



12-32XL

Wheel Horse® Lawn Tractor

Model No. 71199—210000001 and Up

Operator's Manual



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 it immediately. Replacements may be ordered through the engine manufacturer.

Contents

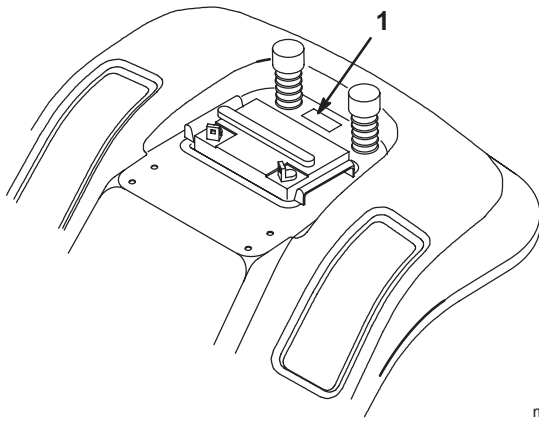
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Introduction

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.

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.



m-1856

Figure 1

1. Location of the model and serial numbers

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

<p>Model No. _____</p> <p>Serial No. _____</p>
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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 two 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 B71.1–1998 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—1998.

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.
- 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.
- Be aware of the mower discharge direction and do not point it at anyone. Do not operate the mower without either the entire grass catcher or the guard in place.
- Slow down before turning.
- Never leave a running machine unattended. Always turn off blades, set parking brake, stop engine, and remove keys before dismounting.
- Turn off blades when not mowing.
- Stop the engine before removing the grass catcher or unclogging the chute.
- Mow 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.

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.
- Remove obstacles such as rocks, tree limbs, etc.
- Watch for holes, ruts or bumps. Uneven terrain could overturn the machine. Tall grass can hide obstacles.
- Use slow speed. Choose a low gear so that you will not have to stop or shift while on the slope.
- Follow Toro's recommendations for wheel weight or counterweights to improve stability.
- Use extra care with grass catchers or other attachments. These can change the stability of the machine.
- Keep all movement on slopes slow and gradual. Do not make sudden changes in speed or direction.
- Avoid starting or stopping on a slope. If tires lose traction, disengage the blades and proceed slowly straight down the slope.
- Do not turn on slopes unless necessary, and then, turn slowly and gradually downhill, if possible.
- 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.
- Do not mow on wet grass. Reduced traction could cause sliding.
- Do not try to stabilize the machine by putting your foot on the ground.
- Do not use a grass catcher on steep slopes.

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 another responsible adult.
- Be alert and turn the machine off if children enter the area.
- Before and while backing, look behind and down 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.
- Never allow children to operate the machine.
- Use extra care when approaching blind corners, shrubs, trees, the end of a fence or other objects that may obscure vision.

Service

- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
 - Use only an approved container.
 - Never remove the gas cap or add fuel when the engine is running. Allow the engine to cool before refueling. Do not smoke.
 - Never refuel the machine indoors.
 - Never store the machine or fuel container inside where there is an open flame, such as near a water heater or furnace.
- Never run a machine inside a closed area.
- Keep nuts and bolts tight, especially the blade attachment bolts. Keep equipment in good 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. Allow the machine to cool before storing.
- Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.
- Grass catcher components are subject to wear, damage and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check components and replace with manufacturer's recommended parts, when necessary.
- Mower blades are sharp and can cut. Wrap the blade(s) or wear gloves, and use extra caution when servicing them.
- 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.



Warning



Engine exhaust contains carbon monoxide, which is an odorless, deadly poison that can kill you.

Do not run engine indoors or in an enclosed area.

- If loading the machine onto a trailer or truck, use a single, full-width ramp only. The ramp angle should not exceed 15 degrees.
- Stop the engine, disconnect spark plug wire(s) and remove key before performing any service, repairs, maintenance or adjustments.
- Slow down before turning. Sharp turns on any terrain may cause loss of control.
- 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 genuine replacement parts to ensure that original standards are maintained.
- Use only Toro approved attachments. Warranty may be voided if used with unapproved attachments.
- Do not mow across hillsides or slopes exceeding 5 degrees.
- Do not mow down hillsides or slopes exceeding 15 degrees.
- Do not mow up hillsides or slopes exceeding 10 degrees.
- If a steep slope must be ascended, back up the hill, and drive forward down the hill, keeping the machine in gear.
- Avoid turning on slopes. If you must turn, turn slowly and gradually downhill, if possible.
- Do not use a grass catcher on steep slopes. Heavy grass bags could cause loss of control or overturn the machine.

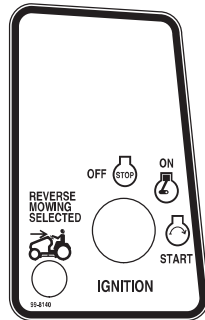
Slope Chart



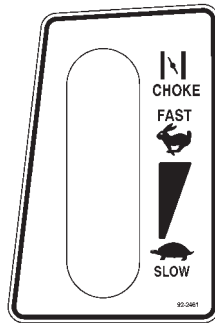
Safety and Instruction Decals



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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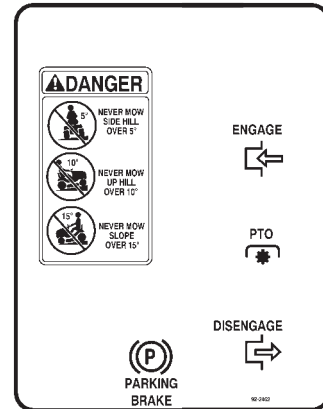
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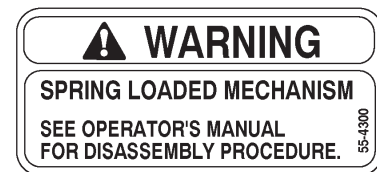
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Gasoline and Oil

Recommended Gasoline

Use UNLEADED Regular Gasoline suitable for automotive use (85 pump octane minimum). Leaded regular gasoline may be used 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 gasoline to expand.
- Never smoke when handling gasoline, and stay away from an open flame or where gasoline fumes may be ignited by a spark.
- 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, then refuel such equipment on a truck or trailer from a portable container, rather than from a gasoline dispenser nozzle.
- If a gasoline dispenser nozzle must be used, 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 machine to provide the following benefits:

- Keeps gasoline fresh during storage of 90 days or less. For longer storage, drain the fuel tank.
- Cleans the engine while it runs
- 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 gas stabilizer/conditioner to the gas.

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

Filling the Fuel Tank

1. Shut the engine off and set the parking brake.
2. Clean around the fuel tank cap and remove the cap. 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. This space in the tank allows gasoline to expand. Do not fill the fuel tank completely full.
3. Install the fuel tank cap securely. Wipe up any gasoline that may have spilled.

Checking the Engine Oil Level

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

Operation

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

Think Safety First

Please carefully read all of the safety instructions and decals in the safety section. Knowing this information could help you, your family, pets, or bystanders avoid injury.

Controls

Become familiar with all of the controls (Fig. 1) before you start the engine and operate the machine.

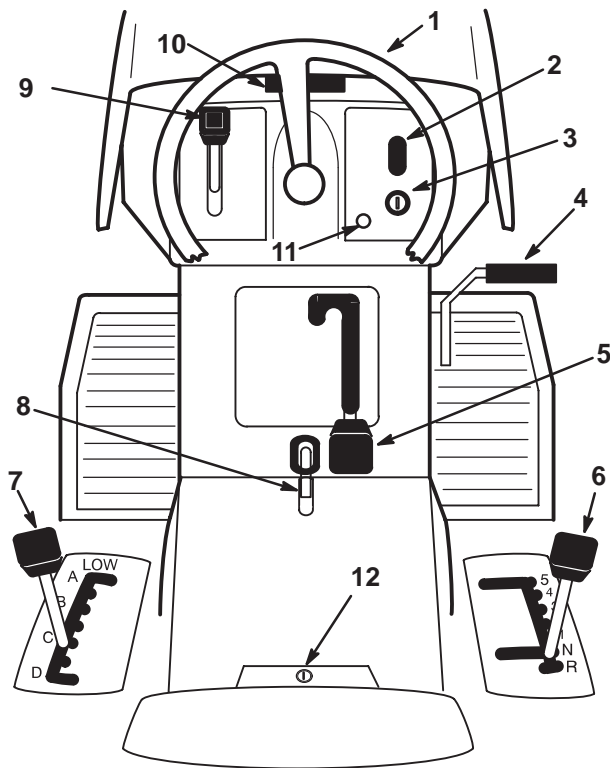


Figure 1

- | | |
|--|------------------------------------|
| 1. Steering wheel | 7. Height-of-cut lever (deck lift) |
| 2. Light switch—on/off (selected models) | 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 selector | 12. KeyChoice® switch |

Parking Brake

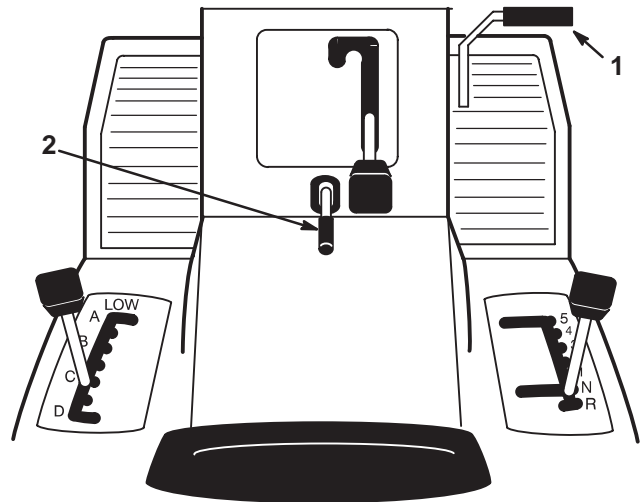
Always set the parking brake when you stop the machine or leave it unattended.

