Form No. 3324-800

TORO®

16-38HXLE

Wheel Horse® Lawn Tractor

Model No. 71242—210000001 and Up

Operator's Manual

CE

International English (GB)

Contents

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.

Introduction

Thank you for purchasing a Toro product.

All of us at Toro want you to be completely satisfied with your new product, so feel free to contact your local Authorized Service Dealer for help with service, genuine replacement parts, or other information you may require.

Whenever you contact your Authorized Service Dealer or the factory, always know the model and serial numbers of your product. These numbers will help the Service Dealer or Service Representative provide exact information about your specific product. You will find the model and serial number plate at the location shown in Figure 1.

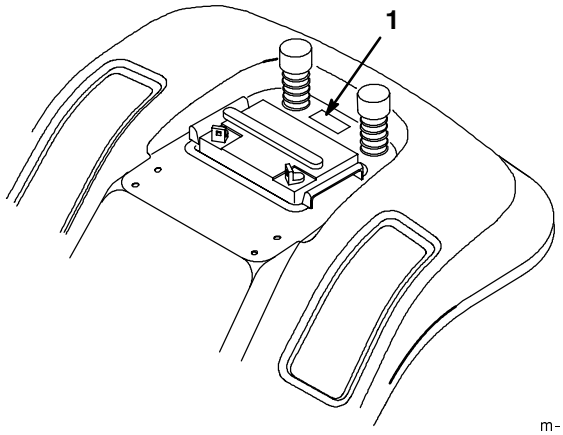


Figure 1

1. Model and serial number plate

8111 Lyndale Avenue South
Bloomington, MN 55420-1196

For your convenience, write the product model and serial numbers in the space below.

Model No: _____

Serial No. _____

Read this manual carefully to learn how to operate and maintain your product correctly. Reading this manual will help you and others avoid personal injury and damage to the product. Although we design, produce and market safe, state-of-the-art products, you are responsible for using the product properly and safely. You are also responsible for training persons, who you allow to use the product, about safe operation.

The warning system in this manual identifies potential hazards and has special safety messages that help you and others avoid personal injury, 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 the recommended precautions are not followed.

Warning signals a hazard that may cause serious injury or death if the recommended precautions are not followed.

Caution signals a hazard that may cause minor or moderate injury if the recommended precautions are not followed.

Two other words are also used 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: 88 dB(A), based on measurements of identical machines per procedures outlined in Directive 84/538/EEC and amendments.

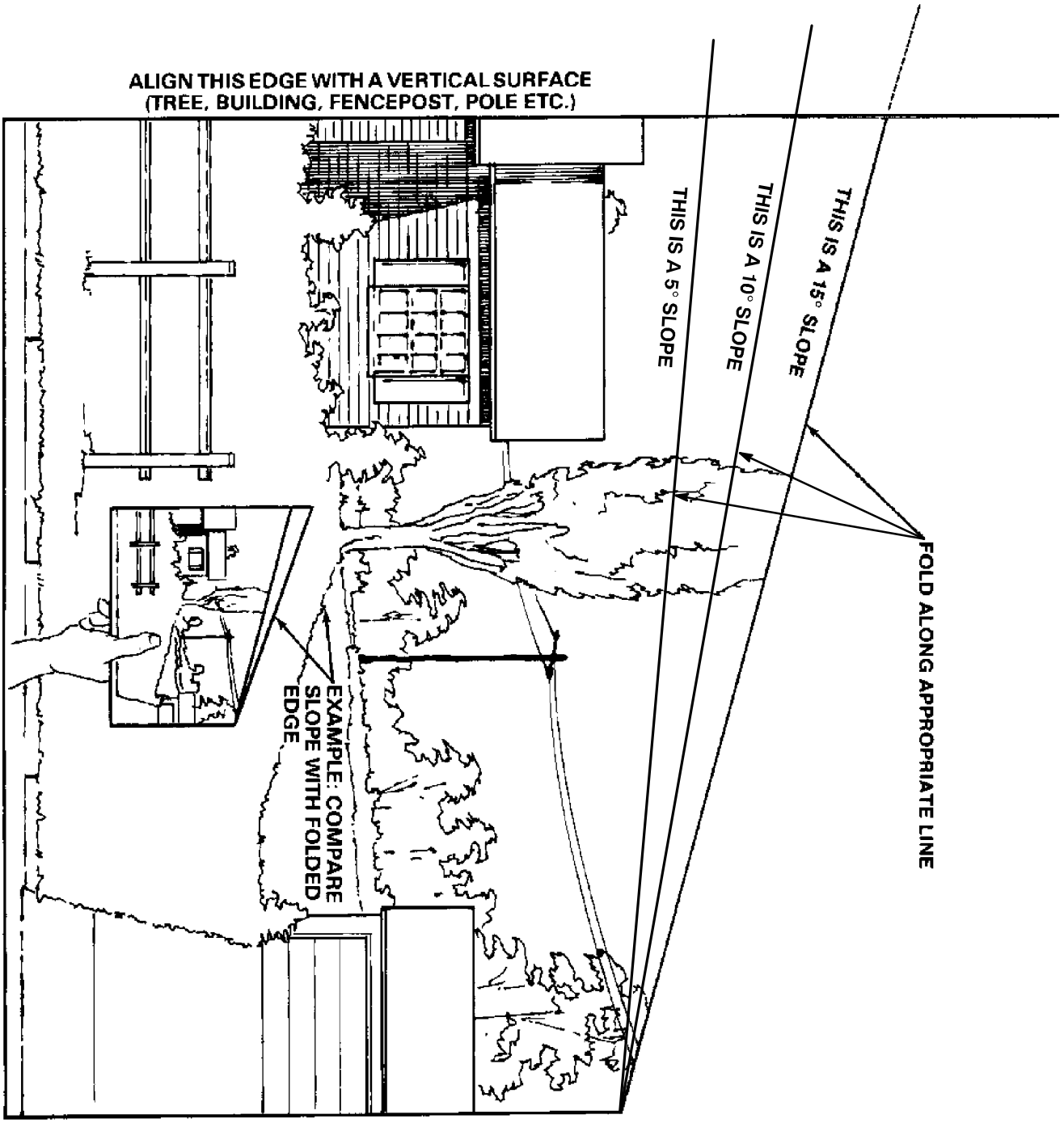
Sound Power Level

This unit has a sound power level of: 100 Lwa, based on measurements of identical machines per procedures outlined in Directive 84/538/EEC and amendments.

Vibration Level

This unit has a maximum hand-arm vibration level of 4.0 m/s^2 and whole body vibration level of 0.2 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

Symbols Glossary

Safety alert symbol

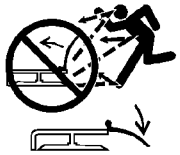
Safety alert symbol

Read the Operator's Manual.

Consult the Operator's Manual for proper service procedures.

Thrown or flying objects—whole body exposure

Thrown or flying objects—rotary side-mounted mower. Keep the deflector shield in place.

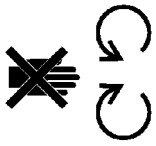


Severing toes or foot—mower blade

Severing fingers or hand—mower blade

The rotating blade can cut off toes or fingers. Stay clear of the blade as long as the engine is running.

Do not open or remove the safety shields while the engine is running.

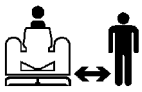


Fire, open light, and smoking are prohibited.

Eye protection must be worn.

Dismemberment—mower in rearward motion

Stay a safe distance from the machine.



Keep children a safe distance from the machine.

Machine rollover—side hill

Machine rollover—up hill

Machine rollover—down hill

Machine rollover

Operating in reverse is not allowed unless it is deactivated by the KeyChoice™ key.

Crushing of fingers or hands—force applied from side

Explosion

Caustic liquids; chemical burns to fingers or hands

Symbols Glossary

Fast

Slow

Decreasing/Increasing

On/Run

Off/Stop

Engine

Engine start

Engine stop

Engine run

Choke

Operating in reverse

Shut off the engine and remove the key before leaving the operator's position.

KeyChoice switch

Do not pull other machines.

Do not dispose of the lead battery in the garbage.

Headlights—main/high beam

Brake system

Parking brake

PTO (Power Take Off)

Engage

Disengage

Low

High

Reverse

Neutral

First gear

Second gear

Third gear up to a maximum number of forward gears

Fuel

Pull the lever out to push the machine.

Push the lever in to drive the machine.

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.

Check 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 symbols 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.

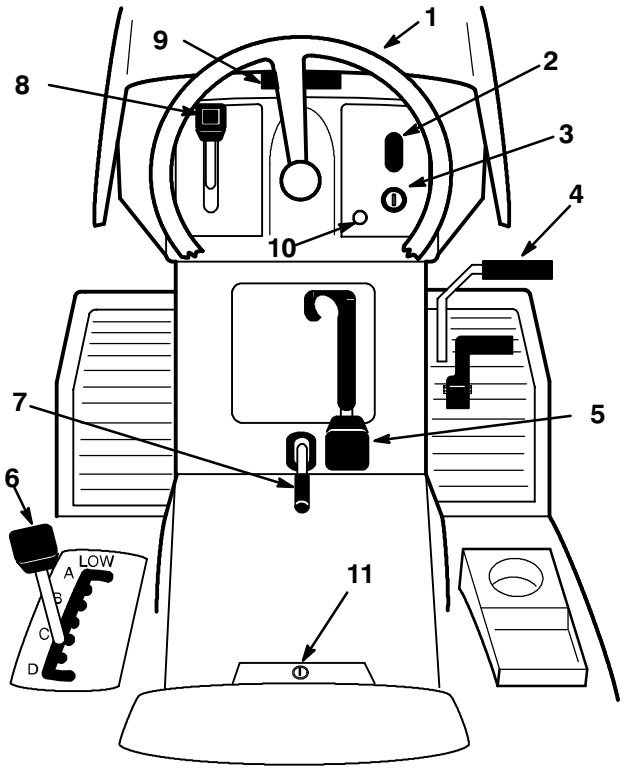


Figure 1

1. Steering wheel
2. Light switch—on/off (selected models)
3. Ignition switch
4. Clutch/brake pedal
5. Blade control (PTO)
6. Height-of-cut lever (deck-lift)
7. Parking brake lever
8. Throttle lever
9. Hood opening
10. Operating-in-reverse light
11. 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 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 the brake pedal. The brake pedal should stay in the depressed (locked) position.

