever Comes First)

- Replace engine oil & filter, OR Easy Change™ 30-Second Oil Change System (If equipped).
- Replace air filter element(s).
- Replace fuel filter.
- Replace spark plug(s).
- Clean engine cooling fins.
- Clean/Replace emission filter (If equipped).
- Sharpen/replace mower blades.
- Check/replace mower drive belts.
- Check/level mower deck.
- Clean mower deck.
- Check mower deck spindle brakes (Manual PTO).
- Clean battery terminals.

Every 200 Hours

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

RM87422,00007BB-19-17JUL17

Service Lubrication

Grease

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

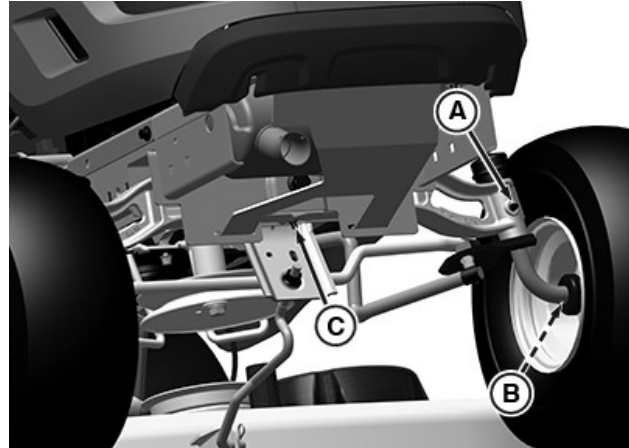
The following grease is recommended for service:

- 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.

OUMX068,0000642-19-03APR19

Lubricating Front Axle



APY36164—UN—10JUL20

Wheel Spindles and Bushings

- Lubricate front wheel spindle grease fitting (A) and wheel hub grease fitting (B), one on each side, with one or two shots of general all-purpose grease.

NOTE: Wheel hub grease fitting (B) is not present on S180 model.

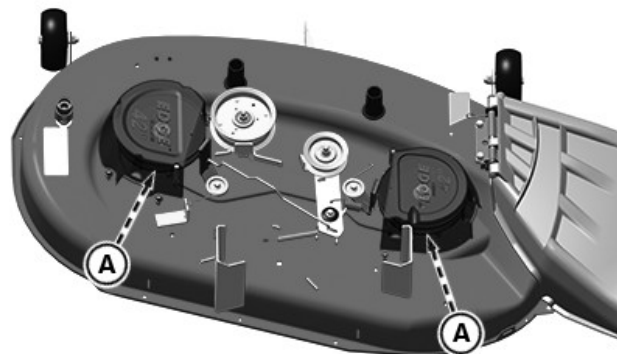
Front Axle Pivot

- Lubricate front axle center pivot grease fitting (C) with one or two shots of general all-purpose grease.

MG39705,00004EC-19-28JUL20

Lubricating Pivot Points

42 in Mower Deck:

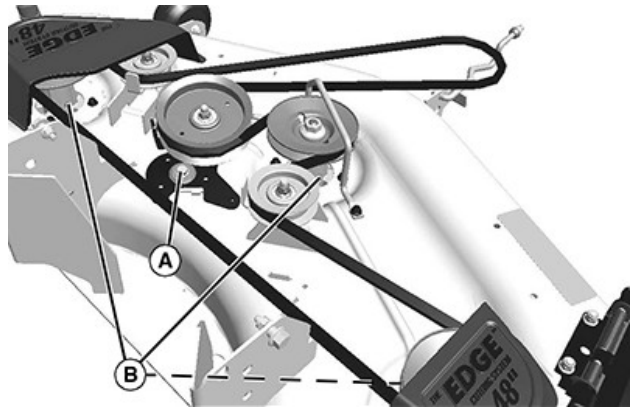


APY36163—UN—10JUL20

- Lubricate the two spindle grease fittings (A) with one or two shots of general all-purpose grease.

Service Engine

48 in and 54 in Mower Decks:



48 in Mower Deck is Shown.

- Lubricate the three spindle grease fittings (B) with one or two shots of general all-purpose grease.

SR99263,000031E-19-14JUL20

Service Engine

Emissions Service Information

A qualified 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.

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-19-28MAR16

Avoid Fumes

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

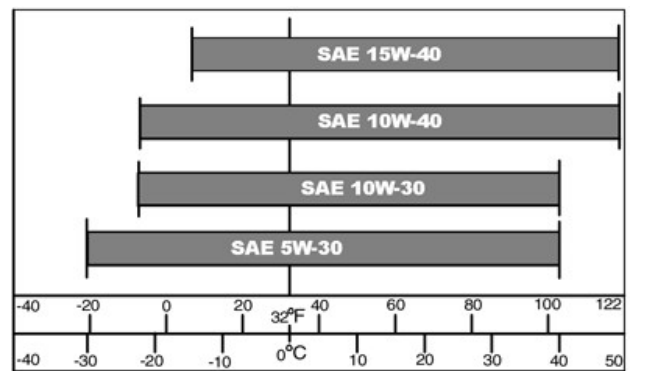
Do not run an engine in an enclosed area, such as a garage, even with doors or windows opened.

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

MP47322,00F4652-19-13JAN15

Engine Oil

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



If equipped with Easy Change™ 30-Second Oil Change System, use SAE 10W-30.

The following John Deere oils are preferred:

- John DeereTurf-Gard™
- John DeerePlus-4™
- John DeerePlus-50™ II

Other oils may be used if above John Deere oils are not available, provided they meet the following specification:

- API Service Classification SJ or higher

RM87422,00007BC-19-17JUL17

Checking Engine Oil Level

IMPORTANT: Avoid damage! Failure to check the oil level regularly could lead to serious 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.

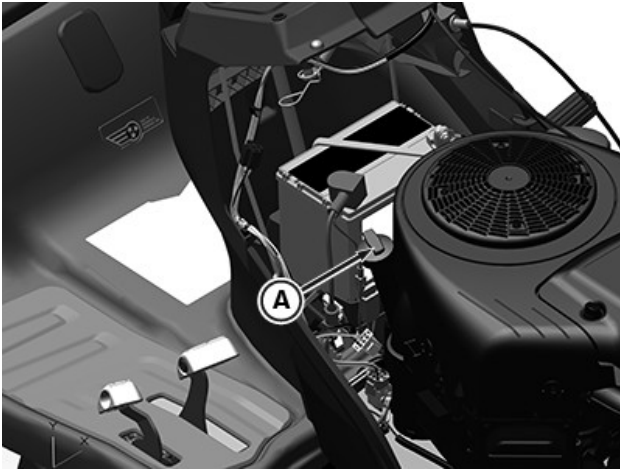
NOTE: Check oil twice a day if you run engine over 4 hours in a day.

Make sure engine is cold when checking engine oil level.

*Turf-Gard is a trademark of Deere & Company
Plus-4 is a trademark of Deere & Company
Plus-50 is a trademark of Deere & Company*

Service Engine

1. Park machine safely on level surface. (See Parking Safely in the Safety section.)
2. Lift hood.
3. Clean area around dipstick to prevent debris from falling into crankcase.



Twin Cylinder Engine Shown

APY36165—UN—10JUL20

4. Remove dipstick (A). Wipe with clean cloth.
5. Install and tighten dipstick.
6. Remove dipstick.
7. Check oil level on dipstick. Oil must be between ADD and FULL marks.
8. If oil level is low, add oil to bring oil level no higher than FULL mark on dipstick. Do not overfill.
9. Install and tighten dipstick. Lower hood.

MG39705.00004AD-19-15JUL20

Changing John Deere Easy Change™ 30-Second Oil Change System (If Equipped)

- For engines equipped with the Easy Change system.
- Replaces the filter and a portion of the engine oil.

CAUTION: Avoid Injury! Park the machine safely using park brake, turn off engine, and disconnect spark plug wires.

IMPORTANT: Avoid Damage! Oil should be changed when engine is cool. It is not necessary to run engine prior to changing oil.

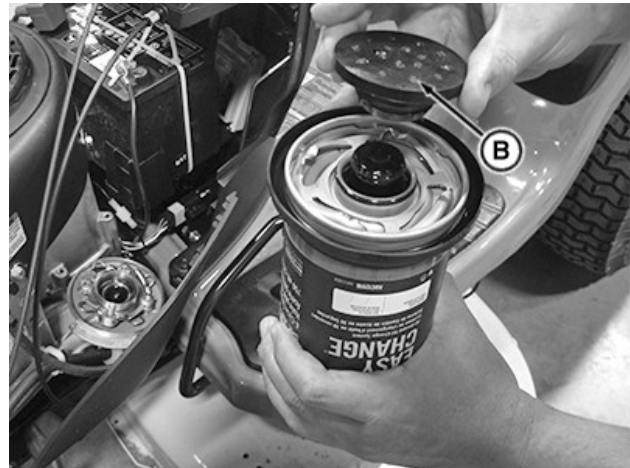
1. Lift hood.
2. Remove shipping tie strap (if equipped) on first service only.



APY08908—UN—29MAY18

A— Easy Change Oil System (ECOS)

3. Remove old easy change oil system (ECOS) (A) by rotating the filter 90 degrees counterclockwise. Push down while rotating.
4. Wipe clean any drips.



PY44545—UN—03AUG17

B— Rubber Cap

5. Remove rubber cap (B) from new ECOS.



APY08907—UN—29MAY18

Shown in Locked Position

- C— Alignment Pointer on the ECOS
- D— Unlocked Pointer
- E— Locked Pointer

Service Engine

6. Install new ECOS by aligning the alignment pointer (C) on the ECOS with the unlocked pointer (D) on the engine. Rotate the ECOS 90 degrees clockwise, until the detent lock engages and the lock pointer on the ECOS (C) and engine (E) are aligned.

IMPORTANT: Avoid Damage! Keep turning the ECOS until the detent is engaged and the lock symbols are aligned.

7. Check oil level with the dipstick. Add oil if necessary.
8. Connect spark plug wires, start, and run engine at idle to check for leaks. Stop engine. Fix any leaks before operating.
9. Lower the hood.
10. The rubber cap can be installed on the used ECOS.

NOTE: Many local government recycling programs, authorized retailers, auto repair stations, and auto parts stores puncture and recycle used oil filters and oil.

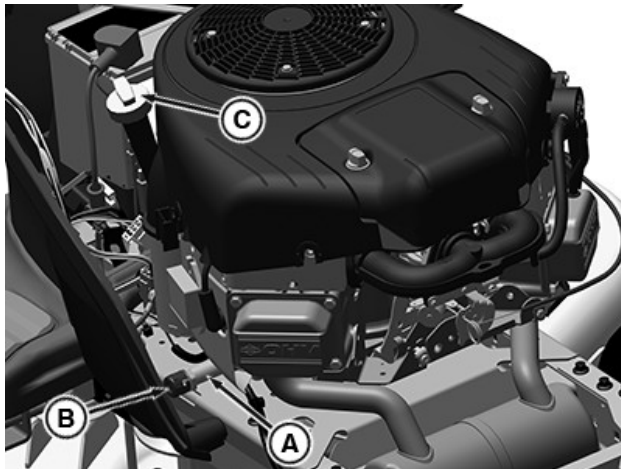
SR99263,000014A-19-09JUL20

Changing Engine Oil and Filter on models not equipped with the John Deere Easy Change™ 30-Second Oil Change System

IMPORTANT: Avoid damage! Change the oil more often if the vehicle is used in extreme conditions:

- Extremely dusty conditions.
- Frequent slow or low-speed operation.
- Frequent short trips.

