



Wheel Horse® XL 380H Lawn Tractor

Model No. 71428—Serial No. 250000001 and Up

Operator's Manual



Warning



CALIFORNIA

Proposition 65 Warning

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

Important The engine in this product is not equipped with a spark arrester muffler. It is a violation of California Public Resource Code Section 4442 to use or operate this engine on any forest-covered, brush-covered, or grass-covered land as defined in CPRC 4126. Other states or federal areas may have similar laws.

This spark ignition system complies with Canadian ICES-002.

Ce système d'allumage par étincelle de véhicule est conforme à la norme NMB-002 du Canada.

The enclosed Engine Owner's Manual is supplied for information regarding The U.S. Environmental Protection Agency (EPA) and the California Emission Control Regulation of emission systems, maintenance and warranty.

Keep this engine Owner's Manual with your unit. Should this engine Owner's Manual become damaged or illegible, replace immediately. Replacements may be ordered through the engine manufacturer.

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Introduction

Read this manual carefully to learn how to operate and maintain your product properly. The information in this manual can help you and others avoid injury and product damage. Although Toro designs and produces safe products, you are responsible for operating the product properly and safely.

You may contact Toro directly at www.Toro.com for product and accessory information, help finding a dealer, or to register your product.

Whenever you need service, genuine Toro parts, or additional information, contact an Authorized Service Dealer or Toro Customer Service and have the model and serial numbers of your product ready. Figure 1 illustrates the location of the model and serial numbers on the product.

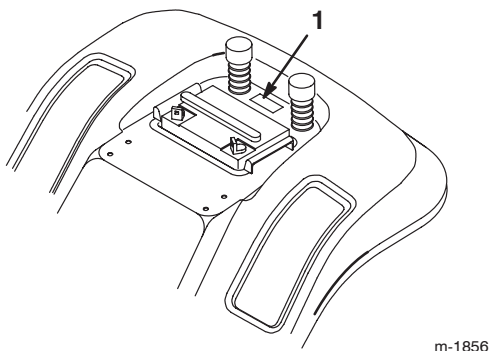


Figure 1

1. Location of the model and serial numbers

Write the product model and serial numbers in the space below:

Model No. _____

Serial No. _____

This manual identifies potential hazards and has special safety messages that help you and others avoid personal injury and even death. ***Danger***, ***Warning***, and ***Caution*** are signal words used to identify the level of hazard. However, regardless of the hazard, be extremely careful.

Danger signals an extreme hazard that **will** cause serious injury or death if you do not follow the recommended precautions.

Warning signals a hazard that **may** cause serious injury or death if you do not follow the recommended precautions.

Caution signals a hazard that may cause minor or moderate injury if you do not follow the recommended precautions.

This manual uses 2 other words to highlight information.

Important calls attention to special mechanical information and **Note**: emphasizes general information worthy of special attention.

Safety

This machine meets or exceeds the B71.1–2003 specifications of the American National Standards Institute, in effect at the time of production. However, improper use or maintenance by the operator or owner can result in injury. To reduce the potential for injury,

comply with these safety instructions and always pay attention to the safety alert **▲** symbol, which means **CAUTION, WARNING, or DANGER**—“personal safety instruction.” Failure to comply with the instruction may result in personal injury or death.

Safe Operating Practices

The following instructions are from ANSI standard B71.1—2003.

This product is capable of amputating hands and feet and throwing objects. Always follow all safety instructions to avoid serious injury or death.

General Operation

- Read, understand, and follow all instructions in the operator’s manual and on the machine before starting.
- Do not place hands or feet near rotating parts or under the machine. Keep clear of the discharge opening at all times.
- Allow only responsible adults who are familiar with the instructions to operate the machine.
- Clear the area of objects such as rocks, toys, wire, etc., which could be picked up and thrown by the blade.
- Be sure the area is clear of other people before mowing. Stop the machine if anyone enters the area.
- Never carry passengers.
- Do not mow in reverse unless absolutely necessary. Always look down and behind before and while backing up.
- Never direct discharged material toward anyone. Avoid discharging material against a wall or obstruction. Material may ricochet back toward the operator. Stop the blade(s) when crossing gravel surfaces.
- Do not operate the mower without either the entire grass catcher, discharge guard or other safety devices in place and working.
- Slow down before turning.
- Never leave a running machine unattended. Always turn off blades, set parking brake, stop engine, and remove key before dismounting.
- Disengage blades when not mowing. Stop the engine and wait for all parts to come to a complete stop before cleaning the machine, removing the grass catcher or unclogging the discharge chute.
- Operate the machine only in daylight or good artificial light.
- Do not operate the machine while under the influence of alcohol or drugs.

- Watch for traffic when operating near or crossing roadways.
- Use extra care when loading or unloading the machine into a trailer or truck.
- Always wear safety goggles or safety glasses with side shields when operating mower.
- 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.
- Always follow the recommendations for wheel weights or counterweights.

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.

- Mow up and down slopes, not across.
- Watch for holes, ruts, bumps, rocks or other hidden obstacles. Uneven terrain could overturn the machine. Tall grass can hide obstacles.
- Choose a low ground speed so you will not have to stop or shift while on a slope.
- Do not mow on wet grass. Tires may lose traction.
- Always keep the machine in gear when going down slopes. Do not shift to neutral and coast downhill.
- Avoid starting, stopping or turning on a slope. If tires lose traction, disengage the blades and proceed slowly straight down the slope.
- Keep all movement on slopes slow and gradual. Do not make sudden changes in speed or direction, which could cause the machine to roll over.
- Use extra care while operating mower with grass catchers or other attachments; they can affect the stability of the machine. Do not use on steep slopes.
- Do not try to stabilize the machine by putting your foot on the ground.
- Do not mow near drop-offs, ditches, or embankments. The machine could suddenly turn over if a wheel goes over the edge of a cliff or ditch, or if an edge caves in.

Children

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. Never assume that children will remain where you last saw them.

- Keep children out of the mowing area and under the watchful care of a responsible adult, not the operator.
- Be alert and turn the machine off if children enter the area.
- Before and while backing or changing direction, look behind, down, and side-to-side for small children.
- Never carry children, even with the blades off. They may fall off and be seriously injured or interfere with safe machine operation.
- Children who have been given rides in the past may suddenly appear in the mowing area for another ride and be run over or backed over by the mower.
- Never allow children to operate the machine.
- Use extra care when approaching blind corners, shrubs, trees, or other objects that may block your view of a child.

Towing

- Tow only with a machine that has a hitch designed for towing. Do not attached towed equipment except at the hitch point.
- This product has a limited towing capacity for small attachments, such as leaf sweepers, rollers or carts. The combined weight of the attachment and load should not exceed the weight of the tractor. Use of these types of attachments should be limited to flat ground.
- Never allow children or others in or on towed equipment.
- On slopes, the weight of towed equipment may cause a loss of traction and control.
- Travel slowly and allow extra distance to stop.

Service

Safe Handling of Gasoline

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

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

- Never fill containers inside a vehicle or on a truck or trailer with a plastic liner. Always place containers on the ground away from your vehicle before filling.
- Remove gas-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment with a portable container, rather than from a gasoline dispenser nozzle.
- Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until the fueling is complete. Do not use a nozzle lock-open device.
- If fuel is spilled on clothing, change clothing immediately.
- Never overfill the fuel tank. Replace gas cap and tighten securely.
- Never leave a running machine unattended. Always turn off blades, set parking brake, stop engine, and remove the ignition and KeyChoice™ keys before dismounting.
- Keep hands, feet, hair and loose clothing away from attachment discharge area, underside of mower and any moving parts while engine is running.
- Do not touch equipment or attachment parts which may be hot from operation. Allow to cool before attempting to maintain, adjust or service.
- Battery acid is poisonous and can cause burns. Avoid contact with skin, eyes and clothing. Protect your face, eyes and clothing when working with a battery.
- Battery gases can explode. Keep cigarettes, sparks and flames away from battery.
- Use only Toro approved attachments. Warranty may be voided if used with unapproved attachments.

General Service

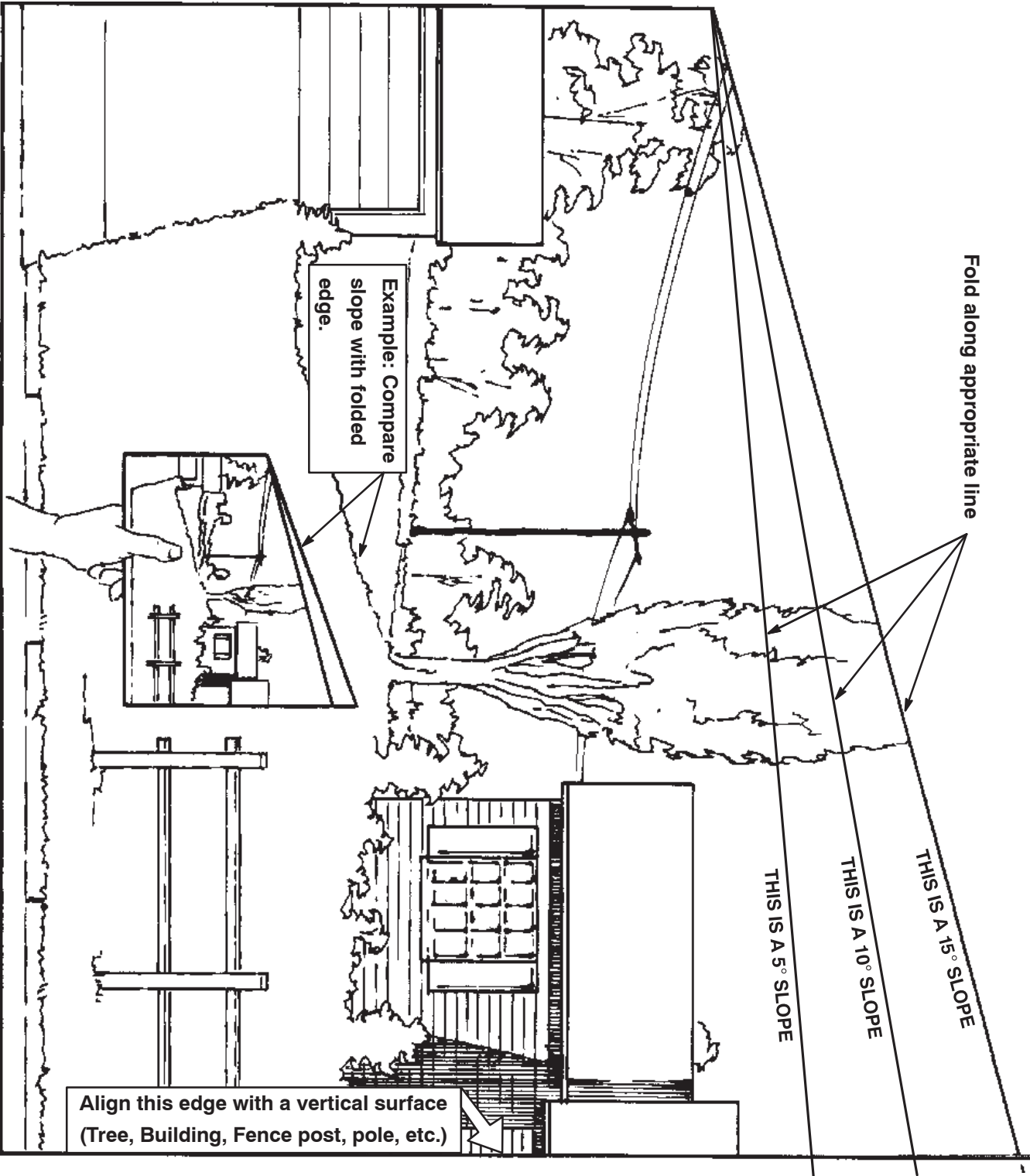
- Never run a machine inside a closed area.
- Keep nuts and bolts tight to be sure the equipment is in safe working condition.
- Never tamper with safety devices. Check their proper operation regularly.
- Keep the machine free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage fuel soaked debris. Allow the machine to cool before storing.
- If you strike a foreign object, stop and inspect the mower. Repair, if necessary, before restarting.
- Never make any adjustments or repairs with the engine running.
- Check grass catcher components and the discharge guard frequently and replace with manufacturer's recommended parts, when necessary.
- Mower blades are sharp and can cut. Wrap the blade(s) or wear gloves, and use extra caution when servicing them.
- Check brake operation frequently. Adjust and service as required.
- Maintain or replace safety and instruction decals as necessary.
- Do not mow across slopes exceeding 5 degrees.
- Do not mow up slopes exceeding 10 degrees.
- Do not mow down slopes exceeding 15 degrees.
- If a steep slope must be ascended, back up the hill, and drive forward down the hill, keeping the machine in gear.
- Use only genuine Toro replacement parts to ensure that original standards are maintained.

Toro Riding Mower Safety

The following list contains safety information specific to Toro products or other safety information that you must know that is not included in the ANSI standards.

- Stop the engine, disconnect spark plug wire(s) and remove key before performing any service, repairs, maintenance or adjustments.

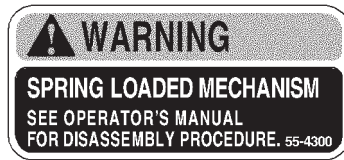
Slope Chart



Safety and Instruction Decals



Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or lost.



