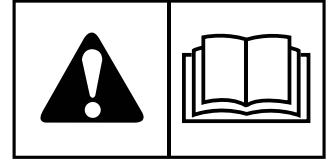




# ***OPERATOR'S MANUAL***

## **IS6200 Series Zero-Turn Riding Mower**



<b>Model</b>	<b>Description</b>
5901849	IS6200ZC48D72
5901851	IS6200ZC48D72 AUS
5902162	IS6200, 72, C48, NA
5902163	IS6200, 72, C48, AUS

**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).**

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# General Information

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

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

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

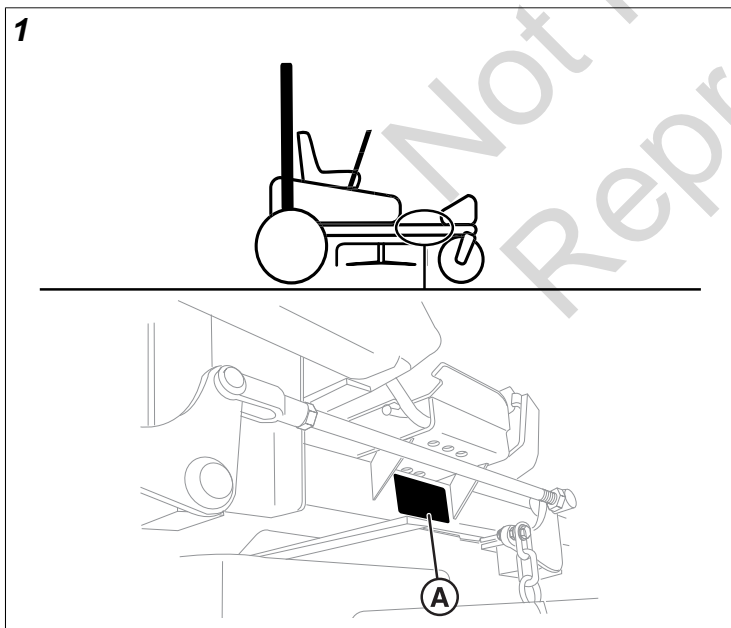
Ferris is a registered trademark of Briggs & Stratton.

## Identifying Your Unit

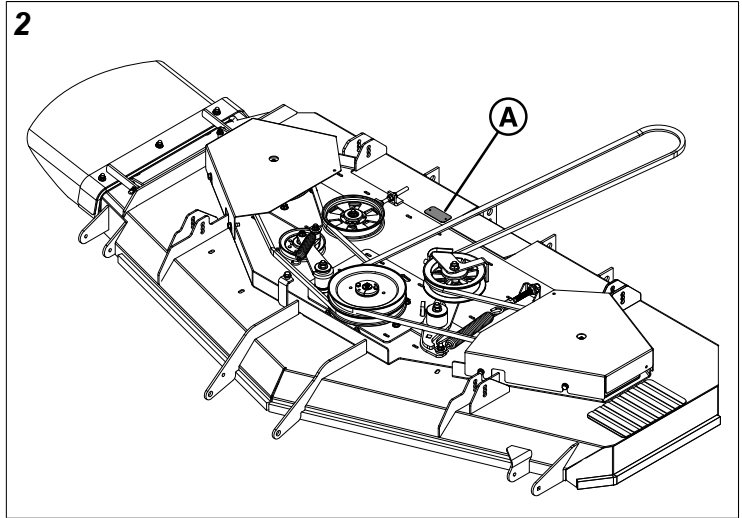
The following products are covered by this manual:

5901849, 5901851, 5902162 & 5902163

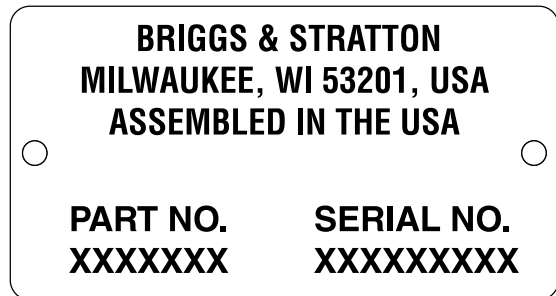
The product identification tag (A, Figure 1) can be found in the location as shown in Figure 1.



If the mower deck is shipped separately from the zero-turn riding mower the product identification tag (A, Figure 2) for the mower deck is located as shown in Figure 2.



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



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


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


Note: For the location of the engine identification numbers refer to the the engine owner's manual or the menu option in the digital display panel.


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


## Operator Safety

### Safety Alert Symbol and Signal Words

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

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

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

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

**NOTICE** indicates information considered important but not hazard-related.

### California Proposition 65

#### **WARNING**

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well ventilated area.
- If in a enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do no idle the engine except as necessary.

For more information go to [www.P65warnings.ca.gov/diesel](http://www.P65warnings.ca.gov/diesel)

### Operating Safely

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

## Operating Safety



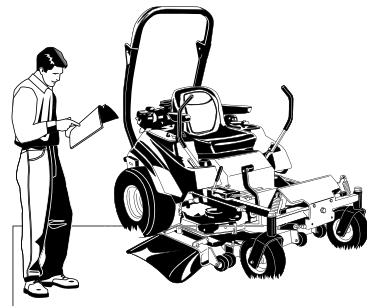
Congratulations on purchasing a superior-quality piece of lawn and garden equipment. Our products are designed and manufactured to meet or exceed all industry standards for safety.

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

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

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

### Read the Manual

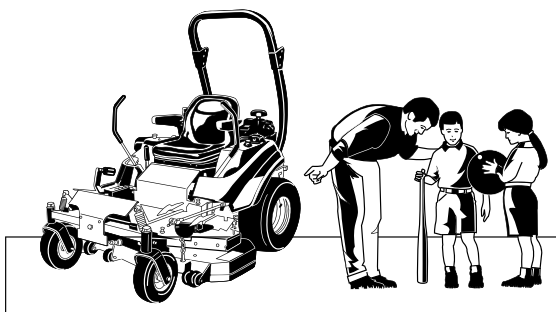


The operator's manual contains important safety information you need to be aware of **BEFORE** you operate your unit as well as **DURING** operation.

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

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

## Children



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

## Slope Operation



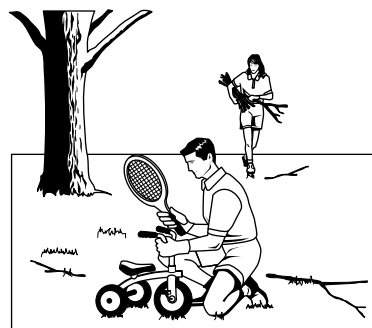
Operation on slopes can be dangerous. Using the unit on a slope that is too steep where you do not have adequate wheel traction (and control) can cause sliding, loss of steering, control, and possible rollover. You should not operate on a slope greater than 15 degrees (a 5.4 foot rise over a 20 foot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

Avoid turning down slopes; if possible turn up slopes. 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.

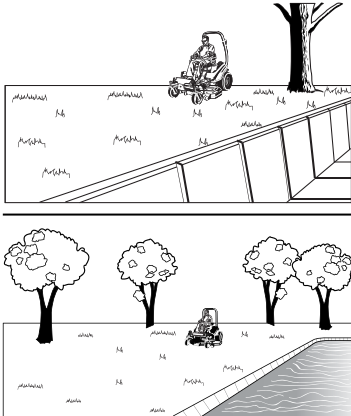
## Roll Bar Use



Keep the roll bar in the raised position and fasten the seat belt. There is no roll over protection when the roll bar is down! Do not jump off if the mower tips (it is safer to be secured by the seat belt with the roll bar raised.)

Lower the roll bar only when necessary (such as to temporarily clear a low overhanging obstacle) and NEVER remove it. Do NOT use the seat belt when the roll bar is down. Raise the roll bar as soon as clearance permits.

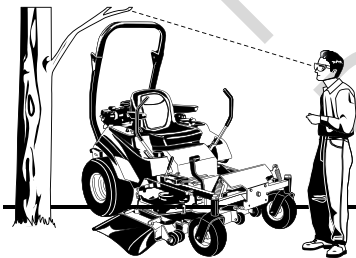
## Retaining Walls, Drop-Offs and Water



Retaining walls and drop-offs around steps and water are a common hazard. Do NOT operate down slope towards or near water, retaining walls, or drop-offs.

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.

## Overhead Obstacles



Check for overhead clearances before driving under any objects. Do not allow the roll bar to contact low overhanging obstacles such as tree branches and guide wires.

## Fuel and Maintenance



### NOTICE

Use ultra low sulfur fuel only.

Consult the engine manufacturer's manual for specific fuel recommendations.

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

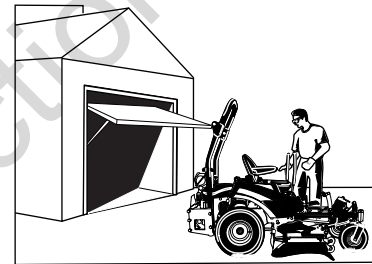
Fuel and its vapors are extremely flammable. Do not smoke while operating or refueling. Do not add fuel while engine is hot or running. Allow engine to cool for at least 3 minutes prior to adding fuel.

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

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

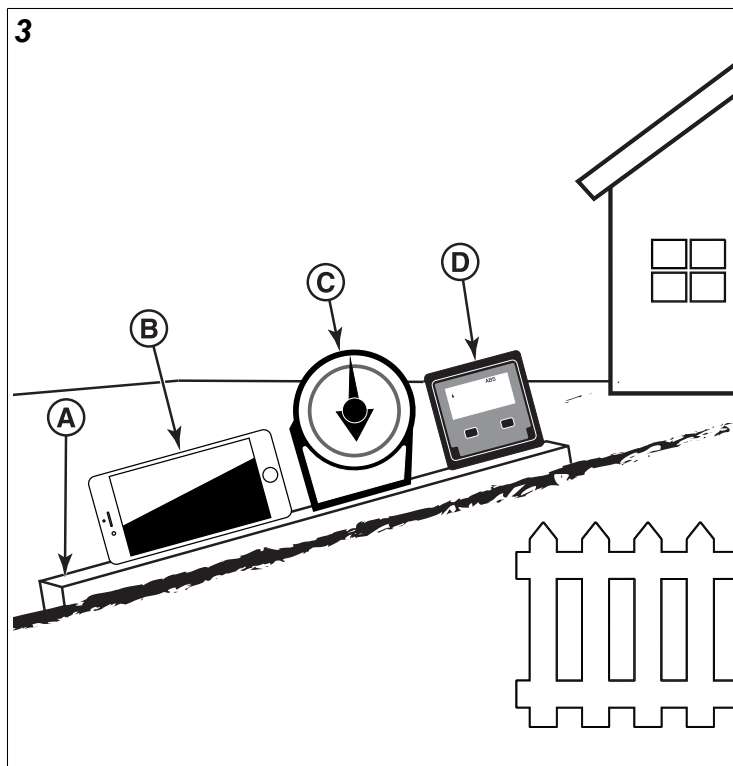
Proper maintenance is critical to the safety and performance of your unit. Keep the unit free of grass, leaves, and excess oil. Be sure to perform the maintenance procedures listed in this manual, especially periodically testing the safety system.

## 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.

## Slope Identification Guide



**How to measure the slope of a lawn surface with a smartphone or an angle finder tool:**



### WARNING

Do not operate on slopes greater than 15 degrees.

1. Use a straight edge at least two (2) feet long (A, Figure 3). A 2x4 or a straight piece of metal works well.
2. Angle finder tools.
  - a. **Use your smartphone:** Many smartphones (B, Figure 3) have an inclinometer (angle finder) located under the compass application (app). Or, search an app store for an Inclinometer app.
  - b. **Use angle finder tools:** Angle finder tools (C and D, Figure 3) are available at local hardware stores or online (also called inclinometer, protractor, angle meter, or angle gauge). Dial type (C) or digital type (D) work, others may not. Read and obey the user instructions supplied with the angle finder tool.
3. Put the two (2) feet long straight edge along the steepest part of the lawn slope. Put the board up and down the slope.
4. Lay the smartphone or angle finder tool on the straight edge and read the angle in degrees. This is the slope of your lawn.

*Note:* A paper gauge slope identification guide is included in your product literature packet and is also available to download from the manufacturer's website.

## Safety Rules and Information

## Training

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

## Preparation

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Use only accessories and attachments approved by the manufacturer.
- Wear appropriate clothing including safety shoes, safety glasses and ear protection. Long hair, loose clothing or jewelry may get tangled in moving parts.
- Inspect the area where the equipment is to be used and remove all objects such as rocks, toys and wire, which can be thrown by the machine.
- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
- Use only an approved container.
- Never remove fuel cap or add fuel with the engine running. Allow engine to cool before refueling. Do not smoke.
- Never refuel or drain the machine indoors.
- Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.

## Operation

- Never run an engine in an enclosed area.
- Mow only in the daylight or with good artificial light, keeping away from holes and hidden hazards.
- Be sure all drives are in neutral and parking brake is engaged before starting engine. Only start engine from the operator's position. Use seat belts if provided.
- Be sure of your footing while using pedestrian controlled equipment, especially when backing up. Walk, don't run. Reduced footing could cause slipping.
- Slow down and use extra care on hillsides. Be sure to travel in the recommended direction on hillsides. Turf

conditions can affect the machines stability. Use caution when operating near drop-offs.

- Do not mow in reverse unless absolutely necessary. Always look down, behind and to the side before changing directions.
- Be aware of the mower discharge direction and do not point it at anyone. Do not operate the mower without either the entire grass catcher or the deflector in place.
- Slow down and use caution when making turns and when changing directions on slopes.
- Never raise deck with the blades running.
- Never leave a running unit unattended. Always disengage the PTO, set parking brake, stop engine, and remove keys before dismounting. Keep hands and feet away from the cutting units.
- Turn off the PTO switch to disengage the blades when not mowing.
- Never operate with guards not securely in place. Be sure all interlocks are attached, adjusted properly and functioning properly.
- Never operate with the discharge deflector raised, removed or altered, unless using a grass catcher.
- Do not change the engine governor setting or overspeed the engine.
- Stop on level ground, lower implements, disengage drives, engage parking brake, shut off engine before leaving the operator's position for any reason including emptying the grass catchers or unclogging the chute.
- Stop equipment and inspect blades after striking objects or abnormal vibration occurs. Make necessary repairs before resuming operations.
- Keep hands and feet away from the cutting units.
- Never carry passengers and keep pets and bystanders away.
- Do not operate the unit while under the influence of alcohol or drugs.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop blades if not mowing.
- Use care when loading or unloading the machine into a trailer or truck.
- Use care when approaching blind corners, shrubs, trees or other objects that may obscure vision.
- To reduce fire hazard, keep unit free of grass, leaves & excess oil. Do not stop or park over dry leaves, grass or combustible materials.



### WARNING

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

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



### CAUTION

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

Wear hearing protection when operating this machine.

## Slope Operation

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



### WARNING

Do not use this machine on slopes greater than 15°.\*

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

Avoid turning down slopes; if possible turn up slopes. Use caution when changing direction and **DO NOT START OR STOP ON SLOPE.**

\* This limit was determined per International Standard ISO 5395-3:2013, Section 4.6 and is based on the ISO 5395-3 Stability Test procedure described in Annex A. The 15 degree "limit of stability" is equal to 60% of the angle at which machine lift-off occurred in static tests. Actual dynamic stability may vary depending on operating conditions.

#### Do:

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

#### Do NOT:

- Avoid starting, stopping, or turning on a slope. Do NOT make sudden changes in speed or direction, which could cause the mower to rollover.
- Do not mow down slope towards or near drop-offs, ditches, or embankments. The mower could suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in. Give yourself a minimum of two mower widths of clearance around these hazards.
- Do not mow on wet grass. Reduced footing or traction could cause sliding.
- Do not try to stabilize the unit by putting your foot on the ground. (ride-on units).
- Do not mow excessively steep slopes.



- Do not use grass catcher on steep slopes.
- Do not mow slopes if you cannot back up them.

## Towed Equipment (Ride-On Units)

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

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

## Emissions

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

## 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

- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only approved gasoline containers.
- Never remove the gas cap or add fuel with the engine running. Allow the engine to cool before refueling.
- Never fuel the machine indoors.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light such as near a water heater or other appliance.

- Never fill containers inside a vehicle or on a truck bed with a plastic bed liner. Always place containers on the ground away from your vehicle before filling.
- Remove gas-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment on a trailer with a portable container, rather than from a gasoline dispenser nozzle.
- Keep nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
- If fuel is spilled on clothing, change clothing immediately.
- Never over-fill the fuel tank. Replace gas cap and tighten securely.
- Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.
- If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapors have dissipated.
- Replace all fuel tank caps and fuel container caps securely.

### Maintenance and Storage

- Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
- Always follow the engine manual instructions for storage preparations before storing the unit for both short and long term periods.
- Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.
- Never store the machine or fuel container inside where there is an open flame, such as in a water heater. Allow unit to cool before storing.
- Shut off fuel while storing or transporting. Do not store fuel near flames or drain indoors.
- Keep all hardware, especially blade attachment bolts, tight and keep all parts in good working condition. Replace all worn or damaged decals.
- Never tamper with safety devices. Check their proper operation regularly.
- Disengage drives, lower implement, set parking brake, stop engine and remove key or disconnect spark plug wire. Wait for all movement to stop before adjusting, cleaning or repairing.
- Clean grass and debris from cutting units, drives, mufflers, and engine to prevent fires. Clean up oil or fuel spillage.
- Let engine cool before storing and do not store near flame.
- Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.
- Park machine on level ground. Never allow untrained personnel to service machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect battery or remove spark plug wire before making any repairs. Disconnect the negative terminal

first and the positive last. Reconnect positive first and negative last.

- Use care when checking blades. Wrap the blade(s) or wear gloves, and use caution when servicing them. Only replace blades. Never straighten or weld them.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothes and use insulated tools.
- Grass catcher components are subject to wear, damage, and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check components and replace with manufacturer's recommended parts, when necessary.
- Check brake operation frequently. Adjust and service as required.
- Use only factory authorized replacement parts when making repairs.
- Always comply with factory specifications on all settings and adjustments.
- Only authorized service locations should be utilized for major service and repair requirements.
- Never attempt to make major repairs on this unit unless you have been properly trained. Improper service procedures can result in hazardous operation, equipment damage and voiding of manufacturer's warranty.

### **WARNING**

**Units with hydraulic pumps, hoses, or motors:** Hydraulic fluid escaping under pressure may have sufficient force to penetrate skin and cause serious injury. If foreign fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result. Keep body and hands away from pin holes or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, and not hands, to search for leaks. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. If leaks occur, have the unit serviced immediately by your authorized dealer.

### **WARNING**

Stored energy device. Improper release of springs can result in serious personal injury. Springs should be removed by an authorized technician.

### **WARNING**

**Units equipped with an engine radiator:** Stored energy device. To prevent serious bodily injury from hot coolant or steam blow-out, never attempt to remove the radiator cap while the engine is running. Stop the engine and wait until it is cool. Even then, use extreme care when removing the cap.

## **Burn Prevention**

Do not touch any part of an operating engine system. The engine, the exhaust, and the engine aftertreatment system can reach temperatures as high as 650° C (1202° F) under normal operating conditions.

Remove all flammable combustible materials or conductive materials such as fuel, oil, and debris from the engine. Do not allow any flammable combustible materials or conductive materials to accumulate on the engine.

Store fuels and lubricants in correctly marked containers away from unauthorized persons. Store oily rags and any flammable materials in protective containers. Do not smoke in areas that are used for storing flammable materials.

Do not expose the engine to any flame.

## **Engine Maintenance or Repair**

Maintenance or repairs to the engine should only be performed by authorized service personnel.

## **Roll Bar Instructions**

For models equipped with factory-installed Roll Over Protection System (ROPS).

### **WARNING**

In order to avoid serious injury or death from roll over, it is important to follow the warnings listed below.

## **Operational Warnings**

- Always use the seat belt when the roll bar is in the raised position.
- Never use the seat belt when the roll bar is in the down position.
- Remember there is no roll over protection when the roll bar is in the down position so it is very important to always keep the roll bar in the raised position whenever possible.
- Lower the roll bar to the down position only when it is absolutely necessary.
- Check for overhead clearances before driving under any objects. Do not allow roll bar to contact low overhanging obstacles such as tree branches and guide wires.
- Never remove the roll bar from the vehicle.
- Do not exceed the machine weight rating of the roll bar.
- Read and follow all of the instructions shown below regarding the inspection and maintenance of the roll bar structure and the seat belt.

## **Inspection of the Roll Bar Protective Structure**

### **WARNING**

Failure to properly inspect and maintain the ROLL BAR protective structure can cause serious injury or death.

A ROLL BAR, like any other safety device, needs to be periodically inspected to verify that the integrity of the device

has not been compromised through normal machine use, misuse, age degradation, modifications, or a roll over.

To maintain operator roll over protection and roll bar effectiveness:

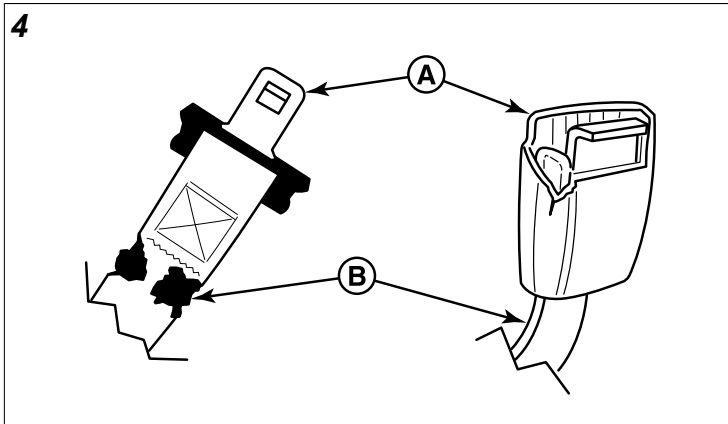
- If a ROLL BAR becomes damaged for any reason, such as a collision, roll over or impact, the ROLL BAR must be replaced. Small undetectable cracks can reduce the effectiveness of the ROLL BAR. Never weld, straighten, or repair the ROLL BAR.
- Never alter the ROLL BAR by welding anything to it or by drilling additional holes.
- BEFORE FIRST TIME USE - Inspect the ROLL BAR structure and mounting hardware for:
  - 1) Check to make sure the machine GVW (Gross Vehicle Weight), including attachments, restrained payload, fuel and operator, is not in excess of the maximum weight specified on the ROLL BAR label.
  - 2) Make sure there isn't any missing, damaged, or loose mounting hardware.
  - 3) Make sure the ROLL BAR has been correctly and completely installed.
- EVERY 100 HOURS - Inspect the ROLL BAR structure and mounting hardware for:
  - 1) Any cracks in the structure (structural members and/or welds).
  - 2) Significant corrosion on any part of the ROLL BAR structure or hardware.
  - 3) Missing, damaged, or loose mounting hardware
  - 4) Mounting hardware that is of a grade lesser than specified.
  - 5) Machine GVW (Gross Vehicle Weight), including attachments, restrained payload, fuel and operator, in excess of the maximum weight specified on the ROLL BAR label.
  - 6) Any modifications that have been made, such as unauthorized welds and holes.
  - 7) Any permanent deformation or twisting of the ROLL BAR structure.
  - 8) That the ROLL BAR label is still in place and is readable.
  - 9) That the ROLL BAR on-product warning labels are still on the ROLL BAR and are readable.
- If there is any doubt as to the condition of the ROLL BAR, remove the machine from service and contact your dealer for assistance.

## Inspection and Maintenance of the Roll Bar Seat Belt



### WARNING

Failure to properly inspect and maintain the seat belt can cause serious injury or death.



- The seat belt like the ROLL BAR, needs to be periodically inspected to verify that the integrity has not been compromised through normal machine use, misuse, age degradation, modifications, or a roll over. If the seat belt does not pass all of the following tests, it should be replaced.
- BEFORE EACH USE – Conduct the following inspections/maintenance of the seat belt and retraction mechanism:
  - 1) Check for dirt or debris in the retraction mechanism. If dirt or debris is found, it should be removed.
  - 2) Check to make sure the retraction mechanism retracts easily and completely.
  - 3) Check for damage to any part of the seat belt (A, Figure 4) such as nicks, cuts, loose stitching, or fraying.
  - 4) Check that the buckle and latch (B) operate properly and that the latch plate is not excessively worn, deformed, or the buckle is damaged or cracked. The seat belt should latch and release easily.

## Safety Decals and Icons

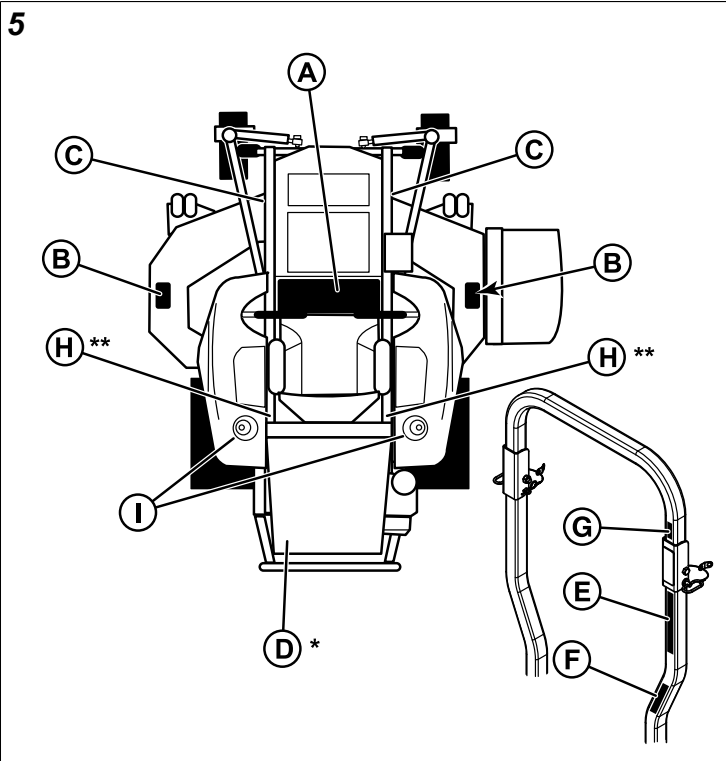
Read the safety decals before operating your unit. The cautions and warnings are for your safety. Understand and follow all safety decals to avoid a personal injury or damage to the unit.



### WARNING

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

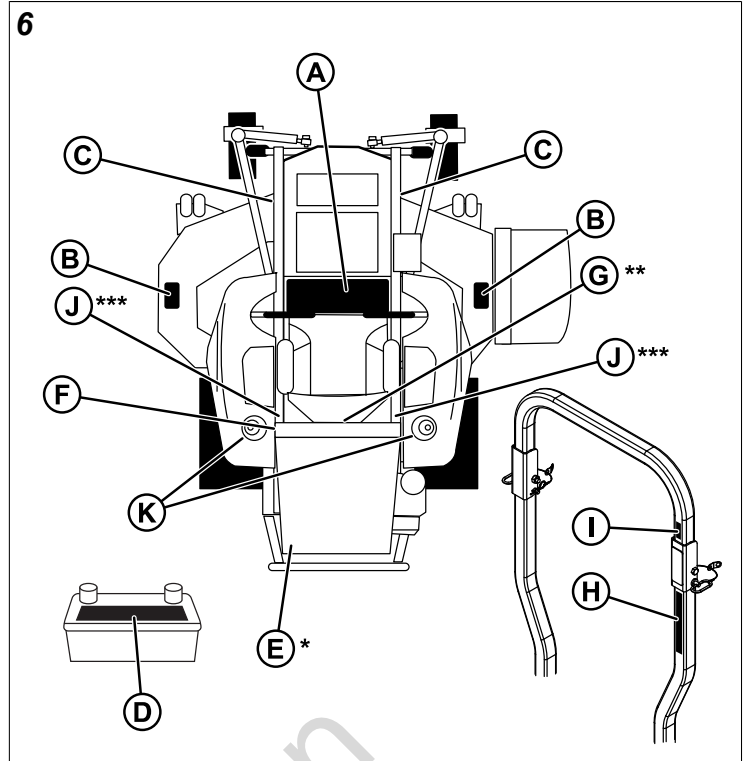
### NORTH AMERICAN MODELS:



\* Located on the pump plate at the rear of the unit.  
 \*\* Decals are located at the Roll Bar mounting point on the unit.

- A. Part Number: 84008252 - Decal, Main Safety
- B. Part Number: 84007896 - Decal, Danger, Discharge
- C. Part Number: 84008198 - Decal, Warning, Pinch Point
- D. Part Number: 84008200 - Decal, Warning, Hand in Belt
- E. Part Number: 5104082YP - Decal, Warning, Folding Roll Bar
- F. Part Number: 5104083YP - Decal, Caution, Folding Roll Bar
- G. Part Number: 5100405YP - Decal, Warning, Overhead Obstacles
- H. Part Number: 84008199 - Decal, Warning, Roll Bar Removed
- I. Fuel Cap Fuel Recommendation

**EXPORT MODELS:**



\* Located on the rear guard by the gearbox drive belt.  
 \*\* Located on the cross rail above the radiator.  
 \*\*\* Located on the unit by the roll bar pockets.

