Form No. 3325-284

TORO®

# Mid–Size Mower

## ProLine Gear 12.5 HP with 36 in. Side Discharge Mower

**30250TE—210000001 and Up**

## Operator’s Manual

CE

English (GB)

This spark ignition system complies with Canadian ICES-002.

Ce système d'allumage par étincelle de véhicule est conforme à la norme NMB-002 du Canada.

# Contents



# Introduction

Read this manual carefully to learn how to operate and maintain your product properly. The information in this manual can help you and others avoid injury and product damage. Although Toro designs and produces safe products, you are responsible for operating the product properly and safely.

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



**8111 Lyndale Avenue South**
**Bloomington, MN 55420-1196**

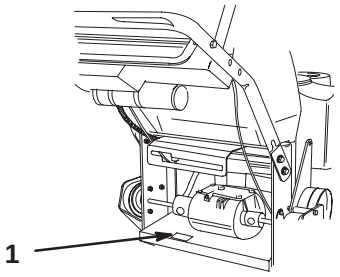



**Figure 1**

1. Location of the model and serial numbers

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

**Model No.** _____

**Serial No.** _____

This manual identifies potential hazards and has special safety messages that help you and others avoid personal injury and even death. ***Danger***, ***Warning***, and ***Caution*** are signal words used to identify the level of hazard. However, regardless of the hazard, be extremely careful.

***Danger*** signals an extreme hazard that *will* cause serious injury or death if you do not follow the recommended precautions.

***Warning*** signals a hazard that *may* cause serious injury or death if you do not follow the recommended precautions.

***Caution*** signals a hazard that may cause minor or moderate injury if you do not follow the recommended precautions.

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

# Safety

**Improperly using or maintaining this lawn mower can result in injury. To reduce the potential for injury, comply with these safety instructions.**

Toro designed and tested this lawn mower for to offer reasonably safe service; however, *failure to comply with the following instructions may result in personal injury.*

**To ensure maximum safety, best performance, and to gain knowledge of the product, it is essential that you and any other operator of the lawn mower read and understand the contents of this manual before the engine is ever started. Pay particular attention to the safety alert symbol ⚠ which means *caution*, *warning*, or *danger* — "personal safety instruction." Read and understand the instruction because it has to do with safety. Failure to comply with the instruction may result in personal injury.**

## General Lawn Mower Safety

The following instructions have been adapted from the ISO standard 5395.

This cutting machine is capable of amputating hands and feet and throwing objects. Failure to observe the following safety instructions could result in 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 mower. Local regulations can restrict the age of the operator.
- Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.
- Understand explanations for all pictograms used on the lawn mower or in the instructions.

### Gasoline

- **WARNING**–Gasoline is highly flammable. Take the following precautions.
  - Store fuel in containers specifically designed for this purpose.
  - Refuel outdoors only and do not smoke while refueling.
  - Add fuel before starting the engine. Never remove the cap of the fuel tank or ad gasoline while the engine is running or when the engine is hot.
  - If gasoline is spilled, do not attempt to start the engine but move the lawn mower away from the area of spillage and avoid creating any source of ignition until gasoline vapors have dissipated.
  - Replace all fuel tank and container caps securely.

### 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 stones, sticks, wires, bones and other foreign objects.

- Before using, always visually inspect to see that guards, and safety devices, such as deflectors and/or grass catchers, are in place and working correctly.
- 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.

## Starting

- Disengage all blade and drive clutches and shift into neutral before starting the engine.
- Do not tilt mower when starting the engine or switching on the motor, unless the mower has to be tilted for starting. In this case, do not tilt it more than absolutely necessary and lift only the part, which is away from the operator.
- Start the engine or switch on the motor carefully according to instructions and with feet well away from the blade(s) and not in front of the discharge chute.

## Operation

- Never mow while people, especially children, or pets are nearby.
- Mow only in daylight or in good artificial light.
- Stay alert for holes in the terrain and other hidden hazards.
- Never direct discharge of material towards bystanders.
- Avoid operating the equipment in wet grass, where feasible.
- Do not put hands or feet near or under rotating parts. Keep clear of the discharge opening at all times.
- Never pick up or carry a lawn mower while the engine is running.
- Use extreme caution when reversing or pulling a pedestrian controlled lawn mower towards you.
- Walk, never run.

Slopes:

- Do not mow excessively steep slopes.
- Exercise extreme caution when on slopes.
- Mow across the face of slopes, never up and down and exercise extreme caution when changing direction on slopes.
- Always be sure of your footing on slopes.

Use low throttle settings when engaging the traction–clutch, especially in high gears. Reduce speed on slopes and in sharp turns to prevent overturning or loss of control.

Stop the blades if the lawn mower has to be tilted for transportation when crossing surfaces other than grass and when transporting the lawn mower to and from the area to be mowed.

Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.

Stop the engine

- whenever you leave the lawn mower.
- before refueling.
- before removing the grass catcher.
- before making height adjustment unless adjustment can be made from the operator's position.

Stop the engine and disconnect the spark–plug lead or turn off and remove key

- before clearing blockages or unclogging chute.
- before checking, cleaning or working on the lawn mower.
- after striking a foreign object, inspect the lawn mower for damage and make repairs before restarting and operating the lawn mower.
- if lawn mower starts to vibrate abnormally (check immediately).

Use care when using sulkies, and

- use only approved drawbar hitch points.
- limit loads to those you can safely control.
- do not turn sharply; use care when reversing.
- do not carry passengers.

Watch out for traffic when crossing or near roadways.

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.

## Maintenance and storage

- Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
- Do not use pressure cleaning equipment on machine.
- Never store the equipment with gasoline in the tank and 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 gasoline storage are free of grass, leaves, or excessive grease.
- Check the grass catcher frequently and replace if worn or deteriorated.
- Replace worn or damaged parts for safety.
- Replace faulty silencers.
- If the fuel tank has to be drained, do this out–doors.
- Do not change the engine governor settings or overspeed the engine. Operating an engine at excessive speed can increase the hazard of personal injury.
- On multibladed lawn mowers, take care as rotating one blade may cause others to rotate.
- Be careful during adjustment of the lawn mower to prevent entrapment of the fingers between moving blades and fixed parts of the lawn mower.
- To ensure the best performance and safety, purchase only genuine Toro replacement parts and accessories. **Do not use "will fit" parts and accessories; they may cause a safety hazard.**

## Sound Pressure Level

This unit has an equivalent continuous A-weighted sound pressure at the operator ear of: 88 dB(A), based on measurements of identical machines per Directive 84/538/EEC.

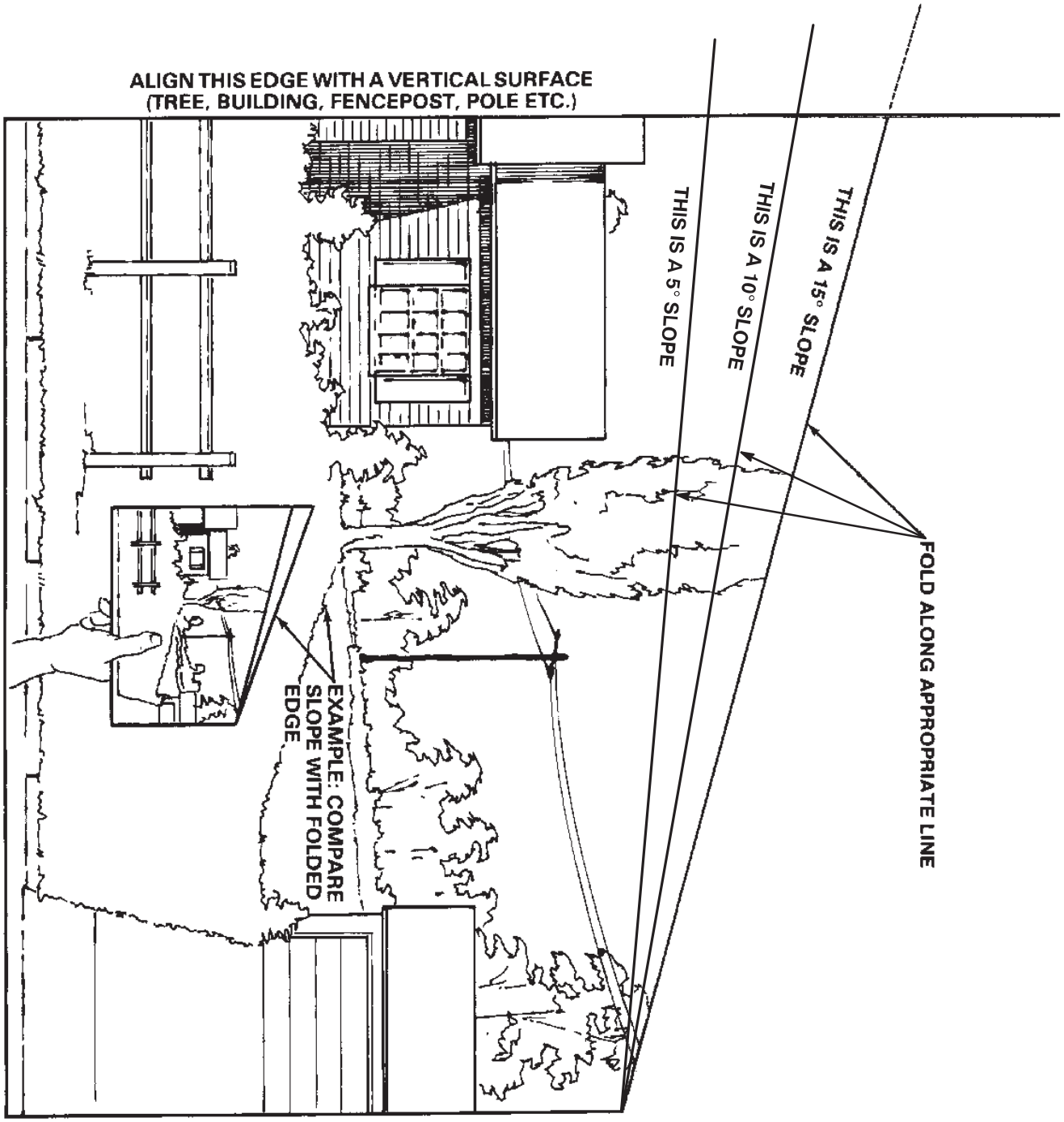
## Sound Power Level

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

## Vibration Level

This unit has a maximum hand-arm vibration level of 4.0 $m/s^2$, based on measurements of identical machines per EN 1033 and EN 1032.

## Slope Chart


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

# Safety and Instruction Decals

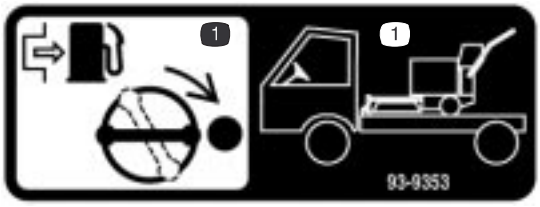
Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or lost.


**93-8069**

1. Warning hot surface—stay away.

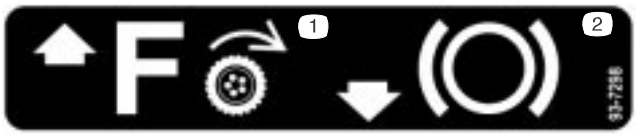

**98–3264**

1. Read the operator's manual for proper transmission shifting




**93–9353**

1. Disengage and shut fuel valve off before transporting

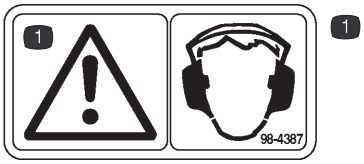



**93–7298**

1. Forward to engage machine traction
2. Back to engage brake


**93–7299**

1. Back to reverse machine traction

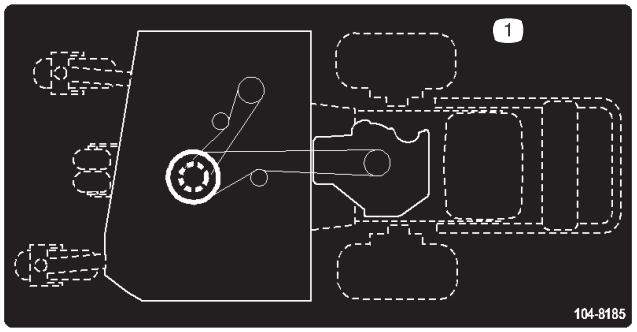



**98–4387**

1. Caution—wear hearing protection.


**93–7442**

1. Parking brake

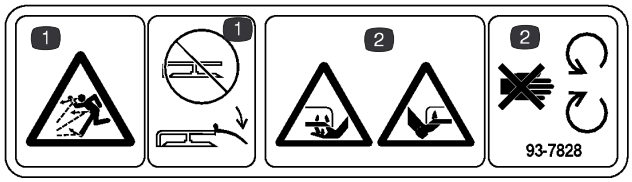



**104–8185**

1. Belt routing

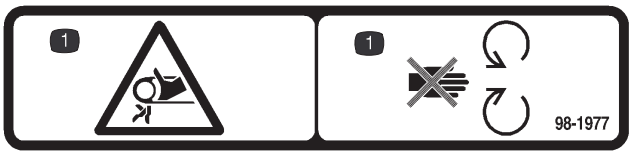

**93–7010**

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



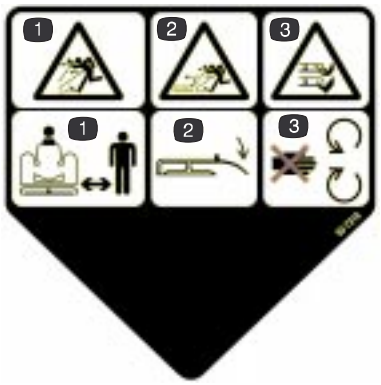

**93–7828**

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




**98-1977**

1. Entanglement hazard—stay away from moving parts.

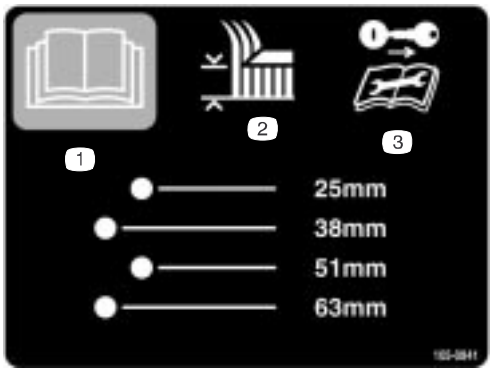


**93–7316**

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

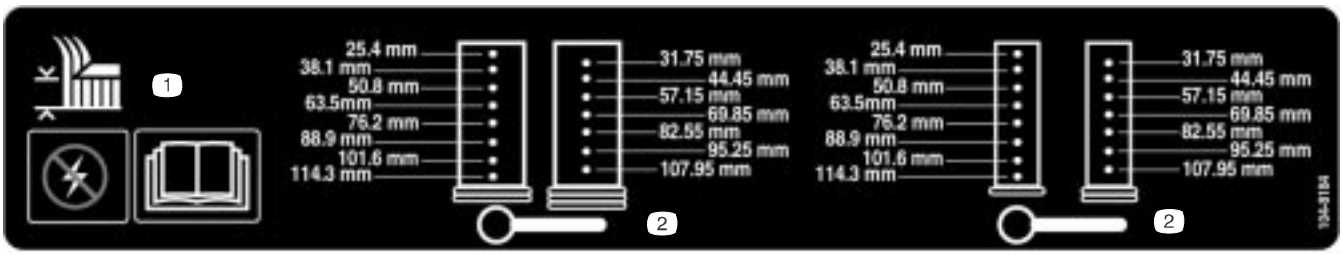

**93-7818**

1. Warning—read the operator's manual for proper blade bolt torque.




**105–0841**

1. Read the operator's manual for proper procedure.
2. Anti–scalp roller height adjustment
3. Read the operator's manual before performing maintenance.