Setting the Parking Brake

1. Push the clutch/brake pedal (Fig. 2) down and hold it in the depressed position.
2. Lift the parking brake lever (Fig. 2) 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. 2). The parking brake lever should release.
2. Gradually release the clutch/brake pedal.



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Figure 2

- | | |
|-----------------------|------------------------|
| 1. Clutch/brake pedal | 2. Parking brake lever |
|-----------------------|------------------------|

Positioning the Seat

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

1. Raise the seat and loosen the adjustment knob (Fig. 3).
2. Move the seat to the desired position and tighten the knob.

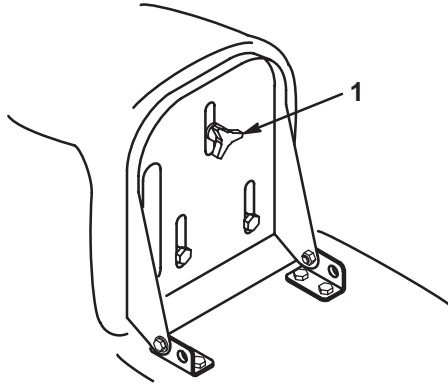


Figure 3

1. Adjustment knob

Headlights

Headlights are optional on some models. A dash-mounted On/Off switch (Fig. 1) controls the headlights. The lights only shine while the engine is running and the switch is On.

Using the Blade Control (PTO)

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

Engaging the Blade(s)

1. Depress the clutch/brake pedal to stop the machine.
2. Move the blade control (PTO) to Engaged (Fig. 4).

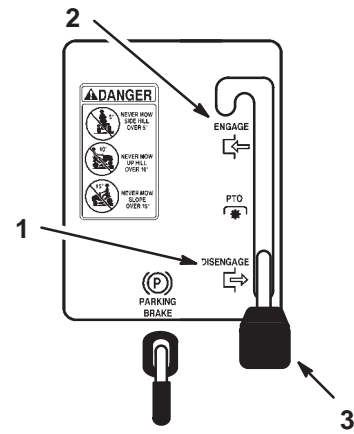


Figure 4

1. Disengaged
2. Engaged
3. Blade control (PTO)

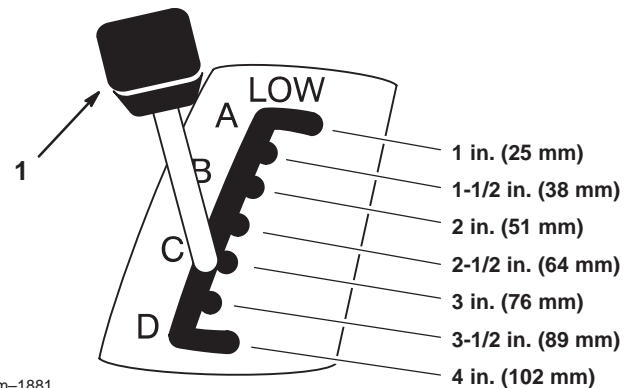
Disengaging the Blade(s)

1. Depress the clutch/brake pedal to stop the machine.
2. Move the PTO to Disengaged (Fig. 4).

Setting the Height-of-Cut

The height-of-cut lever (deck lift) is used to raise and lower the mower to the desired cutting height. The cutting height may be set in one of seven positions from approximately 1 to 4 in. (25 to 102 mm).

Pull on the height-of-cut lever (deck lift) and move it to the desired position (Fig. 5).



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Figure 5

1. Height-of-cut lever (deck lift)

Starting and Stopping the Engine

Starting

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

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

3. Move the ground speed selector into neutral (N) (Fig. 6).
4. Move the PTO to Disengaged (Fig. 7).
5. Move the throttle lever to Choke (Fig. 8).

Note: An engine that has been running and is warm may not require step 5.

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

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, page 37.

7. After the engine starts, slowly move the throttle lever to Fast (Fig. 8). If the engine stalls or hesitates, move the throttle lever back to Choke for a few seconds. Then move the throttle lever to Fast. Repeat this as required.



Figure 6

1. Ground speed selector

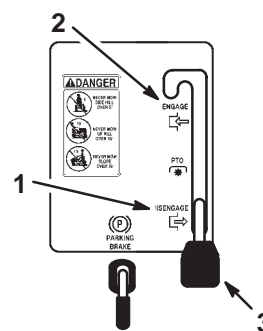


Figure 7

1. Disengaged
2. Engaged
3. Blade control (PTO)

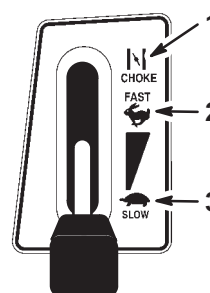


Figure 8

1. Choke
2. Fast
3. Slow

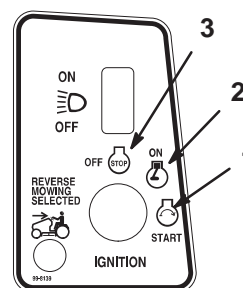


Figure 9

1. Start
2. On
3. Off

Stopping

1. Move the throttle lever to Slow (Fig. 8).
2. Turn the ignition key to Off (Fig. 9).

The Safety System



Caution



If safety interlock switches are disconnected or damaged the machine 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 machine.
- Replace switches every two years regardless of whether they are operating properly or not.

Understanding the Safety System

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

- The clutch/brake pedal is depressed.
- The PTO is Disengaged.

The safety system is designed to stop the engine if:

- You rise from the seat when the clutch/brake pedal is released.
- You rise from the seat when the PTO is Engaged.
- You shift into reverse with the PTO engaged and the operating-in-reverse interlock not deactivated.

Setting the KeyChoice® Switch to Operate in Reverse

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

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



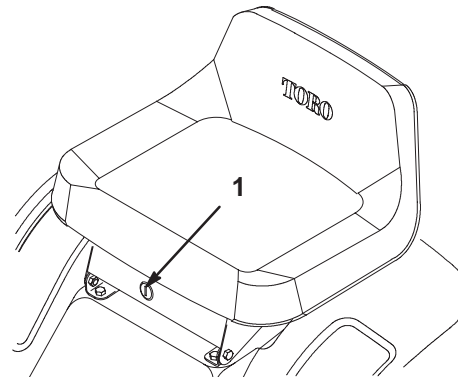
Danger



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

- Do not mow in reverse unless 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 unit unattended.

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



m-4157

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.

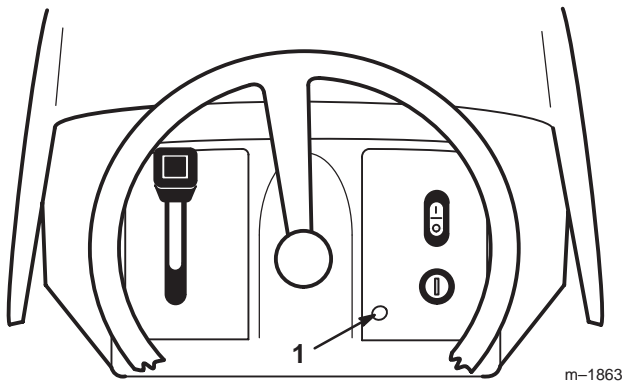


Figure 11

1. Operating-in-Reverse light

4. Shift into reverse and complete your task.
5. Stop the PTO of the engine to activate the interlock.
6. Remove the KeyChoice key and put it in a safe place out of reach of children.

Testing the Safety System

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

1. Move the ground speed selector into Neutral. Set the parking brake. Move the PTO to Engaged. Now turn the ignition key to Start; the engine should not crank.
2. With the ground speed selector in Neutral, move the PTO to Disengaged and release the parking brake. Turn the ignition key to Start; the engine should not crank.
3. With the ground speed selector in Neutral, set the parking brake and move the PTO to Disengaged. Start the engine. While the engine is running, release the parking brake and rise slightly from the seat; the engine should stop.
4. Put the PTO lever in the Disengage position, the ground speed selector in Neutral, and set the parking brake. Start the engine. While the engine is running, move the PTO lever to the Engage position, push in the clutch, and put the ground speed selector in Reverse. The engine should stop.
5. Put the PTO lever in the Disengage position, the ground speed selector in Neutral, and set the parking brake. Start the engine. Move the PTO lever to the Engage position and turn the KeyChoice key and release. The operating-in-reverse warning light should illuminate. Move the PTO lever to the Disengage position and the operating-in-reverse warning light should turn off.

Driving Forward or Backward

The throttle control regulates the engine speed as measured in rpm (revolutions per minute).

To go forward or backward, depress the clutch/brake pedal. Move the ground speed selector to the desired forward speed or reverse. As you slowly release the pedal, the machine will begin to move. Steer the machine with the steering wheel.

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



Caution



Sudden release of the clutch pedal could cause you to lose control and suddenly put the machine in motion.

Always release the clutch pedal slowly when starting the machine in motion.

Selecting Ground Speeds

Important To avoid transmission damage, always depress the clutch/brake pedal before shifting into or out of reverse.

Always start the machine in motion by depressing the clutch/brake pedal and shifting into the desired speed. Once the machine is in motion, you can shift into any forward speed without depressing the clutch/brake pedal. In most conditions, the machine is powerful enough to move out in any speed. If it will not move out in a selected speed (i.e., #5) due to a heavy load, use a lower speed (i.e., #2).

Important Do not shift on slopes. Choose a slow speed so that you will not have to stop or shift while on the slope.

Stopping the Machine

To stop the machine, depress the clutch/brake pedal, shift into neutral, disengage the PTO, and turn the ignition key to Off to stop the engine. Also set the parking brake if you leave the machine unattended; refer to Setting the Parking Brake, 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 machine unattended, even if it is just for a few minutes.

Important To prevent excessive wear, do not “Ride the Brakes.” Shift to a lower speed for slower ground speed. Choose a slow speed so that you will not have to stop or shift while on the slope.

Side Discharge or Mulch 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 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).

