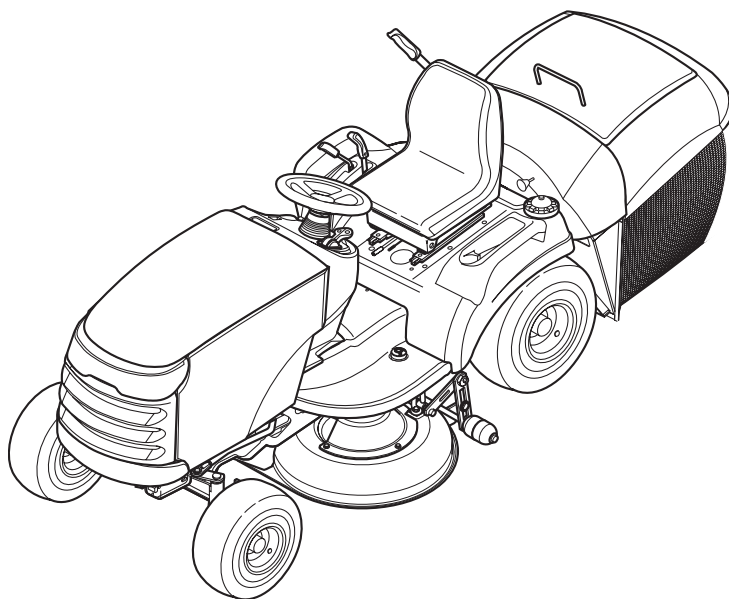


OPERATOR'S MANUAL



Baron XL / 2400 XL / RD Series

18HP Hydro Tractors

Mfg. No.	Description
2690337	Baron XL, 18HP & 40" Mower (CE)
2690339	2418 XL, 18HP 40" Mower (CE)
2690341	RD18S40, 18HP 40" Mower (CE)
2690342	RD18VG40, 18HP 40" Mower (CE)
2690507	Baron XL, 18HP & 40" Mower (CE)
2690508	RD18S40, 18HP 40" Mower (CE)
2690509	RD18VG40, 18HP 40" Mower (CE)
1694670	Baron XL, 18HP (CE)
1694672	2418 XL, 18HP (CE)
1694674	RD18S40, 18HP (CE)
1694675	RD18VG40, 18HP (CE)

40" Mower Decks

Mfg. No.	Description
1694790	40" Mower Deck (CE)
1694796	40" Mower Deck (CE)
1694813	40" Mower Deck (CE)
1695031	40" Mower Deck (CE)
1695032	40" Mower Deck (CE)

20HP Hydro Tractors

Mfg. No.	Description
2690338	Baron XL, 20HP & 40" Mower (CE)
2690340	2420 XL, 20HP & 40" Mower (CE)
2690506	Baron XL, 20HP & 40" Mower (CE)
2690510	2420 XL, 20HP & 40" Mower (CE)
1694671	Baron XL, 20HP (CE)
1694673	2420 XL, 20HP (CE)

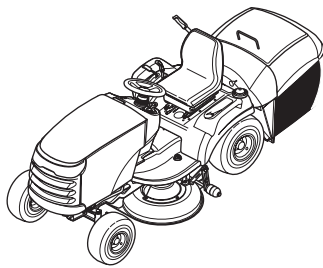


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NOTE: In this manual, "left" and "right" are referred to as seen from the operating position.



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.

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.



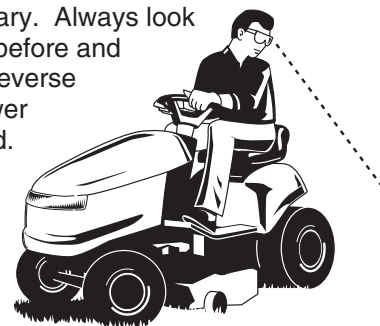
Children

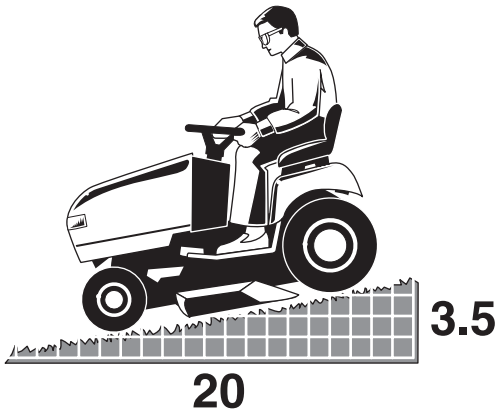
Tragic accidents can occur with children. Do not allow them anywhere near the area of operation. Children are often attracted to the unit and mowing activity. Never assume that children will remain where you last saw them. If there is a risk that children may enter the area where you are mowing, have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

DO NOT GIVE CHILDREN RIDES ON THIS UNIT! This encourages them to come near the unit in the future while it is running, and they could be seriously hurt. They may then approach the unit for a ride when you are not expecting it, and you may run over them.

Reverse

Do not mow in reverse unless absolutely necessary. Always look down and behind before and while traveling in reverse even with the mower blades disengaged.





Slope Operation

You could be seriously injured or even killed if you use this unit on too steep an incline. Using the unit on a slope that is too steep or where you don't have adequate traction can cause you to lose control or roll over.

A good rule of thumb is to not operate on any slope you cannot back up (in 2-wheel drive mode). You should not operate on inclines with a slope greater than a 3.5 foot rise over a 20 foot length. Always drive up and down slopes: never cross the face.

Also note that the surface you are driving on can greatly impact stability and control. Wet grass or icy pavement can seriously affect your ability to control the unit.

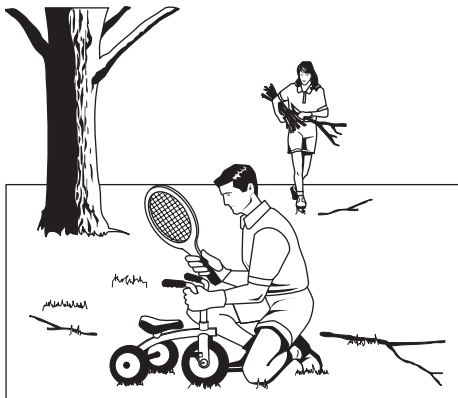
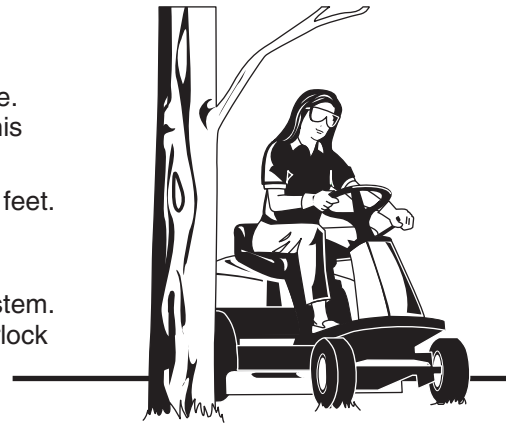
If you feel unsure about operating the unit on an incline, don't do it. It's not worth the risk.

Moving Parts

This equipment has many moving parts that can injure you or someone else. However, if you are seated in the seat properly, and follow all the rules in this book, 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 equipment while it is running!

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.



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 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.

Fuel and Maintenance

Gasoline is extremely flammable. Its vapors are also extremely flammable and can travel to distant ignition sources. Gasoline must only be used as a fuel, not as a solvent or cleaner. It should never be stored any place where its vapors can build up or travel to an ignition source like a pilot light. Fuel belongs in an approved, plastic, sealed gas can, or in the tractor fuel tank with the cap securely closed. Spilled fuel needs to be cleaned up immediately.

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



Safety Rules & Information



Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of unit, severe personal injury or death to you, or bystanders, or damage to property or equipment.

This mowing deck is capable of amputating hands and feet and throwing objects.

The triangle  in text signifies important cautions or warnings which must be followed.

GENERAL OPERATION

1. Read, understand, and follow all instructions in the manual and on the unit before starting.
2. Do not put hands or feet near rotating parts or under the machine. Keep clear of the discharge opening at all times.
3. Only allow responsible adults, who are familiar with the instructions, to operate the unit (local regulations can restrict operator age).
4. Clear the area of objects such as rocks, toys, wire, etc., which could be picked up and thrown by the blade(s).
5. Be sure the area is clear of other people before mowing. Stop the unit if anyone enters the area.
6. Never carry passengers.
7. Do not mow in reverse unless absolutely necessary. Always look down and behind before and while traveling in reverse.
8. Never direct discharge material toward anyone. Avoid discharging material against a wall or obstruction. Material may ricochet back toward the operator. Stop the blade(s) when crossing gravel surfaces.
9. Do not operate the machine without the entire grass catcher, discharge guard (deflector), or other safety devices in place.
10. Slow down before turning.
11. Never leave a running unit unattended. Always disengage the PTO, set parking brake, stop engine, and remove keys before dismounting.
12. Disengage blades (PTO) when not mowing. Shut off engine and wait for all parts to come to a complete stop before cleaning the machine, removing the grass catcher, or unclogging the discharge guard.
13. Operate the machine only in daylight or good artificial light.
14. Do not operate the unit while under the influence of alcohol or drugs.
15. Watch for traffic when operating near or crossing roadways.
16. Use extra care when loading or unloading the unit into a trailer or truck.
17. Always wear eye protection when operating this unit.
18. Data indicates that operators, age 60 years and above, are involved in a large percentage of power equipment-related injuries. These operators should evaluate their ability to operate the equipment safely enough to protect themselves and others from injury.
19. Follow the manufacturer's recommendations for wheel weights or counterweights.
20. Keep in mind the operator is responsible for accidents occurring to other people or property.
21. All drivers should seek and obtain professional and practical instruction.
22. Always wear substantial footwear and trousers. Never operate when barefoot or wearing sandals.
23. Before using, always visually check that the blades and blade hardware are present, intact, and secure. Replace worn or damaged parts.
24. Disengage attachments before: refueling, removing an attachment, making adjustments (unless the adjustment can be made from the operator's position).
25. When the machine is parked, stored, or left unattended, lower the cutting means unless a positive mechanical lock is used.
26. Before leaving the operator's position for any reason, engage the parking brake (if equipped), disengage the PTO, stop the engine, and remove the key.
27. To reduce fire hazard, keep the unit free of grass, leaves, & excess oil. Do not stop or park over dry leaves, grass, or combustible materials.
28. It is a violation of California Public Resource Code Section 4442 to use or operate the engine on or near any forest-covered, brush-covered, or grass-covered land unless the exhaust system is equipped with a spark arrester meeting any applicable local or state laws. Other states or federal areas may have similar laws.

TRANSPORTING AND STORAGE

1. When transporting the unit on an open trailer, make sure it is facing forward, in the direction of travel. If the unit is facing backwards, wind lift could damage the unit.
2. Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
3. Never store the unit (with fuel) in an enclosed poorly ventilated structure. Fuel vapors can travel to an ignition source (such as a furnace, water heater, etc.) and cause an explosion. Fuel vapor is also toxic to humans and animals.
4. Always follow the engine manual instructions for storage preparations before storing the unit for both short and long term periods.
5. Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.
6. Never store the unit or fuel container inside where there is an open flame or pilot light, such as in a water heater. Allow unit to cool before storing.

SLOPE OPERATION

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

Control of a walk-behind or ride-on machine sliding on a slope will not be regained by the application of the brake. The main reasons for loss of control are: insufficient tire grip on the ground, speed too fast, inadequate braking, the type of machine is unsuitable for its task, lack of awareness of the ground conditions, incorrect hitching and load distribution.

1. Mow up and down slopes, not across.
2. Watch for holes, ruts, or bumps. Uneven terrain could overturn the unit. Tall grass can hide obstacles.
3. Choose a slow speed so that you will not have to stop or change speeds while on the slope.
4. Do not mow on wet grass. Tires may lose traction.
5. Always keep unit in gear especially when traveling down slopes. Do not shift to neutral and coast downhill.
6. Avoid starting, stopping, or turning on a slope. If tires lose traction, disengage the blade(s) and proceed slowly straight down the slope.
7. Keep all movement on slopes slow and gradual. Do not make sudden changes in speed or direction, which could cause the machine to rollover.
8. Use extra care while operating machines with grass catchers or other attachments; they can affect the stability of the unit. Do not use on steep slopes.
9. Do not try to stabilize the machine by putting your foot on the ground (ride-on units).
10. Do not mow 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.
11. Do not use grass catchers on steep slopes.
12. Do not mow slopes you cannot back up them.
13. See your authorized dealer/retailer for recommendations of wheel weights or counterweights to improve stability.
14. Remove obstacles such as rocks, tree limbs, etc.
15. Use slow speed. Tires may lose traction on slopes even through the brakes are functioning properly.
16. Do not turn on slopes unless necessary, and then, turn slowly and gradually downhill, if possible.

TOWED EQUIPMENT (RIDE-ON UNITS)

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

WARNING

Never operate on slopes greater than 17.6 percent (10°) which is a rise of 3-1/2 feet (106 cm) vertically in 20 feet (607 cm) horizontally.

When operating on slopes use additional wheel weights or counterweights. See your dealer/retailer to determine which weights are available and appropriate for your unit.

Select slow ground speed before driving onto slope. In addition to front weights, use extra caution when operating on slopes with rear-mounted grass catchers.

Mow UP and DOWN the slope, never across the face, use caution when changing directions and **DO NOT START OR STOP ON SLOPE.**

CHILDREN

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

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

EMISSIONS

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

IGNITION SYSTEM

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

Safety Rules & Information

SERVICE AND MAINTENANCE

Safe Handling of Gasoline

1. Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
2. Use only approved gasoline containers.
3. Never remove the gas cap or add fuel with the engine running. Allow the engine to cool before refueling.
4. Never fuel the machine indoors.
5. Never store the machine or fuel container where there is an open flame, spark, or pilot light such as near a water heater or other appliance.
6. Never fill containers inside a vehicle or on a truck bed with a plastic bed liner. Always place containers on the ground away from your vehicle before filling.
7. Remove gas-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment on a trailer with a portable container, rather than from a gasoline dispenser nozzle.
8. Keep nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
9. If fuel is spilled on clothing, change clothing immediately.
10. Never over-fill the fuel tank. Replace gas cap and tighten securely.
11. Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.
12. If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapors have dissipated.
13. Replace all fuel tank caps and fuel container caps securely.
13. If the fuel tank must be drained, it should be drained outdoors.
14. Replace faulty silencers/mufflers.
15. Use only factory authorized replacement parts when making repairs.
16. Always comply with factory specifications on all settings and adjustments.
17. Only authorized service locations should be utilized for major service and repair requirements.
18. 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.
19. On multiple blade mowers, take care as rotating one blade can cause other blades to rotate.
20. Do not change engine governor settings or over-speed the engine. Operating the engine at excessive speed can increase the hazard of personal injury.
21. Disengage drive attachments, stop the engine, remove the key, and disconnect the spark plug wire(s) before: clearing attachment blockages and chutes, performing service work, striking an object, or if the unit vibrates abnormally. After striking an object, inspect the machine for damage and make repairs before restarting and operating the equipment.
22. Never place hands near the moving parts, such as a hydro pump cooling fan, when the tractor is running. (Hydro pump cooling fans are typically located on top of the transaxle).
23. Units with hydraulic pumps, hoses, or motors: **WARNING:** Hydraulic fluid escaping under pressure may have sufficient force to penetrate skin and cause serious injury. If foreign fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result. Keep body and hands away from pin holes or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, and not hands, to search for leaks. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. If leaks occur, have the unit serviced immediately by your authorized dealer.

