



ProLine

13hp–92cm Mid–Size Mower

30184—200000001 & Up

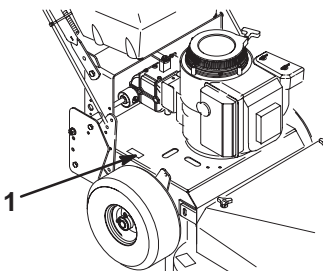
Operator's Manual

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

Toro designed this lawn mower for cutting and mulching grass, or, when equipped with a grass bag, for catching cut grass. Any use for purposes other than these could prove dangerous to the operator or to bystanders.

Note: This engine is **not** equipped with a spark arrester muffler. Operating this mower on any forest-covered, brush-covered, or unimproved grass-covered land without an approved spark arrester muffler may violate your state law.

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.**

To ensure maximum safety, best performance, and to gain knowledge of the product, it is essential that you and any other operator of the lawn mower read and understand the contents of this manual before the motor is ever started. Pay particular attention to the safety alert symbol  which means **CAUTION, WARNING, OR DANGER** — “personal safety instruction.” Read and understand the instruction because it has to do with safety. Failure to comply with instruction may result in personal injury.

General Lawn Mower Safety

The following instructions have been adapted from the ANSI/OPEI standard B71.1—1998 and ISO standard 5395:1990(E). Information or terminology specific to Toro lawn mowers is enclosed in parenthesis.

This cutting machine is capable of amputating hands and feet and throwing objects. Failure to observe the following safety instructions could result in serious injury or death.

Training

- Read the instructions carefully. Be familiar with the controls and the proper use of the equipment before starting.
- See manufacturer’s instructions for proper operation and installation of accessories. Only use accessories approved by the manufacturer.
- Never allow children or people unfamiliar with these instructions to use the mower. Local regulations may restrict the age of the operator.
- Never mow while people, especially children, or pets are nearby. Stop mower if anyone enters the area.

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the mower and the mowing activity. **Never** assume that children will remain where you last saw them.

- Keep children out of the mowing area and under the watchful care of a responsible adult.
- Be alert and turn mower off if children enter the area.
- Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
- Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.

Preparation

- While mowing, always wear substantial footwear and long trousers.
- Do not operate the equipment when barefoot or wearing open sandals.
- Always wear safety goggles or safety glasses with side shields when operating mower.
- Thoroughly inspect the area where the equipment is to be used and remove all stones, sticks, wires, bones, and other foreign objects.
- **Warning: Gasoline is highly flammable.** Take the following precautions:
 - Store fuel in containers specifically designed for this purpose.

- Refuel outdoors only and do not smoke while refuelling.
- Add fuel before starting the engine. Never remove the cap of the fuel tank or add gasoline while the engine is running or when the engine is hot.
- If gasoline is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until gasoline vapors have dissipated.
- Replace all fuel tank and container caps securely.
- If the fuel tank has to be drained, do this outdoors.
- Replace faulty mufflers.
- Before using, always visually inspect to see that the blades, blade bolts, and cutter assembly are not worn or damaged. Replace worn or damaged blades and bolts in sets to preserve balance.
- On multibladed machines, take care as rotating one blade can cause other blades to rotate.
- Stop the blade(s) if the mower has to be tilted for transportation when crossing surfaces other than grass and when transporting the mower to and from the area to be mowed.
- Never operate the mower with damaged or missing guards or shields, or without safety devices; for example, deflectors and/or grass catchers in place.
- Do not change the engine governor settings or overspeed the engine.
- Disengage all blade and drive clutches before starting the engine.
- Start the engine or switch on the motor carefully according to instructions and with feet well away from the blade(s).
- Do not tilt when starting the engine or switching on the motor, unless the mower has to be tilted for starting. In this case, do not tilt it more than absolutely necessary and lift only the part which is away from the operator.
- Do not start the engine when standing in front of the discharge chute.
- Do not put hands or feet near or under rotating parts. Keep clear of the discharge opening at all times.
- Never pick up or carry a mower while the engine is running.

Operation

- Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.
- Mow only in daylight or in good artificial light.
- Always be sure of your footing on slopes.
- Walk; never run.
- Keep a firm hold on the handle.
- For wheeled rotary machines, mow across the face of slopes, never up and down.
- Exercise extreme caution when changing direction on slopes.
- Do not mow excessively steep slopes.
- Use extreme caution when reversing or pulling the mower towards you.
- Before and while moving backwards, look behind and down for small children.
- Stop the engine and disconnect the spark plug lead
 - before clearing blockages or unclogging chute;
 - before checking, cleaning, or working on the mower;
 - after striking a foreign object. Inspect the mower for damage and make repairs before restarting and operating the mower;
 - if mower starts to vibrate abnormally (check immediately).
- Stop the engine
 - whenever you leave the mower;
 - before refuelling.

- Reduce the throttle setting during engine run-out and, if the engine is provided with a shut-off valve, turn the fuel off at the conclusion of mowing.
- Stop the blade(s) when crossing gravel drives, walks, or roads.
- Shut the engine (motor) off and wait until the blade comes to complete stop before removing grass catcher.
- Do not operate the mower while under the influence of alcohol or drugs.
- If the equipment should start to vibrate abnormally, stop the engine (motor) and check immediately for the cause. Vibration is generally a warning of trouble.

Slopes are a major factor related to slip and fall accidents which can result in a severe injury. If you feel uneasy on a slope, do not mow it.

- Watch for holes, ruts, or bumps. Tall grass can hide obstacles.
- **Do not** mow near drop-offs, ditches, or embankments. The operator could lose footing or balance.
- **Do not** mow on wet grass. Reduced footing could cause slipping.