- A. Part Number: 5106565 - Decal, Main Safety
- B. Part Number: 7106109 - Decal, Discharge Safety
- C. Part Number: 5061246 - Decal, Pinch Point
- D. Battery Safety Decal
- E. Part Number: 5061042 - Decal, CE Danger
- F. Part Number: 5102456 - Decal, Fire
- G. Part Number: 5102000 - Decal, Warning, Hot
- H. Part Number: 5100536 - Decal, Safety, CE Roll Bar
- I. Part Number: 5100537 - Decal, Safety, CE Roll Bar, Overhead Obstacles
- J. Part Number: 5100685 - Decal, Warning Roll Bar, CE
- K. Fuel Cap Fuel Recommendation

**Decal, Main Safety**  
 Part Number: 84008252

<p><b>WARNING</b></p> <p><b>Avoid serious injury or death</b></p> <ul style="list-style-type: none"> <li>Read operator's manual before using the product.</li> <li>Do NOT operate the machine unless you are trained.</li> <li>Observe the location and position 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 blades.</li> <li>Be sure blades and engine are stopped before clearing belts or feet near blades.</li> <li>When leaving machine, shut off, remove key and set parking brake.</li> </ul> <p><b>Fire hazard</b></p> <p>Gasoline is flammable. Yard 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 fuel tank clear of yard debris.</li> <li>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.</li> </ul>	<p><b>DANGER</b></p> <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 tools (especially chisels) worn with the blades off. They may fall off or return for another ride when you are not expecting it.</li> <li>Look down, behind and to the side before changing directions 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>Do not operate on slope over 15 degrees.</li> <li>Avoid sudden turns or rapid speed changes.</li> <li>Reduce speed and use extreme caution on slopes.</li> <li>Avoid turning down slopes, if possible turn up slopes.</li> <li>If machine stops forward motion on a slope, stop the blades and drive slowly off the slope.</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 down slopes towards or near water, retaining walls or drop-offs.</li> <li>Give yourself a minimum of two meter widths of clearance around these hazards.</li> </ul> <p><b>Wet or soft slope hazard</b></p> <p>Wet or soft slopes can cause sliding and loss of control.</p> <ul style="list-style-type: none"> <li>Do NOT operate on slopes when grass is wet.</li> <li>Do NOT operate on slopes when soil is soft (such as after heavy rains).</li> </ul>
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**! WARNING**



**Avoid serious injury or death.**

- Read operator's manual before using this product.
- Do NOT operate this machine unless you are trained.
- Know the location and function of all controls.
- Keep safety devices (guards, shields, switches, etc.) in place and working. Wear eye and ear protection.
- Remove objects that could be thrown by the blade.
- Be sure blades and engine are stopped before placing hands or feet near blades.
- When leaving machine, shut off, remove key and set parking brake.

**! WARNING**



**Fire hazard.**

Gasoline is flammable. Yard debris is combustible.

- Allow engine to cool for at least 3 minutes before refueling.
- Keep unit cleaned of yard debris.
- 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.

**! DANGER**



**Amputation hazard.**

Rotating blades cut off arms and legs.

- Stop the mower when children or others are near. Keep bystanders away.
- 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.
- Look down, behind and to the side before changing directions and while backing.

**! DANGER**



**Loss of control and roll-over hazard.**



Operating on slopes can be hazardous and cause loss of control and roll-overs.

- Do not operate on slope over 15 degrees.
- Avoid sudden turns or rapid speed changes.
- Reduce speed and use extreme caution on slopes.
- Avoid turning down slopes; if possible turn up slopes.
- If machine stops forward motion on a slope, stop the blades and drive slowly off the slope.

**! DANGER**



**Water, retaining walls, and drop-off hazards.**

Wheels dropping over edges may result in serious injury, death or drowning.

- Do NOT operate down slopes towards or near water, retaining walls or drop-offs.
- Give yourself a minimum of two mower widths of clearance around these hazards.

**! DANGER**



**Wet or soft slope hazard.**

Wet or soft slopes can cause sliding and loss of control.

- Do NOT operate on slopes when grass is wet.
- Do NOT operate on slopes when soil is soft (such as after heavy rains).

### Decal, Danger, Cut Hand/Foot

Part Number: 84007896



#### DANGER



Keep hands and feet away from deck.



Do not operate mower unless discharge chute or entire grass catcher is in its proper place.

### Decal, Warning, Pinch Point

Part Number: 84008198



#### WARNING



#### Pinch Point.

To avoid injury from loaded spring, read operator's manual before removing spring.

### Decal, Warning, Hand in Belt

Part Number: 84008200



#### WARNING

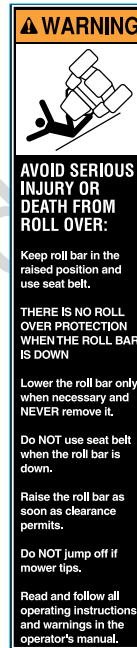


#### Amputation and Pinch Point Hazard.

To avoid injury from rotating parts, stay clear of parts and keep all shields and guards in place.

### Decal, Warning, Folding Roll Bar

Part Number: 5104082YP



#### WARNING

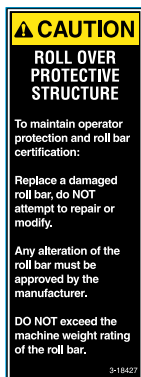


#### Avoid serious injury or death from roll over.

- Keep roll bar in the raised and locked position and use seat belt.
- There is no roll over protection when the roll bar is down.
- Lower the roll bar only when necessary and never remove it.
- Do not use seat belt when the roll bar is down.
- Raise the roll bar as soon as clearance permits.
- Do not jump off if mower tips.
- Read and follow all operating instructions and warnings in the operator's manual.

## Decal, Caution, Folding Roll Bar

Part Number: 5104083YP



### WARNING

#### Roll Over Protective Structure.

To maintain operator protection and roll bar certification:

- Replace a damaged roll bar, do not attempt to repair or modify.
- Any alteration of the roll bar must be approved by the manufacturer.
- Do not exceed the machine weight rating of the roll bar.

## Decal, Warning, Roll Bar and Overhead Obstacles

Part Number: 5100405YP



### WARNING



#### Low overhanging obstacles hazard.

- Check for overhead clearances before driving under any objects. Do not allow roll bar to contact low overhanging obstacles, such as tree branches and guide wires.

## Decal, Warning, Roll Bar Removed

Part Number: 84008199



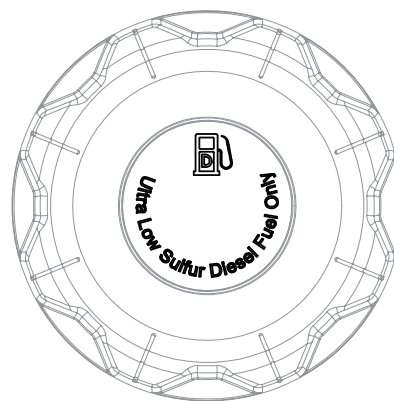
### WARNING



#### Avoid serious injury or death from rollover.

- Do not operate without the roll bar installed and operational.

## Fuel Cap Fuel Recommendation



### NOTICE

Use ultra low sulfur fuel only.

Consult the engine manufacturer's manual for specific fuel recommendations.



### WARNING

Avoid static electricity risk when fueling. Ultra-low sulfur diesel fuel (ULSD fuel) poses a greater static ignition hazard than earlier diesel formulations with higher sulfur contents. Avoid death or serious injury from fire or explosion. Consult with your fuel or fuel system supplier to ensure the delivery system is in compliance with fueling standards for proper grounding and bonding practices.

## Engine Safety Decals

### Universal Warning

The universal warning label is installed on the engine.

See authorized engine manufacturer service dealer for replacement decal.



### WARNING

Do not operate or work on this equipment unless you have read and understand the instructions and warnings in the manuals. Failure to follow the instructions or heed the warnings could result in serious injury or death.

### Hand (High Pressure)

The hand (high pressure) warning label is a wrap around label that is install on the high-pressure fuel line.

See authorized engine manufacturer service dealer for replacement decal.



**! WARNING**

Contact with high pressure fuel may cause fluid penetration and burn hazards. High pressure fuel spray may cause a fire hazard. Failure to follow these inspection

**Ether Warning**

The ether warning label is installed on the right side of the unit above the air cleaner.

**Replacement Part Number:** 5109872



**! WARNING**

Do not use aerosol types of starting aids such as ether. Such use could result in an explosion and personal injury.

**5106565 - Decal, Main Safety**



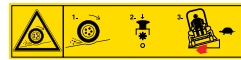
**Warning:** Read and understand the Operator's Manual before using this unit. Know the location and function of all controls. Do not operate this machine unless you are trained.



**Warning:** Consult technical literature before performing technical repairs or maintenance. When leaving the machine, shutoff engine, set the parking brake to the lock position, and remove the ignition key.



**Danger - Amputation and dismemberment hazard:** To avoid injury from rotating blades and moving parts, keep safety devices (guards, shields and switches) in place and working.



**Danger - Loss of traction, sliding, steering and control on slopes hazard:** If machine stops forward motion, stop the blades, and drive slowly off the slope.



**Danger - Amputation hazard:** Do not mow when children or others are around. Never carry riders especially children even with the blades off. Do not mow in reverse unless absolutely necessary. Look down and behind – before and while backing.



**Danger - Tipping and slipping hazard:** Operating on slopes can be hazardous and cause a loss of control and roll-overs. Do not operate on slopes over 15\* degrees. Avoid sudden turns or rapid speed changes. Reduce speed and use extreme caution on slopes. Avoid turning down slopes; if possible, turn up slopes. Do not operate down slopes towards or near water, retaining walls, or drop-offs. Give yourself a minimum of two mower widths of clearance around these hazards.



**Danger - Thrown objects hazard:** Keep bystanders and children a safe distance away. Remove objects that can be thrown by the blade. Do not mow without discharge chute in place.

\*This limit was determined per International Standard ISO 5395-3:2013, Section 4.6 and is based on the ISO 5395-3 Stability Test procedure described in Annex A. The 15 degree "limit of stability" is equal to 60% of the angle at which machine lift-off occurred in static tests. Actual dynamic stability may vary depending on operating conditions.

**7106109 - Decal, Danger, Discharge**



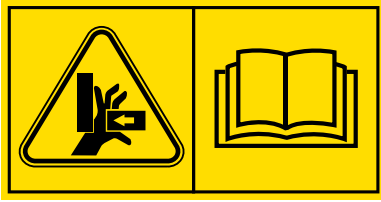
**Danger - Thrown Objects Hazard:** Do not mow without discharge chute or entire grass catcher in place.




**Danger - Amputation and Thrown Objects Hazard:** To avoid injury from rotating blades, stay clear of deck edge and keep others away.

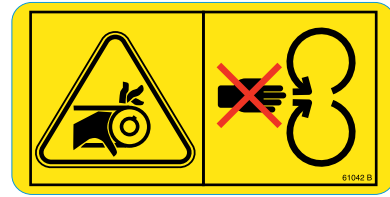



### 5061246 - Decal, Pinch Point



 **Danger: Dismemberment** - This machine can crush and cut. Keep hands away from deck lift rod.

### 5061042 - Decal, Danger




 **Danger: Dismemberment:** This machine can crush and cut. Keep hands away from belts and pulleys.

### Battery Safety Decal




### 5102456 - Decal, Fire



 **Danger: Fire Hazard:** Keep unit free of grass, leaves and excess oil. Do not add fuel while engine is hot or running. Stop engine, remove key and allow to cool for at least 3 minutes prior to adding fuel. Do not add fuel indoors, in an enclosed trailer, garage or other enclosed areas. Clean up spilled fuel. Do not smoke while operating this machine.

### 5102000 - Decal, Warning, Hot

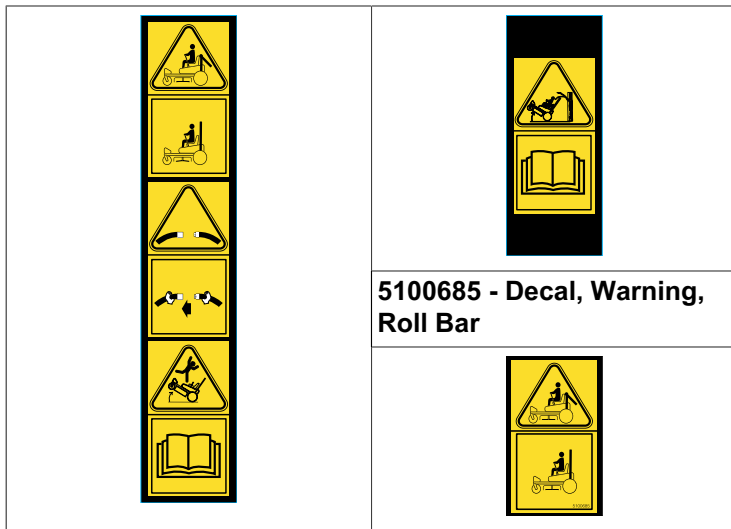


 **Warning: Escaping Steam Can Cause Burns** - Never remove the radiator cap or radiator reservoir cap while the engine is hot or running. Severe thermal burns or injury can occur by escaping steam or hot coolant.

	<p><b>Warning: Fire Hazard</b> - Keep children, open flames and sparks away from the battery, which could ignite explosive gases.</p>
	<p><b>Warning: Sulfuric acid can cause blindness or severe burns</b> - Always wear safety goggles or a face shield when working on or near a battery.</p>
	<p><b>Warning: Batteries produce explosive gases</b> - Read and understand the Operator's Manual before using this machine.</p>
	<p><b>Important: Do not discard a battery in the trash</b> - Contact local authorities for disposal and/or recycling of batteries.</p>
	<p><b>Flush eyes immediately with water. Get medical help fast.</b></p>

### Roll Bar Decals

<p><b>5100536 - Decal, Safety, Roll Bar</b></p>	<p><b>5100537 - Decal, Safety, Overhead Obstacles</b></p>
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- Ground speed control levers are locked in the NEUTRAL position.

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

- Operator rises off seat with PTO engaged, OR
- Operator rises off seat with parking brake disengaged.
- Operator moves ground speed control levers out of their neutral positions before disengaging parking brake.

### 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 rises off seat). If mower drive belt does not stop within seven (7) seconds, see your dealer.

*NOTE: Once the engine has stopped, PTO switch must be turned off, parking brake must be engaged, and the ground speed control levers must be locked in the NEUTRAL position after the operator returns to the seat in order to start the engine.*



### WARNING

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

## Features and Controls

### Control Functions and Locations

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

	<p><b>Warning: Avoid Serious Injury or Death from Roll Over</b> - Keep roll bar in the raised position and use seat belt. There is no roll over protection when roll bar is down. Lower roll bar only when necessary and NEVER remove it. Raise the roll bar as soon as clearance permits.</p>
	<p><b>Warning: Avoid Serious Injury or Death from Roll Over</b> - Keep roll bar in the raised position and use seat belt. Do NOT use seat belt when the roll bar is down.</p>
	<p><b>Warning: Avoid Serious Injury or Death from Roll Over</b> - Do NOT jump off if the mower tips. Read and follow all operating instructions and warnings in the operator's manual.</p>
	<p><b>Warning: Low Overhanging Obstacles Hazard</b> - Check for overhead clearances before driving under any objects. Stay clear. Do NOT allow roll bar to contact low overhanging obstacles, such as tree branches and guide wires. Read and follow all operating instructions and warnings in the operator's manual.</p>

## Safety Interlock System

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

### Operational SAFETY Checks

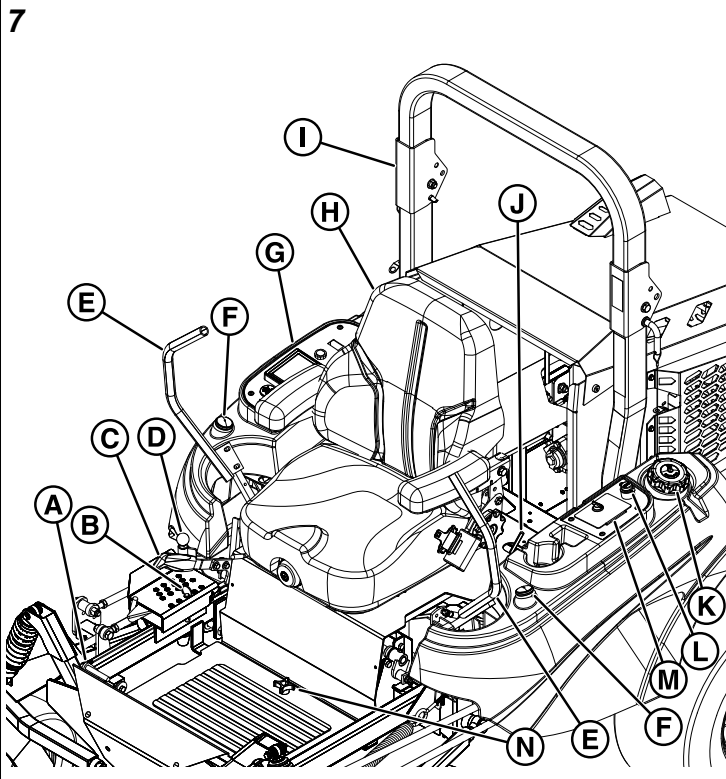
#### Test 1 - Engine SHOULD NOT crank if:

- PTO switch is engaged, OR
- Parking brake is not engaged, OR
- Ground speed control levers are not in the NEUTRAL position.

#### Test 2 - Engine SHOULD crank if:

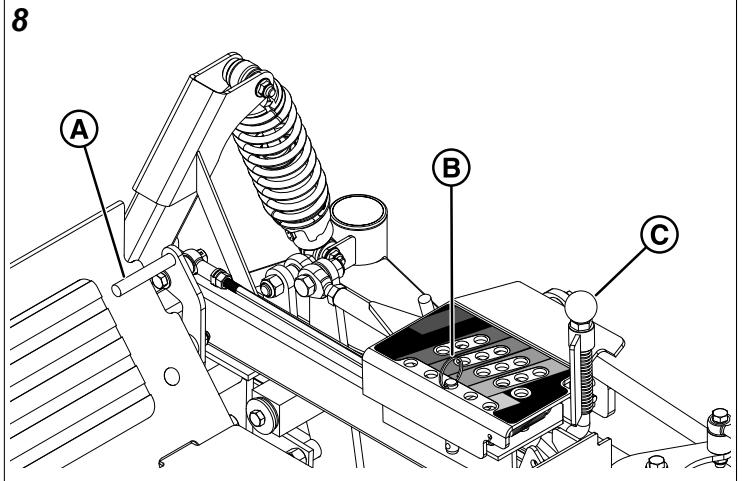
- PTO switch is not engaged, AND
- Parking brake is engaged, AND

## Zero-Turn Rider Controls



- A. Deck Lift Pedal
- B. Cutting Height Adjustment Pin
- C. Parking Brake
- D. Deck Lift Lock Lever and Lockout Plate
- E. Ground Speed Control Levers
- F. Fuel Level Gauge
- G. Instrument Control Panel
- H. Seat
- I. Roll Bar
- J. Seat Latch
- K. Fuel Tank Cap
- L. Power Outlet / USB Port (See Left Fuel Tank Panel Compartment).
- M. Storage Compartment
- N. Removable Floor Plate
- O. Transmission Oil Fill/Tank
- P. Hydraulic Release Valves (One per pump)

**Deck Lift Pedal, Cutting Height Adjustment Pin, and Deck Lift Lock Lever:** Press the deck lift pedal (A, Figure 8) forward to raise the mower deck until it locks into the 6" (15,2 cm) position. Place the cutting height adjustment pin (B) in the desired cutting height hole and release the deck lift lock lever (C).



Cutting Height Adjustment Pin



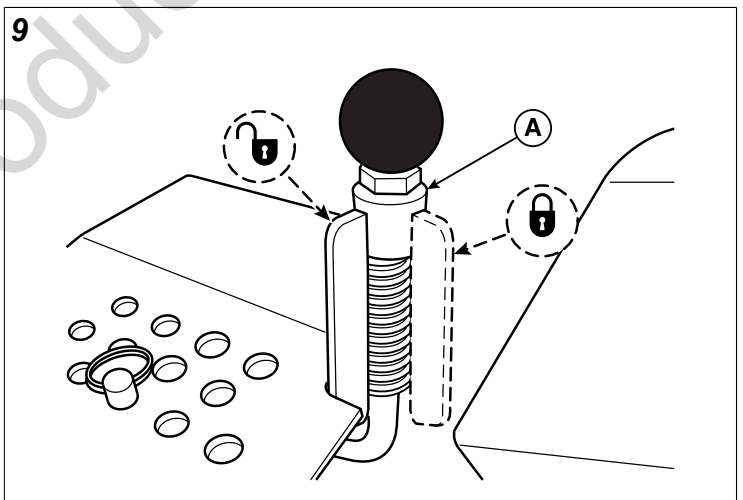
Deck Lift Lock Lever



Cutting Height Pin Storage Hole

### Deck Lift Lockout Plate:

The deck lift lock lever lockout plate (A, Figure 9) can be used to prevent the mower deck from locking the deck in the 6" (15,2 cm) position if you raise the deck during operation to clear an object.



**UNLOCK:** This position will allow the mower deck to be raised and lowered without locking in the TRANSPORT position when raised.



**LOCK:** This position will allow the mower deck to lock in the TRANSPORT position when raised.



**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.



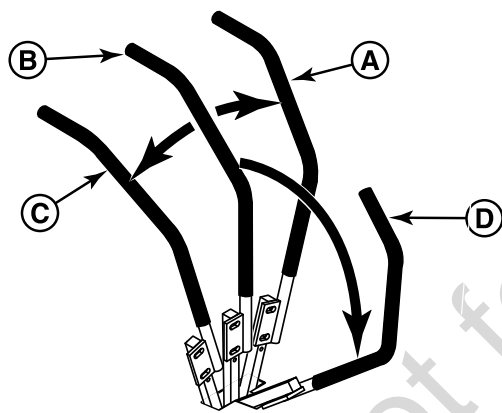
**DISENGAGE:** Releases the parking brake.



**ENGAGE:** Locks the parking brake.

**Ground Speed Control Levers:** These levers control the ground speed and direction of the zero-turn riding mower. The left lever controls the left rear drive wheel and the right lever controls the right rear drive wheel.

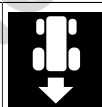
10



Forward



Neutral



Reverse

Moving a lever forward (A, Figure 10) from the NEUTRAL position (B) increases the FORWARD speed of the associated wheel, and pulling back (C) on a lever increases the REVERSE speed.

Moving a levers outwards (D) from the NEUTRAL position locks the levers in the NEUTRAL position.

*Note:* The further a lever is moved away from the neutral position, the faster the drive wheel will turn.

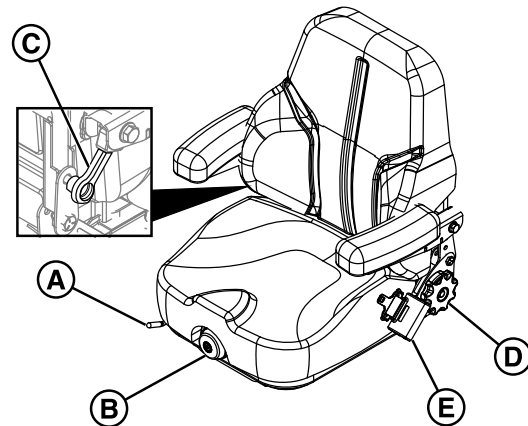
See the *Zero-Turn Riding Mower Driving Practice* section for steering instructions.



**Fuel Level Gauge:** Displays the fuel level in the tank.

**Suspension Seat:** Some models are equipped with a suspension seat. This seat has several additional options. See Figure 11 and the list below for the location of the seats features and brief description of their function.

11

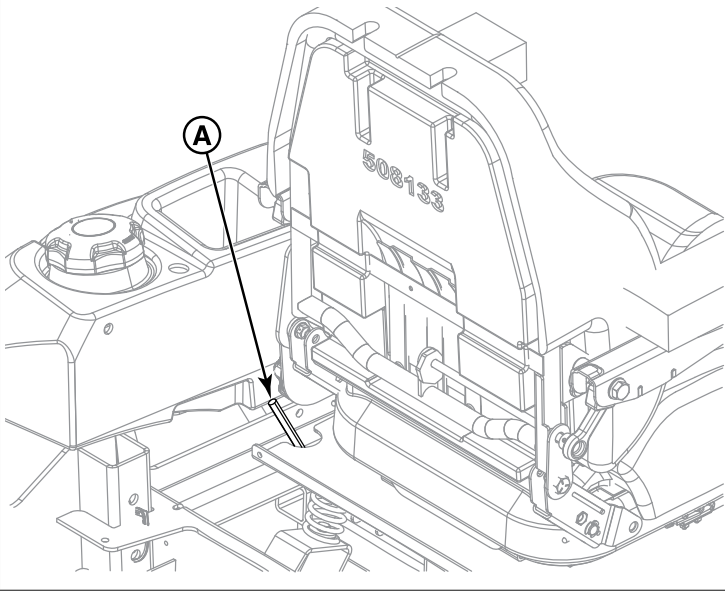


- A. **Seat Adjustment Lever (Forwards/Backwards):**  
The seat can be adjusted forward and back. Move the forwards / backwards seat adjustment lever, position the seat as desired, and release the lever to lock the seat in position.
- B. **Seat Adjustment Knob (Suspension/Ride Comfort):**  
The seat adjustment knob adjusts the suspension of the seat (ride comfort). Turn the adjustment knob until the display scale has a reading that matches the weight of the operator.
- C. **Lumbar Adjustment Lever (Located underneath right hand arm rest):** Turn the lumbar adjustment knob until the desired amount of lumbar is achieved.
- D. **Back Angle Adjustment Knob:** Turn the back angle adjustment knob until the desired amount of back angle is achieved.
- E. **Retractable Seat Belt:** The seat belt is used to secure the operator to the seat.

*Note:* The seat belt should **always** be worn when the Roll Bar is in the raised position. The seat belt should **never** be worn when the Roll Bar is in the down position.

**Seat Latch:** The seat latch (A, Figure 12) secures the seat plate to the frame of the unit

12



To raise the seat plate, release the latch by moving the seat latch towards the front of the unit and then raise the seat plate.

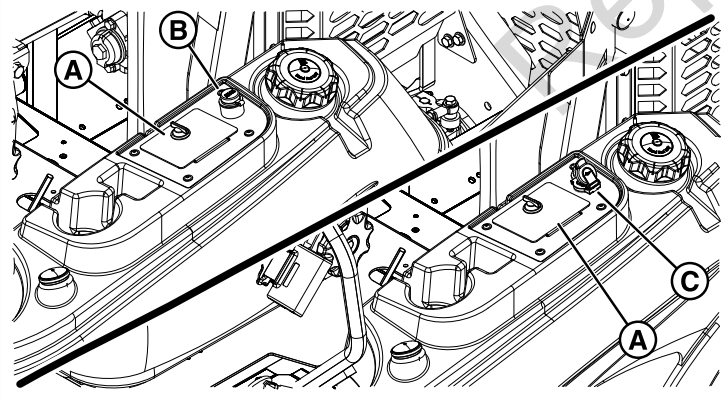
The seat latch is spring loaded. When the seat plate is lowered back into place the seat latch will lock the seat plate into place.

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

**Removable Floor Plate:** The floor plate can be removed for easy access to the mower deck. To remove the plate, remove the retainer hardware and tilt the floor pan up and then remove from the unit. Reverse the process for re-installation.

### Left Fuel Tank Panel Compartment

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- A. **Storage Compartment**
- B. **Power Outlet** (Models in Serial Number Range 4002317666 and below).
- C. **USB Charging Port** (Models in Serial Number Range 4002317667 and above).

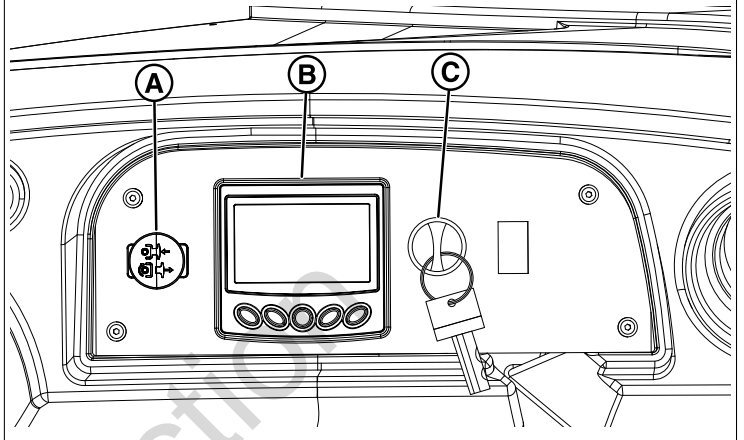
## DC12V

**Power Outlet:** Unit is equipped with a +12V DC, 20A power outlet.

**Dual USB Charging Port:** Open the top door to access the two (2) USB charging ports: one (1) type A port and one (1) type C port. The USB port provides a total current of up to 4.2 amps. The ignition switch must be in the RUN position for charging.

### Instrument Control Panel

14

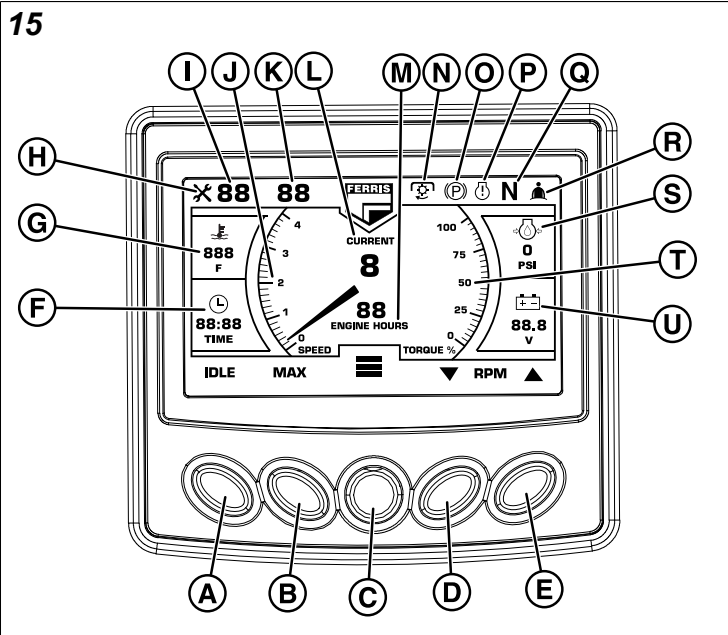


- A. **PTO (Power Take Off) Switch**
- B. **Digital Display Panel**
- C. **Ignition Switch**



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

**Digital Display Panel:**



A	N/A	<b>Engine Throttle Speed - IDLE Position:</b> Press this button to adjust the engine throttle speed to IDLE.
B	N/A	<b>Engine Throttle Speed - Maximum Position:</b> Press this button to adjust the engine throttle speed to the maximum position.
C		<b>Menu Button:</b> Press this button to access the different options available in the digital display panel, such as Service Reminders, PTO Run Time Hours, and Fault Codes and Descriptions.
D		<b>Decrease Engine RPM Button:</b> Press this button to incrementally decrease the engine throttle speed.
E		<b>Increase Engine RPM Button:</b> Press this button to incrementally increase the engine throttle speed.
F		<b>Clock:</b> The clock displays the time of day.
G		<b>Water Temperature Gauge:</b> This gauge displays the engine coolant temperature.
H		<b>Service Reminder Light:</b> This light illuminates when a regular service maintenance item needs to be performed.
I	N/A	<b>Total PTO Hours:</b> This displays the total number of hours that the PTO is engaged.