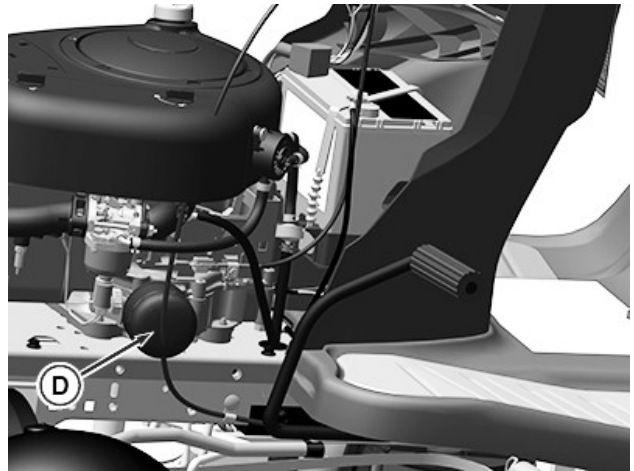
1. Run engine to warm oil.
2. Park machine safely. (See Parking Safely in the SAFETY section.)
3. Lift hood.
4. Remove closeout panels.



Twin Cylinder Engine is Shown.

APY36166—UN—10JUL20

5. Put drain pan under drain valve (A).
6. Rotate and remove drain cap (B) and drain oil into oil drain pan. Allow oil to drain completely.
7. Remove dipstick (C).



Single Cylinder Engine Shown

APY36168—UN—10JUL20

8. Replace oil filter (D).
 - a. Wipe dirt from around oil filter.
 - b. Place a drain pan or funnel under filter tray.
 - c. Remove old filter and filter gasket and dispose of properly. Wipe up any spilled oil.
 - d. Put a light coat of fresh, clean oil on the new filter gasket.
 - e. 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. Install drain cap.
- IMPORTANT: Avoid damage! Do not overfill. Overfilling can cause smoking, hard starting, fouling of spark plug, and oil saturation of air filter.**
10. Add oil no higher than FULL mark on dipstick. Use approximately the amount of oil listed in the Specifications section. Do not overfill.
 11. Install dipstick.
 12. Connect spark plug wires to start and run engine at idle to check for leaks. Stop engine. Fix any leaks before operating.
 13. Check oil level. Add oil if necessary.
 14. Install closeout panels and lower hood.

NOTE: Many local government recycling programs, authorized retailers, auto repair stations, and auto parts stores will puncture and recycle used oil filters and oil.

MG39705,00004AE-19-24JUL20

Cleaning Air Intake Screen and Engine Fins

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

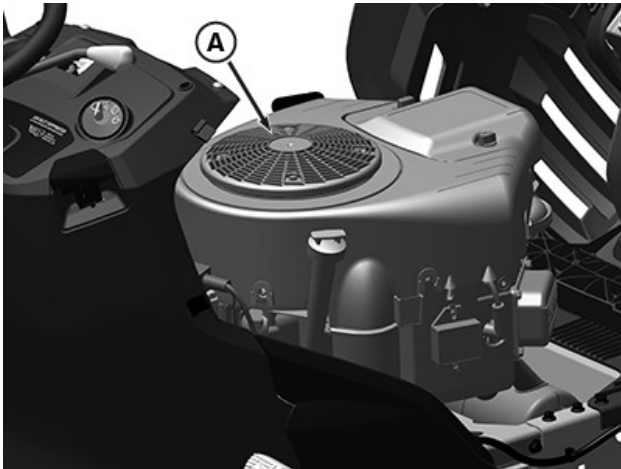
- Clear work area of bystanders.
- Wear eye protection when using compressed air for cleaning purposes.
- Reduce compressed air pressure to 210 kPa (30 psi).

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

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

Service Engine

- Lift hood.



Twin cylinder engine shown

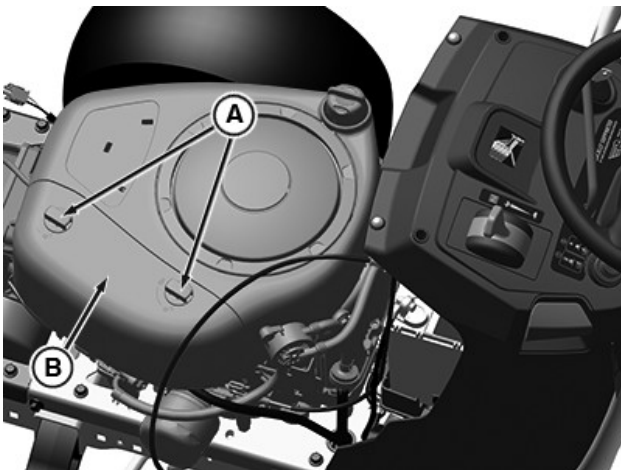
- Clean air intake screen (A), cooling fins and external surfaces with rag, brush, vacuum or compressed air.

- Lower hood.

OUO1023,00001C3-19-15JUL20

Checking and Cleaning Air Cleaner Elements (S100 and S110)

- Park machine safely. (See Parking Safely in the SAFETY section.)
- Let engine cool.
- Lift hood.
- Clean dirt and debris from the air cleaner cover.

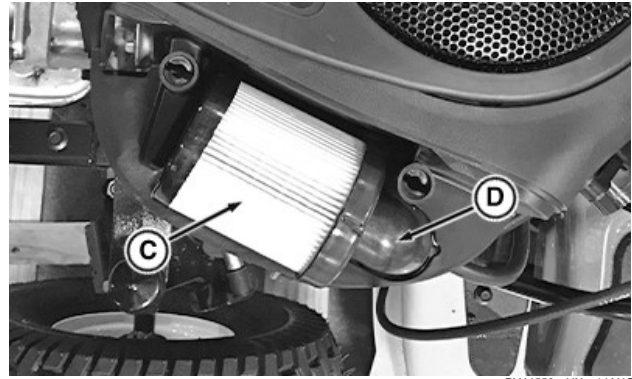


APY36169—UN—10JUL20

- Lift latch (A) to unlock cover (B). Lift cover forward and remove.

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 very dirty, damaged or the seal is cracked.



PY44553—UN—14AUG17

- Inspect the paper filter element (C) without removing it. If the paper filter element is damaged or dirty, replace with new filter:

- Clean air cleaner base very carefully, preventing any dirt from falling into carburetor.
- Carefully pull the paper element from the air cleaner elbow (D).
- Install new paper filter element back onto air cleaner elbow.

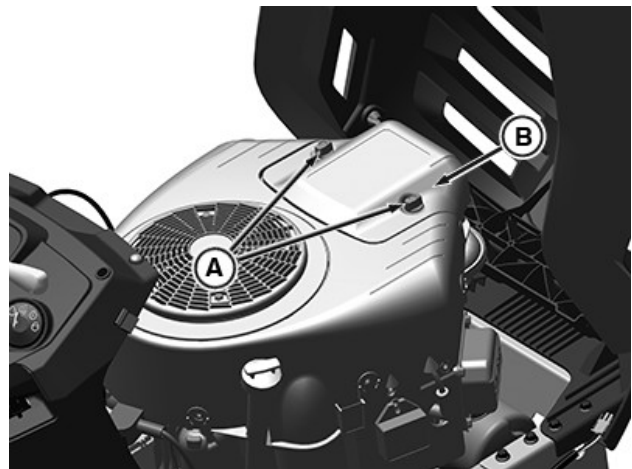
- Install air cleaner cover and push latch down to lock.

- Lower hood.

RM87422,00006B9-19-02JUL20

Checking and Cleaning Air Cleaner Elements (S120, S130, and S140)

- Park machine safely. (See Parking Safely in the SAFETY section.)
- Let engine cool.
- Lift hood.
- Clean dirt and debris from the air cleaner cover.

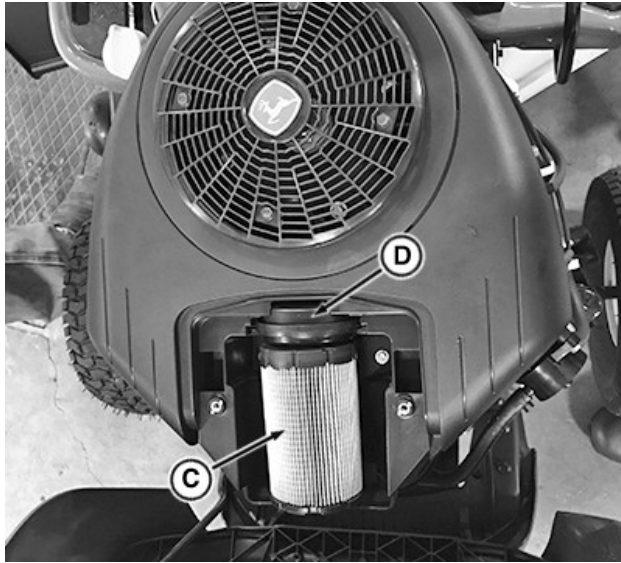


APY36170—UN—10JUL20

- Loosen knobs (A) and remove cover (B).

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

Service Engine



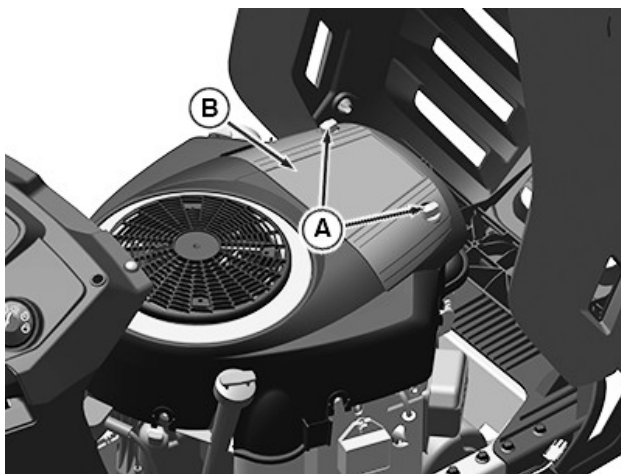
PY44552—UN—14AUG17

6. Inspect the paper filter element (C) without removing it. If the paper filter element is damaged or dirty, replace with new filter:
 - Clean air cleaner base very carefully, preventing any dirt from falling into carburetor.
 - Carefully pull the paper element from the air cleaner seat (D).
 - Install new paper filter element back onto air cleaner seat.
7. Install air cleaner cover and tighten knobs. Do not overtighten.
8. Lower hood.

RM87422.00006BA-19-02JUL20

Checking and Cleaning Air Cleaner Elements (S160, S170, and S180)

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

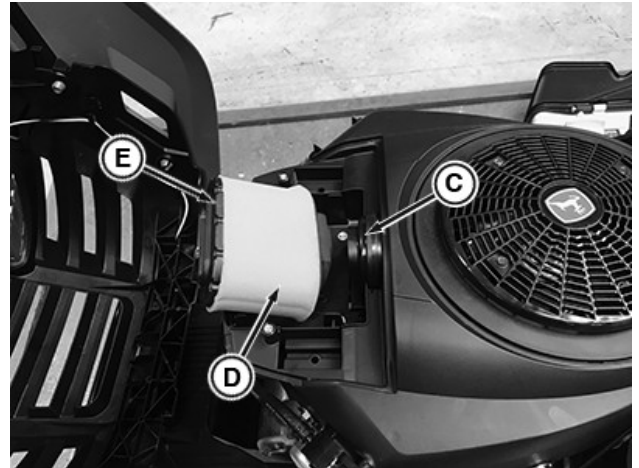


APY36171—UN—10JUL20

5. Loosen two knobs (A) and remove cover (B).

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.