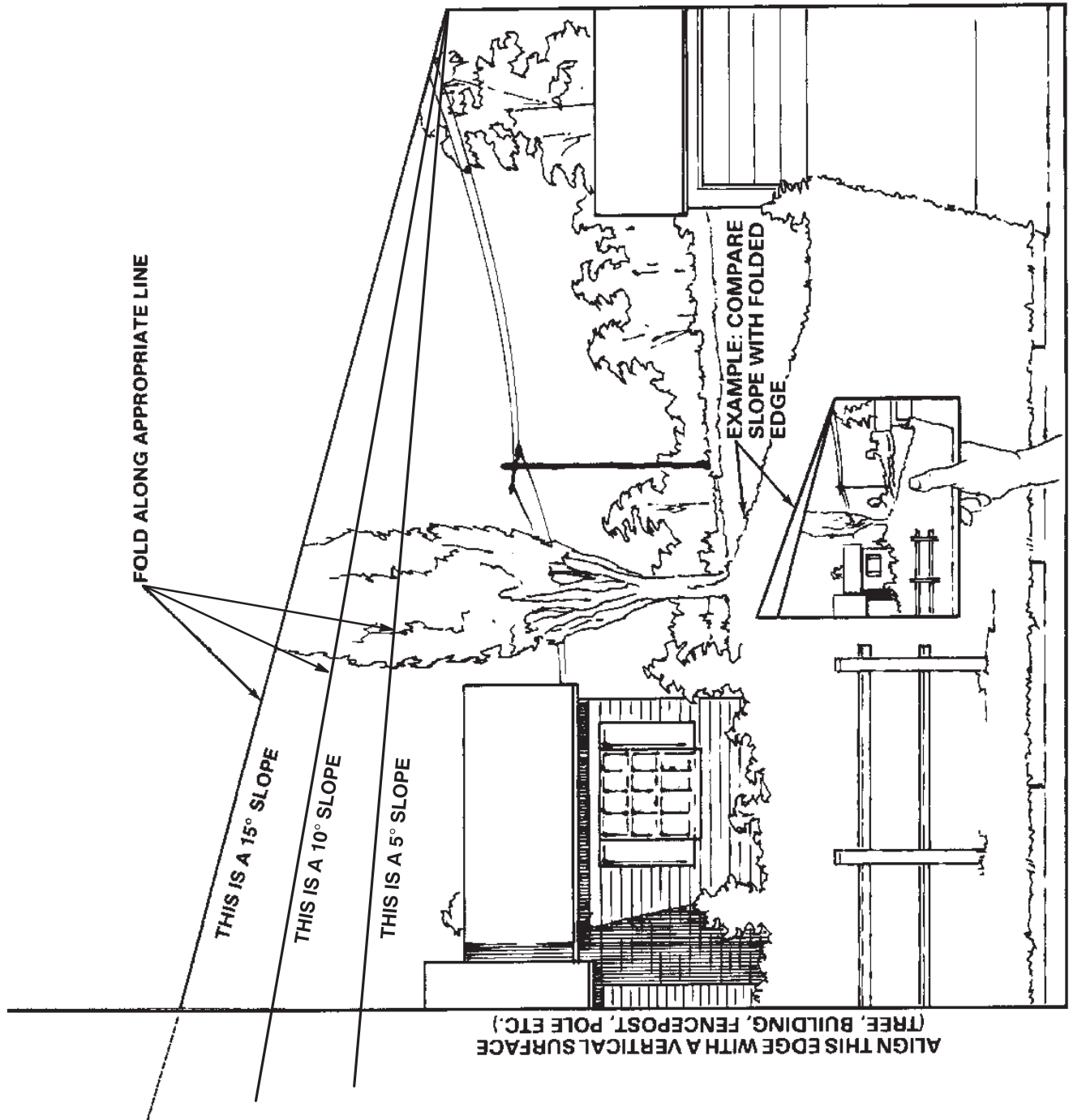
Maintenance and Storage

- Keep all nuts, bolts (especially blade attachment bolts), and screws tight to be sure the equipment is in safe working condition.
- Never store the equipment with gasoline in the tank inside a building where fumes may reach an open flame or spark.
- Allow the engine to cool before storing in any enclosure.
- To reduce the fire hazard, keep the engine, muffler, battery compartment, and gasoline storage area free of grass, leaves, or excessive grease.
- Check the grass catcher frequently for wear or deterioration.
- Replace worn or damaged parts for safety.
- Use extra care when handling gasoline; vapors are explosive.

- tamper with safety devices. Check their proper operation regularly.
- Keep the mower free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage.
- Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.
- Never attempt to make wheel height adjustments while the engine (motor) is running.
- Always disconnect electric mowers (live operated) before cleaning, repairing, or adjusting.
- Grass catcher components are subject to wear, damage, and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check components and replace with manufacturer's recommended parts when necessary.
- Mower blades are sharp and can cut. Wrap the blade(s) or wear gloves, and use extra caution when servicing them.
- Do not change the engine governor setting or overspeed the engine.
- To ensure the best performance and safety, purchase only genuine Toro replacement parts and accessories. **Do not use "will fit" parts and accessories; they may cause a safety hazard.**

Slope Chart

Read all safety instructions on pages 2–9.



Symbols Glossary

Safety alert triangle—
symbol within triangle
indicates a hazard



Fire, open light & smoking
prohibited



Safety alert symbol



Fire or open flame



Explosion



Read operator's manual



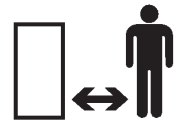
Do not dispose of lead
battery in garbage



Caustic liquids, chemical
burns to fingers or hand



Stay a safe distance
from the machine



Caution, toxic risk



Stay safe distance
from machine



Eye protection must
be worn



Stay safe distance
from machine



First aid, flush with water



Keep children away
from battery



Symbols Glossary

Do not open or remove safety shields while engine is running



Cutting of foot



Thrown or flying objects, whole body exposure



Hot surface, burns to fingers or hands



Thrown or flying objects, whole body exposure



Stop engine before leaving operator position



Do not operate without safety shield in place



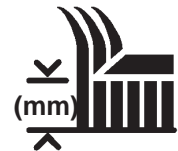
Machine being transported



Keep guards and safety shields in place



Blade cutting element-height adjustment



Severing of toes & fingers, rotary mower blade



Fuel shut off control operation



Severing of fingers or hand, mower blade



Blade retaining bolts must be Torqued to 101–108 N.m















Severing of toes or foot, mower blade



Finger & hand engagement, belt drive



Symbols Glossary

Fast		Parking brake	
Slow		Traction drive	
Decreasing/Increasing		Reverse	R
Stop Engine		Neutral	N
Choke		First gear	1
Fuel		Second gear	2
Power take off (PTO)		Third gear	3
Engage		Fourth gear	4
Disengage		Fifth gear	5
Parking brake		Forward	F

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.

Using Stabilizer/Conditioner

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

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

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

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

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

Filling the Fuel Tank

1. Shut the engine off.
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 30.

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 19 mm (3/4")	8	
Flange nut 3/8–16	8	
Upper handle	1	Install upper handle to frame
Bolt 3/8–16 x 26 mm (1")	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 22.5 mm (7/8")	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 19 mm (3/4") 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 40-47 N•m (30-35 ft. lb.).

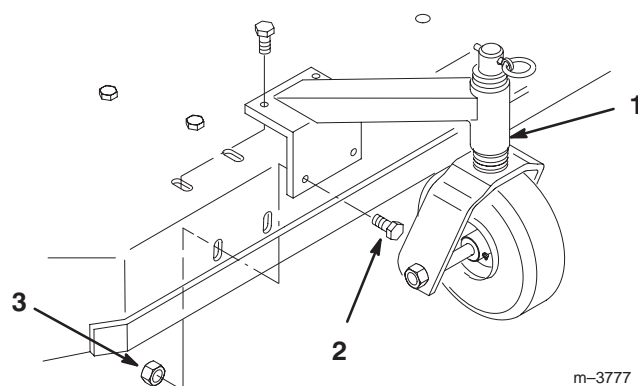


Figure 1

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 mounting holes. Select desired lower mounting holes for high, medium or low position according to operators height (Fig. 2).
2. Secure each side with (2) 3/8-16 x 26mm (1") bolts and (2) 3/8-16 locknuts (Fig. 2).
3. Torque bolts to 34 N•m (25 ft. lbs.).

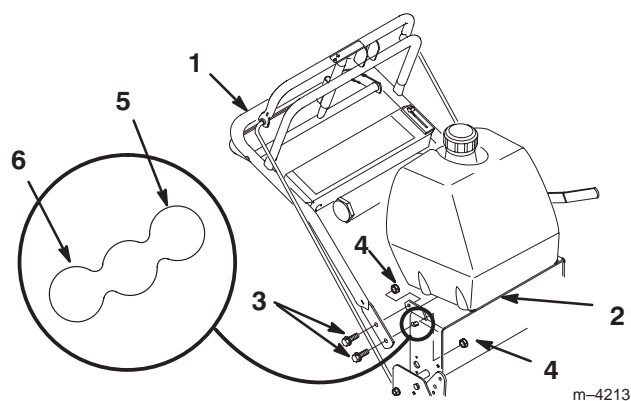


Figure 2

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

1. 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).
2. Thread harness up through rear tube of traction handle (Fig. 3).

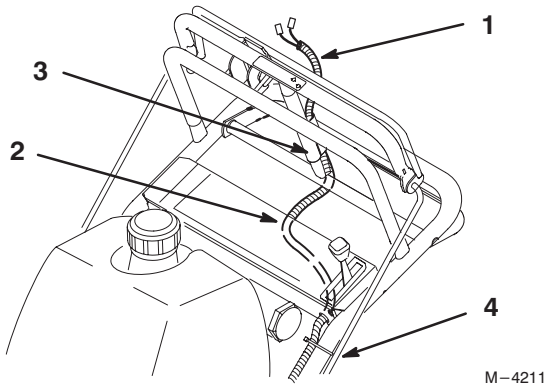


Figure 3

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

3. Insert terminals into plastic plug until the clips snap into position (Fig. 4). If they do not snap turn around.
4. Push plug onto switch to latch interlock (Fig. 4).
5. Secure wire harness and throttle cable to left handle, away from PTO lever, with wire tie (Fig. 3).