**104–8184**

1. Read the operator's manual for proper procedure. Stop electric clutch before changing machines height–of–cut.
2. Insert pin at desired height–of–cut.

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**105–0885**

1. Cutting/dismemberment hazard of hands or feet—stay away from rotating blades and moving parts.
2. Warning—stop engine before leaving the machine.
3. Warning—read the operator's manual.
4. Thrown object hazard—keep bystanders away.
5. Thrown object hazard—keep the deflector in place.

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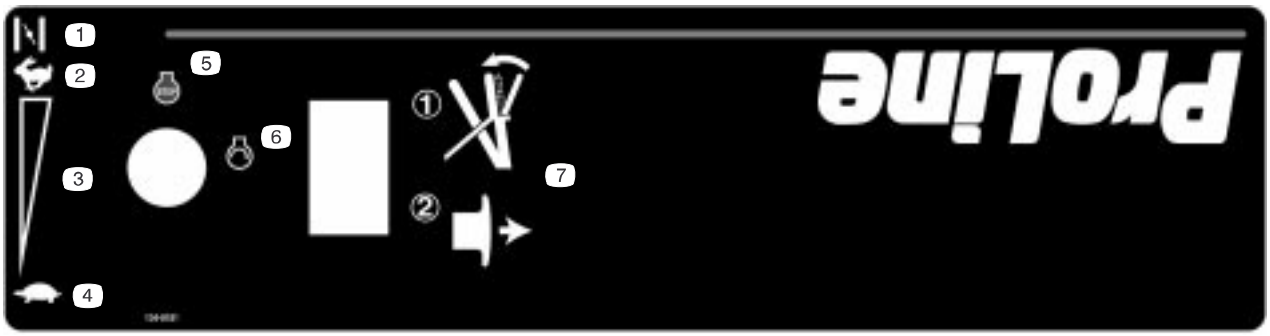


**104–8181**

1. Choke
2. Fast
3. Variable speed
4. Slow
5. Engine stop
6. Engine start
7. Engage the control bar first and then engage PTO.

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# Gasoline and Oil

## Recommended Gasoline

Use UNLEADED Regular Gasoline suitable for automotive use (85 pump octane minimum). Leaded regular gasoline may be used if unleaded regular is not available.

**Important** Never use methanol, gasoline containing methanol, or gasohol containing more than 10% ethanol because the fuel system could be damaged. Do not mix oil with gasoline.

**Danger**

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

- **Fill the fuel tank outdoors, in an open area, when the engine is cold. Wipe up any gasoline that spills.**
- **Do not fill the fuel tank completely full. Add gasoline to the fuel tank until the level is 1/4 in. to 1/2 in. (6 mm to 13 mm) below the bottom of the filler neck. This empty space in the tank allows gasoline to expand.**
- **Never smoke when handling gasoline, and stay away from an open flame or where gasoline fumes may be ignited by a spark.**
- **Store gasoline in an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of gasoline.**
- **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.**

**Warning**

**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

1. Shut the engine off and set the parking brake.
2. Clean around fuel tank cap and remove the cap. Add unleaded regular gasoline to fuel tank, 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 tank completely full.
3. Install fuel tank cap securely. Wipe up any gasoline that may have spilled.

## Check Engine Oil Level

Before you start the engine and use the machine, check the oil level in the engine crankcase; refer to Checking Oil Level, page 24.

# Set Up

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

## Loose Parts

**Note:** Use the chart below to verify all parts have been shipped.

| DESCRIPTION | QTY. | USE |
|---|---|---|
| Fuel tank | 1 | Install control panel and fuel tank |
| Control panel | 1 | |
| Bolt, 5/16 x 7/8 in. (22 mm) | 2 | |
| Lock washer, 5/16 in. | 2 | |
| Washer, 5/16 in. | 4 | |
| Spring | 2 | |
| Stud | 2 | |
| Hose clamp | 1 | |
| Upper handle | 1 | Install upper handle to frame |
| Flanged bolt 3/8 x 1 in. (26 mm) | 4 | |
| Flange nut 3/8 in. | 4 | |
| Clevis pin | 1 | Install control rods |
| Washer | 1 | |
| Hairpin cotter pin | 2 | |
| Hairpin cotter pin | 2 | Install hairpin cotter pins |
| Operator's Manual | 1 | Read before operating machine |
| Engine Operator's Manual | 1 | Read before operating machine |
| Parts Catalog | 1 | |
| Registration card | 1 | Fill out and return to Toro |

## Installing the Control Panel and Fuel Tank

**Note:** Hardware to install control panel and fuel tank is installed in the bottom of fuel tank.

1. Remove the bolts and nuts holding the control panel to the rear frame. Discard these nuts and bolts.
2. Slide the control panel over the shift lever and under the bottom of the rear frame (Fig. 2).

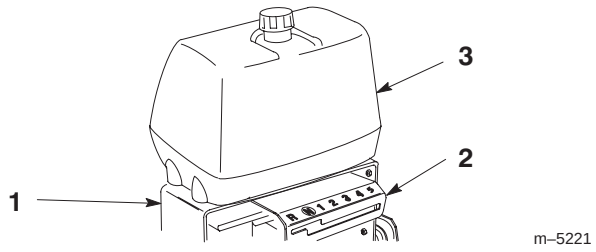



**Figure 2**

1. Rear frame
2. Control panel
3. Fuel tank

3. Align fuel tank with the top of the rear frame (Fig. 2).
4. Place the transmission in neutral.

5. Align the control panel, side to side, so there is 1/16 in. (2 mm) space between panel and lever.

6. Secure the right side control panel and fuel tank to the rear frame (Fig. 3) with 2 bolts (5/16 x 7/8 in. (22mm)), lock washers (5/16 in.) and washers (5/16 in.) (Fig. 3).

7. Secure the left side control panel and fuel tank to the rear frame (Fig. 3) with 2 studs, washers (5/16 in.), springs and locknuts (5/16 in.) (Fig. 3).

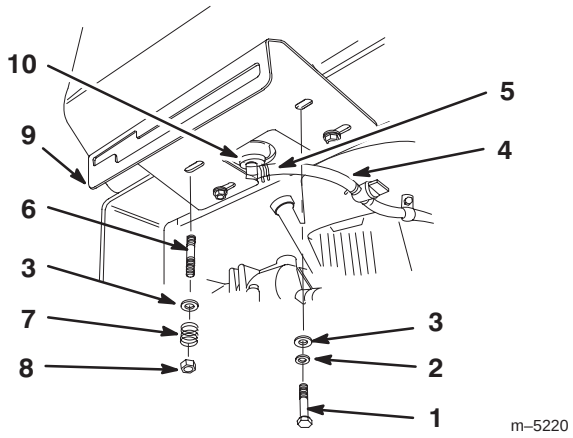



**Figure 3**

1. Bolt, 5/16 x 7/8 in. (22mm)
2. Lock washers, 5/16 in.
3. Washer, 5/16 in.
4. Fuel line
5. Hose clamp
6. Stud
7. Spring
8. Locknut
9. Control panel
10. Fuel tank connection

8. Slide the hose clamp onto the fuel line (Fig. 3).

9. Push the fuel line onto the fuel tank connection and secure it with a hose clamp (Fig. 3).

10. Shift lever to second gear and check alignment of lever in slot of control panel. Clearance between top of lever and the top of the slot should be about equal to the clearance between bottom of the lever and the bottom of the slot.

11. If clearance is not correct, remove lever and bend it slightly to adjust.

**Note:** Do not bend lever while attached to transmission shaft or damage may occur.

# Install Upper Handle

1. Align upper handle with upper mounting holes in rear frame (Fig. 4).

2. Secure each upper mounting hole with a flange bolt (3/8 x 1 in. (26mm)) and flange nut (Fig. 4).

3. Select high, medium or low position for the lower mounting hole (Fig. 4). This allows the upper handle to be adjusted to the user's height preference.

4. Secure each lower mounting hole with a flange bolt (3/8 x 1 in. (26mm)) and flange nut (Fig. 4).

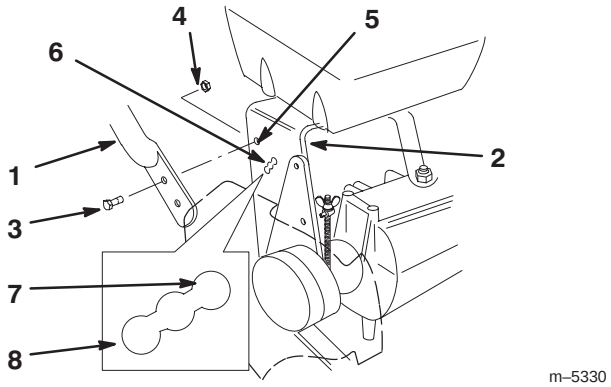



**Figure 4**

1. Upper handle
2. Rear frame
3. Flange bolt, 3/8 x 1 in. (26mm)
4. Flange nut, 3/8 in.
5. Upper mounting hole
6. Lower mounting holes
7. Low position
8. High position

# Install Control Rods

1. Thread rod fittings equal distance onto each control rod. For a starting point, thread fittings on approximately 1–3/4 in. (44 mm) from the start of the threads (Fig. 5).

2. Slide clevis pins through rod fittings and mounting holes in idler brackets (from outside) (Fig. 5). Secure with washers and hairpin cotters (Fig. 5).

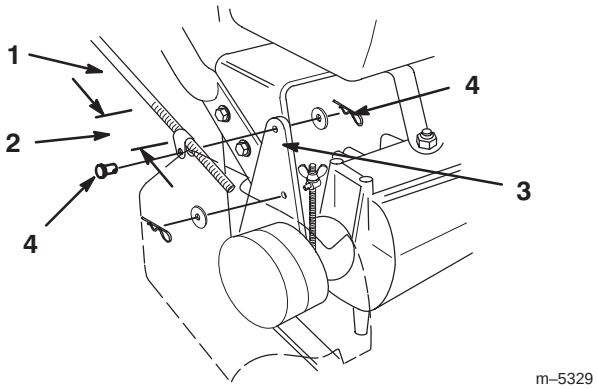


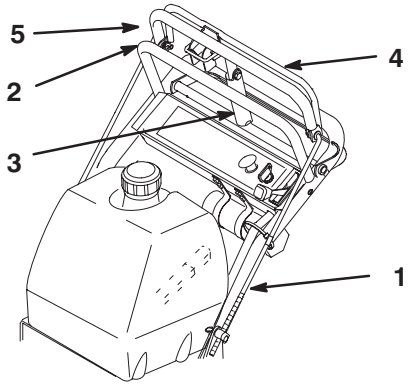

**Figure 5**

1. Control rod and fitting
2. 1–3/4in. (44 mm)
3. Idler bracket
4. Clevis pin, washer and hairpin cotter

3. Check the gap between upper control bar and fixed bar with wheel drive fully engaged. Gap should be approximately 1 to 1-1/4 in. (25–32 mm) (Fig. 6).

**Note:** The upper control bar and fixed bar must be parallel when in engaged, drive, relaxed and brake positions.

**4.** Check operation. If adjustment is required, remove hairpin cotter securing rod to upper control bar. Thread rod in or out of fitting for proper position and install into upper control bar with hairpin cotter.

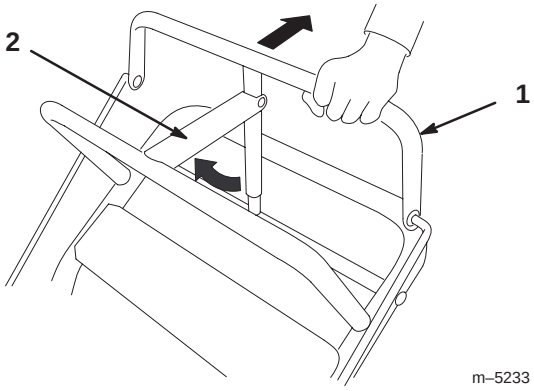



m–5190

**Figure 6**

1. Control rod
2. Fixed control bar
3. Parking brake lever
4. Upper control bar
5. 1 to 1–1/4 in. (25–32mm) gap

**5.** Check parking brake adjustment. Brake rods should be adjusted so parking brake lever is tight when swung into position against the fixed bar while pulling back on upper control bar (Fig. 7).




m–5233

**Figure 7**

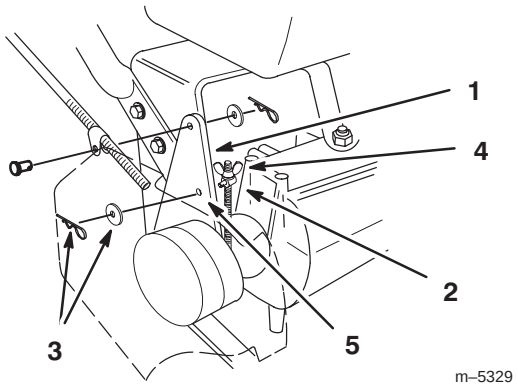
1. Upper control bar
2. Parking brake lever

**6.** If brake adjustment is required, remove hairpin cotter and washer securing brake rod fitting to idler bracket (Fig. 8).

