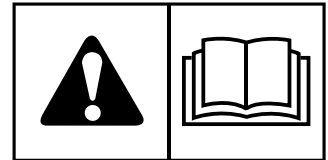




OPERATOR'S MANUAL

FW35 Series Walk Behind Mower



Model	Description
5901329	FW35KAV2148RDCE
5901330	FW35KAV2152RDCE
5901454	FW35BV2648RDCE
5901455	FW35BV2652RDCE
5901827	FW35BV2648SDCE

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Thank you for purchasing this quality-built Ferris Commercial Walk Behind Mower. We're pleased that you've placed your confidence in the Ferris brand. When operated and maintained according to the manuals, your Ferris product will provide many years of dependable service.

The manuals contain safety information to make you aware of the hazards and risks associated with the unit and how to avoid them. This Commercial Walk Behind Mower was designed to be used as described in this operator's manual and operated by trained professionals for finish cutting of established lawns and is not intended for any other purpose. It is important that you read and understand the instructions thoroughly before attempting to start or operate this equipment. Save these original instructions for future reference.

Products Covered by This Manual

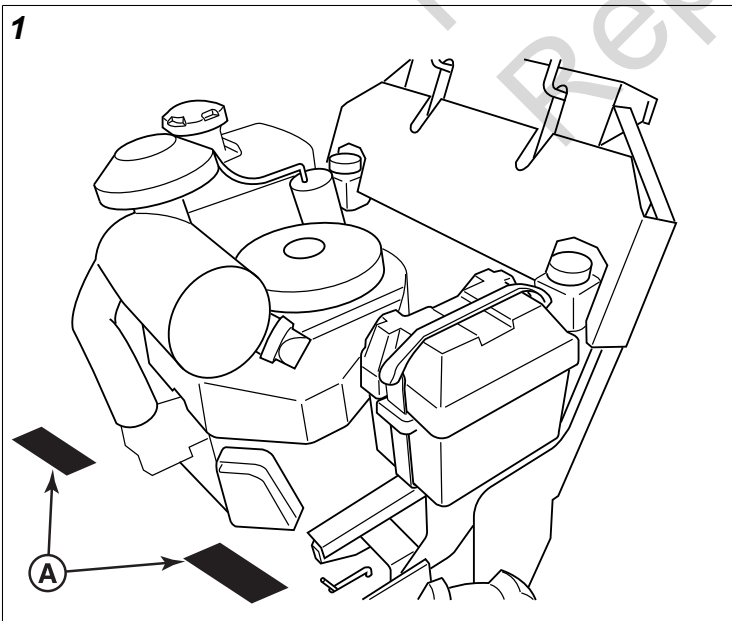
The following products are covered by this manual:
5901329, 5901330, 5901454, 5901455, & 5901827

The images in this document are representative, and are meant to complement the instructional copy they accompany. Your unit may vary from the images displayed. *LEFT* and *RIGHT* are as seen from the operator's position.

Ferris is a registered trademark of Briggs & Stratton Corporation.

Identification Tag Location

The product identification tags (A, Figure 1) can be found in the locations shown.



**BRIGGS & STRATTON
CORPORATION**
MILWAUKEE, WI 53201, USA
ASSEMBLED IN THE USA

PART NO.
XXXXXXX

SERIAL NO.
XXXXXXXXXX

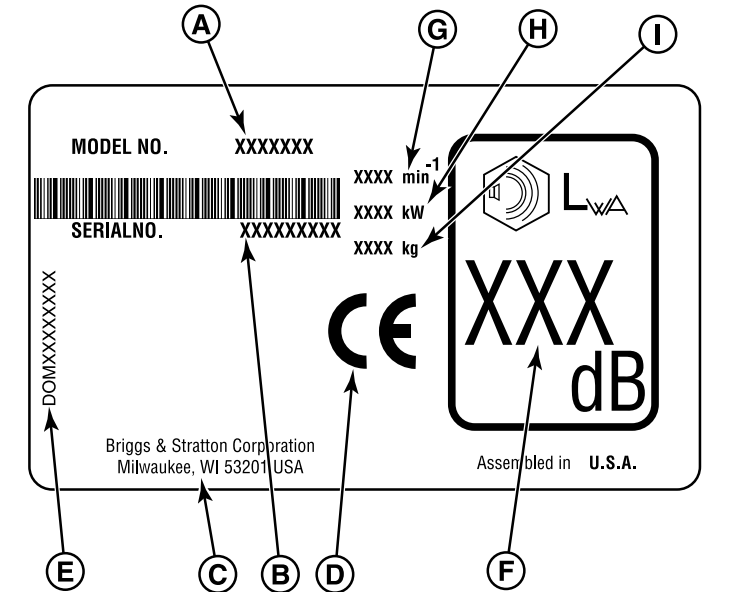
PRODUCT REFERENCE DATA	
Unit Model Number:	
Unit Serial Number:	
Mower Deck Model Number: (if applicable)	
Mower Deck Serial Number: (if applicable)	
Dealer Name:	
Date Purchased:	
ENGINE REFERENCE DATA	
Engine Make:	
Engine Model:	
Engine Type/Spec:	
Engine Code/Serial Number	

When contacting your authorized service dealer for replacement parts, service, or information you **MUST** have these numbers.

Note: For the location of the engine identification numbers, refer to engine owner's manual.

The Illustrated Parts List for this machine can be downloaded from ferrismowers.com. Please provide model and serial number when ordering replacement parts.

CE Identification Tag Markings



A.	Manufacturer's Identification Number
B.	Serial Number

C.	Manufacturer's Address
D.	CE Compliance Logo
E.	Year of Manufacture
F.	Sound Power in Decibels
G.	Maximum Engine Speed in Rotations per Minute
H.	Power Ratings in Kilowatts
I.	Mass of Unit in Kilograms

Operator Safety



WARNING

This product can expose you to chemicals including gasoline engine exhaust, which is known to the State of California to cause cancer, and carbon monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Operating Safely

Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of the unit, severe personal injury or death to you, or bystanders, or damage to property or equipment. **This mowing deck is capable of amputating hands and feet and throwing objects.**

The safety alert triangle (⚠) in text signifies important cautions or warnings which must be followed.

Operating Safety



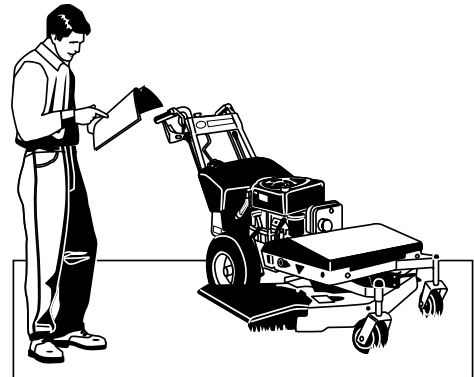
Congratulations on purchasing a superior-quality piece of lawn and garden equipment. Our products are designed and manufactured to meet or exceed all industry standards for safety.

Do not operate this machine unless you have been trained. Reading and understanding this operator's manual is a way to train yourself.

Power equipment is only as safe as the operator. If it is misused, or not properly maintained, it can be dangerous! Remember, you are responsible for your safety and that of those around you.

Use common sense, and think through what you are doing. If you are not sure that the task you are about to perform can be safely done with the equipment you have chosen, ask a professional: contact your local authorized dealer.

Read the Manual

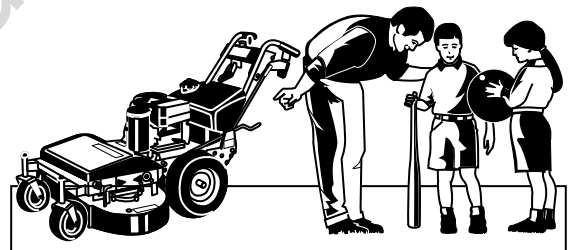


The operator's manual contains important safety information you need to be aware of **BEFORE** you operate your unit as well as **DURING** operation.

Safe operating techniques, an explanation of the product's features and controls, and maintenance information is included to help you get the most out of your equipment investment.

Be sure to completely read the Safety Rules and Information found on the following pages. Also completely read the Operation section.

Children



Tragic accidents can occur with children. Do not allow them anywhere near the area of operation. Children are often attracted to the unit and mowing activity. Never assume that children will remain where you last saw them. If there is a risk that children may enter the area where you are mowing, have another responsible adult watch them.

Slope Operation

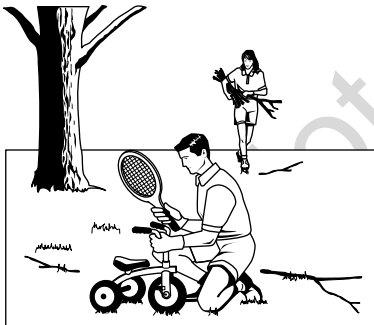


You could be seriously injured if you use this unit on too steep of a slope. Using the unit on a slope that is too steep where you do not have adequate footing and unit traction (and control) can cause you to lose control and possibly slip and fall or roll the unit over.

Always mow across slopes, not up and down (you could slip and fall.)

Also, note that the surface you are on can greatly impact your ability to safely operate this machine. Wet grass or soft soil can seriously affect your footing and traction of the unit. Do not operate on slopes that are slippery, wet, or have soft soil.

Thrown Objects

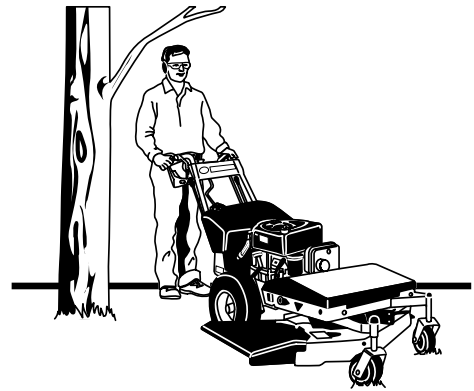


This unit has spinning mower blades. These blades can pick up and throw debris that could seriously injure a bystander. Be sure to clean up the area to be mowed and remove objects that could be thrown by the blade **BEFORE** you start mowing.

Do not operate this unit without the entire grass catcher or discharge guard (deflector) in place.

Also, do not allow anyone in the area while the unit is running! If someone does enter the area, shut the unit off immediately until they leave.

Moving Parts

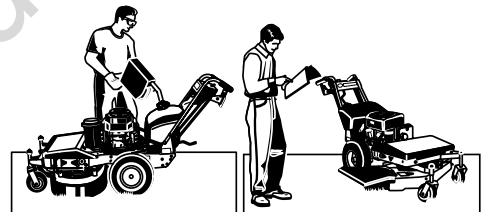


This equipment has many moving parts that can injure you or someone else. However, if you stay in the operator zone (area behind the handles and controls), and follow the safety rules in this operator's manual, the unit is safe to operate.

The mower deck has spinning mower blades that can amputate hands and feet. Do not allow anyone near the unit while it is running! Keep safety devices (guards, shields, and switches) in place and working.

To help you, the operator, use this equipment safely, it is equipped with an operator-present safety system. Do **NOT** attempt to alter or bypass the system. See your dealer immediately if the system does not pass all the safety interlock system tests found in this manual.