J	N/A	<b>Speedometer - Engine RPM Speed:</b> This gauge displays the engine RPM.
K	N/A	<b>Resettable PTO Hours:</b> This displays the current number of PTO. It can be reset by the operator.
L	N/A	<b>Current Engine RPM:</b> This displays the engine RPM's as a numerical readout.
M	N/A	<b>Current Engine Hours:</b> This displays the total number of hours that the engine has run.
N		<b>PTO Clutch Circuit Indicator Light:</b> This light will illuminate when the PTO switch is turned on.
O		<b>Parking Brake Circuit Indicator Light:</b> This light will illuminate when the parking brake is engaged.
P		<b>Engine Fault Indicator Light:</b> This light will illuminate when there is an engine fault code.
Q		<b>Neutral Circuit Indicator Light:</b> This light will illuminate when the ground speed control levers are not locked out in the neutral position.
R		<b>Operator Presence Circuit Indicator Light:</b> This light will illuminate when the operator is sitting in the seat of the unit.
S		<b>Oil Pressure Gauge:</b> This gauge displays the engine oil pressure.
T	N/A	<b>Engine Torque:</b> This gauge displays the percentage of engine torque.
U		<b>Voltage Gauge:</b> This gauge measures the output voltage of the engine charging system.

**Ignition Switch - 3 Position:** 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>HEAT/RUN:</b> Turning the key to this position prior to starting the engine heats the glow plug(s). After the engine starts, the ignition returns to this position and 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.

# Operation

## 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 unit.



### WARNING

- Never operate on slopes greater than 15°.
- Select slow ground speed before driving onto a slope. Use extra caution when operating on slopes with a rear-mounted grass catcher.
- Avoid turning down slopes; if possible turn up slopes. Use caution when changing direction on slopes and **do NOT start or stop on a 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, rider and mower free of grass, leaves and excess grease. Do NOT stop or park rider over dry leaves, grass or combustible materials.
- Fuel 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.



### WARNING

Do NOT load this zero-turn rider on a trailer or truck using two separate ramps. Only use a single ramp that is at least one foot wider than the width of the rear wheels of this rider. This rider has a zero turning radius and the rear wheels could fall off the ramps, or the rider could tip over injuring the operator or bystanders.



## Checks Before Starting

- Check that the crankcase is filled to the full mark on the engine oil dipstick. If necessary, add oil through

the engine oil fill. See the engine operator's manual for instructions, engine oil dipstick location, and oil recommendations.

- Check the radiator fluid level. See engine operator's manual for instructions.
- Check the hydraulic oil level.
- 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 the operator's position.
- Fill the fuel tanks with fresh fuel. Refer to engine manual for fuel recommendations.

## Priming the Fuel System

### NOTICE

Do NOT crank the engine continuously for more than thirty (30) seconds.

Allow the starting motor to cool for two (2) minutes before cranking the engine again.



### WARNING

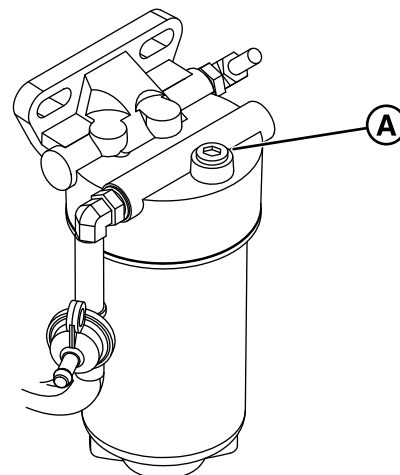
Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn the ignition switch OFF when changing fuel filters or water separator element. Clean up fuel spills immediately.

If air enters the fuel system, the air must be purged from the fuel system before the engine can be started.

The fuel system must be primed before the first use, after any fuel filter maintenance is performed, or if the fuel system is run dry.

1. Ensure that the fuel tanks are full and all fuel lines are unobstructed.
2. Loosen the vent screw (A, Figure 16) on the water separator.

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3. Turn the ignition switch to the RUN/HEAT position.

- The ignition switch will allow the electric priming pump to operate. When fuel free from air comes from the vent screw, tighten the vent screw to a torque of 24 Nm (212 in-lbs). Then, operate the electric priming pump for two (2) minutes.
- Turn the key switch to the OFF position. The fuel system will now be primed and the engine should be able to start.
- Wipe up any spilled fuel.
- Turn the key switch to the START position to crank the engine. After the engine has started, operate the engine at low idle for a minimum of five (5) minutes. For constant engine speed do not apply a load for five (5) minutes.

*Note:* Operating the engine for this period of time will help ensure that the fuel system is free of air. Do NOT loosen the high-pressure fuel lines to purge air from the fuel system.

- Ensure that the fuel system is free from leaks.

## Starting the Engine

### WARNING

- If you do not understand how a specific control functions, or have not yet thoroughly read the *Features and Controls* section, do so now.
- Do NOT attempt to operate the zero-turn riding mower without first becoming familiar with the location and function of all controls.

### WARNING

Do not use aerosol types of starting aids such as ether. Such use could result in an explosion and personal injury.

- While sitting in the operator's seat, engage the parking brake, make sure that the PTO switch is disengaged, and the ground speed control levers are locked in the neutral position.
- Turn the key to the RUN/HEAT position. Hold the key in the position. The digital display panel will display the message "WAIT TO START" and the glow plugs are activated.
- Wait until the message "WAIT TO START" clears from the digital display panel, then turn the key to START.

### NOTICE

Do NOT crank the engine continuously for more than thirty (30) seconds.

Allow the starting motor to cool for two (2) minutes before cranking the engine again.

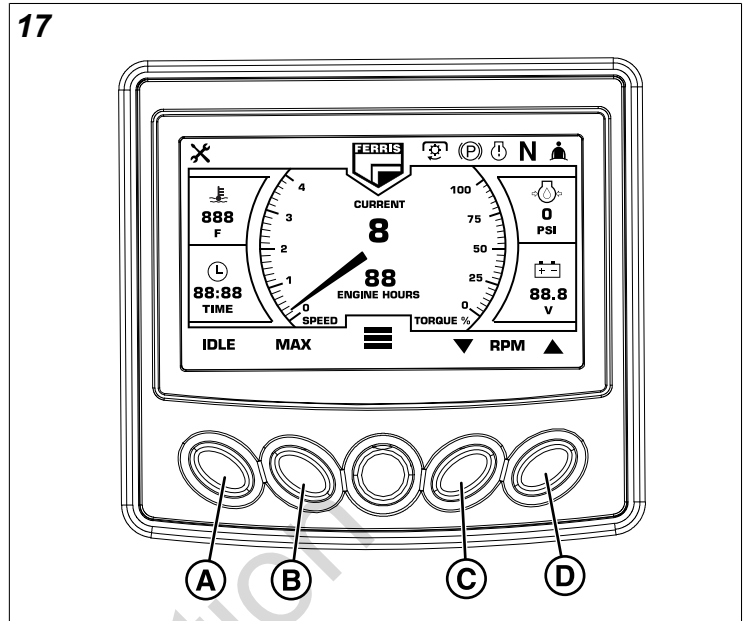
- After the engine starts, the engine throttle will automatically adjust to IDLE. Warm up the engine by running it for a minimum of one (1) minute.
- Set the throttle to maximum throttle speed before engaging the PTO switch or driving the unit.

***In the event of an emergency the engine can be stopped by simply turning the ignition switch to OFF.*** Use this

method only in emergency situations. For normal engine shut down follow the procedure given in the *Stopping the Rider*.

## Adjusting the Throttle Control

The throttle is adjusted by using the buttons on the digital display panel.



- Press the IDLE button (A, Figure 17) to set the engine throttle to the idle throttle setting.
- Press the MAX button (B) to set the engine throttle to the maximum throttle setting.
- Press the INCREASE RPM button (C) to incrementally increase the engine throttle speed.
- Press the DECREASE RPM button (D) to incrementally decrease the engine throttle speed.

## Stopping the Rider

- Return the ground speed control levers to the NEUTRAL position to stop the rider's movement. Pivot the levers outward and lock them into NEUTRAL.
- Disengage the PTO by pushing down on the PTO switch.
- Engage the parking brake by pulling the handle up until it locks into position.
- Press the IDLE button to set the engine throttle to the idle throttle setting.
- Turn the ignition switch to OFF. Remove the key.

## Zero-Turn Driving Practice

The lever controls of the Zero Turn 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 going through the maneuvers shown and becoming familiar with how the unit accelerates, travels, and steers — before you begin mowing — is absolutely essential to getting the most out of the Zero Turn 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.

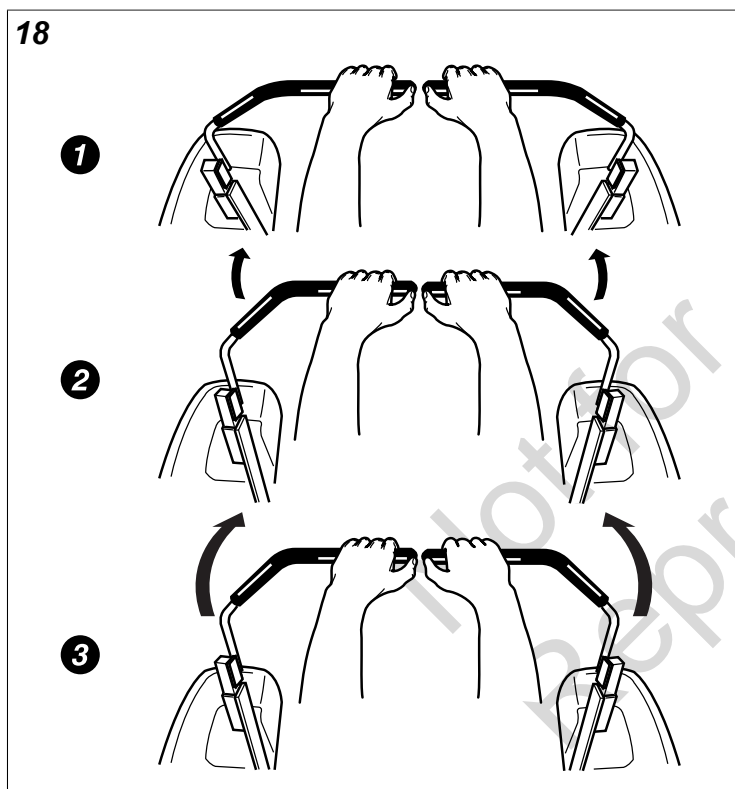
We suggest you begin with the Smooth Travel procedure to the right, and then advance through the forward, reverse, and turning maneuvers.

You must release the parking brake prior to moving the control levers inward.

### Smooth Travel

The lever controls of the Zero Turn rider are responsive.

The BEST method of handling the ground speed control levers is in three steps — as shown in Figure 18.



**FIRST** place your hands onto the levers as shown.

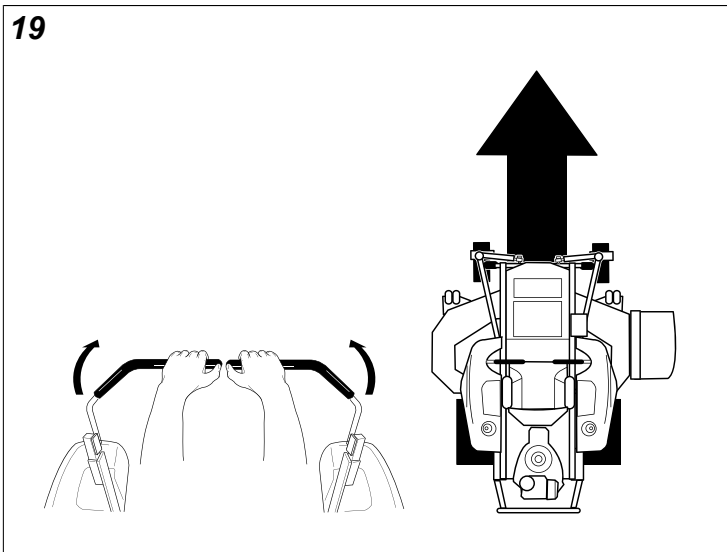
**SECOND**, to go forward gradually push the levers forward with your palms.

**THIRD**, to speed up move the levers farther forward. To slow down smoothly, slowly move the levers toward neutral.

### Basic Driving

#### Forward Travel Practice

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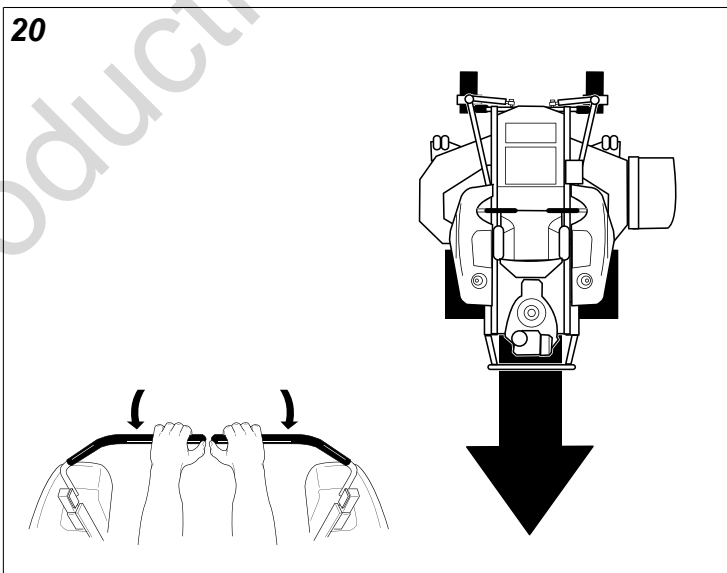


Gradually move both ground speed control levers — evenly FORWARD from neutral. Slow down and repeat.

*NOTE: Straight forward travel takes practice. If necessary, top speed can be balance-adjusted — see the Speed Balancing Adjustment in the Adjustments section near the back of this manual.*

#### Reverse Travel Practice

20

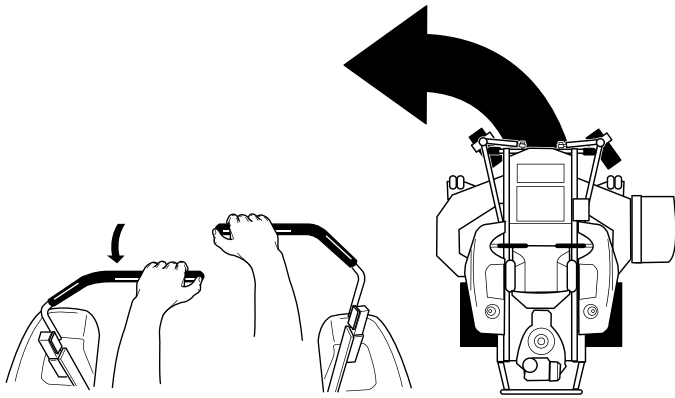


LOOK DOWN & BEHIND, then gradually move both ground speed control levers evenly BACK from neutral. Slow down and repeat.

*NOTE: Practice backing up for several minutes before attempting to do so near objects. The rider turns sharply in reverse as well as forward, and backing up straight takes practice.*

#### Practice Turning Around A Corner

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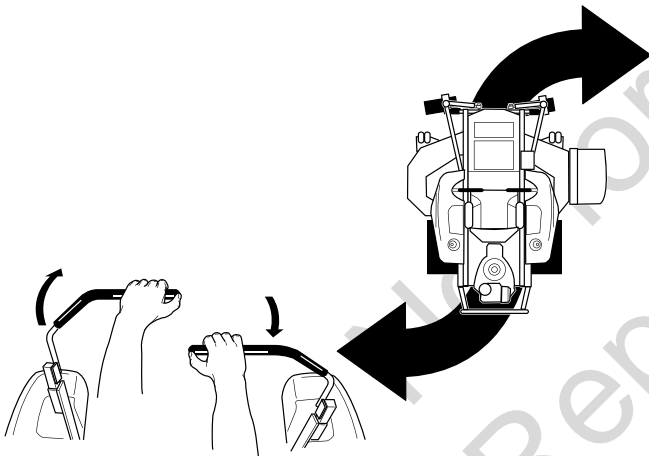


While traveling forward allow one handle to gradually return back toward neutral. Repeat several times.

*NOTE: To prevent pivoting directly on the tire tread, it is best to keep both wheels going at least slightly forward.*

### Practice Turning in Place

22



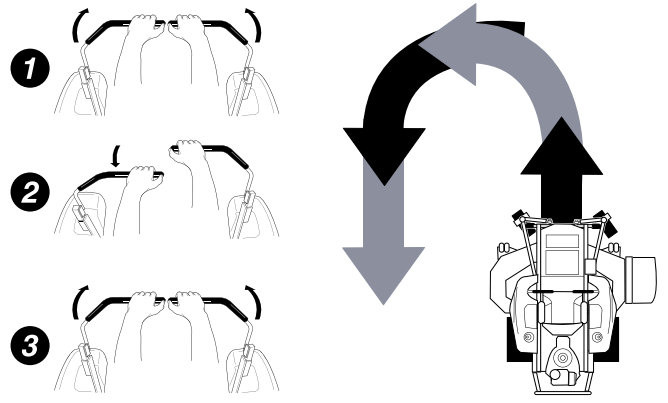
To turn in place, “Zero Turn,” gradually move one ground speed control lever forward from neutral and one lever back from neutral simultaneously. Repeat several times.

*NOTE: Changing the amount each lever is pulled—forward or back, changes the “pivot point” you turn on.*

## Advanced Driving

### Executing an End-Of-Row Zero Turn

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Your Zero Turn Rider’s unique ability to turn in place allows you to turn around at the end of a cutting row rather than having to stop and Y-turn before starting a new row.

For example, to execute a left end-of row zero turn:

1. Slow down at the end of the row.
2. Move the RIGHT ground speed control lever forward slightly while moving the LEFT ground speed control lever back to center and then slightly back from center.
3. Begin mowing forward again.

This technique turns the rider LEFT and slightly overlaps the row just cut—eliminating the need to back up and re-cut missed grass.

*As you become more familiar and experienced with operating the Zero Turn rider, you will learn more maneuvers that will make your mowing time easier and more enjoyable.*

**Remember, the more you practice, the better your control of the Zero Turn will be!**

## Mowing

1. Engage the parking brake. Make sure that the PTO switch is disengaged, the ground speed control levers are locked in the NEUTRAL position and the operator is sitting in the seat.
2. Start the engine. See *Starting the Engine*.
3. Set the mower deck cutting height.
4. Set the engine throttle speed to the 1/2 throttle position.

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

5. Engage the PTO by pulling the PTO switch up.
6. Press the MAX button on the digital display panel to set the engine throttle speed to the maximum throttle setting and beginning mowing.
7. When finished, press the IDLE button on the digital display panel to set the engine throttle to the idle throttle setting and then push the PTO switch down to shut off the PTO.
8. Stop the engine. See *Stopping the Rider*.

## Mowing Recommendations

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

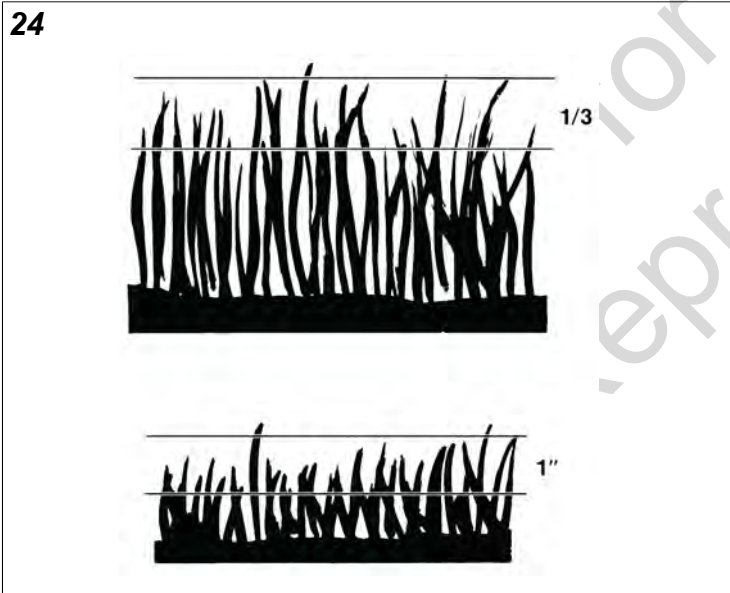
### Height of Grass

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.**

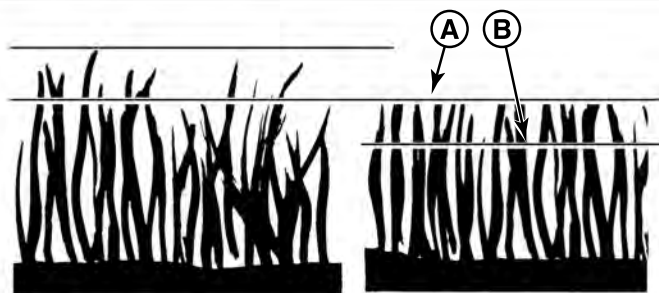


The amount of grass you are able to cut in one pass is also effected by the type of mowing system you are using (for example, broadcasting with side discharge decks can process a much larger volume of grass than mulching does).

**Tall grass requires incremental cutting.** For extremely tall grass, set the cutting height at maximum for the first pass (A, Figure 25), and then reset it to the desired height and mow a second (B) or third time.

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

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### When and How Often to Mow

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

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

### Mowing Patterns

Always start mowing on a smooth, level area.

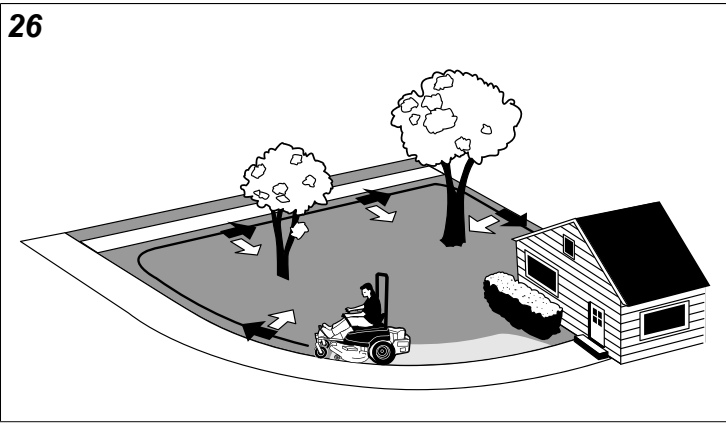
The size and type of area to be mowed will determine the best mowing pattern to use. Obstructions such as trees, fences and buildings, and conditions such as slopes and grades must also be considered.

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

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

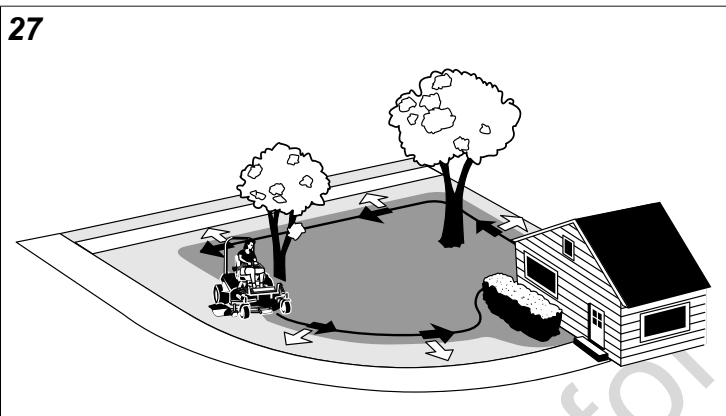
If you hear the engine slowing down, you are mowing too fast—using a slower ground speed will improve the cutting efficiency of the blades and prevents many common cutting problems. Use an appropriate ground speed for the thickness and height of the grass you are cutting (3rd gear or slower for manual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

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

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

## Mowing Methods

### Broadcast Mowing

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

#### Engine Speed & Ground Speed for Broadcasting:

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

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

#### How Much Grass to Cut Off When Broadcasting:

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

## Mulching

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

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

#### Mulching Requires EXCELLENT Mowing Conditions:

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

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

#### Engine Speed & Ground Speed for Mulching:

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

#### How Much Grass to Mulch:

The best mulching action typically results from cutting only the top 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.

## Pushing the Rider By Hand

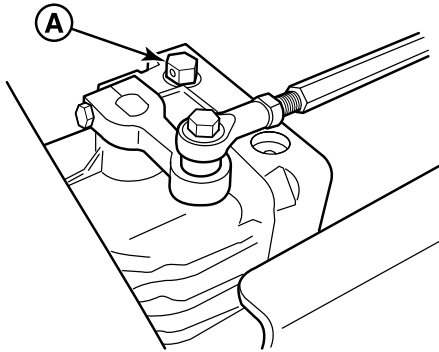
### NOTICE

#### 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.

1. Disengage the PTO, engage the parking brake, turn the ignition OFF, and remove the key.
2. To disengage the pumps (free-wheel position) turn the hydraulic release valves (A, Figure 28) located on the pumps **counter-clockwise** a maximum of two (2) full turns. The hydraulic release valve for the right-hand pump is located on the top of the pump. The hydraulic release valve for the left-hand pump is located on the bottom of the pump.

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3. Disengage the parking brake. The unit can now be pushed by hand.
4. After moving the unit, re-engage the pumps (drive position) by turning the release valves **clockwise** and tighten to 80-120 in. lbs. of torque.

## Raise and Lower the Roll Bar



### WARNING

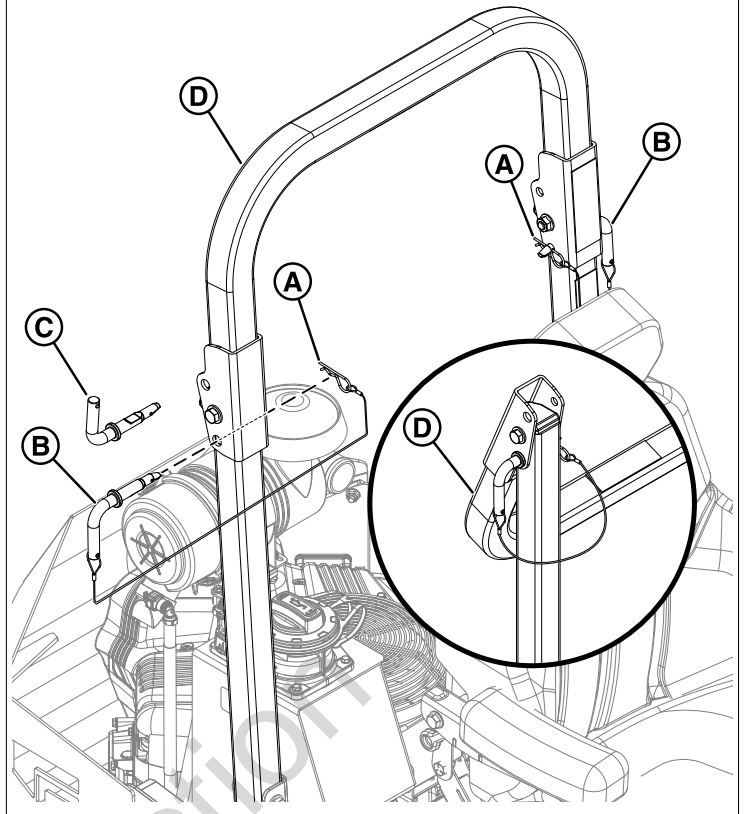
**Avoid serious injury or death from roll over:**

- Keep roll bar in the raised position and use the seat belt.
- There is no roll over protection when the roll bar is down.
- Lower the roll bar only when necessary and **NEVER** remove it.
- Do **NOT** use seat belt when the roll bar is down.
- Raise the roll bar as soon as clearance permits.
- Do **NOT** jump off if the mower tips.

### To lower the roll bar:

1. Pull the hair pin clips (A, Figure 29) out of the retainer pins (B).

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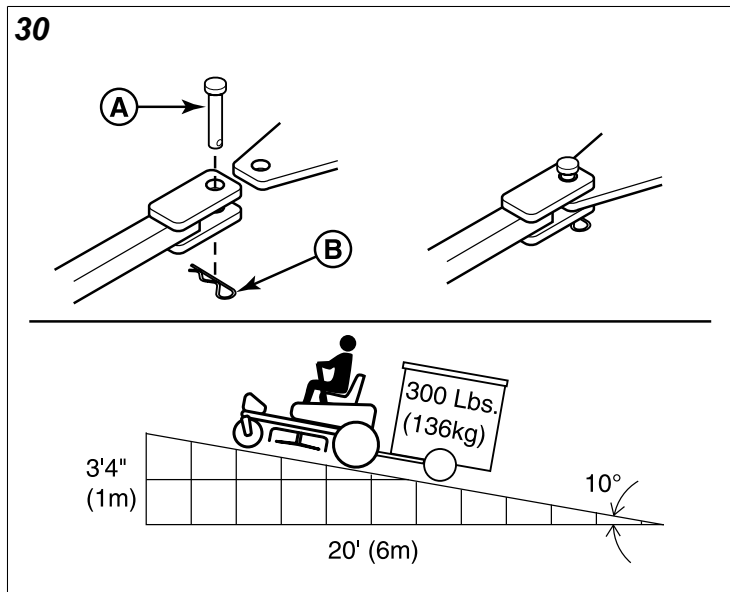
2. Rotate the retainer pins so that the handle of the pin is pointing up (C).
3. Remove the retainer pins. You may need to push or pull on the top loop (D) of the roll bar in order to pull the pins out of the roll bar.
4. Lower the roll bar.
5. With the handles of the retainer pins pointing up, install the retainer pins into the roll bar and secure the roll bar into the down position.
6. Rotate the retainer pins so that the handle of the pin is pointing down and then install the hair pin clips into the retainer pins.

