Form No. 3323-529

TORO®

Wheel Horse®

16-38 XLE Lawn Tractor

71226—200000001 & Up

Operator's Manual

CE

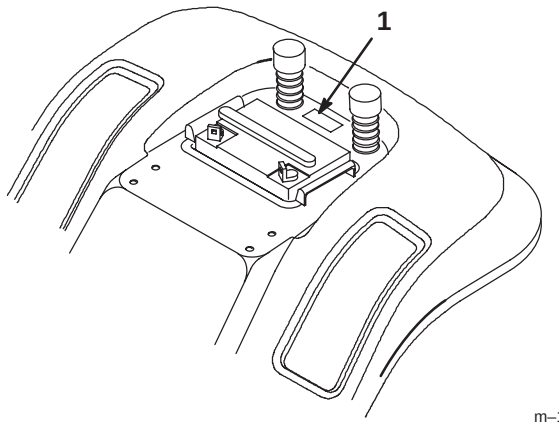
International English (GB)

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 located in a unique place on the product as shown below.



m–1856

1. Model and Serial Number Plate (under the seat)

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.

The left and right side of the machine is determined by sitting on the seat in the normal operator’s position.

©The Toro Company – 1999
All Rights Reserved

Printed in USA

Contents

	Page
Safety	2
Safe Operating Practices for Ride–on (riding) Rotary Lawnmower Machines	2
Safe Operating Practices	2
Sound Pressure Level	4
Sound Power Level	4
Vibration Level	4
Slope Chart	5
Symbols Glossary	7
Symbols Glossary	8
Symbols Glossary	9
Gasoline and Oil	10
Recommended Gasoline	10
Using Stabilizer/Conditioner	11
Filling the Fuel Tank	11
Check Engine Oil Level	11
Operation	12
Think Safety First	12
Controls	12
Parking Brake	12
Positioning the Seat	13
Headlights	13
Using the Blade Control (PTO)	13
Setting the Height-of-Cut	14
Adjusting Mower Wheels	14
Starting and Stopping the Engine	14
The Safety Interlock System	16
Operating-in-Reverse	16
Testing the Safety System	18
Driving Forward or Backward	18
Selecting Ground Speeds	19
Stopping the Machine	19
Side Discharge or Mulch Grass	20
Installing the Discharge Cover	20
Tips for Mowing Grass	21
Maintenance	22
Service Interval Chart	22
Greasing and Lubrication	23
Tire Pressure	23
Brake	24
Wiring Diagram	25
Fuse	26
Headlights	26
Battery	27
Spark Plug	30
Fuel Tank	31
Fuel Filter	31
Air Cleaner	32
Engine Oil	34
Cutting Blade	35
Removing the Mower	37
Installing the Mower	39
Blade Drive Belt	41
Side-to-Side Mower Leveling	42
Front-to-Rear Blade Slope	43
Washing Underside of Mower	45
Cleaning and Storage	46
Troubleshooting	48

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 – Petrol 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 petrol while the engine is running or when the engine is hot.
  - If petrol 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 petrol 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 defective 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 petrol 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 petrol 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.

Sound Pressure Level

This unit has an equivalent continuous A-weighted sound pressure at the operator ear of: 87 dB(A), based on measurements of identical machines per Directive 84/538/EEC.

Sound Power Level

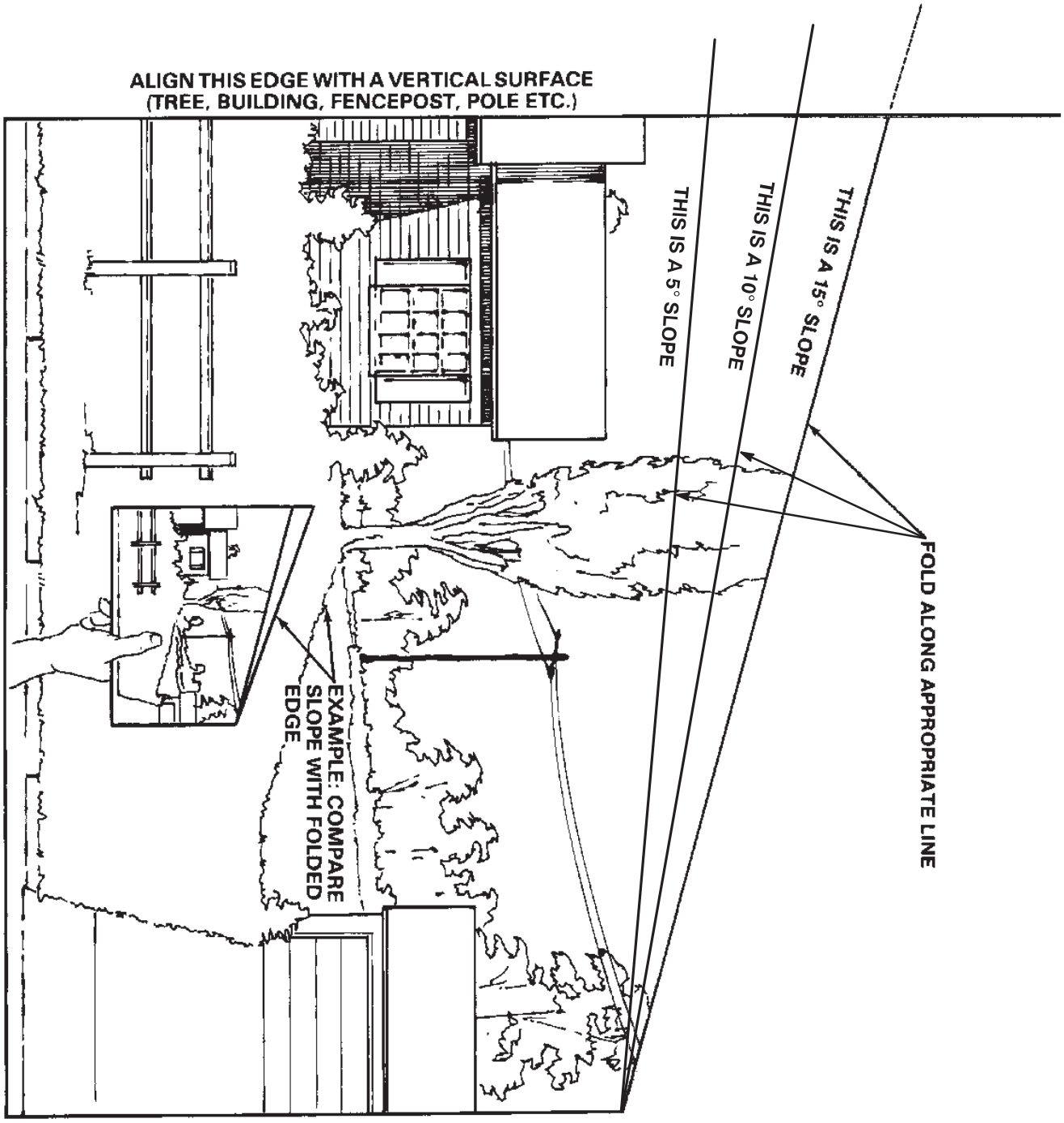
This unit has a sound power level of: 100 Lwa, based on measurements of identical machines per procedures outlined in Directive 84/538/EEC and amendments.

Vibration Level

This unit has a maximum hand-arm vibration level of 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

Read all safety instructions on pages 2–8.



Symbols Glossary

Safety alert symbol

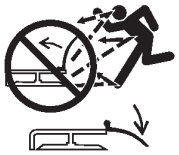
Safety alert symbol

Read operator's manual

Consult Technical Manual for proper service procedures

Thrown or flying objects– Whole body exposure

Thrown or flying objects– Rotary side-mounted mower. Keep deflector shield in place

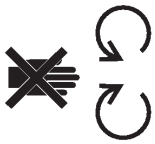


Severing toes or foot– mower blade

Severing fingers or hand– mower blade

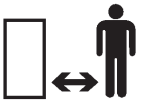
Rotating blade can cut off toes or fingers. Stay clear of blade as long as engine is running

Do not open or remove safety shields while engine is running



Dismemberment–Mower in rearward motion

Stay a safe distance from the machine



Stay a safe distance from the mower

Keep children a safe distance from machine

Machine rollover side hill

Machine rollover up hill

Machine rollover down hill

Machine rollover ROPS

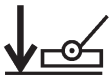
Operating in reverse not allowed unless deactivated by Key Choice switch

Symbols Glossary

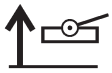
Cutting element–basic symbol

Cutting element–height adjustment

Cutting unit–lower



Cutting unit-raised



Cutting or entanglement of foot–Rotating auger

Severing of fingers or hand–impeller blade

Keep a safe distance from snowthrower

Stay a safe distance from the snowthrower

Tractors must be equipped with 45kg rear wheel weight with this attachment installed

Machine rollover ROPS snowthrower

Severing of hand–Rotating knives

Severing of foot–Rotating knives

Riding on this machine is allowed only on a passenger seat & only if the driver's view is not hindered

Crushing of fingers or hands–Force applied from side

Kickback or upward motion–Stored energy

Shut off engine & remove key before performing maintenance or repair work

Machine travel direction–combined

Low L

High H

Reverse R

Neutral N

First gear 1

Second gear 2

Third gear up to maximum # of forward gears 3

Symbols Glossary

Fast

Slow

Decreasing/Increasing

On/Run

Off/Stop

Engine

Engine start

Engine stop

Choke

Engine temperature

Engine lubricating oil pressure

Engine lubricating oil level

Key Choice Switch

Fuel

Fuel level

Volume empty

Volume full

Battery charging conditin

Head lights–
Main/high beam

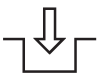
Brake system

Parking brake

Clutch

PTO (Power Take Off)

Engage



Disengage

Unlock

Lock

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

POTENTIAL HAZARD

- **In certain conditions gasoline is extremely flammable and highly explosive.**

WHAT CAN HAPPEN

- **A fire or explosion from gasoline can burn you, others, and cause property damage.**

HOW TO AVOID THE HAZARD

- **Use a funnel and 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" (6 mm 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.**

⚠ DANGER

POTENTIAL HAZARD

- **In certain conditions gasoline is extremely flammable and highly explosive.**

WHAT CAN HAPPEN

- **A fire or explosion from gasoline can burn you, others, and cause property damage.**

HOW TO AVOID THE HAZARD

- **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 round.**
- **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 each fuel tank cap and remove the cap. Add unleaded regular gasoline to both fuel tanks, until the level is 1/4 to 1/2 inch (6 mm to 13 mm) below the bottom of the filler neck. This space in the tank allows gasoline to expand. Do not fill the fuel tanks completely full.
3. Install fuel tank caps securely. Wipe up any gasoline that may have spilled.
4. Fuel gauge is located in right side tank.