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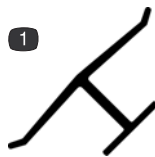
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68-3660



79-3140



Manufacturers Mark

1. Indicates the blade is identified as a part from the original machine manufacturer.



107-4921

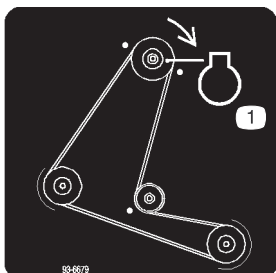
1. Power take-off (PTO)
2. Disengage
3. Engage



92-2461



93-1122



93-6679

1. Engine



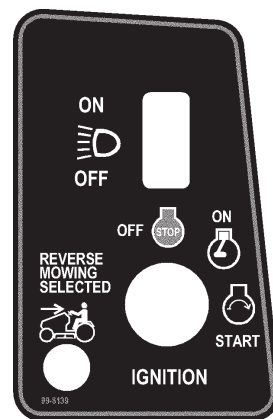
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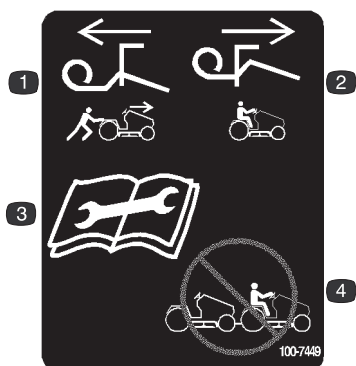
99-5339



108-7817



99-5139



100-7449

1. Pull the lever out to push the machine.
2. Push the lever in to ride on the machine.
3. Read the instructions before servicing or performing maintenance.
4. Do not tow the machine



Battery Symbols

Some or all of these symbols are on your battery.

1. Explosion hazard
2. No fire, open flames, or smoking.
3. Caustic liquid/chemical burn hazard
4. Wear eye protection; explosive gases can cause blindness and other injuries
5. Wear eye protection
6. Read the *Operator's Manual*.
7. Keep bystanders a safe distance from the battery.
8. Battery acid can cause blindness or severe burns.
9. Flush eyes immediately with water and get medical help fast.
10. Contains lead; do not discard.

Gasoline and Oil

Recommended Gasoline

Use unleaded regular gasoline suitable for automotive use (85 pump octane minimum). You may use leaded regular gasoline if unleaded regular is not available.

Important Never use methanol, gasoline containing methanol, or gasohol containing more than 10% ethanol because the fuel system could be damaged. Do not mix oil with gasoline.



Danger



In certain conditions, gasoline is extremely flammable and highly explosive. A fire or explosion from gasoline can burn you and others and can damage property.

- Fill the fuel tank outdoors in an open area when the engine is cold. Wipe up any gasoline that spills.
- Do not fill the fuel tank completely full. Add gasoline to the fuel tank until the level is 1/4 to 1/2 in. (6 to 13 mm) below the bottom of the filler neck. This empty space in the tank allows the gasoline to expand.
- Never smoke when handling gasoline, and stay away from an open flame or where a spark may ignite the gasoline fumes.
- Store gasoline in an approved container and keep it out of the reach of children.
- Never buy more than a 30-day supply of gasoline.
- Always place gasoline containers on the ground away from your vehicle before filling.
- Do not fill gasoline containers inside a vehicle or on a truck or trailer bed because interior carpets or plastic truck bed liners may insulate the container and slow the loss of any static charge.
- When practical, remove gas-powered equipment from the truck or trailer and refuel the equipment with its wheels on the ground.
- If this is not possible, refuel such equipment on a truck or trailer from a portable container, not from a gasoline dispenser nozzle.
- If you must use a gasoline dispenser, keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.

Using Stabilizer/Conditioner

Use a fuel stabilizer/conditioner in the tractor to provide the following benefits:

- It keeps gasoline fresh during storage for up to 90 days. For longer storage, drain the fuel tank.
- It cleans the engine while it runs.
- It eliminates gum-like varnish buildup in the fuel system, which causes hard starting.

Important Do not use fuel additives containing methanol or ethanol.

Add the correct amount of fuel stabilizer/conditioner to the gasoline.

Note: A fuel stabilizer/conditioner is most effective when it is mixed with fresh gasoline. To minimize the chance of varnish deposits in the fuel system, use a fuel stabilizer/conditioner at all times.

Filling the Fuel Tank

1. Stop the engine and wait for all moving parts to stop.
2. Set the parking brake.
3. Clean around the fuel tank cap and remove the cap.
4. Add unleaded regular gasoline to the fuel tank until the level is 1/4 to 1/2 in. (6 to 13 mm) below the bottom of the filler neck. **Do not fill the fuel tank completely full.**

Note: This space in the tank allows gasoline to expand.

5. Install the fuel tank cap securely.
6. Wipe up any gasoline that spills.

Checking the Engine Oil Level

Before you start the engine and use the tractor, check the oil level in the engine crankcase; refer to Checking the Oil Level on page 20.

Operation

Note: Determine the left and right sides of the tractor from the normal operating position.

Controls

Become familiar with all of the controls (Fig. 2) before you start the engine and operate the tractor.

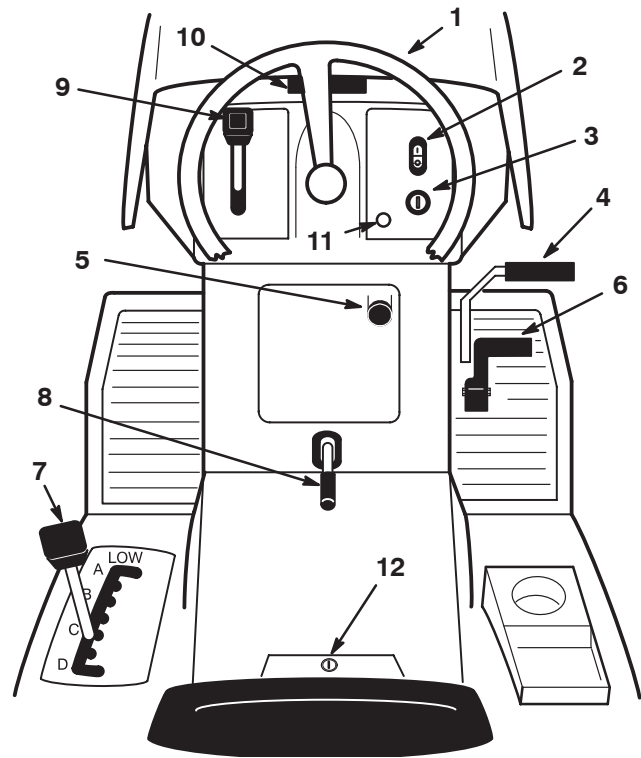


Figure 2

- | | |
|------------------------|--------------------------------|
| 1. Steering wheel | 7. Height-of-cut lever |
| 2. Light switch—on/off | 8. Parking brake lever |
| 3. Ignition switch | 9. Throttle lever |
| 4. Clutch/brake pedal | 10. Hood opening |
| 5. Blade control (PTO) | 11. Operating-in-reverse light |
| 6. Ground speed pedal | 12. KeyChoice® switch |

Using the Parking Brake

Always set the parking brake when you stop the tractor or leave it unattended.

Setting the Parking Brake

1. Push the clutch/brake pedal (Fig. 3) down and hold it in the depressed position.

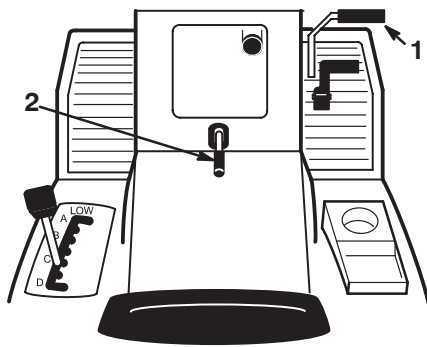


Figure 3

1. Brake pedal
2. Parking brake lever

2. Lift the parking brake lever (Fig. 3) up and gradually take your foot off of the clutch/brake pedal. The clutch/brake pedal should stay in the depressed (locked) position.

Releasing the Parking Brake

1. Push down on the clutch/brake pedal (Fig. 3). The parking brake lever should release.
2. Gradually release the clutch/brake pedal.

Positioning the Seat

The seat can move forward and backward. Position the seat where you have the best control of the tractor and are most comfortable.

1. Raise the seat and loosen the adjustment knob (Fig. 4).

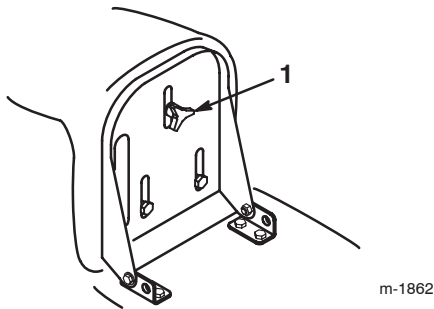


Figure 4

1. Adjustment knob

2. Move the seat to the desired position and tighten the knob.

Using the Headlights

A dash-mounted On/Off switch (Fig. 2) controls the headlights. The lights only shine while the engine is running and the switch is On.

Operating the Blade Control (PTO)

The blade control (PTO) engages and disengages power to the electric clutch.

Engaging the Power Take Off (PTO)

1. Press the clutch/brake pedal to stop the tractor.
2. Pull the blade control (PTO) to on (Fig. 5).

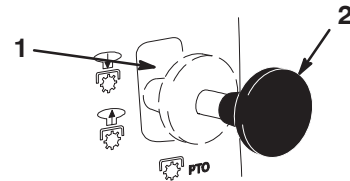


Figure 5

1. Off—disengaged
2. On—engaged

Disengaging the Blade Control (PTO)

1. Press the clutch/brake pedal to stop the tractor.
2. Push the blade control (PTO) to off (Fig. 5).

Setting the Height-of-Cut

The height-of-cut lever is used to raise and lower the mower to the desired cutting height. You can set the height-of-cut to one of seven positions from approximately 1-1/2 to 4-1/2 inches (38 to 116 mm).

1. Park the machine on a level surface, disengage the PTO, set the parking brake, stop the engine, and remove the ignition key.
2. Pull on the height-of-cut lever on the tractor and move it to the desired position (Fig. 6).

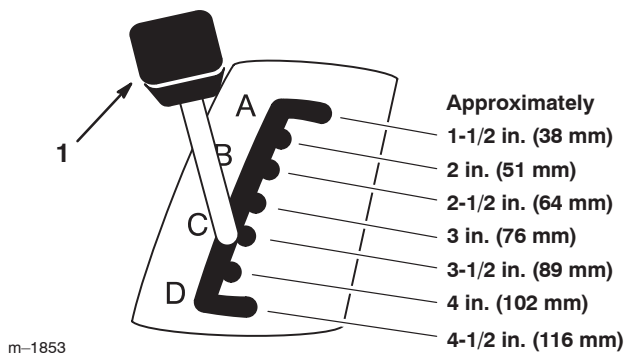


Figure 6

1. Height-of-cut lever

3. Adjust each mower gage wheel to the correct height, as follows:

- A. Remove the hairpin cotter and pin to change the hole location (Fig. 7).

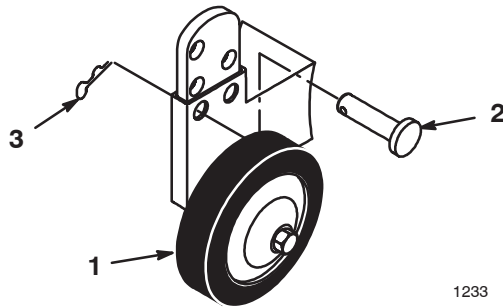


Figure 7

1. Wheel
2. Pin
3. Hairpin cotter

- B. Select a hole position so that the gage wheel is 3/8 inch (10 mm) off of the ground for the height-of-cut to be used (Fig. 7).

- C. Insert the pin and secure it with the hairpin cotter.

Starting the Engine

1. Sit down on the seat.
2. Set the parking brake; refer to Setting the Parking Brake on page 12.

Note: The engine does not start unless you set the parking brake or fully depress the brake pedal.

3. Push the blade control (PTO) to **off** (Fig. 5).
4. Shift the throttle lever to Choke (Fig. 8).

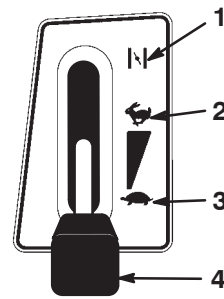


Figure 8

1. Choke
2. Fast
3. Slow
4. Throttle lever

Note: An engine that has been running and is warm may not require step 4.

5. Turn the ignition key clockwise and hold it in the Start position (Fig. 9). When the engine starts, release the key.

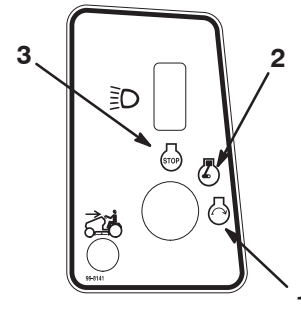


Figure 9

1. Start
2. On
3. Off

Important If the engine does not start after 30 seconds of continuous cranking, turn the ignition key to Off and let the starter motor cool; refer to Troubleshooting on page 38.

6. After the engine starts, slowly shift the throttle lever to Fast (Fig. 8). If the engine stalls or hesitates, shift the throttle lever back to Choke for a few seconds and then shift the throttle lever to Fast. Repeat this step as required.

Stopping the Engine

1. Shift the throttle lever to Fast (Fig. 8).
2. Turn the ignition key to Off and remove the ignition key (Fig. 9).

Using the Safety Interlock System



Caution



If the safety interlock switches are disconnected or damaged, the tractor could operate unexpectedly, causing personal injury.

- Do not tamper with the interlock switches.
- Check the operation of the interlock switches daily and replace any damaged switches before operating the tractor.

Understanding the Safety Interlock System

The safety interlock system is designed to prevent the engine from starting unless:

- You are sitting on the seat.
- The brake pedal is depressed.
- The blade control (PTO) is in the Disengage position.

The safety interlock system is designed to stop the engine if you do the following:

- You rise from the seat when the brake pedal is released.
- You rise from the seat while the blade control (PTO) is in the Engage position.
- You shift into reverse while the blade control (PTO) is in the Engage position.