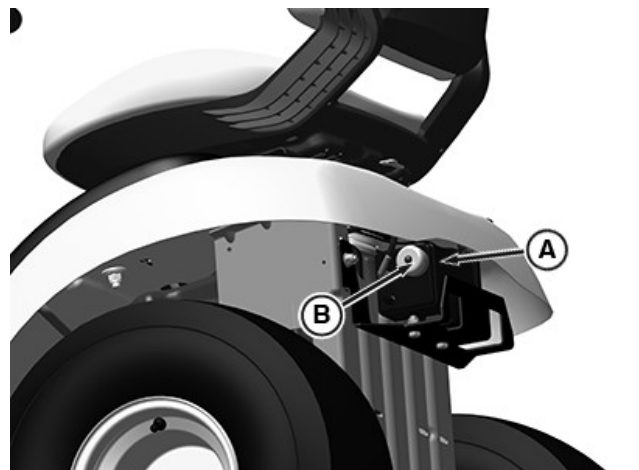
APY36198—UN—10JUL20

6. Pull filter assembly from air cleaner base (C). Inspect the foam pre-cleaner (D) without removing it. If the foam pre-cleaner is dirty:
 - a. Remove it from the paper filter carefully.
 - b. Wash pre-cleaner in a solution of warm water and liquid detergent. Do not use oil.
 - c. Rinse pre-cleaner thoroughly. Squeeze out excess water in a dry cloth until pre-cleaner is completely dry.
7. Inspect the paper filter element (E). If the paper filter element is damaged or dirty, replace with new filter.
8. Clean air cleaner base very carefully, preventing any dirt from falling into carburetor.
9. Install foam pre-cleaner on paper filter element.
10. Install new filter assembly back onto air cleaner base.
11. Install air cleaner cover and tighten two knobs.
12. Lower hood.

RM87422.00006BB-19-06JUL20

Checking and Cleaning Emission Filter (If Equipped)

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



APY36173—UN—10JUL20

2. Inspect filter (A) for dirt and damage, wash or replace if required.
 - a. Remove cover (B) and remove emission filter (A) from under rear of fender deck.

Service Engine

- b. Wash foam filter in a solution of warm water and liquid detergent. Do not use oil.
- c. Rinse filter thoroughly. Squeeze out excess water in a dry cloth until filter is completely dry.

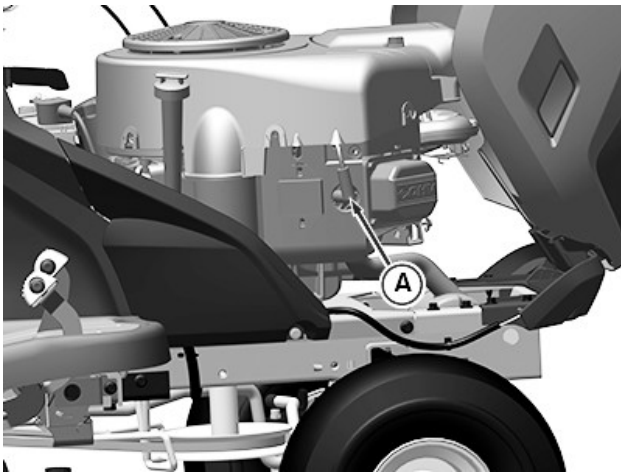
If foam filter cannot be cleaned properly or is damaged, replace with a new filter.

- d. Install foam air filter and secure with cover.

MG39705.00004B0-19-02JUL20

Checking Spark Plug

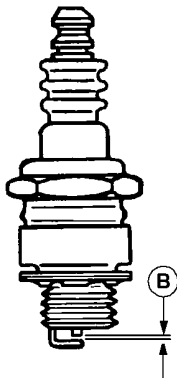
1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Let engine cool.
3. Lift hood.



APY36172—UN—10JUL20

Twin cylinder engine shown

4. Disconnect spark plug wire(s) (A), one on each side on V-twin engines.
5. Remove spark plug(s).
6. Clean spark plug carefully with a wire brush.
7. Inspect spark plug for:
 - Cracked porcelain.
 - Pitted or damaged electrodes.
 - Other wear or damage.
8. Replace spark plug as necessary.



GXAL42022—UN—04MAR13

9. Check plug gap (B) with a wire feeler gauge. To change gap, move the outer electrode.

Gap must meet specifications.

Specification

Spark Plug—Gap. 0.030 in. (0.76 mm)

10. Install and tighten spark plugs to specifications.

Specification

Spark Plug—Torque. 15 lb-ft (20 N·m)

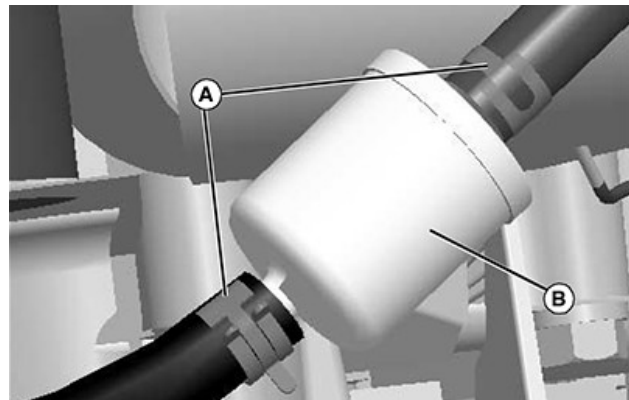
11. Connect spark plug wire(s) and lower hood.

MG39705.00004AF-19-02JUL20

Replacing Fuel Filter

NOTE: Change filter when fuel is low.

1. Park machine safely. (See Parking Safely in the SAFETY section.)
2. Let engine cool.
3. Lift hood.
4. Handle fuel safely. (See Handling Fuel Safely in the SAFETY section.)
5. Put a drain pan under fuel filter.



GXAL42023—UN—04MAR13

6. Slide hose clamps (A) away from fuel filter (B) using a pliers.
7. Disconnect hoses from filter, and raise fuel lines vertically to avoid fuel drainage.

IMPORTANT: Incorrect installation of 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.

8. Connect hoses to new filter making sure the filter arrow is pointed in the direction of the fuel flow.
9. Install clamps and check for leaks.
10. Lower hood.

OOU1023.00001CB-19-01MAR13

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-19-05JUL17

Service Transmission

Service Transmission

Checking Transmission

The transmission is a sealed component. No maintenance is required on this transmission. If you suspect any transmission problems, please contact your authorized dealer.

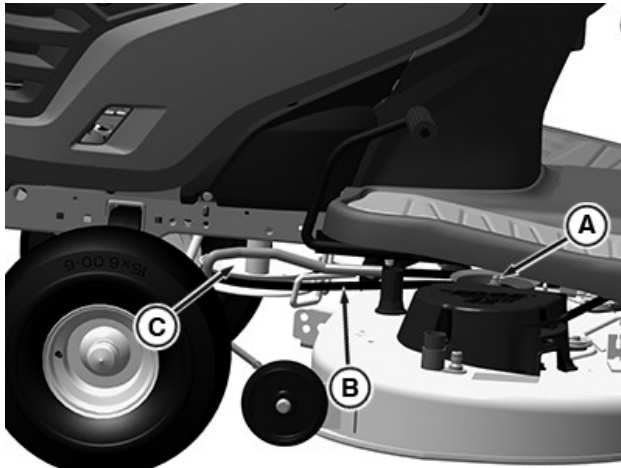
MP47322,00F465D-19-03JUN15

Service Mower

Removing or Installing Mower Drive Belt at Engine Drive Sheave (42 in, 48 in, and 54 in Mower Deck)

1. Park machine safely. (See Parking Safely in Safety section.)
2. Put lift lever in lowest position.

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



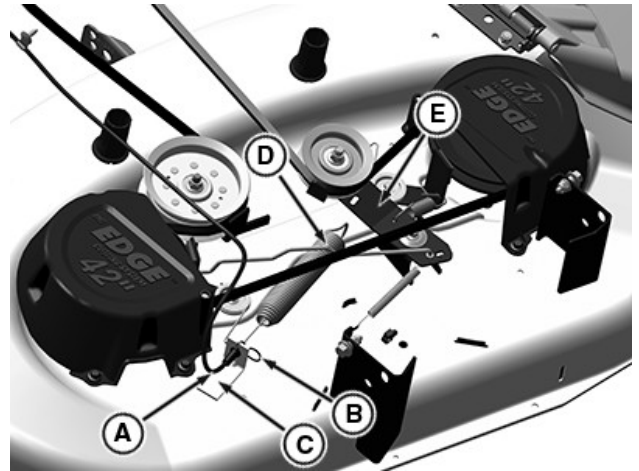
APY36235—UN—24JUL20

3. Put a 15 mm (0.59 in) closed wrench or a socket on the idler sheave nut (A) and rotate clockwise to move idler sheave toward front of tractor and hold to release belt tension.
4. Remove belt (B) from drive sheave (C) and release tension on sheave nut (A).
5. To install the belt on the drive sheave, rotate idler sheave nut clockwise to move idler sheave toward front of tractor and install belt on drive sheave.
6. Release idler sheave nut to tighten belt.

SR99263,00002EE-19-24JUL20

Removing Mower Deck (42 in Mower Deck)

1. Park machine safely. (See Parking Safely in Safety section.)
2. Put wooden blocks under each side of the mower deck.
3. Put attachment lift lever in lowest position, bringing mower deck down onto blocks.



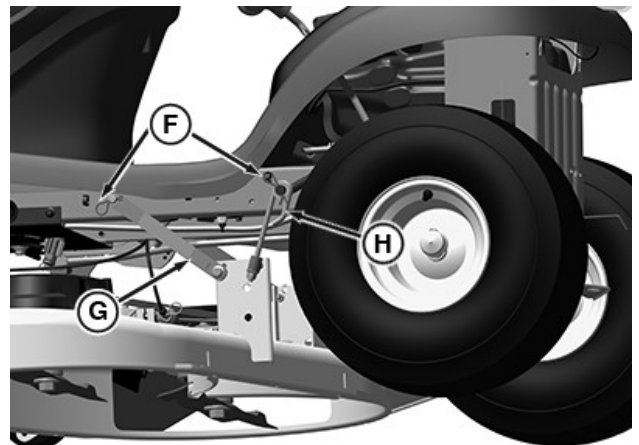
42 in Mower Deck Only

APY15588—UN—24JUL19

4. On machines with 42 in mower deck, disconnect mower engagement drive cable (A) on the left side of the mower deck.
 - a. Remove spring locking pin (B), pull and hold out mower engagement drive cable, lift up, and remove from bracket (C).
 - b. Remove cable spring (D) from the idler sheave bracket (E).

⚠ CAUTION: Avoid injury! Mower lift arms can pinch fingers. Lift arms are spring loaded and can snap back when deck is removed.

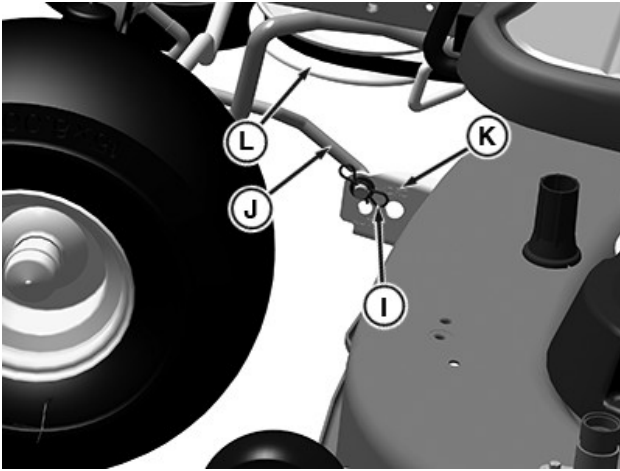
Lock lift lever before pulling pin to remove mower deck.



