Form No. 3326-504

TORO®

13-32XLE

Wheel Horse® Lawn Tractor

Model No. 71209—Serial No. 220010001 and Up

Operator's Manual

CE

International English (GB)

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.

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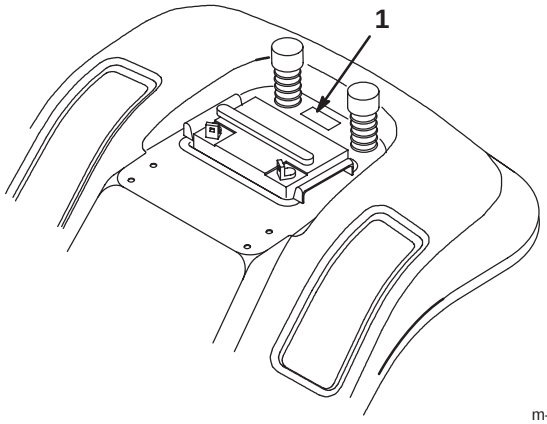
Introduction

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

8111 Lyndale Avenue South
Bloomington, MN 55420-1196

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

Safety

Safe Operation Practices for Ride-on (riding) Rotary Lawnmower Machines

This machine meets or exceeds European Standards 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 the CEN standard EN 836:1997.

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

Training

- Read the instructions carefully. Be familiar with the controls and the proper use of the equipment.
- Never allow children or people unfamiliar with these instructions to use the lawnmower. Local regulations can restrict the age of the operator.
- Never mow while people, especially children, or pets are nearby.
- Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.
- Do not carry passengers.
- All drivers should seek and obtain professional and practical instruction. Such instruction should emphasize:
  - the need for care and concentration when working with ride-on machines;
  - control of a ride-on machine sliding on a slope will not be regained by the application of the brake. The main reasons for loss of control are:
    - insufficient wheel grip;
    - being driven too fast;
    - inadequate braking;
    - the type of machine is unsuitable for its task;
    - lack of awareness of the effect of ground conditions, especially slopes;
    - incorrect hitching and load distribution.

Preparation

- While mowing, always wear substantial footwear and long trousers. Do not operate the equipment when barefoot or wearing open sandals.
- Thoroughly inspect the area where the equipment is to be used and remove all objects which may be thrown by the machine.
- **Warning**—Fuel is highly flammable.
  - Store fuel in containers specifically designed for this purpose.
  - Refuel outdoors only and do not smoke while refuelling.
  - Add fuel before starting the engine. Never remove the cap of the fuel tank or add fuel while the engine is running or when the engine is hot.

  - If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapors have dissipated.
  - Replace all fuel tanks and container caps securely.
- Replace faulty silencers.
- Before using, always visually inspect to see that the blades, blade bolts and cutter assembly are not worn or damaged. Replace worn or damaged blades and bolts in sets to preserve balance.
- On multi-bladed machines, take care as rotating one blade can cause other blades to rotate.

Operation

- Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.
- Mow only in daylight or in good artificial light.
- Before attempting to start the engine, disengage all blade attachment clutches and shift into neutral.
- Do not use on slopes of more than
  - 5° when mowing on side hills;
  - 10° when mowing uphill;
  - 15° when mowing downhill.
- Remember there is no such thing as a safe slope. Travel on grass slopes requires particular care. To guard against overturning:
  - do not stop or start suddenly when going up or downhill;
  - engage clutch slowly, always keep machine in gear, especially when travelling downhill;
  - machine speeds should be kept low on slopes and during tight turns;
  - stay alert for humps and hollows and other hidden hazards;
  - never mow across the face of the slope, unless the lawnmower is designed for this purpose.
- Use care when pulling loads or using heavy equipment.
  - Use only approved drawbar hitch points.
  - Limit loads to those you can safely control.
  - Do not turn sharply. Use care when reversing.
  - Use counterweight(s) or wheel weights when suggested in the instruction handbook.
- Watch out for traffic when crossing or near roadways.
- Stop the blades rotating before crossing surfaces other than grass.
- When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while in operation.
- Never operate the machine with damaged guards or without safety protective devices in place.
- Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed can increase the hazard of personal injury.
- Before leaving the operator's position:
  - disengage the power take-off and lower the attachments;
  - change into neutral and set the parking brake;
  - stop the engine and remove the key.
- Disengage drive to attachments, stop the engine, and disconnect the spark plug wire(s) or remove the ignition key
  - before clearing blockages or unclogging chute;
  - before checking, cleaning or working on the lawnmower;
  - after striking a foreign object. Inspect the lawnmower for damage and make repairs before restarting and operating the equipment;
  - if the machine starts to vibrate abnormally (check immediately).
- Disengage drive to attachments when transporting or not in use.
- Stop the engine and disengage drive to attachment
  - before refuelling;
  - before removing the grass catcher;
  - before making height adjustment unless adjustment can be made from the operator's position.
- Reduce the throttle setting during engine run-out and, if the engine is provided with a shut-off valve, turn the fuel off at the conclusion of mowing.

Maintenance and Storage

- Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
- Never store the equipment with fuel in the tank inside a building where fumes can reach an open flame or spark.
- Allow the engine to cool before storing in any enclosure.

- To reduce the fire hazard, keep the engine, silencer, battery compartment and fuel storage area free of grass, leaves, or excessive grease.
- Check the grass catcher frequently for wear or deterioration.
- Replace worn or damaged parts for safety.
- If the fuel tank has to be drained, this should be done outdoors.
- On multi-bladed machines, take care as rotating one blade can cause other blades to rotate.
- When machine is to be parked, stored or left unattended, lower the cutting means unless a positive mechanical lock is used.

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 CEN standard.

- Use only Toro-approved attachments. Warranty may be voided if used with unapproved attachments.

Sound Pressure Level

This unit has an equivalent continuous A-weighted sound pressure at the operator ear of: 86 dB(A), based on measurements of identical machines per procedures outlined in Machine Directive 98/37/EC and amendments.

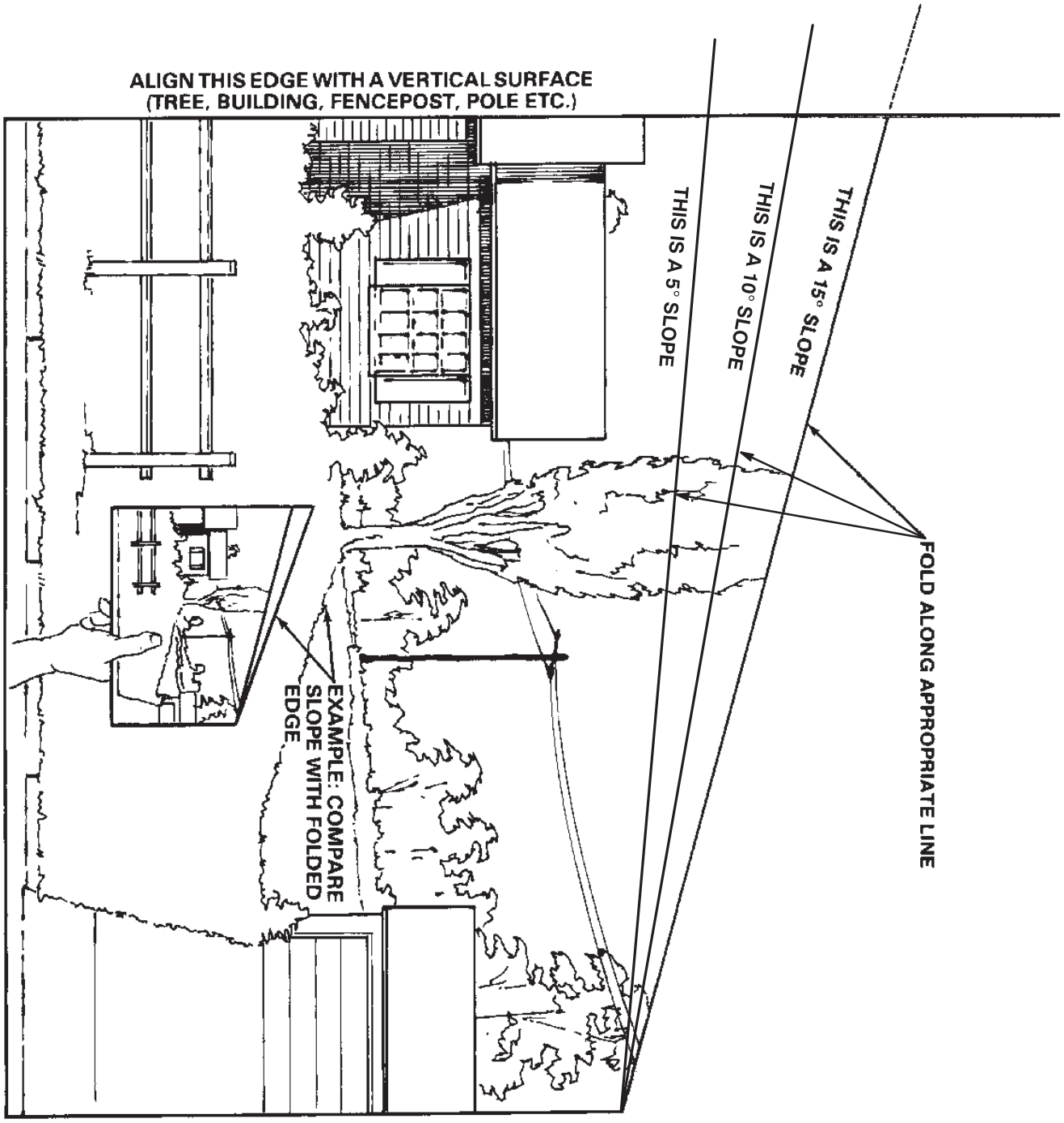
Sound Power Level

This unit has a sound power level of: 100 Lwa, based on measurements of identical machines per procedures outlined in Noise Directive 2000/14/EC and amendments.