Releasing the Parking Brake

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

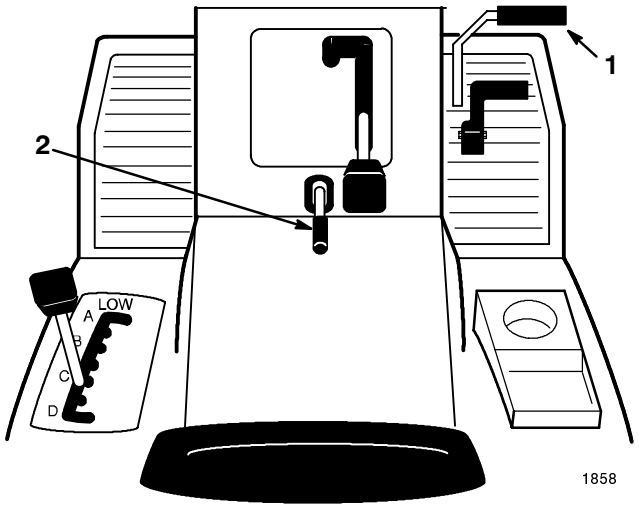


Figure 2

1. 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.

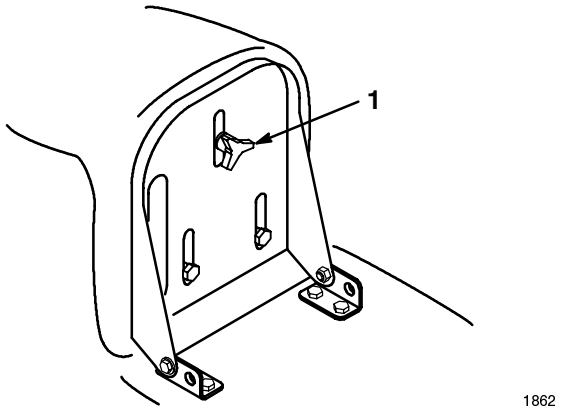


Figure 3

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

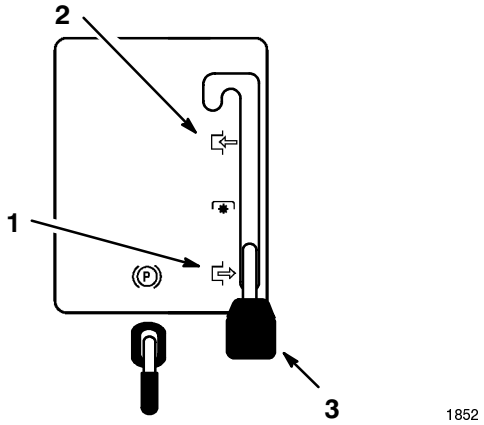


Figure 4

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

Disengaging the Blade(s)

1. Depress the 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.

1. The cutting height may be set in one of seven positions from approximately 1 to 4 in. (25 to 102 mm).
2. Pull on the height-of-cut lever (deck lift) and move it to the desired position (Fig. 5).

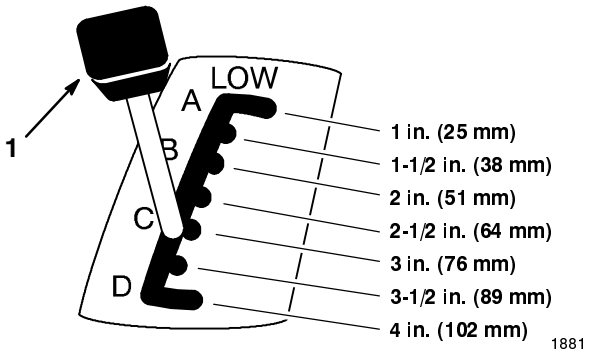


Figure 5

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

Adjusting Mower Wheels

The mower front wheels are to guide it over uneven ground. The height of these wheels can be changed to closer match the height of cut selected for the mower.

Remove the wheel mounting bolt and mount it into the desired hole (Fig. 6).

Use the top hole for the lowest height of cut and the bottom hole for higher heights of cut (Fig. 6).

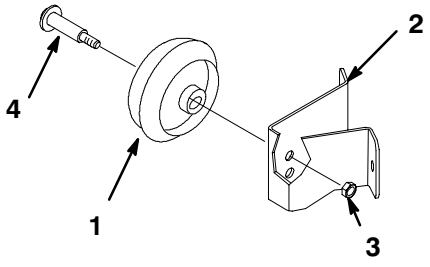


Figure 6

1. Wheel
2. Wheel bracket
3. Locknut
4. Wheel bolt

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 brake pedal.

3. Move the PTO to Disengaged (Fig. 7).
4. Move the throttle lever to Choke (Fig. 8).

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

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

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 39.

6. 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.

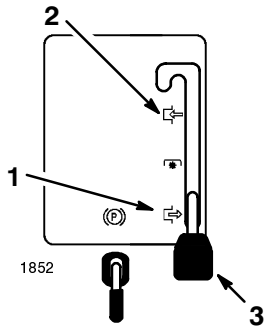


Figure 7

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

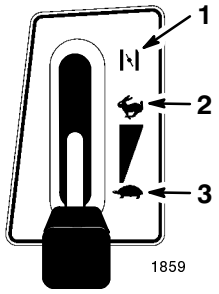


Figure 8

1. Choke
2. Fast
3. Slow

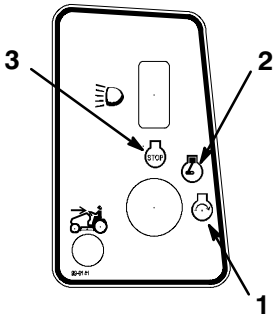


Figure 9

1. Start
2. On
3. Off

Stopping

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

The Safety Interlock System

Understanding the Safety Interlock System

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

- You are sitting on the seat.
- The brake pedal is depressed.
- The PTO is disengaged.

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

- You rise from the seat when the brake pedal is released.
- You rise from the seat when the PTO is Engaged.
- You shift into reverse with the PTO 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. 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).

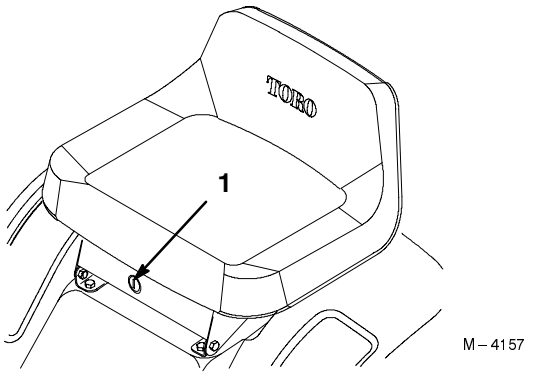


Figure 10

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.

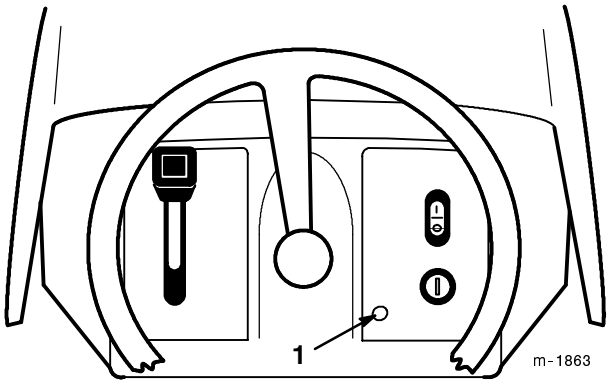


Figure 11

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

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. Set the parking brake. Move the PTO to Engaged. Turn the ignition key to Start; the engine should not crank.
2. Move the PTO to Disengaged and release the parking brake. Turn the ignition key to Start; the engine should not crank.
3. 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 traction control pedal in neutral, and set the parking brake. Start the engine. While the engine is running, move the PTO lever to the Engage position and move the traction control pedal to reverse. The engine should stop.

5. Put the PTO lever in the Disengage position, the traction control pedal 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.

Pushing the Machine by Hand

Important Always push the machine by hand. Never tow the machine because transaxle damage may occur.

To Push the Machine

1. Disengage the PTO, stop the engine, and remove the ignition key.
2. Pull the drive control out to the Push position. This disengages the drive system and allows the wheels to turn freely (Fig. 12).

