Form No. 3352–601

TORO®

Mid–Size Mower

Proline T–Bar Hydro 15hp with 112 cm Side Discharge Mower

Model No. 30299TE—Serial No. 250000001 and Up

Operator's Manual

CE

Register your product at www.Toro.com

Original Instructions (EN)

This spark ignition system complies with Canadian ICES-002.

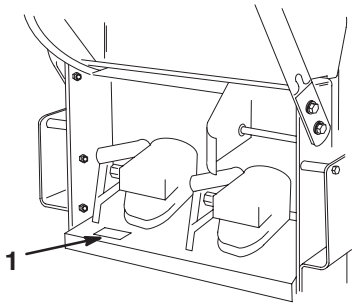
Ce système d'allumage par étincelle de véhicule est conforme à la norme NMB-002 du Canada.

Contents

Introduction

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

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



m–3097

Figure 1

1. Location of the model and serial numbers

8111 Lyndale Avenue South
Bloomington, MN 55420-1196

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

Model No. _____

Serial No. _____

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

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

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

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

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

Safety

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

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

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

Safe Operating Practices

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

Training

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

Preparation

- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by the manufacturer.
- Wear appropriate clothing including hard hat, safety glasses and hearing protection. Long hair, loose clothing or jewelry may get tangled in moving parts.
- Inspect the area where the equipment is to be used and remove all objects such as rocks, toys and wire which can be thrown by the machine.
- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
    - Use only an approved container
    - Never remove gas cap or add fuel with engine running. Allow engine to cool before refueling. Do not smoke.
    - Never refuel or drain the machine indoors.
- Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.

Operation

- Never run an engine in an enclosed area.
- Only operate in good light, keeping away from holes and hidden hazards.
- Be sure all drives are in neutral and parking brake is engaged before starting engine. Only start engine from the operator's position.

- Be sure of your footing while using this machine, especially when backing up. Walk, don't run. Never operate on wet grass. Reduced footing could cause slipping.
- Slow down and use extra care on hillsides. Be sure to travel side to side on hillsides. Turf conditions can affect the machine's stability. Use caution while operating near drop-offs.
- Slow down and use caution when making turns and when changing directions on slopes.
- Never raise deck with the blades running.
- Never operate with the PTO shield, or other guards not securely in place. Be sure all interlocks are attached, adjusted properly, and functioning properly.
- Never operate with the discharge deflector raised, removed or altered, unless using a grass catcher.
- Do not change the engine governor setting or overspeed the engine.
- Stop on level ground, disengage drives, engage parking brake (if provided), shut off engine before leaving the operator's position for any reason including emptying the catchers or unclogging the chute.
- Stop equipment and inspect blades after striking objects or if an abnormal vibration occurs. Make necessary repairs before resuming operations.
- Keep hands and feet away from the cutting unit.
- Look behind and down before backing up to be sure of a clear path.
- Keep pets and bystanders away.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop blades if not mowing.
- Be aware of the mower discharge direction and do not point it at anyone.
- Do not operate the mower under the influence of alcohol or drugs.
- Use care when loading or unloading the machine into or from a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

Maintenance and storage

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

Toro Mower Safety

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

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

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

General Operation

- Allow only responsible adults who are familiar with the instructions to operate the machine.
- Be sure the area is clear of other people before mowing. Stop the machine if anyone enters the area.
- Do not mow in reverse unless absolutely necessary. Always look down and behind before and while backing.
- Be aware of the mower discharge direction and do not point it at anyone. Do not operate the mower without either the entire grass catcher or the guard in place.
- Slow down before turning. Sharp turns on any terrain may cause loss of control.

- Turn off blades when not mowing.
- Keep hands, feet, hair and loose clothing away from attachment discharge area, underside of mower and any moving parts while engine is running.
- Stop the engine before removing the grass catcher or unclogging the chute.
- Mow only in daylight or good artificial light.
- Watch for traffic when operating near or crossing roadways.
- Do not touch equipment or attachment parts which may be hot from operation. Allow to cool before attempting to maintain, adjust or service.
- Use only Toro-approved attachments. Warranty may be voided if used with unapproved attachments.

Slope Operation

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

DO

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

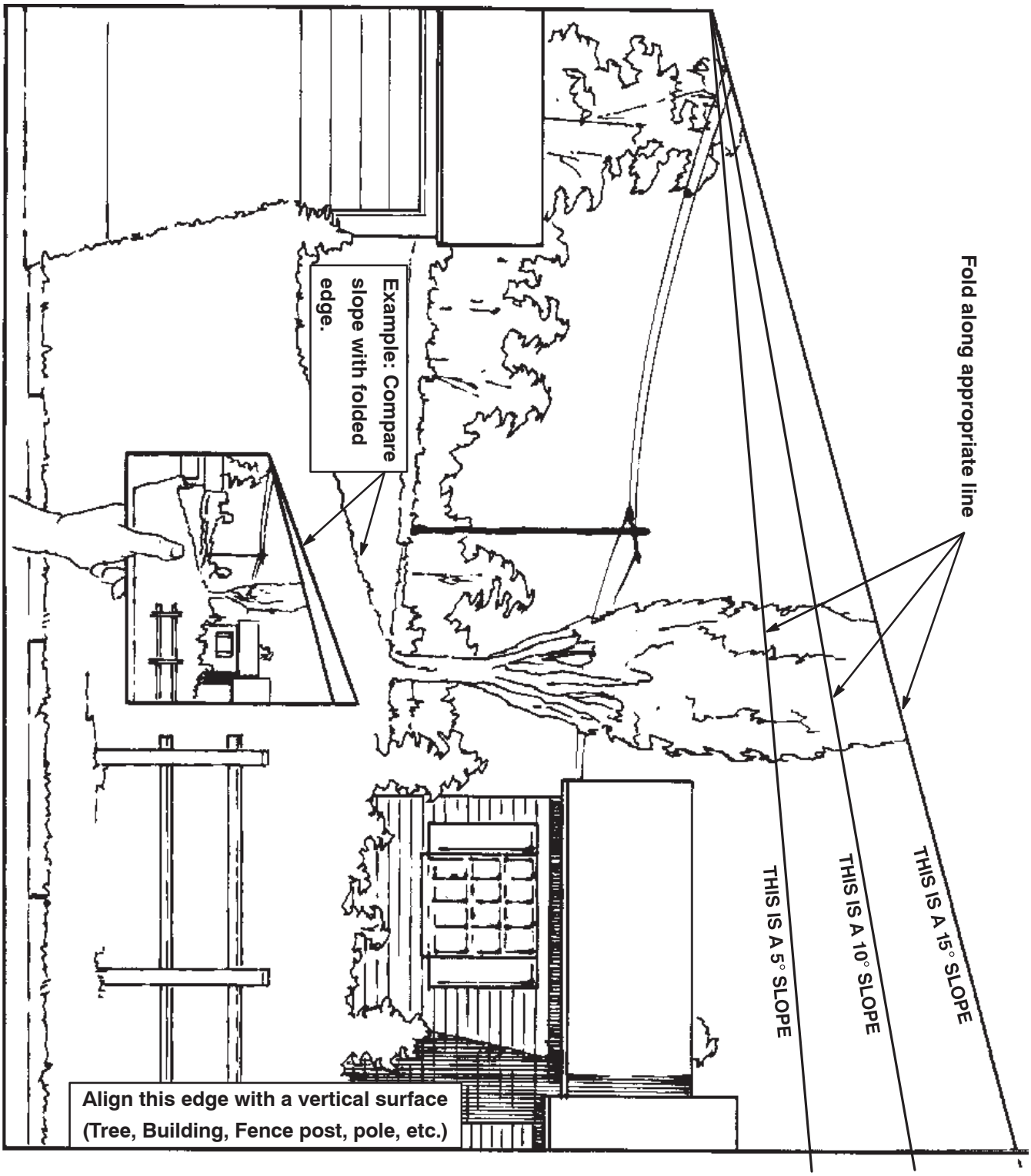
DO NOT

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

Service

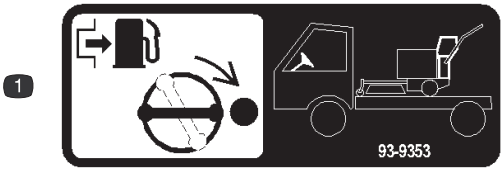
- Never store the machine or fuel container inside where there is an open flame, such as near a water heater or furnace.
- Keep nuts and bolts tight, especially the blade attachment bolts. Keep equipment in good condition.
- Never tamper with safety devices. Check safety systems for proper operation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

Slope Chart


Fold along appropriate line
THIS IS A 15° SLOPE
THIS IS A 10° SLOPE
THIS IS A 5° SLOPE
Example: Compare slope with folded edge.
Align this edge with a vertical surface
(Tree, Building, Fence post, pole, etc.)

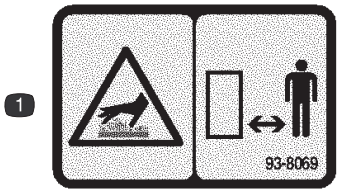
Safety and Instruction Decals

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



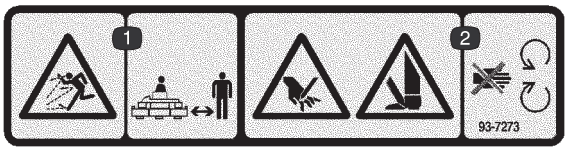
93-9353

1. Shut off the fuel by turning the fuel shutoff valve clockwise before transporting the machine.



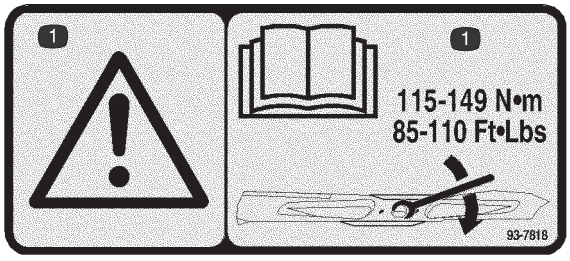
93-8069

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



93-7273

1. Thrown object hazard—keep bystanders a safe distance from the machine.
2. Cutting hazard of hand or foot—stay away from moving parts.

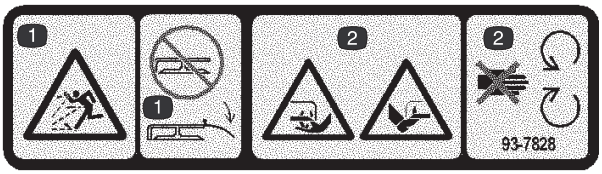


93-7818

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

93-7824

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

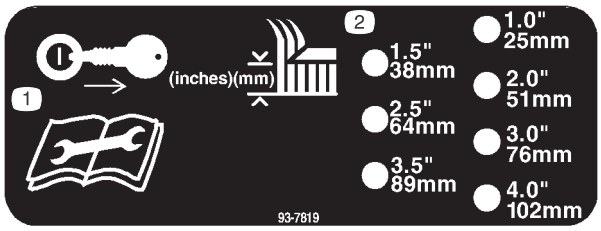


93-7828

1. Thrown object hazard, mower—do not operate the mower with the deflector up or removed; keep the deflector in place.
2. Cutting/dismemberment hazard of hand or foot, mower blade—stay away from moving parts.

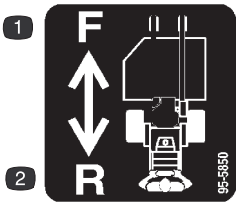
93-7316

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



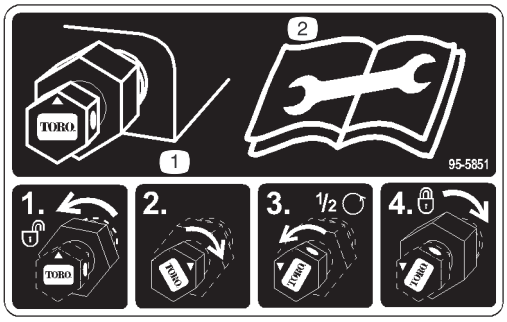
93-7819

1. Remove the ignition key and read the instructions before servicing or performing maintenance.
2. Height of cut settings



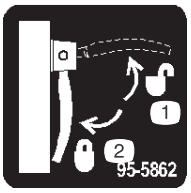
95-5850

1. Forward
2. Reverse



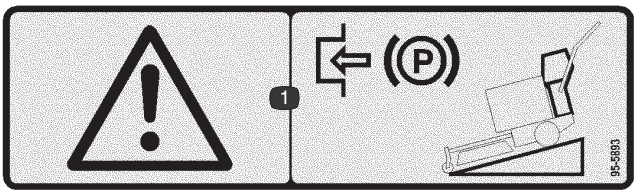
95-5851

1. To adjust the pressure valve, loosen the jam nut, rotate the valve clockwise to close it, rotate the valve counterclockwise 1/2 turn, then tighten the jam nut to lock it in place.
2. Read the instructions before servicing or performing maintenance.



95-5862

1. Unlock
2. Lock



95-5893

1. Warning—engage the parking brake when parking on a hill.

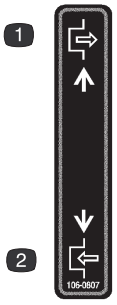
98-4387

1. Warning—wear hearing protection.

Battery Symbols

Some or all of these symbols are on your battery.

1. Explosion hazard
2. No fire, open flames, or smoking.
3. Caustic liquid/chemical burn hazard
4. Wear eye protection; explosive gases can cause blindness and other injuries
5. Wear eye protection
6. Read the *Operator's Manual*.
7. Keep bystanders a safe distance from the battery.
8. Battery acid can cause blindness or severe burns.
9. Flush eyes immediately with water and get medical help fast.
10. Contains lead; do not discard.



106-0807

1. Disengage
2. Engage

95-1545

1. Warning—read the *Operator's Manual.*
2. Thrown object hazard—keep bystanders a safe distance from the machine.
3. Thrown object hazard, mower—keep the deflector in place.
4. Cutting/dismemberment hazard of hand or foot, mower blade—stay away from moving parts.
5. Warning—stop the engine before leaving the machine.
6. Fast
7. Slow
8. Continuous variable setting
9. Lock

106-0685

1. Choke
2. Fast
3. Continuous variable setting
4. Slow
5. Engine—stop
6. Engine—run
7. Engine—start
8. To engage the power take–off (PTO), move the control bar to the handle, then pull the knob.