Check Engine Oil Level

Before you start the engine and use the machine, check the oil level in the engine crankcase; refer to Checking Oil Level, page 34.

Operation

Think Safety First

Please carefully read all 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 the controls (Fig. 1) before you start the engine and operate the machine.

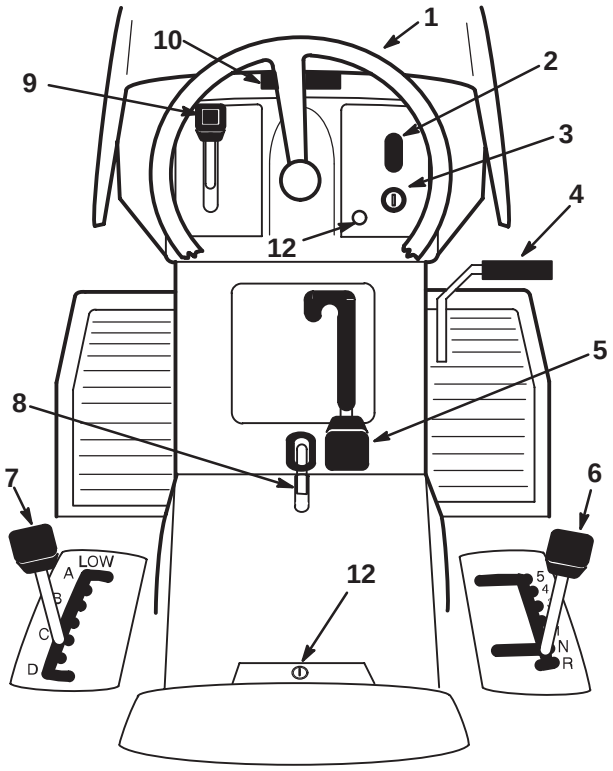


Figure 1

1. Steering wheel
2. Light switch—on/off (selected models)
3. Ignition switch
4. Clutch/brake pedal
5. Blade control (PTO)
6. 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. Key Choice™ switch

Parking Brake

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

Setting the Parking Brake

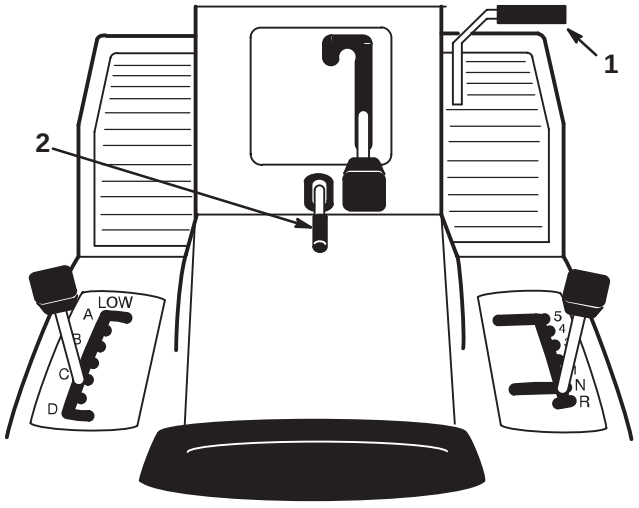
1. Push the clutch/brake pedal (Fig. 2) down and hold it in the depressed position.

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

Releasing the Parking Brake

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

2. Gradually release the clutch/brake pedal.



m–1880

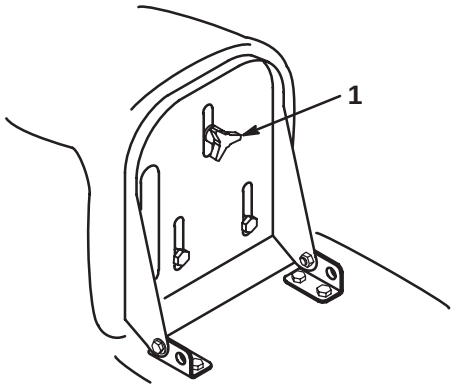
Figure 2

1. Clutch/brake pedal
2. Parking brake lever

Positioning the Seat

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

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



m–1862

Figure 3

1. Adjustment knob

Headlights

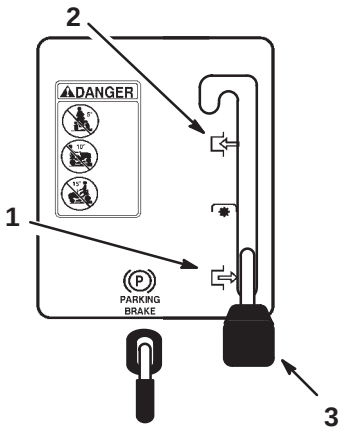
Headlights are optional on some models. A dash-mounted “ON/OFF” switch (Fig. 1) controls the headlights. The lights only shine while the engine is running and the switch is “ON.”

Using the Blade Control (PTO)

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

Engaging the Blade(s)

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



m–1852

Figure 4

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

Disengaging the Blade(s)

1. Depress the clutch/brake pedal to stop the machine.
2. Move the blade control (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 inches (25 to 102 mm).
2. Pull on the height-of-cut lever (deck lift) and move it to the desired position (Fig. 5).

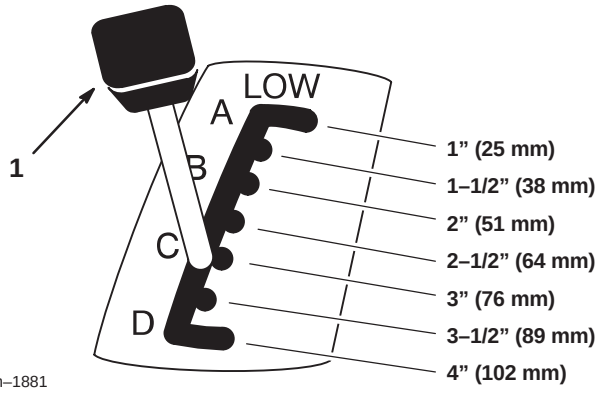


Figure 5

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

Adjusting Mower Wheels

The mower front wheels are to guide the mower over uneven ground. The front wheel height can be changed to more closely match the selected height-of-cut selected for the mower.

1. To change the height of the mower front wheels, remove the wheel mounting bolt and change the hole into which the wheel is mounted (Fig. 6).
2. Use the top hole for lowest cut height, and the bottom hole for higher cut heights (Fig. 6).

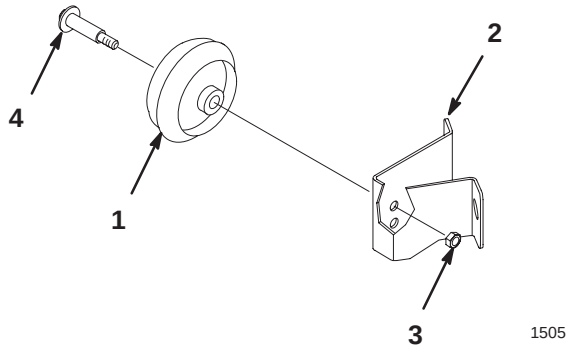


Figure 6

1. Wheel
2. Wheel Bracket
3. Locknut
4. Wheel Bolt

Starting and Stopping the Engine

Starting

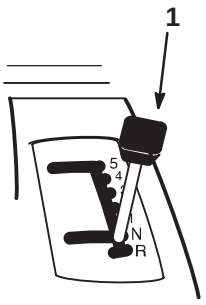
1. Sit down on the seat.
2. Set the parking brake; refer to Setting the Parking Brake, page 12.

   Note: The engine will not start unless you set the parking brake or fully depress the clutch/brake pedal.
3. Move the ground speed selector into neutral "N" (Fig. 7).
4. Move the blade control (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 48.

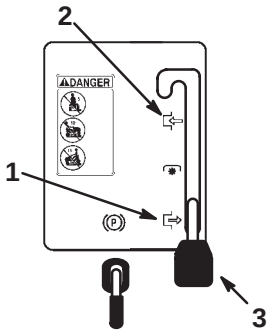
7. After the engine starts, slowly move the throttle lever to “FAST” (Fig. 9). If the engine stalls or hesitates, move the throttle lever back to “CHOKE” for a few seconds. Then move the throttle lever to “FAST.” Repeat this as required.



m–1893

Figure 7

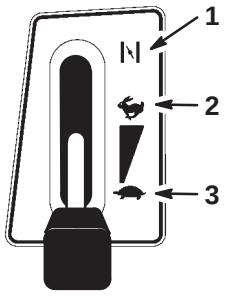
1. Ground speed selector



m–1852

Figure 8

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



m–1859

Figure 9

1. Choke
2. Fast
3. Slow

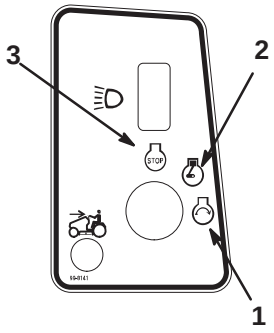


Figure 10

1. Start
2. On
3. Off

Stopping

1. Move the throttle lever to “FAST” (Fig. 9).

2. Turn the ignition key to “OFF” and remove the key (Fig. 10).

Note: If the engine has been working hard or is hot, let it idle for a minute before turning the ignition key “OFF.” This helps cool the engine before it is stopped. In an emergency, the engine may be stopped by turning the ignition key to “OFF.”

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 clutch/brake pedal is depressed
- The blade control (PTO) is “DISENGAGED”

The safety system is designed to stop the engine if:

- You rise from the seat when the clutch/brake pedal is released.
- You rise from the seat when the blade control (PTO) is “ENGAGED.”
- You shift into reverse with the power take off (PTO) engaged and the operating-in-reverse interlock activated.

Operating-in-Reverse

An interlock feature is provided that prevents the Power Take Off (PTO) from operating while the tractor is traveling in reverse. If the unit is shifted into reverse while the mower blade or other PTO driven attachment is engaged, the engine will stop.

Do not mow while backing up unless it is absolutely necessary. If you need to mow while in reverse gear or use other PTO driven attachments (such as a snowthrower or tiller), this no operating-in-reverse interlock may be temporarily deactivated.

Before deactivating this interlock, be sure there are no children present on or near the property where you are using the tractor, and that none are likely to appear while you are mowing or operating an attachment. Be extra observant after you have chosen to deactivate the interlock because the sound of the tractor’s engine might prevent you from being aware that a child or a bystander has entered the area where you are operating the tractor.

If you are certain that you can safely mow in reverse or operate an attachment, deactivate the no operating-in-reverse interlock by turning the Key Choice™ switch (Fig. 11), located on the seat bracket on the right hand side just below the seat, after engaging the blade (PTO). A red light on the front console (Fig. 12) will turn on as a reminder that the no operating-in-reverse interlock has been deactivated. Once the interlock is deactivated it stays in this mode—with your mower blade or PTO-driven attachment operating whenever you back up—and the console light stays on until either the blade (PTO) is disengaged, or the engine is turned off.