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, 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. Shut the engine off and remove the ignition key.
2. Lift the grass deflector and place the discharge cover over the opening onto the lower lip of the mower and slide it into the front hinge (Fig. 12).
3. Slide the hinge pin through the hinge (Fig. 12).
4. Secure the discharge cover to the mower with the wing nut (Fig. 12).

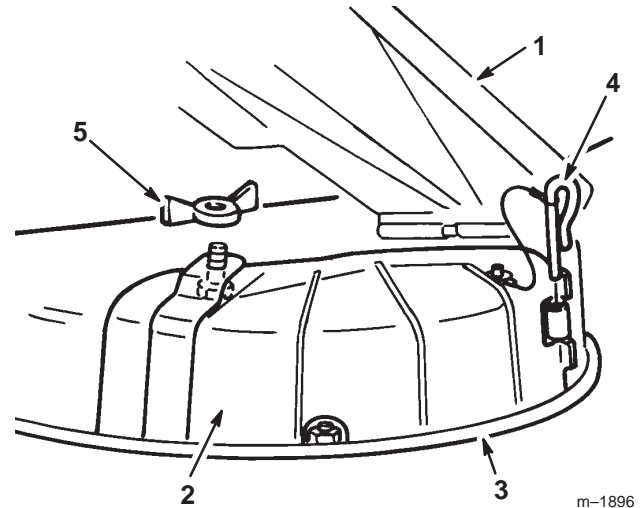


Figure 12

- | | |
|--------------------|--------------|
| 1. Grass deflector | 4. Hinge pin |
| 2. Discharge cover | 5. Wing nut |
| 3. Lower lip | |

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

Tips for Mowing Grass

Fast Throttle Setting

For best mowing and maximum air circulation, operate the engine at Fast. Air is required to thoroughly cut grass clippings, so do not set the height-of-cut too low or totally surround the mower by uncut grass. Always try to have one side of the mower free from uncut grass, which allows air to be drawn into the mower.

Using the Mower for the First Time

Cut grass slightly longer than normal to ensure that the cutting height of the mower does not scalp any uneven ground. However, the cutting height used in the past is generally the best one to use. When cutting grass longer than 6 in. (15 cm) tall, you may want to cut the lawn twice to ensure an acceptable quality of cut.

Cut 1/3 of the Grass Blade

It is best to cut only about 1/3 of the grass blade. Cutting more than that is not recommended, unless grass is sparse or it is late fall when grass grows more slowly.

Mowing Direction

Alternate mowing direction to keep the grass standing straight. This also helps disperse clippings which enhances decomposition and fertilization.

Mow at Correct Intervals

Normally, mow every 4 days. But remember, grass grows at different rates at different times. So 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 you cannot mow for an extended period, first mow at a high cutting height; then mow again 2 days later at a lower height setting.

Avoid Cutting Too Low

If the cutting width of the mower is wider than the mower you previously used, raise the cutting height one notch to ensure uneven turf is not cut too short.

Long Grass

If the grass is ever allowed to grow slightly longer than normal, or if it contains a high degree of moisture, raise the cutting height higher than usual and cut the grass at this setting. Then cut the grass again using the lower, normal setting.

When Stopping

If the machine must be stopped while mowing, a clump of grass clippings may drop onto your lawn. To avoid this:

1. With the blade(s) Engaged, move onto a previously cut area.
2. To disperse the clippings evenly, raise the mower one or two height-of-cut settings while driving forward with the blade(s) Engaged.

Keep the Underside of the Mower Clean

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, cutting quality will eventually become unsatisfactory.

Blade Maintenance

Maintain a sharp blade throughout the cutting season because a sharp blade cuts cleanly without tearing or shredding the grass blades. Tearing and shredding turns grass brown at the edges, which slows growth and increases the chance of disease. Every 30 days, check the cutter blade(s) for sharpness and file down any nicks.

Maintenance

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

Recommended Maintenance Schedule

Maintenance Service Interval	Maintenance Procedure
After first 5 hours of use	<ul style="list-style-type: none"> Change the engine oil.
Each use	<ul style="list-style-type: none"> Check the engine oil level. Check the safety system. Clean the mower housing.
Every 5 hours	<ul style="list-style-type: none"> Check the brakes. Check the cutting blade.
Every 25 hours	<ul style="list-style-type: none"> Grease the chassis.¹ Service the paper air cleaner.¹ Check the spark plug. Check the tire pressure.
Every 50 hours	<ul style="list-style-type: none"> Change the engine oil.²
Every 100 hours	<ul style="list-style-type: none"> Replace the spark plug. Replace the fuel filter. Clean the cooling system.¹
Before storage	<ul style="list-style-type: none"> Perform all of the maintenance procedures listed above. 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 brakes. Check the spark plug. Check the battery electrolyte. 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 before each use.

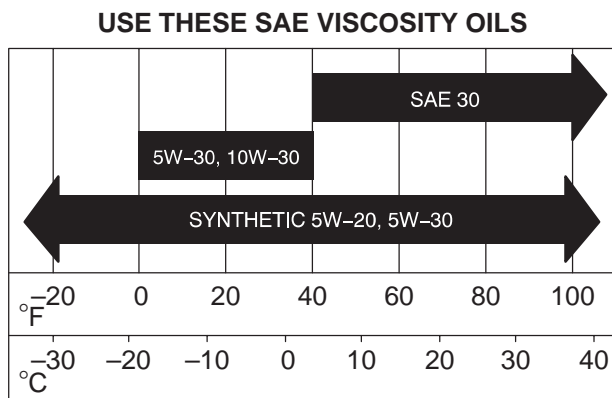
Change the oil after the first 5 operating hours and every 50 operating hours thereafter.

Note: Change 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./1-1/2 qt. (1400 cc/1.4 l)

Viscosity: See the table below.



Checking the Oil Level

1. Park the machine on a level surface, disengage the PTO, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
2. Open the hood.
3. Clean around the oil dipstick (Fig. 13) so that dirt cannot fall into the filler hole and damage the engine.
4. Unscrew the oil dipstick and wipe the metal end clean (Fig. 13).
5. Screw the oil dipstick fully onto the filler tube (Fig. 13). Unscrew the dipstick again and look at the metal end. If the oil level is low, slowly pour only enough oil into the filler tube to raise the level to the Full mark.

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

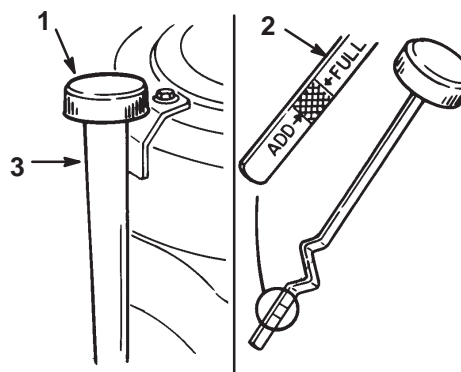


Figure 13

1. Oil dipstick
2. Metal end
3. Filler tube

Changing and Draining the Oil

1. Start the engine and let it run for five minutes. This warms the oil so that it drains better.
2. Park the machine so that the right front side is slightly lower than the left side to ensure that the oil drains completely. Then disengage the PTO, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
3. Open the hood.
4. Place a pan below the oil dipstick/fill tube and remove the drain plug (Fig. 14).
5. When the oil has drained completely, install the drain plug.

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

6. Slowly pour approximately 80% of the specified amount of oil into the filler tube (Fig. 13). Check the oil level; refer to Checking the Oil Level, page 20, steps 4–5.

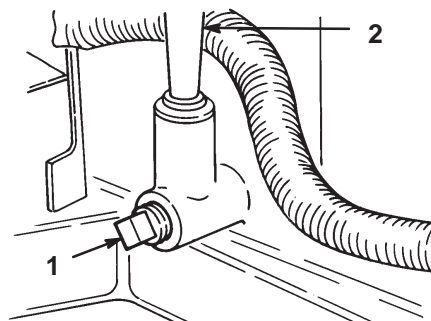


Figure 14

1. Oil drain plug
2. Oil dipstick/fill tube

Servicing the Battery



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 case. If the battery terminals are corroded, clean them with a solution of four parts water and one part baking soda. Apply a light coating of grease to the battery terminals to prevent corrosion.

Voltage: 12 v, 160 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, shift into neutral, set the parking brake, stop the engine, and remove the key.
2. Tip the seat forward to see the battery.
3. Disconnect the negative (black) ground cable from the battery post (Fig. 15).



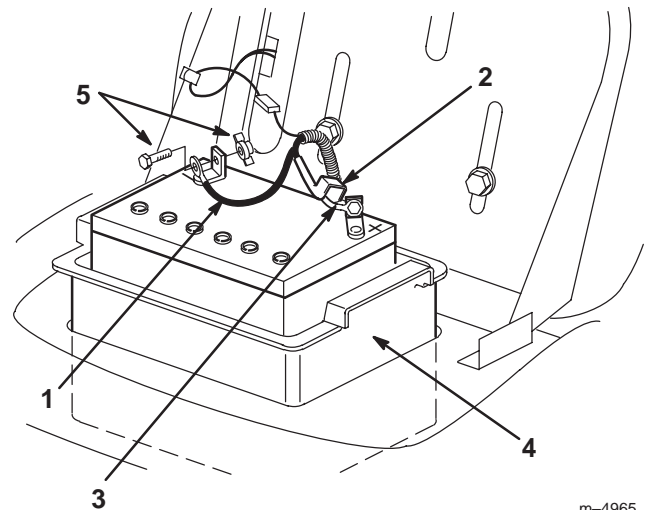
Warning



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 *connect* the positive (red) battery cable before connecting the negative (black) cable.