**7.** Adjust wing nut up or down on brake rod and secure fitting to idler bracket (Fig. 8). Check adjustment and adjust if necessary.

**Note:** Make sure brake rod is installed in front (“F”) mounting hole in idler bracket.

**8.** Repeat procedure on opposite side if adjustment is required to keep control bar and fixed bar parallel.




m–5329

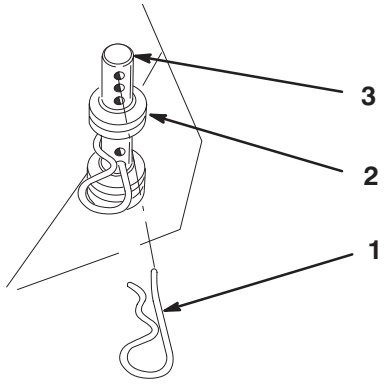
**Figure 8**

1. Idler bracket
2. Brake rod fitting
3. Hairpin cotter and washer
4. Wing nut
5. Hole “F”

## Install Hairpin Cotter Pins

Spare height–of–cut spacers may be stored on posts and retained by a hairpin cotter.

**1.** On opposite side of muffler, install extra hairpin cotter pins into front and rear height–of–cut pins (Fig. 9).




m–5314

**Figure 9**

1. Hairpin cotter
2. Extra spacers
3. Height–of–cut post

# Operation

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

## Think Safety First

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

The use of protective equipment for eyes, hearing, feet and head is recommended.

**Caution**

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

**Wear hearing protection when operating this machine.**

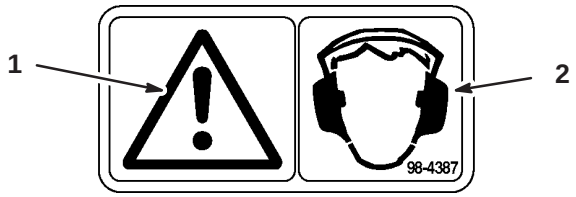



**Figure 10**

1. Caution
2. Wear hearing protection

## Controls

Become familiar with all the controls (Fig. 11) before you start the engine and operate the machine.

**Throttle Control** – The throttle control has three positions: CHOKE, FAST and SLOW.

**Deck Engagement Control Bail** – Control bail used in conjunction with deck engagement switch (PTO) to release blade brake and engage clutch to drive mower blades. Release bail to disengage mower blades.

**Blade Control Switch (PTO)** – Pull switch used in conjunction with control bail to release blade brake and engage clutch to drive mower blades.

**Gear Shift Lever** – Transmission has five forward speeds, neutral and reverse, and has an in-line shift pattern. Do not shift while unit is moving, as transmission damage may occur.

**Upper Control Bar** – Shift to desired gear and push forward on control bar to engage forward traction operation and pull back to brake. Pull right side of control bar to turn right and left side to turn left.

**Lower Control Bar** – Shift transmission to reverse and squeeze the lower control bar and handle together to engage rearward traction operation.

**Parking Brake Lever** – Pull back on upper control bar and swing brake lever up against the upper handle.

**Ignition Switch** – Key switch is used in conjunction with recoil starter. Switch has two positions: RUN and OFF.

**Recoil Starter –** Pull recoil Starter handle to start engine.

**Fuel Shut–off Valve** – (Under fuel tank) Close fuel shut–off valve when transporting or storing mower.

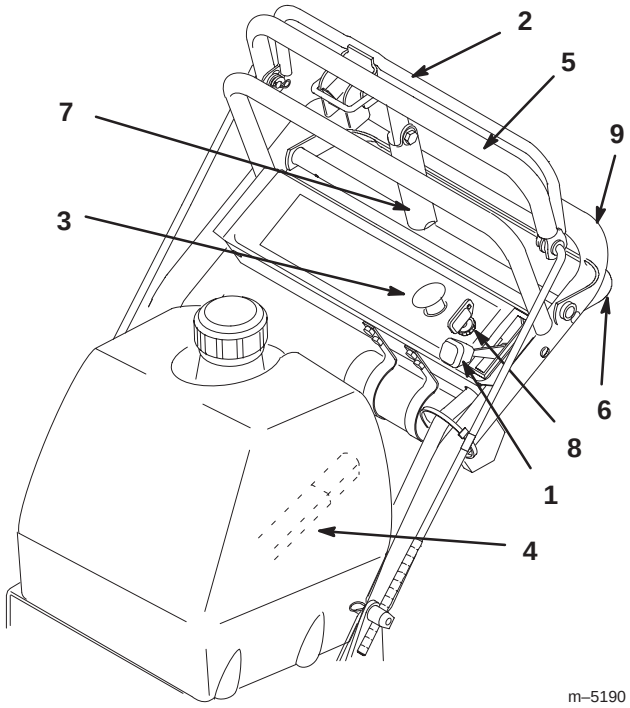



**Figure 11**

1. Throttle control
2. Blade control bail
3. Blade control switch (PTO)
4. Gear shift lever
5. Upper control bar
6. Lower control bar
7. Parking brake lever
8. Ignition switch
9. Handle

## Parking Brake

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

### Setting the Parking Brake

**1.** Pull the upper control bar (Fig. 12) rearward and hold it in this position.

2. Lift the parking brake lock (Fig. 12) up and gradually release the upper control bar. The brake lock should stay in the set (locked) position.

### Releasing the Parking Brake

1. Pull rearward on the upper control bar (Fig. 12). Lower the parking brake lock to the released position.
2. Gradually release the upper control bar.

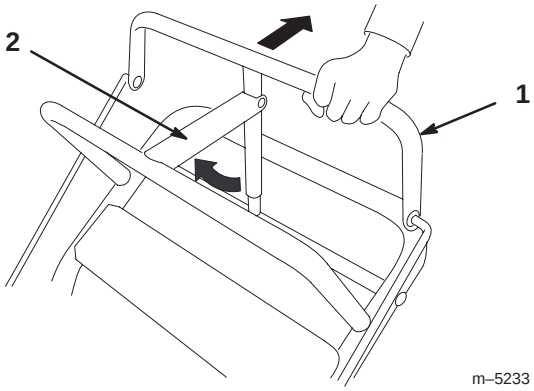



**Figure 12**

1. Upper control bar
2. Parking brake lever (set position)

## Starting and Stopping the Engine

### Starting

1. Make sure spark plug wire(s) are installed on spark plug(s) and fuel valve is open.
2. Move the shift lever to neutral, set the parking brake and turn ignition key to RUN.
3. Move the throttle control to CHOKE position before starting a cold engine.

**Note:** A warm or hot engine usually does not require any choking. To start a warm engine, move throttle control to FAST position.

4. Grasp recoil starter handle firmly and pull out until positive engagement results; then pull handle vigorously to start engine and allow rope to recoil slowly.

**Important** Do not pull recoil rope to its limit or let go of the starter handle when rope is pulled out because rope may break or recoil assembly may be damaged.

### Stopping

1. Move the throttle lever to “SLOW” (Fig. 13).
2. Let engine idle for 30 to 60 seconds before turning the ignition key “OFF.”
3. Turn the ignition key to “OFF” (Fig. 13).

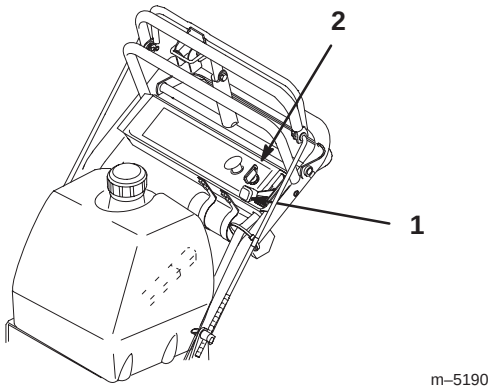



**Figure 13**

1. Throttle lever
2. Ignition key

4. Set the parking brake.
5. Pull wire off spark plug(s) to prevent possibility of accidental starting before storing machine.
6. Close fuel shut off valve before storing machine.

**Important** Make sure fuel shut off valve is closed before transporting or storing machine, as fuel leakage may occur.

## Operating Mower Blade Control (PTO)

The blade control switch (PTO) in conjunction with the blade control bail engages and disengages power to the electric clutch and mower blades.

### Engaging the Mower Blades (PTO)

1. Release the upper control bar to stop the machine (Fig. 14).
2. To engage blade, squeeze blade control bail against upper control bar (Fig. 14).
3. Pull blade switch (PTO) up and release. Hold blade control bail against control bar while operating.
4. Repeat procedure to engage mower blades if blade control bail is released.

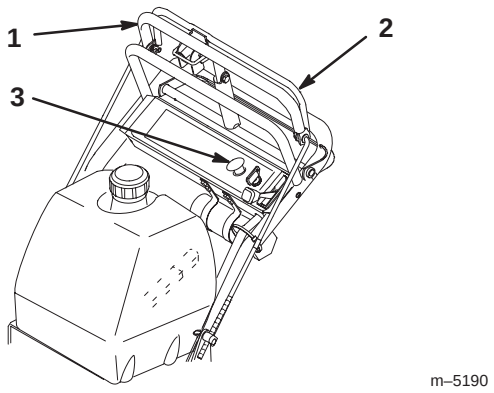



**Figure 14**

1. Upper control bar
2. Blade control bail
3. Blade control switch (PTO)

### Disengaging the Mower Blades (PTO)

**1.** Releasing blade control bail to disengage blades (Fig. 14).

## The Safety Interlock System

**Caution**

**If safety interlock switches are disconnected or damaged the machine could operate unexpectedly causing personal injury.**

- **Do not tamper with the interlock switches.**
- **Check the operation of the interlock switches daily and replace any damaged switches before operating the machine.**

### Understanding the Safety Interlock System

The safety interlock system is designed to prevent the mower blades from rotating unless:

- The control bail is depressed
- The blade control switch (PTO) is pulled “ON”

The safety interlock system is designed to stop the mower blades if you released the blade control bail.

### 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.** Set the parking brake and start the engine; refer to Starting and Stopping the Engine, page 17

**2.** Squeeze the blade control bail against upper control bar. **The blades should not rotate.**

**3.** Then continue holding the blade control bail and pull up on the blade control switch and release. The clutch should engage and the mower blades begin rotating.

**4.** Release the blade control bail. **The blades should stop rotating.**

**5.** With the engine running, pull up the blade control switch (PTO) and release without holding the blade control bail. **The blades should not rotate.**

## 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.

### Forward

**1.** To go forward, move the shift lever to a forward gear.

**2.** Release the parking brake; refer to Releasing the Parking Brake, page 17.

**3.** Slowly press on the upper control bar to move forward (Fig. 15).

To go straight, apply equal pressure to both ends of the upper control bar (Fig. 15).

To turn, release pressure on the upper control bar side away from the direction you want to turn (Fig. 15).

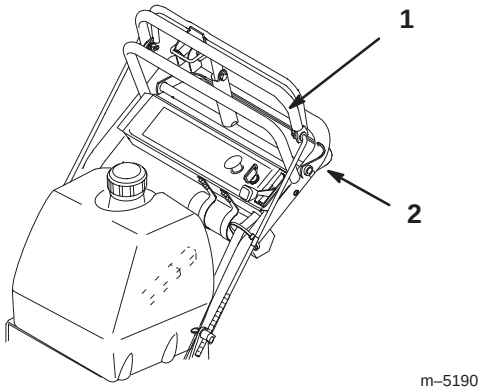



**Figure 15**

1. Upper control bar
2. Lower control bar

### Backward

**1.** To go backward, move the shift lever to reverse gear.

**2.** Release the parking brake; refer to Releasing the Parking Brake, page 17.

**3.** Slowly squeeze the lower control bar and handle together to move rearward (Fig. 15).

## Lower Control Bar Operation

This procedure is for driving up a curb. This can be performed while driving forward or backward.

**1.** Disengage the mower blades.

**Warning**

**A blade can be bent or damaged when driving up a curb. Pieces of blade that may be thrown could seriously injure or kill you or bystanders.**

- **Do not run blades while driving up a curb forward or backward.**

**2.** Select first gear or reverse to drive machine.

**3.** Drive machine until drive wheels contact curb (Fig. 17).

**Note:** Both drive wheels should contact the curb and caster wheels straight.

**4.** At the same time engage lower control bar and lift up on handle (Fig. 16 and 17).

**Note:** Lifting up on handle will assist driving the machine up a curb and not spin the drive wheels.

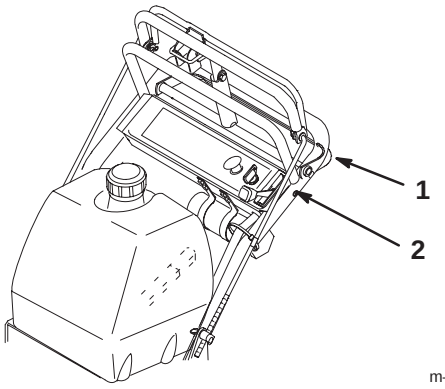



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**Figure 16**

1. Lower Control Bar (Engaged)
2. Handle

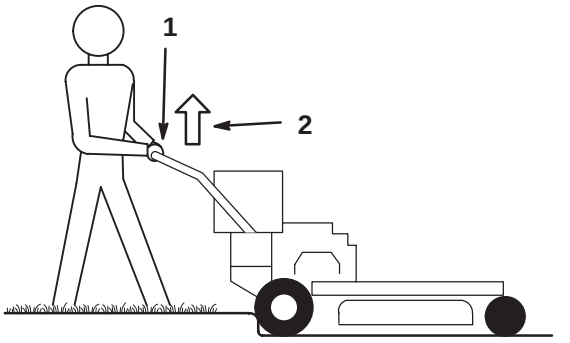


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**Figure 17**

1. Lower Control Bar engaged and mower in reverse.
2. Pull up to assist machine

## Stopping the Machine

To stop the machine, pull back on the upper control bar, release the blade control bail (PTO), and turn the ignition key to “OFF” to stop the engine. Also set the parking brake if you leave the machine unattended; refer to Setting the Parking Brake, page 16. Remember to remove the key from the ignition switch.