### To raise the roll bar:

1. Pull the hair pin clips (A, Figure 29) out of the retainer pins (B).
2. Rotate the retainer pins so that the handle of the pin is pointing up (C).
3. Remove the retainer pins.
4. Raise the top loop (D) of the roll bar into position.
5. With the handles of the retainer pins pointing up, install the retainer pins into the roll bar and secure the roll bar into the raised position.
6. Rotate the retainer pins so that the handle of the pin is pointing down and then install the hair pin clips into the retainer pins.

## Attaching a Trailer

The maximum weight of a towed trailer should be less than 300 lbs (138kg). Secure the trailer with an appropriately sized clevis pin (A, Figure 30) and clip (B).



Excessive towed loads can cause loss of traction and loss of control on slopes. Reduce towed weight when operating on slopes. The surface being driven on greatly impacts traction and stability. Wet or slippery surfaces can greatly reduce traction and the ability to stop or turn. Carefully evaluate the surface conditions before operating the unit and trailer, and never operate on slopes greater than 10°. See SLOPE OPERATION and TOWED EQUIPMENT in the safety section of this manual for additional safety information.

## Storage

### Temporary Storage (30 Days or Less)

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

### WARNING

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

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

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

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

- Keep the unit in an area away from where children may come into contact with it. If there's any chance of unauthorized use, remove the ignition key.
- If the unit can't be stored on a reasonable level surface, chock the wheels.
- Clean all grass and dirt from the mower.
- If temperature is expected to drop below 35 degrees, refer to Long Term Storage, Item 2

### 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. Use an Antifreeze tester to check the cooling system's level of protection. Read the instructions on the Antifreeze container for the appropriate ratio of water to Antifreeze for your geographical area.
3. Prepare the mower deck for storage as follows: Remove mower deck from the unit. Clean underside of mower deck. Coat all bare metal surfaces with paint or light coat of oil to prevent rusting.
4. Clean external surfaces and engine.
5. Prepare engine for storage. See engine owner's manual.
6. Clean any dirt or grass from cylinder head cooling fins, engine housing and air cleaner element.
7. Cover air cleaner and exhaust outlet tightly with plastic or other waterproof material to keep out moisture, dirt and insects.
8. Completely grease and oil unit as outlined in the *Lubrication* section.
9. Clean up unit and apply paint or rust preventative to any areas where paint is chipped or damaged.
10. 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.
11. Drain fuel system completely or add a diesel fuel 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 diesel fumes. Remember, diesel fumes can travel to distant sources of ignition and ignite, causing risk of explosion and fire.

*Note:* Diesel fuel, if permitted to stand unused for extended periods (30 days or more), may develop gummy deposits which can adversely affect the fuel pump and injector tubes and cause engine malfunction. To avoid this condition, add a diesel fuel 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 fuel. 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.

## Diesel Fuel Recommendations

Fuel companies provide fuel tailored to meet the existing weather conditions. These fuels change at the start of the predominant season according to regional weather trends.

Winter fuels are tailored to give ease of starting for cold weather. Summer fuel may be somewhat heavier than winter fuel resulting in slightly better fuel economy and power. Spring and fall fuel is an average blend between winter and summer blend.

For these reasons an effort should be made to purchase fuels in such quantities that they are not carried over into the next season. Using the wrong blend of fuel can cause problems with the engine.

Refer to the engine manufacturer's manual for specific fuel recommendations.

## Maintenance Schedule

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

The digital display panel depicts both engine hours and PTO run time hours. The maintenance intervals are based on the engine hours as displayed by the digital display panel.

UNIT MAINTENANCE
<b>Before Each Use</b>
Check the safety interlock system.
Check the unit's brakes.
Check the unit for loose hardware.
Check the hydraulic oil level.
Clean any debris from the underside of the deck and beneath spindle guards.
<b>Every 25 Hours</b>
Lubricate unit.*

UNIT MAINTENANCE
Check tire air pressures.
<b>Every 50 Hours</b>
Initial change of gearbox oil
<b>Every 100 Hours</b>
Clean and check mower blades. Replace if damaged.*
Check the gearbox oil level.
Clean the battery and battery cables.
<b>Every 250 Hours or Annually**</b>
Change the hydraulic oil and oil filter.*
Change the gearbox oil.

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

\*\* Whichever comes first.

ENGINE MAINTENANCE
<b>Before Each Use</b>
Check the engine oil level.
Check the engine coolant level.
Check/Clean radiator screens
<b>Every 25 Hours</b>
Check/Clean cooling fins and intake.
<b>Every 250 Hours</b>
Check/Replace gearbox oil**
<b>Every 500 Hours</b>
Check/Replace engine oil and filter.***
Check/Replace air filter.***
Check/Replace primary filter/water separator element.***
Check/Replace secondary fuel filter.***
<b>Every 1000 Hours</b>
Check/Replace engine coolant.

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

\*\* Change original gearbox oil after initial 50 hours of operation.

\*\*\* Refer to engine owner's manual.

## Maintenance Procedures

### Service and Maintenance Safety



#### Amputation and crushing hazard.

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

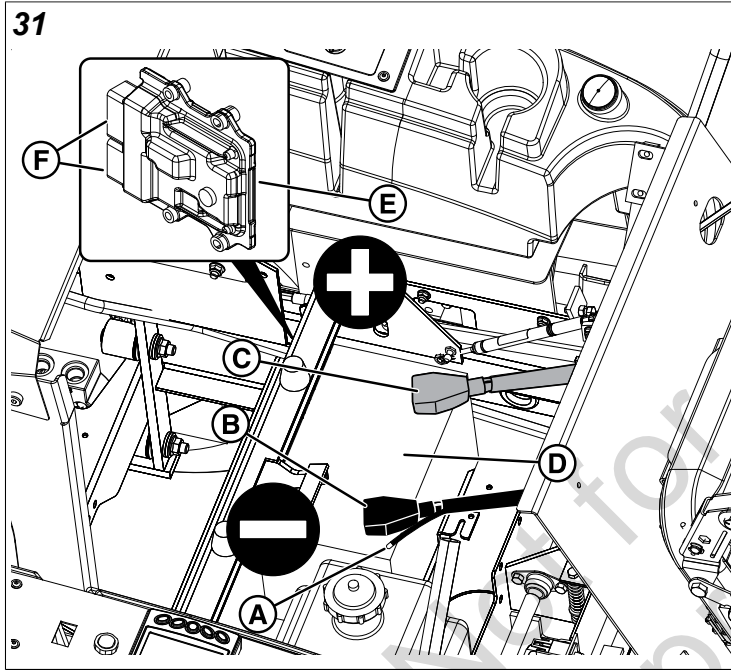
- Read and follow all the applicable safety and instructional messages in this manual.
- Always disengage the mower blades, set the parking brake, turn the engine OFF, remove the ignition key, and wait for all movement to stop prior to performing service and maintenance procedures.

## Welding on Units Equipped with an Electronically Controlled Engine

Correct welding procedures are necessary to avoid damage to the engine's ECM, sensors, and associated components. Disconnect the electrical connections from the ECM before welding on the unit.

### Disconnect the Electrical Connection from the ECM:

1. Release the seat latch and raise the seat plate to access the battery.
2. The unit is equipped with a warning light (A, Figure 31) that will illuminate when it is not safe to remove the battery cables. Wait for the warning light to shut off before removing the battery cables.



3. Disconnect the cables from the battery, negative [-] cable (B) first, positive [+] cable (C) last.
4. Remove the battery (D) from the unit.
5. The ECM (E) is bolted to a plate that is mounted to the frame of the unit by three (3) sets of hardware and ISO mounts. Remove the hardware and ISO mounts that secure the plate and ECM to the frame.
6. Remove the ground wire from the ECM.
7. Tip the ECM unit up to access the J1 and J2 plugs (F).
8. Remove the J1 and J2 plugs from the ECM.
9. Refer to the engine operator's manual before welding on the unit.
10. When done welding, reverse this process to install the ECM and battery back into the unit

## Using the Digital Display Panel

Pressing the MENU button on the digital display panel allows the operator to access other functions of the digital display panel.

### Digital Display Panel Control Icons:

Symbol	Name
	MENU
	INCREASE
	DECREASE
	PREVIOUS SCREEN
	CONFIRM
	UP
	DOWN
	LEFT
	RIGHT
	RESET

### Change the User Settings (Units):

1. Press the MENU button.
2. Select USER SETTINGS and press the CONFIRM button.
3. Select UNITS and press the CONFIRM button.
4. Use the LEFT or RIGHT arrow button to change to the desired unit selection and then press the PREVIOUS SCREEN button three (3) times to return to the main display screen.

### Change the User Settings (Brightness):

1. Press the MENU button.
2. Select USER SETTINGS and press the CONFIRM button.
3. Use the UP or DOWN arrow to select BRIGHTNESS and then press the CONFIRM button.
4. Use the INCREASE or DECREASE buttons to select the desired brightness and then press the PREVIOUS SCREEN button three (3) times to return to the main display screen.

### Change the User Settings (Language):

1. Press the MENU button.
2. Select USER SETTINGS and press the CONFIRM button.
3. Use the UP or DOWN arrow to select LANGUAGE and then press the CONFIRM button.
4. Use the LEFT or RIGHT arrow button to change to the desired language and then press the PREVIOUS SCREEN button three (3) times to return to the main display screen.



### Change the User Settings (Set Time):

1. Press the MENU button.
2. Select USER SETTINGS and press the CONFIRM button.
3. Use the UP or DOWN arrow to select SET TIME and then press the CONFIRM button.
4. Use the LEFT or RIGHT arrow button to select the HOURS number and then use the INCREASE or DECREASE button to select the desired hour. This setting will also change the AM/PM setting as you cycle through the hours.
5. Use the LEFT or RIGHT arrow button to select the MINUTES number and then use the INCREASE or DECREASE button to select the desired minutes.
6. Use the LEFT or RIGHT arrow button to select the 12/24 HOURS and then press the CONFIRM button to change from 12 hour intervals to 24 hour intervals.
7. Use the LEFT or RIGHT arrow button to select the UPDATE and then press the CONFIRM button. This will reboot the display.

### View/Reset the Service Reminders

1. Press the MENU button.
2. Use the UP or DOWN arrow to select UTILITIES and then press the CONFIRM button.
3. Use the UP or DOWN arrow to select SERVICE REMINDERS and then press the CONFIRM button. A message will temporarily pop up on the screen and then disappear.
4. Use the UP or DOWN arrow to select the desired service reminder. The remaining hours before a service item should be performed is displayed. Press the RESET button to reset a service reminder after the maintenance item has been performed.
5. Press the PREVIOUS SCREEN button three (3) times to return to the main display screen.

### Viewing Active [DM1] Fault Codes

1. Press the MENU button.
2. Use the UP or DOWN arrow to select UTILITIES and then press the CONFIRM button.
3. Use the UP or DOWN arrow to select FAULTS and then press the CONFIRM button.
4. Use the UP or DOWN arrow to select ACTIVE [DM1] and then press the CONFIRM button.
5. Use the UP or DOWN arrow to select the desired fault notification and then press the CONFIRM button. More information about the fault will appear on the screen.
6. Press the PREVIOUS SCREEN button five (5) times to return to the main display screen.

### View Stored [DM2] Fault Codes

1. Press the MENU button.
2. Use the UP or DOWN arrow to select UTILITIES and then press the CONFIRM button.

3. Use the UP or DOWN arrow to select FAULTS and then press the CONFIRM button.
4. Use the UP or DOWN arrow to select STORED [DM2] and then press the CONFIRM button.
5. Use the UP or DOWN arrow to select the desired fault notification. Press the RESET button to reset the fault code. Some fault codes can only be reset by an authorized Caterpillar service dealer.
6. Press the PREVIOUS SCREEN button four (4) times to return to the main display screen.

### Viewing System Info

1. Press the MENU button.
2. Use the UP or DOWN arrow to select SYSTEM INFO and then press the CONFIRM button.
3. After viewing the system information press the PREVIOUS SCREEN button two (2) times to return to the main display screen

### Reset the PTO Timer (Daily PTO Hours)

1. Press the MENU button.
2. Use the UP or DOWN arrow to select RESET PTO TIMER and then press the CONFIRM button.
3. A verification message will pop up. If you want to reset the PTO timer press the CONFIRM button.
4. Press the PREVIOUS SCREEN button to return to the main screen.

## High-Pressure Fuel Lines

This unit is equipped with high-pressure fuel lines. Refer to the engine operator's manual before performing any service on fuel lines.

## Static Electricity Hazard when Fueling with Ultra-low Sulfur Diesel Fuel

The removal of sulfur and other compounds in ultra-low sulfur diesel fuel (ULSD fuel) decreases the conductivity of ULSD and increases the ability of ULSD to store static charge. Refineries may have treated the fuel with a static dissipating additive. Many factors can reduce the effectiveness of the additive over time. Static charges can build up in ULSD fuel while the fuel is flowing through fuel delivery systems. Static electricity discharge when combustible vapors are present could result in a fire or explosion. Ensure that the entire system used to refuel your machine (fuel supply tank, transfer pump, transfer hose, nozzle, and others) is properly grounded and bonded.



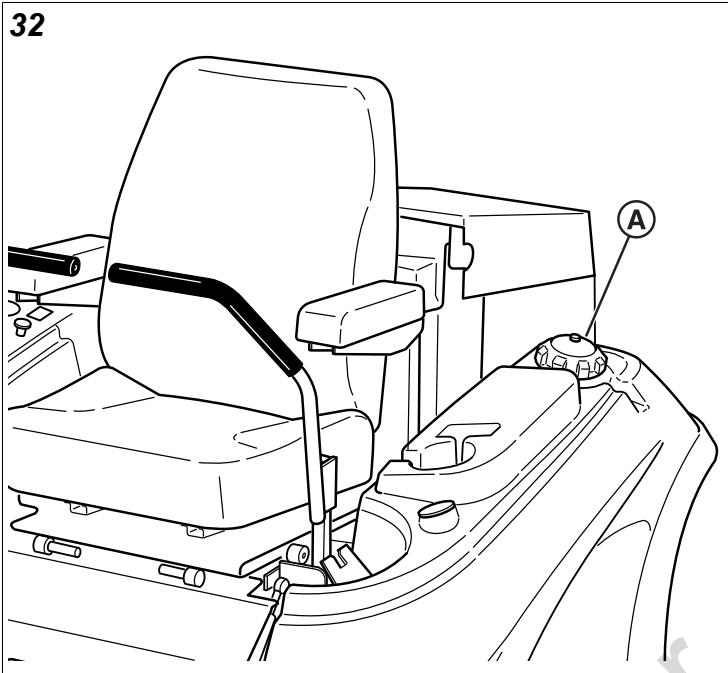
### WARNING

Avoid static electricity risk when fueling. Ultra-low sulfur diesel fuel (ULSD fuel) poses a greater static ignition hazard than earlier diesel formulations with higher sulfur contents. Avoid death or serious injury from fire or explosion. Consult with your fuel or fuel system supplier to ensure the delivery system is in compliance with fueling standards for proper grounding and bonding practices.

## Checking/Adding Fuel

### To add fuel:

1. Using a clean rag or cloth wipe any dirt or debris from around the fuel caps (A, Figure 32) and the fuel filler necks.



**Note:** Do not overfill the fuel tank. Refer to your engine manual for specific fuel recommendations.

2. Fill the fuel tank to the bottom of the fill tube. This will leave room in the tank for fuel expansion.
3. Install and hand tighten the fuel cap.
4. Repeat the same process for the opposite tank.

**NOTICE** Use ultra low sulfur fuel only. Consult the engine manufacturer's manual for specific fuel recommendations.

**NOTICE** Do not use Kerosene in place of diesel fuel or mix with diesel fuel. Kerosene will damage the engine. Consult the engine manufacturer's manual for specific fuel recommendations.



Diesel fuel 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 drain or replace fuel filter when engine is hot, as spilled fuel may ignite. Make sure the filter drain valve is fully closed before returning the unit to service.



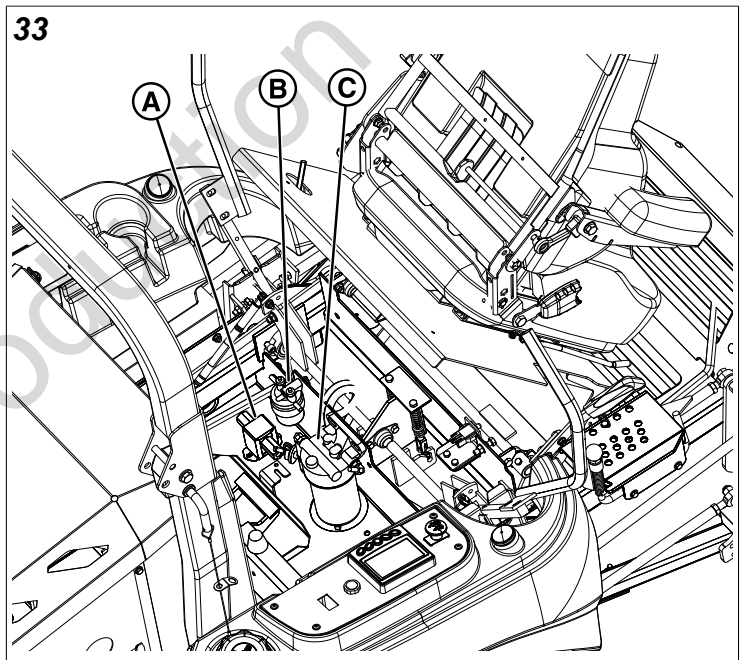
Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn the ignition switch off when changing fuel filters or water separator elements. Clean up fuel spills immediately.

## Servicing The Fuel Filter and Water Separator



Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn the ignition switch to OFF when changing fuel filters or water separator elements. Clean up fuel spills immediately.

This unit is equipped with an electric fuel pump (A, Figure 33), a fuel filter (B), and a water separator (C).



Drain the water separator every 25 hours or whenever water is visible in the bowl.

Replace the filters in both the fuel filter and water separator every 500 hours of operation or as required.

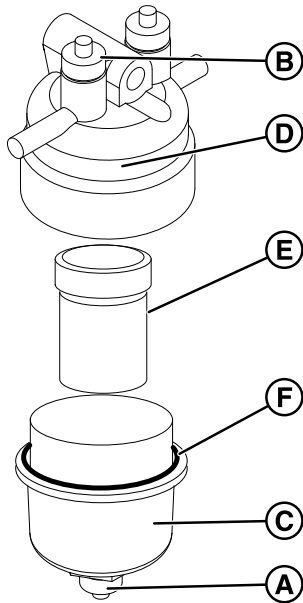
### Replacing the Fuel Filter Elements

The fuel filter element and the water separator element must be replaced at the same time.

1. Park the unit on a flat, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key.
2. Release the seat latch and raise the seat plate to access the fuel filter and water separator.

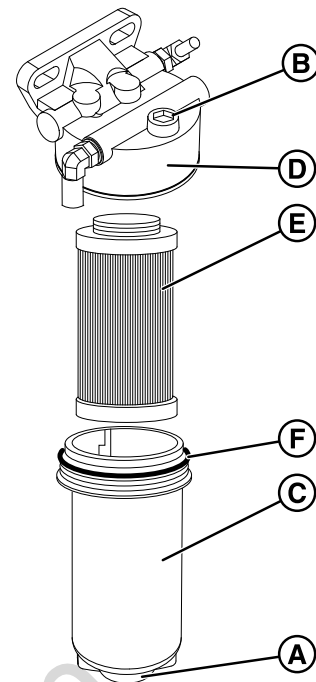
- Place an absorbent cloth below the fuel filter to catch any spilled fuel. Clean up any spilled fuel. Clean the outside body of the filter assembly.
- Open the drain valve (A, Figure 34) and open the vent screw (B) and drain the filter. Close the drain screw and close the vent screw. Use only hand pressure to tighten the drain screw and the vent screw.

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- Remove the filter bowl (C) from the filter (D) and remove the filter element (E) from the filter. Discard the filter element.
- Remove the O-ring seal (F) and discard.
- Ensure that all components are clean and dry.
- Install a new O-ring seal and new filter element.
- Install the filter bowl to the filter and tighten the filter bowl to a torque of 88 in-lbs (10 Nm).
- Place a suitable container under the water separator to catch any fuel that might spill. Clean up and spilled fuel. Clean the outside body of the filter assembly.
- Open the drain valve (A, Figure 34) and if necessary, open the vent screw (B). Allow the fuel to drain from the filter. Tighten the vent screw securely and close the drain valve.

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- Use a suitable strap wrench to remove the filter bowl (C) from the filter base (D).
- Remove the filter element (E) and discard the element.
- Remove the O-ring seal (F) from the filter bowl and discard the O-ring.
- Ensure the filter bowl is clean and free from dirt.
- Install the filter element into the filter base.
- Install new O-ring seal to filter bowl and install the filter bowl to the filter base. Do not use a tool to install the filter assembly. Use hand pressure only to tighten the filter bowl.
- The fuel system must be primed before starting the engine. See *Priming the Fuel System*.

### Draining the Fuel Filter and Water Separator

**NOTICE** The water separator is not a filter. The water separator separates water from the fuel. The engine should never be allowed to run with the water separator more than half full. Engine damage may result.

- Place a suitable container underneath the fuel filter to catch spilled fuel.
- Open the drain (A, Figure 34) on the fuel filter. Dispose of the drained fluid correctly.
- Close drain and use hand pressure only.
- Place a suitable container under the water separator to catch spilled fuel.
- Open the drain valve (A, Figure 35) on the water separator. Dispose of the drained fluid correctly.
- Close the drain valve with hand pressure only.



**NOTICE** The engine manufacturer recommends that you do not fill the oil filter with oil before installing. This oil would not be filtered and could become contaminated. Contaminated oil can cause accelerated wear to engine components or engine damage.

9. Remove the shop cloth and wipe up any spilled oil.
10. Add new oil through the engine oil fill (E). Refer to *Lubricant Viscosity Recommendations* for specific oil recommendations.
11. Install the dipstick.
12. Start the engine and run the engine at IDLE for 2 minutes. Perform this procedure to ensure that the lubrication system has oil and that the oil filters are filled. Inspect the oil filter for leaks.
13. Stop the engine and allow the oil to drain back to the sump for a minimum of 10 minutes.
14. Check the engine oil level using the engine oil dipstick. Add oil if needed.
15. Install the skid plate.

## Clean the Engine Compartment Area with Pressurized Air and Water

Pressurized air and/or water can cause debris and/or hot water to be blown out. This action could result in personal injury.

When pressurized air and/or pressurized water is used for cleaning wear protective clothing, protective shoes, and eye protection. Eye protection includes goggles or a protective face shield.

The maximum air pressure for cleaning purposes must be below 205 kPa (30 psi). The maximum water pressure for cleaning purposes must be below 275 kPa (40 psi).

## Engine Maintenance

For engine maintenance schedules and procedures, please refer to the engine operator's manual.

## Containing Spilled Fluids and Proper Disposal of Waste

Make sure that fluids are contained when performing inspection, maintenance, testing, adjustment, and repair of the unit. Be prepared to collect the fluid with suitable leakproof containers before opening or disassembling any component containing fluids. Do not pour waste onto the ground, down a drain, or into any source of water.



Improper disposal of waste can threaten the environment. Dispose of all fluids according to local regulations and mandates.

## Service Air Filter

Refer to the engine owner's manual for air filter service instructions.

## Check/Add Coolant Level



If engine is warm, DO NOT remove radiator cap.

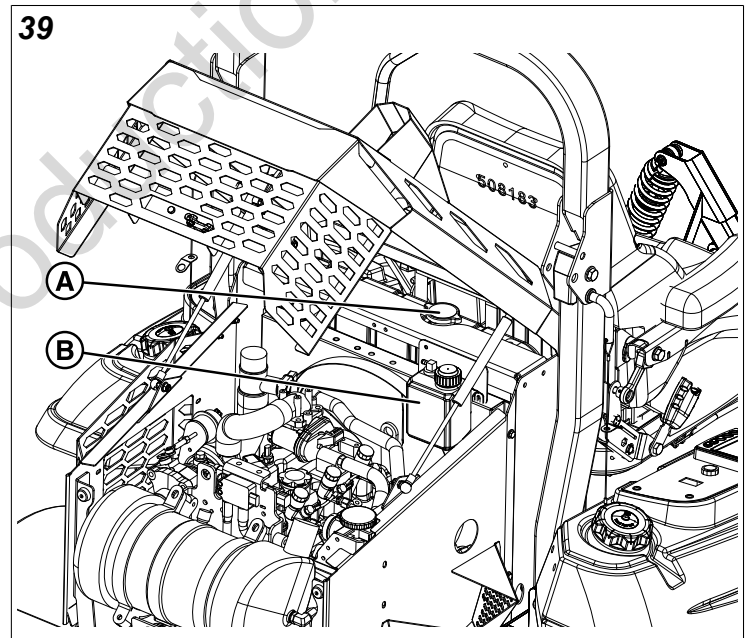
Escaping steam can cause burns.

Never remove the radiator cap or radiator reservoir cap while the engine is hot or running. Severe thermal burns or injury can occur by escaping steam or hot coolant.

- Do NOT touch hot radiator or open reservoir when engine is running.
- Stop and allow engine to cool before removing the radiator cap or the reservoir cap and before changing or adding coolant.

The engine coolant level and quality should be checked before each use when the engine is cool and off.

1. Remove the radiator cap (A, Figure 39) to check the fluid level.



2. Coolant level should be flush with the bottom of the filler tube. If coolant level is low, add coolant until the level is flush with the bottom of the filler tube. Proper coolant mix is a 50/50 mixture of ethylene glycol and distilled water. See engine owners manual for engine coolant specifications.

This unit is equipped with a coolant expansion tank (B). Do not add coolant through the expansion tank.

## Change Engine Coolant

See engine owners manual for specific engine coolant change procedures. The drain valve is located at the base of the radiator.

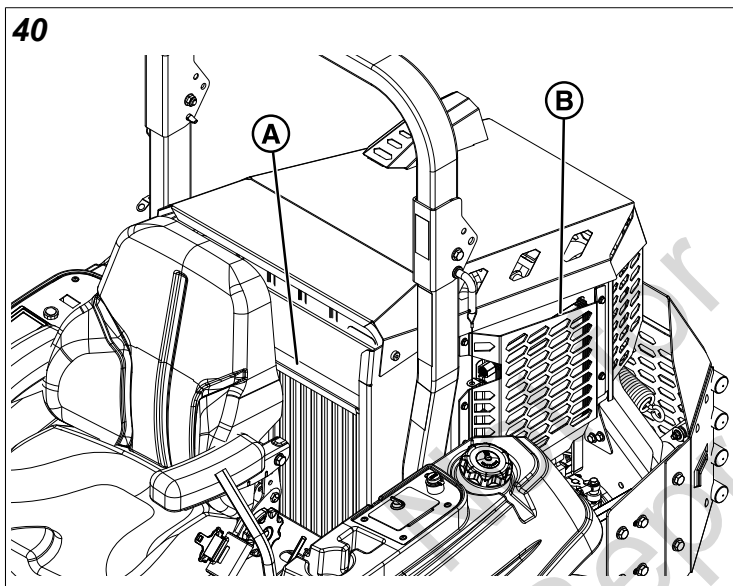
The engine manufacturer recommends that the cooling system be cleaned and the flushed before the recommended maintenance interval conditions exist:

- The engine overheats frequently.
- Foaming is observed.
- Fuel and/or oil has entered the cooling system and the coolant is contaminated.

## Clean Radiator, Screen, and Oil Cooler

Clean the radiator, screen, and oil cooler fins before each use, or as required (depending on conditions) to allow proper air-flow through radiator and hydraulic oil cooler.

1. Raise the seat plate.
2. Lift the radiator screen (A, Figure 40) straight up to remove the screen. Flush the screen with water or blow clean with air. Flush the radiator core with water or blow clean with air. See engine owner's manual for proper radiator cleaning procedures.

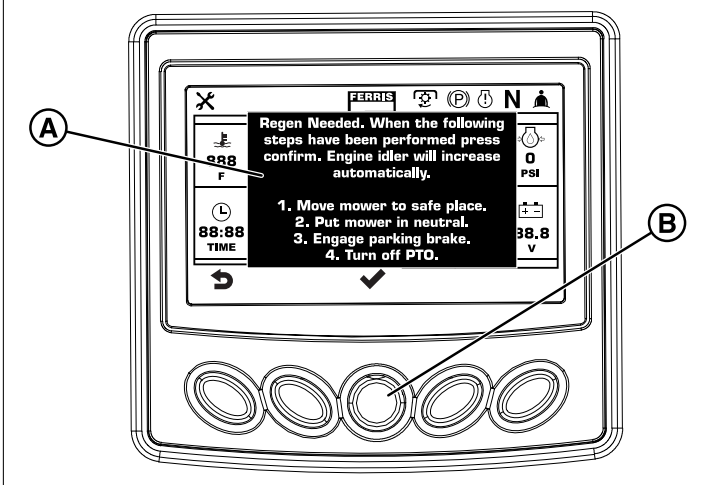


3. Install the radiator screen. Make sure the screen is fully seated in the carrier.
4. Clean all dirt, grass, and debris from the oil cooler fins (B).
5. Lower the seat plate.

## Regen Process (Clean Diesel Particulate Filter)

This unit is equipped with a diesel particulate filter that will clean itself through a regen process. The digital display panel will notify the operator when the regen process is required with a pop up (A, Figure 41) on the screen. The unit will also prevent the operator from changing the engine RPMs until the regen process has been run.