4. Slide the rubber cover up the positive (red) cable. Disconnect the positive (red) cable from the battery post (Fig. 15).
5. Remove the battery box and battery from the chassis (Fig. 15).



m-4965

Figure 15

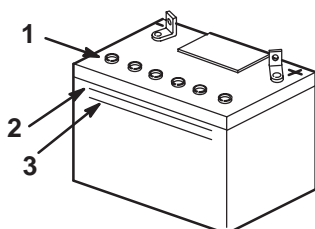
- | | |
|---------------------------|----------------------|
| 1. Negative cable (black) | 4. Battery box |
| 2. Rubber cover | 5. Bolt and wing nut |
| 3. Positive cable (red) | |

Installing the Battery

1. Put the battery into the battery box and install it into the chassis (Fig. 15).
2. Using the bolt and wing nut, connect the positive (red) cable to the positive (+) battery post (Fig. 15). Slide the rubber cover over the battery post.
3. Using the bolt and wing nut, connect the negative (black) cable to the negative (–) battery post (Fig. 15).

Checking the Electrolyte Level

1. Tip the seat forward to see the battery.
2. Look at the side of the battery. The electrolyte must be up to the Upper line (Fig. 16). Do not allow the electrolyte to fall below the Lower line (Fig. 16).
3. If the electrolyte is low, add the required amount of distilled water; refer to Adding Water to the Battery, page 22.



m-5004

Figure 16

1. Filler caps
2. Upper line

3. Lower line



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.

Adding Water to the Battery

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

1. Remove the battery from the tractor; refer to Removing the Battery, page 21.
2. Clean the top of the battery with a paper towel.

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

3. Remove the vent caps from the battery (Fig. 16).
4. Slowly pour distilled water into each battery cell until the electrolyte level is up to the Upper line (Fig. 16) 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 five to ten minutes after filling the battery cells. Add distilled water, if necessary, until the electrolyte level is up to the Upper line (Fig. 16) on the battery case.
6. Reinstall the battery vent caps.

Charging the Battery



Warning

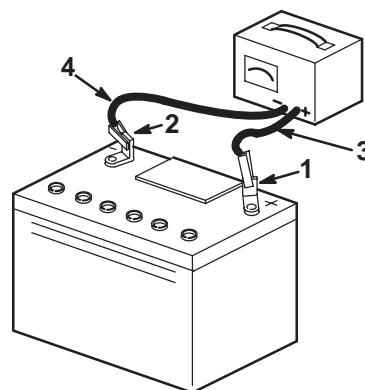


Charging the battery produces gasses that can explode.

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

Important Always keep the battery fully charged (1.260 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, page 21.
2. Check the electrolyte level; refer to Checking the Electrolyte Level, page 22.
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. 17).



m-4970

Figure 17

1. Positive battery post
2. Negative battery post
3. Red (+) charger lead
4. Black (-) charger lead

5. Install the battery in the tractor and connect the battery cables; refer to Installing the Battery, page 21.

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

Servicing the Brake

The brake is on the right side of the rear axle, inside the rear tire (Fig. 18). If the brake does not hold securely or stopping power is insufficient, an adjustment is required.

Checking the Brake

1. Park the machine on a level surface, disengage the PTO, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
2. If the rear wheels lock and skid when you push the tractor forward, no adjustment is required. An adjustment is required if the wheels turn and do not lock; refer to Adjusting the Brake, page 23.

Adjusting the Brake

1. Check the brake before you adjust it; refer to Checking the Brake, page 23.
2. To increase braking resistance, tighten the brake adjusting nut (Fig. 18) 1/8 turn clockwise; then check the brake again. Continue this adjusting and checking process until the brake is set properly.
3. Push down on the clutch/brake pedal to release the parking brake.

Important With the parking brake released, the rear wheels must rotate freely when you push the tractor. If the brake seems to drag, loosen the adjusting nut slightly until the wheels rotate freely. If both conditions cannot be achieved, contact an Authorized Service Dealer immediately.

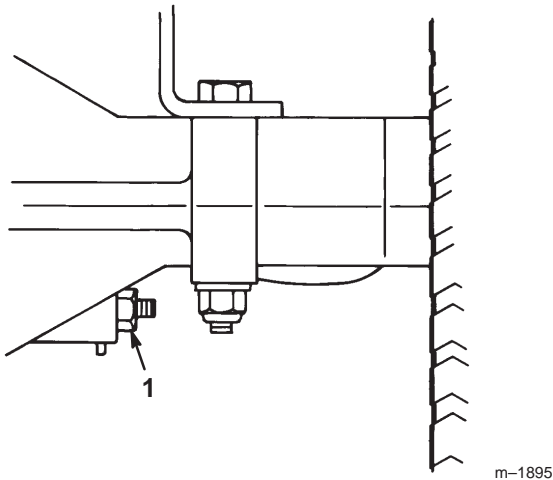


Figure 18

1. Brake adjusting nut

Greasing and Lubrication

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

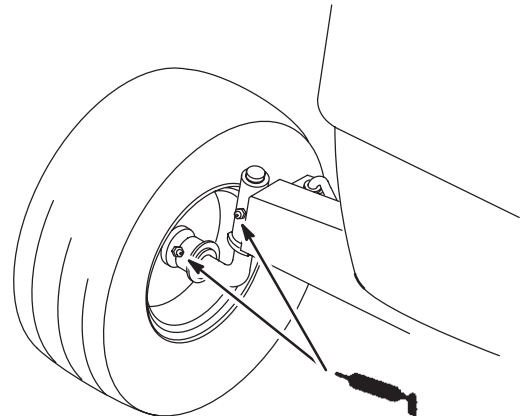
Grease Type: General-purpose grease

How to Grease

1. Disengage the PTO, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
2. Clean the grease fittings with a rag. Make sure to scrape any paint off of the front of the fitting(s).
3. Connect a grease gun to the fitting. Pump grease into the fittings.
4. Wipe up any excess grease.

Where to Add Grease

1. Lubricate the front wheels and steering spindles until grease begins to ooze out of the bearings (Fig. 19).



m-2346

Figure 19

Servicing the Air Cleaner

Clean the paper element after every 25 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 Paper Element

1. Disengage the PTO, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
2. Open the hood.
3. Clean around the air cleaner to prevent dirt from getting into the engine and causing damage. Unscrew the knob and remove the air cleaner cover (Fig. 20).

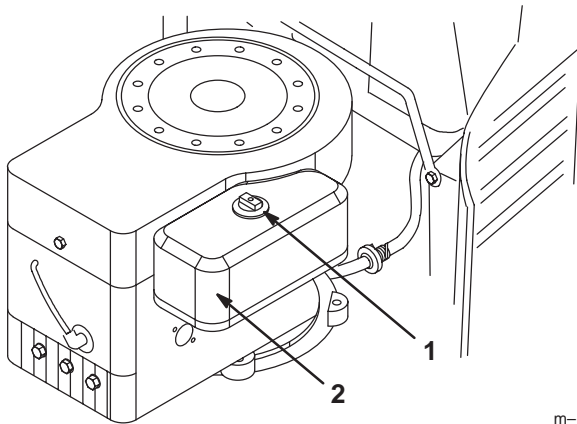


Figure 20

1. Knob
2. Air cleaner cover

4. Unscrew the rubber nut and carefully remove the paper element (Fig. 21).

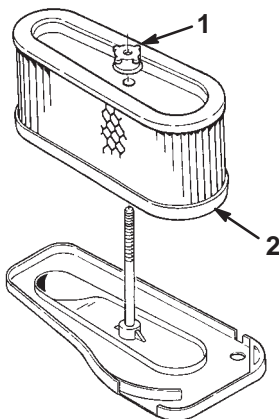


Figure 21

1. Rubber nut
2. Paper element

Cleaning the Paper Element

1. Lightly tap the element on a flat surface to remove dust and dirt (Fig. 22).
2. 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.

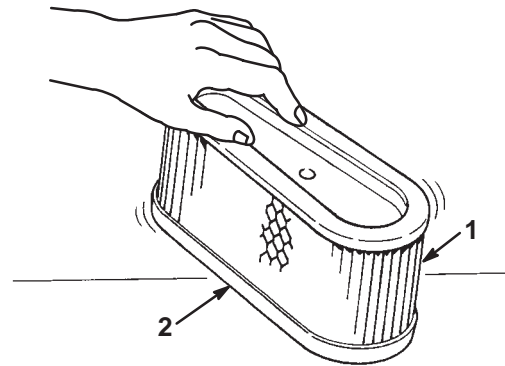


Figure 22

1. Paper element
2. Rubber seal

Installing the Paper Element

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

1. Slide the paper element onto the long rod. Screw the rubber nut finger-tight against the air cleaner (Fig. 21).

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

2. Install the air cleaner cover and knob (Fig. 20). Tighten the knob snugly.
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 RJ-19LM (or equivalent)

Air Gap: 0.030 in. (0.762 mm)

Removing the Spark Plug

1. Disengage the PTO, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
2. Open the hood.
3. Pull the wire off of the spark plug (Fig. 23). Clean around the spark plug to prevent dirt from falling into the engine and potentially causing damage.
4. Remove the spark plug and metal washer.