Setting the KeyChoice® Switch to Operate in Reverse

An interlock feature on the tractor prevents the power take-off (PTO) from operating when you back up the tractor. If you shift the ground speed switch into Reverse with the PTO engaged (i.e., with the mower blades or other attachment running), the engine will stop. **Do not mow in reverse unless it is absolutely necessary.**

If you need to use the blade control (PTO) while backing up, turn off the interlock feature using the KeyChoice switch located near the seat bracket (Fig. 10).



Danger



You could back over a child or bystander while the mower blades or other attachment is engaged and cause serious injury or death.

- Do not mow in reverse unless it is absolutely necessary.
- Do not insert the KeyChoice key unless it is absolutely necessary.
- Always look backward and down before backing up.
- Use the KeyChoice switch only if you are certain no children or other bystanders will enter the mowing area.
- Be very observant after deactivating the interlock because the sound of the engine may prevent you from noticing that a child or bystander has entered the work area.
- Always remove both the ignition and KeyChoice keys and put them in a safe place out of the reach of children or unauthorized users when leaving the tractor unattended.

1. Engage the blade (PTO).
2. Insert the KeyChoice key into the switch (Fig. 10).

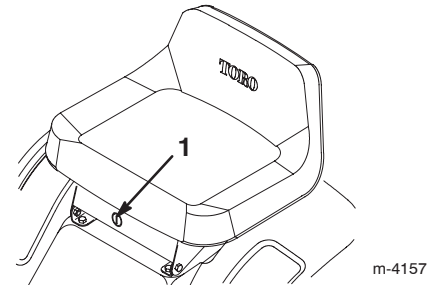


Figure 10

1. KeyChoice switch

3. Turn the KeyChoice key.

A red light on the front console (Fig. 11) turns on, indicating that the interlock is disabled.

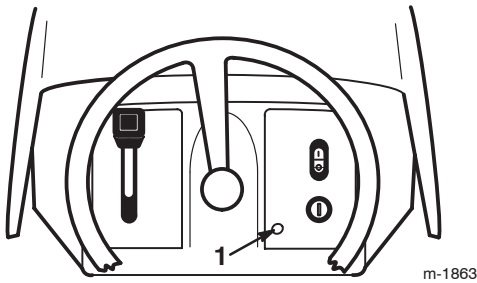


Figure 11

1. Operating-in-reverse light

4. Shift the ground speed switch into Reverse and complete your task.
5. Disengage the blade (PTO) to activate the interlock.
6. Remove the KeyChoice key and put it in a safe place out of the reach of children.

Testing the Safety Interlock System



Caution



If safety interlock switches are disconnected or damaged, the tractor could operate unexpectedly, causing personal injury.

- Do not tamper with the interlock switches.
- Check the operation of the interlock switches daily and replace any damaged switches before operating the tractor.

Test the safety system before you use the tractor each time. If the safety interlock system does not operate as described below, have an Authorized Service Dealer repair the safety interlock system immediately. While sitting in the seat, perform the following checks:

1. Set the parking brake. Shift the blade control (PTO) to Engage, and turn the ignition key to Start: The engine should not crank.
2. Shift the blade control (PTO) to Disengage and release the parking brake. Turn the ignition key to Start: The engine should not crank.
3. Set the parking brake, shift the blade control (PTO) to Disengage, and start the engine. While the engine is running, release the parking brake and rise slightly from the seat: The engine should stop.

4. Shift the blade control (PTO) to Disengage, move the traction control pedal to Neutral, set the parking brake, and start the engine. While the engine is running, shift the blade control (PTO) to Engage and move the traction control pedal to Reverse: The engine should stop.
5. Shift the blade control (PTO) to Disengage, move the traction control pedal to Neutral, and set the parking brake. Start the engine, shift the blade control (PTO) to Engage, and turn the KeyChoice key and release it: The operating-in-reverse warning light should illuminate.
6. Shift the blade control (PTO) to Disengage: The operating-in-reverse warning light should turn off.

Pushing the Tractor Manually

Important Always push the tractor manually. Never tow the tractor because you may damage the transaxle.

To Push the Machine

1. Disengage the blades (PTO).
2. Stop the engine and wait for all moving parts to stop.
3. Remove the ignition key.
4. Pull the drive control out to the Push position (Fig. 12).

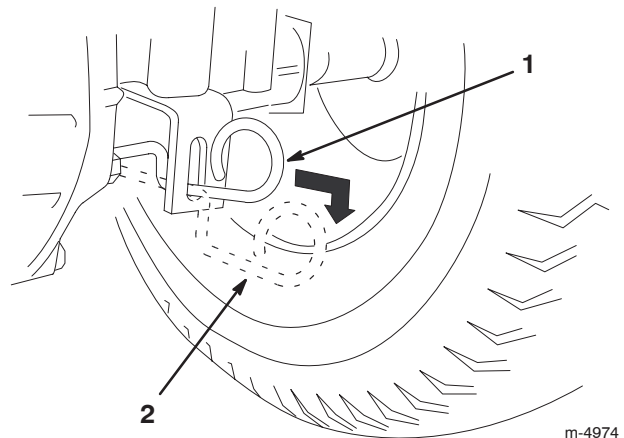


Figure 12

1. Operate position
2. Push position

Note: This disengages the drive system and allows the wheels to turn freely (Fig. 12).

To Operate the Machine

Push the drive control in to the Operate position (Fig. 12).

Note: The machine will not drive unless the drive control is in the Operate position.

Driving the Tractor Forward or Backward

The throttle control regulates the engine speed as measured in RPM (revolutions per minute). Shift the throttle lever into the Fast position for best performance.

1. Release the parking brake; refer to Releasing the Parking Brake on page 13.

Important To avoid transmission damage, always release the parking brake before moving the ground speed pedal.

2. Place your foot on the ground speed pedal (Fig. 13) and slowly press on the top of the pedal to move forward or on the bottom of the pedal to move backward.

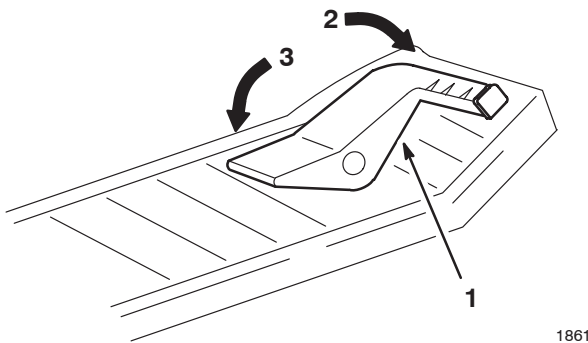


Figure 13

1. Ground speed pedal
2. Forward
3. Backward

Note: The farther you move the ground speed pedal in either direction, the faster the tractor will move in that direction.

Note: To slow down, release the pressure on the ground speed pedal.

Note: For reverse motion, with the blades (PTO) engaged, the operating-in-reverse interlock must be deactivated by the KeyChoice switch located in front of and below the seat.

Stopping the Tractor

To stop the tractor, release the ground speed pedal, disengage the blades (PTO), and turn the ignition key to Off to stop the engine. Also set the parking brake if you leave the tractor unattended; refer to Setting the Parking Brake on page 12. Remember to remove the keys from the ignition and KeyChoice switches.



Caution



Children or bystanders may be injured if they move or attempt to operate the tractor while it is unattended.

Always remove the ignition and KeyChoice keys and set the parking brake when leaving the tractor unattended, even if just for a few minutes.

Side Discharging or Mulching the Grass



Danger



Without the grass deflector, discharge cover, or complete grass catcher assembly mounted in place, you and others are exposed to blade contact and thrown debris. Contact with rotating mower blades and thrown debris will cause injury or death.

- Never remove the grass deflector from the mower because the grass deflector routes material down toward the turf. If the grass deflector is ever damaged, replace it immediately.
- Never put your hands or feet under the mower.
- Never try to clear discharge area or mower blades unless you disengage the blades (PTO) and rotate the ignition key to the Off position. Also remove the key and disconnect the wire from the spark plug.

The mower has a hinged grass deflector that disperses clippings to the side and down toward the turf.

To mulch grass clippings you must install the discharge cover (optional on some models) into the opening in the side of the mower; refer to Installing the Discharge Cover on page 17.

Installing the Discharge Cover

To convert from side discharge to a mulching mower, install the discharge cover into the opening at the side of the mower.

1. Stop the engine and remove the ignition key.

2. Lift the grass deflector and slide the tabs on top of the discharge cover under the grass deflector retaining rod. Rotate the discharge cover down over the opening, and onto the lower lip of the mower (Fig. 14).
3. Secure the discharge cover to the lower lip of the mower with bolts and nuts (Fig. 14).

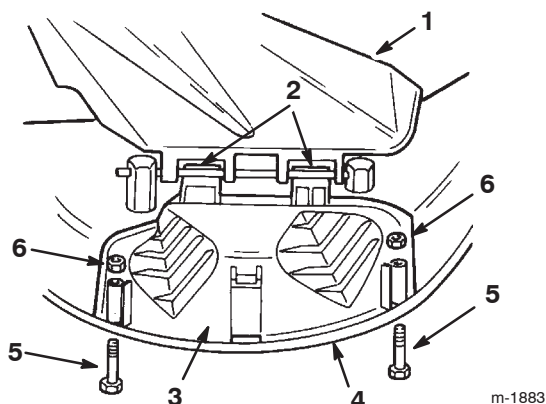


Figure 14

- | | |
|--------------------|--------------|
| 1. Grass deflector | 4. Lower lip |
| 2. Tabs under rod | 5. Bolt |
| 3. Discharge cover | 6. Nut |

Note: Do not over-tighten the nuts, which could distort the cover and cause blade contact.

4. To convert back to a side discharge mower, remove the discharge cover and lower the grass deflector over the discharge opening.

Operating Tips

- For the best performance, operate the engine at the maximum speed. The mower requires air to thoroughly cut grass clippings, so do not set the height-of-cut too low or completely surround the mower in uncut grass. Always leave one side of the mower free from uncut grass to allow the air to be drawn into the mower.
- Cut the grass slightly longer than normal to ensure that the cutting height of the mower does not scalp any uneven ground. When cutting grass longer than 6 in. (15 cm) tall, cut the lawn twice to ensure an acceptable appearance.
- It is best to cut only about 1/3 of the grass blade. Do not cut more than that unless the grass is sparse or it is late fall when grass grows more slowly.
- Alternate the mowing direction to keep the grass standing straight. This also helps disperse clippings and enhances decomposition and fertilization.

- Grass grows at different rates at different times of the season. To maintain the same cutting height, which is a good practice, mow more often in early spring. As the grass growth rate slows in mid summer, mow less frequently.
- If the grass is longer than normal, or if it contains a high degree of moisture, raise the cutting height higher than usual, cut the grass at that setting, and then cut the grass again at the lower, normal setting.
- If you must stop the tractor while mowing, you may leave a clump of grass clippings on your lawn. To avoid this, do the following:
 - Engage the blade and move to a previously cut area.
 - Disperse the clippings evenly by raising the mower 1 or 2 height-of-cut settings while driving forward with the blade engaged.
- Use the washout port to clean clippings and dirt from the underside of the mower after each use. If grass and dirt build up inside the mower, the cutting quality will eventually become unsatisfactory.
- Maintain a sharp blade throughout the season. A sharp blade cuts grass cleanly without tearing or shredding the grass blades. Tearing and shredding the grass turns it brown at the edges, which slows its growth and increases the chance of disease. Every 30 days, check the blade for sharpness and file down any nicks.

Maintenance

Recommended Maintenance Schedule

Maintenance Service Interval	Maintenance Procedure
After first 5 hours	<ul style="list-style-type: none"> • Change the engine oil.
Each use	<ul style="list-style-type: none"> • Check the engine oil level. • Clean the mower housing. • Check the safety system.
Every 5 hours	<ul style="list-style-type: none"> • Check the brakes. • Check the cutting blades.
Every 25 hours	<ul style="list-style-type: none"> • Check the spark plug. • Check the tire pressure. • Grease the chassis.¹ • Service the foam air cleaner.¹
Every 50 hours	<ul style="list-style-type: none"> • Change the engine oil.² • Check the battery electrolyte
Every 100 hours	<ul style="list-style-type: none"> • Service the paper air cleaner.¹ • Change the oil filter.² • Replace the spark plug. • Clean the cooling system.¹ • Replace the fuel filter. • Check the transaxle fluid.
Before storage	<ul style="list-style-type: none"> • Perform all of the maintenance procedures above before storage. • Check the belts for wear/cracks. • Drain the fuel tank. • Paint chipped surfaces. • Charge the battery and disconnect the cables.
After storage	<ul style="list-style-type: none"> • Check the safety system. • Check the battery electrolyte. • Check the brake. • Check the spark plug. • Check the tire pressure.

¹More often in dusty, dirty conditions

²More often when operating the engine under heavy load or in high temperatures

Important Refer to your engine operator's manual for additional maintenance procedures.



Caution



If you leave the key in the ignition switch, someone could accidentally start the engine and seriously injure you or other bystanders.

Remove the key from the ignition and disconnect the wire from the spark plug before you do any maintenance. Set the wire aside so that it does not accidentally contact the spark plug.

Servicing the Engine Oil

Check the oil level daily or after every 8 hours.

Change the oil after the first 5 operating hours and every 50 operating hours thereafter.

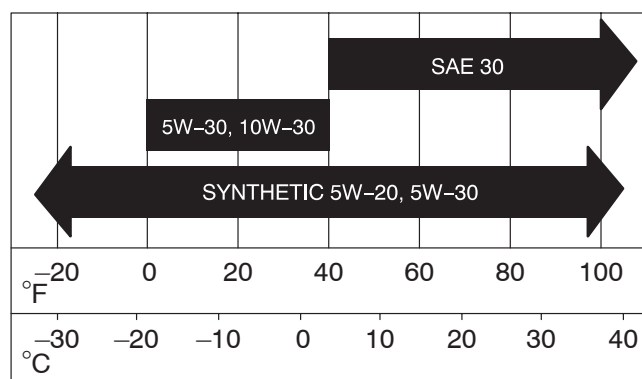
Note: Change the oil more frequently when operating conditions are extremely dusty or sandy.