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If the pop up appears on the digital display screen and the operator cannot adjust the unit's RPMs follow the following procedure:

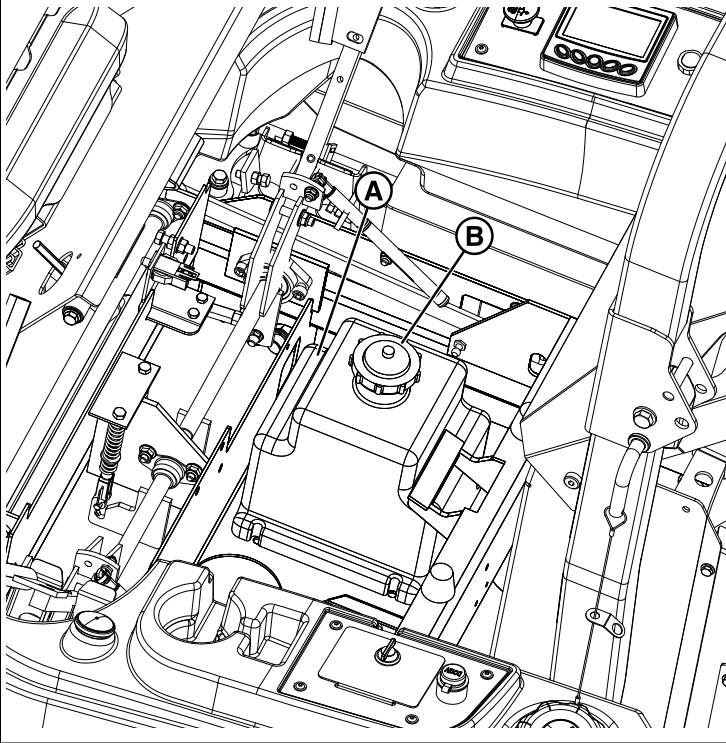
1. Drive the unit to an area away from other people, animals, buildings, or flammable materials. Move the ground speed control levers to the neutral position and tilt outwards to lock them into neutral, engage the parking brake, and turn off the PTO.
2. Press the MENU/CONFIRM button. The unit will start the regen process to clean the diesel particulate filter.
3. After the regen process completes another pop up will appear on the screen stating **"Elevated idle no longer active. Normal operation allowed"**.
4. Press the MENU/CONFIRM button.
5. Resume normal operation.

## Check/Add Hydraulic Oil Level

*Note:* Do not open the hydraulic oil reservoir unless oil is being added.

1. Visually check that the hydraulic oil level is filled to the recess area (A, Figure 42) of the hydraulic oil reservoir.

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2. If necessary, remove the reservoir cap (B) and add either Mobil 1™ 15W-50 oil or Castrol Syntec™ 5W-50 oil. **DO NOT** use conventional oils. Make sure the area around the filler neck is free of dust, dirt, and other debris.

## Changing the Hydraulic Oil Filter

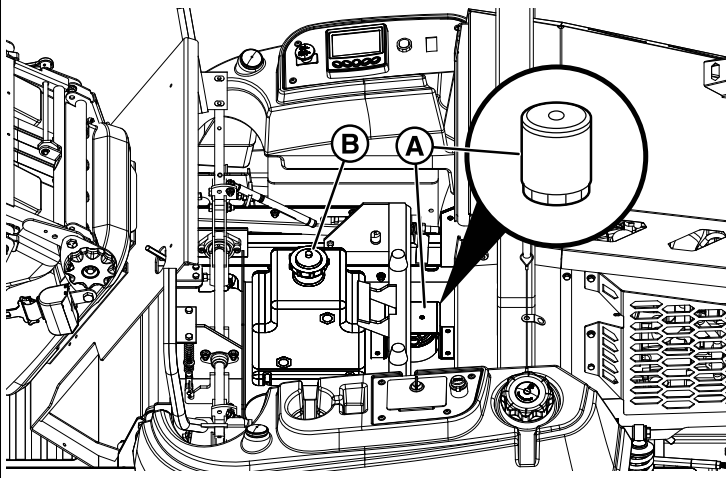
**Change Interval:** Every 250 hours.

**Filter Part Number:** 5021357

*Note:* Removing the oil filter from the filter base will drain the oil reservoir. Have a suitable container ready to catch any spilled oil. Ferris recommends this be a dealer-only service item.

1. Access the hydraulic oil filter (A, Figure 43) from beneath the the frame of the unit. The filter is located behind the hydraulic oil reservoir (B) and in front of the radiator.

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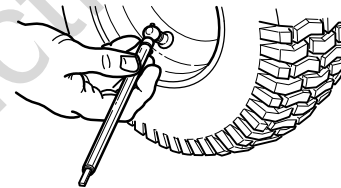


2. Fill the new filter with oil. Lubricate the new filter seal with a few drops of oil.
3. Remove the oil filter and quickly thread the new filter onto the filter base until the gasket makes contact, then tighten 3/4 of a turn more.
4. Raise the seat plate to gain access to the hydraulic oil tank.
5. Fill the hydraulic oil reservoir with fresh oil and replace any oil lost during filter change.
6. Raise the rear of the unit and secure with jack stands. Chock the front wheels to prevent the unit from rolling. Run the unit for several minutes to purge any air from the hydraulic system and check the hydraulic oil level.

**NOTICE** Use caution after changing the filter. Air in the hydraulic system may affect the responsiveness of the control levers. Repeat step #6 until air is completely purged from the system.

## Checking Tire Pressures

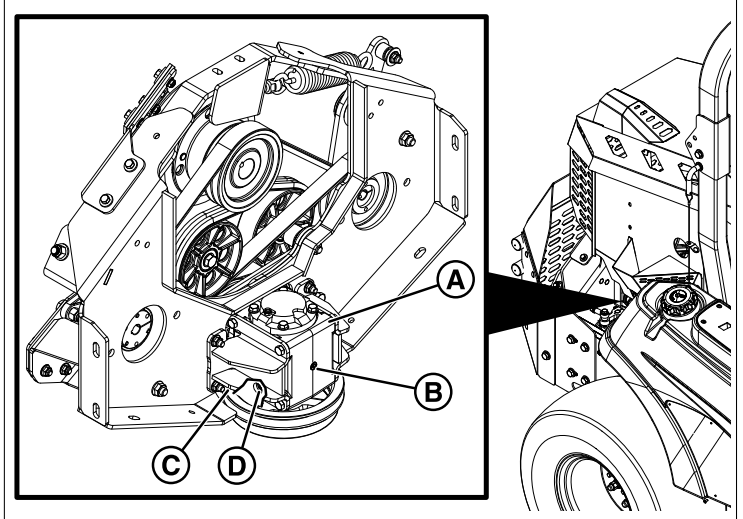
Tire pressure should be checked periodically, and maintained at the levels shown in the Specifications chart. Note that these pressures may differ slightly from the "Max Inflation" stamped on the side-wall of the tires. The pressures shown provide proper traction and extend tire life.



## Check/Add Gearbox Oil Level

This unit is equipped with a sealed gearbox (A, Figure 44) that needs its oil checked periodically. Refer to the *Maintenance Schedule* for the specific intervals for checking the gearbox oil level.

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To check the gearbox oil level:

1. The gearbox's fill plug (B) is located on the front of the gearbox. Remove the fill plug from the gearbox.
2. Once the fill plug is removed, oil should seep out of the fill plug hole. If no oil drains out, fill with Amsoil® SAE 75W-140 weight gear oil (or equivalent) until oil starts to seep from the hole and then replace the fill plug.


## Changing the Gearbox Oil

**Change interval:** Every 250 Hours (Initial Gearbox Oil Change after first 50 hours of operation).

1. Park the unit on a flat, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key.
2. There is a port on the right side lower support bracket (C, Figure 44) that allows access to the drain plug (D).
3. Position the lower gearbox pulley so that when the oil is drained from the gearbox it can drain into a container without spilling on the pulleys and/or belts.
4. Remove the oil drain plug and completely drain the gearbox oil into the container.
5. Replace the drain plug.
6. Remove the oil fill plug (B) and fill with Amsoil® SAE 75W-140 weight gear oil (or equivalent) until oil starts to seep from the fill hole. Replace the oil fill plug.
7. Using a parts solvent, thoroughly clean any excess oil that may have spilled on the pulley, pulley grooves, and/or belts.

## Lubrication


Lubricate the unit at the location shown in Figures 45, 46, 47 and as well as the following lubrication points.

**Grease:** 

- front caster wheel axles and yokes. See *Lubricating the Front Casters*.
- deck lift pivot blocks.
- deck lift linkages.
- mower deck spindles. See *Lubricating the Mower Deck Spindles*.

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

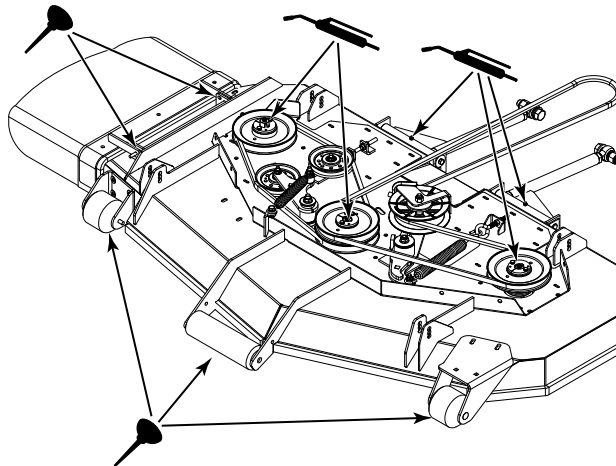
Not all greases are compatible. Your product is manufactured using Heavy Duty Lithium Complex EP, NLGI grade 2 grease (p/n 5109902X1). It is recommended that you service your product with similar grease. 5109902X1 is available through your normal part source. Using non-compatible grease could damage or cause premature parts failures.

**Oil:** 

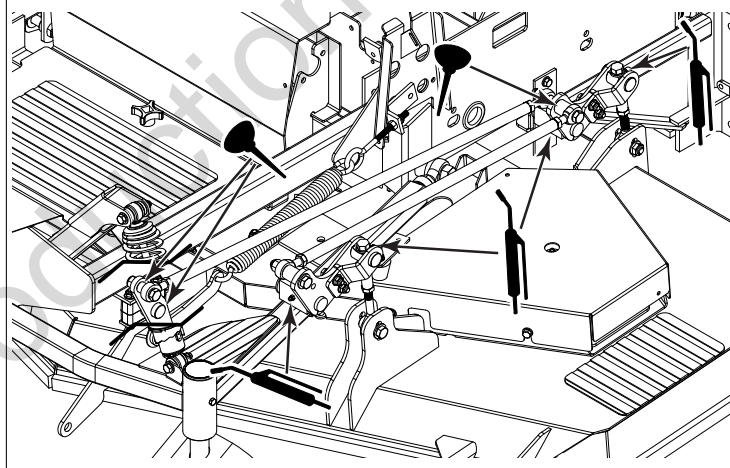
- control handle pivots.
- seat plate pivots.
- deck lift pivots.
- discharge chute hinge.
- parking brake lever shafts.

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.

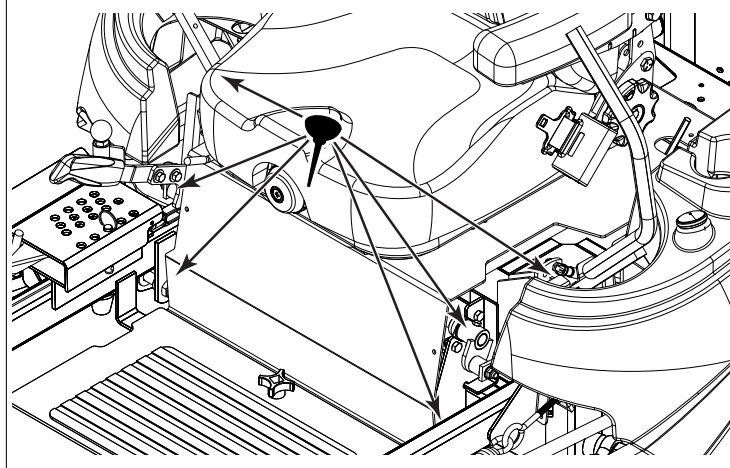
45



46



47



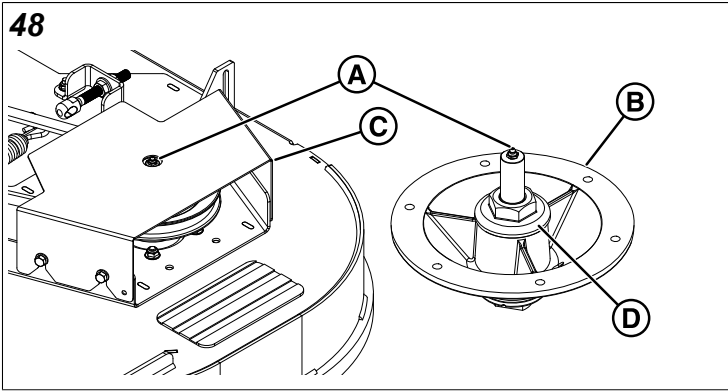
## Lubricating the Mower Deck Spindles

**Interval:** Every 25 hours.

1. The grease fitting (A, Figure 48) for the mower deck spindle (B) is located on the top of the spindle shaft. If



you cannot access it easily through the opening in the mower deck spindle guards (C), remove them.



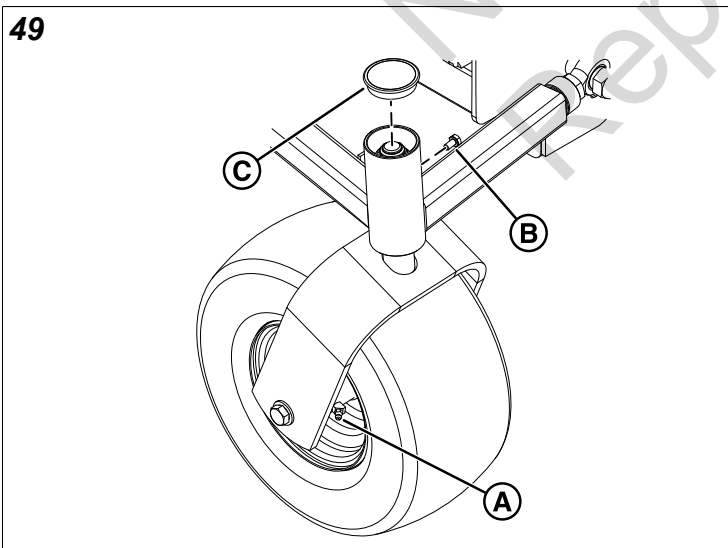
2. Add grease to the mower deck spindle through the grease fitting until grease begins to exit from underneath the debris shield nut (D).
3. Each spindle may take in excess of three (3) ounces of grease. Check the debris shield nut after every five (5) pumps to see if grease is beginning to exit from underneath it.
4. Repeat process for remaining mower deck spindles on the unit.
5. If you removed the mower deck spindle guards install them now.

## Lubricating the Front Casters

**Interval:** Front caster wheel axles (A, Figure 49) - Every 25 hours.

**Interval:** Front caster yoke axles - Yearly.

1. Remove the 1/4-28 bolt (B, Figure 49) screwed into the caster and install a 1/4-28 grease fitting.



2. Carefully remove the upper cap (C) from the front caster tube using a thin flathead screwdriver or a thin plastic trim/clip removal tool.
3. Grease the front caster until the grease penetrates through the upper bearing to the top of the caster axle shaft. Verify that the added grease has not displaced the

lower seal from the caster tube. If the seal is disturbed position it back into place.

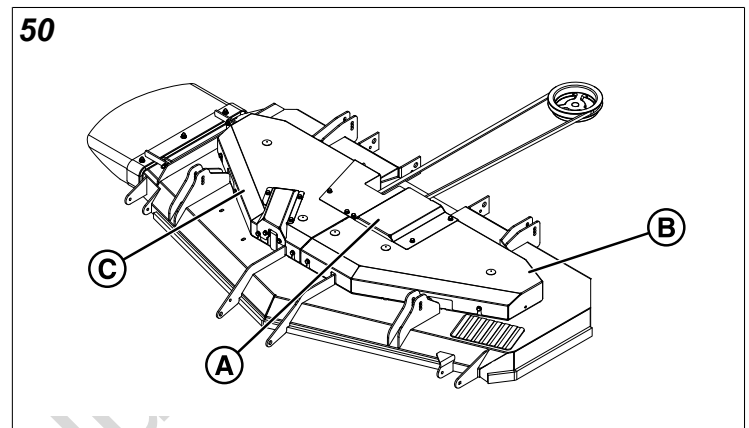
4. Remove the 1/4-28 grease fitting and reinstall the 1/4-28 bolt.
5. Install the upper cap into the front caster tube.
6. Repeat the process for the other side of the unit.

## Cleaning Debris from the Mower Deck

After operating the unit, the mower deck should be checked for debris buildup underneath the deck and on top of the deck, especially beneath the spindle guards and around the belt path.

### Cleaning beneath the spindle guards:

1. Remove the center guard (A, Figure 50), the left spindle guard (B), and right spindle guard (C).



2. Clean any debris from the top of the deck.
3. Install the three (3) guards back in place.

## Servicing the Mower Blades

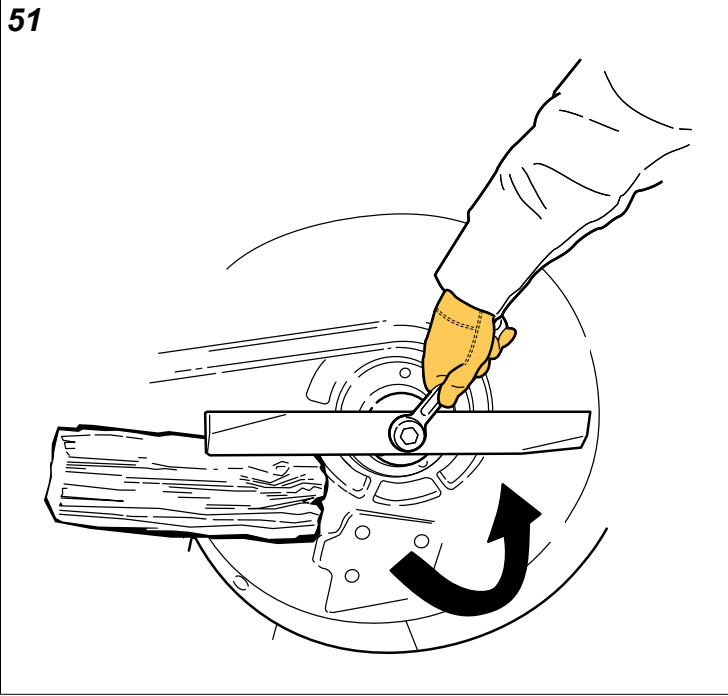
### Removing the Mower Blades



**Laceration hazard**  
Mower blades are sharp.

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

1. Use a block of wood to prevent the mower blade from turning as shown in Figure 51.



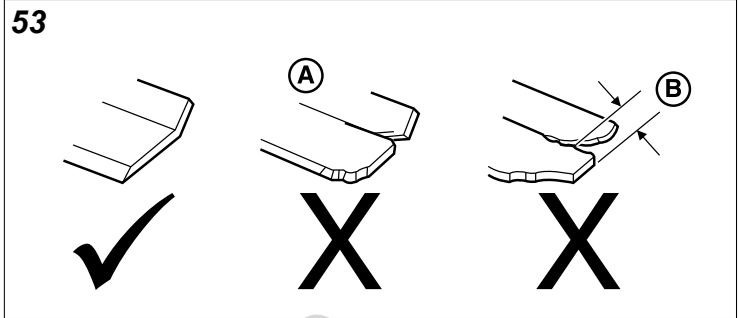
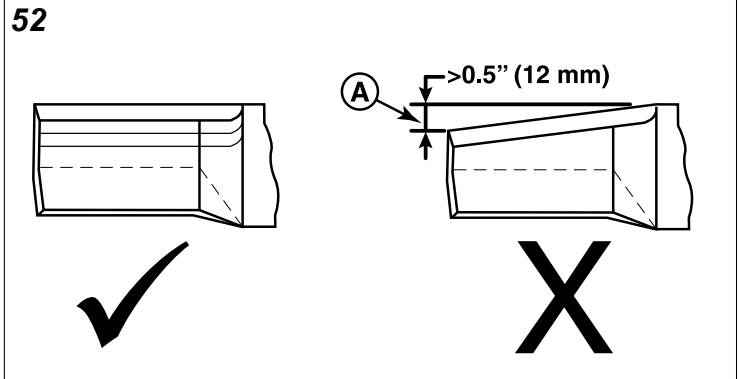
- Using a wrench, remove the bolt securing the blade to the spindle.

### Inspecting the Mower Blades



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

- Inspect the mower blade every 25 hours or at least once per year.
  - If the mower blade hits a solid object, stop the engine immediately and inspect the mower blades.
  - Never weld or straighten bent mower blades.
- Remove the mower blade from the unit. See Removing the Mower Blades.
  - Inspect the mower blade (Figures 52 and 53). Discard the mower blade if it has any of the following conditions:
    - More than .5" (12,7 mm) of the mower blade metal has been removed from previous sharpening or wear (A, Figure 52)
    - The air lifts are excessively eroded (A, Figure 53) and the notch (B) is .25" (6,35 mm) deep or greater.
    - The mower blade is broken or bent.



- If the cutting edges are not sharp or have nicks, sharpen the blades. See Sharpening the Mower Blades.

### Sharpening the Mower Blades

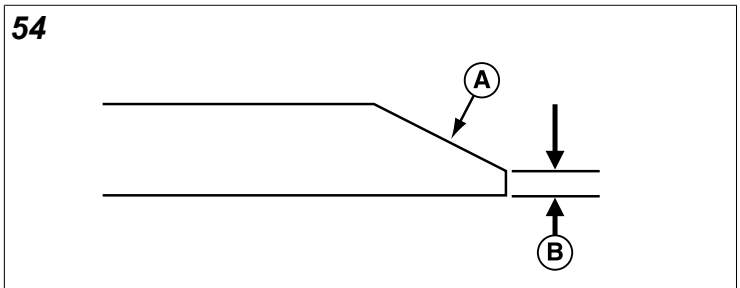


Grinding mower blades throws sparks and fine metal particles that are capable of igniting gasoline and gasoline vapors, and that can injure unprotected eyes.

Be sure all flammable materials are cleared from the area where grinding will occur.

Always wear safety glasses or goggles when grinding mower blades.

- Sharpen mower blades with a grinder, hand file, or electric blade sharpener.
- Sharpen the blade by removing an equal amount of material from the cutting edge of each end of the blade.
- Keep the original bevel (A, Figure 54) when grinding. DO NOT change the mower blade bevel.



- The mower blade should have a maximum of 1/64" (0,40 mm) cutting edge (B) or less.

## Balancing the Mower Blades



**CAUTION**

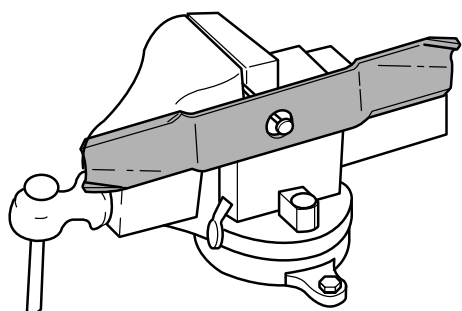
**Thrown objects hazard**

An unbalanced mower blade can create excessive vibration and damage the unit, or cause mower blade failure resulting in thrown debris.

Be sure blade is balanced before installing.

1. Clean the mower blade to remove any dried grass or other debris.
2. Clamp a nail in a bench vise, hang the mower blade on the nail, and position the blade in a level horizontal position as shown in Figure 55.

55



3. Check the balance of the mower blade. If either end of the mower blade moves downward is heavier than the other. Sharpen the heavy end until balance is achieved. See Sharpening the Mower Blades for sharpening instructions.
4. Repeat the process until the mower blade remains in the horizontal, level position.

## Installing the Mower Blades



**CAUTION**

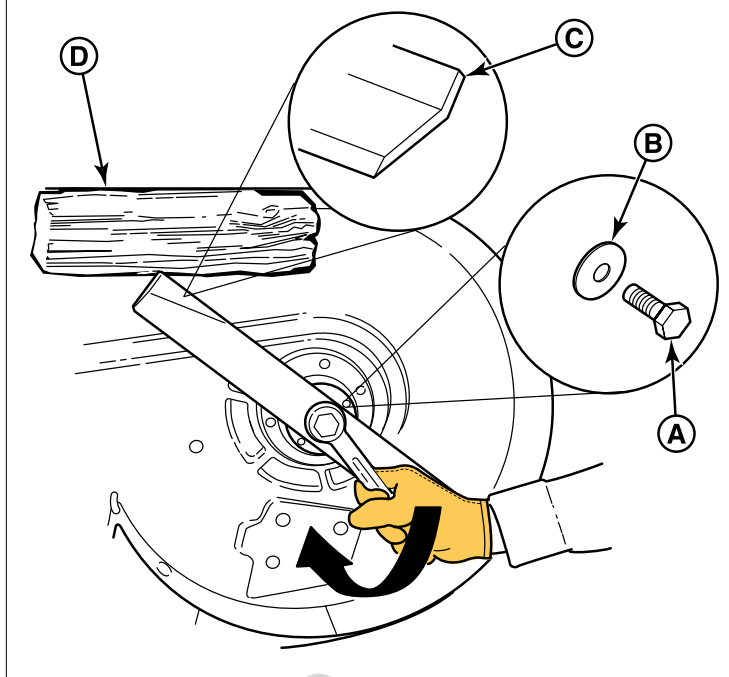
**Laceration hazard.**

Mower blades are sharp.

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

1. Install each mower blade with the air lifts (C, Figure 56) pointing up towards the mower deck as shown in Figure 56 and secure with the mower blade mounting bolt (A) and flat washer (B).

56

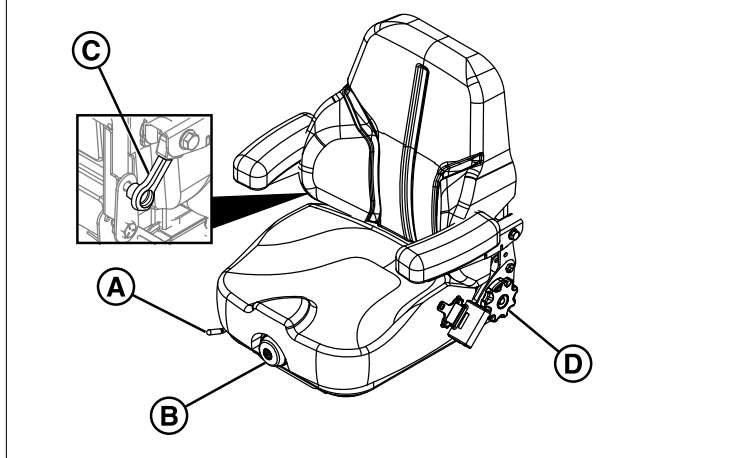


2. Wedge a wooden block (D) between the mower blade and the mower deck housing to keep the mower blade from turning and torque the blade mounting bolt to 120 ft. lbs (163 Nm).

## Seat Adjustment (Suspension Seat)

In addition to the forwards and backwards seat adjustment, models equipped with a suspension seat can be adjusted for suspension (ride comfort), lumbar support, and back angle.

57



**Seat Adjustment Lever (Forwards / Backwards):** The seat can be adjusted forward and back. Move the forwards / backwards seat adjustment lever (A, Figure 57), position the seat as desired, and release the lever to lock the seat in position.

**Seat Adjustment Knob (Suspension/Ride Comfort):** The seat adjustment knob (B) adjusts the suspension of the seat (ride comfort). Turn the adjustment knob until the display scale has a reading that matches the weight of the operator.

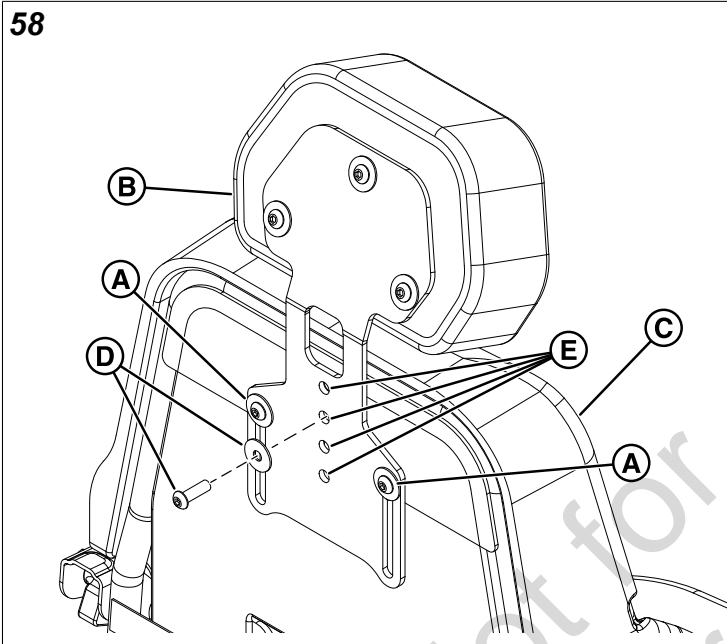
**Lumbar Adjustment Lever:** Turn the lumbar adjustment knob until the desired amount of lumbar is achieved.

**Back Angle Adjustment Knob:** Turn the back angle adjustment knob until the desired amount of back angle is achieved.

## Adjusting the Height of the Head Rest (If Equipped)

The adjustable head rest assembly can be positioned in four different heights.

1. Loosen the outer hardware (A, Figure 58) that secures the head rest assembly (B) to the back of the seat (C).



2. Remove the center hardware (D).
3. Move the head rest assembly up and down until the desired head rest height is achieved and the hole in the seat align with one of the four (4) holes (E) in the head rest assembly.
4. Install the center hardware into the head rest assembly and the back of the seat.
5. Tighten the outer hardware.

