

# OPERATOR'S MANUAL

## Lawn Tractor & Garden Tractor

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### WARNING

**READ AND FOLLOW ALL SAFETY RULES AND INSTRUCTIONS IN THIS MANUAL  
BEFORE ATTEMPTING TO OPERATE THIS MACHINE.  
FAILURE TO COMPLY WITH THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.**

**NOTE:** This Operator's Manual covers several models. Features may vary by model. Not all features in this manual are applicable to all models and the model depicted may differ from yours.



# Important Safe Operation Practices

# 2

## ⚠ WARNING

⚠ This symbol points out important safety instructions which, if not followed, could endanger the personal safety and/or property of yourself and others. Read and follow all instructions in this manual before attempting to operate this machine. Failure to comply with these instructions may result in personal injury. When you see this symbol. **HEED ITS WARNING!**

## ⚠ WARNING

### California Proposition 65

Engine Exhaust, some of its constituents, and certain vehicle components contain or emit chemicals known to State of California to cause cancer and birth defects or other reproductive harm.  
Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

## ⚠ DANGER

This machine was built to be operated according to the safe operation practices in this manual. As with any type of power equipment, carelessness or error on the part of the operator can result in serious injury. This machine is capable of amputating hands and feet and throwing objects. Failure to observe the following safety instructions could result in serious injury or death.

### General Operation

1. Read, understand, and follow all instructions on the machine and in the manual(s) before attempting to assemble and operate. Keep this manual in a safe place for future and regular reference and for ordering replacement parts.
2. Be familiar with all controls and their proper operation. Know how to stop the machine and disengage them quickly.
3. Never allow children under 14 years of age to operate this machine. Children 14 and over should read and understand the instructions and safe operation practices in this manual and on the machine and should be trained and supervised by an adult.
4. Never allow adults to operate this machine without proper instruction.
5. To help avoid blade contact or a thrown object injury, keep bystanders, helpers, children and pets at least 75 feet from the machine while it is in operation. Stop machine if anyone enters the area.
6. Thoroughly inspect the area where the equipment is to be used. Remove all stones, sticks, wire, bones, toys, and other foreign objects which could be picked up and thrown by the blade(s). Thrown objects can cause serious personal injury.
7. Plan your mowing pattern to avoid discharge of material toward roads, sidewalks, bystanders and the like. Also, avoid discharging material against a wall or obstruction which may cause discharged material to ricochet back toward the operator.
8. Always wear safety glasses or safety goggles during operation and while performing an adjustment or repair to protect your eyes. Thrown objects which ricochet can cause serious injury to the eyes.
9. Wear sturdy, rough-soled work shoes and close-fitting slacks and shirts. Loose fitting clothes and jewelry can be caught in movable parts. Never operate this machine in bare feet or sandals.
10. For extended use of this product, hearing protection is recommended.
11. Be aware of the mower and attachment discharge direction and do not point it at anyone. Do not operate the mower without the discharge cover or entire grass catcher in its proper place.
12. Do not put hands or feet near rotating parts or under the cutting deck. Contact with the blade(s) can amputate hands and feet.
13. A missing or damaged discharge cover can cause blade contact or thrown object injuries.
14. Stop the blade(s) when crossing gravel drives, walks, or roads and while not cutting grass.
15. Watch for traffic when operating near or crossing roadways. This machine is not intended for use on any public roadway.
16. Do not operate the machine while under the influence of alcohol or drugs.
17. Mow only in daylight or good artificial light.
18. Never carry passengers.
19. Disengage blade(s) before shifting into reverse. Back up slowly. Always look down and behind before and while backing to avoid a back-over accident.
20. Slow down before turning. Operate the machine smoothly. Avoid erratic operation and excessive speed.
21. Disengage blade(s), set parking brake, stop engine and wait until the blade(s) come to a complete stop before removing grass catcher, emptying grass, unclogging chute, removing any grass or debris, or making any adjustments.
22. Never leave a running machine unattended. Always turn off blade(s), place transmission in neutral, set parking brake, stop engine and remove key before dismounting.
23. Use extra care when loading or unloading the machine into a trailer or truck. This machine should not be driven up or down ramp(s), because the machine could tip over, causing serious personal injury. The machine must be pushed manually on ramp(s) to load or unload properly.
24. Muffler and engine become hot and can cause a burn. Do not touch.
25. Check overhead clearances carefully before driving under low hanging tree branches, wires, door openings etc., where the operator may be struck or pulled from the machine, which could result in serious injury.
26. Disengage all attachment clutches, depress the brake pedal completely and shift into neutral before attempting to start engine.
27. Your machine is designed to cut normal residential grass of a height no more than 10". Do not attempt to mow through unusually tall, dry grass (e.g., pasture) or piles of dry leaves. Dry grass or leaves may contact the engine exhaust and/or build up on the mower deck presenting a potential fire hazard.

28. Use only accessories and attachments approved for this machine by the machine manufacturer. Read, understand and follow all instructions provided with the approved accessory or attachment.
29. 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.
30. If situations occur which are not covered in this manual, use care and good judgment. Contact your customer service representative for assistance.

### **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 mow it.

For your safety, use the slope gauge included as part of this manual to measure slopes before operating this machine on a sloped or hilly area. If the slope is greater than 15 degrees as shown on the slope gauge, do not operate this machine on that area or serious injury could result.

#### **Do:**

1. Mow up and down slopes, not across. Exercise extreme caution when changing direction on slopes.
2. Watch for holes, ruts, bumps, rocks, or other hidden objects. Uneven terrain could overturn the machine. Tall grass can hide obstacles.
3. Use slow speed. Choose a low enough speed setting so that you will not have to stop or shift while on the slope. Tires may lose traction on slopes even though the brakes are functioning properly. Always keep machine in gear when going down slopes to take advantage of engine braking action.
4. Follow the manufacturer's recommendations for wheel weights or counterweights to improve stability.
5. Use extra care with grass catchers or other attachments. These can change the stability of the machine.
6. Keep all movement on the slopes slow and gradual. Do not make sudden changes in speed or direction. Rapid engagement or braking could cause the front of the machine to lift and rapidly flip over backwards which could cause serious injury.
7. Avoid starting or stopping on a slope. If tires lose traction, disengage the blade(s) and proceed slowly straight down the slope.

#### **Do Not:**

1. Do not turn on slopes unless necessary; then, turn slowly and gradually downhill, if possible.
2. 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, ditch, or if an edge caves in.
3. Do not try to stabilize the machine by putting your foot on the ground.
4. Do not use a grass catcher on steep slopes.
5. Do not mow on wet grass. Reduced traction could cause sliding.
6. Do not shift to neutral and coast downhill. Over-speeding may cause the operator to lose control of the machine resulting in serious injury or death.
7. Do not tow heavy pull behind attachments (e.g. loaded dump cart, lawn roller, etc.) on slopes greater than 5 degrees. When going down hill, the extra weight tends to push the tractor and may cause you to lose control (e.g. tractor may speed up, braking and steering ability are reduced, attachment may jack-knife and cause tractor to overturn).

### **Children**

1. Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the machine and the mowing activity. They do not understand the dangers. Never assume that children will remain where you last saw them.
  - a. Keep children out of the mowing area and in watchful care of a responsible adult other than the operator.
  - b. Be alert and turn machine off if a child enters the area.
  - c. Before and while backing, look behind and down for small children.
  - d. Never carry children, even with the blade(s) shut off. They may fall off and be seriously injured or interfere with safe machine operation.
  - e. Use extreme care when approaching blind corners, doorways, shrubs, trees or other objects that may block your vision of a child who may run into the path of the machine.
  - f. To avoid back-over accidents, always disengage the cutting blade(s) before shifting into Reverse. If equipped, the "Reverse Caution Mode" should not be used when children or others are around.

- g. Keep children away from hot or running engines. They can suffer burns from a hot muffler.
  - h. Remove key when machine is unattended to prevent unauthorized operation.
2. Never allow children under 14 years of age to operate this machine. Children 14 and over should read and understand the instructions and safe operation practices in this manual and on the machine and should be trained and supervised by an adult.

### **Towing**

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 recommendation for weight limits 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. Always use extra caution when towing with a machine capable of making tight turns (e.g. "zero-turn" ride-on mower). Make wide turns to avoid jack-knifing.
6. Travel slowly and allow extra distance to stop.
7. Do not shift to neutral and coast downhill.

## Service

### Safe Handling of Gasoline:

1. To avoid personal injury or property damage use extreme care in handling gasoline. **Gasoline is extremely flammable and the vapors are explosive.** Serious personal injury can occur when gasoline is spilled on yourself or your clothes which can ignite. Wash your skin and change clothes immediately.
  - a. Use only an approved gasoline container.
  - b. Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.
  - c. When practical, 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.
  - d. Keep the 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.
  - e. Extinguish all cigarettes, cigars, pipes and other sources of ignition.
  - f. Never fuel machine indoors.
  - g. Never remove gas cap or add fuel while the engine is hot or running. Allow engine to cool at least two minutes before refueling.
  - h. Never over fill fuel tank. Fill tank to no more than the bottom of filler neck to allow space for fuel expansion.
  - i. Replace gasoline cap and tighten securely.
  - j. If gasoline is spilled, wipe it off the engine and equipment. Move machine to another area. Wait 5 minutes before starting the engine.
  - k. To reduce fire hazards, keep machine free of grass, leaves, or other debris build-up. Follow the "Post-Operation Tractor Care" instructions in the Product Care section. Clean up oil or fuel spillage and remove any fuel soaked debris.
  - l. Never store the machine or fuel container inside where there is an open flame, spark or pilot light as on a water heater, space heater, furnace, clothes dryer or other gas appliances.

- m. Allow a machine to cool at least five minutes before storing.

### General Service

1. Never run an engine indoors or in a poorly ventilated area. Engine exhaust contains carbon monoxide, an odorless, and deadly gas.
2. Before cleaning, repairing, or inspecting, make certain the blade(s) and all moving parts have stopped. Disconnect the spark plug wire and ground against the engine to prevent unintended starting.
3. Periodically check to make sure the blades come to complete stop within approximately (5) five seconds after operating the blade disengagement control. If the blades do not stop within this time frame, your machine should be serviced professionally by an authorized service dealer.
4. Check brake operation frequently as it is subjected to wear during normal operation. Adjust and service as required.
5. Check the blade(s) and engine mounting bolts at frequent intervals for proper tightness. Also, visually inspect blade(s) for damage (e.g., excessive wear, bent, cracked). Replace the blade(s) with the original equipment manufacturer's (O.E.M.) blade(s) only, listed in this manual. "Use of parts which do not meet the original equipment specifications may lead to improper performance and compromise safety!"
6. Mower blades are sharp. Wrap the blade or wear gloves, and use extra caution when servicing them.
7. Keep all nuts, bolts, and screws tight to be sure the equipment is in safe working condition.
8. Never tamper with the safety interlock system or other safety devices. Check their proper operation regularly.
9. After striking a foreign object, stop the engine, disconnect the spark plug wire(s) and ground against the engine. Thoroughly inspect the machine for any damage. Repair the damage before starting and operating.
10. Never attempt to make adjustments or repairs to the machine while the engine is running.
11. Grass catcher components and the discharge cover are subject to wear and damage which could expose moving parts or allow objects to be thrown. For safety protection, frequently check components and replace immediately with original equipment manufacturer's (O.E.M.) parts only, listed in this manual. "Use of parts which do not meet the original equipment specifications may lead to improper performance and compromise safety!"
12. Do not change the engine governor settings or over-speed the engine. The

governor controls the maximum safe operating speed of the engine.

13. Maintain or replace safety and instruction labels, as necessary.
14. Observe proper disposal laws and regulations for gas, oil, etc. to protect the environment.
15. According to the Consumer Products Safety Commission (CPSC) and the U.S. Environmental Protection Agency (EPA), this product has an *Average Useful Life* of seven (7) years, or 390 hours of operation. At the end of the *Average Useful Life* have the machine inspected annually by an authorized service dealer to ensure that all mechanical and safety systems are working properly and not worn excessively. Failure to do so can result in accidents, injuries or death.

### Do not modify engine

To avoid serious injury or death, do not modify engine in any way. Tampering with the governor setting can lead to a runaway engine and cause it to operate at unsafe speeds. Never tamper with factory setting of engine governor.

### Notice Regarding Emissions

Engines which are certified to comply with California and federal EPA emission regulations for SORE (Small Off Road Equipment) are certified to operate on regular unleaded gasoline, and may include the following emission control systems: Engine Modification (EM), Oxidizing Catalyst (OC), Secondary Air Injection (SAI) and Three Way Catalyst (TWC) if so equipped.

When required, models are equipped with low permeation fuel lines and fuel tanks for evaporative emission control. California models may also include a carbon canister. Please contact Customer Support for information regarding the evaporative emission control configuration for your model.

### Spark Arrestor

#### WARNING















This machine is equipped with an internal combustion engine and should not be used on or near any unimproved forest-covered, brush-covered or grass-covered land unless the engine's exhaust system is equipped with a spark arrestor meeting applicable local or state laws (if any).

If a spark arrestor is used, it should be maintained in effective working order by the operator. In the State of California the above is required by law (Section 4442 of the California Public Resources Code). Other states may have similar laws. Federal laws apply on federal lands.