Fuel and Maintenance



Always disengage all drives, shutoff the engine and remove the key before doing any cleaning, refueling or servicing.

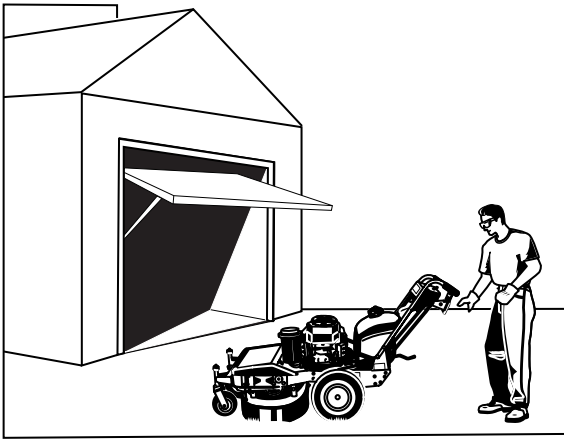
Gasoline and its vapors are extremely flammable. Do not smoke while operating or refueling. Do not add fuel while engine is hot or running. Allow engine to cool for at least 3 minutes prior to adding fuel.

Do not add fuel indoors, in an enclosed trailer, garage or other enclosed area that is not well ventilated. Gasoline spills should be cleaned up promptly and before operation begins.

Gasoline should be stored only in sealed containers approved for fuel.

Proper maintenance is critical to the safety and performance of your unit. Keep the unit free of grass, leaves and excess oil. Be sure to perform the maintenance procedures listed in this manual, especially periodically testing the safety system.

Enclosed Areas



Only operate this unit outdoors and away from unventilated areas such as inside garages or enclosed trailers. The engine emits poisonous carbon monoxide gas and prolonged exposure in an enclosed area can result in serious injury or death.

Safety Rules and Information

Training

- Read, understand, and follow all instructions in the manual and on the unit before starting. If the operator(s) or mechanic(s) can not read English it is the owner's responsibility to explain this material to them.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- All operators and mechanics should be trained. The owner is responsible for training the users.
- Only allow responsible adults, who are familiar with the instructions, to operate the unit.
- Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
- The owner/user can prevent and is responsible for accidents or injuries occurring to themselves, other people or property.
- Data indicates that operators, age 60 years and above, are involved in a large percentage of riding mower-related injuries. These operators should evaluate their ability to operate the riding mower safely enough to protect themselves and others from serious injury.

Preparation

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Use only accessories and attachments approved by the manufacturer.
- Wear appropriate clothing including safety shoes, safety glasses and ear protection. Long hair, loose clothing or jewelry may get tangled in moving parts.
- Inspect the area where the equipment is to be used and remove all objects such as rocks, toys and wire, which can be thrown by the machine.
- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.

- Use only an approved container.
- Never remove fuel cap or add fuel with the engine running. Allow engine to cool before refueling. Do not smoke.
- Never refuel or drain the machine indoors.
- Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.

Operation

- Never run an engine in an enclosed area.
- Mow only in the daylight or with good artificial light, keeping away from holes and hidden hazards.
- Be sure all drives are in neutral and parking brake is engaged before starting engine. Only start engine from the operator's position.
- Be sure of your footing while using pedestrian controlled equipment, especially when backing up. Walk, don't run. Reduced footing could cause slipping.
- Slow down and use extra care on hillsides. Be sure to travel in the recommended direction on hillsides. Turf conditions can affect the machines stability. Use caution when operating near drop-offs.
- Do not mow in reverse unless absolutely necessary. Always look down and behind before and while traveling in reverse.
- Be aware of the mower discharge direction and do not point it at anyone. Do not operate the mower without either the entire grass catcher or the deflector in place.
- Slow down and use caution when making turns and when changing directions on slopes.
- Never raise deck with the blades running.
- Never leave a running unit unattended. Always disengage the PTO, set the parking brake, stop the engine, and remove keys before dismounting. Keep hands and feet away from the cutting units.
- Turn off the PTO switch to disengage the blades when not mowing.
- Never operate with guards not securely in place. Be sure all interlocks are attached, adjusted properly and functioning properly.
- Never operate with the discharge deflector raised, removed or altered, unless using a grass catcher.
- Do not change the engine governor setting or over-speed the engine.
- Stop on level ground, lower implements, disengage drives, engage parking brake, shut off engine before leaving the operator's position for any reason including emptying the grass catchers or unclogging the chute.
- Stop equipment and inspect blades after striking objects or abnormal vibration occurs. Make necessary repairs before resuming operations.
- Keep hands and feet away from the cutting units.
- Look behind and down before backing up to be sure of a clear path.
- Never carry passengers and keep pets and bystanders away.

- Do not operate the unit while under the influence of alcohol or drugs.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop blades if not mowing.
- Use care when loading or unloading the machine into a trailer or truck.
- Use care when approaching blind corners, shrubs, trees or other objects that may obscure vision.
- To reduce fire hazard, keep unit free of grass, leaves & excess oil. Do not stop or park over dry leaves, grass or combustible materials.



It is a violation of California Public Resource Code, Section 4442, to use or operate the engine on any forest-covered, brush-covered or grass-covered land unless the exhaust system is equipped with a spark arrester, as defined in section 4442, maintained in effective working order. Other states or federal jurisdictions may have similar laws. Contact an Authorized Service Dealer to obtain a spark arrester designed for the exhaust system installed on this engine.

- OSHA regulations may require the use of hearing protection when exposed to sound levels greater than 85 dBA for an 8 hour time period.



This machine produces sound level in excess of 85 dBA at the operator's ear and can cause hearing loss through extended periods of exposure. Wear hearing protection when operating this machine.

Slope Operation

Slopes are a major factor related to loss-of-control and tip-over accidents, which can result in severe injury or death. All slopes require extra caution. If you cannot back up the slope or if you feel uneasy on it, do not drive on it.



Operating on a steep slope can cause sliding and loss of steering, control, and rollover. Select slow ground speed before driving onto a slope. Use extra caution when operating on slopes with rear mounted grass catchers.

Mow across the face of slopes, not up and down, use caution when changing directions and **DO NOT START OR STOP ON A SLOPE.**

Do:

- Mow across slopes, not up and down.
- Remove obstacles such as rocks, tree limbs, etc.
- Watch for holes, ruts, or bumps. Uneven terrain could overturn the unit. Tall grass can hide obstacles.
- Use slow speed. Choose a slow speed so that you will not have to stop or change speed while on the slope.

- Use extra care with grass catchers or other attachments. These can change the stability of the unit.
- Keep all movement on the slopes slow and gradual. Do not make sudden changes in speed or direction.
- See your authorized dealer for recommendations of available weights to improve stability.

Do not:

- Avoid starting, stopping, or turning on a slope. If tires lose traction (i.e. machine stops forward motion on a slope), disengage the blade(s) (PTO) and drive slow off the slope.
- Do not turn on slopes unless necessary, and then, turn slowly.
- Do not mow near drop-offs, ditches, or embankments. The operator could lose footing or balance or mower could suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.
- Do not mow on wet grass. Reduced footing or traction could cause sliding.
- Do not mow excessively steep slopes.
- Do not use grass catcher on steep slopes.

Children

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the unit and the mowing activity. Never assume that children will remain where you last saw them.

- Keep children out of the mowing area and under the watchful care of another responsible adult.
- Be alert and turn unit off if children enter the area.
- Before and during reverse operation, look behind and down for small children.
- Never allow children to operate the unit.
- Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

Emissions

- Engine exhaust from this product contains chemicals known, in certain quantities, to cause cancer, birth defects, or other reproductive harm.
- Look for the relevant Emissions Durability Period and Air Index information on the engine emissions label.

Ignition Systems (Gasoline Models)

- This spark ignition system complies with CAN ICES-2/ NMB-2.

Service and Maintenance Safety



Amputation and crushing hazard

Specific steps must be taken in order to perform service and maintenance procedures safely.

Read and follow all the applicable safety and instructional messages in this manual.

Always disengage the mower blades, set the parking brake, turn the engine OFF, remove the ignition key, and wait for all movement to stop prior to performing service and maintenance procedures.

Always disconnect the spark plug wire(s) and fasten it away from the plug before beginning any maintenance or service procedures in order to prevent accidental ignition.

Safe Handling of Gasoline



Fire and explosion hazard

To avoid personal injury or property damage, use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive.

- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only approved gasoline containers.
- Never remove the gas cap or add fuel with the engine running. Allow the engine to cool before refueling.
- Never fuel the machine indoors.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light such as near a water heater or other appliance.
- Never fill containers inside a vehicle or on a truck bed with a plastic bed liner. Always place containers on the ground away from your vehicle before filling.
- Remove gas-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment on a trailer with a portable container, rather than from a gasoline dispenser nozzle.
- Keep nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
- If fuel is spilled on clothing, change clothing immediately.
- Never over-fill the fuel tank. Replace gas cap and tighten securely.
- Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.
- If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapors have dissipated.
- Replace all fuel tank caps and fuel container caps securely.

Maintenance and Storage

- Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
- Always follow the engine manual instructions for storage preparations before storing the unit for both short and long term periods.
- Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.
- Never store the machine or fuel container inside where there is an open flame, such as in a water heater. Allow unit to cool before storing.
- Shut off fuel while storing or transporting. Do not store fuel near flames or drain indoors.
- Keep all hardware, especially blade attachment bolts, tight and keep all parts in good working condition. Replace all worn or damaged decals.
- Never tamper with safety devices. Check their proper operation regularly.
- Disengage drives, lower implement, set parking brake, stop engine and remove key or disconnect spark plug wire. Wait for all movement to stop before adjusting, cleaning or repairing.
- Clean grass and debris from cutting units, drives, mufflers, and engine to prevent fires. Clean up oil or fuel spillage.
- Let engine cool before storing and do not store near flame.
- Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.
- Park machine on level ground. Never allow untrained personnel to service machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect battery or remove spark plug wire before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- Use care when checking blades. Wrap the blade(s) or wear gloves, and use caution when servicing them. Only replace blades. Never straighten or weld them.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothes and use insulated tools.
- Grass catcher components are subject to wear, damage, and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check components and replace with manufacturer's recommended parts, when necessary.
- Check brake operation frequently. Adjust and service as required.
- Use only factory authorized replacement parts when making repairs.

- Always comply with factory specifications on all settings and adjustments.
- Only authorized service locations should be utilized for major service and repair requirements.
- Never attempt to make major repairs on this unit unless you have been properly trained. Improper service procedures can result in hazardous operation, equipment damage and voiding of manufacturer's warranty.
- Units with hydraulic pumps, hoses, or motors: **WARNING:** Hydraulic fluid escaping under pressure may have sufficient force to penetrate skin and cause serious injury. If foreign fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result. Keep body and hands away from pin holes or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, and not hands, to search for leaks. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. If leaks occur, have the unit serviced immediately by your authorized dealer.
- **WARNING:** Stored energy device. Improper release of springs can result in serious personal injury. Springs should be removed by an authorized technician.