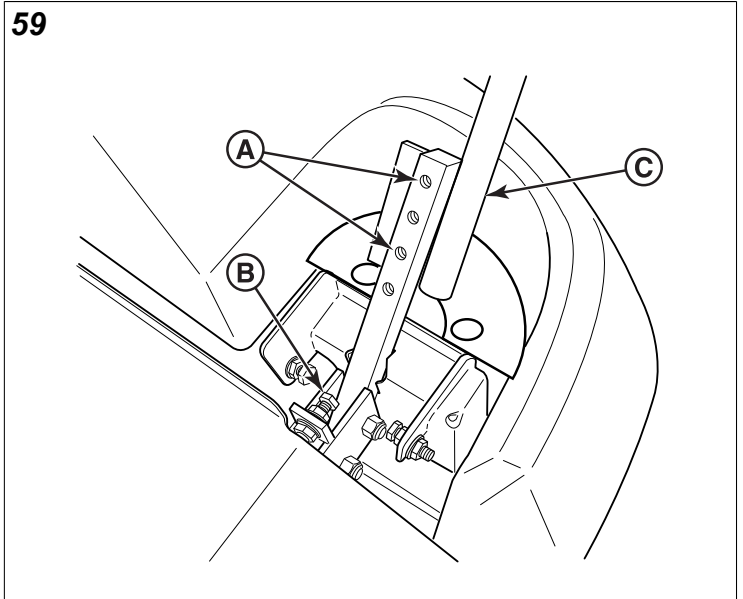
## Ground Speed Control Lever Adjustment

The control levers can be adjusted in three ways. The alignment of the control levers, the placement of the levers (how close the ends are to one another) and the height of the levers can be adjusted.

### To Adjust the Handle Alignment

Loosen the mount bolts (A, Figure 59) and pivot the lever(s) (C) to align with each other.

59



### To Adjust the Handle Placement

Loosen the jam nuts and adjust the placement bolt (B) in or out to properly adjust the lever end spacing.

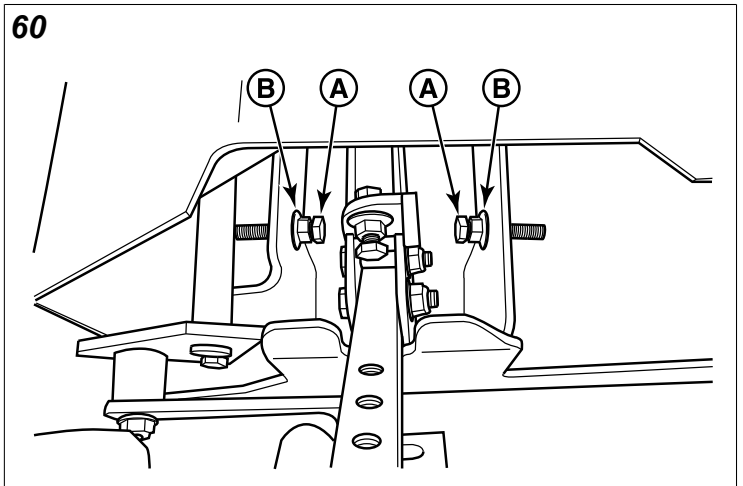
### To Adjust the Handle Height

Remove the mounting hardware and reposition the handle either up or down from its original position. You will need to adjust the handle alignment again as described above.

## Speed Balancing Adjustment

If the unit drifts to the right or left when the ground speed control levers are in the maximum forward position, the top speed of each of these control levers can be balanced by turning the adjustment bolt(s) (A, Figure 60). Only adjust the speed of the wheel that is traveling faster.

60



### To Reduce the Speed of the Faster Wheel

1. Loosen the securing nut (B).
2. Turn the top speed adjustment bolt **counter-clockwise** to reduce the speed.
3. Tighten the securing nut when adjustment is complete.



## WARNING

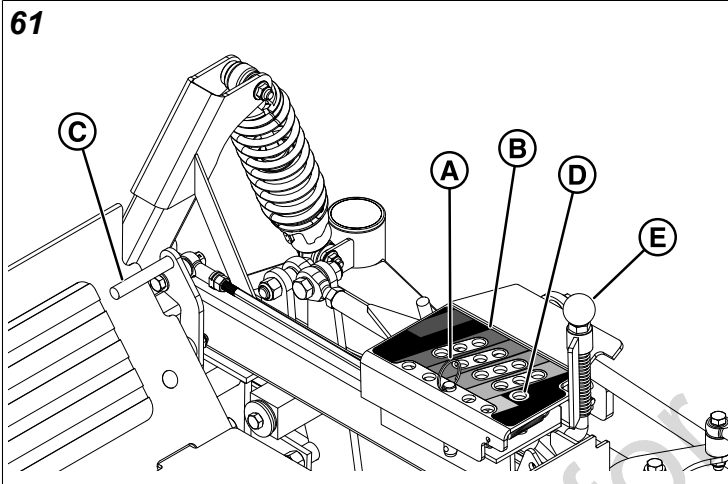
### Unsafe Operation Hazard.

DO NOT adjust the unit for a faster overall speed forward or reverse than it was designed for.

## Cutting Height Adjustment

The cutting height adjustment pin (A, Figure 61) controls the cutting height of the mower deck. The cutting height is adjustable between 1-1/2" (3,8 cm) and 6" (15,2 cm) in 1/4" (0,64 cm) increments.

*Note:* Make sure that the pin is inserted into the holes in both upper and lower plates of the pin box (B).



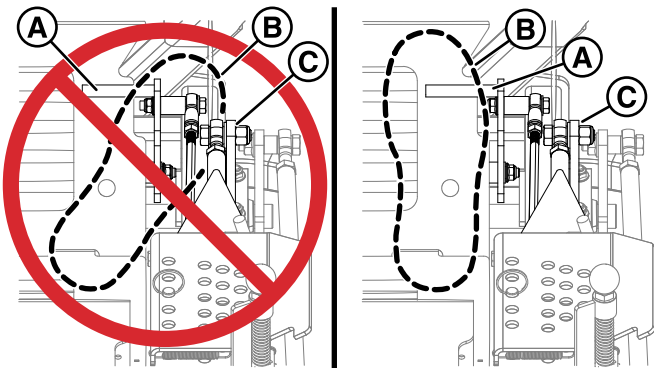
1. While sitting in the operator's seat, press the deck lift pedal (C) forward to raise the mower deck until it locks into the 6" (15,2 cm) position. Do not hold the pedal down after the mower deck locks into the 6" (15,2 cm) position.



## WARNING

### Pinch Point Hazard

When pressing the deck lift pedal (A), keep your foot (B) on the pedal to avoid a potential pinching hazard as the deck height link (C) moves forward.



2. Place the cutting height adjustment pin in the desired cutting height.

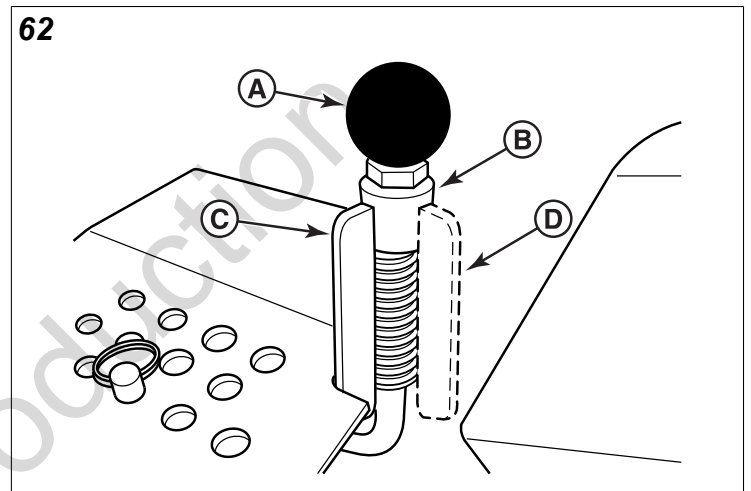
*Note:* If cutting at the 6" (15,2 cm) cutting height, place the cutting height adjustment pin in the pin storage hole (D).

3. Press the deck lift pedal forward to raise the deck and release the deck lock (E).
4. Push the deck lift lock lever to the right to release the lock.
5. Gravity will lower the mower deck until the deck lift pedal comes to rest against the cutting height adjustment pin.

## Deck Lift Lock Lever Lockout Plate Operation

The Deck Lift Lock Lever Lockout Plate (A, Figure 62) can be used to prevent the mower deck from locking the deck in the TRANSPORT position if you raise deck during operation to clear an object.

1. Move the deck lift lock lever (A) away from the operating position, and rotate the deck lift lever lockout plate (B) to the UNLOCK (C) position (facing towards the operating position) and allow the deck lift lever lockout plate to contact the deck height box.



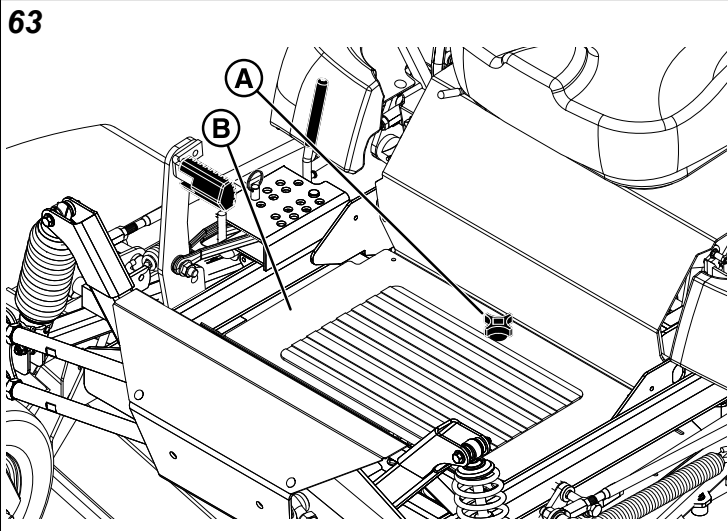
The mower deck can now be raised to the TRANSPORT position without the deck lift lock lever engaging.

2. Move the deck lift lock lever away from the operating position, and rotate the deck lift lever lockout plate (B) to the LOCK (C) position (facing towards the rear of the machine) and allow the deck lift lever to return to its natural position. The mower deck can now be raised to the TRANSPORT position and the deck lift lock lever will lock it in place.

## Floor Pan Removal & Installation

This unit is equipped with a removable floor pan which can be removed to provide better access to the mower deck.

1. Loosen and remove the retaining hardware (A, Figure 63) that secures the floor pan to the frame of the unit.

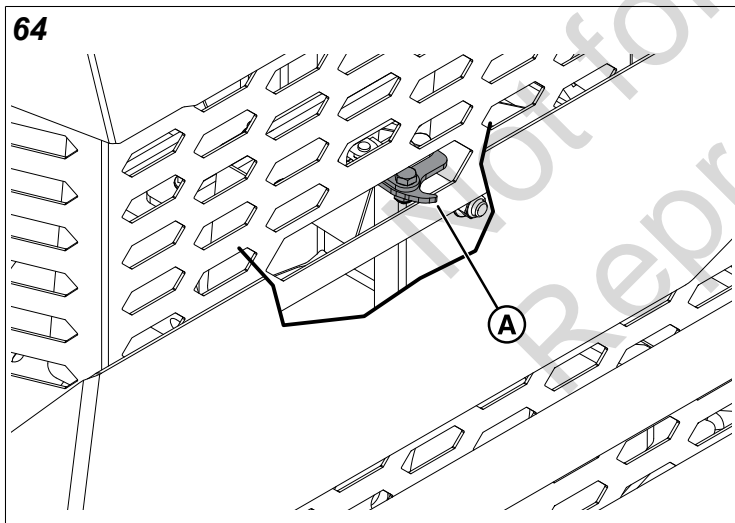


2. Tilt the back end of the floor pan up and then remove it from the unit.
3. To re-install the floor pan: Reverse the removal procedure.

## Operating the Hood Latch

This unit is equipped with a hood latch that must be released prior to opening the hood.

1. Press down on the hood and move the hood latch (A, Figure 64) to the left to release the hood latch.



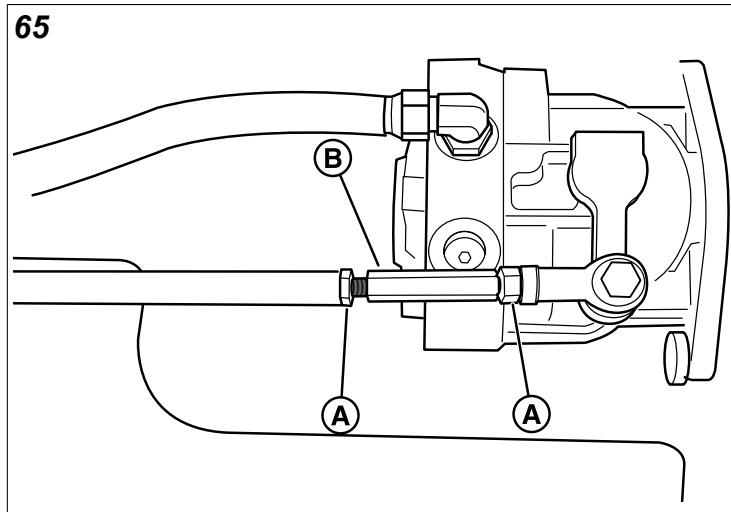
2. Open the hood.
3. The hood latch is spring loaded and will automatically latch the hood in place when the hood is closed.

## Neutral Adjustment

If the unit "creeps" while the ground speed control levers are locked in NEUTRAL, then it may be necessary to adjust the control linkage.

1. Park the unit on a flat, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key.
2. Loosen the jam nuts (A, Figure 65) and turn the adjustment linkage (B) to adjust. If the unit creeps

forward, turn the linkage **clockwise** (while standing at the rear of the unit, facing forward), if the unit creeps backward, turn the linkage **counter-clockwise**.



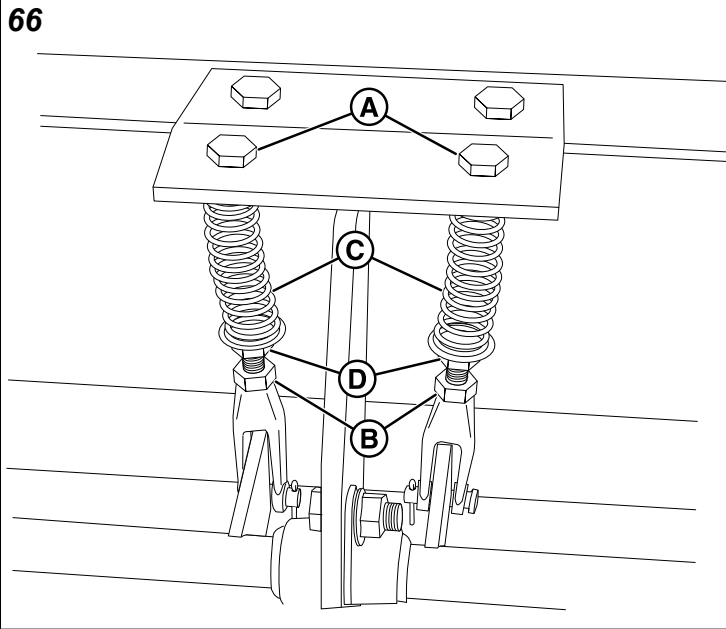
3. Lock the jam nuts when neutral is achieved.

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

## Neutral Position and Return Spring Adjustment

To determine if it is necessary to adjust the neutral position, perform the following steps:

1. Park the unit on a flat, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key.
2. Move the ground speed control levers in to the operating position, pull levers rearward, and release.
3. Move the ground speed control levers out towards the neutral position. If the levers do not align with the notches in the neutral lock plates, it is necessary to adjust the reverse return bolts (A, Figure 66).



### Neutral Position Adjustment

1. Loosen the jam nut (B, Figure 66) locked against the clevis.
2. Turn the reverse return bolt (A) **clockwise** to adjust handle rearward, **counter-clockwise** to adjust handle forward.
3. Pull lever rearward and release to check position again. Adjust as necessary to align levers with notches.
4. Once the lever alignment has been adjusted, lock jam nut against the clevis.

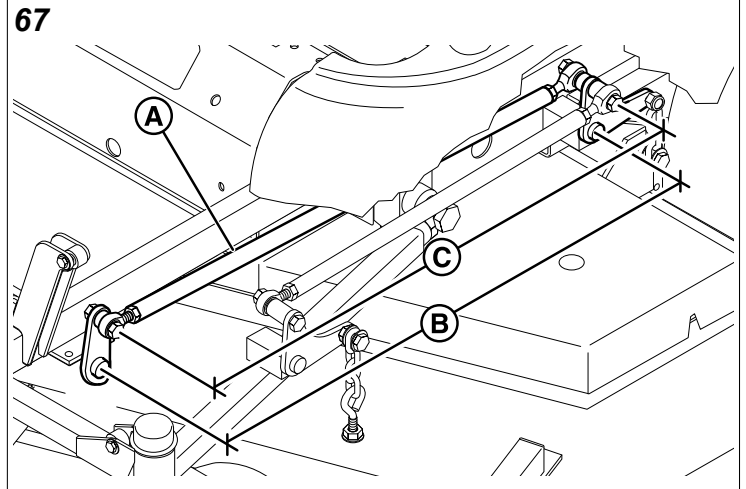
### Return Spring Adjustment

After adjusting the neutral position, lock the levers in the neutral position and measure the reverse return spring (C, Figure 66) length. This should be 2-3/8" (6,03 cm) long. If not, hold the reverse return bolt (A) with a wrench while turning the spring position nut (D) until the measurement is achieved.

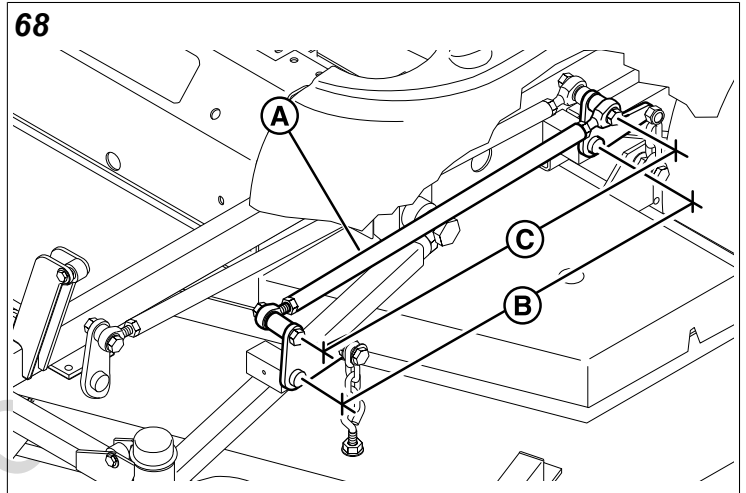
## Deck Lift Rod Timing Adjustment

### Checking the Deck Lift Rod Timing

1. Park the unit on a flat, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key. Verify the tires are inflated to the correct pressure.
2. To check the inner lift rod (A, Figure 67) timing, measure and record the distance between the inner lift pivots (B) and the inner rod pivots (C). Repeat for other side of unit.



3. To check the outer lift rod (A, Figure 68) timing, measure and record the distance between the outer lift pivots (B) and the outer rod pivots (C). Repeat for other side of unit.



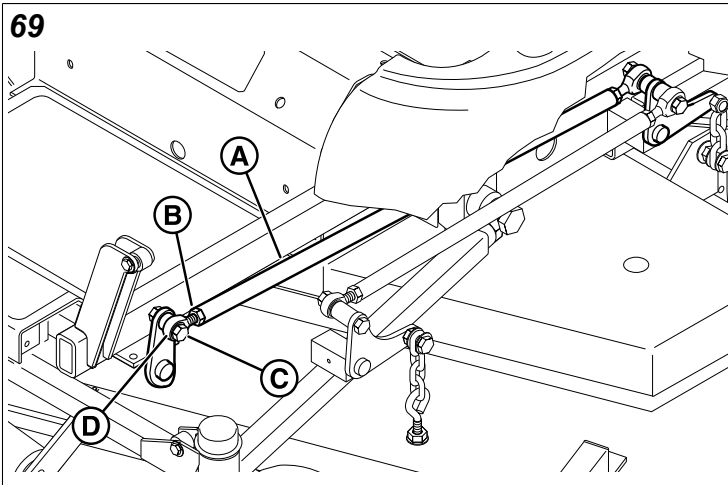
4. If the measurements for the inner rods are equal, and the measurements for the outer rods are equal, no further adjustment is required. If the measurements are NOT equal (greater than 1/8" (3,17 mm) difference), adjustment is required, continue with *Adjusting the Deck Lift Rod Timing*.

### Adjusting the Deck Lift Rod Timing

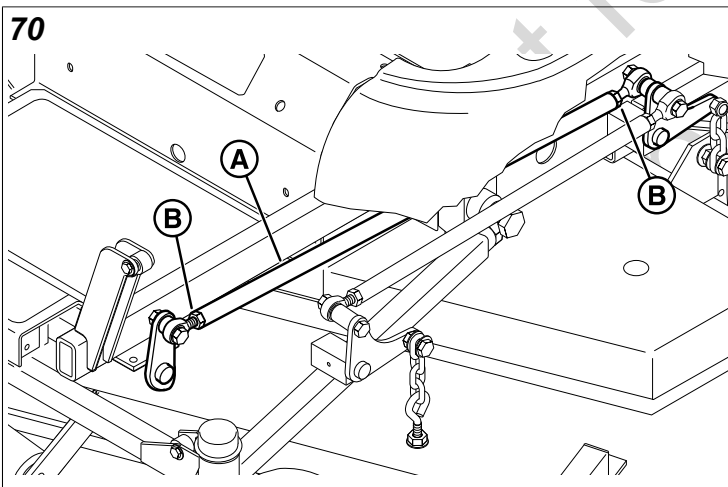
1. Fully depress the deck lift pedal to lock the cut height in the 6" (15,2 cm) position. Remove the cutting height adjustment pin and lower the mower deck.
2. To ensure that the deck is in the lowest position, push the pedal by hand towards the rear of the unit and install the height adjustment pin in the 3" (7.6 cm) position to hold in place.
3. Block up the mower deck until all deck lift linkages are slack.
4. To adjust the inner lift rod follow the directions below that apply to the serial number of your unit.

- **Serial Number Range 4001978818 and below:** To adjust the inner lift rod (A, Figure 69) loosen the jam nut (B) on the front ball joint (C) and then remove the

1/2" hardware (D) fastening the ball joint to the lift pivot arm. Turn the ball joint **clockwise** to shorten the distance between the rod pivots or **counter-clockwise** to lengthen the distance between the rod pivots. Install the ball joint on the lift pivot arm and secure with the 1/2" hardware previously removed. Tighten the jam nut against the lift rod.

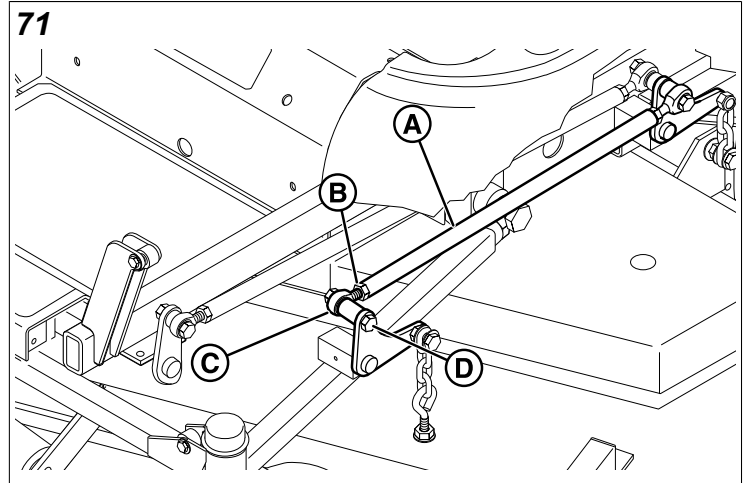


- **Serial Number Range 4001978819 and above:** To adjust the inner lift rod (A, Figure 70) loosen the jam nuts (B) and turn the lift rod to adjust. To shorten the rod length turn the rod **clockwise** (while standing at the rear of the unit, facing forward) to lengthen the rod length turn the rod **counter-clockwise**. Once the rod is adjusted correctly, lock the jam nuts.

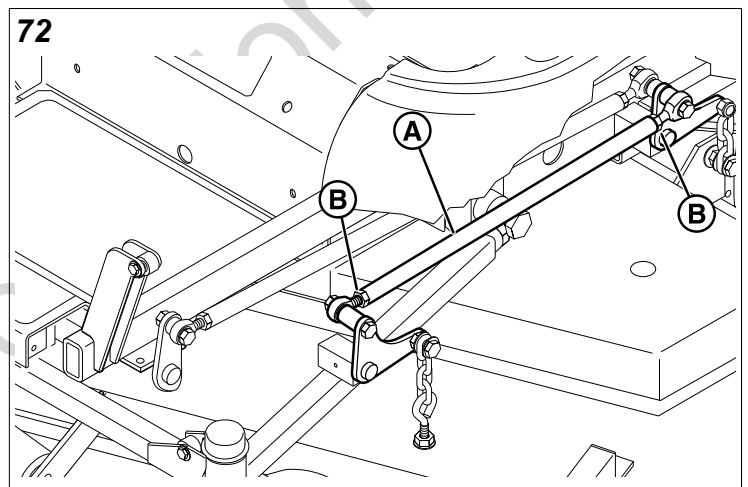


5. To adjust the outer lift rod follow the directions below that apply to the serial number of your unit.

- **Serial Number Range 4001978818 & Below:** To adjust the outer lift rod (A, Figure 71) loosen the jam nut (B) on the front ball joint (C) then remove the 1/2" hardware (D) fastening the ball joint to the lift pivot arm. Turn the ball joint **clockwise** to shorten the distance between the rod pivots or **counter-clockwise** to lengthen the distance between the rod pivots. Install the ball joint on the lift pivot arm and secure with the 1/2" hardware previously removed. Tighten the jam nut against the lift rod.



- **Serial Number Range 4001978819 and above:** To adjust the outer lift rod (A, Figure 72) loosen the jam nuts (B) and turn the lift rod to adjust. To shorten the rod length turn the rod **clockwise** (while standing at the rear of the unit, facing forward) to lengthen the rod length turn the rod **counter-clockwise**. Once the rod is adjusted correctly, lock the jam nuts.



6. Remove blocks from under the mower deck.
7. Remove the cutting height adjustment pin from in front of the deck lift pedal arm. Lift mower deck and install the cutting height adjustment pin in the desired cutting height.

## Deck Leveling Adjustment

Before adjusting the deck level, the deck lift rod timing must be checked and/or adjusted.

### Determining if the Deck Leveling Needs to be Adjusted

1. Park the unit on a flat, level surface. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key.
2. Lock the deck lift pedal in the TRANSPORT position. Place the cutting height adjustment pin in the 4" position and lower the deck lift pedal until the deck lift arm contacts the cutting height adjustment pin.
3. Verify that the tires are inflated to the correct pressure.



- Verify that the mower blades are flat, and not bent or broken. A bent or broken blade must be replaced.

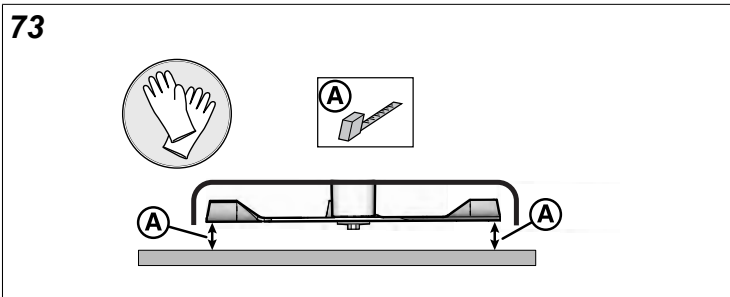


### WARNING

#### Avoid Injury! Mower blades are sharp.

Always wear gloves when handling blades or working near blades.

- See Figure 73. Position the outside mower blades so they face front-to-back.

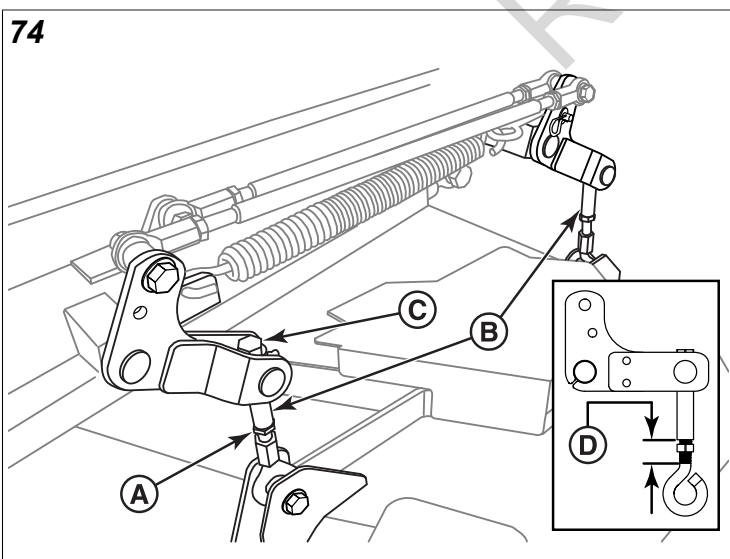


- Measure the front tip (A, Figure 73) of the blade from the cutting edge to the ground.
- Measure the rear tip (A) of the blade from the cutting edge to the ground.
- Repeat the process on the other side of the machine.
  - the front measurements should equal 4" (10,2 cm).
  - the rear measurements should equal 4-1/4" (10,8 cm)

If the measurements do not equal the measurements as listed above, adjust the deck leveling.

### Deck Leveling Procedure

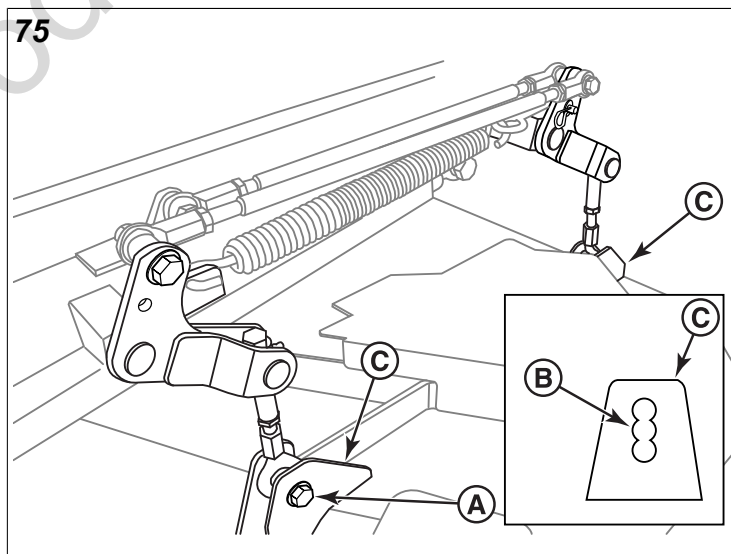
- Place the deck height adjustment pin in the 4" (10,2 cm) position.
- Loosen the jam nut (A, Figure 74) on the deck linkages (B).



