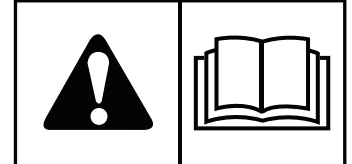




# ***OPERATOR'S MANUAL***

## ***ProCut S Series***

### ***3-Wheel Riding Mowers***



#### **Model Number: Description**

##### **Powerhead**

5900631	H2225KAV	3-Wheel Rider
5900651	H2226B	3-Wheel Rider
5900701	H2227KOH	3-Wheel Rider
5900933	H2226KAV	3-Wheel Rider
5900956	H2227B	3-Wheel Rider
5900533	H2224KAVFS	3-Wheel Rider
5900534	H2228B	3-Wheel Rider
5901279	H2227B	3-Wheel Rider
5902106	H2227B	3-Wheel Rider

##### **Mower Deck**

5900632	R61	61" Mower Deck
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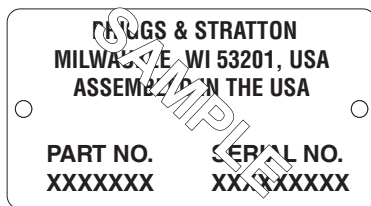
**This manual is available in Spanish. For a copy, contact your Ferris dealer or [www.ferrismowers.com](http://www.ferrismowers.com).  
Este manual está disponible en Español. Para obtener una copia, póngase en contacto con su  
distribuidor Ferris o [www.ferrismowers.com](http://www.ferrismowers.com).**

**Thank you** for purchasing this quality-built FERRIS product. We're pleased that you've placed your confidence in the FERRIS brand. When operated and maintained according to the instructions in this manual, your FERRIS product will provide many years of dependable service.

**This manual contains** safety information to make you aware of the hazards and risks associated with this machine and how to avoid them. This machine is designed and intended to be used and maintained according to the 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 these instructions thoroughly before attempting to start or operate this equipment. **Save these original instructions for future reference.**

## Identification Numbers

Your unit may feature a serial tag that looks like either one of the two following options:



**North American Models**



**North American Models**



**Figure. 1** Location of Identification Tags.  
**A.** Powerhead Identification Tag  
**B.** Mower Deck Identification Tag

PRODUCT REFERENCE DATA	
Unit Model Number	Unit SERIAL Number
Mower Deck Model Number	Mower Deck SERIAL Number
Dealer Name	Date Purchased
ENGINE REFERENCE DATA	
Engine Make	Engine Model
Engine Type/Spec.	Engine Code/Serial Number

## Illustrated Parts List

The Illustrated Parts List for this machine can be downloaded from [ferrismowers.com](http://ferrismowers.com). Please provide model and serial number when ordering replacement parts.

### **! WARNING**

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

### **! WARNING**

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the state of California to cause cancer and reproductive harm.

**Wash hands after handling.**

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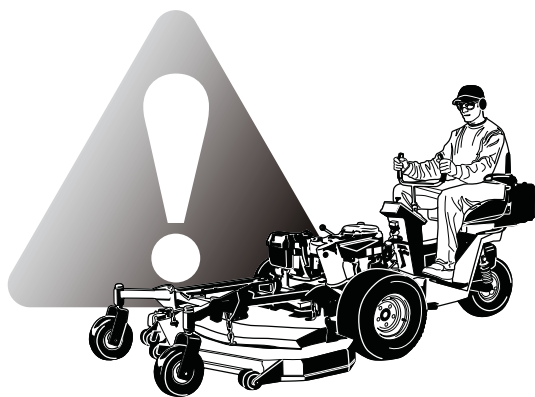
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*NOTE: In this manual, “left” and “right” are referred to as seen from the operating position.*

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## 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.

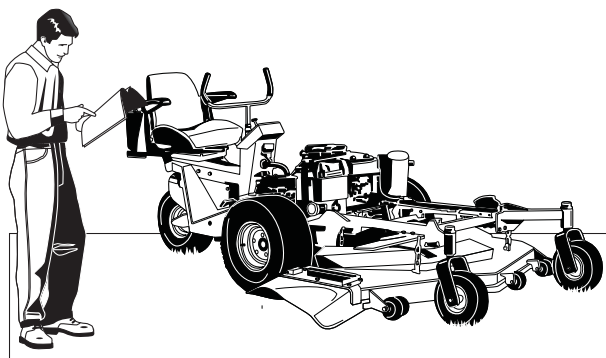
Use common sense, and think through what you are doing. If you are not sure that the task you are about to perform can be safely done with the equipment you have chosen, ask a professional: contact your local authorized dealer.

## Read the Manual

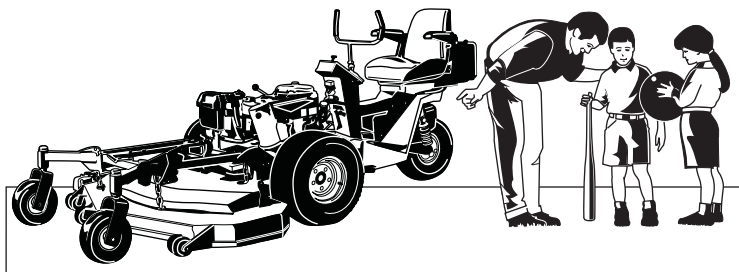
The operator's manual contains important safety information you need to be aware of **BEFORE** you operate your unit as well as **DURING** operation.

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.

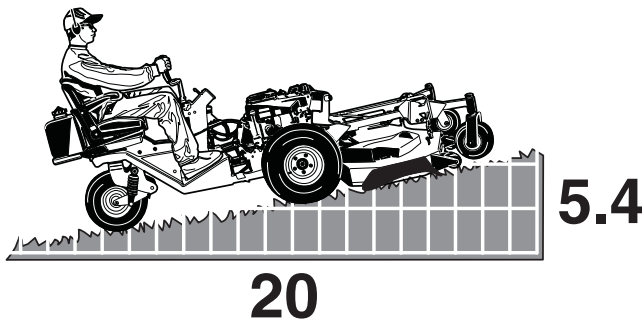


## Children



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



Operation on slopes can be dangerous. Using the unit on a slope that is too steep where you do not have adequate wheel traction (and control) can cause sliding, loss of steering, control, and possible rollover. You should not operate on a slope greater than a 5.4 foot rise over a 20 foot length (15 degrees).

Always mow up and down slopes, not across the face (to maintain traction on the wheels) and avoid sudden turns or rapid speed changes. Reduce speed and use extreme caution on ALL slopes.

Also, note that the surface condition you are on can greatly impact your ability to safely operate this machine. Operating on wet or slippery slopes can cause sliding and loss of steering and control. Do not operate on slopes that are slippery, wet, or have soft soil conditions.

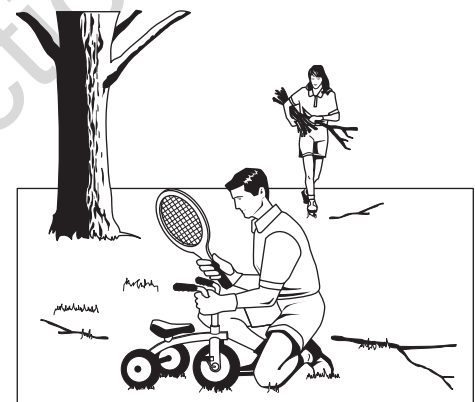
If you feel unsure about operating the unit on a slope, don't do it. It's not worth the risk.

## 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.

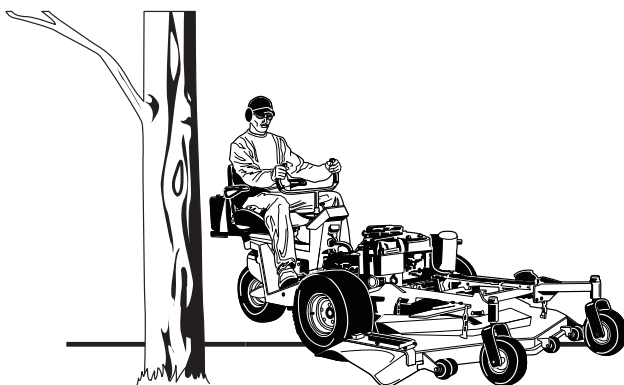


## Moving Parts

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

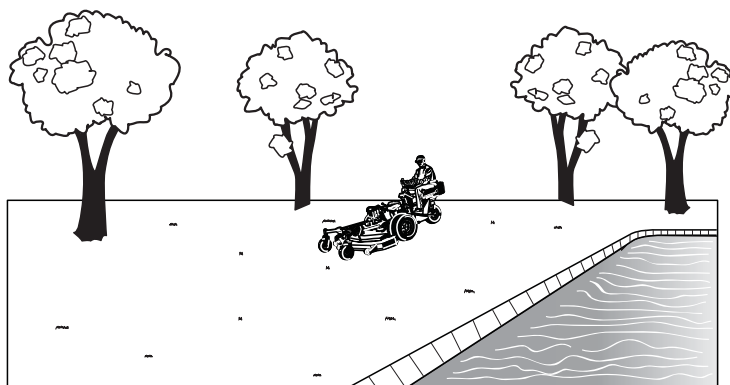
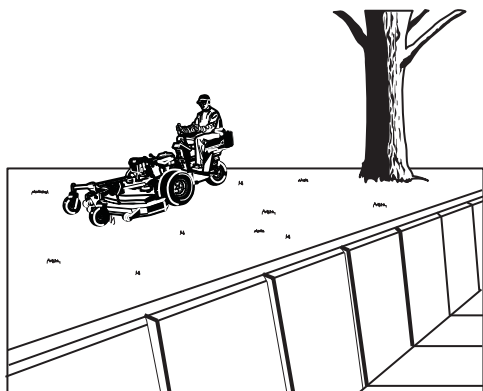
The mower deck has spinning mower blades that can amputate hands and feet. Do not allow anyone near the unit while it is running! Keep safety devices (guards, shields, and switches) in place and working.

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.



## Retaining Walls, Drop-offs, and Water

Retaining walls and drop-offs around steps and water are a common hazard. Give yourself a minimum of two mower widths of clearance around these hazards and hand-trim with a walk behind mower or string trimmer. Wheels dropping over retaining walls, edges, ditches, embankments, or into water can cause rollovers, which may result in serious injury, death, or drowning.



## Fuel and Maintenance

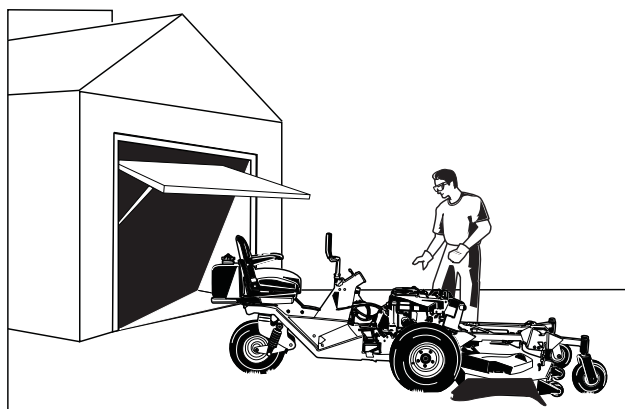
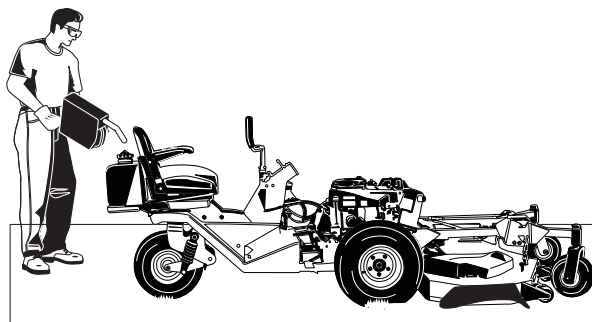
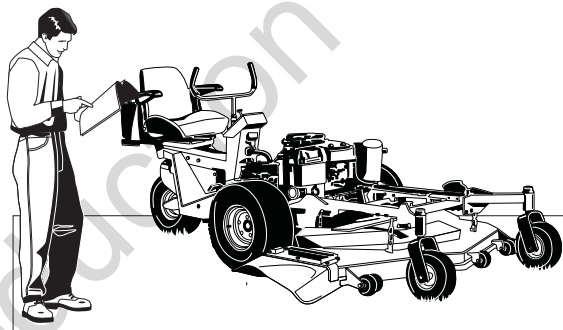
Always disengage all drives, shutoff the engine, and remove the key before doing any cleaning, refueling, or servicing.

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 any 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.



Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of 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 triangle  in text signifies important cautions or warnings which must be followed.

## TRAINING

1. 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.
2. Become familiar with the safe operation of the equipment, operator controls, and safety signs.
3. All operators and mechanics should be trained. The owner is responsible for training the users.
4. Only allow responsible adults, who are familiar with the instructions, to operate the unit.
5. Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
6. The owner/user can prevent and is responsible for accidents or injuries occurring to themselves, other people or property.
7. 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.
2. Mow only in the daylight or with good artificial light, keeping away from holes and hidden hazards.
3. Be sure all drives are in neutral and parking brake is engaged before starting engine. Only start engine from the operator's position. Use seat belts if provided.
4. Be sure of your footing while using pedestrian controlled equipment, especially when backing up. Walk, don't run. Reduced footing could cause slipping.
5. 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.
6. Do not mow in reverse unless absolutely necessary. Always look down and behind before and while traveling in reverse.
7. 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.
8. Slow down and use caution when making turns and when changing directions on slopes.
9. Never raise deck with the blades running.
10. Never leave a running unit unattended. Always disengage the PTO, set parking brake, stop engine, and remove keys before dismounting. Keep hands and feet away from the cutting units.
11. Turn off the PTO switch to disengage the blades when not mowing.
12. Never operate with guards not securely in place. Be sure all interlocks are attached, adjusted properly and functioning properly.
13. Never operate with the discharge deflector raised, removed or altered, unless using a grass catcher.
14. Do not change the engine governor setting or overspeed the engine.
15. 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.
16. Stop equipment and inspect blades after striking objects or abnormal vibration occurs. Make necessary repairs before resuming operations.
17. Keep hands and feet away from the cutting units.
18. Look behind and down before backing up to be sure of a clear path.
19. Never carry passengers and keep pets and bystanders away.
20. Do not operate the unit while under the influence of alcohol or drugs.
21. Slow down and use caution when making turns and crossing roads and sidewalks. Stop blades if not mowing.
22. Use care when loading or unloading the machine into a trailer or truck.

## PREPARATION

1. 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.
2. Wear appropriate clothing including safety shoes, safety glasses and ear protection. Long hair, loose clothing or jewelry may get tangled in moving parts.
3. 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.
4. Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
  - a) Use only an approved container.
  - b) Never remove fuel cap or add fuel with the engine running. Allow engine to cool before refueling. Do not smoke.
  - c) Never refuel or drain the machine indoors.
5. Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.

## OPERATION

1. Never run an engine in an enclosed area.

# Operator Safety

23. Use care when approaching blind corners, shrubs, trees or other objects that may obscure vision.
24. To reduce fire hazard, keep unit free of grass, leaves & excess oil. Do not stop or park over dry leaves, grass or combustible materials.
25. The engine in this unit is not factory equipped with a spark arrester. It is a violation of California Public Resource Code Section 4442 to use or operate the engine on or near any forest-covered, brush-covered, or grass-covered land unless the exhaust system is equipped with a spark arrester meeting any applicable local or state laws. Other states or federal area may have similar laws.
26. OSHA regulations may require the use of hearing protection when exposed to sound levels greater than 85 dBA for an 8 hour time period.

## CAUTION



This machine produces sound levels in excess of 85 dBA at the operator's ear and can cause hearing loss though 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.

## WARNING

Never operate on slopes greater than 15 degrees, which is a rise of 5.4 feet (165 cm) vertically in 20 feet (607 cm) horizontally.

Select slow ground speed before driving onto slope. Use extra caution when operating on slopes with rear-mounted grass catchers.