Oil Type: Detergent oil (API service SF, SG, SH, SJ, or higher)

Crankcase Capacity: 48 oz. or 1-1/2 qt. (1400 cc or 1.4 l) without the oil filter; 56 oz. or 1-3/4 qt. (1700 cc/1.7 l) with the oil filter

Viscosity: See the table below.

USE THESE SAE VISCOSITY OILS



Checking the Oil Level

1. Park the tractor on a level surface.
2. Disengage the PTO and set the parking brake.
3. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Open the hood.
5. Clean around the oil dipstick (Fig. 15) so that dirt cannot fall into the fill hole and damage the engine.

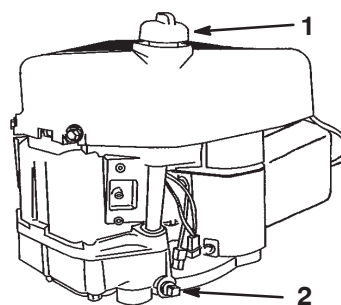


Figure 15

1. Oil dipstick
2. Oil drain plug

6. Unscrew the oil dipstick and wipe the metal end clean (Fig. 16).

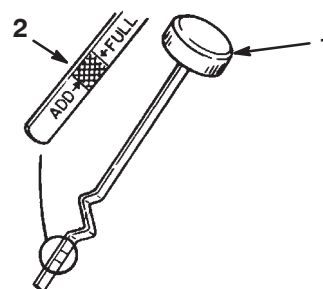


Figure 16

1. Oil dipstick
2. Metal end

7. Screw the oil dipstick fully onto the fill hole. Unscrew the dipstick again and look at the metal end. If the oil level is low, slowly pour only enough oil into the fill hole to raise the level to the Full mark on the dipstick.

Important Do not overfill the crankcase with oil because the engine may be damaged.

Changing the Oil

1. Start the engine and let it run for 5 minutes. This warms the oil so that it drains better.
2. Park the tractor so that the left side is slightly lower than the right side to ensure that the oil drains completely.
3. Disengage the PTO and set the parking brake.
4. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
5. Open the hood.
6. Place a pan below the oil drain plug and remove it (Fig. 15).
7. When the oil has drained completely, install the drain plug.

Note: Dispose of the used oil at a certified recycling center.

8. Change the oil filter, if necessary (Fig. 17).
9. Slowly pour approximately 80% of the specified amount of oil into the fill hole (Fig. 15). Check the oil level; refer to steps 4 and 5 of Checking the Oil Level on page 20.

Changing the Oil Filter

Replace the oil filter every 100 hours or every other oil change.

Note: Change the oil filter more frequently when operating conditions are extremely dusty or sandy.

1. Drain the oil from the engine; refer to Changing the Oil on page 20.
2. Remove the old filter and wipe the filter adapter (Fig. 17) gasket surface.

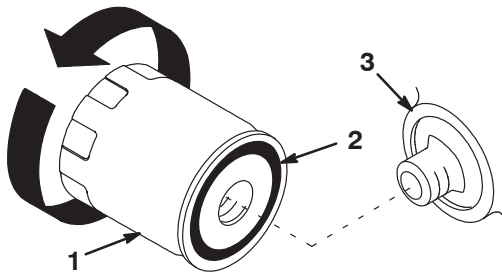


Figure 17

1. Oil filter
2. Gasket

3. Adapter

3. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Fig. 17).
4. Install the replacement oil filter to the filter adapter. Turn the oil filter clockwise until the rubber gasket contacts the filter adapter; then tighten the filter an additional 1/2 to 3/4 turn (Fig. 17).
5. Slowly pour approximately 80% of the specified amount of oil into the fill hole (Fig. 15). Check the oil level; refer to steps 6 and 7 of Checking the Oil Level on page 20.
6. Close the hood.

Servicing the Air Cleaner

Foam Element: Clean after every 25 operating hours, or yearly, whichever occurs first.

Paper Element: Replace after every 100 operating hours or yearly, whichever occurs first.

Note: Service the air cleaner more frequently (every few hours) if operating conditions are extremely dusty or sandy.

Removing the Foam and Paper Elements

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Open the hood.
4. Clean around the air cleaner to prevent dirt from getting into the engine and causing damage. Pull up on the air cleaner cover handle and rotate it toward the engine (Fig. 18). Remove the air cleaner cover.

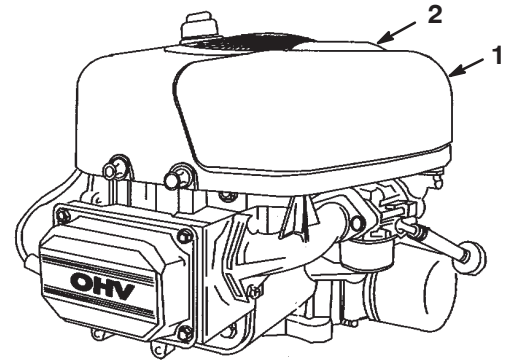


Figure 18

1. Air cleaner cover
2. Air cleaner cover handle

5. Carefully slide the paper element and foam element from the blower housing (Fig. 19).

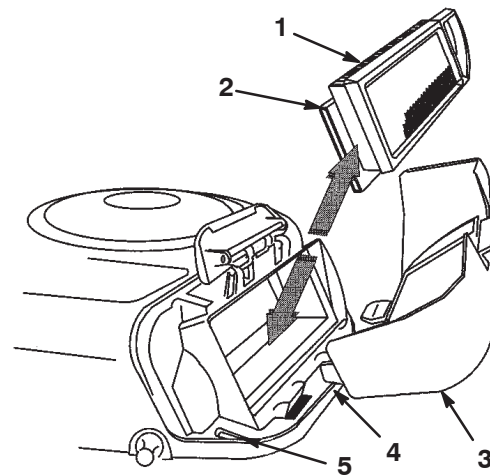


Figure 19

1. Paper element
2. Foam element
3. Air cleaner cover
4. Tab
5. Slot

Cleaning the Foam and Paper Elements

Foam Element:

1. Wash the foam element in liquid soap and warm water. When the element is clean, rinse it thoroughly.
2. Dry the element by squeezing it in a clean cloth. Do **not** oil the element.

Important Replace the foam element if it is torn or worn.

Paper Element:

1. Lightly tap the element on a flat surface to remove dust and dirt.
2. Carefully clean the rubber seal on the paper element to prevent debris from entering the engine.
3. Inspect the element for tears, an oily film, and damage to the rubber seal.

Important Never clean the paper element with pressurized air or liquids, such as solvent, gas, or kerosene. Replace the paper element if it is damaged or cannot be cleaned thoroughly.

Installing the Foam and Paper Elements

Important To prevent engine damage, always operate the engine with the complete foam and paper air cleaner assembly installed.

1. Place the foam element and paper element into the blower housing.

Note: Ensure that the rubber seal is flat against the air cleaner base.

2. Align the tabs on the air cleaner cover with the slots of the blower housing (Fig. 19). Hook the handle onto the cover and press down on the handle to lock the cover in place.
3. Close the hood.

Servicing the Spark Plug

Install a new spark plug after every 100 operating hours. Check the spark plug after every 25 operating hours. Make sure that the air gap between the center and side electrodes is correct before installing the spark plug. Use a spark plug wrench for removing and installing the spark plug and a gapping tool/feeler gauge to check and adjust the air gap.

Type: **Champion QC12YC** (or equivalent)

Air Gap: **0.030 in. (0.76 mm)**

Removing the Spark Plug

1. Disengage the PTO and set the parking brake.

2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Open the hood.
4. Disconnect the wire from the spark plug (Fig. 20).

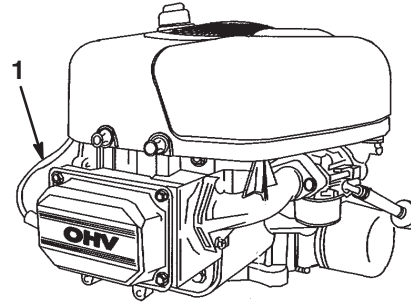


Figure 20

1. Spark-plug wire

5. Clean around the spark plug to prevent dirt from falling into the engine and potentially causing damage.
6. Remove the spark plug and metal washer.

Checking the Spark Plug

1. Look at the center of the spark plug (Fig. 21). If you see light brown or gray on the insulator, the engine is operating properly. A black coating on the insulator usually means the air cleaner is dirty.

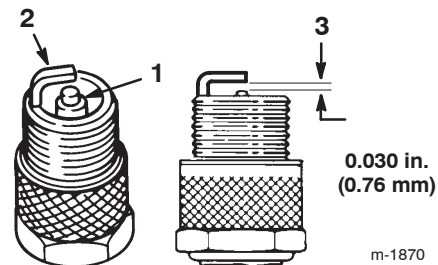


Figure 21

1. Center electrode insulator
2. Side electrode
3. Air gap (not to scale)

Important Never clean the spark plug. Always replace the spark plug when it has a black coating, worn electrodes, an oily film, or cracks.

2. Check the gap between the center and side electrodes (Fig. 21). Bend the side electrode (Fig. 21) if the gap is not correct.

Installing the Spark Plug

1. Install the spark plug and metal washer. Make sure that the air gap is set correctly.
2. Tighten the spark plug to 15 ft.-lb. (20 N-m).
3. Connect the wire to the spark plug (Fig. 20).
4. Close the hood.

Cleaning the Cooling System

Use a dry brush to clean grass and accumulated debris from the engine daily.

Important To prevent contamination of the fuel system, do not use water to clean the engine.

Servicing the Brake

The brake is on the right side of the rear axle, inside the rear tire (Fig. 22). If the brake does not hold securely or stopping power is insufficient, an adjustment is required.

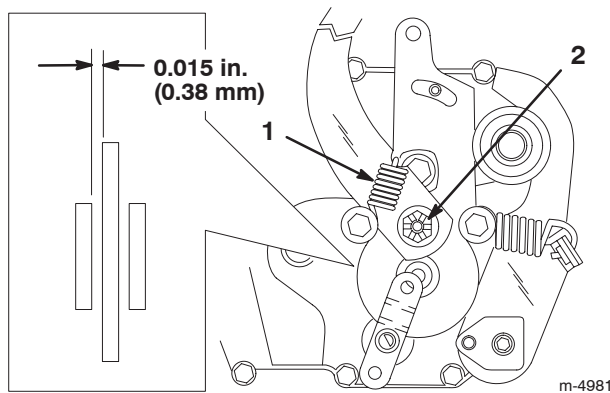


Figure 22

1. Brake arm spring 2. Brake adjusting nut

Checking the Brake

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the ignition key.
4. Move the drive control wire to the Push position; refer to Pushing the Tractor Manually on page 16.

5. If the rear wheels lock and skid when you push the tractor forward, you do not need to adjust the brake. If the wheels turn and do not lock, adjust the brake; refer to Adjusting the Brake on page 23.

Adjusting the Brake

1. Check the brake before you adjust it; refer to Checking the Brake on page 23.
2. Remove the brake arm spring (Fig. 22).
3. Remove the cotter pin that secures the brake adjusting nut and slightly loosen the nut (Fig. 22).
4. Insert a 0.015 in. (0.38 mm) feeler gauge between the brake disc and the brake puck (Fig. 22).
5. Tighten the nut until you feel a slight resistance on the feeler gauge when you slide it in and out.
6. Install a new cotter pin and attach the brake arm spring.
7. Check the brake operation again; refer to Checking the Brake, page 23.

Important With the parking brake released, the rear wheels should rotate freely when you push the tractor. If you cannot set the 0.015 in. (0.38 mm) clearance and get free wheel rotation, contact an Authorized Service Dealer immediately.

Greasing and Lubricating the Tractor

Grease the tractor after every 25 operating hours or once a year, whichever occurs first. Grease more frequently when operating conditions are extremely dusty or sandy.

Grease Type: General-purpose grease

How to Grease

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean the grease fittings with a rag.
4. Scrape any paint off of the front of the fittings.
5. Connect a grease gun to the fitting and pump grease into the fittings.
6. Wipe up any excess grease.

Where to Add Grease

Lubricate the front wheels and steering spindles until grease begins to ooze out of the bearings (Fig. 23).

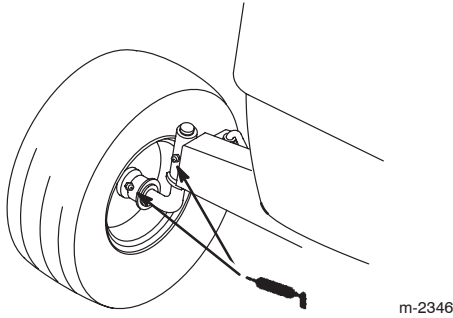


Figure 23

Checking the Tire Pressure

Maintain the air pressure in the front and rear tires at 20 psi (138 kPa). Check the pressure at the valve stem after every 25 operating hours or yearly, whichever occurs first (Fig. 24). Check the tires when they are cold to get the most accurate pressure reading.

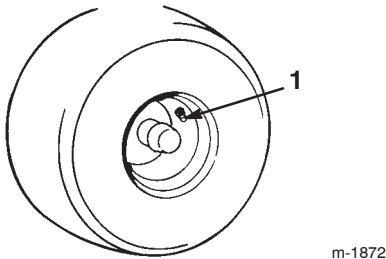


Figure 24

1. Valve stem

Servicing the Battery



Warning



CALIFORNIA

Proposition 65 Warning

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

Always keep the battery clean and fully charged. Use a paper towel to clean the battery and battery box. If the battery terminals are corroded, clean them with a solution of 4 parts water and 1 part baking soda. Apply a light coating of grease to the battery terminals to prevent corrosion.