Gasoline and Oil

Recommended Gasoline

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

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

Danger

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

- **Fill the fuel tank outdoors, in an open area, when the engine is cold. Wipe up any gasoline that spills.**
- **Never fill the fuel tank inside an enclosed trailer.**
- **Do not fill the fuel tank completely full. Add gasoline to the fuel tank until the level is 1/4 to 1/2 in. (6 to 13 mm) below the bottom of the filler neck. This empty space in the tank allows gasoline to expand.**
- **Never smoke when handling gasoline, and stay away from an open flame or where gasoline fumes may be ignited by a spark.**
- **Store gasoline in an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of gasoline.**
- **Always place gasoline containers on the ground away from your vehicle before filling.**
- **Do not fill gasoline containers inside a vehicle or on a truck or trailer bed because interior carpets or plastic truck bed liners may insulate the container and slow the loss of any static charge.**
- **When practical, remove gas–powered equipment from the truck or trailer and refuel the equipment with its wheels on the ground.**
- **If this is not possible, then refuel such equipment on a truck or trailer from a portable container, rather than from a gasoline dispenser nozzle.**
- **If a gasoline dispenser nozzle must be used, keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.**

Warning

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

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

Using Stabilizer/Conditioner

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

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

Important Do not use fuel additives containing methanol or ethanol.

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

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

Filling the Fuel Tank

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

Check Engine Oil Level

Before you start the engine and use the machine, check the oil level in the engine crankcase; refer to Checking the Engine Oil Level, page 26.

Setup

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

Loose Parts

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

Step	Description	Qty.	Use
1	Wheel Net	2 8	Installing the drive wheels
2	Upper handle Flange bolt, 3/8 x 1 inch (25 mm) Flange nut, 3/8 inch	1 4 6	Installing the upper handle
3	Clevis pin Washer Hairpin cotter	1 1 2	Installing the control rods
4	No parts needed		Activating the battery
5	Hydraulic filter	1	Use for initial hydraulic filter change
6	Operator's manual Engine operator's manual Parts catalog Registration card	1 1 1 1	 Read before operating Ordering parts Fill out and return to Toro

Step 1

Installing the Drive Wheels

1. Mount wheels to wheel motor hubs with 8 lug nuts (Fig. 2). Torque bolts to 55 ft.–lb. (75 N·m).

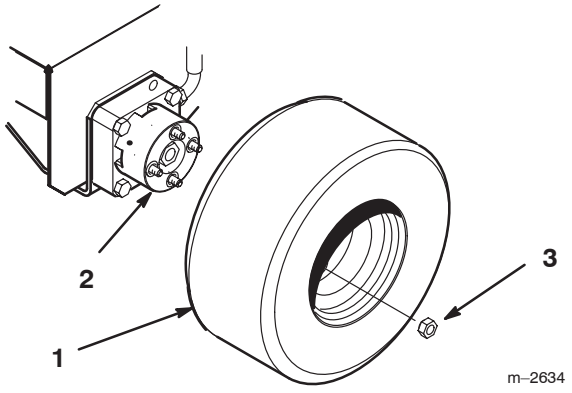


Figure 2

1. Wheel
2. Hub
3. Lug nut

Step 2

Installing the Upper Handle

1. Align upper handle with mounting holes in rear frame (Fig. 3). Select high, medium or low position for lower mounting hole.
2. Secure each side with 2 flange bolts (3/8 x 1 in.) and 2 flange nuts (Fig. 3). Torque bolts to 25 ft.–lb. (34 N·m).

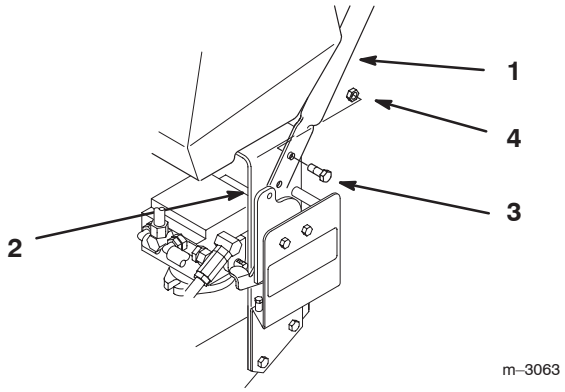


Figure 3

1. Upper handle
2. Rear frame
3. Flange bolt, 3/8 x 1 in.
4. Flange nut, 3/8 in.

Step 3

Installing the Control Rods

Before installing and adjusting control rods loosen quick release levers and move reference control bar all the way forward.

Installing the Left Control Rod

1. Slide clevis pin through rod fitting and mounting hole in control bracket (from outside). Secure with washer and hairpin cotter (Fig. 4).
2. Remove hairpin cotter and rod from upper control bars.
3. Press and hold upper control bars against reference bar, so stop hits.
4. Push rod full forward until bearing is against control bracket stop. Thread rod in or out of fitting on control bracket until rod aligns with holes in upper control bars (Fig. 4).
5. When rod and holes in upper control bars line up, turn rod one additional turn, so rod is shorter.

Note: Upper control bar stop must hit reference bar before roller hits control bracket stop.

6. Connect rod to upper control bars with previously removed hairpin cotter.

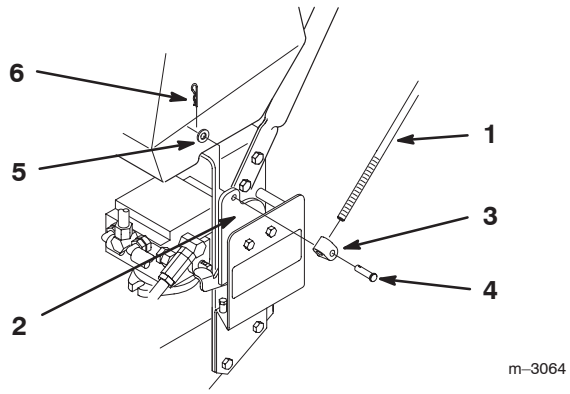


Figure 4

1. Control rod–left
2. Control bracket
3. Rod fitting
4. Clevis pin
5. Washer
6. Hairpin cotter

Installing the Right Control Rod

1. Slide rod into control bracket and secure with hairpin cotter (Fig. 5).
2. Remove hairpin cotter and rod from upper control bars.
3. Press and hold upper control bars against reference bar, so stop hits.
4. Push rod full forward until bearing is against control bracket stop. Loosen wing nut and thread turnbuckle in or out until rod aligns with holes in upper control bars (Fig. 4).
5. When rod and holes in upper control bars line up, rotate turnbuckle one additional turn, so rod is shorter.

Note: Upper control bar stop must hit reference bar before roller hits control bracket stop.

6. Connect rod to upper control bars with previously removed hairpin cotter, tighten wing nut and turnbuckle.

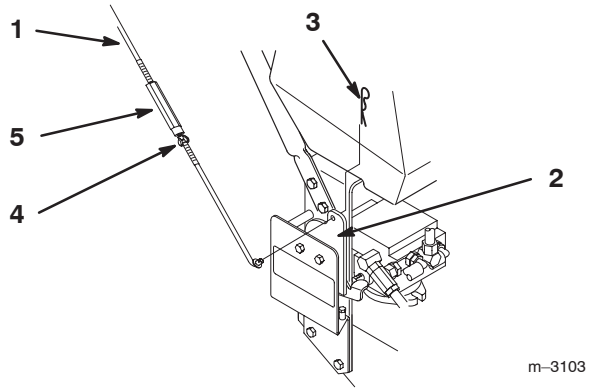


Figure 5

1. Control rod–right
2. Control bracket
3. Hairpin cotter
4. Wing nut
5. Turnbuckle

Adjusting the Tracking

1. After completing assembly check machine tracking. Operate machine by holding upper control bar against reference bar with wheel drive engaged.

2. If machine does not track straight, moves more right or left, adjustment is required.

3. Loosen wing nut on right control rod and rotate turnbuckle in or out to change tracking. Secure turnbuckle in position with wing nut (Fig. 5).

4. Check for proper tracking.

Note: Control rods must be adjusted if handle height position is changed.

Step 4

Activating the Battery

Bulk electrolyte with 1.260 specific gravity must be purchased from a local battery supply outlet.

1. Remove the battery from the machine.

Important Be careful not to damage the long vent tube when removing the battery.

Danger

Battery electrolyte contains sulfuric acid which is a deadly poison and causes severe burns.

- **Do not drink electrolyte and avoid contact with skin, eyes or clothing. Wear safety glasses to shield your eyes and robber gloves to protect your hands.**
- **Fill the battery where clean water is always available for flushing the skin.**
- **Follow all instructions and comply with all safety messages on the electrolyte container.**

2. Remove filler caps from the battery. Slowly pour electrolyte into each cell until the electrolyte level is up to the lower part of the tube (Fig. 6).

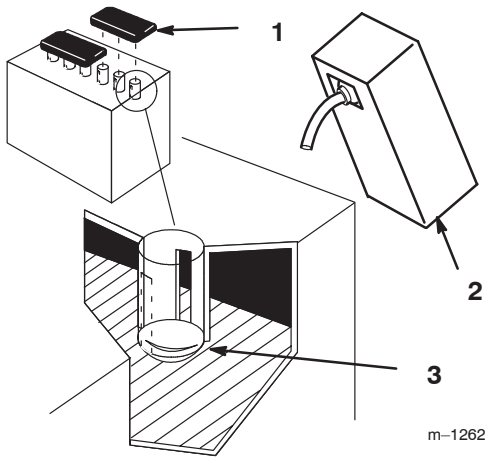


Figure 6

1. Filler caps
2. Electrolyte
3. Lower part of the tube

3. Leave the covers off and connect a 3 to 4 amp battery charger to the battery posts (Fig. 7). Charge the battery at a rate of 4 amperes or less for 4 hours (12 volts).

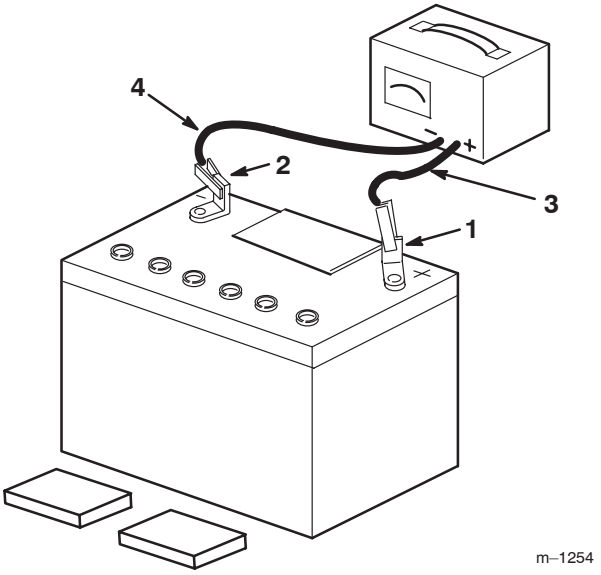


Figure 7

1. Positive post
2. Negative post
3. Charger red (+) wire
4. Charger black (–) wire

Warning

Charging battery produces gasses that can explode and cause serious injury.

- **Keep cigarettes, sparks and flames away from battery.**
- **Make sure the ignition switch is off.**
- **Ventilate when charging or using battery in an enclosed space.**

4. When the battery is fully charged, disconnect the charger from the electrical outlet then from the negative and positive battery posts (Fig. 7).
5. Slowly pour electrolyte into each cell until the level is once again up to the upper line on the battery case (Fig. 6) and install covers.

Operation

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

Think Safety First

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

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

Caution

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

Wear hearing protection when operating this machine.

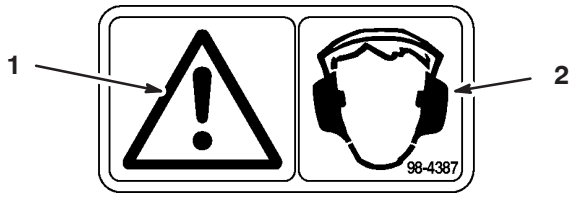


Figure 8

1. Warning—wear hearing protection.

Controls

Become familiar with all the controls (Fig. 9) before you start the engine and operate the machine.

Throttle Control – The throttle control has three positions: fast, slow and choke.

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

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

Upper Control Bar – Push forward on control bar to engage forward traction operation, release to stop. Pull back on control bar to go backwards. Release either side of control bar to turn right or left.

Reference Handle – Limits forward travel of control bar to pre-set position to help maintain desired ground speed and direction of travel. It is locked in position with quick release levers.

Ignition Switch – Key switch is used with the electric starter. Switch has three positions: start, run and off.

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

Hour Meter – Shows total hours that machine has been operated. Only operates with ignition key in the on position.

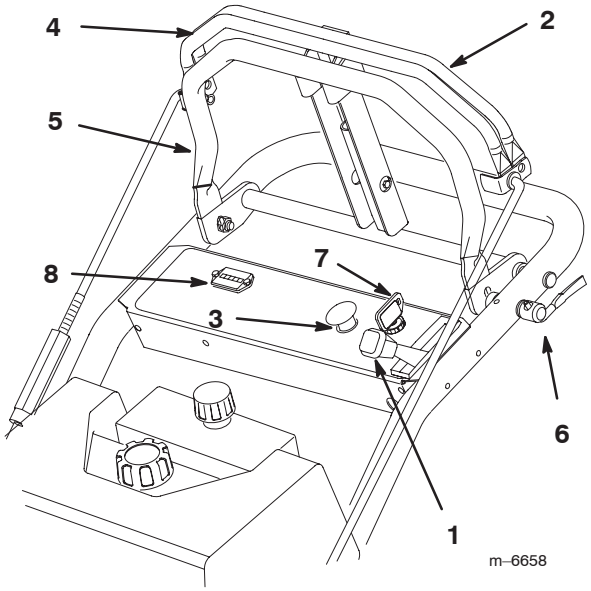


Figure 9

1. Throttle control
2. Blade control bail
3. Blade control switch (PTO)
4. Upper control bar
5. Reference handle
6. Quick release lever
7. Ignition switch
8. Hourmeter

Starting and Stopping the Engine

Starting the Engine

1. Make sure spark plug wire(s) are installed on spark plug(s) and fuel valve is open.

2. Move the throttle control to the choke position before starting a cold engine.

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

3. Turn ignition key to start to energize the starter. When engines starts, release key.

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

4. When engine starts move the throttle control to the fast position.

Stopping the Engine

5. Move the throttle lever to the slow position (Fig. 10).

Note: If the engine has been working hard or is hot, let it idle for a minute before turning the ignition key off. This helps cool the engine before it is stopped. In an emergency, the engine may be stopped by turning the ignition key to off.