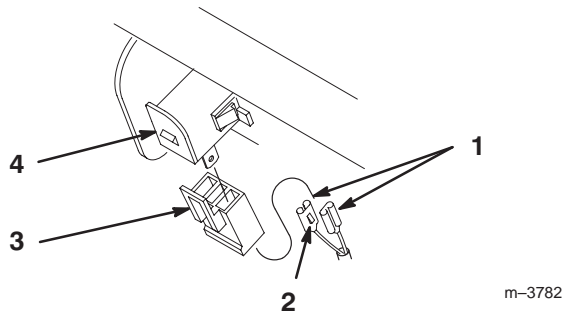


Figure 4

- | | |
|-------------|-----------------|
| 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 51 mm (2 in.) (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 6 mm (1/4") washers and hairpin cotters (Fig. 5).

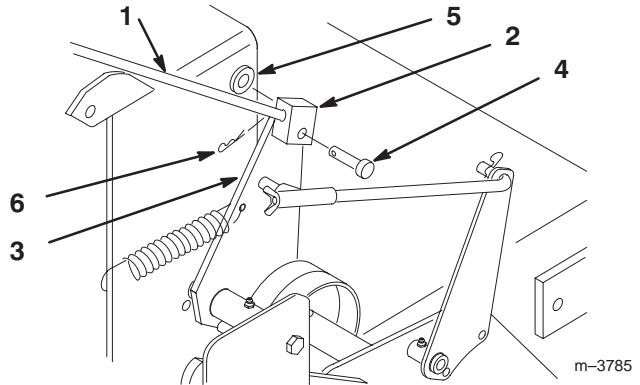


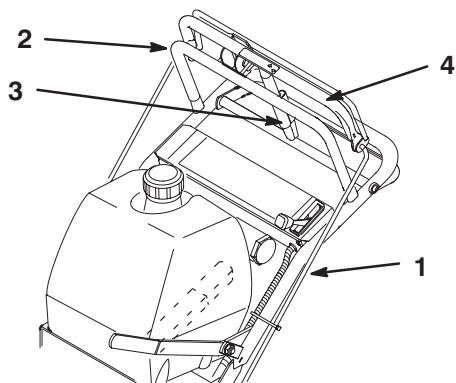
Figure 5

- | | |
|------------------|------------------------|
| 1. Control rod | 4. Clevis pin |
| 2. Trunnion | 5. Washer 6 mm (1/4") |
| 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 25–32 mm (1 to 1-1/4 in.) (Fig. 6).

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

4. After completing assembly 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 37 for instructions.



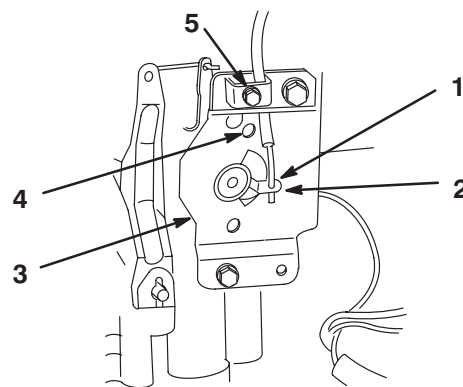
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Figure 6

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



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Figure 7

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

Install Blade Control (PTO) Rod

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

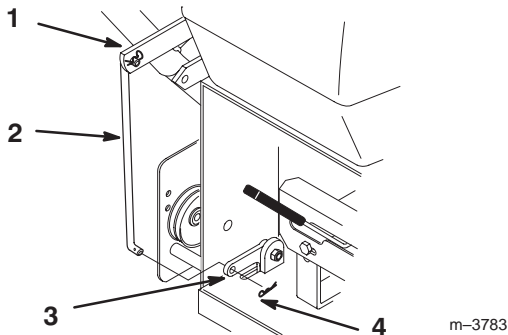


Figure 8

- | | |
|------------------------|-------------------|
| 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 47 N•m (35 ft. lbs.).
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.

7. Shift lever to neutral and check alignment of lever in slot of shifter plate. Clearance between left and right of slot should be about equal. If not move control panel to adjust (Fig. 9).

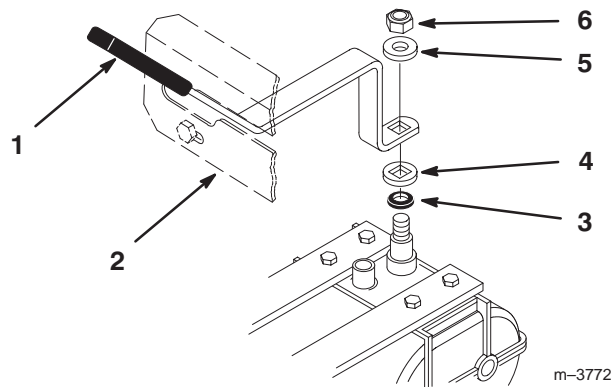


Figure 9

- | | |
|-----------------------|-----------------------|
| 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 22.5 mm (7/8 in.) bolts, (2) 5/16 lock washers and (2) 5/16 washers (Fig. 10).
2. Torque bolts to 13 N•m (10 ft. lbs.).
3. Secure fuel tank left side to frame with (2) 5/16–18 x 22.5 mm (7/8 in.) studs, (2) 5/16 washers and (2) 5/16 locknuts (Fig. 10).
4. Tighten nuts until stud threads appear just below nut.

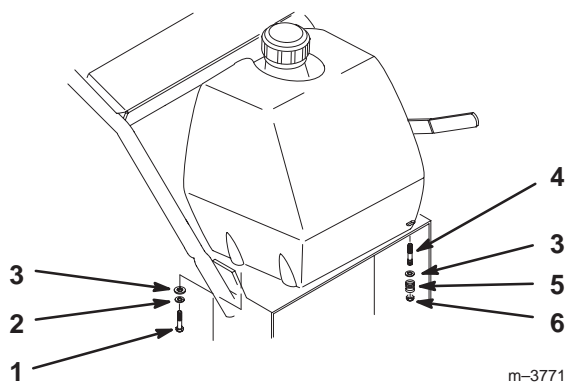


Figure 10

- | | |
|---------------------------------|------------|
| 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 |

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

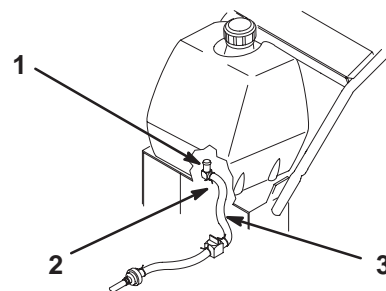


Figure 11

- | | |
|---------------|-----------------|
| 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, all the way, 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.

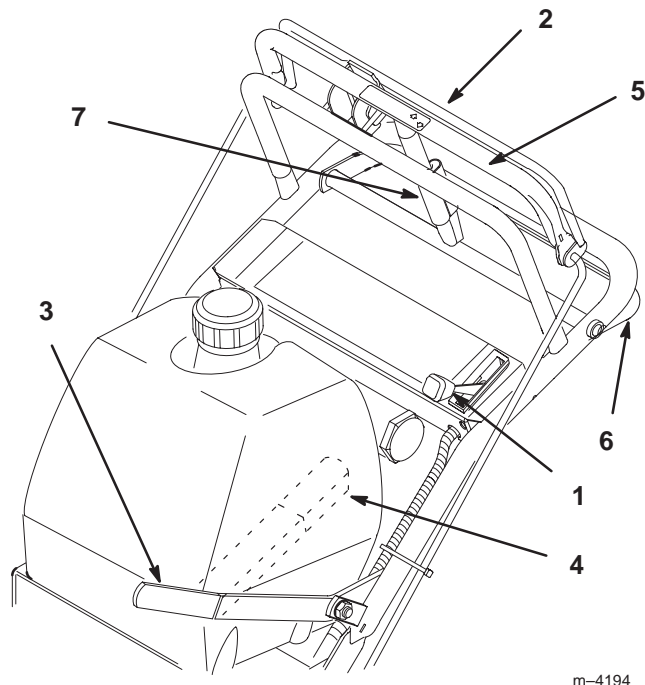
Upper Control Bar – Shift to desired gear and push forward on control bar to engage forward traction operation and pull back to brake. Pull right side of control bar to turn right and left side to turn left.

