



**ProLine**  
**15 HP – 48" Mid-Size Mower**  
30197—200000001 & Up

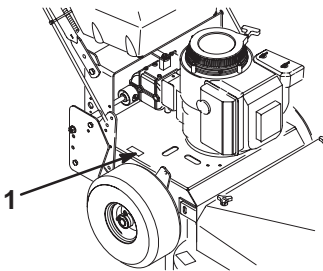
**Operator's Manual**

# Introduction

Thank you for purchasing a Toro product.

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

Whenever you contact your Authorized Service Dealer or the factory, always know the model and serial numbers of your product. These numbers will help the Service Dealer or Service Representative provide exact information about your specific product. You will find the model and serial number plate located in a unique place on the product as shown below.



m-3775

1. Model and Serial Number Plate

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

Model No: \_\_\_\_\_

Serial No. \_\_\_\_\_

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

The warning system in this manual identifies potential hazards and has special safety messages that help you and others avoid personal injury, even death. DANGER, WARNING and CAUTION are signal words used to identify the level of hazard. However, regardless of the hazard, be extremely careful.

**DANGER** signals an extreme hazard that will cause serious injury or death if the recommended precautions are not followed.

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

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

Two other words are also used to highlight information. “Important” calls attention to special mechanical information and “Note” emphasizes general information worthy of special attention.

The left and right side of the machine is determined from the normal operator’s position.



**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.

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**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.**

# Safety

**This machine meets or exceeds CPSC blade safety requirements for rotary mowers and the B71.4 1999 specifications of the American National Standards Institute, in effect at time of production.**

**Note:** The addition of certain attachments that do not meet American National Standards Institute certification will cause noncertification 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—1999.

### 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 ear 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.

## 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. Use seat belts if provided.
- Be sure of your footing while using pedestrian controlled equipment, 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 in the recommended direction 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 property.
- 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, lower implements, 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 units.
- Look behind and down before backing up to be sure of a clear path.
- Never carry passengers and 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 a trailer or truck
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

## Maintenance and Storage

- Disengage drives, lower implement, 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 units, 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. Never allow untrained personnel to service machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.

- Disconnect battery or remove spark plug wire before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- 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.
- Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.
- 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 or other safety information that you must know that is not included in the ANSI standards.

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

### **WARNING**

#### **POTENTIAL HAZARD**

- **Engine exhaust contains carbon monoxide, which is an odorless, deadly poison.**

#### **WHAT CAN HAPPEN**

- **Carbon monoxide can kill you and is also known to the State of California to cause birth defects.**

#### **HOW TO AVOID THE HAZARD**

- **Do not run engine indoors or in an enclosed area.**

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.

**Note:** 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.

## 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.
- Before operating a machine with ROPS (roll over protection) be certain the seat belts are attached to prevent the seat from pivoting forward.

## Slope Operation

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

### DO

- Mow up and down slopes greater than 5°, not across.
- Mow downhill only on slopes above 10°, never mow uphill. If a steep slope must be ascended, back up the hill, and drive forward down the hill, keeping the machine in gear.
- Remove obstacles such as rocks, tree limbs, etc. from the mowing area. Watch for holes, ruts or bumps, as uneven terrain could overturn the machine. Tall grass can hide obstacles.
- Use slow speed so that you will not have to stop while on the slope.
- Follow the manufacturer's recommendations for wheel weights or counterweights to improve stability.
- 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 and proceed slowly straight down the slope.
- When operating machine on slopes, banks or near drop offs, always have ROPS (roll over protection) installed.
- When operating a machine with ROPS (roll over protection) always use seat belt.
- Be certain that the seat belt can be released quickly if the machine is driven or rolls into ponds or water.
- Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.

### DO NOT

- Do not operate machine on hillsides or slopes exceeding 15°.
- 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 try to stabilize the machine by putting your foot on the ground.
- Do not use a grass catcher on steep slopes. Heavy grass bags could cause loss of control or overturn the machine.

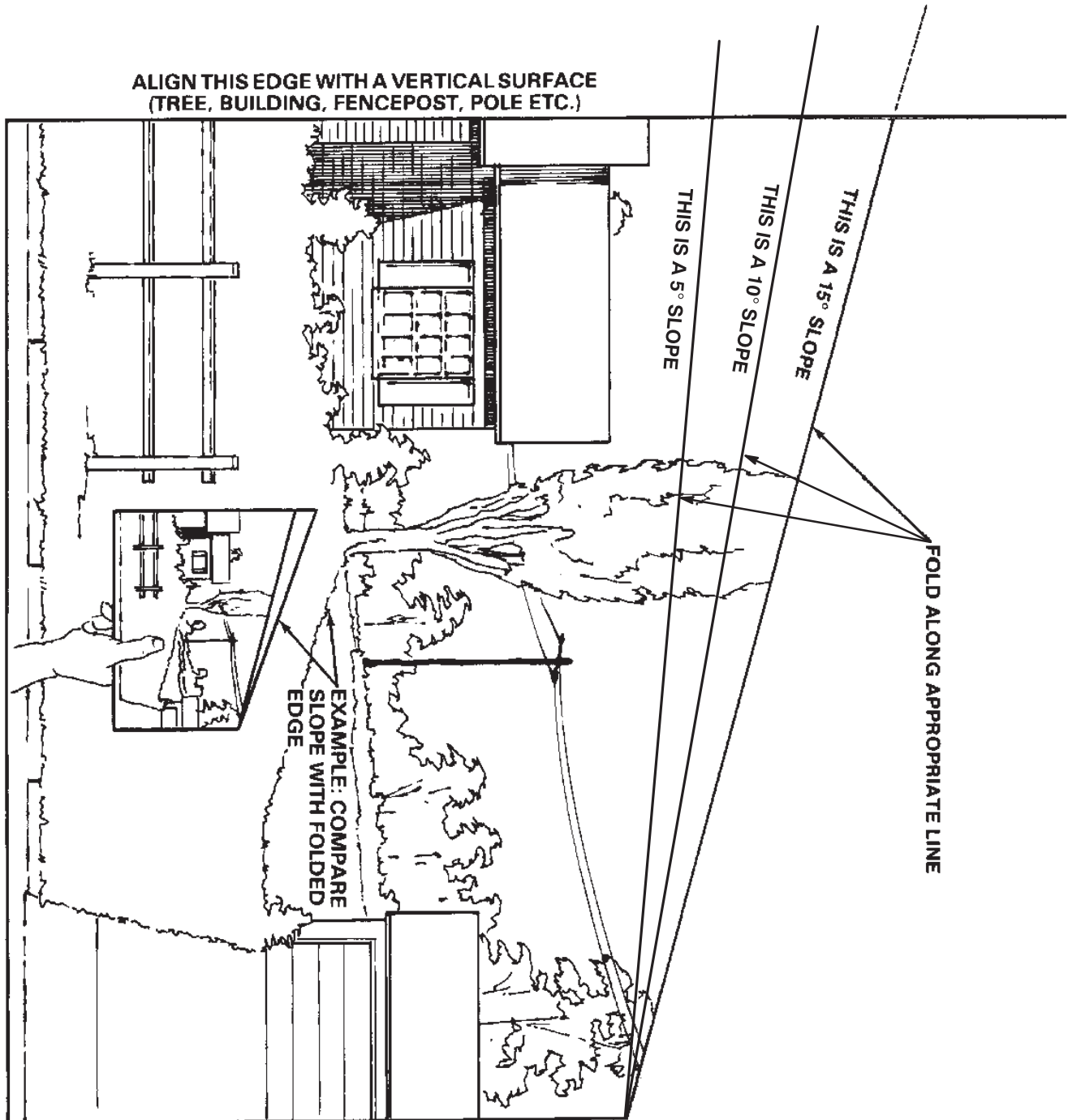
## Service

- 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.
- Battery acid is poisonous and can cause burns. Avoid contact with skin, eyes and clothing. Protect your face, eyes and clothing when working with a battery.
- Battery gases can explode. Keep cigarettes, sparks and flames away from battery.
- Hydraulic fluid escaping under pressure can penetrate the skin and cause injury. Use cardboard or paper to find hydraulic leaks.
- Never modify ROPS (roll over protection) frames or structures because they are specifically designed, sized, located and tested for injury reduction. If a rollover occurs, a modified ROPS will not provide adequate protection.

# Slope Chart

Read all safety instructions on pages 2–9.





## 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.

**ON UPPER CONTROL BAR**  
(Part No. 82–2290)



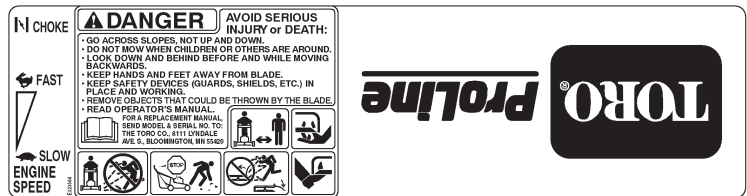
**ON LOWER CONTROL BAR**  
(Part No. 82–2280)



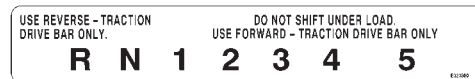
**ON TOP—FRONT OF MOWER**  
(Part No. 66–1340)



**ON CONTROL PANEL**  
(Part No. E323564)



**ON THE GEAR SELECTION PANEL**  
(Part No. E323560)



**ABOVE MUFFLER**  
(Part No. 63–8440)



**ABOVE GRASS DEFLECTOR**  
(Part No. 67–5360)



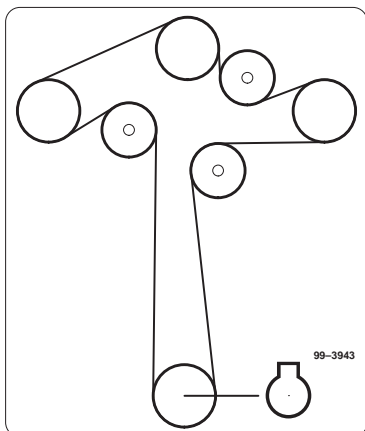
**ON TOP—LEFT SIDE OF MOWER**  
(Part No. 43–8480)



**ON GRASS DEFLECTOR**  
(Part No. 54–9220)



**ON REAR OF MOWER  
(Part No. 99–3943)**



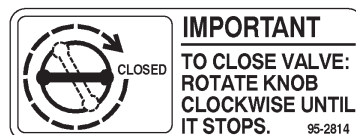
**ON PARKING BRAKE  
(Part No. E323558)**



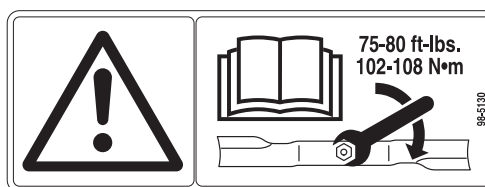
**ON LEFT SIDE OF HANDLE FRAME  
(Part No. E323563)**



**ALONG LEFT SIDE OF FUEL TANK  
(Part No. 95–2814)**



**ON REAR–LEFT CORNER OF MOWER  
(Part No. 98–5130)**



**ON REAR FRAME  
(Part No. E323562)**



# Gasoline and Oil

## Recommended Gasoline

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

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

### DANGER

#### POTENTIAL HAZARD

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

#### WHAT CAN HAPPEN

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

#### HOW TO AVOID THE HAZARD

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

### DANGER

#### POTENTIAL HAZARD

- When fueling, under certain circumstances, a static charge can develop, igniting the gasoline.

#### WHAT CAN HAPPEN

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

#### HOW TO AVOID THE HAZARD

- Always place gasoline containers on the ground away from your vehicle before filling.
- Do not fill gasoline containers inside a vehicle or on a truck or trailer bed because interior carpets or plastic truck bed liners may insulate the container and slow the loss of any static charge.
- When practical, remove gas-powered equipment from the truck or trailer and refuel the equipment with its wheels on the 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**

### **POTENTIAL HAZARD**

- Gasoline is harmful or fatal if swallowed. Long-term exposure to vapors has caused cancer to laboratory animals.