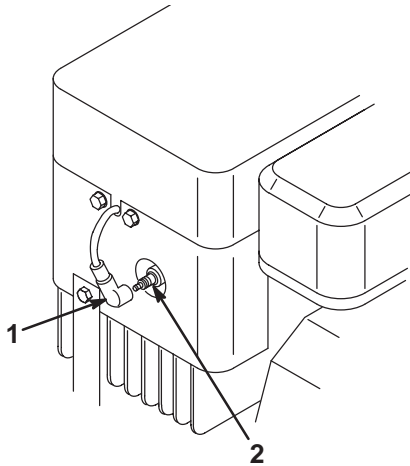


Figure 23

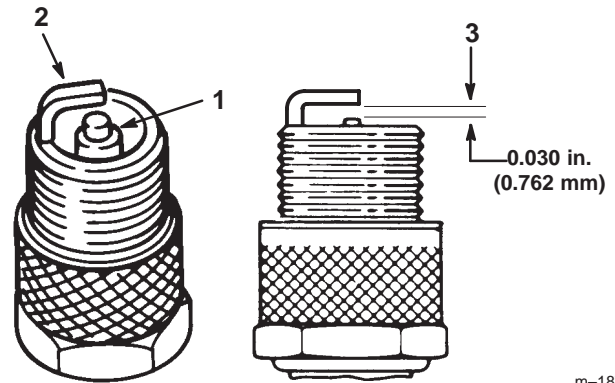
1. Spark plug wire
2. Spark plug

Checking the Spark Plug

1. Look at the center of the spark plug (Fig. 24). 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.

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. 24). Bend the side electrode (Fig. 24) if the gap is not correct.



m-1870

Figure 24

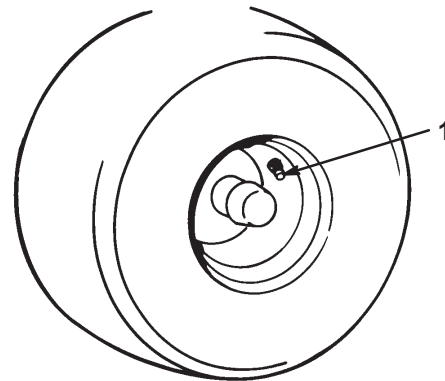
1. Center electrode insulator
2. Side electrode
3. Air gap (not to scale)

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. Push the wire onto the spark plug (Fig. 23).
4. Close the hood.

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. Check the tires when they are cold to get the most accurate pressure reading.



m-1872

Figure 25

1. Valve stem

Draining the Fuel Tank



Danger



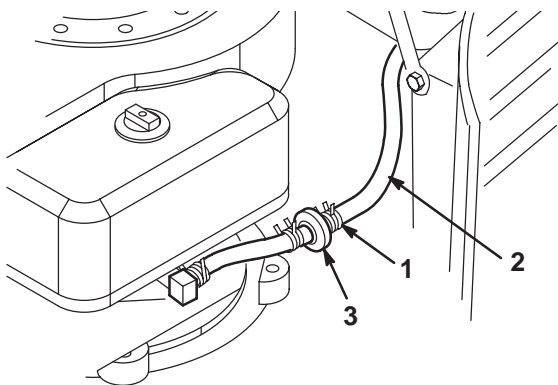
In certain conditions, gasoline is extremely flammable and highly explosive. A fire or explosion from gasoline can burn you and others and can damage property.

- **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 machine so that the left front side is slightly lower than the right side to ensure that the fuel tank drains completely. Disengage the PTO, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
2. Open the hood.
3. Squeeze the ends of the hose clamp together and slide it up the fuel line toward the fuel tank (Fig. 26).
4. Pull the fuel line off of the filter (Fig. 26) and allow 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.

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



m-1873

Figure 26

1. Hose clamp
2. Fuel line
3. Filter

Replacing the Fuel Filter

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

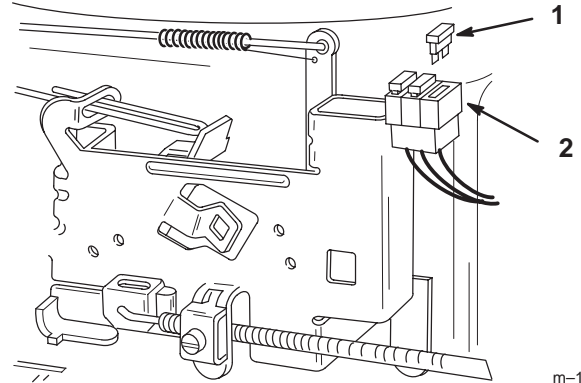
The best time to replace the fuel filter (Fig. 26) is when the fuel tank is empty. Never install a dirty filter if it is removed from the fuel line.

1. Disengage the PTO, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
2. Open the hood.
3. Squeeze the ends of the hose clamps together and slide them away from the filter (Fig. 26).
4. Remove the filter from the fuel lines.
5. Install a new filter and move the hose clamps close to the filter.
6. Close the hood.

Replacing 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. 27) to remove it from the socket. Push down to insert it.

Fuses: 10 amp, blade-type



m-1672

Figure 27

1. Fuse (removed)
2. Socket

Headlights (Optional)

Specification: Bulb # 1156, automotive type

Removing the Bulb

1. Disengage the PTO, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
2. Open the hood. Pull the wire connectors off of both of the bulb holder terminals.
3. Rotate the bulb holder 1/4 turn counterclockwise and remove it from the reflector (Fig. 28).
4. Push and rotate the bulb counterclockwise until it stops (approx. 1/4 turn) and remove the bulb from the bulb holder (Fig. 29).

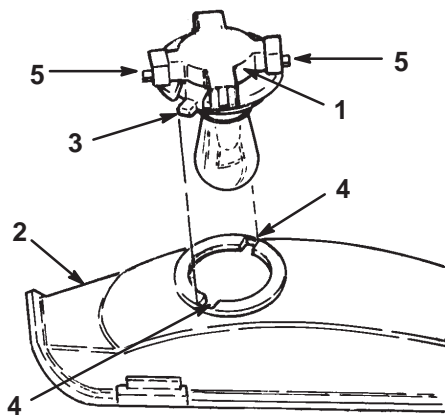


Figure 28

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

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. 29). Push and rotate the bulb clockwise until it stops.

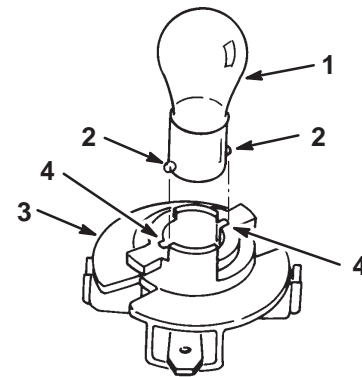


Figure 29

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

2. The bulb holder has two tabs (Fig. 28). 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 Cutting Blade

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



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 Blade(s)

1. Remove the mower; refer to Removing the Mower, page 29.
2. Inspect the cutting edges (Fig. 30). If the edges are not sharp or have nicks, remove the blade(s) and sharpen them; refer to Sharpening the Blade(s), page 28.
3. Inspect the blade(s), especially the curved area (Fig. 30). If you notice any damage, wear, or a slot forming in this area (Fig. 30), immediately install a new blade.

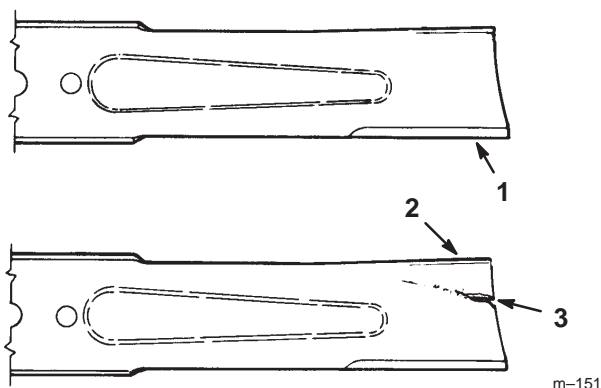


Figure 30

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

Removing the Blade

1. Remove the mower; refer to Removing the Mower, page 29.
2. Carefully tip the mower over.
3. Remove the bolt (5/8 in. wrench), curved washer, retainer, and blade (Fig. 31). A block of wood may be wedged between the blade and the mower to lock the blade when you are removing the bolt.
4. Inspect all parts. If damage is noticed, install new parts.

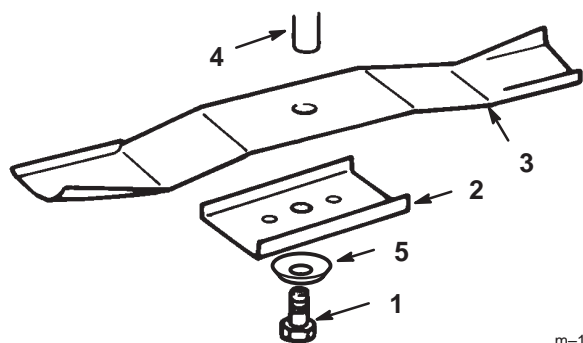


Figure 31

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

Sharpening the Blade(s)

1. Use a file to sharpen the cutting edge at both ends of the blade (Fig. 32). Maintain the original angle. The blade retains its balance if the same amount of material is removed from both cutting edges.



Figure 32

1. Sharpen at original angle
2. Check the balance of the blade by putting it on a blade balancer (Fig. 33). 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.

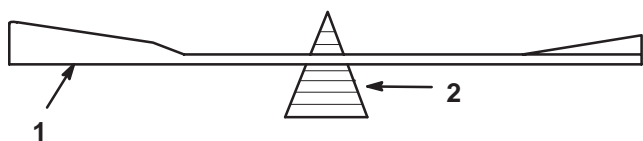


Figure 33

1. Blade
2. Balancer

Installing the Blade(s)

1. Install the blade, blade retainer, curved washer (cupped side toward blade), and the blade bolt (Fig. 31).

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

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

Removing the Mower

1. Park the machine on a level surface, disengage the PTO, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
2. Pull the wire off of the spark plug.
3. Move the height-of-cut lever (deck lift) into the “D” notch.
4. Remove the height-of-cut lift assist spring from the retaining bolt (Fig. 34), using the spring tool provided with the machine. The spring is between the frame and the right rear wheel.

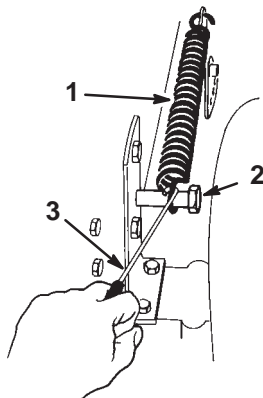
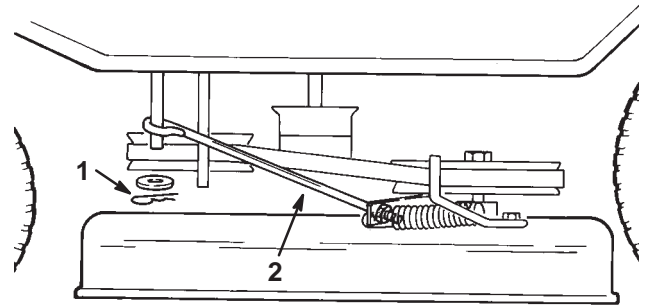


Figure 34

1. Spring
2. Bolt
3. Spring tool

m-1851

6. Remove the hairpin cotter and washer from the blade control arm on the left side of the mower (Fig. 35). Slide the rod off of the arm.