Battery voltage and amperage: 12 volts, 155 cold-cranking amps

Removing the Battery



Warning



Battery terminals or metal tools could short against metal tractor components causing sparks. Sparks can cause the battery gasses to explode, resulting in personal injury.

- When removing or installing the battery, do not allow the battery terminals to touch any metal parts of the tractor.
- Do not allow metal tools to short between the battery terminals and metal parts of the tractor.

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Tip the seat forward to see the battery.
4. Disconnect the negative (black) ground cable from the battery post (Fig. 25).

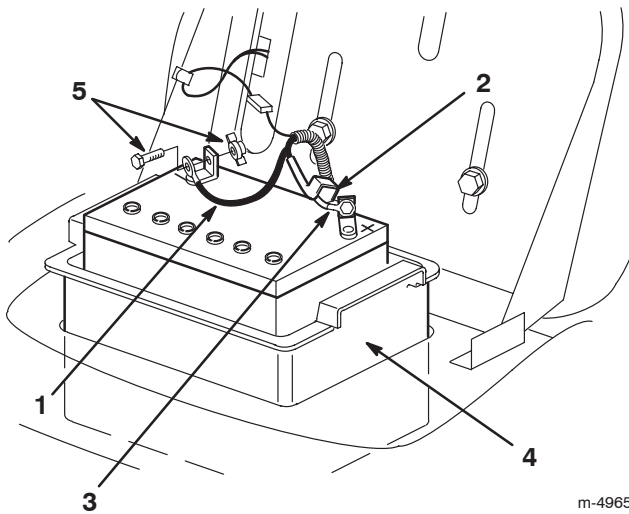


Figure 25

- | | |
|---------------------------|----------------------|
| 1. Negative cable (black) | 4. Battery box |
| 2. Rubber cover | 5. Bolt and wing nut |
| 3. Positive cable (red) | |

! **Warning** !

Incorrect battery cable routing could damage the tractor and cables causing sparks. Sparks can cause the battery gasses to explode, resulting in personal injury.

- Always *disconnect* the negative (black) battery cable before disconnecting the positive (red) cable.
- Always *reconnect* the positive (red) battery cable before reconnecting the negative (black) cable.

- Slide the rubber cover up the positive (red) cable. Disconnect the positive (red) cable from the battery post (Fig. 25).
- Remove the battery box and battery from the chassis (Fig. 25).

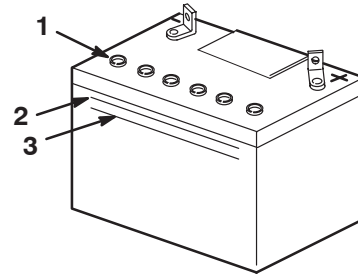
Installing the Battery

- Put the battery into the battery box and install it into the chassis (Fig. 25).
- Using the bolt and wing nut, connect the positive (red) cable to the positive (+) battery post (Fig. 25). Slide the rubber cover over the battery post.
- Using the bolt and wing nut, connect the negative (black) cable to the negative (-) battery post (Fig. 25).

Checking the Electrolyte Level

- Tip the seat forward to see the battery.

- Look at the side of the battery. The electrolyte must be up to the Upper line (Fig. 26).



m-5004

Figure 26

- | | |
|---------------|---------------|
| 1. Vent caps | 3. Lower line |
| 2. Upper line | |

Important Do not allow the electrolyte to fall below the Lower line (Fig. 26).

- If the electrolyte is low, add the required amount of distilled water; refer to Adding Water to the Battery on page 25.

! **Danger** !

Battery electrolyte contains sulfuric acid which is a deadly poison and causes severe burns.

- Do not drink electrolyte and avoid contact with skin, eyes or clothing. Wear safety glasses to shield your eyes and rubber gloves to protect your hands.
- Fill the battery where clean water is always available for flushing the skin.
- Follow all instructions and comply with all safety messages on the electrolyte container.

Adding Water to the Battery

The best time to add distilled water to the battery is just before you operate the tractor. This lets the water mix thoroughly with the electrolyte solution.

- Remove the battery from the tractor; refer to Removing the Battery on page 24.
- Clean the top of the battery with a paper towel.

Important Never fill the battery with distilled water while the battery is installed in the tractor. Electrolyte could be spilled on other parts and cause corrosion.

- Remove the vent caps from the battery (Fig. 26).
- Slowly pour distilled water into each battery cell until the electrolyte level is up to the Upper line (Fig. 26) on the battery case.

Important Do not overfill the battery because electrolyte (sulfuric acid) can cause severe corrosion and damage to the chassis.

5. Wait 5 to 10 minutes after filling the battery cells. Add distilled water, if necessary, until the electrolyte level is up to the Upper line (Fig. 26) on the battery case.
6. Install the battery vent caps.

Charging the Battery



Warning

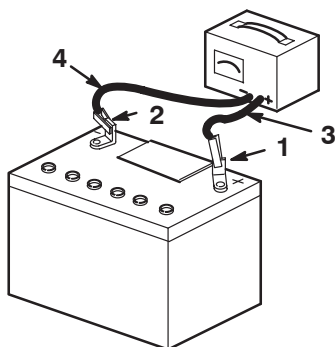


Charging the battery produces gasses that can explode.

Never smoke near the battery and keep sparks and flames away from battery.

Important Always keep the battery fully charged (1.265 specific gravity). This is especially important to prevent battery damage when the temperature is below 32°F (0°C).

1. Remove the battery from the chassis; refer to Removing the Battery on page 24.
2. Check the electrolyte level; refer to Checking the Electrolyte Level on page 25.
3. Make sure that the vent caps are installed in the battery. Charge the battery for 1 hour at 25 to 30 amps or 6 hours at 4 to 6 amps. Do not overcharge the battery.
4. When the battery is fully charged, unplug the charger from the electrical outlet, then disconnect the charger leads from the battery posts (Fig. 27).



m-4970

Figure 27

- | | |
|--------------------------|---------------------------|
| 1. Positive Battery Post | 3. Red (+) Charger Lead |
| 2. Negative Battery Post | 4. Black (-) Charger Lead |

5. Install the battery in the tractor and connect the battery cables; refer to Installing the Battery on page 25.

Important Do not run the tractor with the battery disconnected. Electrical damage may occur.

Draining the Fuel Tank



Danger



In certain conditions, gasoline is extremely flammable and highly explosive. A fire or explosion from gasoline can burn you and others and can damage property.

- Drain gasoline from the fuel tank when the engine is cold. Do this outdoors in an open area. Wipe up any gasoline that spills.
- Never smoke when draining gasoline, and stay away from an open flame or where a spark may ignite the gasoline fumes.

1. Park the tractor so that the left front side is slightly lower than the right side to ensure that the fuel tank drains completely.
2. Disengage the PTO and set the parking brake.
3. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Open the hood.
5. Squeeze the ends of the hose clamp together and slide it up the fuel line toward the fuel tank (Fig. 28).

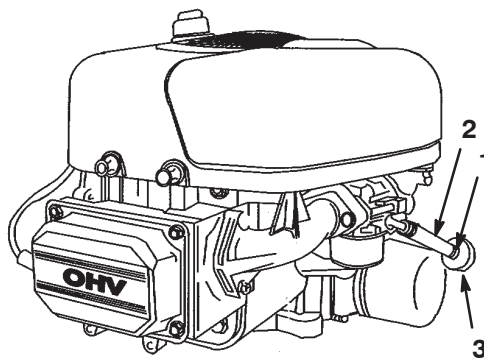


Figure 28

- | | |
|---------------|-----------|
| 1. Hose clamp | 3. Filter |
| 2. Fuel line | |

6. Pull the fuel line off of the filter (Fig. 28) and allow the gasoline to drain into a gas can or drain pan.

Note: Now is the best time to install a new fuel filter because the fuel tank is empty.

7. Install the fuel line onto the filter. Slide the hose clamp close to the filter to secure the fuel line and filter.

Replacing the Fuel Filter

Replace the fuel filter after every 100 operating hours or yearly, whichever occurs first.

The best time to replace the fuel filter (Fig. 28) is when the fuel tank is empty. Never install a dirty filter if it is removed from the fuel line.

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Open the hood.
4. Squeeze the ends of the hose clamps together and slide them away from the filter (Fig. 28).
5. Remove the filter from the fuel lines.
6. Install a new filter and move the hose clamps close to the filter.
7. Close the hood.

Servicing the Transaxle Fluid

Check the fluid level after every 100 hours or yearly, whichever occurs first. Always keep the fluid level at the full level when the transaxle is cold.

Note: The transaxle is factory sealed and does not require oil changes.

Fluid Type: SAE 20W-50 engine oil (API service SH/CD recommended)

Checking the Fluid Level

1. Park the tractor on a level surface.
2. Disengage the PTO and set the parking brake.
3. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Clean around the fill plug (Fig. 29) so that dirt cannot fall into the reservoir if fluid needs to be added.

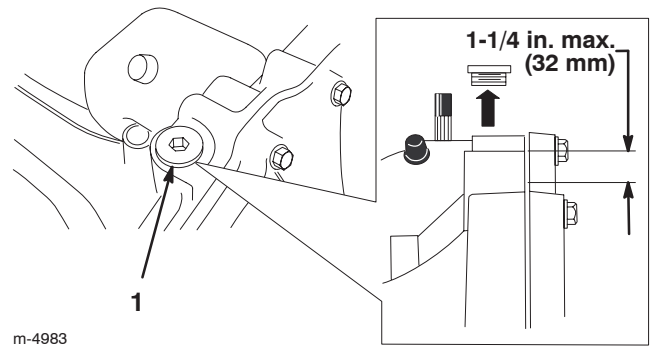


Figure 29

1. Fill plug

5. Remove the fill plug and check the fluid level.

Note: The level should be a maximum of 1-1/4 in. (32 mm) below the top of the fill port (Fig. 29). Add oil if necessary.

6. Install the fill plug.

Servicing the Fuse

The electrical system is protected by fuses. No maintenance is required, however, if a fuse blows check the circuit wiring for a short. To replace a fuse, pull up (Fig. 30) to remove it from the socket. Push down to insert it.

Fuses: 10 amp, blade-type

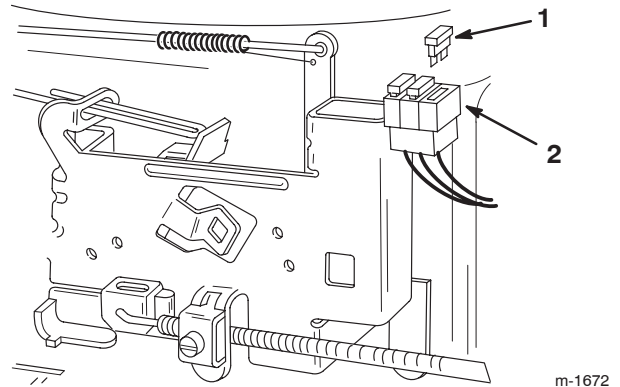


Figure 30

1. Fuse (removed)
2. Socket

Servicing the Headlights

Use a #1156, automotive-type bulb.

Removing the Bulb

1. Disengage the PTO and set the parking brake.

2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Open the hood. Pull the wire connectors off of both of the bulb holder terminals.
4. Rotate the bulb holder 1/4 turn counterclockwise and remove it from the reflector (Fig. 31).

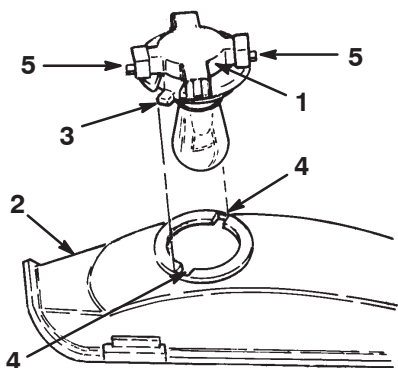


Figure 31

- | | |
|----------------|--------------|
| 1. Bulb holder | 4. Slots |
| 2. Reflector | 5. Terminals |
| 3. Tabs | |

5. Push and rotate the bulb counterclockwise until it stops (approximately 1/4 turn) and remove the bulb from the bulb holder (Fig. 32).

Installing the Bulb

1. The bulb has metal pins on the side of its base. Align the pins with the slots in the bulb holder and insert the base into the holder (Fig. 32). Push and rotate the bulb clockwise until it stops.

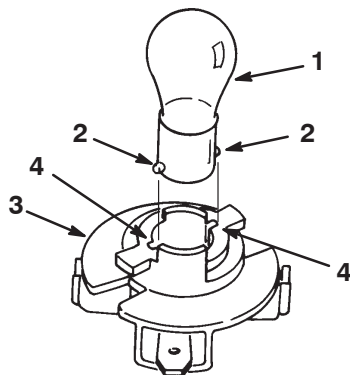


Figure 32

- | | |
|---------------|----------------|
| 1. Bulb | 3. Bulb holder |
| 2. Metal pins | 4. Slots |

2. The bulb holder has 2 tabs (Fig. 31). Align the tabs with the slots in the reflector, insert the bulb holder into the reflector, and rotate it 1/4 turn clockwise until it stops.
3. Push the wire connectors onto the terminals on the bulb holder.

Servicing the Blade

To ensure a superior quality of cut, keep the blades sharp. For convenient sharpening and replacement, you may want to have an extra blades.



Danger



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

- Inspect the blade periodically for wear or damage.
- Replace a worn or damaged blade.

Inspecting the Blades

1. Remove the mower; refer to Removing the Mower on page 29.
2. Inspect the cutting edges (Fig. 33). If the edges are not sharp or have nicks, remove the blades and sharpen them; refer to Sharpening the Blades on page 29.