To Operate the Machine

1. Push the drive control in to the Operate position. This engages the drive system (Fig. 12).

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

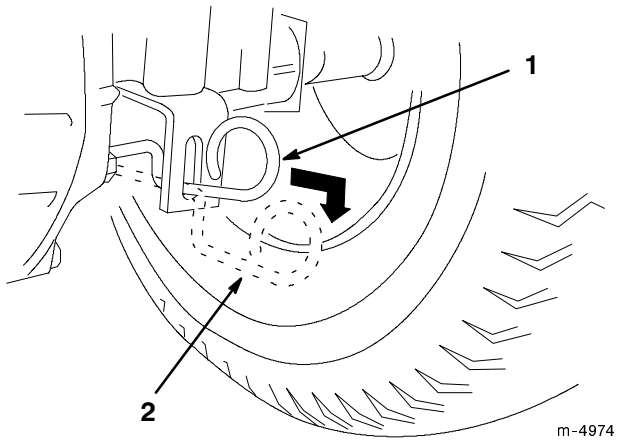


Figure 12

1. Operate position
2. Push position

Driving Forward or Backward

The throttle control regulates the engine speed as measured in rpm (revolutions per minute). Place the throttle control in the Fast position for best performance.

To go forward or backward, release the parking brake; refer to Releasing the Parking Brake, page 12. Place your foot on the traction control pedal and slowly press on the top of the traction control pedal to move forward or on the bottom of the traction control pedal to move backward (Fig. 13). The farther you move the traction control pedal in either direction, the faster the machine will move in that direction.

To slow down, release the pressure on the traction control pedal.

Important To avoid transmission damage, always release the parking brake before moving the traction control pedal.

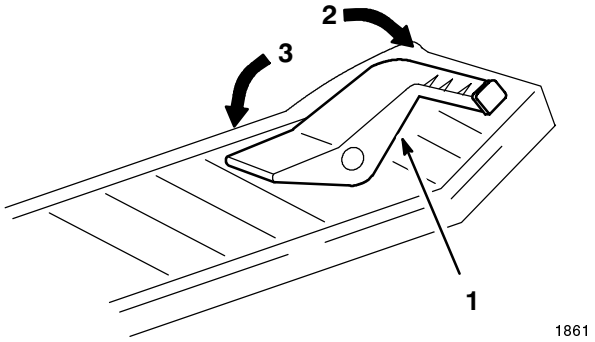


Figure 13

1. Traction control pedal
2. Forward
3. Backward

Stopping the Machine

To stop the machine, release the traction control pedal, 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 key from the ignition switch.

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.

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

Note: Do not overtighten the nuts which could distort the cover and cause blade contact.

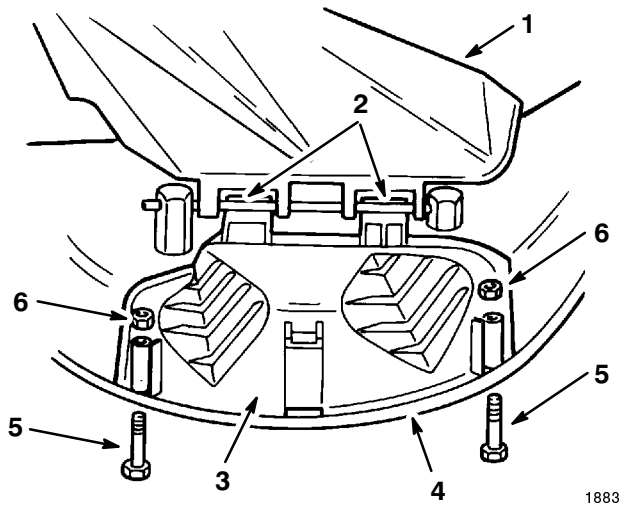


Figure 14

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

4. 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 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 six in. (15.2 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 four 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 two 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 side 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 • Check the battery electrolyte
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]
Every 100 hours	• Change the oil filter[2] • Service the paper air cleaner[1] • Replace the spark plug • Replace the fuel filter • Clean the cooling system[1] • Check the transaxle fluid
Before storage	• Perform all of the maintenance procedures listed above • Check the belts for wear/cracks • Drain the gasoline • 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.

Engine Oil

Service Interval/Specification

Change oil:

- After the first 5 operating hours.
- After every 50 operating hours.

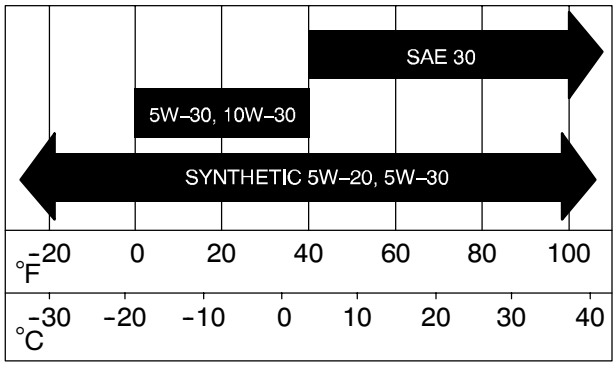
Note: Change oil more frequently when operating conditions are extremely dusty or sandy.

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) when the filter is not changed; 56 oz./1-3/4 qt. (1700 cc/1.7 l) when the filter is changed

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, set the parking brake, stop the engine, and remove the ignition key.
2. Open the hood.
3. Clean around the oil dipstick (Fig. 15) so dirt cannot fall into the filler hole and damage the engine.

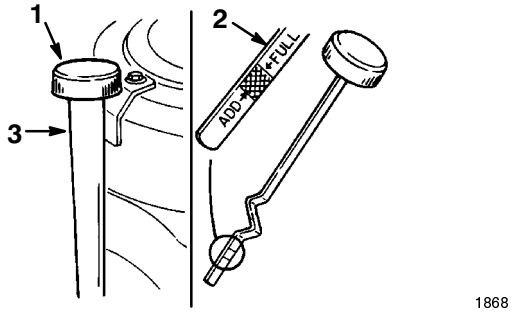


Figure 15

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

4. Unscrew the oil dipstick and wipe the metal end clean (Fig. 15).
5. Screw the oil dipstick fully onto the filler tube (Fig. 15). 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.

Changing and Draining the Oil

1. Start the engine and let it run five minutes. This warms the oil so 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, 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. 16).

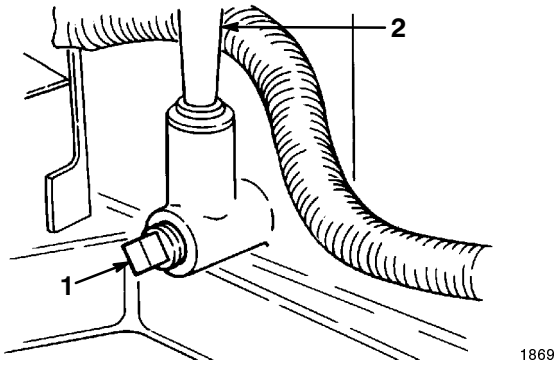


Figure 16

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

5. When the oil has drained completely, install the drain plug.

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

6. Change the oil filter (Fig. 17).
7. Slowly pour approximately 80% of the specified amount of oil into the filler tube (Fig. 15). Check the oil level; refer to Checking the Oil Level, page 20, steps 4–5.

Changing the Oil Filter—Service Interval/Specification

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

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

1. Drain the oil from the engine; refer to Changing and Draining the Oil, page 20.
2. Remove the old filter and wipe the filter adapter (Fig. 17) gasket surface.
3. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Fig. 17).

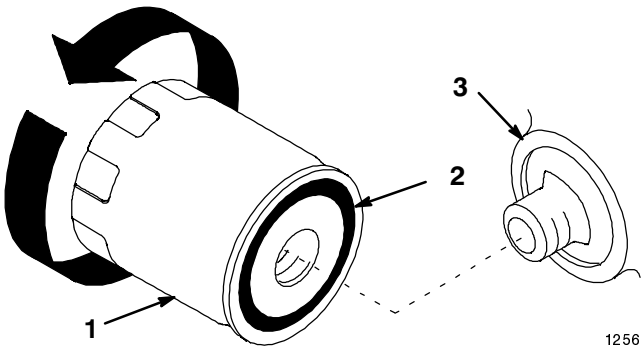


Figure 17

1. Oil filter
2. Gasket
3. Adapter

4. Install the replacement oil filter to the filter adapter. Turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/2 turn (Fig. 17).
5. Slowly pour approximately 80% of the specified amount of oil into the filler tube (Fig. 15). Check the oil level; refer to Checking Oil the Level, page 20, steps 4 and 5.

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.***

Service Interval/Specification

Always keep the battery clean and fully charged. Use a paper towel to clean the 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, 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, 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. 18).

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. 18).
5. Remove the battery box and battery from the chassis.

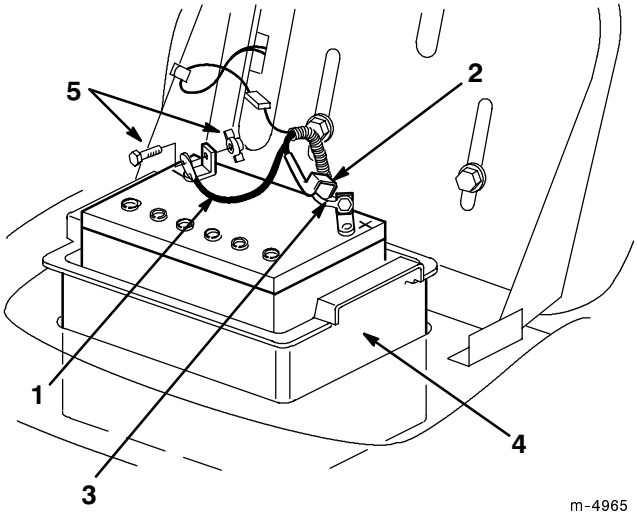


Figure 18

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. 18).
2. Using the bolt and wing nut, connect the positive (red) cable to the positive (+) battery post (Fig. 18). 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. 18).

