



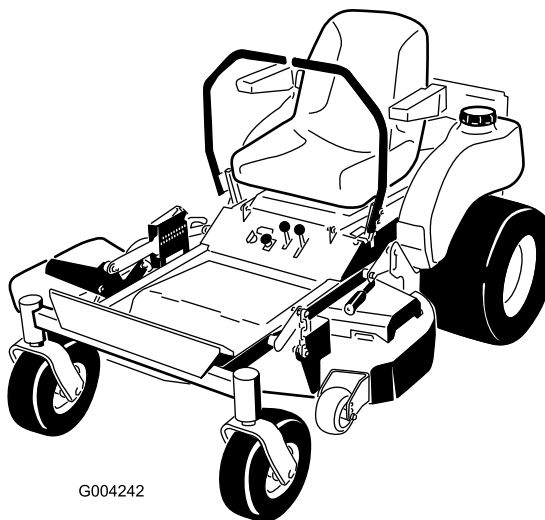
Count on it.

Operator's Manual

Z334 Z Master with a 86cm 7-Gauge Side Discharge Mower or Z340 Z Master with a 102cm 7-Gauge Side Discharge Mower

Model No. 74408TE—Serial No. 270000001 and Up

Model No. 74409TE—Serial No. 270000001 and Up



G004242

Warning

CALIFORNIA Proposition 65 Warning

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

Important: This engine is not equipped with a spark arrester muffler. It is a violation of California Public Resource Code Section 4442 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land. Other states or federal areas may have similar laws.

This spark ignition system complies with Canadian ICES-002

The enclosed Engine Owner's Manual is supplied for information regarding the US Environmental Protection Agency (EPA) and the California Emission Control Regulation of emission systems, maintenance, and warranty. Replacements may be ordered through the engine manufacturer.

Introduction

Read this information carefully to learn how to operate and maintain your product properly and to avoid injury and product damage. You are responsible for operating the product properly and safely.

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

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

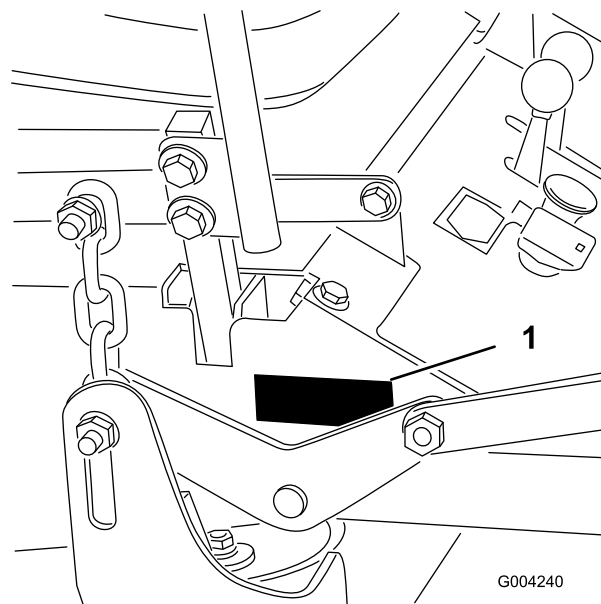


Figure 1

1. Model and serial number location

Model No. _____
Serial No. _____

This manual identifies potential hazards and has safety messages identified by the safety alert symbol (Figure 2), which signals a hazard that may cause serious injury or death if you do not follow the recommended precautions.



Figure 2

1. Safety alert symbol

This manual uses 2 other words to highlight information. **Important** calls attention to special mechanical information and **Note** emphasizes general information worthy of special attention.

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Safety

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.

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

This product is designed for cutting and recycling grass or, when equipped with a grass bagger, for catching cut grass. Any use for purposes other than these could prove dangerous to user and bystanders.

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 control levers. The main reasons for loss of control are:

- ◇ insufficient wheel grip, especially on wet grass;
- ◇ 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

- Be alert, slow down and use caution when making turns. Look behind and to the side before changing directions.
- 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 greater than 15 degrees.
- 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 on a slope;
 - use slow speeds on slopes and during tight turns;
 - stay alert for humps and hollows and other hidden hazards;
- 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.
- 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.

- Engine exhaust contains carbon monoxide, which is an odorless, deadly poison that can kill you. Do not run engine indoors or in an enclosed area.
- Keep hands, feet, hair and loose clothing away from attachment discharge area, underside of mower and any moving parts while engine is running.
- Do not touch equipment or attachment parts which may be hot from operation. Allow to cool before attempting to maintain, adjust, or service.
- Battery acid is poisonous and can cause burns. Avoid contact with skin, eyes and clothing. Protect your face, eyes, and clothing when working with a battery.
- Battery gases can explode. Keep cigarettes, sparks and flames away from battery.
- Use only genuine Toro replacement parts to ensure that original standards are maintained.
- Use only Toro-approved attachments. Warranty may be voided if used with unapproved attachments.

Slope Operation

- Do not mow slopes greater than 15 degrees.
- Do not mow near drop-offs, ditches, steep banks or water. Wheels dropping over edges can cause rollovers, which may result in serious injury, death or drowning.
- Do not mow slopes when grass is wet. Slippery conditions reduce traction and could cause sliding and loss of control.
- Do not make sudden turns or rapid speed changes.

- Use a walk behind mower and/or a hand trimmer near drop-offs, ditches, steep banks or water.
- Reduce speed and use extreme caution on slopes.
- Remove or mark obstacles such as rocks, tree limbs, etc. from the mowing area. Tall grass can hide obstacles.
- Watch for ditches, holes, rocks, dips, and rises that change the operating angle, as rough terrain could overturn the machine.
- Avoid sudden starts when mowing uphill because the mower may tip backwards.
- Be aware that loss of traction may occur going downhill. Weight transfer to the front wheels may cause drive wheels to slip and cause loss of braking and steering.
- Always avoid sudden starting or stopping on a slope. If tires lose traction, disengage the blades and proceed slowly off the slope.
- Follow the manufacturer's recommendations for wheel weights or counterweights to improve stability.
- Use extreme care with grass catchers or other attachments. These can change the stability of the machine and cause loss of control.

Sound Pressure for Z334 Models

This unit has a maximum sound pressure level at the operator's ear of 89 dBA, based on measurements of identical machines per EN 11094 and EN 836.

Sound Power for Z334 Models

This unit has a guaranteed sound power level of 100 dBA, based on measurements of identical machines per EN 11094.

Vibration for Z334 Models

This unit does not exceed a hand/arm vibration level of 1.7 m/s², based on measurements of identical machines per EN 1033. This unit does not exceed a whole body vibration level of

0.67 m/s², based on measurements of identical machines per EN 1032.

Sound Pressure for Z340 Models

This unit has a maximum sound pressure level at the operator's ear of 90 dBA, based on measurements of identical machines per EN 11094 and EN 836.

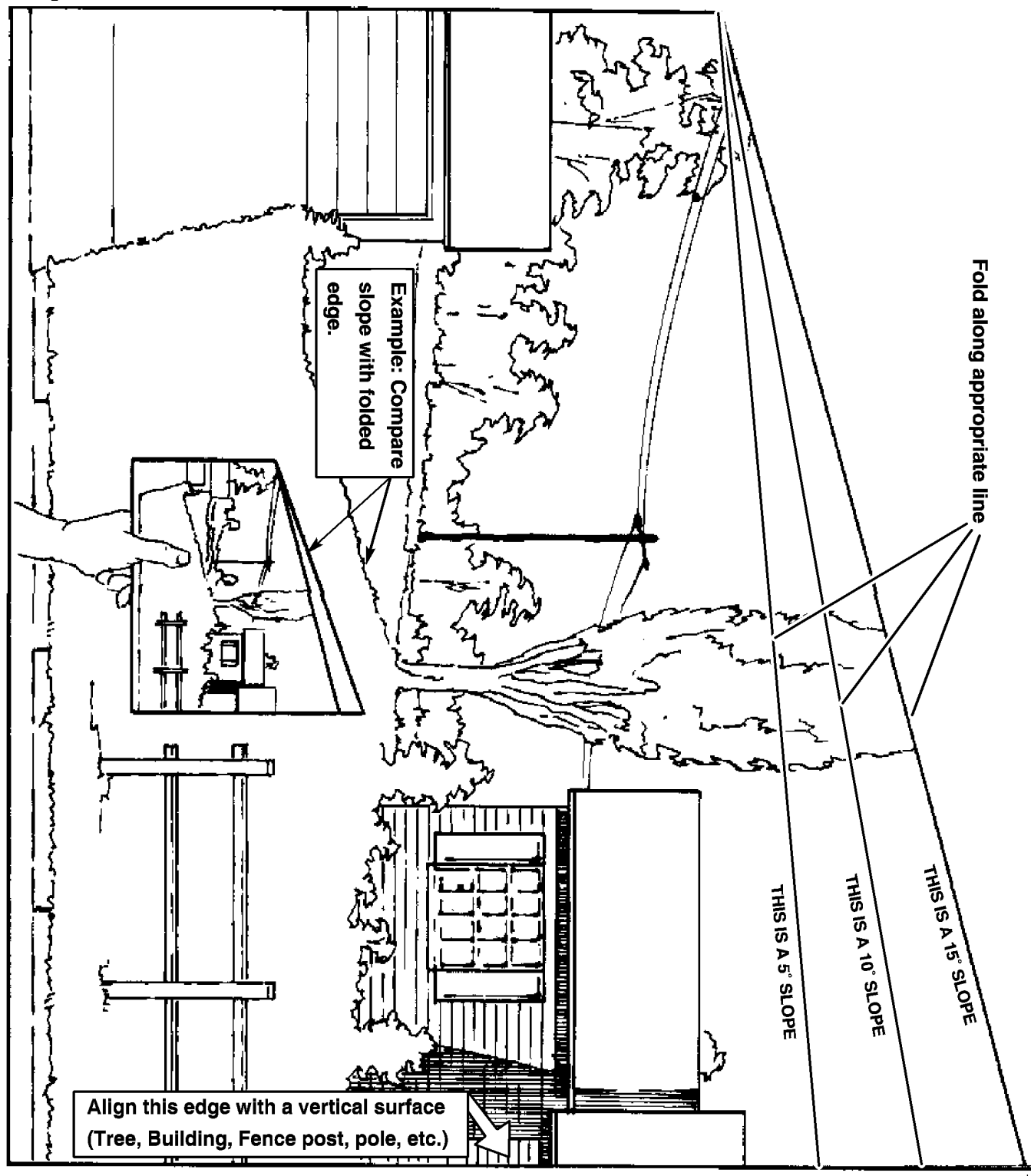
Sound Power for Z340 Models

This unit has a guaranteed sound power level of 100 dBA, based on measurements of identical machines per EN 11094.

Vibration for Z340 Models

This unit does not exceed a hand/arm vibration level of 2.0 m/s², based on measurements of identical machines per EN 1033. This unit does not exceed a whole body vibration level of 0.63 m/s², based on measurements of identical machines per EN 1032.

Slope Chart



Safety and Instructional Decals

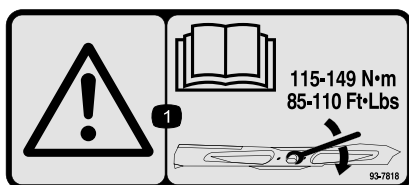


Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or lost.



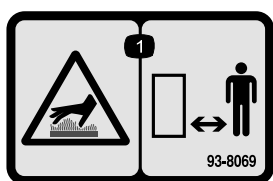
93-7010

1. Thrown object hazard—
2. Thrown object hazard, mower—keep the deflector in place.
3. Cutting/dismemberment of hand or foot—stay away from moving parts.



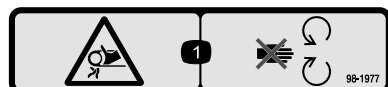
93-7818

1. Warning—read the *Operator's Manual* for instructions on torquing the blade bolt/nut to 115-149 N·m (85-110 ft-lb).



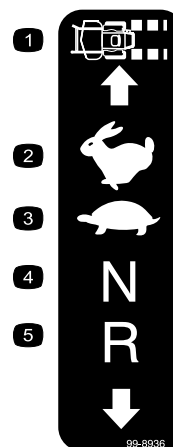
93-8069

1. Hot surface/burn hazard—stay a safe distance from the hot surface.



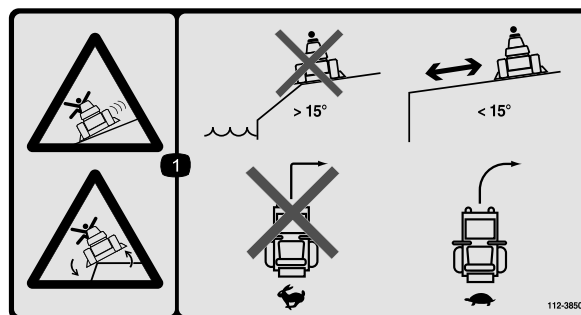
98-1977

1. Entanglement hazard, belt—stay away from moving parts.



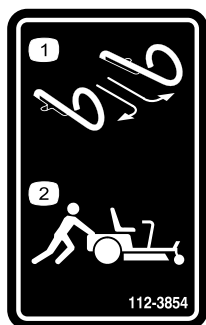
99-8936

1. Machine speed
2. Fast
3. Slow
4. Neutral
5. Reverse



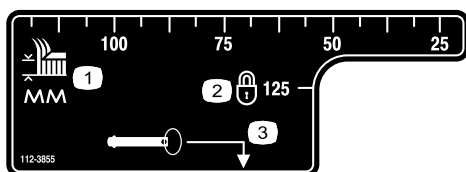
112-3850

1. Sliding and loss of control hazard and tipping hazard, drop-offs—do not operate the machine near drop-offs, slopes greater than 15 degrees, or water; keep a safe distance from drop-offs; do not turn sharply while traveling fast, instead, slow down and turn gradually.



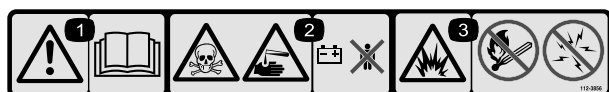
112-3854

1. Pull tow bypass levers rearward and then out to lock into place.
2. Push the machine.



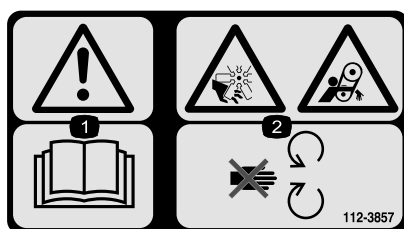
112-3855

1. Height of cut—mm
2. Locked position
3. Locking pin location.



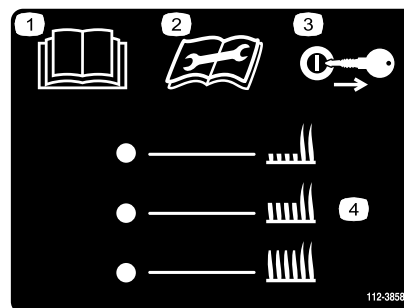
112-3856

1. Warning—read the *Operator's Manual* for more information.
2. Poison hazard; caustic liquid/chemical burn hazard—keep children away from the battery.
3. Explosion hazard—no fire, open flames, or smoking; avoid sparks.



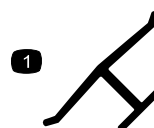
112-3857

1. Warning—read the *Operator's Manual*.
2. Cutting/dismemberment hazard, fan and entanglement hazard, belt—stay away from moving parts.



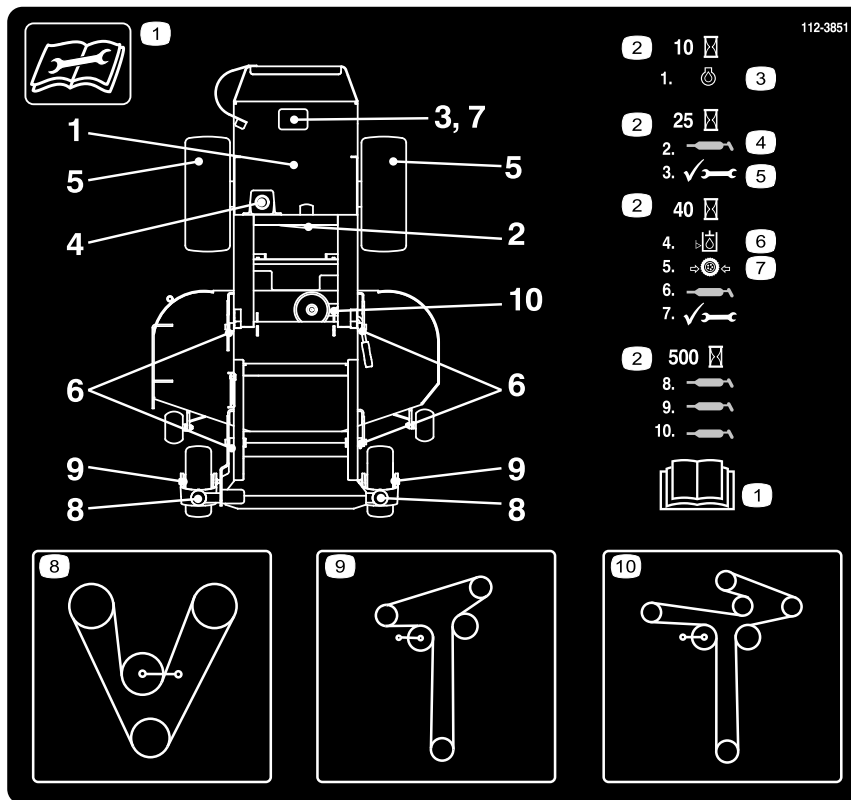
112-3858

1. Read the *Operator's Manual*.
2. Read the instructions before servicing or performing maintenance.
3. Remove the ignition key before adjusting the height of cut.
4. Height of cut settings.