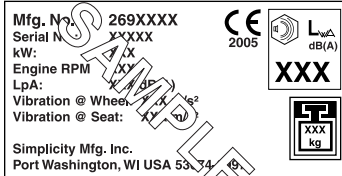
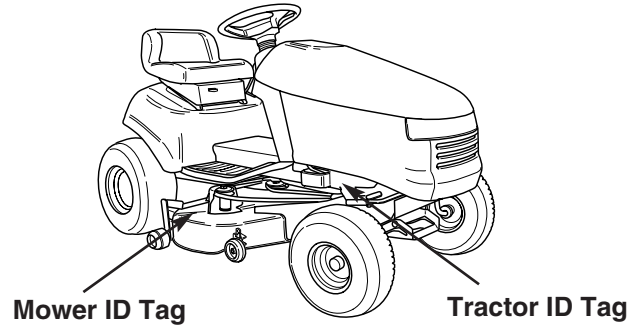
Service & Maintenance

1. Never run the unit in an enclosed area where carbon monoxide fumes may collect.
2. Keep nuts and bolts, especially blade attachment bolts, tight and keep equipment in good condition.
3. Never tamper with safety devices. Check their proper operation regularly and make necessary repairs if they are not functioning properly.
4. Keep unit free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage. and remove any fuel-soaked debris. Allow machine to cool before storage.
5. If you strike an object, stop and inspect the machine. Repair, if necessary, before restarting.
6. Never make adjustments or repairs with the engine running.
7. Check grass catcher components and the discharge guard frequently and replace with manufacturer's recommended parts, when necessary.
8. Mower blades are sharp. Wrap the blade or wear gloves, and use extra caution when servicing them.
9. Check brake operation frequently. Adjust and service as required.
10. Maintain or replace safety and instructions labels, as necessary.
11. Do not remove the fuel filter when the engine is hot as spilled gasoline may ignite. Do not spread fuel line clamps further than necessary. Ensure clamps grip hoses firmly over the filter after installation.
12. Do not use gasoline containing METHANOL, gasohol containing more than 10% ETHANOL, gasoline additives, or white gas because engine/fuel system damage could result.
24. **WARNING:** Stored energy device. Improper release of springs can result in serious personal injury. Springs should be removed by an authorized technician.
25. Models equipped with an engine radiator: **WARNING:** 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.

Identification Numbers



North American Models



CE Models

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

Record your model name/number, manufacturer's identification numbers, and engine serial numbers in the space provided for easy access. These numbers can be found in the locations shown.

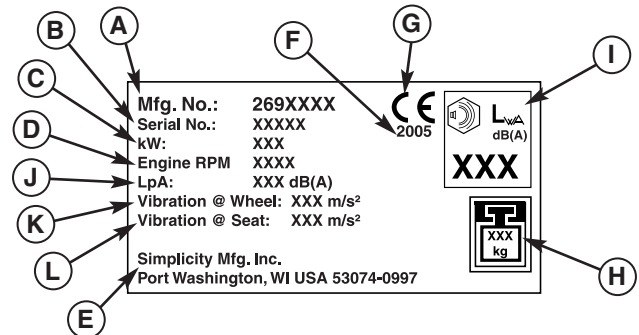
NOTE: For location of engine identification numbers, refer to the engine owner's manual.

CE Models: Place the extra copy of the identification tag in the manual

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

CE IDENTIFICATION TAG MARKINGS

- A. Manufacturer's Identification Number
- B. Manufacturer's Serial Number
- C. Power Rating in Kilowatts
- D. Maximum Engine Speed in Rotations per Minute
- E. Manufacturer's Address
- F. Year of Manufacture
- G. CE Compliance Logo
- H. Mass of Unit in Kilograms
- I. Sound Power in Decibels ***
- J. Sound Pressure at Operator's Position in Decibels **
- K. Vibration at the Steering Wheel *
- L. Vibration at the Seat *



This unit complies with European Harmonized Lawn Mower Standard EN 836, European Machinery Directive 98/37/EC, and European EMC Directive 89/336/EC

* Tested according to EN 836:1997/A2:2001, EN 1032:1996, EN 1033:1995

** Tested according to EN836:1997/A2:2001

*** Tested according to 2000/14/EC

*CE Models:
Place copy of
Identification Tag here.*

Safety Decals

SAFETY DECALS

This unit has been designed and manufactured to provide you with the safety and reliability you would expect from an industry leader in outdoor power equipment manufacturing.

Although reading this manual and the safety instructions it contains will provide you with the necessary basic knowledge to operate this equipment safely and effectively, we have placed several safety labels on the unit to remind you of this important information while you are operating your unit.

All DANGER, WARNING, CAUTION and instructional messages on your rider and mower should be carefully read and obeyed. Personal bodily injury can result when these instructions are not followed. The information is for your safety and it is important! The safety decals below are on your rider and mower.

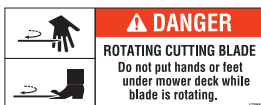
If any of these decals are lost or damaged, replace them at once. See your local dealer for replacements.

These labels are easily applied and will act as a constant visual reminder to you, and others who may use the equipment, to follow the safety instructions necessary for safe, effective operation.

NORTH AMERICAN MODELS



Decal - Operating Instructions, North American Models, Part No. 1722814



Decal - Danger
Part No. 1720660

CE MODELS



Decal - Operating Instructions, CE Models, Part No. 1723175



Decal - Danger,
Rotating Blades
Part No. 1720389

ALL MODELS



Decal - Danger,
Thrown Objects
Part No. 1721107



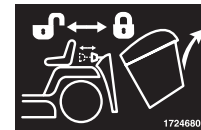
Decal - Danger,
Thrown Objects
Part No. 1720390



Decal - Danger,
Thrown Objects
Part No. 1720391



Decal - Hopper Pedal
Part No. 1723317



Decal - Hopper
Release
Part No. 1724680



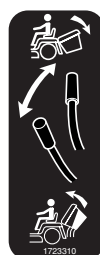
Decal - Drawbar
Limits
Part No. 1721141



Decal -
Transmission
Release
Part No. 1723425



Decal - Cruise
Control / Lift
Part No. 1723713



Decal - Hopper
Control
Part No. 1723310



Decal - Cutting
Height
Part No. 1723470



Decal - Ignition
Positions
Part No. 1722806

SAFETY ICONS

Warning: Read Operator's Manual.

Read and understand the Operator's Manual before using this machine.



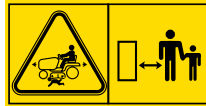
Warning: Remove Key Before Servicing.

Remove the key and consult technical literature before performing repairs or maintenance.



Danger: Dismemberment.

This machine can amputate limbs. Keep bystanders and children away when engine is running.



Danger: Thrown Objects.

This machine is capable of throwing objects and debris. Keep bystanders away.



Danger: Thrown Objects.

Do not operate the with the hopper removed, or without the deflector



Danger: Machine Rollover.

Do not use this machine on slopes greater than 10°.



Danger: Thrown Objects.

Do not operate without first connecting the discharge tube.



Danger: Thrown Objects.

Do not operate with hopper open.



Danger: Dismemberment.

This mower deck can amputate limbs. Keep hands and feet away from blades.



SAFETY INTERLOCK SYSTEM TESTS

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

Operational SAFETY Checks

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

Test 1 — Engine should NOT crank if:

- PTO switch is ON, OR
- Brake pedal is NOT fully depressed (parking brake OFF), OR
- The cruise control lever is NOT in NEUTRAL.

Test 2 — Engine SHOULD crank if:

- PTO switch is OFF, AND
- Brake pedal is fully depressed (parking brake ON), AND
- The cruise control lever is in NEUTRAL.

Test 3 — NORTH AMERICAN MODELS — Engine should SHUT OFF if:

- Operator rises off seat with PTO engaged, OR
- Operator rises off seat with brake pedal NOT fully depressed (parking brake OFF).

Test 3 — CE MODELS — Engine should SHUT OFF if:

- Operator rises off seat.

Test 4 — Blade Brake Check

Mower blades and mower drive belt should come to a complete stop within five seconds after electric PTO switch is turned OFF (or operator rises off seat). If mower drive belt does not stop within five seconds, readjust the PTO clutch as described in the ADJUSTMENTS section or see your dealer.

Test 5 — Reverse Mow Option (RMO) Check

- Engine should shut off if reverse travel is attempted if the PTO has been switched on and RMO has not been activated.
- RMO light should illuminate when RMO has been activated.

WARNING

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

NOTE: Steering wheel removed for clarity

[illegible]

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.



(Single Lever Models)

The throttle/choke lever controls engine speed and choke. Move the throttle forward to increase engine speed and back to decrease engine speed. Always operate at FULL throttle. Move the control fully forward (past the detent) to close the choke. Close the choke for cold starting. Open the choke once the engine starts. A warm engine may not require choking.



The throttle controls engine speed. Move the throttle forward to increase engine speed and back to decrease engine speed. Always operate at FULL throttle.



Close the choke for cold starting. Open the choke once the engine starts. A warm engine may not require choking. Move the lever forward to close the choke.



The light switch turns the tractor headlights on and off.



The hour meter registers hours of use.



Depressing the brake pedal applies the tractor brake.



PTO Switch

The PTO (Power Take-Off) switch engages and disengages attachments that use the PTO. To engage the PTO, pull UP on the switch. Push DOWN to disengage. *Note that the operator must be seated firmly in the tractor seat for the PTO to function.*



Ignition Switch

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



OFF

Stops the engine and shuts off the electrical system.



RUN

Allows the engine to run and powers the electrical system.



START

Cranks the engine for starting.

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



Ground Speed Pedals

The tractor's forward ground speed is controlled by the forward ground speed control pedal. The tractor's reverse ground speed is controlled by the reverse ground speed control pedal.

Depressing either pedal will increase ground speed. Note that the further down the pedal is depressed, the faster the tractor will travel.



Mower Height of Cut Adjustment

The cutting height adjustment knob controls the mower cutting height. The cutting height is infinitely adjustable between 1" and 3-3/4" (2.5cm-9.5cm).



Cutting Height Fine Tuning Adjustment

The cutting height fine tuning adjustment is used to set the mower cutting height between two of the preset cutting positions.



Attachment Lift Control Lever

When using the mower deck, lift the deck off the ground while transporting to and from the job site. **DO NOT** cut with the mower in the raised, transport position.

The attachment lift control lever raises and lowers attachments that utilize the tractor's manual lift linkage. Pushing the lever forward lowers the attachment while pulling the lever back raises the attachment. You must pull back slightly on the lever and depress the release button to change lift positions. Be sure the lever is fully forward when mowing.



Catcher Removal Lock

After depressing the catcher dump lock pedal, pull this knob forward to release the catcher for removal.



Cruise Control (Optional)

The cruise control is used to lock the ground speed control in forward. Move the lever forward until the desired ground speed is reached. To disengage the cruise control move the lever back. In the event you need to stop quickly, depressing the brake pedal will also return the cruise control to neutral.



Seat Adjustment Lever

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



Transmission Release Valve Lever

The transmission release valve lever deactivates the transmission so that the tractor can be pushed by hand. See PUSHING THE TRACTOR BY HAND for operational information.



Catcher-Full Alarm

The "catcher full" alarm sounds when the grass catcher has been filled with cut grass. When the alarm sounds, disengage the PTO, travel to the area in which you desire to dump the grass, then empty the catcher. Note: When using the unit for leaf collection, the alarm may not be activated by dry leaves.



Fuel Tank / Fuel Gauge

The fuel gage indicates the amount of fuel in the fuel tank. To add fuel, remove the filler cap. Be sure to leave room for heat expansion.



Parking Brake

The parking brake knob is used to lock the parking brake when the tractor is stopped. Fully depressing the brake pedal and pulling up on the knob engages the parking brake. Refer to page 12 for a full explanation of parking brake functions.



Catcher Dump Lock Pedal

The catcher dump lock pedal unlocks the catcher so that it can be opened to dump out collected grass.

Features & Controls



Catcher Open/Close Lever

The catcher open/close lever opens the catcher so that it may be emptied and closes it for mowing. To empty the catcher, depress the catcher dump lock pedal and pull forward on the handle. To close, push the lever backward until the catcher closes and locks.



Power Outlet (Select Models)

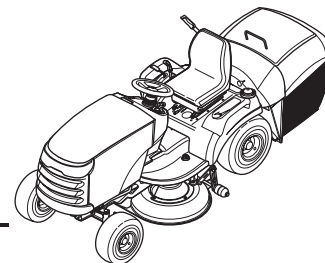
The power outlet is 12V-DC. Accessory must be rated at 14 amps or less.



Reverse Mowing Option (RMO)

The Reverse Mowing Option allows for mowing (or use of other PTO driven attachments) while traveling in reverse. If you choose to mow or operate another attachment in reverse, turn the RMO key after the PTO is engaged. The L.E.D. light will illuminate, and the operator can then mow in reverse. Each time the PTO is disengaged the RMO needs to be reactivated if desired.

Operating the Tractor



GENERAL OPERATING SAFETY

Be sure to read all information in the Safety and Operation sections before attempting to operate this unit. Become familiar with all of the controls and how to stop the unit.

ADDING FUEL

To add fuel:

1. Remove the fuel cap (A, Figure 2).
2. Fill the tank. Do not overfill. Leave room in the tank for fuel expansion. Refer to your engine manual for specific fuel recommendations.
3. Install and hand tighten the fuel cap.