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. 19). Do not allow the electrolyte to fall below the Lower line (Fig. 19).
3. If the electrolyte is low, add the required amount of distilled water; refer to Adding Water to the Battery, page 22.

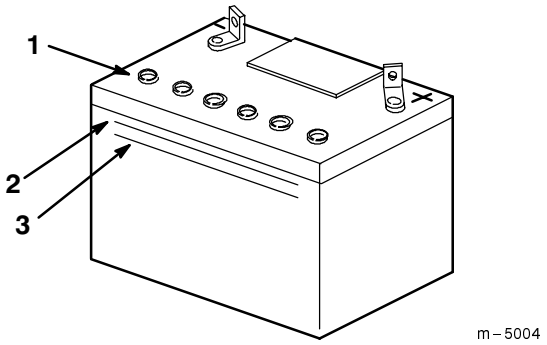


Figure 19

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

3. Remove the vent caps from the battery (Fig. 19).
4. Slowly pour distilled water into each battery cell until the electrolyte level is up to the Upper line (Fig. 19) 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. 19) 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 the vent caps are installed in the battery. Charge the battery for 10 to 15 minutes at 25 to 30 amps or 30 minutes at 4-6 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. 20).

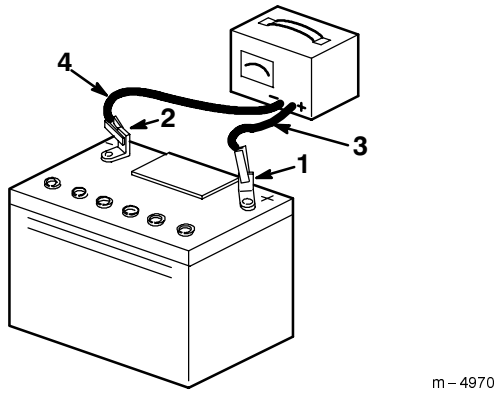


Figure 20

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 22.

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

Brake

The brake is on the right side of the rear axle, inside the rear tire (Fig. 21). If the parking brake does not hold securely, an adjustment is required.

Checking the Brake

1. Park the machine on a level surface, disengage the PTO, set the parking brake, stop the engine, and remove the ignition key.
2. Move the drive control wire to the Push position; refer to Pushing the Machine by Hand, page 16.
3. 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. Remove the brake arm spring (Fig. 21).
3. Remove the cotter pin securing the brake adjusting nut and slightly loosen the nut (Fig. 21).
4. Insert a 0.015 in. (.38 mm) feeler gauge between the brake disc and brake puck (Fig. 21). Tighten the nut until slight resistance is felt on the feeler gauge when sliding it in and out.
5. Install a new cotter pin and reattach the brake arm spring.
6. Check the brake operation again; refer to Checking the Brake, page 23.

Important With the parking brake released, the rear wheels must rotate freely when you push the tractor. If the .015 in. (.38 mm) clearance and free wheel rotation cannot be achieved, contact your service dealer immediately.

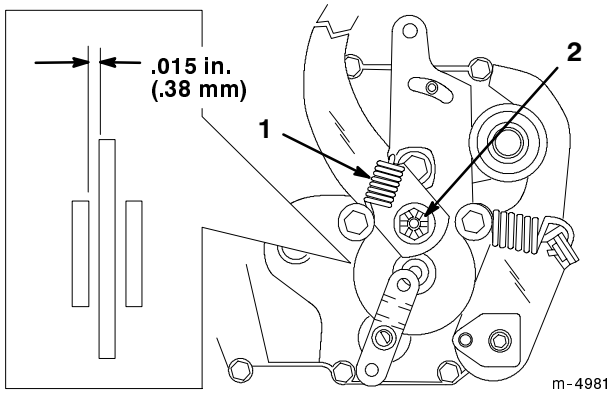


Figure 21

1. Brake arm spring
2. Brake adjusting nut

Greasing and Lubrication

Service Interval/Specification

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, 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. 22).

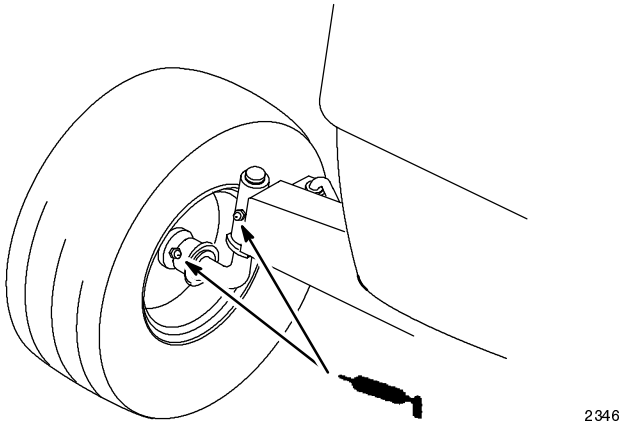


Figure 22

Air Cleaner

Service Interval/Specification

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

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

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

Removing the Foam and Paper Elements

1. Disengage the PTO, 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. 23).

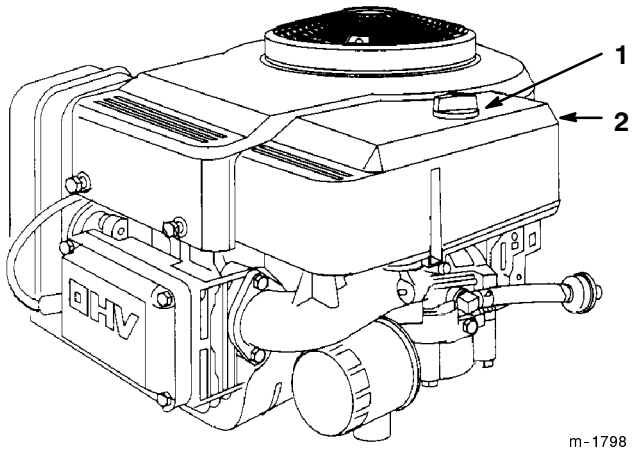


Figure 23

1. Knob 2. Air cleaner cover

4. Carefully slide the foam element off of the paper element (Fig. 24).

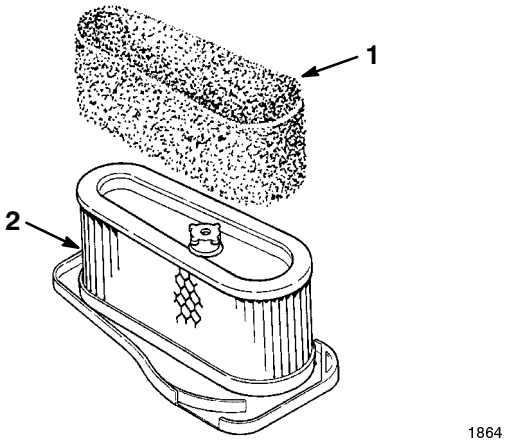


Figure 24

1. Foam element 2. Paper element

5. Unscrew the rubber nut and remove the paper element (Fig. 25).

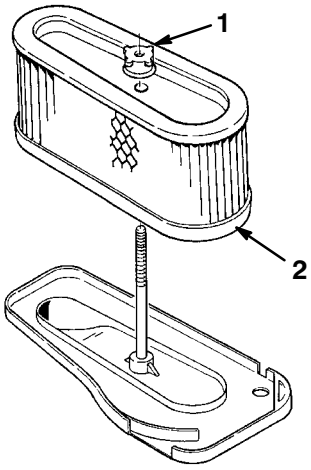


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Figure 25

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. 26). Squeeze the element to distribute the oil.

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

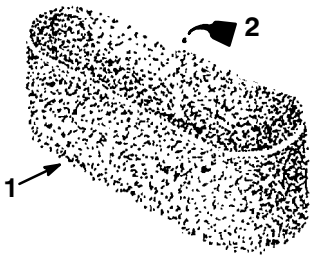

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Figure 26

1. Foam element 2. Oil

2. Paper Element

   A. Lightly tap the element on a flat surface to remove dust and dirt (Fig. 27).

   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.

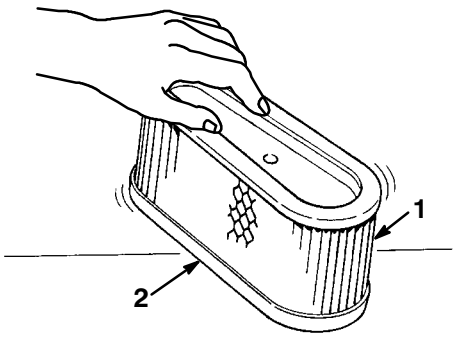

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Figure 27

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. 24).
2. Slide the air cleaner assembly onto the long rod. Now screw the rubber nut finger-tight against the air cleaner (Fig. 25).

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

3. Install the air cleaner cover and knob (Fig. 23). Tighten the knob snugly.
4. Close the hood.

Spark Plug

Service Interval/Specification

Install a new spark plug after every 100 operating hours. Check the spark plug after every 25 operating hours. Make sure 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 RC12YC (or equivalent)

Air Gap: 0.030 in. (0.76 mm).