**Caution**

**Children or bystanders may be injured if they move or attempt to operate the machine 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.**

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

## Side Discharge or Mulch Grass

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

**Danger**

**Without the grass deflector, discharge cover, or complete grass catcher assembly mounted in place, you and others are exposed to blade contact and thrown debris. Contact with rotating mower blade(s) and thrown debris will cause injury or death.**

- **Never remove the grass deflector from the mower because the grass deflector routes material down toward the turf. If the grass deflector is ever damaged, replace it immediately.**
- **Never put your hands or feet under the mower.**
- **Never try to clear discharge area or mower blades unless you release the bail and the power take off (PTO) is off. Rotate the ignition key to "OFF." Also remove the key and pull the wire off the spark plug(s).**

## Adjusting Height-of-Cut

The height-of-cut can be adjusted from 1 to 4-1/2 in. (25.4 to 114.3 mm) in 1/4 in. (6 mm) increments. Adjustment is done by relocating four hairpin cotter pins in different hole location and by adding or removing spacers.

**Note:** Rear height–of–cut pins need at least one spacer or damage can occur to bushing if none are used.

1. To adjust, remove hairpin cotter from height-of-cut post (Fig. 18).
2. Select hole in height-of-cut post corresponding to the height-of-cut desired (Fig. 18).
3. Lift on side of deck and remove hairpin cotter (Fig. 18).
4. Add or remove spacers if needed and then align holes and insert hairpin cotter (Fig. 18).

**Note:** Spare height–of–cut spacers may be stored on posts and retained by a hairpin cotter.

**Important** All four hairpin cotter pins must be in the same hole location and with the correct number of spacers for a level cut.

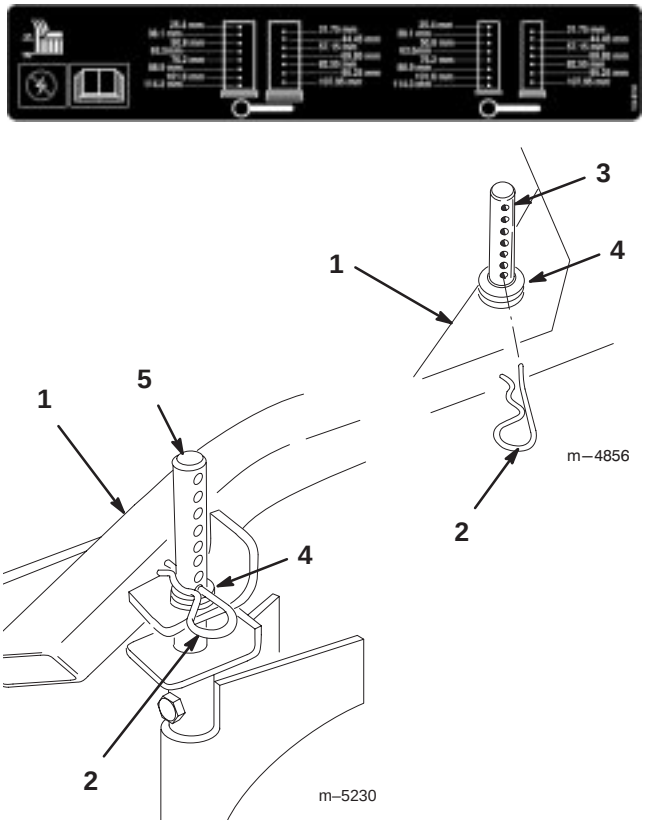



**Figure 18**

1. Carrier Frame
2. Hairpin Cotter
3. Front height–of–cut post
4. Spacers
5. Back height–of–cut post

## Adjusting Center Gage Wheels

The gage wheels must be adjusted in the proper hole location for each height-of-cut position.

1. After adjusting height-of-cut; remove bolt, washers and nut (Fig. 19).
2. Select a hole position so the gage wheels are a minimum of 3/8 in. (9.5 mm) off the ground for the height-of-cut to be used (Fig. 19).

**3.** Reinstall the bolt, washers and nut (Fig. 19).

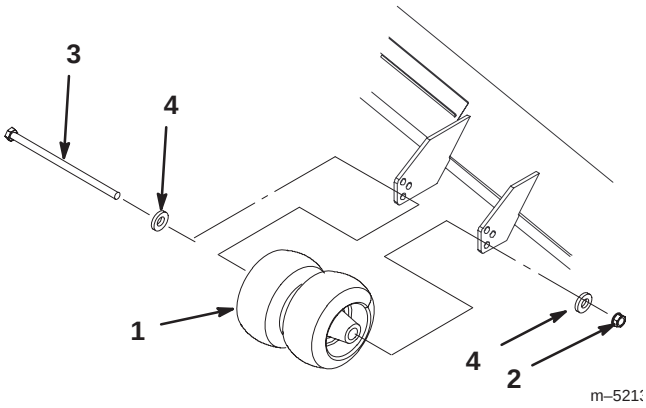



**Figure 19**

1. Center Gage Wheels and Spacer
2. Nut
3. Bolt
4. Washer

# Maintenance

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

## Recommended Maintenance Schedule

| Maintenance Service Interval | Maintenance Procedure |
|---|---|
| Each Use | • Oil—check level<br>• Safety System—check<br>• Brake—check<br>• Engine—clean outside<br>• Mower Housing—clean |
| After first 5 hours | • Oil—change |
| 8 Hours | • Mower Housing—clean<br>• Caster Wheels—grease |
| 25 Hours | • Foam Air Cleaner—clean[1]<br>• Paper Air Cleaner—clean[1] |
| 40 Hours | • Tires—check pressure |
| 50 Hours | • Oil—change[1]<br>• Belts—check |
| 100 Hours | • Spark Plug(s)—check<br>• Electric Clutch—adjust<br>• Engine—clean outside<br>• Oil Filter—change (100 hours or every other oil change) |
| 200 Hours | • Fuel Filter—replace |
| 250 Hours | • Transmission Couplings—grease[1] |
| 300 Hours | • Paper Air Cleaner—replace[1] |
| 400 Hours | • Wheel Bearings—grease[1] |
| At storage | • Chipped Surfaces—paint<br>• Perform all maintenance procedures listed above before storage |

[1]More often in dusty, dirty conditions.

**Important** Refer to your engine operator's manual for additional maintenance procedures.

**Caution**

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

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

# Air Cleaner Service

## Service Interval/Specification

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

Paper Element: Clean after every 100 operating hours.
Replace after every 300 operating hours.

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

## Removing the Foam and Paper Elements

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Clean around the air cleaner to prevent dirt from getting into the engine and causing damage. Unscrew the cover nuts and remove the air cleaner cover (Fig. 20).
3. Remove the air cleaner assembly (Fig. 20).
4. Carefully slide the foam element off the paper element (Fig. 20).

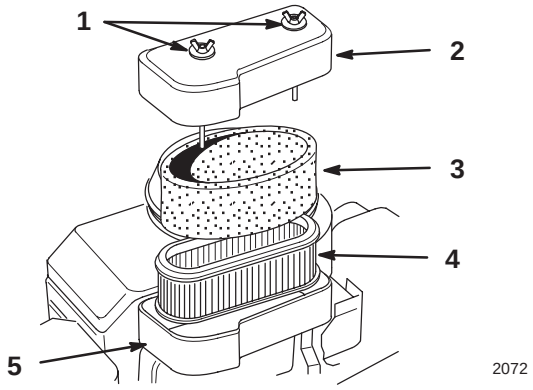



**Figure 20**

1. Cover nut
2. Air cleaner cover
3. Foam element
4. Paper element
5. Air cleaner base

## Cleaning the Foam Element

1. Wash the foam element in liquid soap and warm water. When the element is clean, rinse it thoroughly.
2. Dry the element by squeezing it in a clean cloth.
3. Put one or two ounces (30 to 60ml) of oil on the element (Fig. 21). Squeeze the element to distribute the oil.

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

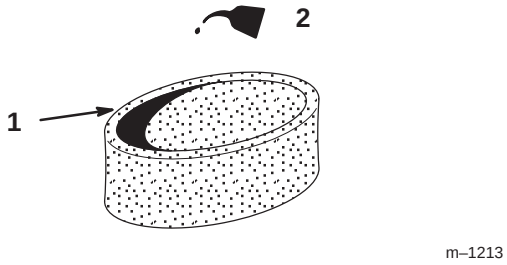



**Figure 21**

1. Foam element
2. Oil

## Cleaning the Paper Element

1. Lightly tap the element on a flat surface to remove dust and dirt (Fig. 22).
2. Inspect the element for tears, an oily film, and damage to the rubber seal.

**Important** Never clean the paper element with pressurized air or liquids, such as solvent, gas, or kerosene. Replace the paper element if it is damaged, defective, or cannot be cleaned thoroughly.

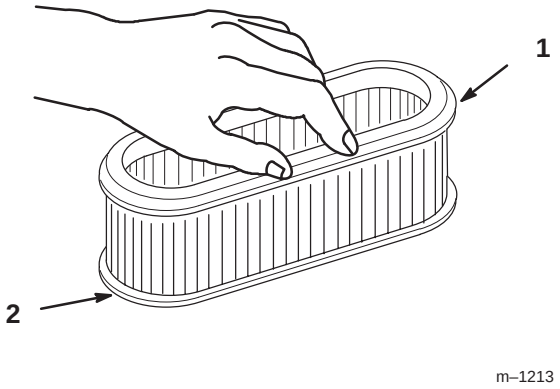



**Figure 22**

1. Paper element
2. Rubber seal

## Installing the Foam and Paper Elements

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

1. Carefully slide the foam element onto the paper air cleaner element (Fig. 20).
2. Place the air cleaner assembly onto the air cleaner base (Fig. 20).

3. Install the air cleaner cover and secure with cover nuts (Fig. 20).

# Engine Oil Service

## Service Interval/Specification

Change oil:

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

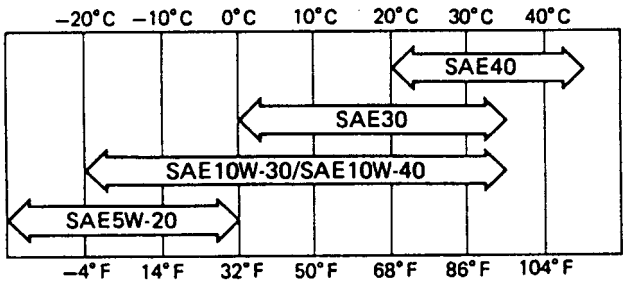
**Note:** Change oil more frequently when operating conditions are extremely dusty or sandy.

Oil Type: Detergent oil (API service SF, SE/CC, CD or SE)

Crankcase Capacity: with filter, 54 oz. (1.6 l)
with out filter, 47 oz. (1.4 l)

Viscosity: See table below

**USE THESE SAE VISCOSITY OILS**




## Checking Oil Level

1. Park the machine on a level surface, disengage the power take off (PTO), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
2. Clean around the oil dipstick (Fig. 23) so dirt cannot fall into the filler hole and damage the engine.
3. Unscrew the oil dipstick and wipe the metal end clean (Fig. 23).
4. Slide the oil dipstick fully into the filler tube, do not thread onto tube (Fig. 23). Pull the dipstick out and look at the metal end. If oil level is low, slowly pour only enough oil into the filler tube to raise the level to the “FULL” mark.

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

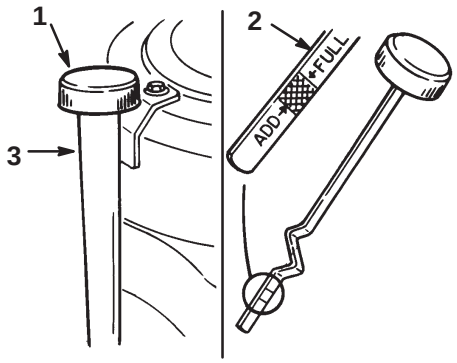



**Figure 23**

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

## Changing/Draining Oil

1. Start the engine and let it run five minutes. This warms the oil so it drains better.
2. Park the machine so that the drain side is slightly lower than the opposite side to assure the oil drains completely. Then disengage the power take off (PTO), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
3. Place a pan below the oil drain. Remove the oil drain plug (Fig. 24).
4. When oil has drained completely, install the oil drain plug.

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

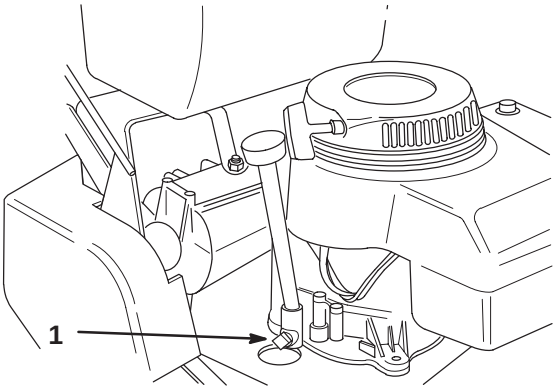



**Figure 24**

1. Oil drain plug

5. Slowly pour approximately 80% of the specified oil, page 24, into the filler tube (Fig. 23). Now check the oil level; refer to Checking Oil Level, page 24. Slowly add additional oil to bring to “FULL” mark on dipstick.

## Change Oil Filter

### Service Interval/Specification

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

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

1. Drain the oil from the engine; refer to Changing/Draining Oil, page 24.
2. Remove the old filter and wipe the filter adapter (Fig. 25) gasket surface.
3. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Fig. 25).

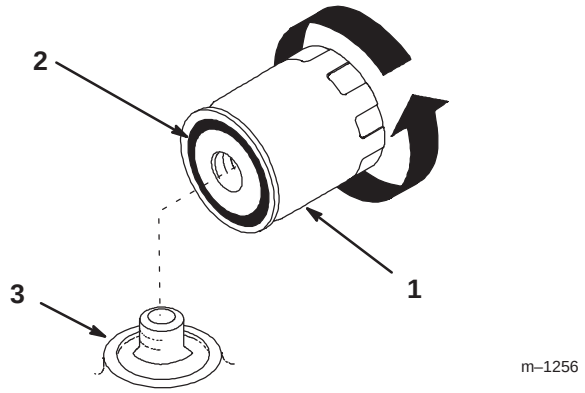



**Figure 25**

1. Oil filter
2. Gasket
3. Adapter

4. Install the replacement oil filter to the filter adapter. Turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 3/4 turn (Fig. 25).
5. Fill the crankcase with the proper type of new oil; refer to Changing/Draining Oil, page 24.

# Spark Plug Service

## Service Interval/Specification

Check the spark plug(s) after every 100 operating hours. Make sure the air gap between the center and side electrodes is correct before installing the spark plug. Use a spark plug wrench for removing and installing the spark plug(s) and a gapping tool/feeler gauge to check and adjust the air gap. Install a new spark plug(s) if necessary.