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



WARNING

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

STARTING THE ENGINE

1. While sitting in the operator's seat, fully depress the brake pedal or set the parking brake.
2. Make sure that your feet are not depressing the ground speed control pedals and that the cruise control lever is in neutral.
3. Disengage the PTO clutch.
4. Close the choke.

NOTE: A warm engine may not require choking.

5. Insert the ignition key and turn it to START.
6. After the engine starts, move the engine throttle control to SLOW. Warm up the engine by running it for at least a minute.
7. Set throttle to FULL.

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

STOPPING THE TRACTOR & ENGINE

1. Return the ground speed control(s) to neutral.
2. Disengage the PTO and wait for all moving parts to stop.
3. Place the throttle control in the position specified in the engine owner's manual provided in the operator's packet shipped with your tractor. Follow any recommended stopping procedures.
4. Turn the ignition switch to OFF. Remove the key.

DRIVING THE TRACTOR

1. Sit in the seat and adjust the seat so that you can comfortably reach all the controls and see the dash-board display.
2. Engage the parking brake.
3. Make sure the PTO switch is disengaged.
4. Start the engine (see STARTING THE ENGINE).
5. Disengage the parking brake and release the brake pedal.
6. Depress the forward ground speed control pedal to travel forward. Release the pedal to stop. Note that the further down the pedal is depressed the faster the tractor will travel.
7. Stop the tractor by releasing the ground speed control pedals, setting the parking brake, and stopping the engine (see STOPPING THE TRACTOR AND ENGINE).

MOWING

1. Set the mower cutting height to the desired level and set the gauge wheels to the appropriate position (if equipped).
2. Engage the parking brake. Make sure the PTO switch is disengaged.
3. Start the engine (see STARTING THE ENGINE).
4. Fully lower the mower using the attachment lift lever.
5. Set the throttle to FULL.
6. Engage the PTO (Mower Deck).
7. Begin mowing. When the “catcher full” alarm sounds, turn off the PTO immediately to prevent discharge tube plugging. Travel to the desired location and empty the catcher.
8. When finished, shut off the PTO and raise the mower using the attachment lift control lever.
9. Stop the engine (see STOPPING THE TRACTOR AND ENGINE).

WARNING

The engine will shut off if the reverse ground speed pedal is depressed while the PTO is on and the RMO has not been activated. The operator should always turn the PTO off prior to driving across on roads, paths or any area that maybe used by other vehicles. Sudden loss of drive could create a hazard.

WARNING

Mowing in reverse can be hazardous to bystanders. Tragic accidents can occur if the operator is not alert to the presence of children. Never activate RMO if children are present. Children are often attracted to the unit and the mowing activity.

MOWING IN REVERSE

If an operator chooses to mow in reverse, the RMO system can be used. To use the Reverse Mowing Option (RMO) turn the RMO key after the PTO is engaged. The L.E.D. light will illuminate, and the operator can then mow in reverse. Each time the PTO is disengaged the RMO needs to be reactivated if desired. The key should be removed to restrict access to the RMO feature.

ATTACHMENT OPERATION IN REVERSE

If an operator chooses to operate a PTO driven attachment in reverse, the RMO system can be used. To use the Reverse Mowing Option (RMO) turn the RMO key after the PTO is engaged. The L.E.D. light will illuminate, and the operator can then operate the attachment in reverse. Each time the PTO is disengaged the RMO needs to be reactivated if desired. The key should be removed to restrict access to the RMO feature.

PUSHING THE TRACTOR BY HAND



DO NOT TOW TRACTOR

Towing the unit will cause transmission damage. • Do not use another vehicle to push or pull this unit. • Do not actuate the transmission release valve lever while the engine is running.

1. Disengage the PTO and turn the engine off.
2. Pull the transmission release back approximately 2-1/2" (6 cm) to lock into released position (Figure 2).
3. The tractor can now be pushed by hand.

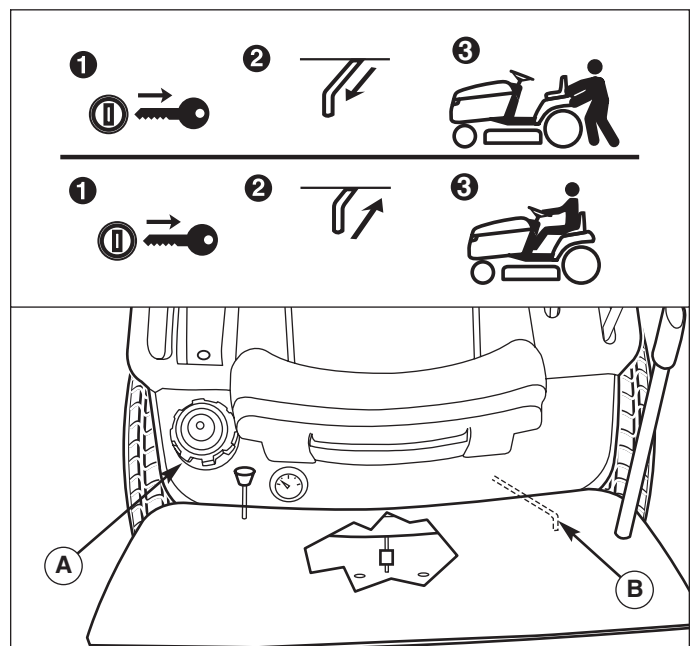


Figure 2. Transmission Release Lever & Fuel Tank
A. Fuel Tank Cap.
B. Transmission Release Lever

Operating the Tractor

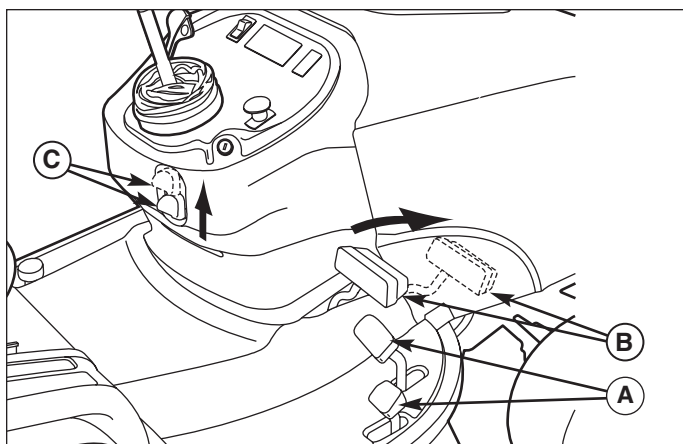


Figure 3. Engaging the Parking Brake

- A. Ground Speed Pedals
- B. Brake Pedal
- C. Parking Brake Knob

PARKING BRAKE FUNCTION

Applying the Parking Brake - See Figure 3. To lock the parking brake, release the ground speed pedals (A), fully depress the brake pedal (B), pull UP on the parking brake knob (C), and then release brake pedal.

Releasing the Parking Brake - See Figure 3. To release the parking brake, fully depress the brake pedal (B) and push the parking brake knob (C) DOWN.

EMPTYING THE CATCHER

To empty the catcher:

1. Depress the catcher dump pedal (A, Figure 4).
2. Extend the catcher lever (B) and use it to empty the catcher.
3. Use the lever (B) to close the catcher, and slide it back into the catcher.

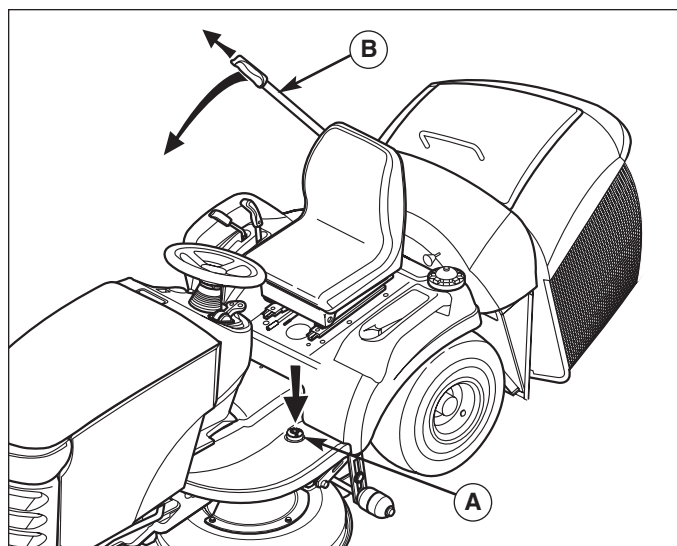


Figure 4. Emptying the Hopper

- A. Catcher Dump Pedal
- B. Catcher Lever

REAR DEFLECTOR

(Select Models)

WARNING

Do not operate the unit without the hopper or deflector in place.

Installation & Removal

1. Remove the grass catcher (see Catcher Removal & Installation).
2. Slide deflector plate posts (B, Figure 5) into notches.
3. Mount deflector plate (A) by sliding clevis pins (C) through holes (E) securing with hair pins & washers (F).
4. Removal is reverse of installation.

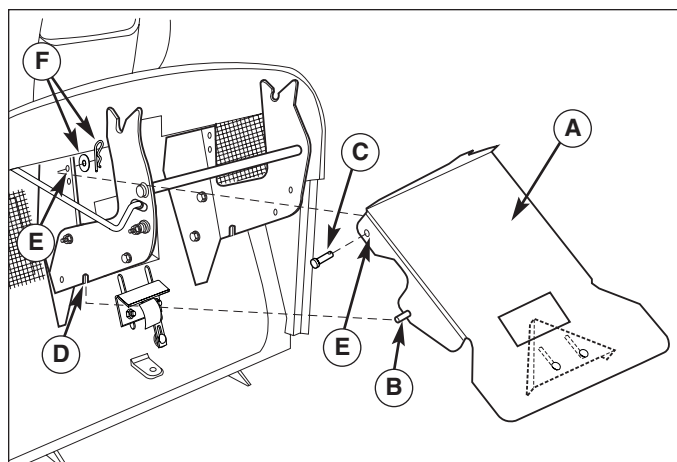


Figure 5. Install Deflector Plate

- A. Deflector Plate
- B. Deflector Plate Posts
- C. Clevis Pins
- D. Notches
- E. Holes
- F. Hair Pins & Washers

ADJUSTING THE DEFLECTOR

(Select Models)

Adjusting the defuser will change the distribution of grass clippings. To adjust the defuser:

1. Loosen hardware (B, Figure 6)
2. Slide defuser (A) up or down.
3. Secure hardware (B).
4. Repeat steps 1-3 if necessary.

ATTACHING A TRAILER

NOTE: Remove the hopper to attach a trailer.

The maximum horizontal drawbar force allowed is 444 Newton. The maximum vertical drawbar force is 222 Newton. This equates to a 396 lbs (180 kg) trailer on a 10 degree hill. Secure the trailer with an appropriately sized clevis pin (A, Figure 7) and clip (B).

STORAGE

⚠ WARNING

Never store the unit (with fuel) in an enclosed, poorly ventilated structure. Fuel vapors can travel to an ignition source (such as a furnace, water heater, etc.) and cause an explosion.

Fuel vapor is also toxic to humans and animals.

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:

- Disengage the PTO, set the parking brake, & remove the key.
- Perform engine maintenance and storage measures listed in the engine owner's manual. This includes draining the fuel system, or adding stabilizer to the fuel (do not store a fueled unit in an enclosed structure - see above).
- Battery life will be increased if it is removed, put in a cool, dry place and fully charged about once a month. If the battery is left in the unit, disconnect the negative cable.

Before starting the unit after it has been stored:

- Check all fluid levels. Check all maintenance items.
- Perform all recommended check and procedures found in the engine owner's manual.
- Allow the engine to warm up for several minutes before use.

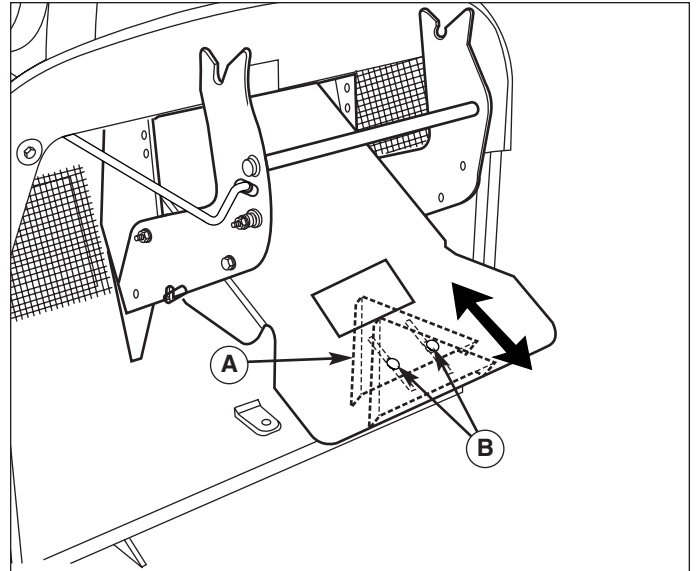


Figure 6. Adjusting the Deflector

A. Defuser
B. Hardware

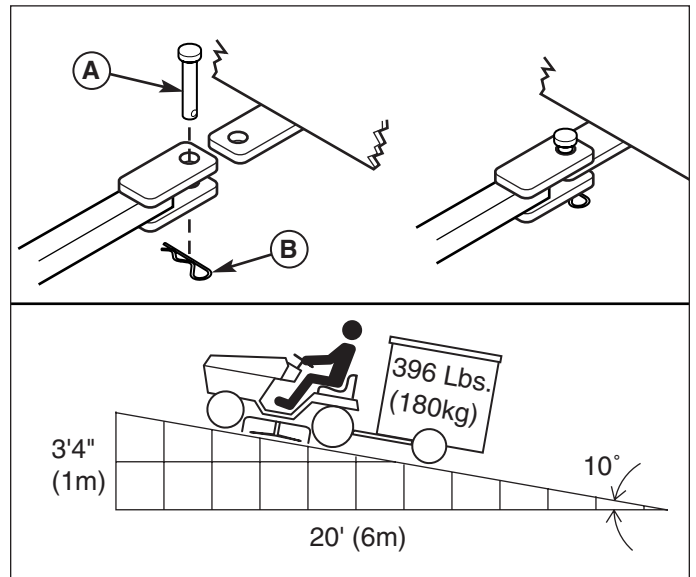


Figure 7. Trailer Weight Recommendations

A. Clevis Pin
B. Clip

Operating the Tractor

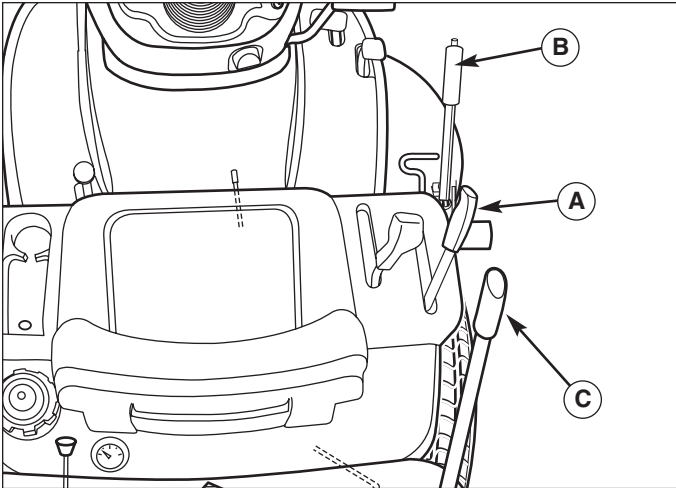


Figure 8. Raising & Lowering Mower
A. Attachment Lift C. Hopper Lever
B. Cutting Height Control

WARNING

Engage parking brake, disengage PTO, stop engine and remove key before attempting to install or remove the mower.