- Turn the hex adjusters on the deck linkages (C) **clockwise** to raise the mower deck or **counter-clockwise** to lower the mower deck.

*Note:* If you are lowering the mower deck measure the amount of visible threads (D) on the deck linkages. If the amount of visible threads shown reaches 2" (5,1 cm) for the front linkages or 1-1/2" (3,8 cm) for the rear linkages, do not lower the mower deck by adjusting the deck linkage any further.

- Re-check the measurements from the tips of the mower blades to the ground. The front measurements should equal 4" (10,2 cm) and the rear measurements should equal 4-1/4" (10,8 cm).
  - if the measurements are correct, tighten the jam nuts on the deck linkages. The adjustment procedure is complete.
  - If the measurements are not correct, the hole that the deck linkage is mounted in on the mower deck will have to be changed.
- Place blocking underneath all four corners of the mower deck.
- Re-position the hardware (A, Figure 75) that secures the deck linkage to the mower deck.
  - If the mower deck was being raised when it was unable to achieve the correct measurements, position the hardware in the next lower hole (B) in the mower deck mount (C).
  - If the mower deck was being lowered when it was unable to achieve the correct measurements, position the hardware in the next higher hole in the mower deck mount.



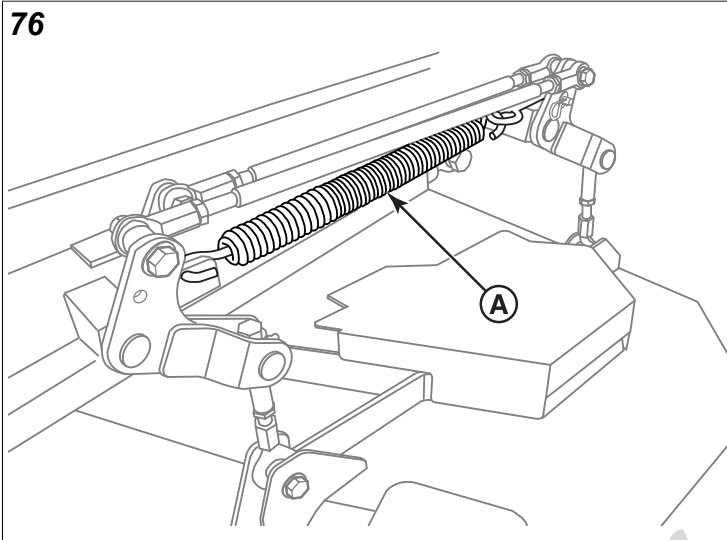
- Remove the blocking from under the mower deck.
- Re-check the measurements from the tips of the mower blades to the ground. The front measurements should equal 4" (10,2 cm) and the rear measurements should equal 4-1/4" (10,8 cm).
  - if the measurements are correct, tighten the jam nuts on the deck linkages. The adjustment procedure is complete.

- If the measurements are not correct, turn the hex adjusters on the deck linkages until the measurements are correct.

9. Tighten the jam nuts on the deck linkages.

## Deck Lift Assist Springs

Some models are equipped with deck lift assist springs (A, Figure 76) that assist the operator in raising the mower deck with the deck lift pedal. The deck lift assist springs are factory set to provide optimal lifting performance.

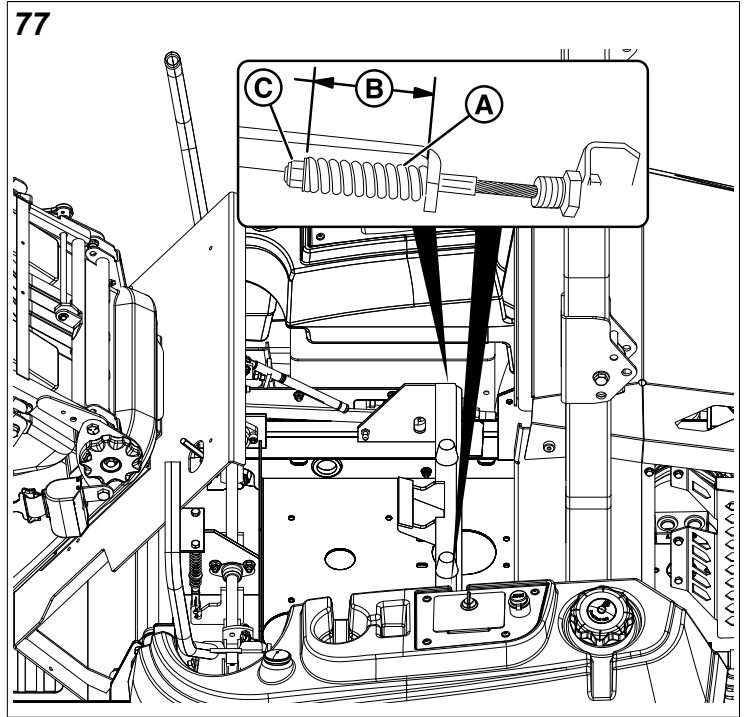


Although it is fastened with a multi-position anchor, this is **not an adjustment point**.

Do NOT attempt to adjust the spring length or lifting performance will be compromised.

## Parking Brake Adjustment

1. Park the unit on a flat, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key.
2. Lock the front wheels of the unit.
3. Locate the upper brake spring (A, Figure 77) through the opening under the fuel tanks.



4. With the parking brake engaged, measure the compressed spring length (B). The spring should be 2" - 2-1/8" (5,0 - 5,4 cm) when compressed.
5. If adjustment is required, disengage the parking brake, and turn the adjustment nut (C).
6. Engage the parking brake and measure the spring.
7. Repeat this process until the measurement is achieved.



### CAUTION

Do not adjust the spring to be shorter than 2" (5,0 cm) when compressed. This may damage the brake caliper.

## Suspension Adjustment

The shock assembly can be adjusted to vary the amount of pre-load applied to the springs. This allows the operator to maintain the ride height.

Use less pre-load for light weight operators. Use more pre-load for heavy weight operators.

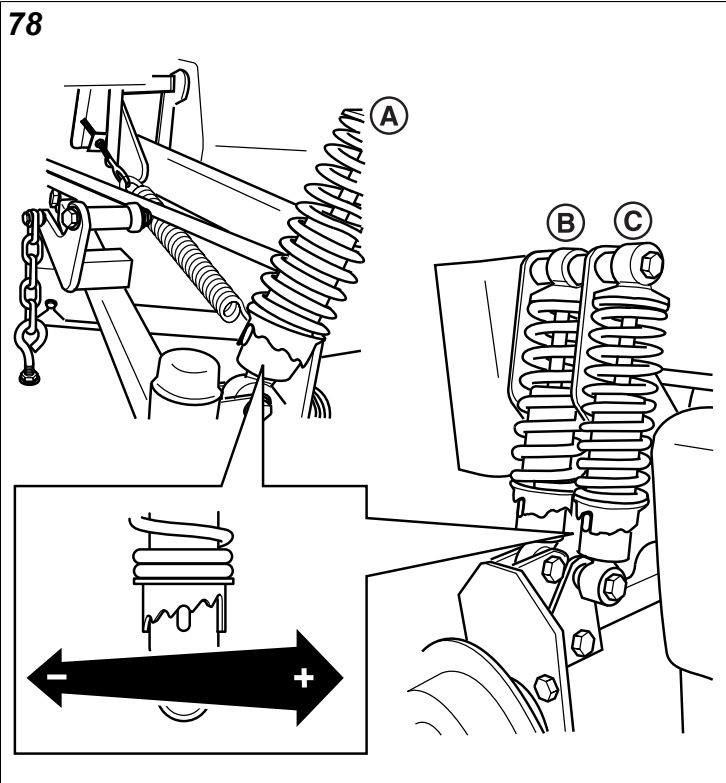
### To adjust the spring pre-load:

1. Park the unit on a flat, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key.



### WARNING

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



- See Figure 78. 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 with both hands, turn **clockwise** to decrease the pre-load, turn **counter-clockwise** to increase the pre-load. Make sure that for each pair of shocks (A, B or C, Figure 78) that the left-hand and right-hand are set to the same amount of pre-load.

*Note:* Spanner wrench is located under the seat. Rear tires must be removed to adjust the rear suspension.

## Rear Tire Camber Adjustment

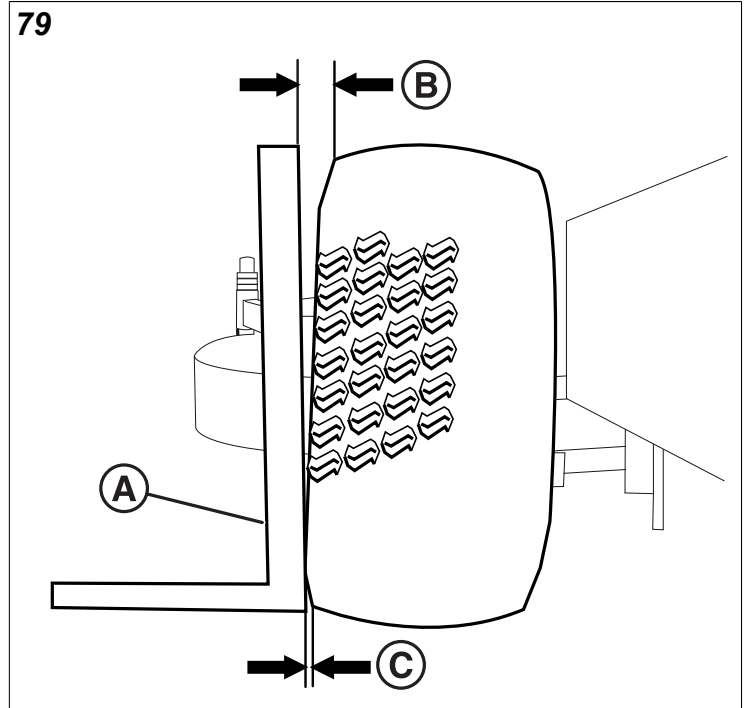
The rubber bushings in the cast A-arms may stretch and wear with time and adversely affect the angle that the rear tire runs against the ground.

To evaluate if the rear tire camber should be adjusted, park the unit on a flat, level surface and view the unit from behind. If you can visually notice that the top of either rear tire is angled towards the unit, then the rear tire camber needs to be adjusted.

To adjust the camber you will need to order and install the correct amount of camber shims (part number 5100332) for each tire that needs to be adjusted from your dealer. Shims should only be installed in even numbered quantities.

### To discover how many shims are needed:

- Park the unit on a flat, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key.
- Place a carpenters square (A, Figure 79) against the rear tire. The bulge in the sidewall will not allow the square to contact the bottom outside edge of the tire where it first contacts the ground.



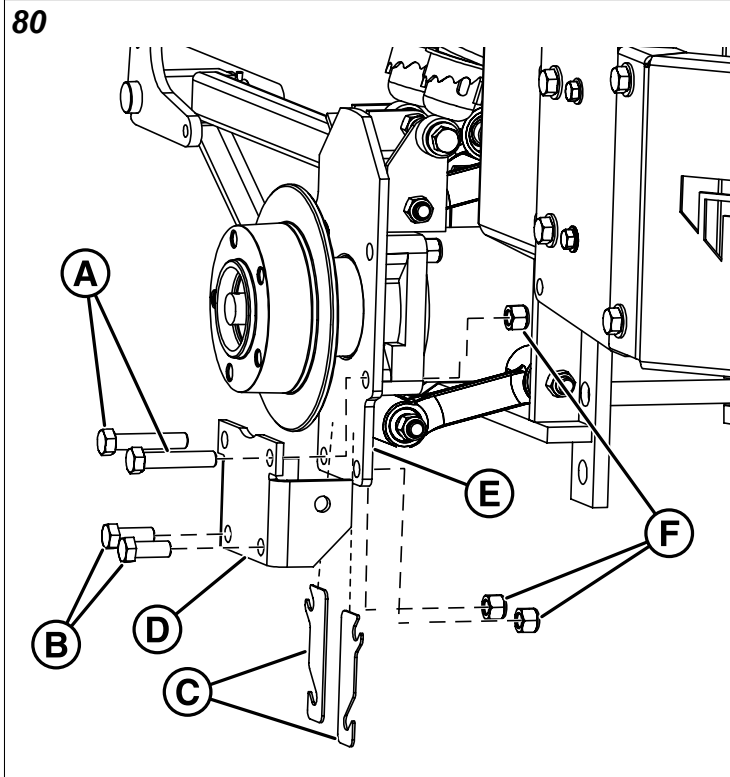
- Measure and record the distance from the carpenters square to the top of the tire (B). Measure and record the distance from the carpenters square to the bottom of the tire (C). Subtract the bottom measurement from the top measurement and reference the chart below for the number of shims that are needed. If the measurement is greater than .75" (1,91 cm) contact your dealer.

Distance Measured	Number of Shims Needed
0.2" (0,51 cm)	2
0.4" (1,04 cm)	4
0.6" (1,52 cm)	6

## Installing the Camber Shims

- Park the unit on a flat, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key.
- Jack up the rear of the machine and secure with jack stands. Remove the rear tire.
- Loosen but do not remove the two (2) 1/2-20 X 3" bolts (A, Figure 80) and the (2) 1/2-20 X 1-3/4" bolts (B).

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4. Install the new camber shims (C) between the adjustable A-arm mount (D) and the rigid A-arm mount (E). The bottom of the slots on the camber shim should rest snugly against the shaft of the 1/2-20 X 3" bolts and the 1/2-20 X 1-3/4" bolts.
5. Tighten the two (2) 1/2-20 X 3" bolts and the (2) 1/2-20 X 1-3/4" bolts.
6. Install the tire.

## Long Left Hand Deck Belt Replacement

**NOTICE** To avoid damaging belts, **do not pry over pulleys.**

1. Park the unit on a flat, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key.
2. Lower the mower deck to its lowest cutting position and remove the mower deck guards and floor pan to gain access to the mower deck drive belts.

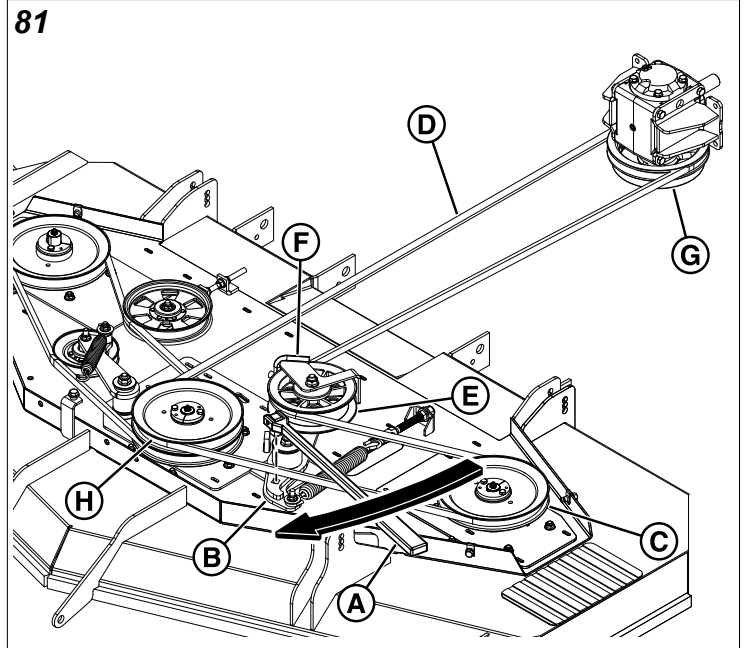


### WARNING

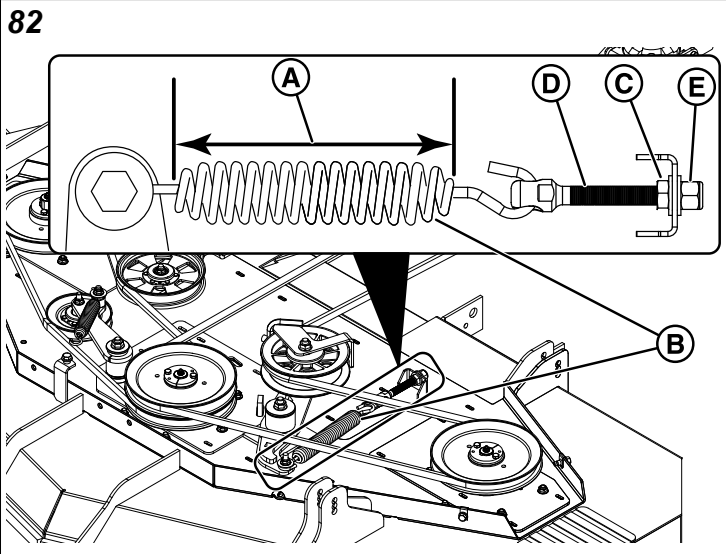
**Use extreme caution when rotating the idler arm with the breaker bar, due to the increased tension in the spring as the idler arm is being rotated. Injury may result if the breaker bar is prematurely released while the spring is under tension.**

3. Using a 1/2" breaker bar (A, Figure 81) place the square end in the opening in the gear box drive idler arm (B) and rotate the idler arm **clockwise**, which will relieve tension on the belt exerted from the idler arm. Remove the belt from the left hand side spindle pulley (C). Carefully release the tension on the breaker bar.

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4. Pull the slack of the belt towards the center of the deck and then remove the long left hand belt (D) from the adjustable idler pulley (E) and its belt guide (F).
5. Remove the old long left hand belt from the gear box drive pulley (G) and the top groove of the center spindle pulley (H).
6. Install the new long left hand belt onto the gearbox drive pulley and the center spindle pulley.
7. Install the long left hand belt into the belt guide on the adjustable idler pulley.
8. Verify that the V-side of the belt runs in the pulley grooves of the center spindle pulley and the gearbox drive pulley. Make sure that the back side of the belt contacts the face of the adjustable idler pulley. Make sure that the belt is correctly routed in the belt guide.
9. Using a 1/2" breaker bar place the square end in the opening in the gearbox drive idler arm and rotate the idler arm **clockwise**, which will relieve tension on the belt exerted from the idler arm. Install the long left hand belt onto the left hand spindle pulley. Carefully release the tension on the breaker bar.
10. Set the mower deck to the 3-1/2" (8,9 cm) cutting position.
11. Measure the coil-to-coil length (A, Figure 82) of the long left hand belt tensioning spring (B). The measurement should equal 10-1/4" (26 cm) ± 1/8 (0,32 cm). If not, loosen the jam nut (C) on the eye bolt (D) and then turn the adjustment nut (E) until the measurement is achieved. Tighten the jam nut.



12. Re-install the mower deck guards and the floor pan.
13. Run the mower under no-load condition for about five (5) minutes to break in the new belts.

## Short Right Hand Deck Belt Replacement (72" Mower Decks)

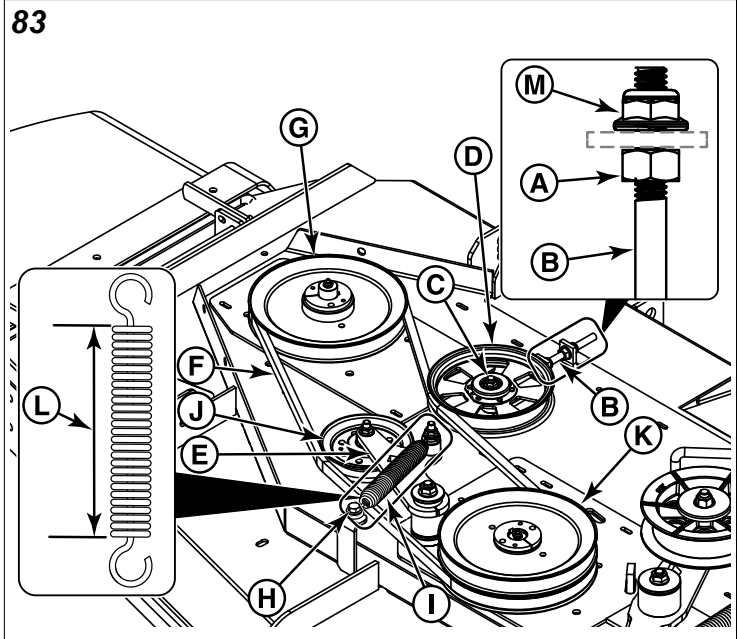
**NOTICE** To avoid damaging belts, **do not pry over pulleys.**

1. Park the unit on a smooth level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key.
2. Lower the mower deck to its lowest cutting position and remove the mower deck guards and floor pan to gain access to the mower deck drive belts.
3. Remove the long left hand deck belt. See *Long Left Hand Deck Belt Replacement* for removal instructions.

### WARNING

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

4. Loosen the jam nut (A, Figure 83) on the carriage bolt (B) and the 3/8" nut (C) that secure the rear idler pulley (D) to the deck. This will allow the rear idler pulley to move in its adjustment slot allowing the belt to be removed.

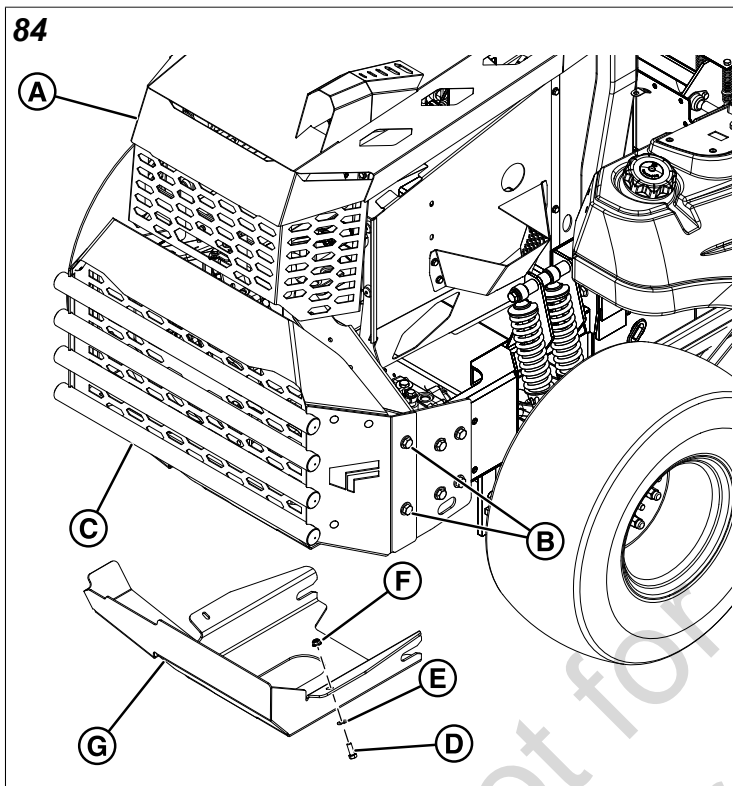


5. Rotate the spindle drive idler arm (E) **clockwise**, which will relieve the tension on the short right hand belt (F) exerted from the idler arm. Remove the belt from the rear back side idler pulley and then the right hand spindle pulley (G). Carefully release the tension on the idler arm.
6. Remove the spring anchor hardware (H) that anchors the idler arm spring (I) to the mower deck.
7. Remove the old short right hand belt from the front idler pulley (J) and the center spindle pulley (K).
8. Install the new short right hand belt onto the center spindle pulley and the front idler pulley.
9. Re-connect the idler arm spring. Install the 3/8 washer and then the spacer onto the shaft of the 3/8 bolt. Install the hook of the idler arm spring around the body of the spacer and then install the bolt into the spring anchor tab and then secure with the 3/8 nylock flange nut.
10. Rotate the spindle drive idler arm **clockwise**, which will relieve tension on the belt exerted from the idler arm. Re-install the belt on the right hand spindle pulley and then the rear back side idler pulley. Make sure that the V-side of the belt runs in grooves of the spindle pulleys and the front idler pulley and that back side of the belt contacts the face of the back side idler pulley. Carefully release the tension on the idler arm.
11. Set the mower deck to the 3-1/2" (8,9 cm) cutting position.
12. Measure the coil-to-coil length (L) of the idler arm spring. The measurement should equal 6-3/8" (16,2 cm) ± 1/8 (0,32 cm). If not, turn the adjustment nut (M) until the measurement is achieved.
13. Tighten the jam nut and the 3/8" nut that secures the rear back side idler pulley to the deck.
14. Re-install the long left hand deck belt. See *Long Left Hand Deck Belt Replacement* for re-installation instructions.
15. Re-install the mower deck guards and the floor pan.

- Run the mower under no-load condition for about five (5) minutes to break in the new belts.

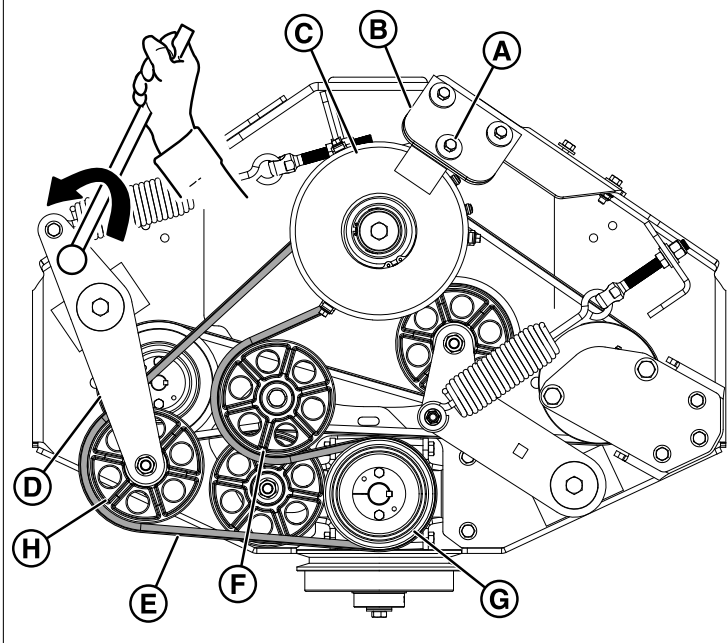
## PTO Clutch Drive Belt Replacement

- Park the unit on a flat, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key.
- Release the hood latch and raise the hood (A, Figure 84).



- Remove the four (4) 1/2 bolts, washers, and nuts (B) that secure the rear bumper assembly (C) to the unit.
- Remove the rear bumper assembly from the unit.
- Remove the two (2) 3/8 bolts (D), washers (E), and nuts (F) that secure the skid plate (G) to the unit.
- Remove the skid plate from the unit.
- Remove the hardware (A, Figure 85) that fastens the clutch anchor pad (B) to the clutch (C). Disconnect the wire harness from the PTO clutch.

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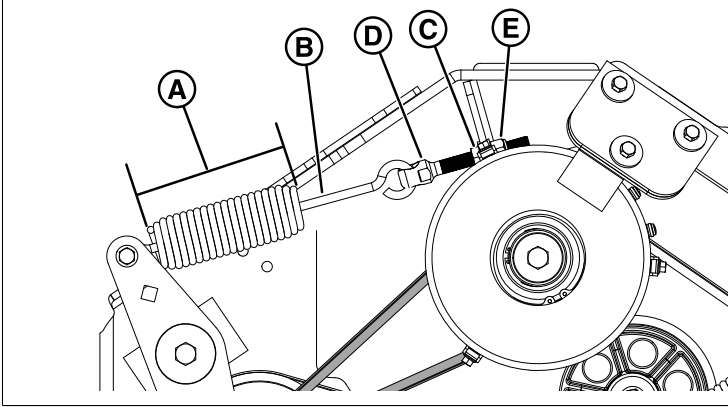


### WARNING

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

- Using a 1/2" breaker bar, place the square end in the square hole located in the idler arm (D). Carefully rotate the idler arm **counter-clockwise** which will relieve the tension on the belt (E) exerted from the idler arm.
- Remove the belt from the stationary idler pulley (F) and the gearbox pulley (G).
- Carefully release the tension on the breaker bar until the idler arm stops movement.
- Remove the belt from the adjustable idler pulley (H) and the PTO clutch pulley.
- Install the new belt on the PTO clutch pulley and the adjustable idler pulley making sure that the V-side of the belt runs in the grooves of the pulley.
- Carefully rotate the idler arm with the breaker bar **counter-clockwise** and install the V-side of the belt in the grooves of the gearbox pulley and the backside of the belt against the face of the stationary idler pulley.
- Carefully release the tension on the breaker bar.
- Install the clutch anchor pad to the clutch with the hardware previously removed. Connect the wire harness to the PTO clutch and make sure that the wires are clear of any moving parts.
- Measure the coil-to-coil length (A, Figure 86) of the belt tensioning spring (B). The measurement should equal 8-1/4" (20,9 cm). If not, adjust the spring length.

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17. Loosen the jam nut (C) on the spring anchor (D).
18. Turn the adjustment nut (E) until the measurement of 8-1/4" (20,9 cm) is achieved.
19. Tighten the jam nut.
20. Install the skid plate and rear bumper assembly.
21. Lower the hood into place and make sure it latches.

## Pump Drive Belt Replacement

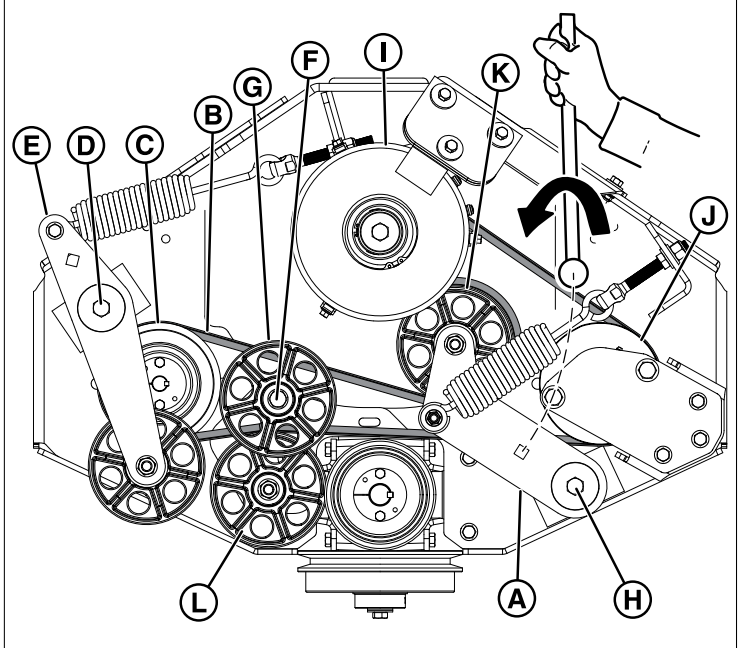
1. Park the unit on a flat level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn the ignition switch to OFF, and remove the ignition key.
2. Remove the PTO clutch drive belt. See *PTO Clutch Drive Belt Replacement* for removal instructions.

