



Mid-Size Mower
ProLine T-Bar Gear 13HP with 32in Side
Discharge Mower

Model No. 30316—Serial No. 250000001 and Up

Operator's Manual



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 this 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.

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

The enclosed Engine Owner's Manual is supplied for information regarding The U.S. Environmental Protection Agency (EPA) and the California Emission Control Regulation of emission systems, maintenance and warranty.

Keep this engine Owner's Manual with your unit. Should this engine Owner's Manual become damaged or illegible, replace immediately. Replacements may be ordered through the engine manufacturer.

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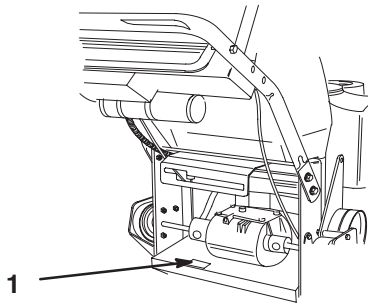
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Introduction

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

Whenever you need service, genuine Toro parts, or additional information, contact an Authorized Service Dealer or Toro Customer Service and have the model and serial numbers of your product ready. Figure NO TAG illustrates the location of the model and serial numbers on the product.



m-5191

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

This machine meets or exceeds the B71.4–2004 specifications of the American National Standards Institute in effect at the time of production.

Note: The addition of attachments made by other manufacturers that do not meet American National Standards Institute certification will cause noncompliance of this machine.

Improper use or maintenance by the operator or owner can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety alert  symbol, which means CAUTION, WARNING, or DANGER—“personal safety instruction.” Failure to comply with the instruction may result in personal injury or death.

Safe Operating Practices

The following instructions are from ANSI standard B71.4—2004.

Training

- Read the Operator’s Manual and other training material. If the operator(s) or mechanic(s) can not read English it is the owner’s responsibility to explain this material to them.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- All operators and mechanics should be trained. The owner is responsible for training the users.
- Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
- The owner/user can prevent and is responsible for accidents or injuries occurring to himself or herself, other people or property.

Preparation

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by the manufacturer.
- Wear appropriate clothing including hard hat, safety glasses and hearing protection. Long hair, loose clothing or jewelry may get tangled in moving parts.
- Inspect the area where the equipment is to be used and remove all objects such as rocks, toys and wire which can be thrown by the machine.

- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
 - Use only an approved container
 - Never remove gas cap or add fuel with engine running. Allow engine to cool before refueling. Do not smoke.
 - Never refuel or drain the machine indoors.
- Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.
- Look behind and down before backing up to be sure of a clear path.
- Keep pets and bystanders away.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop blades if not mowing.
- Be aware of the mower discharge direction and do not point it at anyone.
- Do not operate the mower under the influence of alcohol or drugs.
- Use care when loading or unloading the machine into or from a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

Operation

- Never run an engine in an enclosed area.
- Only operate in good light, keeping away from holes and hidden hazards.
- Be sure all drives are in neutral and parking brake is engaged before starting engine. Only start engine from the operator's position.
- Be sure of your footing while using this machine, especially when backing up. Walk, don't run. Never operate on wet grass. Reduced footing could cause slipping.
- Slow down and use extra care on hillsides. Be sure to travel side to side on hillsides. Turf conditions can affect the machine's stability. Use caution while operating near drop-offs.
- Slow down and use caution when making turns and when changing directions on slopes.
- Never raise deck with the blades running.
- Never operate with the PTO shield, or other guards not securely in place. Be sure all interlocks are attached, adjusted properly, and functioning properly.
- Never operate with the discharge deflector raised, removed or altered, unless using a grass catcher.
- Do not change the engine governor setting or overspeed the engine.
- Stop on level ground, disengage drives, engage parking brake (if provided), shut off engine before leaving the operator's position for any reason including emptying the catchers or unclogging the chute.
- Stop equipment and inspect blades after striking objects or if an abnormal vibration occurs. Make necessary repairs before resuming operations.
- Keep hands and feet away from the cutting unit.

Maintenance and storage

- Disengage drives, set parking brake, stop engine and remove key or disconnect spark plug wire. Wait for all movement to stop before adjusting, cleaning or repairing.
- Clean grass and debris from cutting unit, drives, mufflers, and engine to help prevent fires. Clean up oil or fuel spillage.
- Let engine cool before storing and do not store near flame.
- Shut off fuel while storing or transporting. Do not store fuel near flames or drain indoors.
- Park machine on level ground. Set parking brake. Never allow untrained personnel to service machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Remove spark plug wire before making any repairs.
- Use care when checking blades. Wrap the blade(s) or wear gloves, and use caution when servicing them. Only replace blades. Never straighten or weld them.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Keep all parts in good working condition and all hardware tightened. Replace all worn or damaged decals.

Toro Mower Safety

The following list contains safety information specific to Toro products and other safety information you must know.

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.

General Operation

- Allow only responsible adults who are familiar with the instructions to operate the machine.
- Be sure the area is clear of other people before mowing. Stop the machine if anyone enters the area.
- Do not mow in reverse unless absolutely necessary. Always look down and behind before and while backing.
- Be aware of the mower discharge direction and do not point it at anyone. Do not operate the mower without either the entire grass catcher or the guard in place.
- Slow down before turning. Sharp turns on any terrain may cause loss of control.
- Turn off blades when not mowing.
- Keep hands, feet, hair and loose clothing away from attachment discharge area, underside of mower and any moving parts while engine is running.
- Stop the engine before removing the grass catcher or unclogging the chute.
- Mow only in daylight or good artificial light.
- Watch for traffic when operating near or crossing roadways.
- Do not touch equipment or attachment parts which may be hot from operation. Allow to cool before attempting to maintain, adjust or service.
- Use only Toro-approved attachments. Warranty may be voided if used with unapproved attachments.

Slope Operation

Slopes and ramps are a major factor related to loss-of-control and accidents, which can result in severe injury or death. All slopes and ramps require extra caution. If you feel uneasy on a slope, do not mow it.

DO

- Remove obstacles such as rocks, tree limbs, etc. from the mowing area.
- Watch for holes, ruts or bumps. Tall grass can hide obstacles.
- Use slow speed so that you will not have to stop while on the slope.
- Use extra care with grass catchers or other attachments. These can change the stability of the machine.
- Keep all movement on slopes slow and gradual. Do not make sudden changes in speed or direction.
- Avoid starting or stopping on a slope. If tires lose traction, disengage the blades.
- Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.
- Mow slopes side to side.

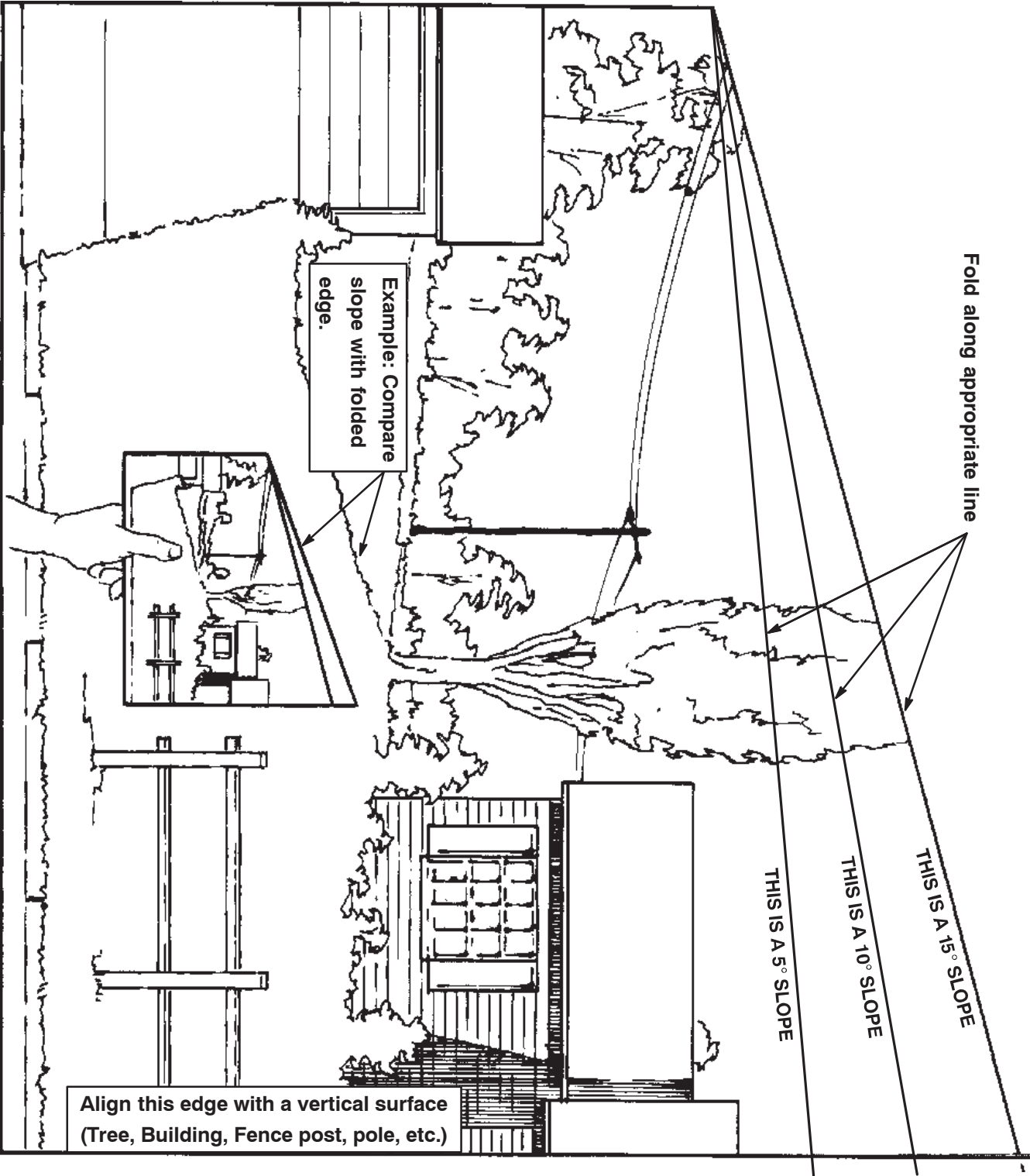
DO NOT

- Do not mow slopes greater than 15 degrees.
- Avoid turning on slopes. If you must turn, turn slowly and gradually downhill, if possible.
- Do not mow near drop-offs, ditches, or embankments. The machine could suddenly turn over if a wheel goes over the edge of a cliff or ditch, or if an edge caves in.
- Do not mow on wet grass. Reduced traction could cause sliding.
- Do not use a grass catcher on steep slopes. Heavy grass bags could cause loss of control of the machine.
- Do not mow up and down slopes.

Service

- Never store the machine or fuel container inside where there is an open flame, such as near a water heater or furnace.
- Keep nuts and bolts tight, especially the blade attachment bolts. Keep equipment in good condition.
- Never tamper with safety devices. Check safety systems for proper operation before each use.
- Use only genuine replacement parts to ensure that original standards are maintained.
- Check brake operation frequently. Adjust and service as required.

Slope Chart



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.