### **WHAT CAN HAPPEN**

- Failure to use caution may result in serious injury or illness

### **HOW TO AVOID THE HAZARD**

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

## **Filling the Fuel Tank**

1. Shut the engine off.
2. Clean around the fuel tank cap and remove the cap. Use a funnel and add unleaded regular gasoline to the fuel tank, until the level is 1/4 to 1/2 inch (6 mm to 13 mm) below the bottom of the filler neck. This space in the tank allows gasoline to expand. Do not fill the fuel tank completely full.
3. Install the fuel tank cap securely. Wipe up any gasoline that may have spilled.

## **Check Engine Oil Level**

Before you start the engine and use the machine, check the oil level in the engine crankcase; refer to Checking Oil Level, page NO TAG.

## **Using Stabilizer/Conditioner**

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

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

**IMPORTANT: Do not use fuel additives containing methanol or ethanol.**

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

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

# Assembly

## Loose Parts

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

DESCRIPTION	QTY.	USE
Castor assemblies	2	Install front castors to mower
Bolt 3/8–16 x 3/4" (19 mm)	8	
Flange nut 3/8–16	8	
Upper handle	1	Install upper handle to frame
Bolt 3/8–16 x 1" (26 mm)	4	
Locknut 3/8–16	4	
Plastic terminal	1	Install wire harness to handle
Wire tie	1	
Rod fitting	2	Install traction control rods
Clevis pin	2	
Washer 1/4"	2	
Hairpin cotter	4	
PTO rod	1	Install PTO rod
Hairpin cotter	2	
Shift lever	1	Install shift lever to transmission
Rubber seal	1	
Square hole washer	1	
Spring washer	1	
Locknut	1	

DESCRIPTION	QTY.	USE
Fuel tank	1	Install fuel tank
Bolt 5/16–1/ x 7/8" (22.5 mm)	2	
Lock washer 5/16"	2	
Washer 5/16"	4	
Stud	2	
Spring	2	
Hose clamp	1	
Operator's Manual	1	Read before operating machine
Engine Operator's Manual	1	
Parts Catalog	1	Fill out and return to Toro
Registration card	1	

## Install Front Castors

1. Align castors with holes on top and front of mower and insert (8) 3/8–16 x 3/4" (19 mm) bolts through mower. Secure with (8) 3/8–16 flange nuts below mower (Fig. 1).

**Note:** Tighten lower bolts first to pull castor against front, then top bolts last.

2. Torque bolts to 30–35 ft. lb. (40–47 N•m).

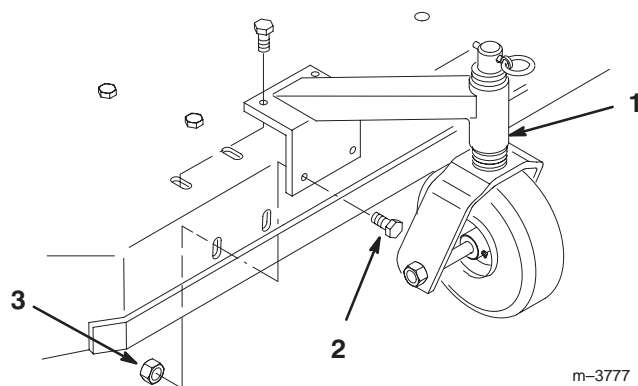


Figure 1

1. Front castor
2. Bolt 3/8–16 x 3/4" (19 mm)
3. Flange nut 3/8–16

## Install Upper Handle

1. Position handle outside frame and align upper handle mounting holes with desired mounting holes in rear frame. High, medium or low according to operators height (Fig. 2).
2. Secure each side with (2) 3/8–16 x 1" (26mm) bolts and (2) 3/8–16 locknuts (Fig. 2).
3. Torque bolts to 25 ft. lbs. (34 N•m).

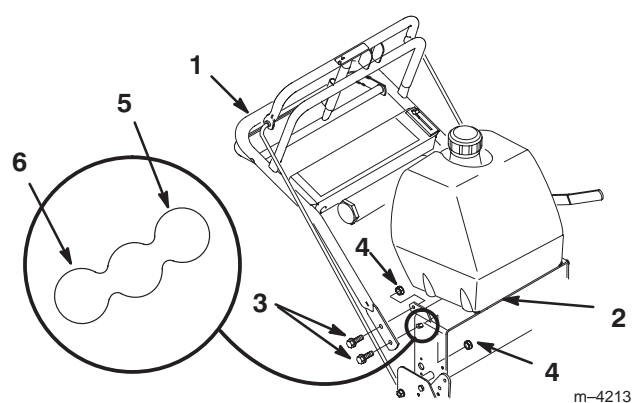
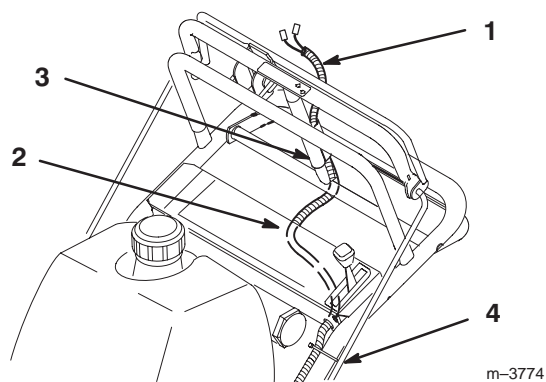


Figure 2

1. Upper handle
2. Rear frame
3. Bolt 3/8–16 x 1" (26mm)
4. Locknut 3/8
5. Low
6. High

## Connect Wire Harness

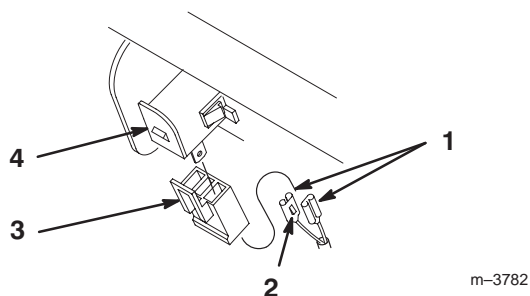
4. Route wire harness inside of frame, along left handle and over throttle cable. Compress wire harness covering and press into lower and upper holes in rear of control panel (Fig. 3).
5. Thread harness up through rear tube of traction handle (Fig. 3).



**Figure 3**

- |                  |             |
|------------------|-------------|
| 1. Wire harness  | 3. Tube     |
| 2. Control panel | 4. Wire tie |

6. Insert terminals into plastic plug until the clips snap into position (Fig. 3). If they do not snap turn around and try again.
7. Push plug onto switch so latches interlock (Fig. 3).
8. Secure wire harness and throttle cable to left handle, away from PTO lever, with wire tie (Fig. 3).

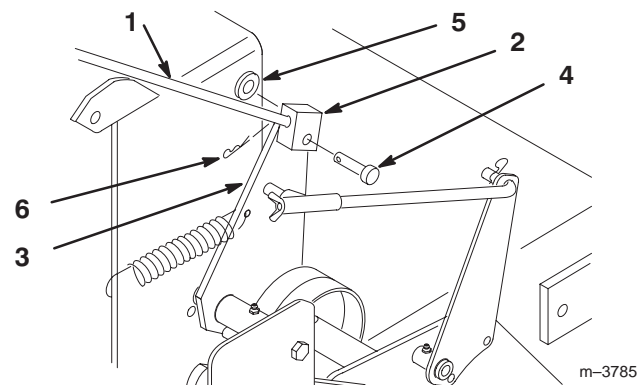


**Figure 4**

- |             |                 |
|-------------|-----------------|
| 1. Terminal | 3. Plastic plug |
| 2. Clip     | 4. Switch       |

## Install Traction Control Rods

1. Thread trunnions equal distance onto each control rod. For a starting point thread on approximately 2 in. (51 mm) (Fig. 5).
2. With trunnion rod up, slide clevis pins through rod fittings and mounting holes in idler brackets (from outside) (Fig. 5). Secure with 1/4" (6 mm) washers and hairpin cotters (Fig. 5).



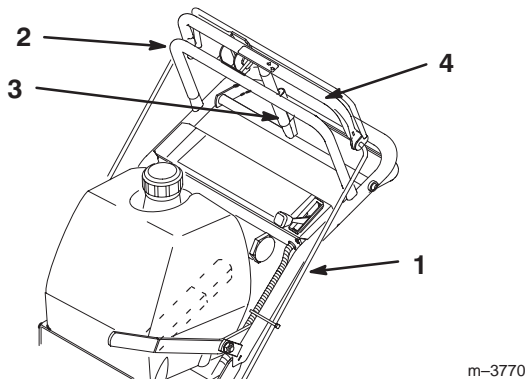
**Figure 5**

- |                  |                       |
|------------------|-----------------------|
| 1. Control rod   | 4. Clevis pin         |
| 2. Trunnion      | 5. Washer 1/4" (6 mm) |
| 3. Idler bracket | 6. Hairpin cotter     |

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

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

4. Check operation. If adjustment is required, remove hairpin cotter securing rod to upper control bar. Thread rod in or out of fitting for proper position and install into upper control bar with hairpin cotter.
5. After adjusting control rods, check parking brake adjustment, refer to: Brake page 36 for instructions.

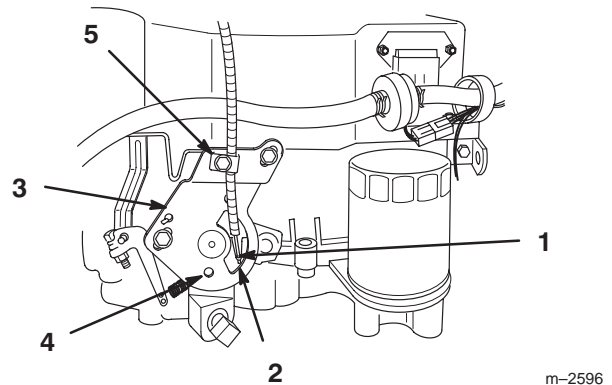


**Figure 6**

- |                      |                        |
|----------------------|------------------------|
| 1. Control rod       | 3. Parking brake lever |
| 2. Fixed control bar | 4. Upper control bar   |

## Connect Throttle Cable

1. Place throttle control lever in FAST position.(Fig. 7).
2. Hook wire Z-bend into hole of speed control lever (Fig. 7).
3. Loosen cable clamp screw allowing cable installation, but do not tighten (Fig. 7).
4. Move control cable casing and wire until hole in speed control lever is aligned with hole in base plate. Insert a 1/4 in. (6.35 mm) diameter pin or bolt into aligned holes to hold adjustment.
5. Pull throttle cable slightly to remove any slack and tighten cable clamp screw to lock adjustment in place.
6. Remove alignment pin and check control operation.



**Figure 7**

- |                        |                                     |
|------------------------|-------------------------------------|
| 1. Wire Z-bend         | 4. Alignment holes 1/4 in. (6.35mm) |
| 2. Speed control lever | 5. Cable clamp                      |
| 3. Base plate          |                                     |

## Install Blade Control (PTO) Rod

1. Rotate blade control lever (PTO) vertical away from left handle so rod drops down.
2. Remove hairpin cotters from bottom end of blade control rod (PTO) (Fig. 8).
3. Secure blade control (PTO) rod through hole in bellcrank with hairpin cotters (Fig. 8).

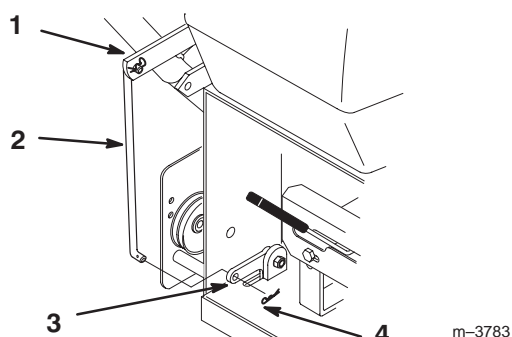


Figure 8

- |                        |                   |
|------------------------|-------------------|
| 1. Blade control lever | 3. Bellcrank      |
| 2. Blade control rod   | 4. Hairpin cotter |

## Install Shift Lever

1. Remove the 3/8" locknut and spring disk washer from the stud on top of the transmission.

**Note:** Do not remove rubber seal washer and square hole washer from transmission shaft.

2. Slide shift lever through control panel and align mounting hole in lever with square on transmission shaft. Secure lever to transmission with previously removed spring washer and locknut (Fig. 9).
3. Replace the spring washer, dish down, and locknut (Fig. 8).
4. Torque nut to 35 ft. lbs. (47 N•m).
5. Shift lever to second gear and check alignment of lever in slot of shifter plate. Clearance between top of lever and the top of the slot should be about equal to the clearance between bottom of the lever and the bottom of the slot.
6. If clearance is not correct, remove lever and bend it slightly to adjust.