A spark arrestor for the muffler is available through your nearest engine authorized service dealer or contact the service department, P.O. Box 361131 Cleveland, Ohio 44136-0019.

## Safety Symbols

This page depicts and describes safety symbols that may appear on this product. Read, understand, and follow all instructions on the machine before attempting to assemble and operate.

Symbol	Description
	<b>READ THE OPERATOR'S MANUAL(S)</b> Read, understand, and follow all instructions in the manual(s) before attempting to assemble and operate.
	<b>DANGER — ROTATING BLADES</b> Never carry passengers. Never carry children, even with the blades off.
	<b>DANGER — ROTATING BLADES</b> Mowing in reverse is not recommended.
	<b>WARNING — ROTATING BLADES</b> Do not put hands or feet near rotating parts or under the cutting deck. Contact with the blade(s) can amputate hands and feet.
	<b>DANGER — ROTATING BLADES</b> Look down and behind before and while backing to avoid a back-over accident.
	<b>WARNING — THROWN OBJECTS</b> This machine may pick up and throw objects which can cause serious personal injury.
	<b>DANGER — SAFETY DEVICES</b> Keep safety devices (guards, shields, switches, etc.) in place and working.
	<b>WARNING — BYSTANDERS</b> Keep bystanders, helpers, children and pets at least 75 feet from the machine while it is in operation.
	<b>WARNING — SLOPE OPERATION</b> Do not operate this machine on a slope greater than 15 degrees. Do not mow across slopes. Mow up and down slopes no greater than 15 degrees. Avoid sudden turns. Use low speed. If machine stops going uphill, stop blades and back down slowly.
	<b>WARNING — HOT SURFACE</b> Engine parts, especially the muffler, become extremely hot during operation. Allow engine and muffler to cool before touching.
	<b>DANGER — ROTATING BLADES</b> To reduce the risk of injury, keep hands and feet away. Do not operate unless discharge cover or grass catcher is in its proper place. If damaged, replace immediately.
	<b>WARNING — FIRE HAZARD</b> Allow machine to cool before fueling or storing.
	<b>WARNING — FIRE HAZARD</b> Do not drive through piles of dry leaves or tall grass.
	<b>WARNING — FIRE HAZARD</b> Do not allow debris to accumulate. The build up of debris can lead to a fire.

### **WARNING**

Your Responsibility — Restrict the use of this power machine to persons who read, understand and follow the warnings and instructions in this manual and on the machine.

**SAVE THESE INSTRUCTIONS!**

## Slope Gauge

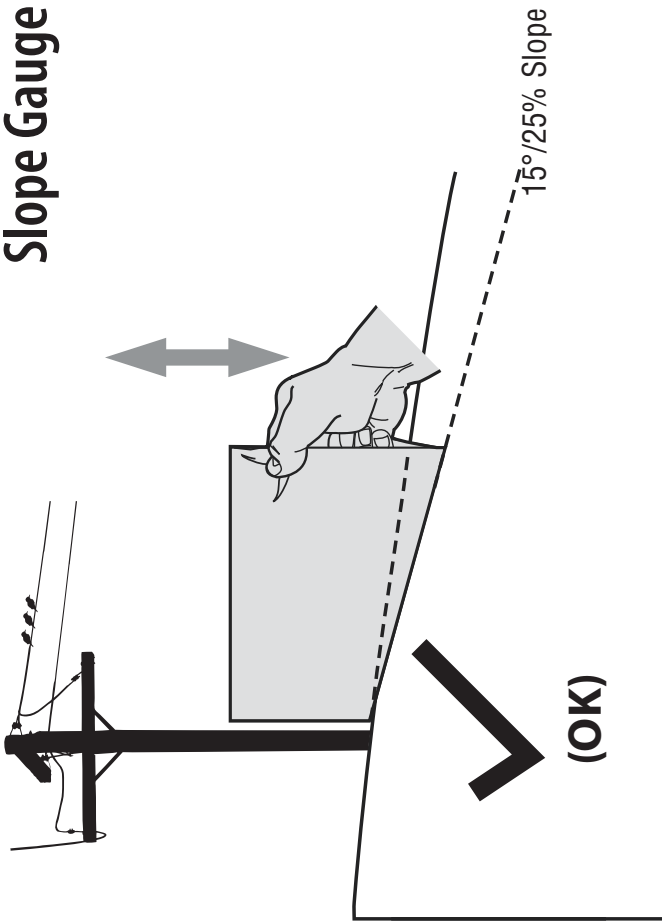


Figure 1

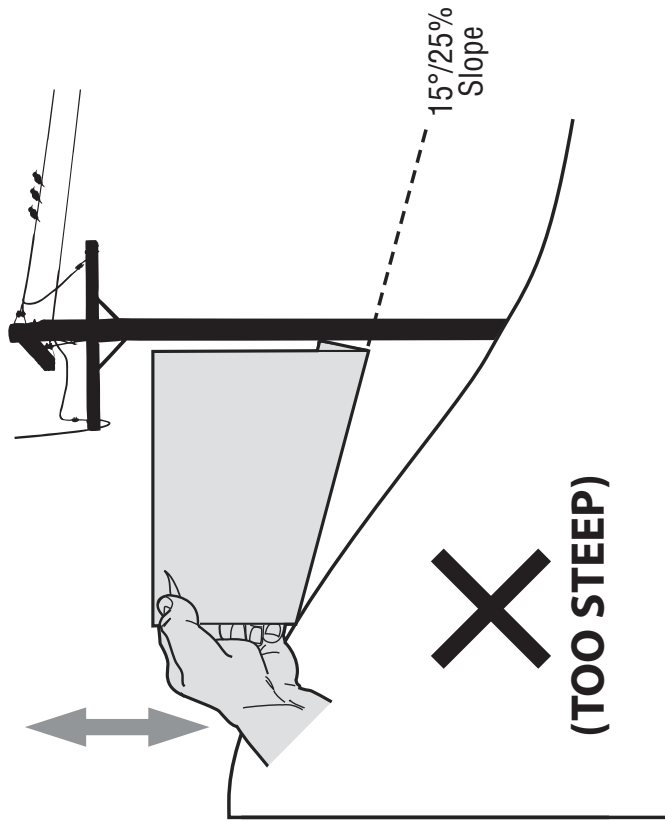


Figure 2

*15°/25% dashed line*

### USE THIS SLOPE GAUGE TO DETERMINE IF A SLOPE IS TOO STEEP FOR SAFE OPERATION!

To check the slope, proceed as follows:

1. Remove this page and fold along the dashed line.
2. Locate a vertical object on or behind the slope (e.g. a pole, building, fence, tree, etc.)
3. Align either side of the slope gauge with the object (See Figure 1 and Figure 2).
4. Adjust gauge up or down until the left corner touches the slope (See Figure 1 and Figure 2).
5. If there is a gap below the gauge, the slope is too steep for safe operation (See Figure 2 above).



**WARNING!** Slopes are a major factor related to tip-over and roll-over accidents which can result in severe injury or death.

Do not operate machine on slopes in excess of 15 degrees. All slopes require extra caution. If you cannot back up the slope or if you feel uneasy on it, do not mow it. Always mow up and down slopes, never across the face of slopes.

## Thank You

Thank you for purchasing this product. It was carefully engineered to provide excellent performance when properly operated and maintained.

Please read this entire manual prior to operating the equipment. It instructs you how to safely and easily set up, operate and maintain your machine. Please be sure that you, and any other persons who will operate the machine, carefully follow the recommended safety practices at all times. Failure to do so could result in personal injury or property damage.

All information in this manual is relative to the most recent product information available at the time. Review this manual frequently to familiarize yourself with the machine, its features and operation. Please be aware that this Operator's Manual may cover a range of

product specifications for various models. Characteristics and features discussed and/or illustrated in this manual may not be applicable to all models. We reserve the right to change product specifications, designs and equipment without notice and without incurring obligation.

If applicable, the power testing information used to establish the power rating of the engine equipped on this machine can be found at [www.opei.org](http://www.opei.org) or the engine manufacturer's web site.

If you have any problems or questions concerning the machine, phone your local authorized service dealer or contact us directly. We want to ensure your complete satisfaction at all times.

Throughout this manual, all references to *right* and *left* side of the machine are observed from the operating position.

## Contents of Crate

- Tractor (1)
- Hood Topper (1) †
- Front Bumper (1) †
- Operator's Manual (1)
- Dash Cap (1) †
- Engine Operator's Manual (1)
- Steering Wheel Asm. (1) †

† — If Equipped

**NOTE:** This Operator's Manual covers several models. Tractor features may vary by model. Not all features in this manual are applicable to all tractor models and the tractor depicted may differ from yours.

**NOTE:** All references in this manual to the left or right side and front or back of the tractor are from the operating position only. Exceptions, if any, will be specified.

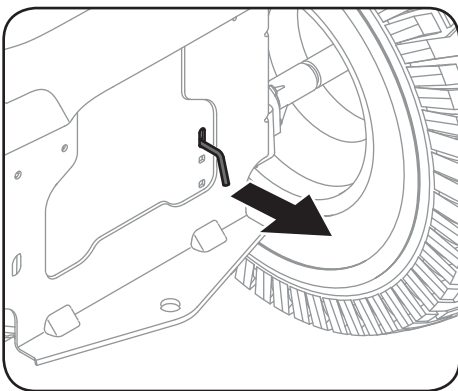
## Tractor Preparation

### Manually Moving the Tractor

#### ⚠ CAUTION

Never tow your tractor. Towing the tractor with the rear wheels on the ground may cause severe damage to the transmission.

1. Engage the transmission bypass rod to move the tractor manually without starting it. The transmission bypass rod is located on the rear of the tractor, on the frame. Engage the bypass rod by pulling out. See Figure 2-1.



**Figure 2-1**

**NOTE:** If the tractor will not move or does not move freely when pushing check if the bypass lever is fully open or the brake is engaged.

**NOTE:** The transmission will NOT engage when the hydrostatic bypass rod is pulled out. Return the rod to its normal position prior to operating the tractor. If the tractor will not move when pushing on the forward/reverse pedals, or moves slowly, check to see if the bypass valve is on.

2. Disengage the bypass rod by pushing the rod back in after moving the tractor. See Figure 2-1.

### Install Operator's Seat (If necessary)

#### ⚠ WARNING

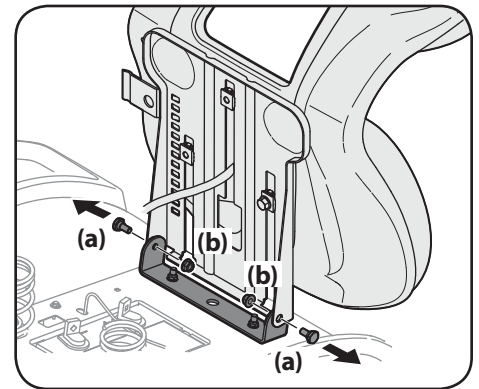
Before operating the tractor, make sure the seat is engaged in the seat-stop. Engage the parking brake. Stand behind the machine and pull back on seat until it clicks into place.

To install the seat proceed as follows:

1. Cut any straps securing the seat assembly to the tractor. Remove any packing material.
 

**NOTE:** Be careful not to cut the wiring harness connecting the seat and the seat switch.

2. Remove the two shoulder screws (a) and flange lock nuts (b) in the seat pan as shown in Figure 2-2.



**Figure 2-2**

**NOTE:** Be sure that the nylon flange bearings (if equipped) remain in place on the seat bracket mounting holes. If they come out during the removal of the shoulder screws and flange lock nuts make sure to replace them before installing the seat.

3. Rotate the seat into position and secure the seat into place with the previously removed shoulder screws (a) and flange lock nuts (b). Be careful not to crimp or damage the wire harness while installing the seat. See Figure 2-3.

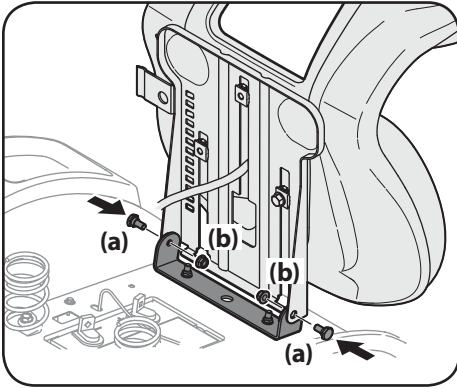


Figure 2-3

4. Using the harness clip attached to the harness, secure the excess wire to the fender by snapping the harness clip in place as shown in Figure 2-4.

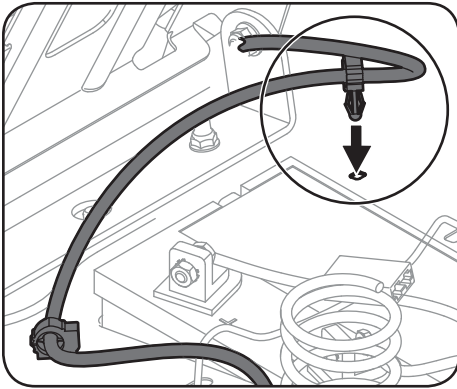


Figure 2-4

### Lower Deck Discharge Chute Deflector

#### ⚠ WARNING

Never operate the mower deck without the chute deflector installed and in the down position.