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

### Do

1. Mow up and down slopes, not across.
2. Remove obstacles such as rocks, tree limbs, etc.
3. Watch for holes, ruts, or bumps. Uneven terrain could overturn the unit. Tall grass can hide obstacles.
4. Use slow speed. Choose a slow speed so that you will not have to stop or change speed while on the slope.
5. Use extra care with grass catchers or other attachments. These can change the stability of the unit.
6. Keep all movement on the slopes slow and gradual. Do not make sudden changes in speed or direction.
7. See your authorized dealer for recommendations of available weights to improve stability.

### Do Not

1. 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.
2. Do not turn on slopes unless necessary, and then, turn slowly.
3. 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.
4. Do not mow on wet grass. Reduced footing or traction could cause sliding.
5. Do not try to stabilize the unit by putting your foot on the ground. (ride-on units)
6. Do not mow excessively steep slopes.
7. Do not use grass catcher on steep slopes.

## TOWED EQUIPMENT (RIDE-ON UNITS)

1. Tow only with a machine that has a hitch designed for towing. Do not attach towed equipment except at the hitch point.
2. Follow the manufacturer's recommendations for weight limit for towed equipment and towing on slopes. See attaching a trailer under OPERATION.
3. Never allow children or others in or on towed equipment.
4. On slopes, the weight of the towed equipment may cause loss of traction and loss of control.
5. Travel slowly and allow extra distance to stop.
6. Do not shift to neutral and coast down hill.

## 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.

1. Keep children out of the mowing area and under the watchful care of another responsible adult.
2. Be alert and turn unit off if children enter the area.
3. Before and during reverse operation, look behind and down for small children.
4. Never carry children, even with the blade(s) off. They may fall off and be seriously injured or interfere with safe unit operation. Children who have been given rides in the past may suddenly appear in the mowing area for another ride and be run over or backed over by the machine.
5. Never allow children to operate the unit.
6. Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

## EMISSIONS

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

## IGNITION SYSTEM (GASOLINE MODELS)

1. This spark ignition system complies with Canadian ICES-002.



## SERVICE AND MAINTENANCE

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

### Safe Handling of Gasoline

1. Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
2. Use only approved gasoline containers.
3. Never remove the gas cap or add fuel with the engine running. Allow the engine to cool before refueling.
4. Never fuel the machine indoors.
5. 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.
6. 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.
7. 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.
8. 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.
9. If fuel is spilled on clothing, change clothing immediately.
10. Never over-fill the fuel tank. Replace gas cap and tighten securely.
11. Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.
12. 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.
13. Replace all fuel tank caps and fuel container caps securely.

### Maintenance and Storage

1. Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
2. Always follow the engine manual instructions for storage preparations before storing the unit for both short and long term periods.
3. Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.
4. 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.
5. Shut off fuel while storing or transporting. Do not store fuel near flames or drain indoors.
6. Keep all hardware, especially blade attachment bolts, tight and keep all parts in good working condition. Replace all worn or damaged decals.
7. Never tamper with safety devices. Check their proper operation regularly.
8. 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.
9. Clean grass and debris from cutting units, drives,

mufflers, and engine to prevent fires. Clean up oil or fuel spillage.

10. Let engine cool before storing and do not store near flame.
11. Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.
12. Park machine on level ground. Never allow untrained personnel to service machine.
13. Use jack stands to support components when required.
14. Carefully release pressure from components with stored energy.
15. 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.
16. 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.
17. Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
18. 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.
19. 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.
20. Check brake operation frequently. Adjust and service as required.
21. Use only factory authorized replacement parts when making repairs.
22. Always comply with factory specifications on all settings and adjustments.
23. Only authorized service locations should be utilized for major service and repair requirements.
24. 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.
25. 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.
26. **WARNING:** Stored energy device. Improper release of springs can result in serious personal injury. Springs should be removed by an authorized technician.

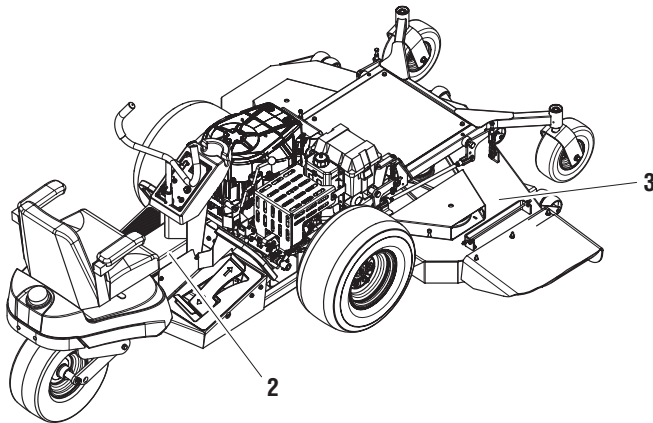
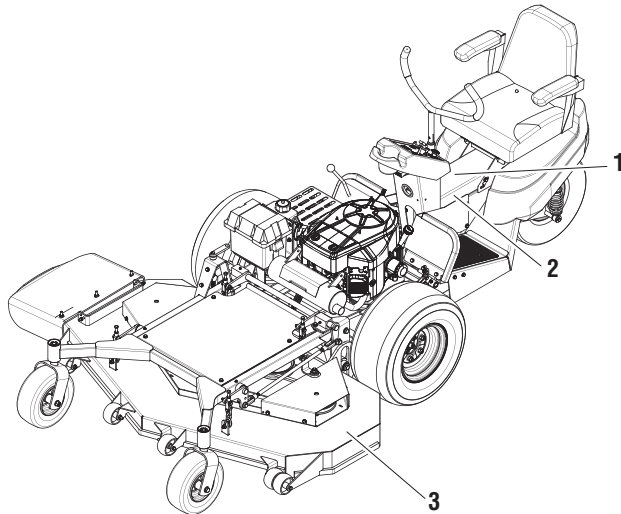
# Operator Safety





## 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.



<b>⚠ WARNING</b>	
	<p><b>Avoid serious injury or death</b></p> <ul style="list-style-type: none"> <li>• Read operator's manual before using this product.</li> <li>• Do NOT operate this machine unless you are trained.</li> <li>• Know the location and function of all controls.</li> <li>• Keep safety devices (guards, shields, switches, etc.) in place and working. Wear eye and ear protection.</li> <li>• Remove objects that could be thrown by the blade.</li> <li>• Be sure blades and engine are stopped before placing hands or feet near blades.</li> <li>• When leaving machine, shut off, remove key and set parking brake.</li> </ul>
<b>⚠ DANGER</b>	
	<p><b>Amputation hazard</b></p> <p>Rotating blades cut off arms and legs.</p> <ul style="list-style-type: none"> <li>• Stop the mower when children or others are near. Keep bystanders away.</li> <li>• Do not carry riders (especially children) even with the blades off. They may fall off or return for another ride when you are not expecting it.</li> <li>• Look down and behind before and while backing.</li> </ul>
	<p><b>Loss of control and roll-over hazard.</b></p> <p>Operating on slopes can be hazardous and cause loss of control and roll-overs.</p> <ul style="list-style-type: none"> <li>• Avoid sudden turns or rapid speed changes.</li> <li>• Reduce speed and use extreme caution on slopes.</li> <li>• Go up and down slopes, NOT across.</li> <li>• Do not operate on slopes over 10 degrees.</li> <li>• If machine stops while going uphill, stop the blades and back down slowly.</li> </ul>
	<p><b>Water, retaining walls and drop-off hazards</b></p> <p>Wheels dropping over edges may result in serious injury, death or drowning.</p> <ul style="list-style-type: none"> <li>• Do NOT operate near water, retaining walls or drop-offs.</li> <li>• Give yourself a minimum of two mower widths of clearance around these hazards.</li> </ul>

<b>⚠ WARNING</b>	
	<p><b>Fire Hazard</b></p> <p>Gasoline is flammable. Debris is combustible.</p> <ul style="list-style-type: none"> <li>• Allow engine to cool for at least 3 minutes before refueling.</li> <li>• Keep unit cleaned of debris.</li> </ul> <p>• This equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. Contact local fire agencies for regulations relating to fire prevention requirements.</p>

<b>⚠ DANGER</b>	
<b>Amputation and thrown objects hazard</b>	
	<ul style="list-style-type: none"> <li>• Keep hands and feet away from deck.</li> </ul>
	<ul style="list-style-type: none"> <li>• Do not operate mower unless discharge chute or entire grass catcher is in its proper place.</li> </ul>



## SAFETY INTERLOCK SYSTEM

This unit is equipped with safety interlock switches and other safety devices. 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

Your unit is equipped with a foot-operated switch safety system. Check the switch operation every fall and spring with the following tests.

#### Test 1 — Engine should NOT crank if:

- PTO switch is engaged, OR
- Parking brake is not engaged, OR
- Operator presence plate is not depressed.

#### Test 2 — Engine SHOULD crank if:

- PTO switch is NOT engaged, AND
- Parking brake is engaged, AND
- Operator presence plate is depressed.

#### Test 3 — Engine should SHUT OFF if:

- Operator presence plate is released with PTO engaged, OR
- Operator presence plate is released with parking brake disengaged.

*NOTE: Once the engine has stopped, PTO switch must be turned off, parking brake must be engaged.*

#### Test 4 — 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 presence plate is released). If mower drive belt does not stop within seven (7) seconds, see PTO CLUTCH ADJUSTMENT section.

## 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.**

## Safety Icons

The 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 the injury. In addition, a hazard icon may be used to represent the type of hazard. An explanation of hazard levels and icons are as follows:

### DANGER

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

### WARNING

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

### CAUTION

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

## CAUTION or NOTICE

These messages presented without the alert symbol indicate a situation where the unit or property could be damaged.

## NORTH AMERICAN SAFETY ICONS



Alert



Toxic Fumes



Read the Manual



Open Flame Hazard



Fire Hazard



Amputation - Rotating Parts



Amputation - Hand In Blade



Amputation - Foot In Blade



Thrown Objects



Hot Surface



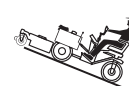
Wear Protective Gear



Pinch Point



Keep Children Away



Slope Operation

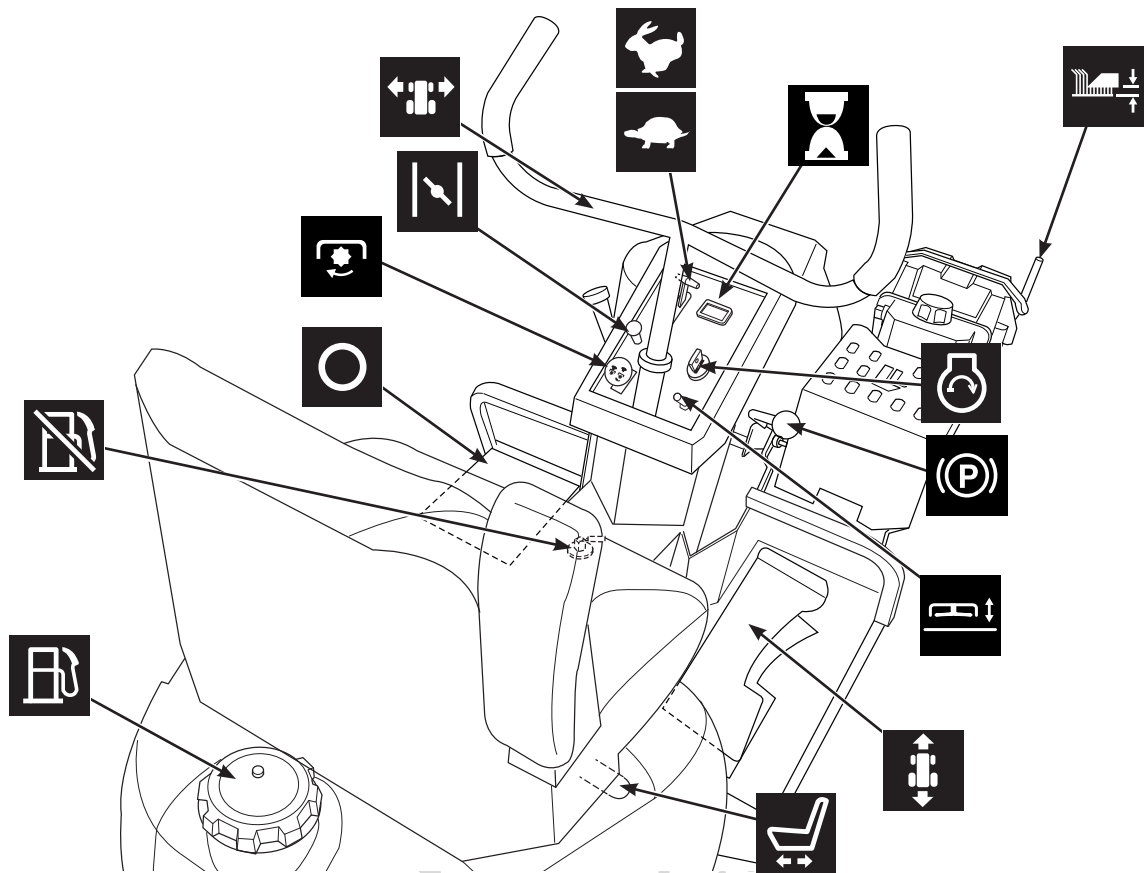


Figure 2. Control Locations

## CONTROL FUNCTIONS

The information below briefly describes the function of individual controls. Starting, stopping, driving, and moving 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.




### Ground Speed Pedal

This pedal controls the ground speed of the rider. Depressing the pedal forward increases the FORWARD speed of the rider, and depressing the pedal rearward increases the REVERSE speed.

*NOTE: The further the pedal is moved away from the neutral position the faster the drive wheels will turn.*



### Ignition Switch

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

	<b>Off</b>	Stops the engine and shuts off the electrical system
	<b>Run</b>	Allows the engine to run and powers the electrical system.
	<b>Start</b>	Cranks the engine for starting.

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

### Parking Brake

	<b>Disengage</b>	Releases the parking brake.
	<b>Engage</b>	Engages the parking brake.

Pull the parking brake lever back to engage the parking brake. Move the lever fully forward to disengage the parking brake.

*NOTE: To start the unit the parking brake must be engaged.*

*NOTE: Allowing the lever to “snap” into the OFF position will place undue strain on the lever and brake linkages.*

## **PTO (Power Take Off) Switch**

The PTO switch engages and disengages the mower. Pull UP on the switch to engage, and push DOWN to disengage.

## **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.

## **Choke**

Close the choke for cold starting. Open the choke once the engine starts. A warm engine may not require choking. Pull up handle to close the choke, Push the handle down to open the choke.

## **Mower Deck Lift Actuator Switch**

Pulling back on the switch will raise the deck, and pushing forward will lower the deck. The actuator must be fully extended during mowing operation. A “ratcheting” sound will be heard at the end on the actuator’s stroke in both directions.

## **Hour Meter**

Measures the time of the PTO being engaged.

## **Engine Kill Pedal**

This pedal is part of the electrical safety system. It must be depressed by the operator’s left foot in order to start the engine. It must remain depressed to release the parking brake and engage the PTO switch.

## **Fuel Tank Cap**

To remove the cap, turn counterclockwise. The fuel shut-off valve is located on the bottom of the fuel tank. The valve is OPEN if the lever is VERTICAL. The valve is CLOSED when the lever is HORIZONTAL.

## **Seat Adjustment Lever**

The seat can be adjusted forward and back. Move the lever forward, position the seat as desired, and release the lever to lock the seat in position.

## **Steering Handles**

Turn the handle in the desired direction to turn the machine. The farther the handle is turned, the tighter the turn will be.

## **Cutting Height Adjust Handle**

The Cutting height adjust handle controls the mower cutting height. To adjust the mower cutting height, turn the crank handle clockwise to raise the cutting height. Turn the crank handle counterclockwise to lower the cutting height.

## **Fuel Selection Valve**

The fuel shut off valve is located underneath the front edge of the operators seat. To draw from the left side of the fuel tank turn the handle to the LEFT. To draw from the right side of the fuel tank turn the handle to the RIGHT. To stop the flow of fuel turn the handle straight back towards the seat.

## GENERAL OPERATING SAFETY

Before first time operation:

- Be sure to read all information in the Safety and Operation sections before attempting to operate this tractor and mower.
- Become familiar with all of the controls and how to stop the unit.
- Drive in an open area without mowing to become accustomed to the units controls and their level of responsiveness.

### **⚠ WARNING**

Never operate on slopes greater than 15°.

Select slow ground speed before driving onto a slope.