Lower Control Bar – Shift transmission to reverse and 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 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.



m-4194

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.

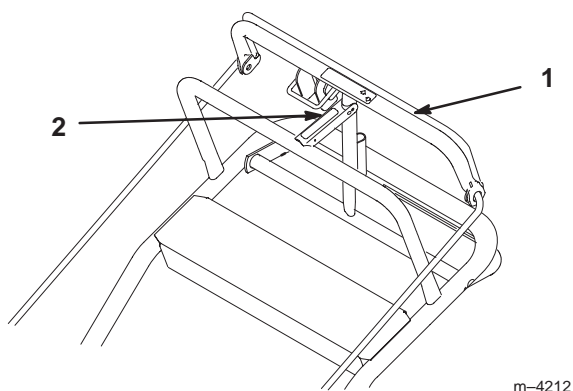


Figure 13

- | | |
|----------------------|-----------------------|
| 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 brake.
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.

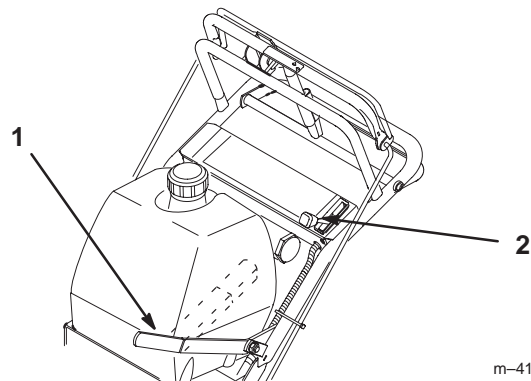
IMPORTANT: Do not pull recoil rope to its limit or let go of the starter handle when rope is pulled out because rope may break or recoil assembly may be damaged.

Stopping

1. Move the throttle lever to “SLOW” (Fig. 14).

Note: If the engine has been working hard or is hot, let it idle for a minute before stopping. This helps cool the engine. In an emergency, the engine may be stopped by pulling the throttle all the way back, past SLOW.

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



m-4194

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 going over-center (Fig. 15).

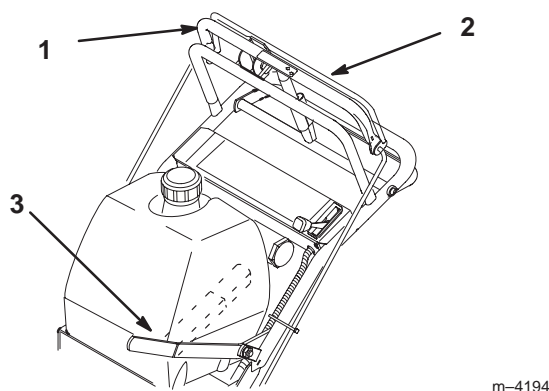


Figure 15

- | | |
|----------------------|------------------------|
| 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 19.
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).

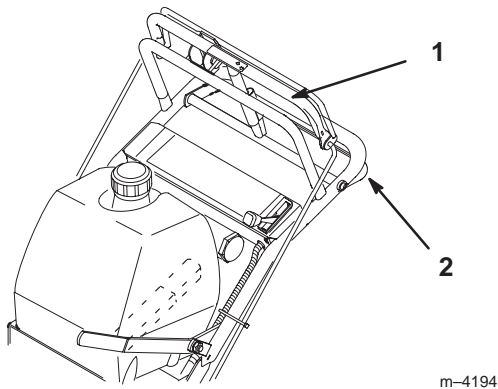


Figure 16

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 19.
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

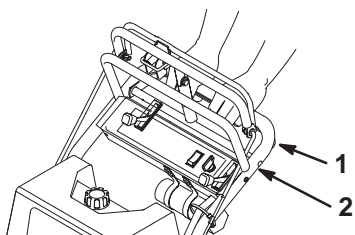
- Do not run blades while driving up a curb forward or backward.

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).

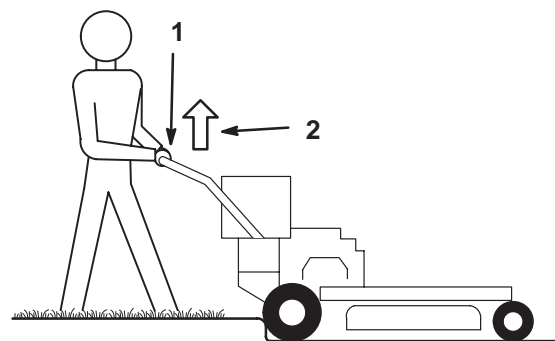
Note: Lifting up on handle will assist driving the machine up a curb and not spin the drive wheels.



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

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 19.

Adjusting Height-of-Cut

A 25mm to 108mm (1" to 4-1/4") range for height-of-cut can be achieved by adjusting blade spacers, rear axle height and front caster 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, 6.35mm (1/4") spacers found on the blade spindle bolts. This allows a range, in 6.35mm (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 101–108 N•m (75–80 ft. lb.).

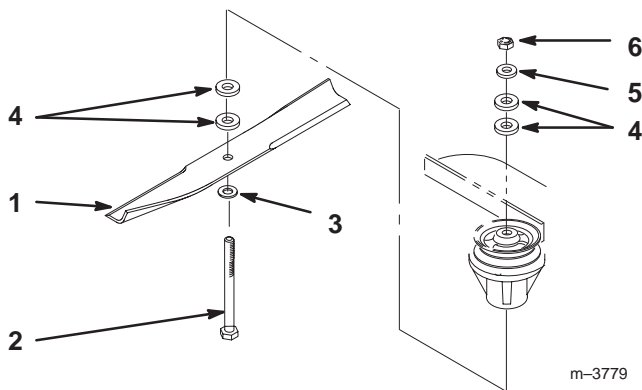


Figure 19

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

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, remove spark plug wire(s) and belt guard (Fig. 20).
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.

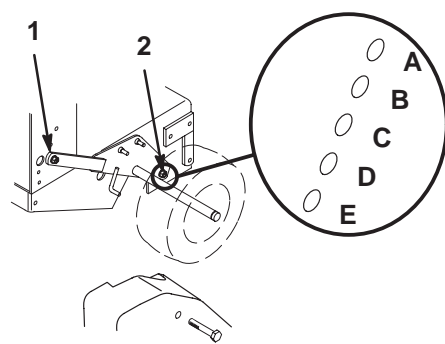


Figure 20

- | | |
|--------------------|-------------------------|
| 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 castor from support and change spacers(Fig. 21).
3. Install castor in support and insert clevis pin(Fig. 21).