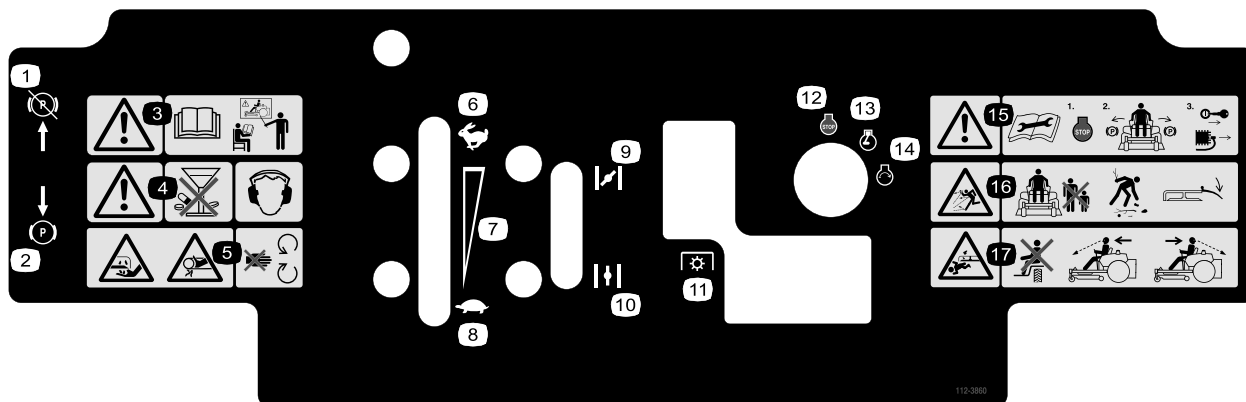
Manufacturer's Mark

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



112-3851

- | | | | |
|--|--|---------------------------------|------------------------------------|
| 1. Read the <i>Operator's Manual</i> before servicing or performing maintenance. | 4. Grease here | 7. Tire pressure | 10. Belt routing—three blade decks |
| 2. Time interval | 5. Check and perform any maintenance necessary | 8. Belt routing—pump drive | |
| 3. Engine oil | 6. Hydraulic oil level | 9. Belt routing—two blade decks | |



112-3860

- | | | | |
|--|--------------------------------|---|---|
| 1. Parking brake—off | 6. Throttle—fast | 11. Power take off (PTO) | 16. Thrown object hazard—keep bystanders a safe distance from the machine, pick up debris before operating, keep deflector in place. |
| 2. Parking brake—on | 7. Continuous variable setting | 12. Engine—stop | 17. Crushing/dismemberment hazard of bystanders—do not carry passengers, look forward and down when operating the machine, look behind and down when reversing. |
| 3. Warning—read the <i>Operator's Manual</i> and receive training. | 8. Throttle—slow | 13. Engine—run | |
| 4. Warning—do not use drugs or alcohol; wear hearing protection. | 9. Choke—closed | 14. Engine—start | |
| 5. Cutting hazard; entanglement hazard of hands—keep away from moving parts. | 10. Choke—open | 15. Warning—read the instructions before servicing or performing maintenance; move the motion control levers to the brake position, remove the ignition key and disconnect the spark plug wire. | |

Product Overview

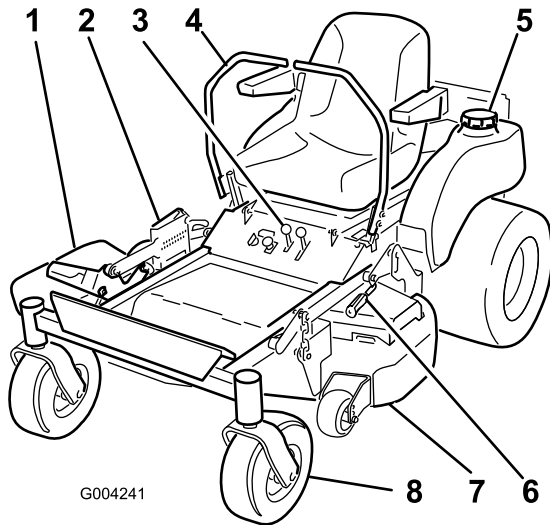


Figure 3

- | | |
|--------------------------------|--------------------------|
| 1. Side discharge chute | 5. Fuel cap (both sides) |
| 2. Height-of-cut selection pin | 6. Parking brake lever |
| 3. Controls | 7. Mower deck |
| 4. Motion control lever | 8. Front caster wheel |

Controls

Become familiar with all the controls before you start the engine and operate the machine (Figure 3 and Figure 4).

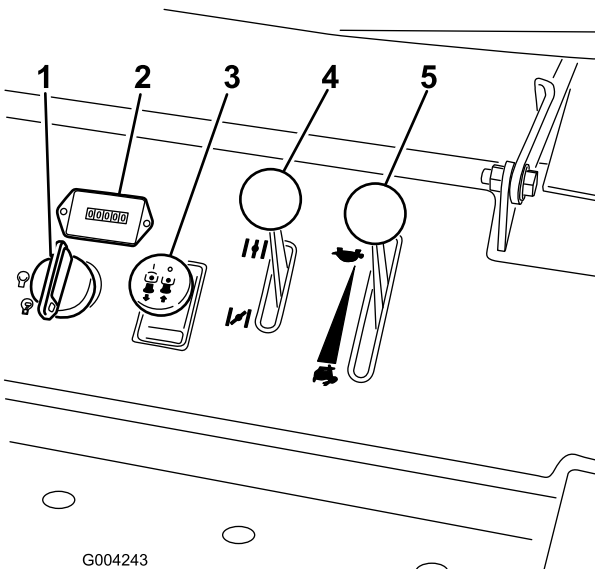


Figure 4

- | | |
|--------------------|---------------------|
| 1. Ignition switch | 4. Choke lever |
| 2. Hour meter | 5. Throttle control |
| 3. PTO Switch | |

Using the Hour Meter

The hour meter (Figure 5) records the number of hours the engine has operated. It operates when the engine is running. Use these times for scheduling regular maintenance.

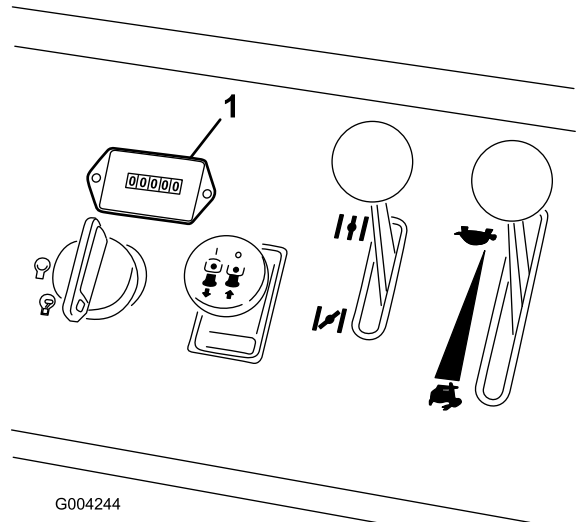


Figure 5

1. Hour meter

Using the Fuel Shutoff Valve

The machine has 2 fuel tanks, one on the left side and the other on the right side. Each tank connects to a check valve and then to a tee. From there a common fuel line leads to the engine (Figure 6).

Close the fuel shutoff valve before transporting or storing the machine.

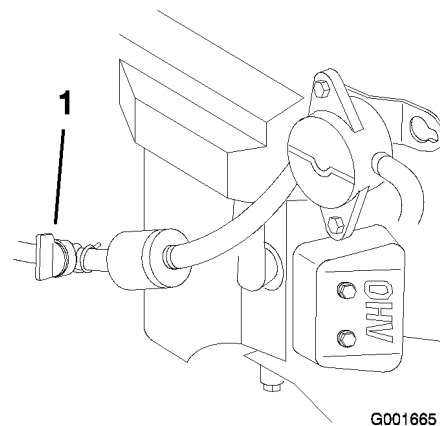


Figure 6

1. Fuel shutoff valve

Operation

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

Adding Fuel

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.



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.
- Never fill the fuel tank inside an enclosed trailer.
- Do not fill the fuel tank completely full. Add gasoline to the fuel tank until the level is 1/4 to 1/2 inch (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.
- Do not operate without entire exhaust system in place and in proper working condition.



In certain conditions during fueling, static electricity can be released causing a spark which can ignite the gasoline vapors. A fire or explosion from gasoline can burn you and others and can damage property.

- 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.



Gasoline is harmful or fatal if swallowed. Long-term exposure to vapors can cause serious injury and illness.

- Avoid prolonged breathing of vapors.
- Keep face away from nozzle and gas tank or conditioner opening.
- Keep gas away from eyes and skin.

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 it is recommended that the fuel tank be drained.

- 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

Note: If the fuel has been totally run out of the machine, make sure both fuel tanks are half full when starting the machine. This will prevent air getting into the fuel system and causing starting problems.

1. Shut the engine off and set the parking brake.
2. Clean around each fuel tank cap and remove the cap.
3. 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.


4. Install fuel tank caps securely.
5. Wipe up any gasoline that may have spilled.

Checking the Engine Oil Level

Before you start the engine and use the machine, check the oil level in the engine crankcase; refer to Checking Oil Level in Engine Maintenance, page 29

Think Safety First

Please read all safety instructions and symbols in the safety section. Knowing this information could help you or bystanders avoid injury.

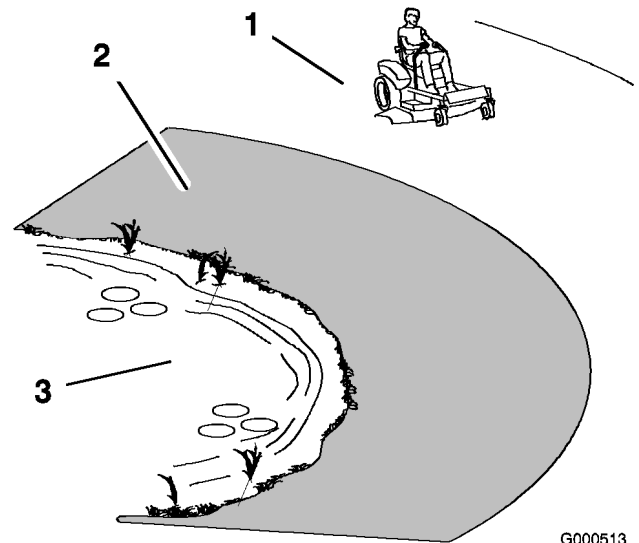


Operating on wet grass or steep slopes can cause sliding and loss of control.

Wheels dropping over edges can cause rollovers, which may result in serious injury, death or drowning.

To avoid loss of control and possibility of rollover:

- Do not operate near drop-offs or near water.
- Do not operate on slopes greater than 15 degrees.
- Reduce speed and use extreme caution on slopes.
- Avoid sudden turns or rapid speed changes.



G000513

Figure 7

1. Safe Zone-use the Z Master here on slopes less than 15 degrees or flat areas.
2. Use walk behind mower and/or hand trimmer near drop-offs and water.
3. Water



This machine produces sound levels in excess of 85 dBA at the operators ear and can cause hearing loss through extended periods of exposure.

Wear hearing protection when operating this machine.

Use protective equipment for your eyes, hearing, feet, and head.

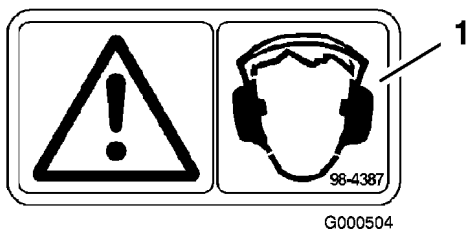


Figure 8

1. Warning— wear hearing protection

Operating the Parking Brake

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

Setting the Parking Brake

1. Move the motion control levers (Figure 14) out to the neutral lock position.
2. Pull up and back on the parking brake lever to set the parking brake (Figure 9). The parking brake lever should stay firmly in the engaged position.



Parking brake may not hold machine parked on a slope and could cause personal injury or property damage.

Do not park on slopes unless wheels are chocked or blocked

Releasing the Parking Brake

Push forward and down on the parking brake lever to release the parking brake (Figure 9).

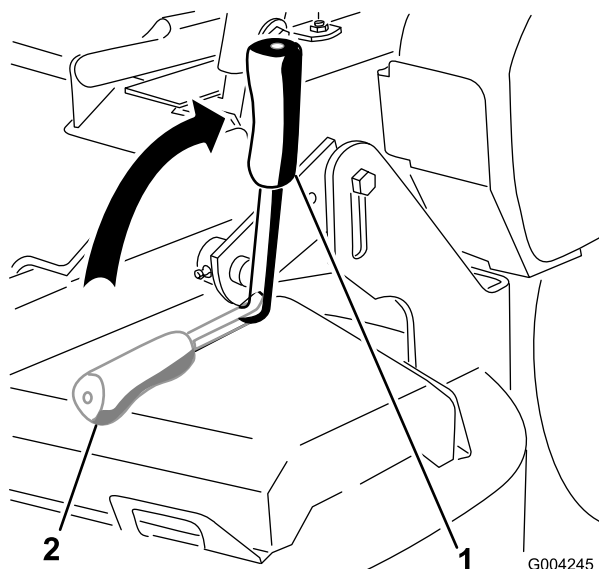


Figure 9

1. Parking brake – Set/ON
2. Parking brake – Released/OFF

Starting and Stopping the Engine

Starting the Engine

1. Sit on the seat and move the motion controls to neutral locked position.
2. Set the parking brake; refer to Setting the Parking Brake.
3. Move the PTO (power take off) switch to the Off position (Figure 10).

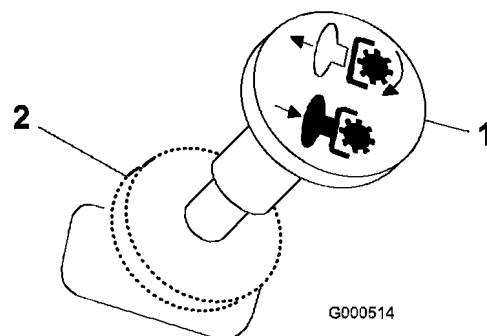


Figure 10

1. PTO—on (knob out)
2. PTO—off (knob in)

4. Move the choke control to the **on** position before starting a cold engine (Figure 11).

Note: A warm or hot engine may not require choking. After engine starts, move choke control to Run position.

5. Move the throttle control to the **fast** position before starting a cold engine (Figure 11).

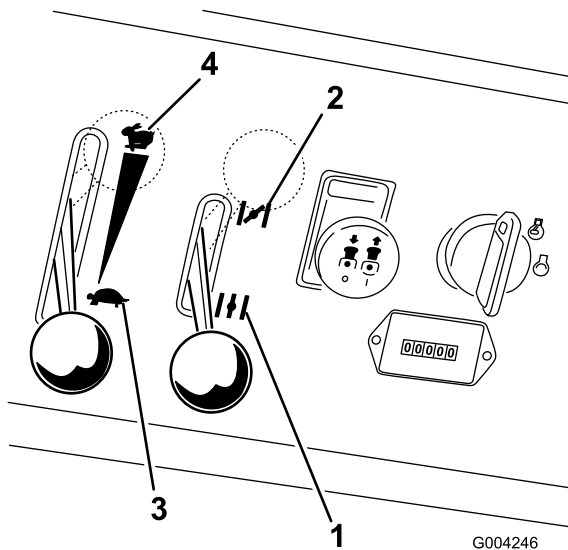
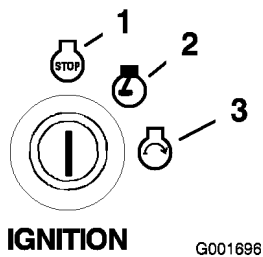


Figure 11

1. Choke—on
2. Choke—off
3. Throttle—slow
4. Throttle—fast

6. Turn the ignition key to Start. When the engine starts, release the key (Figure 12).

Important: Do not engage starter for more than 10 seconds at a time. If engine fails to start allow 30 second cool-down period between attempts. Failure to follow these instructions can burn out starter motor.



IGNITION

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Figure 12

1. Off
2. Run
3. Start

7. After the engine starts, move the choke to off (Figure 11). If the engine stalls or hesitates, move the choke back to on for a few seconds, then move the throttle lever to desired setting. Repeat this as required.