1. Check the mower deck for a shipping brace that may be holding the chute deflector upward for shipment. If the brace is present, it must be removed before operating the tractor. Holding the chute deflector fully upward, remove the shipping brace. Lower the chute deflector and discard the shipping brace. See Figure 2-5.

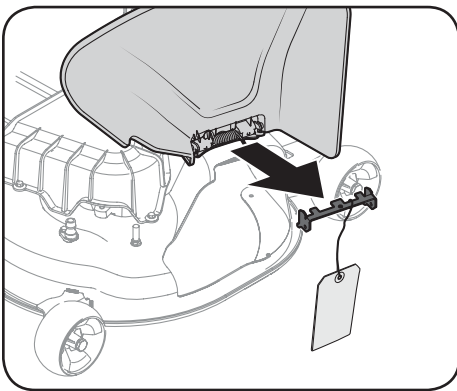


Figure 2-5

### Installing the Hood Topper (If necessary)

To install the hood topper (a), line up the holes on the hood topper (a) up with the tabs (b) in the hood frame as shown in Figure 2-6. Insert the tabs (b) into the hood topper and pull back to lock into place.

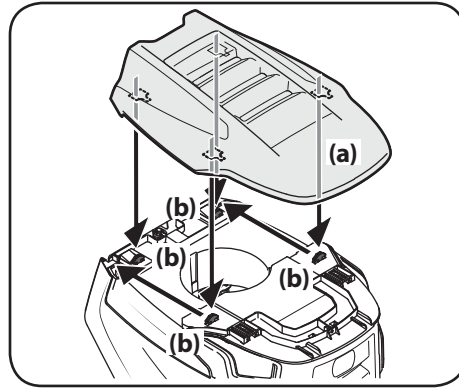


Figure 2-6

Once the hood topper is in place, the two locking tabs (a) near the rear of the hood need to be pushed upward to lock the hood topper in place. See Figure 2-7.

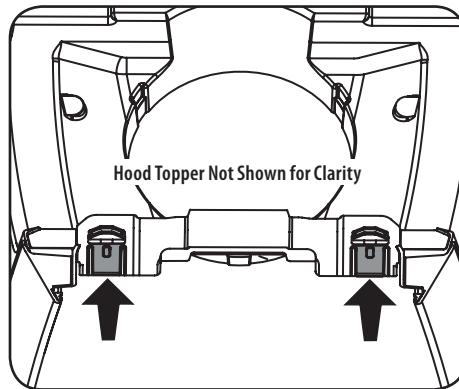


Figure 2-7

### Installing the Dash Cap (If necessary)

To install the dash cap (a), line up the tabs (b) on the dash cap (a) with the holes in the upper dash as shown in Figure 2-8. Slide the tabs (b) into the holes in the upper dash and push forward (c) on the dash cap (a) to lock into place.

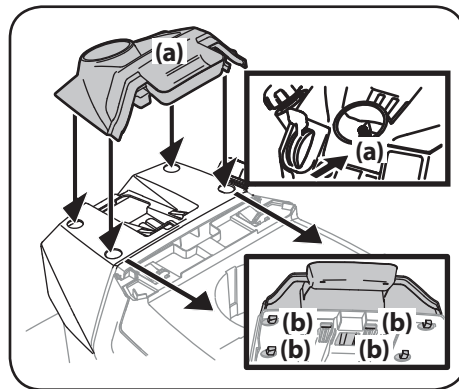


Figure 2-8

**NOTE:** Be sure to press on the lower part of the dash cap (a) facing the operator position to ensure the lower tabs on the dash cap are in place.

### Installing the Steering Wheel (If necessary)

The hardware for attaching the steering wheel has been packed within the steering wheel, beneath the steering wheel cap. Carefully pry off the steering wheel cap and remove the hardware.

**IMPORTANT!** Do not use impact tools to install or remove the steering wheel. Doing so may cause damage to critical power steering components.

1. With the wheels of the tractor pointing straight forward, align the steering wheel (a) by using the center-line (b) on the front of the steering wheel (a) pointing straight ahead and the flat section (c) of the steering wheel (a) facing toward the seat, place the steering wheel (a) over the steering shaft (d). See Figure 2-9.

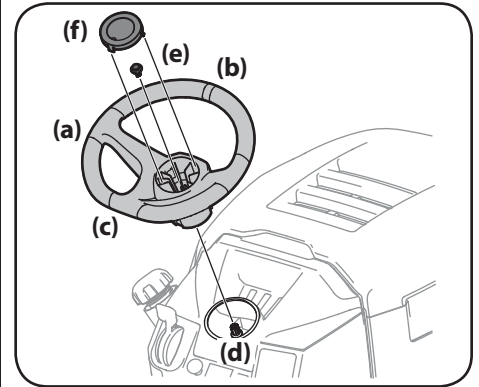


Figure 2-9

2. Secure the steering wheel (a) with the hex bolt (e) from under the steering wheel cap (f) and torque to 18-22 ft.-lbs.
3. Place the steering wheel cap (f) over the center of the steering wheel (a) and push downward until it "clicks" into place.

**NOTE:** The hex bolt (e) securing the steering wheel (a) has thread locker applied to it, so if it is removed, it is recommended that the hex bolt (a) be replaced or thread lock re-applied.

### Installing the Front Bumper (If necessary)

The hardware for attaching the front bumper is shipped installed into the bumper.

1. Remove the four hex screws (a) from the bumper (b).
2. Position the bumper brackets to the *inside* of the tractor's frame and secure it in place with the four hex flange screws (a). See Figure 2-10.

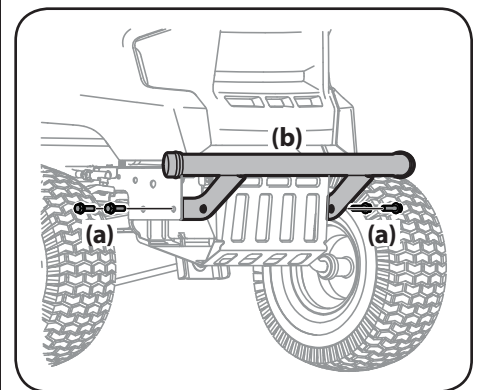


Figure 2-10

## Adjusting the Seat

To adjust the position of the seat, lift the seat adjustment lever up. Slide the seat forward or rearward to the desired position; then release the adjustment lever. Make sure seat is locked into position before operating the tractor. See Figure 2-11.

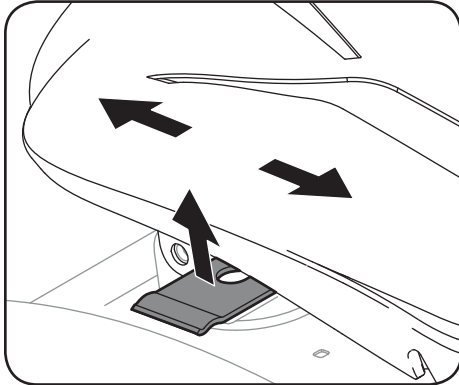


Figure 2-11

## Connecting the Battery Cables

### ⚠ WARNING

California **PROPOSITION 65** Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

### ⚠ CAUTION

When attaching battery cables, always connect the **POSITIVE (Red)** wire to its terminal first, followed by the **NEGATIVE (Black)** wire.

For shipping reasons, both battery cables on your equipment may have been left disconnected from the terminals at the factory. To connect the battery cables, proceed as follows:

**NOTE:** The positive battery terminal is marked Pos. (+). The negative battery terminal is marked Neg. (-).

- Remove the plastic cover, if present, from the positive battery terminal and attach the red cable to the positive battery terminal (+) with the bolt (a) and hex nut (b). See Figure 2-12.

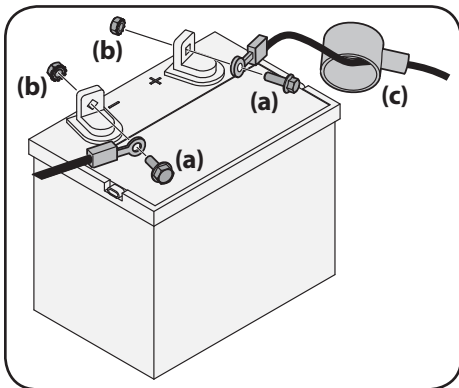


Figure 2-12

- Remove the plastic cover, if present, from the negative battery terminal and attach the black cable to the negative battery terminal (-) with the bolt (a) and hex nut (b). See Figure 2-12.

- Position the red rubber boot (c) over the positive battery terminal to help protect it from corrosion.

**NOTE:** If the battery is put into service after the date shown on top/side of battery, charge the battery as instructed in the Product Care section on page 8 prior to operating the tractor.

## Checking Tire Pressure

### ⚠ WARNING

Equal tire pressure should be maintained at all times. Refer to the tire sidewall for proper pressure.

The tires on your tractor may be over-inflated for shipping purposes. Reduce the tire pressure before operating the tractor. Check the sidewall of tire for maximum p.s.i.

**NOTE:** Equal tire pressure is critical for level cutting deck performance.

## Setting the Deck Wheels

### ⚠ WARNING

Keep hands and feet away from the discharge opening of the cutting deck.

**NOTE:** The deck wheels are an anti-scalp feature of the deck and are not designed to support the weight of the cutting deck.

Move the tractor on a firm and level surface, preferably pavement, and proceed as follows:

- Check the tire pressure, make sure the pressure is correct and equal on all tires.
- Make sure the deck is level, both front-to-back and side-to-side. See the Product Care section for deck leveling information and instructions.
- Select the height position of the cutting deck by placing the deck lift lever in the normally desired mowing height setting.
- Check the wheels for contact or excessive clearance with the surface below. The deck wheels should have between  $\frac{1}{4}$ " and  $\frac{1}{2}$ " clearance above the ground. Proceed as follows to adjust the wheels:
  - Raise the deck lift handle to its highest setting.
  - Remove the front (a) and rear (b) deck wheels by removing the flange lock nuts (c) and shoulder bolts (d) that secure them to the deck. See Figure 2-13.

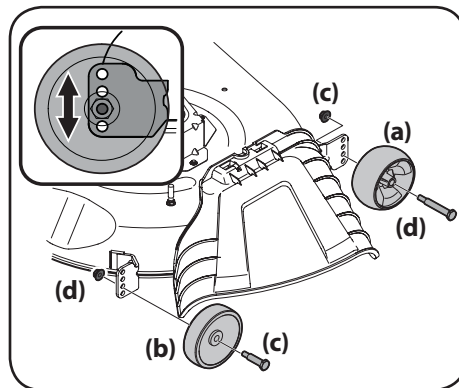


Figure 2-13

- Place the deck lift lever in the desired mowing height setting.
- Reinsert the shoulder bolt (with each deck wheel) into the index hole that leaves approximately  $\frac{1}{2}$ -inch between the bottom of the wheel and the pavement. Tighten the flange lock nut and shoulder bolt to between 25-30 ft-lbs using a torque wrench.

**NOTE:** Refer to Adjusting the Deck in the Product Care section of this manual for more detailed instructions regarding various deck adjustments.

## Gas & Oil

The fuel tank is located at the outer/left of the dash and holds 3 gallons of gas (EFI tractors hold 2.5 gallons). Remove the fuel cap by turning it counter-clockwise. Use only clean, fresh (no more than 30 days old), unleaded gasoline. Fill the tank no higher than the bottom of the fill neck to allow space for fuel expansion.

### ⚠ WARNING

Use extreme care when handling gasoline. Gasoline is extremely flammable and the vapors are explosive. Never fuel the machine indoors or while the engine is hot or running. Extinguish cigarettes, cigars, pipes and other sources of ignition.

**NOTE:** Your tractor is shipped with oil in the engine. However, you **MUST** check the oil level before operating. See the Product Care section for instructions on checking, adding and changing oil.

### ⚠ CAUTION

Always check the engine oil level before each use as instructed in the engine operator's manual. Add oil as necessary. Failure to do so may result in serious damage to your engine.

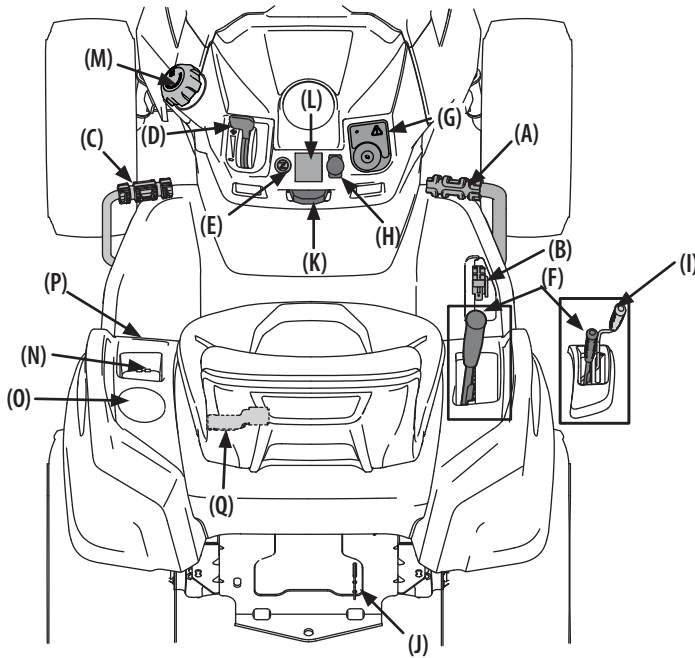


Figure 3-1

**Note:** This Operator's Manual covers several models. Tractor features may vary by model. Not all features in this manual are applicable to all tractor models and the tractor depicted may differ from yours.