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

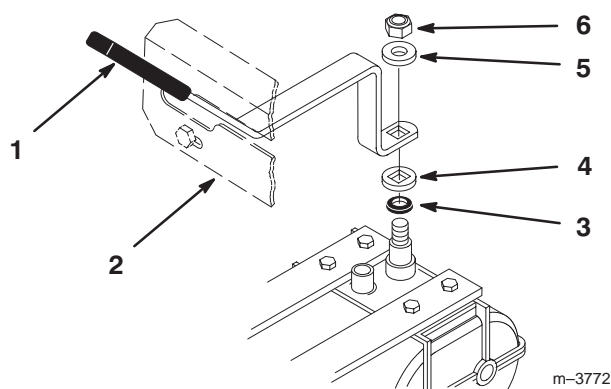
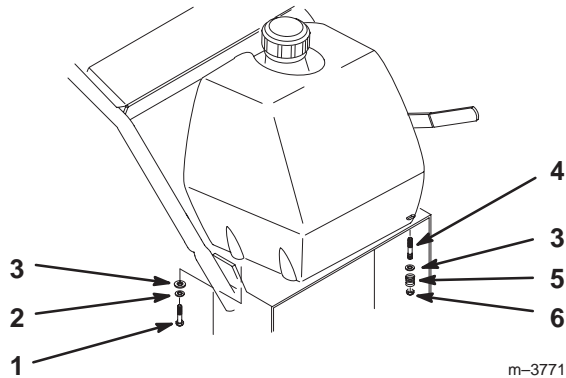


Figure 9

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

## Mount Fuel Tank

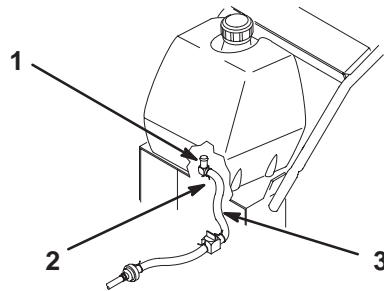
1. Align fuel tank to top of rear frame and secure fuel tank right side with (2) 5/16–18 x 7/8 in. (22.5 mm) bolts, (2) 5/16 lock washers and (2) 5/16 washers (Fig. 10).
2. Secure fuel tank left side to frame with (2) 5/16–18 x 7/8 in. (22.5 mm) studs, (2) 5/16 washers and (2) 5/16 locknuts (Fig. 10).



**Figure 10**

- |                                 |            |
|---------------------------------|------------|
| 1. Bolt 5/8–18 x 7/8" (22.5 mm) | 4. Stud    |
| 2. Lock washer 5/16             | 5. Spring  |
| 3. Washer 5/16                  | 6. Locknut |
- 

3. Push fuel line onto fuel tank fitting and secure with hose clamp (Fig. 11).



**Figure 11**

- |               |                 |
|---------------|-----------------|
| 1. Fuel line  | 3. Fuel fitting |
| 2. Hose clamp |                 |
-

# Operation

## Think Safety First

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

## Controls

Become familiar with all the controls (Fig. 12) before you start the engine and operate the machine.

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

**Bail** – The bail, in conjunction with the PTO switch, allows the engine to be started with the PTO disengaged. With the bail compressed the blade control (PTO) can be engaged. Release the bail with the PTO engaged and the engine stops.

**Blade Control (PTO)** – The blade control lever (PTO) engages and disengages power to the mower blades. Move the PTO lever forward to engage the blades. Pull rearward to stop driving 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 pull rearward on lower control bar to engage rearward traction operation.

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

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

**Fuel Shut-off Valve** – (In fuel line) Close fuel shut-off valve when transporting or storing mower.

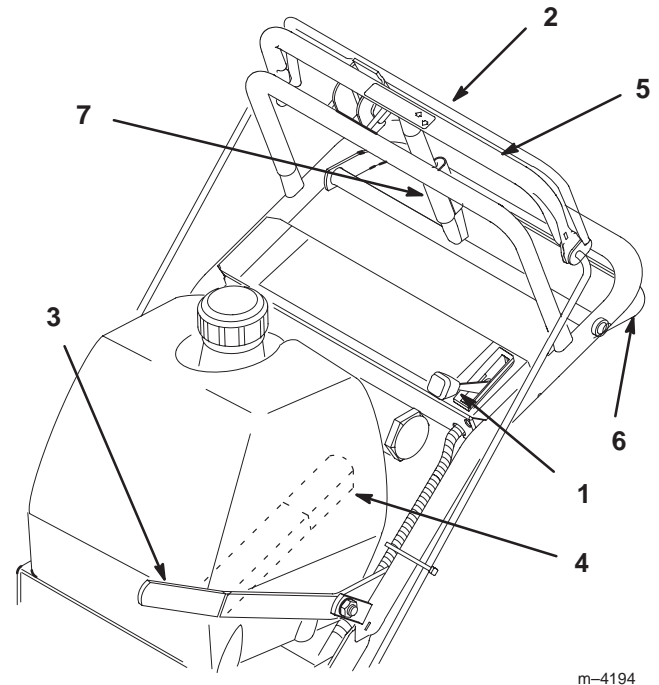


Figure 12

- |                        |                        |
|------------------------|------------------------|
| 1. Throttle control    | 5. Upper control bar   |
| 2. Bail                | 6. Lower control bar   |
| 3. Blade control (PTO) | 7. Parking brake lever |
| 4. Gear shift lever    |                        |

## Parking Brake

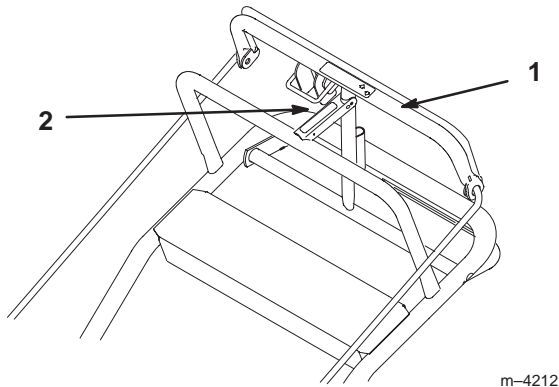
Always set the parking brake when you stop the machine or leave it unattended.

### Setting the Parking Brake

1. Pull the upper control bar rearward and hold it in this position (Fig. 13).
2. Lift the parking brake lock up and gradually release the upper control bar (Fig. 13). 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 lock
-

## Starting and Stopping the Engine

### Starting

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

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

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

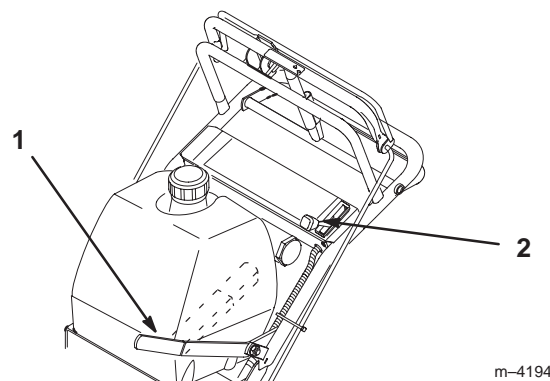
**IMPORTANT: Do not pull recoil rope to its limit or let go of the starter handle when rope is pulled out because rope may break or recoil assembly may be damaged.**

### Stopping

1. Move the throttle lever midway between FAST and SLOW (Fig. 14).

**Note:** Allow the engine to run a minimum of 15 seconds and then stop the engine.

2. To stop the engine pull the throttle all the way back, past SLOW (Fig. 14).



**Figure 14**

1. Blade control (PTO)                      2. Throttle lever

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

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

## Operating Blade Control (PTO)

The blade control (PTO) lever engages and disengages power to the mower blades.

### Engaging the Mower Blades (PTO)

1. Pull on the upper control bar to stop the machine (Fig. 15).
2. Hold the bail against the upper control bar (Fig. 15).
3. To engage blade(s), push the blade control lever firmly forward, until it latches over-center (Fig. 15).

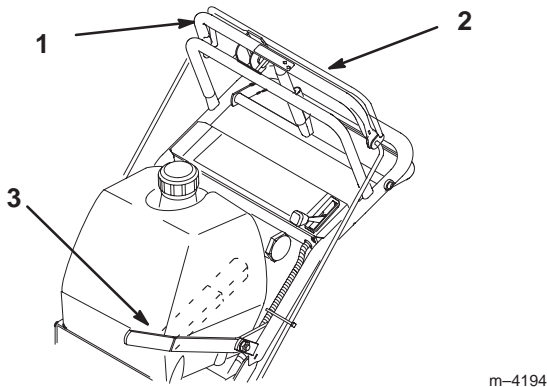


Figure 15

- |                      |                        |
|----------------------|------------------------|
| 1. Upper control bar | 3. Blade control (PTO) |
| 2. Bail              |                        |

### Disengaging the Mower Blades (PTO)

1. To disengage the blade(s), pull blade control lever rearward, all the way (Fig. 15).

**Note:** It is necessary to fully and manually disengage mower.

## The Safety Interlock System

### Understanding the Safety Interlock System

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

- The throttle lever is all the way back, past SLOW
- The blade control lever (PTO) is engaged

The safety interlock system is also designed to stop the engine if you released the bail with the PTO engaged or move the throttle all the way back, past SLOW.

### Testing the Safety Interlock System

Test the safety interlock system before you use the machine each time. If the safety system does not operate as described below, have an Authorized Service Dealer repair the safety system immediately.

1. Set the parking brake, disengage the PTO and place the throttle forward. Start the engine. With the engine running squeeze the bail against upper control bar and push the mower blade control lever forward. The mower blades begin rotating.
2. With the engine running, release the bail. The engine should stop.
3. Start the engine again.
4. With the engine running, move the throttle lever all the way back, past SLOW. The engine should stop.

## Driving Forward or Backward

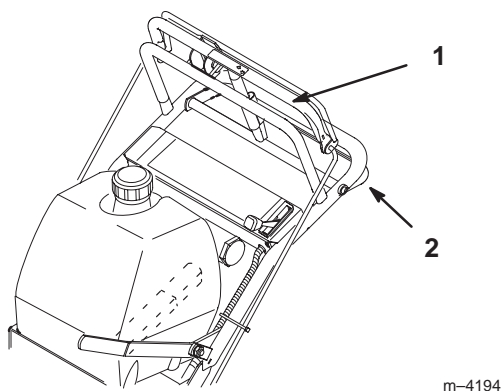
The throttle control regulates the engine speed as measured in rpm (revolutions per minute). Place the throttle control in the “FAST” position for best performance.

### Forward

1. To go forward, move the shift lever to a forward gear.
2. Release the parking brake: refer to Releasing the Parking Brake, page 20.
3. Slowly press on the upper control bar to move forward (Fig. 16).

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 toward the direction you want to turn (Fig. 16).



**Figure 16**

1. Upper control bar

2. Lower control bar

### Backward

1. To go backward, move the shift lever to reverse gear.
2. Release the parking brake: refer to Releasing the Parking Brake, page 20.
3. Slowly squeeze on the lower control bar and handle together to move rearward (Fig. 16).

## Lower Control Bar Operation

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

1. Disengage the mower blades.

### WARNING

#### POTENTIAL HAZARD

- A blade can be bent or damaged when driving up a curb. Blades could break apart and pieces could be thrown at bystanders or at you as you use the mower.