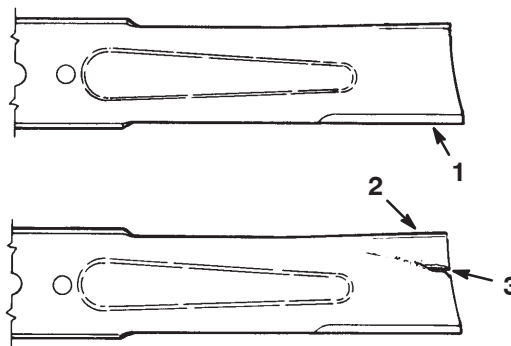


Figure 33

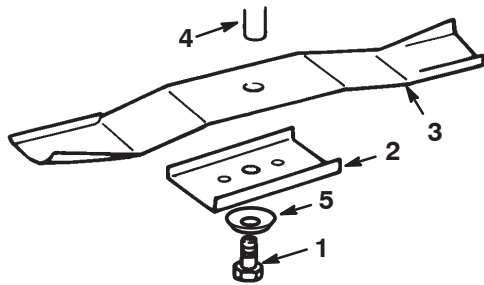
- | | |
|-----------------|----------------------|
| 1. Cutting edge | 3. Wear/slot forming |
| 2. Curved area | |

3. Inspect the blades, especially the curved area (Fig. 33). If you notice any damage, wear, or a slot forming in this area (Fig. 33), immediately install a new blade.

Removing the Blades

1. Remove the mower; refer to Removing the Mower on page 29.

- Carefully tip the mower over.
- Remove the bolt (5/8 in. wrench), curved washer, retainer and blade (Fig. 34). A block of wood may be wedged between the blade and the mower to lock the blade when you are removing the bolt.



m-1886

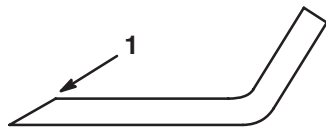
Figure 34

- | | |
|-------------|------------------|
| 1. Bolt | 4. Spindle |
| 2. Retainer | 5. Curved washer |
| 3. Blade | |

- Inspect all parts. If damage is noticed, install new parts.

Sharpening the Blades

- Use a file to sharpen the cutting edge at both ends of the blade (Fig. 35). Maintain the original angle. The blade retains its balance if the same amount of material is removed from both cutting edges.

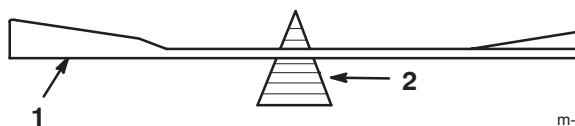


m-1854

Figure 35

- Sharpen at original angle

- Check the balance of the blade by putting it on a blade balancer (Fig. 36). If the blade stays in a horizontal position, the blade is balanced and can be used. If the blade is not balanced, file some metal off of the back side of the blade. Repeat this procedure until the blade is balanced.



m-1855

Figure 36

- | | |
|----------|-------------|
| 1. Blade | 2. Balancer |
|----------|-------------|

Installing the Blades

- Install the blade, blade retainer, curved washer (cupped side toward blade), and the blade bolt (Fig. 34).

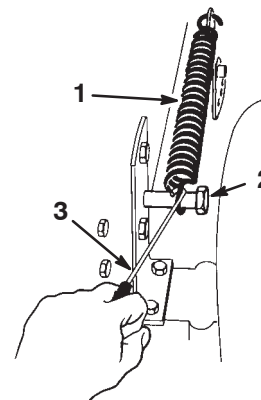
Important The curved part of the blade must be pointing toward the inside of the mower to ensure proper cutting.

- Tighten the blade bolt to 45 to 60 ft-lb (61 to 81 N·m).

Removing the Mower

- Park the tractor on a level surface.
- Disengage the PTO and set the parking brake.
- Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
- Move the height-of-cut lever into the D notch.
- Remove the height-of-cut lift assist spring from the retaining bolt (Fig. 37). The spring is between the frame and the right rear wheel.

Note: Use the spring tool provided with the machine.



m-1851

Figure 37

- | | |
|-----------|----------------|
| 1. Spring | 3. Spring tool |
| 2. Bolt | |



Caution



When you remove the mower, the spring-tensioned height-of-cut lever could suddenly release and injure you or someone else.

Move the height-of-cut lever to the "D" position and remove the height-of-cut assist spring to release the spring tension.

- Move the height-of-cut lever into the "A" notch.

7. Unhook the spring on the idler pulley arm from the bracket on the mower (Fig. 38).

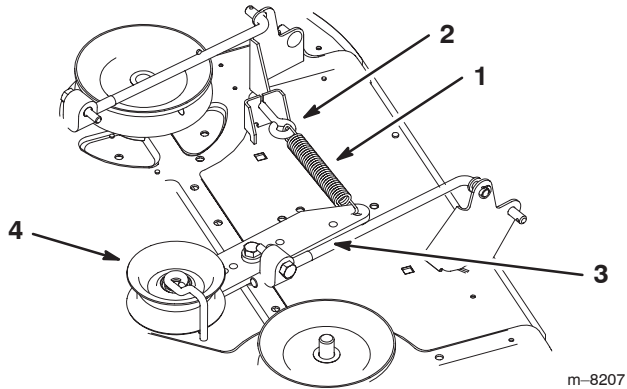


Figure 38

- | | |
|-----------------|-----------------|
| 1. Idler spring | 3. Idler arm |
| 2. Eye-bolt | 4. Idler pulley |

8. Remove the bolts and lock nuts and pull the two mower pivot mount brackets down from the front axle (Fig. 39).

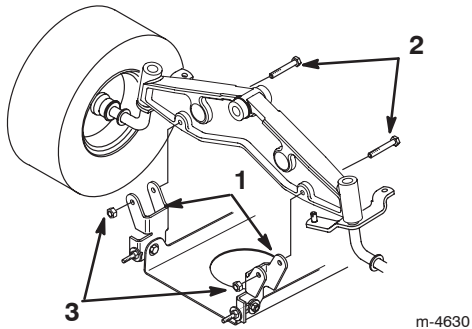


Figure 39

- | | |
|--------------------------|------------|
| 1. Pivot mount bracket | 3. Locknut |
| 2. Bolt 5/16 x 2-1/2 in. | |

9. Remove the hairpin cotter and washer from the end of the long rod (Fig. 40). Slide the rod out of the mower mount.

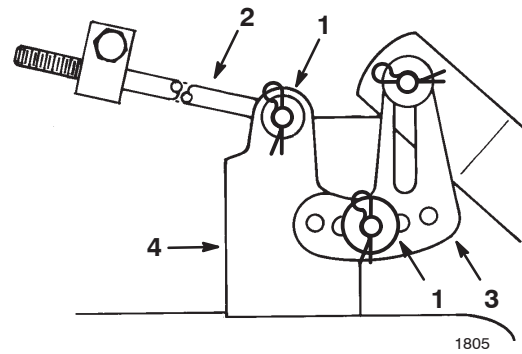


Figure 40

- | | |
|------------------------------|---------------------|
| 1. Hairpin cotter and washer | 3. Leveling bracket |
| 2. Long rod | 4. Mower mount |

10. Remove the hairpin cotter and washer at the mower leveling bracket (Fig. 40). Slide the bracket off of the mounting pin. Install the washer and hairpin cotter for storage.

11. Rotate the leveling bracket up toward the frame, and hook the long rod into one of the holes to store. Secure the long rod with the washer and hairpin cotter.

12. Repeat steps 9 through 11 on the opposite side of the mower.

13. Move the height-of-cut lever into the D notch. Hook the lift assist spring onto the retaining bolt for storage (Fig. 37).

14. Remove the mower belt from the electric clutch pulley (Fig. 41).

15. Remove the mower belt from the lower engine pulley (Fig. 41).

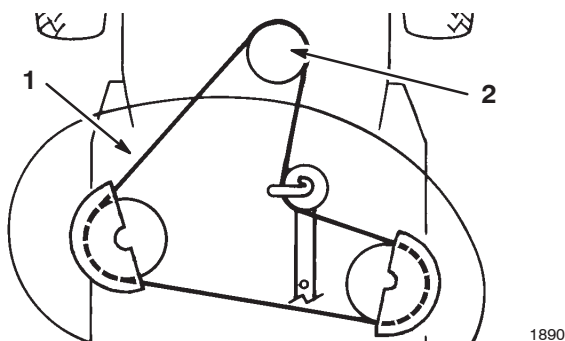


Figure 41

Top View

1. Mower belt 2. Electric clutch pulley

16. Turn the front wheels fully to the left. Slide the mower out to the right to complete removal.

Installing the Mower



Danger



Without the grass deflector, discharge cover, or complete grass catcher assembly mounted in place, you and others are exposed to blade contact and thrown debris. Contact with the rotating mower blade(s) and thrown debris will cause injury or death.

- Never remove the grass deflector from the mower because the grass deflector routes material down toward the turf. If the grass deflector is ever damaged, replace it immediately.
- Never put your hands or feet under the mower.
- Never try to clear the discharge area or mower blades unless you move the power take off (PTO) to Off and rotate the ignition key to Off. Also remove the key and pull the wire off of the spark plug(s).

1. Park the machine on a level surface, disengage the blade control (PTO), set the parking brake, and turn the ignition key to Off to stop the engine. Remove the key.
2. Turn the front wheels fully to the left. Slide the mower under the chassis from the right side.

3. Install the mower belt onto the lower engine pulley (Fig. 41).
4. Install the mower pivot mount brackets onto the front axle with the bolts and locknuts (Fig. 42).

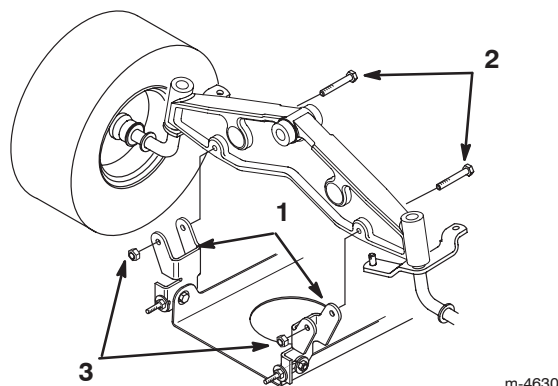


Figure 42

1. Pivot mount bracket 3. Locknut
2. Bolt, 5/16 x 2-1/2 in.

5. Move the height-of-cut lever into the D notch.
6. Remove the lift assist spring between the mower right side lift bracket and the retaining bolt (Fig. 43).

Note: Use the spring tool provided with the machine.

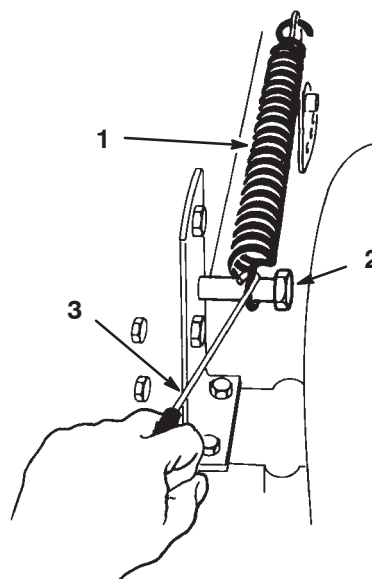


Figure 43

1. Spring 3. Spring tool
2. Bolt

7. Move the height-of-cut lever into the A notch.

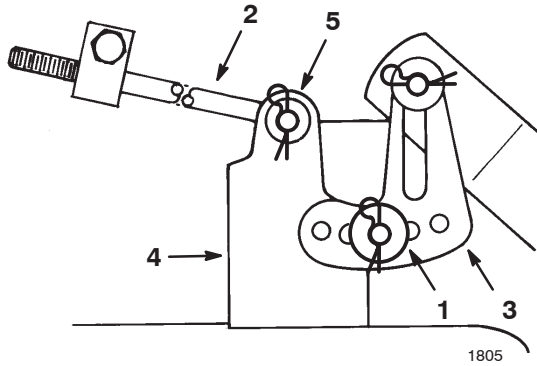


Figure 44

- | | |
|------------------------------------|-----------------------------------|
| 1. Hairpin cotter and thick washer | 4. Mower mount |
| 2. Long rod | 5. Hairpin cotter and thin washer |
| 3. Leveling bracket | |

8. Slide the end of the long rod through the hole in the mower mount (Fig. 44).
9. Install the thin washer and hairpin cotter to secure the rod in place (Fig. 44).
10. Mount the slotted mower leveling bracket onto the pin on the mower mount (Fig. 44).
11. Install the thick washer and hairpin cotter to secure the mower (Fig. 44).
12. Repeat steps 8 through 11 on the opposite side of the mower.
13. Hook the idler spring from the idler pulley arm to the eye-bolt on the mower (Fig. 45).

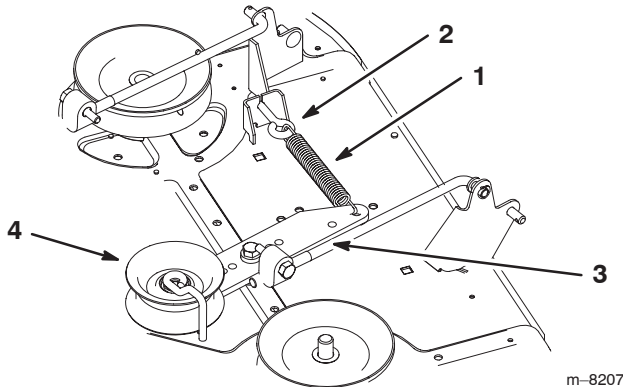


Figure 45

- | | |
|-----------------|-----------------|
| 1. Idler spring | 3. Idler arm |
| 2. Eye-bolt | 4. Idler pulley |

14. Move the height-of-cut lever into the D notch to make it easier to install the height-of-cut lift assist spring.

15. Hook the lift assist spring between the mower right side lift bracket and the retaining bolt (Fig. 46).

Note: Use the spring tool provided with the machine.