### WARNING

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

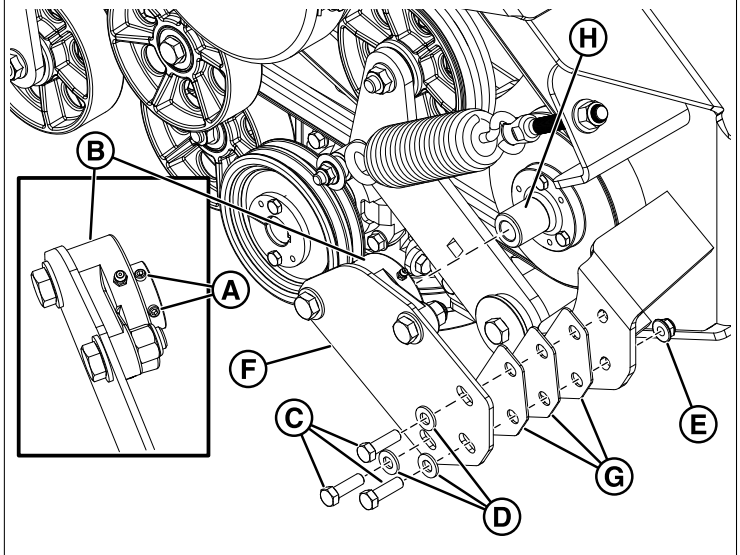
3. Using a 1/2" breaker bar, place the square end in the opening located in the idler arm (A, Figure 87). Carefully rotate the breaker bar **counter-clockwise**, which will relieve the tension on the belt (B) exerted from the idler arm.

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4. Remove the belt from the left hand pump drive pulley (C).
5. Carefully release the tension on the breaker bar.
6. Loosen, but do not remove, the hardware (D) that secures the PTO clutch belt idler arm (E).
7. Loosen, but do not remove, the hardware (F) that secures the stationary idler pulley (G).
8. Loosen, but do not remove, the hardware (H) that secures the pump drive belt idler arm (A).
9. Loosen the two (2) set screws (A, Figure 88) on the pump support bearing (B).

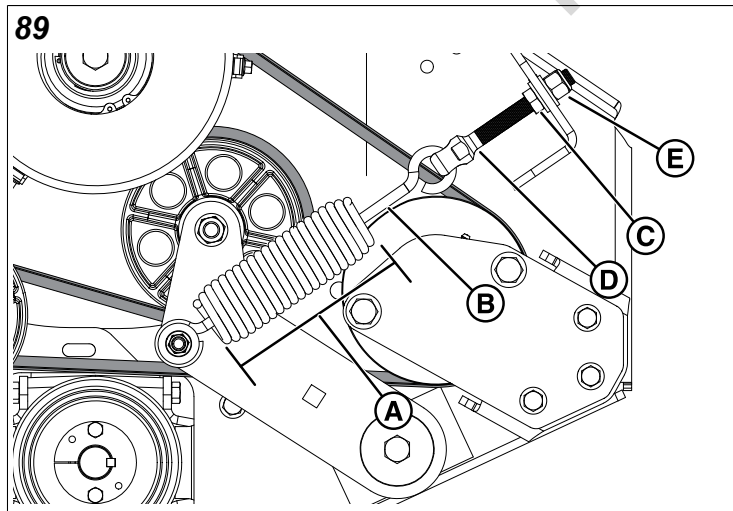
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10. Remove the three (3) 3/8" bolts (C), washers (D), and nuts (E) that secure the bearing support plate assembly (F) and the spacer shims (G) from the unit.

Note: The spacers shims are added as needed for proper alignment during manufacturing. Figure 88 depicts three (3) shims but your unit might have a different number of shims.

11. Remove the belt from the unit.
12. Install the belt onto the pump drive pulley (I, Figure 87), the right hand pump pulley (J), and the adjustable idler pulley (K). Make sure that the V-side of the belt aligns with the grooves of the pump drive pulley and the right hand pump pulley and that the back side of the belt contacts the face of the adjustable idler pulley.
13. Align the pump support bearing (B, Figure 88) with the shaft (H) on the right hand pump pulley.
14. Secure the pump support bearing to the unit using the three (3) 3/8" bolts (C), washers (D), and nuts (E) that were previously removed.
15. Verify that the pump support bearing is properly aligned onto the shaft on the right hand pump pulley and then tighten the two (2) set screws (A).
16. Using a 1/2" breaker bar, place the square end in the opening located in the idler arm (A, Figure 87). Carefully rotate the breaker bar **counter-clockwise**.
17. Install the belt onto the left hand pump pulley (C) and the stationary idler pulley (L). Make sure the the V-side of the belt aligns with the grooves of the left hand pump pulley and that the backside of the belt contacts the face of the stationary idler pulley.
18. Carefully release the tension on the breaker bar.
19. Tighten the hardware (D) that secures the PTO clutch belt idler arm (E).
20. Tighten the hardware (F) that secures the stationary idler pulley (G).
21. Tighten the hardware (H) that secures the pump drive belt idler arm (A).
22. Measure the coil-to-coil length (A, Figure 89) of the belt tensioning spring (B). The measurement should equal 8" (20,3 cm). If not, adjust the belt spring length.

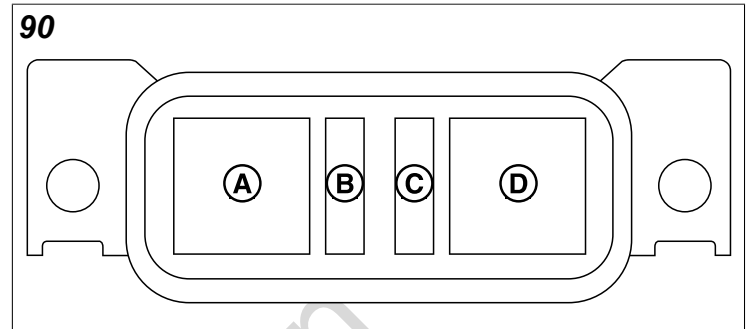


23. Loosen the jam nut (C) on the spring anchor (D).

24. Turn the adjustment nut (E) until the measurement of 8" (20,3 cm) is achieved.
25. Install the PTO clutch drive belt. See *PTO Clutch Drive Belt Replacement* for installation instructions.

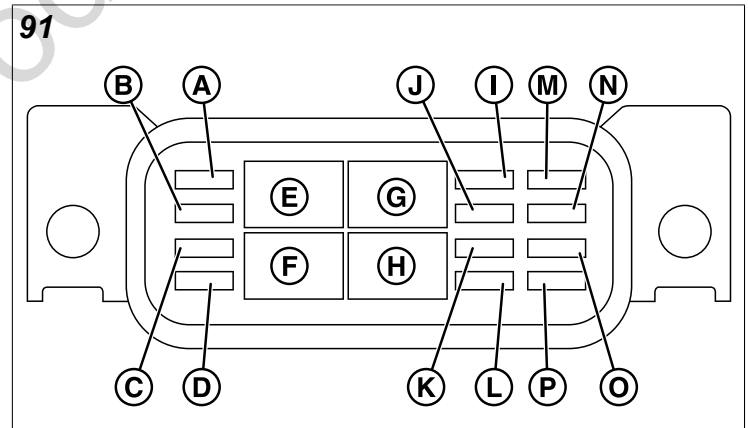
## Fuse Location and Identification

The electrical system for this unit is equipped with two (2) fuse boxes that contain several fuses and relays. The fuse boxes can be accessed by releasing the seat latch and raising the seat plate. The fuse boxes are located on the frame rail in front of the radiator screen. See the charts and figures below for the circuit and amperage of the fuses.



Fuse Block One (Figure 90)

Callout	Function	Amperage	Fuse/Relay
A	Start	80 amp	Relay
B	Start	20 amp	Fuse
C	Glow Plugs	25 amp	Fuse
D	Glow Plugs	80 amp	Relay



Fuse Block Two (Figure 91)

Callout	Function	Amperage	Fuse/Relay
A	Spare	5 amp	Fuse
B	Spare	10 amp	Fuse
C	Spare	20 amp	Fuse
D	Fuel Pump Relay Coil	5 amp	Fuse
E	Engine	35 amp	Relay
F	Spare	35 amp	Relay
G	PTO	35 amp	Relay
H	Fuel Pump	35 amp	Relay
I	PTO	20 amp	Fuse



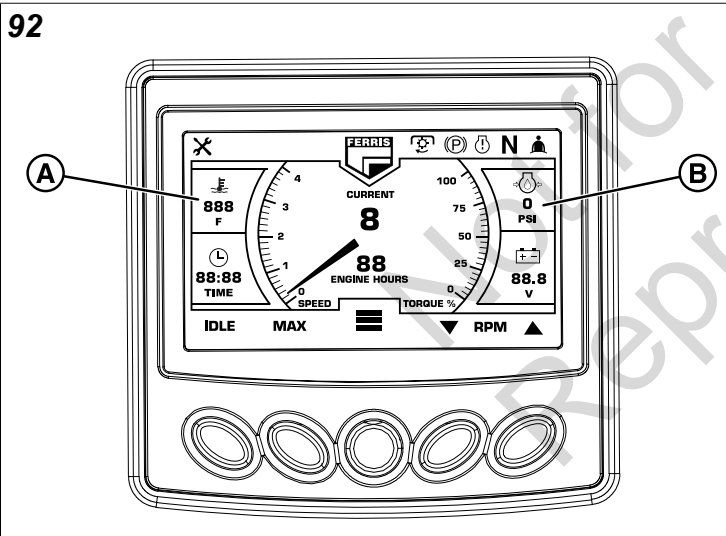
Callout	Function	Amperage	Fuse/Relay
J (S/N: 4002317666 and below)	12 Volt Outlet	20 amp	Fuse
J (S/N: 4002317667 and above)	USB Port	5 amp	Fuse
K	Engine	30 amp	Fuse
L	Cat Tool	5 amp	Fuse
M	Display	2 amp	Fuse
N	Key	5 amp	Fuse
O	Disconnect Lamp	5 amp	Fuse
P	Fuel Pump	10 amp	Fuse

## Deck Shut Down Module

This unit is equipped with a deck shut down module that will automatically shut down the mower deck if the engine loses oil pressure or begins to overheat.

### What to do if the deck shuts down during operation:

- Immediately check the digital display panel to see if
  - the water temperature gauge (A, Figure 92) has turned RED and/or is reading a high temperature or;
  - the oil pressure gauge (B) has turned RED and/or is reading a low PSI.



**If the oil pressure gauge has turned RED and/or is reading a low PSI:**

- Shut the unit off immediately and see your dealer.

**If the water temperature gauge has turned RED and/or reads a high temperature:**

- Move the ground speed controls levers to the neutral position, disengage the PTO switch, engage the parking brake, and reduce to half throttle speed. Leave the engine running so the radiator fan will continue to run and coolant continues to circulate.
- Check the engine coolant level. See *Check the Engine Coolant Level*. Add coolant if necessary.
- Check to see if the radiator screen is dirty or plugged. See *Clean the Radiator and Screen*. Clean radiator screen if necessary.

- If these procedures do not cause the engine to begin to cool down, shut the unit off and see your dealer.

### After the problem has been resolved:

- The PTO switch must be disengaged before it can be re-engaged.

## Cleaning the Battery and Cables

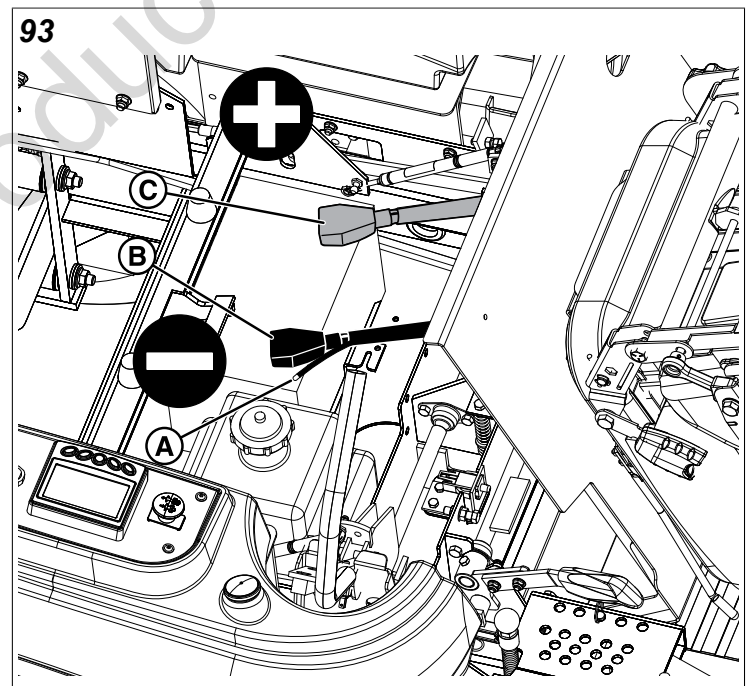
This unit is equipped with a maintenance-free 691MF battery.



**Keep open flames and sparks away from the battery.**

- Keep open flames and sparks away from the battery.
- Be careful when handling the battery.
- Keep flames and sparks away from the battery.
- 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.

1. Release the seat latch and raise the seat plate to access the battery.
2. This unit is equipped with a warning light (A, Figure 93) that will illuminate when it is not safe to remove the battery cables. Wait for the warning light to shut off before removing the battery cables.



3. Disconnect the cables from the battery, negative [-] cable first (B).
4. Clean the battery terminals and cable ends with a wire brush until shiny.
5. Install the battery and attach the battery cables, positive [+] cable first (C).
6. Coat the cable ends and the battery terminals with petroleum jelly or non-conducting grease.

## 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, have the battery serviced by your dealer.
  2. Always unplug or turn the charger off before attaching or removing the clamp connections.
  3. Carefully attach the clamps to the battery in proper polarity (usually red to [+] positive and black to [-] negative).
  4. Turn the charger voltage adjustment to the proper voltage. Set the charger to the "automatic charging" setting for maintenance-free batteries. Plug the charger into an electrical outlet as far away from the battery as possible.
  5. Unplug the charger once it has charged the battery and has shut itself off. Remove the negative (black) charger cable first by squeezing the alligator clip. Remove the positive (red) charger cable from the battery in the same fashion.

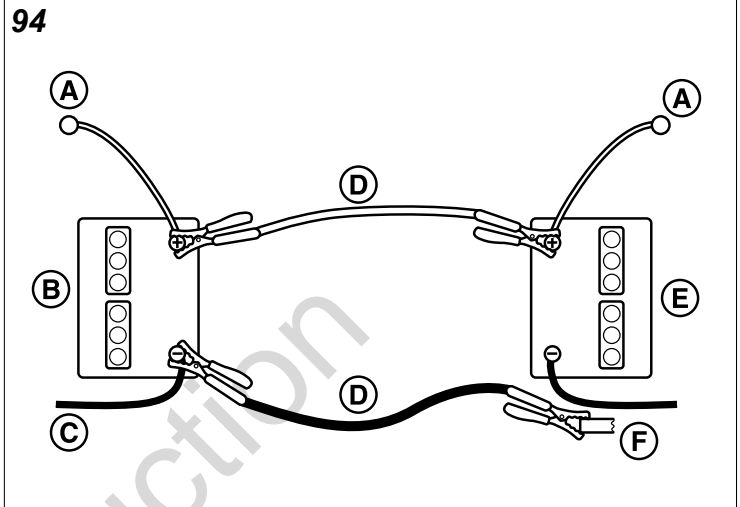
### Jump Starting With Auxiliary (Booster) Battery

Jump starting is not recommended. However, if it must be done, follow these directions. Both booster and discharged batteries should be treated carefully when using jumper cables. Follow the steps below EXACTLY, being careful not to cause sparks. Refer to Figure 94.

### 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.

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



**This hook-up is for negative grounded vehicles.**

Callout	Description
A	To Starter Switch
B	Starting Vehicle Battery
C	To Ground
D	Jumper Cable
E	Discharged Vehicle Battery
F	Engine Block

**Make sure vehicles do not touch.**

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.



Any procedure other than the preceding could result in:

- (a) personal injury caused by electrolyte squirting out the battery vents,
- (b) personal injury or property damage due to battery explosion,
- (c) 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.

## 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 to operating properly.

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

Refer to **Maintenance Procedures** 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.



Remove ignition key prior to performing maintenance on the unit.

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

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

## Troubleshooting Charts

### Troubleshooting the Zero-Turn Rider

Problem: Engine will not turnover or start.	
Cause	Remedy
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 fill the fuel tanks. Prime the fuel system.
Ground speed control levers not locked in neutral position.	Position the ground speed control levers in the NEUTRAL position.
Operator not in seat.	Assume operator's position in seat.
Glow plugs not pre-heated.	Pre-heat the glow plugs.
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 and replace broke or frayed wires. Tighten loose connections.
Solenoid or starter motor faulty.	See authorized service dealer.
Safety interlock switch faulty.	Replace as needed. See authorized service dealer.
Water in fuel.	Drain fuel and replace with fresh fuel.
Fuel is old or stale.	Drain fuel and replace with fresh fuel.

Problem: Engine starts hard or runs poorly.	
Cause	Remedy
Fuel mixture too rich.	Clean air filter.
Air in the fuel system.	Prime the fuel system.

Problem: Engine knocks.	
Cause	Remedy
Low engine oil level.	Check/Add engine oil as required.
Using wrong grade oil.	See the engine manufacturer's operator's manual.

Problem: Excessive oil consumption.	
Cause	Remedy
Engine running too hot.	Clean radiator screens and air cleaner.
Using wrong weight oil.	See the engine manufacturer's operator's manual.
Too much engine oil in crankcase.	Drain excess engine oil.

<b>Problem: Engine exhaust is black.</b>	
Cause	Remedy
Dirty air filter.	Replace air filter. See the engine manufacturer's operator's manual.
Air in the fuel system.	Prime the fuel system.

<b>Problem: Engine runs but unit will not drive.</b>	
Cause	Remedy
Hydraulic pump dump valve(s) in "open" position.	Turn dump valve(s) <b>clockwise</b> to close. Torque to 80-120 in-lbs (9-13,5 Nm).
Belt is broken.	See <i>Pump Drive Belt Replacement</i> .
Drive belt slips.	See problem and cause below.
Brake is not fully released.	See authorized service dealer.

<b>Problem: Unit drive belt slips.</b>	
Cause	Remedy
Pulleys or belt greasy or oily.	Clean as required.
Belt tension is too loose.	Adjust spring tension. See <i>Pump Drive Belt Replacement</i> .
Belt stretched or worn.	Replace belt.

<b>Problem: Parking brake will not hold.</b>	
Cause	Remedy
Brake is incorrectly adjusted.	See <i>Parking Brake Adjustment</i> .
Brake pads worn.	Replace with new brake pads.

<b>Problem: Unit steers or handles poorly.</b>	
Cause	Remedy
Steering linkage is loose.	Check and tighten any loose connections.
Improper tire inflation.	See <i>Checking Tire Pressures</i> .

<b>Problem: Engine RPMs cannot be changed.</b>	
Cause	Remedy
Diesel particulate filter needs to be cleaned.	See <i>Regen Process (Clean Diesel Particulate Filter)</i> .

## Troubleshooting the Mower

<b>Problem: Mower Deck will not raise.</b>	
Cause	Remedy
Deck Lift Linkage not properly attached or damaged.	See authorized service dealer.
Leak in the hydraulic system.	See authorized service dealer.

<b>Problem: Engine stalls easily with the mower deck engaged.</b>	
Cause	Remedy
Engine speed too slow.	See engine speed to full throttle.
Ground speed too fast.	Decrease ground speed.
Cutting height set too low.	Cut tall grass at a higher cutting height during the first pass and then lower deck and cut again.
Discharge chute jamming with cut grass.	Cut grass with discharge pointing towards previously cut area.

<b>Problem: Excessive mower vibration.</b>	
Cause	Remedy

<b>Problem: Excessive mower vibration.</b>	
Blade mounting bolts are loose.	Tighten the blade mounting bolts to 120 ft-lbs (163 Nm).
Mower blades, spindles, or pulleys are bent.	Check and replace as necessary.
Mower blades are out of balance.	Remove, sharpen, and balance blades. See <i>Servicing the Mower Blades</i> .
Belt installed incorrectly.	Install belt correctly.

<b>Problem: Excessive belt wear or breakage.</b>	
Cause	Remedy
Bent or rough pulleys.	Repair or replace.
Using incorrect belt.	Replace with correct belt.
Incorrect belt tension.	Adjust the correct tension.

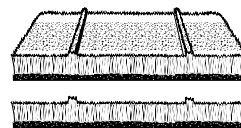
<b>Problem: Mower drive belt slips or fails to drive.</b>	
Cause	Remedy
Incorrect belt tension.	Adjust to the correct belt tension.
Drive belt is broken.	Replace with a new belt.

<b>Problem: Mower deck does not engage.</b>	
Cause	Remedy
Electrical wiring damage.	Locate and repair damaged wire.
Battery voltage too low.	Recharge battery and check alternator. See <i>Battery Service</i> .

<b>Problem: Mower disengages during operation and will not re-engage (See <i>Deck Shut Down Module</i>).</b>	
Cause	Remedy
Unit has overheated.	Allow the engine to cool, disengage the mower deck, and then re-engage the mower deck.
Unit has lost oil pressure.	Shut the unit down and see authorized service dealer.

## Troubleshooting Common Cutting Problems

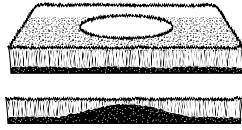
<b>Problem: Streaking</b>	
Streaking is when thin strips of uncut grass are left behind the mower. Streaking is usually caused by operator error or poor blade maintenance.	



Cause	Remedy
Blades are not sharp.	Sharpen your blades.
Blades are worn down too far.	Replace your blades.
Engine speed is too slow.	Always mow at full throttle.
Ground speed is too fast.	Slow down.
Deck is plugged with grass.	Clean out the mower.
Not overlapping cutting rows enough.	Overlap your cutting rows
Not overlapping enough when turning.	When turning your effective cutting width decreases—overlap more when turning.

### Problem: Scalping

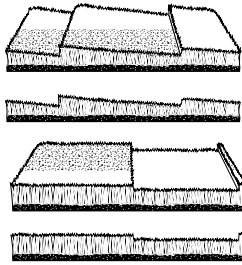
Scalping is when the mower deck comes close to or hits the ground. Scalping can be caused by the mower deck misadjustment, unevenness in the lawn, or by mower deck bouncing because the ground speed is too fast.



Cause	Remedy
Lawn is uneven or bumpy.	Roll or level the lawn.
Mower deck cutting height is set too low.	Raise the cutting height.
Ground speed is too fast.	Slow down.
Deck is not leveled correctly.	Correctly level the deck.
Tire pressure is low or uneven.	Check and inflate the tires.

### Problem: Stepped Cutting

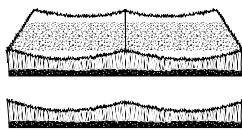
Stepped cutting is sharp ridges or uneven levels left in the lawn surface. Stepped cutting is usually caused by mower deck damage or misadjustment, or damage to the mower blades.



Cause	Remedy
Deck is not leveled correctly.	Level the deck correctly.
Tires are not properly inflated.	Check and inflate the tires.
Blades are damaged.	Replace the blades.
Deck shell is damaged.	Repair or replace the deck.
Mower spindle is bent or loose.	Repair or replace the spindle.
Blades are installed incorrectly.	Reinstall the blades correctly.

### Problem: Uneven Cutting

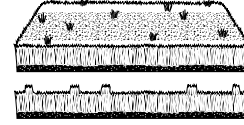
Uneven cutting is waviness or smooth troughs in the lawn surface. Uneven cutting is usually caused by mower deck damage or misadjustment.



Cause	Remedy
Deck is not leveled correctly.	Level the deck correctly.
Blades are dull or worn.	Sharpen or replace the blades.
Blades are damaged.	Replace the blades.
Deck is clogged with grass clippings.	Clean out the deck.
Deck shell is damaged.	Repair or replace the deck.
Mower spindle is bent or loose.	Repair or replace the spindle.
Blades are installed incorrectly.	Reinstall the blades correctly.
Tires are not properly inflated.	Check and inflate the tires.

### Problem: Stringers

Stringers are sparse patches of uncut grass left behind the mower. Stringers are usually caused by operator error or poor blade maintenance.



Cause	Remedy
Blades are not sharp or nicked.	Sharpen your blades.
Blades are worn down too far.	Replace your blades.
Engine speed is too slow.	Always mow at full throttle.
Ground speed is too fast.	Slow down.
Deck is plugged with grass.	Clean out the mower.

## Specifications

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

### ENGINE

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

Fits models: 5901849, 5901851, 5902162 & 5902163

#### Caterpillar C1.7

<b>Make</b>	Caterpillar
<b>Model</b>	C1.7
<b>Electrical System</b>	12V-2kW Starter; 12V-85A Alternator; Battery: 700 CCA

### CHASSIS

<b>Fuel Tank Capacity</b>	13.5 gallons (49,2 L) total
<b>Rear Wheels</b>	
Tire Size	26 X 12.00 - 12
Inflation Pressure	15 psi (1,03 bar)
<b>Front Wheels</b>	
Tire Size	13 X 6.50 - 6
Inflation Pressure	25 psi (1,72 bar)

### FLUID CAPACITIES

System	Capacity
Engine Oil Capacity	See Engine Operator's Manual.
Fuel Tank Capacity	See Chassis chart.
Radiator Capacity	11 quarts (10.4 liters)
Hydraulic System Capacity	9.5 quarts (9 liters)
Gearbox Capacity	13 ounces (0.38 liters)

### TRANSMISSIONS

<b>Left Hand Pump</b>	Hydro-Gear® PW-1ACC
<b>Right Hand Pump</b>	Hydro-Gear® PW-1DCC
<b>Left Hand Wheel Motor</b>	Parker TG0335LB080AANG
<b>Right Hand Wheel Motor</b>	Parker TG0335LB081AANG
<b>Type</b>	Pump and wheel motor
<b>Hydraulic Fluid</b>	Mobil 1™ 15W-50 synthetic oil or Castrol Syntec™ 5W-50 oil

<b>Speeds @ 3100 rpm</b>	Forward: 0-11 MPH (0-17,7 km/h)
	Reverse: 0-5 MPH (0-8,05 km/h)

**DIMENSIONS**

<b>Models with 72" Mower Decks</b>	
<b>Overall Length</b>	90" (228,6 cm)
<b>Overall Width (with discharge chute up)</b>	73-7/16" (186,5 cm)

<b>Models with 72" Mower Decks</b>	
<b>Overall Width (with discharge chute down)</b>	86" (218 cm)
<b>Height</b>	72-1/4" (183,5 cm)
<b>Weight (approximate)</b>	2520 lbs (1143 kg)

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# Warranty

This unit is equipped with a digital display panel that displays both engine hours and PTO run time hours. The warranty is based on the engine hours as displayed by the hour meter.

## Warranty Statement

BRIGGS & STRATTON WARRANTY POLICY (November 2018)

### LIMITED WARRANTY

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

**There is no other express warranty. Implied warranties, including those of merchantability and fitness for a particular purpose, are limited to the warranty period listed below, or to the extent permitted by law. Liability for incidental or consequential damages are excluded to the extent exclusion is permitted by law.** Some states or countries do not allow limitations on how long an implied warranty lasts, and some states or countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state or country to country.\*\*

WARRANTY PERIOD		
Covered Parts	Standard Warranty Period	Rental Warranty Period
Riding mowers - except as noted below +	4 years (48 months) or 500 hours, whichever occurs first. Unlimited hours during the first 2 years (24 months)	90 days
+Coil over shocks and all suspension related components	5 years (60 months) unlimited hours	90 days
+Hydro Drive Belt, Tires, Brake Pads, Hoses, Battery, Blades	90 days	90 days
+Mower Deck Drive Belt (Conventional Single Belt Deck Drive Systems)	1 year (12 months) or 100 hours, whichever occurs first	90 days
+Mower Deck Drive Belt (Two Belt Deck Drive Systems)	3 years (36 months) or 300 hours, whichever occurs first. (Parts and labor in year one; parts only in years two and three)	90 days
+Attachments	1 year	90 days
+Engine*	See Engine Operator's Manual	See Engine Operator's Manual

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

\*\* In Australia, the following applies, notwithstanding any other provision: 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 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. Unless required under Australian Consumer Law, Ferris shall not be liable under this Warranty to the Customer or any other person in connection with this Warranty, for consequential, direct or indirect damages, loss or costs incurred or suffered by the Customer or any other person; or any damage to property, loss of turnover, loss of profits, loss of business or loss of goodwill, arising out of the failure of any product to operate properly. For warranty service, find the nearest Authorized Service Dealer in our dealer locator map at [ferrismowers.com](http://ferrismowers.com) (Select region: Australia), or by calling 1300 274 447, or by emailing or writing to [salesenquiries@briggsandstratton.com.au](mailto:salesenquiries@briggsandstratton.com.au), Briggs & Stratton Australia Pty Ltd, 3 Imperata Pl, Kemps Creek, NSW, Australia, 2178.

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

To ensure prompt and complete warranty coverage, register your product at the website shown above or at [www.onlineproductregistration.com](http://www.onlineproductregistration.com), or mail the completed registration card (if provided), or call 1-800-743-4115 (in USA).

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

## ABOUT YOUR WARRANTY

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

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

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

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

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

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

**5419128 Revision -**

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