Type: NGK BMR-4A, Champion RCJ–8
(or equivalent) Air Gap: 0.025 in. (0.65 mm)

## Removing the Spark Plug(s)

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
2. Pull the wire(s) off the spark plug(s) (Fig. 26). Now clean around the spark plug(s) to prevent dirt from falling into the engine and potentially causing damage.
3. Remove the spark plug(s) and metal washer.

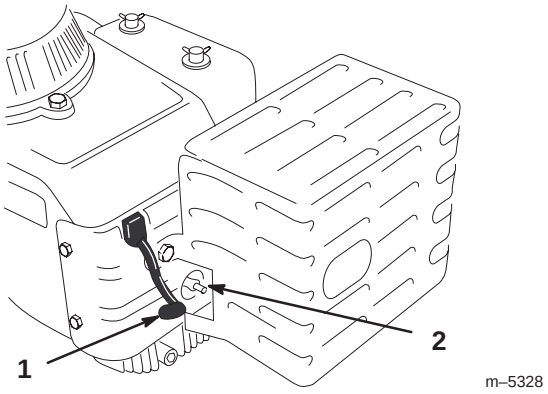



**Figure 26**

1. Spark plug wire
2. Spark plug

## Checking the Spark Plug

1. Look at the center of the spark plug(s) (Fig. 27). If you see light brown or gray on the insulator, the engine is operating properly. A black coating on the insulator usually means the air cleaner is dirty.

**Important** Never clean the spark plug(s). Always replace the spark plug(s) when it has: a black coating, worn electrodes, an oily film, or cracks.

2. Check the gap between the center and side electrodes (Fig. 27). Bend the side electrode (Fig. 27) if the gap is not correct.

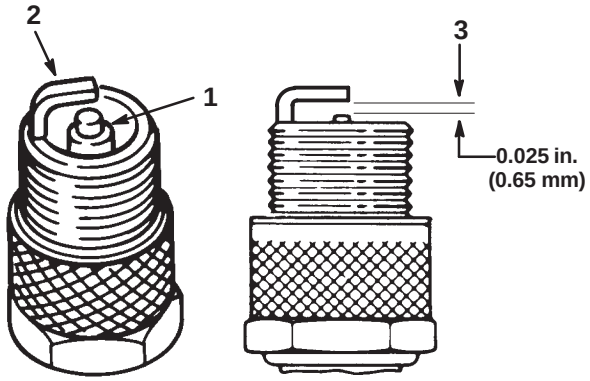



**Figure 27**

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

## Installing the Spark Plug(s)

1. Install the spark plug(s). Make sure the air gap is set correctly.
2. Tighten the spark plug(s) to 20 ft-lb (27 N•m).
3. Push the wire(s) onto the spark plug(s) (Fig. 26).

# Greasing and Lubrication

## Service Interval/Specification

Grease with No. 2 general purpose lithium base or molybdenum base grease.

## How to Grease

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
2. Clean the grease fittings with a rag. Make sure to scrape any paint off the front of the fitting(s).
3. Connect a grease gun to the fitting. Pump grease into the fittings until grease begins to ooze out of the bearings.
4. Wipe up any excess grease.

## Lubricate the castor and wheel bearings

1. Lubricate the front wheel bearings and front spindles until grease begins to ooze out of the bearings (Fig. 28).
2. Remove rear wheel grease cap. Lubricate the rear wheel bearing (Fig. 28).

**Note:** Make sure the rear wheel grease caps are removed before lubricating rear wheels.

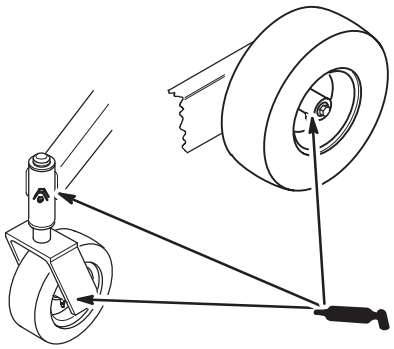


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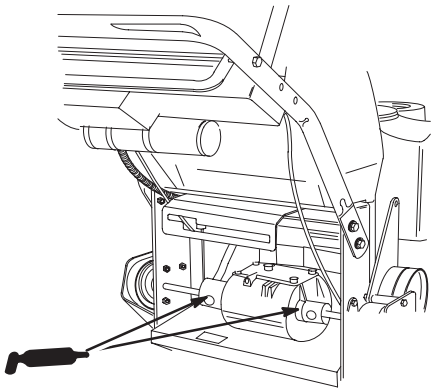
**Figure 28**

## Lubricate the transmission couplers

1. Lubricate the transmission couplers located in the back of the machine (Fig. 29).



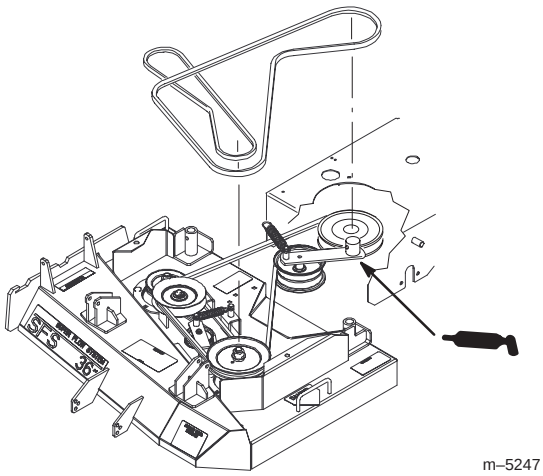
m–5191

**Figure 29**

## Greasing the PTO Drive Belt Idler

1. Stop the engine, set the parking brake, remove the key and disconnect the spark plug wire(s) from the spark plug(s).

**2.** Grease the fitting on the PTO belt idler arm pivot (Fig. 30).




m–5247

**Figure 30**

# Cleaning the Cooling System

## Service Interval/Specification

Before each use, check and clean engine cooling system. 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.

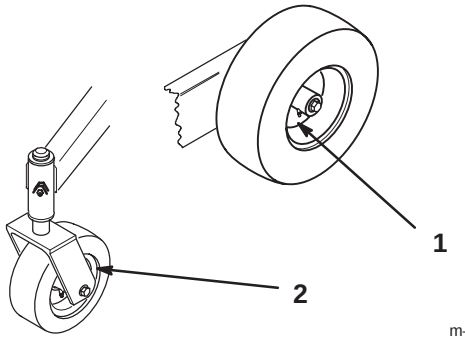
# Checking Tire Pressure

## Service Interval/Specification

Maintain the air pressure in the front and rear tires as specified. Check the pressure at the valve stem after every 40 operating hours or monthly, whichever occurs first (Fig. 31). Check the tires when they are cold to get the most accurate pressure reading.

Rear Tire Pressure: 12–14 psi (83–97 kPa)

Castor Tire Pressure: 20–24 psi (138–165 kPa)




m–2147

**Figure 31**

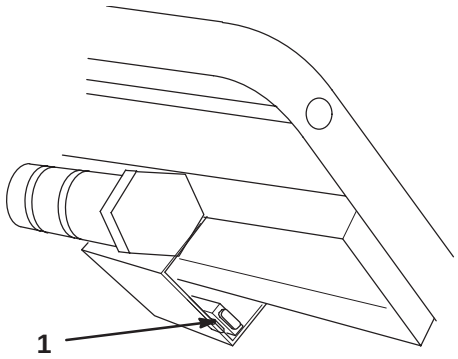
1. Rear Tire
2. Castor tire

# Fuse Service

## Service Interval/Specification

The electrical system is protected by a fuse. It requires no maintenance. If the fuse blows check component or circuit for malfunction or short. To replace fuse pull out on the fuse (Fig. 32) to remove or replace it.

Fuse: F1–7.5 amp, blade-type




m–5206

**Figure 32**

1. Fuse 7.5 amp

# Brake Service

## Service Interval/Specification

Before each use, check brakes for proper operation.

Always set the parking brake when you stop the machine or leave it unattended. If the parking brake does not hold securely, an adjustment is required.

## Checking the Brake

1. Park the machine on a level surface, disengage the power take off (PTO), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
2. Rear wheels must lock when you try to push the machine forward. Adjustment is required if the wheels turn and do not lock; refer to Adjusting the Brake, page 28.
3. Release the brake and press upper control bar very lightly, approximately 1/2 in. (13 mm), wheels should rotate freely.
4. If both conditions are met no adjustment is required.

## Adjusting the Brake

The brake lever is on the upper control bar (Fig. 11). If the parking brake does not hold securely, an adjustment is required.

1. Check the brake before you adjust it; refer to Checking the Brake, page 28.
2. Release the parking brake; refer to Releasing the Parking Brake, page 17.
3. To adjust the brake remove the cotter pin and washer from the brake lever (Fig. 33).
4. Rotate the trunnion so it smoothly slides into brake lever hole “F” (Fig. 33). Tighten wing nut.
5. Secure trunnion to brake lever with washer and cotter pin (Fig. 33).
6. Check the brake operation again; refer to Checking the Brake, page 28.

**Important** With the parking brake released, the rear wheels must rotate freely when you push the mower. If brake action and free wheel rotation cannot be achieved contact your service dealer immediately.

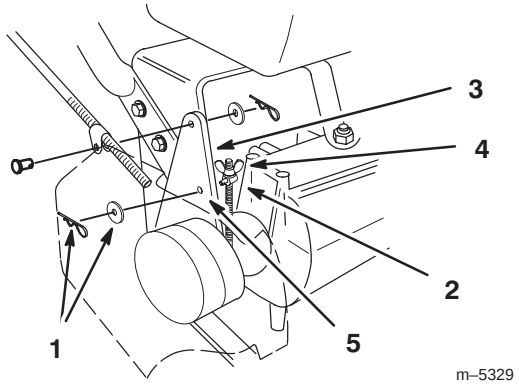



**Figure 33**

1. Hairpin cotter and washer
2. Trunnion
3. Brake lever
4. Wing nut
5. Hole “F”
6. Drive belt shroud

# Adjusting the Electric Clutch

The clutch is adjustable to ensure proper engagement and proper braking. Check adjustment after every 100 hours of operation.

1. To adjust clutch, tighten or loosen lock nuts on flange studs (Fig. 34).
2. Check adjustment by inserting feeler gauge thru slots next to studs (Fig. 34).
3. The proper disengaged clearance between the clutch plates is .012–.018 in. (0.30-0.45 mm). It will be necessary to check this clearance at each of the three slots to ensure the plates are parallel to each other.

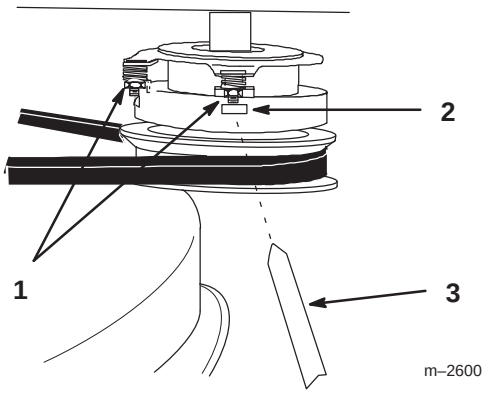



**Figure 34**

1. Adjusting nut
2. Slot
3. Feeler gauge

# Fuel Tank Service

**Danger**

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

- **Drain gasoline from the fuel tank when the engine is cold. Do this outdoors in an open area. Wipe up any gasoline that spills.**
- **Never smoke when draining gasoline, and stay away from an open flame or where a spark may ignite the gasoline fumes.**

## Draining The Fuel Tank

1. Park the machine on a level surface, to assure fuel tank drains completely. Then disengage the power take off (PTO), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
2. Close fuel shut–off valve at fuel tank (Fig. 35).
3. Squeeze the ends of the hose clamp together and slide it up the fuel line away from valve (Fig. 35).
4. Pull the fuel line off the valve (Fig. 35). Open fuel shut-off valve and allow gasoline to drain into a gas can or drain pan.

**Note:** Now is the best time to install a new fuel filter because the fuel tank is empty. Refer to Replacing the Fuel Filter; page 29.

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

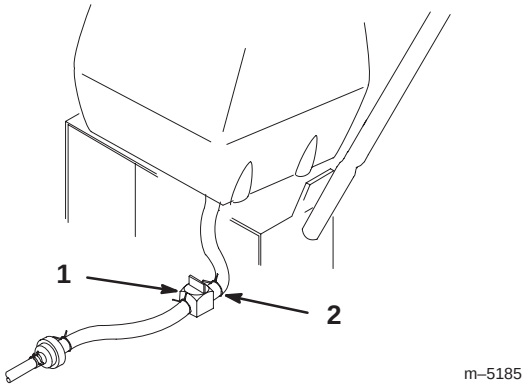



**Figure 35**

1. Fuel shut-off valve
2. Clamp

# Fuel Filter Service

## Service Interval/Specification

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

## Replacing the Fuel Filter

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

**Note:** Note how the fuel filter is installed.

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
2. Close fuel shut–off valve at fuel tank (Fig. 35).

**Note:** Remove fuel line from fuel valve that is closest to the engine.

3. Squeeze the ends of the hose clamps together and slide them away from the filter (Fig. 36).
4. Remove the filter from the fuel lines.
5. Install a new filter and move the hose clamps close to the filter.
6. Open fuel shut-off valve at fuel tank (Fig. 35).
7. Check for fuel leaks and repair if needed (Fig. 35).

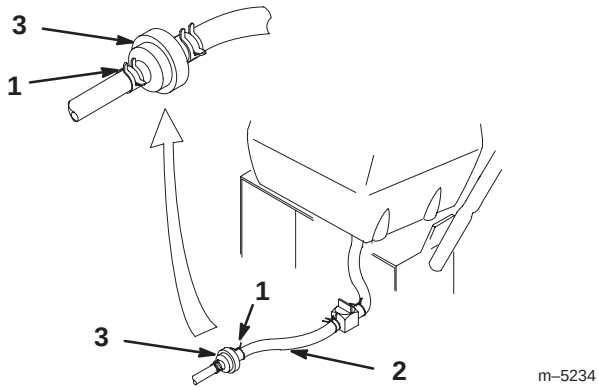



**Figure 36**

1. Hose clamp
2. Fuel line
3. Filter

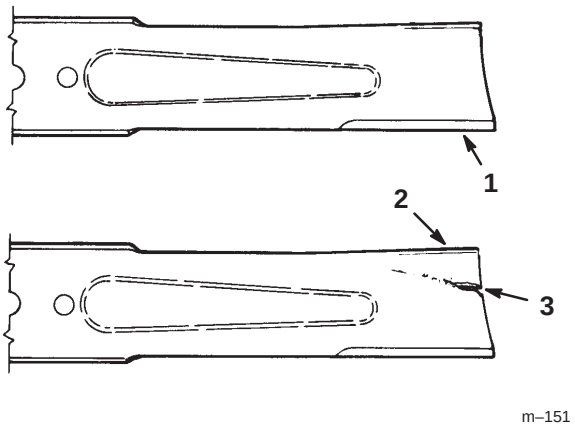



**Figure 37**

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

# Cutting Blade Service

To ensure a superior quality of cut, keep the blades sharp. For convenient sharpening and replacement, you may want to keep extra blades on hand.