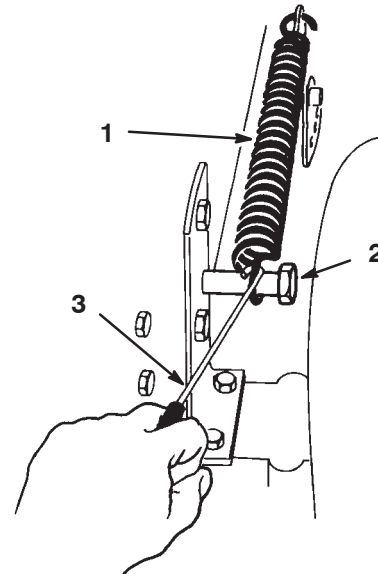


Figure 46

- | | |
|-----------|----------------|
| 1. Spring | 3. Spring tool |
| 2. Bolt | |

16. Check the mower level; refer to Leveling the Mower from Side-to-Side on page 33 and Front-to-Rear Blade Slope on page 33.

Replacing the Blade Drive Belt

Removing the Blade Drive Belt

1. Remove the mower; refer to Removing the Mower on page 31.
2. Remove the pulley cover mounting screws and pulley covers from both blade pulleys (Fig. 47).
3. Loosen, but do not remove, the bolt and nut securing the idler pulley and belt guide (Fig. 47).
4. Remove the belt from the pulleys.

Installing the Blade Drive Belt

1. Install the new belt around the blade pulleys and under the belt guide on the idler pulley.
2. Position the idler pulley belt guide so it points toward the left, 90° to the idler arm (Fig. 47). Tighten the mounting bolt and lock nut securing the idler pulley and belt guide.

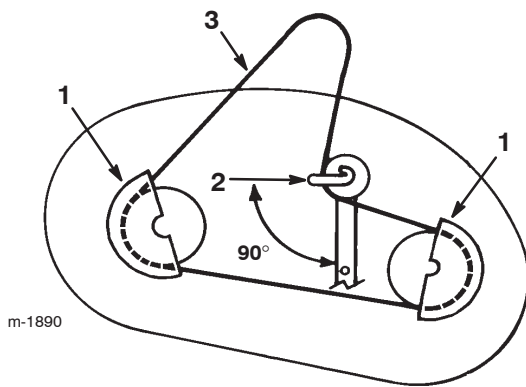


Figure 47

Top View

1. Pulley cover
2. Idler pulley belt guide position
3. Mower belt

3. Install the left and right pulley covers with the mounting screws (Fig. 47).
4. Install the mower; refer to Installing the Mower on page 31.

Leveling the Mower from Side-to-Side

The mower blades must be level from side to side. Check the side-to-side level any time you install the mower or when you see an uneven cut on your lawn. Before you level the mower, set the air pressure in the front and rear tires to the recommended inflation; refer to Checking the Tire Pressure on page 24.

1. Park the tractor on a level surface.
2. Disengage the PTO and set the parking brake.
3. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Move the height-of-cut lever into the C notch.
5. Carefully rotate the blades side to side (Fig. 48). Measure between the outside cutting edges and the flat surface (Fig. 48). If both measurements are not within 3/16 in. (5 mm), an adjustment is required; refer to steps 6 and 7.

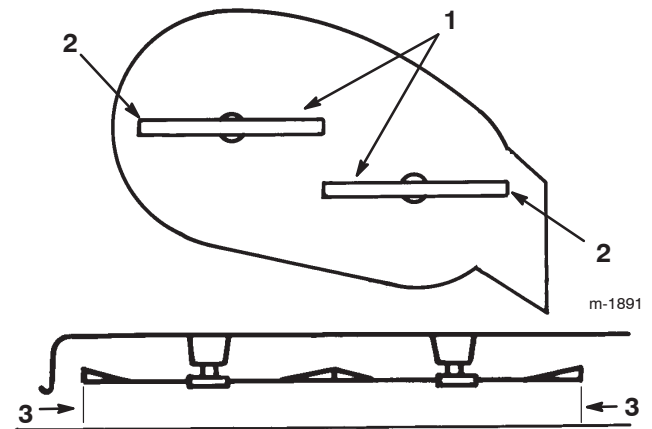


Figure 48

1. Blades side to side
2. Outside cutting edges
3. Measure here

6. Remove the hairpin cotter and washer from the leveling bracket (Fig. 49). To level the blades, reposition the leveling bracket in a different hole and install the washer and hairpin cotter (Fig. 49). A front hole lowers the blade height and a rear hole raises its height. Repeat this procedure on the opposite side of the mower.

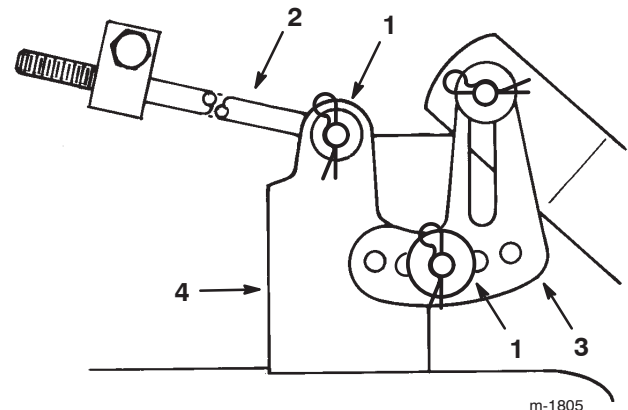


Figure 49

1. Hairpin cotter and washer
2. Long rod
3. Leveling bracket
4. Mower mount

7. Check the front-to-rear blade slope; refer to Adjusting the Front-to-Rear Blade Slope on page 33.

Adjusting the Front-to-Rear Blade Slope

Check the front-to-rear blade slope any time you install the mower. Before you check the slope, set the air pressure in the front and rear tires to the recommended inflation; refer to Checking the Tire Pressure on page 24. If the front of the

mower is not within a range of 1/8 to 3/8 in. (4 to 11 mm) lower than the rear of the mower, adjust the blade slope using the following instructions:

1. Park the tractor on a level surface.
2. Disengage the PTO and set the parking brake.
3. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Check and adjust the side-to-side blade level if you have not checked the setting; refer to Leveling the Mower from Side-to-Side on page 33.
5. Measure the length of the rod extending out of the front of the adjusting block on the sides of the chassis (Fig. 50).

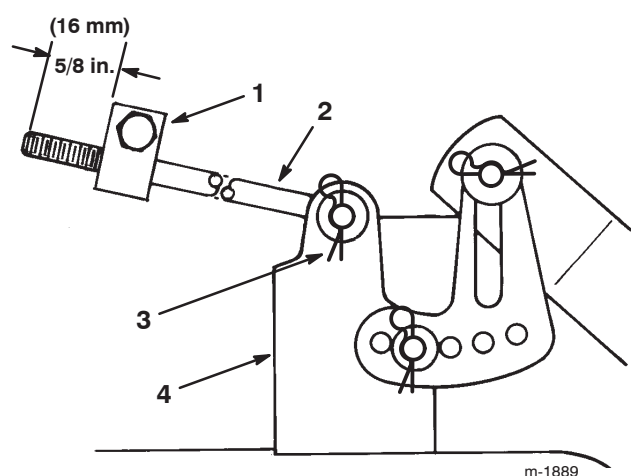


Figure 50

- | | |
|--------------------|------------------------------|
| 1. Adjusting block | 3. Hairpin cotter and washer |
| 2. Long rod | 4. Mower mount |

Note: If the rod length is not 5/8 in. (16 mm), remove the hairpin cotter and washer from the end of the rod (Fig. 50) and turn the rod until you obtain the 5/8 in. (16 mm) dimension.

6. Install the end of the rod into the hole in the mower mount and secure it with the washer and hairpin cotter. Repeat this procedure on the opposite side of the mower.
7. Check the front-to-rear slope by measuring between the bottom of the mower (front center and rear center) and the flat surface (Fig. 51). If the front is not within a range of 1/8 to 3/8 in. (4 to 11 mm) lower than the rear, an adjustment is required.

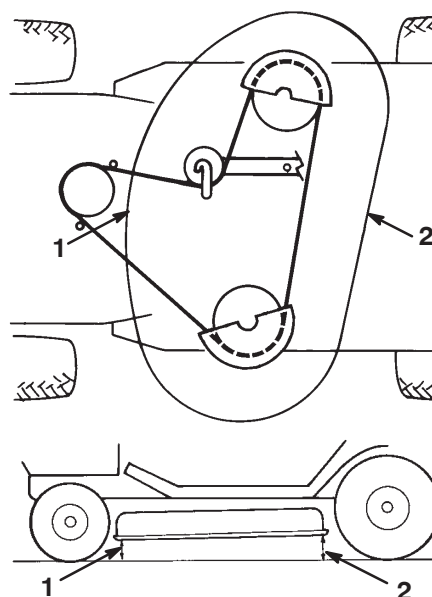


Figure 51

- | | |
|-------------------------|------------------------|
| 1. Measure front center | 2. Measure rear center |
|-------------------------|------------------------|

8. To adjust the front-to-rear blade slope, loosen the front pivot plate mounting bolts slightly (Fig. 52).

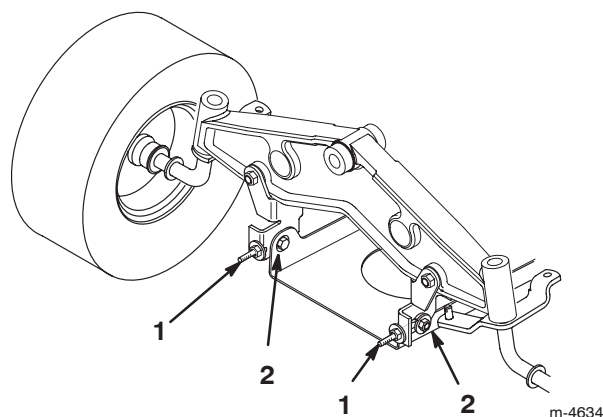


Figure 52

- | | |
|------------------------|--------------------|
| 1. Pivot mounting bolt | 2. Eyebolt locknut |
|------------------------|--------------------|

9. Rotate the locknuts on the eyebolts to change the adjustment (Fig. 52). To raise the front of the mower, tighten the eyebolt locknuts. To lower the front of the mower, loosen the eyebolt locknuts.
10. After adjusting both eyebolt locknuts evenly, check the front-to-rear slope again. Continue adjusting the eyebolts until the front blade tip is 0 to 3/8 in. (0-9 mm) lower than the rear blade tip (Fig. 51).

11. When the front-to-rear slope is correct, tighten the pivot plate mounting bolts (Fig. 52).
12. When the front-to-rear blade slope is correct, recheck the side-to-side level of the mower; refer to Leveling the Mower from Side-to-Side on page 33.

Washing the Underside of the Mower

After each use, wash the underside of the mower to prevent grass buildup for improved mulch action and clipping dispersal.

1. Park the tractor on a level surface.
2. Disengage the PTO and set the parking brake.
3. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Screw the coupling to the end of a garden hose, attach the coupling to the mower washout fitting, and turn the water on high (Fig. 53).

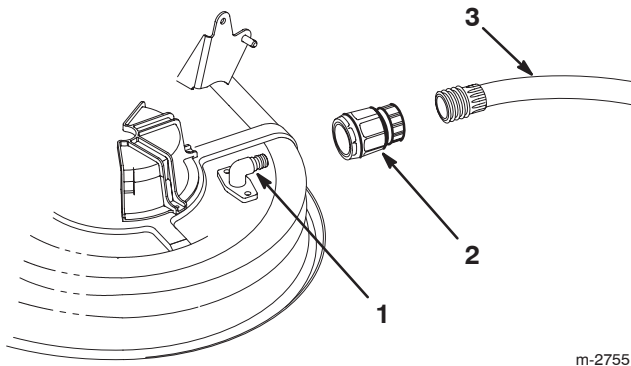


Figure 53

1. Washout fitting
2. Coupling
3. Hose

Note: Spread petroleum jelly on the washout fitting o-ring to make the coupling slide on easier and protect the o-ring.

5. Lower the mower to the lowest height of cut.
6. Sit on the seat.
7. Start the engine.
8. Engage the blades (PTO) and let the mower run for 1 to 3 minutes.
9. Disengage the blades (PTO).
10. Stop the engine and wait for all moving parts to stop.
11. Remove the ignition key.

12. Turn off the water and remove the coupling from the washout fitting and hose.
13. Run the mower again for 1 to 3 minutes to remove excess water.



Warning



A broken or missing washout fitting could expose you and others to thrown objects or blade contact. Contact with blade or thrown debris contact will cause injury or death.

- Replace broken or missing washout fitting immediately, before using mower again.
- Plug any holes in mower with bolts and locknuts.
- Never put your hands or feet under the mower or through openings in the mower.

Cleaning and Storing the Tractor

1. Park the tractor on a level surface.
2. Disengage the PTO and set the parking brake.
3. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Remove grass clippings, dirt, and grime from the external parts of the entire tractor, especially the engine. Clean dirt and chaff from the outside of the engine cylinder head fins and blower housing.

Important You can wash the tractor with mild detergent and water. **Do not use a pressure washer to wash the tractor.** Pressure washing may damage the electrical system or wash away necessary grease at friction points. Avoid excessive use of water, especially near the control panel, lights, engine, and battery.

5. Check the brake; refer to Servicing the Brake on page 23.
6. Service the air cleaner; refer to Servicing the Air Cleaner on page 21.
7. Grease the chassis; refer to Greasing and Lubricating the Tractor on page 23.
8. Change the crankcase oil and filter; refer to Servicing the Engine Oil on page 20.
9. Check the tire pressure; refer to Checking the Tire Pressure on page 24.