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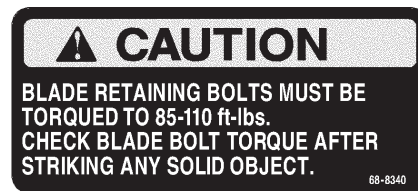
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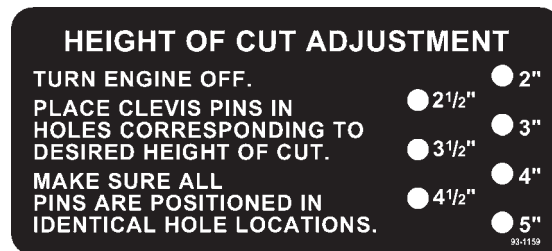
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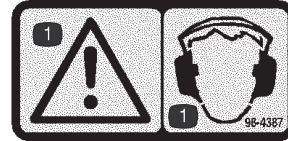
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98-3256



98-0776



98-4387

1. Warning—wear hearing protection.



105-0884



106-5499

1. Engine—stop
2. Engine—start
3. Move the control bar to the handle, then pull the knob.

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 Do not use methanol, gasoline containing methanol, or gasohol containing more than 10% ethanol because the fuel system could be damaged. Do not mix oil with the 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.
- 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.
- 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.

Stabilizer/Conditioner

Use a fuel stabilizer/conditioner in the machine to provide the following benefits:

- Keeps gasoline fresh during storage of 90 days or less. For longer storage, drain the fuel tank.
- Cleans the engine while it runs
- Eliminates gum-like varnish buildup in the fuel system, which causes hard starting

Important Do not use fuel additives containing methanol or ethanol.

Add the correct amount of gas stabilizer/conditioner to the gas.

Note: A fuel stabilizer/conditioner is most effective when mixed with fresh gasoline. To minimize the chance of varnish deposits in the fuel system, use fuel stabilizer at all times.

Filling the Fuel Tank

1. Shut the engine off.
2. Clean around the fuel tank cap and remove the cap.
3. Add unleaded regular 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.

Note: This space in the tank allows gasoline to expand. Do not fill the fuel tank completely full.

4. Install the fuel tank cap 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, page 25.

Setup

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.

Step	Description	Qty.	Use
1	Handle assembly	1	Installing the handle assembly
	Flanged bolt 3/8 x 1 inch	4	
	Flange nut 3/8 inch	4	
2	Fuel tank with studs installed	1	Installing shift lever plate and fuel tank
	Shift lever plate	1	
	Bolt, 5/16 x 7/8 inch	2	
	Lock washer, 5/16 inch	2	
	Washer, 5/16 inch	4	
	Spring	2	
Hose clamp	1		
3	No parts needed		Adjusting the shift lever plate
4	Clevis pin	2	Installing the control rods
	Washer	2	
	Hairpin cotter pin	2	
5	Oil drain hose	1	Use for draining engine oil
6	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

Step 1

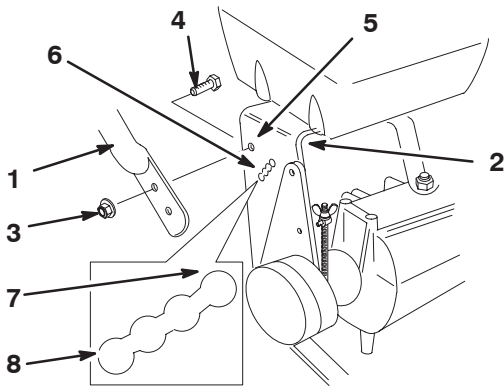
Parts needed for this step:

- 1 Handle assembly
- 4 Flange bolts, 3/8 x 1 inch
- 4 Flange nuts, 3/8 inch

Installing the Handle Assembly

1. Align handle with upper mounting holes in rear frame (Fig. 2).
2. Secure the handle at each upper mounting hole with a flange bolt (3/8 x 1 inch) and flange nut (Fig. 2).
3. Select the low position for the lower mounting hole (Fig. 2).
4. Secure the handle at each lower mounting hole with a flange bolt (3/8 x 1 inch) and flange nut (Fig. 2).

Note: The handle position can be adjusted to match the operator's height preference.



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Figure 2

- | | |
|------------------------------|-------------------------|
| 1. Upper handle | 5. Upper mounting hole |
| 2. Rear frame | 6. Lower mounting holes |
| 3. Flange nut, 3/8 inch | 7. Low position |
| 4. Flange bolt, 3/8 x 1 inch | 8. High position |

Note: Handle assembly must be installed before fuel tank is installed.

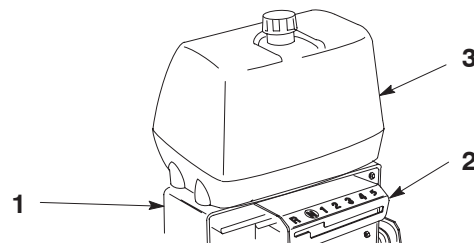
Step 2

Parts needed for this step:

- 1 Fuel tank with studs installed
- 1 Shift lever plate
- 2 Bolts, 5/16 x 7/8 inch
- 2 Lock washers, 5/16 inch
- 2 Flat washers, 5/16 inch
- 2 Springs
- 1 Hose clamp

Installing the Shift Lever Plate and Fuel Tank

1. Remove the bolts and nuts holding the shift lever plate to the rear frame. Discard these nuts and bolts.
2. Slide the shift lever plate over the shift lever and under the bottom of the rear frame (Fig. 3).



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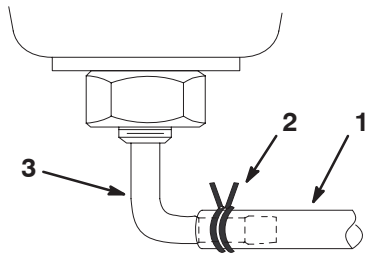
Figure 3

- | | |
|----------------------|--------------|
| 1. Rear frame | 3. Fuel tank |
| 2. Shift lever plate | |

3. Align fuel tank with the top of the rear frame (Fig. 3).
4. Push the fuel line onto the fuel tank connection and secure it with the hose clamp that is on the fuel line (Fig. 5).

Note: To ease assembly of fuel line to fuel tank connection, apply a light lubricant, such as WD 40, to end of fuel line.

Note: Make sure the fuel line and clamp are on as shown in Figure 4.



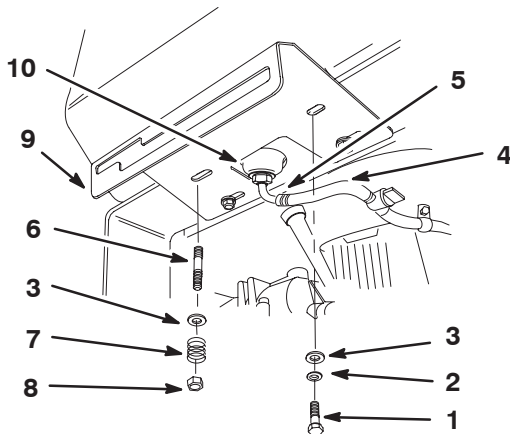
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Figure 4

- | | |
|--------------|-------------------------|
| 1. Fuel line | 3. Fuel tank connection |
| 2. Clamp | |

- Secure the right side of shift lever plate and fuel tank to the rear frame (Fig. 5) with 2 bolts (5/16 x 7/8 inch), lock washers (5/16 inch) and washers (5/16 inch) (Fig. 5).
- Secure the left side shift lever plate and fuel tank to the rear frame (Fig. 5) with washers (5/16 inch), springs and locknuts (5/16 inch) (Fig. 5).

Note: Tighten left side of shift lever plate until it is completely tight and then unscrew locknut one full turn. This will allow the spring to work.



m-6465

Figure 5

- | | |
|----------------------------|--------------------------|
| 1. Bolt, 5/16 x 7/8 inch | 6. Stud |
| 2. Lock washers, 5/16 inch | 7. Spring |
| 3. Washer, 5/16 inch | 8. Locknut |
| 4. Fuel line | 9. Shift lever plate |
| 5. Hose clamp | 10. Fuel tank connection |

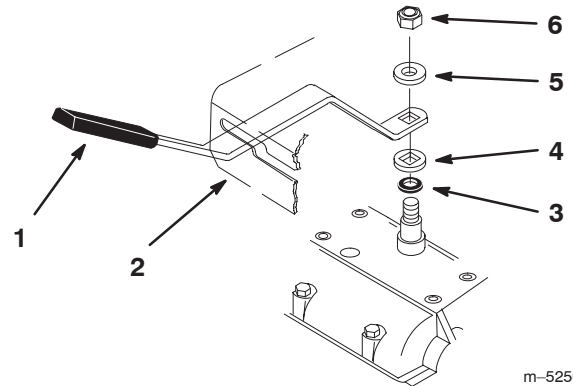
Step

3

No parts needed for this step.

Adjusting the Shift Lever Plate

- Shift lever to second gear and check alignment of lever in slot of shifter lever plate. The clearance between top and bottom of the shift lever should be equal (Fig. 7).
- If clearance is not correct, remove lever and bend it slightly to adjust (Fig. 6).



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Figure 6

- | | |
|-----------------------|-----------------------|
| 1. Shift lever | 4. Square hole washer |
| 2. Shift lever plate | 5. Spring washer |
| 3. Rubber seal washer | 6. Locknut, 3/8 inch |

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

- Shift lever to neutral and check alignment of lever in slot of shifter lever plate. The clearance on the sides of shift lever should be equal (Fig. 7).
- If clearance is not correct, loosen shift lever plate and adjust it side-to-side. Tighten the shift lever plate.

Note: Tighten the left side of the shift lever plate until it is completely tight and then unscrew the locknut one full turn. This will allow the spring to work.

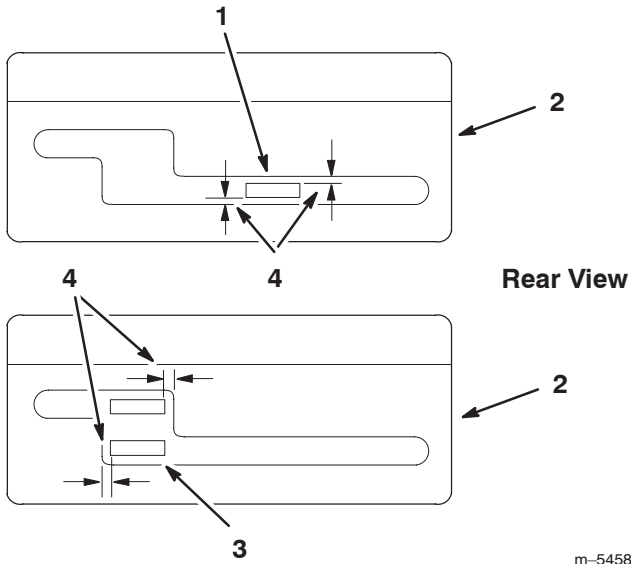


Figure 7

- | | |
|--------------------------|-------------------------|
| 1. Shift lever, 2nd gear | 3. Shift lever, neutral |
| 2. Shift lever plate | 4. Equal distance |

Step

4

Parts needed for this step:

- 2 Clevis pins
- 2 Washers
- 2 Hairpin cotter pins

Installing the Control Rods

1. Make sure the rod fittings are equal distance onto each control rod. The rod fittings should be approximately 3-1/2 inch (89 mm) from the start of the threads (Fig. 8).
2. Slide clevis pins through rod fittings and mounting holes in idler brackets (from outside) (Fig. 8). Secure with washers and hairpin coppers (Fig. 8).