Vibration Level

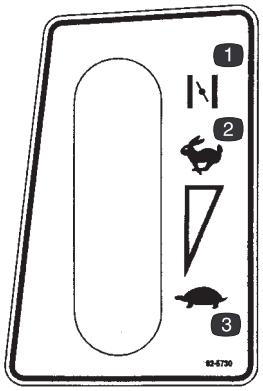
This unit has a maximum hand-arm vibration level of 5.39 m/s^2 and whole body vibration level of 0.27 m/s^2, based on measurements of identical machines per EN 1033 and EN 1032.

Slope Chart


ALIGN THIS EDGE WITH A VERTICAL SURFACE
(TREE, BUILDING, FENCEPOST, POLE ETC.)
THIS IS A 5° SLOPE
THIS IS A 10° SLOPE
THIS IS A 15° SLOPE
FOLD ALONG APPROPRIATE LINE
EXAMPLE: COMPARE SLOPE WITH FOLDED EDGE

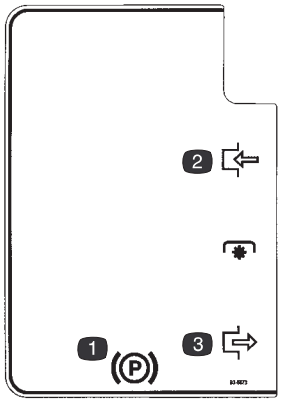
Safety and Instruction Decals

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.



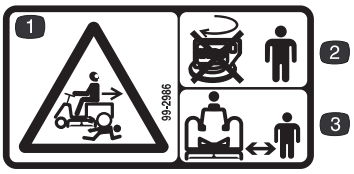
92-5730

1. Choke
2. Throttle—fast
3. Throttle—slow



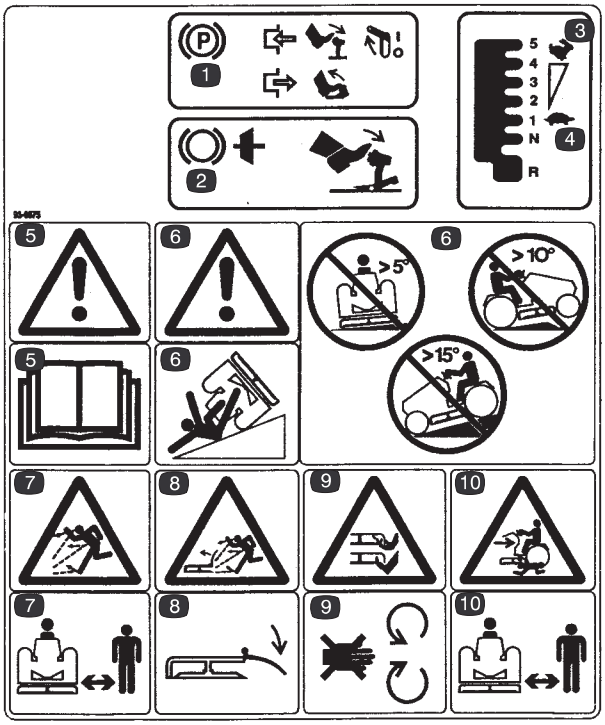
93-6673

1. Parking brake
2. PTO—engage
3. PTO—disengage



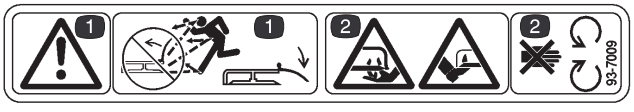
99-2986

1. Crushing and dismemberment hazard—look back and down while backing up.
2. Do not activate the operating-in-reverse feature when bystanders are present.
3. Keep children away.



93-6675

1. To set the parking brake, push the clutch/brake pedal, lift the parking brake lever, and take your foot off of the clutch/brake pedal.
2. To release the parking brake, push the clutch/brake pedal.
3. Throttle—fast
4. Throttle—slow
5. Warning—read the operator's manual.
6. Warning—tipping hazard. Do not drive across slopes greater than 5 degrees, up slopes greater than 10 degrees, or down slopes greater than 15 degrees.
7. Thrown object hazard—keep bystanders away.
8. Thrown object hazard from mower—keep the deflector in place.
9. Cutting/dismemberment hazard of hands or feet—stay away from rotating blades and moving parts.
10. Crushing/dismemberment hazard—keep bystanders away.



93-7009

1. Thrown object hazard from mower—keep the deflector in place.
2. Cutting/dismemberment hazard of hands and feet—stay away from rotating blades and moving parts.

104–4164

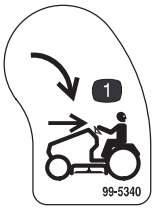
1. Contains lead,—do not throw the battery in the garbage.
2. Recycle
3. Wear eye protection—explosive gases can cause blindness and other injuries.
4. No sparks, flame, or smoking
5. Sulfuric acid can cause blindness or severe burns.
6. Flush eyes immediately with water and get medical help fast.
7. Maximum fill line
8. Minimum fill line
9. Instructions for activating the battery.

93-7010

1. Thrown objects hazard—keep bystanders away.
2. Thrown object hazard from mower—keep the deflector in place.
3. Cutting/dismemberment hazard of hands and feet—stay away from rotating blades and moving parts.

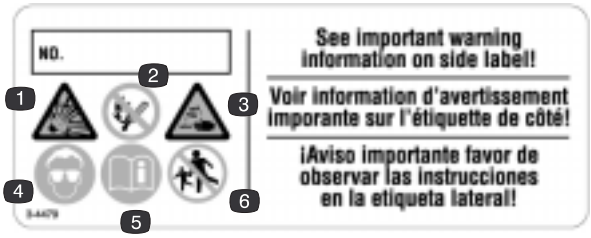
93-6674

1. Crushing hazard of fingers or hand—read the operator's manual before performing maintenance work.



99-5340

1. KeyChoice®—turn to mow in reverse.



104-4163

1. Explosion hazard
2. No sparks, flame, or smoking
3. Caustic liquid hazard—burns to hand and damage to items
4. Wear eye protection
5. Read the operator's manual
6. Keep bystanders away

99-8142

1. Operating-in-reverse light
2. Engine off
3. Engine on
4. Engine start

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

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. 2) before you start the engine and operate the machine.

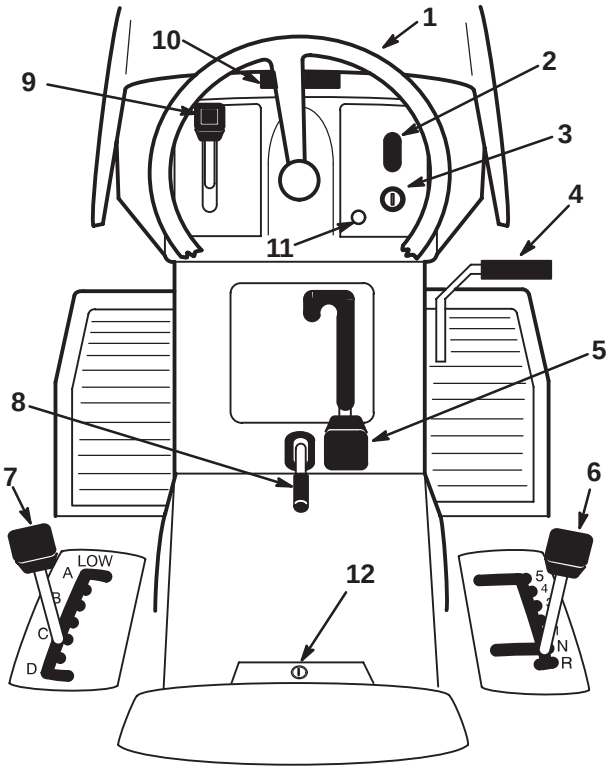


Figure 2

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

Parking Brake

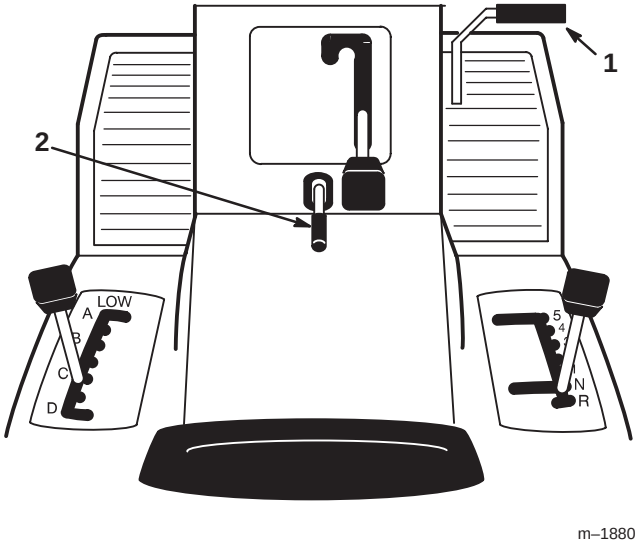
Always set the parking brake when you stop the machine or leave it unattended.