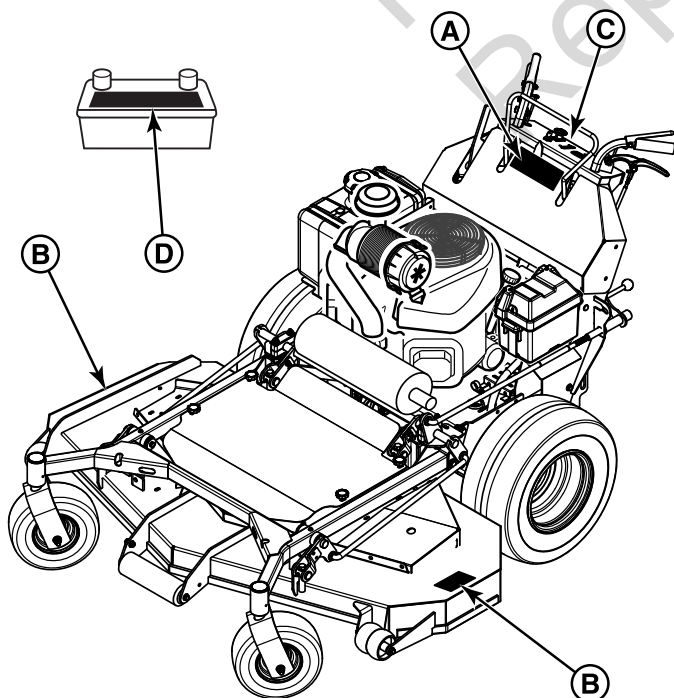
Safety Decals

Before operating your unit, read the safety decals. The cautions and warnings are for your safety. To avoid a personal injury or damage to the unit, understand and follow all safety decals.



WARNING






If any safety decals become worn or damaged, and cannot be read, order replacement decals from your local dealer.




A	Part Number: 5103934 - Decal, Main Safety, CE WB
B	Part Number: 7106109 - Decal, Discharge Safety, Export
C	Part Number: 5104566 - Decal, Dash Panel, WKB, Man/Elec Start
D	Battery Decal


CE Safety Icons

	Warning: Read Operator's Manual - Read and understand the operator's manual before using this machine.
	Danger: Fire Hazard - Keep the unit free of grass, leaves and excess oil. Do not add fuel while engine is hot or running. Stop engine and allow to cool for at least 3 minutes prior to adding fuel. Do not add fuel indoors, in an enclosed trailer, garage or other enclosed areas. Clean up spilled fuel. Do not smoke while operating this machine.
	Danger: Thrown Objects - This machine is capable of thrown objects and debris. Keep bystanders away.
	Danger: Dismemberment - This mower deck can amputate limbs. Keep hands and feet away from blades.
	Danger: Machine Rollover - Operating on steep slopes can cause sliding and loss of steering, control and rollover.


	Danger: Amputation and Thrown Objects Hazard - To avoid injury from rotating blades, stay clear of the deck edge and keep others away.
	Danger: Thrown Objects Hazard - Do not mow without discharge chute or entire grass catcher in place.
	Warning: Fire Hazard - Keep children, open flames and sparks away from the battery, which could ignite explosive gases.
	Warning: Sulfuric acid can cause blindness or severe burns - Always wear safety goggles or a face shield when working on or near a battery.
	Warning: Batteries produce explosive gases - Read and understand the Operator's Manual before using this machine.
	Important: Do not discard a battery in the trash - Contact local authorities for disposal and/or recycling of batteries.

Safety Alert Symbol and Signal Words

The safety alert symbol () is used to identify safety information about hazards that can result in personal injury. A signal word (DANGER, WARNING, or CAUTION) is used with the alert symbol to indicate the likelihood and the potential severity of injury. In addition, a hazard symbol may be used to represent the type of hazard.

 **DANGER** indicates a hazard which, if not avoided, **will result in death or serious injury**.

 **WARNING** indicates a hazard which, if not avoided, **could result in death or serious injury**.

 **CAUTION** indicates a hazard which, if not avoided, **could result in minor or moderate injury**.

NOTICE indicates a situation that **could result in damage to the product**.

Safety Interlock System

This unit is equipped with safety interlock switches. These safety systems are present for your safety, do not attempt to bypass safety switches, and never tamper with safety devices. Check their operation regularly.

Operational SAFETY Checks

Test 1 - Engine should NOT crank if:

- Forward speed control lever is not in the NEUTRAL position.

Test 2 - Engine SHOULD crank if:

- Forward speed control lever is in the NEUTRAL position.

Test 3 - Engine should SHUT OFF if:

- **S/N: 2016973573 & Below:** Operator moves the forward speed control lever FORWARD with the parking brake engaged, OR
- Operator releases the operator presence handles while the forward speed control lever is not in the NEUTRAL position.

Test 4 - PTO Switch (blades) should SHUT OFF if:

- If the PTO switch is ON and the operator releases the operator presence handles, OR
- The operator presses the PTO switch down to the OFF position.

Test 5 - PTO Switch (blades) SHOULD turn on if:

- Operator depresses the operator presence handles and the PTO switch is pulled up to the ON position.

Test 6 - Blade Brake Check:

Mower blades and mower drive belt should come to a complete stop within seven (7) seconds after electric PTO switch is turned OFF (or operator releases the operator presence handles). If the mower drive belt does not stop within seven (7) seconds, see your dealer.

Note: Once the engine has been stopped, the forward speed control lever must be returned to the NEUTRAL position, the parking brake should be engaged, the operator presence handles should be depressed and the PTO switch should be in the OFF position in order to start the engine.



WARNING

If the unit does not pass a safety test, do NOT operate it. See your authorized dealer. Under no circumstance should you attempt to defeat the purpose of the safety interlock system.

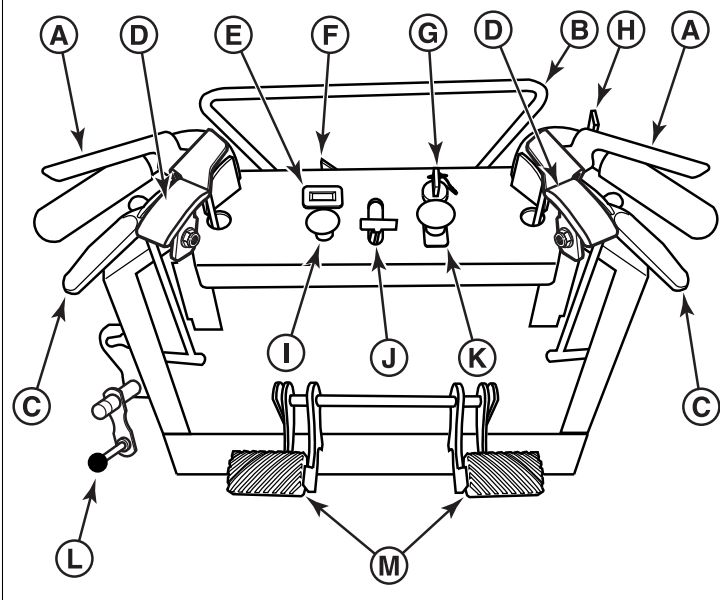
Features and Controls

Control Locations & Functions

The information below briefly describes the function of individual controls. Starting, stopping, driving, and mowing require the combined use of several controls applied in specific sequences. To learn what combination and sequence of controls to use for various tasks see the *Operation* section.

Control Locations & Functions - Operator's Position

2



Callout	Control Name
A	Operator Presence Handles
B	Forward Speed Control Lever
C	Drive Levers
D	Forward Speed Override Control Levers
E	Hour Meter
F	Forward Speed Indicator
G	Ignition Switch
H	Parking Brake Lever
I	Choke
J	Throttle Control
K	PTO (Power Take Off) Switch
L	Cutting Height Adjustment Handle
M	Neutral Return Pedals

Operator Presence Handles: These handles are a major factor in the safety interlock system of the mower. Both handles are tied together so depressing one handle depresses both. The operator must depress the handles in order to activate the PTO (Power Take Off) switch.

If the operator presence handles are released and the forward speed control lever is in the NEUTRAL position and the PTO switch is engaged, the mower blades will stop, but the engine will remain running.

If the operator presence handles are released and the forward speed control lever is NOT in the NEUTRAL position, the engine will stop (with or without the PTO engaged).

Forward Speed Control Lever / Drive Levers: These levers control the ground speed and direction of travel of the mower.

Icon	Control Name
	Forward Speed Control Lever
S/N: 2017008010 & Below	
	Left Drive Lever
	Right Drive Lever
S/N: 2017008011 & Above	
	Left Drive Lever
	Right Drive Lever

Icon	Control Position
	Forward
	Neutral
	Reverse

The **forward speed control lever** controls the forward ground speed of both drive wheels. **S/N: 2016973573 & Below:** The parking brake must be released before moving the forward speed control lever out of the NEUTRAL position or the engine will stop. **S/N: 2016973574 & Above:** The forward speed control lever cannot be moved forward out of the NEUTRAL position if the parking brake lever is engaged.

The **left drive lever** controls the steering and reverse ground speed of the left drive wheel. The **right drive lever** controls the steering and reverse ground speed of the right drive wheel. Squeeze both reverse speed control levers evenly to move in reverse.

See the *Driving the Mower* section for proper steering instructions.

Forward Speed Override Control Levers: The forward speed override control levers were designed to provide increased traction and controllability for operation on slopes and side hills.

To increase the forward speed of the left drive tire press the left hand forward speed control lever down.

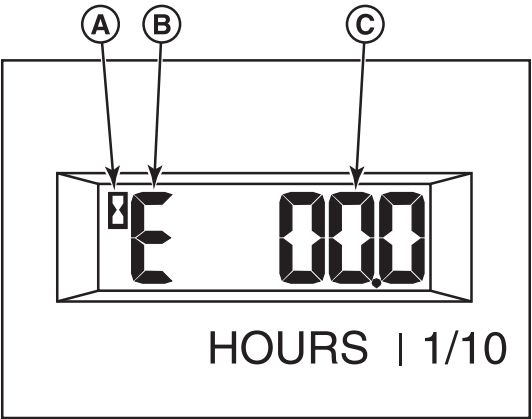
To increase the forward speed of the right drive tire press the right hand forward speed control lever down.

Your machine is equipped with one of the different styles of hour meter listed below.

Hour Meter (Displays Numbers Only): The hour meter measures the number of hours that the ignition switch is in

the RUN position and the operator presence handles are pressed down. The hour meter has a self contained power source so the total hours are always visible.

Hour Meter (Displays Numbers and Letters): This unit is equipped with a dual function hour meter that records the number of hours that the engine has run while the operator presence handles were pressed down and the number of hours that the PTO switch has been engaged.



"A" - Hour Glass Icon - The hour glass icon flashes when the hour meter is recording the passage of time.

"B" - Mode Icon - The mode icon will display an "E" when displaying engine hours, and a "P" when displaying PTO hours.

"C" - Time Display - This is the number of hours that are recorded.

The default display of the hour meter is engine hours. The mode icon will display a "E" and the hour glass icon will not flash.

To begin recording engine hours, start the unit's engine and press down the operator presence handles. The hour glass icon will flash.