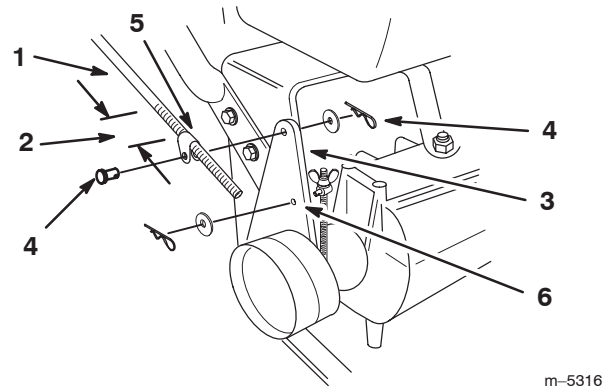


Figure 8

- | | |
|----------------------------|--|
| 1. Control rod and fitting | 4. Clevis pin, washer and hairpin cotter |
| 2. 3-1/2inch (89 mm) | 5. Rod fitting |
| 3. Idler bracket | 6. Hole F |

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 inch (25-32 mm) (Fig. 9).

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, washer and clevis pin securing control rod fitting to idler bracket. Thread fitting up or down on rod until proper position is attained and install into fitting to idler bracket with clevis pin, washer and hairpin cotter.

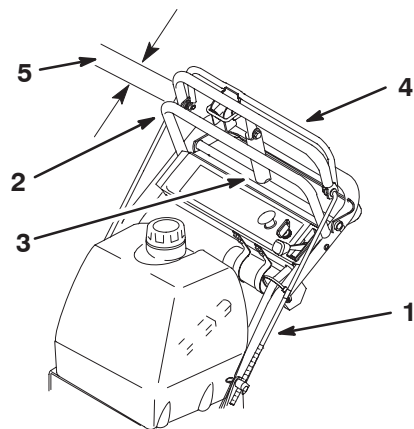


Figure 9

- | | |
|------------------------|----------------------------------|
| 1. Control rod | 5. 1 to 1-1/4 inch (25-32mm) gap |
| 2. Fixed control bar | 6. Fitting |
| 3. Parking brake lever | |
| 4. Upper control bar | |

5. Check the parking brake adjustment (Fig. 10). Refer to Checking the Brakes, page NO TAG.

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

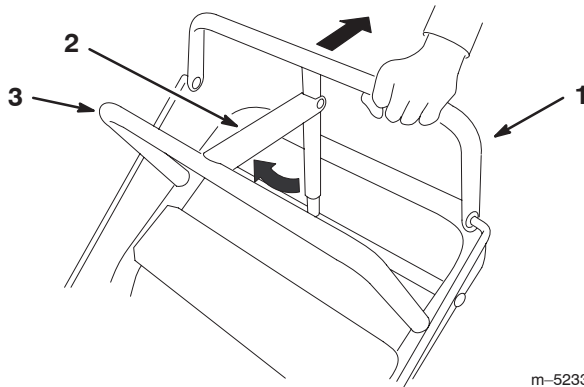


Figure 10

- 1. Upper control bar
- 2. Parking brake lever
- 3. Fixed bar

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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, such as but not limited to, for eyes, hearing, feet and head is recommended.

!
Caution
!

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

Wear hearing protection when operating this machine.



Figure 11

- 1. Warning
- 2. Wear hearing protection

Controls

Become familiar with all the controls (Fig. 12) 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 – Close fuel shut-off valve when transporting or storing mower.

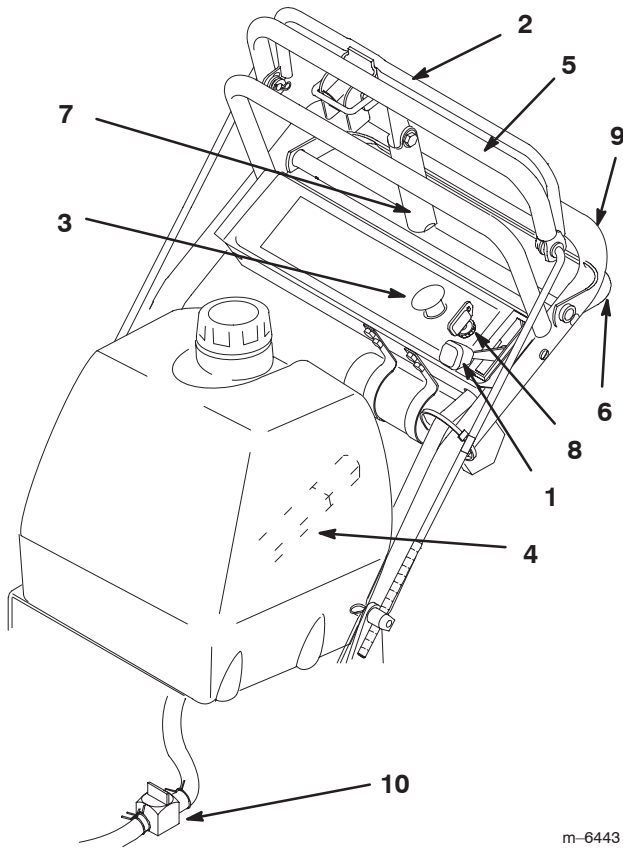


Figure 12

- | | |
|-------------------------------|-------------------------|
| 1. Throttle control | 6. Lower control bar |
| 2. Blade control bail | 7. Parking brake lever |
| 3. Blade control switch (PTO) | 8. Ignition switch |
| 4. Gear shift lever | 9. Handle |
| 5. Upper control bar | 10. Fuel shut-off valve |

Operating the 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. 13) rearward and hold it in this position.
2. Lift the parking brake lock (Fig. 13) 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. 13). Lower the parking brake lock to the released position.
2. Gradually release the upper control bar.

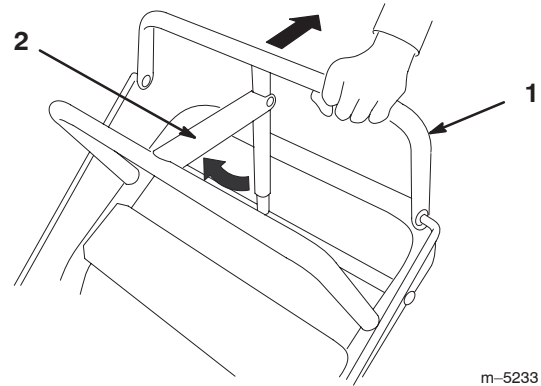


Figure 13

1. Upper control bar
2. Parking brake lever

Starting and Stopping the Engine

Starting the Engine

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 the choke position before starting a cold engine.

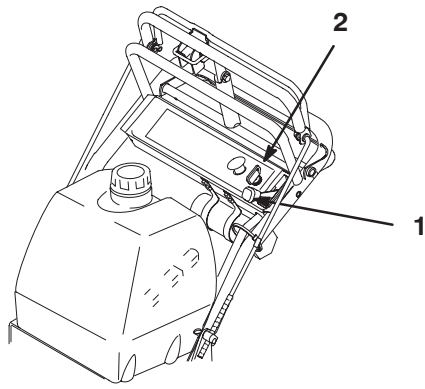
Note: A warm or hot engine usually does not require any choking. To start a warm engine, move throttle control to Fast position.

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 the Engine

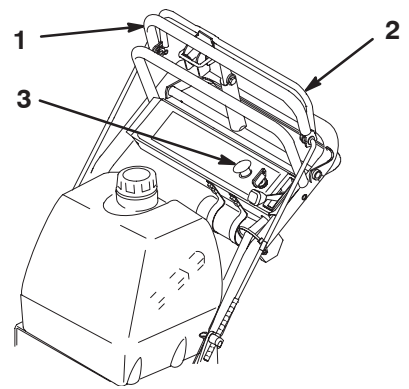
1. Move the throttle lever to slow (Fig. 14).
2. Let engine idle for 30 to 60 seconds before turning the ignition key off.
3. Turn the ignition key to off (Fig. 14).



m-6443

Figure 14

1. Throttle lever
2. Ignition key



m-6443

Figure 15

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

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 the 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. 15).
2. To engage blade, squeeze blade control bail against upper control bar (Fig. 15).
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.

Disengaging the Mower Blades (PTO)

1. Release the blade control bail to disengage blades (Fig. 15).

The Safety Interlock System

Caution
<p>If safety interlock switches are disconnected or damaged the machine could operate unexpectedly causing personal injury.</p> <ul style="list-style-type: none"> 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, 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 16.
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.

Driving 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 16.
3. Slowly press on the upper control bar to move forward (Fig. 16).

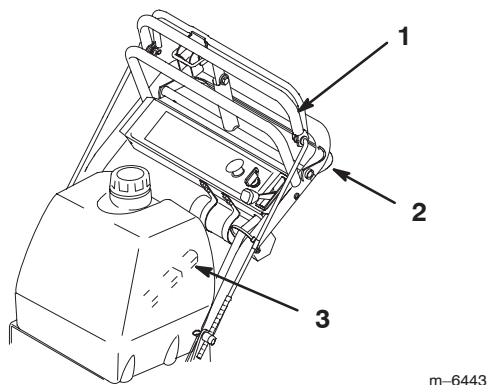


Figure 16

1. Upper control bar
2. Lower control bar

To go straight, apply equal pressure to both ends of the upper control bar (Fig. 16).

To turn, release pressure on the upper control bar side away from the direction you want to turn (Fig. 16).

Driving Backward

1. To go backward, move the shift lever to reverse gear.
2. Release the parking brake: refer to Releasing the Parking Brake, page 16.
3. Slowly squeeze the lower control bar and handle together to move rearward (Fig. 16).

Using the Lower Control Bar Operation

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

Note: Some curbs do not allow the rear drive tires to contact the curb. If this happens, drive the machine up the curb at an angle.

	Warning	
<p>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.</p> <ul style="list-style-type: none"> • Do not run blades while driving up a curb forward or backward. 		

Driving Forward Up a Curb

1. Disengage the mower blades.
2. Select first gear to drive the machine.
3. Drive machine until the castor wheels contact curb (Fig. 17).
4. Lift the front of the machine by pushing down on the handle (Fig. 17).
5. Drive machine until drive wheels contact curb (Fig. 17).
6. Lower the front of the machine (Fig. 17).
7. At the same time engage lower control bar and lift up on handle to drive over the curb (Fig. 16 and 17).

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

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

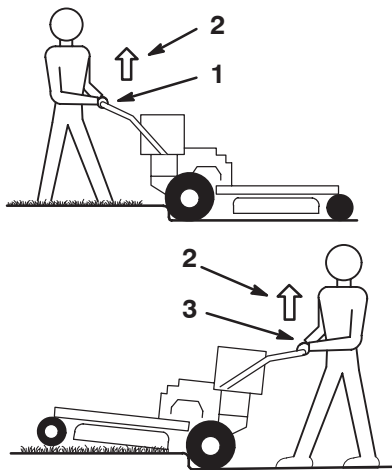


Figure 17

m-4185

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

Driving Backward Up a Curb

1. Disengage the mower blades.
2. Select reverse to drive machine.
3. Drive the 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.

Stopping the Machine

To stop the machine, pull back on the upper control bar, release the blade control bail (PTO), and stop the engine. If you will be leaving the machine unattended, remove the ignition key and set the parking brake; refer to Setting the Parking Brake, page 16.