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

### **⚠ WARNING**

Never allow passengers to ride on the unit.

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, tractor and mower free of grass, leaves and excess grease. Do not stop or park tractor 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

- Check that crankcase is filled to full mark on dipstick. See the engine Operator's Manual for instructions and oil recommendations.
- Make sure all nuts, bolts, screws and pins are in place and tight.
- Adjust the seat position, and make certain you can reach all controls from operator's position.
- Fill the fuel tank with fresh fuel. Refer to engine manual for fuel recommendations.

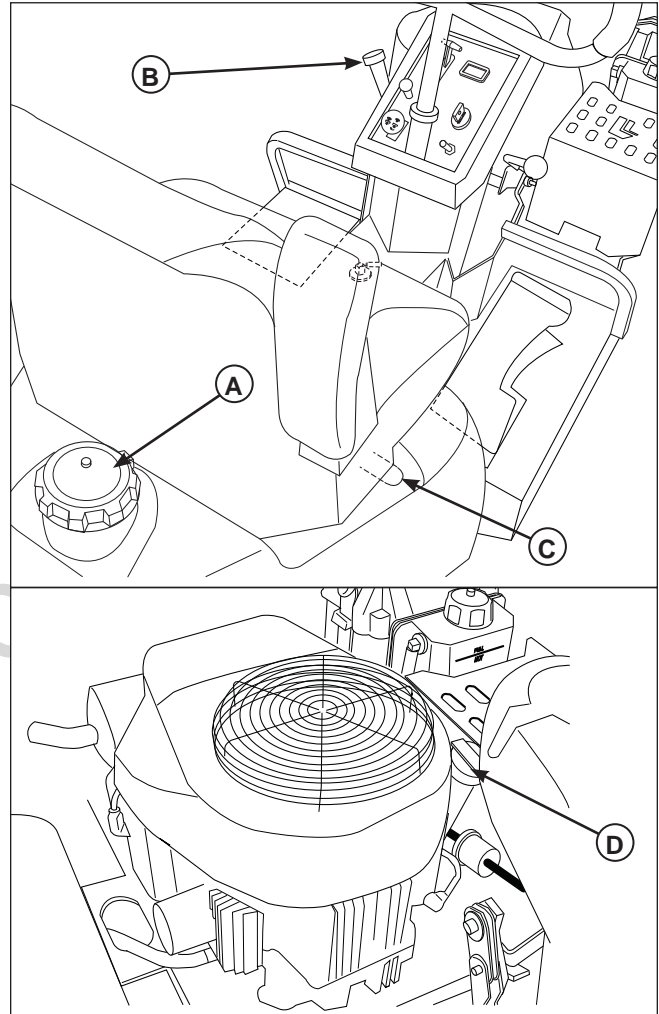


Figure 3. Pre-Start Checks

- A. Fuel Tank Filler Neck
- B. Crankcase Oil Fill (Kawasaki Models)
- C. Seat Adjustment Lever
- D. Crankcase Oil Fill (Briggs & Stratton 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 tractor without first becoming familiar with the location and function of **ALL** controls.

## **STARTING THE ENGINE**

1. While sitting in the operator's seat with your feet placed on the foot rests, engage the parking brake and make sure the PTO switch is disengaged.
2. **NOTE: A warm engine may not require choking.**  
Set the engine throttle control to FAST throttle position. Then fully close the choke by pulling the knob OUT fully.
3. Insert the key into the ignition switch and turn it to START.
4. After the engine starts, gradually open the choke (push knob down fully). Reduce to half throttle speed and allow engine to warm up.

*Warm up the engine by running it for at least a minute before engaging the PTO switch or driving the rider.*

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 TRACTOR AND ENGINE.*

## **STOPPING THE TRACTOR AND ENGINE**

1. Taking your foot off of the transmission foot control pedal will return the transmission to neutral and stop tractor movement.
2. Disengage the PTO by pushing down on the PTO switch.
3. Engage the parking brake by pulling the handle towards the operator until it locks into position.
4. Move the throttle control to mid-throttle position and turn the ignition key to OFF. Remove the key.

## THREE WHEEL RIDER DRIVING PRACTICE

The speed and steering controls of the Three Wheel rider are *responsive*, and learning to gain a *smooth* and *efficient* control of the rider's forward, reverse, and turning movements will take some practice.

Spending some time becoming familiar with how the unit accelerates, travels, and steers — before you begin mowing — is absolutely essential to getting the most out of the three wheel rider.

**Locate a smooth, flat area of your lawn — one with plenty of room to maneuver.** (Clear the area of objects, people and animals before you begin.) Operate the unit at mid-throttle during this practice session (ALWAYS operate at full throttle when mowing), and turn slowly to prevent tire slippage and damage to your lawn.

We suggest you begin practicing straight travel in both the forward and reverse directions. Next practice turning in both the forward and reverse directions to understand how the tractor reacts. Practice in an area large enough to make a turn safely.

You must release the parking brake prior to moving the transmission foot control pedal.

## Driving the Mower

1. Sit on the seat and adjust the seat so that you can comfortably reach all the controls and see the dash panel.
2. Make sure the parking brake is engaged.
3. Make sure the PTO switch is disengaged.
4. Start the engine (see STARTING THE ENGINE).
5. Disengage the parking brake.
6. Refer to the diagram in Figure 4. To travel forward gradually depress the front of the foot control pedal. Release the pedal to stop.

*NOTE: The further down the pedal is depressed in either direction the faster the mower will travel.*

7. To travel backwards gradually depress the rear of the foot control pedal. Release the pedal to stop.
8. Stop the tractor by releasing the foot control pedal, setting the parking brake, and stopping the engine (see STOPPING THE ENGINE & MOWER).

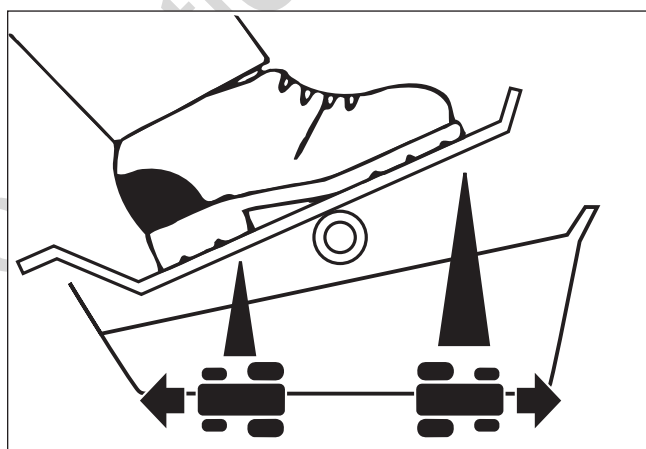


Figure 4. Transmission Speed & Direction



## MOWING

Before mowing, set the cutting height as described in the *Troubleshooting, Adjustments & Service* section.

1. Engage the parking brake. Make sure the PTO switch is disengaged and operator is seated in operator's position with feet on foot rests.
2. Start the engine (see STARTING THE ENGINE).
3. Set the throttle control to FAST.
4. Disengage parking brake.
5. Extend the deck actuator fully so that the blades are parallel to the ground. A "ratcheting" sound is heard when the deck actuator is fully extended.
6. Engage the PTO by pulling up on the PTO switch.
7. Begin mowing.
8. When finished, shut off the PTO.
9. Stop the engine (see STOPPING THE ENGINE & MOWER)

## MOWING RECOMMENDATIONS

Several factors can affect how well your machine cuts grass, Ferris recommends following proper mowing recommendations to 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.

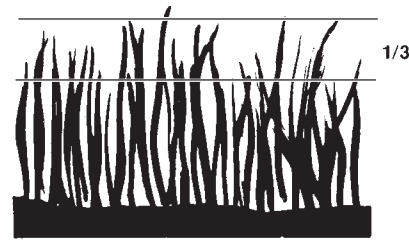
Cutting off too much at one time shocks the plant's growth system and weakens the grass plants. **A good rule of thumb is the 1/3 rule: to cut no more than one third of the grass height, and never more than 1 inch at a time.**

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).

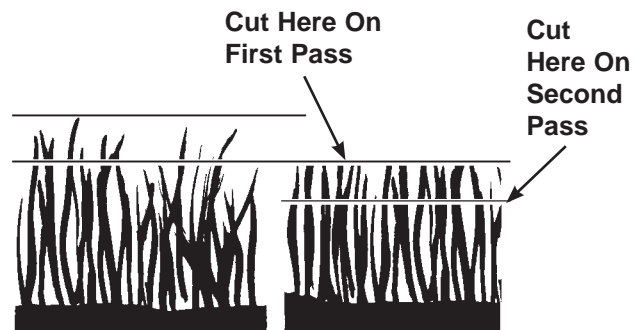
## Tall Grass Requires Incremental Cutting

For extremely tall grass, set the cutting height at maximum for the first pass, and then reset it to the desired height and mow a second 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.



### Proper Cutting Height



### Incremental Cutting

## 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:

1. Mow when the grass is between three and five inches high.
2. 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.
3. Mow at time of day when the grass is cool and dry. Late afternoon or early evening often provide these ideal mowing conditions.
4. 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

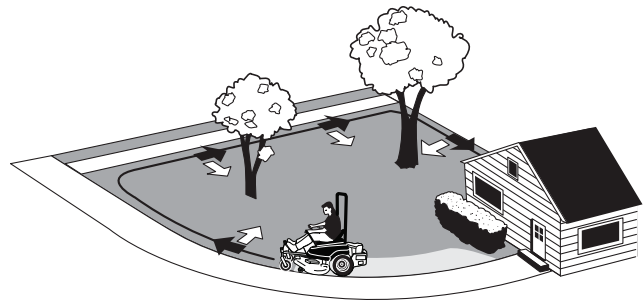
Always start mowing on a smooth, level area.

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.

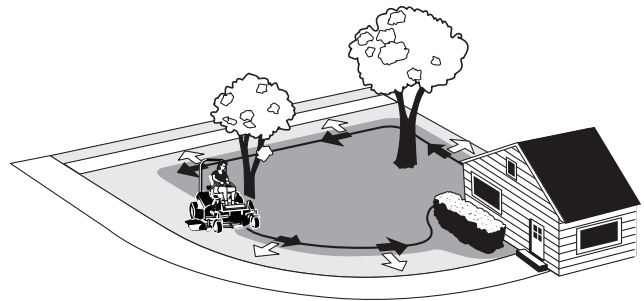
1. Cut long straight strips overlapping slightly.
2. Where possible, change patterns occasionally to eliminate matting, graining or a corrugated appearance.
3. For a truly professional cut, mow across the lawn in one direction, then recut the lawn by mowing perpendicular to the previous cut.

**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.



*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.*



*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

### Proper 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

## Proper Mulching

Mulching consists of a mower deck which cuts and recuts 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.

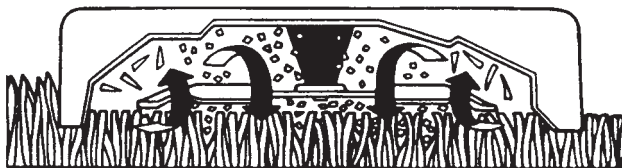
Do not use the mower as a mulching mower during the first two or three mowings in the spring. The long grass blades, quick growth, and often wetter conditions are more suitable for broadcasting (side-discharging) or grass bagging operation.

### ENGINE SPEED & GROUND SPEED FOR BROADCASTING

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 1/2 inch to 3/4 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.



Mulching Action

## PUSHING THE RIDER BY



### DO NOT TOW RIDER

Towing the unit will cause hydraulic pump and wheel motor damage. Do not use another vehicle to push or pull this unit.

## HAND

1. Disengage the PTO, engage the parking brake, turn the ignition OFF and remove the key.
2. To disengage the pump (free-wheel position), turn the hydraulic release valve (A, Figure 5) located on the hydraulic pump COUNTER-CLOCKWISE a maximum of 2 full turns.
3. Disengage the parking brake.

The tractor can now be pushed by hand.

4. After moving the tractor, re-engage the pumps (drive position) by turning the release valves CLOCKWISE and tighten to 80-120 in. lbs. of torque.

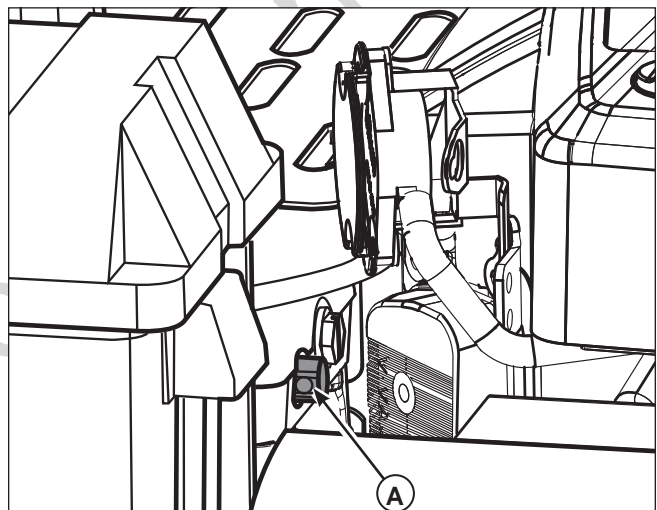


Figure 5. Hydraulic System By-Pass  
A. Hydraulic Release Valve

## 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.

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 Normal Care 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.

## 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.

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.

## MAINTENANCE SCHEDULE & PROCEDURES

The following schedule should be followed for normal care of your mower. You will need to keep a record of your operating time.

<b>UNIT MAINTENANCE</b>
<b>Before Each Use</b>
Check Safety Interlock System
Check Rider Brakes
Check Mower Blade Stopping Time
Check Rider / Mower for loose hardware
Check Tire Pressure
Check Hydraulic Oil Level
<b>Every 25 Hours</b>
Clean Deck & Check / Replace Mower Blades
Lubricate Rider & Mower
<b>Every 100 Hours</b>
Clean Battery & Cables
<b>Every 200 Hours</b>
Change Hydraulic Oil & Filter

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

<b>ENGINE MAINTENANCE</b>
<b>Before Each Use</b>
Check Engine Oil Level
<b>Every 25 Hours</b>
Check / Clean Cooling Fins & Intake*
<b>Every 50 Hours</b>
Check / Clean Spark Arrester**
<b>Refer to Engine Manufacturer's Owner's Manual</b>
Service Air Filter
Change Oil Filter
Check / Replace Spark Plugs
Check / Replace Fuel Filter

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

\*\* If equipped. Replace if damaged.

# Regular Maintenance

## CHECK TIRE PRESSURES

Tire pressure should be checked periodically, and maintained at the levels shown in the 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, improve cut quality, and extend tire life.

Tire	Serial Number	Pressure	
		psi	bar
Caster	2013131012 & Below	40	2,76
Caster	2013131013 & Above	25	1,72
Drive	All	15	1,03
Steering	All	25	1,72

## CHECKING / ADDING FUEL

To add fuel:

1. Remove the fuel cap (D, Figure 7).
2. 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.*

3. Install and hand tighten the fuel cap.

## FUEL FILTER

The fuel filter (C, Figure 7) is located in the fuel line between fuel shut off valve and carburetor, near the fuel pump. If filter is dirty or clogged, replace as follows:

1. Close the fuel selector valve.
2. Disconnect the negative battery cable.
3. Place a container below the filter to catch spilled fuel.
4. Using a pliers, open and slide hose clamps from fuel filter.
5. Remove hoses from filter.
6. Install new filter in proper flow direction in fuel line.
7. Secure with hose clamps.
8. Reconnect the negative battery cable and open the fuel selector valve when finished.



Do not use gasoline containing METHANOL, gasohol containing more than 10% ethanol, gasoline additives, premium gasoline, or white gas because engine/fuel system damage could result.