To begin recording PTO hours, pull the PTO switch up to engage the PTO clutch. The unit's engine must be running and the operator presence handles must be pressed down. The mode icon will display a "P" and the hour glass icon will flash.

While recording PTO hours, the hour meter also records engine hours; however, the hour meter only displays PTO hours when recording PTO hours.

To stop recording PTO hours, push the PTO switch down to disengage the PTO clutch.

To stop recording engine hours, release the operator presence handles.

The hour meter has a self contained power source so that the recorded hours are always visible even when the engine is OFF.

Forward Speed Indicator: The purpose of the Forward Speed Indicator is to help the operator quickly reset the

forward speed control of the mower to a preferred driving speed.

Icon	
Control Name	Forward Speed Indicator

The forward speed indicator works in conjunction with the Forward Speed Control Lever and the Neutral Return Pedal. The further the Forward Speed Control Lever is pressed forward the further the Forward Speed Indicator travels to the right. When the Forward Speed Control Lever is pulled rearward or the Neutral Return Pedal is being depressed the Forward Speed Indicator travels to the left

Ignition Switch: The ignition switch starts and stops the engine, it has three positions:

	OFF	Stops the engine and shuts off the electrical system.
	RUN	Allows the engine to run and powers the electrical system.
	START	Cranks the engine for starting.

NOTE: Never leave the ignition switch in the RUN position with the engine stopped—this drains the battery.

(P) Parking Brake: Pull the parking brake lever rearward and up to engage the parking brake. Move the lever fully forward and down to disengage the parking brake.

	Disengage	Releases the parking brake.
	Engage	Locks the parking brake.


Choke: Close the choke for cold starting. Open the choke once the engine starts. A warm engine may not require choking. Pull the knob UP to close the choke. Push the knob DOWN to open the choke.

Throttle Control: The throttle controls engine speed. Move the throttle forward to increase engine speed and back to decrease engine speed. Always operate at FULL throttle when mowing.

	Fast throttle speed.
	Slow throttle speed.

PTO (Power Take Off) Switch: The PTO switch engages and disengages the mower blades. Pull UP on the switch to engage, and push DOWN to disengage.

Neutral Return Pedals:

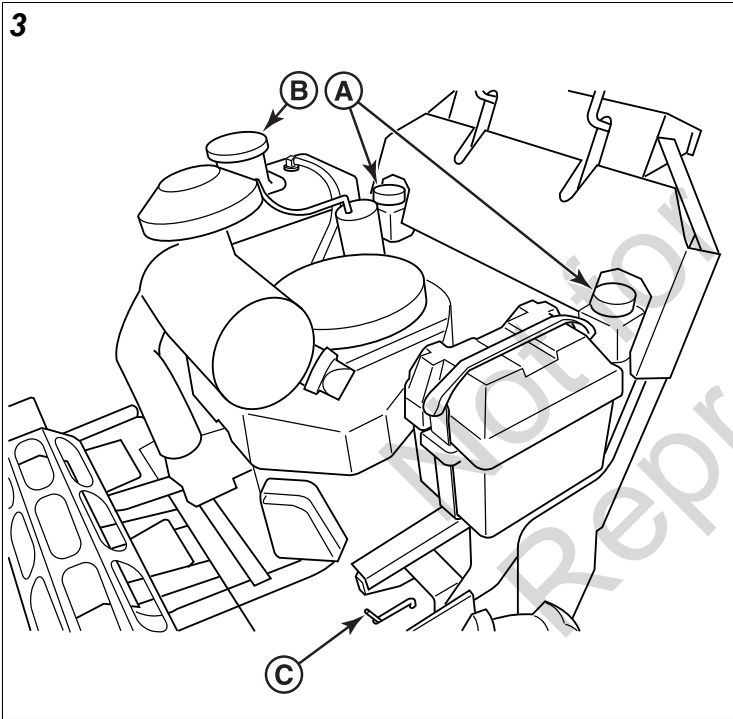
Icon	Control Name
	Neutral Return Pedals

The neutral return pedals provide a hands-free return to neutral. The pedals are used in conjunction with the drive levers to properly stop the machine. The two pedals are connected together so depressing one depresses both.

The operator must fully depress the neutral pedal downwards to return the mower to neutral. The mower must be in the neutral position to start the engine.

See the *Stopping the Mower* section for operating instructions of the neutral return pedals.

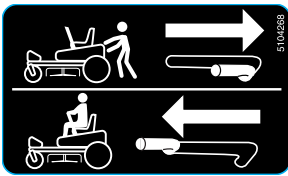
Control Locations & Functions - Left Side of Mower



Callout	Control Name
A	Transmission Oil Fill
B	Fuel Tank Cap
C	Transmission Release Levers


Fuel Tank Cap: To remove the cap, turn **counter-clockwise**.

Transmission Release Levers:

Icon	Control Name
	Transmission Release Levers

This unit is equipped with two transmission release levers. The transmission release levers deactivate the transaxle so that the unit can be pushed by hand. Both transmission release levers must be in the same position whether you are driving the unit or pushing it by hand. See *Pushing the Unit by Hand* for operational information.

Cutting Height Adjustment Handle:

Icon	Control Name
	Cutting Height Adjustment Handle

The cutting height adjustment handle controls the mower deck cutting height. To raise the mower deck cutting height: crank the cutting height adjustment handle **clockwise**. To lower the mower deck cutting height crank: the cutting height adjustment handle **counter-clockwise**.

Operation

Before First-Time Use

- Be sure to read all information in the Safety and Operation sections before attempting to operate this unit.
- Become familiar with all of the controls and how to stop the unit.
- Operate in an open area without engaging the PTO to become accustomed to the unit.



WARNING



Read the operator's manual before attempting to operate the machine.

If you do not understand how a specific control functions, or have not yet thoroughly read the Features and Controls section, do so now.

Do not attempt to operate the mower without first becoming familiar with the location and function of all controls.

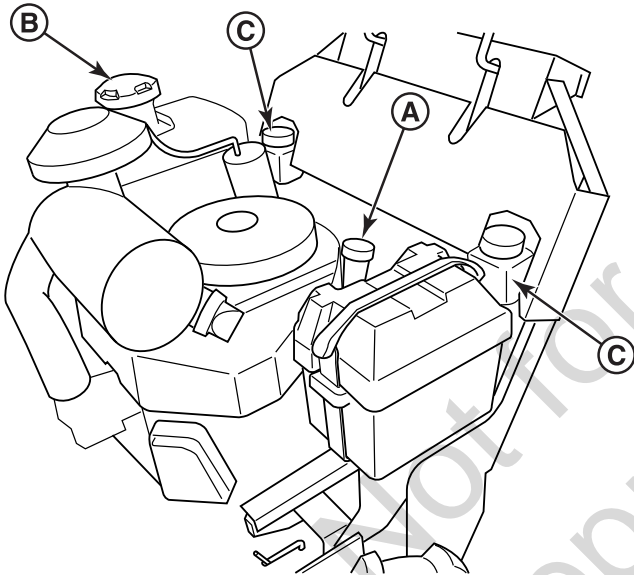


WARNING

- Before leaving the operator's position for any reason, engage the parking brake, disengage the PTO, stop the engine and remove the key.
- To reduce fire hazard, keep the engine and mower free of grass, leaves and excess grease. Do NOT stop or park unit over dry leaves, grass or combustible materials.
- Gasoline is highly flammable and must be handled with care. Never fill the tank when the engine is still hot from recent operation. Do NOT allow open flame, smoking or matches in the area. Avoid over-filling and wipe up any spills.

Checks Before Starting

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- Check that crankcase is filled to the full mark on the dipstick (A, Figure 4). See the engine Operator's Manual for engine oil dipstick location, oil fill instructions, and oil recommendations.
- Make sure all nuts, bolts, screws, and pins are in place and tight.
- Fill the fuel tank (B) with fresh fuel. Refer to engine manual for fuel recommendations.
- Check the hydraulic oil tank (C) and make sure that the oil level is up to the FULL COLD mark.

Starting the Engine - Carbureted Models



WARNING

If you do not understand how a specific control functions, or have not yet thoroughly read the **Features & Controls** section, do so now.

Do NOT attempt to operate the unit without first becoming familiar with the location and function of ALL controls.

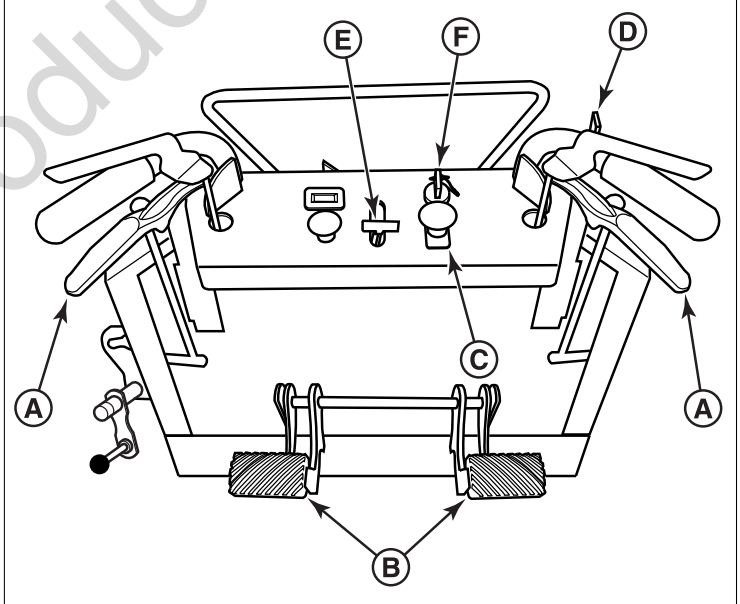
1. Engage the parking brake and make sure the PTO switch is disengaged and the forward speed control lever is in the NEUTRAL position.
2. Set the engine throttle control to FULL throttle position. Then fully close the choke by pulling the knob OUT fully.
NOTE: A warm engine may not require choking.
3. Insert the key into the ignition switch and turn it to the START position.
4. After the engine starts, gradually open the choke (push knob down fully). Reduce to half throttle speed and allow to warm up. Warm up the engine by running it for at least a minute before engaging the PTO switch or driving the mower.
5. After warming the engine, ALWAYS operate the unit at FULL THROTTLE when mowing.

In the event of an emergency the engine can be stopped by simply turning the ignition switch to STOP. Use this method only in emergency situations. For normal engine shut down follow the procedure given in STOPPING THE MOWER

Stopping the Mower

1. Gently squeeze both drive levers (A, Figure 5) evenly to stop the unit.

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2. Once the unit is stopped, firmly depress the neutral return pedal (B) to place the transmission in neutral.
3. Disengage the PTO by pushing down on the PTO switch (C).
4. Engage the parking brake by pulling the parking brake lever (D) fully up and rearward towards the handle bars.
5. Move the throttle control (E) to mid-throttle position and turn the ignition key (F) to OFF. Remove the key.

Driving the Mower

Before attempting to drive the mower make sure you have read the Features and Controls section and understand the location and function of the controls.