⚠
Caution
⚠

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

Always remove the ignition and 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 adjustable from 2 to 5 inches (51 to 127 mm). The height-of-cut is adjustable in 1/2-inch (13 mm) increments by removing the hairpin cotters and relocating the support rods in different hole locations in the brackets at each corner of the mower (Fig. 18).

Stop the engine before adjusting the height-of-cut.

Note: Both support rods must be in the same hole location for even cutting.

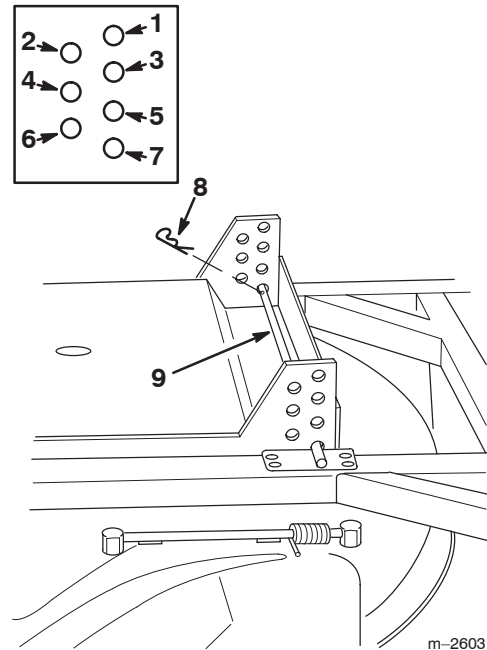


Figure 18

m-2603

- | | |
|---------------------------------------|----------------------------|
| 1. 2 inch (51 mm) height-of-cut (HOC) | 5. 4 inch (102 mm) HOC |
| 2. 2-1/2 inch (64 mm) HOC | 6. 4-1/2 inch (114 mm) HOC |
| 3. 3 inch (76 mm) HOC | 7. 5 inch (127 mm) HOC |
| 4. 3-1/2 inch (89 mm) HOC | 8. Hairpin cotter |
| | 9. Support rod |

Transporting the 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).**

Tips for Mowing Grass

Fast Throttle Setting

For best mowing and maximum air circulation, operate the engine in the Fast throttle position.

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 6 inch (152 mm) 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. 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.

Avoid Cutting Too Low

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.

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 longer than normal, or if it contains a high degree of moisture, raise the cutting height higher than usual and cut the grass at this setting. Then cut the grass again using the lower, normal setting.

When Stopping

If the machine must be stopped while mowing, a clump of grass clippings may drop onto the lawn. To avoid this, move onto a previously cut area with the blade 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 blade daily for sharpness and for any wear or damage. File down any nicks and sharpen the blade as necessary. If a blade is damaged or worn, replace it immediately with a genuine Toro replacement blade.

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	<ul style="list-style-type: none"> • Oil—check level • Safety Interlock System—test • Brake—test • Engine—clean the cooling system • Mower housing—clean
After first 8 hours	<ul style="list-style-type: none"> • Oil—change
8 Hours	<ul style="list-style-type: none"> • Wheel bearings—grease¹ • Cutting blade—check for wear, cracks, or other damage • Blade spindle bearing—grease • Mower housing—clean
25 Hours	<ul style="list-style-type: none"> • Foam air cleaner—service¹
50 Hours	<ul style="list-style-type: none"> • Belts—check for wear or cracks • Tires—check pressure
100 Hours	<ul style="list-style-type: none"> • Oil—change¹ • Paper air cleaner—replace¹ • Electric clutch—adjust • Engine—clean the cooling system
200 Hours	<ul style="list-style-type: none"> • Oil filter—change • Transmission couplings—grease¹ • Spark plug—check • Fuel filter—replace
Storage Service	<ul style="list-style-type: none"> • Perform all procedures listed above • Chipped surfaces—paint

¹More 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 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 before you do any maintenance. Set the wire aside so that it does not accidentally contact the spark plug.

Servicing the Cutting Blade

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

! **Danger** !

A worn or damaged blade can break, and a piece of the blade could be thrown into the operator's or bystander's area, resulting in serious personal injury or death.

- Inspect the blade periodically for wear or damage.
- Replace a worn or damaged blade.

Before Servicing the Blade

Park the machine on a level surface, disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.

Inspecting the Blade

- Inspect the cutting edges (Fig 19).

If the edges are not sharp or have nicks, remove and sharpen the blade; refer to *Sharpening the Blade*, page 23.

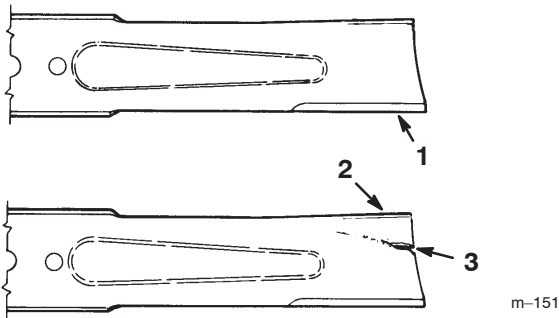


Figure 19

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

- Inspect the blade, especially the curved area (Fig. 19).

If you notice any damage, wear, or a slot forming in this area (item 3 in Fig. 19), immediately install a new blade.

Checking for a Bent Blade

- Rotate the blade until the ends face forward and backward (Fig. 20).
- Measure at the C location (Fig. 20) from a level surface to the cutting edge of the blade (Fig. 21). Note this dimension.

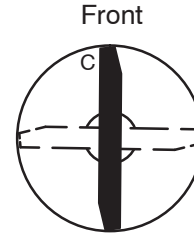
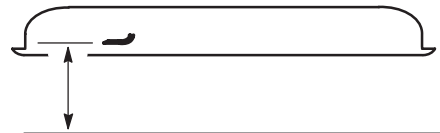


Figure 20

m-2616



m-2617

MEASURE FROM CUTTING EDGE TO A LEVEL SURFACE

Figure 21

- Rotate the opposite end of the blade forward.
- Measure from a level surface to the cutting edge of the blade at the same position as in step 2.
- The difference between the dimensions obtained in steps 1 and 2 must not exceed 1/8 inch (3 mm).

If this dimension exceeds 1/8 inch (3 mm), the blade is bent and you must replace it.

! **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 Blade

Replace the blade if it hits a solid object, it is out of balance, or it 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.
2. Remove the blade bolt, lock washer, anti-scalp cup, blade, and spacer from the spindle shaft (Fig. 22).

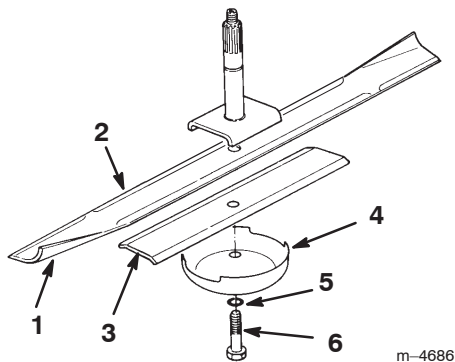


Figure 22

- | | |
|---------------------------|-------------------|
| 1. Sail area of the blade | 4. Anti-scalp cup |
| 2. Blade | 5. Lock washer |
| 3. Spacer | 6. Blade bolt |

Sharpening the Blade

1. Use a file to sharpen the cutting edge at both ends of the blade (Fig. 23).

Note: Maintain the original angle. Remove an equal amount of material from each side of the blade to maintain the blade balance.

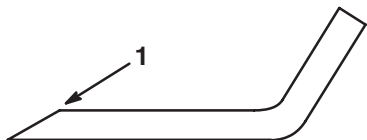


Figure 23

1. Sharpen at original angle

2. Check the balance of the blade by putting it on a blade balancer (Fig. 24).

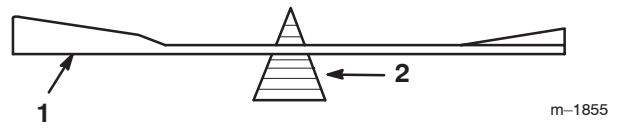


Figure 24

1. Blade
2. Balancer

3. If the blade stays in a horizontal position, it is balanced and can be used.
4. If the blade is not balanced, file some metal off the end of the sail area only (Fig. 22).
5. Repeat this procedure until the blade is balanced.

Installing the Blade

1. Install the spacer and blade onto the spindle shaft (Fig. 22).

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

2. Install the anti-scalp cup, lock washer, and blade bolt (Fig. 22).
3. Torque the blade bolt to 85 to 110 ft-lb (115 to 149 N·m).

Servicing the Air Cleaner

Service Interval/Specification

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

Paper Element: Replace after every 100 operating hours.

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

Note: Service the air cleaner more frequently 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. Remove the key.

2. Clean around the air cleaner to prevent dirt from getting into the engine and causing damage. Unscrew the cover nut and remove the air cleaner cover (Fig. 25).
3. Remove the air cleaner assembly (Fig. 25).
4. Carefully slide the foam element off the paper element (Fig. 25).

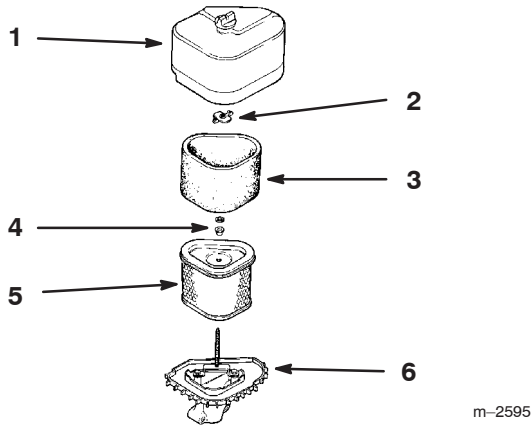


Figure 25

- | | |
|------------------|-----------------------|
| 1. Cover and nut | 4. Washer and grommet |
| 2. Wing nut | 5. Paper element |
| 3. Foam element | 6. Air cleaner base |

Cleaning the Foam Elements

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 of oil on the element (Fig. 26). Squeeze the element to distribute the oil.

Note: Excess oil in the foam element restricts the air flow through the element and may reach the paper filter and clog it.

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

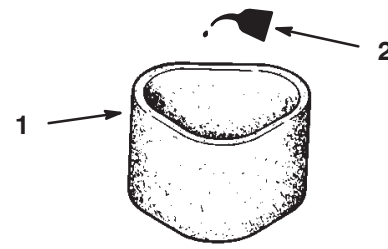


Figure 26

- | | |
|-----------------|--------|
| 1. Foam element | 2. Oil |
|-----------------|--------|

Inspecting the Paper Element

Important Never clean the paper element with pressurized air or liquids, such as solvent, gas, or kerosene.

1. Inspect the element for tears, an oily film, and damage to the rubber seal (Fig. 27).
2. Replace the paper element if it is damaged or excessively dirty.

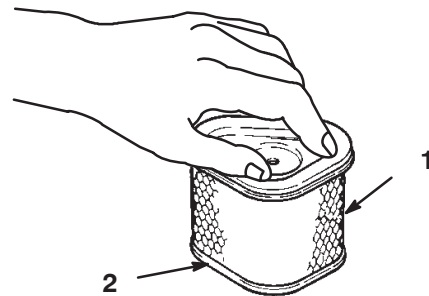


Figure 27

- | | |
|------------------|----------------|
| 1. Paper element | 2. Rubber seal |
|------------------|----------------|

Installing the Foam and Paper Elements

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

1. Installing the Foam and Paper Elements
 1. Carefully slide the foam element onto the paper air cleaner element (Fig. 25).
 2. Place the air cleaner assembly onto the air cleaner base (Fig. 25).