Stopping the Engine

1. Push the PTO to the off position (Figure 10).
2. Move the throttle lever midway between the slow and fast positions (Figure 11).
3. Let the engine idle for 60 seconds.
4. Turn the ignition key to the off position and remove the key (Figure 12).
5. Close the fuel shut off valve before transporting or storing the machine (Figure 6).

Important: Make sure that the fuel shut off valve is closed before transporting or storing the machine, as fuel leakage may occur. Set the parking brake before transporting. Make sure to remove the key as the fuel pump may run and cause the battery to lose charge.



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

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

Operating the Power Take Off (PTO)

The power take off (PTO) switch starts and stops the mower blades and any powered attachments.

Engaging the PTO

1. If the engine is cold, allow the engine to warm up 5 to 10 minutes before engaging the PTO.
2. While seated in the seat, release the pressure on the traction control levers and place in neutral.
3. Place the throttle in the fast position.

Note: Engaging the PTO with the throttle at the half or less position will cause excessive wear to the drive belts.

4. Pull out on the power take off (PTO) switch to engage it (Figure 13).

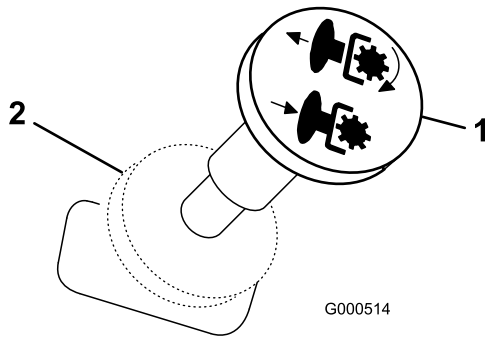


Figure 13

1. PTO-On (knob out) 2. PTO-Off (knob in)

Disengaging the PTO

To disengage, push the PTO switch to the off position (Figure 13).

The Safety Interlock System



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.

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 parking brake is engaged.
- The power take off (PTO) is off.
- The motion control levers are in the neutral locked position

The safety interlock system also is designed to stop the engine when the traction controls are moved from the locked position with the parking brake engaged or if you rise from the seat when the PTO switch is on.

Testing the Safety Interlock System

Test the safety interlock 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.

1. Sitting on the seat, engage the parking brake and move the PTO to on. Try starting the engine; the engine should not crank.
2. Sitting on the seat, engage the parking brake and move the PTO to off. Move either motion control lever (out of neutral locked position). Try starting the engine; the engine should not crank. Repeat for other control lever.
3. Sitting on the seat, engage the parking brake, move the PTO switch to off and move the motion control levers to neutral lock position. Now start the engine. While the engine is running, release the parking brake, move the PTO to on and rise slightly from the seat; the engine should stop.
4. Sitting on the seat, engage the parking brake, move the PTO switch to off and move the motion control levers to neutral lock position. Now start the engine. While the engine is running, center either motion control and move (forward or reverse); the engine should stop. Repeat for other motion control.
5. Sitting on the seat, disengage the parking brake, move the PTO switch to off and move the motion control levers to neutral lock position. Try starting the engine; the engine should not crank.

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. Always operate in the full throttle position when mowing.



Machine can spin very rapidly. Operator may lose control of machine and cause personal injury or damage to machine.

- Use caution when making turns.
- Slow the machine down before making sharp turns.

Driving Forward

1. Release the parking brake; refer to Releasing the Parking Brake.
2. Move the levers to the center, the un-locked position.
3. To go forward, slowly push the motion control levers forward (Figure 14).

Note: The engine will kill if the traction control levers are moved with the parking brake engaged.

To go straight, apply equal pressure to both motion control levers (Figure 14).

To turn, move the motion control lever toward neutral in the direction you want to turn (Figure 14).

The farther you move the traction control levers in either direction, the faster the machine will move in that direction.

To stop, pull the motion control levers to the center position.

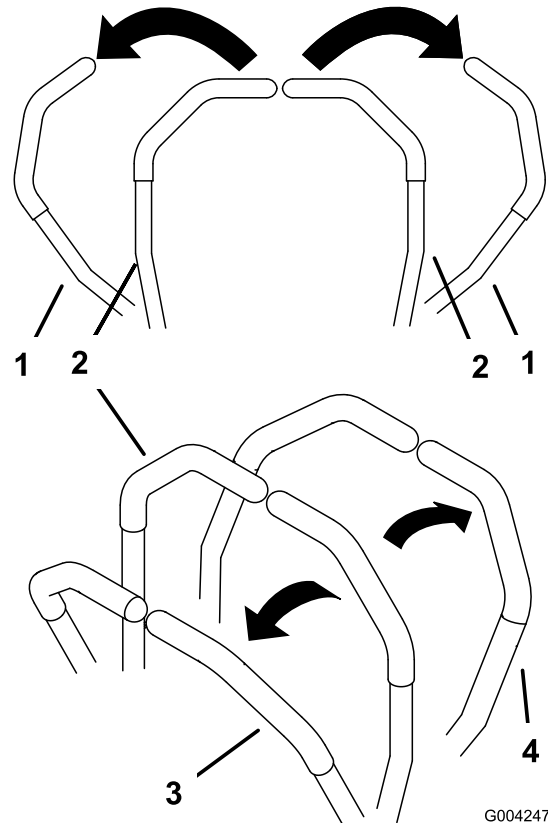


Figure 14

- | | |
|---|-------------|
| 1. Motion control lever-neutral lock position | 3. Forward |
| 2. Center un-lock position | 4. Backward |

Driving Backward

1. Move the levers to the center, un-locked position.
2. To go backward, slowly pull the motion control levers rearward (Figure 14).

To go straight, apply equal pressure to both motion control levers (Figure 14).

To turn, release pressure on the motion control lever toward the direction you want to turn (Figure 14).

To stop, push the motion control levers to the neutral position.

Stopping the Machine

To stop the machine, move the traction control levers to the center position and move them out to the locked position, disengage the power take off (PTO), and turn the ignition key to off.

Set the parking brake when you leave the machine; refer to Setting the Parking Brake in Operation,

page 14. Remember to remove the key from the ignition switch.



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

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

Adjusting the Height-of-Cut

The height-of-cut is adjusted from 25 to 125 mm (1 to 5 inch) in 1/4 inch (6 mm) increments by relocating the clevis pin into different hole locations.

1. Raise the height-of-cut lever to the transport position (also the 5 inch (125 mm) cutting height position) (Figure 15).
2. To adjust, remove the clevis pin from the height-of-cut bracket (Figure 15).
3. Select a hole in the height-of-cut bracket corresponding to the height-of-cut desired and, insert the clevis pin (Figure 15).
4. Move the lever to the selected height.

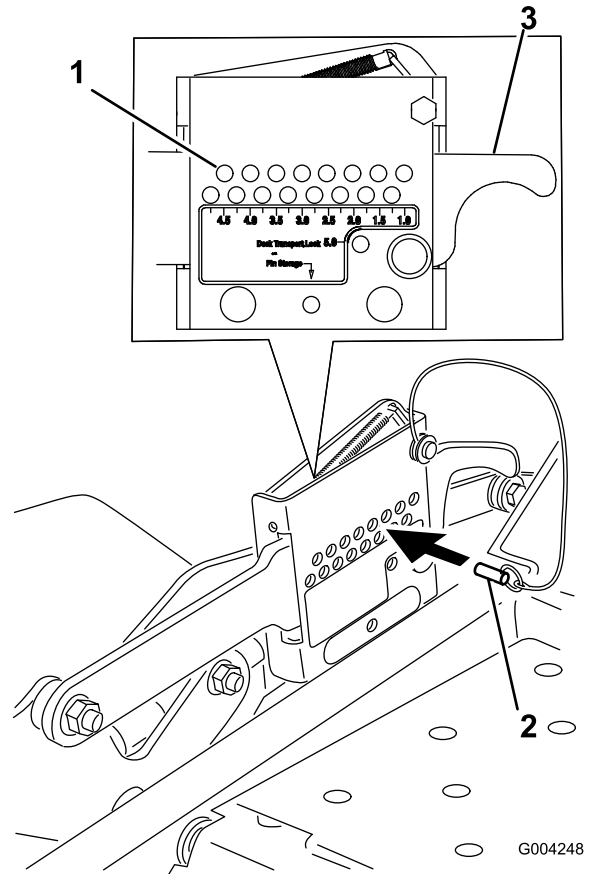


Figure 15

1. Height of cut holes 2. Clevis Pin

Using the Lift Assist Pedal

The lift assist pedal is used for raising the mower deck. This allows for easier raising of the mower deck.

1. Place your foot onto lift assist lever.
2. Press on the lift assist lever while pulling up on the height-of-cut lever (Figure 16).

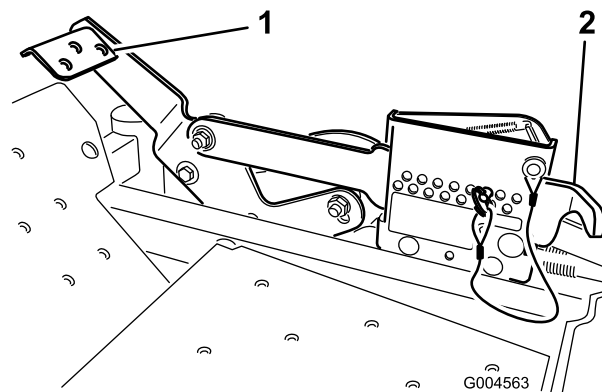


Figure 16

1. Lift Assist pedal 2. Height-of-cut lever

Adjusting the Anti-Scalp Rollers

Whenever you change the height-of-cut, adjust the height of the anti-scalp rollers.

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. After adjusting the height-of-cut, adjust the rollers by removing the flange nut, bushing, spacer, and bolt (Figure 17).
4. Select a hole so the anti-scalp roller is positioned to the nearest corresponding height-of-cut desired.
5. Install the flange nut, bushing, spacer, and bolt. Torque to 40-45 ft-lb (54-61 N•m) (Figure 17).
6. Repeat this adjustment on the other anti-scalp rollers.

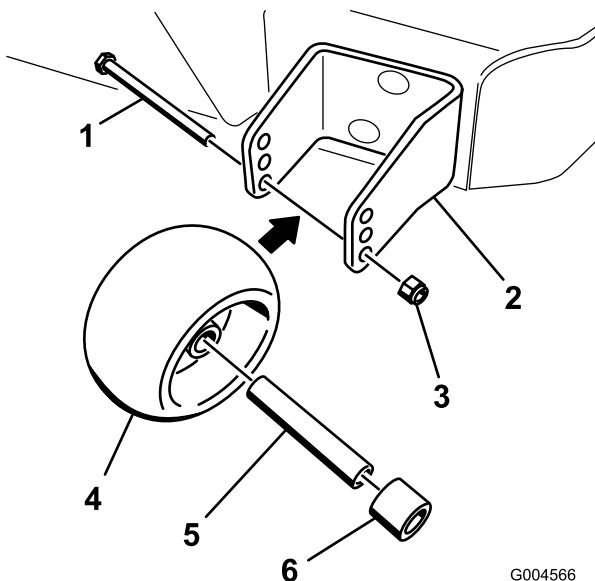


Figure 17

- | | |
|------------------------------|----------------------|
| 1. Bolt | 4. Anti-scalp roller |
| 2. Anti-scalp roller bracket | 5. Spacer |
| 3. Flange Nut | 6. Bushing |

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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. Remove the seat retaining bracket (Figure 19).

2. Raise the seat and loosen the adjustment bolts (Figure 18).
3. Move the seat to the desired position and tighten the bolts.

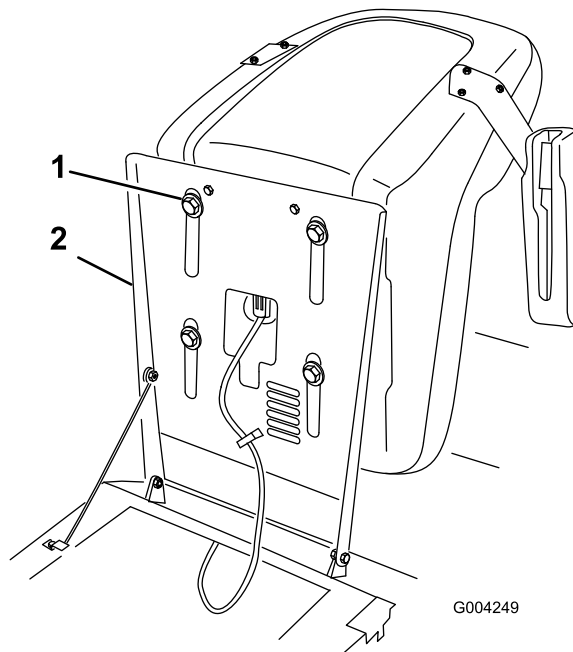


Figure 18

- | | |
|---------------------|---------|
| 1. Adjustment bolts | 2. Seat |
|---------------------|---------|

4. Lower the seat and secure the seat with the seat retaining bracket (Figure 19).

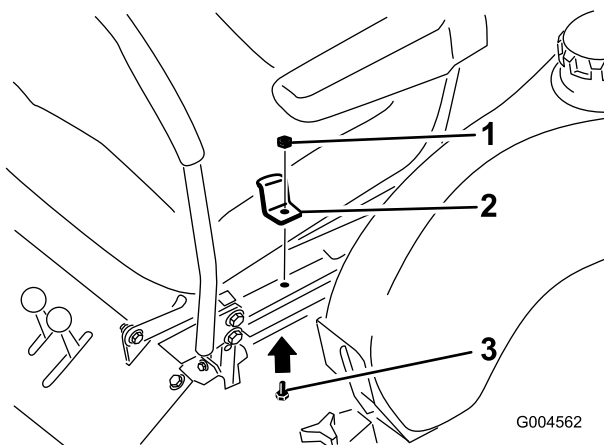


Figure 19

- | | |
|--------------------------|---------|
| 1. Nut | 3. Bolt |
| 2. Seat retainer bracket | |

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Pushing the Machine by Hand

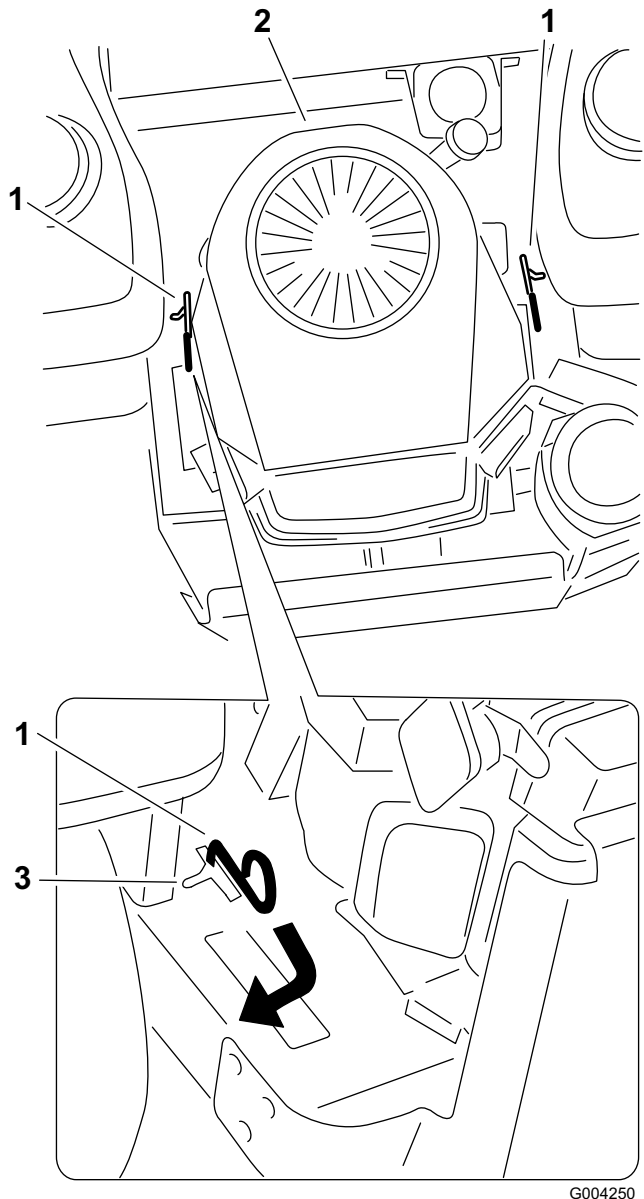
Important: Always push the machine by hand. Never tow the machine because damage may occur.

To Push the Machine

1. Disengage the blade control switch and move the control levers to the neutral locked position and apply the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Pull the two bypass levers rearward and push them to the outside into the slot to lock them into place. (Figure 20).

Note: Make sure both bypass levers are disengaged before pushing the machine.

4. Disengage the parking brake to push the machine.



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Figure 20

- | | |
|----------------------|---------|
| 1. Bypass lever | 3. Slot |
| 2. Topview of engine | |

To Operate the Machine

Push each bypass lever to the inside and push them forward (Figure 20).