**Note:** References to LEFT, RIGHT, FRONT, and REAR indicate that position on the tractor when facing forward while seated in the operator's seat.

**WARNING**  
Read and follow all safety rules and instructions in this manual, including the entire Operation section, before attempting to operate this machine. Failure to comply with all safety rules and instructions may result in personal injury.

### Forward Drive Pedal (A)

The forward drive pedal is located on the right side of the machine, along the running board. Press the forward drive pedal forward to cause the tractor to travel forward. Ground speed is also controlled with the forward drive pedal. The further forward the pedal is pivoted, the faster the tractor will travel. The pedal will return to its original/neutral position when it's not pressed.

### Reverse Drive Pedal (B)

The reverse drive pedal is located on the right side of the tractor along the running board. Ground speed is also controlled with the reverse drive pedal. The further downward the pedal is pivoted, the faster the tractor will travel. The pedal will return to its original/neutral position when it's not pressed.

### Brake Pedal (C)

The brake pedal is located on the left side of the tractor, along the running board. The brake pedal can be used for stopping the tractor or setting the parking brake.

**Note:** The brake pedal must be fully depressed to activate the safety interlock switch when starting the tractor.

### Throttle/Choke Control Lever or Throttle Control (D)

#### Throttle/Choke Control Lever (If equipped)

The throttle/choke control lever is located on the left side of the tractor's dash panel. This lever controls the speed of the engine and, when pushed all the way forward, past the detent position closes the choke for cold starting. When set in a given position, the throttle will maintain a uniform engine speed.

**Note:** When operating the tractor with the cutting deck engaged, be certain that the throttle/choke control is always in the FAST position.

#### Throttle Control (If equipped)

The throttle control is located on the left side of the tractor's dash panel. When set in a given position, a uniform engine speed will be maintained.

Push the throttle control handle forward to increase the engine speed. The tractor is designed to operate with the throttle control in the FAST position (full throttle) when the mower deck is engaged.

Pull the throttle control handle rearward to decrease the engine speed.



### Choke Control (If equipped) (E)

The choke control is located on the dash panel to the right of the throttle/choke or throttle control and controls the position of the engine choke. Pull the knob out/up to choke the engine; push the knob in/down to open the choke.



### Deck Lift Lever (F)

#### Electric PTO tractors



#### Manual PTO tractors



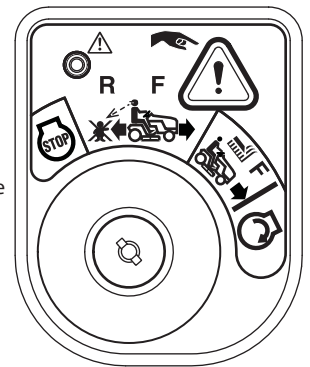
The lift lever is located in the right fender and is used to raise and lower the deck. Pull the handle to the left out of the index notch and push downward to lower the deck, or pull upward to raise the deck. When the desired height is attained, move the lift handle to the right until fully in the index notch.

### Ignition Module (G)

#### Turn-Key Start

**WARNING**  
Never leave a running machine unattended. Always disengage PTO, set parking brake, stop engine and remove key to prevent unintended starting

To start the engine, insert the key into the ignition switch and turn clockwise to the START position. Release the key into the NORMAL MOWING MODE position once the engine has fired.

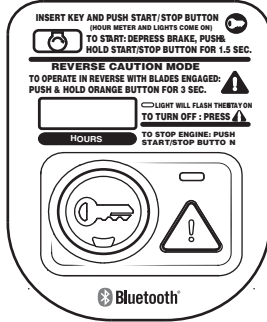


To stop the engine, turn the ignition key counterclockwise to the STOP position.

**CAUTION**  
Prior to operating the tractor, refer to both Safety Interlock Switches and Starting The Engine in the Operation section of this manual for detailed instructions regarding the Ignition Switch Module and operating the tractor in REVERSE CAUTION MODE.

## PBS (Push Button Start)/Service Minder & Hour Meter w/ Bluetooth® (If equipped)

PBS tractors come with or without Bluetooth®. If equipped, connect your Bluetooth® enabled LCD service minder & hour meter to your smartphone by downloading the App for your Bluetooth® capable Android or iOS device.



It is an innovative new way to interact with your outdoor power equipment directly through your mobile device.

The app's automated maintenance dashboard and log will help you keep your machine running at peak performance and protect your investment by tracking total hours across the lifetime of your equipment.

Receive alert notifications when it's time to perform essential maintenance tasks. Your dashboard provides real time monitoring and indicates when it's time for you to check or change the oil, air filter, blades or battery. It also enables you to locate and contact service centers, access step-by-step instructions to perform routine maintenance and purchase replacement parts directly from your mobile device.

Simply download the app and follow the quick step-by-step instructions on how to sync your mobile device with your equipment.

### ⚠ WARNING

Never leave a running machine unattended. Always disengage PTO, set parking brake, stop engine and remove the key.

To start the engine, insert the ignition key and depress for 1.5 seconds until the engine starts cranking. If the engine does not start after 5 seconds, a 3 second delay will occur. Release the key and press again to attempt to start.

**Note:** If the REVERSE CAUTION MODE button is depressed during starting, the starting sequence is aborted and needs to be restarted.

To stop the engine, press ignition key or remove the ignition key.

### ⚠ CAUTION

Prior to operating the tractor, refer to both Safety Interlock Switches and Starting The Engine in the Operation section of this manual for detailed instructions regarding the Ignition Switch Module and operating the tractor in REVERSE CAUTION MODE .

When the ignition key is inserted and depressed for less than 1.5 seconds, the LCD Service Minder & Hour Meter will briefly display the battery voltage, followed by the tractor's accumulated hours.

**Note:** Hours of tractor operation are recorded only when the engine is running.

The LCD Service Minder will remind the operator of maintenance intervals for changing the engine oil, air filter service, low engine oil and low battery warnings.

## Change Oil

The LCD will display the letters "CHG", followed by the letters "OIL" for two hours after the meter reaches 50 hours. This oil service minder interval will occur every 50 hours. Before the interval expires, change the engine oil as instructed in the Engine Operator's Manual.

### Low Oil (If equipped)

The letters "LO" followed by the letters "OIL", then followed by the letters "PRESSURE" will indicate the tractor is low on oil. When an engine is not running and immediately after the engine is started the oil pressure may be low. This can trigger the "LO" "OIL" text. This is normal. If the low oil indication persists stop the tractor immediately and check the engine oil level as instructed in the Engine Operator's Manual.

**Note:** The "LOW OIL" function only works if the engine is equipped with an oil pressure switch.

### Low Battery/High Battery

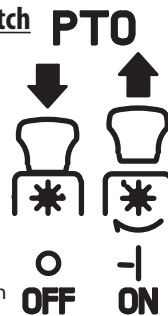
At startup, the battery voltage is briefly displayed then changes to accumulated hours. The battery indicator will display, followed by the letters "LO" will display followed by the letters "BATT" is displayed on the LCD when the voltage drops below 11.0 volts. When this occurs, the battery is in need of a charge or the engine's charging system is not generating sufficient amperage. Charge the battery as instructed in the Product Care section of this manual or have the charging system checked by your local service dealer.

At startup, the battery voltage is briefly displayed then changes to accumulated hours. The battery indicator will display, followed by the letters "HI" will display followed by the letters "BATT" is displayed on the LCD when the voltage raises above 16.0 volts. When this occurs, have the charging system checked by your local service dealer.

## Power Take-Off (PTO) Switch (Electric PTO tractors) (H)

The PTO switch is located on the dash panel to the right of the LCD Service Minder & Hour Meter (If equipped).

Activating the PTO engages power to the cutting deck or other (separately available) attachments. See the Operation section for information and instructions on using the PTO.



## PTO/Blade Engage Handle (Manual PTO tractors) (I)



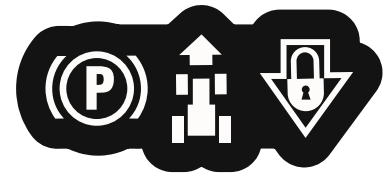
The PTO/blade engage handle is located on the right fender. Activating the PTO engages power to the cutting deck or other (separately available) attachments. See the Operation section for information and instructions on using the PTO.

## Transmission Bypass Rod (J)

The transmission bypass rod is located at the rear of the tractor on the lower right section of the frame.

When engaged, the rod opens a bypass within the hydrostatic transmissions, which allows the tractor to be pushed short distances by hand. Refer to the Assembly & Set-Up section for instructions on using the bypass feature.

## Park Brake/Cruise Control Lever (K)



Located in the center of the tractor's dash panel below the steering wheel, the park brake/cruise control lever is used to engage the parking brake and the cruise control. Refer to the Driving the Tractor section of this manual for detailed instructions regarding the parking brake.

**Note:** The parking brake must be set if the operator leaves the seat with the engine running or the engine will automatically shut off.

**Note:** Cruise control can NOT be engaged at the tractor's fastest ground speed.

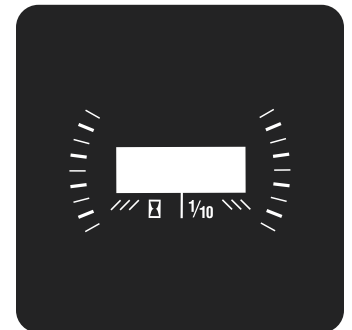
### ⚠ WARNING

Never leave a running machine unattended. Always disengage the PTO, set the parking brake, stop the engine and remove the key to prevent unintended starting.

## Hour Meter (L)

### LCD Service Minder & Hour Meter (If equipped)

When the ignition key is rotated out of the STOP position but not into the START position, the LCD Service Minder and Hour Meter will briefly display the battery voltage, followed by the tractor's accumulated hours.



**Note:** When the ignition key is out of the STOP position the hourglass symbol is illuminated/blinks to indicate it is recording the hours of tractor operation, regardless of whether the engine is started.

The LCD Service Minder will remind the operator of maintenance intervals for changing the engine oil, air filter service, low engine oil and low battery warnings.

### Change Oil

The LCD will display the letters "CHG", followed by the letters "OIL", followed by the letters "SOON", then finally followed by the meter's accumulated time. "CHG/OIL/SOON/TIME" will alternate on the display for 7 minutes after the meter reaches 50 hours. This oil service minder interval will occur every 50 hours. Before the interval expires, change the engine oil as instructed in the Engine Operator's Manual.

### Low Oil (If equipped)

The letters "LO" followed by the letters "OIL", then followed by the meter's accumulated time will indicate the tractor is low on oil. When an engine is not running and immediately after the engine is started the oil pressure may be low. This can trigger the "LO" "OIL" text. This is normal. If the low oil indication persists stop the tractor immediately and check the engine oil level as instructed in the Engine Operator's Manual.

**Note:** The "LOW OIL" function only works if the engine is equipped with an oil pressure switch.

### Low Battery

At startup, the battery voltage is briefly displayed then changes to accumulated hours. The letters "LO" will display followed by the letters "BATT" and then followed by the meter's accumulated time. "LO/BATT/TIME" is displayed on the LCD when the voltage drops below 11.5 volts. When this occurs, the battery is in need of a charge or the engine's charging system is not generating sufficient amperage. Charge the battery as instructed in the Service section of this manual or have the charging system checked by your local service dealer.

### Air Filter Service

The letters "CLN" will display, followed by the letters "AIR", followed by "FILT", then followed by the meter's accumulated time. "CLN/AIR/FILT/TIME" will alternate on the display for 7 minutes after the meter reaches 50 hours. This air filter service minder time interval will be every 50 hours. On intervals that are common with oil service, the oil message will be displayed first followed by the air filter message.

### LCD Service Minder & Hour Meter w/ Bluetooth® (If equipped)

Connect your Bluetooth® enabled LCD service minder & hour meter to your smartphone by downloading the App for your Bluetooth® capable Android or iOS device.



The app's automated maintenance dashboard and log will help you keep your machine running at peak performance and protect your investment by tracking total hours across the lifetime of your equipment.

Receive alert notifications when it's time to perform essential maintenance tasks. Your dashboard provides real time monitoring and indicates when it's time for you to check or change the oil, air filter, blades or battery. The App also enables you to locate and contact service centers, access step-by-step instructions to perform routine maintenance and purchase replacement parts directly from your mobile device.

Simply download the app and follow the quick step-by-step instructions on how to sync your mobile device with your equipment.

### Fuel Tank Cap (M)

The fuel tank cap is located to the left of the dash. Turn the fill cap to remove. The fuel cap is tethered to the tractor to prevent its loss. Do not attempt to remove the cap from the tractor. Fill tank to the bottom of the filler neck, allowing some space in the tank for fuel expansion. Do not overfill the tank.