**Warning**

**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.**

## 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" to stop the engine. Remove the key and disconnect the spark plug wire(s) from the spark plug(s).

## Inspecting the Blades

1. Inspect the cutting edges (Fig 37). If the edges are not sharp or have nicks, remove and sharpen the blades. Refer to Sharpening the Blades on page 31.
2. Inspect the blades, especially the curved area (Fig. 37). If you notice any damage, wear, or a slot forming in this area (item 3 in Fig. 37), immediately install a new blade.

## Checking for Bent Blades

1. Rotate the blades until the ends face forward and backward (Fig. 38). Measure from a level surface to the cutting edge, position "A", of the blades (Fig. 39). Note this dimension.

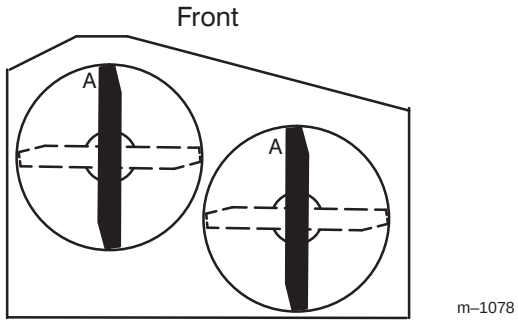
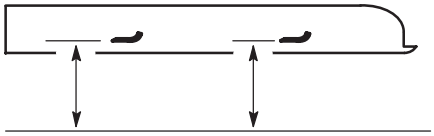



**Figure 38**



**MEASURE FROM CUTTING EDGE TO A LEVEL SURFACE**

m–1087

**Figure 39**

2. Rotate the opposite ends of the blades forward.
3. Measure from a level surface to the cutting edge of the blades at the same position as in step 1. The difference between the dimensions obtained in steps 1 and 2 must not exceed 1/8 in. (3 mm). If this dimension exceeds

1/8 in. (3 mm), the blade is bent and must be replaced. Refer to Removing the Blades, and Installing the Blades on page 31.

**Warning**

**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 non-conformance with safety standards.

1. Hold the blade end using a rag or thickly-padded glove. Remove the blade bolt, blade stiffener and blade from the spindle shaft (Fig. 40).

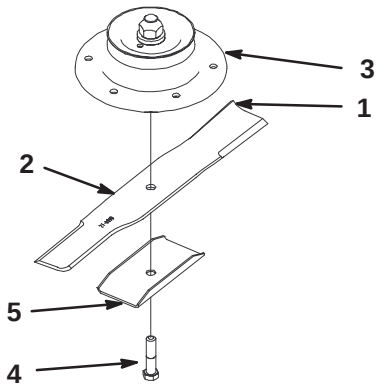



**Figure 40**

1. Sail Area of Blade
2. Blade
3. Blade spindle
4. Blade Bolt
5. Blade stiffener

## Sharpening the Blades

1. Use a file to sharpen the cutting edge at both ends of the blade (Fig. 41). Maintain the original angle. The blade retains its balance if the same amount of material is removed from both cutting edges.

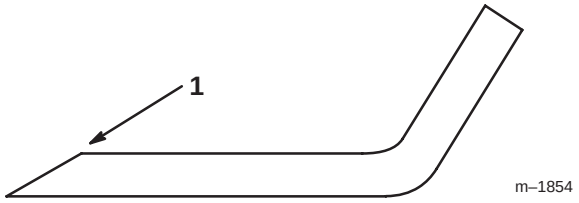



**Figure 41**

1. Sharpen at original angle

2. Check the balance of the blade by putting it on a blade balancer (Fig. 42). 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 (Fig. 40). Repeat this procedure until the blade is balanced.

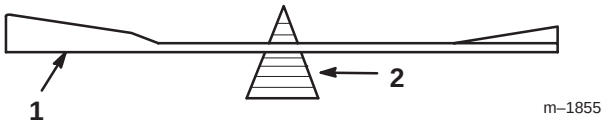



**Figure 42**

1. Blade
2. Balancer

## Installing the Blades

1. Install the blade onto the spindle shaft (Fig. 40).

**Important** The sail part of the blade must be pointing upward, toward the inside of the mower to ensure proper cutting (Fig. 40).

2. Install the lock washer and blade bolt (Fig. 40). Torque the blade bolt to 85–110 ft-lb (115–140 N•m).

# Correcting Cutting Unit Mismatch

If one deck blade cuts lower than the other, correct as follows.

**Note:** Tire air pressure is critical in these procedures. Make sure all tires have correct pressure.

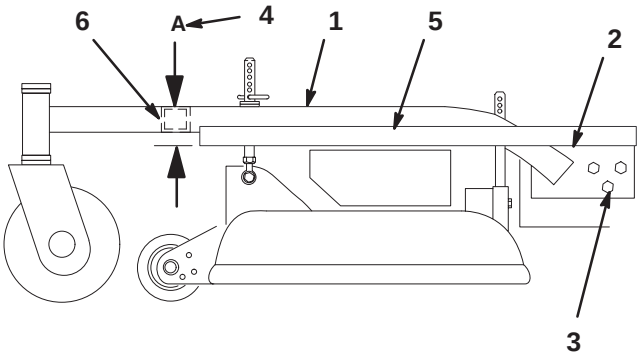
1. Stop the engine, remove the key and disconnect the spark plug wire(s) from the spark plug(s).
2. Adjust the tire pressure in all tires to specifications on page 27.
3. Check that the blades and spindle shafts are not bent. Refer to Checking for Bent Blades on page 30.
4. Set the height-of-cut to the 4 in. (101.6 mm) position. Refer to Adjusting the Height-Of-Cut in the Operation section.

5. Perform steps in the following sections Frame Set Up, Checking Front–to–Rear Pitch and Checking Side–to–Side Leveling.

# Frame Set Up

## Checking Carrier Frame and Deck Alignment

1. Stop the engine, remove the key and disconnect the spark plug wire(s) from the spark plug(s).
2. Place a long straight edge on top of the engine deck as shown in figure 43.
3. At the carrier frame cross tube, measure location “A” height (Fig. 43). This measurement must be 2–13/16 in. (71.4 mm), plus or minus a 1/4 in. (6 mm).
4. If the height at location “A” is not correct, adjustment is needed.
5. Loosen the carrier frame mounting bolts on both sides of the machine (Fig. 43).
6. Align the carrier frame and engine deck to match 2–13/16 in. (71.4 mm), plus or minus a 1/4 in. (6 mm) at location “A” (Fig. 43).
7. Tighten the carrier frame mounting bolts on both sides of the machine.



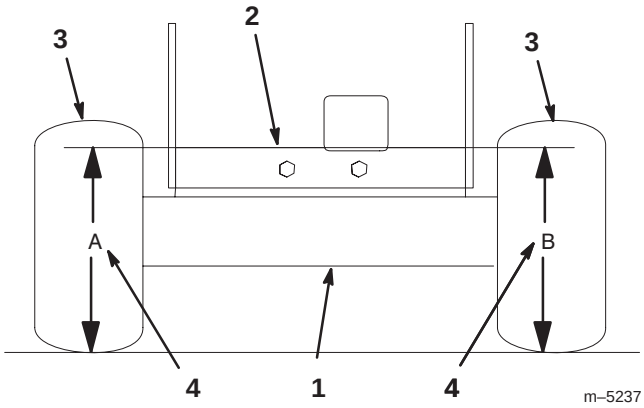

m–5315

**Figure 43**

1. Carrier Frame
2. Top of engine deck
3. Carrier frame mounting bolts
4. Location A, 2–13/16 in. (71.4 mm) ±1/4 in. (6 mm)
5. Straight edge
6. Carrier frame cross tube

## Checking Engine Deck Height

1. Stop the engine, remove the key and disconnect the spark plug wire(s) from the spark plug(s).
2. Adjust the tire pressure in all tires to specifications on page 27.
3. Measure engine deck height at location “A” (Fig. 44).
4. Measure engine deck height at location “B” (Fig. 44).
5. If the height at location “A” and “B” are not the same, change tire pressure slightly to make them the same.




m–5237

**Figure 44**

1. Back view of machine
2. Top of engine deck
3. Tires
4. Same height at locations A and B

## Checking Carrier Frame Front–to–Rear Pitch

The carrier frame must have a pitch of a 1/4 in. (6 mm) over the length of 24 inches (61cm) on the carrier frame (Fig. 45).

1. Measure out 24 inches (61cm) on the carrier frame (Fig. 45).
2. Measure carrier frame height at location “A” (Fig. 45).
3. Measure carrier frame height at location “B” (Fig. 45).
4. The height at location “A” must be a 1/4–3/8 in. (6 mm –10 mm) lower than location “B” (Fig. 45).
5. If the carrier frame is not correct, move caster spacers to make it a 1/4–3/8 in. (6 mm –10 mm) pitch (Fig. 45). Move spacers from top or bottom to make the correct pitch.

**6.** The tire pressure may also be adjusted slightly to make a 1/4 in. (6 mm) pitch.

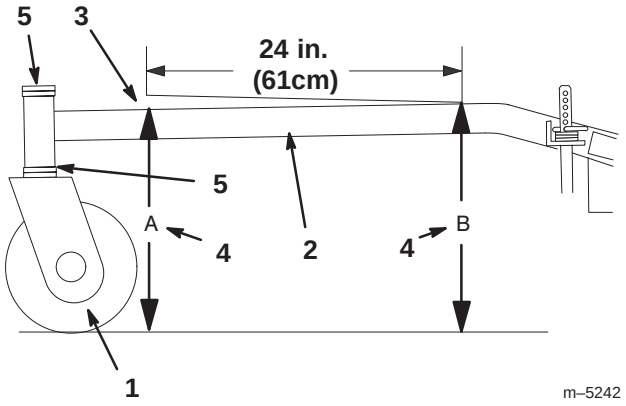



**Figure 45**

1. Caster Wheel
2. Carrier Frame
3. 1/4–3/8 in. (6 mm–10 mm) pitch over 24 in. (61 cm) length
4. Height at locations A and B
5. Caster spacers

## Checking Carrier Frame Side–to–Side

**1.** Stop the engine, remove the key and disconnect the spark plug wire(s) from the spark plug(s).

**2.** Adjust the tire pressure in all tires to specifications on page 27.

**3.** Measure carrier frame height at location “A” (Fig. 46).

**4.** Measure carrier frame height at location “B” (Fig. 46).

**5.** If the carrier frame height is not the same move spacers from top or bottom of caster wheel, to make it level. The tire pressure may also be adjusted slightly to make it level.

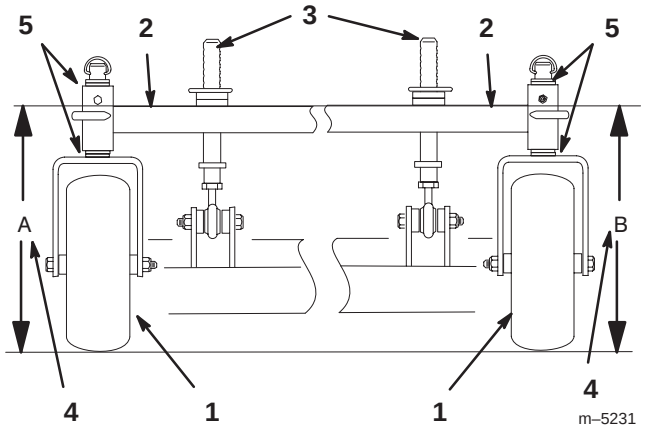



**Figure 46**

1. Caster Wheel
2. Carrier Frame
3. Front height–of–cut pins
4. Same height at locations A and B
5. Caster spacers

# Checking the Deck Front-to-Rear Pitch

**1.** Check the tire pressure on both deck and traction unit.

**2.** Position one blade front-to-rear (Fig. 47). Measure at “C” and “D” locations (Fig. 47) from a level surface to the cutting edge of the blade tips (Fig. 48).

**3.** **The mower blade should be 1/4 in. (6 mm) lower in front “C” than in the rear “D”.** Rotate blades and repeat for other blades. If it is not correct, proceed to Changing the Deck Front–to–Rear Pitch.

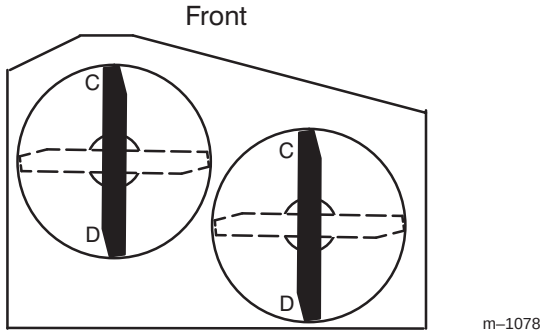
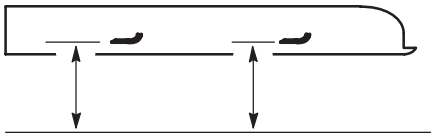



**Figure 47**



MEASURE FROM CUTTING EDGE TO A LEVEL SURFACE

m–1087

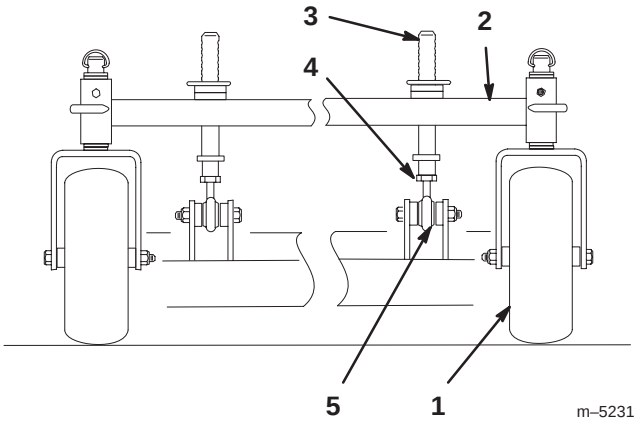
**Figure 48**

# Changing the Deck Front-to-Rear Pitch

Changing the front–to–rear pitch is done by adjusting the front height–of–cut posts.