Setting the Parking Brake

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



m–1880

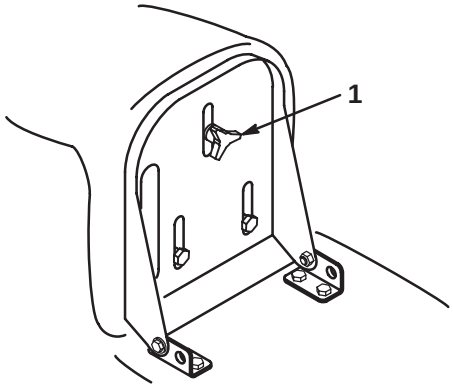
Figure 3

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. 4).
2. Move the seat to the desired position and tighten the knob.



m–1862

Figure 4

1. Adjustment knob

Headlights

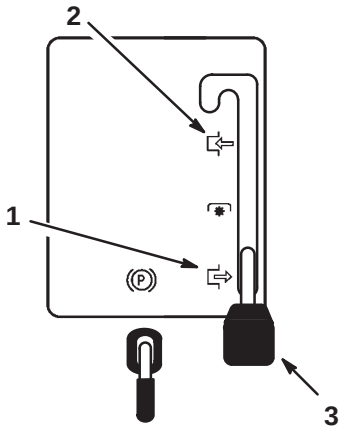
Headlights are optional on some models. A dash-mounted On/Off switch (Fig. 2) controls the headlights. The lights only shine while the engine is running and the switch is On.

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. 5).



m–1852

Figure 5

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

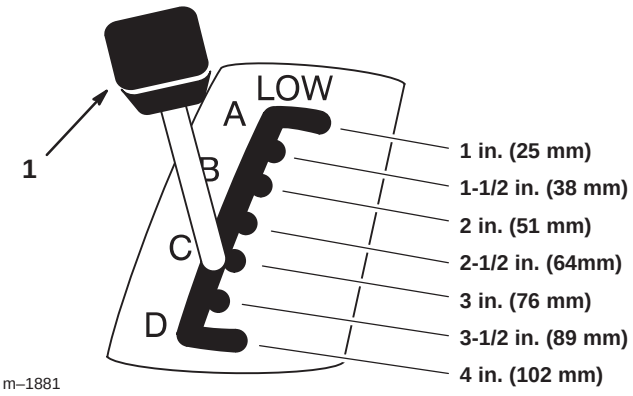
Disengaging the Blade(s)

1. Depress the clutch/brake pedal to stop the machine.
2. Move the PTO to Disengaged (Fig. 5).

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. 6).



m–1881

Figure 6

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 13.

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

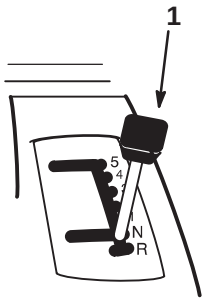
3. Move the ground speed selector into neutral (N) (Fig. 7).
4. Move the PTO to Disengaged (Fig. 8).
5. Move the throttle lever to Choke (Fig. 9).

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. 10). 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.

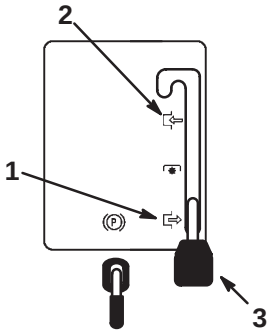
7. After the engine starts, slowly move the throttle lever to Fast (Fig. 9). If the engine stalls or hesitates, move the throttle lever back to Choke for a few seconds. Then move the throttle lever to Fast. Repeat this as required.



m–1893

Figure 7

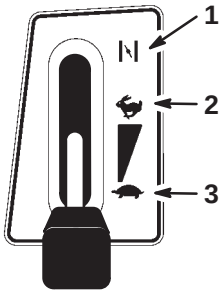
1. Ground speed selector



m–1852

Figure 8

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



m–1859

Figure 9

1. Choke
2. Fast
3. Slow

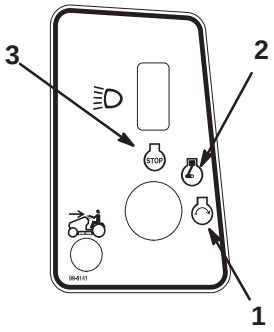


Figure 10

1. Start
2. On
3. Off

Stopping

1. Move the throttle lever to Slow (Fig. 9).

2. Turn the ignition key to Off (Fig. 10).

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 or the blade is Engaged.

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. 11).

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. 11).

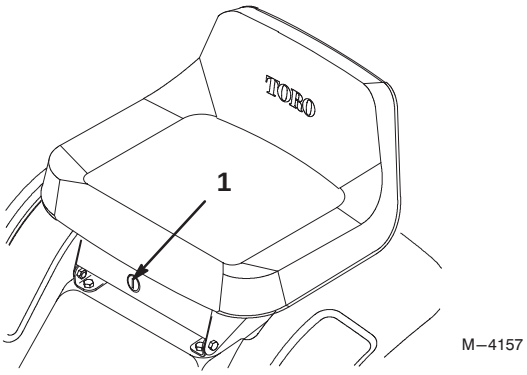


Figure 11

1. KeyChoice switch

3. Turn the KeyChoice key.

   A red light on the front console (Fig. 12) turns on, indicating that the interlock is disabled.

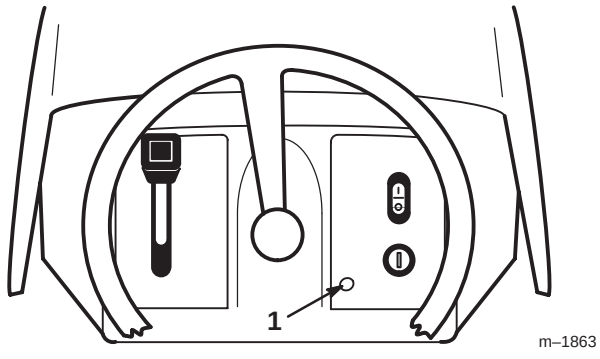


Figure 12

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

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.**

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 in 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 it. 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 13. 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 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 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 discharge area or mower blades unless you move the PTO to Off and rotate the ignition key to Off. Also remove the key and pull the wire off 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. 13).
3. Slide the hinge pin through the hinge (Fig. 13).
4. Secure the discharge cover to the mower with the wing nut (Fig. 13).

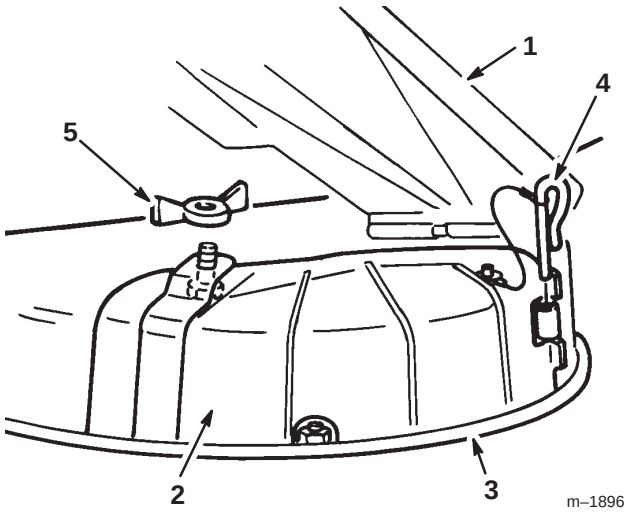


Figure 13

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

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 the 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	• Change the engine oil.
Each use	• Check the engine oil level. • Check the safety system. • Clean the mower housing.
Every 5 hours	• Check the brakes. • Check the cutting blade.
Every 25 hours	• Grease the chassis.[1] • Service the foam air cleaner.[1] • Check the spark plug. • Check the tire pressure.
Every 50 hours	• Change the engine oil.[2] • Check the battery electrolyte.
Every 100 hours	• Service the paper air cleaner.[1] • Replace the spark plug. • Replace the fuel filter. • Clean the cooling system.[1]
Before storage	• 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	• Check the safety system. • Check the brakes. • Check the spark plug. • Check the battery electrolyte. • Check the tire pressure.