Push the cap downward on the fuel tank fill neck and turn clockwise until it clicks to tighten. Always re-install the fuel cap tightly onto the fuel tank after removing.

#### ⚠ WARNING

Never fill the fuel tank when the engine is running. If the engine is hot from recently running, allow to cool for several minutes before refueling. Highly flammable gasoline could splash onto the engine and cause a fire.

### Storage Tray (N)

The storage tray is located to the left of the operator's seat.

### Cup Holder (O)

The cup holder is located to the left of the operator's seat.

### Differential Lock Pedal (If equipped) (P)

The differential lock pedal is located on the left of the tractor to the rear of the running board near the seat box. Activating the differential lock increases traction by maintaining equal wheel speed on the rear tires. See the Differential Lock section for more information on using the differential lock.

### Seat Adjustment Lever (Q)

The seat adjustment lever is located below the left of the seat. The lever allows for adjustment forward or backward of the operator's seat. Refer to the Assembly & Set-Up section for instructions on adjusting the seat position.

### Operation


#### ⚠ WARNING

Avoid serious injury or death. Go up and down slopes, not across. Avoid sudden turns. Do not operate unit where it could slip or tip. If machine stops going uphill, stop PTO and back down the hill safely. Keep safety devices (guards, shields and switches) in place and working. Remove objects that could be thrown by the blades. Know location and function of all controls. Be sure the blades and the engine are stopped before placing hands or feet near blades. Before leaving operator's position, disengage PTO, engage brake lock, shut off and remove key.

### Safety Interlock Switches

This tractor is equipped with a safety interlock system for the protection of the operator. If the interlock system should ever malfunction, do not operate tractor. Contact your service dealer.

- The safety interlock system prevents the engine from cranking or starting unless the parking brake is engaged, and the PTO (Blade Engage) knob is in the disengaged (OFF) position.

- The engine will automatically shut off if the operator leaves the seat before engaging the parking brake.
- The electric PTO (Blade Engage) clutch will automatically shut off if the operator leaves the tractor's seat with the PTO (Blade Engage) knob in the engaged (ON) position, regardless of whether the parking brake is engaged.
- With the ignition key in the NORMAL MOWING  position, the electric PTO (Blade Engage) clutch will automatically shut off if the PTO (Blade Engage) knob is moved into the engaged (ON) position with the drive pedal in position for Reverse travel.

#### ⚠ WARNING


Do not operate the tractor if the interlock system is malfunctioning. This system was designed for your safety and protection.

### Starting the Engine

**Note:** Refer to the Assembly & Set-up section of this manual for Gasoline and Oil fill-up instructions.


Continue below for turn-key ignitions, skip ahead to the PBS Ignition Section for Push-Button Start ignitions.



#### Turn-Key Ignition

- Insert the tractor key into the ignition module.
- Place the PTO/Blade Engage lever to OFF position.
- Engage the tractor's parking brake (P).
- Push the choke control (if equipped) upward into the choke on  position.

**Note:** If the engine is warmed up, it may not be necessary to place the choke control in the choke position.

- Move the throttle control lever to midway between the FAST  and SLOW  positions.

**Note:** When operating the tractor be certain that the throttle lever is always in the FAST  (rabbit) position. Operating with the throttle at less than full throttle may lead to shortened battery life.

- Turn the ignition key clockwise to the START  position. After the engine starts, release the key. It will return to the NORMAL MOWING  position.


#### ⚠ CAUTION


Do NOT hold the key in the START  position for longer than ten seconds at a time. Doing so may cause damage to your engine's electric starter.

- After the engine starts, deactivate the choke control (if equipped).

**Note:** Do NOT leave the choke control (if equipped) on while operating the tractor. Doing so will result in a "rich" fuel mixture and cause the engine to run poorly.

## PBS Ignition




1. Place the PTO in the DISENGAGED (OFF) position.
2. Fully engage the tractor's brake.
3. Move the throttle into the FAST  position.
4. Insert the ignition key and press the ignition key.

**Note:** When operating the tractor be certain that the throttle lever is always in the FAST  position. Operating with the throttle at less than full throttle may lead to shortened battery life.


## Stopping the Engine

### ⚠ WARNING

If you strike a foreign object, stop the engine and disconnect the spark plug wire(s). Thoroughly inspect the machine for any damage. Repair the damage before restarting and operating.


1. If the blades are engaged, place the PTO/ Blade Engage lever  in the OFF position.
2. Place the throttle control near the SLOW  position.
3. Turn the ignition key counterclockwise to the STOP  position or on PBS units, press or remove the ignition key.
4. Remove the key from the ignition module to prevent unintended starting.

## Reverse Caution Mode (Turn-Key)

The REVERSE CAUTION MODE  position of the ignition module allows the tractor to be operated in reverse with the blades (PTO) engaged.



**Note:** Mowing in reverse is not recommended.

### ⚠ WARNING

Use extreme caution while operating the tractor in the REVERSE CAUTION MODE . Always look down and behind before and while backing. Do not operate the tractor when children or others are around. Stop the tractor immediately if someone enters the area.

To use the REVERSE CAUTION MODE :

**Note:** The operator MUST be seated in the tractor seat.

1. Start the engine as previously instructed.
2. Turn the key from the NORMAL MOWING  (a) position to the REVERSE CAUTION MODE  (b) position of the ignition module. See Figure 3-1.

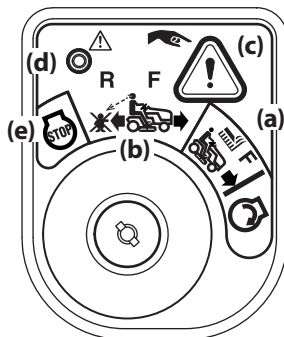








Figure 3-1

3. Press the REVERSE PUSH BUTTON  (c) at the top, right corner of the ignition module. The red indicator light (d) at the top, left corner of the ignition module will be ON while activated. See Figure 3-1.
4. Once activated (indicator light ON), the tractor can be driven in reverse with the cutting blades (PTO) engaged.
5. Always look down and behind before and while backing to make sure no children are around. After resuming forward motion, return key to the NORMAL MOWING  (a) position.

The REVERSE CAUTION MODE (b)  will remain activated until:


- a. The key is placed in either the NORMAL MOWING  (a) position or STOP  (e) position or
- b. The operator leaves the seat.

## Reverse Caution Mode (PBS)

The REVERSE CAUTION MODE  allows the tractor to be operated in reverse with the blades (PTO) engaged.



**Note:** Mowing in reverse is not recommended.

### ⚠ WARNING

Use extreme caution while operating the tractor in the REVERSE CAUTION MODE . Always look down and behind before and while backing. Do not operate the tractor when children or others are around. Stop the tractor immediately if someone enters the area.

To use the REVERSE CAUTION MODE :

**Note:** The operator MUST be seated in the tractor seat.

1. Start the engine as instructed above.
2. Press the REVERSE CAUTION MODE  button and hold for 3 seconds. The indicator light will flash for 3 seconds and will stay on when the REVERSE CAUTION MODE  is activated. See Figure 3-2.

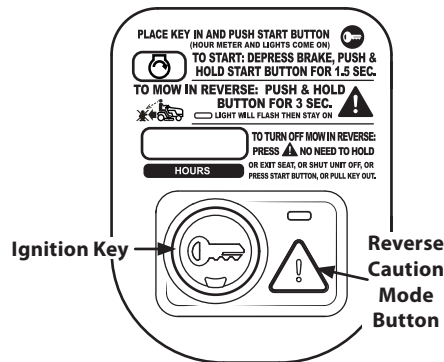






Figure 3-2


3. The indicator light above the REVERSE CAUTION MODE  button will be ON while activated. See Figure 3-2.
4. Once activated (indicator light ON), the tractor can be driven in reverse with the cutting blades (PTO) engaged.

5. Always look down and behind before and while backing to make sure no children are around. After resuming forward motion, press the REVERSE CAUTION MODE  button to return to NORMAL MOWING.
6. The REVERSE CAUTION MODE  will remain activated until:
  - a. The REVERSE CAUTION MODE  button is pressed or the ignition key is pressed or removed.
  - b. The operator leaves the seat (electric PTO)/the parking brake is set (manual PTO).

## Driving The Tractor

### ⚠ WARNING

Avoid sudden starts, excessive speed and sudden stops.

1. Lightly press the brake pedal to release the parking brake. Move the throttle into the FAST  position.
2. To travel FORWARD, slowly press the forward drive pedal (a) forward until the desired speed is achieved. See Figure 3-3.

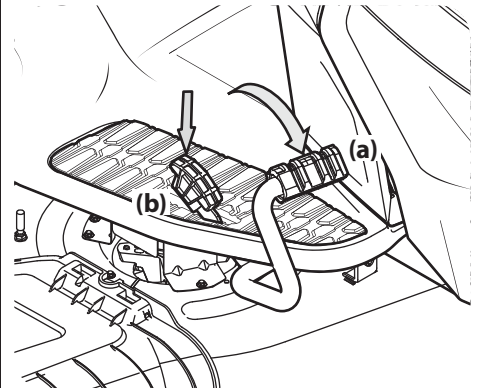


Figure 3-3

3. To travel in REVERSE, check that the area behind is clear then slowly depress the reverse drive pedal (b) until the desired speed is achieved. See Figure 3-3.

### ⚠ CAUTION

Do NOT attempt to change the direction of travel when the tractor is in motion. Always bring the tractor to a complete stop before changing from forward to reverse or vice versa.

### ⚠ WARNING

Do not leave the seat of the tractor without first placing the PTO in the DISENGAGED (OFF) position and engaging the parking brake. If leaving the tractor unattended, also turn the engine off and remove the ignition key.

## Driving On Slopes

Refer to the SLOPE GAUGE on page 6 to help determine slopes where you may operate the tractor safely.

### ⚠ WARNING

Do not mow on inclines with a slope in excess of 15 degrees (a rise of approximately 2-½ feet every 10 feet). The tractor could overturn and cause serious injury.

- Mow up and down slopes, NEVER across.
- Exercise extreme caution when changing direction on slopes.
- Watch for holes, ruts, bumps, rocks, or other hidden objects. Uneven terrain could overturn the machine. Tall grass can hide obstacles.
- Avoid turns when driving on a slope. If a turn must be made, turn down the slope. Turning up a slope greatly increases the chance of a roll over.
- Avoid stopping when driving up a slope. If it is necessary to stop while driving up a slope, start up smoothly and carefully to reduce the possibility of flipping the tractor over backward.

## Engaging the Parking Brake

**Note:** The parking brake must be set if the operator leaves the seat with the engine running or the engine will automatically shut off.

To set the parking brake:

To set the parking brake:

1. Press the brake pedal completely down with your left foot and hold it in that position.
2. Press down on the parking brake/cruise control lever and hold it in that position.
3. Remove your foot from the brake pedal.
4. Release pressure from the parking brake/cruise control lever.

After completing step 3, the brake pedal should remain in the down position. If it doesn't, the parking brake is *not* engaged. Repeat steps 1-4 to engage the parking brake.

To disengage the parking brake, lightly press the brake pedal.

### ⚠ WARNING

Never leave a running machine unattended. Always disengage PTO, set parking brake, stop engine and remove key to prevent unintended starting.

## Setting The Cruise Control

### ⚠ WARNING

Never engage the cruise control lever while traveling in reverse.

To set the cruise control:

1. Slowly press the forward drive pedal with your right foot until the desired speed is achieved.
2. Press down on the parking brake/cruise control lever and hold it in that position.
3. Remove your foot from the forward drive pedal.
4. Release pressure from the parking brake/cruise control lever.

After completing step 3, the forward drive pedal should remain in the down position and the tractor will maintain the same forward speed. If it doesn't, the cruise control is *not* engaged. Repeat steps 1-4 to engage the cruise control.

To disengage the cruise control, lightly press the forward drive pedal or the brake pedal.



**Note:** Cruise control can not be set at the tractor's fastest ground speed. If the operator should attempt to do so, the tractor will automatically decelerate to the fastest optimal mowing ground speed.

To change the direction of travel from forward to reverse when cruise control is engaged, press the brake pedal to disengage and bring the tractor to complete stop. Then slowly press the reverse drive pedal with the ball of your foot to travel in reverse.

## Using the Deck Lift Lever

To raise or lower the cutting deck, move the lift lever to the left, then place it in the notch best suited for your application.


## Operating the Headlights

On turn-key tractors the lamps are ON whenever the ignition key is rotated out of the STOP  position. The lamps turn OFF when the ignition key is moved to the STOP  position.

On PBS tractors The lamps are ON whenever the engine is on. If the ignition key is pressed for less than 1.5 seconds, the headlights will remain on for 15 seconds. The lamps turn OFF when the engine is turned OFF.

## Engaging the PTO (Electric PTO tractors)

Engaging the PTO transfers power to the cutting deck or other (separately available) attachments. To engage the PTO:

1. Move the throttle to the FAST  position.
2. Pull the PTO switch up/out into the engaged (ON) position. See Figure 3-4.