3. Install the air cleaner cover and secure with cover nuts (Fig. 25).

Servicing the Engine Oil

Change oil after the first 8 operating hours and then every 100 operating hours thereafter.

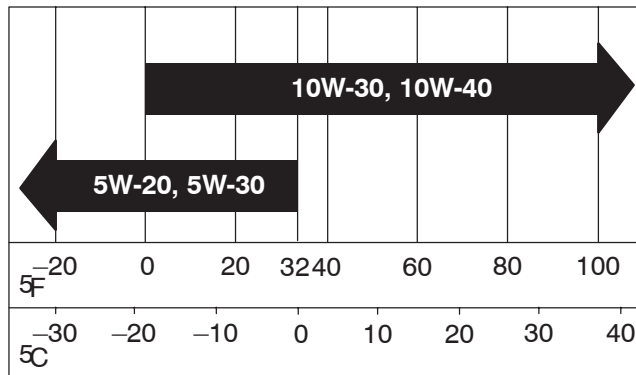
Note: Change oil more frequently when operating conditions are extremely dusty or sandy.

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

Crankcase Capacity: w/filter, 64 oz. (1.9 l)

Viscosity: See table below

Use these SAE viscosity oils:



Checking the Engine Oil Level

1. Park the machine on a level surface, disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
2. Clean around the oil dipstick (Fig. 28) so dirt cannot fall into the filler hole and damage the engine.

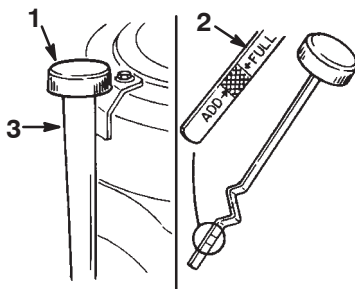


Figure 28

1. Oil dipstick
 2. Metal end
 3. Filler tube
3. Unscrew the oil dipstick and wipe the metal end clean (Fig. 28).

4. Slide the oil dipstick fully into the filler tube; **do not** thread it onto the tube (Fig. 28).
5. Pull the dipstick out and look at the metal end (Fig. 28).
6. If oil level is low, slowly pour only enough oil into the filler tube to raise the level to the Full mark (Fig. 28).

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

Changing the Engine 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 ensure that the oil drains completely.
3. Disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
4. Place a pan below the oil drain (Fig. 29).

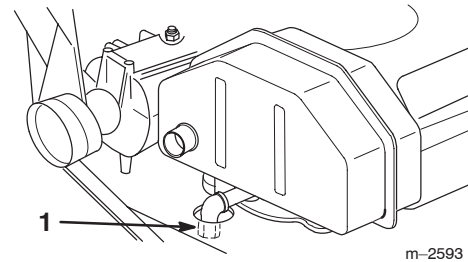


Figure 29

1. Oil drain cap
5. Remove the oil drain cap (Fig. 29).
6. When oil has drained completely, install the oil drain cap.
7. Slowly pour approximately 80% of the specified amount of oil, refer to page 25, into the filler tube (Fig. 28).
8. Check the oil level; refer to Checking Oil Level, page 25.
9. Slowly add additional oil to bring the level to the Full mark on the dipstick (Fig. 28).
10. Dispose of the used oil at a recycling center.

Changing the Oil Filter

Replace the oil filter every 200 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 25.
2. Remove the old filter and wipe the filter adapter gasket surface (Fig. 30).

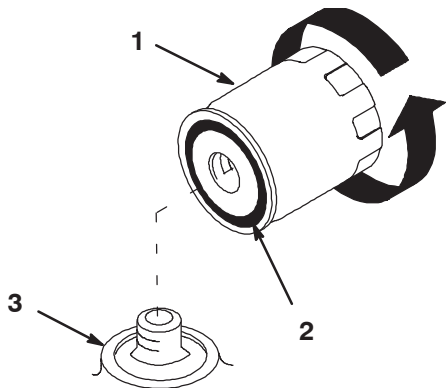


Figure 30

1. Oil filter
2. Gasket
3. Adapter

3. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Fig. 30).
4. Install the replacement oil filter to the filter adapter as follows:
 - A. Turn the oil filter clockwise until the rubber gasket contacts the filter adapter (Fig. 30).
 - B. Tighten the filter an additional 1/2 turn (Fig. 30).
5. Fill the crankcase with the proper type of new oil; refer to Changing the Engine Oil, page 25.

Servicing the Spark Plug

Check the spark plug after every 200 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 plug and a gapping tool/feeler gauge to check and adjust the air gap. Install a new spark plug if necessary.

Type: Champion RC12YC or equivalent
Air Gap: 0.040 inch (1.02 mm)

Removing the Spark Plug

1. Disengage the blade control (PTO), set the parking brake, stop the engine, and remove the key.
2. Pull the wire off of the spark plug (Fig. 31).
3. Clean around the spark plug to prevent dirt from falling into the engine and potentially causing damage.
4. Remove the spark plug and metal washer.

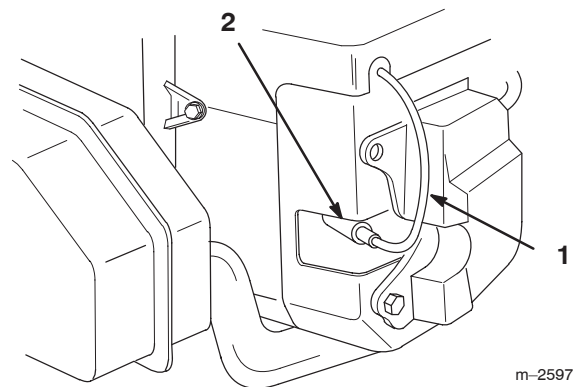


Figure 31

1. Spark plug wire
2. Spark plug

Checking the Spark Plug

1. Look at the center of the spark plug (Fig. 32).
2. 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 Do not clean the spark plug. Always replace the spark plug when it has a black coating, worn electrodes, an oily film, or cracks.

3. Check the gap between the center and side electrodes (Fig. 32).

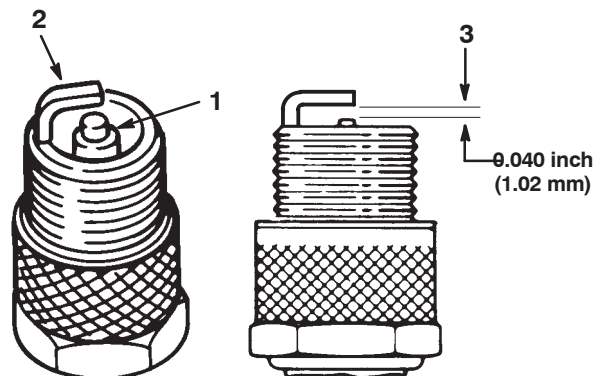


Figure 32

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

4. Bend the side electrode (Fig. 32) if the gap is not correct.

Installing the Spark Plug

1. Install the spark plug and metal washer.
2. Tighten the spark plug to 20 ft-lb (27 N·m).

3. Push the wire onto the spark plug (Fig. 31).

Greasing the Machine

Grease the wheel and spindle bearing fittings every 8 operating hours and the transmission couplers every 200 operating hours. Grease more frequently when operating conditions are extremely dusty or sandy.

Grease Type: General-purpose grease.

Adding Grease to a Fitting

1. Disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
2. Clean the grease fitting with a rag.
3. Scrape any paint off the front of the fitting.
4. Connect a grease gun to the fitting.
5. Pump grease into the fitting until grease begins to ooze out of the bearings.
6. Wipe up any excess grease.

Where to Add Grease

- Grease the wheel bearings and front spindles (Fig. 33).

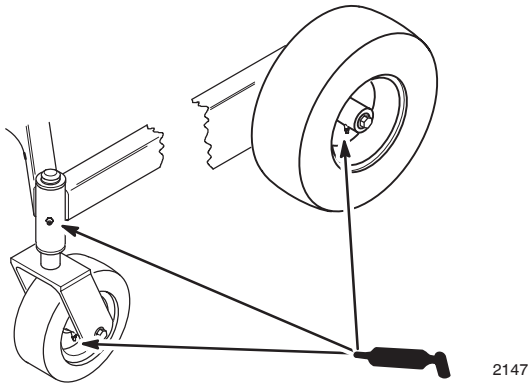


Figure 33

- Grease the fitting on the spindle pulley bearing (Fig. 40).

Note: You can access the spindle grease fitting through the hole in the mower cover.

- Grease the transmission couplers (Fig. 34).

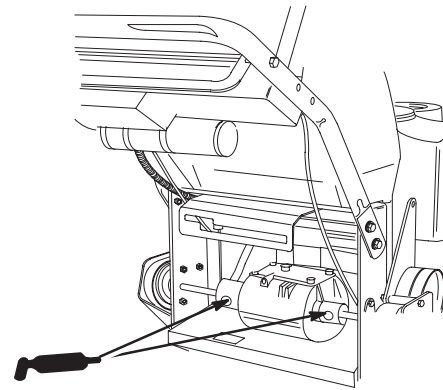


Figure 34

m-5191

Checking the Tire Pressure

Check the pressure at the valve stem after every 50 operating hours or monthly, whichever occurs first (Fig. 35). Check the tires when they are cold to get the most accurate pressure reading.

Pressure: 15 psi (103 kPa) rear and castor tires

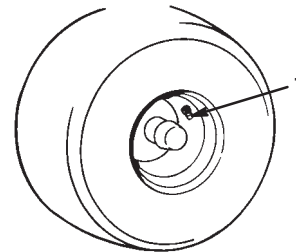


Figure 35

1. Valve stem

Draining the Fuel Tank



Danger



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

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

1. Park the machine on a level surface, to ensure that the fuel tank drains completely.

2. Disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
3. Close the fuel shut-off valve at the fuel tank (Fig. 36).

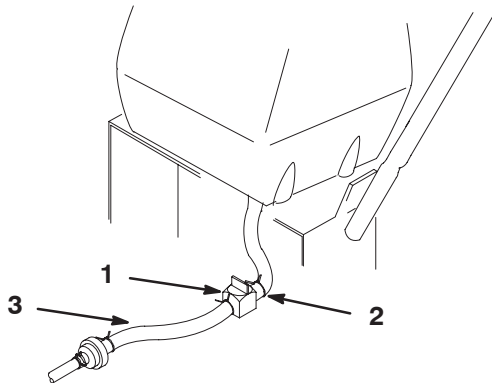


Figure 36

1. Fuel shut-off valve
2. Clamp
3. Fuel line

4. Squeeze the ends of the hose clamp together and slide it up the fuel line away from the valve (Fig. 36).
5. Pull the fuel line off of the valve (Fig. 36).
6. Open the fuel shut-off valve and allow the 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 28.

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

Replacing the Fuel Filter

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

Important Do not install a used filter.

1. Disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
2. Close fuel shut-off valve at the fuel tank (Fig. 36).
3. Squeeze the ends of the hose clamps together and slide them away from the filter (Fig. 37).
4. Remove the filter from the fuel lines.
5. Install a new filter and move the hose clamps close to the filter.
6. Open the fuel shut-off valve at the fuel tank (Fig. 36).