APY36174—UN—10JUL20

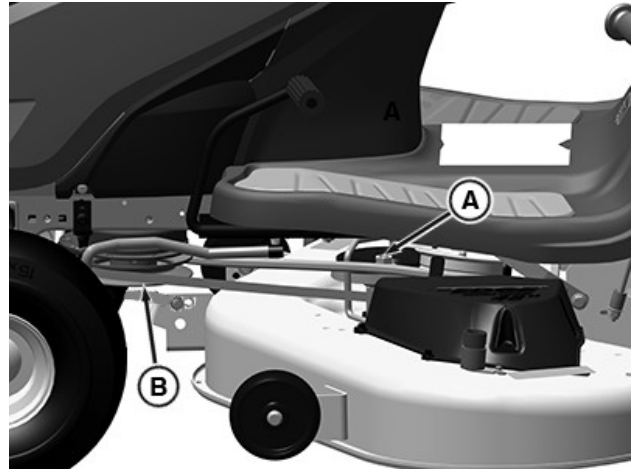
5. Remove spring locking pins (F) and washers and disconnect rear draft arm (G) and adjustable lift links (H) on each side.

Service Mower



42 in Mower Deck Shown

APY36236—UN—24JUL20



48 in Mower Deck Shown

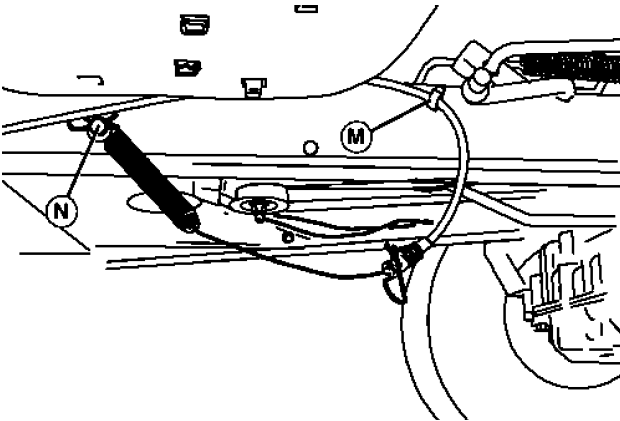
APY36186—UN—10JUL20

6. Remove spring locking pin (I) and washer and front draft rod (J) from the mower deck bracket (K).
7. Remove mower drive belt from drive sheave (L).
8. Remove wooden blocks from both sides and slide mower deck out from under the machine.
9. When operating the machine without the mower deck.
 - Remove front draft rod from the machine and attach it to the mower deck.

4. Put a 15 mm closed-end wrench or a socket on the idler sheave nut (A) and rotate clockwise to move idler sheave toward front of tractor and hold to release belt tension.
5. Remove mower drive belt from drive sheave (B).

⚠ CAUTION: Avoid injury! Mower lift arms can pinch fingers. Lift arms are spring loaded and can snap back when deck is removed.

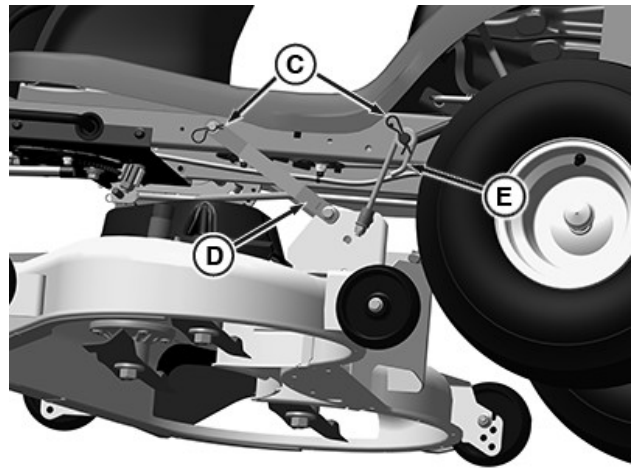
Lock lift lever before pulling pin to remove mower deck.



42 in Mower Deck Shown

GXAL42028—UN—05MAR13

- On 42 in mower deck only: Push mower engagement drive cable into clip (M) and hook end of the cable spring with hardware (N) into peg on the left side of the machine frame.



48 in Mower Deck Shown

APY36187—UN—10JUL20

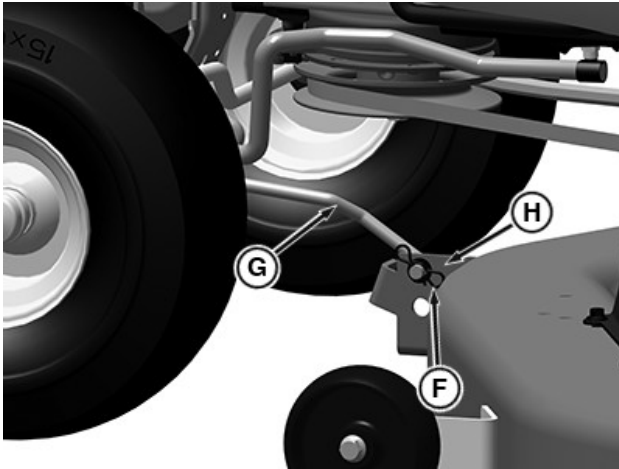
6. Remove spring locking pins and washers (C) and disconnect rear draft arm (D) and adjustable lift links (E) on each side.

SR99263,00002EF-19-24JUL20

Removing Mower Deck (48 in and 54 in Mower Decks)

1. Park machine safely. (See Parking Safely in Safety section.)
2. Put wood blocks under each side of mower deck.
3. Put attachment lift lever in lowest position, bringing mower deck down onto blocks.

Service Mower



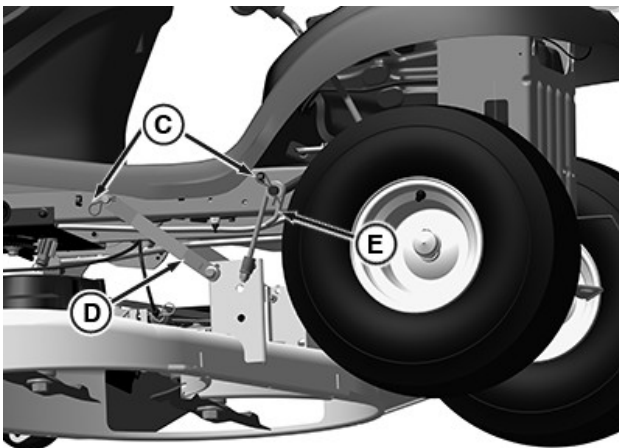
APY36238—UN—24JUL20

7. Remove spring locking pin (F) and washer and front draft rod (G) from mower deck bracket (H).
8. Remove wood blocks from both sides and slide mower deck out from under the machine.
9. When operating the machine without the mower deck, remove front draft rod from machine and attach it to the mower deck.

SR99263,000033D-19-24JUL20

Installing Mower Deck (42 in Mower Deck)

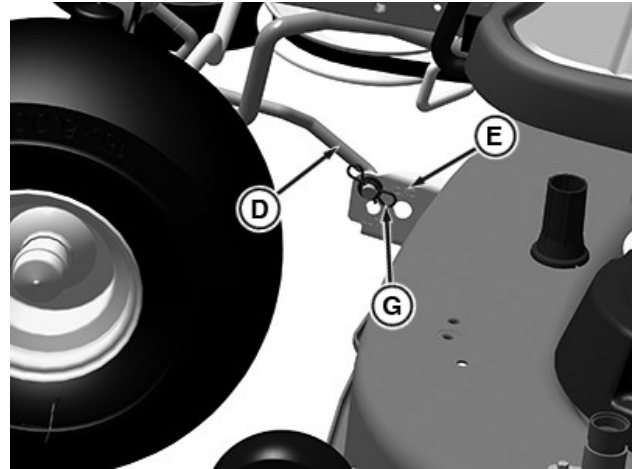
1. Park machine safely. (See Parking Safely in Safety section.)
2. Put attachment lift lever in the transport position.
3. Slide mower under machine.
4. Put wooden blocks under each side of mower deck.
5. Put attachment lift lever in lowest position.



APY36176—UN—10JUL20

6. Fasten rear draft arm (A) and adjustable lift link (B), on each side, with washers and spring locking pins (C).

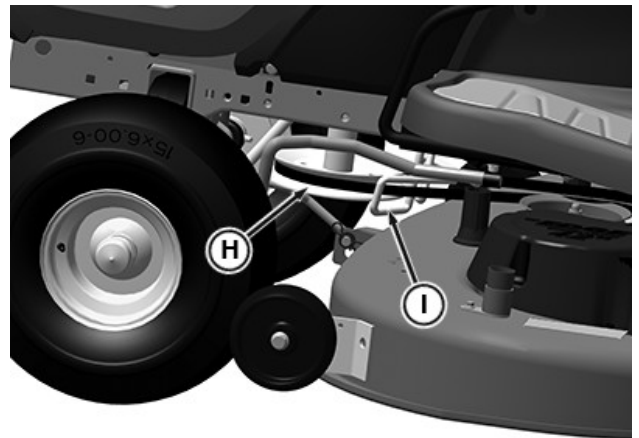
IMPORTANT: Avoid damage! To prevent clutch damage, make sure that front draft rod is installed correctly. Secure rod with washer and spring locking pin on the left side of mower deck bracket.



APY36237—UN—24JUL20

7. Install front draft rod (D) into mower deck bracket (E) in the upper hole.
8. Secure front draft rod with washer and spring locking pin (G).

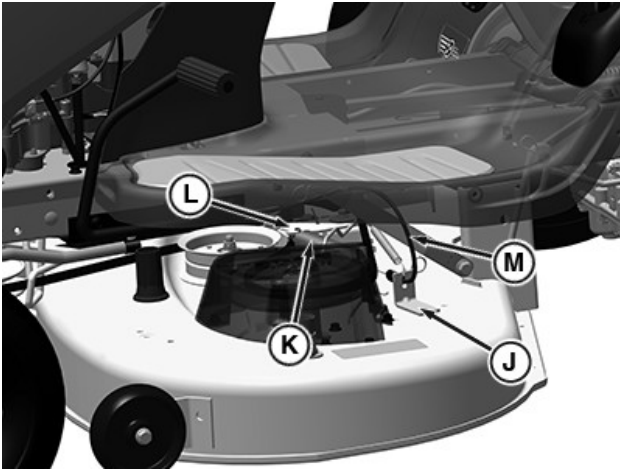
CAUTION: Avoid injury! Component is spring-assisted and under tension. Injury can occur if spring-assisted component is released suddenly.



APY36239—UN—24JUL20

9. Put mower drive belt on engine drive sheave (H). Make sure that belt is routed through both belt guides (I).
10. Remove wooden blocks from both sides of mower deck.
11. Attach mower engagement drive cable.