6. Turn the ignition key to off (Fig. 10).

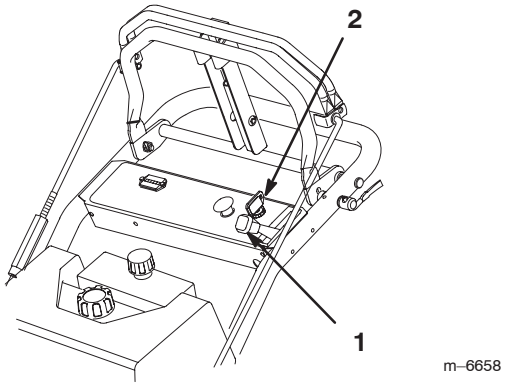


Figure 10

1. Throttle lever
2. Ignition key

7. Pull wire off spark plug(s) to prevent possibility of accidental starting before transporting or storing machine.

8. Close fuel shut off valve, under fuel tank, before transporting or storing machine.

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

Operating Mower Blade Control (PTO)

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

Engaging the Mower Blades (PTO)

1. Release the upper control bar to stop the machine (Fig. 11).

2. To engage blade, squeeze blade control bail against upper control bar (Fig. 11).

3. Pull blade switch (PTO) up and release. Hold blade control bail against control bar while operating.

4. Repeat procedure to engage mower blades if blade control bail is released.

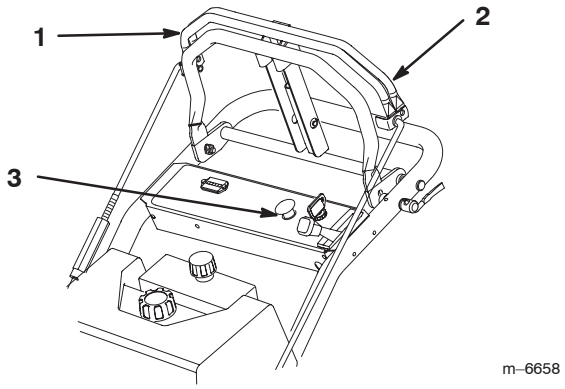


Figure 11

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

Disengaging the Mower Blades (PTO)

1. Release the blade control bail to disengage blades (Fig. 11).

The Safety Interlock System

Caution

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

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

Understanding the Safety Interlock System

The safety interlock system is designed to prevent the mower from starting unless the control bar is in the neutral position and to prevent the blades from rotating when the blade control is released.

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 machine on a flat, open area.

2. Push the control bar full forward.

3. Rotate the ignition key to the start position and slowly move the control bar back to neutral. The engine should not crank until control bar is within 5° of neutral position.

4. Start the engine; refer to Starting and Stopping the Engine, page 18. With engine running and control bar in neutral position, squeeze control bail against control bar (Do not press deck engagement switch), clutch should not engage and blades must not rotate.

5. Continue holding the blade control bail and press the rocker switch forward to on and release. The clutch should engage and the mower blades begin rotating.

6. Release the blade control bail. The clutch must disengage and the blades stop rotating.

7. Release the blade control bail (PTO), then push the blade control switch (PTO) to the on position without holding the blade control bail. The clutch must not engage and the blades must not rotate.

8. If all the above conditions are not met have an Authorized Service Dealer repair the safety system immediately.

Driving Forward or Backward

The Enhanced T–Bar control system is designed to provide easy and comfortable operation of the hydrostatic drive. The control regulates ground speed, as well as forward, reverse and neutral functions, as well as steering direction.

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.

Operate the machine with the engine speed set at slow or medium when learning how to use the controls. Practice driving the machine in a level open area.

Selecting Ground Speed

1. Place the quick release levers in the unlock position (Fig. 12).

2. Move the reference bar forward or backward to set the desired forward speed. The pointer indicates approximate ground speed (Fig. 12). When the bar is in the full forward position the ground speed is approximately 6 mph. When the reference bar is in the middle position the ground speed is approximately 3 mph.

Note: In normal conditions, a 2.5 to 3.0 mph ground speed (middle position of the reference bar) is best for cutting performance. Use a faster ground speed for light cutting or transport. Use a slower ground speed in heavy cutting loads.

3. Place the quick release levers in the lock position (Fig. 12).

Driving Forward

1. To go forward, slowly press on the upper control bar against the reference bar (Fig. 12).
2. To go straight, apply equal pressure to both ends of the upper control bar (Fig. 12).
3. To turn, release pressure on the upper control bar side toward the direction you want to turn (Fig. 12).
4. Adjust reference bar to maintain a comfortable pre-set ground speed (Fig. 12).
5. To stop, release the upper control bar to stop both wheels (Fig. 12).

Note: If the front of the deck lifts off the ground when the upper control bar is quickly pushed forward or the machine is unable to drive uphill, an adjustment may be needed. Refer to: Adjusting By-pass Valve on page 32.

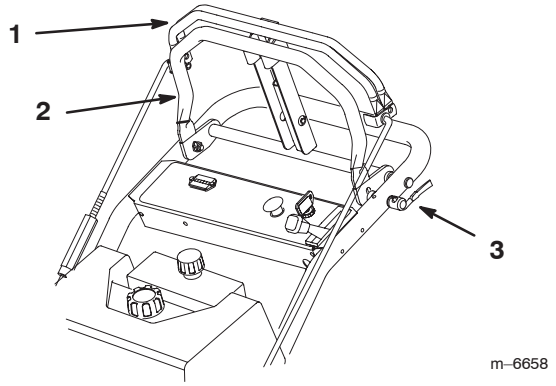


Figure 12

1. Upper control bar
2. Reference control bar
3. Quick release lever

Driving Backward

1. To go backward, slowly pull the control bar rearward (Fig. 12).
2. To go straight, apply equal pressure to both ends of the upper control bar (Fig. 12).
3. To turn, release pressure on the upper control bar side away from the direction you want to turn (Fig. 12).
4. To stop, release the upper control bar to stop both wheels (Fig. 12).

Placing Machine in Neutral

Release the upper control bar to stop. The machine will automatically return to neutral. When in neutral, the hydrostatic drive system will provide dynamic braking so the machine will not roll.

Note: Very slow drive motion with engine running and the control in neutral is normal. Excessive drive motion when the control is in neutral may indicate adjustment is needed. Refer to: Adjusting the Machine Neutral on page 38.

Stopping the Machine

1. To stop, release the upper control bar to stop both wheels (Fig. 12).
2. Release the blade control bail (PTO), to stop the mower blades. Move the engine speed throttle control to to the slow position.
3. Turn the ignition key to off. Remember to remove the key from the ignition switch.

Important If the machine is on a slope, block the wheels to prevent the machine from slowly rolling.

Important If the machine will be left unattended, close the fuel shut off valve and disconnect the wire(s) from the spark plug(s).

Caution

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

Always remove the ignition key and chock or block tires when leaving the machine unattended, even if just for a few minutes.

Transporting Machines

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

To transport the machine:

- Chock or block wheels.
- Securely fasten the machine to the trailer or truck with straps, chains, cable, or ropes.

- Secure a trailer to towing vehicle with safety chains.

Important If the machine is loaded on a truck or trailer for transport, securely restrain the machine to prevent movement.

Pushing the Machine by Hand

The by–pass valve also allows the machine to be pushed by hand with the engine not running for easier servicing. If the by–pass valve is opened to push the machine by hand, adjustment is required for operation.

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

To Push the Machine

1. Disengage the power take off (PTO) and turn the ignition key to off.
2. Loosen jam nuts and rotate by-pass valves open 5 turns to push. This allows hydraulic fluid to by-pass the pump and the wheels to turn (Fig. 13).

Important Rotate by-pass valve a maximum of 5 turns so the valve does not come out of the body causing fluid to run out.

To Operate the Machine

If the by–pass valve is opened to push the machine by hand, adjustment is required for operation. Refer to Adjusting the By-pass Valve on page 32.

Note: The machine will not drive unless by-pass valves are properly adjusted.

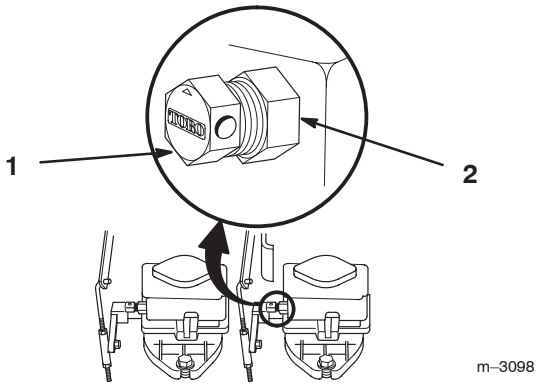


Figure 13

1. By-pass valve
2. Jam nut

Side Discharge or Mulch Grass

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

Danger

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

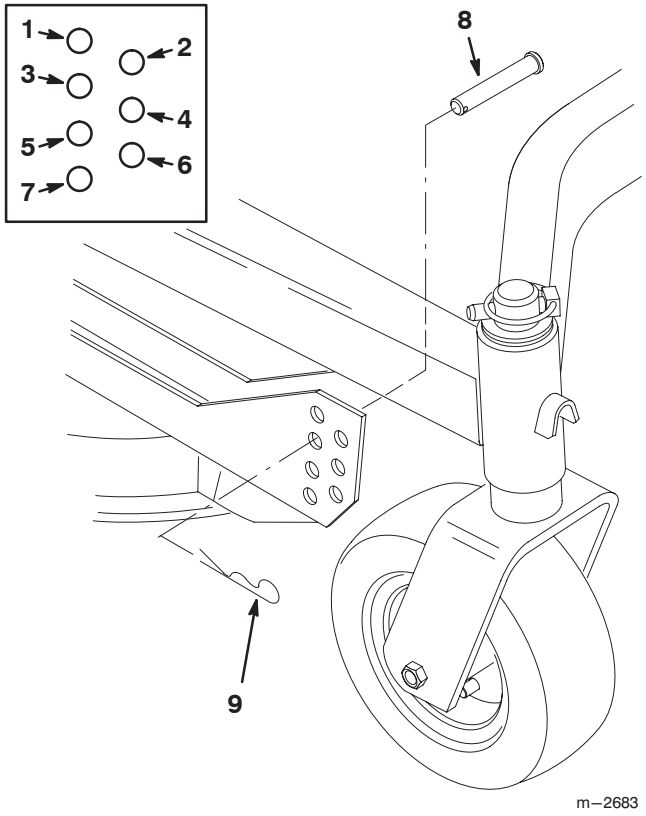
- **Never remove the grass deflector from the mower because the grass deflector routes material down toward the turf. If the grass deflector is ever damaged, replace it immediately.**
- **Never put your hands or feet under the mower.**
- **Never try to clear discharge area or mower blades unless you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

Adjusting the Height-of-Cut

The height-of-cut is adjustable from 2 to 5 inches (51 to 127 mm) in 1/2 inch (13 mm) increments by relocating the clevis pins in different hole locations in brackets at each corner of the cutting unit (Fig. 14).

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

Note: All four pins must be in the same hole location for even cutting.



m–2683

Figure 14

1. 2 inch (51 mm) Cut Height
2. 2-1/2 inch (64 mm) Cut Height
3. 3 inch (76 mm) Cut Height
4. 3-1/2 inch (89 mm) Cut Height
5. 4 inch (102 mm) Cut Height
6. 4-1/2 inch (114 mm) Cut Height
7. 5 inch (127 mm) Cut Height
8. Clevis Pin
9. Hairpin Cotter

Adjusting Gage Wheels

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

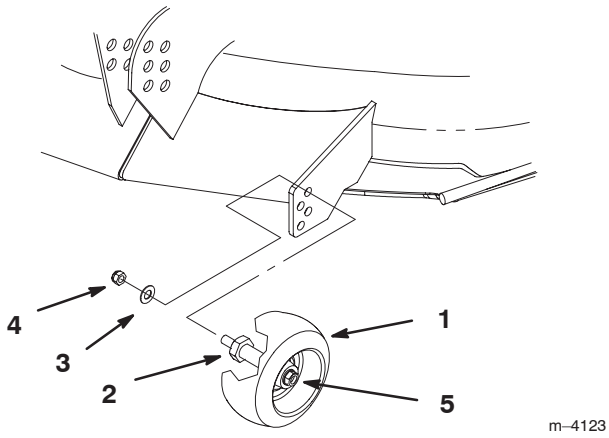
1. After adjusting height-of-cut remove nut and washer while holding stud with wrench (Fig. 15).

Note: Do not remove the wheel nut and washer (Fig. 15).

2. Select a hole position so the gage wheel is 3/8 inch (9.5 mm) off the ground for the height-of-cut to be used (Fig. 15).

3. Reinstall the stud nut and washer (Fig. 15).

4. Repeat adjustment on other gage wheels.



m–4123

Figure 15

1. Gage Wheel
2. Stud
3. Washer
4. Nut
5. Wheel nut and washer. Do Not Remove.

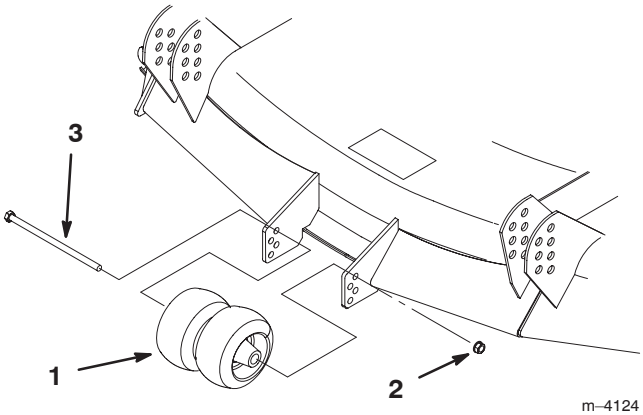
Adjusting Center Gage Wheels

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

1. After adjusting height-of-cut remove bolt and nut (Fig. 16).

2. Select a hole position so the gage wheel is 3/8 inch (9.5 mm) off the ground for the height-of-cut to be used (Fig. 16).