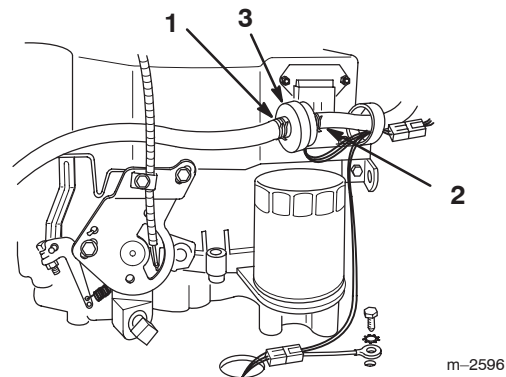


Figure 37

1. Hose clamp
2. Fuel line
3. Filter

Cleaning the Cooling System

Before each use, check and clean the 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 to ensure adequate cooling and correct engine speed and reduce the possibility of overheating and mechanical damage to the engine.

Servicing the Brake

Before each use, check the 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 blade control (PTO), and set the parking brake.
2. Push the machine forward.

The rear wheels should lock. If the wheels turn and do not lock, adjust the brake; refer to Adjusting the Brake, page 28.

3. Release the brake and press upper control bar very lightly, approximately 1/2 inch (13 mm).

The wheels should rotate freely. If not, adjust the brake; refer to Adjusting the Brake, page 28.

Adjusting the Brake

The brake lever is on the upper control bar (Fig. 13). If the parking brake does not hold securely or the control bar is not parallel with the fixed bar, 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 16.
3. Remove the cotter pin and washer from the brake lever (Fig. 38).

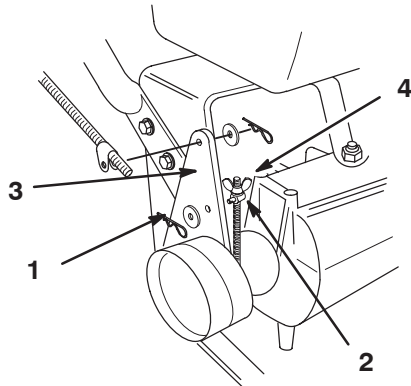


Figure 38

- | | |
|------------------------------|----------------|
| 1. Hairpin cotter and washer | 3. Brake lever |
| 2. Trunnion | 4. Wing nut |

4. Rotate the wing nut so the trunnion smoothly slides into the brake lever (Fig. 38).
5. Secure the trunnion to the brake lever with the washer and cotter pin (Fig. 38).
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 you cannot achieve brake action and free wheel rotation contact your service dealer immediately.

Replacing the Drive Belt

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

1. Disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
2. Remove the top bolt securing idler support and idler bracket to the rear frame (Fig. 39).

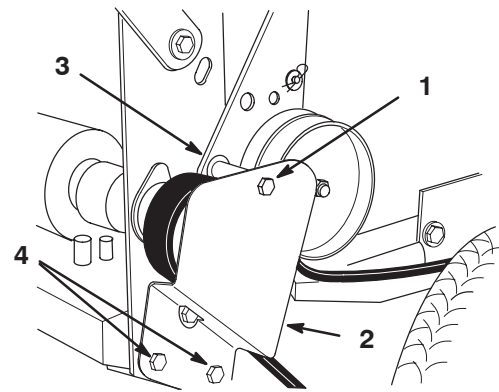


Figure 39

- | | |
|------------------|------------------|
| 1. Top bolt | 3. Idler support |
| 2. Idler bracket | 4. Bottom bolt |

3. Loosen the bottom 2 bolts enough to allow the belt to pass between the drive pulley and the idler support (Fig. 39).
4. Raise wheel off the ground enough to allow belt removal.

Replacing the Mower Drive Belt

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

1. Disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
2. Loosen the hand knob holding the mower cover to the top of the mower and remove the cover (Fig. 40).

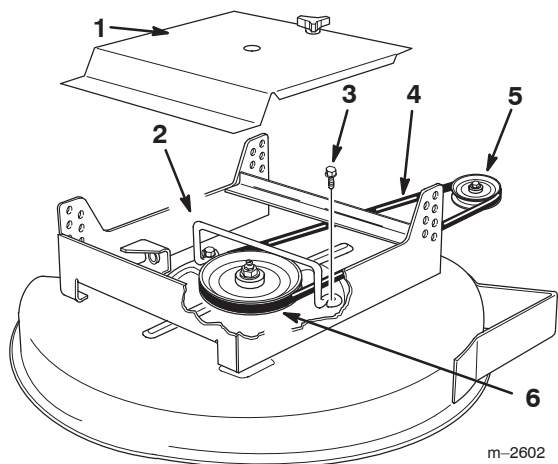


Figure 40

- | | |
|-------------------------|-------------------------------|
| 1. Mower cover | 4. Drive belt |
| 2. Belt guide | 5. Traction unit drive pulley |
| 3. Flange-head bolt (2) | 6. Spindle pulley |

- Remove the two flange-head bolts holding the belt guide to the top of the mower and remove the belt guide (Fig. 40).
- Loosen the jam nuts on the adjusting shafts to relieve the tension on the drive belt, then remove the worn drive belt from the pulleys (Fig. 41).

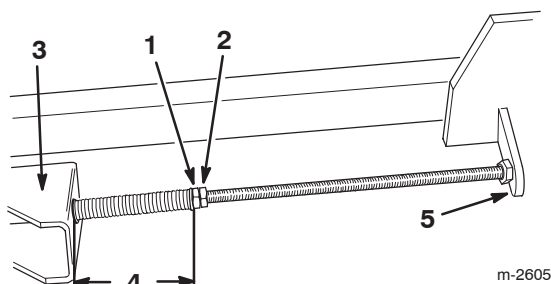


Figure 41

- | | |
|--|-------------------------------|
| 1. Front jam Nut | 5. Carrier frame mounting tab |
| 2. Rear jam nut | |
| 3. Mower mounting bracket | |
| 4. 4-3/4 inch (12 cm) between the washer and bushing, minus one turn | |

- Install the replacement drive belt around the drive pulley on the traction unit and the spindle pulley (Fig. 41).
- Install the belt guide on the mower with the two flange-head bolts. Ensure that the formed loops face toward the rear of the mower (Fig. 41).

- Tighten the front jam nut on each adjusting shaft until the springs are completely compressed, approximately 4-3/4 inch (12 cm) measured between the washer and the bushing, then back the front jam nuts off one turn (Fig. 41).

Important Do not overtighten the jam nuts after the springs are fully compressed, as this can damage the drive belt (Fig. 41).

- Tighten the rear jam nuts (Fig. 41).
- Install the mower cover onto the cutting unit, then tighten the hand knob (Fig. 40).

Replacing the Traction Belt

- Disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
- Raise the front of the machine and hold it with jack stands.
- Disconnect the in-line wire connector from the wire harness to the electric clutch.
- Remove mower drive belt; refer to Replacing the Mower Drive Belt, page 29.
- Remove the left front engine mounting bolt which secures the clutch retainer to the frame (Fig. 42).

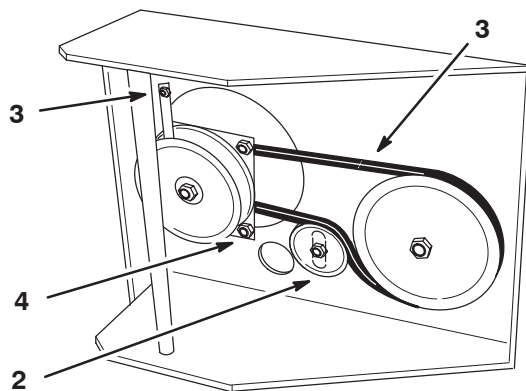


Figure 42

- | | |
|------------------|--------------------|
| 1. Traction belt | 3. Clutch retainer |
| 2. Idler pulley | 4. Adjusting nut |

- Unhook the retainer from the clutch and remove the retainer (Fig. 42).
- Loosen the idler mounting bolt enough to move the idler pulley and remove the traction belt from the drive pulley and clutch (Fig. 42).
- Install the new belt around the clutch and drive pulley (Fig. 42).

9. Hook the clutch retainer into the clutch and secure it to frame with the engine mounting bolt (Fig. 42).
10. Torque the engine mounting bolt to 170 to 220 in-lb (19 to 24 N·m).
11. Connect the clutch in-line wire connector to the wire harness.

Adjusting the Electric Clutch

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

1. Disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
2. Check the adjustment by inserting a feeler gauge through slots next to each of the studs (Fig. 43) to ensure that the plates are parallel.

The proper clearance between the clutch plates is 0.012 to 0.018 inch (0.30 to 0.45 mm).

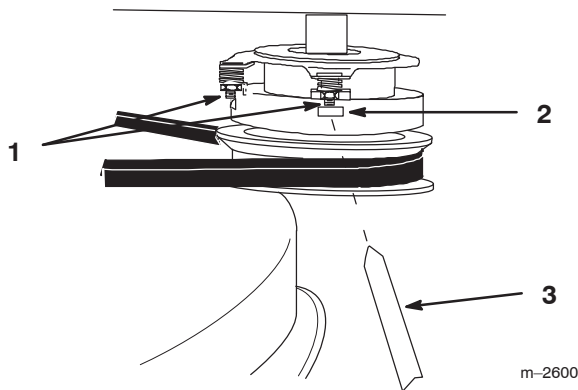


Figure 43

1. Adjusting nut
2. Slot
3. Feeler gauge

3. To adjust the clutch, tighten or loosen the locknuts on the flange studs as necessary (Fig. 43).

Correcting Mower Mismatch

If one side of the mower cuts lower than the other, correct it as follows:

1. Disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
2. Adjust the tire pressure in the traction unit tires to specifications.
3. Check that the blades are not bent; refer to Checking for a Bent Blade, page 22.
4. Set the height-of-cut to the 2-1/2 inch (64 mm) position; refer to Adjusting the Height-of-Cut, page 19.
5. Ensure that the mower support rods are resting on the frame cushions.

Setting the Front to Rear Pitch

1. Check the traction unit tire pressures.
2. Position the blade front-to-rear (Fig. 44).
3. Measure at the **C** and **D** locations (Fig. 44) from a level surface to the cutting edge of the blades (Fig. 45).

The mower should be 1/8 to 5/8 inch (3 to 16 mm) lower in front than in the rear.

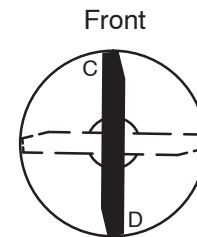
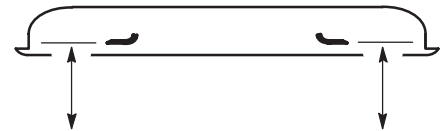


Figure 44

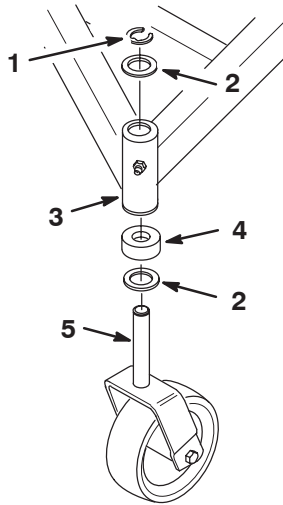


MEASURE FROM CUTTING EDGE TO A LEVEL SURFACE

Figure 45

4. If an adjustment is necessary, move an equal number of thrust washers on both castor wheel forks. Move the thrust washers from the top of the carrier frame mounting tube to the bottom to raise the front of the mower. Move the thrust washers from the bottom of the mounting tube to the top to lower the front of the mower. (Fig. 46).