MOWER DECK REMOVAL & INSTALLATION

Removing the Mower Deck

1. Park tractor on a hard, level surface such as a concrete floor. Turn off PTO switch and engine, remove the key and apply parking brake.
2. Place mower in the lowest cutting position using the mower height adjuster (B, Figure 8).
3. Place the mower lift lever (A, Figure 8) in the lowered position.
3. Remove the grass catcher (see Catcher Removal & Installation).
4. Disconnect the mower lift arms (A, Figure 9) from the tractor lift arms (B) on both sides of the mower deck. Re-install washers (C) and safety clips (D).

CAUTION

The muffler and surrounding areas may be hot.

5. Release belt tension with arm (A). Remove belt from PTO pulley (B, Figure 10).
6. Turn wheels straight ahead. Pull back on spring-loaded lever (B, Figure 12) and lift mower hitch off of the tractor brackets.
7. Push the discharger tube (A, Figure 11) toward the back to separate it from the mower discharge opening (B).
8. Turn wheels fully left, and slide mower deck out right side of tractor.

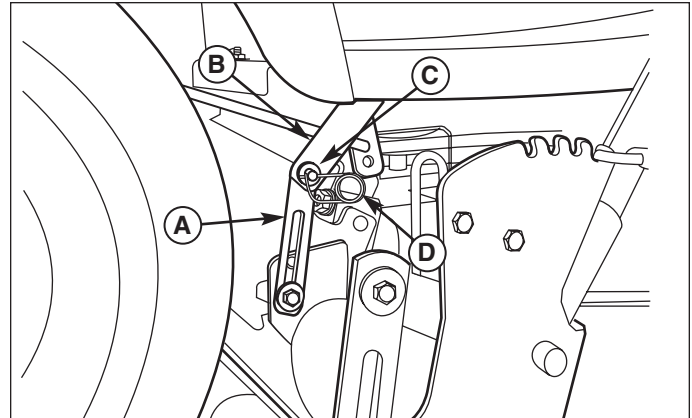


Figure 9. Lift Arms
(Viewed from underneath right side of tractor)
A. Mower Lift Arm
B. Tractor Lift Arm
C. Flat Washer
D. Safety Clip

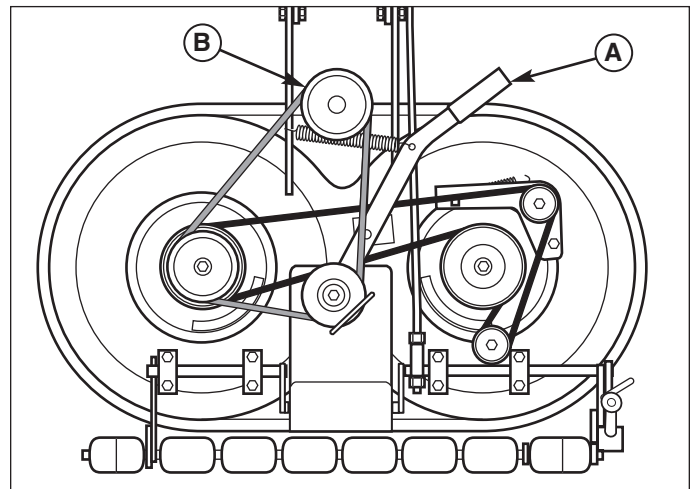


Figure 10. Removing & Installing Belt
A. Idler Arm
B. PTO Pulley

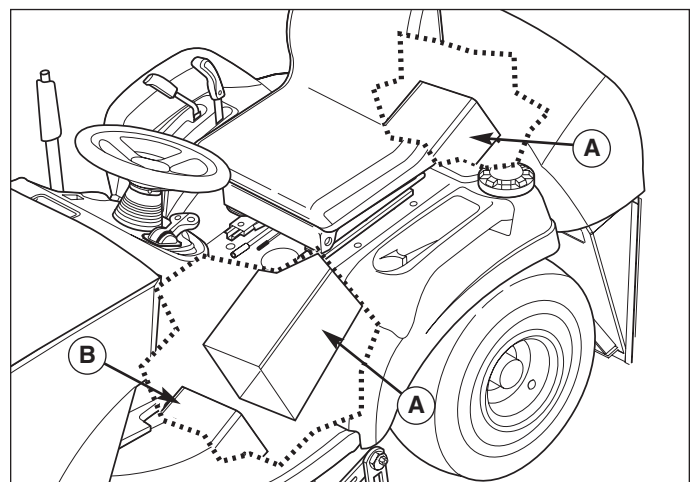


Figure 11. Discharge Tube
A. Discharge Tube
B. Mower Discharge Opening

Installing the Mower Deck

1. Park tractor, shut off PTO and engine, remove the key and apply parking brake. Turn the wheels fully to the left.
2. From the rear with the grass catcher open pull discharge chute to rear.
3. Place mower height adjuster (B, Figure 8) in the lowest cutting position. Place the mower lift lever (A) in the lowest position. Slide mower deck under right side of tractor so that mower hitch is aligned with front tractor hitch.
4. See Figure 11. Slide the discharge tube onto the mower discharge opening.
5. See Figure 12. Turn wheels straight. Pull back on the spring-loaded lever (B) while lifting up on the mower hitch. Install mower hitch onto tractor hitch brackets (A). When properly installed, the spring-loaded lever should seat fully underneath the brackets.
6. See Figure 9. Connect the mower lift arms (A) to the tractor lift arms (B) using the flat washer (C) and safety clip (D).
7. See Figure 10. Move idler arm (A) to relieve belt tension. Install belt onto the PTO pulley (B).
8. Check that the discharge tube and mower opening are aligned and connected.
9. Install the grass catcher (see Catcher Removal & Installation).

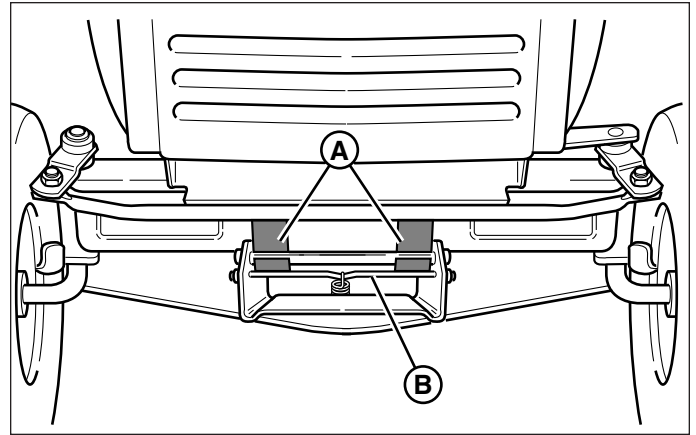


Figure 12. Mower Hitch
A. Tractor Hitch Brackets
B. Spring-Loaded Lever

CATCHER REMOVAL & INSTALLATION

WARNING

Do not operate the unit without the hopper or deflector in place.

1. Move the catcher removal knob (C, Figure 13) forward to unlock the catcher from the rear support arms.
2. Depress the catcher dump lock pedal (A).
3. Use the catcher lever (B) to open the catcher slightly.
4. Lift the catcher off the rear support arms.
5. Install in reverse order of removal. To assist installing the catcher, be sure to line up the alignment marks on the catcher and rear of the tractor.

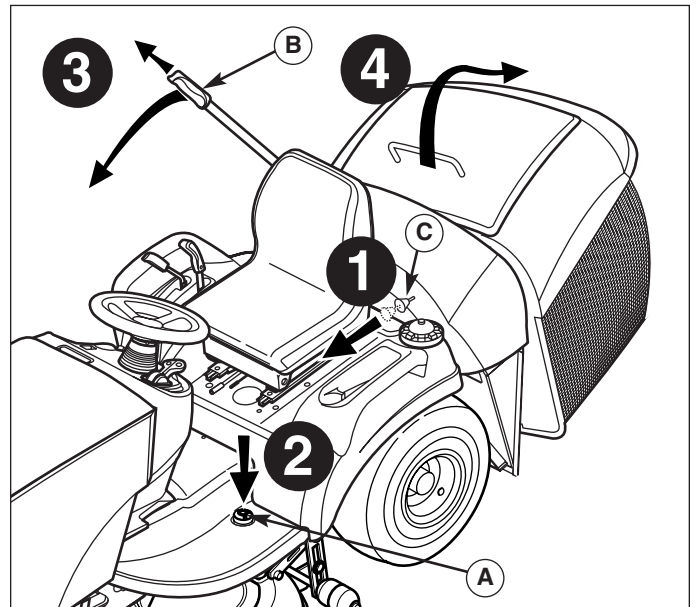


Figure 13. Emptying the Hopper
A. Catcher Dump Pedal
B. Catcher Lever
C. Catcher Lock Knob

Operating the Tractor

MULCH PLUG INSTALLATION & REMOVAL (SOME MODELS)

1. Secure plate (B, Figure 14) to the mulch plug (A) using 1/4-20 x 3/4 capscrews (D) and 1/4 lockwashers (C).

WARNING

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

2. Remove the mower deck from the unit. See the unit's Operating Instructions.
3. Insert mulch plug assembly (A, Figure 15) into discharge (B) from the under side of the mower deck.
4. Secure mulch plug (A, Figure 16) by sliding latch lever into (C) into mulch plug (A) as shown. Slide latch all the way in.
5. Reinstall mower deck onto unit. See the unit's Operating Instructions.
6. Removal is reverse of installation.

12 Volt Power Outlet

(Select Models)

CAUTION

Avoid Injury. Safe operation requires your full attention. Do not wear radio or music headphones while operating machine.

The 12-volt accessory plug is located in the left side pod (D, Figure 2). It can be used to power small electronic devices. The accessory must be rated at 14 amps or less.

Note: Operating a 12-volt accessory, especially with the engine at idle, may cause battery discharge. When not using the accessory plug it must be covered with the rubber plug to prevent moisture from causing a short circuit. Entrance of water into plug can cause a short circuit.

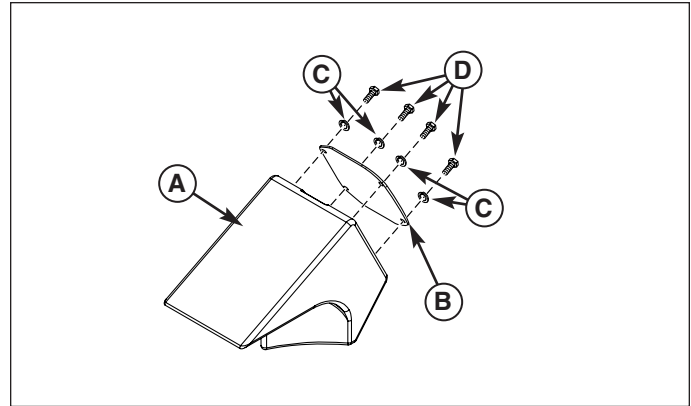


Figure 14. Install Plate to Mulch Plug

A. Mulch Plug
B. Plate

C. Lockwashers
D. Capscrews, 1/4-20 x 3/4

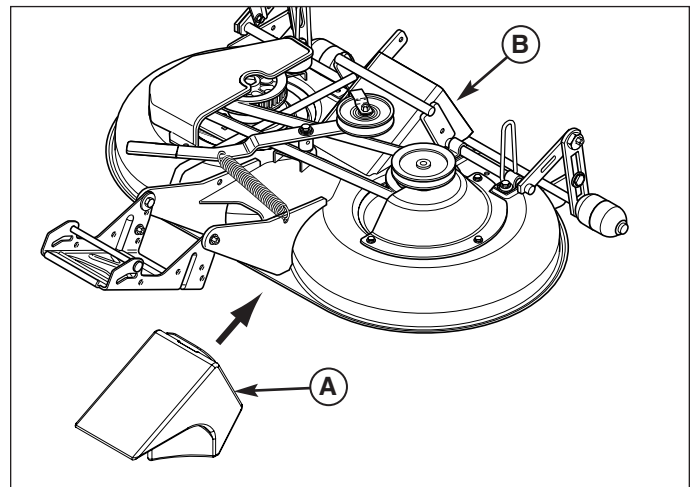


Figure 15. Install Mulch Plug

A. Mulch Plug

B. Discharge

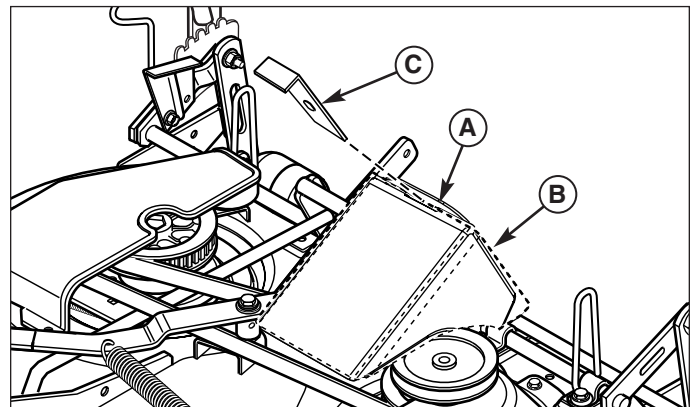
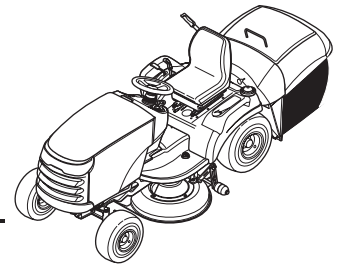


Figure 16. Install Latch Lever

A. Mulch Plug
B. Discharge

C. Latch Lever

Regular Maintenance



MAINTENANCE SCHEDULE & PROCEDURES

The following schedule should be followed for normal care of your tractor and mower. Use the hour meter to determine your operating time.