[1]More often in dusty, dirty conditions

[2]More 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 accidently 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.

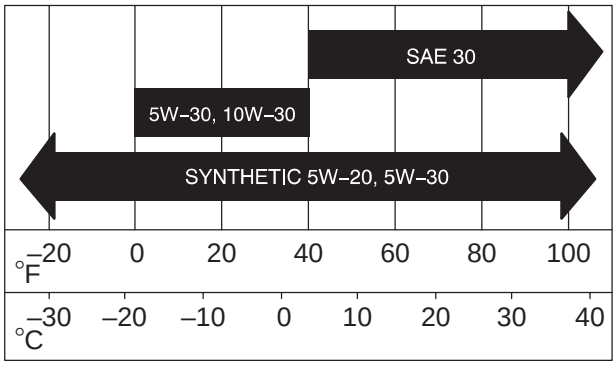
Note: Change the oil more frequently when operating conditions are extremely dusty or sandy.

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

Crankcase Capacity: 48 oz./1-1/2 qt. (1400 cc/1.4 l)

Viscosity: See the table below.

USE THESE SAE VISCOSITY OILS



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. 14) 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. 14).
5. Screw the oil dipstick fully onto the filler tube (Fig. 14). 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 on the dipstick.

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

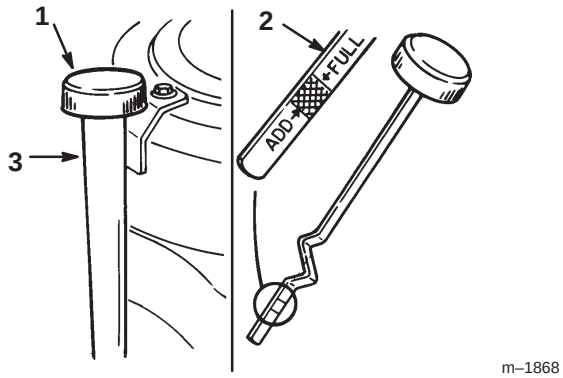


Figure 14

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. 15).
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. 14). Check the oil level; refer to Checking the Oil Level, page 20, steps 4–5.

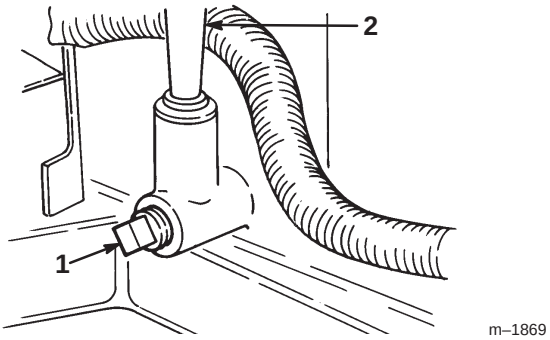


Figure 15

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 box. 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, 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, shift into neutral, set the parking brake, stop the engine, and remove the ignition key.
2. Tip the seat forward to see the battery.
3. Disconnect the negative (black) ground cable from the battery post (Fig. 16).

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. 16).
5. Remove the battery box and battery from the chassis (Fig. 16).

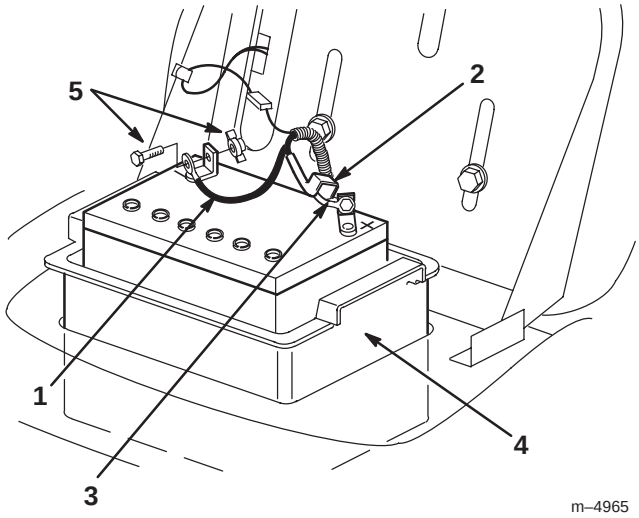


Figure 16

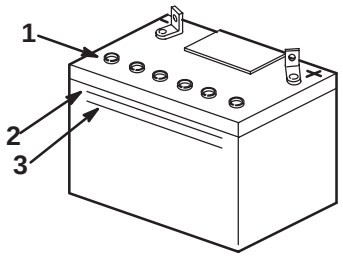
1. Negative cable (black)
2. Rubber cover
3. Positive cable (red)
4. Battery box
5. Bolt and wing nut

Installing the Battery

1. Put the battery into the battery box and install it into the chassis (Fig. 16).
2. Using the bolt and wing nut, connect the positive (red) cable to the positive (+) battery post (Fig. 16). 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. 16).

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. 17). Do not allow the electrolyte to fall below the Lower line (Fig. 17).
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 17

1. Vent 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 is installed in the tractor. Electrolyte could be spilled on other parts and cause corrosion.

3. Remove the vent caps from the battery (Fig. 17).
4. Slowly pour distilled water into each battery cell until the electrolyte level is up to the Upper line (Fig. 17) 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. 17) on the battery case.
6. Reinstall the battery vent caps.

Charging the Battery

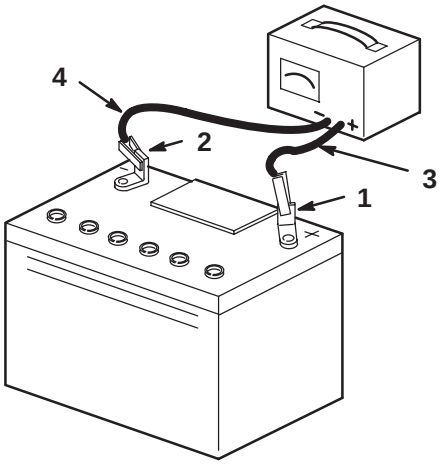
Warning

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. 18).



m–4970

Figure 18

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. 19). 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. 19) 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.

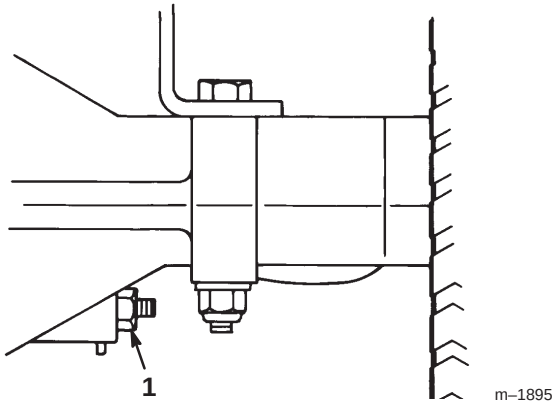


Figure 19

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. 20).

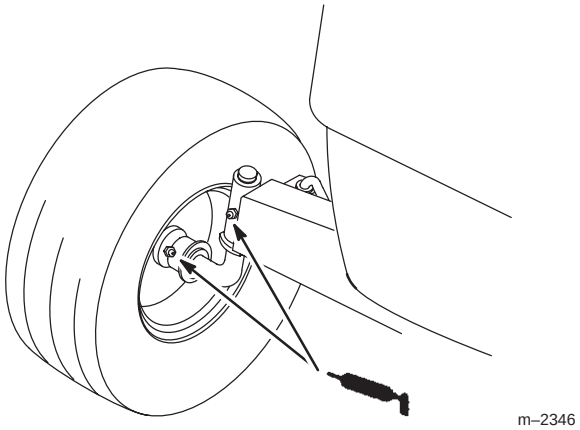


Figure 20

Servicing the Air Cleaner

Foam Element: Clean and oil after every 25 operating hours.

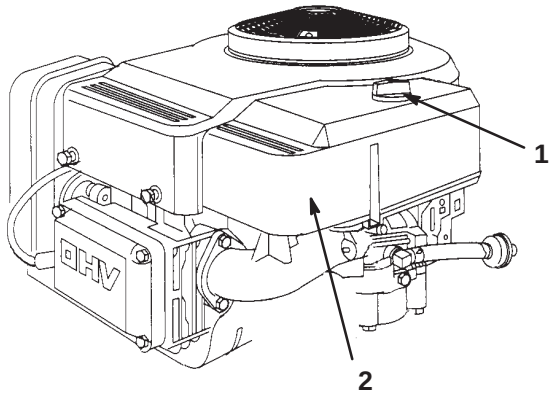
Paper Element: Replace after every 100 operating hours or yearly, whichever occurs first.

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, 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. 21).