#### WHAT CAN HAPPEN

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

#### HOW TO AVOID THE HAZARD

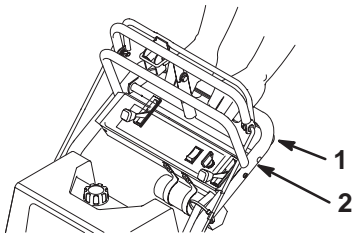
- Do not run blades while driving up a curb forward or backward.

2. Select first gear or reverse to drive machine.
3. Drive machine until drive wheels contact curb (Fig. 18).

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

4. At the same time engage lower control bar and lift up on handle (Fig. 17 and 18).

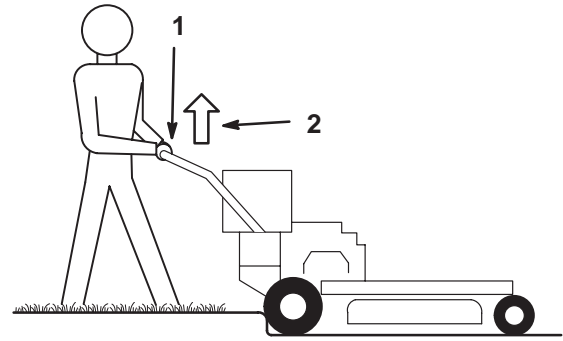
**Note:** Lifting up on handle will assist driving the machine up a curb and not spin the drive wheels.



m-4192

**Figure 17**

1. Lower Control Bar (Engaged)
2. Handle



m-4185

**Figure 18**

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

## Stopping the Machine

To stop the machine apply the brakes, pull back on the upper control bar, release the bail and set the parking brake; refer to Setting the Parking Brake, page 20.

## Adjusting Height-of-Cut

A 1" to 4-1/4" range for height-of-cut can be achieved by adjusting blade spacers, rear axle height and front castor spacers. Use the Height-of-Cut chart on page 26 to select the combination required

### Adjust Blade Height

Blades are adjusted by using the four, 1/4" spacers found on the blade spindle bolts. This allows a range, in 1/4" increments, of cutting height in any axle position. The same number of blade spacers must be used on all blades to achieve a level cut (two above and two below, one above and three below, etc.).

1. Stop engine and remove spark plug wire(s).
2. Hold blade bolt and remove nut. Slide bolt down, through spindle, and change spacers as required (Fig. 19).
3. Insert bolt, add extra spacer(s), and secure with thin washer and nut (Fig. 19).
4. Torque blade bolt to 75–80 ft. lb. (101–108 N•m).

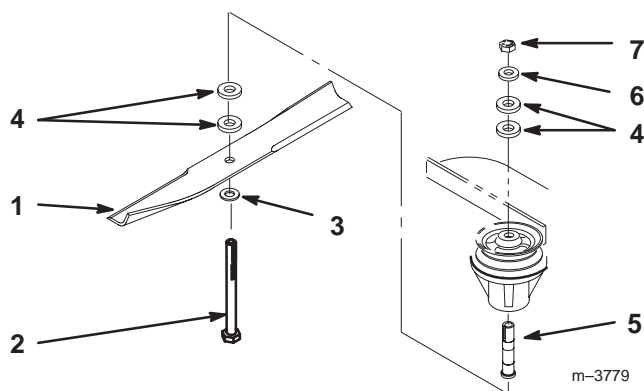


Figure 19

- |                |                |
|----------------|----------------|
| 1. Blade       | 5. Tube        |
| 2. Blade bolt  | 6. Thin washer |
| 3. Cone washer | 7. Nut         |
| 4. Spacer      |                |

### Adjust Axle Height

Desired height-of-cut range can be obtained by adjusting the rear axle and placing caster spacers above or below the caster arm (see chart).

1. Stop engine and remove spark plug wire(s).
2. Loosen but do not remove the (2) axle pivot bolts and the (2) axle adjustment bolts (Fig. 20).
3. Place a jack under the rear center of the engine frame. Raise the back end of the engine frame up enough to remove front (2) axle adjustment bolts (Fig. 20).
4. Raise or lower the engine frame with the jack, so that front (2) axle adjustment bolts can be installed in the desired hole location (Fig. 20). A tapered punch can be used to help align the holes.
5. Tighten all (4) bolts and lower the unit.
6. Adjust control rods and brake linkages as required, refer to: Assembly and Brake.

**IMPORTANT: It will be necessary to adjust control rods and brake linkage when changing axle positions for proper traction and brake function.**

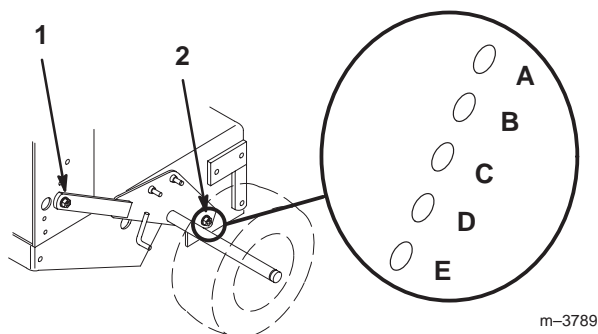
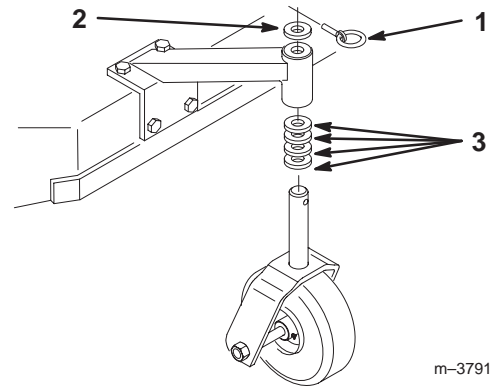


Figure 20

- |                    |                         |
|--------------------|-------------------------|
| 1. Axle pivot bolt | 2. Axle adjustment bolt |
|--------------------|-------------------------|

## Adjust Caster Position

1. Using the height-of-cut chart, adjust the caster spacers to match with the axle hole selected (Fig. 21).
2. Remove clevis pin, slide caster from support and change spacers(Fig. 21).
3. Install caster in support and insert clevis pin(Fig. 21).



**Figure 21**

1. Clevis pin
2. 3/16" (5 mm) spacer
3. 1/2" (13 mm) spacer

## Height-of-Cut Chart

Axle Position	No. of Spacers Below Caster		Number of 1/4" Blade Spacers Below Spindle				
	1/2"	3/16"	4	3	2	1	0
A	0	0	1"	1-1/4"	1-1/2"	1-3/4"	2"
A	0	1	1-1/8"	1-3/8"	1-5/8"	1-7/8"	2-1/8"
A	1	0	1-3/8"	1-5/8"	1-7/8"	2-1/8"	2-3/8"
B	0	1	1-3/8"	1-5/8"	1-7/8"	2-1/8"	2-3/8"
B	1	0	1-5/8"	1-7/8"	2-1/8"	2-3/8"	2-5/8"
B	1	1	1-3/4"	2"	2-1/4"	2-1/2"	2-3/4"
B	2	0	2"	2-1/4"	2-1/2"	2-3/4"	3"
C	1	1	1-7/8"	2-1/8"	2-3/8"	2-5/8"	2-7/8"
C	2	0	2-1/8"	2-3/8"	2-5/8"	2-7/8"	3-1/8"
C	2	1	2-1/4"	2-1/2"	2-3/4"	3"	3-1/4"
C	3	0	2-1/2"	2-3/4"	3"	3-1/4"	3-1/2"
D	2	1	2-3/8"	2-5/8"	2-7/8"	3-1/8"	3-3/8"
D	3	0	2-1/2"	2-3/4"	3"	3-1/4"	3-1/2"
D	3	1	2-3/4"	3"	3-1/4"	3-1/2"	3-3/4"
D	4	0	3"	3-1/4"	3-1/2"	3-3/4"	4"
E	3	1	2-7/8"	3-1/8"	3-3/8"	3-5/8"	3-7/8"
E	4	0	3-1/8"	3-3/8"	3-5/8"	3-7/8"	4-1/8"
E	4	1	3-1/4"	3-1/2"	3-3/4"	4"	4-1/4"

# Maintenance

## Service Interval Chart

Service Operation	Each Use	8 Hours	25 Hours	50 Hours	100 Hours	200 Hours	Storage Service
Oil—check level	X						X
Oil—change*		Initial			X		X
Oil Filter—change (200 hours or every other oil change)						X	X
Safety System—check	X						X
Brakes—check	X						X
Cutting Blades – check		X			X		X
Wheel Bearings—grease*	X						X
Transmission Couplers – grease*				X			X
Idler Pivots – grease*	X						X
Belt Blade Idler Pivots – grease*				X			X
Foam Air Cleaner—service*			X				X
Paper Air Cleaner—replace*					X		X
Spark Plug(s)—check						X	X
Belts—check for wear/cracks				X			X
PTO Belt—check tension		Initial		X			X
Gasoline—drain							X
Engine—clean cooling system	X				X		X
Fuel Filter—replace						X	X
Tires—check pressure				X			X
Chipped Surfaces—paint							X
* More often in dusty, dirty conditions							

## Air Cleaner

### Service Interval/Specification

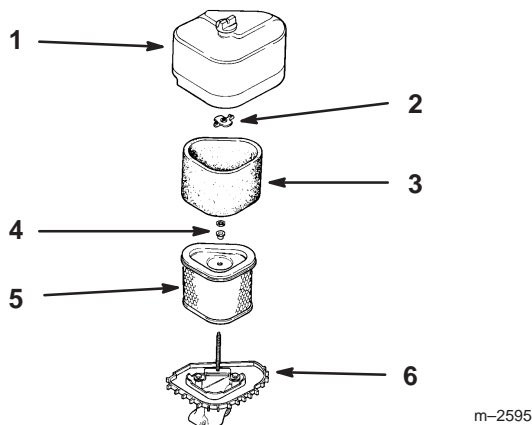
Foam Element: Clean and re-oil after every 25 operating hours.

Paper Element: Replace after every 100 operating hours.

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

### Removing the Foam and Paper Elements

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Clean around the air cleaner to prevent dirt from getting into the engine and causing damage. Unscrew the cover nut and remove the air cleaner cover (Fig. 22).
3. Remove the air cleaner assembly (Fig. 22).
4. Carefully slide the foam element off the paper element (Fig. 22).



**Figure 22**

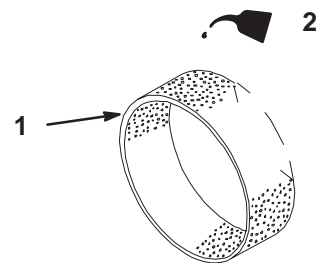
- |                  |                       |
|------------------|-----------------------|
| 1. Cover and nut | 4. Washer and grommet |
| 2. Wing nut      | 5. Paper element      |
| 3. Foam element  | 6. Air cleaner base   |

### Cleaning the Foam and Paper Elements

#### 1. Foam Element

- A. Wash the foam element in liquid soap and warm water. When the element is clean, rinse it thoroughly.
- B. Dry the element by squeezing it in a clean cloth.
- C. Put one or two ounces of oil on the element (Fig. 23). Squeeze the element to distribute the oil.

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



**Figure 23**

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

## 2. Paper Element

- A. Lightly tap the element on a flat surface to remove dust and dirt (Fig. 24).
- B. Inspect the element for tears, an oily film, and damage to the rubber seal.

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

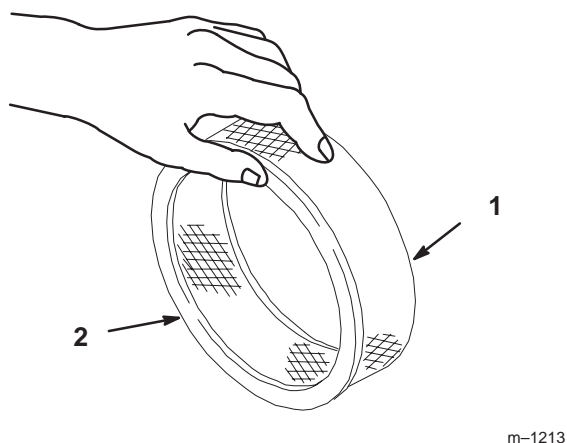


Figure 24

1. Paper element
2. Rubber seal

## Installing the Foam and Paper Elements

## 1. Installing the Foam and Paper Elements

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

1. Carefully slide the foam element onto the paper air cleaner element (Fig. 22).
2. Place the air cleaner assembly onto the air cleaner base (Fig. 22).
3. Install the air cleaner cover and secure with cover nuts (Fig. 22).