SAFETY ITEMS	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	Every 250 Hours	Spring & Fall
Check Grass Collector for Wear	●					
Check Safety Interlock System						●
Check Tractor Brakes						●
Check Mower Blade Stopping Time				●		●
TRACTOR MAINTENANCE ITEMS	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	Every 250 Hours	Spring & Fall
Check Tractor/Mower for loose hardware		●				
Check / Clean Cooling Fins				●		
Check / Adjust PTO Clutch			●		●	
Lubricate Tractor & Mower **			●			
Lubricate Rear Axle Shafts						Yearly
Clean Battery & Cables				●		
Check Tire Pressure			●			
Clean Deck & Check/Replace Mower Blades **				●		
Perform Transmission Maint. (Varies by Model)					***●	
Check Mower Blade Timing (40" Mowers)						Yearly
Check Arbor Drive Belt Tension (40" Mowers)						Yearly
ENGINE MAINTENANCE ITEMS	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	Every 250 Hours	Spring & Fall
Check Engine Oil Level	●					
Check / Change Engine Air Filter	These procedures and their service intervals can be found in the engine manufacturer's owner's manual. Always refer to the engine manual for engine-related information.					
Change Engine Oil & Filter *						
Inspect Spark Plug(s)						
Check / Replace Fuel Filter						

* Change original engine oil after initial break-in period. Refer to engine owner's manual.

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

*** Service after the first 25 hours of operation, then every 250 hours of operation.

CHECK TIRE PRESSURES

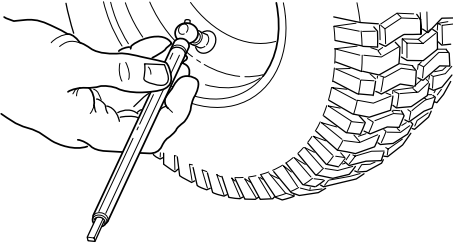
Service Interval: Every 25 Hours

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

TRANSMISSION MAINTENANCE

K46 Maintenance

The K46 is a sealed unit and does not require regular maintenance. If the transmission lacks drive or is excessively noisy, it may need to be purged. See TRANSMISSION PURGING in the Troubleshooting, Adjustments, & Service Section.



Size	PSI	bar
20 x 10.0-8	6-8	,41-,55
15 x 6.00-6	12-15	,8-1

Figure 17. Tire Pressure

BATTERY MAINTENANCE

⚠ WARNING

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

Cleaning the Battery and Cables

Service Interval: Every 100 Hours

1. Disconnect the cables from the battery, negative cable first (A, Figure 18).
2. Remove the battery hold-down (C) and battery.
3. Clean the battery compartment with a solution of baking soda and water.
4. Clean the battery terminals and cable ends with a wire brush and battery terminal cleaner until shiny.
5. Reinstall the battery in the battery compartment, and secure with the battery hold-down (C).
6. Reattach the battery cables, positive cable first (B).
7. Coat the cable ends and battery terminals with petroleum jelly or non-conducting grease.

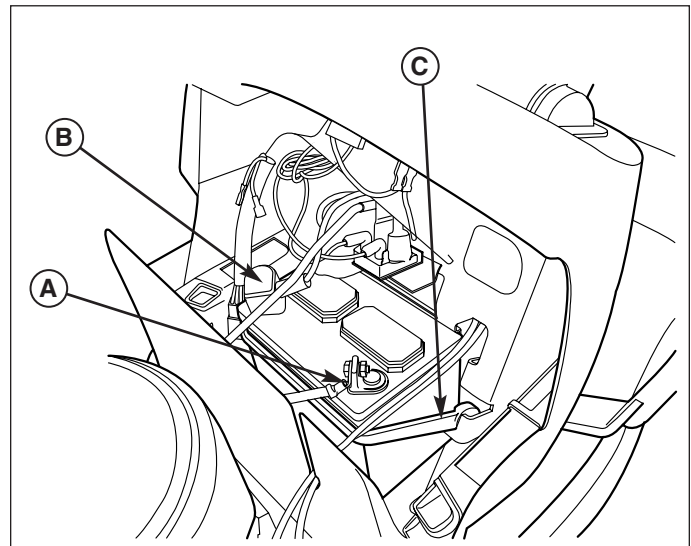


Figure 18. Battery
A. Negative Cable
B. Positive Cable & Cover
C. Rubber Hold-Down Strap

Regular Maintenance

LUBRICATION

Service Interval: Every 25 Hours

Lubricate the unit at the locations shown in Figures 19-22 as well as the lubrication points listed. Generally, all moving metal parts should be oiled where contact is made with other parts. Keep oil and grease off belts and pulleys. Wipe surfaces clean before and after lubrication.

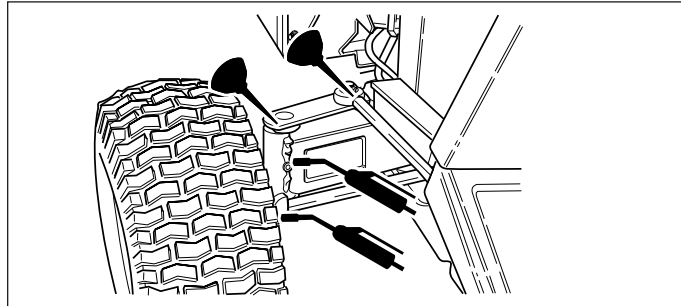


Figure 19. Lubricate Steering Linkage

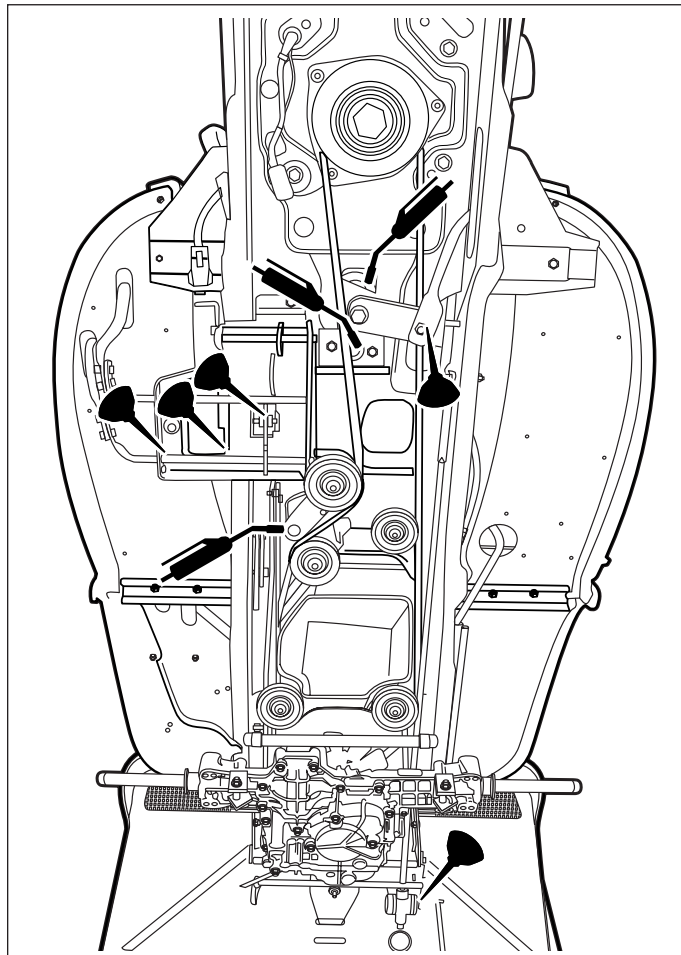


Figure 20. Lubricating the Tractor

Grease:



- steering linkage
- foot pedal
- mower linkage
- transmission idler assembly pivot
- rear axle shafts (remove wheel hubs)

Use grease fittings when present. Automotive lithium grease is recommended.

Oil:



- control linkage
- seat adjustment assembly
- brake linkage
- mower deck height adjustment linkage
- manual lift lever

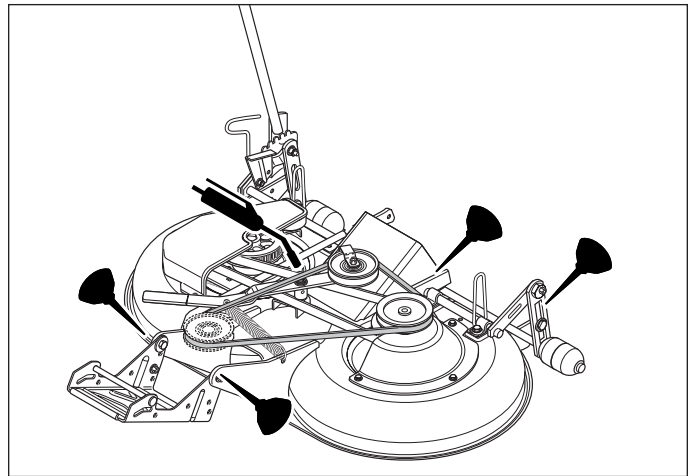


Figure 21. Mower Lubrication Points - 40"

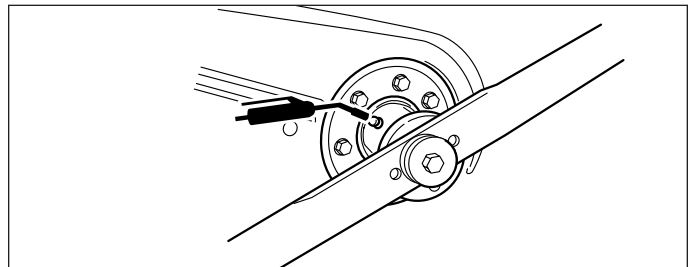


Figure 22. Arbor Lubrication Points

LUBRICATE REAR AXLE SHAFTS

Service Interval: Yearly

We recommend removing the rear wheel hubs and lubricating the axle shafts yearly. This prevents the wheel hubs from seizing onto the axle shaft and makes future service easier.

1. Turn off the ignition, turn off the PTO, engage the parking brake, and block the front tires.
2. Using a jack or chain hoist positioned at the center of the rear frame, carefully jack the unit up until the rear tires are approximately 1" - 2" (2.5-5cm) off the ground.

NOTE: For overall unit stability during service, do not jack rear end higher than required for wheel removal.

3. Support the rear of the unit on jackstands positioned under the rear frame.

NOTE: Your axle assembly may differ slightly from the assembly pictured: the quantity of washers is adjusted on a tractor by tractor basis during assembly to allow a small amount of axle end-play.

4. Remove the hardware retaining the wheel assembly to the axle and lubricate the axle shaft using anti-seize compound or lithium grease.
5. Reinstall the components in reverse order of disassembly and lower the unit. Be sure the key (A, Figure 23) is in place in the axle keyway.

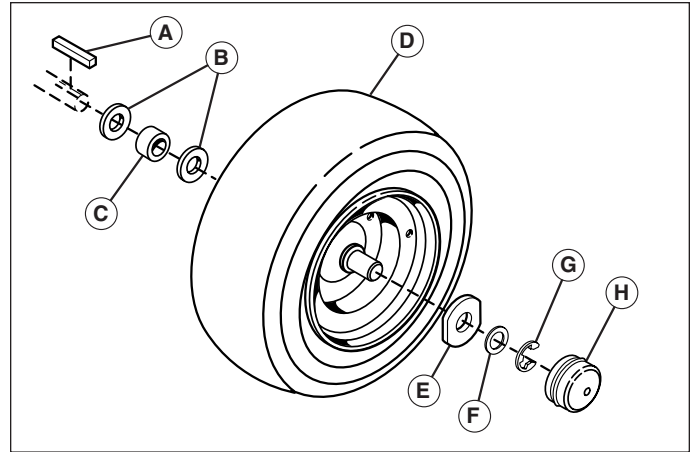


Figure 23. Rear Axle Hardware

- | | |
|-----------------------------|-----------------------------|
| A. Key | E. Axle Cap Retainer |
| B. Stationary Washer | F. Small Washer |
| C. Large Washer | G. Retaining Ring |
| D. Wheel & Tire | H. Axle Cap |

Regular Maintenance

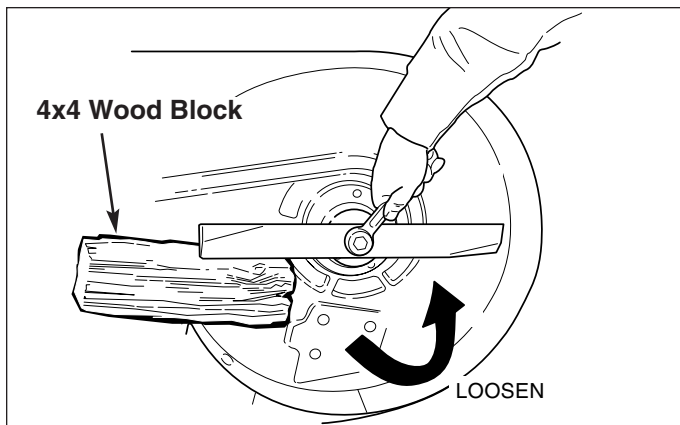


Figure 24. Removing the Blade

SERVICING THE MOWER BLADES

WARNING

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

Service Interval: Every 100 Hours or As Required

NOTE: Replace blades and bolts in sets.

1. Remove mower from the tractor. See Mower Installation & Removal.
2. Blades should be sharp and free of nicks and dents. If worn or damaged, replace the blades as described in following steps.
3. To remove the blade, use a wood block to hold blade while removing the blade mounting capscrew (Figure 24).
4. Install the new blades with the lift tabs pointing up toward deck (Figure 25). Secure with a capscrew (E), spring washer (D), spline washer (C), and alignment pin (B) (be certain the spline washer is aligned with the shaft). Use a wooden block to prevent blade rotation and torque capscrews to 45-55 ft.lbs. (61-75 N.m.).

WARNING

For your personal safety, blade mounting capscrews must each be installed with a spline washer and spring washer, then securely tightened. Torque blade mounting capscrew to 45 - 55 ft. lbs. (61 - 75 N.m.)