Note: Do not insert the “Key Choice” key unless it is absolutely necessary to mow in reverse or operate an attachment. The “Key Choice” key should also be removed from the unit if it will be operated by someone other than a responsible, experienced operator. This will prevent the unit from operating in reverse with the mower blade or other PTO attachment engaged. Always remove both the ignition and the “Key Choice” keys and put them in a safe place out of the reach of children when leaving the unit unattended.

⚠ CAUTION

POTENTIAL HAZARD

- **A child or bystander could be backed over by a riding mower with its blade(s) engaged.**

WHAT CAN HAPPEN

- **Blade contact will cause serious personal injury or death.**

HOW TO AVOID THE HAZARD

- **Do not mow in reverse unless absolutely necessary.**
- **Always look backward and down before backing up.**
- **Use “Key Choice” switch only if you are certain no children or other bystanders will appear in the mowing area.**
- **Always remove both the ignition and Key Choice keys and put them in a safe place out of the reach of children or unauthorized users when leaving the unit unattended.**

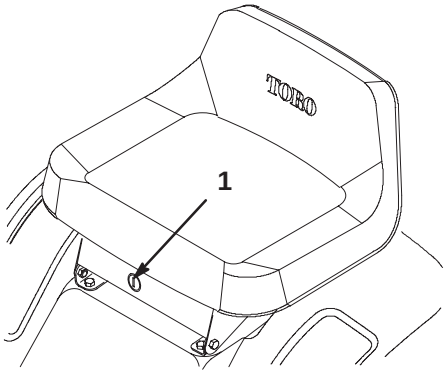


Figure 11

1. “Key Choice” switch

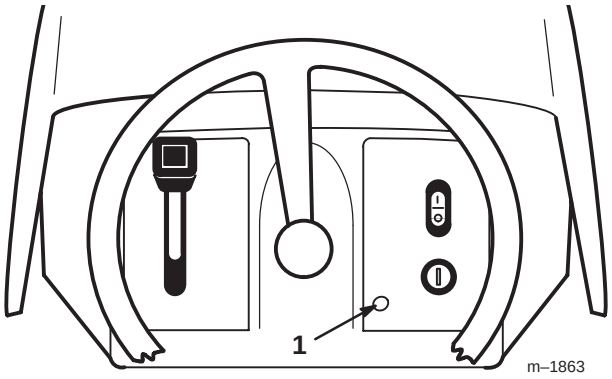


Figure 12

1. Operating–in–Reverse light

Testing the Safety System

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

1. Move the ground speed selector into neutral "N." Set the parking brake. Move the blade control (PTO) to "ENGAGED." Now turn the ignition key to "START"; the engine should not crank.

2. With the ground speed selector in neutral "N," move the blade control (PTO) to "DISENGAGED" and release the parking brake. Now turn the ignition key to "START"; the engine should not crank.

3. With the ground speed selector in neutral "N," set the parking brake and move the blade control (PTO) to "DISENGAGED." Now 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 and the ground speed selector in neutral. 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 and the ground speed selector in neutral. Start the engine. Move the PTO lever to the "engage" position and turn the Key Choice key and release. The Operating-in-Reverse warning light should illuminate. Move the PTO lever to the "disengage" position and the Operating-in-Reverse warning light should turn off.

Driving Forward or Backward

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

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

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

⚠ CAUTION

POTENTIAL HAZARD

- **If you release the clutch/brake pedal too quickly when the ground speed selector is in gear, you could suddenly put the machine in motion.**

WHAT CAN HAPPEN

- **Sudden engagement of the machine's drive system could cause you to lose control.**

HOW TO AVOID THE HAZARD

- **Always release the clutch/brake pedal slowly when starting the machine in motion (forward or reverse).**

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 blade control (PTO), and turn the ignition key to "OFF" to stop the engine. Also set the parking brake if you leave the machine unattended; refer to Setting the Parking Brake, page 12. Remember to remove the keys from the ignition and Key Choice switches.

⚠ CAUTION

POTENTIAL HAZARD

- **Someone could move or attempt to operate the tractor while it is unattended.**

WHAT CAN HAPPEN

- **Children or bystanders may be injured if they use the tractor.**

HOW TO AVOID THE HAZARD

- **Always remove the ignition and "Key Choice" keys and set the parking brake when leaving the machine unattended, even if just for a few minutes.**

IMPORTANT: 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

POTENTIAL HAZARD

- **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.**

WHAT CAN HAPPEN

- **Contact with rotating mower blade(s) and thrown debris will cause injury or death.**

HOW TO AVOID THE HAZARD

- **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 blade control (PTO) to "DISENGAGED" and rotate the ignition key to "OFF." Also remove the key and pull the wire off the spark plug.**

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

2. 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 20.

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. 13).

3. Secure the discharge cover to the lower lip of the mower with bolts and nuts (Fig. 13).

Note: Do not over-tighten nuts, distorting cover causing blade contact.

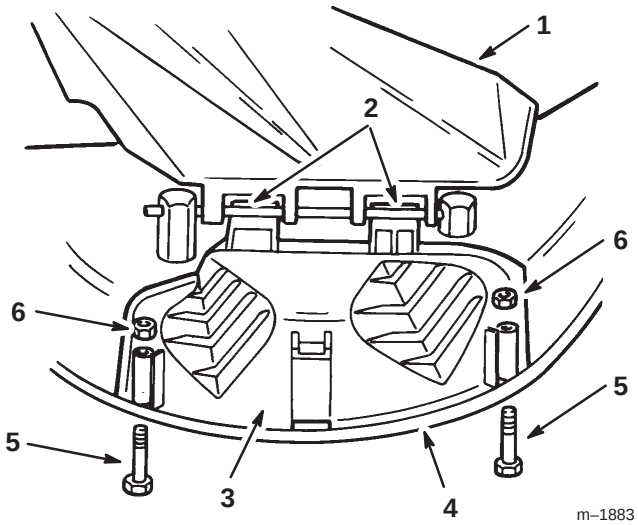


Figure 13

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 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 inches tall, you may want to cut the lawn twice to assure 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’s forward motion 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

Service Interval Chart

Service Operation	Each Use	5 Hours	25 Hours	Storage Service	Spring Service	Notes
Oil—initial change		X				
Oil—periodic change (50 hours or once each season)				X		
Oil—check level	X					
Safety System—check	X	X	X		X	
Cutter Blade—check		X	X	X		
Brake—check		X	X	X	X	
Chassis—grease			X	X		More often in dusty, dirty conditions
Foam Air Cleaner—service			X	X		
Paper Air Cleaner—replace				X		
Spark Plug—check			X	X	X	
Belts—check for wear/cracks				X		
Gasoline—drain				X		
Engine—clean outside			X	X		
Mower Housing—clean	X	X		X		
Chipped Surfaces—paint				X		
Battery—check electrolyte	X	X	X	X	X	
Battery—charge, disconnect cables				X		
Fuel Filter—replace				X		
Tires—check pressure			X	X	X	

⚠ CAUTION

POTENTIAL HAZARD

- **If you leave the key in the ignition switch, someone could start the engine.**

WHAT CAN HAPPEN

- **Accidental starting of the engine could seriously injure you or other bystanders.**

HOW TO AVOID THE HAZARD

- **Remove the key from the ignition switch and pull the wire off the spark plug before you do any maintenance. Also push the wire aside so it does not accidentally contact the spark plug.**

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.

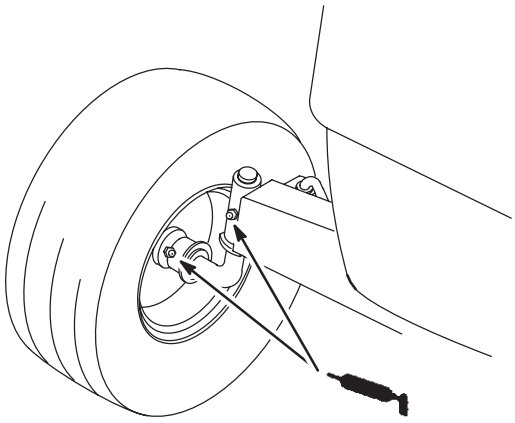
Grease Type: General-purpose grease.

How to Grease

1. Disengage the blade control (PTO), shift into neutral, set the parking brake, and turn the ignition key to “OFF” to stop the engine.
2. Clean the grease fittings with a rag. Make sure to scrape any paint off 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 the bearings (Fig. 14).



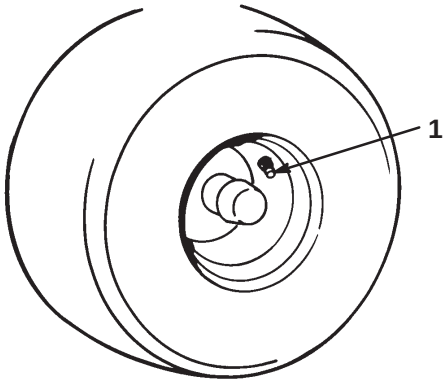
m–2346

Figure 14

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



m–1872

Figure 15

1. Valve stem

Brake

The brake is on the right side of the rear axle, inside the rear tire (Fig. 16). 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 blade control (PTO), shift into neutral, set the parking brake, and turn the ignition key to "OFF" to stop the engine.

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 24.

Adjusting the Brake

1. Check the brake before you adjust it; refer to Checking the Brake, page 24.

2. To increase braking resistance, tighten the brake adjusting nut (Fig. 16) 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.