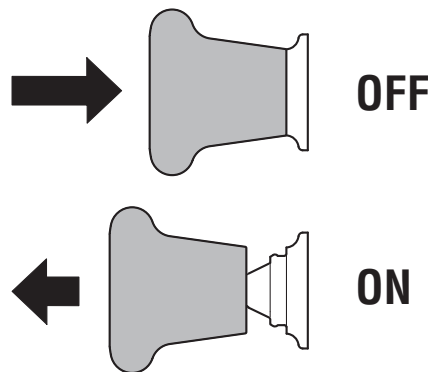




Figure 3-4

- Note:** When operating the tractor be certain that the throttle is always in the FAST  position. Operating with the throttle at less than full throttle may lead to premature battery wear and a poor quality cut.
3. To disengage the PTO, push the PTO switch down/in to the disengaged (OFF) position.

## Engaging the PTO (Manual PTO tractors)

Engaging the PTO transfers power to the cutting deck or other (separately available) attachments. To engage the PTO:

1. Move the throttle to the FAST  position.
2. Push the PTO handle forward into the engaged (ON) position. See Figure 3-5.

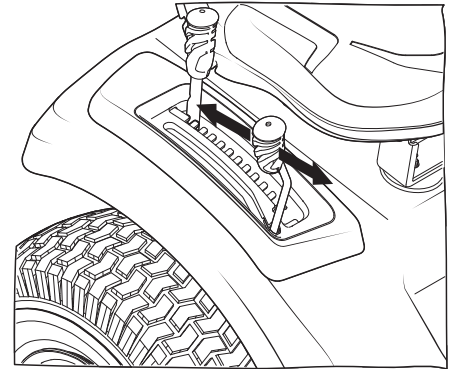



Figure 3-5

**Note:** When operating the tractor be certain that the throttle is always in the FAST  position. Operating with the throttle at less than full throttle may lead to premature battery wear and a poor quality cut.

3. To disengage the PTO, pull the PTO handle rearward into the disengaged (OFF) position.

## Using the Differential Lock (If equipped)

### ⚠ WARNING

When the differential lock is on, be sure to allow for a larger turning radius and greater steering effort.

### ⚠ WARNING

Engage the differential lock only when the vehicle is stationary. Do not use the differential lock when traveling downhill.

**Note:** The system should only be used when poor traction is encountered. It should be disengaged when traveling on solid surfaces.

In some instances, the tractor may be driven in slippery or low-traction situations and it may be necessary to activate the differential lock. To use the differential lock proceed as follows.

1. Stop the motion of the tractor.
2. Press down on the pedal to engage the differential lock.

**Note:** The differential lock only works while the pedal is pressed.

**Note:** Engagement may be delayed. The differential lock will engage when different wheel speeds are detected.

**Note:** Disengagement may be delayed. The differential lock will disengage when the rear wheel speeds allow it to release.

3. To disengage the differential lock, release the pedal.

## Maintenance Schedule

	Before Each use	After First 5 Hours	Every 10 Hours	Every 25 Hours	Every 50 Hours	Every 100 Hours	Prior to Storing	See Engine Manual
Check/Clean Engine Intake Screens & Cooling Fans *	✓						✓	
Check/Clean Exhaust Manifold, Muffler Pipe & Muffler Shields *	✓						✓	
Check/Clean Hood/Dash Panel Louvers *	✓						✓	
Check/Clean Top & Underside of Deck, Under and Around Spindle Covers & Belt Area *	✓						✓	
Check/Clean Around Fuses, Wiring and Wiring Harnesses *	✓						✓	
Check/Clean Around Transmission, Axle and Fans *	✓						✓	
Check Engine Oil Level	✓							
Check Air Filter for Dirty	✓							
Clean Battery Terminals			✓				✓	
Grease All Lubrication Points				✓			✓	
Check Blades/Sharpen or Replace as Needed			✓				✓	
Check Tire Pressure			✓				✓	
Inspect & Lube Deck Wheels				✓			✓	
Check Deck Level/Pitch				✓			✓	
Check Belts & Pulleys for Damage/Wear					✓			
Check That All Hardware is in Place & Secure						✓		
Check Spark Plug Condition & Gap #						✓	✓	✓
Engine Break-In Oil Change #		✓						✓
Change Engine Oil #					✓		✓	✓
Replace Oil Filter					✓		✓	✓
Clean or Change Air Filter #					✓			✓
Replace Fuel Filter					✓			✓
Have Valve Lash Checked & Adjusted †								✓

\*-- Perform more often in dry conditions and/or when mulching

# -- Refer to engine operator's manual for instructions specific to your engine

† -- Have this item performed by an authorized service dealer

**Note:** This Operator's Manual covers several models. Tractor features may vary by model. Not all features in this manual are applicable to all tractor models and the tractor depicted may differ from yours.

**⚠ WARNING**

Before inspecting or cleaning always disengage the PTO, set the parking brake, stop the engine and remove the key to prevent unintended starting.

**Post-Operation Tractor Care**

After each operation of the tractor, the following procedures should be implemented to extend the life of your tractor and ensure safe operating conditions.

**⚠ DANGER**

Failure to follow these recommendations may result in serious injury to yourself or others and may cause damage to the tractor.

**Cleaning the Underside of the Deck**

**Smart Jet**

Your tractor's deck is equipped with a water port on its surface as part of its deck wash system.

Use the Smart Jet to rinse grass clippings from the deck's underside and prevent the buildup of corrosive chemicals. Complete the following steps AFTER EACH MOWING:

1. Drive the tractor to a level, clear spot on your lawn, near enough for your garden hose to reach.

**⚠ WARNING**


Make certain the tractor's discharge chute is directed AWAY from people, your house, garage, parked cars, etc.


2. Disengage the PTO, set the parking brake and stop the engine.
3. Thread the hose coupler (packaged with your tractor's Operator's Manual) onto the end of your garden hose.
4. Attach the hose coupler to the water port on your decks surface. See Figure 4-6.



**Figure 4-6**

**Note:** Make sure that the hose is not routed under the deck and is clear of all moving parts.

5. Turn the water on.
6. While sitting in the operator's position on the tractor, start the engine and place the throttle lever in the FAST  position.
7. Move the tractor's PTO into the engaged (ON) position.

8. Remain in the operator's position with the deck engaged for a minimum of two minutes, allowing the underside of the deck to thoroughly rinse.
  9. Move the tractor's PTO into the disengaged (OFF) position.
  10. Turn the ignition key to the STOP  position to turn the tractor's engine off.
  11. Turn the water off and detach the hose coupler from the water port on your deck's surface.
- Note:** On 50" and 54" decks there are two water ports; one on each side of the deck.
12. After cleaning your deck with the Smart Jet system, return to the operator's position and engage the PTO. Keep the deck running for a minimum of two minutes, allowing the underside of the deck to thoroughly dry.

**Cleaning the Tractor**

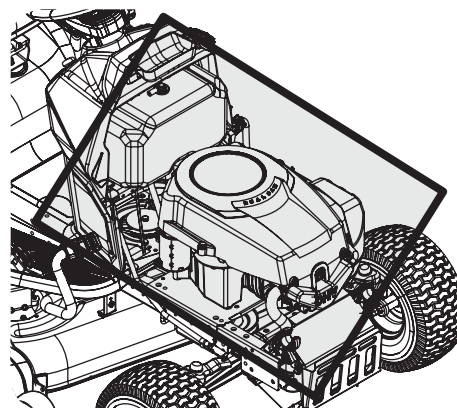
**⚠ WARNING**

If the tractor has been recently run, the engine, muffler and surrounding metal surfaces will be hot and can cause burns to the skin. Let the engine cool for at least five minutes. Exercise caution to avoid burns.

Your tractor should be cleaned after each use and under certain conditions, i.e. dry conditions and/or mulching situations, additional cleaning may be necessary.

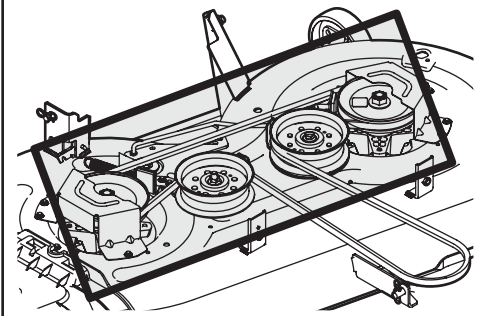
One of the best ways to keep your tractor running efficiently and to reduce fire risk is to regularly remove debris buildup from the tractor. Follow the recommendations below and contact your authorized dealer with any questions.

- Allow the machine to cool in an open area before cleaning.
- Do not use water on any part of the tractor except the underside of the cutting deck. Doing so can cause damage to the tractor's spindle bearings, electrical system and engine, leading to premature failures. The use of compressed air and/or leaf blower will help keep the tractor clean.
- Clean under the hood. Exhaust manifold, around fuses, all wiring and harnesses, muffler pipe, muffler shield, engine intake screens and cooling fins, etc. See Figure 4-7.



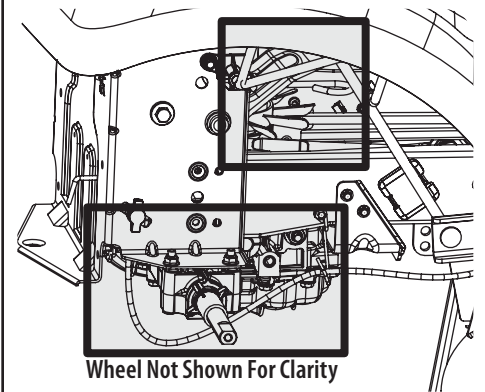
**Figure 4-7**

- Clean the top of the mower deck, under the spindle covers and belt area. See Figure 4-8.



**Figure 4-8**

- Clean around and near the transmission, axle and the fan area. See Figure 4-9.



**Figure 4-9**

- Debris can accumulate anywhere on the tractor, especially on horizontal surfaces. Additional cleaning may be necessary when mowing in dry conditions or when mulching.
- Fuel leaks/spills, oil leaks/spills and excess lubrication can also become collections sites for debris. Immediate repair and cleaning up oil or fuel spills can help reduce fire hazards.
- In addition to cleaning the tractor before operating and storing, do not attempt to mow unusually tall grass (10" or higher), dry grass (e.g., pasture) or piles of dry leaves. Dry grass or leaves may contact the engine exhaust and/or build up on the mower deck presenting a potential fire hazard.

**Storing the Tractor**

- Allow the machine to cool in an open area before storing.
- Do not park the tractor near any flammable materials (wood, cloth or chemicals) or any open flames or other potential source of ignition (furnace, water heater or any other type of heater).
- Remove all combustible materials from the tractor before storing. Empty cargo boxes, grass catchers or containers.
- Always shut off fuel flow when storing or transporting if tractor is equipped with a fuel shutoff.
- Check the fuel system (lines, tank, cap and fittings) frequently for cracks or leaks. Repair and clean as necessary.

## Maintenance

### Engine

Refer to the Engine Operator's Manual for all engine issues and questions.

**Note:** Maintenance, repair, or replacement of the emission control devices and systems which are being done at owner's expense may be performed by any engine repair establishment or individual. **Warranty repairs must be performed by an authorized dealer.**

### Battery

#### ⚠ WARNING

California **PROPOSITION 65:** Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

The battery is sealed and is maintenance-free. Acid levels cannot be checked and fluid can not be added.

- Always keep the battery cables and terminals clean and free of corrosive build-up.
- After cleaning the battery and terminals, apply a light coat of petroleum jelly or grease to both terminals.

#### ⚠ CAUTION

If removing the battery for cleaning, disconnect the **NEGATIVE (Black)** wire from its terminal first, followed by the **POSITIVE (Red)** wire. When re-installing the battery, always connect the **POSITIVE (Red)** wire its terminal first, followed by the **NEGATIVE (Black)** wire. Be certain that the wires are connected to the correct terminals; reversing them could result in serious damage to your engine's alternating system.

### Jump Starting

#### ⚠ WARNING

Never jump start a damaged or frozen battery. Be certain the vehicles do not touch, and ignitions are off. Do not allow cable clamps to touch.

1. Connect positive (+) cable to positive (+) post of your tractor's discharged battery.
2. Connect the other end of the cable to the positive (+) post of the jumper battery.
3. Connect the second cable negative (-) to the other post of the jumper battery.
4. Make the final connection on the engine block of the tractor, away from the battery. Attach to an unpainted part to assure a good connection.

#### ⚠ CAUTION

If the jumper battery is installed on a vehicle (i.e. car, truck), do NOT start the vehicle's engine when jump starting your tractor.

5. Start the tractor (as instructed in the Operation section of this manual).
6. Remove the jumper cables in reverse order of connection.

### Charging

#### ⚠ WARNING

Batteries give off an explosive gas while charging. Charge the battery in a well ventilated area and keep away from an open flame or pilot light as on a water heater, space heater, furnace, clothes dryer or other gas appliances.

#### ⚠ CAUTION

When charging your tractor's battery, use only a charger designed for 12V lead-acid batteries. Read your battery charger's Owner's Manual prior to charging your tractor's battery. Always follow its instructions and heed its warnings.

If your tractor has not been put into use for an extended period of time, charge the battery as follows:

1. Set your battery charger to deliver a max of 10 amperes.
2. If your battery charger is automatic, charge the battery until the charger indicates that charging is complete. If the charger is not automatic, charge for no fewer than eight hours.