5. Check that the mower blades are timed perpendicular to each other (see Figure 26). If not, remove the blade and rotate the adapter (A, Figure 25).

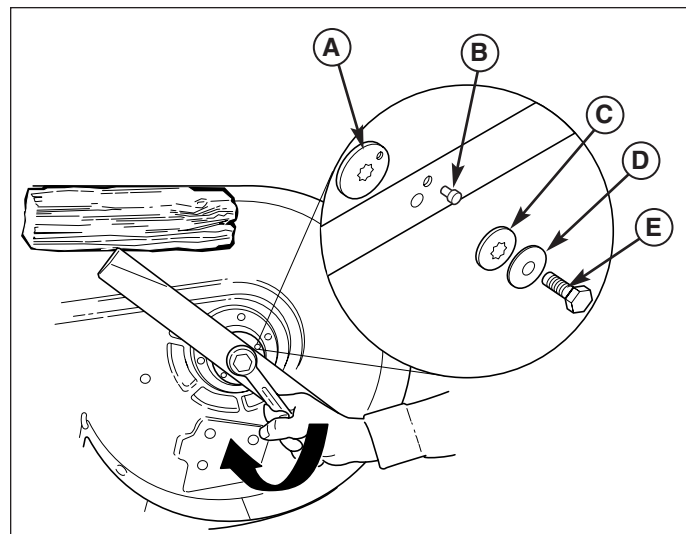


Figure 25. Installing The Blade

- | | |
|------------------|---------------|
| A. Adapter | D. Cup Washer |
| B. Alignment Pin | E. Capscrew |
| C. Spline Washer | |

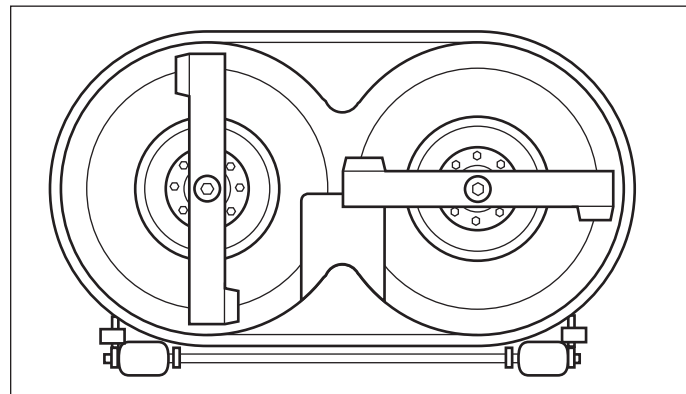


Figure 26. Blade Timing

CHECK MOWER BLADE TIMING

Service Interval: Yearly

1. Remove mower from the tractor. See Mower Installation & Removal.
2. Check that the mower blades are perpendicular to each other (Figure 26). If not, remove the blade and rotate the adapter (A, Figure 25) using the procedure outlined in Servicing the Mower Blades

SET MOWER BELT TENSION

WARNING

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

Service Interval: Yearly

1. Turn the PTO to the off position, engage the parking brake, turn the engine off, and remove the key. Remove the mower deck (see "Mower deck removal").
2. Remove the screws securing the belt covers. Remove the belt covers.
3. Loosen the idler assembly capscrew (B, Figure 27).
4. Using a 3/8" drive ratchet and extension (D), move the spring-loaded idler assembly (A) to relieve tension on the belt (C).
5. Remove the belt (C) and inspect it for cracks, missing teeth and wear. Replace belt if worn or damaged.
6. Reinstall the belt (C). Releasing the idler assembly (B) allows the spring to automatically tension the clogged belt.
7. Tighten the idler assembly capscrew (B) and reinstall the belt covers.

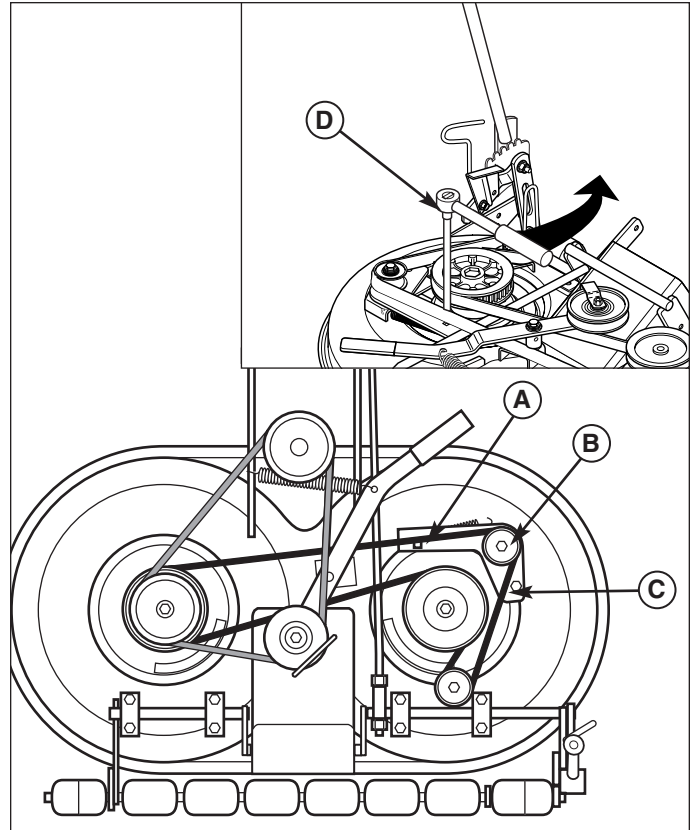


Figure 27. Mower Belt Tension

A. 3/8" Square Hole
B. Pulley Capscrew

C. Arbor Drive Belt
D. Ratchet

SAFETY INTERLOCK SYSTEM CHECK

Service Interval: Every Fall & Spring

Check the function of the safety interlock system using the test procedure found on page 7 of this manual. If the tractor fails any of the tests, see your dealer.

BLADE BRAKE CHECK

Service Interval: Every 100 Hours or Fall & Spring

Mower blades and mower drive belt should come to a complete stop within five seconds after electric PTO switch is turned off.

1. With tractor in neutral, PTO disengaged and operator in seat, start the engine.
2. Look over the left-hand footrest at the mower drive belt. Engage the PTO and wait several seconds. Disengage the PTO and check the amount of time it takes for the mower drive belt to stop.
3. If mower drive belt does not stop within five seconds, re-adjust the clutch or see your dealer.

PTO CLUTCH ADJUSTMENT CHECK

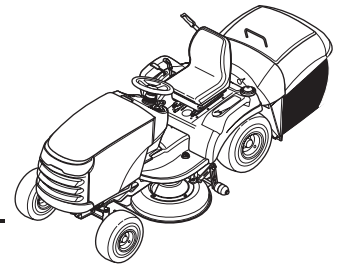
Service Interval: After 25 Hrs, Then Every 250 Hrs

Check the PTO clutch adjustment after every 250 hours of operation—or if the clutch starts slipping or will not engage. Check and adjust the clutch using the procedure outlined in the Adjustments section of this manual.

ENGINE MAINTENANCE

Refer to the engine owner's manual for all engine maintenance procedures and recommendations.

Troubleshooting, Adjustments, & Service



TROUBLESHOOTING

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

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

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

WARNING

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

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

TROUBLESHOOTING THE TRACTOR

PROBLEM	CAUSE	REMEDY
Engine will not turn over.	1. Brake pedal not depressed.	Fully depress brake pedal.
	2. PTO (electric clutch) switch in ON position.	Place in OFF position.
	3. Cruise control engaged.	Move lever to Neutral position.
	4. Circuit breaker tripped.	Wait one minute for automatic reset. Replace if defective.
	5. Battery terminals require cleaning.	See Battery Maintenance Section.
	6. Battery discharged or dead.	Recharge or replace.
	7. Solenoid or starter motor faulty.	See your dealer.
	8. Safety interlock switch faulty	See your dealer.
	9. Not sitting in seat.	Sit in seat.
Engine will turn over, but will not start.	1. Engine flooded.	Disengage choke.
	2. Safety interlock switch faulty	See your dealer.
	3. Spark plug(s) faulty, fouled or incorrectly gapped.	Clean and gap or replace. See engine manual.
	4. Water in fuel.	Drain fuel & refill with fresh fuel. Replace fuel filter.
	5. Gas is old or stale.	Drain fuel & refill with fresh fuel. Replace fuel filter.
Engine starts hard or runs poorly.	1. Fuel mixture too rich.	Clean air filter. Check choke adjustment
	2. Spark plug(s) faulty, fouled, or incorrectly gapped.	Clean and gap or replace. See engine manual.
Engine knocks.	1. Low oil level.	Check/add oil as required.
	2. Using wrong grade oil.	See engine manual.
Excessive oil consumption.	1. Engine running too hot.	Clean engine fins, blower screen and air cleaner. Clean radiator screen.
	2. Using wrong weight oil.	See engine manual.
	3. Too much oil in crankcase.	Drain excess oil.
Engine exhaust is black.	1. Dirty air filter.	Replace air filter. See engine manual.
	2. Choke closed.	Open choke.
Engine runs, but tractor will not drive.	1. Ground speed control pedals not depressed.	Depress pedals.
	2. Transmission release lever in "push" position.	Move into drive position.
	3. Drive belt is broken.	See Drive Belt Replacement.
	4. Drive belt slips.	See cause and remedy below.
	5. Parking brake is engaged.	Disengage parking brake.

Tractor Troubleshooting Continued

Tractor drive belt slips.	<ol style="list-style-type: none"> 1. Pulleys or belt greasy or oily. 2. Belt stretched or worn. 3. Idler pulley pivot bracket "frozen" in declutched position. 	<p>Clean as required. Replace with new belt. Remove idler pulley bracket, clean and lubricate.</p>
Brake will not hold.	<ol style="list-style-type: none"> 1. Brake is incorrectly adjusted. 2. Internal brake worn. 	<p>See Brake Adjustment. See your dealer.</p>
Tractor steers hard or handles poorly.	<ol style="list-style-type: none"> 1. Steering linkage is loose. 2. Improper tire inflation. 3. Front wheel spindle bearings dry. 	<p>Check and tighten any loose connections. See Steering Gear Adjustment. Check and correct. Grease spindles. See Lubricating the Tractor.</p>

TROUBLESHOOTING THE MOWER

PROBLEM	CAUSE	REMEDY
Mower will not raise.	<ol style="list-style-type: none"> 1. Lift linkage not properly attached or damaged. 	Attach or repair.
Mower cut is uneven.	<ol style="list-style-type: none"> 1. Mower not leveled properly. 2. Tractor tires not inflated equally. 	<p>See Mower Adjustment. See Maintenance Section.</p>
Mower cut is rough looking.	<ol style="list-style-type: none"> 1. Engine speed too slow. 2. Ground speed too fast. 3. Blades are dull. 4. Mower drive belt slipping because it is oily or worn. 5. Check PTO (Electric Clutch) Adjustment. 6. Blades not properly fastened to arbors. 	<p>Set to full throttle. Slow down. Replace blades. See Mower Blade Service. Clean or replace belt as necessary.</p> <p>See Adjustments Section.</p> <p>See Servicing the Mower Blades.</p>
Engine stalls easily with mower engaged.	<ol style="list-style-type: none"> 1. Engine speed too slow. 2. Ground speed too fast. 3. Carburetor improperly adjusted. 4. Cutting height set too low. 5. Discharge chute jamming with cut grass. 6. Engine not up to operating temperature. 7. Starting mower in tall grass. 	<p>Set to full throttle. Slow down. See Engine Manual. Cut tall grass at maximum cutting height during first pass. Cut grass with discharge pointing toward previously cut area. Run engine for several minutes to warm-up.</p> <p>Start the mower in a cleared area.</p>
Excessive mower vibration.	<ol style="list-style-type: none"> 1. Blade mounting screws are loose. 2. Mower blades, arbors, or pulleys are bent. 3. Mower blades are out of balance. 4. Belt installed incorrectly. 	<p>Tighten to 45-55 ft.lbs. (61-75 N.m.).</p> <p>Check and replace as necessary.</p> <p>Replace blades. See Servicing the Mower Blades. Reinstall Correctly.</p>
Excessive belt wear or breakage.	<ol style="list-style-type: none"> 1. Bent or rough pulleys. 2. Using incorrect belt. 	<p>Repair or replace. Replace with correct belt.</p>
Mower drive belt slips or fails to drive.	<ol style="list-style-type: none"> 1. Idler pulley spring broken or not properly attached. 2. Belt stops out of adjustment. 3. Mower drive belt broken. 4. PTO clutch out of adjustment. 	<p>Repair or replace as needed.</p> <p>Check belt stops. Replace drive belt. Adjust PTO clutch.</p>
Mower blades out of time.	<ol style="list-style-type: none"> 1. Drive belt tension incorrect. 2. Shear pin broken. 	<p>Perform mower belt tension check. Replace.</p>

SEAT ADJUSTMENT

Pitch Adjustment

The pitch of the seat can be adjusted to one of three positions. To adjust, remove the carriage bolts, spacers, washers, and nuts (B, Figure 28) from the hinge and reinstall them in the desired holes.

Seat Slide Adjustment

The seat can also be adjusted forward and back. Move the lever (A, Figure 28), position the seat as desired, and release the lever to lock the seat into position.

Seat Spring Adjustment

The seat springs (C, Figure 28) can be adjusted to provide a softer or firmer ride. Tilt the seat forward and slide the spring assembly (C) forward for a softer ride, and back for a firmer ride.

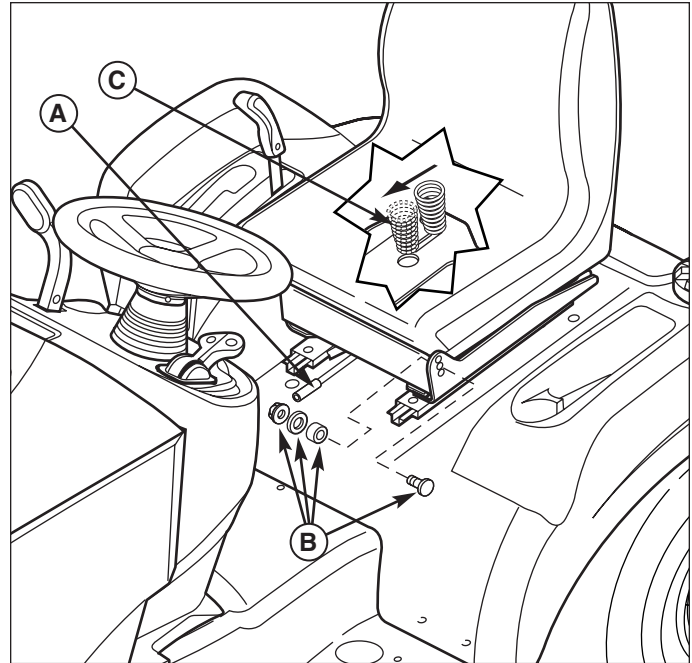


Figure 28. Seat Adjustment

A. Seat Adjustment Lever

B. Carriage Bolt, Spacer, Washer, & Nut

C. Seat Spring

HOPPER LATCH ADJUSTMENT

If the hopper will not latch when the lever is quickly closed, the latch clearance may need to be adjusted. Loosen the capscrews (A, Figure 29) and adjust the plates on both sides of the back plate as needed.