Service Mower

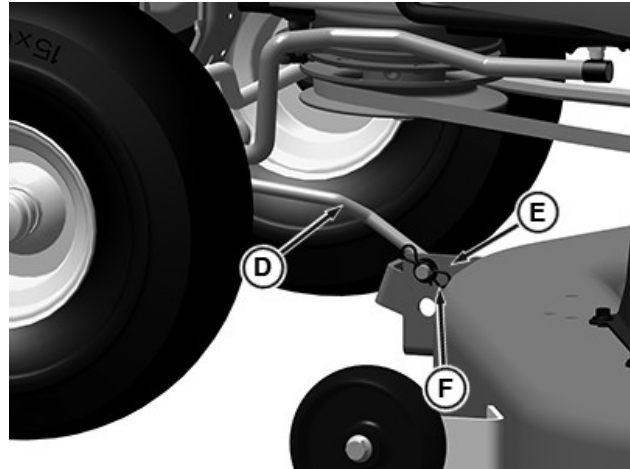


APY36190—UN—10JUL20

- a. Route cable under mower belt and brake rod and attach cable spring (K) to idler sheave bracket (L).
- b. Pull out on cable (M), align black end of cable with slot in bracket (J) and release cable into slot. Secure with spring locking pin (O).

12. Level mower deck.

SR99263,00002F0-19-24JUL20



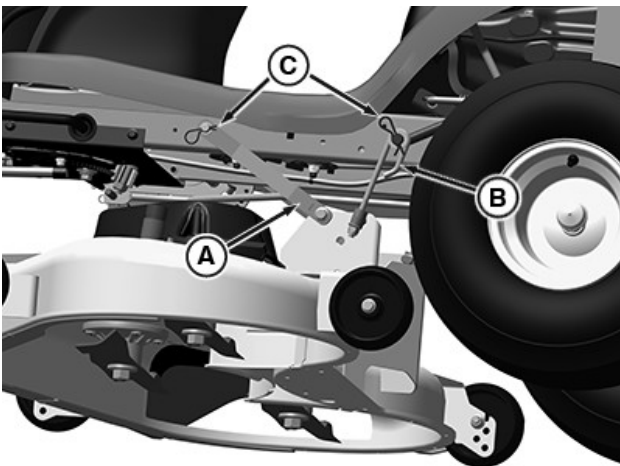
APY36193—UN—24JUL20

7. Install front draft rod (D) into mower deck bracket (E) upper hole (shown).
8. Secure front draft rod with washer and spring locking pin (F).

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

Installing Mower Deck (48 in and 54 in Mower Decks)

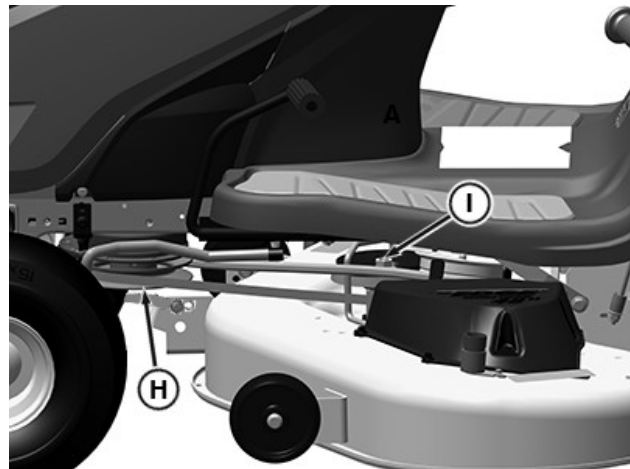
1. Park machine safely. (See Parking Safely in Safety section.)
2. Put attachment lift lever in the transport position.
3. Slide mower under machine.
4. Put wood blocks under each side of mower deck.
5. Put attachment lift lever in lowest position.



APY36191—UN—10JUL20

6. Fasten rear draft arm (A) and adjustable lift link (B), on each side, with washers and spring locking pins (C).

IMPORTANT: Avoid damage! To prevent clutch damage, make sure that front draft rod is installed correctly. Secure rod with washer and spring locking pin on the left side of mower deck bracket.



APY36192—UN—10JUL20

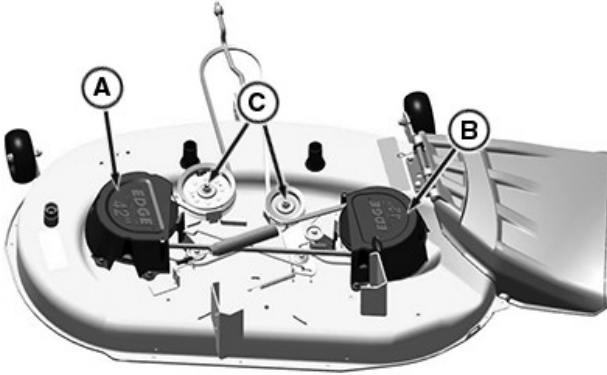
9. Put mower drive belt on engine drive sheave (H). Put a 15 mm closed-end wrench or socket on the idler sheave nut (I) and rotate clockwise, moving idler sheave and tensioning arm toward front of tractor. Hold while installing belt on drive sheave.
10. Remove wood blocks from both sides of mower deck.
11. Level mower deck.

SR99263,000033E-19-24JUL20

Replacing Mower Drive Belt (42 in Mower Deck)

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Remove mower deck.

Service Mower



APY22313—UN—18JUL19

3. Remove drive belt:
 - a. Remove three capscrews and belt shield (A).
 - b. Remove two capscrews and belt shield (B).
 - c. Loosen sheaves (C).
 - d. Remove mower belt.
4. Inspect belt for wear or damage; replace as necessary.
5. Clean top surface of mower deck and sheaves.
6. Install belt on mower deck as shown. Make sure belt is in the groove of each sheave.
7. Tighten sheaves to specifications.

Specification

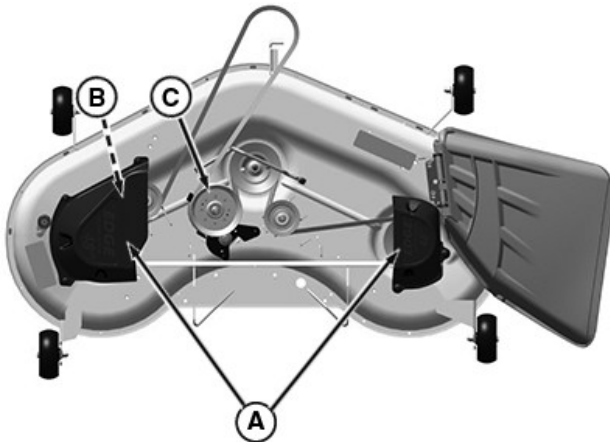
Mower Deck Drive Sheave Nuts (42 in Mower Deck)—Torque. 47 N·m (35 lb-ft)

8. Install belt shields.
9. Install mower deck.
10. Adjust mower belt tension and spindle brakes, if necessary.

MG39705,00004B1-19-02JUL20

Replacing Mower Drive Belt (48 in and 54 in Mower Decks)

1. Park machine safely. (See Parking Safely in Safety section.)
2. Remove mower deck.



48 in mower deck shown

APY22314—UN—24JUL19

3. Remove five capscrews and left and right belt shields (A).
4. Remove drive belt.
 - a. Loosen left side sheaves (B) and (C).
 - b. Remove mower belt.
5. Inspect belt for wear or damage; replace as necessary.
6. Clean top surface of mower deck and sheaves.
7. Install belt on mower deck as shown. Make sure belt is in the groove of each sheave.
8. Tighten sheaves to specifications.

Specification

Mower Deck Drive Sheave Nuts (48 in and 54 in Mower Deck)—Torque. 47 N·m (35 lb-ft)

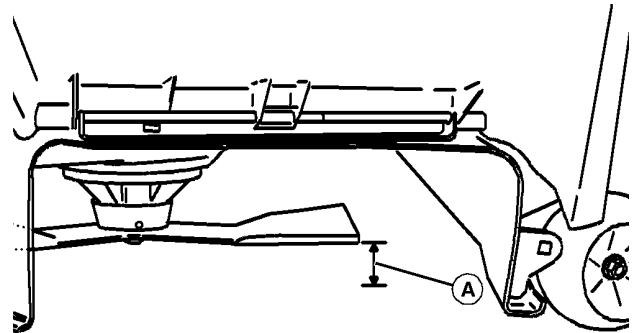
9. Install belt shields.
10. Install mower deck.

MG39705,00004B2-19-02JUL20

Checking for Bent Mower Blades

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.

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Raise mower deck to highest position to access blades.



MXAL42867—UN—09APR13

Mower Deck With Side Discharge Used for Illustration

3. 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.

SR99263,00002AA-19-10APR20

Servicing Mower Blades

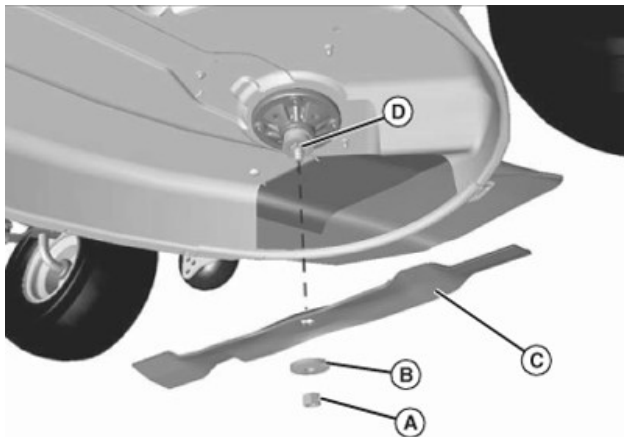
CAUTION: Avoid injury! Rotating blades are dangerous. Before adjusting or servicing mower: Disconnect spark plug wires or battery negative (-) cable to prevent engine from starting accidentally. Always wear gloves when handling mower blades or working near blades.

Removing Mower Blades

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

Service Electrical

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.



GXAL42597—UN—19MAR13

4. Loosen and remove nut (A), washer (B), and blade (C).
5. Inspect blades; sharpen, balance, or replace blades as necessary.

Installing Mower Blades

1. Position mower blade (C) with the cutting edge towards the ground.
2. Align the splined center hole in the blade with the splined spindle shaft (D) and put the blade onto the mower spindle shaft.
3. Install washer, with cupped side towards blade, and install nut to secure blade onto splined spindle shaft.
4. Block mower blade with a piece of wood to prevent spinning and tighten nut.
5. Using 15/16 in socket, tighten 5/8 in blade nut to specifications.

Specification

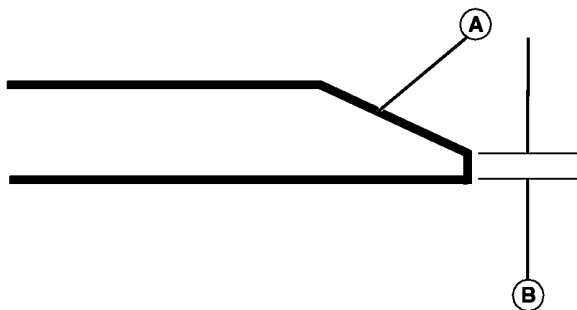
Mower Deck Blade Nut—Torque. 88 N·m (65 lb-ft)

SR99263,00002E3-19-06APR20

Sharpening Blades

CAUTION: Avoid injury! Blades are sharp. Always wear gloves when handling blades or working near blades. Always wear safety eye protection when grinding.

- Sharpen blades with grinder, hand file, or electric blade sharpener.



GXAL42041—UN—04MAR13

- Keep original bevel (A) when grinding.
- The blade cutting edge (B) should meet specifications.

Specification

Mower Blade Cutting Edge—Distance. 0.40 mm (1/64 in)

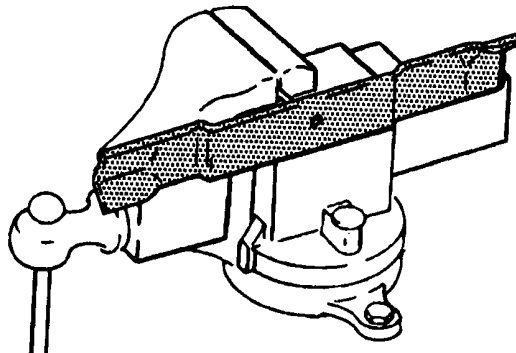
- Balance blades before installing.