3. Reinstall the bolt and nut (Fig. 16).



m–4124

Figure 16

1. Center Gage Wheels
2. Nut
3. Bolt

Tips for Mowing Grass

Fast Throttle Setting

For best mowing and maximum air circulation, operate the engine at fast. Air is required to thoroughly cut grass clippings, so do not set the height-of-cut so low as to totally surround the mower by uncut grass. Always try to have one side of the mower free from uncut grass, which allows air to be drawn into the mower.

Cutting a Lawn for the First Time

Cut grass slightly longer than normal to ensure the cutting height of the mower does not scalp any uneven ground. However, the cutting height used in the past is generally the best one to use. When cutting grass longer than six inches tall, you may want to cut the lawn twice to ensure an acceptable quality of cut.

Cut 1/3 of the Grass Blade

It is best to cut only about 1/3 of the grass blade. Cutting more than that is not recommended unless grass is sparse, or it is late fall when grass grows more slowly.

Mowing Direction

Alternate mowing direction to keep the grass standing straight. This also helps disperse clippings which enhances decomposition and fertilization.

Mow at Correct Intervals

Normally, mow every four days. But remember, grass grows at different rates at different times. So to maintain the same cutting height, which is a good practice, mow more often in early spring. As the grass growth rate slows in mid summer, mow less frequently. If you cannot mow for an extended period, first mow at a high cutting height; then mow again two days later at a lower height setting.

Cutting Speed

To improve cut quality, use a slower ground speed.

Avoid Cutting Too Low

If the cutting width of the mower is wider than the mower you previously used, raise the cutting height to ensure that uneven turf is not cut too short.

Long Grass

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

When Stopping

If the machine's forward motion must be stopped while mowing, a clump of grass clippings may drop onto your lawn. To avoid this, move onto a previously cut area with the blades engaged.

Keep the Underside of the Mower Clean

Clean clippings and dirt from the underside of the mower after each use. If grass and dirt build up inside the mower, cutting quality will eventually become unsatisfactory.

Blade Maintenance

Maintain a sharp blade throughout the cutting season because a sharp blade cuts cleanly without tearing or shredding the grass blades. Tearing and shredding turns grass brown at the edges, which slows growth and increases the chance of disease. Check the cutter blades daily for sharpness, and for any wear or damage. File down any nicks and sharpen the blades as necessary. If a blade is damaged or worn, replace it immediately with a genuine Toro replacement blade.

Maintenance

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

Recommended Maintenance Schedule

Maintenance Service Interval	Maintenance Procedure
Each Use	• Engine oil—check level • Safety System—check • Battery electrolyte—check • Cooling system—clean • Mower housing—clean
After first 8 Hours	• Engine oil—change • Hydraulic filter—change
8 Hours	• Battery electrolyte—check • Hydraulic fluid—check • Mower housing—clean • Cutting Blades—check • Blade Spindle Bearings—grease
25 Hours	• Foam Air Cleaner—service[1] • PTO Belt Idler Arm—grease • Caster Wheels—grease
50 Hours	• Tires—check pressure • Belts—check for wear/cracks
100 Hours	• Engine oil—change[1] • Electric Clutch—adjust • Hydraulic lines—check • Paper Air Cleaner—replace[1] • Cooling system—clean
200 Hours	• Oil Filter—change (200 hours or every other oil change) • Fuel Filter—replace • Spark Plug(s)—check • Hydraulic oil filter—change
At storage	• Chipped Surfaces—paint • Perform all maintenance procedures listed above before storage

[1]More often in dusty, dirty conditions.

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

Caution

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

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

Servicing the Air Cleaner

Service Interval/Specification

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

Paper Element: Replace after every 100 operating hours.

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

Note: Service the air cleaner more frequently if operating conditions are extremely dusty or sandy.

Removing the Foam and Paper Elements

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to off. Remove the key.
2. Clean around the air cleaner to prevent dirt from getting into the engine and causing damage. Unscrew the cover nut and remove the air cleaner cover (Fig. 17).
3. Remove the air cleaner assembly (Fig. 17).
4. Carefully slide the foam element off the paper element (Fig. 17).

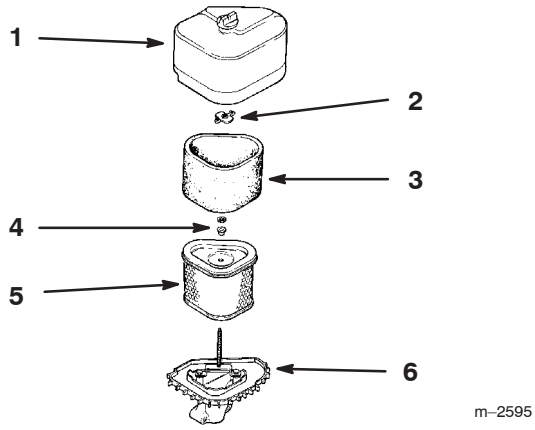


Figure 17

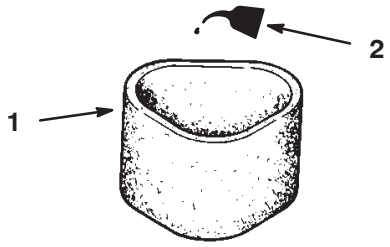
1. Cover and nut
2. Wing nut
3. Foam element
4. Washer and grommet
5. Paper element
6. Air cleaner base

Cleaning the Foam Elements

1. Wash the foam element in liquid soap and warm water. When the element is clean, rinse it thoroughly.
2. Dry the element by squeezing it in a clean cloth.
3. Put one or two ounces of oil on the element (Fig. 18). Squeeze the element to distribute the oil.

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

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



m–5193

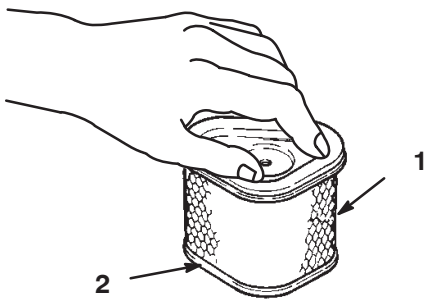
Figure 18

1. Foam element 2. Oil

Inspecting the Paper Element

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

1. Inspect the element for tears, an oily film, and damage to the rubber seal (Fig. 19).
2. Replace the paper element if it is damaged or excessively dirty.



m–5192

Figure 19

1. Paper element 2. Rubber seal

Installing the Foam and Paper Elements

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

1. Installing the Foam and Paper Elements

1. Carefully slide the foam element onto the paper air cleaner element (Fig. 17).
2. Place the air cleaner assembly onto the air cleaner base (Fig. 17).
3. Install the air cleaner cover and secure with cover nuts (Fig. 17).

Servicing the Engine Oil

Change the engine oil:

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

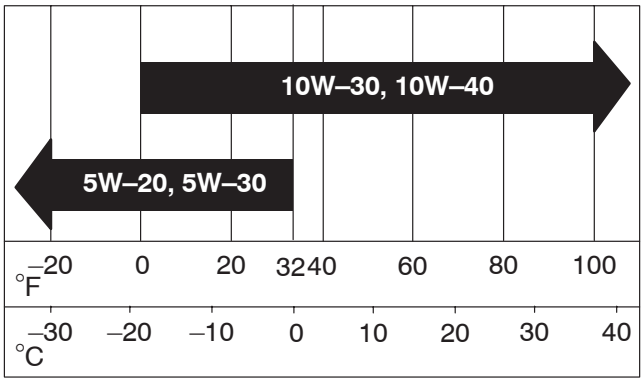
Note: Change oil more frequently when operating conditions are extremely dusty or sandy.

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

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

Viscosity: See table below

USE THESE SAE VISCOSITY OILS



Checking the Engine Oil Level

1. Park the machine on a level surface, disengage the power take off (PTO) and turn the ignition key to off. Remove the key.
2. Clean around the oil dipstick (Fig. 20) so dirt cannot fall into the filler hole and damage the engine.
3. Unscrew the oil dipstick and wipe the metal end clean (Fig. 20).
4. Slide the oil dipstick fully into the filler tube, do not thread onto tube (Fig. 20). 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.

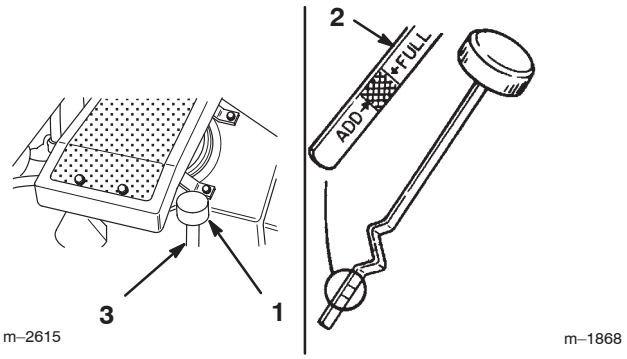


Figure 20

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

Changing the Engine Oil

1. Start the engine and let it run five minutes. This warms the oil so it drains better.
2. Park the machine so that the drain side is slightly lower than the opposite side to assure the oil drains completely. Then disengage the power take off (PTO) and turn the ignition key to off. Remove the key.
3. Place a pan below the oil drain. Remove the oil drain cap (Fig. 21).
4. When oil has drained completely, install the oil drain cap.

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

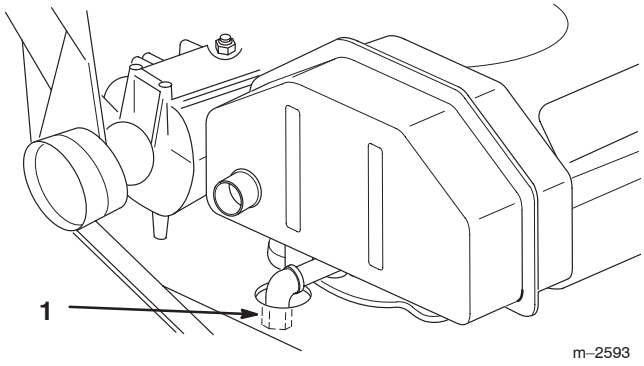


Figure 21

1. Oil drain cap

5. Slowly pour approximately 80% of the specified oil, page 26, into the filler tube (Fig. 20).
6. Now check the oil level; refer to Checking the Engine Oil Level, page 26.
7. Slowly add additional oil to bring to the full mark on the dipstick.

Changing the Engine Oil Filter

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

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

1. Drain the oil from the engine; refer to Changing/Draining Oil, page 27.
2. Remove the old filter and wipe the filter adapter (Fig. 22) gasket surface.
3. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Fig. 22).

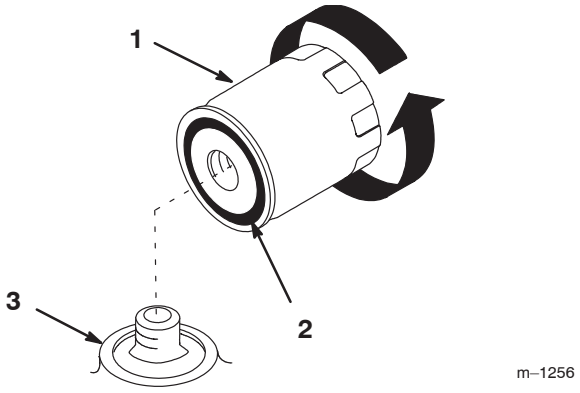


Figure 22

1. Oil filter
2. Gasket
3. Adapter

4. Install the replacement oil filter to the filter adapter. Turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/2 turn (Fig. 22).
5. Fill the crankcase with the proper type of new oil; refer to Changing/Draining Oil, page 27.

Servicing the Spark Plug

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. Remove the key.

2. Pull the wire(s) off the spark plug(s) (Fig. 23). 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.

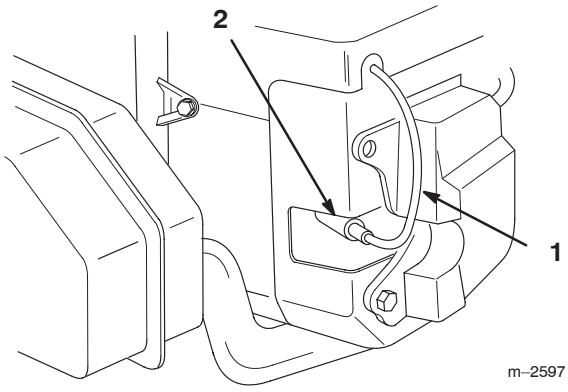


Figure 23

1. Spark plug wire
2. Spark plug

Checking the Spark Plug

1. Look at the center of the spark plug(s) (Fig. 24). 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. 24). Bend the side electrode (Fig. 24) if the gap is not correct.

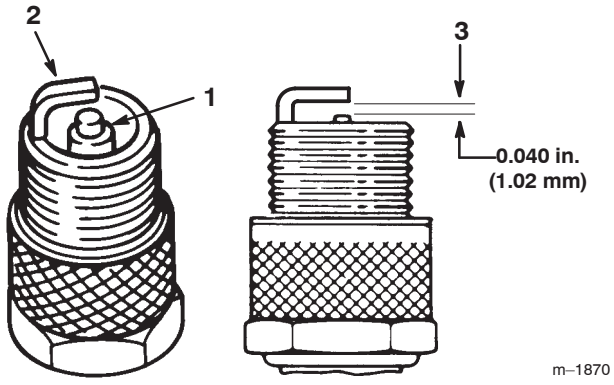


Figure 24

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. 23).

Greasing the Bearings and Bushings

The cutting unit must be lubricated regularly. Refer to the Recommended Maintenance Schedule on page 24. Grease with No. 2 general purpose lithium base or molybdenum base grease.

1. Stop the engine, remove the key and disconnect the spark plug wire(s) from the spark plug(s).
2. Grease the fittings on the three spindle bearings and the idler arm (Fig. 47).

Note: You'll have to remove the deck cover to access the grease fitting on the idler arm.