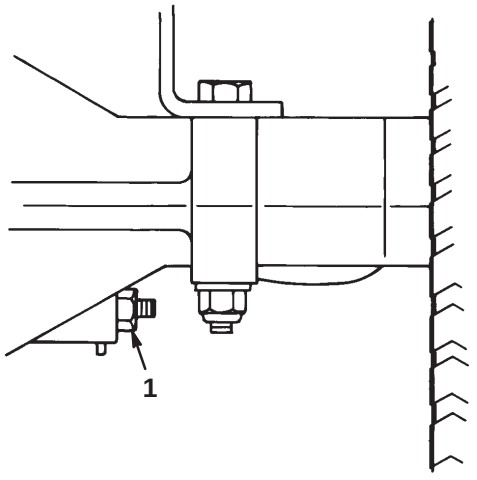
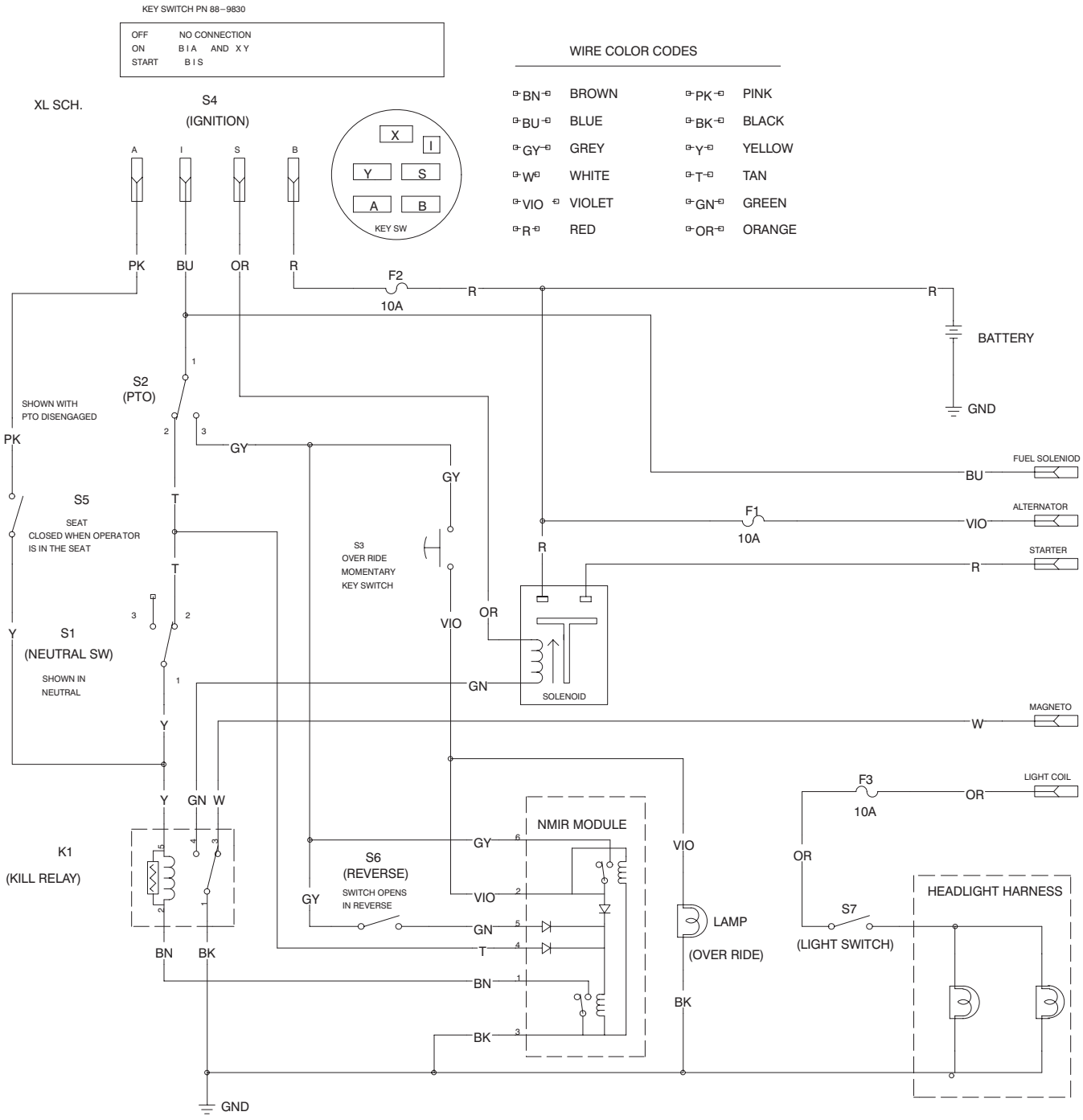


Figure 16

1. Brake adjusting nut

Wiring Diagram



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. 17) to remove from the socket. Push down to insert.

Fuses: 10 amp, blade-type

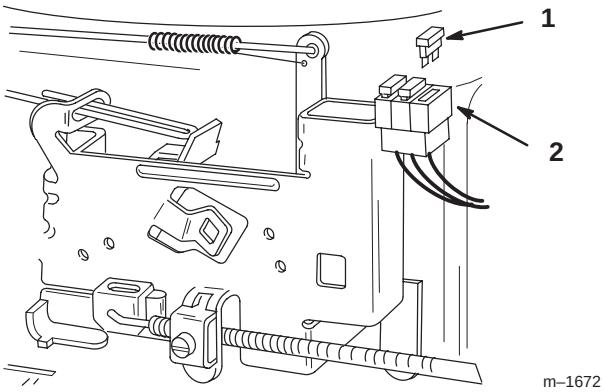


Figure 17

1. Fuse (removed)
2. Socket

Headlights

Specification: Bulb # 1156, automotive type.

Removing the Bulb

1. Disengage the blade control (PTO), shift into neutral, set the parking brake, and turn the ignition key to “OFF” to stop the engine.

2. Open the hood. Pull wire connectors off both bulb holder terminals.

3. Rotate the bulb holder 1/4 turn counterclockwise and remove it from the reflector (Fig. 18).

4. Push and rotate the bulb counterclockwise until it stops (approx. 1/4 turn) and remove bulb from the bulb holder (Fig. 19).

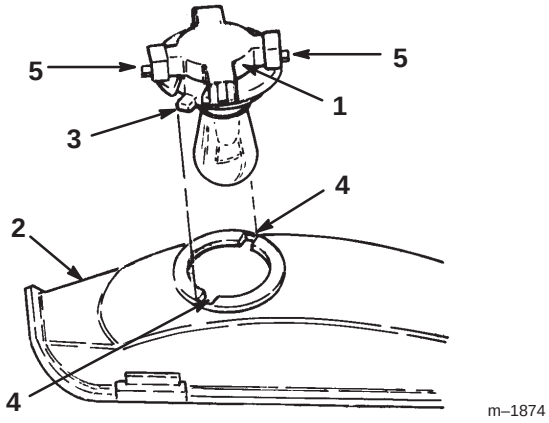


Figure 18

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

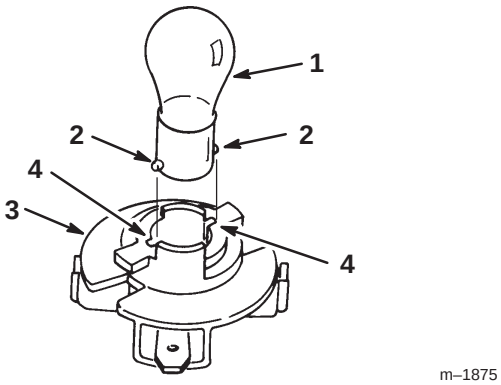


Figure 19

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

2. The bulb holder has two tabs (Fig. 18). 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.

Battery

Service Interval/Specification

Check the electrolyte level in the battery before each use. 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, 160 Cold Cranking Amps

Removing the Battery

1. Disengage the blade control (PTO), shift into neutral, set the parking brake, and turn the ignition key to “OFF” to stop the engine.

2. Tip the seat forward to see the battery.

3. Disconnect the negative (black) ground cable from the battery post (Fig. 20).

4. Slide the rubber cover up the positive (red) cable. Disconnect the positive (red) cable from the battery post (Fig. 20).

5. Remove the battery box, battery, and long vent tube from the chassis (Fig. 21).

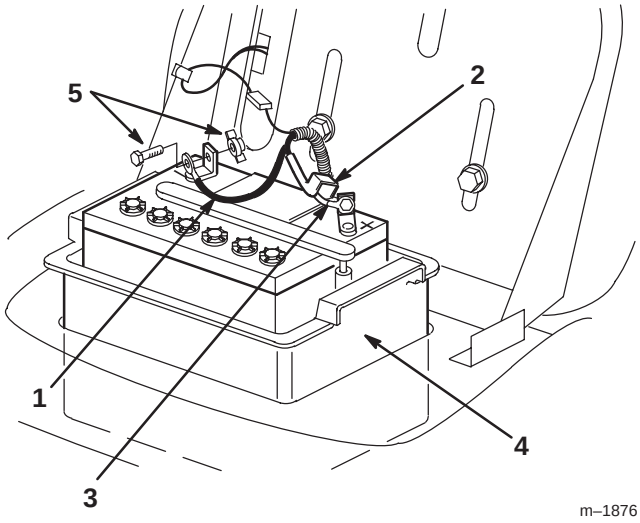


Figure 20

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 slide the vent tube into the channel and through the slot in the bottom of the box (Fig. 21).

IMPORTANT: Look down into the cut out area where the battery box fits into the chassis. Notice the holes at the end of the right frame member (Fig. 21). Always install the long battery vent tube through the holes to prevent battery acid from corroding the tractor and mower.

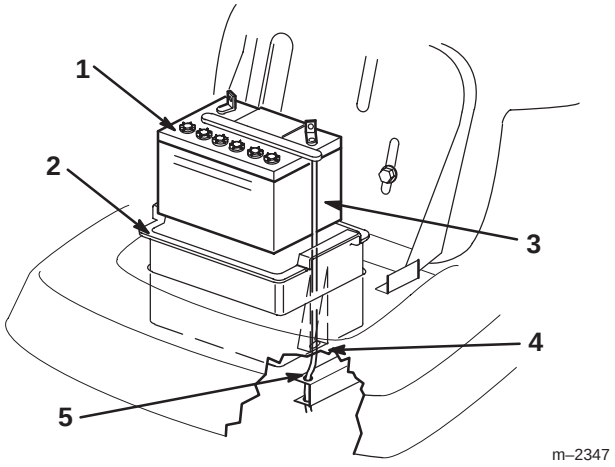


Figure 21

1. Battery
2. Battery box
3. Vent tube
4. Slot in battery box
5. Holes in frame

2. Install the battery box and battery into the chassis (Fig. 21). Make sure to slide the end of the vent tube through the holes in the frame (Fig. 21).

3. Using the bolt and wing nut, connect the positive (red) cable to the positive (+) battery post (Fig. 20). Slide the rubber cover over the battery post.

4. Using the bolt and wing nut, connect the negative (black) cable to the negative (–) battery post (Fig. 20).

Checking 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. 22). Do not allow the electrolyte to get below the “LOWER” line (Fig. 22).

3. If the electrolyte is low, add the required amount of distilled water; refer to Adding Water to the Battery, page 29.

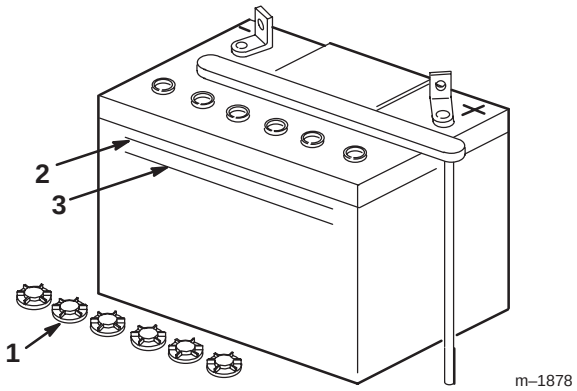


Figure 22

1. Filler caps
2. UPPER line
3. LOWER line

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. Clean the top of the battery with a paper towel.
2. Unscrew the filler caps (Fig. 22).
3. Slowly pour distilled water into each battery cell until the level is up to the "UPPER" line (Fig. 22) on the battery case.