Note: The machine will not drive unless the bypass levers are pushed forward.

Using the Side Discharge

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



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 the discharge area or mower blades unless you move the power take off (PTO) to the off position, rotate the ignition key to off and remove the key.**
- **Make sure the grass deflector is in the down position.**

Transporting Machines

Use a heavy-duty trailer or truck to transport the machine. Ensure that the trailer or truck has all necessary lighting and marking as required by law. Please carefully read all the safety instructions. Knowing this information could help you, your family, pets or bystanders avoid injury.

To transport the machine:

- Lock the brake and block the wheels.
- Securely fasten the machine to the trailer or truck with straps, chains, cable, or ropes.
- Secure a trailer to the towing vehicle with safety chains.



Driving on the street or roadway without turn signals, lights, reflective markings, or a slow moving vehicle emblem is dangerous and can lead to accidents causing personal injury.

Do not drive machine on a public street or roadway.

Loading Machines

Use extreme caution when loading units on trailers or trucks. One full width ramp that is wide enough to extend beyond the rear tires is recommended instead of individual ramps for each side of the unit (Figure 21). The lower rear section of the tractor frame extends back between the rear wheels and serves as a stop for tipping backward. Having a full width ramp provides a surface for the frame members to contact if the unit starts to tip backward. If it is not possible to use one full width ramp, use enough individual ramps to simulate a full width continuous ramp.

The ramp should be long enough so that the angles do not exceed 15 degrees (Figure 21). A steeper angle may cause mower components to get caught as the unit moves from ramp to trailer or truck. Steeper angles may also cause the unit to tip backward. If loading on or near a slope, position the trailer or truck so it is on the down side of the slope and the ramp extends up the slope. This will minimize the ramp angle. The trailer or truck should be as level as possible.

Important: Do Not attempt to turn the unit while on the ramp; you may lose control and drive off the side.

Avoid sudden acceleration when driving up a ramp and sudden deceleration when backing down a ramp. Both maneuvers can cause the unit to tip backward.



Loading a unit onto a trailer or truck increases the possibility of backward tip-over and could cause serious injury or death.

- Use extreme caution when operating a unit on a ramp.
- Use only a single, full width ramp; Do Not use individual ramps for each side of the unit.
- If individual ramps must be used, use enough ramps to create an unbroken ramp surface wider than the unit.
- Do not exceed a 15 degree angle between ramp and ground or between ramp and trailer or truck.
- Avoid sudden acceleration while driving unit up a ramp to avoid tipping backward.
- Avoid sudden deceleration while backing unit down a ramp to avoid tipping backward.

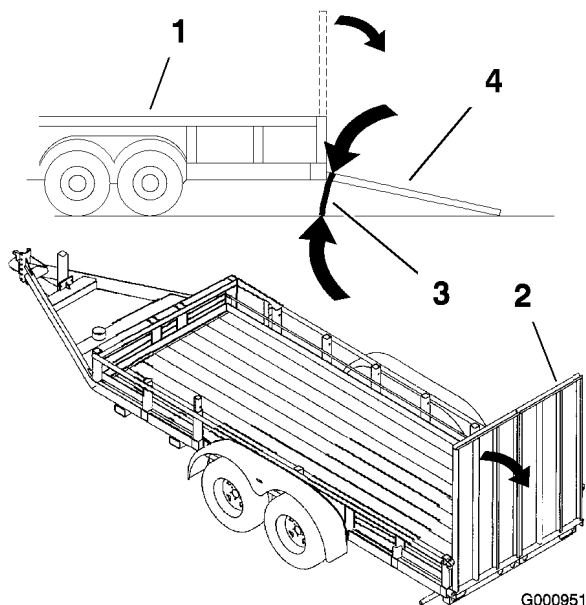


Figure 21

- | | |
|--------------------|--------------------------------|
| 1. Trailer | 3. Not greater than 15 degrees |
| 2. Full width ramp | 4. Full width ramp—side view |

Operating Tips

Fast Throttle Setting

For best mowing and maximum air circulation, operate the engine at the fast throttle position. Air is required to thoroughly cut grass clippings, so do not set the height-of-cut so low as to 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.

Cutting a Lawn 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 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.

Cutting Speed

To improve cut quality, use a slower ground speed in certain conditions.

Avoid Cutting Too Low

If the cutting width of the mower is wider than the mower you previously used, raise the cutting height to ensure that 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, move onto a previously cut area with the blades engaged.

Keep the Underside of the Mower Clean

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. Check the cutter blades daily for sharpness, and for any wear or damage. File down any nicks and sharpen the blades as necessary. If a blade is damaged or worn, replace it immediately with a genuine TORO replacement blade.

Maintenance

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 8 operating hours	<ul style="list-style-type: none"> • Check for any loose fasteners and tighten them. • Change the engine oil. • Tighten the wheel lug nuts. • Check the hydraulic fluid.
After the first 250 operating hours	<ul style="list-style-type: none"> • Change the hydraulic filters and oil.
Before each use or daily	<ul style="list-style-type: none"> • Check the safety system. • Check the engine oil level. • Clean the air intake screen. • Check the brake. • Check the mower blades. • Clean the mower deck.
Every 25 hours	<ul style="list-style-type: none"> • Clean foam air cleaner element.
Every 50 hours	<ul style="list-style-type: none"> • Check the paper air cleaner element. • Check the tire pressure. • Check pump drive belt. • Check the hydraulic fluid.
Every 100 hours	<ul style="list-style-type: none"> • Change the engine oil. • Check the spark plugs. • Check and clean engine cooling fins and shrouds. • Inspect the belts for cracks and wear.
Every 150 hours	<ul style="list-style-type: none"> • Lubricate the machine with light oil (Refer to Lubrication).
Every 200 hours	<ul style="list-style-type: none"> • Replace the paper air cleaner element. • Replace the oil filter. • Replace the fuel filter.
Every 500 hours	<ul style="list-style-type: none"> • Adjust the caster pivot bearing.
Yearly	<ul style="list-style-type: none"> • Grease the front caster pivots (more often in dirty or dusty conditions). • Lubricate the caster wheel hubs. • Change the hydraulic filter and oil.

Important: Refer to your Engine Operator's Manual for additional maintenance procedures.



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

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

Lubrication

Greasing and Lubrication

Lubricate the machine when shown on the Check Service Reference Aid decal (Figure 22). Grease more frequently when operating conditions are extremely dusty or sandy.

Grease Type: General-purpose grease.

How to Grease

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean the grease fittings with a rag. Make sure to scrape any paint off the front of the fitting(s).
4. Connect a grease gun to the fitting. Pump grease into the fittings until grease begins to ooze out of the bearings.
5. Wipe up any excess grease.

Greasing the Front Caster Pivots

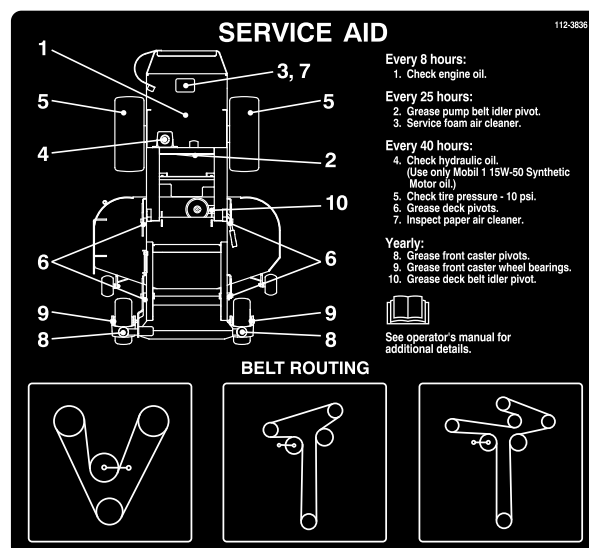
Lubricate the front caster pivots once a year.

1. Remove the dust cap and adjust the caster pivots. Keep the dust cap off until greasing is done. Refer to Adjusting the Caster Pivot Bearing in Drive System Maintenance, page 37.
2. Remove the hex plug. Thread a grease zerk into the hole.
3. Pump grease into the zerk until it oozes out around the top bearing.
4. Remove the grease zerk in the hole. Install the hex plug and cap.

Where to Add Grease

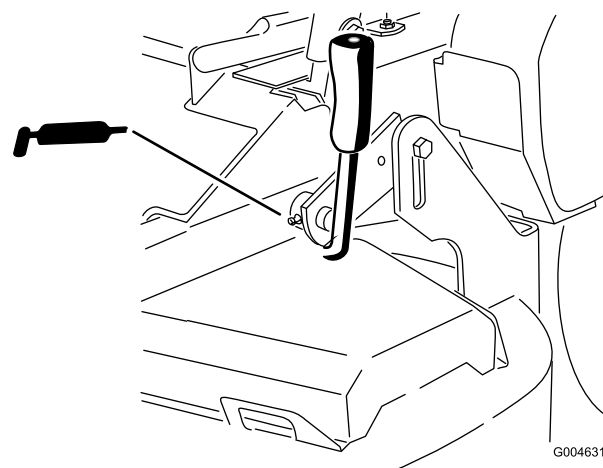
Lubricate the grease fittings as shown on the Check Service Reference Aid decal (Figure 22).

Grease and oil the linkages as shown in Figure 24 and Figure 25.



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Figure 22



G004631

Figure 23

Brake handle pivot

Where to Add Light Oil or Spray Lubrication

Lubricate the machine in the following areas with spray type lubricant or light oil. Lubricate every 150 hours.

- Brake control links.
- Motion control pivots.

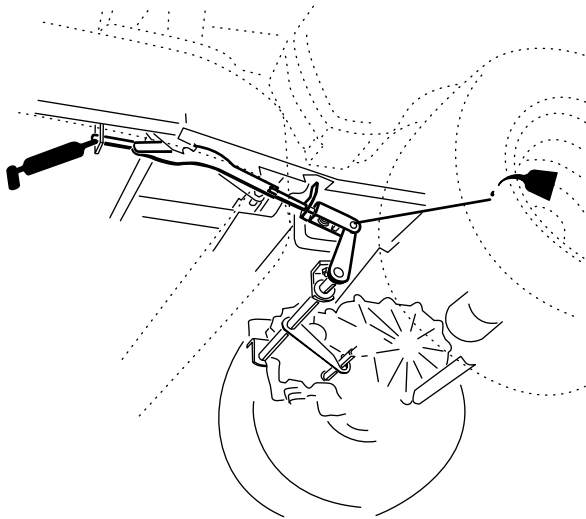


Figure 24

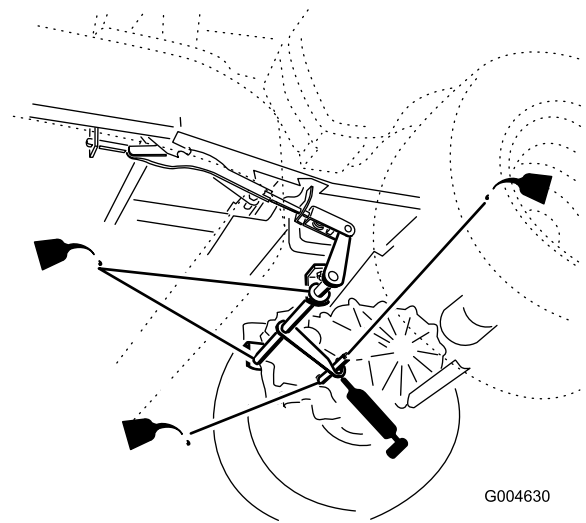


Figure 25

Lubricating the Caster Wheel Hubs

Note: When performing this procedure, the old seals will need to be replaced with new seals. Contact an Authorized Service Dealer for the correct seals.

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.

3. Raise the front of the machine and support it with jack stands.
4. Remove then nut and bolt holding the caster wheel to the front caster fork (Figure 26).
5. Remove the seal guard from the wheel hub (Figure 26).

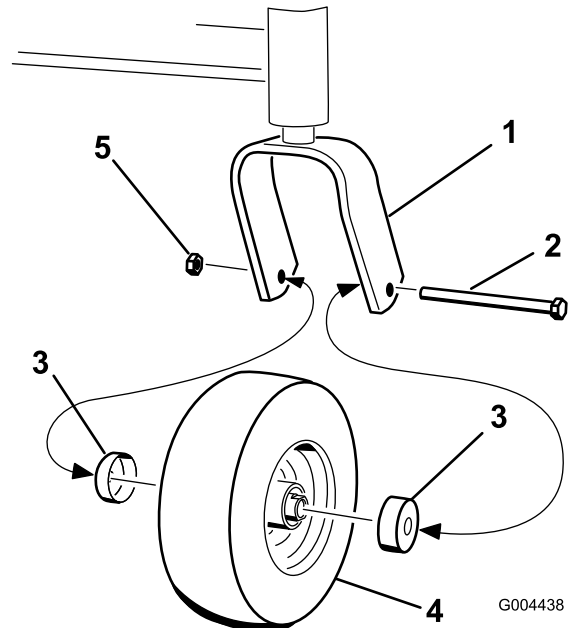


Figure 26

- | | |
|----------------|-----------------|
| 1. Caster fork | 4. Caster wheel |
| 2. Bolt | 5. Nut |
| 3. Seal guard | |

6. Remove **one** of the spacer nuts (with wrench flats) from the axle (Figure 28).

Note: Thread locking adhesive has been applied to the spacer nuts.

7. Remove the axle **without** removing the opposite spacer nut (Figure 28).
8. Remove the seals and inspect the bearings for wear or damage. Replace the bearings if needed.
9. Pack the bearings with general purpose grease.
10. Insert the bearing and a new seal into the wheel (Figure 28).

Note: Do not install the nut all the way onto the axle.

11. If both spacer nuts were removed from the axle, apply thread locking adhesive to the spacer nut. Install the spacer nuts onto the axle leaving an 1/8 inch (3mm) of the nut past the axle (Figure 27).

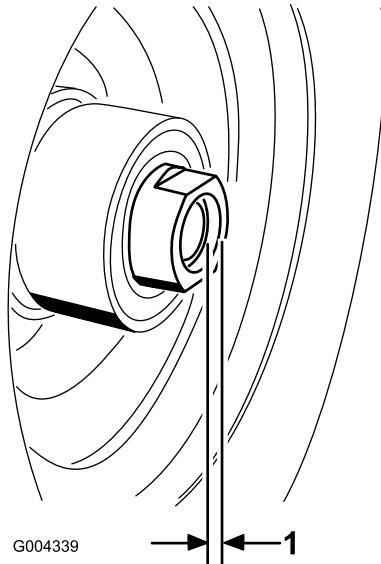


Figure 27

1. 1/8 inch (3 mm) of the nut past the axle

12. Install the assembled nut and axle into the wheel on the side with the bearing and a new seal (Figure 28).
13. Place the wheel with the open end facing up and fill the area inside the wheel with multi-purpose grease.
14. Install the second bearing and a new seal into the wheel (Figure 28).
15. Apply thread locking adhesive to the second spacer nut and install it onto the axle with the wrench flats facing outward.
16. Torque the spacer nut to 75-80 in-lb (8-9 N·m) then loosen it and torque it to 20-25 in-lb (2-3 N·m). Make sure the axle does not extend past either nut (Figure 27).
17. Install the seal guards over the wheel hubs and insert the wheel into the caster fork (Figure 26).
18. Install the caster bolt and tighten the nut (Figure 26).

Important: Check the bearing adjustment often to prevent seal and bearing damage. Spin the caster tire. The tire should not spin freely more than 1 to 2 revolutions or have any side-to-side play between the caster fork. If the wheel spins freely, adjust the torque on the spacer nut until there is a slight amount of drag.

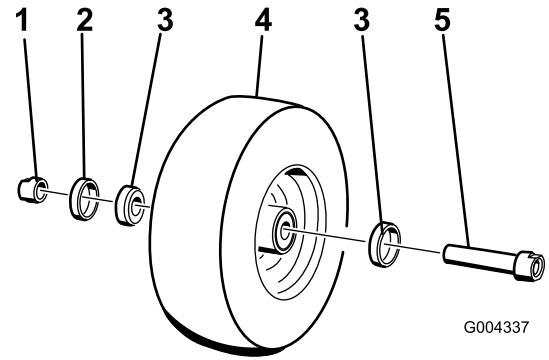


Figure 28

- | | |
|--------------------------------------|---------------------------|
| 1. Spacer nut | 4. Caster wheel |
| 2. Bearing seal (new seals required) | 5. Nut and axle assembled |
| 3. Bearing | |

Engine Maintenance

Servicing the Air Cleaner

Service Interval/Specification

Foam element: Clean it after every 25 operating hours.

Paper element: Check it after every 50 operating hours. Replace it after every 200 operating hours or yearly, whichever comes first.

Inspect the foam and paper elements and replace them if they are damaged or excessively dirty.

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

Important: Do not oil the foam or paper element.