## Engine Oil

### Service Interval/Specification

Change oil:

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

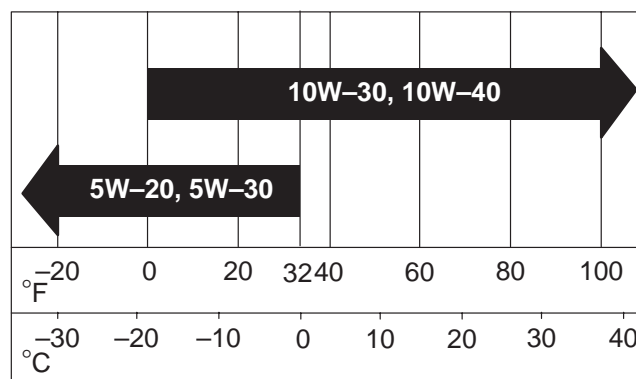
**Note:** Change oil more frequently when operating conditions are extremely dusty or sandy.

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

Crankcase Capacity: w/filter, 2 qt. (1.9 l)

Viscosity: See table below

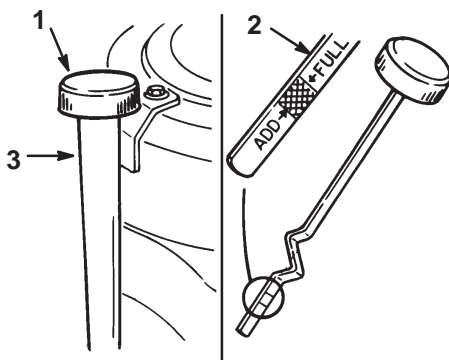
## USE THESE SAE VISCOSITY OILS



## Checking Oil Level

1. Park the machine on a level surface, disengage the power take off (PTO), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
2. Clean around the oil dipstick (Fig. 25) so dirt cannot fall into the filler hole and damage the engine.
3. Unscrew the oil dipstick and wipe the metal end clean (Fig. 25).
4. Slide the oil dipstick fully into the filler tube, do not thread onto tube (Fig. 25). Pull the dipstick out and look at the metal end. If oil level is low, slowly pour only enough oil into the filler tube to raise the level to the “FULL” mark.

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



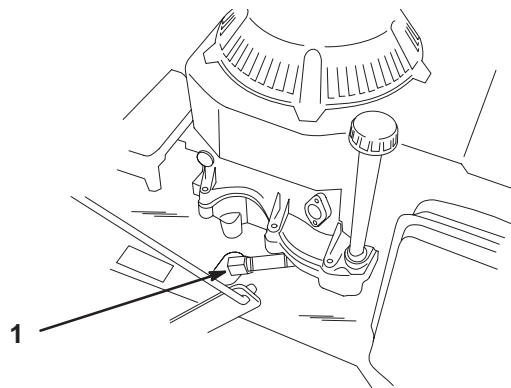
**Figure 25**

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

## Changing/Draining Oil

1. Start the engine and let it run five minutes. This warms the oil so it drains better.
2. Park the machine so that the drain side is slightly lower than the opposite side to assure the oil drains completely. Then disengage the power take off (PTO), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
3. Place a pan below the oil drain. Remove the oil drain cap (Fig. 26).
4. When oil has drained completely, install the oil drain cap.

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



m-4758

**Figure 26**

1. Oil drain cap

5. Slowly pour approximately 80% of the specified amount of oil specified, page 29, into the filler tube (Fig. 25). Now check the oil level; refer to Checking Oil Level, page 30. Slowly add additional oil to bring to “FULL” mark on dipstick.

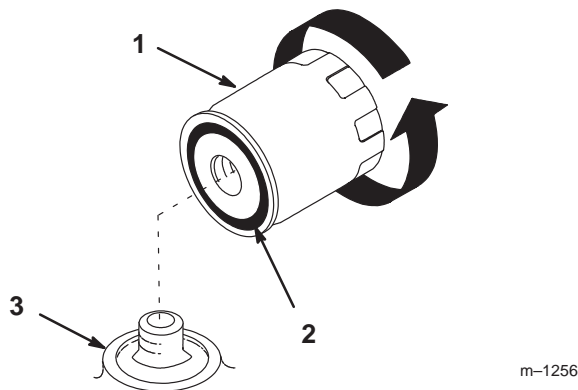
## Change Oil Filter

### Service Interval/Specification

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 30.
2. Remove the old filter and wipe the filter adapter (Fig. 27) gasket surface.
3. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Fig. 27).



**Figure 27**

- |               |            |
|---------------|------------|
| 1. Oil filter | 3. Adapter |
| 2. Gasket     |            |

4. Install the replacement oil filter to the filter adapter. Turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/2 turn (Fig. 27).
5. Fill the crankcase with the proper type of new oil; refer to Changing/Draining Oil, page 30.

## Spark Plug

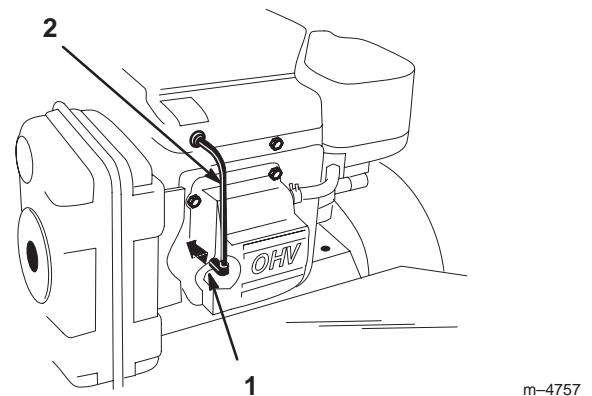
### Service Interval/Specification

Check the spark plug(s) after every 200 operating hours. Make sure the air gap between the center and side electrodes is correct before installing the spark plug. Use a spark plug wrench for removing and installing the spark plug(s) and a gapping tool/feeler gauge to check and adjust the air gap. Install a new spark plug(s) if necessary.

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

### Removing the Spark Plug(s)

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.
2. Pull the wire(s) off the spark plug(s) (Fig. 28). Now clean around the spark plug(s) to prevent dirt from falling into the engine and potentially causing damage.
3. Remove the spark plug(s) and metal washer.



**Figure 28**

- |                    |               |
|--------------------|---------------|
| 1. Spark plug wire | 2. Spark plug |
|--------------------|---------------|

## Checking the Spark Plug

1. Look at the center of the spark plug(s) (Fig. 29). If you see light brown or gray on the insulator, the engine is operating properly. A black coating on the insulator usually means the air cleaner is dirty.

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

2. Check the gap between the center and side electrodes (Fig. 29). Bend the side electrode (Fig. 29) if the gap is not correct.

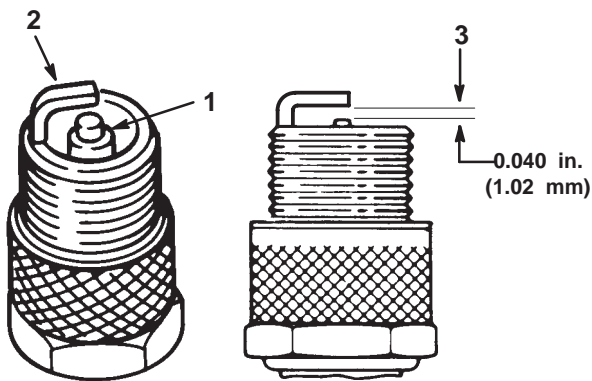


Figure 29

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

## Installing the Spark Plug(s)

1. Install the spark plug(s) and metal washer. Make sure the air gap is set correctly.
2. Tighten the spark plug(s) to 20 ft-lb (27 N.m).
3. Push the wire(s) onto the spark plug(s) (Fig. 28).

## Cutting Blades

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

### WARNING

#### POTENTIAL HAZARD

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

#### WHAT CAN HAPPEN

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

#### HOW TO AVOID THE HAZARD

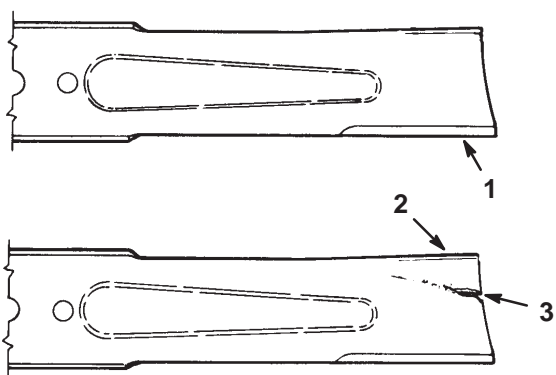
- Periodically inspect the blade for wear and damage. Immediately install a new blade if it is worn or damaged.

## Before Inspecting or Servicing the Blades

Park the machine on a level surface, disengage the blade control (PTO) and set the parking brake.

## Inspecting the Blades

1. Inspect the cutting edges (Fig 30). If the edges are not sharp or have nicks, remove and sharpen the blades. Refer to Sharpening the Blades on page 34.
2. Inspect the blades, especially the curved area (Fig. 30). If you notice any damage, wear, or a slot forming in this area (item 3 in Fig. 30), immediately install a new blade.



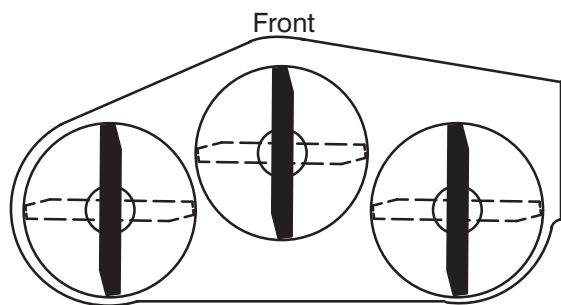
m-151

Figure 30

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

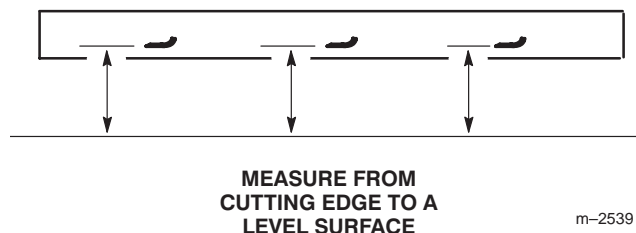
## Checking for Bent Blades

1. Rotate the blades until the ends face forward and backward (Fig. 31). Measure from a level surface to the cutting edge of the blades (Fig. 32). Note this dimension.



m-1078

Figure 31



m-2539

Figure 32

2. Rotate the opposite ends of the blades forward. Measure from a level surface to the cutting edge of the blades at the same position as in step 1 above. The difference between the dimensions obtained in steps 1 and 2 must not exceed 1/8" (3 mm). If this dimension exceeds 1/8" (3 mm), the blade is bent and must be replaced. Refer to Removing the Blades, and Installing the Blades on page 34.

## ! WARNING

### POTENTIAL HAZARD

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

### WHAT CAN HAPPEN

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

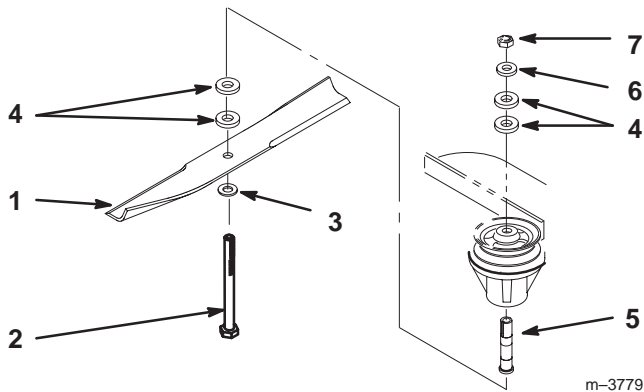
### HOW TO AVOID THE HAZARD

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

## Removing the Blades

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

Hold the blade bolt with a wrench. Remove the nut, blade bolt, cone washer, blade, spacers and thin washer from the spindle (Fig. 33).