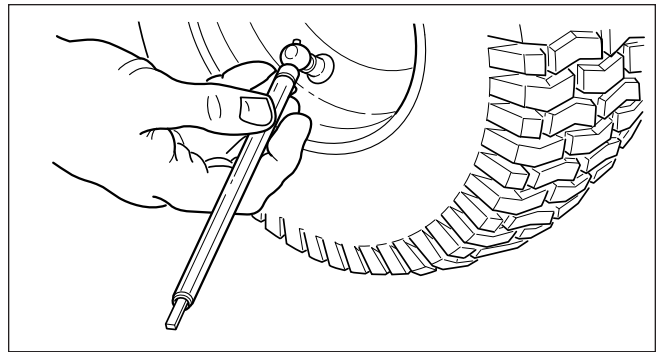


Figure 6. Checking Tire Pressure

## ! WARNING

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. Do not remove fuel filter when engine is hot, as spilled gasoline may ignite. DO NOT spread hose clamps further than necessary. Ensure clamps grip hoses firmly over filter after installation.

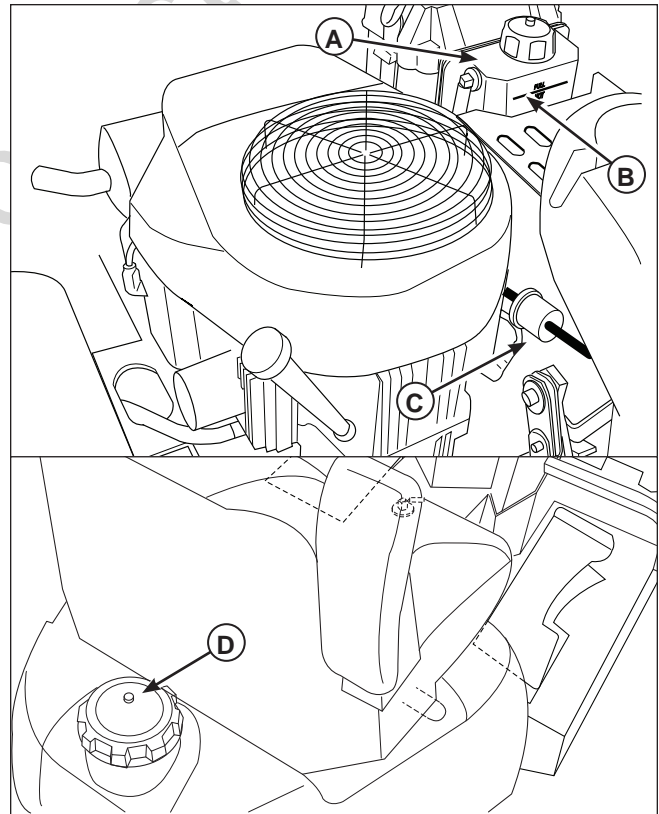


Figure 7. Fuel Tank, Oil Reservoir & Fuel Filter

- A. Oil Reservoir
- B. “FULL” Line
- C. Fuel Filter
- D. Fuel Cap

## CHECK HYDRAULIC OIL LEVEL

1. Observe the oil reservoir (A, Figure 7). The oil level should be at the "FULL" line (C).
2. Before removing the reservoir cap, make sure the area around the reservoir cap is free of dust, dirt, or other debris.
3. If necessary, unscrew the reservoir cap and add either Mobil 1™, 15W-50 synthetic oil or Castrol Syntec™ 5W-50 oil. **DO NOT** use conventional oils. Fill until oil level reaches "FULL" line.
4. Reinstall oil reservoir cap.

## CHANGE OIL & FILTER

1. Warm engine by running for a few minutes. (Refer to the engine operator's manual for oil & filter replacement instructions.)
2. Remove the oil drain hose (A, Figure 8) from the storage position on the left-hand side of the engine deck and route over the side of the engine deck and behind the tire as shown in Figure 8.

*NOTE: Briggs & Stratton models have the oil drain hose installed on the right-hand side of the engine.*

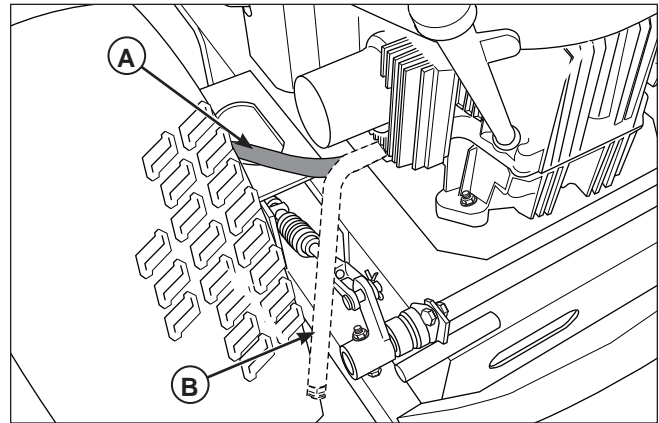
3. Place a small pan under the oil drain hose to catch the oil. Using the appropriate tools, remove the cap from the oil drain hose and drain the engine oil.
4. After draining, replace the cap and wipe up any spilled oil. Place the oil drain hose back into the storage position.
5. Place an absorbent shop cloth under the engine oil filter. Remove the engine oil filter and replace with a new one.
6. Add engine oil (Refer to the engine operator's manual for oil filling instructions.)
7. Remove the shop cloth and wipe up any spilled oil.

## SERVICE AIR FILTER

Refer to engine owners manual.

## INSPECT MUFFLER AND SPARK ARRESTER

Inspect the muffler for cracks, corrosion, or other damage. Remove the spark arrester, if equipped, and inspect for damage or carbon blockage. If replacement parts are required, make sure to use only original equipment replacement parts.



**Figure 8. Engine Oil Drain (Kawasaki Model Shown.)**

- A. Oil Drain Hose (Storage Position)**
- B. Oil Drain Hose (Draining Position)**

### **⚠ WARNING**

Replacement parts must be the same and installed in the same position as the original parts or fire could result.

# Regular Maintenance

## LUBRICATION

Lubricate the unit at the locations shown in Figure 9 as well as the following lubrication points.

### Grease:



- foot pedal pivot
- steering shaft
- brake handle pivot
- L/R brake lever pivots

Use grease fittings when present. Disassemble parts to apply grease to moving parts when grease fittings are not installed.

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

### Oil:



- seat plate rails
- deck lift pivots
- discharge chute hinge
- foot pedal mechanism

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

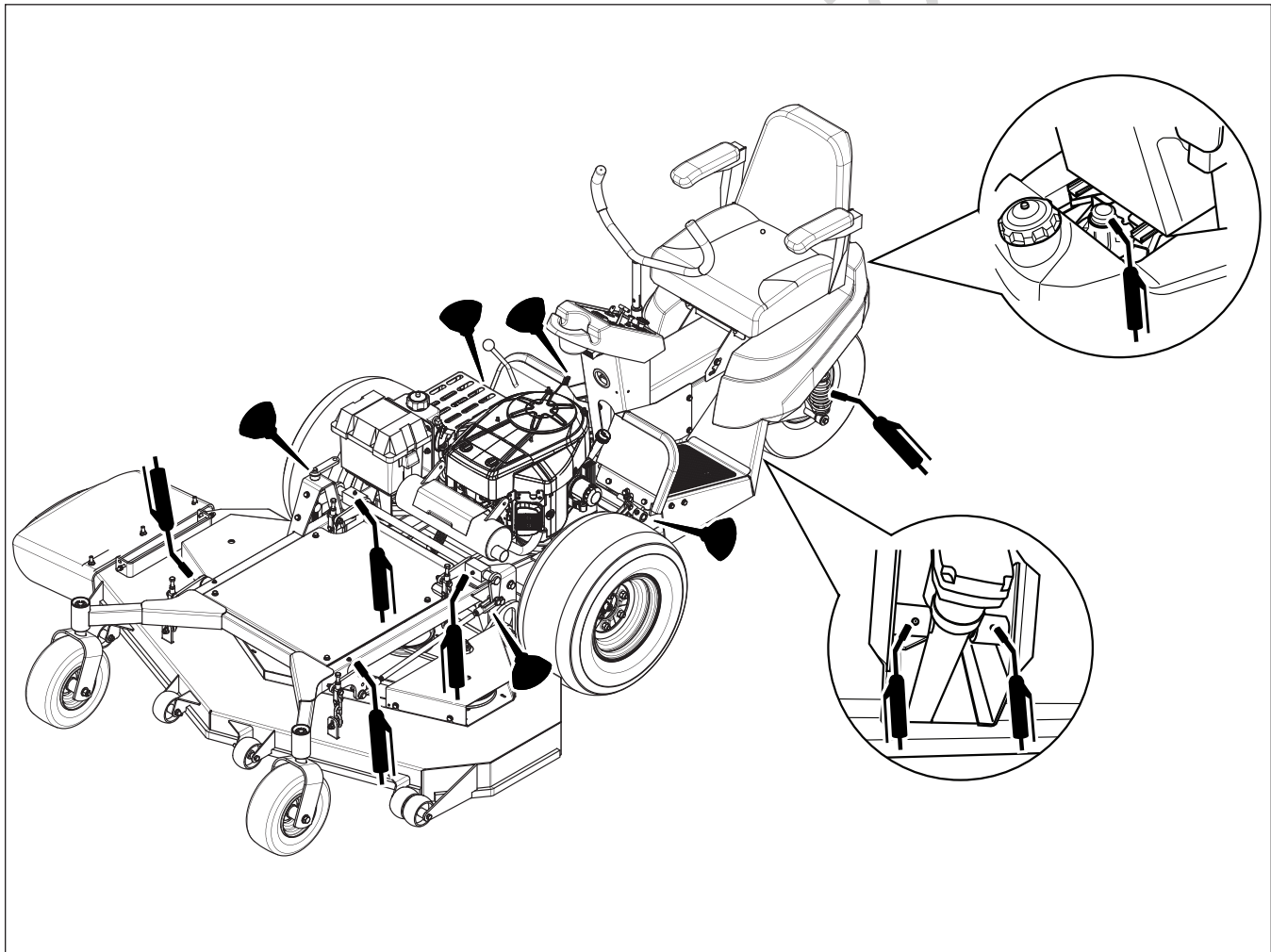
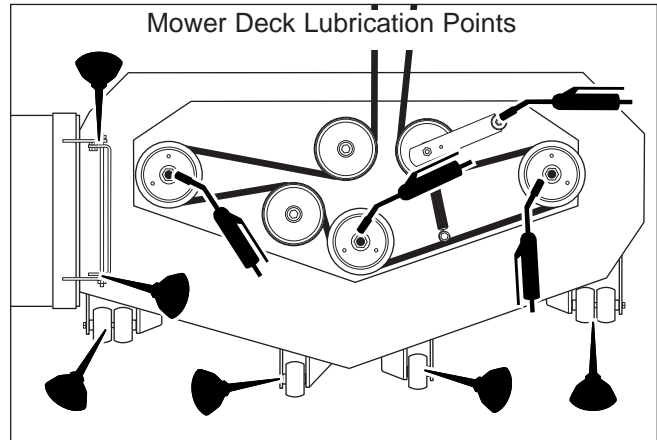


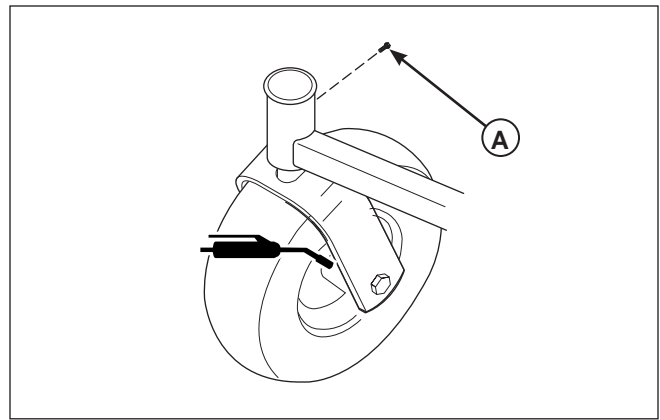
Figure 9. Lubrication Points



## Lubricating the Front Casters

**Interval:** Annually

1. Remove the 1/4-28 bolt (A, Figure 10) that is screwed into the caster and install a 1/4-28 grease fitting.
2. Grease the front caster.
3. Remove the 1/4-28 grease fitting and reinstall the 1/4-28 bolt.
4. Repeat the process for the other side of the machine.



**Figure 10. Lubricating the Front Casters**  
A. 1/4-28 Bolt

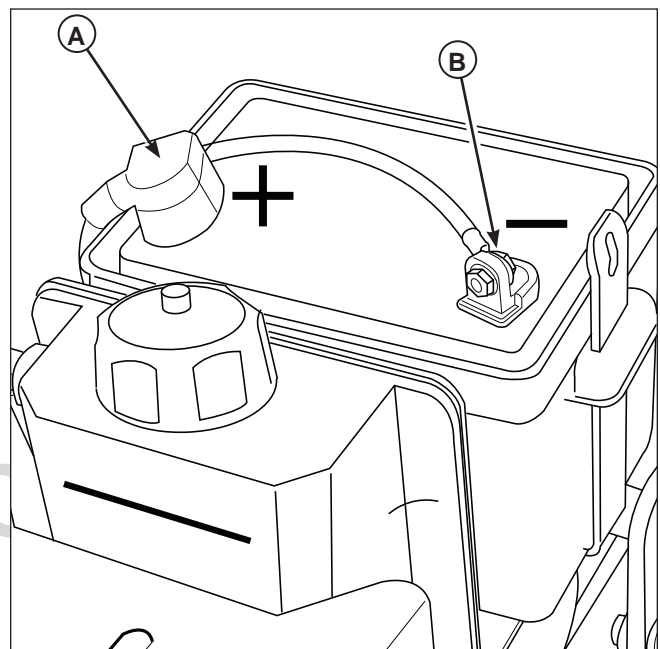
## BATTERY MAINTENANCE

### Cleaning the Battery and Cables

1. Disconnect the cables from the battery, negative cable first (B, Figure 11).
2. Clean the battery terminals and cable ends with a wire brush until shiny.
3. Reinstall the battery and reattach the battery cables, positive cable first (A)
4. Coat the cable ends and battery terminals with petroleum jelly or non-conducting grease.

### **⚠ WARNING**

When removing or installing battery cables, disconnect the negative cable **FIRST** and reconnect it **LAST**. If not done in this order, the positive terminal can be shorted to the frame by a tool.



**Figure 11. Battery Compartment**  
A. Positive (+) Cable & Terminal  
B. Negative (-) Cable & Terminal

# Regular Maintenance

## SERVICING THE MOWER BLADES

### ⚠ CAUTION

Avoid injury! Mower blades are sharp.

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

### Removing the Mower Blade

1. See Figure 12. To remove the mower blade, wedge a wooden block between the mower blade and the mower deck housing to keep the mower blade from turning, then remove the mower blade and the blade retaining hardware.

### ⚠ DANGER

Avoid injury! A worn or damaged blade can break, and a piece of the mower blade could be thrown into the operator's or bystander's area, resulting in serious personal injury or death.

- Inspect the mower blade every 25 hours or at least once a year.
- If the mower blade hits a solid object, stop the engine immediately and inspect the mower blade.
- Never weld or straighten bent mower blades.

### Inspecting the Mower Blades

1. Remove the mower blade from the unit. See *Removing the Blade*.
2. Inspect the mower blade (Figures 13 & 14). **Discard the mower blade if it has any of the below conditions.**
  - A.) Has more than .5" (12,7 mm) of the mower blade metal removed from previous sharpening or wear (D, Figure 13).
  - B.) The air lifts are excessively eroded (B & C, Figure 14) and the notch (C) is .25" (6,35 mm) deep or greater.
  - C.) Mower blade is bent or broken.
3. If the cutting edges are not sharp or have nicks, sharpen the blades. See *Sharpening the Mower Blades*.