5. Check the side-to-side leveling of the cutting unit.



m-2504

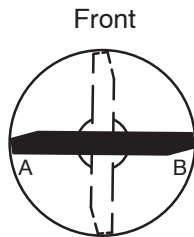
Figure 46

- | | |
|---------------------------------------|----------------------|
| 1. Retaining ring | 4. Spacer |
| 2. Thrust washer (locate as required) | 5. Castor wheel fork |
| 3. Carrier frame mounting tube | |

Setting the Side to Side Level

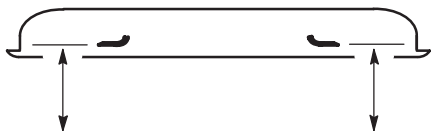
1. Position the blade side-to-side (Fig. 47).
2. Measure at the **A** and **B** locations (Fig. 47) from a level surface to the cutting edges of the blade (Fig. 48).

The difference between measurements **A** and **B** should be no more than 1/4 inch (6 mm).



m-2620

Figure 47



m-2619

MEASURE FROM CUTTING EDGE TO A LEVEL SURFACE

Figure 48

3. To change the side-to-side leveling, move the thrust washers on one castor wheel fork only. Move the thrust washer(s) from the top of the carrier frame mounting

tube to the bottom to raise the corresponding side of the mower. Move the thrust washer(s) from the bottom of the mounting tube to the top to lower the corresponding side of the mower. (Fig. 46).

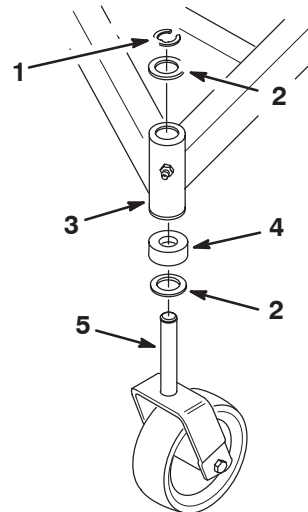
4. Check the front-to-rear pitch of the cutting unit.

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, replace the bushings.

1. Disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
2. Raise the cutting unit so the castor wheels are off the floor, then block up the front of the mower with jack stands.
3. Remove the retaining ring and thrust washer(s) from the top of the castor wheel fork (Fig. 49).
4. Pull the castor wheel fork out of the mounting tube, leaving the spacer and thrust washer(s) on the bottom of the fork.

Remember the location of the thrust washers and spacer on each fork to ensure correct installation and to maintain a level mower.

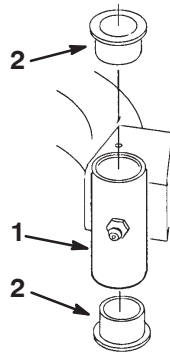


m-2504

Figure 49

- | | |
|--------------------------------|----------------------|
| 1. Retaining ring | 4. Spacer |
| 2. Thrust washer | 5. Castor wheel fork |
| 3. Carrier frame mounting tube | |

5. Insert a pin punch into the mounting tube and carefully drive out the bushings (Fig. 50).



m-1076

Figure 50

- | | |
|--------------------------------|------------|
| 1. Carrier frame mounting tube | 2. Bushing |
|--------------------------------|------------|

6. Clean the inside of the mounting tube.
7. Grease the inside and outside of the new bushings.
8. Using a hammer and flat plate, carefully drive the bushings into the mounting tube.
9. Inspect the castor wheel forks for wear and replace them if necessary (Fig. 51).
10. Slide the castor wheel fork through the bushings in the mounting tube.
11. Install the thrust washer(s) onto the fork and secure it with the retaining ring (Fig. 49).

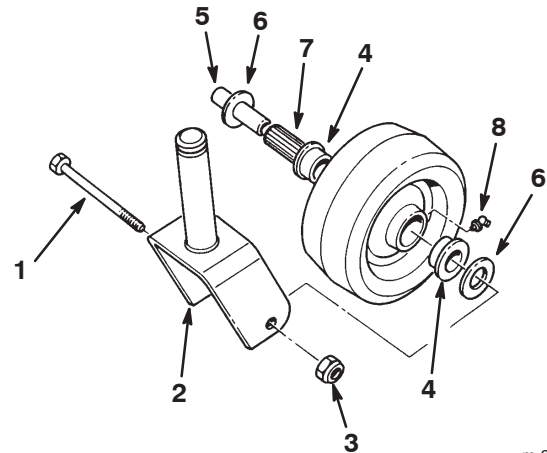
Important The inside diameter of the bushings may collapse slightly when installed. If the castor wheel fork does not slide into the new bushings, ream both bushings to an inside diameter of 1.126 inch (28.6 mm).

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

Servicing the Castor Wheels and Bearings

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

1. Disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
2. Remove the locknut and wheel bolt holding the castor wheel to the castor fork (Fig. 51).



m-2621

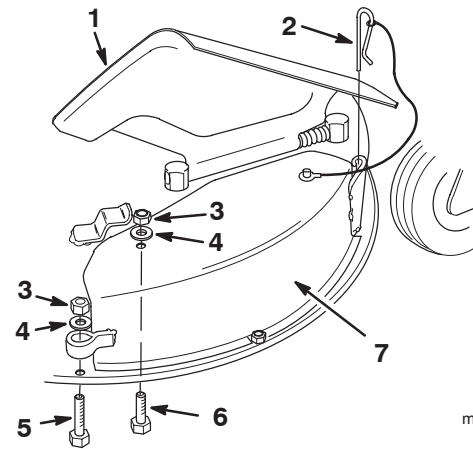
Figure 51

- | | |
|----------------|--------------------|
| 1. Wheel bolt | 5. Spanner bushing |
| 2. Castor fork | 6. Wheel spacer |
| 3. Locknut | 7. Roller bearing |
| 4. Bushing | 8. Grease fitting |

3. Remove the wheel spacers and bushings, then pull the spanner bushing and roller bearing out of the wheel hub (Fig. 51).
4. Clean any grease and dirt from the wheel hub (Fig. 51).
5. Inspect the roller bearing, bushings, spanner bushing, and inside of the wheel hub for wear. Replace any damaged or worn parts (Fig. 51).
6. Place a bushing into the wheel hub (Fig. 51).
7. Grease the roller bearing and spanner bushing and slide them into the wheel hub (Fig. 51).

8. Place the second bushing into the wheel hub (Fig. 51).
9. Install the wheel spacers on the outside of the bushings, then install the castor wheel into the castor fork (Fig. 51).
10. Secure the castor wheel to the castor fork with the wheel bolt and locknut. Tighten the locknut until the spinner bushing bottoms against the inside of the castor fork (Fig. 51).
11. Grease the fitting on the castor wheel.

Removing the Discharge Cover for Discharge Mowing



m-2630

Figure 52

- | | |
|-----------------------|----------------------------|
| 1. Grass deflector | 5. Bolt, 5/16 x 2-1/4 inch |
| 2. Chute pin | 6. Bolt, 5/16 x 1-1/4 inch |
| 3. Locknut, 5/16 inch | 7. Discharge cover |
| 4. Flat washer | |

4. Remove the locknut, flat washer, and bolt (5/16 x 1-1/4 inch) holding the top of the discharge cover to the top of the mower (Fig. 52).
5. Remove the locknut, flat washer, and bolt (5/16 x 2-1/4 inch) holding the loop on the rear of the discharge cover to the deck ring (Fig. 52).
6. Remove the discharge cover from the mower (Fig. 52).



Danger



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

- Never remove the grass deflector from the mower because the grass deflector routes material down toward the turf. If the grass deflector is ever damaged, replace it immediately.
- Never put your hands or feet under the mower.
- Never try to clear discharge area or mower blades unless you move the blade control switch (PTO) to the Off position and rotate the ignition key to the Off position. Also remove the key and pull the wire off the spark plug.

1. Disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
2. Thoroughly clean the mower.
3. Raise the grass deflector and remove the chute pin on the front of the discharge cover (Fig. 52).



Warning



Open holes in the mower could allow the mower to throw objects in the operator's or bystander's direction and result in serious injury.

Never operate the mower with open holes; install hardware in all open mounting hole when you remove the discharge cover.

7. Install the bolt (5/16 x 1-1/4 inch), flat washer, and locknut removed in step 4 into the open hole in the top of the mower for safety.

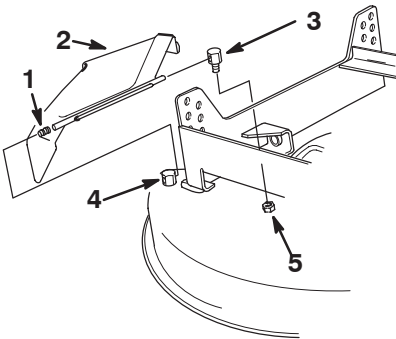
Replacing the Grass Deflector

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 without a grass deflector, discharge cover, or grass catcher installed.

1. Remove the locknut holding the rear deflector pivot post to the mower and remove the rear pivot post (Fig. 53).



m-2606

Figure 53

- | | |
|------------------------------|-------------------------------|
| 1. Spring | 4. Front deflector pivot post |
| 2. Deflector assembly | 5. Locknut |
| 3. Rear deflector pivot post | |
2. Remove the deflector assembly from the front (fixed) deflector pivot post and remove the deflector assembly from the mower (Fig. 53).
 3. Install the spring onto the replacement deflector assembly, then install the deflector assembly into the front deflector pivot post.
 4. Ensure that the free end of the spring is positioned correctly on the top of the mower, then install the rear end of the deflector assembly into the rear deflector pivot post.
 5. Install the rear deflector pivot post onto the mower and tighten the locknut (Fig. 53).

Important The grass deflector must be spring-loaded in the down position. Lift the deflector up to test that it snaps to the full down position.

Cleaning and Storage

1. Disengage the blade control (PTO), set the parking brake, stop the engine, remove the key, and disconnect the spark plug wire from the spark plug.
2. Remove grass clippings, dirt, and grime from the external parts of the entire machine, especially the engine. Clean dirt and chaff from the outside of the engine cylinder head fins and blower housing.

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

3. Clean dirt and chaff from the top of the mower.
 4. Scrape heavy buildup of grass and dirt from the underside of the mower, then wash the mower with a garden hose.
 5. Check the condition of the blade, refer to Servicing the Cutting Blade on page 22.
 6. Check the condition of the drive belt.
 7. Check the brake; refer to Servicing the Brake, page 28.
 8. Service the air cleaner; refer to Servicing the Air Cleaner, page 23.
 9. Grease the machine; refer to Greasing the Machine, page 27.
 10. Change the crankcase oil; refer to Servicing the Engine Oil, page 25.
 11. Remove the spark plug and check its condition; refer to Servicing the Spark Plug, page 26.
 12. With the spark plug removed from the engine, pour two tablespoons of engine oil into the spark plug hole.
 13. Use the starter to crank the engine and distribute the oil inside the cylinder.
 14. Install the spark plug but do not install the wire on the spark plug.
 15. Check the tire pressure; refer to Maintaining Tire Pressure, page 27.
 16. For storage over 30 days, prepare the traction unit as follows.
 - A. Add a petroleum based stabilizer/conditioner to the fuel in the tank. Follow the 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 gasoline and used at all times.
- B. Run the engine to distribute conditioned fuel through the fuel system (5 minutes).