Removing the Foam and Paper Elements

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Clean around the air cleaner to prevent dirt from getting into the engine and causing damage (Figure 29).
4. Unscrew the cover knob and remove the air cleaner cover (Figure 29).

- Remove the 2 wing nuts and remove the air cleaner assembly (Figure 29).
- Carefully pull the foam element off the paper element (Figure 29).

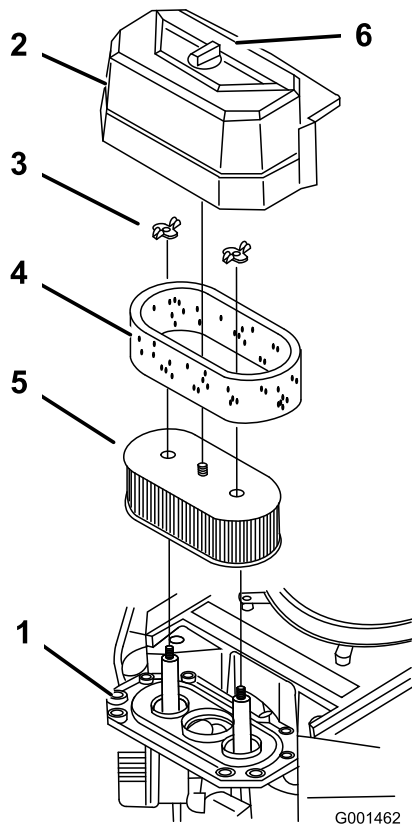


Figure 29

- | | |
|-------------|------------------|
| 1. Engine | 4. Foam element |
| 2. Cover | 5. Paper element |
| 3. Wing nut | 6. Cover knob |

Cleaning the Foam Air Cleaner Element

- Wash the foam element in liquid soap and warm water. When the element is clean, rinse it thoroughly.
- Dry the element by squeezing it in a clean cloth.

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

Servicing the Paper Air Cleaner Element

- Do not clean the paper filter. Replace it after 200 operating hours (Figure 29).

- Inspect the element for tears, an oily film, or damage to the rubber seal.
- Replace the paper element if it is damaged.

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.

- Carefully slide the foam element onto the paper air cleaner element (Figure 29).
- Place the air cleaner assembly onto the air cleaner base and secure it with the 2 wing nuts (Figure 29).
- Place the air cleaner cover into position and tighten the cover knob (Figure 29).

Servicing the Engine Oil

Service Interval/Specification

Change the engine oil as follows:

- After the first 8 operating hours
- After every 100 operating hours

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

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

Crankcase Capacity: 58 ounces (1.7 liter) with the filter removed; 51 ounces (1.5 liter) without the filter removed

Viscosity: Refer to the table below

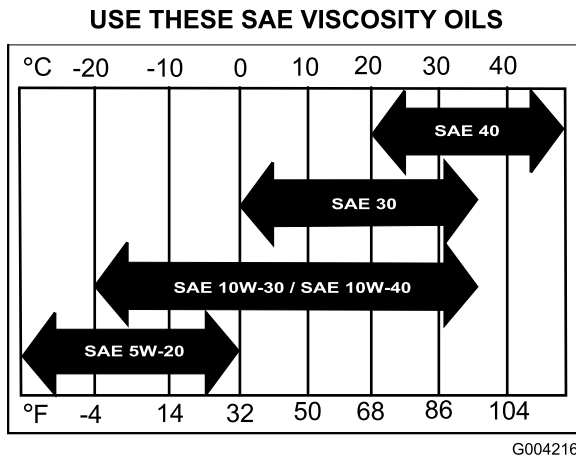


Figure 30

Checking the Engine Oil Level

1. Park the machine on a level surface.
2. Disengage the PTO, turn the ignition key to off, and remove the key.
3. Wait for all moving parts to stop before leaving the operating position and then chock or block tires.
4. Clean around the oil dipstick (Figure 31) so that dirt cannot fall into the filler hole and damage the engine.

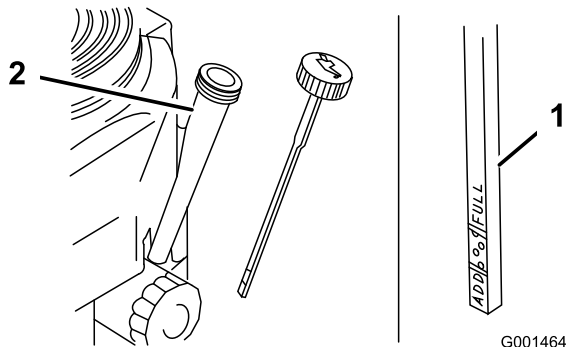


Figure 31

1. Oil dipstick
2. Filler tube

5. Unscrew the oil dipstick and wipe the end clean (Figure 31).
6. Slide the oil dipstick fully into the filler tube, but do not thread onto tube (Figure 31).
7. Pull the dipstick out and look at the 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 and run the engine; engine damage can result.

Changing 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 drain side is slightly lower than the opposite side to assure the oil drains completely.
3. Disengage the PTO and set the parking brake.
4. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
5. Slide the drain hose over the oil drain valve.
6. Place a pan below the drain hose. Rotate oil drain valve to allow oil to drain (Figure 32).
7. When oil has drained completely, close the drain valve.
8. Remove the drain hose (Figure 32).

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

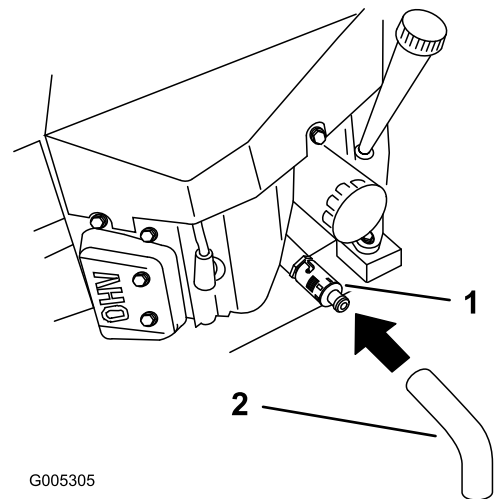


Figure 32

1. Oil drain valve
2. Oil drain hose

9. Slowly pour approximately 80% of the specified oil into the filler tube (Figure 31).
10. Check the oil level; refer to Checking the Engine Oil Level.
11. Slowly add the additional oil to bring it to the **Full** mark.

Changing the Oil Filter

Replace the oil filter every 200 operating hours or every other oil change.

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

1. Drain the oil from the engine; refer to Changing the Engine Oil.
2. Remove the old filter (Figure 33).

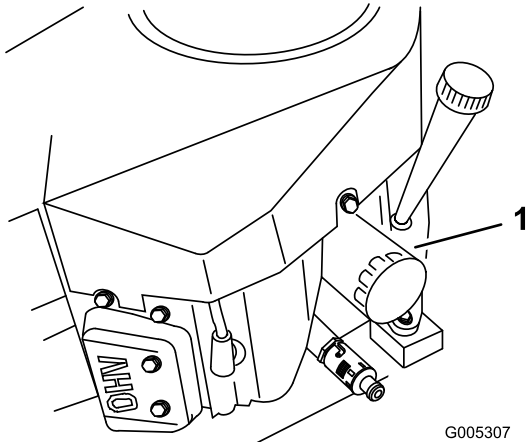


Figure 33

1. Oil filter
2. Adapter

3. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Figure 34).
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 3/4 turn (Figure 34).

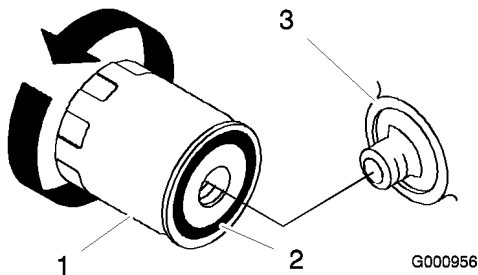


Figure 34

1. Oil filter
2. Rubber gasket
3. Filter adapter

5. Fill the crankcase with the proper type of new oil; refer to Servicing the Engine Oil.

6. Run the engine for about 3 minutes, stop the engine, and check for oil leaks around the oil filter.
7. Check the engine oil level and add oil if needed.

Servicing the Spark Plugs

Service Interval/Specification

Check the spark plugs after every 100 operating hours.

Ensure that the air gap between the center and side electrodes is correct before installing the spark plug. Use a spark plug wrench for removing and installing the spark plugs and a gapping tool/feeler gauge to check and adjust the air gap. Install a new spark plugs if necessary.

Type: Champion® RCJ8Y or equivalent Air Gap: 0.030 inch (0.75 mm)

Removing the Spark Plugs

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Disconnect the wires from the spark plugs (Figure 35).

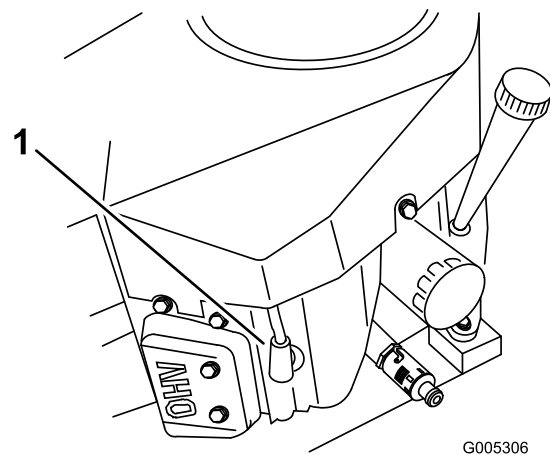


Figure 35

1. Spark-plug wire/spark plug

4. Clean around the spark plugs to prevent dirt from falling into the engine and potentially causing damage.
5. Remove the spark plugs and the metal washers.

Checking the Spark Plugs

1. Look at the center of the spark plugs (Figure 36). If you see light brown or gray on the insulator, the engine is operating properly. A black coating on the insulator usually means that the air cleaner is dirty.
2. If needed, clean the spark plug with a wire brush to remove carbon deposits.

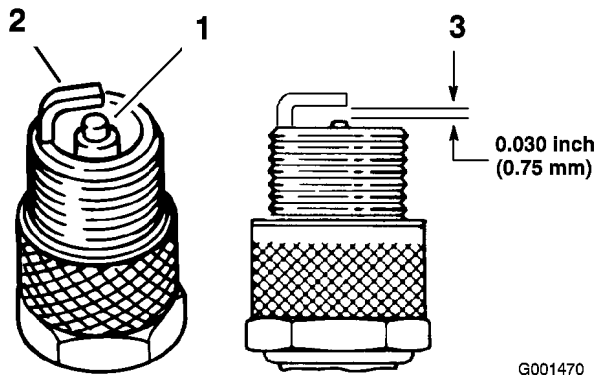


Figure 36

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

Important: Always replace the spark plugs when it has a black coating, worn electrodes, an oily film, or cracks.

3. Check the gap between the center and side electrodes (Figure 36). Bend the side electrode (Figure 36) if the gap is not correct.

Installing the Spark Plugs

1. Install the spark plugs and the metal washer. Ensure that the air gap is set correctly.
2. Tighten the spark plugs to 16 ft-lb (22 N•m).
3. Connect the wires to the spark plugs (Figure 35).

Fuel System Maintenance

Draining the Fuel Tank



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 on a level surface, to ensure that the fuel tank drains completely.
2. Disengage the blade control switch and move the control levers to the neutral locked position and apply the parking brake.
3. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Close the fuel shut-off valve located near the fuel filter.
5. Loosen the hose clamp at the fuel filter and slide it up the fuel line away from the fuel filter (Figure 37).

Note: A small amount of fuel may drain from the fuel lines. Place a drain pan under the fuel lines to collect the fuel. Wipe up any spilled fuel.

6. Pull the fuel line off of the fuel filter (Figure 37).
7. Open the fuel shut-off valve. 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.

Replacing the Fuel Filter

Replace the fuel filter after every 200 operating hours or yearly, whichever occurs first.

Never install a dirty filter if it is removed from the fuel line.

1. Disengage the blade control switch and move the control levers to the neutral locked position and apply the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Close the fuel shut-off valve located under the front of the fuel tank.
4. Squeeze the ends of the hose clamps together and slide them away from the filter (Figure 37).

Note: A small amount of fuel may drain from the fuel lines. Place a drain pan under the fuel lines to collect the fuel. Wipe up any spilled fuel.

5. Remove the filter from the fuel lines.
6. Install a new filter and move the hose clamps close to the filter (Figure 37).

Important: Install the filter so the direction of the flow arrow is consistent with the flow of fuel; from the gas tank to the engine.

7. Open the fuel shut-off valve.

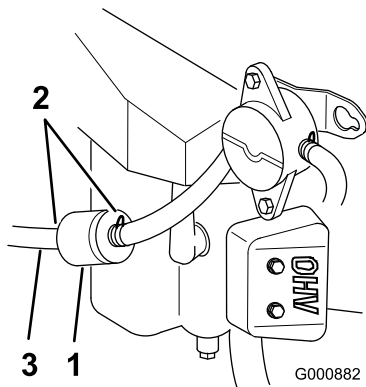


Figure 37

1. Fuel filter
2. Hose clamp
3. Fuel line

Electrical System Maintenance

Servicing the Battery

Warning

CALIFORNIA

Proposition 65 Warning

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



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.

Removing the Battery



Battery terminals or metal tools could short against metal machine 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 machine.
- Do not allow metal tools to short between the battery terminals and metal parts of the machine.



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

- Always Disconnect the negative (black) battery cable before disconnecting the positive (red) cable.
- Always Reconnect the positive (red) battery cable before reconnecting the negative (black) cable.

1. Disengage the PTO, move the motion control levers to the neutral locked position, and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the seat retainer bracket and raise the seat up.
4. First disconnect the negative battery cable and ground wire from the negative (-) battery terminal (Figure 38).
5. Slide the red terminal boot off the positive (red) battery terminal. Then remove the positive (red) battery cable (Figure 38).

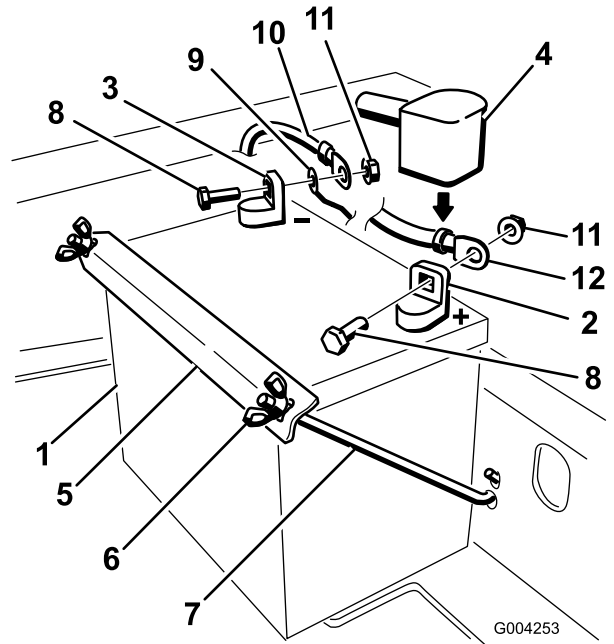


Figure 38

- | | |
|--------------------------|----------------------------|
| 1. Battery | 7. J-bolts |
| 2. Positive battery post | 8. Bolt (1/4 x 3/4 inch) |
| 3. Negative battery post | 9. Ground wire |
| 4. Terminal boot | 10. Negative battery cable |
| 5. Battery clamp | 11. Locknut (1/4 inch) |
| 6. Wingnut (1/4 inch) | 12. Positive battery cable |

6. Remove both wing nuts (1/4 inch) securing the battery clamp (Figure 38).
7. Remove the battery.

Installing the Battery

1. Position battery in the tray with the terminal posts toward the engine (Figure 38).
2. First, install the positive (red) battery cable to positive (+) battery terminal.
3. Then install the negative battery cable and ground wire to the negative (-) battery terminal.
4. Secure the cables with 2 bolts (1/4 x 3/4 inch), 2 washers (1/4 inch), and 2 locknuts (1/4 inch) (Figure 38).
5. Slide the red terminal boot onto the positive (red) battery post.
6. Secure battery with J-bolts, hold down clamp and 2 washers (1/4 inch), and 2 wing nuts (1/4 inch) (Figure 38).
7. Install the seat retainer bracket.

Charging the Battery



Charging the battery produces gasses that can explode.

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

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

1. Charge battery for 10 to 15 minutes at 25 to 30 amps or 30 minutes at 4-6 amps.
2. When the battery is fully charged, unplug the charger from the electrical outlet, then disconnect the charger leads from the battery posts (Figure 39).