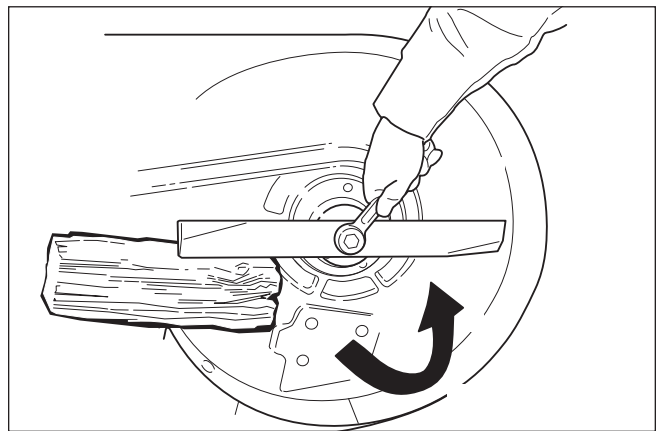


Figure 12. Loosening the Mower Blade for Removal

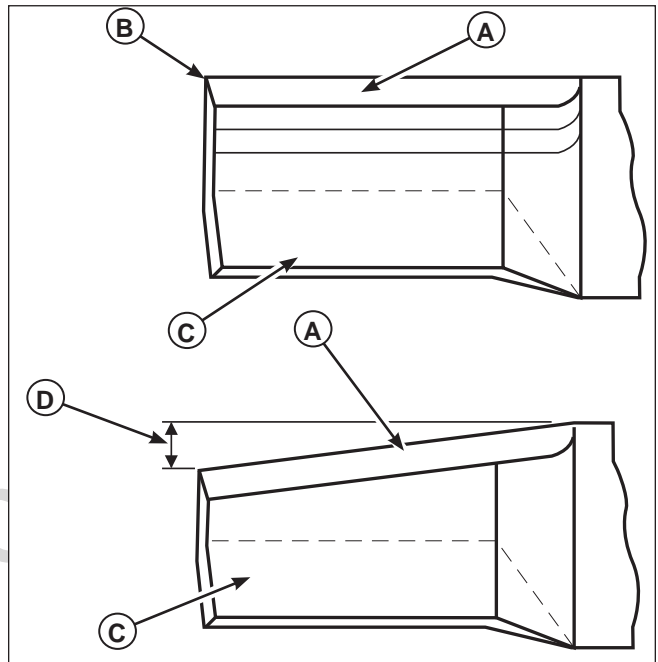


Figure 13. inspecting the Mower Blade Tips  
A. Mower Blade Cutting Edge  
B. Square Corner  
C. Air Lift  
D. Wear Measurement - DISCARD Mower Blade If greater than .5" (12,7 mm)

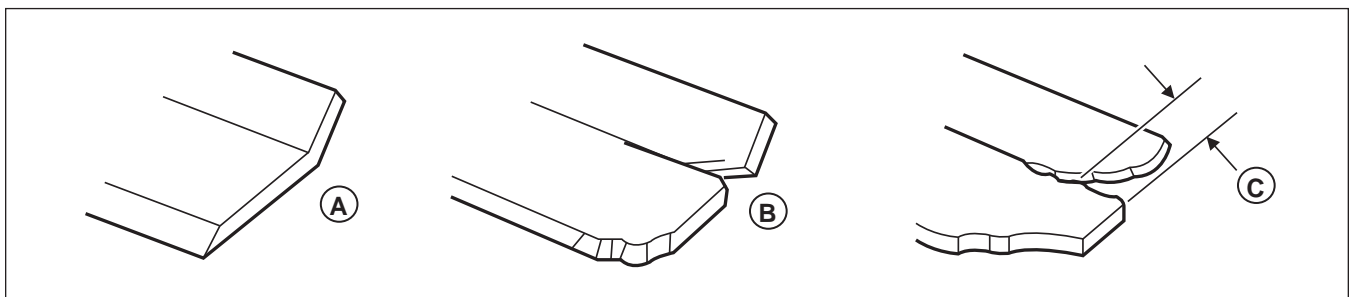


Figure 14. inspecting the Mower Blade Air Lifts  
A. New Mower Blade      B. Mower Blade at Wear Limit (A notch begins to form)  
C. Mower Blade in Dangerous Condition (Notch measures .25" (6,35 mm) or greater DO NOT USE. Replace with new mower blade.)

## Sharpening the Mower Blade

### **CAUTION**

Avoid injury! Mower blades are sharp.

- Always wear gloves when handling the mower blades.
- Always wear safety eye protection when grinding.

1. Sharpen the mower blades with grinder, hand file, or electric blade sharpener.
2. Sharpen the mower blade by removing an equal amount of material from each end of the mower blade.
3. Keep the original bevel (A, Figure 15) when grinding. DO NOT change the mower blade bevel.
4. The mower blade should have a maximum 1/64" (0,40 mm) cutting edge (B) or less.
5. Balance the mower blades before installing.

### **CAUTION**

Avoid injury! Keep mower blades balanced.

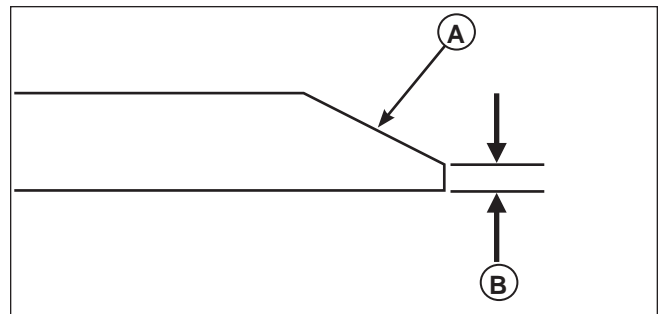
- An unbalanced mower blade can create excessive vibration and damage the unit or cause mower blade failure.

## Balancing the Mower Blades

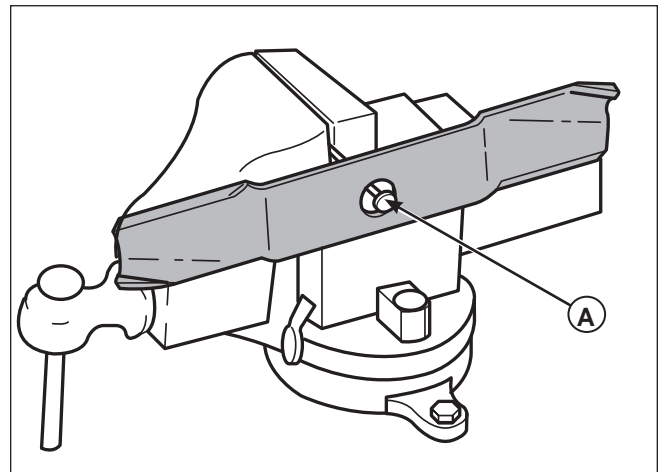
1. Clean the mower blade to remove any dried grass or other debris.
2. See Figure 16. Put the mower blade on a nail in a vise and turn the mower blade to the horizontal position.
3. Check the balance of the mower blade. If either end of the mower blade moves downward, sharpen the heavy end until the mower blade is balanced. See *Sharpening the Mower Blades* for proper sharpening instructions.
4. Repeat the process until the mower blade remains in the horizontal position.

## Reinstalling the Mower Blades

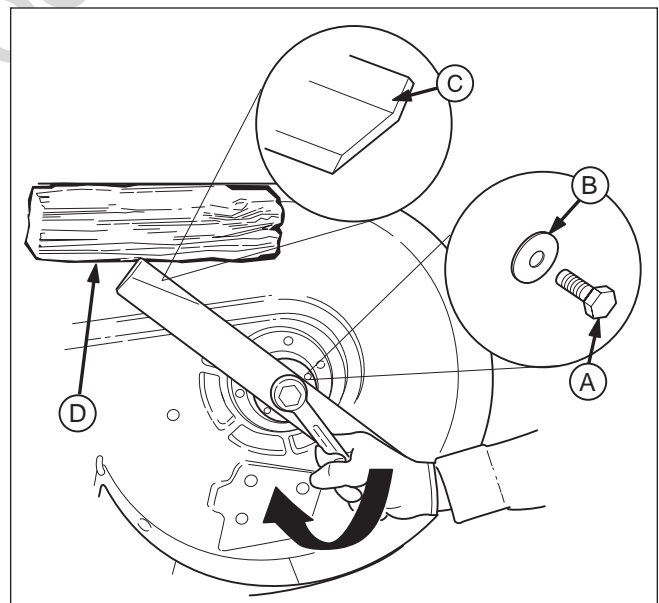
1. Reinstall each mower blade with the air lifts pointing up towards the mower deck as shown in Figure 17. Wedge a wooden block between the mower blade and the mower deck housing, and secure the mower blade with the mower blade mounting bolt and flat washer (A & B, Figure 31) and torque to 120 ft. lbs (163 Nm).



**Figure 15. Sharpening the Mower Blade**  
**A. Mower Blade Bevel**  
**B. Mower Blade Cutting Edge**



**Figure 16. Balancing the Mower Blade**  
**A. Nail**



**Figure 17. Tightening the Mower Blade for Installation**  
**A. Mower Blade Mounting Bolt**  
**B. Flat Washer**  
**C. Mower Blade Air Lift (Points Up For Installation)**  
**D. 4 X 4 Wooden Block**

## TROUBLESHOOTING

While normal care and regular maintenance will extend the life of your equipment, prolonged or constant use may eventually require that service be performed to allow it to continue operating properly.

The troubleshooting guide below lists the most common problems, their causes and remedies.

See the information on the following pages for instructions on how to perform most of these minor adjustments and service repairs yourself. If you prefer, all of these procedures can be performed for you by your local authorized dealer.

### WARNING

**To avoid serious injury, perform maintenance on the mower only when the engine is stopped and the parking brake engaged.**

**Always remove the ignition key, disconnect the spark plug wire and fasten it away from the plug before beginning the maintenance, to prevent accidental starting of the engine.**

TROUBLESHOOTING THE RIDER		
PROBLEM	CAUSE	REMEDY
<b>Engine will not turnover or start.</b>	Parking brake not engaged.	Engage parking brake.
	PTO (electric clutch) switch in ON position.	Place in OFF position.
	Out of fuel.	If engine is hot, allow it to cool, then refill the fuel tank.
	Engine flooded.	Move throttle control out of CHOKE position.
	Fuse blown.	Replace fuse.
	Battery terminals require cleaning.	Clean the battery terminals.
	Battery discharged or dead.	Recharge or replace.
	Wiring loose or broken.	Visually check wiring & replace broken or frayed wires. Tighten loose connections.
	Solenoid or starter motor faulty.	Repair or replace. See authorized dealer.
	Safety interlock switch faulty.	Repair or replace. See authorized dealer.
	Spark plug(s) faulty, fouled, or incorrectly gapped.	Clean and gap or replace. See engine manual.
	Water in fuel.	Drain fuel & refill with fresh fuel.
Gas is old or stale.	Drain fuel & refill with fresh fuel.	
<b>Engine starts hard or runs poorly.</b>	Fuel mixture too rich.	Clean air filter. Check choke adjustment (throttle control).
	Spark plug(s) faulty, fouled, or incorrectly gapped.	Clean and gap or replace. (See engine manual.)
<b>Engine knocks.</b>	Low oil level.	Check / add oil as required.
	Using wrong grade oil.	See engine manual.
<b>Excessive oil consumption.</b>	Engine running too hot.	Clean engine fins, blower screen and air cleaner.
	Using wrong weight oil.	See engine manual.
	Too much oil in crankcase.	Drain excess oil.
<b>Engine exhaust is black.</b>	Dirty air filter.	Replace air filter. See engine manual.
	Engine choke control is in closed position.	Open choke control.

# Troubleshooting, Adjustment & Service

## *Rider Troubleshooting Continued.*

<b>PROBLEM</b>	<b>CAUSE</b>	<b>REMEDY</b>
<b>Engine runs, but mower will not drive.</b>	Hydraulic release valves in "open" position.	Position hydraulic release valves in "drive" position.
	Belt is broken.	See Drive Belt Replacement.
	Drive belt slips.	See problem and cause below.
	Brake is not fully released.	See service dealer.
<b>Transmission drive belt slips.</b>	Pulleys or belt greasy or oily.	Clean as required.
	Clutch is out of adjustment.	See service dealer.
	Belt stretched or worn.	Replace belt.
<b>Brake will not hold.</b>	Brake is incorrectly adjusted.	See Brake Adjustment.
	Brake mechanism is worn.	Have transaxle repaired.
<b>Mower steers hard or handles poorly.</b>	Steering linkage is loose.	Check and tighten any loose connections.
	Improper tire inflation.	See Regular Maintenance section.

## **TROUBLESHOOTING THE MOWER DECK**

<b>PROBLEM</b>	<b>CAUSE</b>	<b>REMEDY</b>
<b>Engine stalls easily with mower engaged.</b>	Engine speed too slow.	Set to full throttle.
	Ground speed too fast.	Decrease ground speed.
	Cutting height set too low.	Cut tall grass at maximum cutting height during first pass.
	Discharge chute jamming with cut grass	Cut grass with discharge pointing toward previously cut area.
<b>Excessive mower vibration.</b>	Blade mounting screws are loose.	Tighten to 120 ft.lbs. (163 Nm)
	Mower blades, arbors or pulleys are bent.	Check and replace as necessary.
	Mower blades are out of balance.	Remove, sharpen and balance blades. See Maintenance section.
	Belt installed incorrectly.	Reinstall correctly.
<b>Excessive belt wear or breakage.</b>	Bent or rough pulleys.	Repair or replace.
	Using incorrect belt.	Replace with correct belt.
<b>Mower drive belt slips or fails to drive.</b>	Belt tension improperly adjusted.	Adjust belt tension. See Belt Replacement.
	Idler pulley spring broken or not properly adjusted.	Repair or adjust as needed.
	Mower drive belt broken.	Replace drive belt.

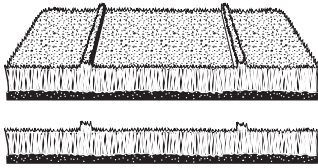
## TROUBLESHOOTING COMMON CUTTING PROBLEMS

### PROBLEM

### CAUSE

### REMEDY

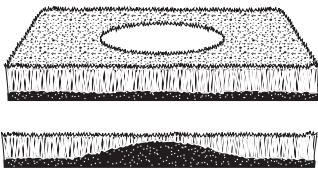
#### Streaking



1. Blades are not sharp.
2. Blades are worn down too far.
3. Engine speed is too slow.
4. Ground speed is too fast.
5. Deck is plugged with grass.
6. Not overlapping cutting rows enough.
7. Not overlapping enough when turning.

1. Sharpen your blades.
2. Replace your blades.
3. Always mow at FULL throttle.
4. Slow down.
5. Clean out the mower.
6. Overlap you cutting rows.
7. When turning your effective cutting width decreases—overlap more when turning.

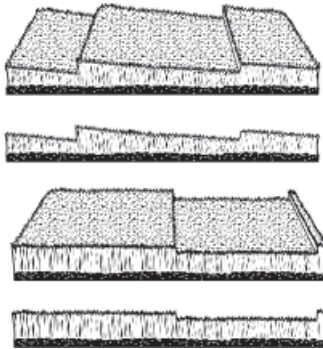
#### Scalping



1. Lawn is uneven or bumpy.
2. Mower deck cutting height is set too low.
3. Ground speed is too fast.
4. Deck is not levelled correctly.
5. Tire pressure is low or uneven.

1. Roll or level the lawn.
2. Raise the cutting height.
3. Slow down.
4. Correctly level the deck.
5. Check and inflate the tires.

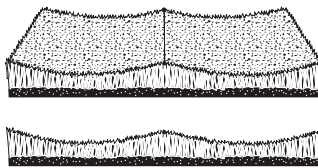
#### Stepped Cutting.



1. Deck is not leveled correctly.
2. Tires are not properly inflated.
3. Blades are damaged.
4. Deck shell is damaged.
5. Mower spindle is bent or loose.
6. Blades are installed incorrectly.

1. Level the deck correctly.
2. Check and inflate the tires.
3. Replace the blades.
4. Repair or replace the deck.
5. Repair or replace the spindle.
6. Reinstall the blades correctly.

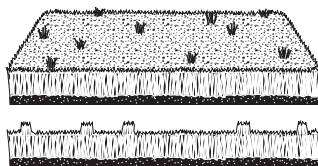
#### Uneven Cutting



1. Deck is not leveled correctly.
2. Blades are dull or worn.
3. Blades are damaged.
4. Deck is clogged with grass clippings.
5. Deck shell is damaged.
6. Mower spindle is bent or loose.
7. Blades are installed incorrectly.
8. Tires are not properly inflated.

1. Level the deck correctly.
2. Sharpen or replace the blades.
3. Replace the blades.
4. Clean out the deck.
5. Repair or replace the deck.
6. Repair or replace the spindle.
7. Reinstall the blades correctly.
8. Check and inflate the tires.