   IMPORTANT: Do not overfill the battery because electrolyte (sulfuric acid) can cause severe corrosion and damage to the chassis.
4. Screw the filler caps onto the battery.

Charging the 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 27.
2. Check the electrolyte level; refer to Checking Electrolyte Level, page 28, steps 2–3.
3. Remove the filler caps from the battery and connect a 3 to 4 amp battery charger to the battery posts. Charge the battery at a rate of 4 amperes or less for 4 hours (12 volts). Do not overcharge the battery. Install the filler caps after the battery is fully charged.

⚠ WARNING

POTENTIAL HAZARD
- **Charging the battery produces gasses.**

WHAT CAN HAPPEN
- **Battery gasses can explode.**

HOW TO AVOID THE HAZARD
- **Keep cigarettes, sparks and flames away from battery.**

4. Install the battery in the chassis; refer to Installing the Battery, page 27.

Spark Plug

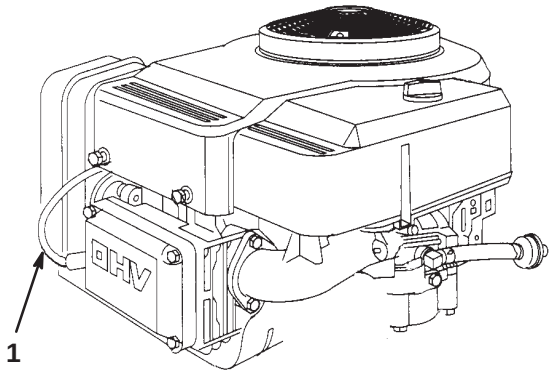
Service Interval/Specification

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 RJ–19LM (or equivalent)
Air Gap: 0.030” (0.762 mm)

Removing the Spark Plug

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



m–1884

Figure 23

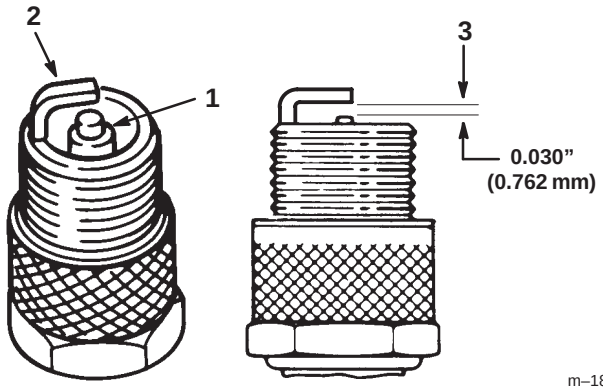
1. Spark plug wire

Checking the Spark Plug

1. Look at the center of the spark plug (Fig. 24). If you see light brown or gray on the insulator, the engine is operating properly. A black coating on the insulator usually means the air cleaner is dirty.

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

2. Check the gap between the center and side electrodes (Fig. 24). Bend the side electrode (Fig. 24) if the gap is not correct.



m–1870

Figure 24

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

Installing the Spark Plug

1. Install the spark plug and metal washer. Make sure the air gap is set correctly.
2. Tighten the spark plug to 15 ft-lb (20.4 Nm).
3. Push the wire onto the spark plug (Fig. 23).
4. Close the hood.

Fuel Tank

Draining The Fuel Tank

⚠ DANGER

POTENTIAL HAZARD
- **In certain conditions gasoline is extremely flammable and highly explosive.**

WHAT CAN HAPPEN
- **A fire or explosion from gasoline can burn you, others, and cause property damage.**

HOW TO AVOID THE HAZARD
- **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 drain gasoline near an open flame or where gasoline fumes may be ignited by a spark.**
- **Never smoke a cigarette, cigar or pipe.**

1. Park the machine so that the left front side is slightly lower than the right side to assure fuel tank drains completely. Then disengage the blade control (PTO), shift into neutral, set the parking brake, and turn the ignition key to “OFF” to stop the engine.

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. 25).

4. Pull the fuel line off the filter (Fig. 25) 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.

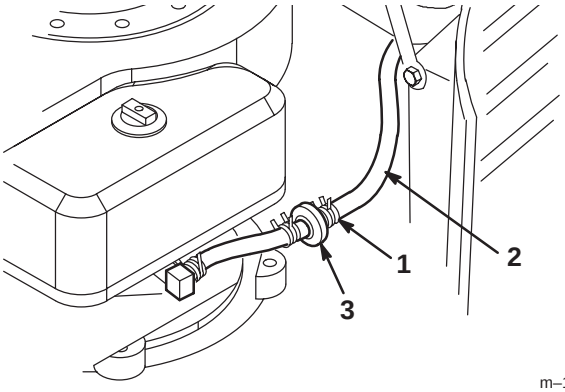


Figure 25

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. 25) is when the fuel tank is empty. Never install a dirty filter if it is removed from the fuel line.

1. Disengage the blade control (PTO), shift into neutral, set the parking brake, and turn the ignition key to “OFF” to stop the engine.

2. Open the hood.

3. Squeeze the ends of the hose clamps together and slide them away from the filter (Fig. 25).

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.

Air Cleaner

Service Interval/Specification

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

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

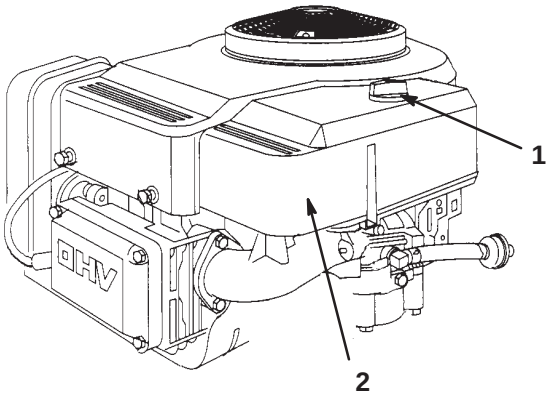
Note: Service the air cleaner more frequently (every few hours) if operating conditions are extremely dusty or sandy.

Removing the Foam and Paper Elements

1. Disengage the blade control (PTO), shift into neutral, set the parking brake, and turn the ignition key to “OFF” to stop the engine.

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. 26).

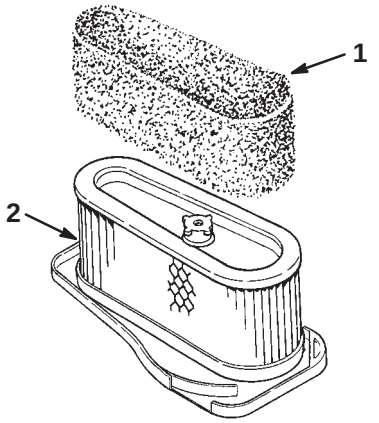


m–1884

Figure 26

1. Knob
2. Air cleaner cover

4. Carefully slide the foam element off the paper element (Fig. 27).

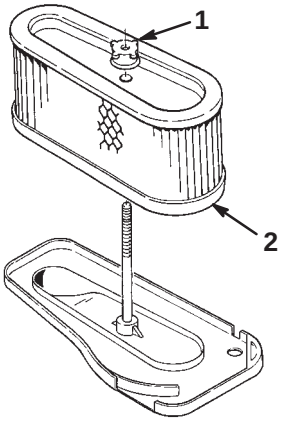


m–1864

Figure 27

1. Foam element
2. Paper element

5. Unscrew the rubber nut and remove the paper element (Fig. 28).



m–1865

Figure 28

1. Rubber nut
2. Paper element

Cleaning the Foam and Paper Elements

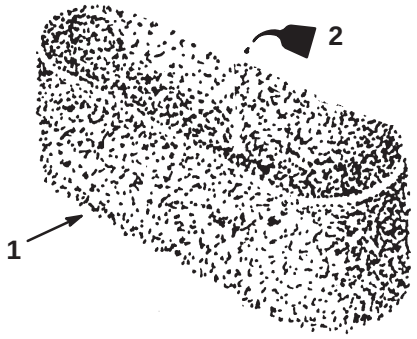
1. Foam Element

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

IMPORTANT: Replace the foam element if it is torn or worn.



m–1866

Figure 29

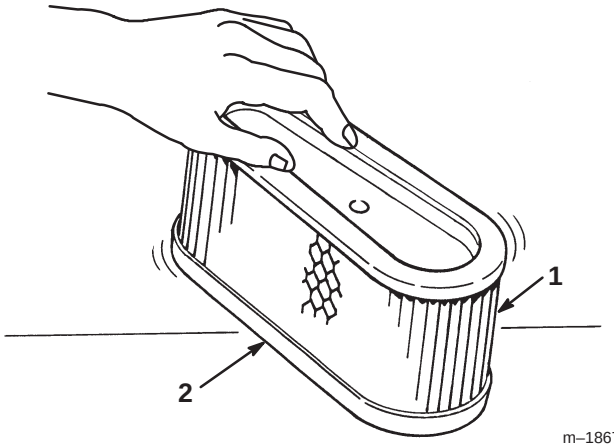
1. Foam element 2. Oil

2. Paper Element

A. Lightly tap the element on a flat surface to remove dust and dirt (Fig. 30).

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, defective, or cannot be cleaned thoroughly.



m–1867

Figure 30

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. 27).

2. Slide the air cleaner assembly onto the long rod. Screw the rubber nut finger-tight against the air cleaner (Fig. 28).

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

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

4. Close the hood.

Engine Oil

Service Interval/Specification

Change oil:

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

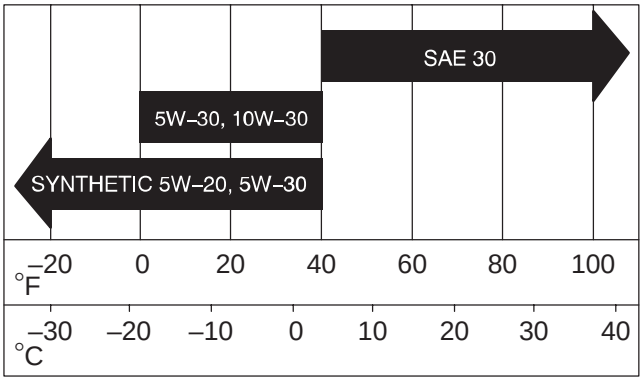
Note: Change oil more frequently when operating conditions are extremely dusty or sandy.