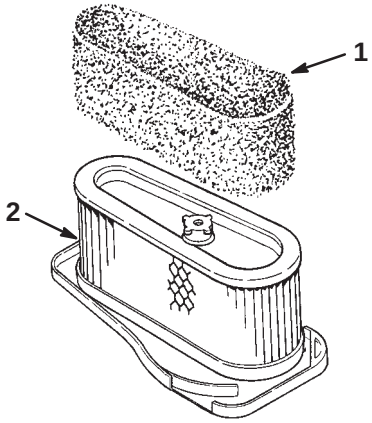


m–1884

Figure 21

1. Knob 2. Air cleaner cover

4. Carefully slide the foam element off of the paper element (Fig. 22).

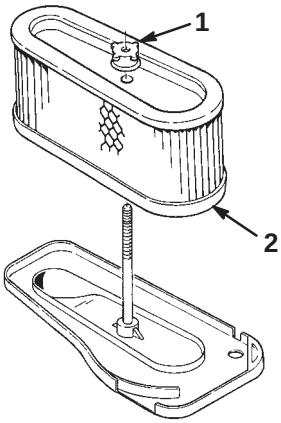


m–1864

Figure 22

1. Foam element 2. Paper element

5. Unscrew the rubber nut and remove the paper element (Fig. 23).



m–1865

Figure 23

1. Rubber nut 2. Paper element

Cleaning the Foam and Paper Elements

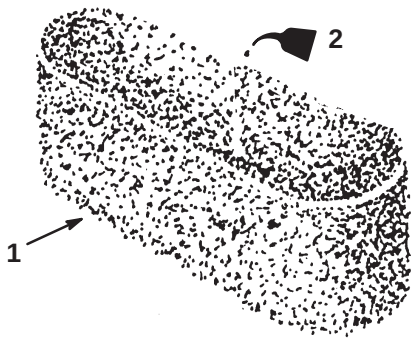
1. Foam Element

A. Wash the foam element in liquid soap and warm water. When the element is clean, rinse it thoroughly.

B. Dry the element by squeezing it in a clean cloth.

C. Put one or two ounces of oil on the element (Fig. 24). Squeeze the element to distribute the oil.

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



m–1866

Figure 24

1. Foam element 2. Oil

2. Paper Element

   A. Lightly tap the element on a flat surface to remove dust and dirt (Fig. 25).

   B. 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.

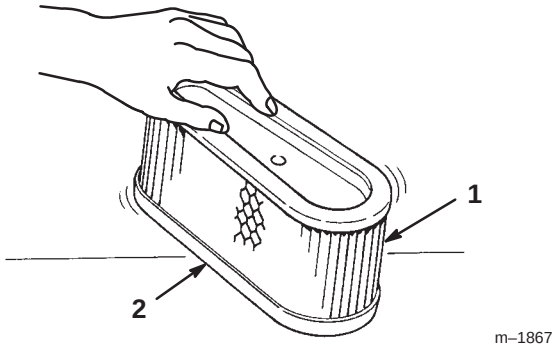


Figure 25

1. Paper element 2. Rubber seal

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. Carefully slide the foam element onto the paper air cleaner element (Fig. 22).
2. Slide the air cleaner assembly onto the long rod. Screw the rubber nut finger-tight against the air cleaner (Fig. 23).

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

3. Install the air cleaner cover and knob (Fig. 21). Tighten the knob snugly.
4. 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. 26). 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.

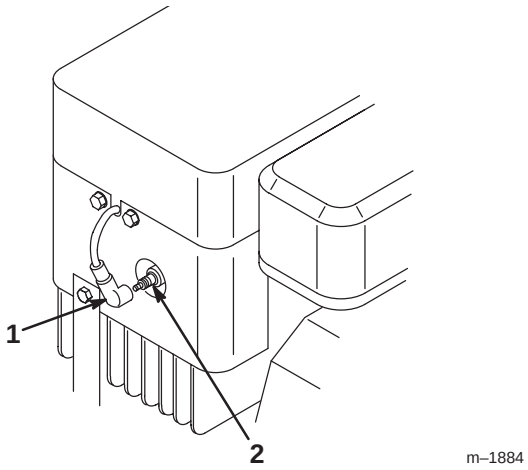


Figure 26

1. Spark plug wire 2. Spark plug

Checking the Spark Plug

1. Look at the center of the spark plug (Fig. 27). 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. 27). Bend the side electrode (Fig. 27) if the gap is not correct.

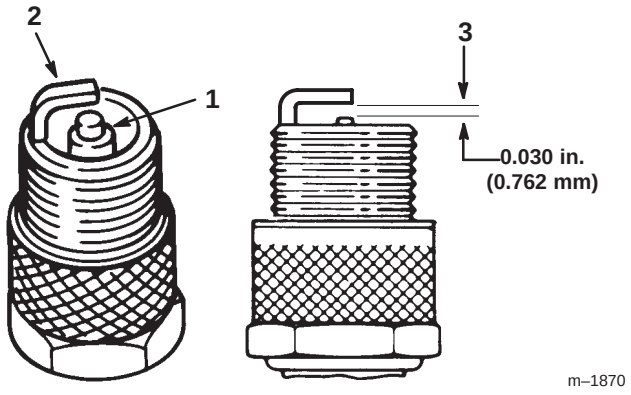


Figure 27

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. 26).

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.

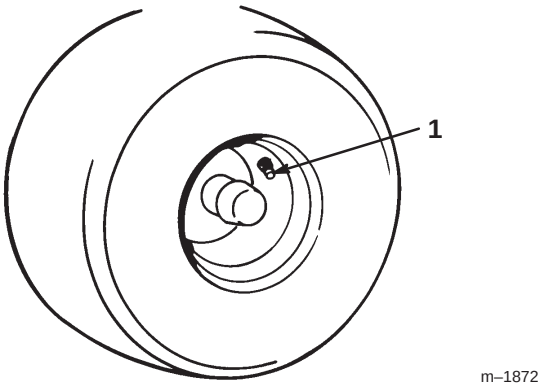


Figure 28

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. 29).

4. Pull the fuel line off of the filter (Fig. 29) 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.

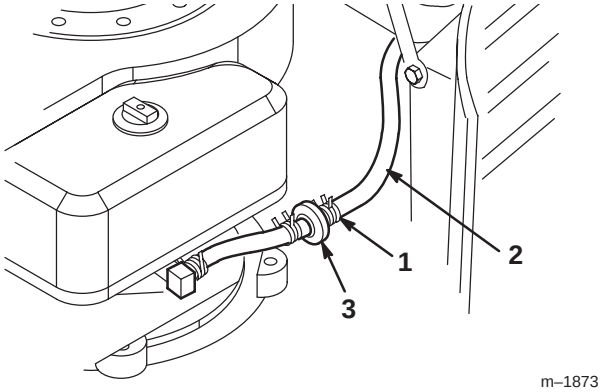


Figure 29

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. 29) 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. 29).
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.

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

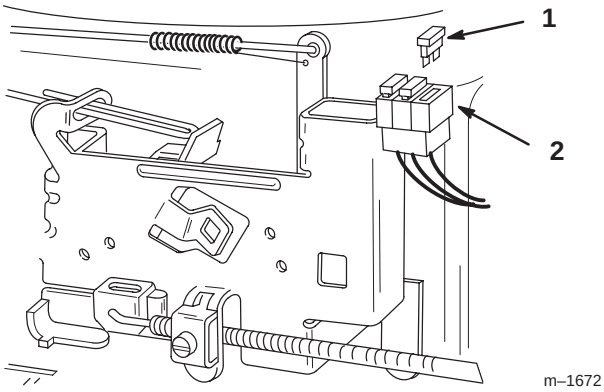


Figure 30

1. Fuse (removed)
2. Socket

Headlights

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. 31).
4. Push and rotate the bulb counterclockwise until it stops (approx. 1/4 turn) and remove the bulb from the bulb holder (Fig. 32).

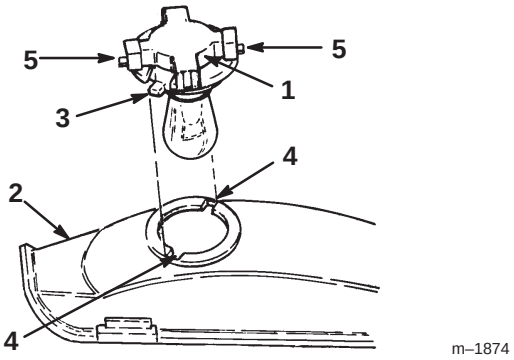


Figure 31

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

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.

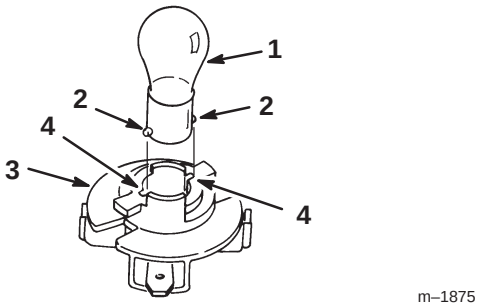


Figure 32

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

2. The bulb holder has two 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 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. 33). 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. 33). If you notice any damage, wear, or a slot forming in this area (Fig. 33), immediately install a new blade.