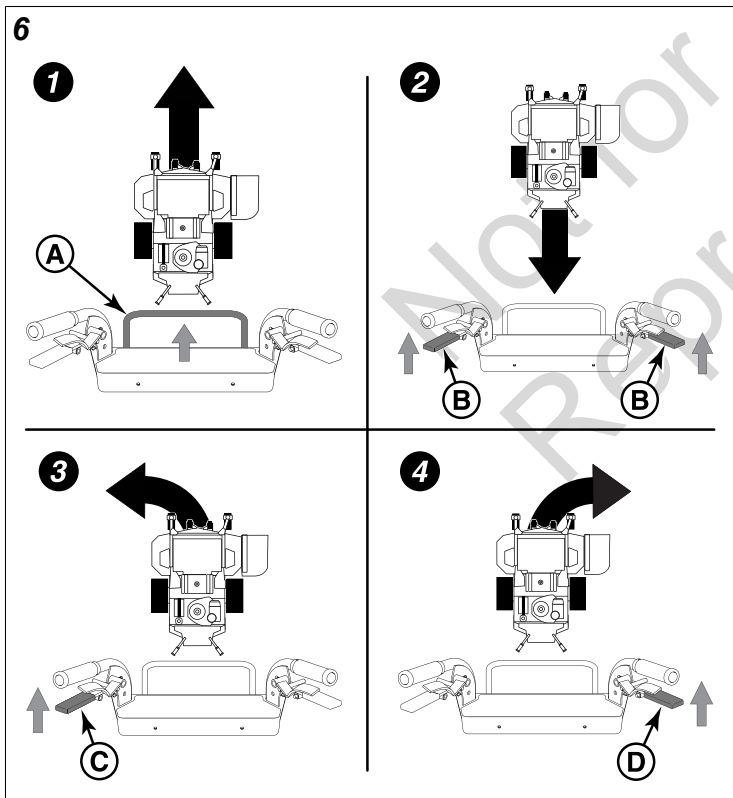
The hydrostatic transmission has an infinite number of speeds between full speed forward and reverse, with the faster speeds being achieved by moving the forward speed control lever and reverse speed control levers farthest in the direction of travel.

For normal use, the throttle should be kept fully open and the ground speed of the machine determined by the forward speed control lever. When transporting the machine or when loading or unloading from a truck or trailer, partial throttle should be used to slow the reaction time of the controls and reduce noise.

Practice maneuvering the machine at a slow engine speed on level ground with the PTO switch in the "OFF" position until you are familiar with the controls.

To Move Forward and Set Forward Speed

1. Disengage the parking brake.
2. Gently move the forward speed control lever (A, Figure 6, inset 1) forward until desired speed is achieved.



To Move Backward

1. Disengage the parking brake.
2. Gently squeeze both drive levers (B, inset 2) evenly, until desired speed is achieved.

To Slow or Stop Machine

1. Gently squeeze both drive levers evenly to slow the machine.
2. Continuing to squeeze the drive levers will stop the machine.
3. Once the machine is stopped, firmly depress the neutral return pedal to place the transmissions in neutral.
4. Engage the parking brake.

NOTE: Continuing to squeeze the drive levers after the machine is stopped, will cause the machine to move in reverse.

Turning the Machine

Note: Always reduce speed in a turn.

Turning Left:

Gently squeeze the left drive lever (C, inset 3). A sharp or gentle turn is determined by the amount of force applied to the drive lever.

Turning Right:

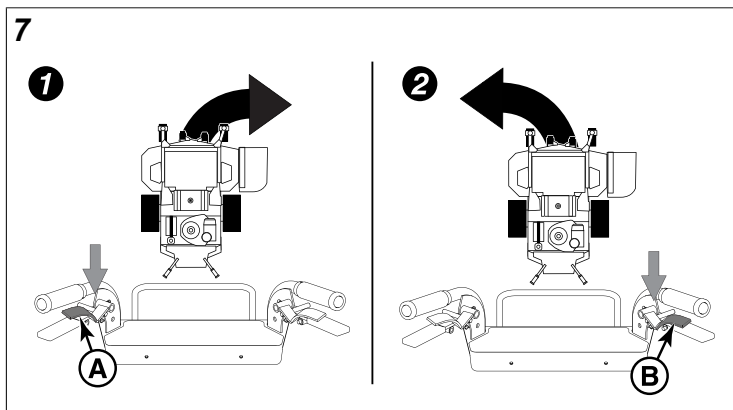
Gently squeeze the right drive lever (D, inset 4). A sharp or gentle turn is determined by the amount of force applied to the drive lever.

Temporarily Increase Forward Speed

The forward speed override control levers were designed to provide increased traction and controllability for operation on slopes and side hills.

To increase the forward speed to the left hand wheel:

Gently depress the left hand forward speed override control lever (A, Figure 7, inset 1) to temporarily increase the forward speed to the left hand wheel.



To increase the forward speed to the right hand wheel:

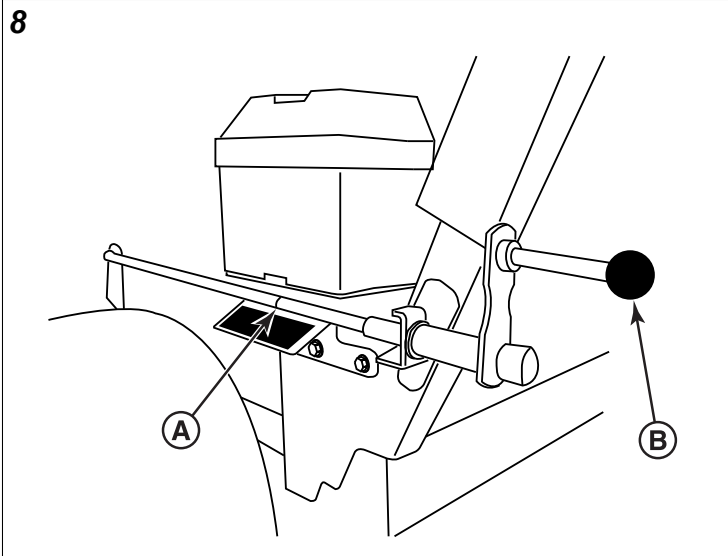
Gently depress the right hand forward speed override control lever (B, inset 2) to temporarily increase the forward speed to the right hand wheel.

Increase forward movement speed:

Gently depress both forward speed override control levers evenly to temporarily increase the forward speed of the machine.

Cutting Height Adjustment

The cutting height indicator (A, Figure 8) will help you identify the cutting height.



To raise the mower deck:

Turn the cutting height adjustment handle (B) **clockwise**.

To lower the mower deck:

Turn the cutting height adjustment handle **counter-clockwise**.

Mowing

Before mowing, set the cutting height as described in *Cutting Height Adjustment*.

1. Engage the parking brake. Make sure that the PTO switch is disengaged and the forward speed control lever is in the neutral position.
2. Start the engine (see *Starting the Engine*).
3. Set the throttle to the $\frac{1}{2}$ throttle position.

Note: It is best practice to engage the PTO with the throttle set at the minimum throttle position necessary to engage the deck drive system without stalling the engine.

4. Engage the PTO by pulling up the PTO switch.
5. Move the throttle to the "FAST" position and begin mowing.
6. Release the parking brake and begin mowing.
7. When finished, reduce throttle speed so that the engine idles and push the PTO switch down to shut off the PTO.
8. Stop the engine. See *Stopping the Mower*.

Mowing Recommendations

Several factors can affect how well your machine cuts grass. Following proper mowing recommendations can improve the performance and life of your machine.

Height of Grass

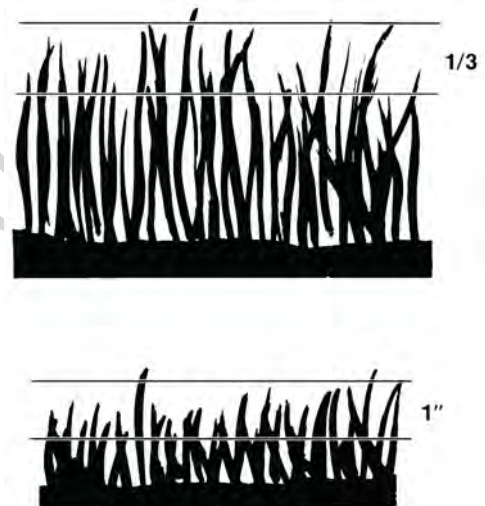
Often cutting height is a matter of personal preference. Typically, you should mow the grass when it is between three and five inches high. The proper cutting height range for a specific lawn will depend upon several factors, including the type of grass, the amount of rainfall, the prevailing temperature, and the lawn's overall condition.

Cutting the grass too short causes weak, thin grass plants, which are easily damaged by dry periods and pests. Cutting too short is often more damaging than allowing the grass to be slightly higher.

Letting grass grow a bit longer—especially when it is hot and dry—reduces heat build-up, preserves needed moisture and protects the grass from heat damage and other problems. However, allowing grass to grow too high can cause thin turf and additional problems.

Cutting off too much at one time shocks the plant's growth system and weakens the grass plants. **A good rule of thumb is the 1/3 rule: to cut no more than one third of the grass height, and never more than 1 inch at a time.**

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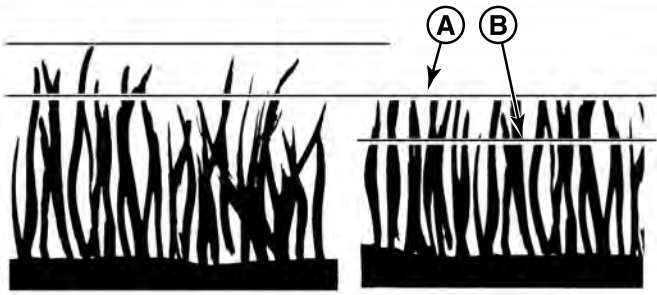


The amount of grass you are able to cut in one pass is also effected by the type of mowing system you are using (for example, broadcasting with side discharge decks can process a much larger volume of grass than mulching does).

Tall grass requires incremental cutting. For extremely tall grass, set the cutting height at maximum for the first pass (A, Figure 10), and then reset it to the desired height and mow a second (B) or third time.

Don't cover the grass surface with a heavy layer of clippings. Consider using a grass collection system and starting a compost pile.

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When and How Often to Mow

The time of day and condition of the grass greatly affect the results you'll get when mowing. For the best results, follow these guidelines:

- Mow when the grass is between three and five inches high.
- Mow with sharp blades. Short clippings of grass one inch or shorter decompose more quickly than longer blades. Sharp mower blades cut grass cleanly and efficiently, preventing frayed edges which harm the grass.
- Mow at time of day when the grass is cool and dry. Late afternoon or early evening often provide these ideal mowing conditions.
- Avoid mowing after rain or even heavy dew, and never mulch when the grass is wet (moist grass does not mulch well, and clumps beneath the mower deck).

Mowing Patterns

Always start mowing on a smooth, level area.