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

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

Viscosity: See table below

USE THESE SAE VISCOSITY OILS



Checking Oil Level

1. Park the machine on a level surface, disengage the blade control (PTO), shift into neutral, set the parking brake, and turn the ignition key to "OFF" to stop the engine.
2. Open the hood.
3. Clean around the oil dipstick (Fig. 31) so dirt cannot fall into the filler hole and damage the engine.
4. Unscrew the oil dipstick and wipe the metal end clean (Fig. 31).
5. Screw the oil dipstick fully onto the filler tube (Fig. 31). Unscrew the dipstick again and look at the metal end. If oil level is low, slowly pour only enough oil into the filler tube to raise the level to the "FULL" mark.

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

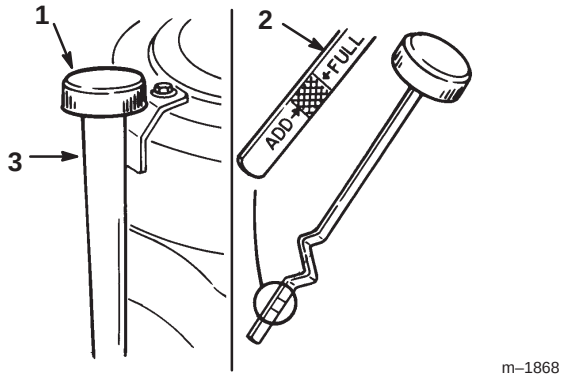


Figure 31

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

Changing/Draining 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 assure the oil drains completely. Then disengage the blade control (PTO), shift into neutral, set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
3. Open the hood.
4. Place a pan below the oil dipstick/fill tube and remove the drain plug (Fig. 32).
5. When 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. 31). Check the oil level; refer to Checking Oil Level, page 34, steps 4–5.

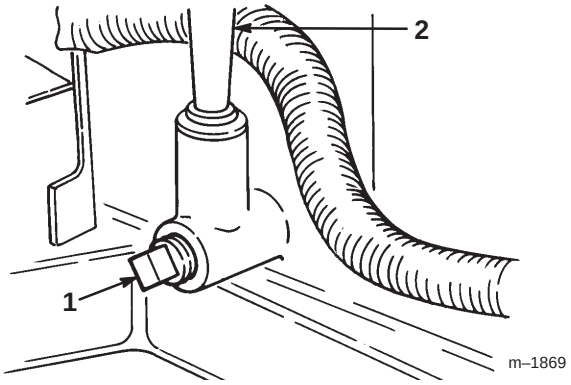


Figure 32

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

Cutting Blade

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

⚠ WARNING

POTENTIAL HAZARD

- **A blade that is worn or damaged could break apart and pieces could be thrown at bystanders or at you as you use the mower.**

WHAT CAN HAPPEN

- **Pieces of blade that may be thrown could seriously injure or kill you or bystanders.**

HOW TO AVOID THE HAZARD

- **Periodically inspect the blade for wear and damage. Immediately install a new blade if it is worn or damaged.**

Inspecting the Blade(s)

1. Remove the mower; refer to Removing the Mower, page 37.

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 36.

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.

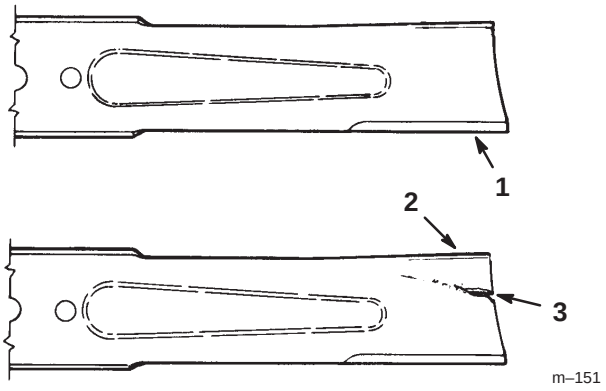


Figure 33

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

Removing the Blade

1. Remove the mower; refer to Removing the Mower, page 37.

2. Carefully tip the mower over.

3. Remove the bolt (5/8” 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.

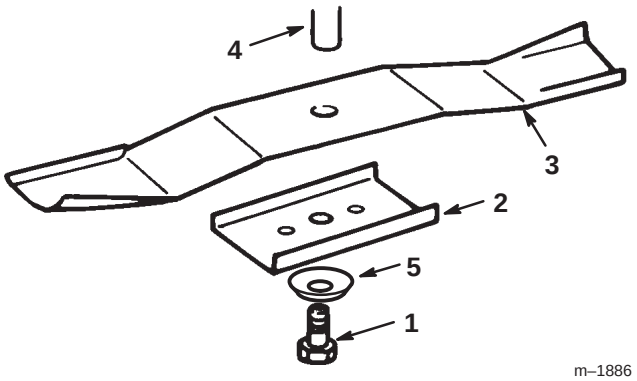


Figure 34

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.

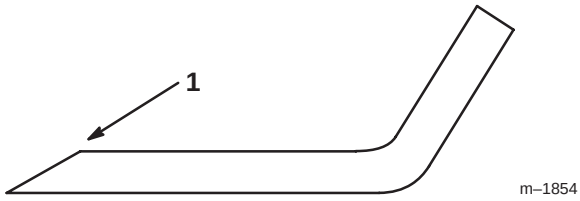


Figure 35

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 the back side of the blade. Repeat this procedure until the blade is balanced.

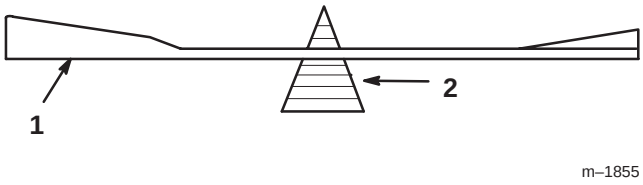


Figure 36

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 assure proper cutting.

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

Removing the Mower

1. Park the machine on a level surface, disengage the blade control (PTO), shift into neutral, set the parking brake, and turn the ignition key to “OFF” to stop the engine.

2. Remove the key from the ignition switch and pull the wire off 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.

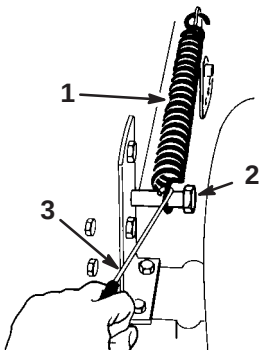


Figure 37

1. Spring
2. Bolt
3. Spring tool

⚠ CAUTION

POTENTIAL HAZARD

- **The height-of-cut lever (deck lift) is spring-tensioned.**

WHAT CAN HAPPEN

- **When the mower is being removed, this spring-loaded mechanism could suddenly release and injure you or someone else.**

HOW TO AVOID THE HAZARD

- **Move the height-of-cut lever (deck lift) to the “D” position and remove the height-of-cut lift assist spring to release the spring tension.**

5. Move the height-of-cut lever (deck lift) into the “A” notch.

6. Unhook the blade control (PTO) cable ring end from the idler spring (Fig. 38).

7. Remove jam nut from blade control (PTO) cable at mounting bracket. Slide the cable from the bracket (Fig. 38).

8. Move the cable out of the way and lay inside frame rail so it cannot get caught in drive belts or pulleys.

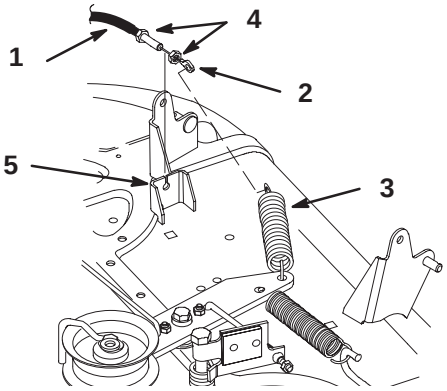


Figure 38

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

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

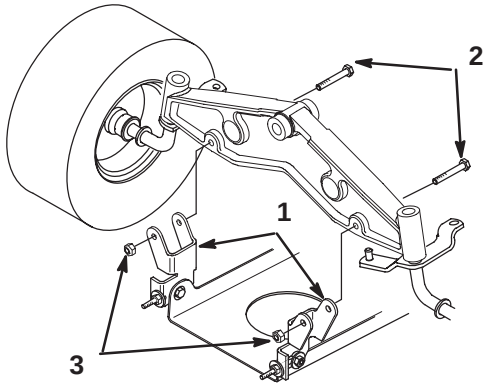


Figure 39

1. Pivot mount bracket
2. Bolt 5/16–18 x 2-1/2"
3. Lock nut

10. Remove the hair pin cotter and washer from the end of the long rod (Fig. 40). Slide the rod out of the mower mount.

11. Remove the hair pin cotter and washer at the mower leveling bracket (Fig. 40). Slide the bracket off the mounting pin. Re-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. Secure long rod with washer and hairpin cotter. Repeat for opposite side of the mower.

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

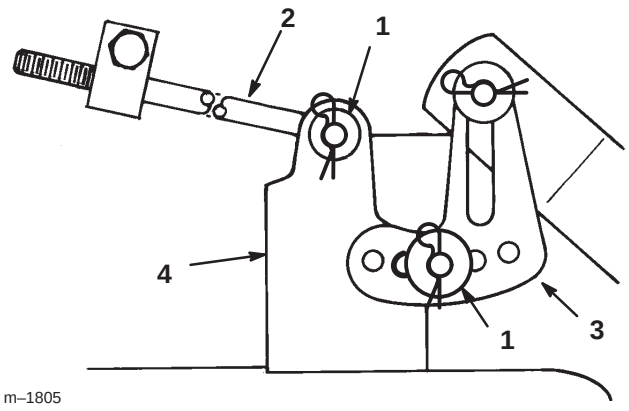


Figure 40

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

14. 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.

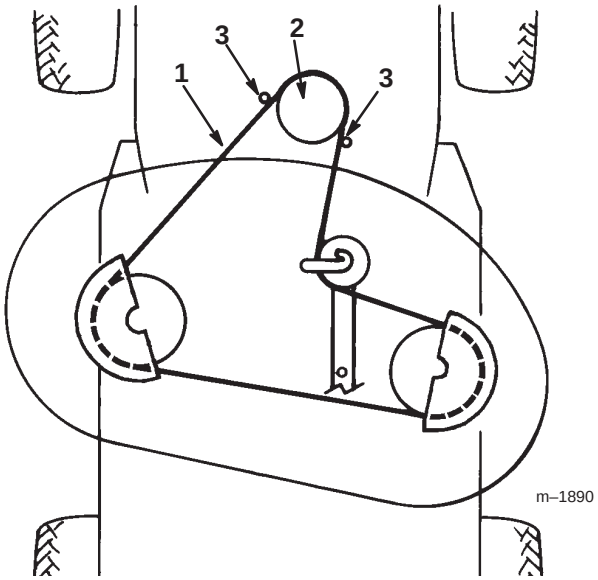


Figure 41

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 blade control (PTO), shift into neutral, set the parking brake, and turn the ignition key to “OFF” to stop the engine.