10. Prepare the tractor for storage when non-use occurs over 30 days. Prepare tractor for storage as follows.

A. Add a petroleum based stabilizer/conditioner to fuel in the tank. Follow the mixing instructions from the stabilizer manufacturer. (1 oz. per gallon). **Do not use an alcohol based stabilizer (ethanol or methanol).**

Note: A fuel stabilizer/conditioner is most effective when mixed with fresh gasoline and used at all times.

B. Run the engine to distribute conditioned fuel through the fuel system (5 minutes).

C. Stop the engine, allow it to cool, and drain the fuel tank; refer to Draining the Fuel Tank on page 26.

D. Restart the engine and run it until it stops.

E. Choke or prime the engine.

F. Start and run the engine until it will not start. Use the primer, if equipped on the tractor, several times to ensure that no fuel remains in the primer system.

G. Dispose of fuel properly. Recycle as per local codes.

Important Do not store stabilizer/conditioned gasoline over 90 days.

11. Remove the spark plug and check its condition; refer to Servicing the Spark Plug on page 22. With the spark plug removed from the engine, pour 2 tablespoons of engine oil into the spark plug hole. Use the electric starter to crank the engine and distribute the oil inside the cylinder. Install the spark plug; refer to Servicing the Spark Plug on page 22. Do not install the wire on the spark plug.

12. Disconnect the negative battery cable. Clean the battery and battery terminals. Check the electrolyte level and charge it fully; refer to Servicing the Battery on page 24. Leave the negative battery cable disconnected from the battery during storage.

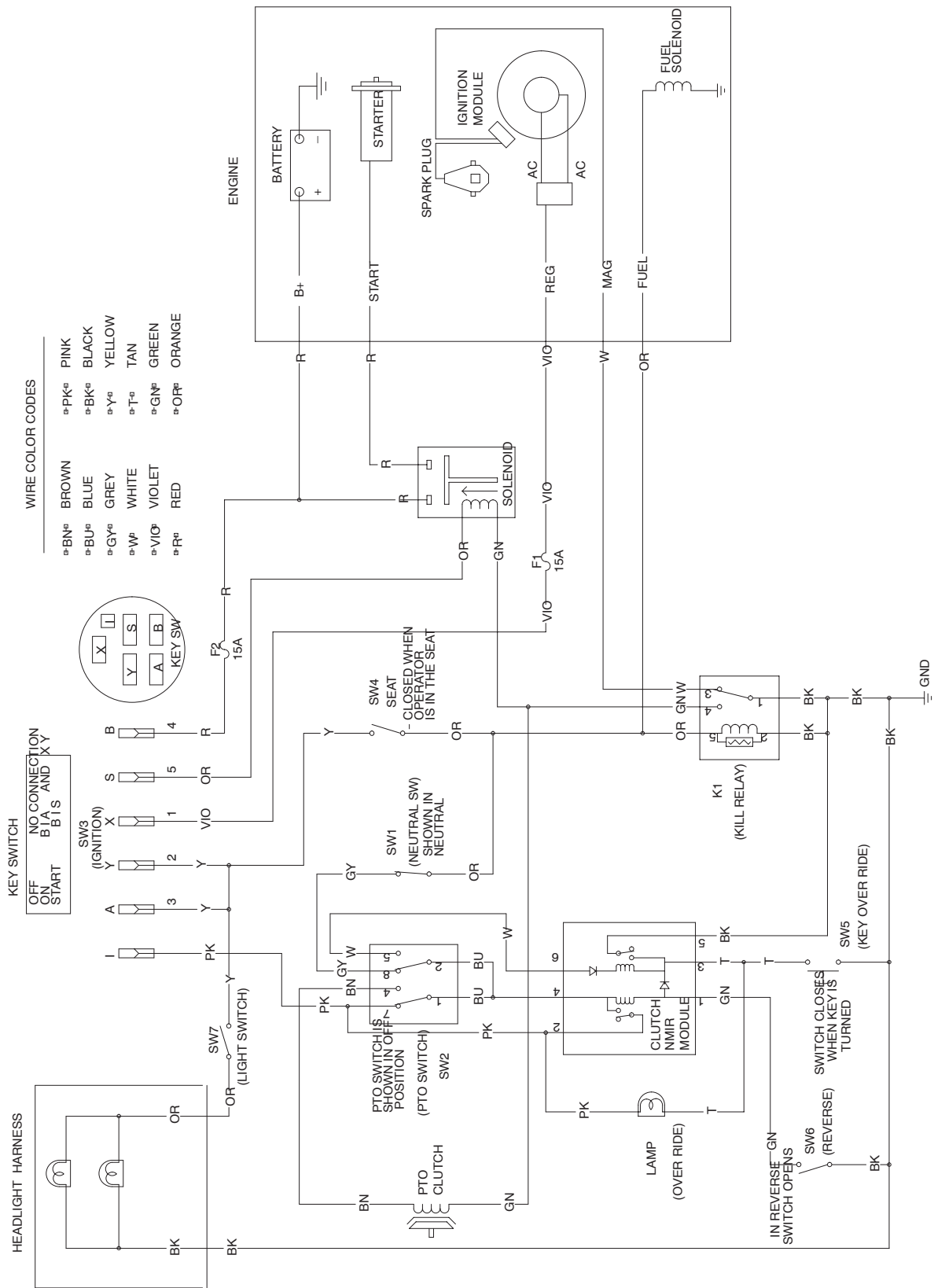
Important The battery must be fully charged to prevent it from freezing and being damaged at temperatures below 32°F (0°C). A fully charged battery can be stored during the winter season without recharging.

13. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged or defective.

14. Paint all scratched or bare metal surfaces. Paint is available from an Authorized Service Dealer.

15. Store the tractor in a clean, dry garage or storage area. Remove the ignition and KeyChoice keys from the mower and keep them in a memorable place. Cover the tractor to protect it and keep it clean.

Wiring Diagram



Troubleshooting

Problem	Possible Causes	Corrective Action
The starter does not crank.	<ol style="list-style-type: none"> 1. The blades (PTO) are engaged. 2. The parking brake is not on. 3. The battery is dead. 4. The electrical connections are corroded or loose. 5. A fuse is blown. 6. A relay or switch is damaged. 	<ol style="list-style-type: none"> 1. Shift the blade control (PTO) lever to Disengaged. 2. Set the parking brake. 3. Charge the battery. 4. Check the electrical connections for good contact. 5. Replace the fuse. 6. Contact an Authorized Service Dealer.
The engine will not start, starts hard, or fails to keep running.	<ol style="list-style-type: none"> 1. The operator is not seated. 2. The fuel tank is empty. 3. The air cleaner is dirty. 4. The spark plug wire is loose or disconnected. 5. The spark plug is pitted, fouled, or the gap is incorrect. 6. The choke is not closing. 7. There is dirt in the fuel filter. 8. The idle speed is too low or the mixture is incorrect. 9. Dirt, water, or stale fuel is in the fuel system. 	<ol style="list-style-type: none"> 1. Sit on the seat. 2. Fill the fuel tank with gasoline. 3. Clean or replace the air cleaner element. 4. Install the wire on the spark plug. 5. Install a new, correctly-gapped spark plug. 6. Adjust the throttle cable. 7. Replace the fuel filter. 8. Adjust the carburetor idle speed and idle mixture. 9. Contact an Authorized Service Dealer.
The engine overheats.	<ol style="list-style-type: none"> 1. The engine load is excessive. 2. The oil level in the crankcase is low. 3. The cooling fins and air passages under the engine blower housing are plugged. 	<ol style="list-style-type: none"> 1. Shift into lower gear to reduce ground speed. 2. Add oil to the crankcase. 3. Remove the obstruction from the cooling fins and air passages.

Problem	Possible Causes	Corrective Action
The engine loses power.	<ol style="list-style-type: none"> 1. The engine load is excessive. 2. The air cleaner is dirty. 3. The oil level in the crankcase is low. 4. The cooling fins and air passages under the engine blower housing are plugged. 5. The spark plug is pitted, fouled, or the gap is incorrect. 6. The vent hole in the fuel cap is plugged. 7. There is dirt in the fuel filter. 8. Dirt, water, or stale fuel is in the fuel system. 	<ol style="list-style-type: none"> 1. Shift into lower gear to reduce ground speed. 2. Clean the air cleaner element. 3. Add oil to the crankcase. 4. Remove the obstruction from the cooling fins and air passages. 5. Install a new, correctly-gapped spark plug. 6. Clean or replace the fuel cap. 7. Replace the fuel filter. 8. Contact an Authorized Service Dealer.
There is abnormal vibration.	<ol style="list-style-type: none"> 1. The cutting blades are bent or unbalanced. 2. The blade mounting bolt is loose. 3. The engine mounting bolts are loose. 4. There is a loose engine pulley, idler pulley, or blade pulley. 5. The engine pulley is damaged. 	<ol style="list-style-type: none"> 1. Install a new cutting blades. 2. Tighten the blade mounting bolt. 3. Tighten the engine mounting bolts. 4. Tighten the appropriate pulley. 5. Contact an Authorized Service Dealer.
The blades does not rotate.	<ol style="list-style-type: none"> 1. The blade drive belt is worn, loose, or broken. 2. The blade drive belt is off of the pulley. 	<ol style="list-style-type: none"> 1. Install a new blade drive belt. 2. Install a blade drive belt and check the idler pulley and belt guides for the correct position.
The tractor does not drive.	<ol style="list-style-type: none"> 1. The drive control is in the Push position. 2. The traction belt is worn, loose, or broken. 3. The traction belt is off of the pulley. 	<ol style="list-style-type: none"> 1. Move the drive control to the Operate position. 2. Contact an Authorized Service Dealer. 3. Contact an Authorized Service Dealer.
The cutting height is uneven.	<ol style="list-style-type: none"> 1. The tire pressure is incorrect. 2. The mower is not level. 3. The underside of the mower is dirty. 	<ol style="list-style-type: none"> 1. Set the tire pressure. 2. Level the mower from side-to-side and front-to-rear. 3. Clean the underside of the mower.



Consumer
Lawn Tractors
and
Lawn & Garden
Tractors

The Toro Total Coverage Guarantee

A Two-Year Full Warranty (Limited Warranty for Commercial Use)

Conditions and Products Covered

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly promise to repair any Toro Product used for normal residential purposes* if defective in materials or workmanship. The following time periods apply from the date of purchase:

<u>Products</u>	<u>Warranty Period</u>
• All Products and Attachments	2 year full warranty
• 300, 400XT, and 5xi Series:	
Frame	5 year full warranty
Front Axle	5 year full warranty
Drive Shaft (5xi Series Only)	5 year full warranty
• All Batteries	1 year full warranty

This warranty covers both the cost of parts and labor, and transportation within a fifteen mile radius of the servicing dealer.

This warranty applies to all consumer Lawn Tractors, Lawn and Garden Tractors, and their attachments.

* Normal residential purposes means use of the product on the same lot as your home. Use at more than one location is considered commercial use, and the commercial use warranty would apply.

Limited Warranty for Commercial Use

Toro Consumer Products and attachments used for commercial, institutional, or rental use are warranted against defects in materials or workmanship for the following time periods from the date of purchase:

<u>Products</u>	<u>Warranty Period</u>
• 300, 400XT, and 5xi Series:	
Liquid Cooled Gas Engines	1 year limited warranty
Air Cooled Gas and Diesel Engines	2 year limited warranty
All other items	1 year limited warranty
• All other Lawn Tractors and Lawn & Garden Tractors	90 day limited warranty

Instructions for Obtaining Warranty Service

If you think that your Toro Product contains a defect in materials or workmanship, follow this procedure:

1. Contact any Toro Authorized or Master Service Dealer to arrange service at their dealership. To locate a dealer convenient to you, refer to the Yellow Pages of your telephone directory (look under "Lawn Mowers") or access our website at www.Toro.com. U.S. Customers may also call toll free: 866-854-9035 to use our 24-hour Toro dealer locator system.
2. Bring the product and your proof of purchase (sales receipt) to the Service Dealer.

Countries Other than the United States or Canada

Customers who have purchased Toro products exported from the United States or Canada should contact their Toro Distributor (Dealer) to obtain guarantee policies for your country, province, or state. If for any reason you are dissatisfied with your Distributor's service or have difficulty obtaining guarantee information, contact the Toro importer. If all other remedies fail, you may contact us at Toro Warranty Company.

If for any reason you are dissatisfied with the Service Dealer's analysis or with the assistance provided, contact us at:

Customer Care Department, Consumer Division
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196
Toll Free: 866-854-8930 (U.S. customers)
Toll Free: 866-854-9033 (Canada customers)

Owner Responsibilities

You must maintain your Toro Product by following the maintenance procedures described in the operator's manual. Such routine maintenance, whether performed by a dealer or by you, is at your expense.

Items and Conditions Not Covered

There is no other express warranty except for special emission system coverage on some products. This express warranty does not cover:

- Cost of regular maintenance service or parts, such as filters, fuel, lubricants, tune-up parts, blade sharpening, brake and clutch adjustments.
- Any product or part which has been altered or misused or required replacement or repair due to normal wear, accidents, or lack of proper maintenance.
- Repairs necessary due to improper fuel, contaminants in the fuel system, or failure to properly prepare the fuel system prior to any period of non-use over three months.
- Pickup and delivery charges for distances beyond a fifteen mile radius from an Authorized Toro Service Dealer.

All repairs covered by this warranty must be performed by an Authorized Toro Service Dealer using Toro approved replacement parts.

General Conditions

Repair by an Authorized Toro Service Dealer is your sole remedy under this warranty.

Neither The Toro Company nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of the Toro Products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty.

Some states do not allow exclusions of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.