3. Grease the fittings on the carrier frame mounting tubes and castor wheels (Fig. 25).

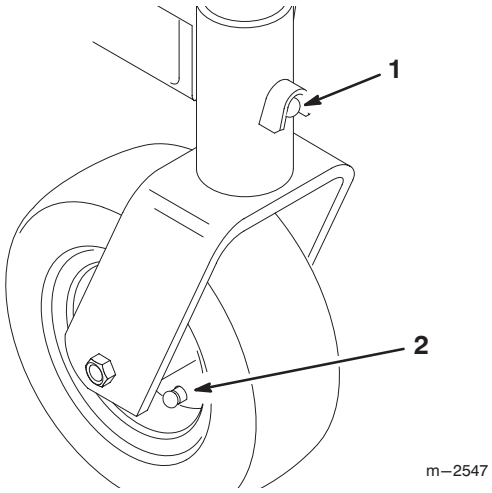


Figure 25

1. Carrier Frame Mounting Tube Grease Fitting
2. Castor Wheel Grease Fitting

Cleaning the Cooling Systems

Before each use, check and clean hydraulic and engine cooling systems. Remove any build–up of grass, dirt or other debris from the oil cooler screen and engine air intake. Every 100 hours clean oil cooler, engine cylinder and cylinder head cooling fins. Also clean around carburetor, governor levers and linkage. This will help

insure adequate cooling to hydraulic pumps, motors and engine and will reduce the possibility of overheating and mechanical damage.

1. Remove oil cooler from the engine (Fig. 26). Save all mounting hardware.
2. Blow out fins of oil cooler and area between fins and screen with compressed air. If area between screen and fins is tightly packed, remove oil cooler from screen. Removing two retaining screws (Fig. 26). Save all mounting hardware.
3. Clean off engine air intake (Fig. 26).
4. Install oil cooler onto engine with previously removed hardware (Fig. 26).

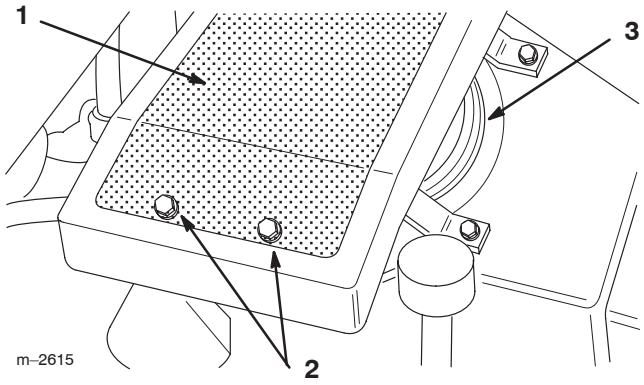


Figure 26

1. Oil cooler screen
2. Oil cooler retaining screw
3. Engine air intake

Checking the Tire Pressure

Maintain the air pressure in the front and rear tires as specified. Uneven tire pressure can cause uneven cut. Check the pressure at the valve stem after every 50 operating hours or monthly, whichever occurs first (Fig. 27). Check the tires when they are cold to get the most accurate pressure reading.

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

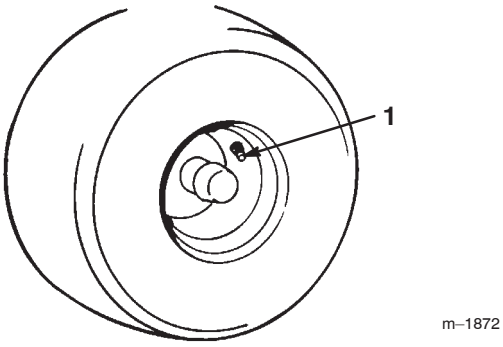


Figure 27

1. Valve stem

Servicing the Fuse

Service Interval/Specification

The electrical system is protected by a fuse. It requires no maintenance, however, if the fuse blows check component/circuit for malfunction or short. To replace fuse pull out on the fuse (Fig. 28) to remove or replace it.

Fuse: F1–7.5 amp, blade-type

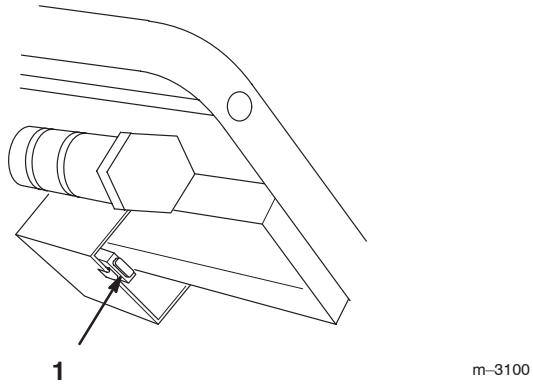


Figure 28

1. Fuse 7.5 amp

Servicing the Fuel Tank

Danger

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

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

Draining The Fuel Tank

1. Park the machine on a level surface, to assure fuel tank drains completely. Then disengage the power take off (PTO) and turn the ignition key to off. Remove the key.
2. Close fuel shut–off valve at fuel tank (Fig. 29).
3. Squeeze the ends of the hose clamp together and slide it up the fuel line away from valve (Fig. 29).
4. Pull the fuel line off the valve (Fig. 29). 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 30.

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

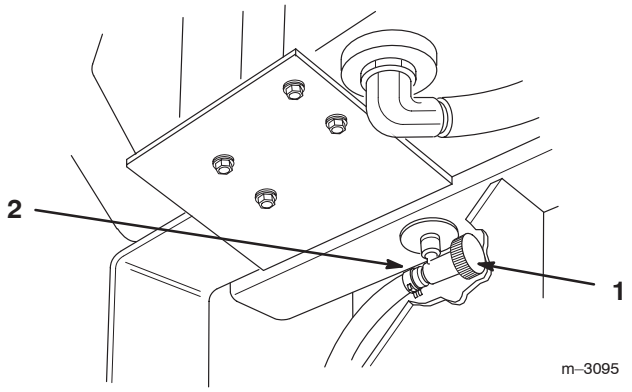


Figure 29

1. Fuel shut-off valve
2. Clamp

Servicing the Fuel Filter

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 power take off (PTO) and turn the ignition key to off. Remove the key.
2. Close fuel shut–off valve at fuel tank (Fig. 29).
3. Squeeze the ends of the hose clamps together and slide them away from the filter (Fig. 30).
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. 29).

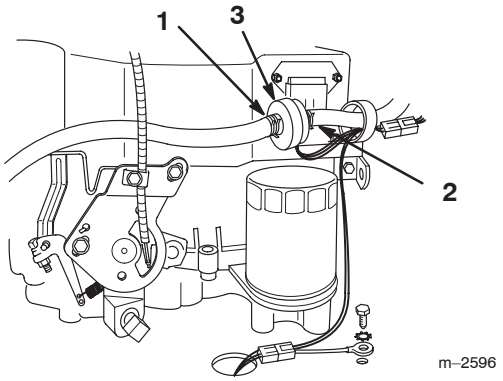


Figure 30

1. Hose clamp
2. Fuel line
3. Filter

Servicing the Hydraulic System

Checking the Hydraulic Fluid

Check the hydraulic fluid level before engine is first started and after every 8 operating hours.

Fluid Type: Mobilube 424 (ISO 68) or equivalent anti–wear hydraulic fluid.

Important Use only hydraulic oils specified. Other fluids could cause system damage.

Tank Capacity: 1-3/4 qt. (1.6 l)

1. Position machine on a level surface and stop the engine.
2. Clean area around filler neck and cap\dipstick of hydraulic tank (Fig. 31).

3. Remove cap\dipstick from filler neck and wipe with a clean rag. Insert cap\dipstick and seat cap all the way into filler neck; then remove and check fluid level. Fluid level should be in between marks on dipstick.
4. If level is low, add fluid to raise level to full mark.
5. Install cap\dipstick onto filler neck.

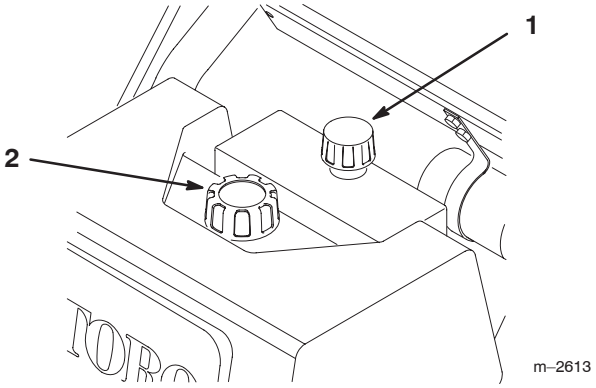


Figure 31

1. Hydraulic tank cap
2. Fuel tank cap\dipstick

Replacing the Hydraulic Filter

Change the hydraulic filter:

- After the first 8 operating hours.
- After every 200 operating hours.

1. Position machine on a level surface, stop the engine, and remove key from ignition switch.

Important Do not substitute automotive oil filter or severe hydraulic system damage may result.

2. Place drain pan under filter, remove the old filter and wipe the filter adapter gasket surface (Fig. 32).

Note: Make sure fluid is completely drained before installing new filter.

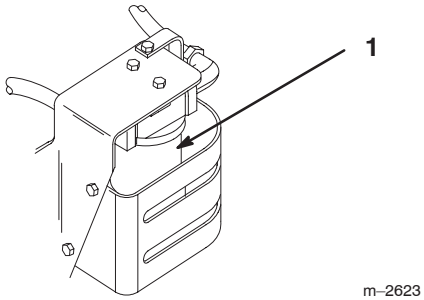


Figure 32

1. Hydraulic filter

3. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Fig. 33).
4. Install replacement hydraulic filter onto 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. 33).
5. Start engine and let run for about two minutes to purge air from the system. Stop the engine and check for leaks. If one or both wheels will not drive, refer Bleeding Hydraulic System, page 31.
6. Check fluid level in hydraulic tank and add to raise level to FULL mark on dipstick. **Do Not over fill**.

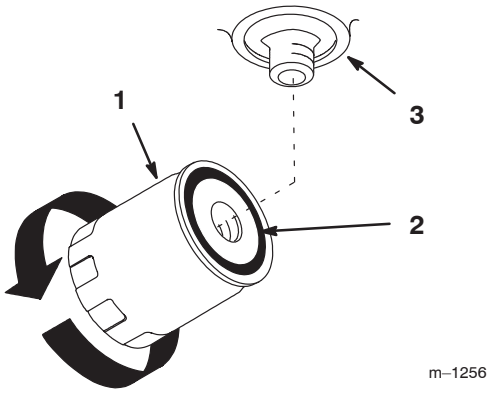


Figure 33

1. Hydraulic filter
2. Gasket
3. Adapter

Bleeding the Hydraulic System

The traction system is self bleeding, however, it may be necessary to bleed the system if fluid is changed or after work is performed on the system.

1. Raise the rear of machine until wheels are off the floor and support with jack stands.
2. Start the engine and run at idle speed. Engage traction on one side and spin the wheel by hand.
3. When the wheel begins to spin on its own, keep it engaged until wheel drives smoothly. (minimum 2 minute)
4. Check hydraulic fluid level as it drops and add as required to maintain level.
5. Repeat procedure on opposite wheel.

Checking the Hydraulic Lines

After every 100 operating hours, check hydraulic lines and hoses for leaks, loose fittings, kinked lines, loose mounting supports, wear, weather and chemical deterioration. Make necessary repairs before operating.

Warning

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

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

Adjusting the By-pass Valve

The by–pass valve is adjustable to ensure easy operation with a variety of deck sizes. If the front of the deck lifts off the ground when the upper control bar is quickly pushed forward or the machine is unable to drive up hills, an adjustment may be needed.

Testing the By–pass Valve

1. Start engine and run for 5 minutes at 3/4 throttle, to warm hydraulic fluid.
2. Drive the machine to a clear and level open area such as a driveway.

Important There should be at least 10 feet of clear area in front of the machine.

3. Loosen the quick release levers and push the reference bar forward to the fast position. Lock the quick release levers to secure the reference bar.
4. Move throttle control to 3/4 throttle.
5. Quickly push the upper control bar against the reference bar. The front caster wheels should almost lift off the ground. If front caster wheels lift the off the ground , the machine is too aggressive and adjustment is required.
6. Move the engine throttle to the fast position.
7. Quickly push the upper control bar against the reference bar. The front caster wheels should lift approximately 1 inch off the ground. If front caster wheels lift the off the ground more than 2 inches, the machine is too aggressive. Adjustment is required.
8. If the machine accelerates slowly, and the front caster wheels do not lift off the ground, the machine is too un–responsive. Adjustment is required.

Adjusting the By–pass Valve

The by–pass valve should be adjusted to deliver best performance for the size (weight) mower you have. The by–pass valve factory setting is 1/2 turn out.

The following values can be used as initial settings for different size mowers:
52 in. 1/2 turn out
44 in. 1 turn out
37 in. 1–1/6 turn out
36 in. 1–1/6 turn out

1. Loosen large jam nut several turns (Fig. 34).
2. Gently close by–pass valve (Fig. 34).

Important Do not over–tighten valve or needle and seat may be damaged. Do not exceed 50 inch pounds to close valve.

3. Open by–pass valve 1/2 turn (Fig. 34).
4. Tighten jam nut to lock the adjustment (Fig. 34).
5. Repeat the Test Procedure to check for proper operation.

Important By–pass valve adjustment is very sensitive, do not adjust more than 1/6 turn (one flat) at a time.

6. If the machine is too aggressive or tends to jump forward, the valve needs to be opened further.
7. If the machine is slow to respond, the valve needs to be closed further.
8. Repeat the Test Procedure to check for proper operation. Re-adjust the by–pass valves until proper performance is achieved.

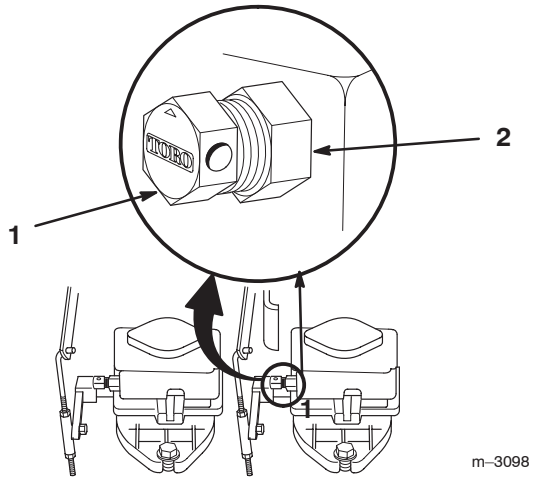


Figure 34

1. By-pass valve
2. Jam nut

Servicing the 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

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

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

Before Inspecting or Servicing the Blades

Park the machine on a level surface, disengage the blade control (PTO) and set the parking brake. Turn the ignition key to **off**. Remove the key and disconnect the spark plug wire(s) from the spark plug(s).