MX00654,000039E-19-05JUL17

Balancing Blades

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

1. Clean blade.



GXAL42042—UN—04MAR13

2. Put blade on nail in a vise. Turn blade to horizontal position.
3. Check balance. If blade is not balanced, heavy end of blade will drop.
4. Grind bevel of heavy end. Do not change blade bevel.

MX00654,000039F-19-26MAY15

Service Electrical

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-19-03MAY20

Service the Battery Safely



MXAL42869—UN—09APR13

CAUTION: Avoid injury! The battery produces a flammable and explosive gas. To prevent the battery from exploding:

Service Electrical

- 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.

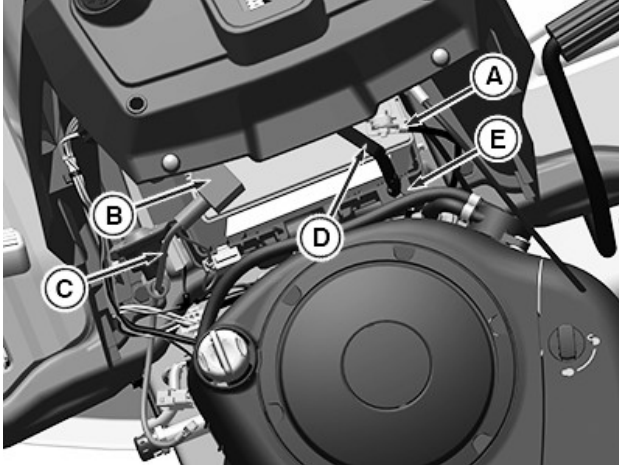
MG39705,00004B3-19-03JUL20

MP47322,00F466F-19-13JAN15

Removing and Installing the Battery

Removing

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

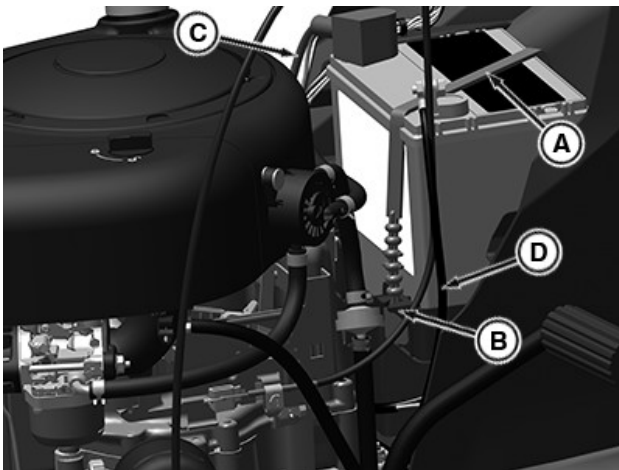


APY36177—UN—10JUL20

2. Disconnect negative (-) battery cable (A).
3. Push red cover (B) away from positive (+) battery terminal and remove cable (C) from battery.
4. Remove the battery strap (D) from C type clip (E) on the front left side of the battery tray.
5. Remove battery.

Installing

1. Place battery into battery tray.



APY36178—UN—27JUL20

2. Insert the battery strap (A) into the clip (B) between the beads on the strap.
3. Connect positive (+) cable (C) to positive (+) battery terminal first, then negative (-) cable (D) to negative (-) battery terminal.
4. Apply spray lubricant to terminal to help prevent corrosion.

5. Slide red cover over positive battery terminal.

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 spray lubricant to terminal to prevent corrosion.

MP47322,00F4671-19-15MAR13

Using Booster Battery

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

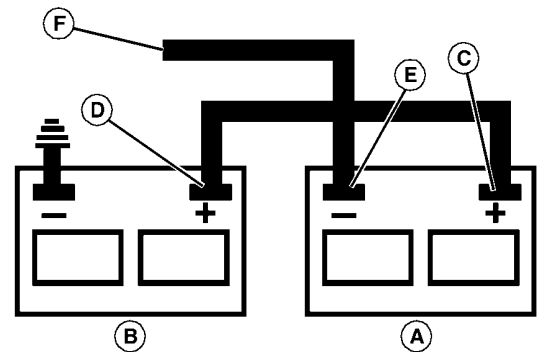
To prevent the battery from exploding:

- 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 specification.

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—09APR13

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).

Service Miscellaneous

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.

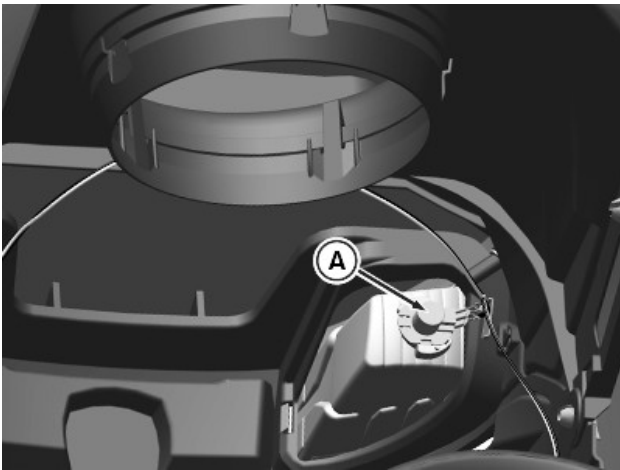
Install negative booster cable away from moving parts in the engine compartment, such as belts and fan blades.

4. 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.

MP47322,00F4672-19-05JUN15

Replacing Headlight Bulb

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



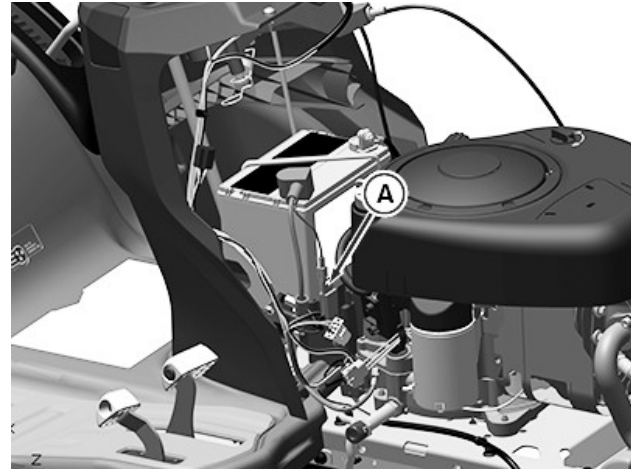
APY36179—UN—10JUL20

3. Turn bulb socket (A) 1/4 turn counterclockwise to remove.
4. Replace defective bulb with a new bulb.
5. Insert bulb socket into housing, push in and turn 1/4 turn clockwise to install.
6. Lower hood.

MG39705,00004B4-19-03JUL20

Replacing Fuse

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



APY36188—UN—10JUL20

3. Pull defective fuse (A) out of socket.
4. Check metal clip in fuse window and discard fuse if clip is broken.
5. Push new 20 A fuse into socket.
6. Lower hood.

MG39705,00004B5-19-03JUL20

Service Miscellaneous

Using Proper Fuel and Stabilizer

IMPORTANT: Avoid damage! Using stale, contaminated, or improper fuel can 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.

MP47322,00F4674-19-26MAY15

Service Miscellaneous

Filling 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.
- To prevent static electric discharge, use 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.
- To keep condensation out of the fuel tank, fill the fuel tank at the end of operation each day.
- If using a funnel, make sure it is plastic and has no screen or filter.

To prevent condensation and freezing during cold weather, fill fuel tank at the end of operation each day.

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Allow engine to cool.
3. Remove any trash 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. Install fuel tank cap and turn cap until it clicks.

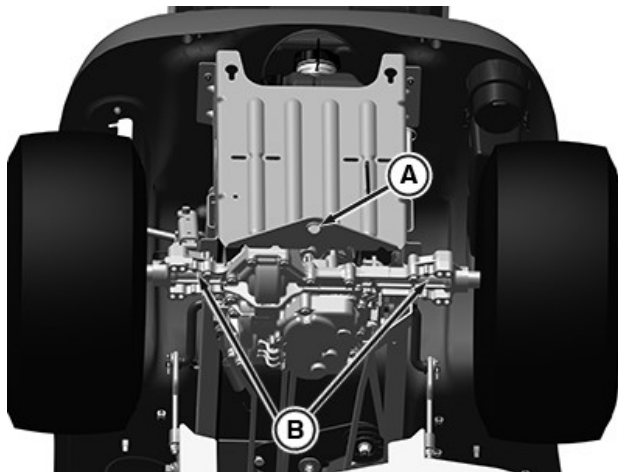
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Lifting Machine

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

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

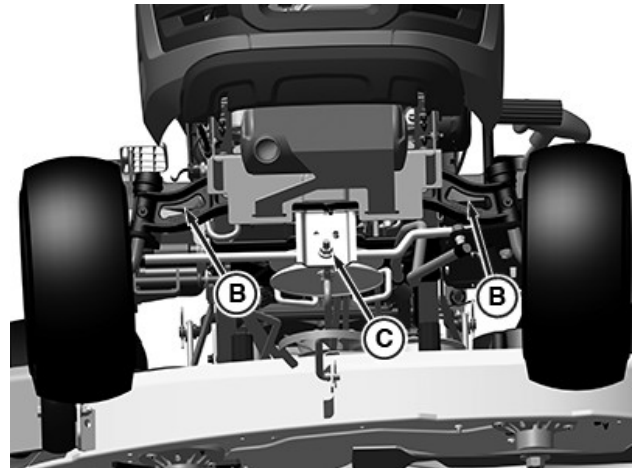
- Use a safe lifting device rated for the load to be lifted.
- Lower machine onto jackstands or other stable supports and block wheels before servicing.



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2. Safely lift rear of the machine at the machine frame point (A). Place jackstands or other stable supports onto transaxle locations (B) where mounting bolts for frame come through.

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



APY36181—UN—10JUL20

4. Safely lift front of the machine at the machine frame point (C). Place jackstands or other stable supports under the frame on each side at location (B).
5. If only lifting front of machine, block rear wheels remaining on ground to avoid movement of the machine.
6. To lower the machine, lift front and/or rear of machine, and remove jackstands or supports. Lower machine.

MG39705.00004ED-19-28JUL20

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.)

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Removing and Installing Hood

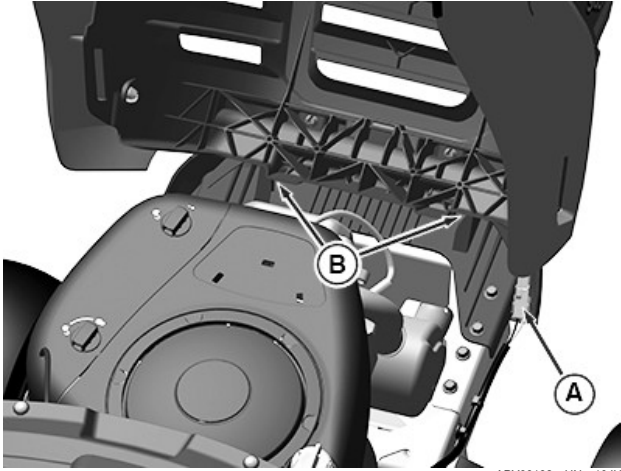
Removing

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.