Removing the Spark Plug

1. Disengage the PTO, 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. 28). 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.

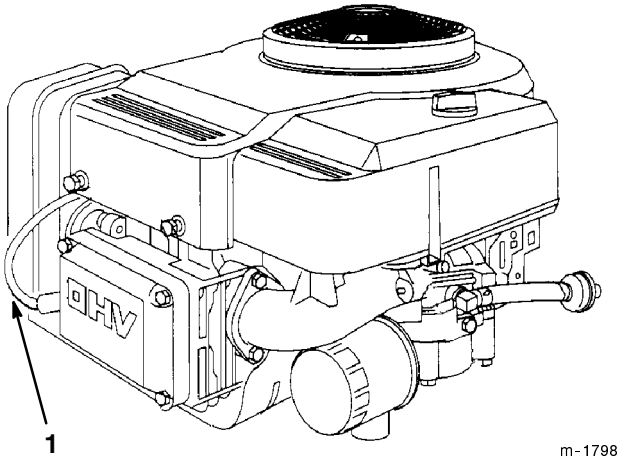


Figure 28

1. Spark plug wire

Checking the Spark Plug

1. Look at the center of the spark plug (Fig. 29). 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. 29). Bend the side electrode (Fig. 29) if the gap is not correct.

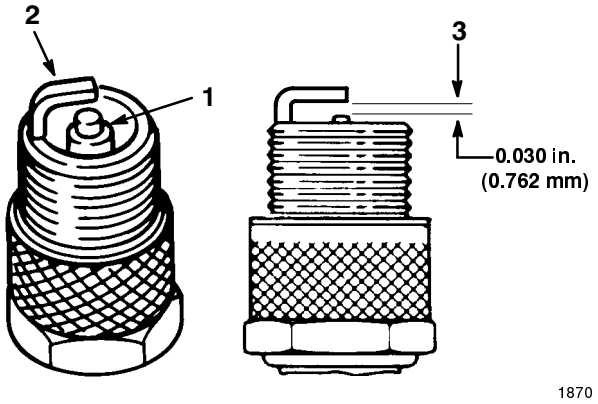


Figure 29

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 the air gap is set correctly.
2. Tighten the spark plug to 15 ft.-lb. (20.4 N•m).
3. Push the wire onto the spark plug (Fig. 28).
4. Close the hood.

Tire Pressure

Service Interval/Specification

Maintain the air pressure in the front and rear tires at 20 psi (138 kPa). Check the pressure at the valve stem after every 25 operating hours or yearly, whichever occurs first (Fig. 30). Check the tires when they are cold to get the most accurate pressure reading.

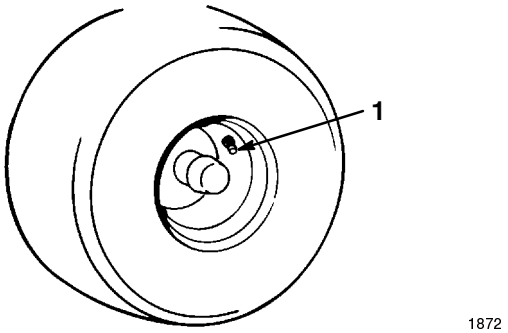


Figure 30

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. Then disengage the PTO, 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. 31).
4. Pull the fuel line off of the filter (Fig. 31) 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.

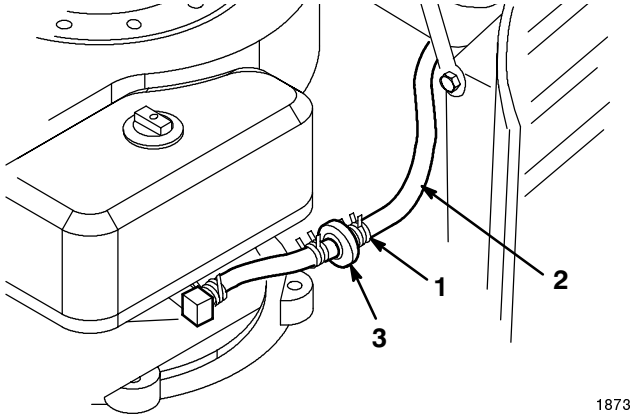


Figure 31

1. Hose clamp
2. Fuel line
3. Filter

Fuel Filter

Service Interval/Specification

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

Replacing the Fuel Filter

The best time to replace the fuel filter (Fig. 31) is when the fuel tank is empty. Never install a dirty filter if it is removed from the fuel line.

1. Disengage the PTO, 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. 31).
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.

Transaxle Fluid

Service Interval/Specification

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

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

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

Checking Fluid Level

1. Park the machine on a level surface, disengage the PTO, set the parking brake, stop the engine, and remove the ignition key.
2. Clean around the fill plug (Fig. 32) so dirt cannot fall into the reservoir if fluid needs to be added.
3. Remove the fill plug and check the fluid level. The level should be a maximum of 1-1/4 in. (32 mm) below the top of the fill port (Fig. 32). Add oil if necessary.

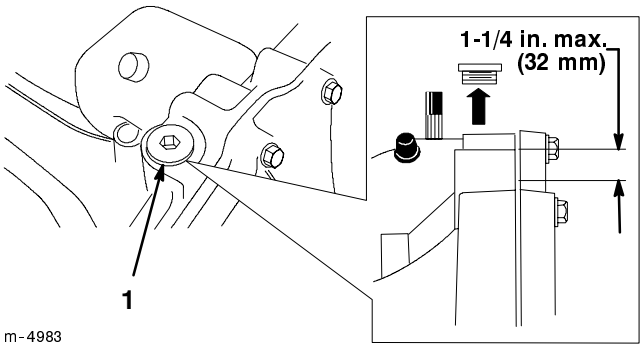


Figure 32

1. Fill plug

4. Replace the fill plug.

Fuse

Service Interval/Specification

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. 33) to remove it from the socket. Push down to insert it.

Fuse: 10 amp, blade-type

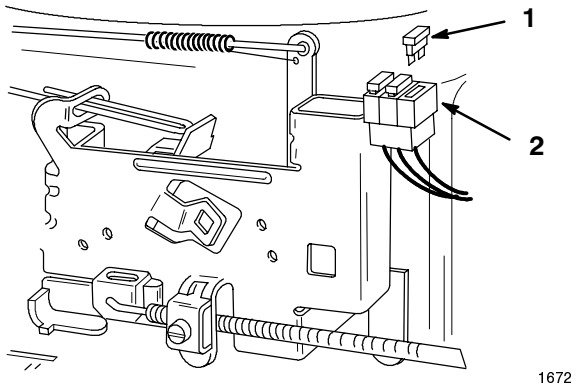


Figure 33

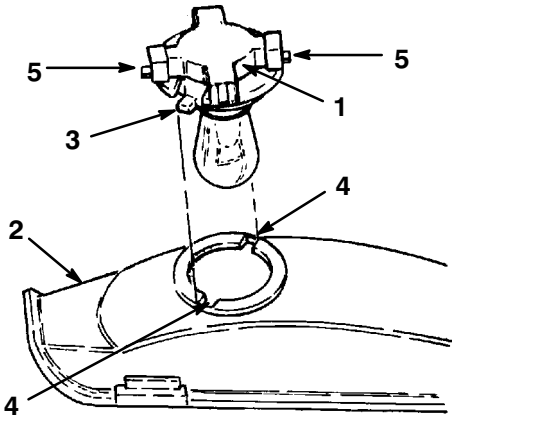
1. Fuse (removed)
2. Socket

Headlights

Specification: Bulb # 1156, automotive type

Removing the Bulb

1. Disengage the PTO, set the parking brake, stop the engine, and remove the ignition key.
2. Open the hood. Pull 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. 34).
4. Push and rotate the bulb counterclockwise until it stops (approx. 1/4 turn) and remove the bulb from the bulb holder (Fig. 35).