## Changing the Deck Front–to–Rear Pitch by Adjusting Front Height–of–Cut Posts

1. To change the front-to-rear pitch, the front height–of–cut posts can be adjusted (Fig. 49).
2. To raise the front of the deck, loosen jam nut and rotate the front pin clockwise (Fig. 49).
3. To lower the front of the deck, loosen jam nut and rotate the front pin counter clockwise (Fig. 49).




m–5231

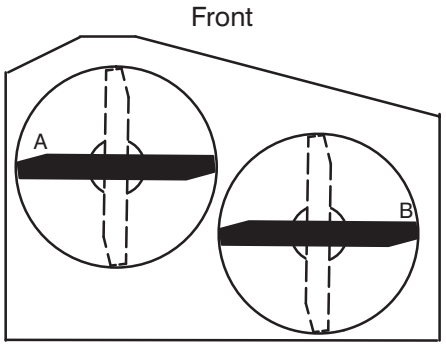
**Figure 49**

1. Caster Wheel
2. Carrier Frame
3. Front height–of–cut pins
4. Jam nut
5. Ball joint

4. Position the blades front-to-rear (Fig. 47). Measure at “C” and “D” locations (Fig. 47) from a level surface to the cutting edge of the blades (Fig. 48).
5. Check the side-to-side leveling of the cutting unit.

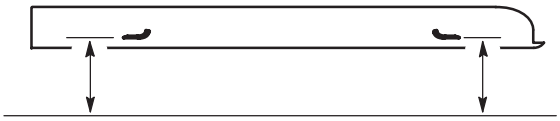
# Checking the Deck Side-to-Side Leveling

1. Check the tire pressure on both deck and traction unit.
2. Position the blades side-to-side (Fig. 50). Measure at “A” and “B” locations (Fig. 50) from a level surface to the cutting edge of blade tips (Fig. 51).
3. The difference between measurements “A” and “B” should be no more than 1/4 in. (6 mm).




m–1078

**Figure 50**



MEASURE FROM CUTTING EDGE TO A LEVEL SURFACE

m–2550

**Figure 51**

# Changing the Side-to-Side Leveling

Changing the side–to–side leveling is done by adjusting tire pressure.

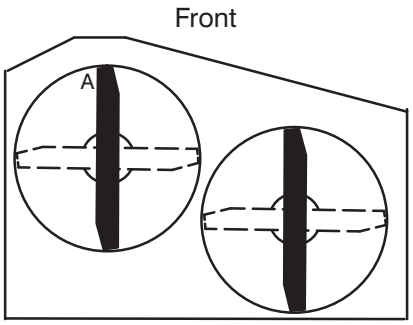
## Changing the Side–to–Side Leveling with Tire Pressure

1. Change the tire pressure on both deck and traction unit. Do this to the corresponding side that needs adjustment.
2. Recheck the front-to-rear pitch and side to side leveling of the cutting unit.

# Matching Height of Cut

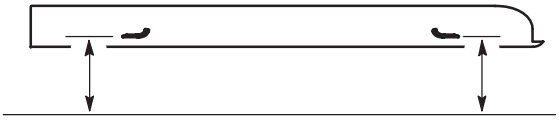
1. Check the tire pressure on both deck and traction unit.

2. Set the height-of-cut to the 4 in. (101.6 mm) position following the height-of-cut decal.
3. With the machine on level surface, position one blade front-to-rear (Fig. 52). Measure at “A” and from level surface to the cutting edge of the blade tips (Fig. 53).
4. The measurement should be 4 in. (101.6 mm).




m–1078

**Figure 52**



**MEASURE FROM CUTTING EDGE TO A LEVEL SURFACE**

m–2550

**Figure 53**

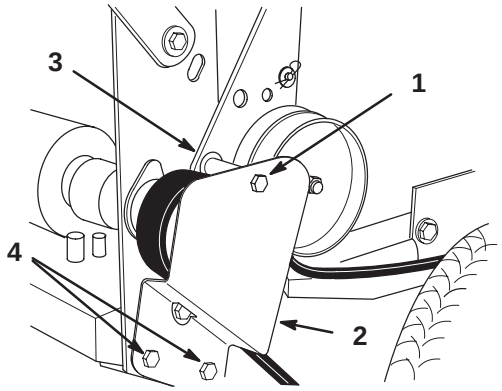
5. If it does not measure correctly, add air pressure in rear tires to raise height–of–cut
6. If it does not measure correctly, decrease air pressure in rear tires to lower height–of–cut.
7. Check carrier frame front–to–rear pitch.

# Replacing the Drive Belt

## Service Interval/Specification

Check all belts after every 50 operating hours or monthly, whichever occurs first. Look for dirt, wear, cracks and signs of overheating.

1. Remove belt guard, not shown for clarity.
2. Remove top capscrew securing idler support and idler bracket to rear frame (Fig. 54).
3. Loosen bottom two mounting screws enough to allow belt to pass between drive pulley and idler support (Fig. 54).
4. Raise wheel off ground enough to allow belt removal.
5. Install belt guard, not shown for clarity.




m–1722

**Figure 54**

1. Top capscrew
2. Idler bracket
3. Idler support
4. Bottom capscrew

# Replacing the Traction Belt

1. Raise the front of the machine and hold with jack stands. Remove lower shield.
2. Disconnect clutch wire connector from wire harness.
3. Remove PTO drive belt. Refer to Replacing the PTO Drive Belt on page 36.
4. Remove clutch retainer from the engine deck (Fig. 55).
5. Unhook tension spring from side of frame (Fig. 55).
6. Loosen pivot bolt enough to remove traction belt from the drive pulley and clutch.
7. Install new belt around clutch and drive pulley.
8. Torque pivot bolt to 35-40 ft. lb. (47-54 N.m). Install tension spring between idler arm and frame bracket (Fig. 55).
9. Install clutch retainer to the engine deck (Fig. 55).
10. Connect clutch wire connector to wire harness.

**11.** Install PTO drive belt. Install lower shield.

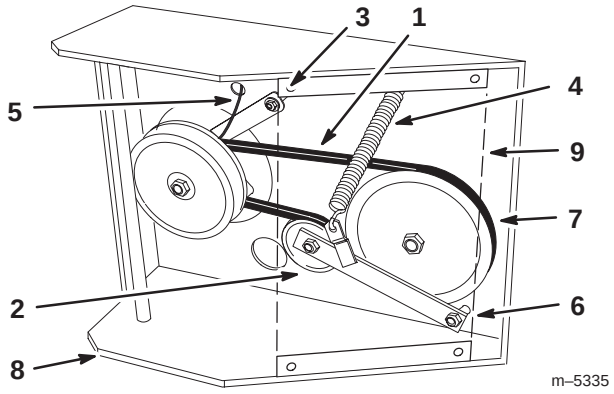



**Figure 55**

1. Traction belt
2. Idler pulley
3. Clutch retainer
4. Tension spring
5. Clutch wire connector
6. Pivot bolt
7. Drive pulley
8. Engine deck
9. Lower shield

# Replacing the Deck Belt

Squealing when the belt is rotating, blades slipping when cutting grass, frayed belt edges, burn marks and cracks are signs of a worn deck belt. Replace the deck belt if any of these conditions are evident.

**1.** Stop the engine, remove the key and disconnect the spark plug wire(s) from the spark plug(s).

**2.** Remove the knobs holding the carrier frame cover and remove the carrier frame cover.

**3.** Remove the knobs holding the belt covers to the cutting unit and remove the belt covers.

**4.** Remove the PTO drive belt. Refer to Replacing the PTO Drive Belt on page 36.

**5.** Disconnect the idler arm spring to relieve tension on the idler arm and idler pulley, then remove the worn deck belt (Fig. 56).

**6.** Install the new deck belt around the outward spindle pulley, the idler pulley, and in the lower groove of the double spindle pulley (Fig. 56).

**7.** Reconnect the idler arm spring (Fig. 56).

**8.** Adjust deck belt guide an 1/8 in. from belt (Fig. 56).

**9.** Install the PTO drive belt. Refer to Replacing the PTO Drive Belt on page 36.

**10.** Reinstall the deck cover onto the cutting unit, then reinstall and tighten the knobs.

**11.** Install the carrier frame cover onto the cutting unit, then install and tighten the hand knobs.

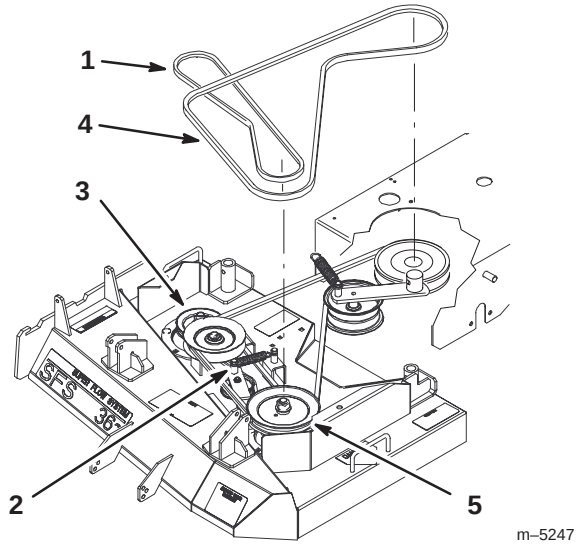



**Figure 56**

1. Deck belt
2. Idler arm spring
3. Outward pulley
4. PTO Drive Belt
5. Double Spindle Pulley

# Replacing the PTO Drive Belt

Squealing when the belt is rotating, blades slipping when cutting grass, frayed belt edges, burn marks and cracks are signs of a worn drive belt. Replace the drive belt if any of these conditions are evident.

**1.** Stop the engine, remove the key and disconnect the spark plug wire(s) from the spark plug(s).

**2.** Remove the knobs holding the carrier frame cover and remove the carrier frame cover.

**3.** Remove the knobs holding the belt covers to the top of the cutting unit and remove the belt covers.

**4.** Remove the heat shield from the the engine deck and carrier frame.

**5.** Remove the idler spring from idler arm. Remove the drive belt from the PTO engagement pulley and the center spindle pulley (Fig. 57).

**6.** Remove the worn drive belt (Fig. 57).

**7.** Install the new drive belt onto the PTO engagement pulley and the top groove of the center spindle pulley (Fig. 57).

**8.** Install belt onto idler pulley and then install idler spring (Fig. 57).

**9.** Adjust PTO drive belt guides an 1/8 in. (3mm) from belt (Fig. 57).

**10.** install the heat shield to the the engine deck and carrier frame.

**11.** Reinstall the belt covers onto the cutting unit, then reinstall and tighten the knobs.

**12.** Reinstall the carrier frame cover onto the cutting unit, then reinstall and tighten the hand knobs.

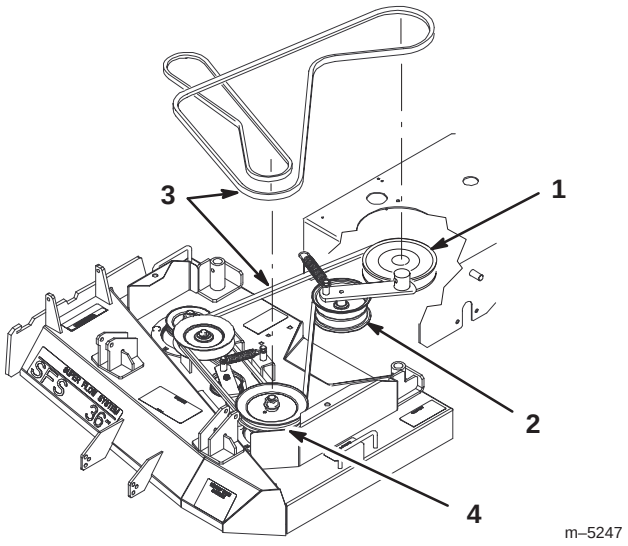



**Figure 57**

1. PTO engagement pulley
2. Drive belt idler
3. Drive Belt
4. Double Spindle Pulley

## Replacing the Castor Wheel Fork Bushings

The castor wheel forks are mounted in bushings pressed into the top and bottom of the carrier frame mounting tubes. To check the bushings, move the castor forks back and forth and side-to-side. If a castor fork is loose, the bushings are worn and must be replaced.

**1.** Raise the cutting unit so the castor wheels are off the floor, then block up the front of the mower with jack stands.

**2.** Remove the locking pin and spacer(s) from the top of the castor wheel fork (Fig. 58).

**3.** Pull the castor wheel fork out of the mounting tube, leaving the spacer(s) on the bottom of the fork. Remember the location of the spacers on each fork to ensure correct installation, and to maintain a level deck.

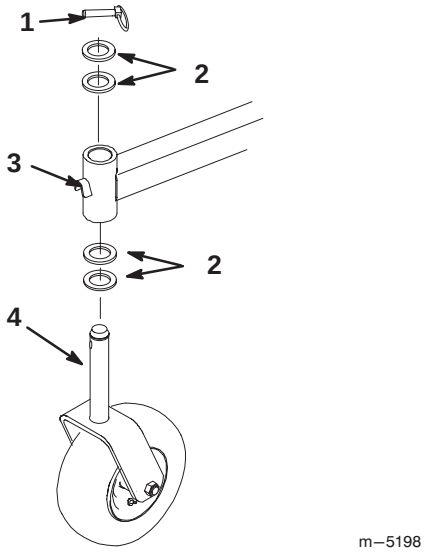



**Figure 58**

1. Locking Pin
2. Spacers (locate as required)
3. Carrier frame mounting tube
4. Caster wheel fork

**4.** Insert a pin punch into the mounting tube and carefully drive out the bushings (Fig. 59). Clean the inside of the mounting tube.

**5.** Grease the inside and outside of the new bushings. Use a hammer and flat plate to carefully drive the bushings into the mounting tube.

**6.** Inspect the caster wheel fork for wear and replace if necessary (Fig. 58).

**7.** Slide the caster wheel fork through the bushings in the mounting tube. Replace the spacer(s) onto the fork and secure with the retaining ring (Fig 58).