Inspecting the Blades

1. Inspect the cutting edges (Fig 35). 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. 35). If you notice any damage, wear, or a slot forming in this area (item 3 in Fig. 35), immediately install a new blade.

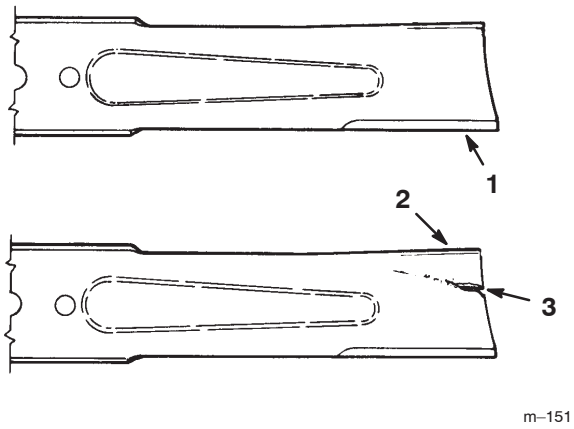


Figure 35

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

Checking for Bent Blades

1. Rotate the blades until the ends face forward and backward (Fig. 36). Measure from a level surface to the cutting edge, position **A**, of the blades (Fig. 37). Note this dimension.

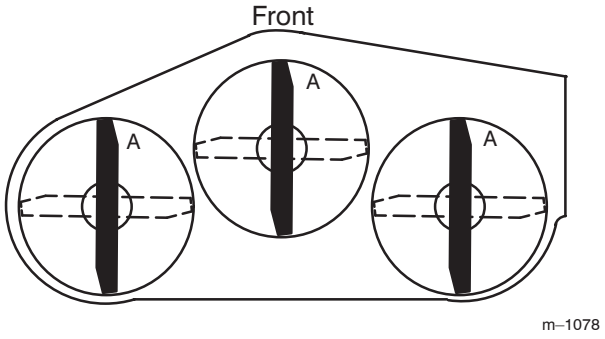
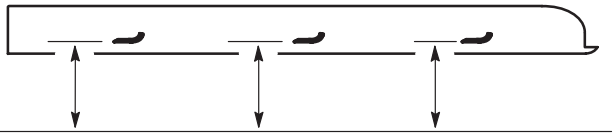


Figure 36



MEASURE FROM CUTTING EDGE TO A LEVEL SURFACE

m–2539

Figure 37

2. Rotate the opposite ends of the blades forward.
3. Measure from a level surface to the cutting edge of the blades at the same position as in step 1. The difference between the dimensions obtained in steps 1 and 2 must

not exceed 1/8 inch (3 mm). If this dimension exceeds 1/8 inch (3 mm), the blade is bent and must be replaced. Refer to Installing the Blades on page 34.

Warning

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

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

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 end using a rag or thickly-padded glove. Remove the blade bolt, washer, anti-scalp cup and blade from the spindle shaft (Fig. 38).

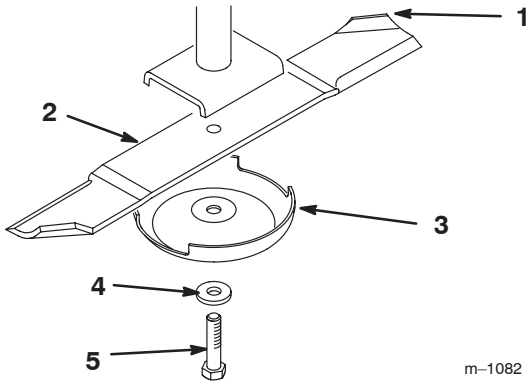


Figure 38

1. Sail Area of Blade
2. Blade
3. Anti-scalp cup
4. Washer
5. Blade Bolt

Sharpening the Blades

1. Use a file to sharpen the cutting edge at both ends of the blade (Fig. 39). Maintain the original angle. The blade retains its balance if the same amount of material is removed from both cutting edges.

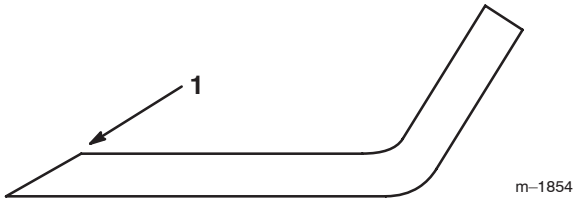


Figure 39

1. Sharpen at original angle

2. Check the balance of the blade by putting it on a blade balancer (Fig. 40). 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. 38). Repeat this procedure until the blade is balanced.

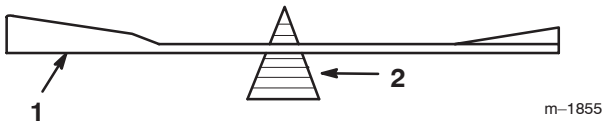


Figure 40

1. Blade
2. Balancer

Installing the Blades

1. Install the blade onto the spindle shaft (Fig. 38).

Important The sail part of the blade must be pointing upward, toward the inside of the mower to ensure proper cutting (Fig. 38).

2. Install the anti-scalp, lock washer, and blade bolt (Fig. 38). Torque the blade bolt to 85–110 ft-lb (115–140 N•m).

Correcting the Mower Quality of Cut

If one cutter blade cuts lower than the other, correct as follows:

1. Stop the engine, remove the key and disconnect the spark plug wire(s) from the spark plug(s).
2. Adjust the tire pressure in all tires to specifications and check that the blades are not bent. Refer to Checking for Bent Blades on page 33.
3. Set the height-of-cut to the 2-1/2” position. Refer to Adjusting the Height-Of-Cut in the Operation section. Make sure the clevis pins are resting on the frame cushions.

4. Rotate the blades so the tips line up with one another. The blade tips must be within 1/8” (3 mm) of each other. If the blade tips are not within 1/8” (3 mm) of each other, add shims (Part No. 3256-24) between the appropriate spindle housing and the bottom of the cutting unit to align the blades.

Setting the Front-to-Rear Pitch

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

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

1. Disengage the PTO and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Check the tire pressure on both deck and traction unit.
4. Position one blade front-to-rear (Fig. 41). Measure at **C** and **D** locations (Fig. 41) from a level surface to the cutting edge of the blade tips (Fig. 42).
5. The mower blade should be **1/4 inch (6 mm) lower in front at *C* than in the rear at *D*.** Rotate blades and repeat for other blades.

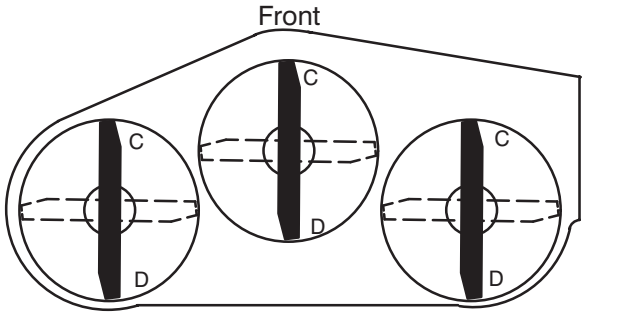


Figure 41

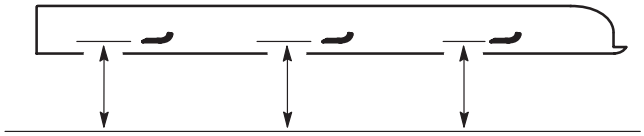


Figure 42

6. To change the front-to-rear pitch, move an equal number of thrust washers on both castor wheel forks. Move the thrust washers from the top of the carrier frame mounting tube to the bottom to raise the front of the mower. Move the thrust washers from the bottom of the mounting tube to the top to lower the front of the mower (Fig. 43).
7. Check the side-to-side leveling of the cutting unit.

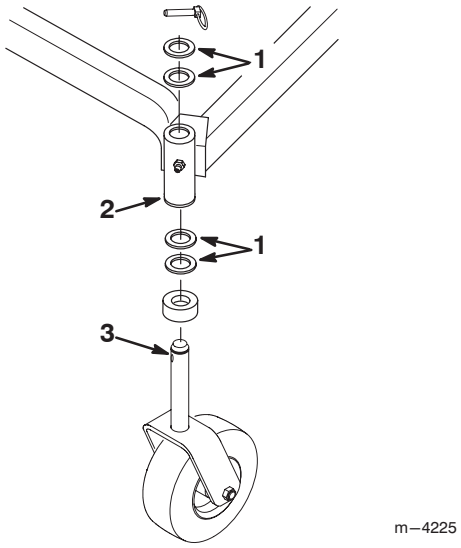


Figure 43

1. Thrust Washers (locate as required)
2. Carrier Frame Mounting Tube
3. Castor Wheel Fork

Checking the Deck Side-to-Side Leveling

1. Check the tire pressure on both deck and traction unit.
2. Position the blades side-to-side (Fig. 44). Measure at **A** and **B** locations (Fig. 44) from a level surface to the cutting edge of blade tips (Fig. 45).
3. The difference between measurements **A** and **B** should be no more than 1/4 inch (6 mm).

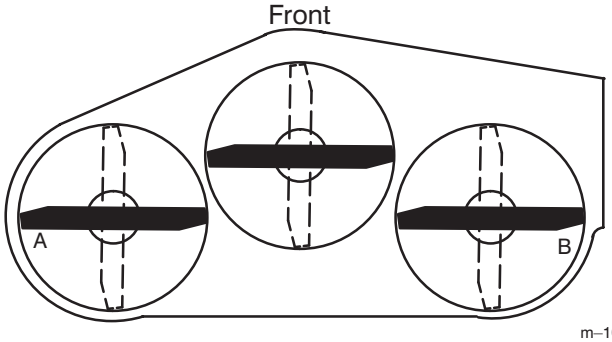
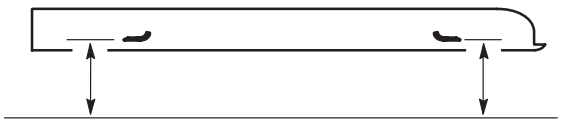


Figure 44



MEASURE FROM CUTTING EDGE TO A LEVEL SURFACE

m–2550

Figure 45

Replacing the Traction Belt

Check traction drive belt for wear after every 50 hours of operation.

1. Raise the front of the machine and hold with jack stands.
2. Disconnect in–line wire connector from wire harness to electric clutch.
3. Remove mower drive belt; refer to mower Operator's Manual.
4. Remove left front engine mounting bolt securing clutch retainer to frame (Fig. 46). Unhook retainer from clutch and remove retainer.
5. Move idler pulley and remove traction belt from the drive pulleys and clutch.
6. Install new belt around clutch and drive pulleys.
7. Hook clutch retainer into clutch and secure to frame with engine mounting bolt. Torque engine mounting bolt to 170-220 in. lb. (19-24 N.m).
8. Connect clutch in–line wire connector to wire harness.

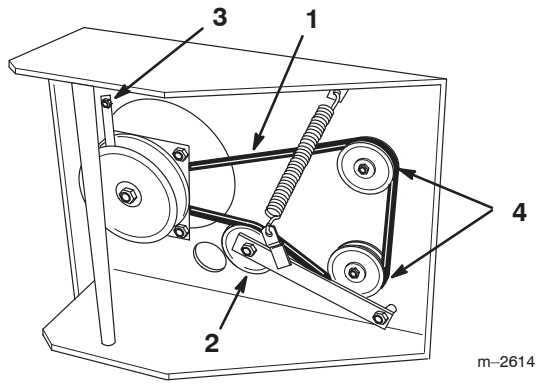


Figure 46

1. Traction belt
2. Idler pulley
3. Clutch retainer
4. Drive pulley

Replacing the Mower Belt

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

1. Stop the engine, remove the key and disconnect the spark plug wire(s) from the spark plug(s).
2. Remove the screws holding the deck cover to the top of the cutting unit and remove the deck cover.
3. Remove the drive belt. Refer to Replacing the Drive Belt, steps 1–4 on page 36.
4. Disconnect the idler arm spring to relieve tension on the idler arm and idler pulley, then remove the worn deck belt (Fig. 47).
5. Install the new deck belt around the two outboard spindle pulleys, the idler pulley, and in the lower groove of the center spindle pulley (Fig. 47).
6. Reconnect the idler arm spring (Fig. 47).

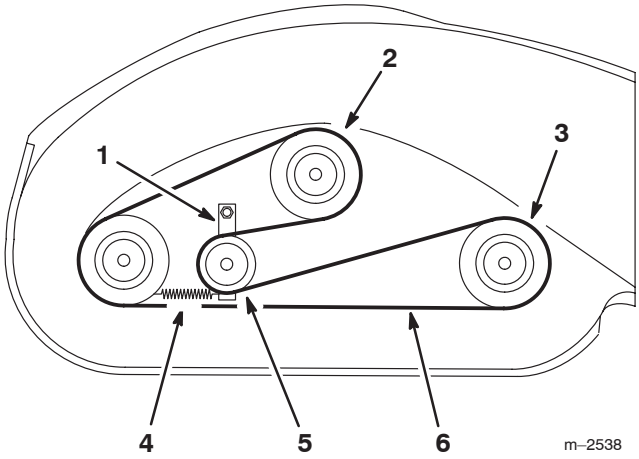


Figure 47

Top View

1. Idler Arm
2. Center Spindle Pulley
3. Outboard Spindle Pulley (2)
4. Idler Arm Spring
5. Idler Pulley
6. Deck Belt

Replacing the Drive Belt

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

1. Stop the engine, remove the key and disconnect the spark plug wire(s) from the spark plug(s).
2. Remove the screws holding the deck cover to the top of the cutting unit and remove the deck cover.