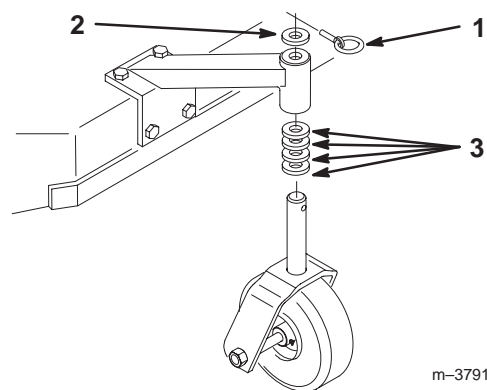


Figure 21

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

Height-of-Cut Chart

Axle Position	No. of Spacers Below Caster		Number of 6mm (1/4") Blade Spacers Below Spindle				
	13mm (1/2")	5 mm (3/16")	4	3	2	1	0
A	0	0	26mm (1")	32mm (1-1/4")	39mm (1-1/2")	45mm (1-3/4")	51mm (2")
A	0	1	29mm (1-1/8")	35mm (1-3/8")	42mm (1-5/8")	48mm (1-7/8")	54mm (2-1/8")
A	1	0	35mm (1-3/8")	42mm (1-5/8")	48mm (1-7/8")	54mm (2-1/8")	61mm (2-3/8")
B	0	1	35mm (1-3/8")	42mm (1-5/8")	48mm (1-7/8")	54mm (2-1/8")	61mm (2-3/8")
B	1	0	42mm (1-5/8")	48mm (1-7/8")	54mm (2-1/8")	61mm (2-3/8")	67mm (2-5/8")
B	1	1	45mm (1-3/4")	51mm (2")	57mm (2-1/4")	64mm (2-1/2")	70mm (2-3/4")
B	2	0	51mm (2")	57mm (2-1/4")	64mm (2-1/2")	70mm (2-3/4")	76mm (3")
C	1	1	48mm (1-7/8")	54mm (2-1/8")	61mm (2-3/8")	67mm (2-5/8")	73mm (2-7/8")
C	2	0	54mm (2-1/8")	61mm (2-3/8")	67mm (2-5/8")	73mm (2-7/8")	79mm (3-1/8")
C	2	1	57mm (2-1/4")	64mm (2-1/2")	70mm (2-3/4")	76mm (3")	82mm (3-1/4")
C	3	0	64mm (2-1/2")	70mm (2-3/4")	76mm (3")	82mm (3-1/4")	89mm (3-1/2")
D	2	1	61mm (2-3/8")	67mm (2-5/8")	73mm (2-7/8")	79mm (3-1/8")	86mm (3-3/8")
D	3	0	64mm (2-1/2")	70mm (2-3/4")	76mm (3")	82mm (3-1/4")	89mm (3-1/2")
D	3	1	70mm (2-3/4")	76mm (3")	82mm (3-1/4")	89mm (3-1/2")	95mm (3-3/4")
D	4	0	76mm (3")	82mm (3-1/4")	89mm (3-1/2")	95mm (3-3/4")	102mm (4")
E	3	1	73mm (2-7/8")	79mm (3-1/8")	86mm (3-3/8")	92mm (3-5/8")	98mm (3-7/8")
E	4	0	79mm (3-1/8")	86mm (3-3/8")	92mm (3-5/8")	98mm (3-7/8")	105mm (4-1/8")
E	4	1	82mm (3-1/4")	89mm (3-1/2")	95mm (3-3/4")	102mm (4")	108mm (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
Blade Belt Idler Pivot – 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 blade control (PTO) and set the parking brake.
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).

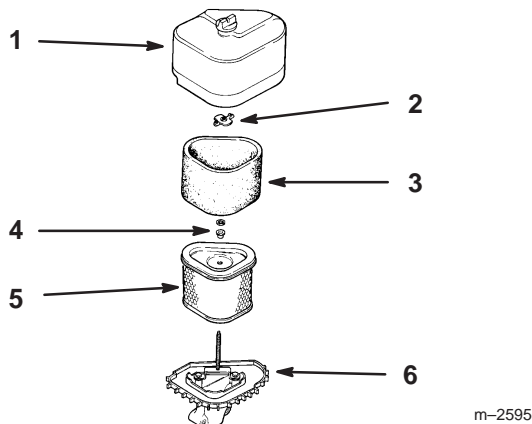


Figure 22

- | | |
|------------------|-----------------------|
| 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.

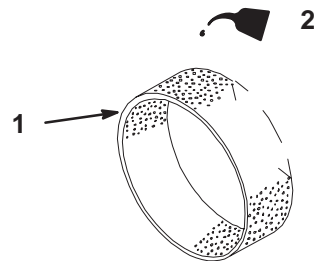


Figure 23

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

m-1213

m-2595

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.

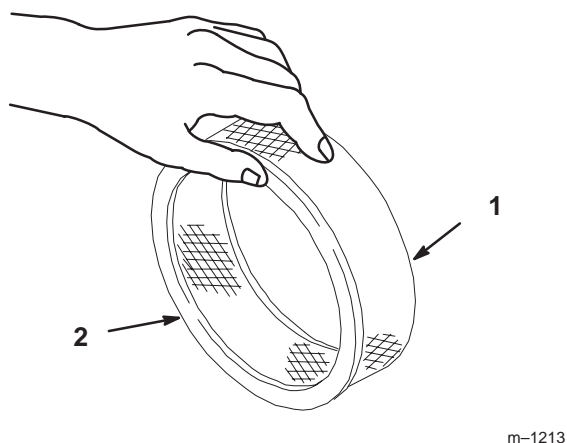


Figure 24

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.

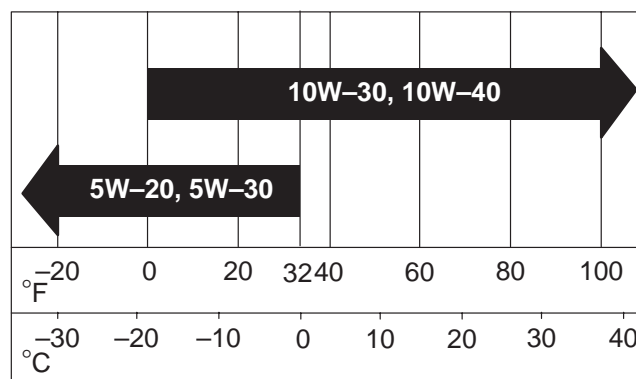
Note: Change oil more frequently when operating conditions are extremely dusty or sandy.

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 blade control (PTO) and set the parking.
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.

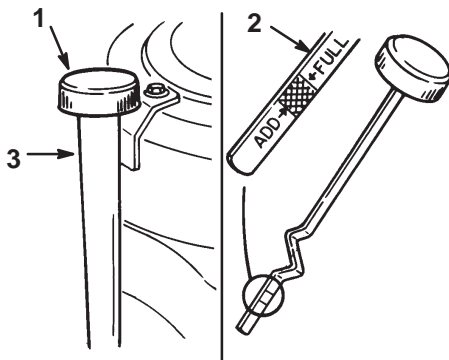


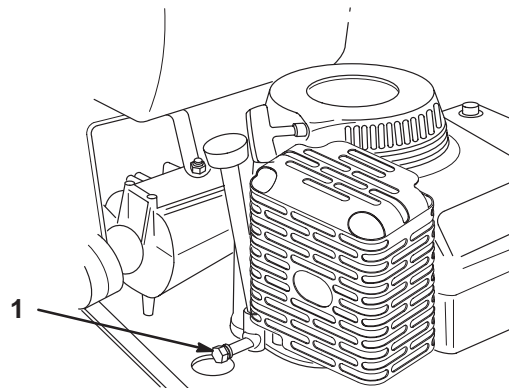
Figure 25

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

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 blade control (PTO), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
3. Place a pan below the oil drain. Remove the oil drain plug (Fig. 26).
4. When oil has drained completely, install the oil drain plug.

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



m-3816

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).

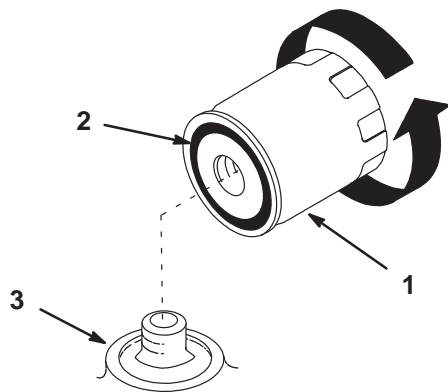


Figure 27

- | | |
|---------------|------------|
| 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 3/4 turn (Fig. 27).
5. Fill the crankcase with the proper type of new oil; refer to Changing/Draining Oil, page 30.