#### Stingers



1. Blades are not sharp or nicked.
2. Blades are worn down too far.
3. Engine speed is too low.
4. Ground speed is too fast.
5. Deck is plugged with grass.

1. Sharpen your blades.
2. Replace your blades.
3. Always mow at full throttle.
4. Slow down.
5. Clean out the mower.

## MOWING HEIGHT ADJUSTMENT

See Figure 18. The mowing height adjustment can be changed by turning the cutting height adjustment handle.

### To Raise the Mower Deck:

Turn the cutting height adjustment handle (A, Figure 18) CLOCKWISE.

### To Lower the Mower Deck:

Turn the cutting height adjustment handle COUNTER-CLOCKWISE.

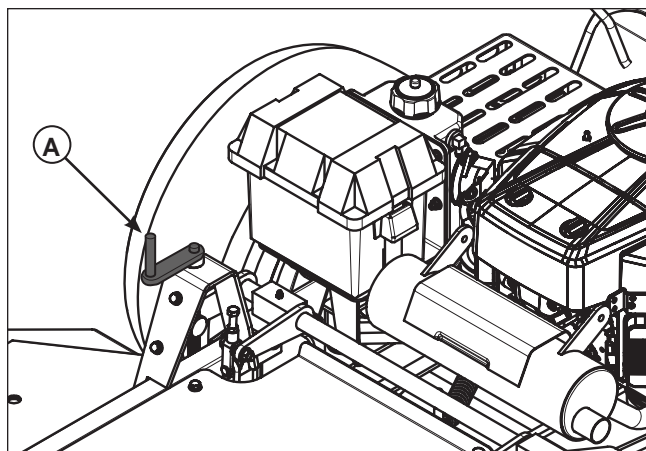


Figure 18. Cutting Height Adjustment  
A. Cutting Height Adjustment Handle

## SEAT HEIGHT ADJUSTMENT

In addition to the operator seat being adjustable in the forward and back position, the height of the operator seat can also be adjusted up and down.

### To Adjust the Seat Up and Down:

1. Pull the seat adjustment lever (A, Figure 19) forward and move the seat to the furthest forward position to provide extra clearance between the seat and the gas tank.
2. Loosen but do not remove the front seat mounting hardware (B).
3. Remove the rear seat mounting hardware (C).
4. Maneuver the seat mount (D) until the desired height is achieved.
5. Reinstall the rear mounting hardware and then tighten both the front and rear mounting hardware.
6. Pull the seat adjustment lever forward and adjust the seat to the desired front and back position.

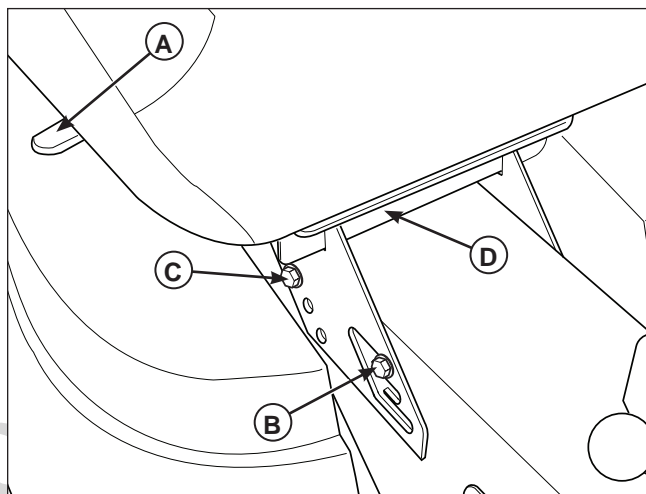


Figure 19. Seat Height Adjustment  
A. Seat Adjustment Lever  
B. Front Mounting Hardware  
C. Rear Mouning Hardware  
D. Seat Mount

# Troubleshooting, Adjustment & Service

## MOWER BELT REPLACEMENT



To avoid damaging belts, DO NOT PRY BELTS OVER PULLEYS.

### Mower Deck Drive Belt

1. Park the machine on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn off the engine, and remove the ignition key.
2. Remove the mower deck guard.

### ! WARNING

Use extreme caution when rotating the idler arm with the combination wrench, due to the increased tension in the spring as the idler arm is being rotated. Injury may result if the combination wrench is prematurely released while the spring is under tension.

3. Using a 3/4" combination wrench, place the box end on the 1/2" nut located on the end of the idler arm (A, Figure 20). Carefully rotate the breaker bar CLOCKWISE, which will relieve the tension on the belt exerted from the idler arm.
4. Slide the drive belt over the edge of the stationary idler pulley (B). Carefully release the tension on the breaker bar until the idler arm comes to a stop.
6. Remove the old belt and replace with a new one. Make sure the V-side of the belt runs in the pulley grooves.
7. Install the drive belt on the PTO pulley, the spindle pulleys, and all idler pulleys except the stationary pulley. Carefully rotate the 3/4" combination wrench CLOCKWISE and install the belt on the stationary idler pulley. Carefully release the tension on the 3/4" combination wrench. The belt should be routed exactly as shown in Figure 21.
8. Reinstall the mower deck guard.
9. Run the mower under no-load condition for about 5 minutes to break-in the new belt.

### Check the Mower Belt Idler Tensioner Spring Length (S/N: 2015249869 & Above)

1. Park the machine on a smooth level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn off the engine and remove the ignition key.
2. Lower the mower deck to its lowest cutting position.

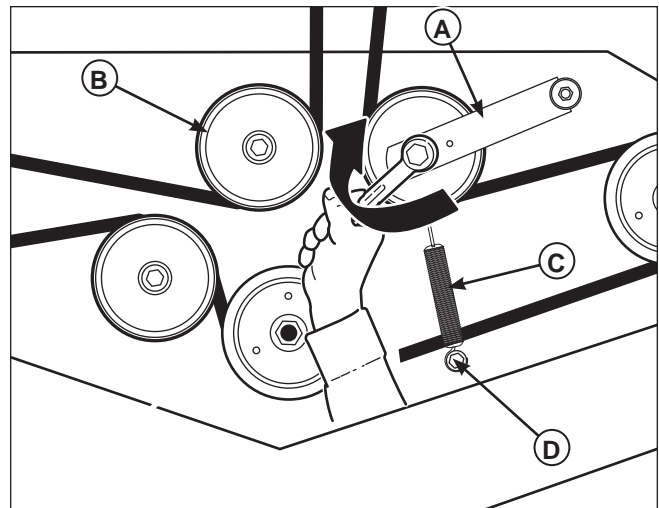


Figure 20. Mower PTO Belt

- A. Idler Arm
- B. Stationary Idler Pulley
- C. Idler Tension Spring
- D. Anchor Bolt

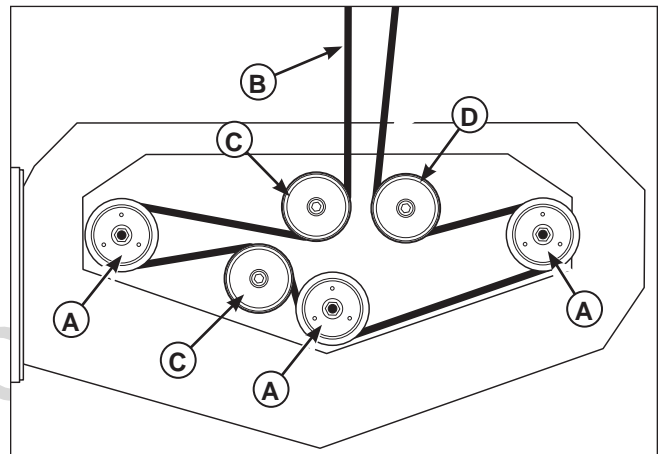


Figure 21. Mower PTO Belt Routing

- A. Spindle Pulley
- B. PTO Drive Belt
- C. Stationary Idler Pulley
- D. Spring-loaded Idler Pulley

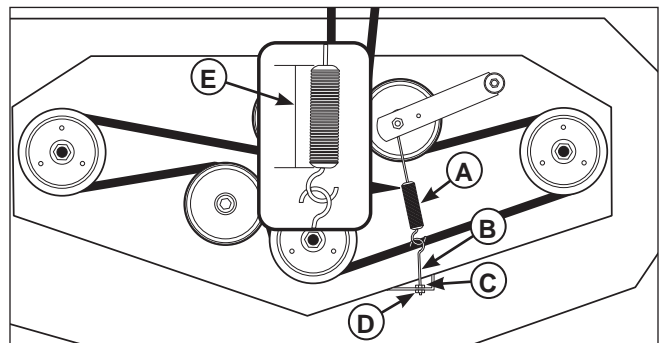


Figure 22. Mower Belt Idler Spring Length

- A. Mower Belt Tensioner Spring
- B. Anchor Eyebolt
- C. Jam Nut
- D. Adjustment Nut
- E. Measurement - 6-1/4" (15,9)



3. Measure the coil length of the mower belt tension spring (A, Figure 22). The measurement should equal 6-1/4" (15,9). If the measurement doesn't equal 6-1/4" (15,9), adjust the mower belt idler tensioner spring length.

## Adjusting the Mower Belt Idler Tensioner Spring Length (S/N: 2015249869 & Above)

1. Loosen the jam nut (C, Figure 22).
2. Turn the adjustment nut (D) until 6-1/4" (15,9) is achieved.
3. Retighten the jam nut.

## PUMP DRIVE BELT REPLACEMENT S/N: 2015675570 & BELOW



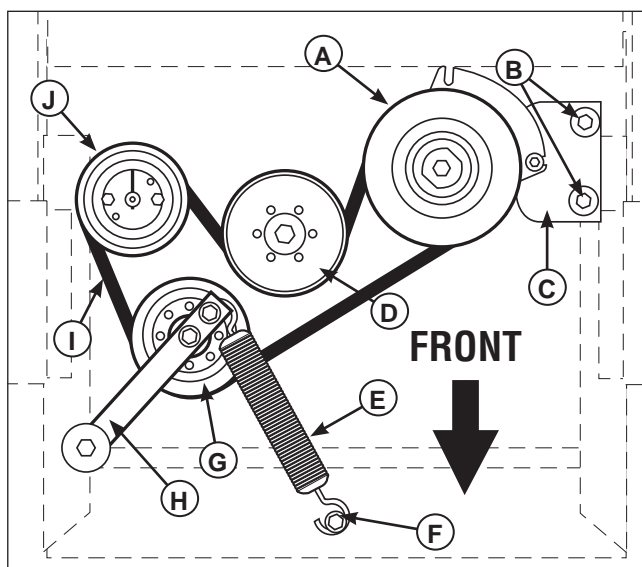
**To avoid damaging belt, DO NOT PRY BELTS OVER PULLEYS.**

1. Park the unit on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn off the engine, and remove the ignition key.
2. Remove the mower deck drive belt. See *MOWER BELT REPLACEMENT* section.
3. Remove the clutch anchor bolts (B, Figure 23) that fasten the clutch anchor pad (C) to the anchor.
4. Unplug the PTO clutch from the wire harness.
5. Push the idler arm forward and remove the belt tension spring from the spring anchor bolt (F).

### **WARNING**

**STORED ENERGY DEVICE:** Improper release of the belt tension spring can result in personal injury. Use extreme caution when removing this spring.

6. Drop the belt (I) from the crankshaft pulley and around the PTO clutch (A).
7. Remove the old belt and replace with a new one. Make sure the V-side of the belt runs in the pulley grooves.
8. Reinstall the belt tension spring onto the anchor bolt.
9. Plug the PTO clutch into the wire harness.
10. Reinstall the clutch anchor pad and hardware (C & B). Tighten securely.
11. Reinstall the deck drive belt. See *MOWER BELT*



**Figure 23. Pump Drive Belt (S/N: 2015675570 & Below)**

- A. PTO Clutch and Crankshaft Pulley
- B. Anchor Bolts
- C. Clutch Anchor Pad
- D. Stationary Idler Pulley
- E. Belt Tension Spring
- F. Spring Anchor Bolt
- G. Spring-loaded Idler Pulley
- H. Idler Arm
- I. Belt
- J. Pump Drive Pulley

# Troubleshooting, Adjustment & Service

REPLACEMENT sections.

## PUMP DRIVE BELT REPLACEMENT S/N: 2015675571 & ABOVE



To avoid damaging belt, DO NOT  
PRY BELTS OVER PULLEYS.

1. Park the unit on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn off the engine, and remove the ignition key.
2. Remove the mower deck drive belt. See *MOWER BELT REPLACEMENT* section.
3. Remove the clutch anchor bolts (A, Figure 24) that fasten the clutch anchor pad (B) to the anchor.
4. Unplug the PTO clutch (C) from the wire harness.

### WARNING

**STORED ENERGY DEVICE:** Improper release of the belt tension spring can result in personal injury.  
Use extreme caution when removing this spring.

5. Loosen the jam nut (D) on the spring anchor eye bolt (E).
6. Loosen the adjustment nut (F) on the spring anchor eye bolt to release the majority of the belt tension. Use caution to remove the nut to completely release the tension.
7. Remove the old belt and replace with a new one (G). Make sure the V-side of the belt runs in the grooves of the adjustable idler pulley (H), the pump pulley (I), and the crankshaft pulley, and that the back side of the belt contacts the face of the stationary idler pulley (J).
8. Re-install the spring anchor eye bolt into the spring anchor tab and loosely fasten the adjustment nut.
9. Tighten the nut until the belt tensioning spring (K) achieves a coil-to-coil measurement of 3-1/8" (7.9 cm).
10. Tighten the jam nut.
11. Plug the PTO clutch into the wire harness.
12. Reinstall the clutch anchor pad and hardware (A & B). Tighten securely.
13. Reinstall the deck drive belt. See *MOWER BELT REPLACEMENT* sections.

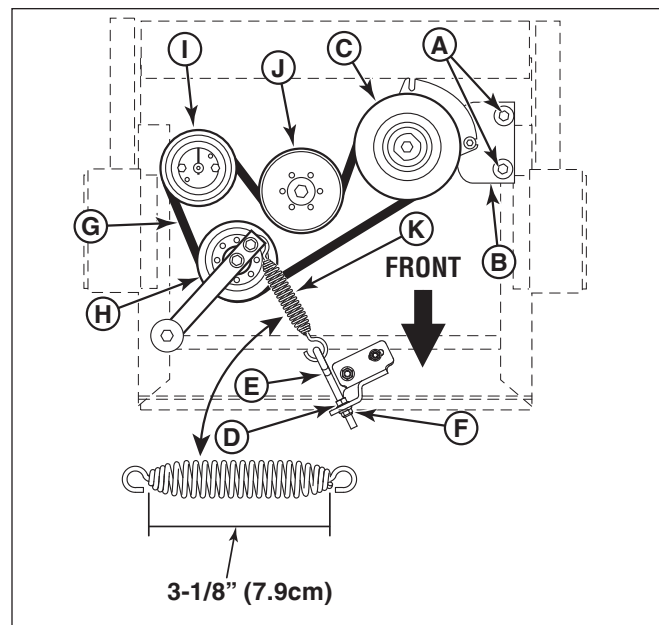
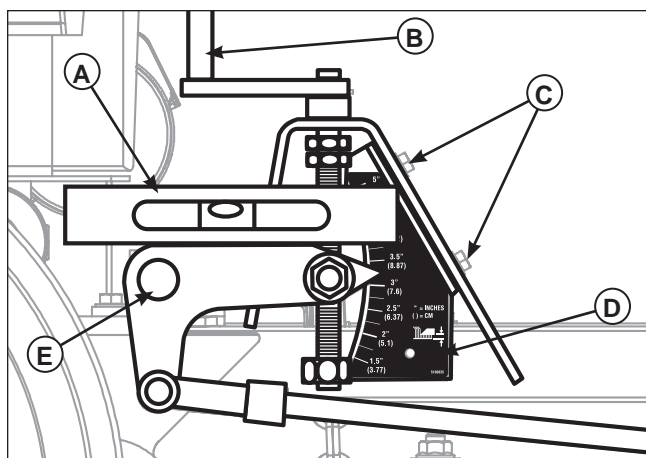


Figure 24. Pump Drive Belt (S/N: 2015675570 & Below)