3. Loosen the jam nuts on each adjusting shaft to loosen the tension on the drive belt.

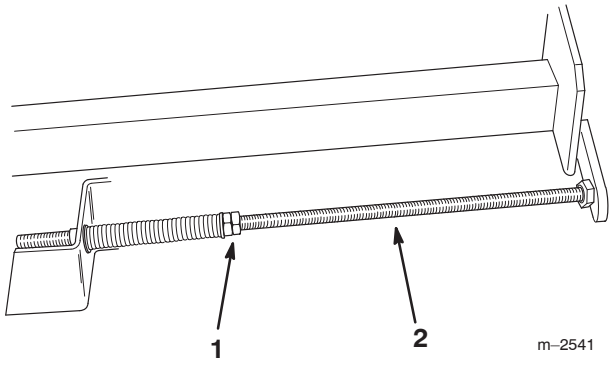


Figure 48

1. Jam Nuts
2. Adjusting Shaft

4. Remove the worn drive belt (Fig. 49).

5. Install the new drive belt onto the traction unit drive pulley and the top groove of the center spindle pulley (Fig. 49).

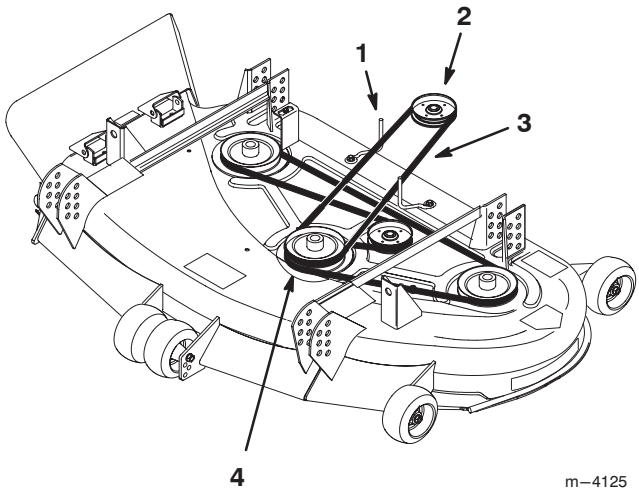


Figure 49

1. Belt Guide (2)
2. Traction Unit Drive Pulley
3. Drive Belt
4. Center Spindle Pulley

6. Tighten the jam nuts on the adjusting shafts until the springs are compressed to a length of 5 inches (12.7 cm) (Fig 50).

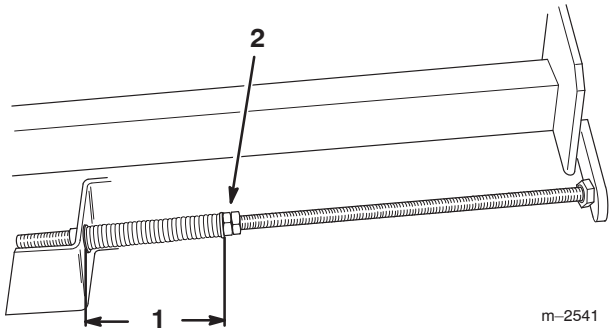


Figure 50

1. 5” between the Spacer and Bushing
2. Jam Nuts

7. Reinstall the deck cover onto the cutting unit, then reinstall and tighten the screws.

Adjusting the Electric Clutch

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

1. To adjust clutch, tighten or loosen lock nuts on flange studs (Fig. 51).

2. Check adjustment by inserting feeler gauge through slots next to studs (Fig. 51).

3. The proper disengaged clearance between the clutch plates is .012–.024 in. (0.30-0.60 mm). It will be necessary to check this clearance at each of the three slots to ensure the plates are parallel to each other.

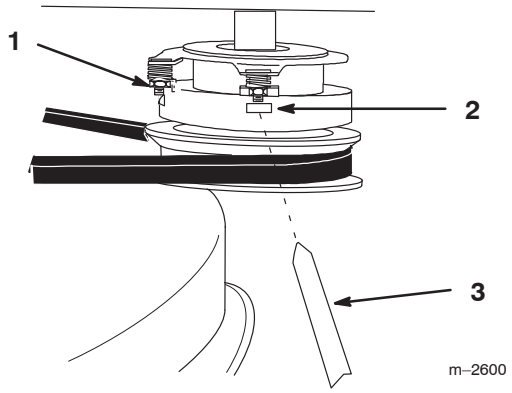


Figure 51

1. Adjusting nut
2. Slot
3. Feeler gauge

Adjusting the Machine Neutral

If wheels turn when control bar is in neutral, adjustment is required

1. Raise rear of the machine so wheels are off the ground and support with jack stands.

Caution

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

Always remove the ignition and chock or block tires when leaving the machine unattended, even if just for a few minutes.

2. Start engine and run for 5 minutes at 3/4 throttle, to warm hydraulic fluid.
3. Move control bar rearward and forward then release. If wheels rotate when control bar is in neutral, adjustment is required.
4. Loosen top and bottom jam nuts at pump arm neutral adjustment sleeve (Fig. 52).
5. Push down on Pump Arm until Sleeve contacts bottom nut (Fig. 52). Wheel should now be rotating slowly in reverse.
6. Turn bottom nut up slowly, moving sleeve and pump arm up, until wheel stops rotating (Fig. 52).
7. Turn top nut down against sleeve and tighten to lock the adjustment (Fig. 52).
8. Repeat step 3 above to check adjustment. Repeat adjustment procedure if necessary.
9. Repeat on other wheel, if necessary.

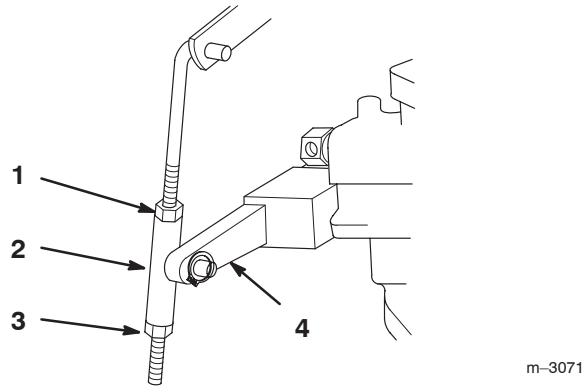


Figure 52

1. Top jam nut
2. Sleeve
3. Bottom jam nut
4. Pump arm

Servicing the Battery

Check the electrolyte level in the battery before each use. Always keep the battery clean and fully charged. Use a paper towel to clean the battery case. If the battery terminals are corroded, clean them with a solution of four parts water and one part baking soda. Apply a light coating of grease to the battery terminals to prevent corrosion.

Voltage: 12 v, 280 Cold Cranking Amps

Checking the Electrolyte Level

1. Open covers to see into the cells. The electrolyte must be up to the lower part of the tube (Fig. 53). Do not allow the electrolyte to get below the plates. (Fig. 53).
2. If the electrolyte is low, add the required amount of distilled water; refer to Adding Water to the Battery, page 38.

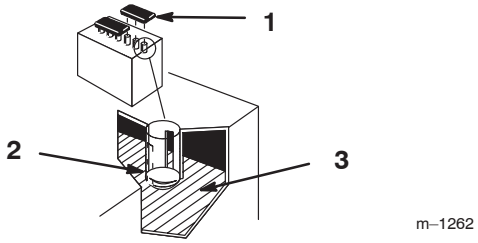


Figure 53

1. Filler caps
2. Lower part of tube
3. Plates

Adding Water to the Battery

The best time to add distilled water to the battery is just before you operate the machine. This lets the water mix thoroughly with the electrolyte solution.

1. Clean the top of the battery with a paper towel.
2. Lift off the filler caps (Fig. 53).
3. Slowly pour distilled water into each battery cell until the level is up to the lower part of the tube (Fig. 53).

Important Do not overfill the battery because electrolyte (sulfuric acid) can cause severe corrosion and damage to the chassis.

4. Press the filler caps onto the battery.

Charging the Battery

Important Always keep the battery fully charged (1.260 specific gravity). This is especially important to prevent battery damage when the temperature is below 32°F (0°C).

5. Check the electrolyte level; refer to Checking Electrolyte Level, page 38.

6. Remove the filler caps from the battery and connect a 3 to 4 amp battery charger to the battery posts. Charge the battery at a rate of 4 amperes or less for 4 hours (12 volts). Do not overcharge the battery. Install the filler caps after the battery is fully charged.

Warning

Charging the battery produces gasses that can explode.

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

Removing the Battery

Warning

Battery terminals or metal tools could short against metal tractor components causing sparks. Sparks can cause the battery gasses to explode, resulting in personal injury.

- **When removing or installing the battery, do not allow the battery terminals to touch any metal parts of the tractor.**
- **Do not allow metal tools to short between the battery terminals and metal parts of the tractor.**

Warning

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

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

1. Disengage the power take off (PTO), chock or block tires, and turn the ignition key to off. Remove the key.

2. With the engine off, locate the battery.

3. Lift the black rubber cover up on the negative cable. Disconnect the negative (black) ground cable from the battery post (Fig. 54).

4. Lift the red rubber cover up on the positive cable. Disconnect the positive cable (red cover) from the battery post (Fig. 54).

5. Remove the battery hold down plate (Fig. 54). Remove battery from the machine.

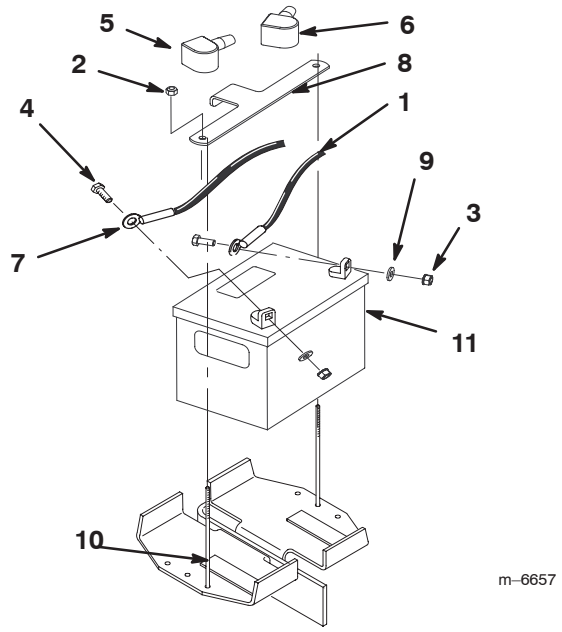


Figure 54

1. Negative cable
2. Nut (1/4 in.)
3. Nut (5/16 in.)
4. Bolt
5. Rubber cover (red)
6. Rubber cover (black)
7. Positive cable
8. Battery hold down plate
9. Washer
10. Battery hold down
11. Battery

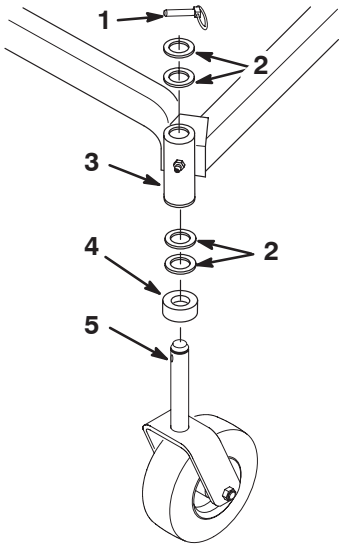
Replacing the Caster Wheel Fork Bushings

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

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

2. Remove the locking pin and spacer(s) from the top of the caster wheel fork (Fig. 55).

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



m−4225

Figure 55

1. Locking Pin
2. Thrust Washers (locate as required)
3. Carrier Frame Mounting Tube
4. Spacer
5. Castor Wheel Fork

4. Insert a pin punch into the mounting tube and carefully drive out the bushings (Fig. 56). Clean the inside of the mounting tube.

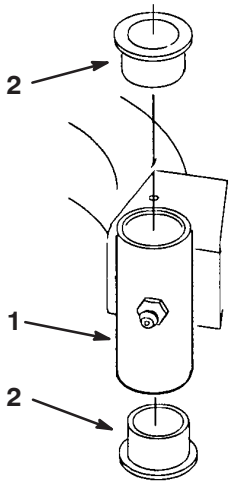
5. Grease the inside and outside of the new bushings. Use a hammer and flat plate to carefully drive the bushings into the mounting tube.

6. Inspect the caster wheel fork for wear and replace if necessary (Fig. 55).

7. Slide the caster wheel fork through the bushings in the mounting tube. Replace the spacer(s) onto the fork and secure with the retaining ring (Fig 55).

Important The inside diameter of the bushings may collapse slightly when installed. If the caster wheel fork does not slide into the new bushings, ream both bushings to an inside diameter of 1.126 inch (29 mm).

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



m−1076

Figure 56

1. Carrier Frame Mounting Tube
2. Bushing

Caster Wheel and Bearings Service

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

1. Remove the locknut and wheel bolt holding the caster wheel to the caster fork (Fig. 57).

2. Remove one bushing, then pull the spanner bushing and roller bearing out of the wheel hub (Fig. 57).

3. Remove the other bushing from the wheel hub and clean any grease and dirt from the wheel hub (Fig. 57).

4. Inspect the roller bearing, bushings, spanner bushing and inside of the wheel hub for wear. Replace any defective or worn parts (Fig. 57).

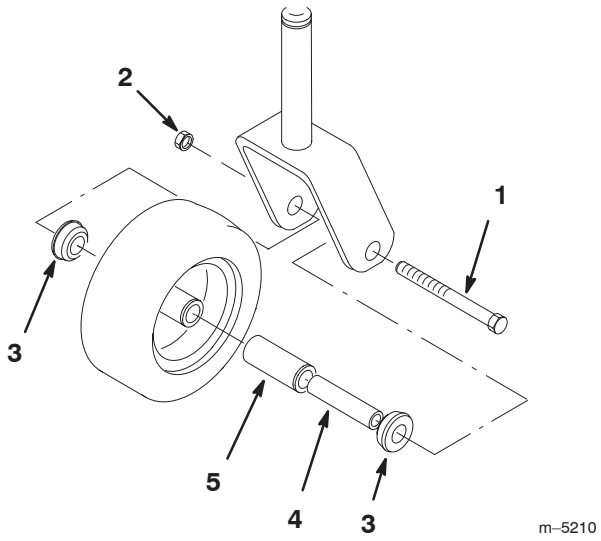


Figure 57

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

5. To assemble, place one bushing into the wheel hub. Grease the roller bearing and spanner bushing, and slide them into the wheel hub. Place the second bushing into the wheel hub (Fig. 57).