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

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

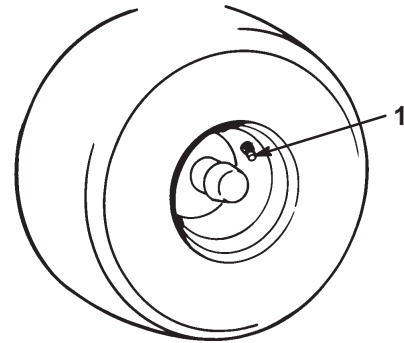


Figure 28

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.

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: 1.02 mm (0.040 in.).

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. 29). 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.

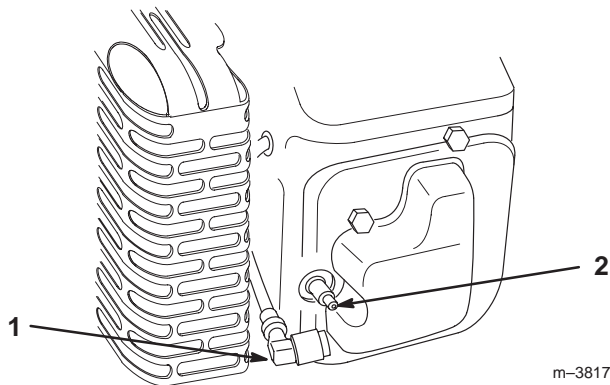


Figure 29

1. Spark plug wire
2. Spark plug

Checking the Spark Plug

1. Look at the center of the spark plug(s) (Fig. 30). 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. 30). Bend the side electrode (Fig. 30) if the gap is not correct.

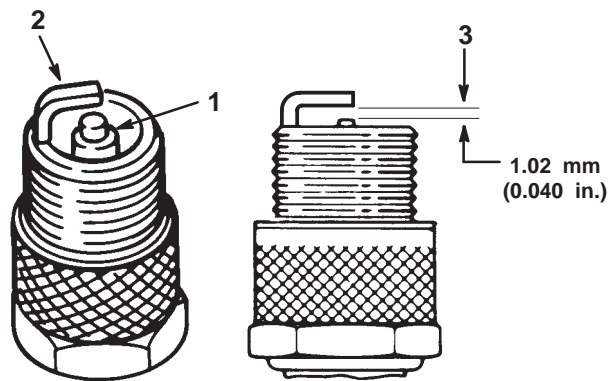


Figure 30

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 27 N•m (20 ft-lb).
3. Push the wire(s) onto the spark plug(s) (Fig. 29).

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

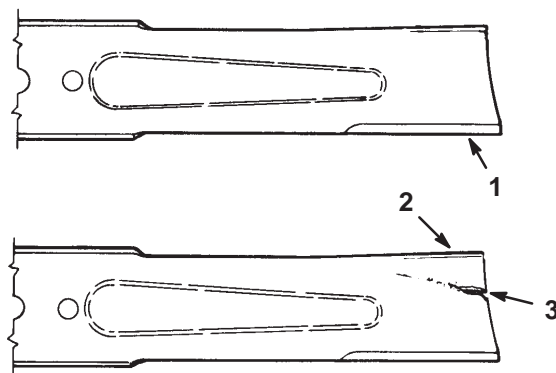
- Periodically inspect the blade for wear and damage. Immediately install a new blade if it is worn or damaged.

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 31). If the edges are not sharp or have nicks, remove and sharpen the blades. Refer to Sharpening the Blades on page 35.
2. Inspect the blades, especially the curved area (Fig. 31). If you notice any damage, wear, or a slot forming in this area (item 3 in Fig. 31), immediately install a new blade.



m-151

Figure 31

- | | |
|-----------------|----------------------|
| 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. 32). Measure from a level surface to the cutting edge of the blades (Fig. 33). Note this dimension.

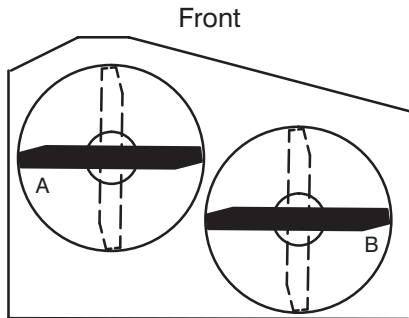
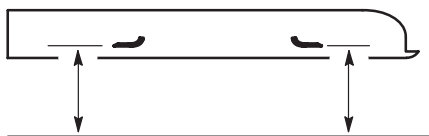


Figure 32



MEASURE FROM
CUTTING EDGE TO A
LEVEL SURFACE

Figure 33

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 3 mm (1/8"). If this dimension exceeds 3 mm (1/8"), the blade is bent and must be replaced. Refer to Removing the Blades, and Installing the Blades on page 35.

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. 34).

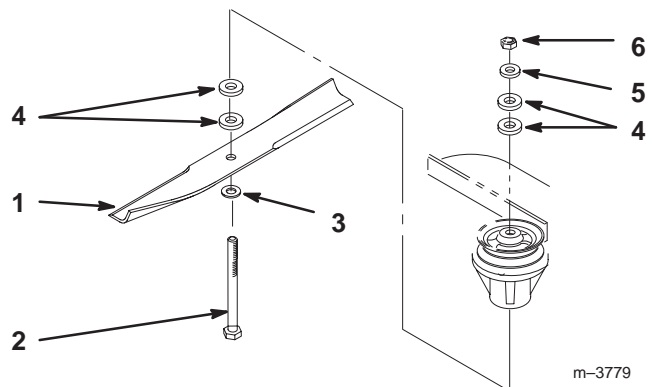


Figure 34

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

Sharpening the Blades

1. Use a file to sharpen the cutting edge at both ends of the blade (Fig. 35). Maintain the original angle. The blade retains its balance if the same amount of material is removed from both cutting edges.

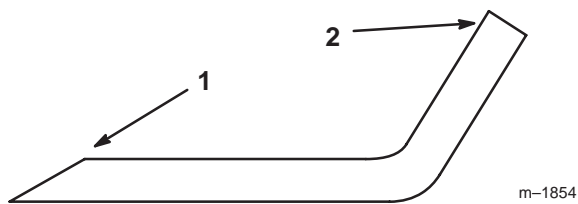


Figure 35

1. Sharpen at original angle
2. Sail

2. Check the balance of the blade by putting it on a blade balancer (Fig. 36). If the blade stays in a horizontal position, the blade is balanced and can be used. If the blade is not balanced, file some metal off the end of the sail area only (Fig. 35). Repeat this procedure until the blade is balanced.

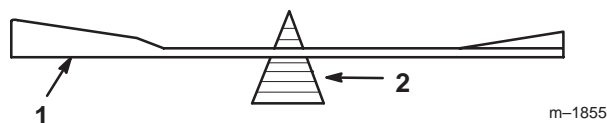


Figure 36

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. 34).

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. 34).
3. Torque the blade bolt to 101–108 N•m (75–80 ft. lb.).

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.