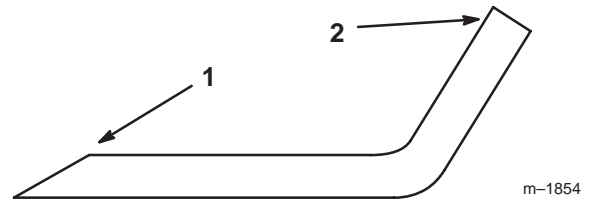


**Figure 33**

- |                |                |
|----------------|----------------|
| 1. Blade       | 5. Tube        |
| 2. Blade bolt  | 6. Thin washer |
| 3. Cone washer | 7. Nut         |
| 4. Spacer      |                |

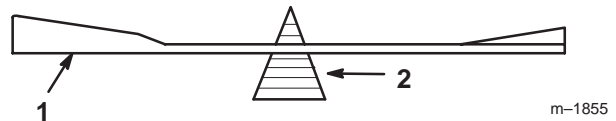
## Sharpening the Blades

1. Use a file to sharpen the cutting edge at both ends of the blade (Fig. 34). Maintain the original angle. The blade retains its balance if the same amount of material is removed from both cutting edges.



**Figure 34**

1. Sharpen at original angle
  2. Sail
2. Check the balance of the blade by putting it on a blade balancer (Fig. 35). If the blade stays in a horizontal position, the blade is balanced and can be used. If the blade is not balanced, file some metal off the end of the sail area only (Fig. 34). Repeat this procedure until the blade is balanced.



**Figure 35**

1. Blade
2. Balancer

## Installing the Blades

1. Place the blade onto the bolt, over cone washer. Select proper number of spacer(s) for height-of-cut and slide bolt into spindle (Fig. 33).

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

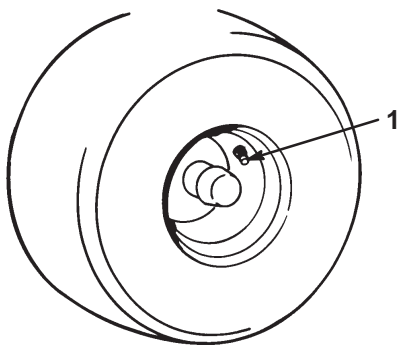
2. Install remaining spacer(s) and secure with thin washer and nut (Fig. 33).
3. Torque the blade bolt to 75–80 ft. lb. (101–108 N•m).

## Tire Pressure

### Service Interval/Specification

Maintain the air pressure in the front and rear tires as specified. Check the pressure at the valve stem after every 50 operating hours or monthly, whichever occurs first (Fig. 36). Check the tires when they are cold to get the most accurate pressure reading.

Pressure: 15 psi (103 kPa) rear tires  
25–30 psi (172–207 kPa) castor tires



**Figure 36**

1. Valve stem

## Cleaning the Cooling System

### Service Interval/Specification

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

## Greasing and Lubrication

### Service Interval/Specification

Grease the areas shown and at intervals in Where to Add Grease section below. Grease more frequently when operating conditions are extremely dusty or sandy.

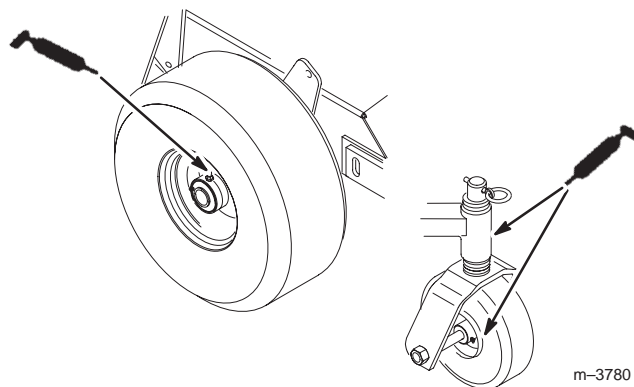
Grease Type: General-purpose grease.

### How to Grease

1. Disengage the blade control (PTO) and set the parking brake.
2. Clean the grease fittings with a rag. Make sure to scrape any paint off the front of the fitting(s).
3. Connect a grease gun to the fitting. Pump grease into the fittings until grease begins to ooze out of the bearings.
4. Wipe up any excess grease.

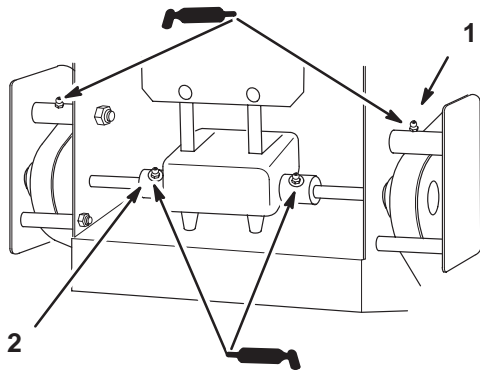
### Where to Add Grease

1. Lubricate the drive and castor wheel bearings and front spindles (Fig. 37). Lubricate every 8 hours.



**Figure 37**

2. Lubricate the transmission couplers every 50 hours and idler arm pivots every 8 hours (Fig 38).

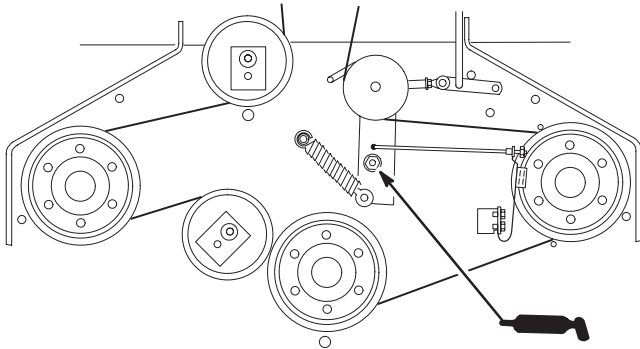


m-3797

**Figure 38**

- |  |  |
|--|--|
| 1. Idler Arm Pivots<br>(Lubricate after 8 hours) | 2. Transmission Couplers<br>(Lubricate after 50 hours) |
|--|--|

3. Lubricate the blade belt idler arm pivot. (Fig. 39). Lubricate every 50 hours.



m-4731

**Figure 39**

## Brake

### Service Interval/Specification

Before each use, check brakes for proper operation.

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

### Checking the Brake

1. Park the machine on a level surface, disengage the blade control (PTO) and set the parking brake.
2. Rear wheels must lock when you try to push the machine forward or backward. Adjustment is required if the wheels turn and do not lock; refer to Adjusting the Brake, page 37.
3. Release the brake and press upper control bar very lightly, approximately 1/2 in. (13 mm), wheels should rotate freely.
4. If both conditions are met, no adjustment is required.

## Adjusting the Brake

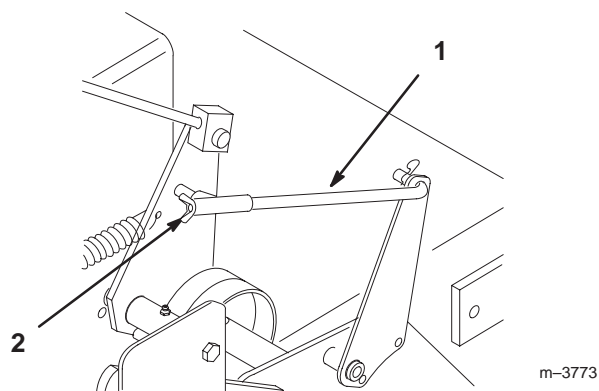
The brake lever is on the upper control bar (Fig. 12). If the parking brake does not hold securely, an adjustment is required.

1. Check the brake before you adjust it; refer to Checking the Brake, page 36.
2. Release the parking brake; refer to Releasing the Parking Brake, page 20.
3. To adjust brake set the parking brake latch, and rotate the wing nuts on the brake rods (Fig. 40). Clockwise to tighten the brake and counterclockwise to loosen the brake.

**Note:** Control bar should be parallel with reference bar when properly adjusted.

4. Check the brake operation again; refer to Checking the Brake, page 36.

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



**Figure 40**

1. Brake rod

2. Wing nut

## Fuel Tank

### Draining The Fuel Tank

#### DANGER

##### POTENTIAL HAZARD

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

##### WHAT CAN HAPPEN

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

##### HOW TO AVOID THE HAZARD

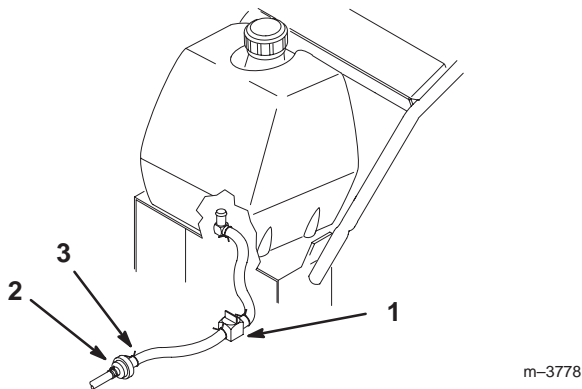
- Drain gasoline from the fuel tank when the engine is cold. Do this outdoors in an open area. Wipe up any gasoline that spills.
- Never drain gasoline near an open flame or where gasoline fumes may be ignited by a spark.
- Never smoke a cigarette, cigar or pipe.

1. Park the machine on a level surface, to assure fuel tank drains completely. Disengage the blade control (PTO) and set the parking brake. Stop engine.
2. Close the fuel shut-off valve in fuel line (Fig. 41).
3. Squeeze the ends of the hose clamp together and slide it up the fuel line away from fuel filter (Fig. 41).

4. Pull the fuel line off the fuel filter (Fig. 41). Open fuel shut-off valve and allow gasoline to drain into a gas can or drain pan.

**Note:** Now is the best time to install a new fuel filter because the fuel tank is empty. Refer to Replacing the Fuel Filter; page 38.

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



**Figure 41**

- |                        |          |
|------------------------|----------|
| 1. Fuel shut-off valve | 3. Clamp |
| 2. Fuel filter         |          |

## Fuel Filter

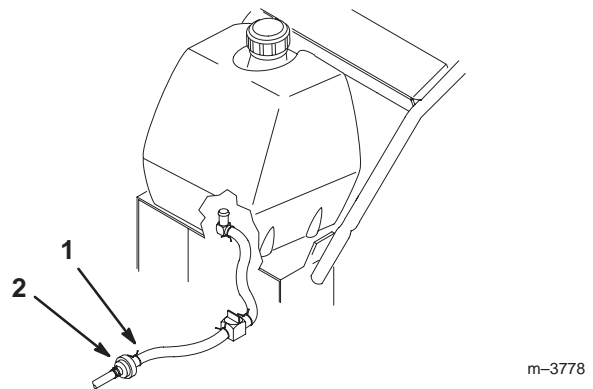
### Service Interval/Specification

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

### Replacing the Fuel Filter

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

1. Disengage the blade control (PTO) and set the parking brake. Stop engine.
2. Close fuel shut-off valve (Fig. 41).
3. Squeeze the ends of the hose clamps together and slide them away from the filter (Fig. 42).
4. Remove the filter from the fuel lines.
5. Install a new filter and move the hose clamps close to the filter.
6. Open fuel shut-off valve at fuel tank (Fig. 41).



**Figure 42**

- |               |           |
|---------------|-----------|
| 1. Hose clamp | 2. Filter |
|---------------|-----------|

## Replacing the Wheel Belt

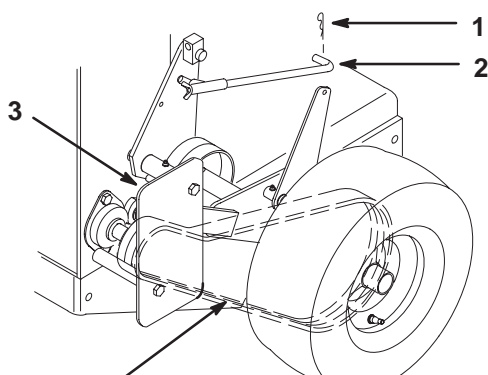
### Service Interval/Specification

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

1. Remove hairpin cotter securing brake rod to brake arm to relax belt idler tension (Fig. 43).
2. Remove bottom and loosen top bolts of shield to rotate for belt clearance (Fig. 43).
3. Lift belt past idler and off drive pulley (Fig. 43).
4. Raise wheel off ground enough to allow belt removal.