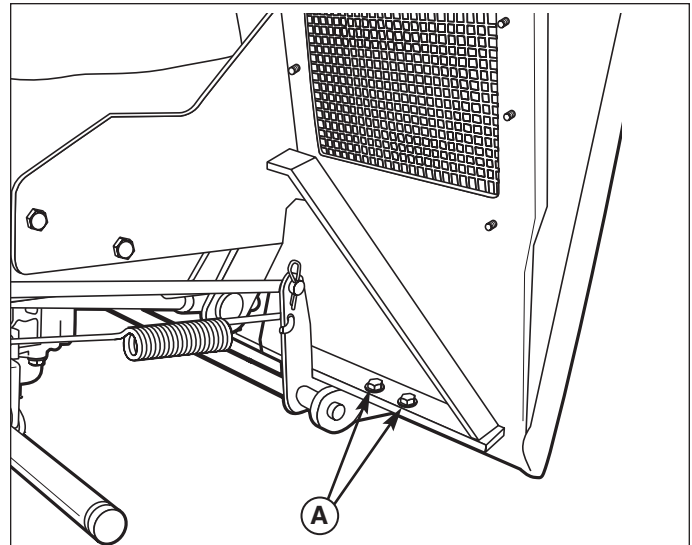


Figure 29. Left Rear Wheel Well

A. Hopper Latch Capscrews

STEERING GEAR ADJUSTMENT

If there is excessive slack in the steering system, the steering gear backlash can be removed.

1. See Figure 30. Locate the steering gear assembly on the underside of the tractor. Loosen the two nuts and adjust the bracket so the gear teeth are closely meshed.
2. Tighten nuts to 36-44 ft. lbs. (49-59 Nm) after adjustment.

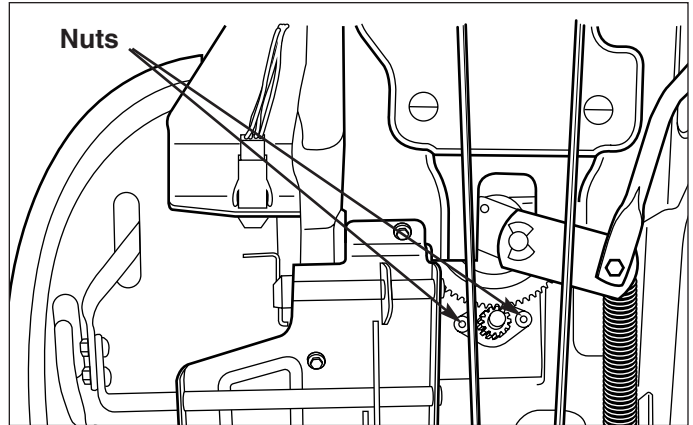


Figure 30. Steering Gear Adjustment

BRAKE ADJUSTMENT

1. Disengage the PTO, stop the engine, block the wheels, remove the ignition key, and engage the parking brake.
2. Remove the mower deck (see Mower Deck Removal).
3. Locate the brake spring (A, Figure 31) and adjustment nut (B).
4. With the parking brake engaged, measure the compressed spring length. The spring should be 2-1/2" (6,4 cm) when compressed.

If the spring is not within this range, turn the adjustment nut (B, Figure 31) to compress or release the spring.

If this adjustment does not correct a braking problem, see your dealer.

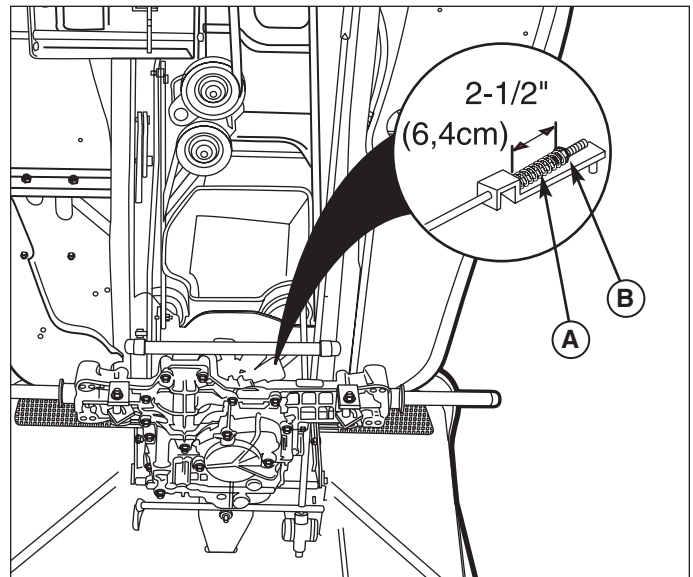


Figure 31. Brake Spring Adjustment

A. Brake Spring
B. Adjustment Nut

CATCHER-FULL ALARM ADJUSTMENT

There are two ways to adjust the “catcher full” alarm one for grass volume and one for sensitivity.

GRASS VOLUME ADJUSTMENT

Sliding the paddle bracket (C, Figure 32) up increases the volume of grass in the collector before the alarm goes off. Sliding the paddle bracket (C) down decreases the volume of grass in the collector before the alarm goes off.

1. Loosen bracket hardware (B).
2. Slide paddle bracket (C) up or down.
3. Tighten bracket hardware (B).

SENSITIVITY ADJUSTMENT

Sliding the carriage bolt, washer and nut (D) up decreases the sensitivity in the collector before the alarm goes off. Sliding the carriage bolt, washer and nut (D) down increases the sensitivity in the collector before the alarm goes off.

1. Loosen carriage bolt, washer and nut (D).
2. Slide carriage bolt, washer and nut (D) up or down the alarm paddle (A).
3. Tighten carriage bolt, washer and nut (D).

Note: It may be necessary to change the catcher-full alarm as turf conditions change.

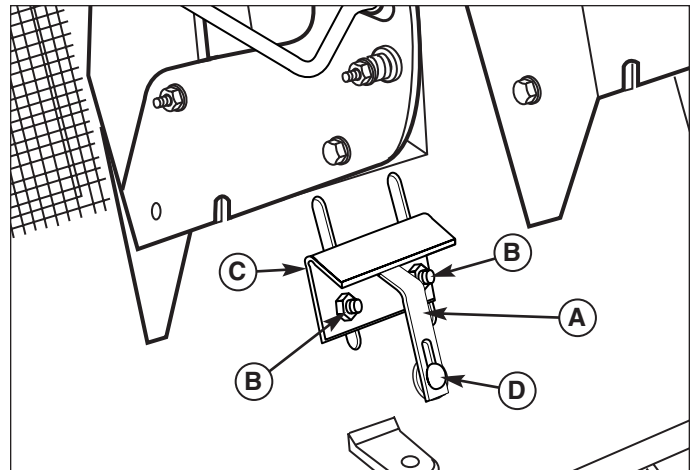


Figure 32. Catcher Alarm Adjustment
A. Alarm Paddle **C. Paddle Bracket**
B. Bracket Hardware **D. Carriage Bolt, Washer and Nut**

MOWER LIFT ADJUSTMENT

The mower lift rod (A, Figure 33) can be inserted into two holes depending on the amount of mower lift desired. The upper hole provides higher mower lift when the attachment lift lever is placed in transport position. The lower hole will not lift the mower as high in transport position, but requires less lift effort.

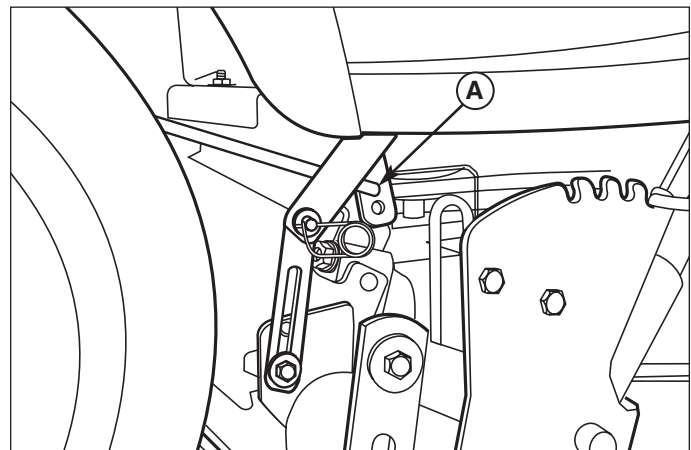


Figure 33. Mower Lift Adjust
(Viewed from underneath right side of tractor)
A. Mower Lift Rod

BATTERY CHARGING

WARNING

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

A dead battery or one too weak to start the engine may be the result of a defect in the charging system or other electrical component. 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.

To charge the battery, follow the instructions provided by the battery charger manufacturer as well as all warnings included in the safety rules sections of this book. Charge the battery until fully charged (until the specific gravity of the electrolyte is 1.250 or higher and the electrolyte temperature is at least 60° F). Do not charge at a rate higher than 10 amps.

PTO CLUTCH ADJUSTMENT

WARNING

To avoid serious injury, perform adjustments only with engine stopped, key removed and tractor on level ground.

Check the PTO clutch adjustment after every 250 hours of operation. Also perform the following procedure if the clutch is slipping or will not engage, or if a new clutch has been installed.

1. Remove key from ignition switch and disconnect spark plug wires to prevent the possibility of accidental starting while the PTO is being adjusted.
2. See Figure 34. Note the position of the 3 adjustment windows (A) in the side of the brake plate and the nylock adjustment nuts (B).
3. Insert a .012"-.015" (2,5-4mm) feeler gauge (C) through each window, positioning the gauge between the rotor face and the armature face as shown in Figure 35.
4. Alternately tighten the adjustment nuts (B, Figure 32) until the rotor face and armature face just contacts the gauge.
5. Check the windows for an equal amount of tension when the gauge is inserted and removed, and make any necessary adjustments by tightening or loosening the adjustment nuts.

NOTE: The actual air gap between the rotor and armature may vary even after performing the adjustment procedure. This is due to dimensional variations on component parts, and is an acceptable condition.

6. Check the mower blade stopping time. The mower blades and mower drive belt should come to a complete stop within five seconds after the electric PTO switch is turned off.
7. Perform the **BLADE BRAKE CHECK** found in the **MAINTENANCE** Section. Mower blades and mower drive belt should come to a complete stop within five seconds after electric PTO switch is turned off.

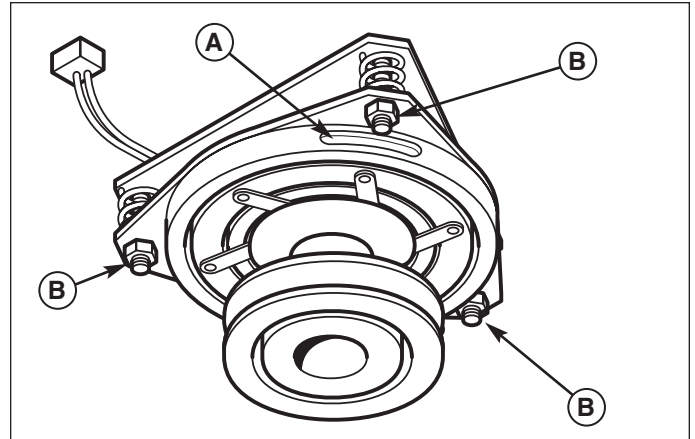


Figure 34. PTO Clutch Adjustment
A. Adjustment Window (Qty. 3, one shown)
B. Adjustment Nut

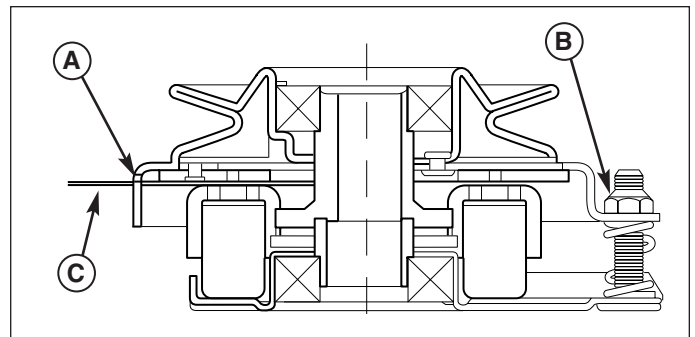


Figure 35. Adjust PTO Clutch
A. Window
B. Adjustment Nut
C. Feeler Gauge

TRANSMISSION PURGING

Purge the transmission if the unit is excessively noisy or lacks drive in forward or reverse.

1. Elevate the rear end of the tractor using a chain hoist or floor jack. Support the rear of the unit using jack-stands. Elevate the unit just high enough for the rear wheels to clear the ground.
2. Activate the seat switch, depress the clutch / brake pedal, and start the engine. After the engine has started, set throttle to IDLE.
3. Release the brake pedal and fully depress the forward ground speed pedal.
4. While holding the forward ground speed pedal down, engage and disengage the transmission release valve lever (A, Figure 36) several times.
5. Fully depress the reverse ground speed pedal.
6. While holding the reverse ground speed pedal down, engage and disengage the transmission release valve lever (A) several times.
7. Engage the transmission release valve lever and stroke the transmission from full forward to full reverse several times.
8. Lower the tractor and test run for several minutes.