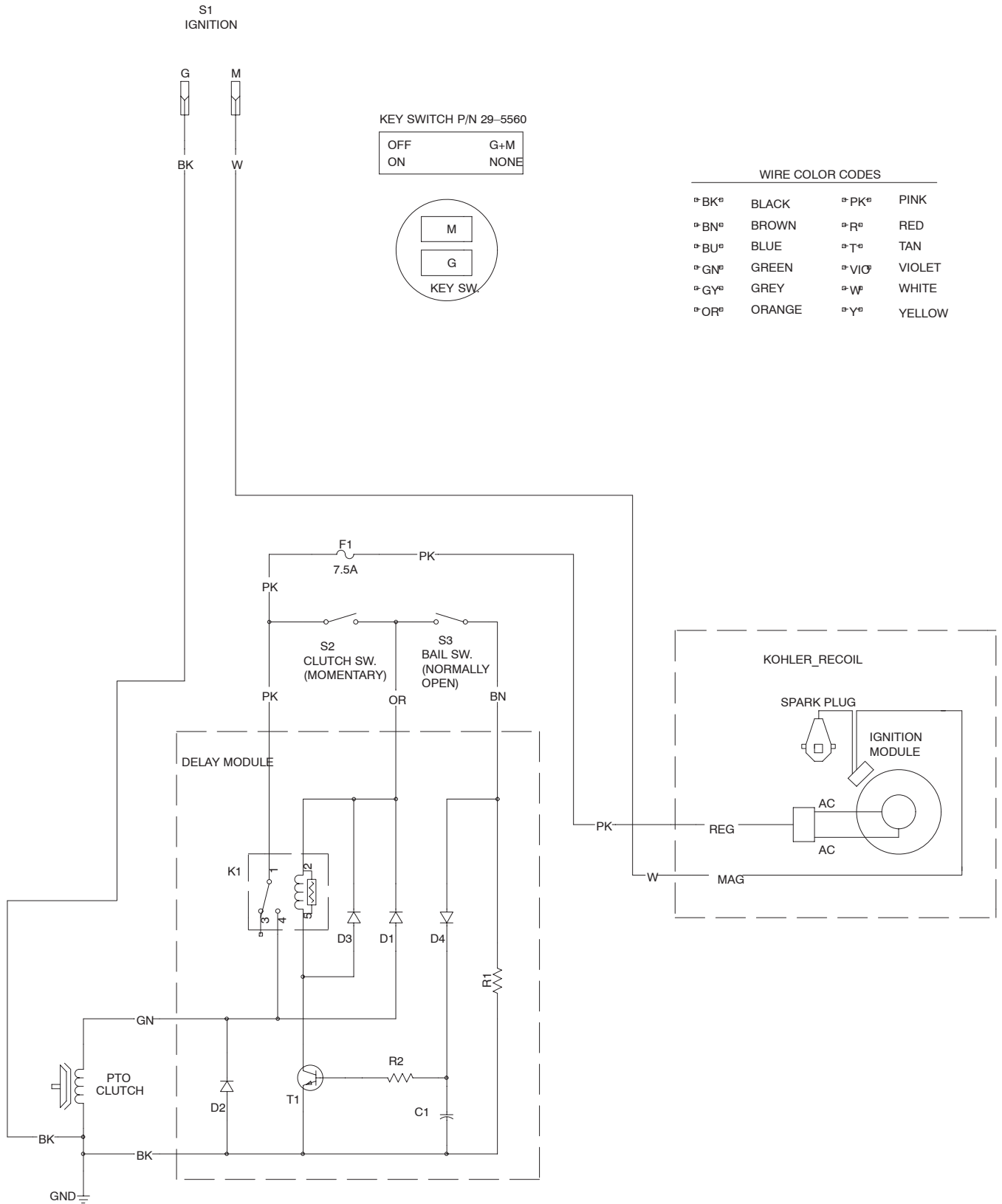
- C. Stop the engine, allow it to cool, and drain the fuel tank; refer to Draining the Fuel Tank, page 27.
- D. Start the engine and run it until it stops.
- E. Choke the engine.
- F. Start and run the engine until it will not start again.
- G. Dispose of fuel properly. Recycle as per local codes.

Important Do not store stabilizer/conditioned gasoline over 90 days.

- 17. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged.
- 18. Paint all scratched or bare metal surfaces.

Paint is available from your Authorized Service Dealer.
- 19. Store the machine in a clean, dry garage or storage area.
- 20. Remove the key from the ignition switch and keep it in a memorable place.
- 21. Cover the machine to protect it and keep it clean.

Wiring Diagram



Troubleshooting

Problem	Possible Causes	Corrective Action
Engine will not start, starts hard, or fails to keep running.	<ol style="list-style-type: none"> 1. The fuel tank is empty. 2. The choke is not on. 3. The air cleaner is dirty. 4. The spark plug wire is loose or disconnected. 5. The spark plug is pitted, fouled, or gap is incorrect. 6. There is dirt in fuel filter. 7. There is dirt, water, or stale fuel in the fuel system. 	<ol style="list-style-type: none"> 1. Fill the fuel tank with gasoline. 2. Move the choke lever to the On position. 3. Clean or replace the air cleaner element. 4. Install the wire on the spark plug. 5. Install a new, correctly gapped spark plug. 6. Replace the fuel filter. 7. Contact your Authorized Service Dealer.
Engine loses power.	<ol style="list-style-type: none"> 1. The engine load is excessive. 2. The air cleaner is dirty. 3. The oil level in the crankcase is low. 4. The cooling fins and air passages under the engine blower housing are plugged. 5. The spark plug is pitted, fouled, or the gap is incorrect. 6. The vent hole in the fuel cap is plugged. 7. There is dirt in the fuel filter. 8. There is dirt, water, or stale fuel in the fuel system. 	<ol style="list-style-type: none"> 1. Reduce ground speed. 2. Clean the air cleaner element. 3. Add oil to the crankcase. 4. Remove obstructions from the cooling fins and air passages. 5. Install a new, correctly gapped spark plug. 6. Clean or replace the fuel cap. 7. Replace the fuel filter. 8. Contact your Authorized Service Dealer.
Engine overheats.	<ol style="list-style-type: none"> 1. The engine load is excessive. 2. The oil level in the crankcase is low. 3. The cooling fins and air passages under the engine blower housing are plugged. 	<ol style="list-style-type: none"> 1. Reduce ground speed. 2. Add oil to the crankcase. 3. Remove obstructions from the cooling fins and air passages.

Problem	Possible Causes	Corrective Action
Abnormal vibration.	<ol style="list-style-type: none"> 1. The blade is bent or unbalanced. 2. The blade mounting bolt is loose. 3. The engine mounting bolts are loose. 4. There is a loose engine pulley, idler pulley, or spindle pulley. 5. The engine pulley is damaged. 6. The blade spindle is bent. 	<ol style="list-style-type: none"> 1. Install a new blade. 2. Tighten the blade mounting bolt. 3. Tighten the engine mounting bolts. 4. Tighten the appropriate pulley. 5. Contact your Authorized Service Dealer. 6. Contact your Authorized Service Dealer.
Machine does not drive.	<ol style="list-style-type: none"> 1. The shift lever is in Neutral. 2. The traction belt is worn, loose, or broken. 3. The traction belt is off the pulley. 	<ol style="list-style-type: none"> 1. Move shift lever to a drive gear position. 2. Change the traction belt. 3. Change the traction belt.
Uneven cutting height.	<ol style="list-style-type: none"> 1. The blade is dull. 2. The blade is bent. 3. The mower is not level. 4. The underside of the mower is dirty. 5. The traction unit tire pressure is incorrect. 6. The blade spindle bent. 	<ol style="list-style-type: none"> 1. Sharpen the blade. 2. Install a new blade. 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 your Authorized Service Dealer.
Blade does not rotate.	<ol style="list-style-type: none"> 1. The mower drive belt is worn, loose, or broken. 2. The mower drive belt is off the pulley. 	<ol style="list-style-type: none"> 1. Install a new mower drive belt. 2. Install the mower drive belt and check the adjusting shafts and belt guide for correct position.



Landscape Contractor
Equipment (LCE)

The Toro Total Coverage Guarantee

A Limited Warranty

Conditions and Products Covered

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly promise to repair the listed Toro product if defective in materials or workmanship.

This warranty applies to:

- ProLine Mid-Size Walk Power Mowers and Accessories
- Z Master Mid-Mount ZRTs and Accessories

The following time periods apply from the date of purchase:

Components	Warranty Period
• Engines*	2 years
• Hydraulic Systems	2 years
• Traction Unit Frame	2 years
• Carrier Frame	2 years
• Deck Shells	2 years
• Deck Spindles	3 years Parts, 2 years Labor
• Z500 Series Clutches	2 years
• Remaining Components	1 year

This warranty includes the cost of parts and labor, but you must pay transportation costs.

* Some engines used on Toro LCE products are warranted by the engine manufacturer.

Instructions for Obtaining Warranty Service

If you think that your Toro LCE product contains a defect in materials or workmanship, follow this procedure:

1. Contact any Toro Authorized or Master Service Dealer to arrange service at their dealership. To locate a dealer convenient to you, access our website at www.Toro.com. You may also call our Toro Customer Care Department toll free at 888-865-5676 (U.S. customers) or 888-865-5691 (Canada customers).
2. Bring the product and your proof of purchase (sales receipt) to the Service Dealer.

If for any reason you are dissatisfied with the Service Dealer's analysis or with the assistance provided, call us toll free at the numbers above or write us at:

LCE Customer Care Department
8111 Lyndale Avenue South
Bloomington, MN 55420-1196

Countries Other than the United States or Canada

Customers who have purchased Toro products exported from the United States or Canada should contact their Toro Distributor (Dealer) to obtain guarantee policies for your country, province, or state. If for any reason you are dissatisfied with your Distributor's service or have difficulty obtaining guarantee information, contact the Toro importer. If all other remedies fail, you may contact us at Toro Warranty Company.

Owner Responsibilities

You must maintain your Toro product by following the maintenance procedures described in the *Operator's Manual*. Such routine maintenance, whether performed by a dealer or by you, is at your expense.

Items and Conditions Not Covered

There is no other express warranty except for special emission system coverage on some products. This express warranty does not cover the following:

- Cost of regular maintenance service or parts, such as filters, fuel, lubricants, tune-up parts, blade sharpening, brake and clutch adjustments.
- Any product or part which has been altered or misused or required replacement or repair due to normal wear, accidents, or lack of proper maintenance.
- Repairs necessary due to improper fuel, contaminants in the fuel system, or failure to properly prepare the fuel system prior to any period of non-use over three months.
- Pickup and delivery charges.
- Operational misuse, neglect, or accidents.
- Repairs or attempted repairs by anyone other than an Authorized Toro Service Dealer using Toro approved parts.

General Conditions

All repairs covered by this warranty must be performed by an Authorized Toro Service Dealer using Toro approved replacement parts.

Repair by an Authorized Toro Service Dealer is your sole remedy under this warranty.

Neither The Toro Company nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of the Toro products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty.

Some states do not allow exclusions of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you.

All implied warranties of merchantability (that the product is fit for ordinary use) and fitness for use (that the product is fit for a particular purpose) are limited to the duration of the express warranty.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.