Service Miscellaneous

IMPORTANT: Avoid damage! Do not operate machine with hood open. Hood must be closed for proper engine cooling and exhaust.

1. Park machine safely. (See Parking Safely in the Safety section.)
2. Let engine cool.



3. Open hood.
4. Disconnect wiring harness (A).



5. Apply pressure to the pointed position on the left side of hood and slowly lower hood. Left side pivot will release after rotating closed approximately 45°. Once left side pivot releases, slide out right side pivot. Lower hood slightly and lift hood from brackets (B).

Installing

1. Slide right side hood pivot into the tractor bracket with hood in open position (left side pivot slides into place as hood closes) and slowly close hood.
2. Open hood.
3. Connect wiring harness. Verify that wiring harness is properly retained.
4. Close hood.

MG39705.00004EF-19-28JUL20

Cleaning Plastic Surfaces

IMPORTANT: Avoid damage! Improper care of machine plastic surfaces can damage that surface:

- Do not wipe plastic surfaces when they are dry. Dry wiping results in minor surface scratches.
- Use a soft, clean cloth (bath towel, diaper, automotive mitt.)
- Do not use abrasive materials, such as polishing compounds, on plastic surfaces.

1. Rinse hood and entire machine with clean water to remove dirt and dust that may scratch the surface.
2. Wash surface with clean water and a mild liquid automotive washing soap.

IMPORTANT: Avoid damage! Insect repellent spray may damage plastic and painted surfaces. Do not spray insect repellent near machine.

3. Dry thoroughly to avoid water spots.
4. Wax the surface with a liquid automotive wax. Use products that specifically say "contains no abrasives."

IMPORTANT: Avoid damage! Do not use a power buffer to remove wax.

5. Buff applied wax by hand using a clean, soft cloth.

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Cleaning and Repairing Metal Surfaces

Cleaning:

Follow automotive practices to care for your vehicle 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.

IMPORTANT: Avoid damage! Do not use rubbing compound on painted surfaces.

2. 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.

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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.
- Prolonged exposure to sunlight damages some surfaces.

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Service Miscellaneous

Removing and Installing Front Wheel Assembly

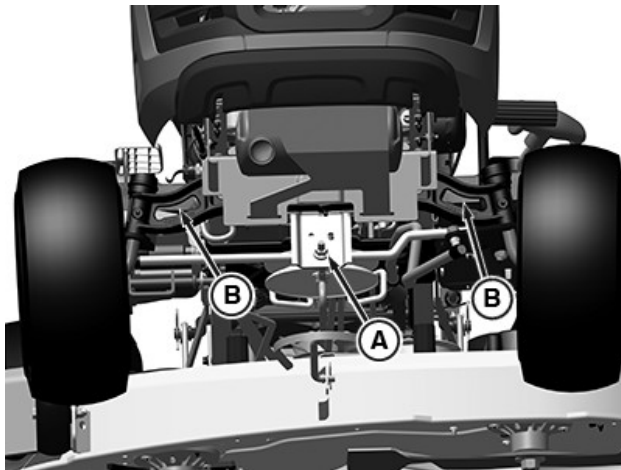
Removing:

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

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 jackstands or other stable supports and block wheels before servicing.

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



2. Safely lift and support machine. Place safe lifting device under end of front hanger bracket at location (A), and place jackstands or other stable supports under frame on each side at location (B). Block wheels remaining on the ground to prevent machine movement.



3. Remove plastic cap (C) from end of wheel hub.

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



4. Remove snap ring (D) from end of axle.
5. Remove washer (E) and wheel from axle.

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.

6. Take wheel assembly to an authorized service dealer for repairs.

Installing

1. Grease spindles and wheel hub grease fittings with specified grease.
2. Install wheel and washer (E) on axle.
3. Install snap ring (D).
4. Install plastic cap (C).
5. Safely remove jackstands and lower machine.

SR99263,00002B1-19-03JUL20

Removing and Installing Rear Wheel Assembly

Removing

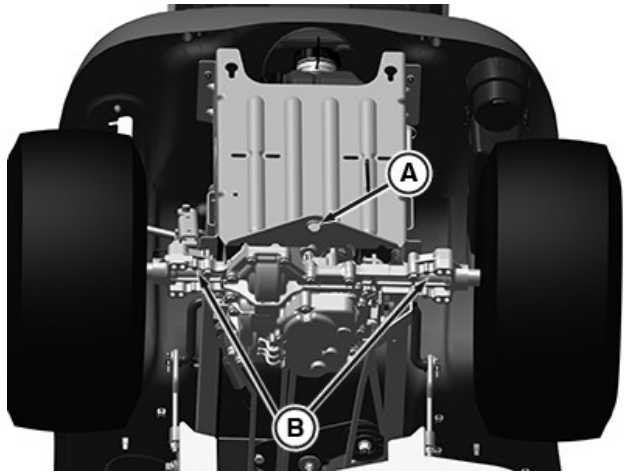
1. Park machine safely. (See Parking Safely in the Safety section.)

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 jackstands or other stable supports and block wheels before servicing.

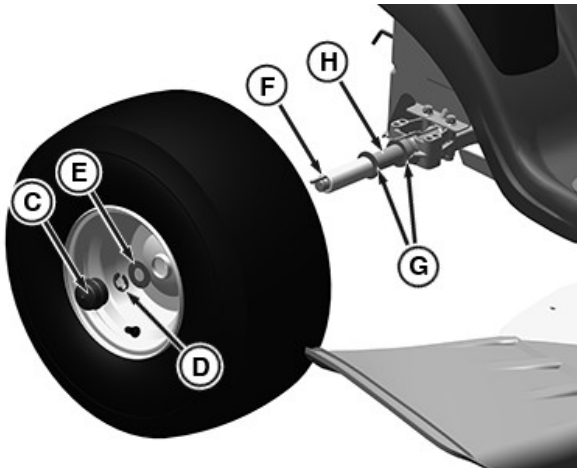
IMPORTANT: Avoid damage! Place jackstands under frame, not under transmission or engine, when raising or supporting machine.

Troubleshooting



APY36180—UN—10JUL20

2. Safely lift and support machine. Place safe lifting device under transmission centered under machine frame point (A). Place jackstands or other stable supports on each side (B) where mounting bolts for frame come through. Block wheels remaining on the ground to prevent machine movement.



APY36185—UN—10JUL20

3. Remove plastic cap (C), snap ring (D), and washer (E).
4. Remove wheel.

IMPORTANT: Avoid damage! Do not lose the shaft key. Key must be installed for wheels to rotate and tractor to move.

5. Remove shaft key (F) (shown on end of transmission shaft), two washers (G), except for model S100, and spacer (H).

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.

6. Take wheel assembly to an authorized service dealer for repairs.

Installing

IMPORTANT: Avoid damage! Do not lose the shaft key. Key must be installed for wheels to rotate and tractor to move.

NOTE: Rear wheels are installed with valves to the outside.

1. Install two washers (G), except on model S100, spacer (H), and shaft key (F).
2. Install rear wheel, washer (E), snap ring (D), and plastic cap (C).

3. Safely remove jackstands and lower machine.

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Troubleshooting

Using 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-19-13NOV18

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	Brake pedal not depressed. Mower is engaged. Spark plug wire is loose or disconnected. Improper fuel. Transmission is in reverse. Plugged fuel filter. Defective safety switch. Electrical problem - See Electrical Troubleshooting Section
Engine Is Hard To Start	Choke cable not adjusted properly. Plugged fuel filter. Faulty spark plug. Stale or improper fuel. Loose or corroded electrical connections. Improper engine oil viscosity.
Engine Runs Unevenly	Cooling fins plugged. Loose electrical connections. Choke or throttle cable sticking. 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

Troubleshooting

IF	CHECK
	plugged. Cooling fins plugged. Engine oil low or too high. Engine operated too long at a slow idle speed.
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. Choke partially engaged.
Engine Stops When REVERSE Foot Pedal Is Depressed And Attachment Is Engaged (Hydrostatic)	Normal condition. (See Using Reverse Implement Option in the OPERATING section.)
Engine Stops When Automatic Shift Lever Is Moved To The R (REVERSE) Position and Attachment Is Engaged (Automatic)	Normal condition. (See Using Reverse Implement Option in the OPERATING section.)

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Electrical

IF	CHECK
Starter Does Not Work Or Will Not Turn Engine	Brake pedal is not depressed. Mower is engaged. Battery terminals are corroded. Battery not charged. Transmission is in reverse. Blown fuse.
Battery Will Not Charge	Dead cell in the battery. Battery cables and terminals are dirty. Low engine speed or excessive idling.
Lights Do Not Work	Light plug disconnected. Loose or burned out bulb.
The fuel level indicator flashes "E33" intermittently or shows full bars constantly when fuel tank is not full	Check the fuel sender connector located beneath the seat for full and proper connection. If connections are good but the problem persists, contact your John Deere Dealer.

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Tractor

IF	CHECK
Tractor Vibrates Too Much Or Rattles Excessively	Attachment drive belts worn or damaged. Traction drive belt damaged or worn. Dirt on drive sheaves. Blades bent or out of balance.
Tractor Will Not Move With Engine Running	Parking brake locked. Bypass rod is pulled out.

OUO1023.00001EB-19-19JUN15

Mower

IF	CHECK
Discharge Chute Plugged	Travel speed too fast. Grass too long. Grass too wet. Engine rpm not at wide open throttle. Restricted air flow. Belt installed incorrectly.
Patches Of Grass Uncut	Travel speed too fast. Engine rpm not at wide open throttle. Mower deck needs cleaning.
Belt Slipping	Debris in sheaves. Worn belt. Belt tension is incorrect.
Too Much Vibration	Debris on mower deck or in sheaves. Damaged drive belt. Damaged sheaves or sheaves out of alignment. Blades out of balance.
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.
Uneven Cut	Mower deck not leveled properly. Travel speed too fast. Blades dull. Mower wheels not adjusted correctly. Tire pressure unequal.
Mower (Or Other Attachment) Stops When Vehicle Is Operated in REVERSE	Normal condition. (See Using Reverse Implement Option in the OPERATING section.)

OUO1023.00001EC-19-19JUN15

Storage

Storage

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.

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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.

MP47322,00F4681-19-13JUL16

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.)

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.

2. Turn on engine and allow to run until it runs out of fuel.
3. For machines equipped with key switch, turn key to off position.

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.
4. 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.
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.

NOTE: The stored battery should be recharged every 90 days.

10. Charge the battery.

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

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

RM87422,00007C9-19-19JUL17

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.