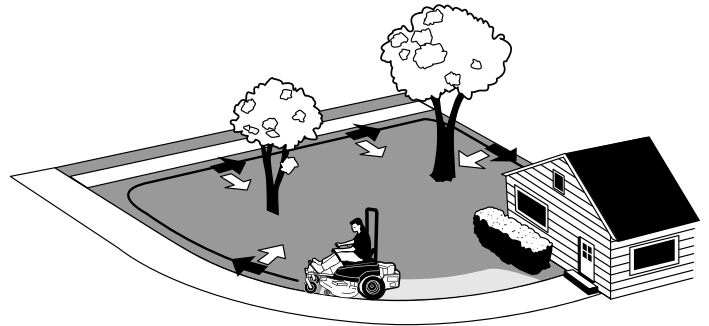
The size and type of area to be mowed will determine the best mowing pattern to use. Obstructions such as trees, fences and buildings, and conditions such as slopes and grades must also be considered.

- Cut long straight strips overlapping slightly.
- Where possible, change patterns occasionally to eliminate matting, graining or a corrugated appearance.
- For a truly professional cut, mow across the lawn in one direction, then re-cut the lawn by mowing perpendicular to the previous cut.

Note: Always operate the engine at FULL THROTTLE when mowing.

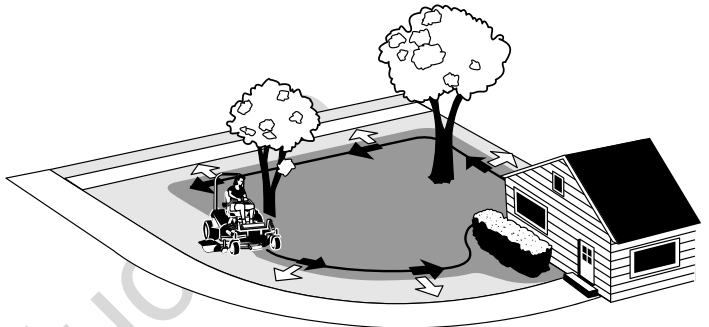
If you hear the engine slowing down, you are mowing too fast—using a slower ground speed will improve the cutting efficiency of the blades and prevents many common cutting problems. Use an appropriate ground speed for the thickness and height of the grass you are cutting (3rd gear or slower for manual gear models). If you hear the engine slowing down you are mowing too fast, use a slower ground speed.

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Where possible, make one or two passes around the outside of the area discharging the grass INTO the lawn to keep the cut grass off fences and walks.

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The remainder of the mowing should be done in the opposite direction so that the clippings are dispersed OUT onto the area of lawn previously cut.

Mowing Methods

Broadcast Mowing

Broadcasting, or side-discharging, disperses fine clippings evenly over the entire lawn. Many golf courses use this method. Your mower has a deep dish deck to allow freer circulation of clippings so they are broadcast evenly over the lawn.

Engine Speed & Ground Speed for Broadcasting:

Always operate the engine at full throttle when mowing. If you hear the engine slowing down, you are mowing too fast—using a slower ground speed will improve the cutting efficiency of the blades and prevents many common cutting problems.

ALWAYS use an appropriate ground speed for the thickness and height of the grass you are cutting (3rd gear or slower for manual gear models). If you hear the engine slowing down you are mowing too fast, use a slower ground speed.

How Much Grass to Cut Off When Broadcasting:

Mow when the grass is 3-5 inches long. Do not cut the grass shorter than 2 to 2-1/2 inches. Do not cut off more than 1 inch of grass in a single pass.

Mulching

Mulching consists of a mower deck which cuts and re-cuts clippings into tiny particles and which then blows them down INTO the lawn. These tiny particles decompose rapidly into by-products your lawn can use. UNDER PROPER CONDITIONS, your mulching mower will virtually eliminate noticeable clippings on the lawn surface.

Note: When mulching under heavy cutting conditions, a rumbling sound may be present and is normal.

Mulching Requires EXCELLENT Mowing Conditions:

Mulching mowers cannot function properly if the grass is wet, or if the grass is simply too high to cut. Even more than normal mowing, mulching requires that the grass be dry and the appropriate amount is cut.

Do not use the mower as a mulching mower during the first two or three mowings in the spring. The long grass blades, quick growth, and often wetter conditions are more suitable for broadcasting (side-discharging) or grass bagging operation.

Engine Speed & Ground Speed for Mulching:

Use full engine throttle matched with a slow ground speed so that clippings will be finely cut. Ground speed while mulching should be HALF of the speed that would be used when broadcasting (side discharging) under similar conditions. Since mulching requires more horsepower than broadcasting, using a slower ground speed is vitally important for proper mulching operation.

How Much Grass to Mulch:

The best mulching action typically results from cutting only the top ½ inch to ¾ inch of grass blade. This provides short clippings which decompose properly (much more quickly than longer clippings). The ideal cutting height will vary with climate, time of year, and quality of your lawn. We recommend that you experiment with both the cutting height and ground speed until you achieve the best cut. Start with a high cutting height and using progressively lower settings until you find a cutting height that is matched to your mowing conditions and preferences.

Pushing the Unit by Hand

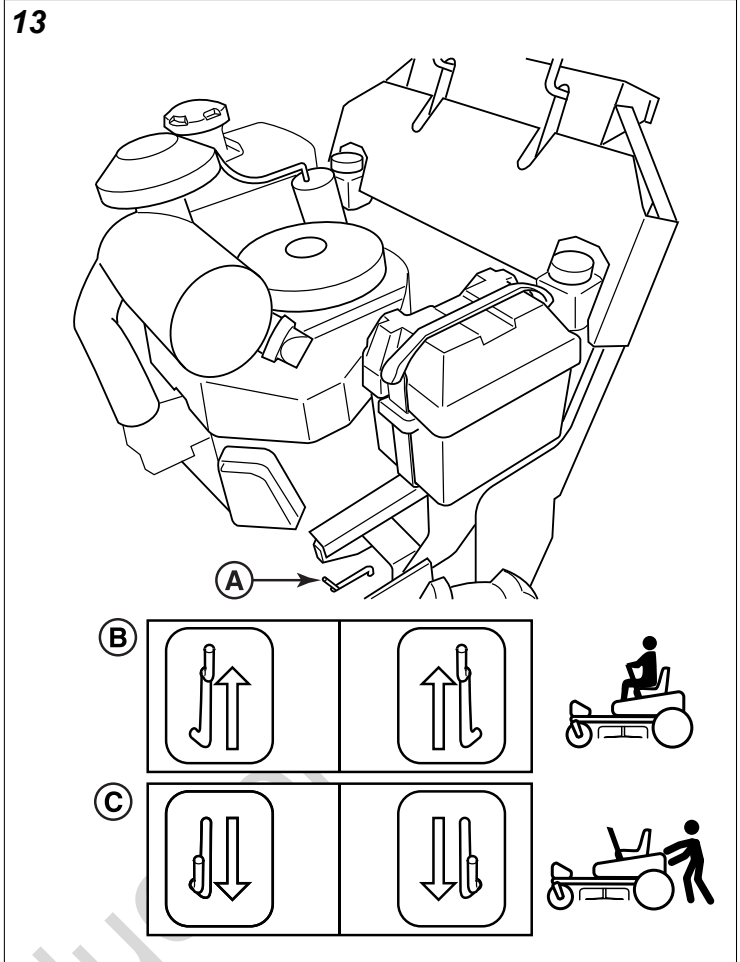
NOTICE

Towing the units while the transmissions are engaged will cause transmission damage. Do NOT use another vehicle to push or pull this unit.

This unit is equipped with two transmission release levers.

1. Depress the neutral return pedals to return the transmissions to NEUTRAL, disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the key.
2. Locate the transmission release levers (A, Figure 13) by the rear wheels of the unit.

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3. To disengage the transmissions (free-wheel position), pull both transmission release levers back and out (C) so they lock in the disengaged (free-wheel) position.
4. Disengage the parking brake. The unit can now be pushed by hand.
5. After moving the unit, re-engage the transmissions (drive position) by pulling the transmission release levers rearward and inward (B) to release them from the disengaged position and then allow them to move to the engaged (drive) position.

Storage

Temporary Storage (30 Days or Less)

Remember, the fuel tank will still contain some gasoline, so never store the unit indoors or in any other area where fuel vapor could travel to any ignition source. Fuel vapor is also toxic if inhaled, so never store the unit in any structure used for human or animal habitation.

WARNING

Never store the unit, with gasoline in engine or fuel tank, in a heated shelter or in enclosed, poorly ventilated enclosures. Gasoline fumes may reach an open flame, spark or pilot light (such as a furnace, water heater, clothes dryer, etc.) and cause an explosion.

Handle gasoline carefully. It is highly flammable and careless use could result in serious fire damage to your person or property.

Drain fuel into an approved container outdoors away from open flame or sparks.

Here is a checklist of things to do when storing your unit temporarily or in between uses:

- Keep the unit in an area away from where children may come into contact with it. If there's any chance of unauthorized use, remove the spark plug (s) and put in a safe place. Be sure the spark plug opening is protected from foreign objects with a suitable cover.
- If the unit can't be stored on a reasonable level surface, chock the wheels.
- Clean all grass and dirt from the mower.

Long Term Storage (Longer Than 30 Days)

Before you store your unit for the off-season, read the Maintenance and Storage instructions in the Safety Rules section, then perform the following steps:

1. Drain crankcase oil while engine is hot and refill with a grade of oil that will be required when unit is used again.
2. Prepare the mower deck for storage as follows:
 - a.) Remove mower deck from the unit.
 - b.) Clean underside of mower deck.
 - c.) Coat all bare metal surfaces with paint or light coat of oil to prevent rusting.
3. Clean external surfaces and engine.
4. Prepare engine for storage. See engine owner's manual.
5. Clean any dirt or grass from cylinder head cooling fins, engine housing and air cleaner element.
6. Cover air cleaner and exhaust outlet tightly with plastic or other waterproof material to keep out moisture, dirt and insects.
7. Completely grease and oil unit as outlined in the *Lubrication* section.
8. Clean up unit and apply paint or rust preventative to any areas where paint is chipped or damaged.
9. Be sure the battery is filled to the proper level with water and is fully charged. Battery life will be increased if it is removed, put in a cool, dry place and fully charged about once a month. If battery is left in unit, disconnect the negative cable.
10. Drain fuel system completely or add a gasoline stabilizer to the fuel system. If you have chosen to use a fuel stabilizer and have not drained the fuel system, follow all safety instructions and storage precautions in this

manual to prevent the possibility of fire from the ignition of gasoline fumes. Remember, gasoline fumes can travel to distant sources of ignition and ignite, causing risk of explosion and fire.

NOTE: Gasoline, if permitted to stand unused for extended periods (30 days or more), may develop gummy deposits which can adversely affect the engine carburetor and cause engine malfunction. To avoid this condition, add a gasoline stabilizer to the fuel tank and run the engine a few minutes, or drain all fuel from the unit before placing it in storage.

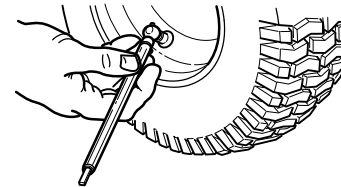
Starting After Long Term Storage

Before starting the unit after it has been stored for a long period of time, perform the following steps.