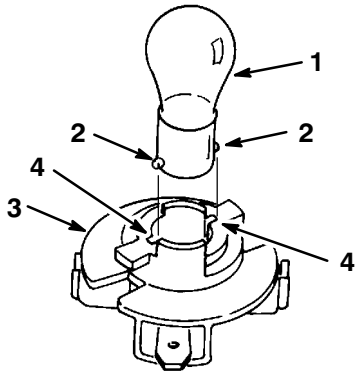
1874

Figure 34

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



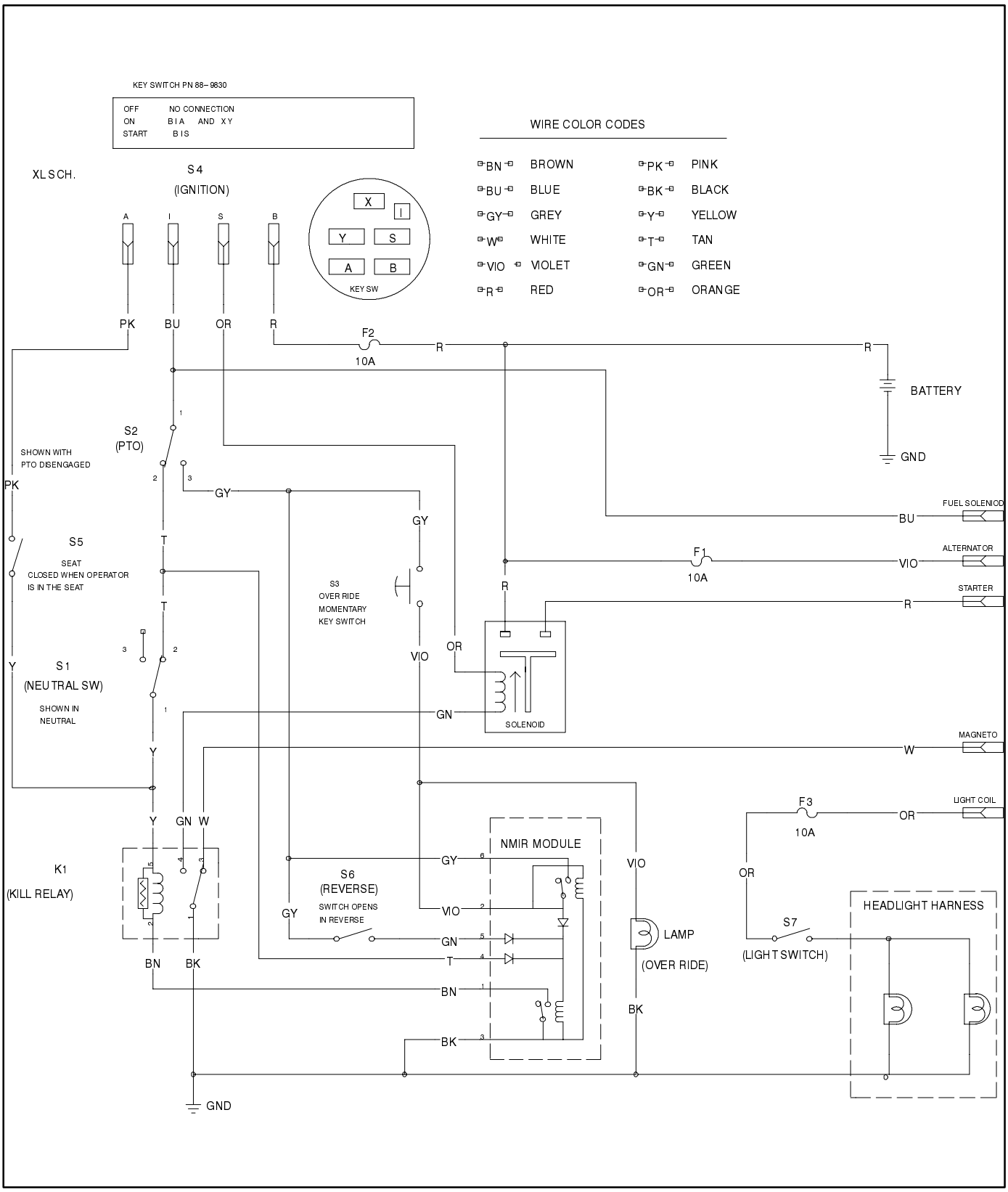
1875

Figure 35

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

2. The bulb holder has two tabs (Fig. 34). 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.

Wiring Diagram



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 32.
2. Inspect the cutting edges (Fig. 36). If the edges are not sharp or have nicks, remove the blade(s) and sharpen them; refer to Sharpening the Blade(s), page 31.
3. Inspect the blade(s), especially the curved area (Fig. 36). If you notice any damage, wear, or a slot forming in this area (Fig. 36), immediately install a new blade.

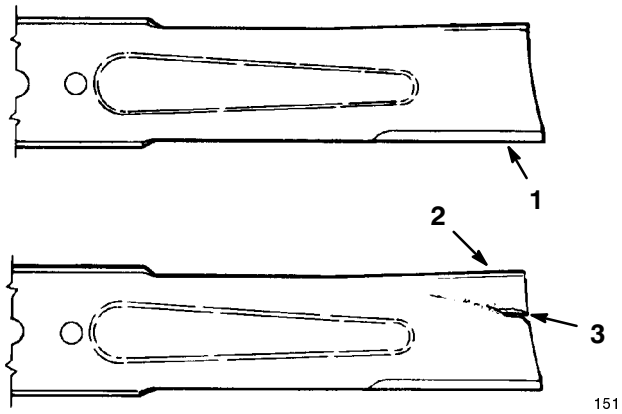


Figure 36

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

Removing the Blade

1. Remove the mower; refer to Removing the Mower, page 32.
2. Carefully tip the mower over.
3. Remove the bolt (5/8 in. wrench), curved washer, retainer, and blade (Fig. 37). 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.

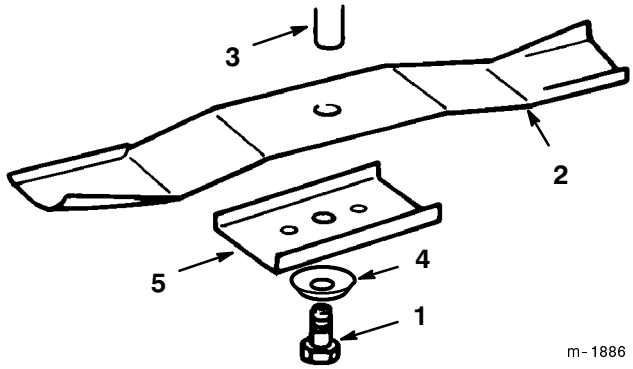


Figure 37

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

Sharpening the Blade(s)

1. Use a file to sharpen the cutting edge at both ends of the blade (Fig. 38). Maintain the original angle. The blade retains its balance if the same amount of material is removed from both cutting edges.

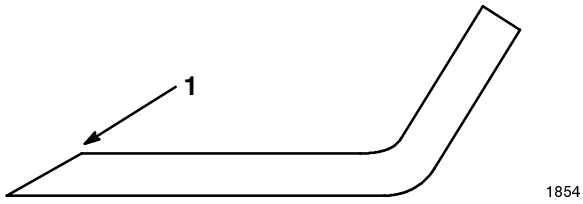


Figure 38

1. Sharpen at original angle

2. Check the balance of the blade by putting it on a blade balancer (Fig. 39). 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.

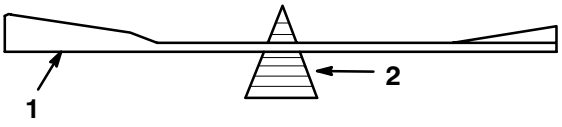


Figure 39

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. 37).

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

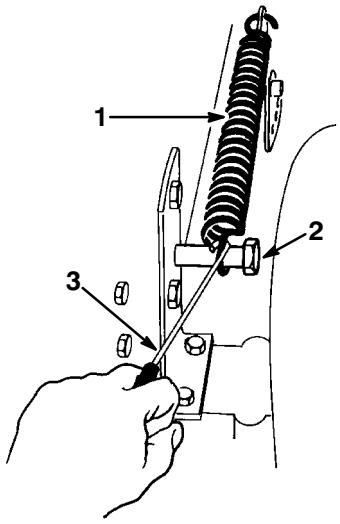


Figure 40

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. Unhook the PTO cable ring end from the idler spring (Fig. 41).

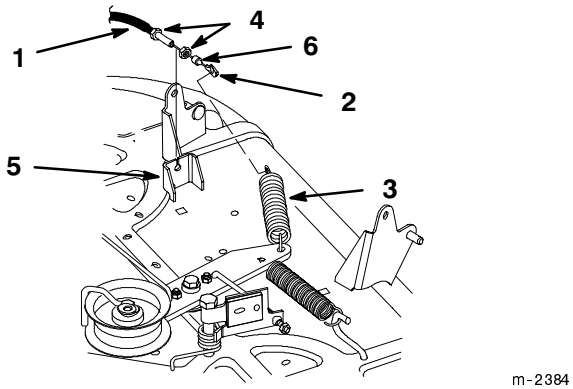


Figure 41

1. Blade control (PTO) cable
2. Ring end
3. Idler spring
4. Jam nut
5. Mounting bracket
6. Rubber wiper

7. Remove the rubber wiper and jam nut from the PTO cable at the mounting bracket. Slide the cable from the bracket (Fig. 41).
8. Move the cable out of the way and lay it inside the frame rail so it cannot get caught in the drive belts or pulleys.

9. Remove the bolts and locknuts and pull the two mower pivot mount brackets down from the front axle (Fig. 42).

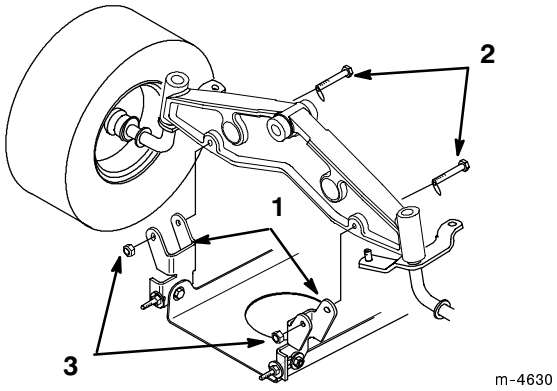


Figure 42

1. Pivot mount bracket
2. Bolt 5/16-18 x 2-1/2 in.
3. Locknut

10. Remove the hairpin cotter and washer from the end of the long rod (Fig. 43). Slide the rod out of the mower mount. Repeat this step on the opposite side of the mower.

11. Remove the hairpin cotter and washer at the mower leveling bracket (Fig. 43). Slide the bracket off of the mounting pin. Install the washer and hairpin cotter for storage.

12. Rotate the leveling bracket up toward the frame, and hook the long rod into one of the holes to store it. Secure the long rod with the washer and hairpin cotter. Repeat for the opposite side of the mower.