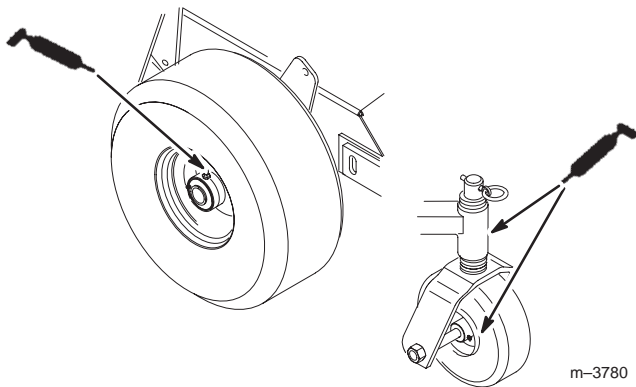


Figure 37

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

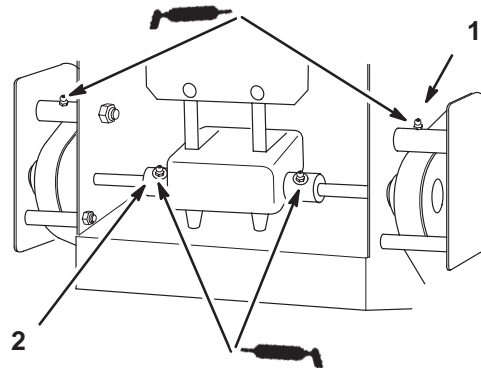


Figure 38

1. Idler Arm Pivots (Lubricate after 8 hours)
2. Transmission Couplers (Lubricate after 50 hours)

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

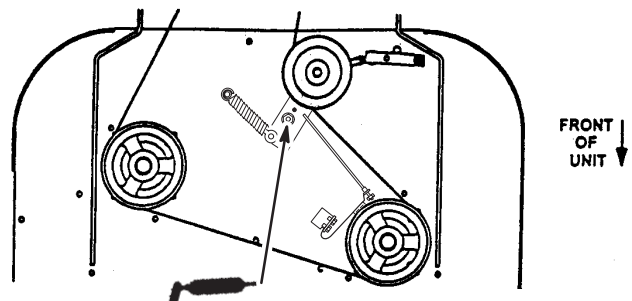


Figure 39

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 13 mm (1/2 in.), 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. Remove belt guard.
2. Check the brake before you adjust it; refer to Checking the Brake, page 37.
3. Release the parking brake; refer to Releasing the Parking Brake, page 19.
4. 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.

5. Check the brake operation again; refer to Checking the Brake, page 37.

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.

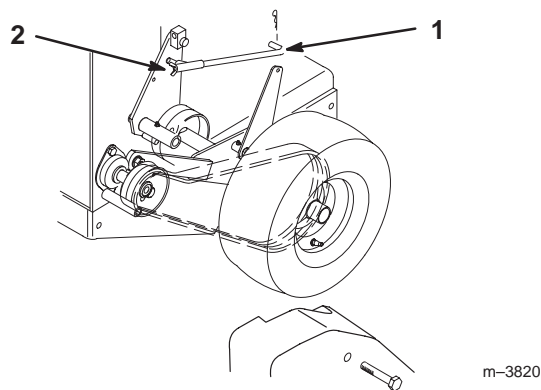


Figure 40

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

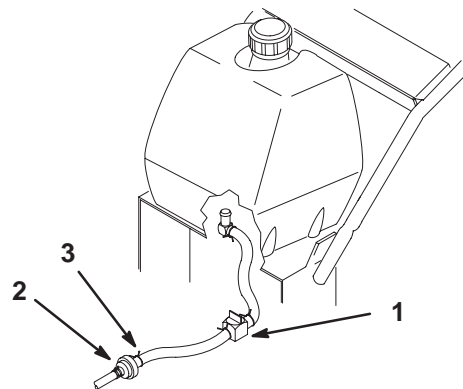
- Drain gasoline from the fuel tank when the engine is cold. Do this outdoors in an open area. Wipe up any gasoline that spills.
- Never drain gasoline near an open flame or where gasoline fumes may be ignited by a spark.
- Never smoke a cigarette, cigar or pipe.

1. Park the machine on a level surface, to assure fuel tank drains completely. Then disengage the blade control (PTO) and set the parking brake.
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 39.

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



m-3778

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).

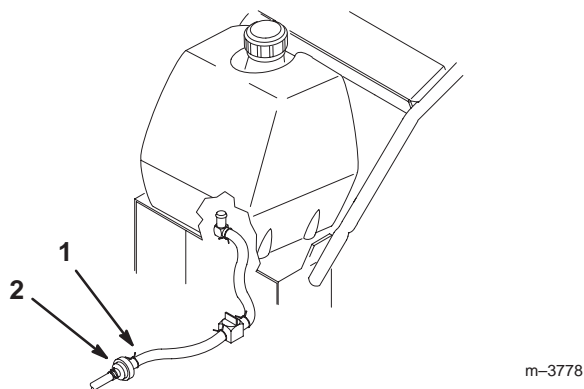


Figure 42

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 belt guard.
2. Remove hairpin cotter securing brake rod to brake arm to relax belt idler tension (Fig. 43).
3. Remove bottom and loosen top bolts of shield to rotate for belt clearance (Fig. 43).
4. Lift belt past idler and off drive pulley (Fig. 43).
5. 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 43). The pointed part of the scraper should be centered and as deep in the pulley groove as possible, without rubbing at any point.

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

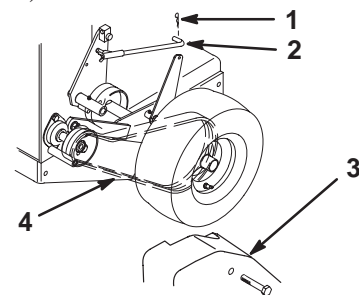


Figure 43

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. 47).
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. 47).
8. Check the belt guides under the engine frame for proper adjustment (Fig. 44). The distance between the belt guide and mower belt should be 32mm (1-1/4") when mower belt is engaged. Adjust as necessary. The disengaged belt should not drag or fall off pulley when guides are properly adjusted.

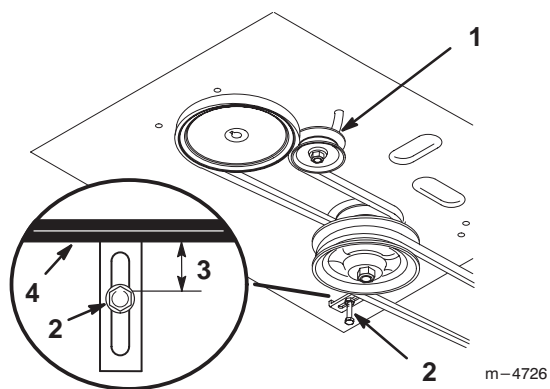


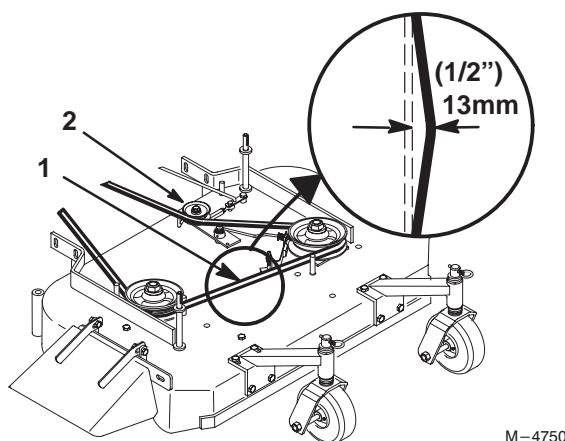
Figure 44

- | | |
|------------------|-------------------|
| 1. Idler in slot | 3. 32 mm (1-1/4") |
| 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 42.

Note: Proper belt tension is 4.54–6.8 Kg (10–15 lbs.) with the belt deflected a 13mm (1/2") halfway between pulleys (Fig. 45).