- A. Clutch Anchor Bolts
- B. Clutch Anchor Pad
- C. PTO Clutch and Crankshaft Pulley
- D. Jam Nut
- E. Spring Anchor Eyebolt
- F. Adjustment Nut
- G. Belt
- H. Adjustable Idler Pulley
- I. Pump Pulley
- J. Stationary Idler Pulley
- K. Belt Tensioning Spring

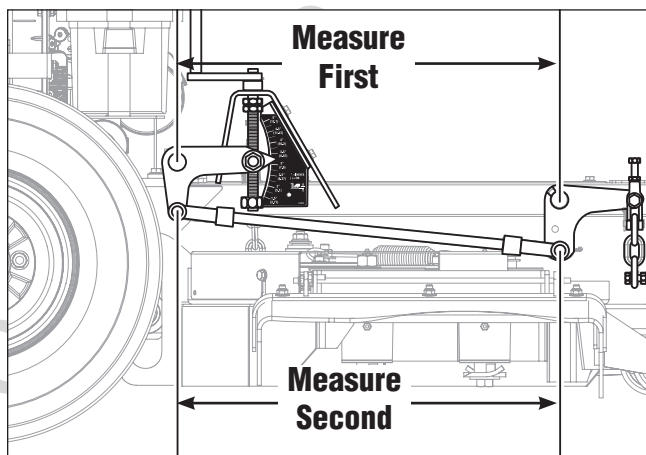
## DECK LIFT ROD TIMING ADJUSTMENT

1. Park machine on a flat, level surface. Disengage the PTO, stop the engine, and engage the parking brake. Make sure that all of the tires are properly inflated.
2. Place a level (A, Figure 25) on top of the cutting height indicator (E) and adjust the cutting height indicator up or down with the deck height adjustment handle (B) until the cutting height indicator is level.
3. Loosen, but do not remove the height indication plate hardware (C) that secures the height indicator plate (D). Maneuver the height indicator plate up or down until the cutting height indicator points to the 3.25" (8,26 cm) mark. Tighten the height indication plate hardware.
4. Refer to Figure 26. To check the deck lift rod timing, measure and record the distance between the lift pivots and the rod pivots. Repeat for the other side of unit.
5. If the measurements for the rods and pivots are equal, no further adjustment is required. If the measurements are NOT equal (greater than 1/8" (3,17 mm) difference), adjustment is required, continue with Step 6.
6. Block up the mower deck until all hanger chains are slack.
7. Refer to Figure 27. To adjust the lift rods the 1/2-20 steel clevises (C, Figure 27) will need to be adjusted. Loosen the 1/2-20 jam nut (B) that tightens against the clevis. Remove the cotter pin (E), and the clevis pin (D) that are connected to the front deck lift pivot (A). Turn the clevis to adjust the length of the rod. Reinstall the clevis pin and the hair pin. Tighten the 1/2-20 jam nut. Measure and record the distance between the lift pivots and the rod pivots. Repeat the process until the measurements are equal.

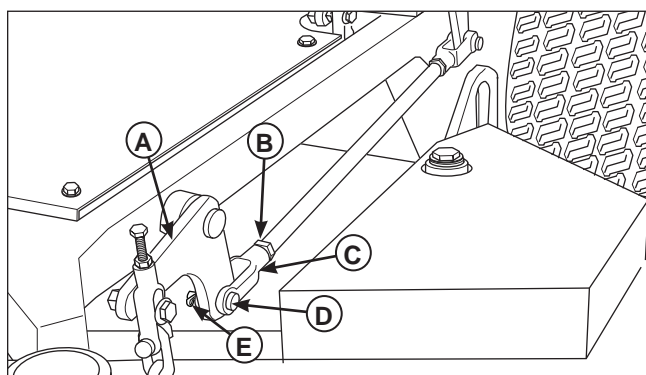


**Figure 25. Deck Height Position**

- A. Level**
- B. Deck Height Adjustment Handle**
- C. Height Indication Plate Hardware**
- D. Height Indication Plate**
- E. Cutting Height Indicator**



**Figure 26. Measure and Adjust Lift Rod Timing**



**Figure 27. Lift Rod Clevis Adjustment**

- A. Front Deck Lift Pivot**
- B. 1/2-20 Jam Nut**
- C. 1/2-20 Steel Clevis**
- D. Clevis Pin**
- E. Cotter Pin**

## DECK LEVELING ADJUSTMENT

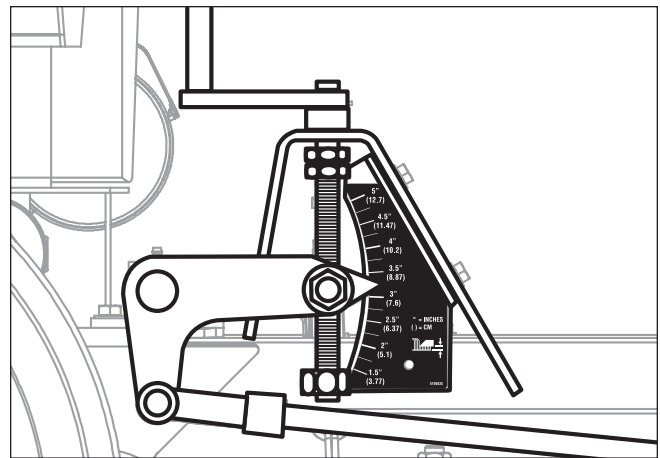
*NOTE: Before adjusting the deck level, the deck lift rod timing must be checked and if necessary, adjusted.*

1. Park machine on a flat, level surface. Disengage the PTO, stop the engine, engage the parking brake, and remove the key from the ignition. Make sure that all of the tires are properly inflated.
2. Crank the deck height adjustment handle so the cutting height indicator points to the 3.25" (8,26 cm). See Figure 28.

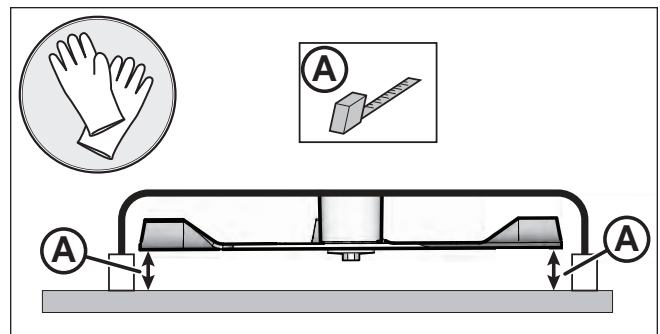
### WARNING

**Mower blades are sharp. For your personal safety, do not handle mower blades with bare hands. Careless or improper handling of blades may result in serious injury or death.**

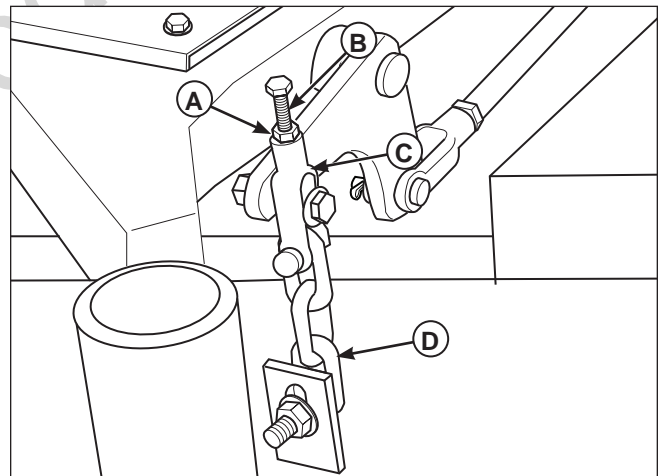
3. Manually position the left hand mower blade so that the blade is pointing towards the front and back of the mower.
4. Measure from the front tip of the blade on the cutting edge to the ground. Record this distance.
5. Measure from the back tip of the blade on the cutting edge to the ground. Record this distance.
6. Repeat steps # 3 - 5 for the right hand blade.
7. Place blocking under each corner of the mower deck until the front of the blade to the ground measures 3-1/4" (8,3 cm) and the back of the blade to the ground measures 3-1/2" (8,9 cm).
8. Loosen the hardware that tightens the bottom of the hanger chain (D, Figure 30) to the deck. Slide the chains down in the slots until the chains are tight and tighten the nuts. See Figure 30.
9. Remove the blocks from under the deck.
10. Repeat steps # 3 - 6 to check the blade height measurements. The front measurement should be 3-1/4" and the rear measurement should be 3-1/2". If the measurements are correct, no further adjustment is necessary. If they are not correct, continue with Step 11.
11. Loosen the jam nut (A, Figure 30) on the adjuster bolt (B) in the chain hanger clevis (C). Turn the adjuster bolt until the correct measurements are achieved. Ensure that all four hanger chains are taut, then retighten the jam nut against the chain hanger clevis.



**Figure 28. Deck Height Position**  
A. Cutting Height Indicator



**Figure 29. Setting the Blade Height**



**Figure 30. Lift Rod Clevis Adjustment**

- A. Jam Nut
- B. Adjuster Bolt
- C. Chain Hanger Clevis
- D. Deck Hanger Chain

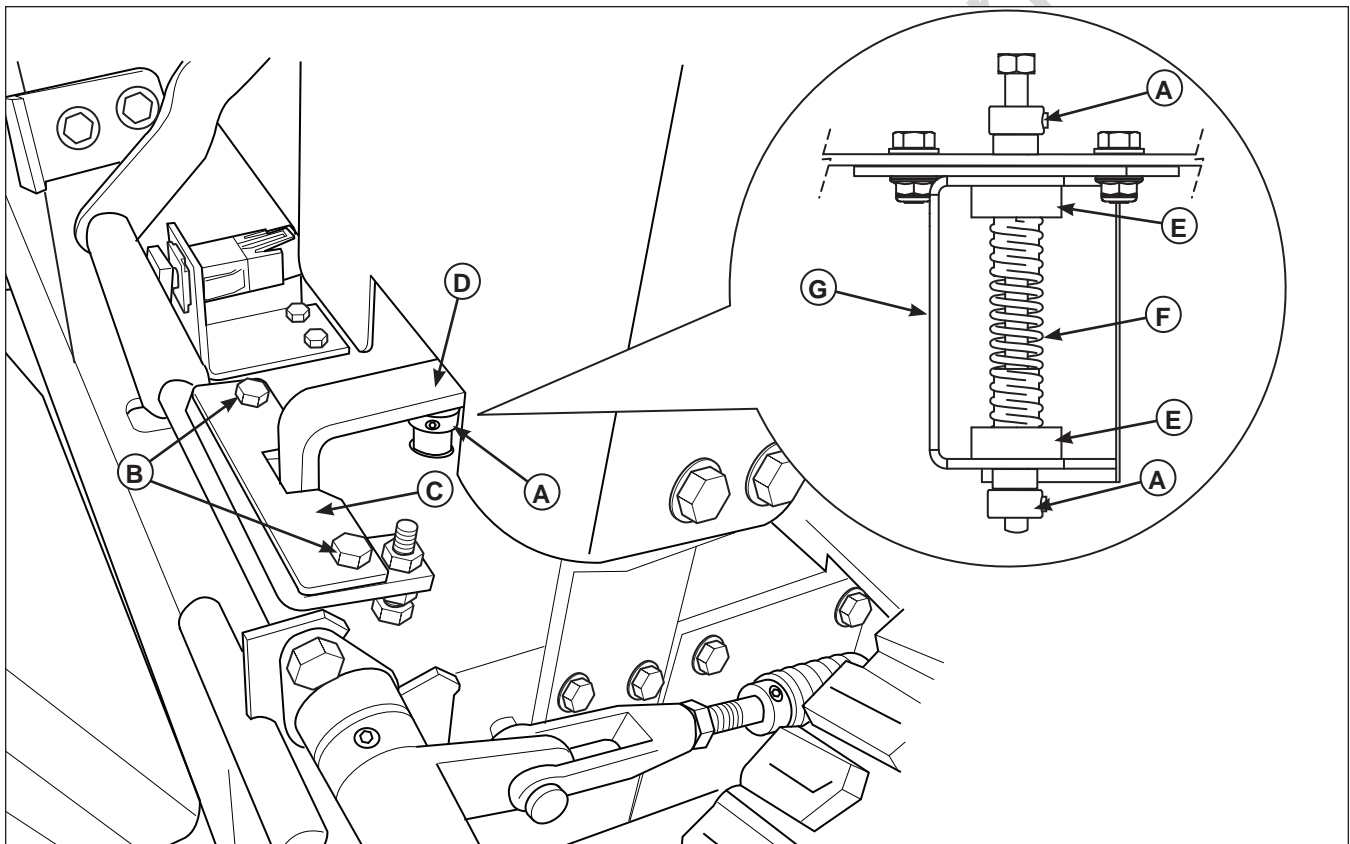
## TRANSMISSION FOOT CONTROL PEDAL NEUTRAL ADJUSTMENT

If the tractor “creeps” (gradually moves forward or backwards) while the transmission foot control pedal is in the neutral position, then it may be necessary to adjust transmission foot control pedal neutral adjustment.

1. Park the machine on a flat, level surface. Disengage the PTO, stop the engine, and engage the parking brake.
2. Loosen the set collars (A, Figure 31) that are located on the top and bottom of the neutral return spring (F.)
3. Loosen the neutral lock plate hardware (B.) If the machine creeps forward, slide the neutral lock plate (C) and the pump control arm (D) slightly to the right. If the machine creeps backwards, slide the neutral lock plate and the pump control arm slightly to the left. Retighten the hardware that secures the neutral lock plate.

4. Refer to 31. Make sure that the top plastic bushing (E) is seated tightly against the top of the neutral return bracket (G). Make sure that the bottom plastic bushing (E) is seated tightly against the bottom of the neutral return bracket. Tighten the set collars (A).

*NOTE: This adjustment should not be performed while the machine is running. It may take several attempts to achieve neutral, depending up how much the machine creeps.*



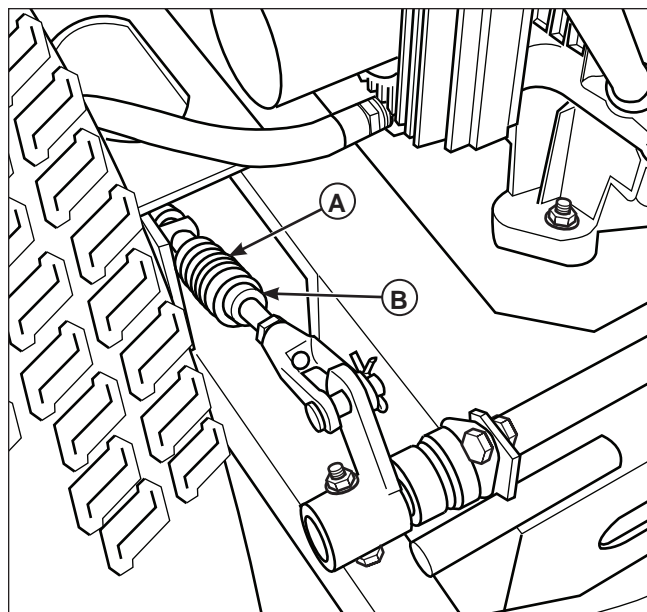
**Figure 31. Neutral Position**

- A. Set Collars**
- B. Neutral Lock Plate Hardware**
- C. Neutral Lock Plate**
- D. Pump Control Arm**
- E.. Plastic Bushings**
- F. Neutral Return Spring**
- G. Neutral Return Bracket**

## PARKING BRAKE ADJUSTMENT

1. Park the machine on a flat, level surface. Disengage the PTO, stop the engine, and engage the parking brake.
2. Chock the drive tires and then release the parking brake handle
3. Locate the two parking brake springs (A, Figure 32). One is located on the left rear side of the engine deck by the left drive wheel and the other is located on the rear right side of the engine deck by the right drive wheel.
4. Loosen the set collar (B) and then tighten it snugly against the white brake spring. Repeat process for other side.
5. Re-engage the parking brake handle and unchock the wheels.

**If this does not correct the braking problem, see you Ferris dealer.**



**Figure 32. Parking Brake Adjustment**  
**A. Parking Brake Spring**  
**B. Set Collar**

## REAR SUSPENSION ADJUSTMENT

The shock assembly can be adjusted in two ways to allow the operator to customize the ride according to operator's weight and/or operating conditions. You have the option of adjusting the spring pre-load and/or the upper mounting position.