6. Install the caster wheel into the caster fork and secure with the wheel bolt and locknut. Tighten the locknut until the spanner bushing bottoms against the inside of the caster forks (Fig. 57).

7. Grease the fitting on the caster wheel.

Replacing the Grass Deflector

Warning

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

Never operate the lawn mower unless you install a cover plate, a mulch plate, or a grass chute and catcher.

1. Remove the locknut, bolt, spring and spacer holding the deflector to the pivot brackets (Fig. 58). Remove the damaged or worn grass deflector.

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

Note: Make sure the **L** end of spring is installed behind deck edge before installing the bolt as shown in figure 58.

3. Install bolt and nut. Place the **J** hook end of spring around grass deflector (Fig. 58).

Important The grass deflector must be able to rotate. Lift the deflector up to the full open position and ensure that it rotates into the full down position.

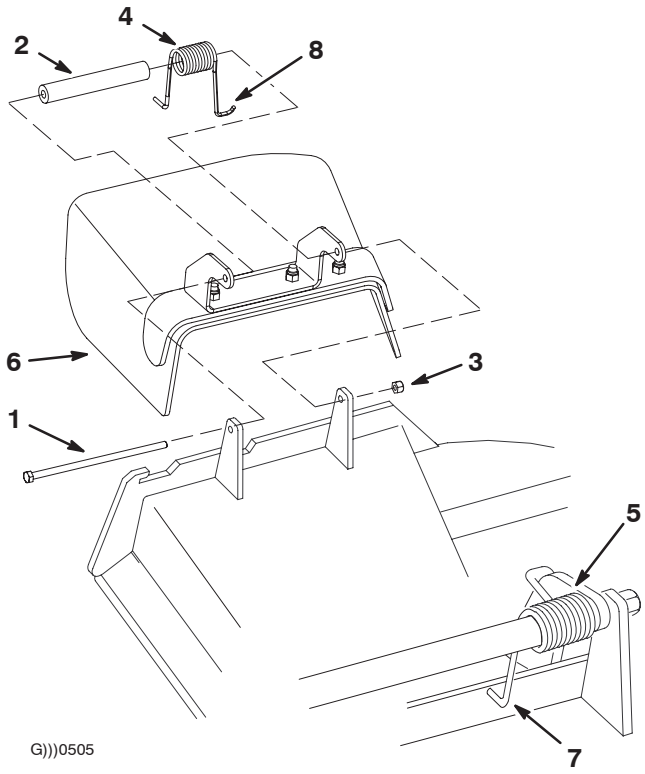
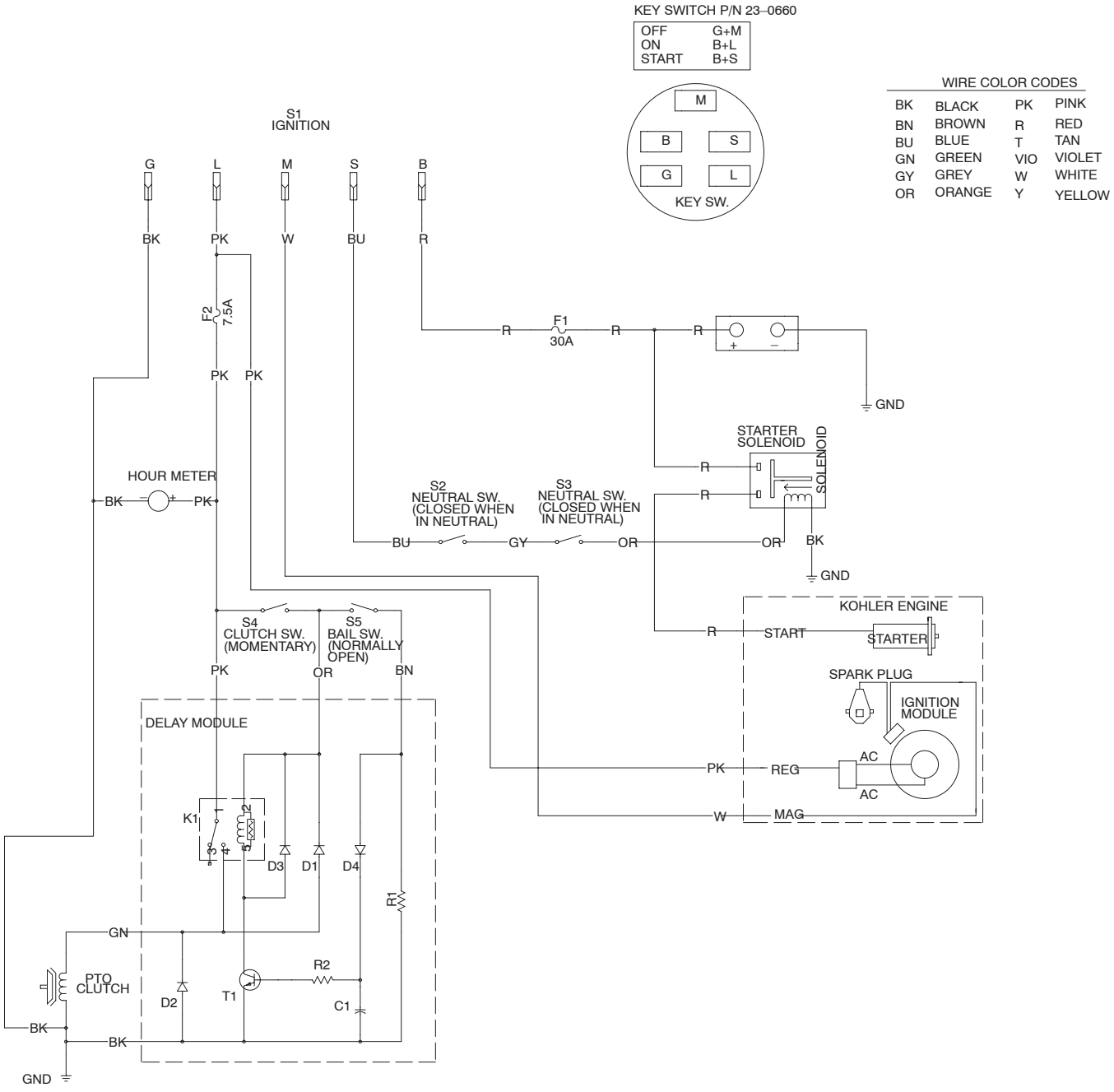


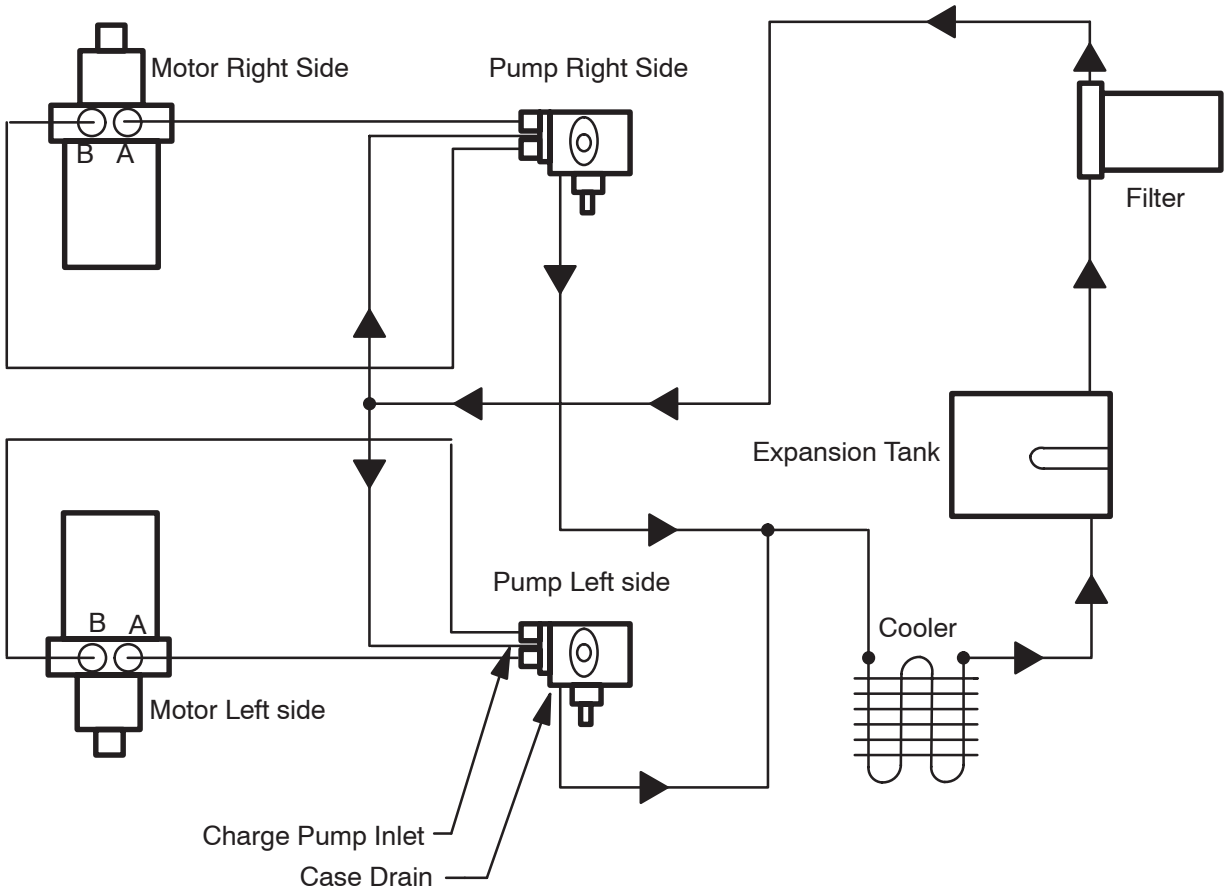
Figure 58

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

Wiring Diagram



Hydraulic Diagram



Cleaning and Storage

1. Disengage the power take off (PTO) and turn the ignition key to off. Remove the key.
2. Remove grass clippings, dirt, and grime from the external parts of the entire machine, especially the engine. 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, engine, hydraulic pumps and motors.

3. Service the air cleaner; refer to Servicing the Air Cleaner, page 25.
4. Change the crankcase oil; refer to Servicing the Engine Oil, page 26.
5. Change the hydraulic fluid; refer to Servicing the Hydraulic System, page 30.
6. Remove the spark plug(s) and check its condition; refer to Spark Plug, page 27. 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).
7. Check the tire pressure; refer to Servicing the Tire Pressure, page 29.
8. For storage over 30 days, prepare the traction unit as follows.
9. Add a petroleum based stabilizer/conditioner to fuel in the tank. Follow mixing instructions from stabilizer manufacturer. **Do not use an alcohol based stabilizer (ethanol or methanol).**

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

10. Run the engine to distribute conditioned fuel through the fuel system (5 minutes).

11. Stop the engine, allow it to cool and drain the fuel tank; refer to Draining the Fuel Tank, page 30.

12. Restart the engine and run it until it stops.

13. Choke or prime the engine.

14. 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.

15. Dispose of fuel properly. Recycle as per local codes.

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

16. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged or defective.

17. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.

18. Store the machine in a clean, dry garage or storage area. Remove the key from the ignition switch and keep it in a memorable place. Cover the machine to protect it and keep it clean.

Troubleshooting

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Engine will not start, starts hard, or fails to keep running.	1. Fuel tank is empty.	1. Fill fuel tank with gasoline.
	2. Choke is not On.	2. Move choke lever to On.
	3. Air cleaner is dirty.	3. Clean or replace air cleaner element.
	4. Spark plug wire is loose or disconnected.	4. Install wire on spark plug.
	5. Spark plug is pitted, fouled, or gap is incorrect.	5. Install new, correctly gapped spark plug.
	6. Dirt in fuel filter.	6. Replace fuel filter.
	7. Dirt, water, or stale fuel is in fuel system.	7. Contact Authorized Service Dealer.
	8. Battery is dead.	8. Charge battery.
Engine loses power.	1. Engine load is excessive.	1. Reduce ground speed.
	2. Air cleaner is dirty.	2. Clean air cleaner element.
	3. Oil level in crankcase is low.	3. Add oil to crankcase.
	4. Cooling fins and air passages under engine blower housing are plugged.	4. Remove obstruction from cooling fins and air passages.
	5. Spark plug is pitted, fouled, or gap is incorrect.	5. Install new, correctly gapped spark plug.
	6. Vent hole in fuel cap is plugged.	6. Clean or replace the fuel cap.
	7. Dirt in fuel filter.	7. Replace fuel filter.
	8. Dirt, water, or stale fuel is in fuel system.	8. Contact Authorized Service Dealer.

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Engine overheats.	1. Engine load is excessive. 2. Oil level in crankcase is low. 3. Cooling fins and air passages under engine blower housing are plugged.	1. Reduce ground speed. 2. Add oil to crankcase. 3. Remove obstruction from cooling fins and air passages.
Abnormal vibration.	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.	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.
Machine does not drive.	1. Hydrostatic fluid level low. 2. Traction belt is worn, loose or broken. 3. Traction belt is off pulley.	1. Fill hydrostatic fluid tank. 2. Change Belt. 3. Change Belt.
Machine does not drive up hills or inclines.	1. By-pass valve is adjusted too far open.	1. Adjust by-pass valve
Machine moves slowly in neutral.	1. Neutral is mis-adjusted. 2. Return spring is broken or missing. 3. Linkage is dirty or bent.	1. Adjust hydro pump neutral. 2. Replace return spring. 3. Clean and lubricate linkage. Replace bent or worn parts.
Machine drive is too aggressive. Mower lifts when drive is engaged.	1. By-pass valve is adjusted too far closed.	1. Adjust by-pass valve
Uneven cutting height	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.	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.

PROBLEM	POSSIBLE CAUSES	CORRECTIVE ACTION
Blades do not rotate.	1. Drive belt is worn, loose or broken.	1. Install new drive belt.
	2. Drive belt is off pulley.	2. Install drive belt and check adjusting shafts and belt guides for correct position.
	3. Deck belt is worn, loose or broken.	3. Install new deck belt.
	4. Deck belt is off pulley.	4. Install deck pulley and check the idler pulley, idler arm and spring for correct position and function.


TORO®