1. Remove any blocks from under the unit.
2. Install the battery if it was removed.
3. Unplug the exhaust outlet and air cleaner.
4. Fill the fuel tank with fresh gasoline. See engine manual for recommendations.
5. See engine owner's manual and follow all instructions for preparing engine after storage.
6. Check crankcase oil level and add proper oil if necessary. If any condensation has developed during storage, drain crankcase oil and refill.
7. Inflate tires to proper pressure. Check fluid levels.
8. Start the engine and let it run slowly. DO NOT run at high speed immediately after starting. Be sure to run engine only outdoors or in well ventilated area.

Checking Tire Pressures

Tire pressure should be checked periodically, and maintained at the levels shown in the Specifications chart. Note that these pressures may differ slightly from the "Max Inflation" stamped on the side-wall of the tires. The pressures shown provide proper traction and extend tire life.



Checking / Adding Fuel



Fuel and its vapors are extremely flammable and explosive.

Fire or explosion can cause severe burns or death.

Gasoline is highly flammable and must be handled with care. Never fill the tank when the engine is still hot from recent operation. Do NOT allow open flame, smoking or matches in the area. Avoid over-filling and wipe up any spills.

To add fuel:

1. Stop the engine and allow it to cool for at least 3 minutes.
2. Remove the fuel cap.
3. Fill the tank to the bottom of the filler neck. This will allow for fuel expansion.
NOTE: Do not overfill. Refer to your engine manual for specific fuel recommendations.
4. Install and hand tighten the fuel cap.

Check Engine Oil Level

Interval: Before Each Use

Refer to the engine owners manual for dipstick and oil fill locations and specific engine oil check and fill procedures.

Cleaning Debris from the Machine

Service Interval: Before each use or daily

1. Park the unit on a flat level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF and remove the key.
2. Clean off any oil, debris, or grass build-up on the machine and cutting deck, especially under deck belt shields, around the fuel tank, and around the engine and exhaust area.

Lubrication

Moving components with grease fittings must be lubricated at the intervals as specified in the *Maintenance Chart*.

Grease fitting Location	Qty of Fittings
Forward Speed Control Lever Rod (A, Figure 14)	1
Drive Lever Pivots (B)	2
Grease-able Ball Joints - Units in serial number range 2017170234 & below only (C)	8
Forward Speed Override Control Lever Pivots (D)	2
Forward Speed Indicator Pivot (A, Figure 15)	1
Parking Brake Lever Pivot - Units in serial number range 2017170234 & below only (B)	1
Parking Brake Pivots - Units in serial number range 2017170235 & above only (C)	2
Frame Rails (A, Figure 16)	2
Deck Adjusters (B)	4
Mower Deck Spindles (A, Figure 17)	3
Front Caster Wheel Axles (See <i>Lubricating the Front Casters</i>) (A, Figure 1)	2
Front Casters (See <i>Lubricating the Front Casters</i>)	N/A

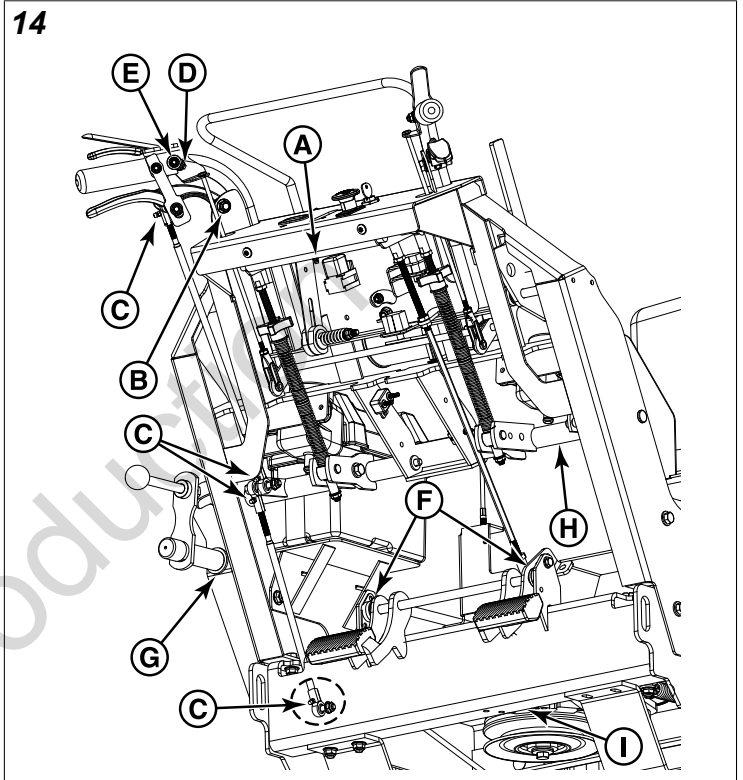
Not all greases are compatible. Red grease (p/n 5022285) is recommended, automotive-type, high-temperature, lithium grease may be used when this is not available.

Oil Application Locations
Ball Joints - Units in serial number range 2017170235 & above only (C, Figure 14)
Operator presence flap pivots (E)
Neutral return pedal pivots (F)
Deck Lift Crank Pivots (G)

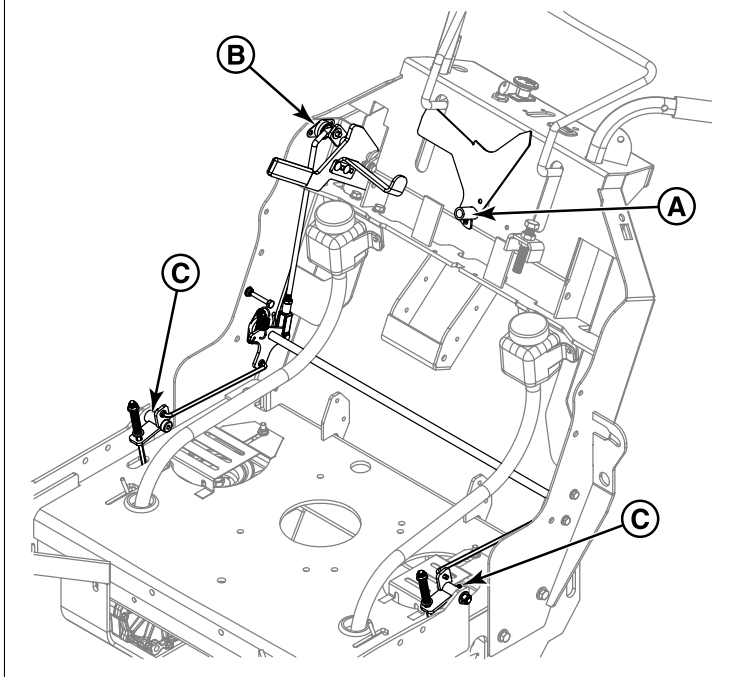
Oil Application Locations

Control Rod Pivots (H)
Lower Parking Brake Rod Pivots (I)
Parking Brake Lever Pivots - Units in serial number range 2017170235 & above only (B, Figure 15)
Deck Lift Linkage Rods (C, Figure 16)
Deck Lift Trunnions (D)
Discharge Chute Rod Hinge (B, Figure 17)

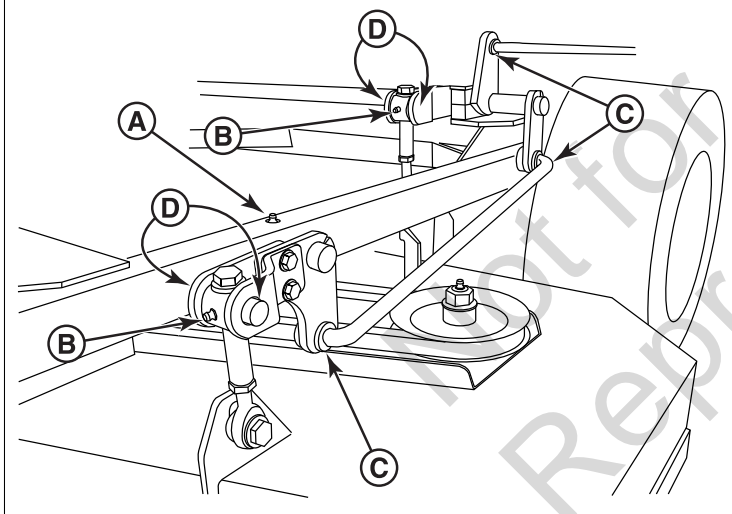
Generally, all moving metal parts should be oiled where contact is made with other parts. Keep oil and grease off belt and pulleys. Remember to wipe fittings and surfaces clean both before and after lubrication.



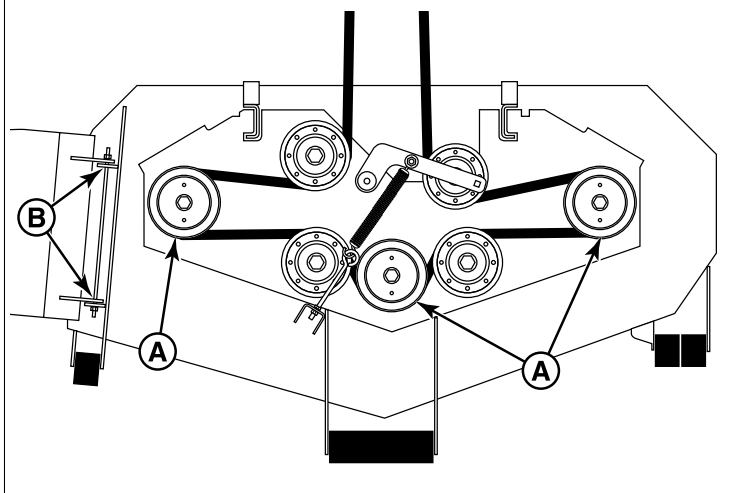
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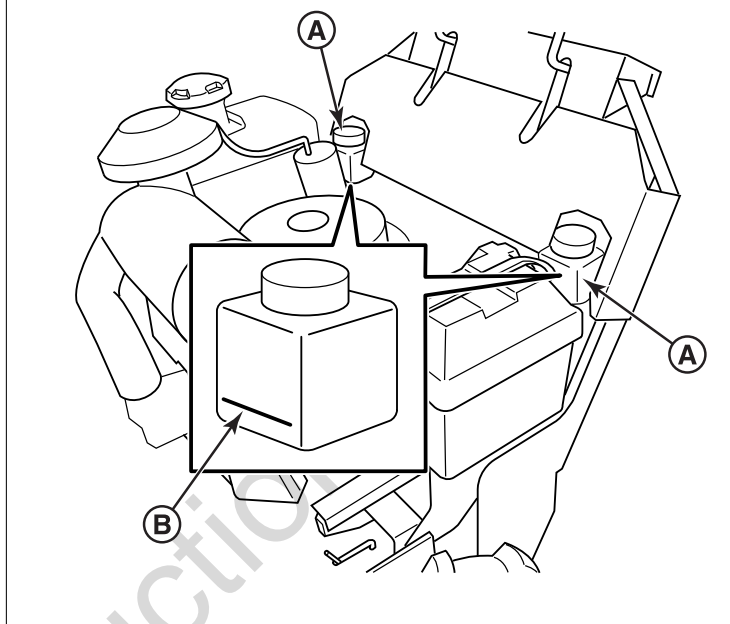


Check / Fill Transmission Oil

Oil Type: 20W-50 conventional detergent motor oil.