**Important** The inside diameter of the bushings may collapse slightly when installed. If the caster wheel fork does not slide into the new bushings, ream both bushings to an inside diameter of 1.126 in. (28.6mm).

**8.** Grease the fitting on the carrier frame mounting tube using No. 2 general purpose lithium base or molybdenum base grease.

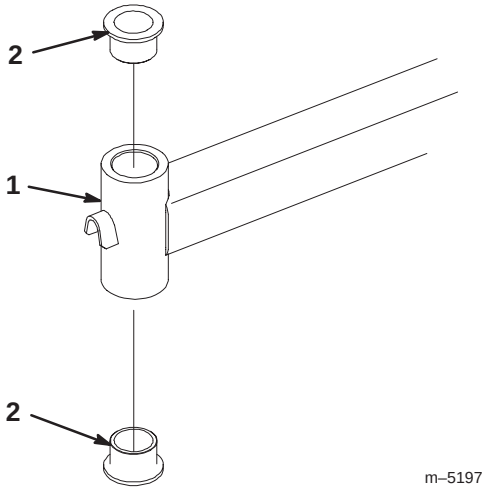



**Figure 59**

1. Carrier Frame Mounting Tube
2. Bushing

## Caster Wheel and Bearings Service

The caster wheels rotate on a roller bearing supported by a spanner bushing. If the bearing is kept well lubricated, wear will be minimal. Failure to keep the bearing well lubricated will cause rapid wear. A wobbly caster wheel usually indicates a worn bearing.

**1.** Remove the locknut and wheel bolt holding the caster wheel to the caster fork (Fig. 60).

**2.** Remove one bushing, then pull the spanner bushing and roller bearing out of the wheel hub (Fig. 60).

**3.** Remove the other bushing from the wheel hub and clean any grease and dirt from the wheel hub (Fig. 60).

**4.** Inspect the roller bearing, bushings, spanner bushing and inside of the wheel hub for wear. Replace any defective or worn parts (Fig. 60).

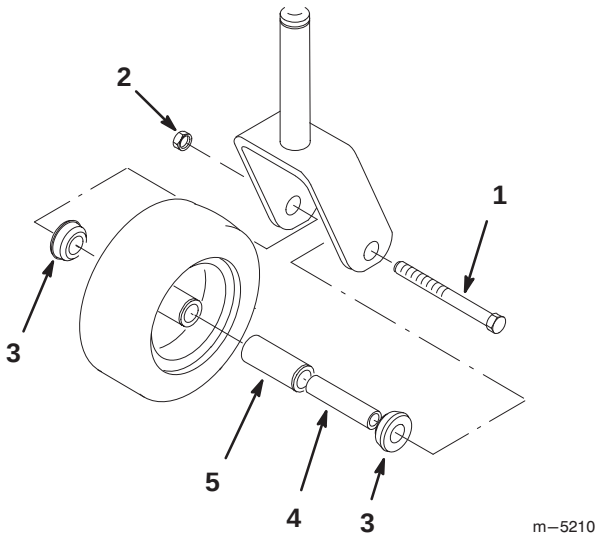



**Figure 60**

1. Locknut
2. Wheel Bolt
3. Bushing
4. Spanner Bushing
5. Roller Bearing

**5.** To assemble, place one bushing into the wheel hub. Grease the roller bearing and spanner bushing and slide them into the wheel hub. Place the second bushing into the wheel hub (Fig. 60).

**6.** Install the caster wheel into the caster fork and secure with the wheel bolt and locknut. Tighten the locknut until the spanner bushing bottoms against the inside of the caster forks (Fig. 60).

**7.** Grease the fitting on the caster wheel.

## Replacing the Grass Deflector

**Warning**

**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.**

**1.** Remove the locknut, bolt, spring and spacer holding the deflector to the pivot brackets (Fig. 61). Remove damaged or worn grass deflector.

**2.** Place spacer and spring onto grass deflector. Place the "L" end of spring behind deck edge.

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

**3.** Install bolt and nut. Place "J" hook end of spring around grass deflector (Fig. 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.

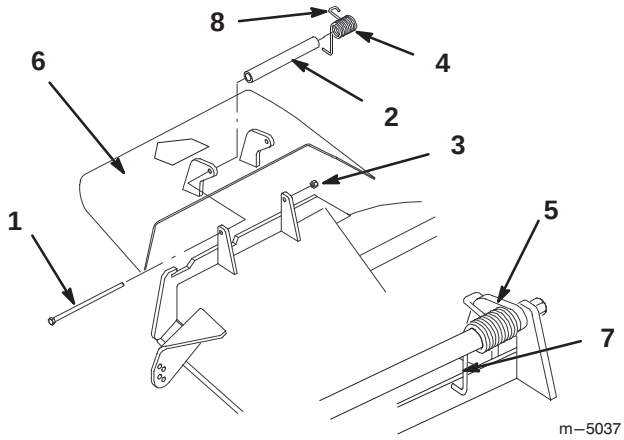
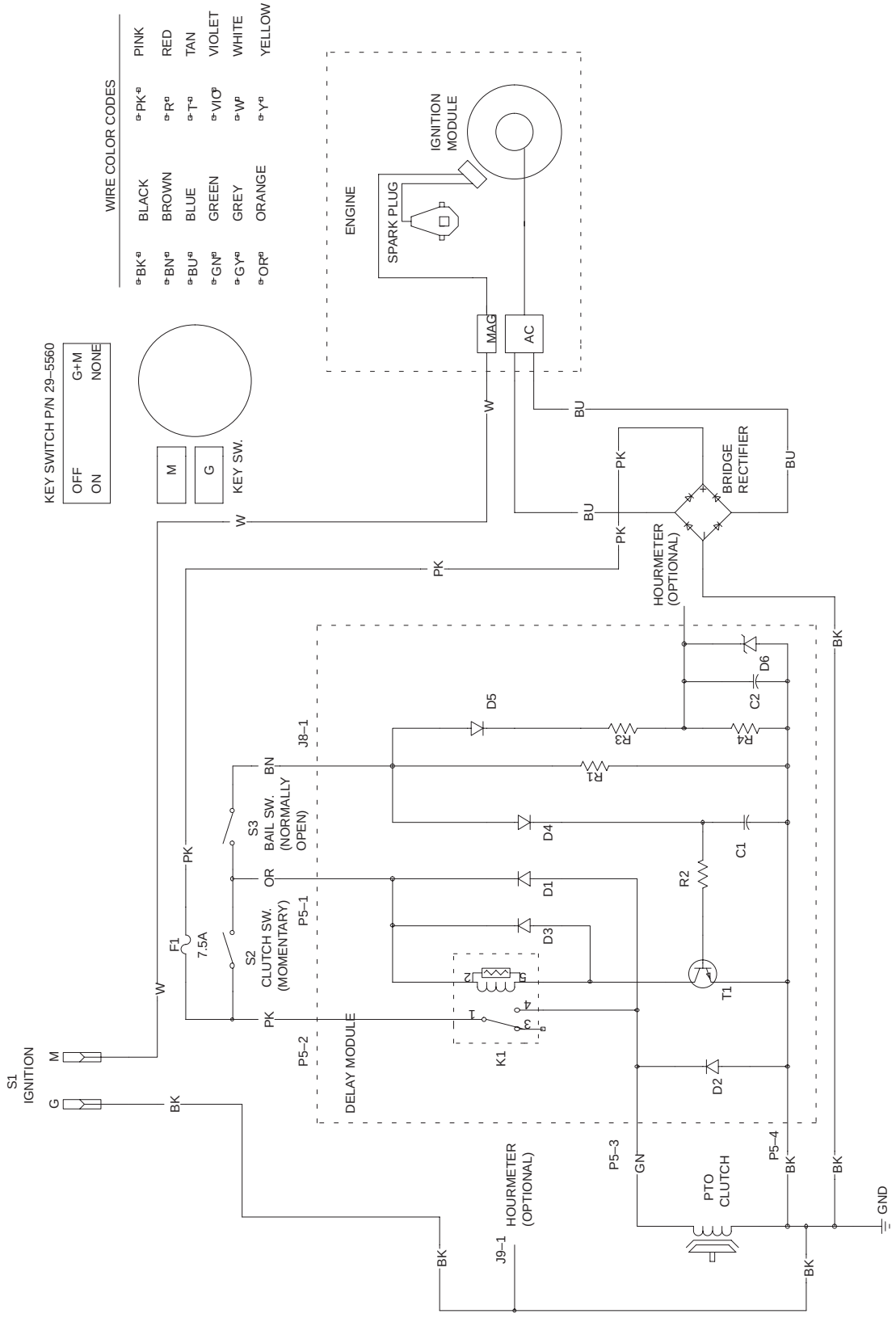



**Figure 61**

1. Bolt
2. Spacer
3. Locknut
4. Spring
5. Spring installed
6. Grass Deflector
7. "L" end of spring, place behind deck edge before installing bolt
8. "J" hook end of spring

# Wiring Diagram



## Cleaning and Storage

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Remove grass clippings, dirt, and grime from the external parts of the entire machine, especially the engine. Clean dirt and chaff from the outside of the engine's cylinder head fins and blower housing.

**Important** You can wash the machine with mild detergent and water. Do not pressure wash the machine. Avoid excessive use of water, especially near the control panel, and engine.

3. Check the brake; refer to Brake Service, page 27.
4. Service the air cleaner; refer to Air Cleaner Service, page 23.
5. Grease the machine; refer to Greasing and Lubrication, page 26.
6. Change the crankcase oil; refer to Engine Oil Service, page 24.
7. Check the tire pressure; refer to Tire Pressure, page 27.
8. For long-term storage (more than 90 days) add stabilizer/conditioner additive to fuel in the tank (1 oz. per gallon or 7.82 ml to one liter).
   A. Run engine to distribute conditioned fuel through the fuel system (5 minutes).
   B. Stop engine, allow to cool and drain the fuel tank; refer to Fuel Tank, page 29, or operate engine until it stops.
   C. Restart engine and run until it stops. Repeat, on "CHOKE" until engine will not restart.
   D. Dispose of fuel properly. Recycle as per local codes.

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

9. Remove the spark plug(s) and check its condition; refer to Spark Plug Service, page 25. With the spark plug(s) removed from the engine, pour two tablespoons of engine oil into the spark plug hole. Now use the starter to crank the engine and distribute the oil inside the cylinder. Install the spark plug(s). Do not install the wire on the spark plug(s).
10. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged or defective.
11. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
12. Store the machine in a clean, dry garage or storage area. Remove the key from the ignition switch and keep it in a memorable place. Cover the machine to protect it and keep it clean.

# Troubleshooting

| PROBLEM | POSSIBLE CAUSES | CORRECTIVE ACTION |
|---|---|---|
| Engine will not start, starts hard, or fails to keep running. | 1. Fuel tank is empty. | 1. Fill fuel tank with gasoline. |
| | 2. Choke is not ON. | 2. Move throttle lever to choke position. |
| | 3. Air cleaner is dirty. | 3. Clean or replace air cleaner element. |
| | 4. Spark plug wire is loose or disconnected. | 4. Install wire on spark plug. |
| | 5. Spark plug is pitted, fouled, or gap is incorrect. | 5. Install new, correctly gapped spark plug. |
| | 6. Dirt in fuel filter. | 6. Replace fuel filter. |
| | 7. Dirt, water, or stale fuel is in fuel system. | 7. Contact Authorized Service Dealer. |

| PROBLEM | POSSIBLE CAUSES | CORRECTIVE ACTION |
|---|---|---|
| Engine loses power. | 1. Engine load is excessive.<br>2. Air cleaner is dirty.<br>3. Oil level in crankcase is low.<br>4. Cooling fins and air passages under engine blower housing are plugged.<br>5. Spark plug is pitted, fouled, or gap is incorrect.<br>6. Vent hole in fuel cap is plugged.<br>7. Dirt in fuel filter.<br>8. Dirt, water, or stale fuel is in fuel system. | 1. Reduce ground speed.<br>2. Clean air cleaner element.<br>3. Add oil to crankcase.<br>4. Remove obstruction from cooling fins and air passages.<br>5. Install new, correctly gapped spark plug.<br>6. Clean or replace the fuel cap.<br>7. Replace fuel filter.<br>8. Contact Authorized Service Dealer. |
| Engine overheats. | 1. Engine load is excessive.<br>2. Oil level in crankcase is low.<br>3. Cooling fins and air passages under engine blower housing are plugged. | 1. Reduce ground speed.<br>2. Add oil to crankcase.<br>3. Remove obstruction from cooling fins and air passages. |
| Machine does not drive. | 1. Shift lever is in NEUTRAL.<br>2. Traction belt is worn, loose or broken.<br>3. Traction belt is off pulley. | 1. Move shift lever to a drive gear position.<br>2. Change Belt.<br>3. Change Belt. |
| Abnormal vibration. | 1. Cutting blade(s) is/are bent or unbalanced.<br>2. Blade mounting bolt is loose.<br>3. Engine mounting bolts are loose.<br>4. Loose engine pulley, idler pulley, or blade pulley.<br>5. Engine pulley is damaged.<br>6. Blade spindle bent. | 1. Install new cutting blade(s).<br>2. Tighten blade mounting bolt.<br>3. Tighten engine mounting bolts.<br>4. Tighten the appropriate pulley.<br>5. Contact Authorized Service Dealer.<br>6. Contact Authorized Service Dealer. |

| PROBLEM | POSSIBLE CAUSES | CORRECTIVE ACTION |
|---|---|---|
| Uneven cutting height. | 1. Blade(s) not sharp. | 1. Sharpen blade(s). |
| | 2. Cutting blade(s) is/are bent. | 2. Install new cutting blade(s). |
| | 3. Mower is not level. | 3. Level mower from side-to-side and front-to-rear. |
| | 4. Underside of mower is dirty. | 4. Clean the underside of the mower. |
| | 5. Tire pressure is incorrect. | 5. Adjust tire pressure. |
| | 6. Blade spindle bent. | 6. Contact Authorized Service Dealer. |
| Blades do not rotate. | 1. PTO Drive belt is worn, loose or broken. | 1. Install new drive belt. |
| | 2. PTO Drive belt is off pulley. | 2. Install drive belt and check adjusting shafts and belt guides for correct position. |
| | 3. Deck belt is worn, loose or broken. | 3. Install new deck belt. |
| | 4. Deck belt is off pulley. | 4. Install deck pulley and check the idler pulley, idler arm and spring for correct position and function. |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