2. Remove the key from the ignition switch and pull the wire off the spark plug.

3. Turn the front wheels fully to the left. Slide the mower under the chassis from the right side.

4. Install 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 guides away from the pulley. There must be a maximum 1/8” (3.175 mm) between the belt guide and the edge of the pulley to keep the belt on the pulley during operation. If the space is more than 1/8” (3.175 mm), adjust the belt guide(s) and tighten them securely. The belt guide must not contact the pulley.

5. Install the mower pivot mount brackets to the front axle with bolts and lock nuts (Fig. 42).

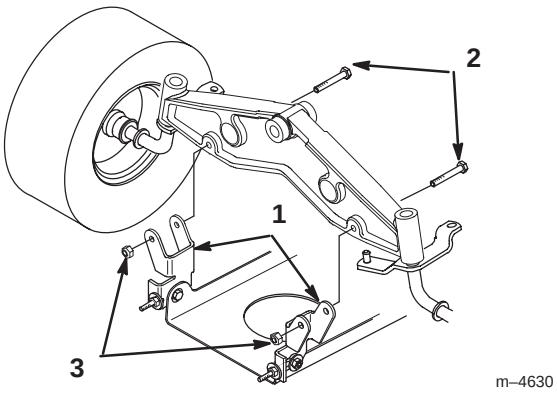


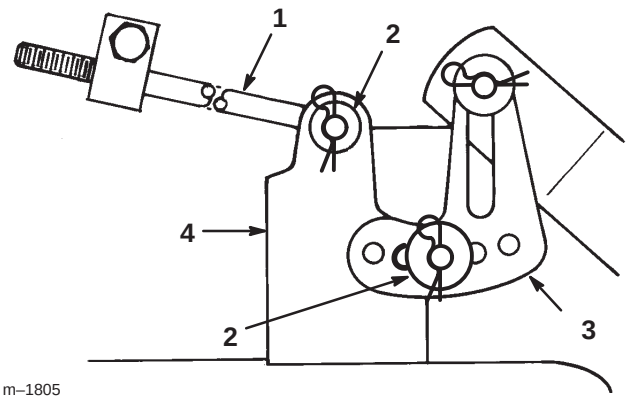
Figure 42

1. Pivot mount bracket
2. Bolt 5/16–18 x 2-1/2”
3. Lock nut

6. Move the height-of-cut lever (deck lift) 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 hair pin 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 hair pin cotter to secure the mower. Repeat this step on the opposite side of the mower.



m–1805

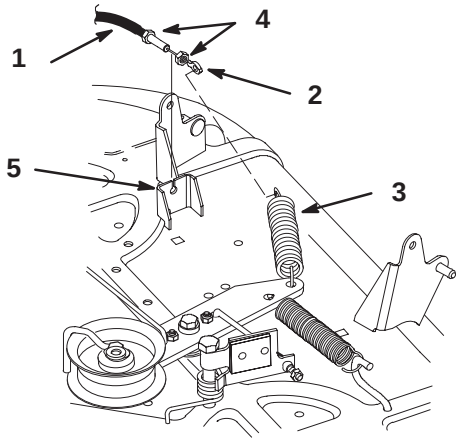
Figure 43

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

9. Look under tractor and take down blade control (PTO) cable nested inside frame rail.

10. Remove first jam nut and thread second jam nut onto the blade control (PTO) cable all the way. Rout cable through slot in deck bracket and thread second jam nut onto cable (Fig. 44).

11. Hook end of blade control (PTO) cable onto idler spring (Fig. 44).



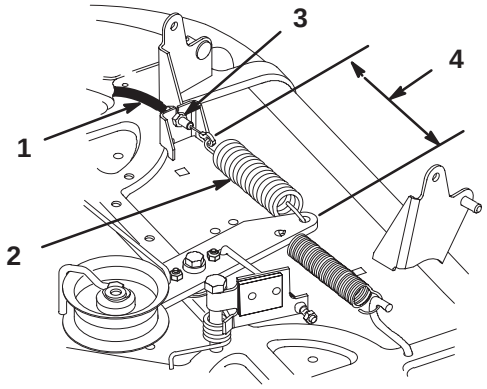
m–2384

Figure 44

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

12. Engage blade control (PTO) lever on dash. Measure distance between hook ends of idler spring (Fig. 45). Adjust jam nuts so 6” (150 mm) dimension is obtained (Fig. 45).

13. Tighten jam nuts securely and disengage blade control (PTO).



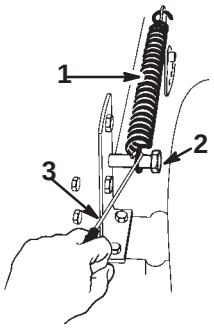
m–2385

Figure 45

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

14. Move the height-of-cut lever (deck lift) 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. 46), using the spring tool provided with the machine.



m–1851

Figure 46

1. Spring
2. Bolt
3. Spring tool

16. Check side-to-side blade level; refer to Side-to-Side Mower Leveling, page 42.

Blade Drive Belt

Removing the Blade Drive Belt

1. Remove the mower; refer to Removing the Mower, page 37.

2. Remove the pulley cover mounting screws and pulley covers from both blade pulleys (Fig. 47).

3. Loosen, but do not remove the bolt and nut securing the idler pulley and belt guide (Fig. 47).

4. Remove the belt from the pulleys.

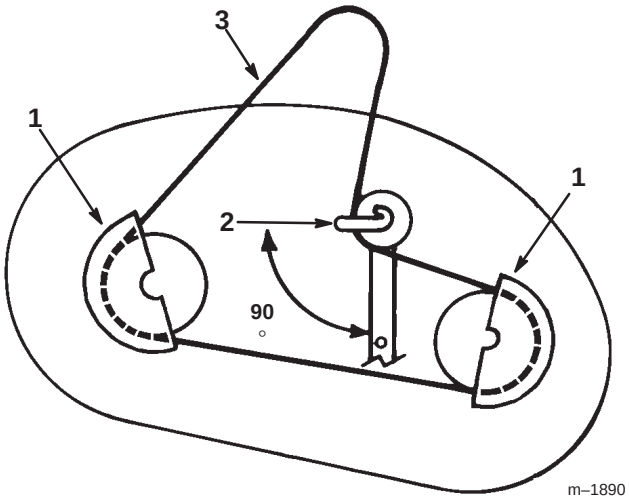
Installing the Blade Drive Belt

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

2. Position the idler pulley belt guide so it points toward the left, 90° to the idler arm (Fig. 47). Tighten the mounting bolt and lock nut securing the idler pulley and belt guide.

3. Install the left and right pulley covers with the mounting screws (Fig. 47).

4. Install the mower; refer to Installing the Mower, page 39.



m–1890

Figure 47

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 21) in the Maintenance Section.

1. Park the machine on a level surface, disengage the blade control (PTO), shift into neutral, set the parking brake, and turn the ignition key to “OFF” to stop the engine.

2. Remove the key from the ignition switch and pull the wire off the spark plug.

3. Carefully rotate blade(s) side to side (Fig. 48). Measure between the outside cutting edges and the flat surface (Fig. 48). If both measurements are not within 3/16” (5 mm), an adjustment is required; refer to steps 4 and 5.

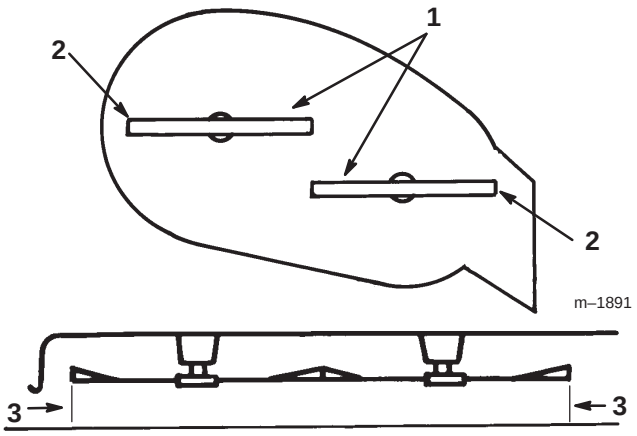


Figure 48

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

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

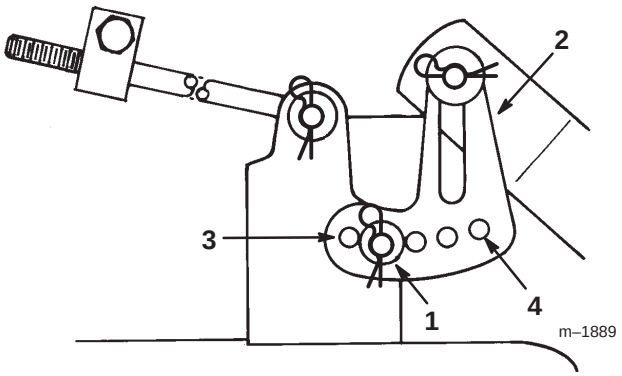


Figure 49

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

5. Now check the front-to-rear blade slope; refer to Front-to-Rear Blade Slope, page 43.

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 “Tire Pressure” (page 21) in the Maintenance Section. If the front of the mower is not within a range of 1/8”–3/8” (3.5 mm–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 blade control (PTO), shift into neutral, set the parking brake, and turn the ignition key to “OFF” to stop the engine.

2. Remove the key from the ignition switch and pull the wire off the spark plug.

3. Check and adjust side-to-side blade level if you have not checked the setting; refer to Side-to-Side Mower Leveling, page 42.

4. Move the height-of-cut lever (deck lift) into the “C” notch.

5. Measure the length of the rod extending out the front of the adjusting block on the sides of the chassis (Fig. 50). If the rod length is not 5/8” (16 mm), remove the hair pin cotter and washer from the end of the rod (Fig. 50), and turn the rod until the 5/8” (16 mm) dimension is obtained. Then install the end of the rod into the hole in the mower mount and secure in place with washer and hair pin cotter. Repeat this procedure on the opposite side of the mower.