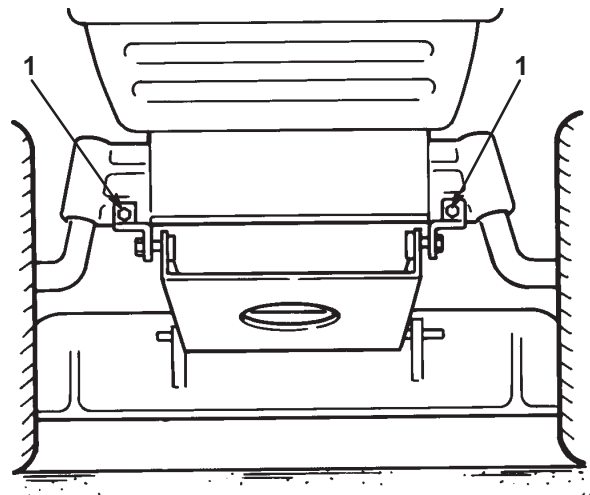


m-1897

Figure 35

1. Hairpin cotter and washer
2. Rod

7. Remove the bolts and locknuts and pull the two mower pivot mount brackets down from the front axle (Fig. 36).



m-1888

Figure 36

1. Pivot mount brackets



Caution



When the mower is being removed, the spring-tensioned height-of-cut lever (deck lift) 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.

5. Move the height-of-cut lever into the “A” notch.

8. Remove the hairpin cotter and washer at the top of the mower leveling bracket (Fig. 37). Slide the bracket off of the mounting pin. Repeat this step on the opposite side of the mower.

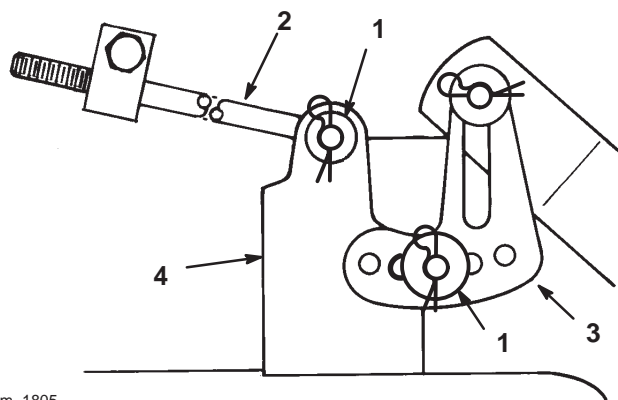


Figure 37

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

9. Remove the hairpin cotter and washer from the end of the long rod (Fig. 37). Slide the rod out of the mower mount. Repeat this step on the opposite side of the mower.

Important Tape or tie the long rods against the chassis to protect them from damage when you remove the mower.

10. Remove the mower belt from the lower engine pulley (Fig. 38). If you are careful, you can flex the belt guide(s) just far enough away from the pulley to remove the belt. If it is too difficult to remove the belt, loosen the bolts and nuts securing the belt guides.

Important Do not bend the belt guide(s) away from the pulley because the belt will not operate properly when the mower is installed later.

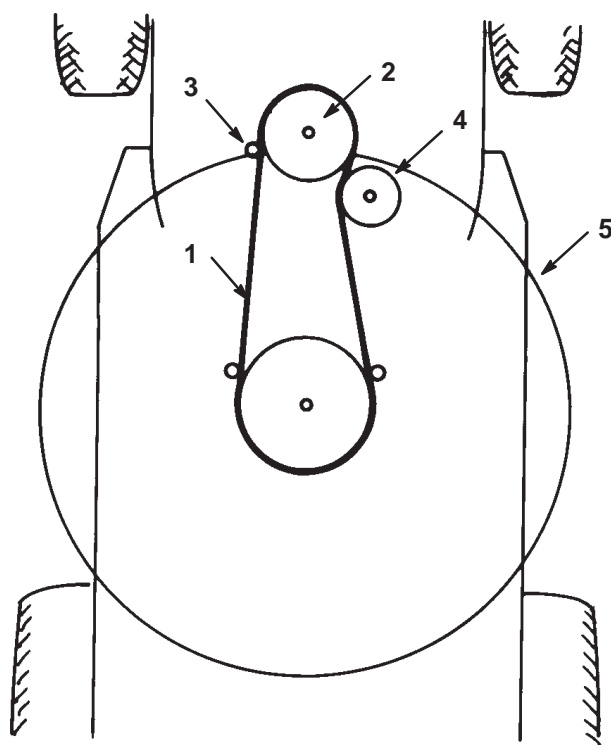


Figure 38

Top View

- | | |
|------------------|-----------------|
| 1. Mower belt | 4. Idler pulley |
| 2. Engine pulley | 5. 32" mower |
| 3. Belt guide | |

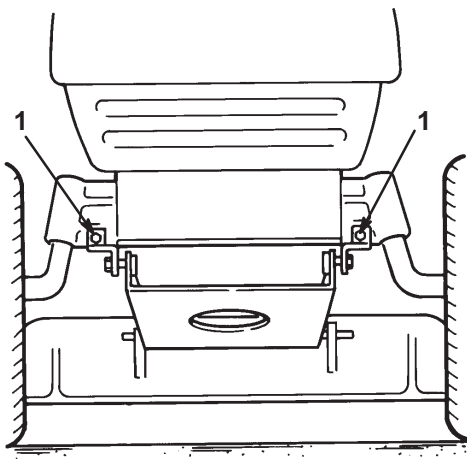
11. Turn the front wheels fully to the left. Slide the mower out to the right to complete the removal process.

Installing the Mower

1. Park the machine on a level surface, disengage the PTO, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
2. Pull the wire off of the spark plug.
3. Turn the front wheels fully to the left. Slide the mower under the chassis from the right side.
4. Install the mower belt onto the lower engine pulley (Fig. 38). If you are careful, you can flex the belt guide(s) just far enough away from the pulley to install the belt. If it is too difficult to install the belt, loosen the bolts and nuts securing the belt guides.

Important Do not bend the belt guide(s) away from the pulley. There must be a maximum 1/8 in. (3.2 mm) between the belt guide(s) and the edge of the pulley to keep the belt on the pulley during operation. If the space is more than 1/8 in. (3.2 mm), adjust the belt guide(s) and tighten them securely. The belt guide(s) must not contact the pulley.

5. Install the mower pivot mount brackets to the front axle with bolts and locknuts (Fig. 39).

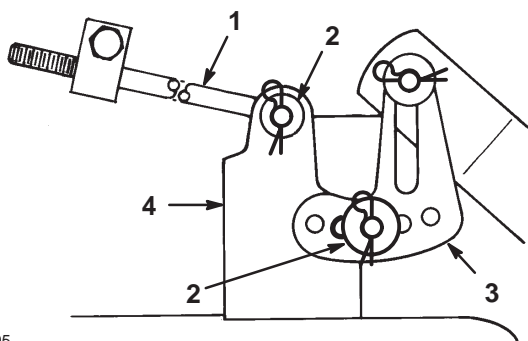


m-1888

Figure 39

1. Pivot mount brackets

6. Move the height-of-cut lever into the "A" notch.
7. Slide the end of the long rod through the hole in the mower mount (Fig. 40). Install the washer and hairpin cotter to secure the rod in place. Repeat this step on the opposite side of the mower.

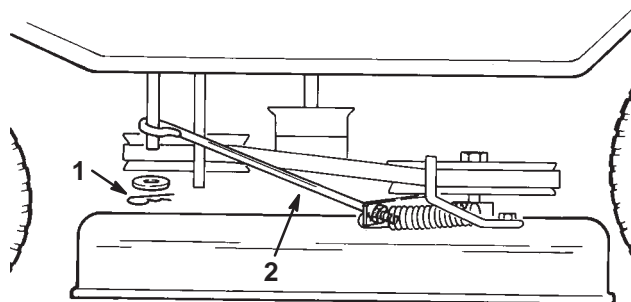


m-1805

Figure 40

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

8. Mount the slotted mower leveling bracket onto the pin on the height-of-cut arm (Fig. 40). Install the washer and hairpin cotter to secure the mower. Repeat this step on the opposite side of the mower.
9. Install the blade control rod onto the blade control arm and secure it with the washer and hairpin cotter (Fig. 41).

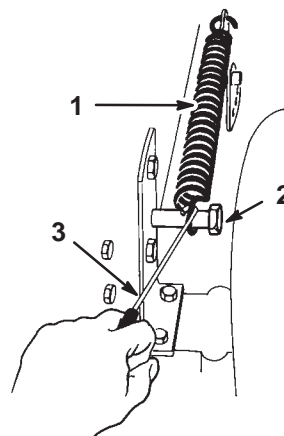


m-1897

Figure 41

1. Hairpin cotter and washer
2. Rod

10. Move the height-of-cut lever into the "D" notch to make it easier to install the height-of-cut lift assist spring.
11. Hook the height-of-cut lift assist spring onto the retaining bolt (Fig. 42), using the spring tool provided with the machine.



m-1851

Figure 42

1. Spring
2. Bolt
3. Spring tool

12. Check the side-to-side blade level; refer to Side-to-Side Mower Leveling, page 32.

Blade Drive Belt

Removing the Blade Drive Belt

1. Remove the mower; refer to Removing the Mower, page 29.
2. Loosen the belt guide mounting bolts and move the belt guides away from the pulley (Fig. 43).
3. Remove the belt from the pulley.