Items to consider before adjusting the suspension.

- Less spring pre-load should be used with light weight operators, which will provide a softer, more cushioned ride.
- More spring pre-load or upper mounting position #2 should be used with heavy weight operators.

### To adjust the spring pre-load:

1. Park machine on a flat, level surface. Disengage the PTO, stop the engine and engage the parking brake.
2. See Figure 33. Using the supplied spanner wrench (p/n 5022853), insert the tip of the wrench into the notch in the pre-load adjuster. While holding the wrench in place with one hand, turn COUNTER-CLOCKWISE to increase the pre-load, turn CLOCKWISE to decrease the pre-load.

*NOTE: Spanner wrench is located in the publication packet with this manual.*

### To adjust the upper mounting position:

1. Park machine on a flat, level surface. Disengage the PTO, stop the engine and engage the parking brake.
2. Place a 50 lbs (22.7 kg) weight on the front of the deck.
3. While standing to the side of the machine use the mower deck lift actuator switch located on the control panel to raise the deck. With no operator present in the seat and the additional weight on the front of the deck, raising the deck with the mower deck lift actuator switch will cause the rear of the machine to raise off of the floor.
4. Place wooden blocks underneath the rear tire.
5. Use the mower deck lift actuator switch to lower the deck. With no operator present in the seat and the additional weight on the front of the deck, lowering the deck with the mower deck lift actuator switch will cause the rear of the machine to be lowered towards the ground. Slowly lower the deck until the rear steering wheel rests on the blocks and the pressure on the upper shock mounting bolt is relieved.

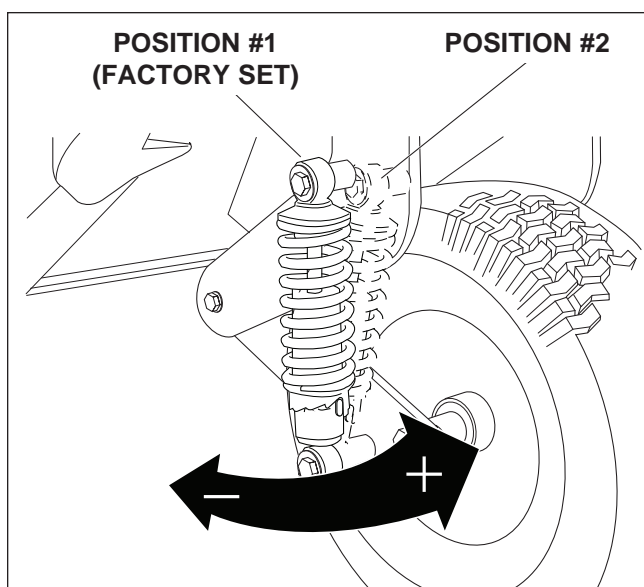


Figure 33. Rear Suspension Adjustments

### **! WARNING**

**Use two hands when adjusting the shock springs. This will prevent the wrench from slipping while pressure is being applied.**

*NOTE: The shock should move freely on the mounting bolt when the pressure is relieved.*

6. Remove the upper shock mounting hardware and pivot the shock to the position #2 (see Figure 33).
7. Reinstall the upper shock mounting hardware and tighten securely.
8. Remove the wooden blocks from under the rear steering tire.
9. Remove the 50 lbs (22.7 kg) weight from the front of the deck.

## BATTERY SERVICE



### WARNING

Keep open flames and sparks away from the battery; the gasses coming from it are highly explosive. Ventilate the battery well during charging.

### Checking Battery Voltage

A voltmeter can be used to determine condition of battery. When engine is off, the voltmeter shows battery voltage, which should be 12 volts. When engine is running, the voltmeter shows voltage of charging circuit which normally is 13 to 14 volts.

A dead battery or one too weak to start the engine may not mean the battery needs to be replaced. For example, it may mean that the alternator is not charging the battery properly. If there is any doubt about the cause of the problem, see your dealer. If you need to replace the battery, follow the steps under Cleaning the Battery & Cables in the Regular Maintenance Section.

### Charging a Completely Discharged Battery



### WARNING

Do NOT charge battery with key switch ON.

Never use a quick battery charger to start engine.

Always disconnect negative (-) battery cable before charging battery.

1. Be aware of all the safety precautions you should observe during the charging operation. If you are unfamiliar with the use of a battery charger and hydrometer, have the battery serviced by your dealer.
2. Add distilled water sufficient to cover the plate (fill to the proper level near the end of the charge). If the battery is extremely cold, allow it to warm before adding water because the water level will rise as it warms. Also, an extremely cold battery will not accept a normal charge until it becomes warm.
3. Always unplug or turn the charger off before attaching or removing the clamp connections.
4. Carefully attach the clamps to the battery in proper polarity (usually red to [+] positive and black to [-] negative).
5. While charging, periodically measure the temperature of the electrolyte. If the temperature

exceeds 125° F (51.6° C), or if violent gassing or spewing of electrolyte occurs, the charging rate must be reduced or temporarily halted to prevent battery damage.

6. Charge the battery until fully charged (until the specific gravity of the electrolyte is 1.250 or higher and the electrolyte temperature is at least 60° F). The best method of making certain a battery is fully charged, but not over charged, is to measure the specific gravity of a cell once per hour. The battery is fully charged when the cells are gassing freely at low charging rate and less than 0.003 change in specific gravity occurs over a three hour period.

### Jump Starting With Auxiliary (Booster) Battery

Jump starting is not recommended. However, if it must be done, follow these directions. Both booster and dis-charged batteries should be treated carefully when using jumper cables. Follow the steps below EXACTLY, being careful not to cause sparks. Refer to Figure 34.

1. Both batteries must be of the same voltage.
2. Position the vehicle with the booster battery adjacent to the vehicle with the discharged battery so that booster cables can be connected easily to the batteries in both vehicles. Make certain vehicles do not touch each other.
3. Wear safety glasses and shield eyes and face from batteries at all times. Be sure vent caps are tight. Place damp cloth over vent caps on both batteries.
4. Connect positive (+) cable to positive post of discharged battery (wired to starter or solenoid).
5. Connect the other end of same cable to same post marked positive (+) on booster battery.
6. Connect the second cable negative (-) to other post of booster battery.
7. Make final connection on engine block of stalled vehicle away from battery. Do not lean over batteries.
8. Start the engine of the vehicle with the booster battery. Wait a few minutes, then attempt to start the engine of the vehicle with the discharged battery.
9. If the vehicle does not start after cranking for ten (10) seconds, STOP PROCEDURE. More than ten (10) seconds seldom starts the engine unless some mechanical adjustment is made. Allow a sixty (60) second cool down period between starting attempts. Failure to follow these guidelines can burn out starter motor.



10. After starting, allow the engine to return to idle speed. Remove the cable connection at the engine or frame. Then remove the other end of the same cable from the booster battery.
11. Remove the other cable by disconnecting at the discharged battery first and then disconnect the opposite end from the booster battery.
12. Discard the damp cloths that were placed over the battery vent caps.

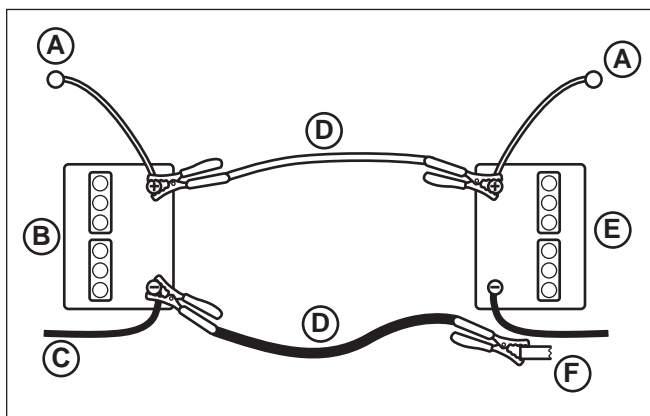


Figure 34. Jump Starting

<i>This hook-up is for negative grounded vehicles.</i>	
Callout	Description
A	To Starter Switch
B	Starting Vehicle Battery
C	To Ground
D	Jumper Cable
E	Discharged Vehicle Battery
F	Engine Block
<b><i>Make sure vehicles do not touch.</i></b>	

## **! WARNING**

Any procedure other than the preceding could result in:

- (1) personal injury caused by electrolyte squirting out the battery vents,
- (2) personal injury or property damage due to battery explosion,
- (3) damage to the charging system of the booster vehicle or of the immobilized vehicle.

Do not attempt to jump start a vehicle having a frozen battery because the battery may rupture or explode. If a frozen battery is suspected, examine all fill vents on the battery. If ice can be seen or if the electrolyte fluid cannot be seen, do not attempt to start with jumper cables as long as the battery remains frozen.

## **! WARNING**

For your personal safety, use extreme care when jump starting. Never expose battery to open flame or electric spark – battery action generates hydrogen gas which is flammable and explosive. Do not allow battery acid to contact skin, eyes, fabrics, or painted surfaces. Batteries contain a sulfuric acid solution which can cause serious personal injury or property damage.

When removing or installing battery cables, disconnect the negative cable **FIRST** and reconnect it **LAST**. If not done in this order, the positive terminal can be shorted to the frame by a tool.

To avoid engine damage, do not disconnect battery while engine is running. Be sure terminal connections are tight before starting.

# Specifications

## 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.

#### 25 Gross HP† Kawasaki

**Make** Kawasaki  
**Model** FH721V  
**Electrical System** 12 Volt, 15 amp. Alternator, Battery: 350 CCA

#### 26 Gross HP† Kawasaki

**Make** Kawasaki  
**Model** FS730V  
**Electrical System** 12 Volt, 15 amp. Alternator, Battery: 350 CCA

#### 26 Gross HP\* Briggs & Stratton Professional Series

**Make** Briggs & Stratton  
**Model**  
*S/N: 2013130926 & Below:* 44P7770120G1  
*S/N: 2013130927 & Above:* 44P7770136G1  
**Electrical System** 12 Volt, 16 amp. Alternator, Battery: 350 CCA

#### 27 Gross HP\* Briggs & Stratton Professional Series

**Make** Briggs & Stratton  
**Model** 44Q7770145G1  
**Electrical System** 12 Volt, 16 amp. Alternator, Battery: 350 CCA

#### 27 Gross HP<sup>1</sup> Kohler

**Make** Kohler  
**Model** CV740S  
**Electrical System** 12 Volt, 16 amp. Alternator, Battery: 350 CCA

#### 24 Gross HP† Kawasaki

**Make** Kawasaki  
**Model** FS730V-ES00-S  
**Electrical System** 12 volt, 15 amp charging coil; Battery: 350 cca

#### 27 Gross HP\* Briggs & Stratton Commercial Turf

**Make** Briggs & Stratton  
**Model** 49T877-0010-G1  
**Electrical System** 12 volt, 16 amp. Alternator; Battery: 350 cca

#### 28 Gross HP\* Briggs & Stratton Commercial Turf

**Make** Briggs & Stratton  
**Model** 49L977-0125-G5  
**Electrical System** 12 volt, 16 amp. Alternator; Battery: 350 cca

#### 27 Gross HP\* Briggs & Stratton CXI

**Make** Briggs & Stratton  
**Model** 44T977-0054-G1  
**Electrical System** 12 volt, 16 amp. Alternator; Battery: 350 cca

**†Power Ratings:** All power levels are stated gross horsepower per SAE J2723 as rated by Kawasaki and tested per the SAE J1995 test standard. The gross power curves and more information can be viewed at [www.kawasaki-criticalpower.com](http://www.kawasaki-criticalpower.com).

**\*Power Ratings:** The gross power rating for individual gasoline engine models is labeled in accordance with SAE (Society of Automotive Engineers) code J1940 Small Engine Power & Torque Rating Procedure, and is rated in accordance with SAE J1995. Torque values are derived at 2600 RPM for those engines with "rpm" called out on the label and 3060 RPM for all others; horsepower values are derived at 3600 RPM. The gross power curves can be viewed at [www.BRIGGSandSTRATTON.COM](http://www.BRIGGSandSTRATTON.COM). Net power values are taken with exhaust and air cleaner installed whereas gross power values are collected without these attachments. Actual gross engine power will be higher than net engine power and is affected by, among other things, ambient operating conditions and engine-to-engine variability. Given the wide array of products on which engines are placed, the gasoline engine may not develop the rated gross power when used in a given piece of power equipment. This difference is due to a variety of factors including, but not limited to, the variety of engine components (air cleaner, exhaust, charging, cooling, carburetor, fuel pump, etc.), application limitations, ambient operating conditions (temperature, humidity, altitude), and engine-to-engine variability. Due to manufacturing and capacity limitations, Briggs & Stratton may substitute an engine of higher rated power for this engine.

**†Power Ratings:** Actual sustained equipment horsepower will likely be lower due to operating limitations and environmental factors.

## CHASSIS

**Fuel Tank** Capacity: 6 gallons (27 L)  
**Drive Wheels** Tire Size: 20 x 10.00 - 10  
Inflation Pressure: 15 psi (1,03 bar)  
**Steering Wheel** Tire Size: 18 x 7.50 - 8  
Inflation Pressure: 25 psi (1,76 bar)  
**Caster Wheel** Tire Size: 11 x 4.00 - 5  
*S/N: 2013131012 & Below:* Inflation Pressure: 40 psi (2,76 bar)  
*S/N: 2013131013 & Above:* Inflation Pressure: 25 psi (1,76 bar)

## HYDRAULIC PUMP

(S/N: All): PR-2KCC-GV1F-XXXX (5100642)

## WHEEL MOTORS:

(S/N: 2014514856 & Below)

LH / RH HGM-12C-4025

(S/N: 2014514857 - 2014545938)

LH HGM-12E-3054 (5102130)

RH HGM-12E-3050 (5102138)

(S/N: 2014545939 & Above)

LH TL0195LS080AAKZ (5102814)

RH TL0195LS081AAKZ (5102815)

**Type** Pump and Wheel Motor  
**Hydraulic Fluid** 5W-50 Synthetic  
**Speeds** Forward: 0-8 MPH (0-12.87 km/h)  
@ 3400 rpm Reverse: 0-4 MPH (0-6.44 km/h)

## DIMENSIONS:

**Overall Length** 115" (292 cm)  
**Overall Width** 63" (160 cm)  
**Height** 48" (122 cm)  
**Weight (apx..)** 1100 lbs. (499 Kg)

**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 [WWW.FERRISINDUSTRIES.COM](http://WWW.FERRISINDUSTRIES.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 one year from purchase, or to the extent permitted by law. All other implied warranties are excluded. 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	4 years (48 months) or 500 hours, whichever occurs first. Unlimited hours during the first 2 years (24 months) (+Except as noted below)	90 days
Walk mowers (over 30 inches of cutting width)	2 years (24 months) unlimited hours (+Except as noted below)	90 days
+Belts, Tires, Brake Pads, Hoses, Battery, Blades	90 days	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 [FERRISINDUSTRIES.COM/AU](http://FERRISINDUSTRIES.COM/AU), or by calling 1300 274 447, or by emailing or writing to [salesenquires@briggsandstratton.com.au](mailto: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 end user, and continues for the period of time or hours stated in the table above.

**No warranty registration is necessary to obtain warranty on Briggs & Stratton products. 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.**

**ABOUT YOUR WARRANTY**

We welcome warranty repair and apologize to you for being inconvenienced. Warranty service is available only through *FERRIS* Authorized Service Dealers. Most warranty repairs are handled routinely, but sometimes requests for warranty service may not be appropriate. 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 void your warranty. Warranty is not allowed 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 parts is not covered by warranty.

**Normal Wear** - Like all mechanical devices, your unit is subject to wear even when properly maintained. This warranty does not cover 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 Fuel** - In order to function correctly, this product requires fresh fuel that conforms to the criteria specified in the Operator's Manual. Damage caused by stale fuel (carburetor leaks, clogged fuel tubes, sticking valves, etc) 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. There is no warranty coverage on equipment used for primary power in place of utility power or on equipment used in life support applications. This warranty also excludes failures due to acts of God and other force majeure events beyond the manufacturer's control.



# ***OPERATOR'S MANUAL***

***ProCut S Series  
3-Wheel Riding Mowers***

Not for  
Reproduction