1. Check the oil level when the unit is cold. Locate the transmission oil reservoirs (A, Figure 18) located on the handle bar assembly. The oil should be up to the "FULL COLD" mark (B). If the oil is below this level, proceed to step 2.

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2. Before removing the reservoir caps, make sure the area around the reservoir cap and fill neck of the reservoir is free of dust, dirt, or other debris. Remove the reservoir cap.
3. Add oil up to the "FULL COLD" mark (B).
4. Reinstall the reservoir caps.

Purging the Air from the Hydraulic System

Due to the effects air has on efficiency in hydraulic drive systems, it is critical that it be purged from the system. These purge procedures should be implemented any time a hydraulic system has been opened to facilitate maintenance or any additional oil has been added to the system.

The resulting symptoms of air in the hydraulic system may be:

- Noisy operation.
- Lack of power or drive after short term operation.
- High operation temperature and excessive expansion of oil.

Before starting, make sure the transaxles/transmissions are at the proper oil levels. If it is not, fill to the specifications outlined in the *Check / Fill Transmission Oil Level* procedure.

Purging Air from the Hydraulic System:

1. Chock the front wheels to prevent the machine from rolling. Raise the rear of the machine so that the vehicle's rear tires do not contact the ground. Position jack stands under the rear of the machine to secure it.

2. Open the transaxle's bypass valves (see *Pushing the Unit by Hand* for the location and function of the bypass valves), start the engine, release the parking brake, and slowly move the unit's control levers in both forward and reverse directions (5 to 6 times), as air is purged from the unit, the oil level will drop.
3. Depress the neutral return pedals to return the transmissions to neutral, stop the engine, and engage the parking brake.
4. Close the transaxle's bypass valves, start the engine, release the parking brake, and slowly move the unit's control levers in both forward and reverse directions (5 to 6 times), as air is purged from the unit, the oil level will drop.
5. Stop the engine. Remove the jack stands from underneath the machine.
6. Repeat the process detailed above but with the unit's drive wheels on the ground. The procedure should be performed in an area free of any objects or bystanders.

It may be necessary to repeat the process detailed above until all the air is completely purged from the system. When the transaxles/transmissions operate at normal noise levels and move smoothly forward and reverse at normal speeds, then the transaxles/transmissions are considered purged.

Maintenance Schedule

The following schedule should be followed for normal care of your unit. You will need to keep a record of your operating time. Determining operating time is easily accomplished by observing the hour meter.

If your unit is equipped with a dual function hour meter that displays both engine hours and PTO hours, the maintenance intervals are based on the engine hours as displayed by the hour meter.

UNIT MAINTENANCE	
Before each use	
Check safety interlock system.	
Check unit brakes.	
Check unit for loose hardware.	
Check hydraulic oil level.	
Check tire pressures.	
Every 25 Hours	
Clean mower deck and check / Replace mower blades.*	
Lubricate unit and mower deck.*	
Every 100 Hours	
Check mower blade stopping time.	
Clean Battery & Cables (if equipped)	
Initial Change of Hydraulic Oil.	
Every 400 Hours of Yearly	
Change hydraulic oil filter.	

ENGINE MAINTENANCE	
Before each use	
Check engine oil level.	

ENGINE MAINTENANCE	
Clean visible debris from engine compartment.	
Every 50 Hours	
Inspect / Clean spark arrester.**	
Every 100 Hours	
Check fuel filter.	
Refer to engine owner's manual	
Service air filter.	
Change engine oil and filter.	
Check / Replace spark plugs.	

* More often in hot (over 85° F; 30° C) weather or dusty operating conditions.

**If equipped. Replace if damaged.

Specifications

Specifications are correct at time of printing and are subject to change without notice.

ENGINE

For complete engine specifications see the engine manufacturer's operator's manual included with your unit.

Fits models: 5901329 & 5901330

Kawasaki FX651V	
Make	Kawasaki
Model	FX651V-DS00-S
Electrical System	12 volt, 15 amp charging coil, Battery: 340 cca

Fits models: 5901454, 5901455, & 5901827

Briggs & Stratton Vanguard 49R977	
Make	Briggs & Stratton
Model	49R977-0001-G1
Electrical System	12 volt, 16 amp alternator, Battery: 340 cca

CHASSIS

Fuel Tank Capacity	5 gallons (18.73 L)
Rear Wheels	
Tire Size (Models with 48" Mower Deck):	20.00 X 7.00 - 10
Tire Size (Models with 52" Mower Deck):	20.00 X 8.00 - 10
Inflation Pressure	15 psi (1.03 bar)
Front Wheels	
Tire Size	9.00 X 3.50 - 4
Inflation Pressure	N/A (Flat Free)

TRANSMISSIONS

S/N: 2017170234 & Below	
LH	ZJ-GMFE-3B5B-1RLX (5102809)
RH	ZJ-KMFE-3C5C-1RLX (5102810)

S/N: 2017170235 & Above	
LH	ZL-GMFE-3L5B-1PXX (5104707)
RH	ZL-KMFE-3L5C-1PXX (5104706)
Type	ZT3100
Hydraulic Fluid	SAE 20W-50 motor oil
Speeds	
Forward	0-7 MPH (0-11.27 km/h)
Reverse	0-3 MPH (0-4.83 km/h)

DIMENSIONS

Models with 48" Side Discharge Mower Deck	
Overall Length	78-3/4" (200 cm)
Overall Width (with discharge chute up)	49-1/2" (125,7 cm)
Overall Width (with discharge chute down)	62-1/2" (159 cm)
Height	41-1/2" (105,4 cm)
Weight (approximate)	809 lbs (367 kg)

Models with 48" Rear Discharge Mower Deck	
Overall Length	78-3/4" (200 cm)
Overall Width	49-1/2" (125,7 cm)
Height	41-1/2" (105,4 cm)
Weight (approximate)	809 lbs (367 kg)

Models with 52" Rear Discharge Mower Deck	
Overall Length	78-3/4" (200 cm)
Overall Width	53-1/2" (136 cm)
Height	41-1/2" (105,4 cm)
Weight (approximate)	814 lbs (369.2 kg)

Warranty

If your unit is equipped with a dual function hour meter that displays both engine hours and PTO hours, the warranty is based on the engine hours as displayed by the hour meter.

Warranty Statement

BRIGGS & STRATTON WARRANTY POLICY (January 2014)

LIMITED WARRANTY

Briggs & Stratton warrants that, during the warranty period specified below, it will repair or replace, free of charge, any part that is defective in material or workmanship or both. Transportation charges on product submitted for repair or replacement under this warranty must be borne by purchaser. This warranty is effective for and is subject to the time periods and conditions stated below. For warranty service, find the nearest Authorized Service Dealer in our dealer locator map at ferrismowers.com. The purchaser must contact the Authorized Service Dealer, and then make the product available to the Authorized Service Dealer for inspection and testing.

There is no other express warranty. Implied warranties, including those of merchantability and fitness for a particular purpose, are limited to the warranty period

listed below, or to the extent permitted by law. Liability for incidental or consequential damages are excluded to the extent exclusion is permitted by law. Some states or countries do not allow limitations on how long an implied warranty lasts, and some states or countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state or country to country.**

WARRANTY PERIOD		
Covered Parts	Standard Warranty Period	Rental Warranty Period
Riding mowers - except as noted below +	4 years (48 months) or 500 hours, whichever occurs first. Unlimited hours during the first 2 years (24 months)	90 days
Walk mowers - except as noted below + (over 30 inches of cutting width)	2 years (24 months) unlimited hours	90 days
+Hydro Drive Belt, Gearbox Drive Belt, Tires, Brake Pads, Hoses, Battery, Blades	90 days	90 days
+Mower Deck Drive Belt (Conventional Single Belt Deck Drive Systems)	1 year (12 months) or 100 hours, whichever occurs first	90 days
+Mower Deck Drive Belts (Two Belt Deck Drive Systems)	3 years (36 months) or 300 hours, whichever occurs first. (Parts and labor in year one; parts only in years two and three.)	90 days
+Attachments	1 year	90 days
+Engine*	See Engine Operator's Manual	See Engine Operator's Manual

* Emissions-related components are covered by the Emissions Warranty Statement

** In Australia - Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. For warranty service, find the nearest Authorized Service Dealer in our dealer locator map at ferrismowers.com (Select region: Australia), or by calling 1300 274 447, or by emailing or writing to salesenquires@briggsandstratton.com.au, Briggs & Stratton Australia Pty Ltd, 1 Moorebank Avenue, NSW, Australia, 2170.

The warranty period begins on the date of purchase by the first retail or commercial customer.

To ensure prompt and complete warranty coverage, register your product at the website shown above or at www.onlineproductregistration.com, or mail the completed

registration card (if provided), or call 1-800-743-4115 (in USA).

Save your proof of purchase receipt. If you do not provide proof of the initial purchase date at the time warranty service is requested, the manufacturing date of the product will be used to determine the warranty period. Product registration is not required to obtain warranty service on Briggs & Stratton products.

ABOUT YOUR WARRANTY

Warranty service is available only through *Ferris* Authorized Service Dealers. This warranty only covers defects in materials or workmanship. It does not cover damage caused by improper use or abuse, improper maintenance or repair, normal wear and tear, or stale or unapproved fuel.

Improper Use and Abuse - The proper, intended use of this product is described in the Operator's Manual. Using the product in a way not described in the Operator's Manual or using the product after it has been damaged will not be covered under this warranty. Warranty coverage will also not be provided if the serial number on the product has been removed or the product has been altered or modified in any way, or if the product has evidence of abuse such as impact damage, or water/chemical corrosion damage.

Improper Maintenance or Repair - This product must be maintained according to the procedures and schedules provided in the Operator's Manual, and serviced or repaired using genuine Briggs & Stratton parts or equivalent. Damage caused by lack of maintenance or use of non-original or non-equivalent parts is not covered by warranty.

Normal Wear and Tear - Like all mechanical devices, the unit is subject to wear even when properly maintained. This warranty does not cover replacement or repairs when normal use has exhausted the life of a part or the equipment. Except as noted in the warranty period, maintenance and wear items such as filters, belts, cutting blades, and brake pads (except engine brake pads) are not covered by warranty due to wear characteristics alone, unless the cause is due to defects in material or workmanship.

Stale or Unapproved Fuel - In order to function correctly, this product requires fresh fuel that conforms to the criteria specified in the Operator's Manual. Engine or equipment damage caused by stale fuel or the use of unapproved fuels (such as E15 or E85 ethanol blends) is not covered by warranty.

Other Exclusions - This warranty excludes damage due to accident, abuse, modifications, alterations, improper servicing, freezing or chemical deterioration. Attachments or accessories that were not originally packaged with the product are also excluded. This warranty does not include used, reconditioned, second-hand, or demonstration equipment or engines. This warranty also excludes failures due to acts of God and other force majeure events beyond the manufacturer's control.

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