Installing the Blade Drive Belt

1. Install the new belt around the blade pulley and inside both of the belt guides (Fig. 43).
2. Adjust the belt guides so they are 1/8 in. (3 mm) away from the pulley. Tighten the mounting bolts (Fig. 43).

Important Make certain the left side belt guide is very tight so it does not move when the brake spring pulls against it.

3. Install the mower; refer to Installing the Mower, page 30.

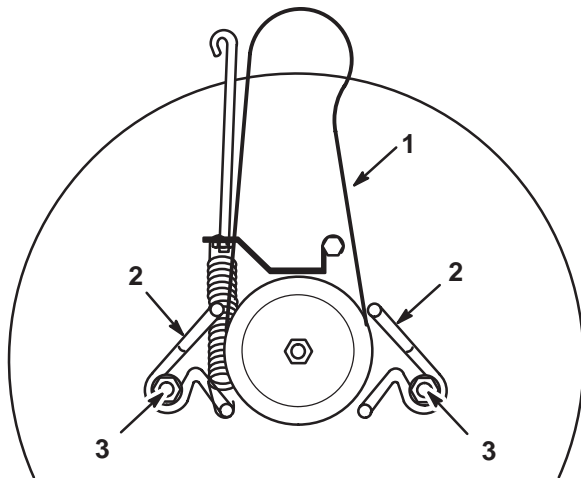


Figure 43

Top View

- | | |
|---------------|------------------|
| 1. Mower belt | 3. Mounting bolt |
| 2. Belt guide | |

Side-to-Side Mower Leveling

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, page 25.

1. Park the machine on a level surface, disengage the PTO, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
2. Pull the wire off of the spark plug.
3. Move the height-of-cut lever into the "C" notch.
4. Carefully rotate the blade(s) side to side (Fig. 44). Measure between the outside cutting edges and the flat surface (Fig. 44). If both measurements are not within 3/16 in. (5 mm), an adjustment is required; refer to steps 5 and 6.

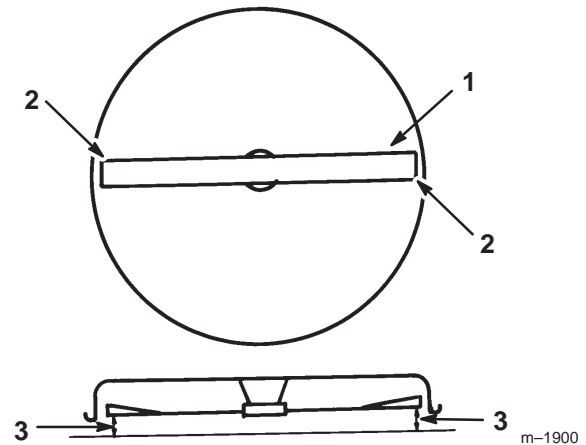


Figure 44

- | | |
|--------------------------|-----------------|
| 1. Blade side to side | 3. Measure here |
| 2. Outside cutting edges | |

5. Remove the hairpin cotter and washer from the leveling bracket (Fig. 45). To level the blade(s), reposition the leveling bracket in a different hole and install the washer and hairpin cotter. (Fig. 45). A front hole lowers the blade height and a rear hole raises its height. Repeat this procedure on the opposite side of the mower.

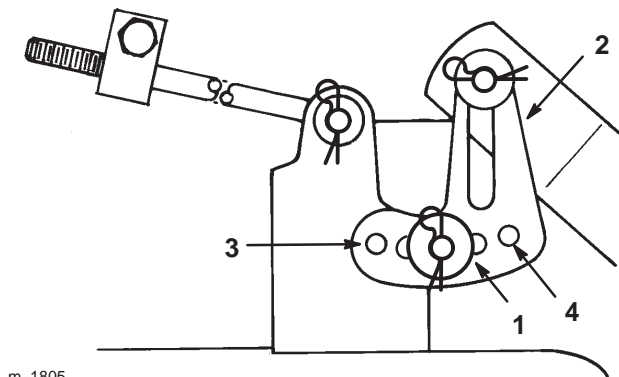


Figure 45

- | | |
|------------------------------|---------------|
| 1. Hairpin cotter and washer | 3. Front hole |
| 2. Leveling bracket | 4. Rear hole |

6. Check the front-to-rear blade slope; refer to Front-to-Rear Blade Slope, page 33.

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, page 25. If the front of the mower is more than 5/8 in. (16 mm) lower than the rear of the mower, adjust the blade slope using the following instructions:

1. Park the machine on a level surface, disengage the PTO, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
2. Pull the wire off of the spark plug.
3. Check and adjust side-to-side blade level if you have not checked the setting; refer to Side-to-Side Mower Leveling, page 32.
4. Move the height-of-cut lever into the "C" notch.
5. Check the front-to-rear blade slope by measuring between the bottom of the mower (front center and rear center) and the flat surface (Fig. 46). If the front of the mower is more than 5/8 in. (16 mm) lower than the rear of the mower, an adjustment is required; refer to steps 6–10.

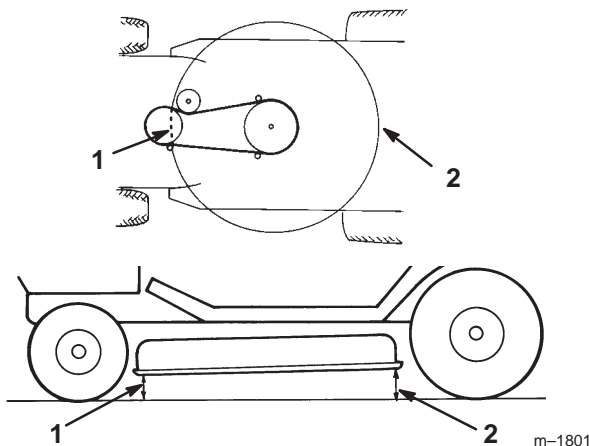


Figure 46

1. Measure front center
2. Measure rear center

6. Measure the length of the rod extending out of the front of the adjusting block on the sides of the chassis (Fig. 47). If the rod length is not 5/8 in. (16 mm), remove the hairpin cotter and washer from the end of the rod (Fig. 47), and turn the rod until the 5/8 in. (16 mm) dimension is obtained. Then install the end of the rod into the hole in the mower mount and secure it in place with the washer and hairpin cotter. Repeat this procedure on the opposite side of the mower.

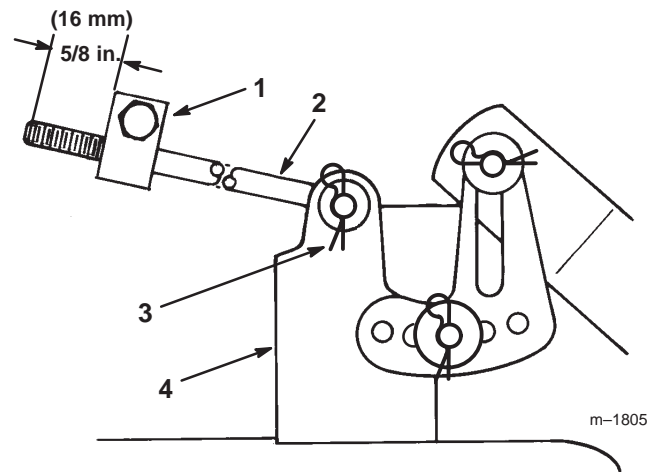


Figure 47

1. Adjusting block
 2. Long rod
 3. Hairpin cotter and washer
 4. Mower mount
7. Check the front-to-rear slope again. If the front of the mower is more than 5/8 in. (16 mm) lower than the rear of the mower, proceed to step 8 for the adjusting instructions. Otherwise, recheck the side-to-side level to ensure it did not change.
 8. Adjust the front-to-rear slope by rotating the special slope adjusting nuts on both sides of the mower pivot mount (Fig. 48).
 9. Using a 1 in. wrench or socket, slowly rotate the left side slope adjusting nut down to raise the front of the mower and up to lower it (Fig. 48). Rotate the slope adjusting nut until the front of the mower is 1/4 to 5/8 in. (6 to 16 mm) lower than the rear of the mower.
 10. Slowly rotate the right side slope adjusting nut until both adjusting nuts are in the same position.

Important If the slope adjustment does not stay in position after you adjust it, tighten the center bolt and locknut and repeat step 9.

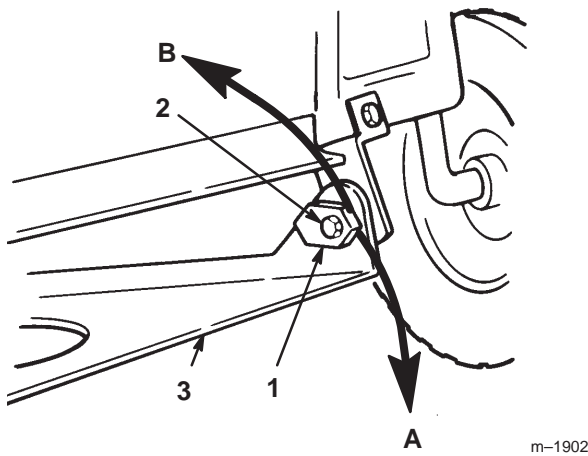


Figure 48

1. Slope adjusting nut (left)
A = Down to raise mower
B = Up to lower mower
2. Bolt and locknut
3. Mower pivot mount

11. If the 1/4 to 5/8 in. (6 to 16 mm) front slope cannot be achieved by rotating the slope adjusting nut, move the mower pivot mount at the mower (Fig. 49).

12. Remove the shoulder bolts and locknuts from the mower (Fig. 49).

13. Lower the mower pivot one hole and install the shoulder bolts and locknuts (Fig. 49).

Note: If your mower has only one hole, see an Authorized Service Dealer.