### Fuse

#### ⚠ WARNING

Before servicing, repairing, or inspecting, always disengage PTO, set parking brake, stop engine and remove ignition key to prevent unintended starting.

A 20 AMP fuse is installed in your tractor's wiring harness to protect the tractor's electrical system from damage caused by excessive amperage.

If the electrical system does not function, or your tractor's engine will not crank, check to be certain that the fuse has not blown. It is located under the seat, attached to the **POSITIVE (Red)** wire leading to the battery.

#### ⚠ CAUTION

Always use a replacement fuse with the same amperage capacity as the blown fuse.

### Relays & Switches

There are several safety switches in the electrical system. If a function of the safety interlock system described earlier is not functioning properly, have the electrical system checked by your authorized service dealer.

### Engine

Refer to the Engine Operator's Manual for all engine maintenance procedures and instructions.

**Note:** If the "LOW OIL" text appears immediately after the engine is started the oil pressure may be low. This is normal. If the low oil indication persists stop the tractor immediately and check the engine oil level as instructed in the Engine Operator's Manual.

**Note:** The "Low Oil" function only works if the engine is equipped with an oil pressure switch.

### Changing the Engine Oil

#### ⚠ WARNING

If the engine has been recently run, the engine, muffler and surrounding metal surfaces will be hot and can cause burns to the skin. Exercise caution to avoid burns.

**Note:** The oil filter should be changed at every oil change interval. To complete an oil change, proceed as follows:

To complete an oil change, proceed as follows:

1. Run the engine for a short time to warm the engine oil. The oil will flow more freely and carry away more impurities. Use care to avoid burns from hot oil.
2. Open the tractor's hood and locate the oil drain port on the side of the engine.
3. Place an appropriate oil collection container with at least a 2.5 quart capacity below the opening of the oil drain tube, to collect the used oil. Remove the oil fill cap/dipstick from the oil fill tube.
4. Pop open the protective cap on the end of the oil drain valve to expose the drain port. See Figure 4-1.

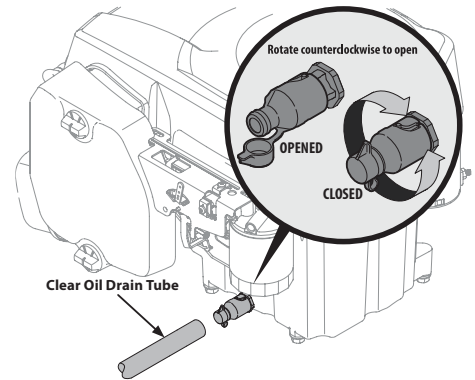


Figure 4-1

5. Remove the oil fill cap/dipstick from the oil fill tube.
6. Push the clear oil drain tube (packed with this manual) onto the oil drain port. Route the opposite end of the tube into an appropriate oil collection container with at least a 2.5 quart capacity to collect the used oil.
7. The engine is equipped with a twist-and-pull drain port. Turn the oil drain valve ¼-turn counter-clockwise, then pull outward to begin draining oil. After the oil has finished draining, push the end of the oil drain valve back in and turn ¼-turn clockwise to secure it back in place. Re-cap the end of the oil drain valve to keep debris from entering the drain port.
7. Replace the oil filter, and refill the engine with new oil as instructed in the engine operator's manual.
8. To refill the oil, close the oil drain and refer to the engine operator's manual for refilling instructions, oil type and amount.

**Note:** Place an absorbent towel beneath the oil filter to keep oil off the clutch.

**Note:** Maintenance, repair, or replacement of the emission control devices and systems which are being done at owner's expense may be performed by any engine repair establishment or individual. **Warranty repairs must be performed by an authorized service dealer.**

## Lubrication

### ⚠ DANGER

Bearing failures and overheating can result in fire/ Always follow the instructions in this manual regarding lubrications locations and intervals. Contact your authorized dealer with any questions about the lubrication locations and intervals or any unusual noises coming from any areas a bearing may be located.

### ⚠ WARNING

Before lubricating, repairing, or inspecting, always disengage the PTO, set the parking brake, stop the engine and remove the key to prevent unintended starting.

## Front Wheels

Each of the front wheel axles and rims is equipped with a grease fitting. See Figure 4-2 for the location of the grease fitting on the axles and Figure 4-3 for the location of the grease fitting on the rims. Lubricate with a No. 2 multi-purpose grease applied with a grease gun after every 25 hours of tractor operation.

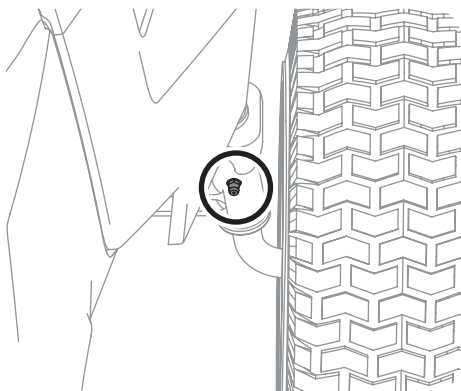


Figure 4-2

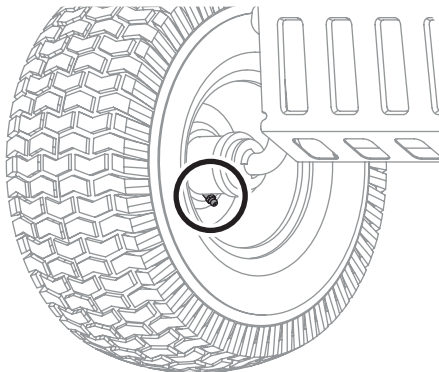


Figure 4-3

## Deck Wheels

The wheels on the deck which are spherical shaped (50" and 54" decks have 4) are equipped with a grease fitting. Lubricate with a No. 2 multi-purpose grease applied with a grease gun after every 25 hours of tractor operation.

## Pivot Points & Linkage

Lubricate all the pivot points on the drive system, parking brake and lift linkage at least once a season with light oil.

**Note:** It is not necessary to grease the steering pinion/sector gear interface. Doing so will allow dirt to accumulate and can affect steering performance.

## Hydrostatic Transmission

The hydrostatic transmission is sealed at the factory and is maintenance-free. The fluid level cannot be checked and the fluid cannot be changed.

## Adjustments

### ⚠ WARNING

Shut the engine off, remove the ignition key and engage the parking brake before making adjustments. Protect your hands by using heavy gloves when handling the blades.

**Note:** Check the tractor's tire pressure before performing any deck leveling adjustments. Refer to Tires on page 11 for information regarding tire pressure.

## Adjusting the Deck

### Leveling the Deck (Front-To-Rear)

The front of the deck is supported by a stabilizer bar that can be adjusted to level the deck from front to rear. The front of the deck should be between  $\frac{1}{4}$ " and  $\frac{3}{8}$ " lower than the rear of the deck. Adjust if necessary as follows:

1. Park the tractor on a firm, level surface and place the deck lift lever in the middle position and rotate the blade nearest the discharge chute so that it is parallel with the tractor.
2. Measure the distance from the front of the blade tip to the ground and the rear of the blade tip to the ground. The front of the deck should be between  $\frac{1}{4}$ " and  $\frac{3}{8}$ " less than the rear of deck.
3. Determine the approximate distance necessary for proper adjustment and proceed, if necessary.
4. To *raise* the front of the deck, loosen the outer nut then tighten (thread inward) the nut against the front hanger bracket. See Figure 4-4. When proper adjustment is achieved, re-tighten the outer nut to 25-30 ft.-lbs.

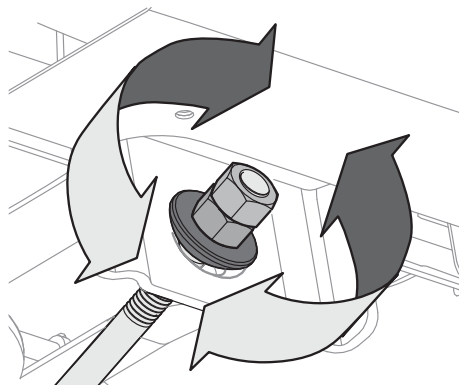


Figure 4-4

5. To *lower* the front of the deck, loosen the outer nut then loosen (thread outward) the nut, away from the front hanger bracket. See Figure 4-4. When proper adjustment is achieved, re-tighten the outer nut.

### Leveling the Deck (Side-to-Side)

If the deck appears to be mowing unevenly, a side-to-side adjustment can be performed. Adjust if necessary as follows:

1. With the tractor parked on a firm, level surface, place the deck lift lever in the middle position and rotate both blades so that they are perpendicular with the tractor.

2. Measure the distance from the outside of the left blade tip to the ground and the distance from the outside of the right blade tip to the ground. Both measurements taken should be equal. If they're not, proceed to the next step.
3. Under the rear fenders inside the wheels there is a lift adjustment rod for each side of the deck. See Figure 4-5.

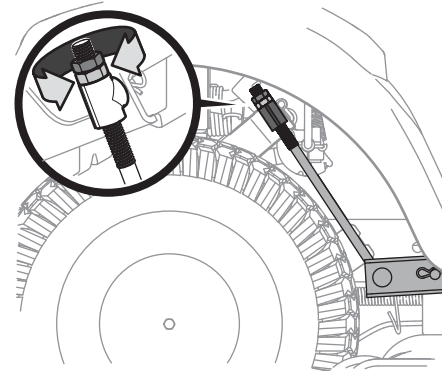


Figure 4-5

4. Minor side-to-side adjustments should be made using primarily the left adjustment rod.
5. To raise the left side of the deck, loosen the upper nut on the end of the lift rod, then turn the lower nut clockwise. When the proper adjustment is achieved, tighten the upper nut to secure in place. To lower the left side of the deck, loosen the upper nut on the end of the lift rod, then turn the lower nut counterclockwise. When the proper adjustment is achieved, tighten the upper nut to 25-30 ft.-lbs. to secure in place.
6. The deck is properly leveled when both blade tip measurements taken earlier are equal.

## Adjusting the Deck Height

The height of the deck can be adjusted to ensure that the setting on your deck height lever is accurate. To adjust the deck height proceed as follows:

1. Park the tractor on a firm, level surface and place the deck lift lever in the highest position (4") and rotate the blade nearest the discharge chute so that it is perpendicular with the tractor.
2. Measure the distance from the outside of the left blade tip to the ground and the distance from the outside of the right blade tip to the ground. Both measurements taken should be 4". If they're not, proceed to the next step.
3. Using the right and left lift rods, raise or lower the necessary side of the deck until both sides are measured at 4" from the pavement.

## Adjusting the Deck Wheels

### ⚠ WARNING

Keep hands and feet away from the discharge opening of the deck.

**Note:** The deck wheels are an anti-scalp feature of the deck and are not designed to support the weight of the deck.

The deck wheels should be approximately ¼-½" above the ground when the deck is set in the desired height setting. To adjust the deck wheels see the Assembly & Set-Up section for instructions.

### Seat Adjustment

Refer to the Assembly & Set-Up section of this manual for seat adjustment instructions.

#### ⚠ WARNING

Before operating the tractor, make sure the seat is engaged in the seat-stop. Engage the parking brake. Stand behind the machine and pull back on seat until it clicks into place.

### Parking Brake Adjustment

If the tractor does not come to a complete stop when the brake pedal is completely depressed, or if the tractor's rear wheels can roll with the parking brake applied (and the hydrostatic relief valve open), the brake is in need of adjustment. See your authorized service dealer to have the brake adjusted.

### Hydrostatic Neutral Adjustment

If the tractor creeps forward or rearward when neither the forward nor reverse pedal is depressed, contact your local authorized dealer to have the neutral setting properly adjusted.

### Wheel Alignment

If your tractor pulls to one side or is out of alignment, a wheel alignment might be necessary. Take your tractor to an authorized service dealer to have the wheels properly aligned.

### Off-Season Storage

If your lawn tractor is not going to be operated for an extended period of time (thirty days to approximately six months), the lawn tractor should be prepared for storage. Store the lawn tractor in a dry and protected location. If stored outside, cover the lawn tractor (including the tires) to protect it from the elements. The procedures outlined below should be performed whenever the lawn tractor is placed in storage.

1. Change the engine oil and filter following the instructions provided in the Engine Operator's Manual.

#### ⚠ WARNING

Never store the lawn tractor with fuel in the tank indoors or in poorly ventilated enclosures, where fuel fumes may reach an open flame, spark or pilot light as on a furnace, water heater, clothes dryer, etc.

2. Service the engine as instructed in the separate Engine Operator's Manual.
3. Engines stored between 30 and 90 days need to be treated with a gasoline stabilizer and engines stored over 90 days need to be run empty of fuel to prevent deterioration and gum from forming in fuel system or on essential carburetor parts. If the gasoline in your engine deteriorates during storage, you may need to have the carburetor, and other fuel system components, serviced or replaced.
3. Remove the spark plugs and pour approximately one ounce of oil into each cylinder. Crank the engine one or two turns to spread the oil evenly on the cylinder walls. Replace the spark plugs.

4. Clean the engine and the entire tractor thoroughly.

**Note:** Use of a pressure washer or garden hose is not recommended to clean your lawn tractor. They may cause damage to electrical components, spindles, pulleys, bearings or the engine. The use of water will result in shortened life and reduce serviceability.