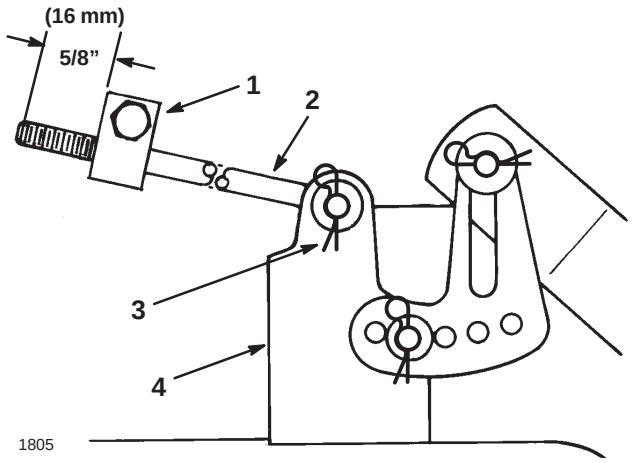


Figure 50

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

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. 51). If the front is not within a range of 1/8”–3/8” (3.5mm–10.5mm) lower than the rear, an adjustment is required.

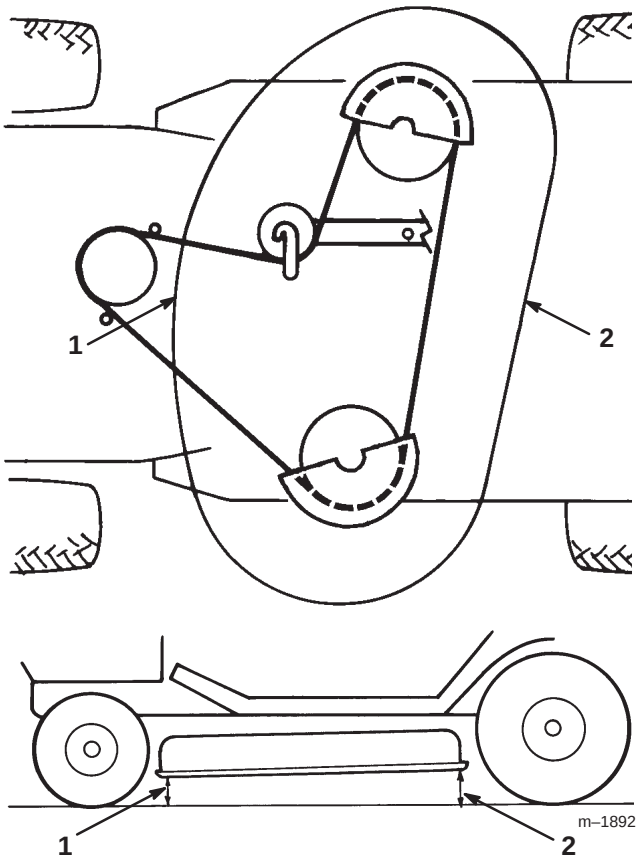


Figure 51

1. Measure front center
2. Measure rear center

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

8. Rotate lock nuts on eyebolts to change adjustment (Fig. 52).To raise the front of the mower tighten the eyebolt lock nuts. To lower the front of the mower loosen the eyebolt lock nuts.

9. After adjusting both eyebolt lock nuts evenly, check the front-to-rear slope again. Continue adjusting eyebolts until the front blade tip is 0-3/8” (0-9.2 mm) lower than the rear blade tip (Fig. 51).

10. When front-to-rear slope is correct, tighten the pivot plate mounting bolts (Fig. 52).

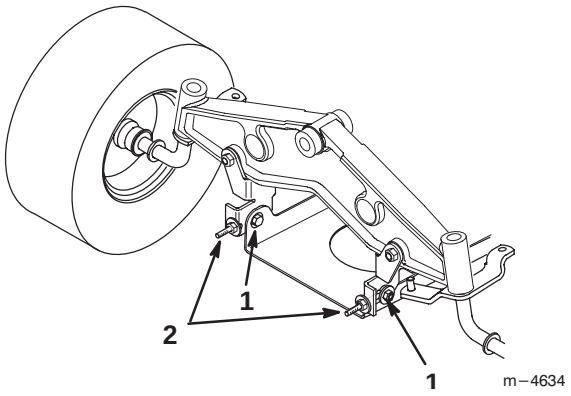


Figure 52

1. Pivot mounting bolt
2. Eyebolt locknut

11. When front-to-rear blade slope is correct, recheck the side-to-side level of the mower; refer to Side-to-Side Mower Leveling, page 42.

Washing Underside of Mower

After each use wash the underside of the mower to prevent grass build-up for improved mulch action and clipping dispersal.

1. Park the machine on a hard, level surface, disengage the power take off (PTO) and turn the ignition key to “OFF” to stop the engine.

2. Screw coupling to the end of a garden hose, attach coupling to mower washout fitting and turn water on high (Fig. 53).

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

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

4. Sit on the seat and start the engine. Engage power take off (PTO) and let mower run for one to three minutes.

5. Disengage the power take off (PTO) and turn the ignition key to “OFF” to stop the engine.

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

7. Run mower again for one to three minutes to remove excess water.

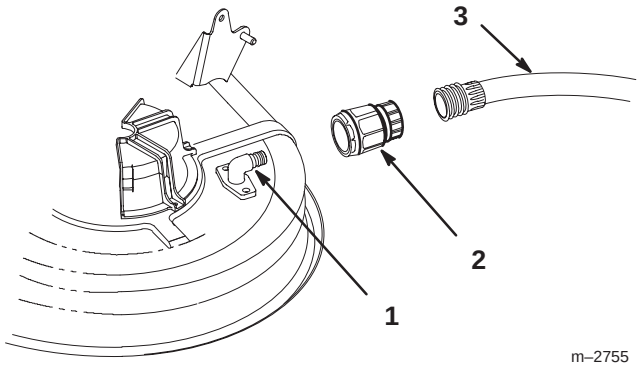


Figure 53

1. Washout fitting
2. Coupling (not included)
3. Hose

⚠ WARNING

POTENTIAL HAZARD

- **A broken or missing washout fitting could expose you and others to thrown objects or blade contact.**

WHAT CAN HAPPEN

- **Contact with thrown debris or blade contact will cause injury or death.**

HOW TO AVOID THE HAZARD

- **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 power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the 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's cylinder head fins and blower housing.

IMPORTANT: You can wash the machine with mild detergent and water. DO NOT PRESSURE 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 the battery.

3. Check the brake; refer to Brake, page 23.

4. Service the air cleaner; refer to Air Cleaner, page 32.

5. Grease the chassis; refer to Greasing and Lubrication, page 23.

6. Change the crankcase oil; refer to Engine Oil, page 34.

7. Remove the spark plug(s) and check its condition; refer to Spark Plug, page 30. With the spark plug(s) removed from the engine, pour two tablespoons of engine oil into the spark plug hole. Now 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 30. Do not install the wire on the spark plug(s).

8. Remove the battery from the chassis, check the electrolyte level, and charge it fully; refer to Battery, page 27. Do not connect the battery cables to the battery posts 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 maintains its charge for about 50 days at temperatures lower than 40°F (4°C). If the temperatures will be above 40°F (4°C), check the water level in the battery and charge it every 30 days.

9. Check the tire pressure; refer to Tire Pressure, page 23.

10. For storage over 30 days, prepare the traction unit as follows.

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

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

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

C. Stop the engine, allow it to cool and drain the fuel tank; refer to Draining Fuel Tank, page 31.

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 machine, several times to ensure no fuel remains in primer system.

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

IMPORTANT: Do not store stabilizer/conditioned gasoline over 90 days.

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

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 key from the ignition switch and keep it in a memorable place. Cover the machine to protect it and keep it clean.

Troubleshooting

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Starter does not crank	1. Blade control (PTO) is ENGAGED.	1. Move blade control (PTO) to DISENGAGED.
	2. Parking brake is not on.	2. Set parking brake.
	3. Battery is dead.	3. Charge the battery.
	4. Electrical connections are corroded or loose.	4. Check electrical connections for good contact.
	5. Fuse is blown.	5. Replace fuse.
	6. Relay or switch is defective.	6. Contact Authorized Service Dealer.
Engine will not start, starts hard, or fails to keep running.	1. Operator is not seated.	1. Sit on the seat.
	2. Fuel tank is empty.	2. Fill fuel tank with gasoline.
	3. Air cleaner is dirty.	3. Clean or replace air cleaner element.
	4. Spark plug wire is loose or disconnected.	4. Install wire on spark plug.
	5. Spark plug is pitted, fouled, or gap is incorrect.	5. Install new, correctly gapped spark plug.
	6. Choke is not closing.	6. Adjust throttle cable.
	7. Dirt in fuel filter.	7. Replace fuel filter.
	8. Idle speed is too low or mixture is incorrect.	8. Adjust carburetor idle speed and idle mixture.
	9. Dirt, water, or stale fuel is in fuel system.	9. Contact Authorized Service Dealer.
Engine loses power.	1. Engine load is excessive.	1. Shift into lower gear to reduce ground speed.
	2. Air cleaner is dirty.	2. Clean air cleaner element.
	3. Oil level in crankcase is low.	3. Add oil to crankcase.
	4. Cooling fins and air passages under engine blower housing are plugged.	4. Remove obstruction from cooling fins and air passages.
	5. Spark plug is pitted, fouled, or gap is incorrect.	5. Install new, correctly gapped spark plug.

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Engine loses power (continued).	6. Vent hole in fuel cap is plugged.	6. Clean or replace the fuel cap.
	7. Dirt in fuel filter.	7. Replace fuel filter.
	8. Dirt, water, or stale fuel is in fuel system.	8. Contact Authorized Service Dealer.
Engine overheats.	1. Engine load is excessive.	1. Shift into lower gear to reduce ground speed.
	2. Oil level in crankcase is low.	2. Add oil to crankcase.
	3. Cooling fins and air passages under engine blower housing are plugged.	3. Remove obstruction from cooling fins and air passages.
Abnormal vibration.	1. Cutting blade(s) is bent or unbalanced.	1. Install new cutting blade(s).
	2. Blade mounting bolt is loose.	2. Tighten blade mounting bolt.
	3. Engine mounting bolts are loose.	3. Tighten engine mounting bolts.
	4. Loose engine pulley, idler pulley, or blade pulley.	4. Tighten the appropriate pulley.
	5. Engine pulley is damaged.	5. Contact Authorized Service Dealer.
Blade(s) does not rotate.	1. Blade drive belt is worn, loose or broken.	1. Install new blade drive belt.
	2. Blade drive belt is off pulley.	2. Install blade drive belt and check idler pulley and belt guides for correct position.
Machine does not drive.	1. Traction belt is worn, loose or broken.	1. Contact Authorized Service Dealer.
	2. Traction belt is off pulley.	2. Contact Authorized Service Dealer.
	3. Transmission does not shift.	3. Contact Authorized Service Dealer.
Uneven cutting height.	1. Tire pressure is incorrect.	1. Set tire pressure.
	2. Mower is not level.	2. Level mower from side-to-side and front-to-rear.
	3. Underside of mower is dirty.	3. Clean the underside of the mower.

TORO®