13. Move the height-of-cut lever into the “D” notch. Hook lift assist spring onto the retaining bolt for storage (Fig. 40).

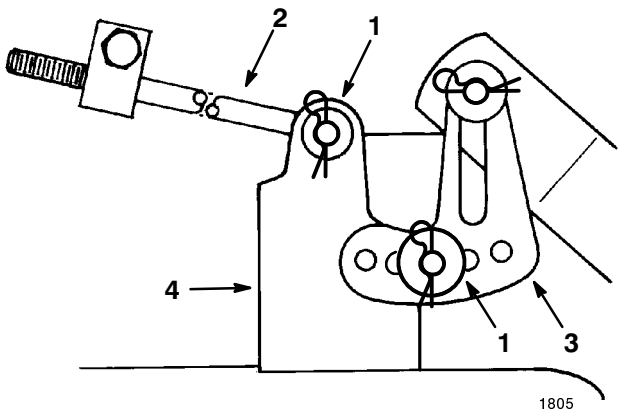


Figure 43

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

14. Remove the mower belt from the lower engine pulley (Fig. 44). 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.

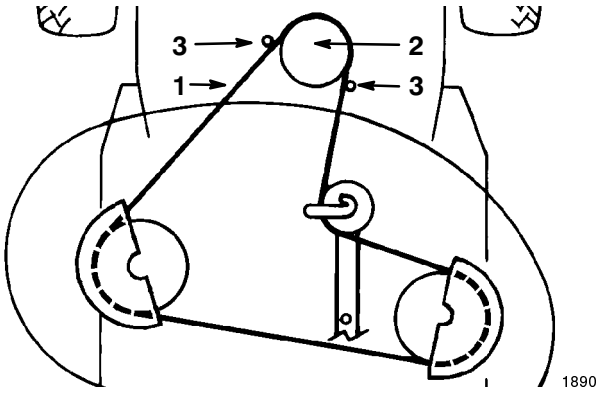


Figure 44

Top View

1. Mower belt
2. Engine pulley
3. Belt guides

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

Installing the Mower

1. Park the machine on a level surface, disengage the PTO, set the parking brake, stop the engine, and remove the ignition key.
2. Pull 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. 44). 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. 45).

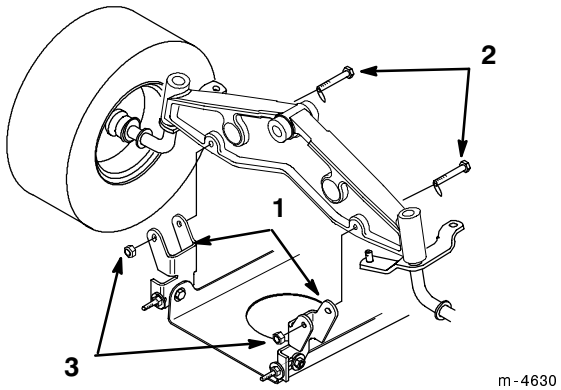


Figure 45

1. Pivot mount bracket
2. Bolt 5/16-18 x 2-1/2 in.
3. Locknut

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. 46). 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. 46). Install the washer and hairpin cotter to secure the mower. Repeat this step on the opposite side of the mower.

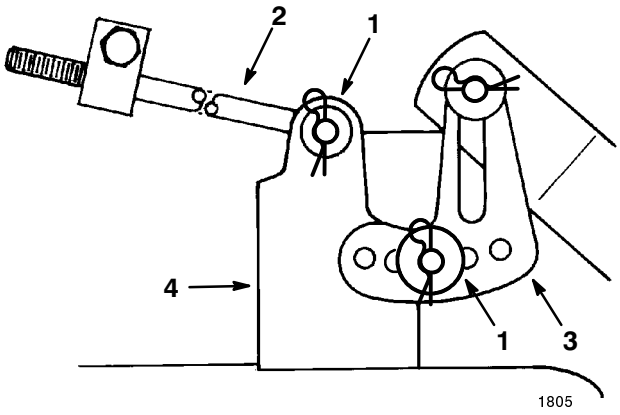


Figure 46

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

9. Look under the tractor and take down the PTO cable nested inside the frame rail.
10. Remove the rubber wiper and first jam nut. Thread the second jam nut onto the PTO cable all the way. Route the cable through the slot in the deck bracket and thread the second jam nut onto the cable (Fig. 47).

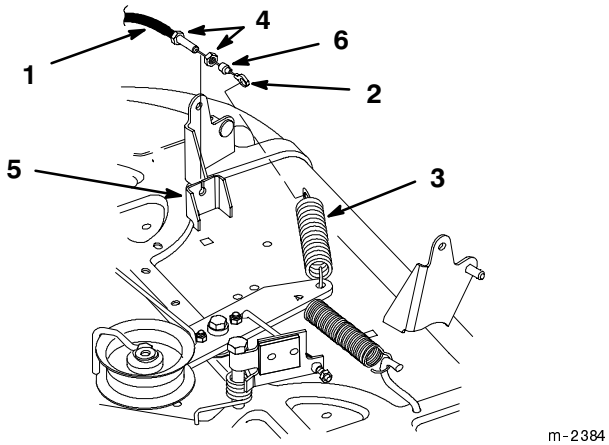


Figure 47

1. Blade control cable
2. Mounting bracket slot
3. Cable ring end
4. Idler spring
5. Jam nut
6. Rubber wiper

11. Hook the end of the PTO cable onto the idler spring (Fig. 47).

12. Engage the PTO lever on the dash. Measure the distance between the hook ends of the idler spring (Fig. 48). Adjust the jam nuts until a 6 in. (150 mm) dimension is obtained (Fig. 48).

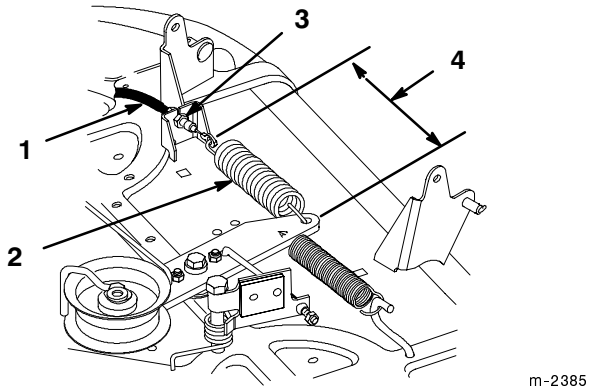


Figure 48

1. Blade control cable
2. Idler spring
3. Jam nut
4. 6 in. (150 mm) engaged

13. Tighten the jam nuts securely, install the rubber wiper, and disengage the PTO.

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

15. Hook the height-of-cut lift assist spring onto the retaining bolt (Fig. 40), using the spring tool provided with the machine.

16. Check the side-to-side blade level; refer to Side-to-Side Mower Leveling, page 35.

Blade Drive Belt

Removing the Blade Drive Belt

1. Remove the mower; refer to Removing the Mower, page 32.

2. Remove the pulley cover mounting screws and pulley covers from both blade pulleys (Fig. 49).

3. Loosen, but do not remove, the bolt and nut securing the idler pulley and belt guide (Fig. 49).

4. Remove the belt from the pulleys.

Installing the Blade Drive Belt

1. Install the new belt around the blade pulleys and under the belt guide on the idler pulley.

2. Position the idler pulley belt guide so it points toward the left, 90° to the idler arm (Fig. 49). Tighten the mounting bolt and locknut securing the idler pulley and belt guide.

3. Install the left and right pulley covers with the mounting screws (Fig. 49).

4. Install the mower; refer to Installing the Mower, page 34.

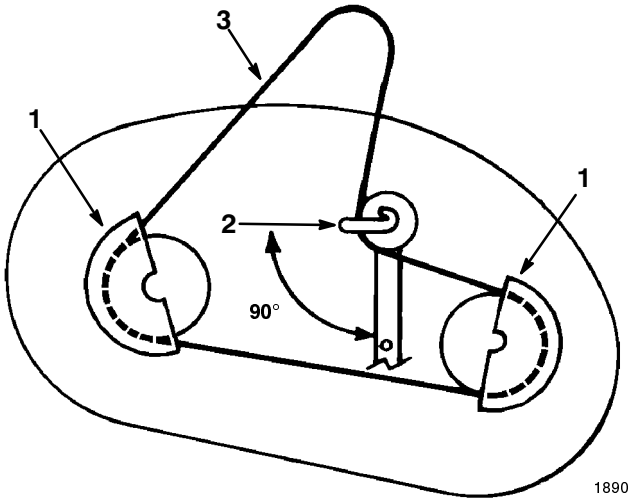


Figure 49

Top View

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

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 Tire Pressure, page 26.

1. Park the machine on a level surface, disengage the PTO, set the parking brake, stop the engine, and remove the ignition key.

2. Pull the wire off the spark plug.

3. Move the height-of-cut lever into the “C” notch.

4. Carefully rotate the blade(s) side to side (Fig. 50). Measure between the outside cutting edges and the flat surface (Fig. 50). If both measurements are not within 3/16 in. (5 mm), an adjustment is required; refer to steps 5 and 6.