**Note:** Ensure that the mud and grass scraper is adjusted properly and centered in the pulley grooves (see page 42). The pointed part of the scraper should be centered and as deep in the pulley groove as possible, without rubbing at any point.

5. Replace drive belt.
6. Secure shield with previously removed bolt and tighten bolts (Fig. 43).
7. Secure brake rod to brake arm with haripin cotter (Fig. 43).

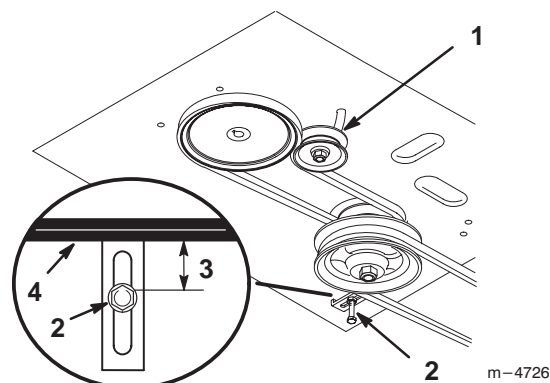


**Figure 43**

- |                   |               |
|-------------------|---------------|
| 1. Hairpin cotter | 3. Shield     |
| 2. Brake rod      | 4. Drive belt |

## Replacing the Traction Belt

1. Stop the engine, set the parking brake and remove the spark plug wire(s).
2. Raise the rear of the machine and hold with jack stands.
3. Remove mower belt (Fig. 45).
4. Loosen pivot bolt enough to slide idler pulley in slot and remove traction belt from the engine and drive pulleys.
5. Install new belt around engine and drive pulleys (Fig. 44).
6. Slide idler pulley in engine frame to tension traction belt (Fig. 44).
7. Install the mower belt (Fig. 45).
8. Check the belt guide under the engine frame for proper adjustment (Fig. 44). The distance between the belt guide and mower belt should be 1-3/8" (35mm). Adjust as necessary. The disengaged belt should not drag or fall off pulley when guides are properly adjusted.



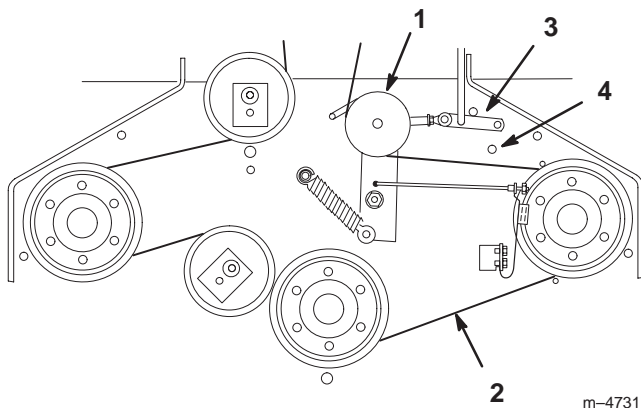
**Figure 44**

- |                  |                   |
|------------------|-------------------|
| 1. Idler in slot | 3. 1-3/8" (35 mm) |
| 2. Belt guide    | 4. Mower belt     |

## Replacing the Mower Belt

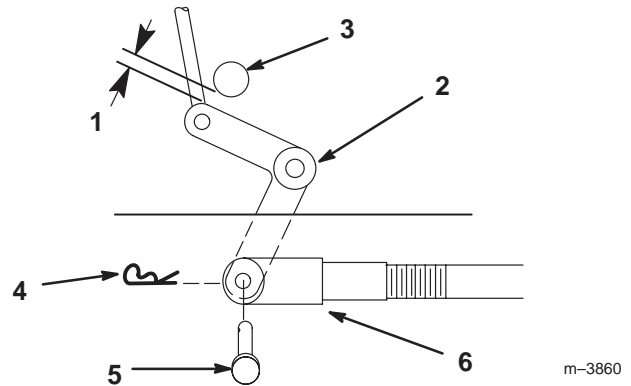
1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key and spark plug wire.
2. Remove the knobs and belt cover on mower.
3. Remove idler pulley and then remove worn belt (Fig. 45).
4. Install new belt.
5. Install idler pulley.
6. Engage PTO and check belt tension. See Adjusting Mower Belt Tension, page 41.

**Note:** Proper belt tension is 10–15 lbs. with the belt deflected a 1/2" (13mm) halfway between pulleys (Fig. 45).



**Figure 45**

- |                                 |               |
|---------------------------------|---------------|
| 1. Idler pulley                 | 3. Assist arm |
| 2. 1/2" (13 mm) deflection here | 4. Front stop |



**Figure 46**

- |                              |                   |
|------------------------------|-------------------|
| 1. 1/16" (2mm)–1/8" (3mm)    | 4. Hairpin cotter |
| 2. Bellcrank                 | 5. Clevis pin     |
| 3. Transmission output shaft | 6. Clevis         |

9. Disengage the PTO. If the assist arm does not contact the front stop on the mower deck (Fig. 45), readjust the clevis to bring the bellcrank closer to the transmission output shaft (Fig. 46).
10. Check the belt guide under the engine frame for proper adjustment (Fig. 44). The distance between the belt guide and mower belt should be 1-3/8" (35mm). Adjust as necessary. The disengaged belt should not drag or fall off pulley when guides are properly adjusted.

7. Engage PTO lever and check the clearance between the bellcrank and the transmission output shaft (Fig. 46). Space should be 1/16" (2mm)–1/8" (3mm).
8. Remove hairpin cotter and clevis pin from bellcrank. Rotate clevis clockwise on rod to increase or counterclockwise to decrease clearance (Fig. 46).

# Adjusting Mower Belt Tension

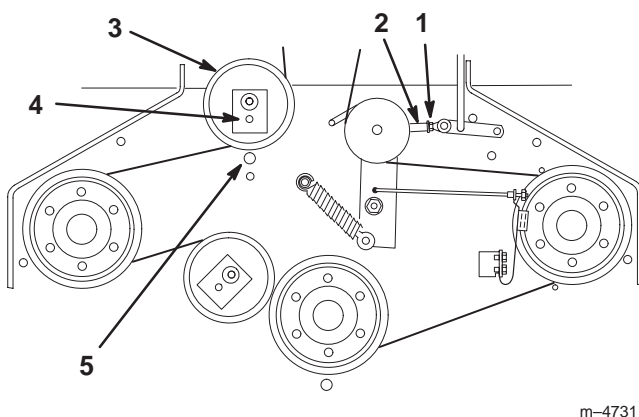
## Service Interval/Specification

Check belt tension after the first hour of operation and at least twice during the first 24 hours of operation.

**IMPORTANT:** Belt must be tight enough to not slip during heavy loads while cutting grass. Over tensioning will reduce belt and spindle bearing life.

1. Set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key and spark plug wire.
2. Loosen locknut on turnbuckle (Fig. 47).
3. Rotate turnbuckle toward rear of mower to increase tension on belt. Rotate turnbuckle toward front of mower to decrease tension on belt (Fig. 47).

**Note:** The eyebolt threads on both ends of the turnbuckle should be engaged a minimum of 5/16" (8mm).



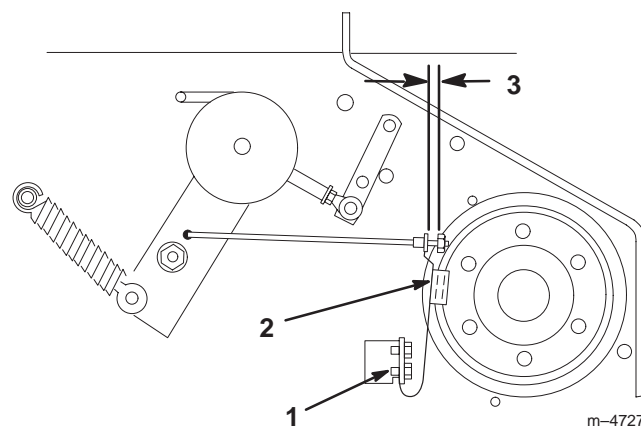
**Figure 47**

- |                      |                                    |
|----------------------|------------------------------------|
| 1. Locknut           | 4. Front position for idler pulley |
| 2. Turnbuckle        | 5. Belt guide                      |
| 3. Rear idler pulley |                                    |

4. If the belt is still loose after making adjustments to the turnbuckle, reposition the rear idler pulley to the front hole. The belt guide next to the pulley must also be moved to the front hole (Fig. 47).
5. Readjust the turnbuckle.

## Adjusting the Blade Brake

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key and spark plug wire.
2. If necessary, adjust the spring mounting bolts so that the blade brake pad rubs against the pulley edges (Fig. 48).
3. Adjust the nut at the end of the blade brake rod until there is 1/8" (3mm)–3/16" (5mm) between the nut and spacer (Fig. 48).
4. Engage the blades. Ensure the blade brake pad no longer contacts the pulley edges.



**Figure 48**

- |                          |                           |
|--------------------------|---------------------------|
| 1. Spring mounting bolts | 3. 1/8" (3mm)–3/16" (5mm) |
| 2. Blade brake pad       |                           |

## Adjusting Grass\Mud Scraper

1. Loosen the locknut holding scraper to the engine frame (Fig. 49).
2. Rotate scraper until they align with center of pulley grooves (Fig. 49).
3. Tighten the locknut (Fig. 49).

**Note:** The scraper must not contact the pulley on the sides or bottom of grooves. Re-adjust if necessary.

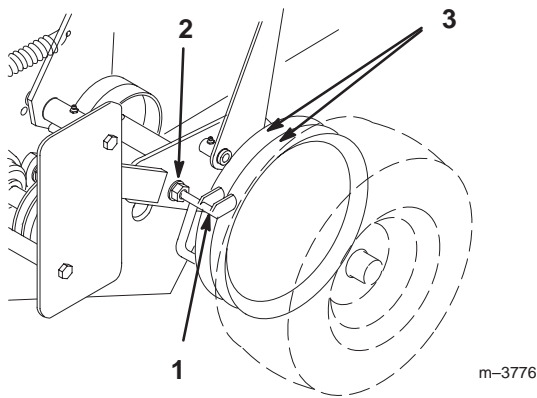


Figure 49

1. Scraper
2. Locknut
3. Pulley

## Replacing the Grass Deflector

1. Remove the locknut, bolt, spring and spacer holding deflector to the mounts (Fig. 50).
2. Straighten deflector mounts if they are bent (Fig. 50).
3. Install new deflector between mounts with spacer and spring. Hook the front end of the spring around the front deflector mount. Insert bolt through spacer and secure with locknut. Confirm there is downward spring force on deflector (Fig. 50).
4. Tighten the bolt and locknut until they lightly contact the pivot brackets (Fig. 50).