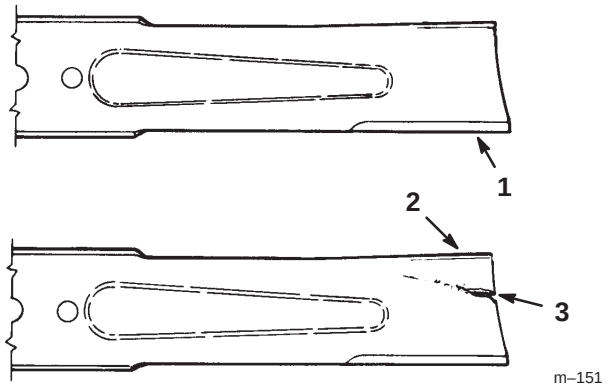


Figure 33

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. 34). 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.

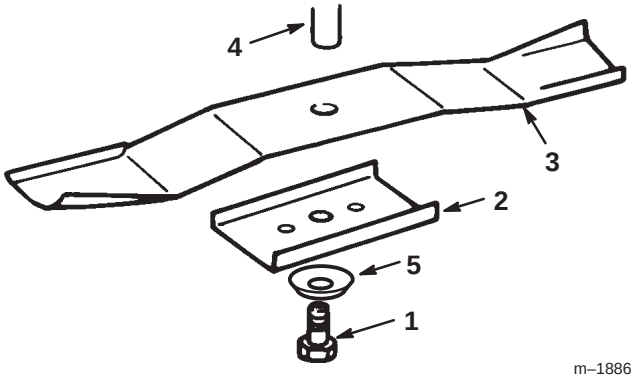


Figure 34

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. 35). Maintain the original angle. The blade retains its balance if the same amount of material is removed from both cutting edges.

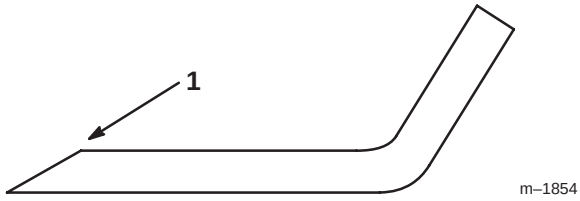


Figure 35

1. Sharpen at original angle

2. 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.

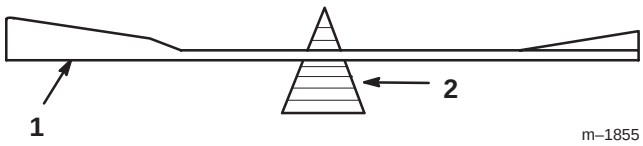


Figure 36

1. Blade
2. Balancer

Installing the Blade(s)

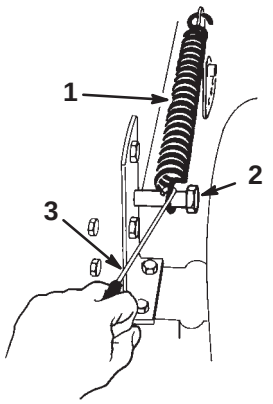
1. Install the blade, blade retainer, curved washer (cupped side toward blade), and the blade bolt (Fig. 34).

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. 37), using the spring tool provided with the machine. The spring is between the frame and the right rear wheel.



m–1851

Figure 37

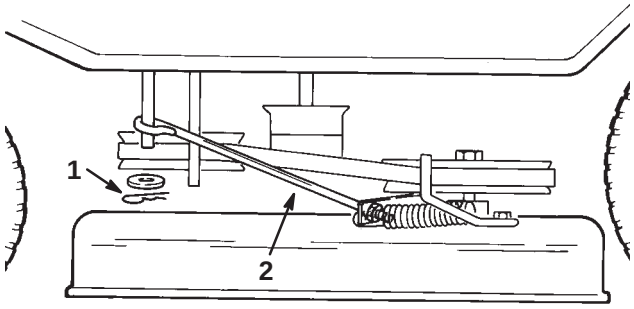
1. Spring
2. Bolt
3. Spring tool

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.
6. Remove the hairpin cotter and washer from the blade control arm on the left side of the mower (Fig. 38). Slide the rod off of the arm.

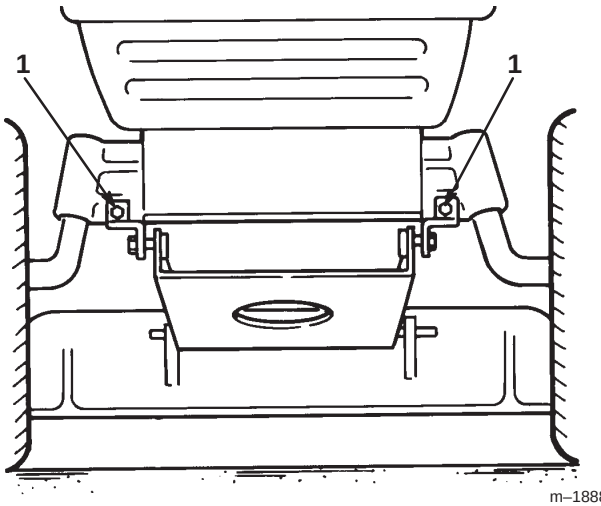


m–1897

Figure 38

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. 39).

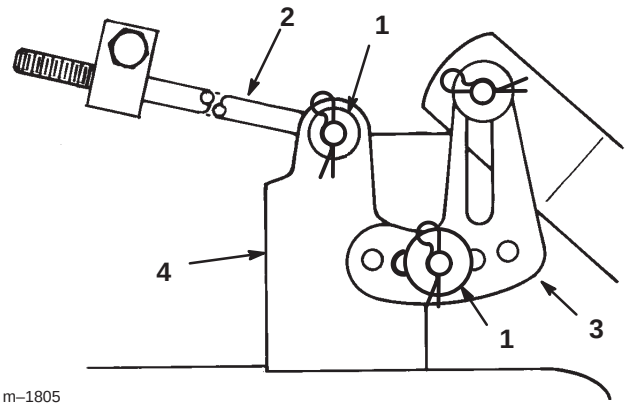


m–1888

Figure 39

1. Pivot mount brackets

8. Remove the hairpin cotter and washer at the top of the mower leveling bracket (Fig. 40). Slide the bracket off of the mounting pin. Repeat this step on the opposite side of the mower.



m–1805

Figure 40

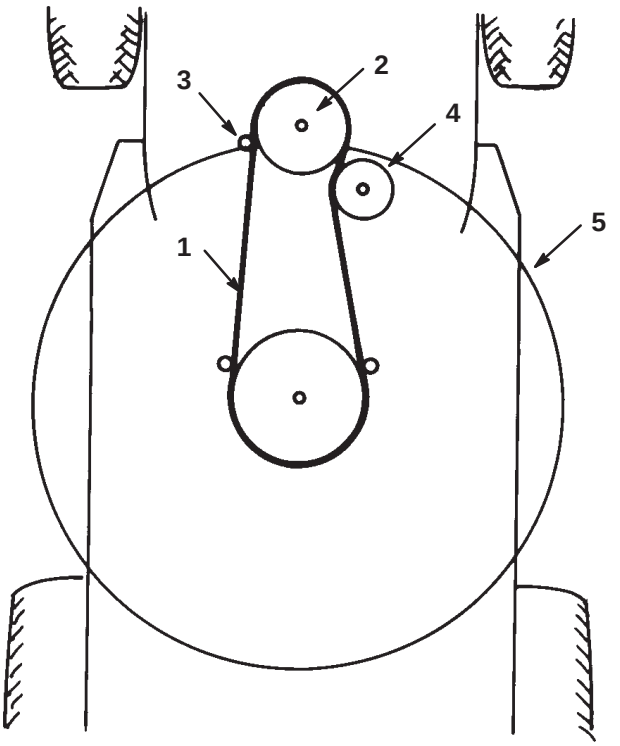
1. Hairpin cotter and washer
2. Long rod
3. Leveling bracket
4. Mower mount

9. Remove the hairpin cotter and washer from the end of the long rod (Fig. 40). 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. 41). 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.



m–1898

Figure 41

Top View

1. Mower belt
2. Engine pulley
3. Belt guide
4. Idler pulley
5. 32” mower

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. 41). 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. 42).

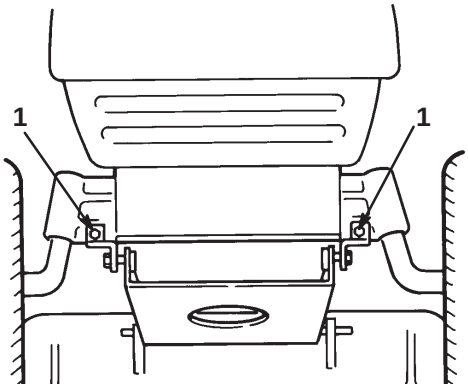


Figure 42

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. 43). Install the washer and hairpin cotter to secure the rod in place. Repeat this step on the opposite side of the mower.