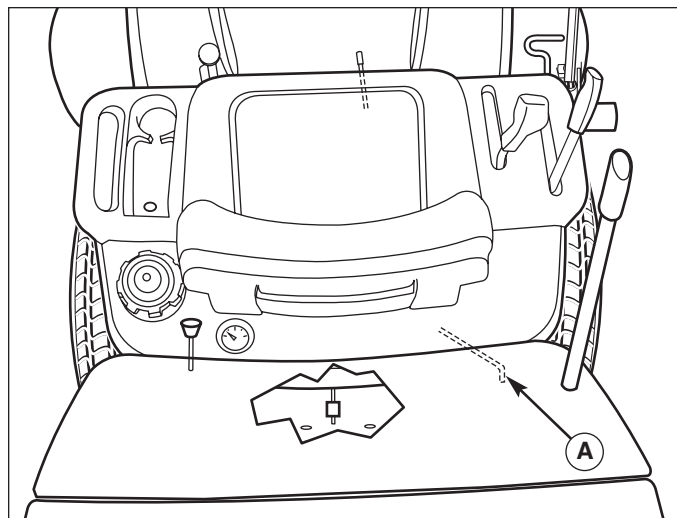


Figure 36. Transmission Release Lever
A. Transmission Release Lever

MOWER ADJUSTMENTS

WARNING

Before checking mower, shut off PTO and engine, remove the key, and allow all moving parts to stop.

Cutting Height Adjustment

The cutting height adjustment lever (A, Figure 37) controls the mower cutting height. Push the button to release the lever. Move the lever back to raise the deck and forward to lower it.

Leveling The Mower

If the cut is uneven, the mower may need leveling. Unequal or improper tire pressure may also cause an uneven cut. Make sure tire pressure is correct as specified in Checking Tire Pressure.

1. With the mower installed, place the tractor on a smooth, level surface such as a concrete floor. Turn the front wheels straight forward.
2. Check for bent blades and replace if necessary.
3. Disengage the PTO. Place the mower in mid-cut position. Arrange one of the mower blades so that it is pointing from side-to-side.
4. Measure the distance between the outside tips of each blade and the ground. If there is more than 1/8" (3mm) difference between the measurements on each side, proceed to step 5. If the difference is 1/8" (3mm) or less, proceed to step 6.
5. See Figure 38. Loosen the outside nut (A). Turn the eccentric nut (B) to raise or lower left-hand side of mower. When mower is level, hold the eccentric nut while tightening the outside nut.
6. Arrange the blades so they face front-to-back.
7. Measure the distance from the ground to front tip and rear tip of the left and right-hand blades. Front tips should be 1/8"-1/4" higher. If not, proceed with steps 8 - 10.
8. See Figure 39. To raise front of mower deck, loosen front nut (A) and turn rear nut (B) against bracket (C).
9. To lower front of mower deck, loosen rear nut (B) and bracket (C) will move backwards to lengthen rod.
10. Re-check measurement before tightening front nut (A) against bracket.

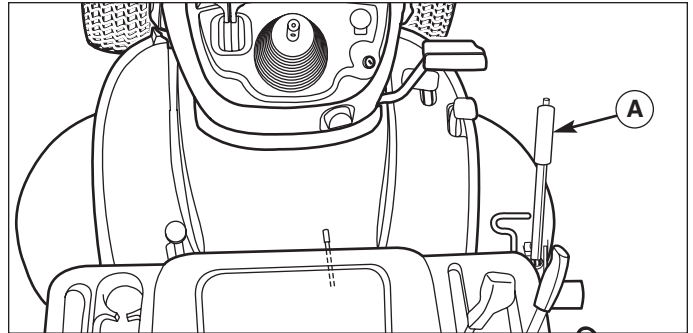


Figure 37. Mower Cutting Height Adjustment
A. Adjustment Lever

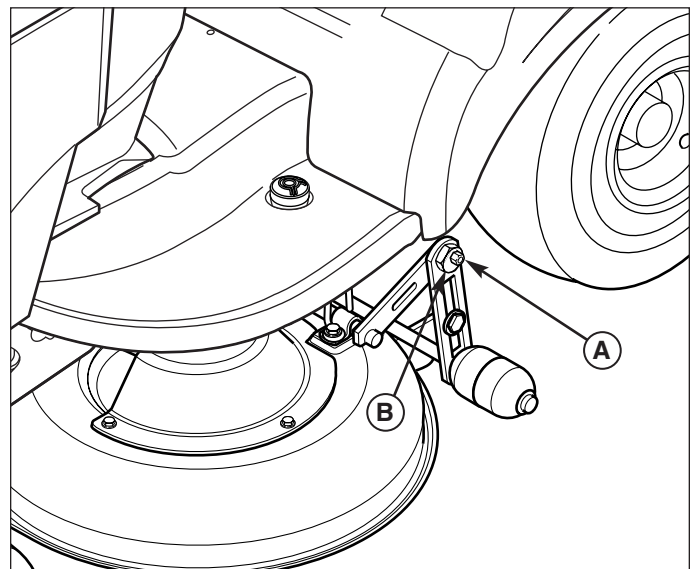


Figure 38. Leveling The Mower Side-to-Side
A. Outside Nut B. Eccentric Nut

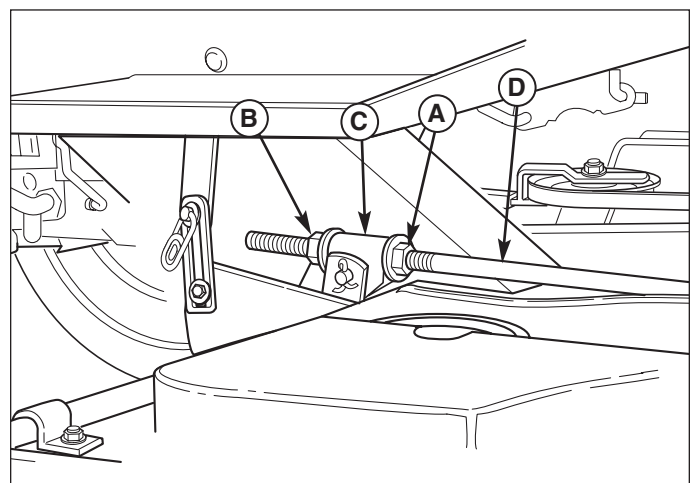


Figure 39. Leveling The Mower Front-To-Back
A. Front Nut C. Mower Bracket
B. Rear Nut D. Adjustment Rod

PTO BELT REPLACEMENT

1. With the mower deck installed, park the tractor on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, shut the engine off, and remove the key.
2. Remove the mower deck (see “Mower deck removal”). Remove the belt covers.
3. Note the position of the idler pulley belt guide (E, Figure 40). Loosen the idler pulley capscrew and remove the belt from the pulley (D).
4. Install the new belt (B) as shown. When the mower deck is installed on the tractor, the belt wraps around the PTO clutch pulley (A), idler pulley (D) and mower deck drive pulley (C).
5. Return the idler pulley belt guide (E) to its original position and tighten the idler pulley capscrew.

ARBOR DRIVE BELT REPLACEMENT

1. With the mower deck installed, park the tractor on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, shut the engine off, and remove the key.
2. Remove the mower deck (see “Mower Deck Removal”). Remove the belt covers.
3. Loosen the idler assembly capscrew (G, Figure 40).
4. Using a ratchet (A, Figure 41), move the idler assembly (H) to relieve tension on the belt (F).
5. Remove the belt (F).
6. Install a new belt (F) on the pulleys as shown. Releasing the idler assembly (H) allows the spring to automatically tension the cogged belt.
7. Tighten the idler assembly capscrew (G). Reinstall the belt covers.
8. Check that the blades are positioned perpendicular to each other as shown in Figure 42. If not, perform the mower blade timing procedure found in the “Regular Maintenance” section.

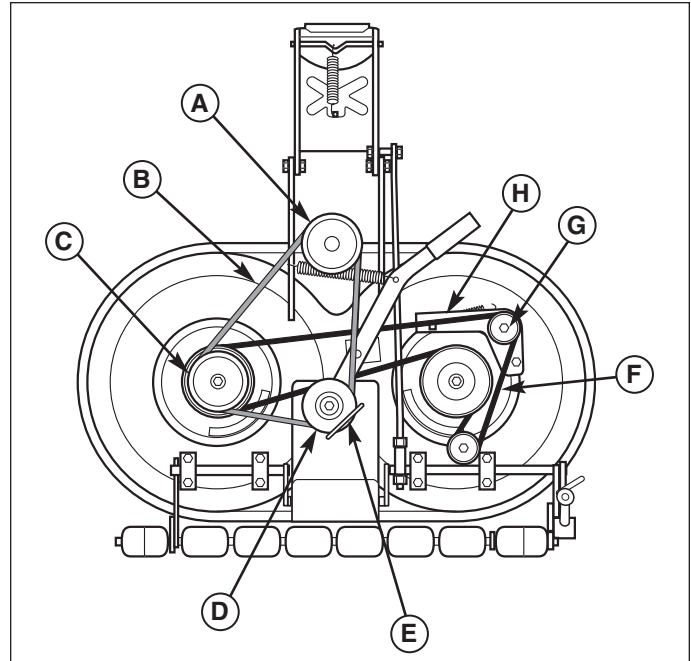


Figure 40. Mower Belts

- A. PTO Pulley (Engine)
- B. PTO Belt
- C. Mower Deck Drive Pulley
- D. Idler Pulley
- E. Belt Guide
- F. Arbor Drive Belt
- G. Idler Capscrew
- H. Idler Assembly Bracket

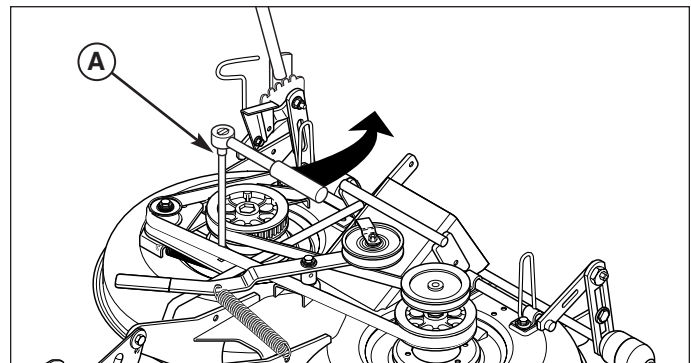


Figure 41. Release Belt Tension
A. 3/8" Ratchet and Extension

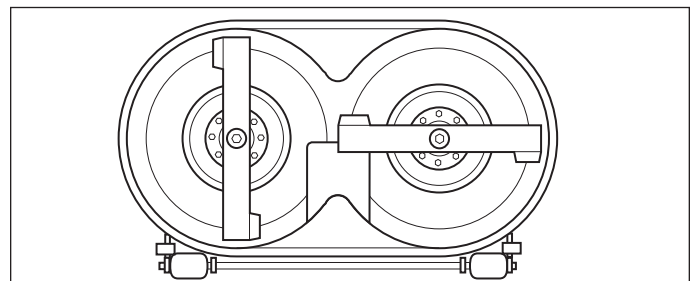
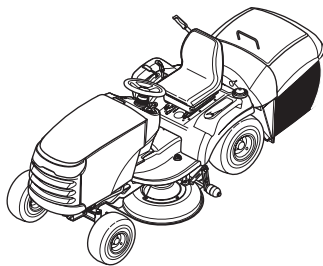


Figure 42. Mower Blade Alignment



Specifications

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

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

ENGINE:

20 HP* Briggs & Stratton

Make	Briggs & Stratton
Model	Vanguard
Horsepower	20 @ 3600 rpm
Displacement	34.8 Cu. in (570 cc)
Electrical System	12 Volt, 16 amp. Alternator, Battery: 230 CCA
Oil Capacity	48 Oz. (1.4 L)

18 HP* Briggs & Stratton

Make	Briggs & Stratton
Model	Vanguard
Horsepower	18 @ 3600 rpm
Displacement	34.8 Cu. in (570 cc)
Electrical System	12 Volt, 16 amp. Alternator, Battery: 230 CCA
Oil Capacity	48 Oz. (1.4 L)

18 HP* Briggs & Stratton

Make	Briggs & Stratton
Model	Intek 406777
Horsepower	18 @ 3600 rpm
Displacement	40 Cu. in (656 cc)
Electrical System	12 Volt, 16 amp. Alternator, Battery: 230 CCA
Oil Capacity	1-7/8 qt. (1.9L)

CHASSIS:

Fuel Tank Cap.	Capacity: 2.5 Gallons (9.5 L)
Rear Wheels	Tire Size: 20 x 10 - 8 Inflation Pressure: 6-8 psi (,41-,55 bar)
Front Wheels	Tire Size: 15 x 6.00-6 Inflation Press.: 15 psi (,8-1,0 bar)

TRANSMISSION:

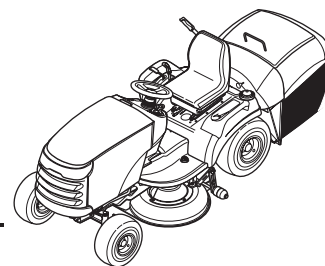
K46

Type	Hydrostatic Tuff Torq K46
Hydraulic Fluid	10w 30 Premium Engine Oil
Capacity	2.6 qt (2,5 L)
Speeds	Forward: 0-5.5 MPH (0-8,8 km/h) Reverse: 0-3.5 MPH (0-5,6 km/h)
@ 3400 rpm	
Continuous Torque Output	215 ft. lbs. (291 N.m.)
Drawbar Rating	440 lbs. (200 Kg)
Maximum Weight on Axle	584 lbs. (265 Kg)

DIMENSIONS

Overall Length	109" (277 cm)
Length (Tractor Only)	76" (193 cm)
Overall Width	37" (94 cm)
Height	At Top of Seat: 44" (112 cm)
Weight (approx.)	
16HP Tractor	695 lbs. (318 kg)

Parts & Accessories



REPLACEMENT PARTS

Replacement parts are available from your authorized dealer. Always use genuine Simplicity Service Parts.

MAINTENANCE ITEMS

Many convenient and helpful service and maintenance items are available from your authorized dealer. Some of these items include:

Engine Oil	Tire Sealant
Touch-Up Paint	Degreaser/Degreaser
Grease Gun Kit	Gas Stabilizer
8 oz. Grease Tube	

OPTIONAL ACCESSORIES

Rear Deflector	Gas Cans
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TECHNICAL MANUALS

Additional copies of this manual are available, as well as fully illustrated parts lists. These manuals show all of the product's components in exploded views (3D illustrations which show the relationship of parts and how they go together) as well as part numbers and quantities used. Important assembly notes and torque values are also included.

For applicable manuals currently available for your model, contact our Customer Publications Department at 262-284-8519 (Simplicity) / 866-313-6682 (Snapper). Have the information listed in the box below available when phoning in your request. Technical manuals can be downloaded from

www.simplicitymfg.com

www.snapper.com

Model: _____

Mfg. No.: _____

Your Name: _____

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City, State, Zip: _____

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