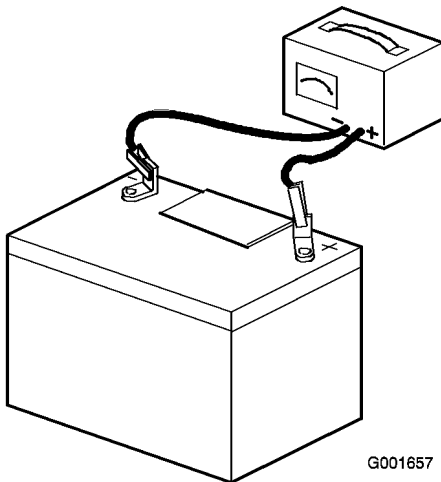


Figure 39

3. Install the battery in the machine and connect the battery cables; refer to Installing the Battery.

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

Servicing the Fuses

The electrical system is protected by fuses. It requires no maintenance, however, if a fuse blows check component/circuit for malfunction or short.

Fuse:

- Main, F1-20 amp, blade-type
 - Charge circuit, F2-20 amp, blade-type
1. Remove the seat retainer bracket.
 2. Raise the seat to gain access to the fuses on the left side of the machine (Figure 40).
 3. To replace the fuses, pull out on the fuse to remove it.
 4. Install a new fuse (Figure 40).

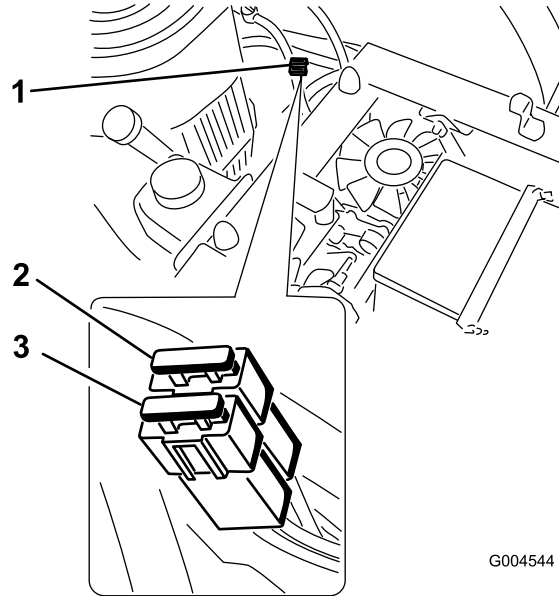


Figure 40

1. Fuse location
2. Main, 20 amp
3. Charge circuit, 20 amp

5. Install the seat retainer bracket.

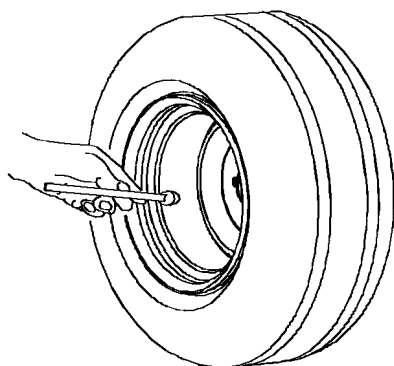
Drive System Maintenance

Checking the Tire Pressure

Check the pressure at the valve stem after every 50 operating hours or monthly, whichever occurs first (Figure 41).

Maintain the air pressure in the rear tires at 13 psi (90 kPa). Uneven tire pressure can cause uneven cut. Check the tires when they are cold to get the most accurate pressure reading.

Note: The front tires are semi-pneumatic tires and do not require air pressure maintenance.



G001055

Figure 41

Adjusting the Caster Pivot Bearing

Check after every 500 operating hours or at storage, whichever comes first.

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the dust cap from caster and tighten lock nut (Figure 42).
4. Tighten the locknut until the spring washers are flat and then back off a 1/4 turn to properly set the pre-load on the bearings (Figure 42).

Important: Make sure spring washers are installed correctly as shown in Figure 42.

5. Install the dust cap (Figure 42).

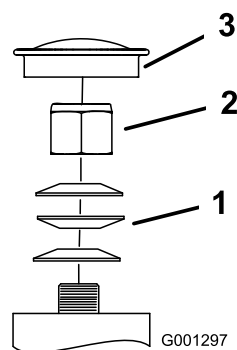


Figure 42

1. Spring Washers
2. Lock Nut

3. Dust Cap

Cooling System Maintenance

Cleaning the Air Intake Screen

Before each use remove any build-up of grass, dirt or other debris from the cylinder and cylinder head cooling fins, air intake screen on flywheel end, and carburetor-governor levers and linkage. This will help insure adequate cooling and correct engine speed and will reduce the possibility of overheating and mechanical damage to the engine.

Cleaning the Cooling System

Clean the air intake screen from grass and debris before each use.

Check and clean cooling fins and engine shrouds every 100 hours or yearly, whichever comes first.

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Remove the guard, air intake screen and fan housing (Figure 43).

4. Clean the debris and grass from the engine parts.
5. Install the guard, air intake screen and fan housing (Figure 43).

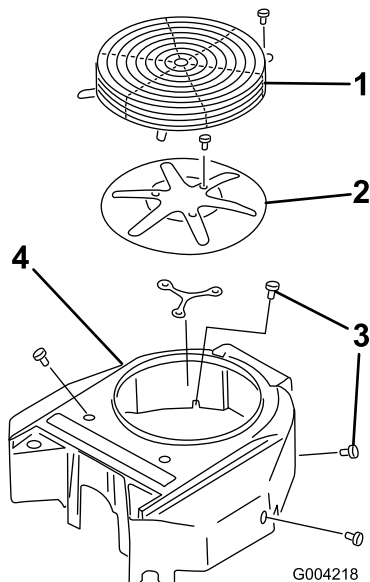


Figure 43

- | | |
|----------------------|----------------|
| 1. Guard | 3. Bolt |
| 2. Air intake screen | 4. Fan housing |

should rotate freely, if not; see an Authorized Service Dealer for maintenance.

Belt Maintenance

Inspecting the Belts

Inspect all belts every 100 hours.

Check belts for cracks, frayed edges, burn marks or any other damage. Replace damaged belts.

Replacing the Mower Belt

The signs of a worn mower belt are squealing while the belt is rotating, blades slipping while you are cutting grass, frayed belt edges, burn marks, and cracks. Replace the mower belt if you detect any of these signs.

1. Disengage the PTO, move the motion control levers to the neutral locked position, and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Set the mower deck to the 3 inch (76 mm) height-of-cut setting to allow access and minimize the belt tension.
4. Remove the 2 bolts and washers in each belt cover and remove the belt covers (Figure 46).
5. Pull on the idler arm to relieve the belt tension on the left spindle pulley (Figure 44 or Figure 45).
6. Remove the old belt.
7. Install the new belt around the pulleys (Figure 44 or Figure 45).
8. Install the belt onto the spring loaded idler pulley.

Brake Maintenance

Servicing the Brakes

Before each use, check the brakes on both a level surface and slope.

Always set the parking brake when you stop the machine or leave it unattended. If the parking brake does not hold securely, see an Authorized Service Dealer for maintenance.

Checking the Brake

1. Park the machine on a level surface, disengage the blade control (PTO).
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Apply the parking brake. The wheels must lock when you try to push the machine forward.
4. If the wheels do not lock, see an Authorized Service Dealer for maintenance.
5. Release the brakes and move the neutral/brake locks to the neutral position. The wheels

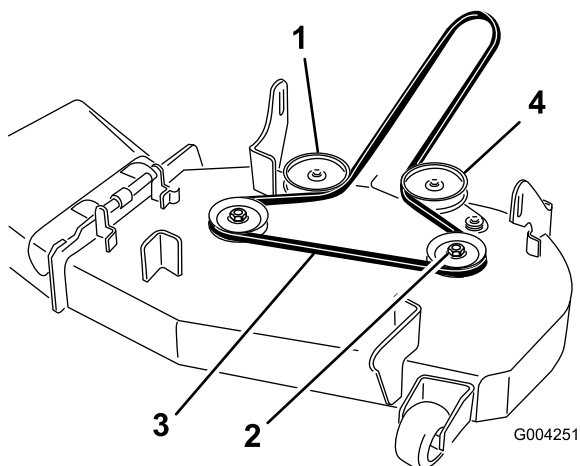


Figure 44

34 inch Mower

- | | |
|------------------------|----------------------------|
| 1. Fixed idler pulley | 3. Mower belt |
| 2. Left spindle pulley | 4. Spring-loaded idler arm |

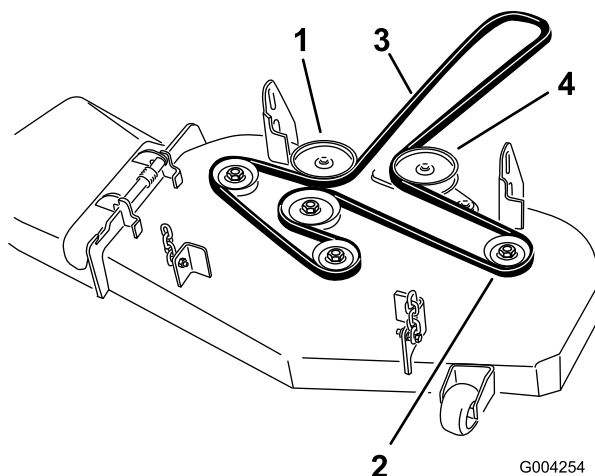


Figure 45

40 inch Mower

- | | |
|------------------------|----------------------------|
| 1. Fixed idler pulley | 3. Mower belt |
| 2. Left spindle pulley | 4. Spring-loaded idler arm |

9. Install the belt covers over the outside spindles (Figure 46).
10. Install the washers and bolts that hold the belt covers in place.

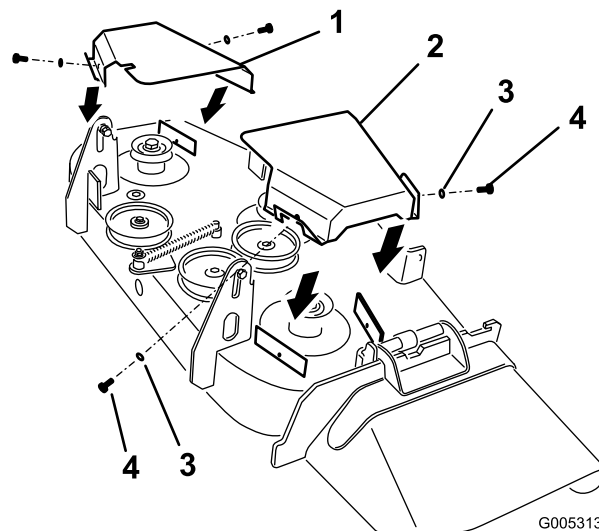


Figure 46

40 inch mower shown

- | | |
|---------------------|-----------|
| 1. Left belt cover | 3. Washer |
| 2. Right belt cover | 4. Bolt |

Replacing the Pump Drive Belt

Check the pump drive belt for wear after every 50 operating hours.

1. Remove the seat retainer bracket.
2. Raise the seat and locate the pump drive belt.
3. Remove the bolt from the clutch stop and unplug the clutch electrical wire (Figure 47).
4. Pull on the idler pulley to relieve the belt tension on the idler pulley (Figure 47).
5. Remove the pump drive belt from the engine and the hydraulic pump pulleys (Figure 47).
6. Install the new belt around the engine and the hydraulic pump pulleys (Figure 47).
7. Pull the spring-loaded idler to the side and align the belt.
8. Release the pressure on the spring loaded idler (Figure 47).

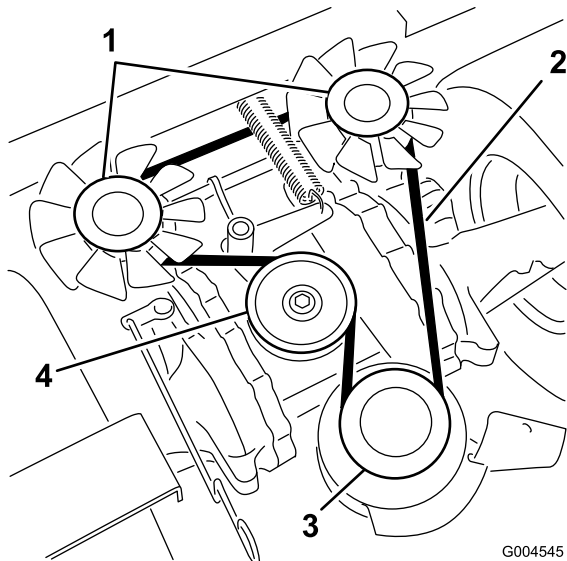


Figure 47

- | | |
|------------------------------|-------------------------------|
| 1. Transmission pump pulleys | 3. Engine pulley |
| 2. Pump drive belt | 4. Spring loaded idler pulley |

9. Install the seat retainer bracket.

Controls System Maintenance

Adjusting the Control Handle Neutral Position

1. Disengage the PTO, move the motion control levers to the neutral locked position, and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Loosen the bolts and curved washers installed in the levers (Figure 48).
4. Align the levers front to rear position by bring the levers together to the neutral position and slide them until they are aligned, then tighten the bolts (Figure 49).

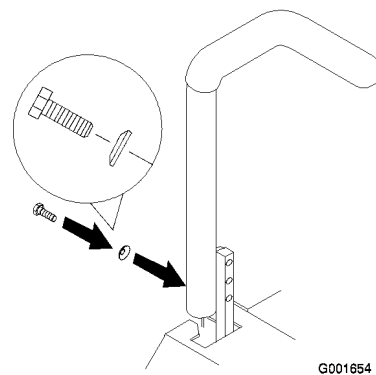


Figure 48

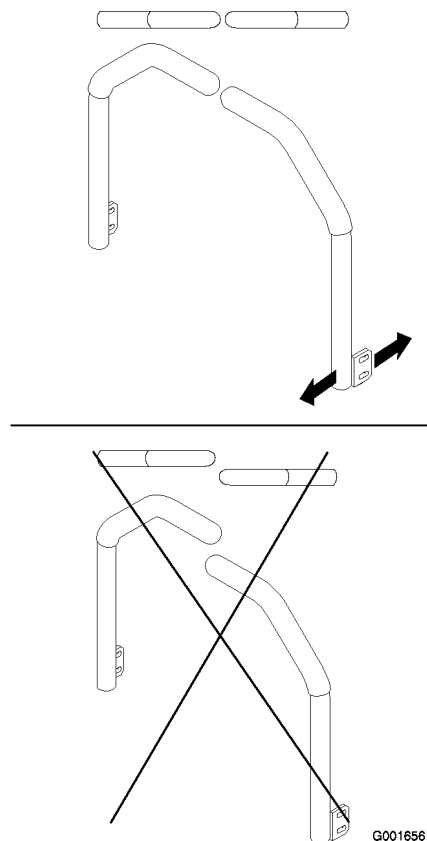


Figure 49

5. If the ends of the levers hit against each other, adjust the levers by rotating them out to the neutral locked position and carefully bend them outward. Repeat this step as needed.

Adjusting the Tracking

1. If the machine turns right or left when the handles are pushed forward together, adjust the stop on the side opposite that the machine turns.

2. Loosen the bolt located in front of the control lever.
3. Move the stop until the machine drives straight (Figure 50).
4. Tighten the bolt located in front of the control lever (Figure 50).

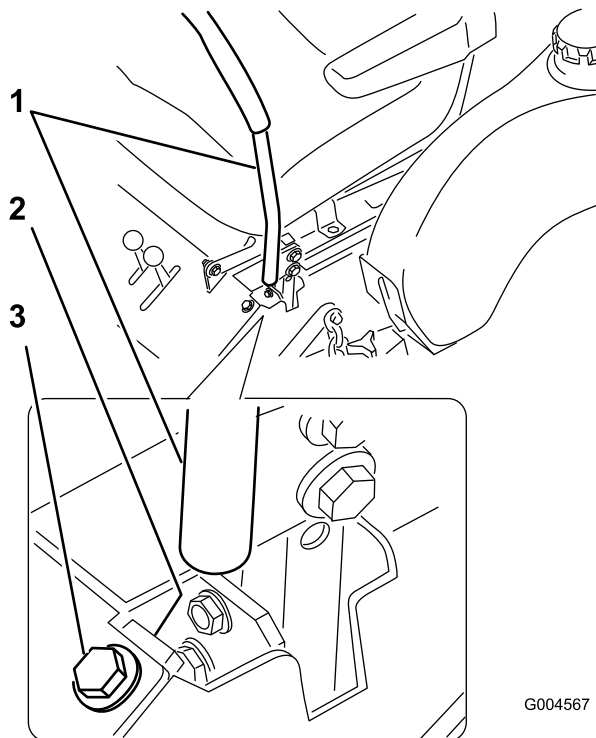


Figure 50

- | | |
|------------------|---------------------------------------|
| 1. Control lever | 3. Bolt in front of the control lever |
| 2. Stop | |

Hydraulic System Maintenance

Servicing the Hydraulic System

Checking the Hydraulic Fluid

Fluid Type: Mobil 1 15W-50 synthetic motor oil or equivalent synthetic oil.

Important: Use oil specified or equivalent. Other fluids could cause system damage.

Check the hydraulic fluid level:

- Before the engine is first started.

- After the first 8 operating hours.
- After every 50 operating hours.

Note: There are two ways of checking the hydraulic oil; when the oil is warm or when the oil is cold. The tank has two levels depending if the oil is warm or cold (Figure 51).