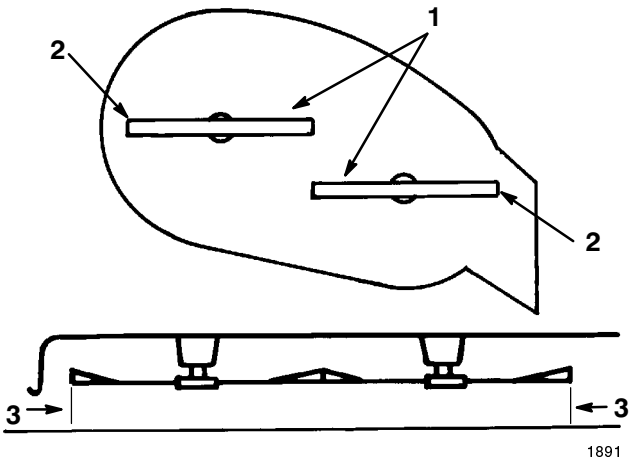


Figure 50

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

5. Remove the hairpin cotter and washer from the leveling bracket (Fig. 51). To level the blade(s), reposition the leveling bracket in a different hole and install the washer and hairpin cotter. (Fig. 51). A front hole lowers the blade height and a rear hole raises its height. Repeat this procedure on the opposite side of the mower.

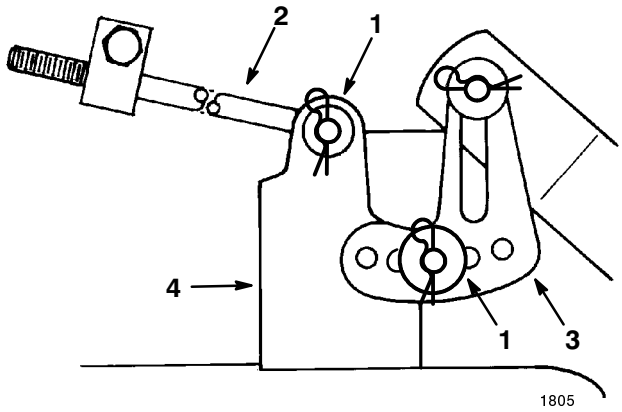


Figure 51

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

6. Check the front-to-rear blade slope; refer to Front-to-Rear Blade Slope, page 36.

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 Tire Pressure, page 26. If the front of the mower is not within a range of 1/8–3/8 in. (3.5–10.5 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, set the parking brake, stop the engine, and remove the ignition key.
2. Pull the wire off the spark plug.
3. Check and adjust the side-to-side blade level if you have not checked the setting; refer to Side-to-Side Mower Leveling, page 35.
4. Move the height-of-cut lever into the “C” notch.
5. Measure the length of the rod extending out of the front of the adjusting block on the sides of the chassis (Fig. 52). If the rod length is not 5/8 in. (16 mm), remove the hairpin cotter and washer from the end of the rod (Fig. 52) 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 with the washer and hairpin cotter. Repeat this procedure on the opposite side of the mower.

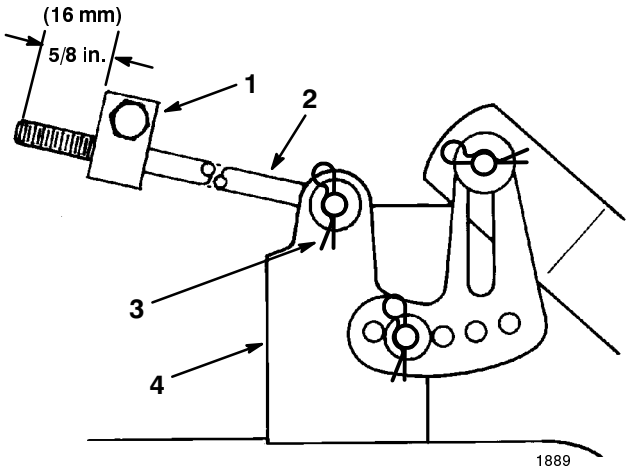


Figure 52

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

6. Check the front-to-rear slope by measuring between the bottom of the mower (front center and rear center) and the flat surface (Fig. 53). If the front is not within a range of 1/8–3/8 in. (3.5–10.5 mm) lower than the rear, an adjustment is required.

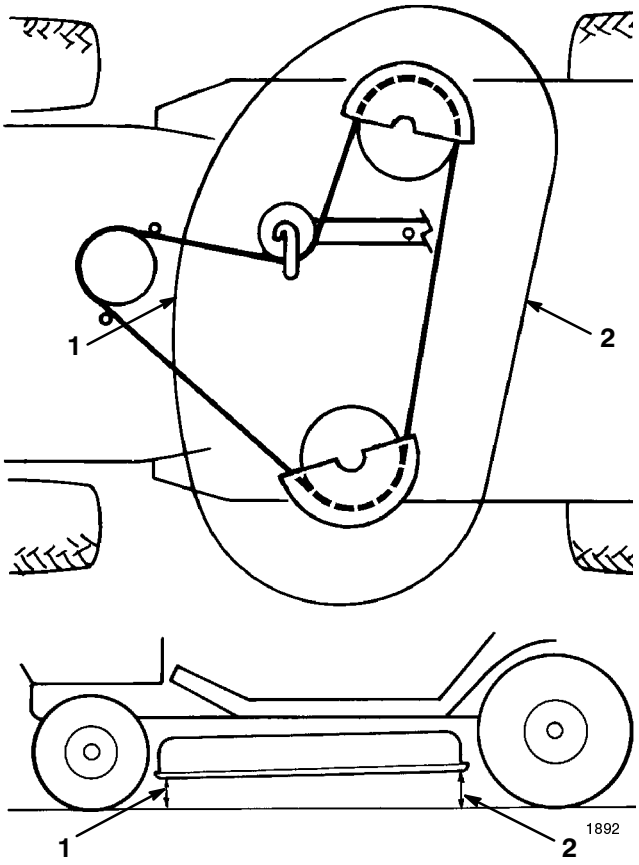


Figure 53

1. Measure front center
2. Measure rear center

7. To adjust the front-to-rear blade slope, loosen the front pivot plate mounting bolts slightly (Fig. 54).

8. Rotate the locknuts on the eyebolts to change the adjustment (Fig. 54). To raise the front of the mower, tighten the eyebolt locknuts. To lower the front of the mower, loosen the eyebolt locknuts.

9. After adjusting both of the eyebolt locknuts evenly, check the front-to-rear slope again. Continue adjusting the eyebolts until the front blade tip is 0–3/8 in. (0–9.2 mm) lower than the rear blade tip (Fig. 54).

10. When the front-to-rear slope is correct, tighten the pivot plate mounting bolts (Fig. 54).

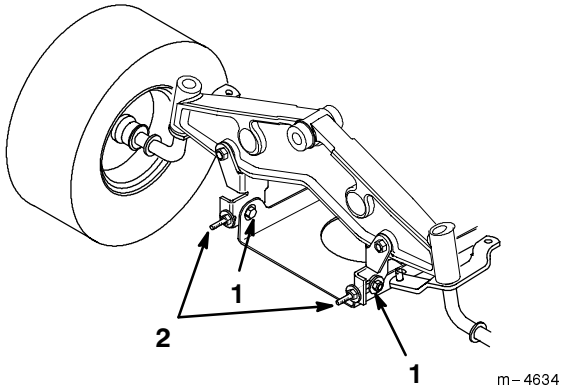


Figure 54

1. Pivot mounting bolt
2. Eyebolt locknut

11. 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 35.

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 coupling (not included) to the mower washout fitting and turn the water on high (Fig. 55).

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

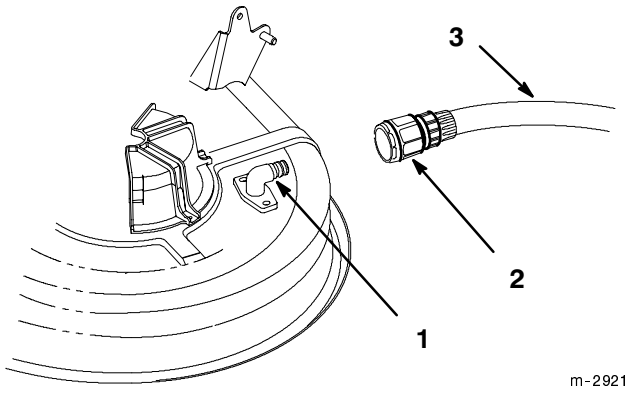


Figure 55

1. Washout fitting
2. Coupling (not included)
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.
6. Turn the water off and remove the coupling from the washout fitting and hose.
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 Brake, page 23.
4. Service the air cleaner; refer to Air Cleaner, page 24.
5. Grease the chassis; refer to Greasing and Lubrication, page 24.
6. Change the crankcase oil and filter; refer to Engine Oil, page 20.
7. Check the tire pressure; refer to Tire Pressure, page 26.
8. Prepare the machine for storage when non-use occurs over 30 days. Prepare machine for storage as follows.

   A. Add a petroleum based stabilizer/conditioner to fuel in the tank. Follow mixing instructions from stabilizer manufacture. (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 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 27.
   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 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 Spark Plug, page 26. 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 26. 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 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.

Troubleshooting

Problem	Possible Causes	Corrective Action
The starter does not crank.	1. The 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.	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.	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.	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 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.	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 fuel filter. 8. Dirt, water, or stale fuel is in the fuel system.	1. 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.	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. 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 a 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 drive control is in the Push position. 2. The traction belt is worn, loose, or broken. 3. The traction belt is off of the pulley.	1. Move the drive control to the Operate position. 2. Contact an Authorized Service Dealer. 3. Contact an Authorized Service Dealer.
The mower is cutting unevenly.	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 front-to-rear. 3. Clean the underside of the mower.