14. Repeat front-to-rear blade slope adjustment; refer to steps 8–10.

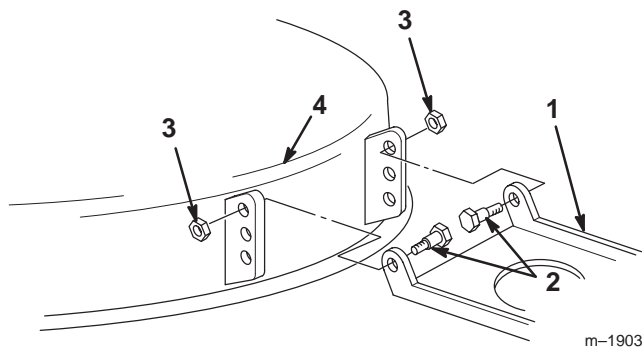


Figure 49

1. Mower pivot
2. Shoulder bolt
3. Locknut
4. Mower

15. Recheck the front-to-rear slope again; refer to step 5.

16. When the front-to-rear blade slope is correct, recheck the side-to-side level of the mower; refer to Side-to-Side Mower Leveling, page 32.

17. Push the wire onto the spark plug.

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 machine on a hard level surface, disengage the PTO, stop the engine, and remove the ignition key.
2. Attach the hose coupling to the end of the mower washout fitting, and turn the water on high (Fig. 50).

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

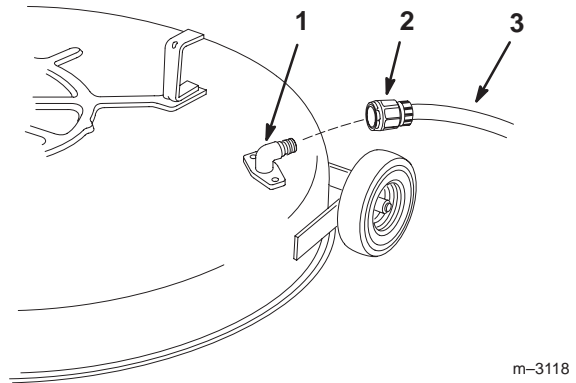


Figure 50

1. Washout fitting
2. Coupling
3. Hose

3. Lower the mower to the lowest height-of-cut.

4. Sit on the seat and start the engine. Engage the PTO and let the mower run for one to three minutes.

5. Disengage the PTO, stop the engine, and remove the ignition key. Wait for all moving parts to stop.

6. Turn the water off and remove the hose coupling from the washout fitting.

Note: If the mower is not clean after one washing, soak it and let it stand for 30 minutes. Then repeat the process.

7. Run the mower again for one to three 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 hole(s) in mower with bolts and locknuts.
- Never put your hands or feet under the mower or through openings in the mower.

Cleaning and Storage

1. Disengage the PTO, set the parking brake, stop the engine, and remove the ignition key.
2. Remove grass clippings, dirt, and grime from the external parts of the entire machine, especially the engine. Clean dirt and chaff from the outside of the engine cylinder head fins and blower housing.

Important You can wash the machine with mild detergent and water. **Do not use a pressure washer to wash the machine.** 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.

3. Check the brake; refer to Servicing the Brake, page 25.
4. Service the air cleaner; refer to Servicing the Air Cleaner, page 24.
5. Grease the chassis; refer to Greasing and Lubrication, page 23.
6. Change the crankcase oil; refer to Servicing the Engine Oil, page 20.
7. Check the tire pressure; refer to Checking the Tire Pressure, page 25.
8. For storage over 30 days, prepare the traction unit as follows:
 - A. Add a petroleum based stabilizer/conditioner to fuel in the tank. Follow the mixing instructions from 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, page 26.
- D. Restart 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 machine, several times to ensure that no fuel remains in primer system.
- G. Dispose of fuel properly. Recycle as per local codes.

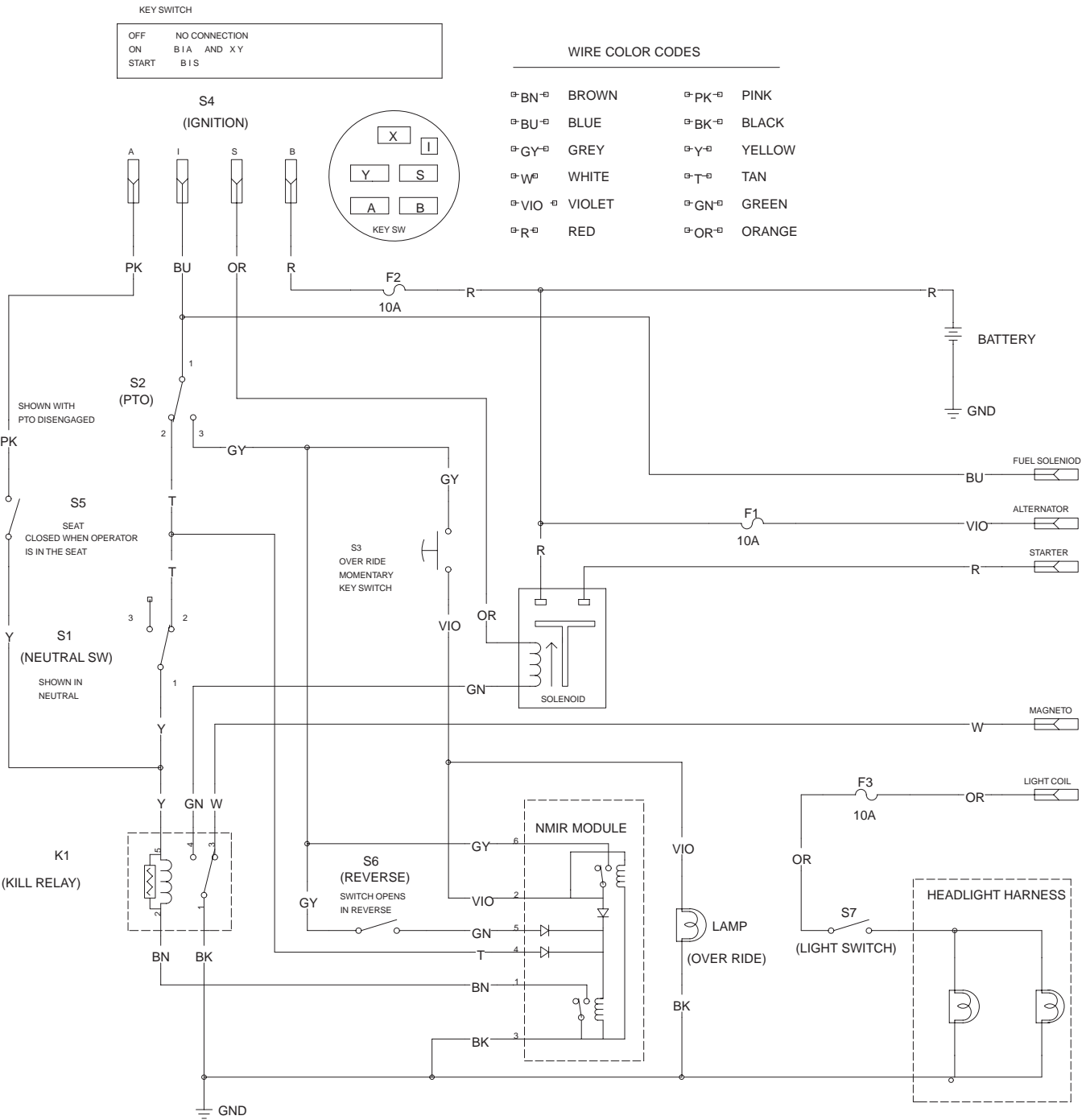
Important Do not store stabilizer/conditioned gasoline over 90 days.

9. Remove the spark plug(s) and check its condition; refer to Servicing the Spark Plug, page 24. With the spark plug(s) removed from the engine, pour two 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(s); refer to Servicing the Spark Plug, page 24. Do not install the wire on the spark plug(s).
10. Disconnect the negative battery cable. Clean the battery and battery terminals. Check the electrolyte level and charge it fully; refer to Servicing the Battery, page 21. 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 one winter season without recharging.

11. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is worn or damaged.
12. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
13. Store the machine 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 machine 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 blade control (PTO) is 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. Move the PTO 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 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 a 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.

Problem	Possible Causes	Corrective Action
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 a lower gear to reduce ground speed. 2. Add oil to the crankcase. 3. Remove the obstruction from the cooling fins and air passages.
There is an abnormal vibration.	<ol style="list-style-type: none"> 1. The cutting blade(s) is 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 new cutting blade(s). 2. Tighten the blade mounting bolt. 3. Tighten the engine mounting bolts. 4. Tighten the appropriate pulley. 5. Contact an Authorized Service Dealer.
The blade(s) 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 the blade drive belt and check the idler pulley and belt guides for the correct position.
The machine does not drive.	<ol style="list-style-type: none"> 1. The traction belt is worn, loose, or broken. 2. The traction belt is off of the pulley. 3. The transmission does not shift. 	<ol style="list-style-type: none"> 1. Contact an Authorized Service Dealer. 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 from front to rear. 3. Clean the underside of the mower.



Consumer
Riding
Products

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	2 year full warranty
• 300 and 5xi Series Tractors:	
Chassis	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 riding products 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>
• All Products	90 day limited warranty
• 300 and 5xi Series Tractors	
Chassis	1 year limited warranty
Liquid Cooled Gas Engines	1 year limited warranty
Air Cooled Gas and Diesel Engines	2 year limited warranty

Instructions for Obtaining Warranty Service

Should you feel your Toro Product contains a defect in materials or workmanship, contact the retailer who sold you the product or any Authorized Service Dealer or Master Service Dealer. The Yellow Pages of your telephone directory is a good reference source. The dealer will either arrange service at his/her dealership or recommend another Authorized Service Dealer who may be more convenient. You may need proof of purchase (copy of registration card, sales receipt, etc.) for warranty validation.

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 of the defect in materials or workmanship or if you need a referral to a Toro Service Dealer, please feel free to contact us at:

Customer Service Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196
952-888-8801 or 800-421-9684

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.