1. Position the machine on a level surface and set the parking brake.
2. Clean the area around the hydraulic tank (Figure 51).
3. If the machine has not been started and is cold, ensure the fluid is up to the cold line on the side of the hydraulic tank.
4. If the machine has been run and is up to normal operating temperature, ensure the fluid is up to the hot line on the side of the hydraulic tank.
5. If fluid is needed, remove the cap from the filler neck (Figure 51).
6. Add fluid to the reservoir until it reaches the cold or hot line of the tank depending on the temperature of the fluid.
7. Install the cap on filler neck.

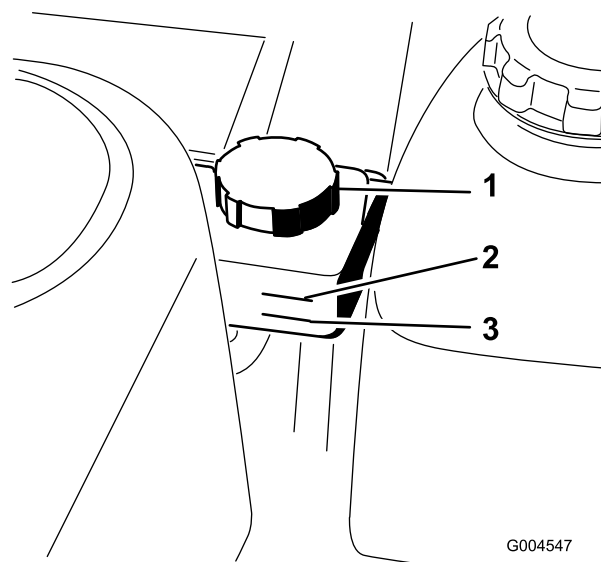


Figure 51

- | | |
|-------------------------|--------------------------|
| 1. Cap | 3. Cold fluid level-full |
| 2. Hot fluid level-full | |



Hydraulic fluid escaping under pressure can penetrate skin and cause injury.

- If hydraulic fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this type of injury. Gangrene may result if this is not done.
- Keep body and hands away from pin hole leaks or nozzles that eject high pressure hydraulic fluid.
- Use cardboard or paper to find hydraulic leaks.
- Safely relieve all pressure in the hydraulic system before performing any work on the hydraulic system.
- Make sure all hydraulic fluid hoses and lines are in good condition and all hydraulic connections and fittings are tight before applying pressure to hydraulic system.

Replacing the Hydraulic Filters and Oil

Change the hydraulic filter and oil:

- After the first 250 operating hours.
 - Change yearly after the first 250 operating hours.
1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
 2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
- Important:** Do not substitute automotive oil filter or severe hydraulic system damage may result.
3. Locate the two filters, one under each transmission and remove the filter guards.
 4. Carefully clean the area around the filters. It is important that no dirt or contamination enter the hydraulic system (Figure 52).
 5. Unscrew the filters and allow the oil to drain from the drive system (Figure 52).

Important: Before reinstalling new filters, apply a thin coat of oil on the surface of the filters rubber seal.

6. Install the new filters clockwise until rubber seal contacts the filter adapter and then tighten the filter an additional 3/4 to 1 full turn.
 7. Remove the vent plug on each transmission and fill through the hydraulic tank, when oil comes out of vent reinstall plug. Torque the plugs to 180 in-lb (244 N·m).
 8. Add oil until it reaches the cold line on the hydraulic tank (Figure 51).
 9. Raise the rear of machine up just enough to allow the drive wheels to turn freely and support it with jack stands.
- Note:** Ensure there is proper ventilation when running the machine. Do not run the engine indoors or in an enclosed area without proper ventilation. Ensure there is proper ventilation when running the machine. Engine exhaust contains carbon monoxide, which is an odorless, deadly poison that can kill you.
10. Start the engine and move the throttle control ahead to the 1/2 throttle position. Disengage the parking brake.

11. With the bypass valve **open** and the engine running, slowly move the directional control in both forward and reverse 5 or 6 times.
12. With the bypass valve **closed** and the engine running, slowly move the directional control in both forward and reverse directions 5 to 6 times. Stop the engine and check the oil level, and add oil as required to the hot line.
13. Repeat items 11 and 12 as necessary until all the air is completely purged from the system. When the transaxle operates at normal noise levels and moves smoothly forward and reverse at normal speeds, then the transaxle is purged.

Important: Do not change hydraulic system oil (except for what can be drained when changing filter), unless it is felt the oil has been contaminated or been extremely hot. Changing the oil unnecessarily could damage the hydraulic system by introducing contaminants into the system.

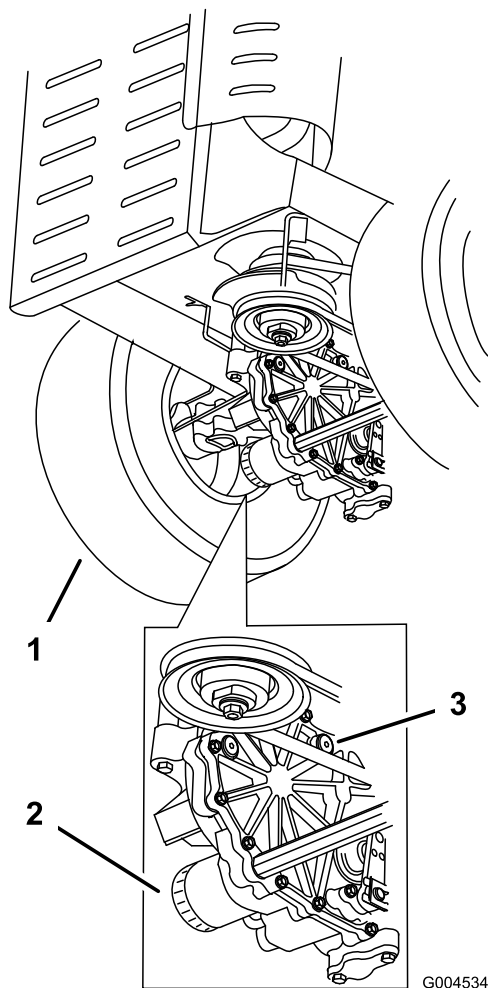


Figure 52

- 1. Left rear tire
- 2. Hydraulic filter
- 3. Vent plug

5. Place two thick blocks under rear left and right lower edge of the mower deck so the weight of the deck rests on the blocks.
6. Lower the mower to the 3 inch (76 mm) height-of-cut position.
7. Loosen the bolts connecting the two chains and the two rear brackets to the mower (Figure 54).
8. Adjust the two rear bolts so they are in the middle of the slot located in the pivot bracket (Figure 54).
9. Adjust the bolts so the end of the bolt is flush with the nut. This will allow the bushing to roll in the slot in the mower deck bracket (Figure 53).
10. Adjust the discharge side front bolt so it is in the middle of the slot located in the pivot bracket (Figure 54).
11. Raise the mower deck and remove the blocks holding up the mower deck.
12. Adjust the left front bolt in the pivot bracket so the chain has no slack in it.
13. Inspect the four chains. The chains need to have tension.

Note: When properly adjusted, the front blade tip will be a 1/4 inch (6 mm) lower for 34 inch mowers and 3/16 (4 mm) lower for 40 inch mowers than the rear blade tip. Refer to Checking for Bent Blades for the procedure to measure the blade tip height.

Mower Deck Maintenance

Leveling the Mower

Important: There are only three measuring positions needed to level the mower.

1. Position mower on a flat surface.
2. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
3. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
4. Check tire pressure of the rear tires. If needed, adjust to 13 psi (90 kPa)

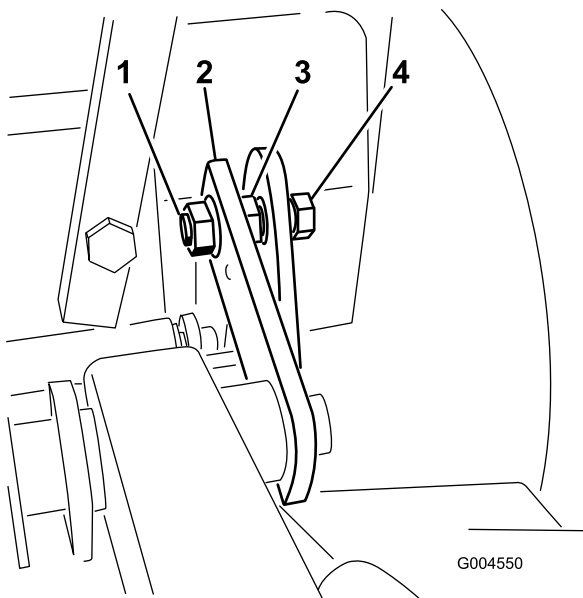


Figure 53

- | | |
|---|---------|
| 1. Keep the end of the bolt
flush with the nut | 3. Nut |
| 2. Rear pivot bracket | 4. Bolt |
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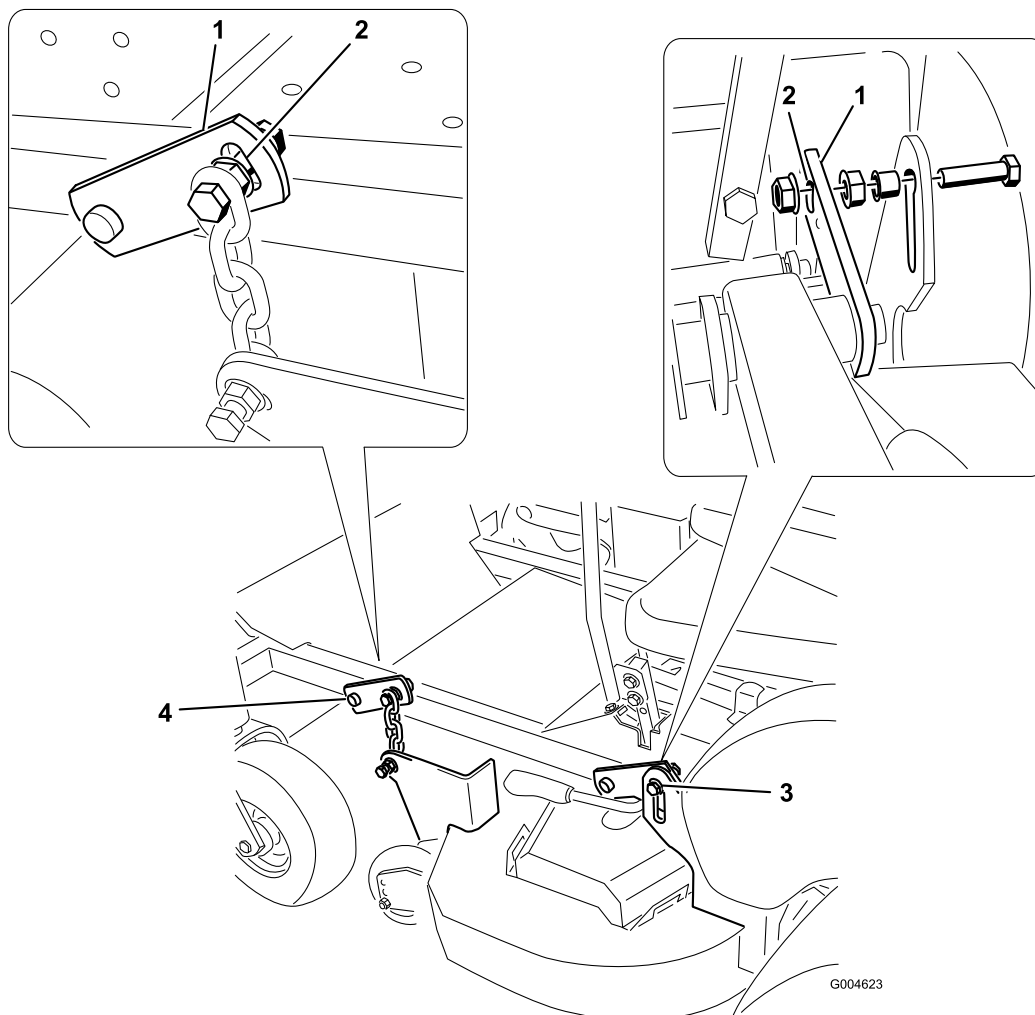


Figure 54

Left side shown

1. Pivot bracket
2. Bolt installed in the middle of the slot

3. Rear pivot bracket
4. Front pivot bracket

14. The right blade at the front position (Figure 56 or Figure 57) needs to be the same height as the left blade at the front position.

If there is more than an 1/8 inch (3 mm) difference between left and right, then adjust the mounting bolts in the slot to level the mower deck left to right.

Note: The mower deck cutting height can be adjusted. Loosen the height of cut bracket and adjust it forward or backward to get the correct height. Tighten the bracket after the adjustment is made.

tearing or shredding the grass blades. Tearing and shredding turns grass brown at the edges, which slows growth and increases the chance of disease.

Check the cutter blades daily for sharpness, and for any wear or damage. File down any nicks and sharpen the blades as necessary. If a blade is damaged or worn, replace it immediately with a genuine Toro replacement blade. For convenient sharpening and replacement, you may want to keep extra blades on hand.

Servicing the Cutting Blades

Maintain sharp blades throughout the cutting season because sharp blades cut cleanly without



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.

Inspect and check the blades every 8 hours.

Before Inspecting or Servicing the Blades

Park the machine on a level surface, disengage the blade control (PTO), and set the parking brake. Turn the ignition key to Off. Remove the key.

Inspecting the Blades

1. Inspect the cutting edges (Figure 55). If the edges are not sharp or have nicks, remove and sharpen the blades. Refer to Sharpening the Blades.
2. Inspect the blades, especially the curved area (Figure 55). If you notice any damage, wear, or a slot forming in this area (Figure 55), immediately install a new blade.

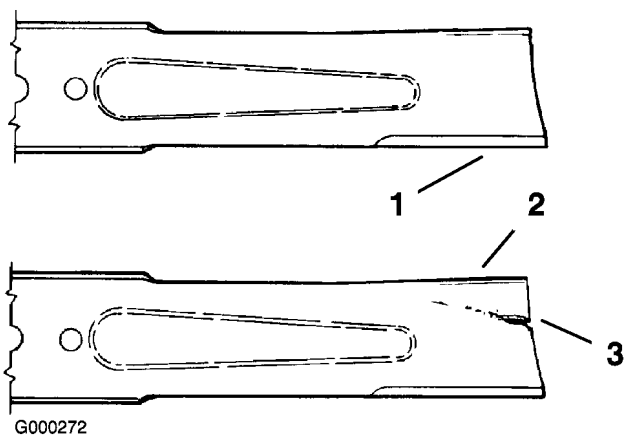


Figure 55

1. Cutting Edge
2. Curved Area
3. Wear/slot Forming

Checking for Bent Blades

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.

2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Rotate the blades until the ends face forward and backward (Figure 56 or Figure 57). Measure from a level surface to the cutting edge at position **A**, of the blades (Figure 56 or Figure 57). Note this dimension.

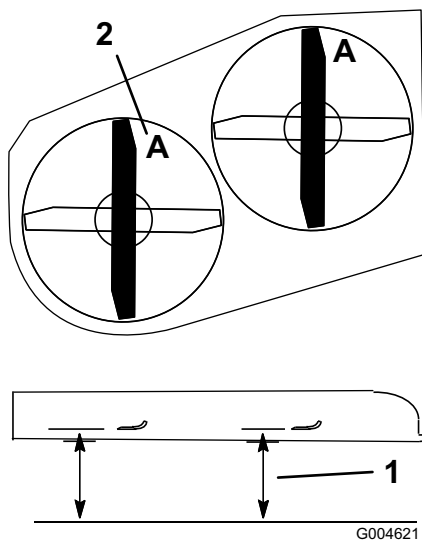


Figure 56

34 inch Mower

1. Measure here from blade to hard surface
2. Position A

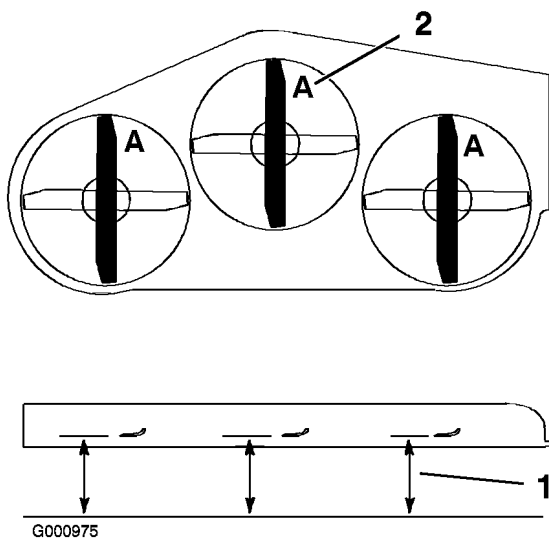


Figure 57

40 inch Mower

1. Measure here from blade to hard surface
2. Position A

4. Rotate the opposite ends of the blades forward.
5. Measure from a level surface to the cutting edge of the blades at the same position as in step 3 above. The difference between the dimensions obtained in steps 3 and 4 must not exceed 1/16 inch (1.5 mm). If this dimension exceeds 1/16 inch (1.5 mm), the blade is bent and must be replaced; refer to Removing the Blades and Installing the Blades.