5. Sharpen the blades so that the mower will be ready to use when needed.
  6. Protect the metal surfaces. Repair scratches with the appropriate touch-up spray paint.
  7. Clean and fully charge the battery, then disconnect the negative cable at the battery to prevent possible discharge. Recharge the battery periodically when in storage.
- Note:** Remove the battery if exposed to prolonged periods of sub-freezing temperatures. Store in a cool, dry location where temperatures are above freezing.
8. Lubricate all lubrication points.
  9. Jack the mower up and store it on blocks to take the weight off of the tires.

### Removing the Lawn Tractor from Storage

1. Check the engine oil.
2. Fully charge the battery, lower lawn tractor off blocks, and inflate the tires to the recommended pressure.
3. Remove the spark plugs and wipe them off. Using the starter, crank the engine to pump the excess oil out of the spark plug holes. Replace the spark plugs and the ignition leads.
4. If drained before storing, fill the fuel tank with clean, fresh gasoline.
5. Start the engine and allow to idle for a few minutes to ensure engine is operating properly.
6. Drive the lawn tractor without a load to make certain all the lawn tractor systems are functioning properly.

## Service

### Deck Removal

To remove the deck, proceed as follows:

1. Place the PTO in the DISENGAGED (OFF) position and ENGAGE the parking brake.
2. Lower the deck by moving the deck lift lever into the bottom notch on the right fender.
3. For tractors with manual PTO's continue with step 4, for electric PTO models skip ahead to step 8.
4. Loosen, but do not remove the flange lock nut on the right idler pulley and the hex screw on the left idler pulley.

5. Remove the hex screw securing the engine pulley keeper rod to the frame. See Figure 4-1.

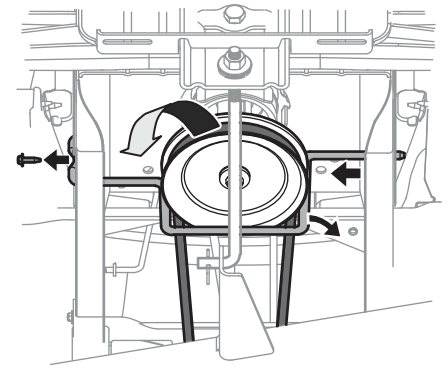


Figure 4-1

6. Slide the rod to the right to remove it.
 

**Note:** Be careful not to damage the wire harness when removing the rod.
7. Remove the bow pin that secures the PTO cable to the bracket on the deck, slide the PTO cable out of the bracket and unhook the spring from the idler bracket. See Figure 4-2.

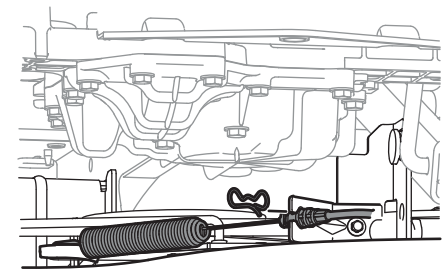


Figure 4-2

8. Working on the right side of the tractor, insert a ¾" drive ratchet wrench, set to *tighten*, into square hole found on the idler bracket. See Figure 4-3.

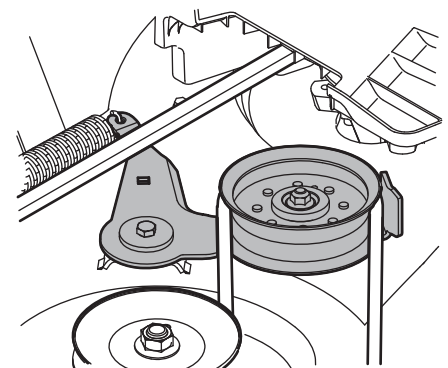


Figure 4-3

- Pivot the wrench forward to move the deck drive pulley forward. See Figure 4-3.

<b>⚠ WARNING</b>
Avoid pinching injuries. Never place your fingers on the idler spring or between the belt and a pulley while installing the belt.

- Carefully remove the belt from around the PTO pulley.
- Looking at the deck from the left side of the tractor, locate the bow-tie pin on the rear left side of the deck. See Figure 4-4.

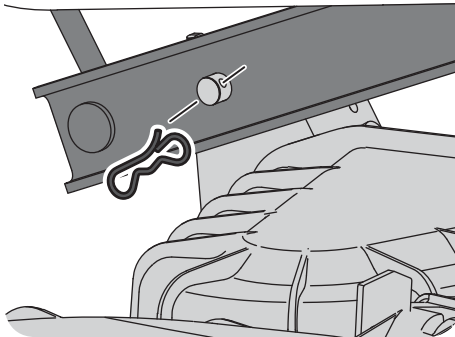


Figure 4-4

- Remove the pin and slide the deck pin out of the deck lift arm. See Figure 4-4.
- Repeat the above steps on the tractor's right side.
- Pull the bow-tie pin out of the front deck lift rod securing it to the deck. See Figure 4-5. Slide the deck lift rod out of the front hanger bracket.

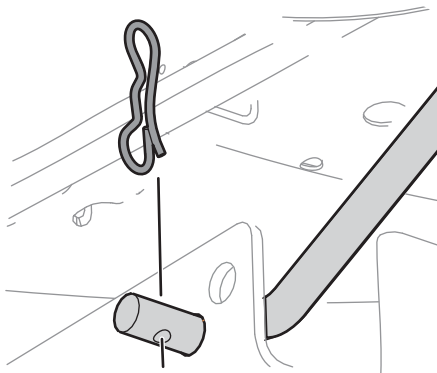


Figure 4-5

- Move the deck lift lever into the top notch to raise the deck lift up and out of the way.

<b>⚠ CAUTION</b>
There is a certain amount of spring tension due to the weight of the deck. When removing the lift linkage from the deck the tension of the springs will go from the deck to the deck lift handle and snap back.

- Gently slide the deck out from underneath the tractor.

## Cutting Blades

<b>⚠ WARNING</b>
Shut the engine off and remove ignition key before removing the cutting blade(s) for sharpening or replacement. Protect your hands by using heavy gloves when grasping the blade.

<b>⚠ WARNING</b>
Periodically inspect the blade and/or spindle for cracks or damage, especially after you've struck a foreign object. Do not operate the machine until damaged components are replaced.

<b>⚠ CAUTION</b>
If the cutting edge of the blade has previously been sharpened, or if any metal separation is present, replace the blades with new ones.

To remove the blades, proceed as follows.

- Remove the deck from beneath the tractor, (refer to Deck Removal earlier in this section) then gently flip the deck over to expose its underside.
- Place a block of wood between the deck housing baffle and the cutting blade to act as a stabilizer. See Figure 4-6.

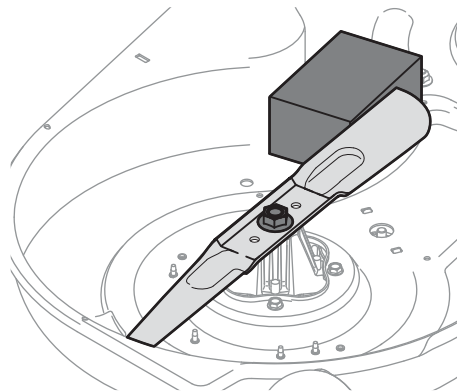


Figure 4-6

- Remove the hex flange nut that secures the blade to the spindle assembly. See Figure 4-6.
- To properly sharpen the cutting blades, remove equal amounts of metal from both ends of the blades along the cutting edges, parallel to the trailing edge, at a 25° to 30° angle. Always grind each cutting blade edge equally to maintain proper blade balance. See Figure 4-7.

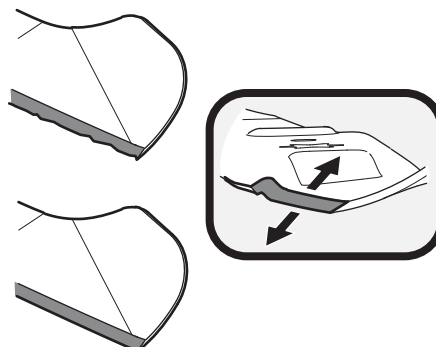


Figure 4-7

- Test the blade's balance using a blade balancer. Grind metal from the heavy side until it balances evenly.

<b>⚠ WARNING</b>
A poorly balanced blade will cause excessive vibration, may damage the tractor and/or result in personal injury.

**Note:** When replacing the blade, be sure to install the blade with the side of the blade marked "Bottom" (or with a part number stamped in it) facing the ground when the mower is in the operating position.

<b>⚠ CAUTION</b>
Use a torque wrench to tighten the blade spindle hex flange nut to between 70 ft-lbs and 90 ft-lbs.

## Changing the Deck Belt

<b>⚠ WARNING</b>
The V-belts found on your tractor are specially designed to engage and disengage safely. A substitute (non-OEM) V-belt can be dangerous by not disengaging completely. For a proper working machine, use factory approved belts.

All belts on your tractor are subject to wear and should be replaced if any signs of wear are present. To change or replace the deck belt on your tractor, proceed as follows:

- Remove the deck as instructed earlier in this section under Deck Removal.
- Loosen, but do not remove the hardware on the right and left idler pulley.

**Note:** On some decks it may be necessary to remove the spindle covers to remove and/or install the new belt. To remove the spindle covers, remove the screws securing them to the deck.

- Carefully remove the belt from around the idler pulleys and the spindle pulleys.

<b>⚠ WARNING</b>
Avoid pinching injuries. Never place your fingers on the idler spring or between the belt and a pulley while removing the belt.

- Route the new belt as shown in the applicable figure on the following pages. See Figure 4-9 for 42" decks, Figure 4-9 for 46" decks and Figure 4-10 for 50" & 54" decks.

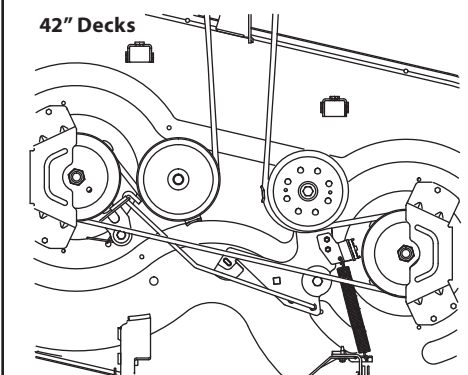


Figure 4-8

### 46" Decks

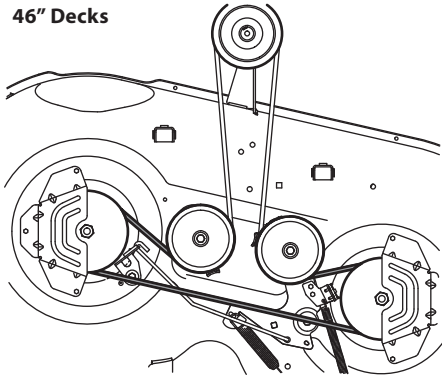


Figure 4-9

### 50" & 54" Decks

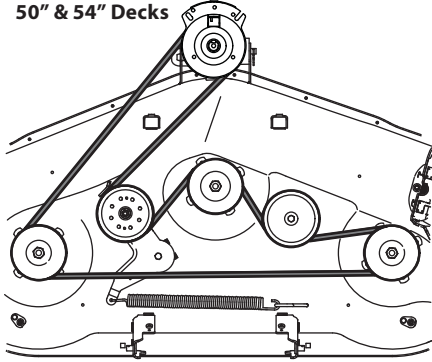


Figure 4-10

**Note:** Use a  $\frac{3}{8}$ " drive ratchet wrench as instructed in earlier steps when routing the new belt.

5. Retighten idler pulleys, if loosened earlier.
6. Remount the spindle covers if removed earlier.
7. Re-install the deck make sure the belt remains routed around the pulleys as instructed.
8. On manual PTO units, re-install the engine pulley keeper rod and the PTO cable.
9. Pull the right side of the belt and place the narrow V side of the belt into the PTO pulley. See Figure 4-11.

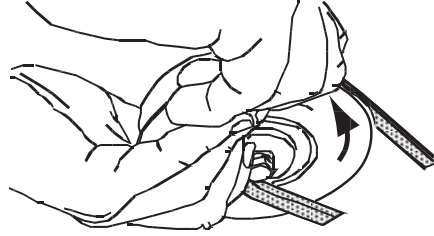


Figure 4-11

10. While holding the belt and pulley together, rotate the pulley to the left. Continue holding and rotating the pulley and belt until the belt is fully rolled into the PTO pulley.

### Changing the Transmission Drive Belt

Several components must be removed and special tools used in order to change the tractor's transmission drive belt. See your authorized dealer to have the transmission drive belt replaced.

### Troubleshooting

#### Excessive Vibration

1. Cutting blade loose.
  - Tighten cutting blade and deck spindle.
2. Cutting blade damaged, unbalanced or bent.
  - Replace the cutting blade.

#### Uneven Cut

1. Deck not properly leveled.
  - Perform side-to-side deck adjustment.
2. Cutting blade dull or damaged.
  - Sharpen or replace cutting blade.
3. Uneven tire pressure.
  - Check and correct tire pressure in all four tires.