**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.

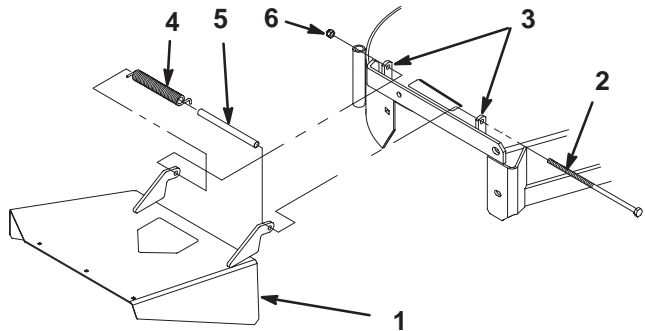
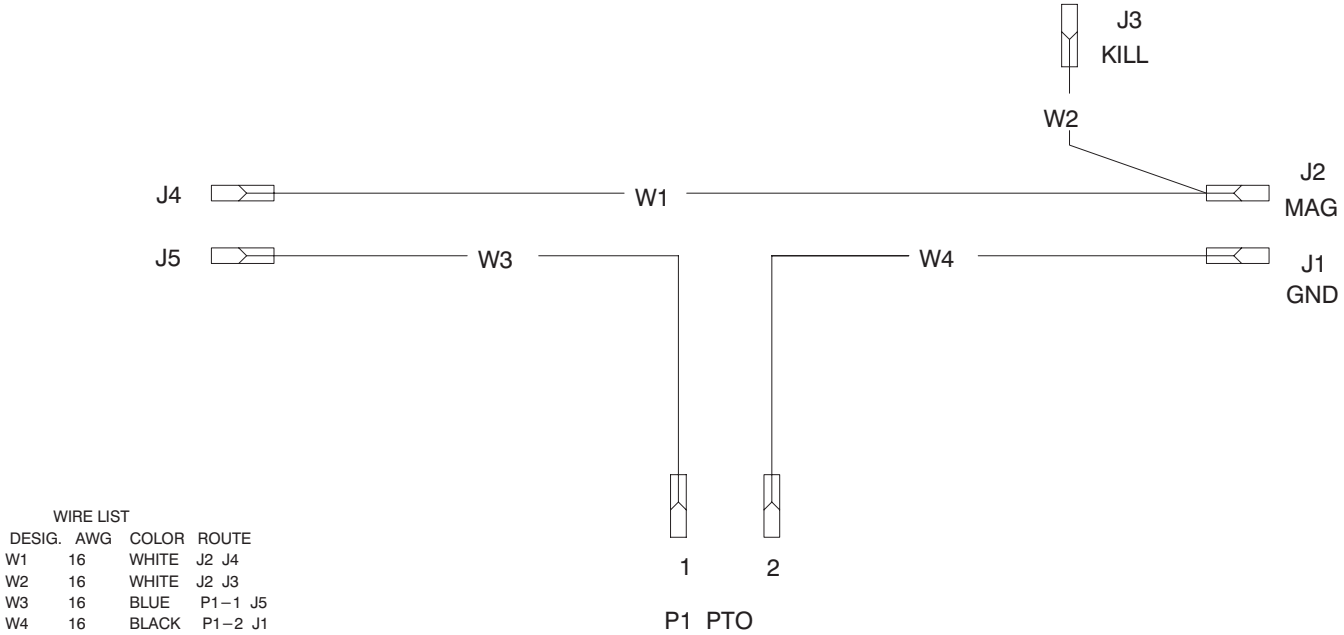


Figure 50

1. Deflector
2. Bolt
3. Deflector mount
4. Spring
5. Spacer
6. Locknut

M-4766

# Wiring Diagram



## Cleaning and Storage

1. Disengage the blade control (PTO), set the parking brake and turn the machine “OFF”.
2. Remove grass clippings, dirt, and grime from the external parts of the entire machine, especially the engine. Clean dirt and chaff from the outside of the engine’s cylinder head fins and blower housing.

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

**When done washing, start engine and engage PTO and run for five minutes. This will dry machine before storing.**

3. Check the brake; refer to Brake, page 36.
4. Service the air cleaner; refer to Air Cleaner, page 28.
5. Grease the machine; refer to Greasing and Lubrication, page 35.
6. Change the crankcase oil; refer to Engine Oil, page 29.
7. Check the tire pressure; refer to Tire Pressure, page 35.
8. For storage over 30 days, prepare the traction unit as follows.
  - A. Add a petroleum based stabilizer/conditioner to fuel in the tank. Follow mixing instructions from stabilizer manufacturer. (1 oz. per gallon). **Do not use an alcohol based stabilizer (ethanol or methanol).**

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

- B. Run the engine to distribute conditioned fuel through the fuel system (5 minutes).
- C. Stop the engine, allow it to cool and drain the fuel tank; refer to Draining Fuel Tank, page 37.
- D. Restart the engine and run it until it stops.
- E. Choke or prime the engine.
- F. Start and run the engine until it will not start again. Use the primer, if equipped on machine, several times to ensure no fuel remains in primer system.
- G. Dispose of fuel properly. Recycle as per local codes.

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

9. Remove the spark plug(s) and check its condition; refer to Spark Plug, page NO TAG. With the spark plug(s) removed from the engine, pour two tablespoons of engine oil into the spark plug hole. Now use the starter to crank the engine and distribute the oil inside the cylinder. Install the spark plug(s). Do not install the wire on the spark plug(s).
10. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged or defective.
11. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
12. Store the machine in a clean, dry garage or storage area. Cover the machine to protect it and keep it clean.

# Troubleshooting

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Engine will not start, starts hard, or fails to keep running.	<ol style="list-style-type: none"> <li>1. Fuel tank is empty.</li> <li>2. Choke is not ON.</li> <li>3. Air cleaner is dirty.</li> <li>4. Spark plug wire is loose or disconnected.</li> <li>5. Spark plug is pitted, fouled, or gap is incorrect.</li> <li>6. Dirt in fuel filter.</li> <li>7. Dirt, water, or stale fuel is in fuel system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill fuel tank with gasoline.</li> <li>2. Move choke lever to ON.</li> <li>3. Clean or replace air cleaner element.</li> <li>4. Install wire on spark plug.</li> <li>5. Install new, correctly gapped spark plug.</li> <li>6. Replace fuel filter.</li> <li>7. Contact Authorized Service Dealer.</li> </ol>
Engine loses power.	<ol style="list-style-type: none"> <li>1. Engine load is excessive.</li> <li>2. Air cleaner is dirty.</li> <li>3. Oil level in crankcase is low.</li> <li>4. Cooling fins and air passages under engine blower housing are plugged.</li> <li>5. Spark plug is pitted, fouled, or gap is incorrect.</li> <li>6. Vent hole in fuel cap is plugged.</li> <li>7. Dirt in fuel filter.</li> <li>8. Dirt, water, or stale fuel is in fuel system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce ground speed.</li> <li>2. Clean air cleaner element.</li> <li>3. Add oil to crankcase.</li> <li>4. Remove obstruction from cooling fins and air passages.</li> <li>5. Install new, correctly gapped spark plug.</li> <li>6. Clean or replace the fuel cap.</li> <li>7. Replace fuel filter.</li> <li>8. Contact Authorized Service Dealer.</li> </ol>
Engine overheats.	<ol style="list-style-type: none"> <li>1. Engine load is excessive.</li> <li>2. Oil level in crankcase is low.</li> <li>3. Cooling fins and air passages under engine blower housing are plugged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce ground speed.</li> <li>2. Add oil to crankcase.</li> <li>3. Remove obstruction from cooling fins and air passages.</li> </ol>
Abnormal vibration.	<ol style="list-style-type: none"> <li>1. Engine mounting bolts are loose.</li> <li>2. Loose engine pulley, idler pulley, or blade pulley.</li> <li>3. Engine pulley is damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten engine mounting bolts.</li> <li>2. Tighten the appropriate pulley.</li> <li>3. Contact Authorized Service Dealer.</li> </ol>

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Machine does not drive.	<ol style="list-style-type: none"> <li>1. Shift lever is in NEUTRAL.</li> <li>2. Traction belt is worn, loose or broken.</li> <li>3. Traction belt is off pulley.</li> </ol>	<ol style="list-style-type: none"> <li>1. Move shift lever to a drive gear position.</li> <li>2. Change Belt.</li> <li>3. Change Belt.</li> </ol>
Abnormal vibration.	<ol style="list-style-type: none"> <li>1. Cutting blade(s) is/are bent or unbalanced.</li> <li>2. Blade mounting bolt is loose.</li> <li>3. Engine mounting bolts are loose.</li> <li>4. Loose engine pulley, idler pulley, or blade pulley.</li> <li>5. Engine pulley is damaged.</li> <li>6. Blade spindle bent.</li> </ol>	<ol style="list-style-type: none"> <li>1. Install new cutting blade(s).</li> <li>2. Tighten blade mounting bolt.</li> <li>3. Tighten engine mounting bolts.</li> <li>4. Tighten the appropriate pulley.</li> <li>5. Contact Authorized Service Dealer.</li> <li>6. Contact Authorized Service Dealer.</li> </ol>
Uneven cutting height.	<ol style="list-style-type: none"> <li>1. Blade(s) not sharp.</li> <li>2. Cutting blade(s) is/are bent.</li> <li>3. Mower is not level.</li> <li>4. Underside of mower is dirty.</li> <li>5. Tire pressure is incorrect.</li> <li>6. Blade spindle bent.</li> </ol>	<ol style="list-style-type: none"> <li>1. Sharpen blade(s).</li> <li>2. Install new cutting blade(s).</li> <li>3. Level mower from side-to-side and front-to-rear.</li> <li>4. Clean the underside of the mower.</li> <li>5. Adjust tire pressure.</li> <li>6. Contact Authorized Service Dealer.</li> </ol>
Blades do not rotate.	<ol style="list-style-type: none"> <li>1. Drive belt is worn, loose or broken.</li> <li>2. Drive belt is off pulley.</li> <li>3. Deck belt is worn, loose or broken.</li> <li>4. Deck belt is off pulley.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check belt tension.</li> <li>2. Install drive belt and check adjusting shafts and belt guides for correct position.</li> <li>3. Install new deck belt.</li> <li>4. Install deck pulley and check the idler pulley, idler arm and spring for correct position and function.</li> </ol>
Blades do not stop when disengaged.	<ol style="list-style-type: none"> <li>1. Blade brake is not adjusted properly.</li> <li>2. Belt guide is not set properly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust blade brake.</li> <li>2. Adjust belt guide.</li> </ol>









## THE TORO TOTAL COVERAGE GUARANTEE

### A One-Year Limited Warranty (A Two-Year Full Warranty for Residential Use)

#### What Is Covered By This Express Warranty?

The Toro Company promises to repair any TORO Product used for commercial, institutional, or rental purposes if defective in materials or workmanship. The following time frames apply from the date of purchase:

Product	Warranty Period
All Products	1 year
All Spindles	2 years parts & labor, 3rd year parts only
Engines on the following:	2 years
Out Front and MidMount Zero Radius Tractors	
ProLine Mid-size Mowers	
Groundsmaster Riding Mowers	
ProLine Hand Held Gas Products (AE & LE engines only)	
Backpack Blowers	

The cost of parts and labor are included, but the customer pays the transportation cost. Transportation within a 15-mile radius of a TORO ProLine Service Dealer is covered under this warranty for Riding Products, Midsized Mowers and Turf Maintenance Equipment.

#### What Products Are Covered By This Warranty?

- Z-Master Zero Radius Tractors
- ProLine Mid-size Mowers
- Groundsmaster Riding Mowers
- ProLine Hand-held Gas Products
- Backpack Blowers
- Turf Maintenance Equipment
- Debris Management Equipment

#### How About Residential Use?

TORO Products used for residential use are covered by a full two-year warranty.

#### How Do You Get Warranty Service?

Should you feel your TORO Product contains a defect in materials or workmanship, contact the dealer who sold you the product or any TORO ProLine Service Dealer. The Yellow Pages of your telephone directory is a good reference source; look under TORO Commercial Service Dealers. The Service Dealer will either arrange service at his/her dealership or recommend another authorized Service Dealer who may be more convenient. You may need proof of purchase (copy of registration card, sales receipt, etc.) for warranty validation.

If for any reason you are dissatisfied with a Service Dealer's analysis of the defect in materials or workmanship or if you need a referral to a TORO ProLine Service Dealer, please feel free to contact us at the following address:

Toro Customer Service Department  
8111 Lyndale Avenue South  
Bloomington, MN 55420-1196  
612-888-8801 or 800-348-2424

#### What Must You Do To Keep The Warranty In Effect?

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.

#### What Does This Warranty Not Cover? and How Does Your State Law Relate To This Warranty?

There is no other express warranty except for special emission system coverage on some products and as described above. This express warranty does not cover:

- 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 for distances beyond a 15-mile radius from a TORO ProLine Service Dealer.

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

**The Toro Company is not liable for indirect 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, so the above exclusion may not apply to you.**

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

#### 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 The Toro Company.