A blade that is bent or damaged could break apart and could seriously injure or kill you or bystanders.

- Always replace bent or damaged blade with a new blade.
- Never file or create sharp notches in the edges or surfaces of blade.

Removing the Blades

Blades must be replaced if a solid object is hit, if the blade is out of balance or is bent. To ensure optimum performance and continued safety conformance of the machine, use genuine Toro replacement blades. Replacement blades made by other manufacturers may result in nonconformance with safety standards.



Contact with a sharp blade can cause serious injury.

Wear gloves or wrap sharp edges of the blade with a rag.

1. Hold the blade end using a rag or thickly-padded glove.
2. Remove the blade bolt, spring disk and blade from the spindle shaft (Figure 60).

Sharpening the Blades



When sharpening blade, pieces of blade could be thrown and cause serious injury.

Wear proper eye protection when sharpening blade.

1. Use a file to sharpen the cutting edge at both ends of the blade (Figure 58). Maintain the original angle. The blade retains its balance if the same amount of material is removed from both cutting edges.

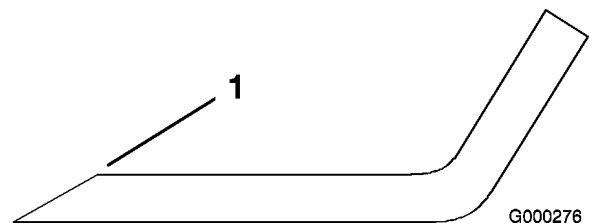


Figure 58

1. Sharpen at original angle
2. Check the balance of the blade by putting it on a blade balancer (Figure 59). 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 end of the sail area only (Figure 60). Repeat this procedure until the blade is balanced.

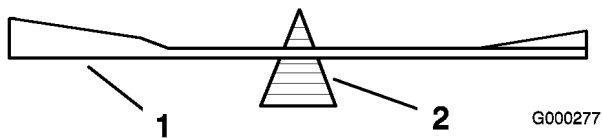


Figure 59

1. Blade 2. Balancer

Installing the Blades

1. Install the blade onto the spindle shaft (Figure 60).

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

2. Install the spring disk and blade bolt. The spring disk cone must be installed toward the bolt head (Figure 60). Torque the blade bolt to 85-110 ft-lb (115-150 N•m).

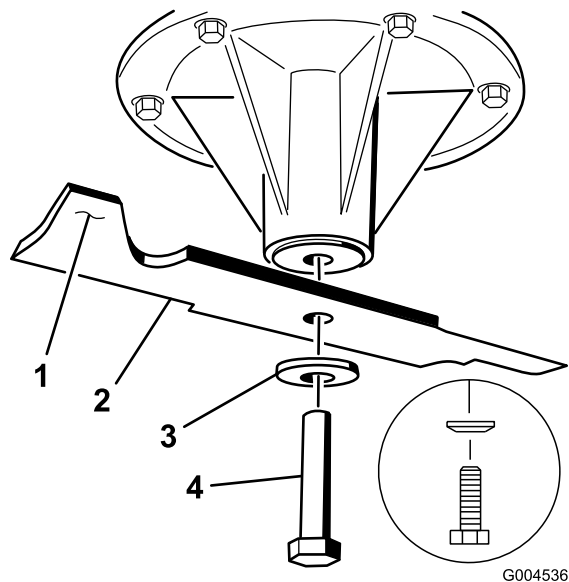


Figure 60

1. Sail Area of Blade 4. Blade Bolt
2. Blade 5. Cone Towards Bolt Head
3. Spring Disk

Replacing the Grass Deflector



An uncovered discharge opening could allow the lawn mower to throw objects in the operator's or bystander's direction and result in serious injury. Also, contact with the blade could occur.

- Never operate the lawn mower unless you install a cover plate, a mulch plate, or a grass chute and catcher.
- Make sure the grass deflector is in the down position.

1. Remove the locknut, bolt, spring and spacer holding the deflector to the pivot brackets (Figure 61). Remove the damaged or worn grass deflector.
2. Place the spacer and spring onto grass deflector. Place one end of spring behind deck edge.

Note: Make sure the end of the spring is installed behind the deck edge before installing the bolt as shown in Figure 61.

3. Install the bolt and nut. Place the end of the spring around the grass deflector (Figure 61).

Important: The grass deflector must be able to lower down into position. Lift the deflector up to test that it lowers into the full down position.

Dispose of these according to your state and local regulations.

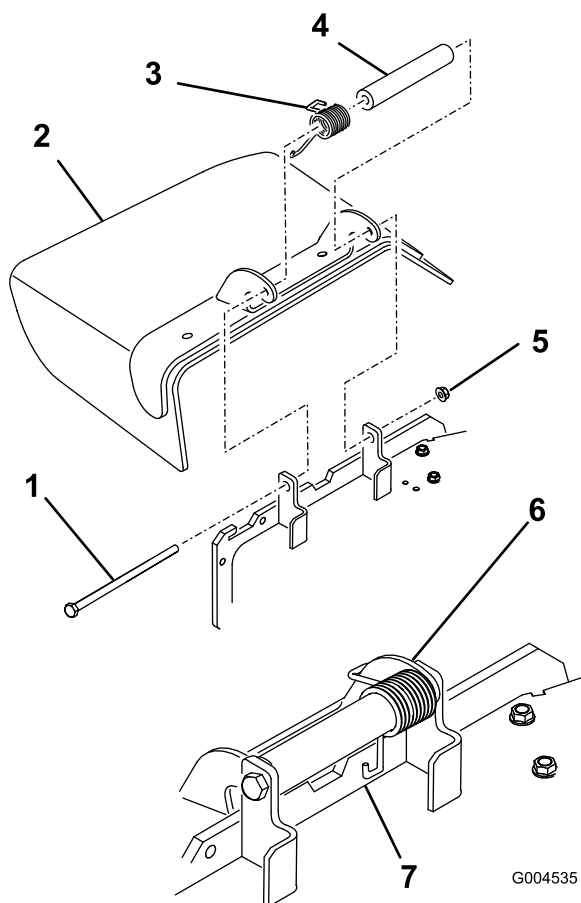


Figure 61

- | | |
|--------------------|---------------------|
| 1. Bolt | 5. Locknut |
| 2. Grass Deflector | 6. Spring installed |
| 3. Spring | 7. Mower deck |
| 4. Spacer | |

Cleaning

Cleaning Under the Mower

Remove the grass buildup under the mower daily.

1. Disengage the PTO, move the motion control levers to the neutral locked position and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Raise the mower to the transport position.
4. Lift the front of the machine and support the machine using jack stands.

Waste Disposal

Engine oil, batteries, hydraulic oil, and engine coolant are pollutants to the environment.

Storage

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to Off. Remove the key.
2. Remove grass clippings, dirt, and grime from the external parts of the entire machine, especially the engine and hydraulic system. 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 pressure wash the machine. Avoid excessive use of water, especially near the control panel, engine, hydraulic pumps, and motors.

3. Service the air cleaner; refer to Servicing the Air Cleaner in Engine Maintenance, page 29.
4. Grease the machine; refer to Greasing and Lubrication in Lubrication, page 27.
5. Change the crankcase oil; refer to Servicing the Engine Oil in Engine Maintenance, page 29.
6. Check the tire pressure; refer to Checking the Tire Pressure in Drive System Maintenance, page 37.
7. Change the hydraulic filter; refer to Servicing the Hydraulic System in Hydraulic System Maintenance, page 41.
8. Charge the battery; refer to Servicing the Battery in Electrical System Maintenance, page 34.
9. Scrape any heavy buildup of grass and dirt from the underside of the mower, then wash the mower with a garden hose.

Note: Run the machine with the PTO engaged and the engine at high idle for 2 to 5 minutes after washing.

10. Check the condition of the blades; refer to Servicing the Cutting Blades in Mower Deck Maintenance, page 43.
11. Prepare the machine for storage when non-use occurs over 30 days. Prepare the machine for storage as follows:
 - A. Add a petroleum based stabilizer/conditioner to fuel in the tank. Follow mixing instructions from

the stabilizer manufacturer. Do not use an alcohol based stabilizer (ethanol or methanol).

Note: A fuel stabilizer/conditioner is most effective when mixed with fresh fuel 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 Servicing the Fuel Tank in Fuel System Maintenance, page 33.
- D. Restart the engine and run it until it stops.
- E. Dispose of fuel properly. Recycle as per local codes.

Important: Do not store stabilizer/conditioned fuel over 90 days.

12. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged.
13. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
14. Store the machine in a clean, dry garage or storage area. Remove the key from the ignition switch and keep it out of reach of children or other unauthorized users. Cover the machine to protect it and keep it clean.

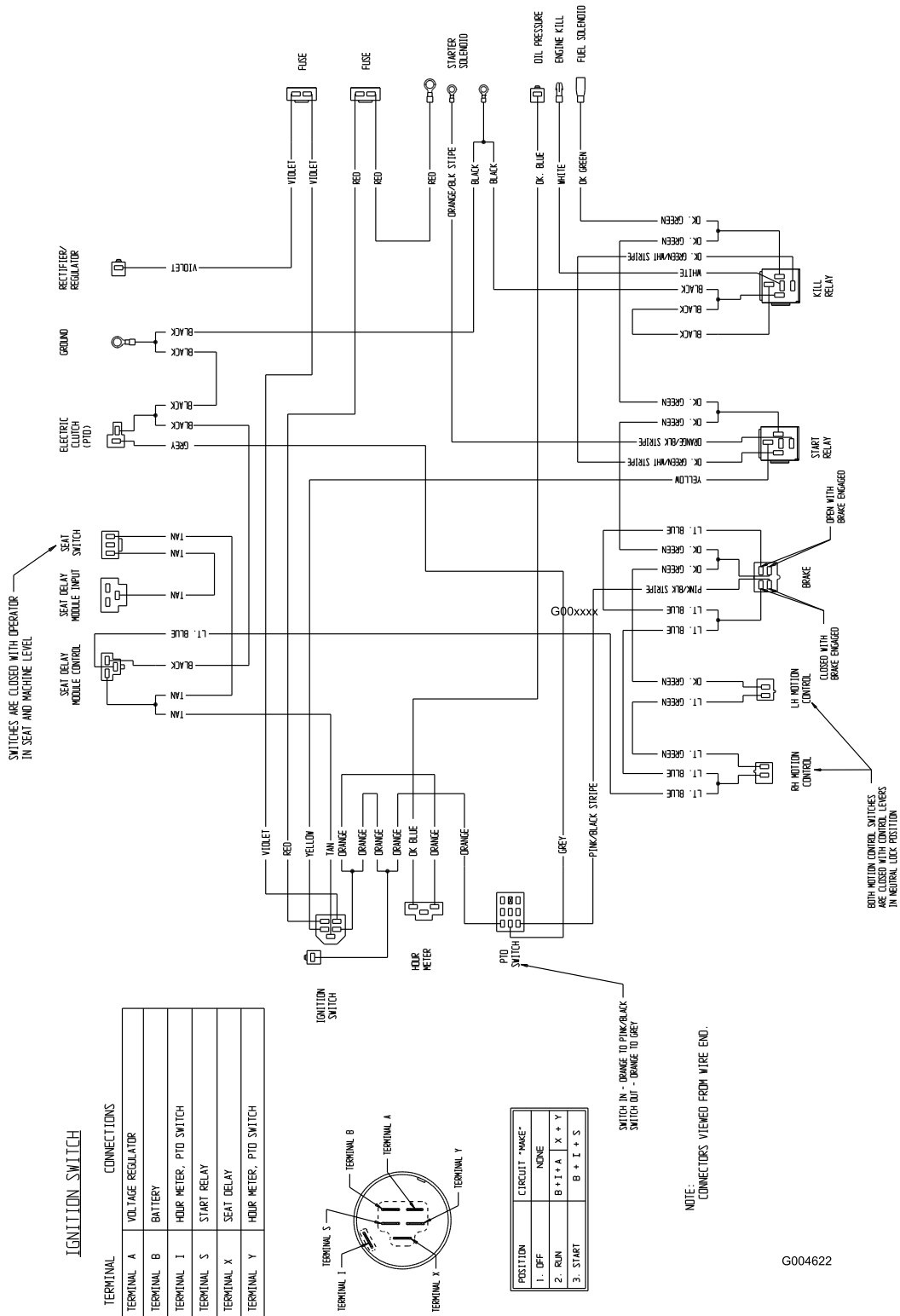
Troubleshooting

Problem	Possible Cause	Corrective Action
Starter does not crank	<ol style="list-style-type: none"> 1. Blade control (PTO) is engaged. 2. Parking brake is not on. 3. Operator is not seated. 4. Battery is dead. 5. Electrical connections are corroded or loose. 6. Fuse is blown. 7. Relay or switch is defective. 	<ol style="list-style-type: none"> 1. Move the blade control (PTO) to disengaged. 2. Set the parking brake. 3. Sit on the seat. 4. Charge the battery. 5. Check the electrical connections for good contact. 6. Replace the fuse. 7. Contact an Authorized Service Dealer.
Engine will not start, starts hard, or fails to keep running.	<ol style="list-style-type: none"> 1. One fuel tank is empty. 2. Air cleaner is dirty. 3. Dirt in the fuel filter. 4. Dirt, water, or stale fuel is in the fuel system. 	<ol style="list-style-type: none"> 1. Fill both fuel tanks with fuel. 2. Clean or replace the air cleaner element. 3. Replace the fuel filter. 4. Contact an Authorized Service Dealer.
Engine loses power.	<ol style="list-style-type: none"> 1. Engine load is excessive. 2. Air cleaner is dirty. 3. Oil level in the crankcase is low. 4. Cooling fins and air passages above the engine are plugged. 5. Vent hole in the fuel cap is plugged. 6. Dirt in the fuel filter. 7. Dirt, water, or stale fuel is in the fuel system. 	<ol style="list-style-type: none"> 1. Reduce the 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. Clean or replace the fuel cap. 6. Replace the fuel filter. 7. Contact an Authorized Service Dealer.
Engine overheats.	<ol style="list-style-type: none"> 1. Engine load is excessive. 2. Oil level in the crankcase is low. 3. Cooling fins and air passages above the engine are plugged. 	<ol style="list-style-type: none"> 1. Reduce the ground speed. 2. Add oil to the crankcase. 3. Remove the obstruction from the cooling fins and air passages.

Problem	Possible Cause	Corrective Action
Machine does not drive.	<ol style="list-style-type: none"> 1. By pass valve is not closed tight. 2. Drive or pump belt is worn, loose or broken. 3. Drive or pump belt is off a pulley. 4. Broken or missing idler spring. 5. Hydraulic fluid level is low or too hot. 6. Hydraulic fluid level is low in the transmission. 	<ol style="list-style-type: none"> 1. Tighten the by pass valve. 2. Change the belt. 3. Change the belt. 4. Replace the spring. 5. Add hydraulic fluid to reservoir or let it cool down. 6. Bleed the air from the transmission.
Abnormal vibration.	<ol style="list-style-type: none"> 1. Cutting blade(s) is/are bent or unbalanced. 2. Blade mounting bolt is loose. 3. Engine mounting bolts are loose. 4. Loose engine pulley, idler pulley, or blade pulley. 5. Engine pulley is damaged. 6. Blade spindle is bent. 7. Motor mount is loose or worn. 	<ol style="list-style-type: none"> 1. Install new cutting blade(s). 2. Tighten the blade mounting bolt. 3. Tighten the engine mounting bolts. 4. Tighten the appropriate pulley. 5. Contact an Authorized Service Dealer. 6. Contact an Authorized Service Dealer. 7. Contact an Authorized Service Dealer.
Uneven cutting height.	<ol style="list-style-type: none"> 1. Blade(s) not sharp. 2. Cutting blade(s) is/are bent. 3. Mower is not level. 4. Underside of mower is dirty. 5. Tire pressure is not correct. 6. Blade spindle bent. 	<ol style="list-style-type: none"> 1. Sharpen the blade(s). 2. Install new cutting blade(s). 3. Level the mower from side-to-side and front-to-rear. 4. Clean the underside of the mower. 5. Adjust the tire pressure. 6. Contact an Authorized Service Dealer.

Problem	Possible Cause	Corrective Action
Blades do not rotate.	<ol style="list-style-type: none"> 1. Drive belt is worn, loose or broken. 2. Drive belt is off pulley. 3. Deck belt is worn, loose or broken. 4. Deck belt is off pulley. 5. Broken or missing idler spring. 	<ol style="list-style-type: none"> 1. Check the belt tension. 2. Install the drive belt and check adjusting shafts and belt guides for correct position. 3. Install a new deck belt. 4. Install the deck pulley and check the idler pulley, idler arm and spring for correct position and function. 5. Replace the spring.

Schematics



Wire Diagram (Rev. A)