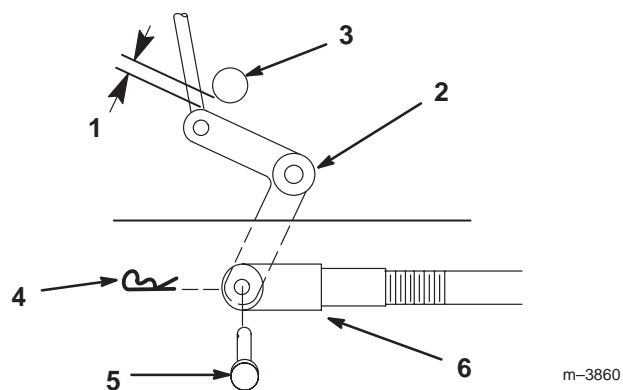


M-4750

Figure 45

1. Belt (1/2" (13mm) Deflection)
2. Idler Pulley

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

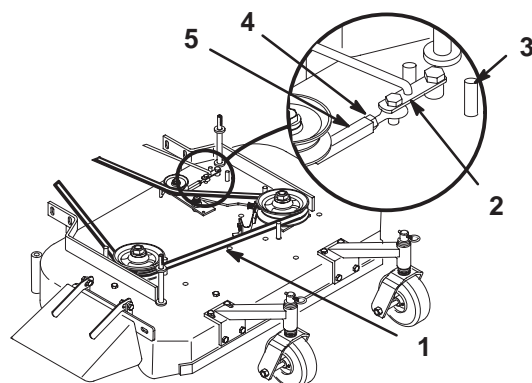


m-3860

Figure 46

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

9. Disengage the PTO. If the assist arm does not contact the front stop on the mower deck (Fig. 47), readjust the clevis to bring the bellcrank closer to the transmission output shaft (Fig. 46).



m-4739

Figure 47

1. 1/2" (13 mm) deflection here
2. Assist arm
3. Front stop
4. Locknut
5. Turnbuckle

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 32mm (1-1/4") when mower belt is engaged. Adjust as necessary. The disengaged belt should not drag or fall off pulley when guides are properly adjusted.

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 8mm (5/16”).

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 3mm–5mm (1/8”– 3/16”) between the nut and spacer (Fig. 48).
4. Engage the blades. Ensure the blade brake pad no longer contacts the pulley edges.

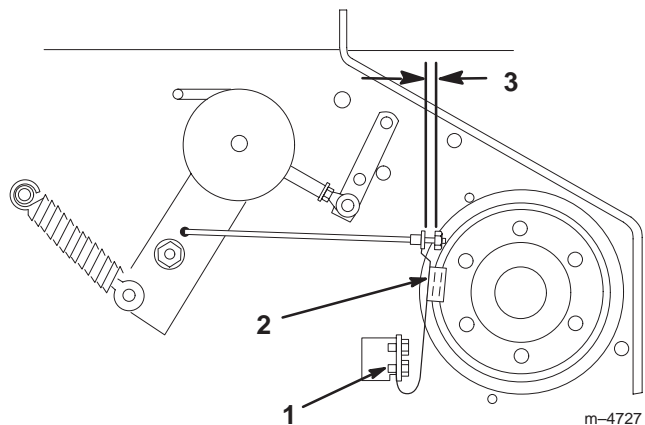


Figure 48

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

Adjusting Grass\Mud Scraper

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

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

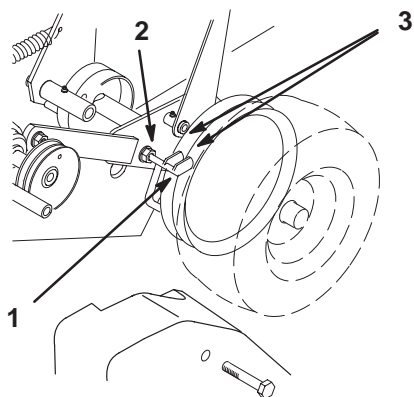


Figure 49

- | | |
|------------|-----------|
| 1. Scraper | 3. Pulley |
| 2. Locknut | |

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. Place spacer through spring and hook the front end of the spring around the front deflector mount. Insert bolt through mounts and spacer. 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.

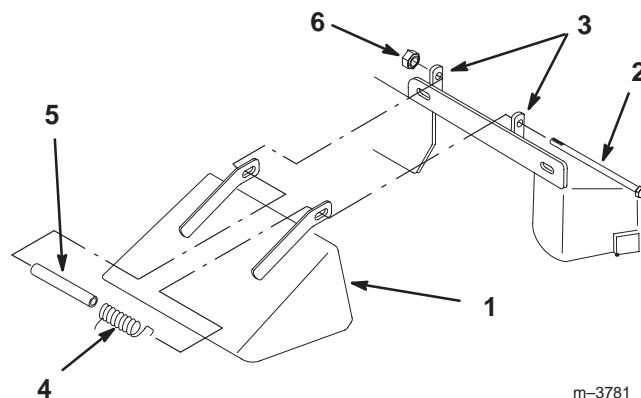
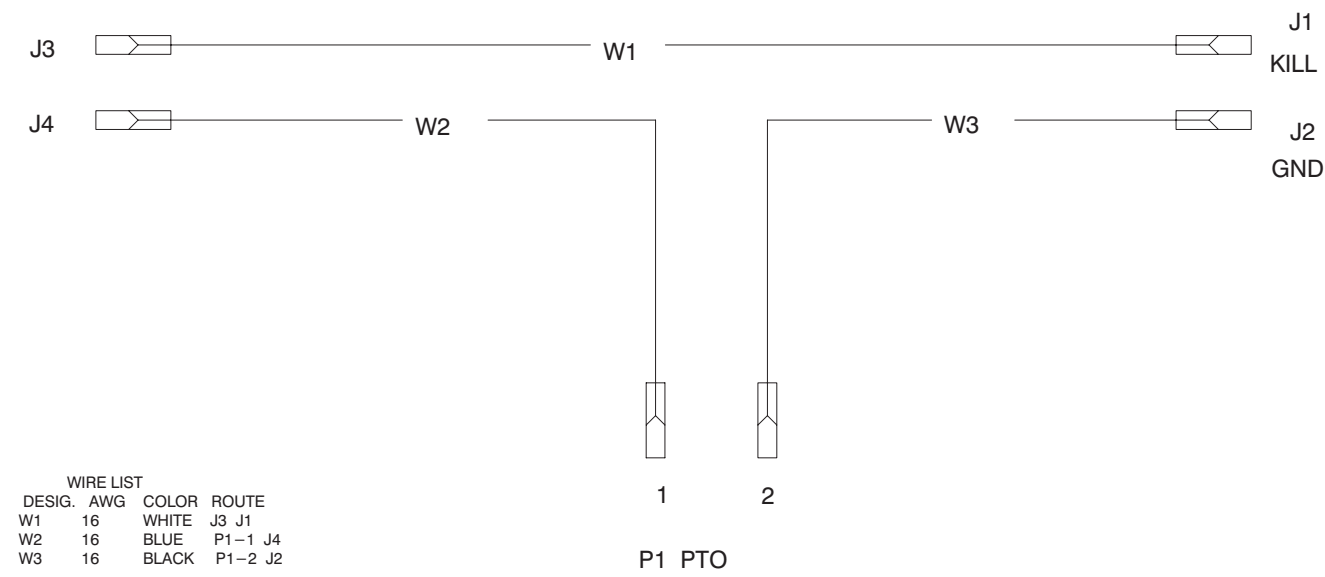


Figure 50

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

Wiring Diagram



Cleaning and Storage

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

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

3. Check the brake; refer to Brake, page 37.
4. Service the air cleaner; refer to Air Cleaner, page 28.
5. Grease the machine; refer to Greasing and Lubrication, page 36.
6. Change the crankcase oil; refer to Engine Oil, page 29.
7. Remove the spark plug(s) and check its condition; refer to Spark Plug, page 32. 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).
8. Check the tire pressure; refer to Tire Pressure, page 31.

9. 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 38.
- 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.

10. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged or defective.
11. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
12. Store the machine in a clean, dry garage or storage area. Remove the key from the ignition switch and keep it in a memorable place. Cover the machine to protect it and keep it clean.

Troubleshooting

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

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