MP47322,00F4683-19-05JUL17

Specifications

Hydrostatic "Model S100"

Engine Model Briggs & Stratton 31
Power Rating Information www.briggsandstratton.com/
Displacement. 500 cc (30.5 in³)
Spark Plug Gap. 0.76 mm (0.030 in)

Specifications

Spark Plug Torque	20 N·m (15 lb·ft)
Cylinders	Single
Oil Filter	Standard
Air Filter	Cartridge
Transmission	Hydrostatic
Transaxle Model	TL200
Travel Speed - Forward	0—8.9 km/h (0—5.5 mph)
Travel Speed - Reverse	0—4.8 km/h (0—3.0 mph)

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Hydrostatic “Model S110”

Engine Model	Briggs & Stratton 33
Power Rating Information	www.briggsandstratton.com/
Displacement	540 cc (33 in ³)
Spark Plug Gap	0.76 mm (0.030 in)
Spark Plug Torque	20 N·m (15 lb·ft)
Cylinders	Single
Oil Filter	Standard
Air Filter	Cartridge
Transmission	Hydrostatic
Transaxle Model	TL200
Travel Speed - Forward	0—8.9 km/h (0—5.5 mph)
Travel Speed - Reverse	0—4.8 km/h (0—3.0 mph)

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Hydrostatic “Models S120, S130, S140, and S160

Engine Model	Briggs & Stratton 44
Power Rating Information	www.briggsandstratton.com/
Displacement	724 cc (44.2 in ³)
Spark Plug Gap	0.76 mm (0.030 in)
Spark Plug Torque	20 N·m (15 lb·ft)
Cylinders	Twin
Oil Filter (If Equipped)	John Deere Easy Change™ 30-Second Oil Change System
Air Filter	Cartridge
Transmission	Hydrostatic
Transaxle Model	TL200
Travel Speed - Forward	0—8.9 km/h (0—5.5 mph)
Travel Speed - Reverse	0—4.8 km/h (0—3.0 mph)

John Deere Easy Change is a trademark of Deere & Company

MG39705,00004DE-19-27JUL20

Hydrostatic “Models S170 and S180”

Engine Model	Briggs & Stratton 44
Power Rating Information	www.briggsandstratton.com/
Displacement	724 cc (44.2 in ³)
Spark Plug Gap	0.76 mm (0.030 in)
Spark Plug Torque	20 N·m (15 lb·ft)
Cylinders	Twin
Oil Filter	John Deere Easy Change™ 30-Second Oil Change System

Air Filter	Cartridge
Transmission	Hydrostatic
Transaxle Model	Tuff Torq™ HD K46
Travel Speed - Forward	0—8.9 km/h (0—5.5 mph)
Travel Speed - Reverse	0—4.8 km/h (0—3.0 mph)

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MG39705,00004DF-19-27JUL20

Electrical System

Charging System	Regulated Circuit
Charging System Capacity (S100, S110, S120, S130, and S140)	9 Amp
Charging System Capacity (S160, S170, and S180)	16 Amp
Battery Voltage	12 Volts
Battery Type	BCI Group U1

SR99263,0000339-19-12MAY20

Fuel System (All Models)

Fuel Types (Recommended):	
	Regular Grade 87 Octane Unleaded Fuel
	Ethanol Blended Fuel (Up to 10%)
	MTBE Reformulated Fuel (Up to 15%)

OUO1023,00001F8-19-01MAR13

Tires

Models S100, S110, and S120	
Size (Front)	15 x 6.00 - 6
Size (Rear)	20 x 8.0 - 8
Tire Pressure (Front)	97 kPa (14 psi)
Tire Pressure (Rear)	69 kPa (10 psi)
Models S130, S140, and S160	
Size (Front)	15 x 6.00 - 6
Size (Rear)	20 x 10.0 - 8
Tire Pressure (Front)	97 kPa (14 psi)
Tire Pressure (Rear)	69 kPa (10 psi)
Models S170 and S180	
Size (Front)	16 x 6.5 - 8
Size (Rear)	22 x 9.5 - 12
Tire Pressure (Front)	83 kPa (12 psi)
Tire Pressure (Rear)	83 kPa (12 psi)

(Tire pressure information is also located on the sidewalls of the tires)

SR99263,000033A-19-12MAY20

Capacities

Models S100 and S110	
Crankcase, with Oil Filter	1.4 L (1.5 qt)
Models S140	
Crankcase, with Oil Filter	1.9 L (2.0 qt)
Models S120, S130, S160, S170, and S180	

Warranty

Crankcase, with Easy Change™ 30-Second Oil Change System 2.6 L (2.8 qt)
Fuel Tank (All Models) 9 L (2.4 gal)
Towing:
Maximum Towing Capacity: Do not exceed combined weight of the pulling machine, operator, and installed ballast.

SR99263,000033B-19-28JUL20

Dimensions

Height (S100 and S110) 108 cm (42.5 in)
Height (S120, S130, and S140) 113 cm (45.5 in)
Height (S160) 118 cm (46.46 in)
Height (S170 and S180) 118 cm (46.5 in)
Length (Overall)
(S100, S110, and S120) 175 cm (68.75 in)
Length (Overall) (S130) 186 cm (73.25 in)
Length (Overall) (S140) 177 cm (69.5 in)
Length (Overall) (S160) 191 cm (75.2 in)
Length (Overall) (S170 and S180) 194 cm (76.5 in)
Width (Mower Deck Chute Down)
(S100, S110, S120, and S130) 138 cm (54.4 in)
Width (Mower Deck Chute Down) (S160) 155 cm (61 in)
Width (Mower Deck Chute Down)
(S140 and S170) 152 cm (60 in)
Width (Mower Deck Chute Down) (S180) 174 cm (68.5 in)
Weight: S100 189 kg (415 lb)
Weight: S110 193 kg (423 lb)
Weight: S120 198 kg (436 lb)
Weight: S130 201 kg (443 lb)
Weight: S140 218 kg (479 lb)
Weight: S160 217.72 kg (480 lb)
Weight: S170 229 kg (504 lb)
Weight: S180 241 kg (530 lb)

SR99263,000033C-19-15MAY20

Mower Deck - 107 cm (42 in)

Blades Rotary 2
Blade Nut Torque (w/5/8 in. Nut) 88 N•m (65 lb-ft)
Cutting Height (Approximately) 2.5 -10.2 cm (1 - 4 in)
Cutting Width 107 cm (42 in)

SR99263,000014D-19-24JUL19

Mower Deck - 122 cm (48 in)

Blades Rotary 3
Blade Nut Torque (w/5/8 in. Nut) 88 N•m (65 lb-ft)
Cutting Height (Approximately) 2.5 -10.2 cm (1 - 4 in)
Cutting Width 122 cm (48 in)

SR99263,000014E-19-24JUL19

Mower Deck - 137 cm (54 in)

Blades Rotary 3
Blade Nut Torque (w/5/8 in. Nut) 88 N•m (65 lb-ft)
Cutting Height (Approximately) 2.5 -10.2 cm (1 - 4 in)
Cutting Width 137 cm (54 in)

SR99263,000014F-19-24JUL19

Recommended Lubricants

Engine Oil Turf-Gard™ OR Plus-4™
Grease Grease-Gard™ Premium Plus
. John Deere Multi-Purpose HD Lithium Complex Grease

*Turf-Gard is a trademark of Deere & Company
Plus-4 is a trademark of Deere & Company
Grease-Gard is a trademark of Deere & Company*

(Specifications and design subject to change without notice.)

MG39705,00004DA-19-24JUL20

Warranty

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_warranties.page

Website (French):

http://fr.deere.ca/en_CA/services_and_support/service_plans_warranties/service_plans_warranties.page

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.

Warranty

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

MP47322,00F4690-19-09JUL15

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

Warranty

- 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.

MK71445,000033D-19-30APR20

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.)

MX00654,0000314-19-21AUG14

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.

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

Warranty

Warranty Code	Free Replacement Period	Pro Rata Warranty Period
6	6 Months	0 Months
12	12 Months	0 Months
18	18 Months	0 Months

OUMX068,0000504-19-10MAY17

John Deere Quality Statement

John Deere Quality Statement

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:

http://www.deere.com/globalhome/deerecom/global_home.page?CC=true

Select your country and then click on the Contact Us link.

SP66632,00043A7-19-10MAY17

Service Record

Service Record

Record Service Dates

Oil Change	Oil Filter Change (If Equipped)	Lubricate Machine	Air Cleaner Element Check/Clean	Fuel Filter Change

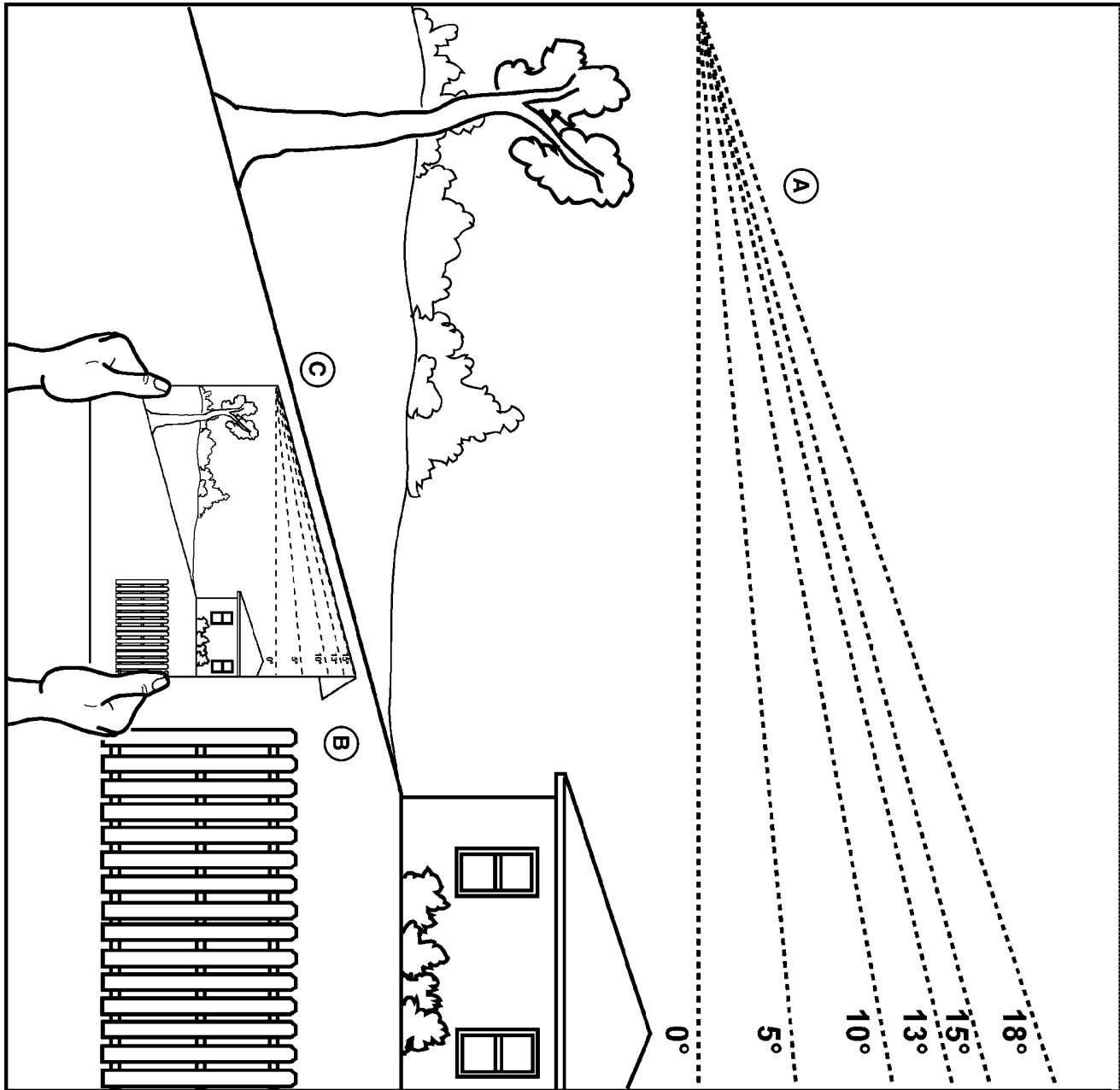
OUO1082,00066CA-19-15MAY17

Slope Gauge

Slope Gauge

Slope Gauge Template

Hold up or copy this page and follow the directions below to use the Slope Gauge Template.



MXT013189—UN—22APR15

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.

OUMX068,0000513-19-05,JUL17

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Notes

Notes