8. Mount the slotted mower leveling bracket onto the pin on the height-of-cut arm (Fig. 43). Install the washer and hairpin cotter to secure the mower. Repeat this step on the opposite side of the mower.

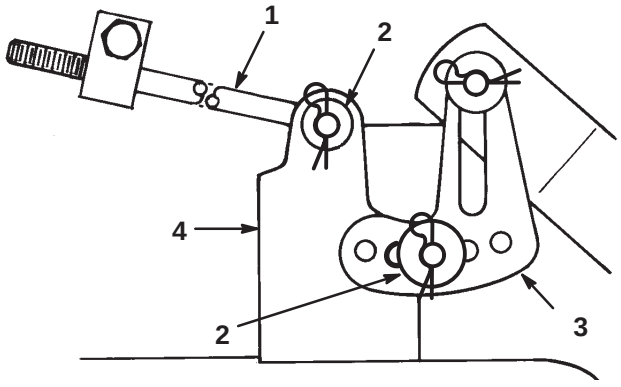
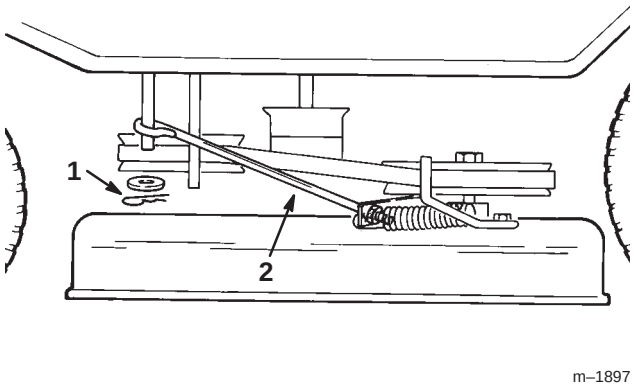


Figure 43

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

9. Install the blade control rod onto the blade control arm and secure it with the washer and hairpin cotter (Fig. 44).



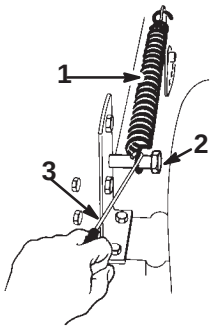
m–1897

Figure 44

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. 45) using the spring tool provided with the machine.



m–1851

Figure 45

1. Spring
2. Bolt
3. Spring tool

12. Check the side-to-side blade level; refer to Leveling the Mower from Side-to-Side, 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. 46).
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. 46).
2. Adjust the belt guides so they are 1/8 in. (3 mm) away from the pulley. Tighten the mounting bolts (Fig. 46).

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.

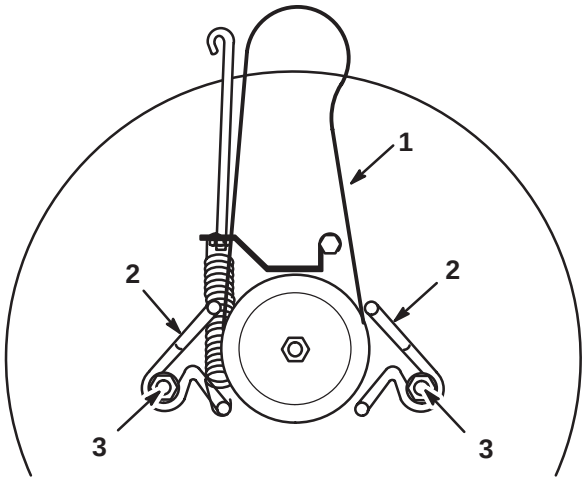


Figure 46

Top View

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

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, page 26.

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. 47). Measure between the outside cutting edges and the flat surface (Fig. 47). If both measurements are not within 3/16 in. (5 mm), an adjustment is required; refer to steps 5 and 6.

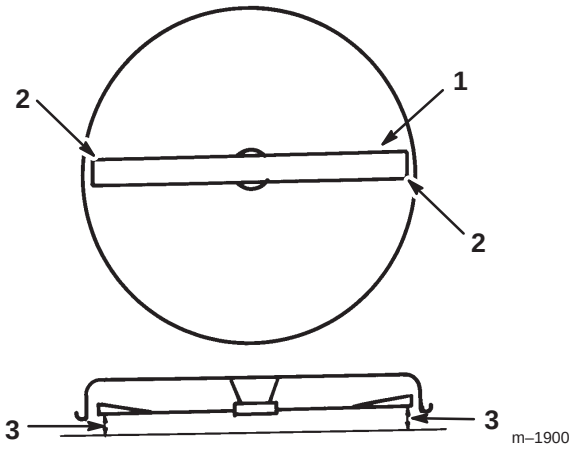


Figure 47

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

5. Remove the hairpin cotter and washer from the leveling bracket (Fig. 48). To level the blade(s), reposition the leveling bracket in a different hole and install the washer and hairpin cotter (Fig. 48). A front hole lowers the blade height and a rear hole raises its height. Repeat this procedure on the opposite side of the mower.

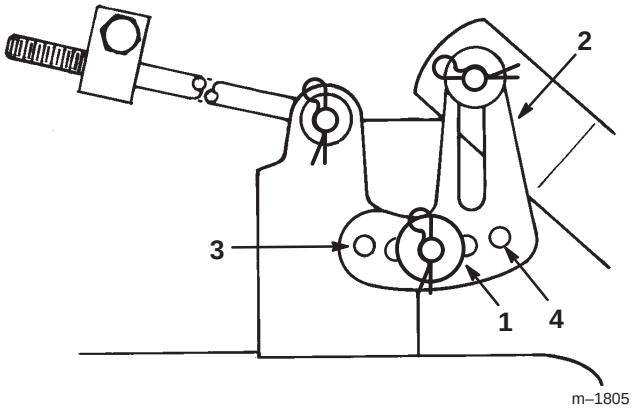


Figure 48

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

6. Check the front-to-rear blade slope; refer to Adjusting the Front-to-Rear Blade Slope, 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, page 26. 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 the side-to-side blade level if you have not checked the setting; refer to Leveling the Mower from Side-to-Side, 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. 49). 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.

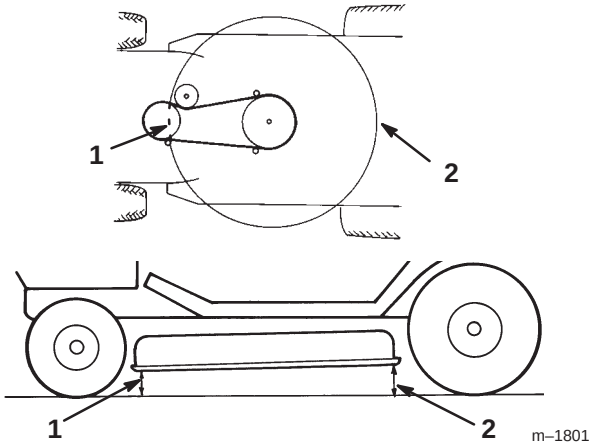


Figure 49

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. 50). 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 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.

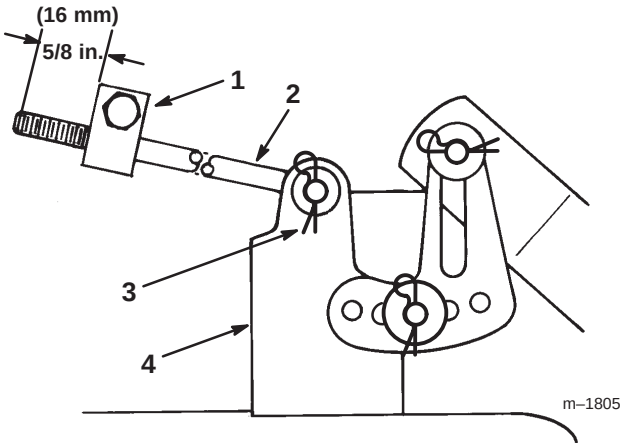


Figure 50

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. 51).

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. 51). 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.

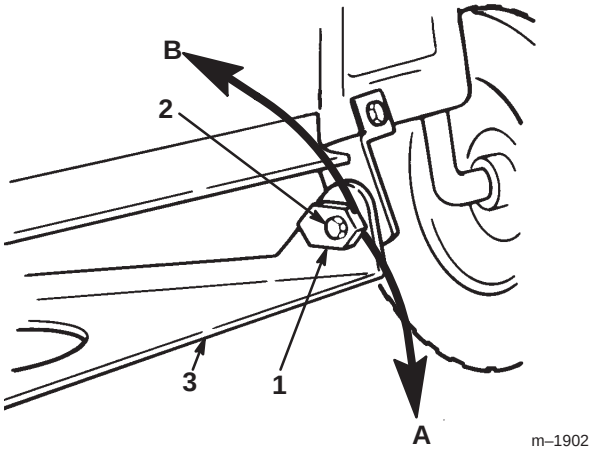


Figure 51

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

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.

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. 52).

12. Remove the shoulder bolts and locknuts from the mower (Fig. 52).

13. Lower the mower pivot one hole and install the shoulder bolts and locknuts (Fig. 52).

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.

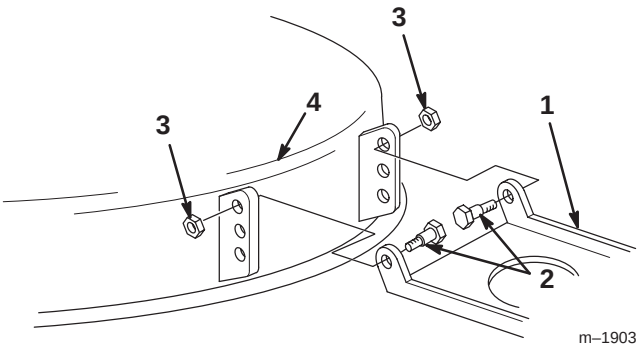


Figure 52

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 Leveling the Mower from Side-to-Side, 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. 53).

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

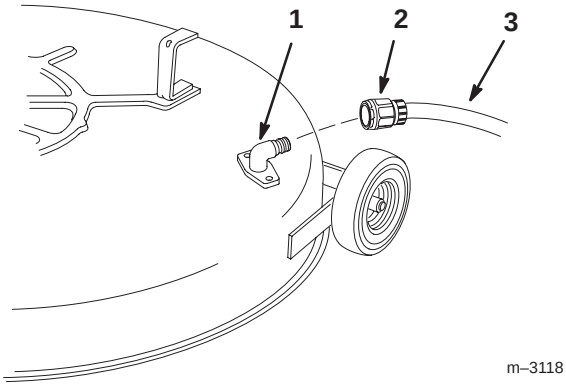


Figure 53

1. Washout fitting
2. Coupling (not supplied)
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 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 Checking the Brake, page 23.

4. Service the air cleaner; refer to Servicing the Air Cleaner, page 23.

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 26.

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 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, 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 again. Use the primer, if equipped on the machine, 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.

9. Remove the spark plug(s) and check its condition; refer to Servicing the Spark Plug, page 25. 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 Spark Plug, page 25. 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.

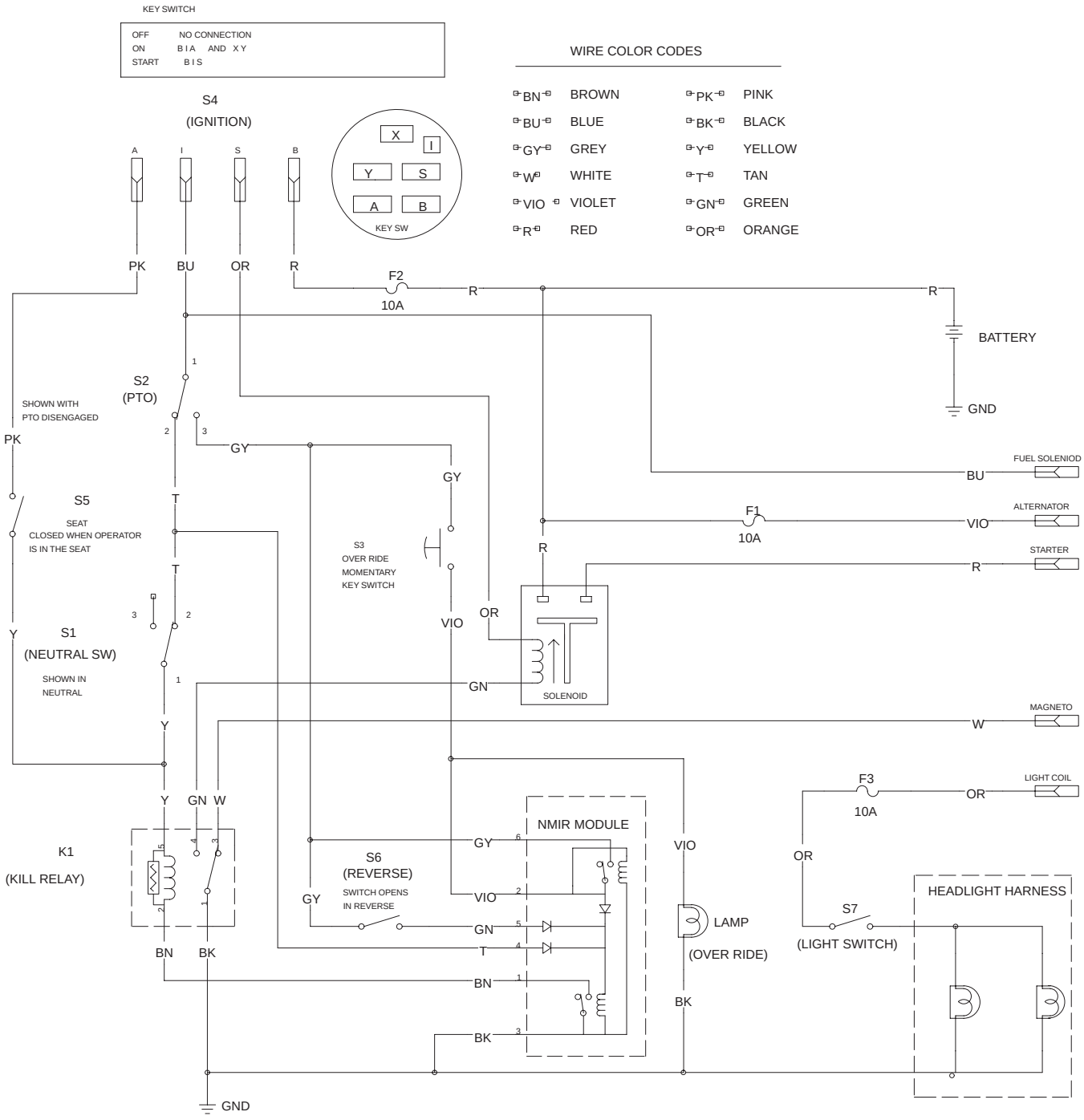
Important The battery must be fully charged to prevent it from freezing and being damaged at temperatures below 32°F (0°C). A fully charged battery can be stored one winter season without recharging.

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.	1. The blade control (PTO) is Engaged.	1. Move the PTO to Disengaged.
	2. The parking brake is not on.	2. Set the parking brake.
	3. The battery is dead.	3. Charge the battery.
	4. The electrical connections are corroded or loose.	4. Check the electrical connections for good contact.
	5. A fuse is blown.	5. Replace the fuse.
	6. A relay or switch is damaged.	6. Contact an Authorized Service Dealer.
The engine will not start, starts hard, or fails to keep running.	1. The operator is not seated.	1. Sit on the seat.
	2. The fuel tank is empty.	2. Fill the fuel tank with gasoline.
	3. The air cleaner is dirty.	3. Clean or replace the air cleaner element.
	4. The spark plug wire is loose or disconnected.	4. Install the wire on the spark plug.
	5. The spark plug is pitted, fouled, or the gap is incorrect.	5. Install a new, correctly-gapped spark plug.
	6. The choke is not closing.	6. Adjust the throttle cable.
	7. There is dirt in the fuel filter.	7. Replace the fuel filter.
	8. The idle speed is too low or the mixture is incorrect.	8. Adjust the carburetor idle speed and idle mixture.
	9. Dirt, water, or stale fuel is in the fuel system.	9. Contact an Authorized Service Dealer.
The engine loses power.	1. The engine load is excessive.	1. Shift into a lower gear to reduce ground speed.
	2. The air cleaner is dirty.	2. Clean the air cleaner element.
	3. The oil level in the crankcase is low.	3. Add oil to the crankcase.
	4. The cooling fins and air passages under the engine blower housing are plugged.	4. Remove the obstruction from the cooling fins and air passages.
	5. The spark plug is pitted, fouled, or the gap is incorrect.	5. Install a new, correctly-gapped spark plug.
	6. The vent hole in the fuel cap is plugged.	6. Clean or replace the fuel cap.
	7. There is dirt in the fuel filter.	7. Replace the fuel filter.
	8. Dirt, water, or stale fuel is in the fuel system.	8. Contact an Authorized Service Dealer.

Problem	Possible Causes	Corrective Action
The engine overheats.	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.	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.	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.	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.	1. The blade drive belt is worn, loose, or broken. 2. The blade drive belt is off of the pulley.	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.	1. The traction belt is worn, loose, or broken. 2. The traction belt is off of the pulley. 3. The transmission does not shift.	1. Contact an Authorized Service Dealer. 2. Contact an Authorized Service Dealer. 3. Contact an Authorized Service Dealer.
The cutting height is uneven.	1. The tire pressure is incorrect. 2. The mower is not level. 3. The underside of the mower is dirty.	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.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