FORM NO. 3318–739

TORO®

Z–MASTER

Z118 Zero Radius Tractor

Model No. 74105 – 790001 & Up

Operator's Manual

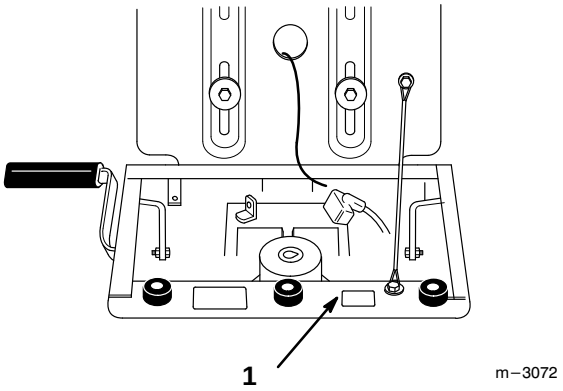
IMPORTANT: Read this manual carefully. It contains information about your safety and the safety of others. Also become familiar with the controls and their proper use before you operate the product.

Introduction

Thank you for purchasing a Toro product.

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

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



1. Model and Serial Number Plate

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

Model No: _____

Serial No. _____

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

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

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

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

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

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

The left and right side of the machine is determined by sitting on the seat in the normal operator’s position.

⚠ WARNING: ⚠

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

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Contents

Safety

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

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

⚠ WARNING

POTENTIAL HAZARD

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

WHAT CAN HAPPEN

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

HOW TO AVOID THE HAZARD

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

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

Note: This engine is NOT equipped with a spark arrestor muffler. Use or operation of this mower in the State of California on any forest-covered or unimproved grass-covered land, without an approved spark arrester muffler, is a violation of the law. Other states may have similar laws.

General Operation

1. Read, understand, and follow all instructions in the operator's manual and on the machine before starting.

2. Allow only responsible adults who are familiar with the instructions to operate the machine.

3. Clear the area of objects such as rocks, toys, wire, etc., which could be picked up and thrown by the blade.

4. Be sure the area is clear of other people before mowing. Stop the machine if anyone enters the area.

5. Never carry passengers.

6. Do not mow in reverse unless absolutely necessary. Always look down and behind before and while backing.

7. 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.

8. Slow down before turning. Sharp turns on any terrain may cause loss of control.

9. Never leave a running machine unattended. Always turn off blades, set parking brake, stop engine, and remove key before dismounting.

10. Turn off blades when not mowing.

11. Keep hands, feet, hair and loose clothing away from attachment discharge area, underside of mower and any moving parts while engine is running.

12. Stop the engine before removing the grass catcher or unclogging the chute.

13. Mow only in daylight or good artificial light.

14. Do not operate the machine while under the influence of alcohol or drugs.

15. Watch for traffic when operating near or crossing roadways.

16. Use extra care when loading or unloading the machine onto a trailer or truck.

17. Do not touch equipment or attachment parts which may be hot from operation. Allow to cool before attempting to maintain, adjust or service.

18. Before operating a machine with ROPS (roll over protection) be certain the seat belt retainers are attached to prevent the seat from pivoting forward.

Slope Operation

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

DO

- Mow up and down slopes greater than 5°, not across.
- Mow downhill only on slopes above 10°, never mow uphill. If a steep slope must be ascended, back up the hill, and drive forward down the hill, keeping the machine in gear.
- Remove obstacles such as rocks, tree limbs, etc. from the mowing area. Watch for holes, ruts or bumps, as uneven terrain could overturn the machine. Tall grass can hide obstacles.
- Use slow speed. Choose a low gear so that you will not have to stop or shift while on the slope.
- Follow the manufacturer’s recommendations for wheel weight or counterweights to improve stability.
- Use extra care with grass catchers or other attachments. These can change the stability of the machine.
- Keep all movement on slopes slow and gradual. Do not make sudden changes in speed or direction.
- Avoid starting or stopping on a slope. If tires lose traction, disengage the blades and proceed slowly straight down the slope.
- When operating machine on slopes, banks or drop offs, always have ROPS (roll over protection) installed.
- When operating a machine with ROPS (roll over protection) always use seat belt.
- Be certain that the seat belt can be released quickly if the machine is driven or rolls into ponds of water.
- Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.

DO NOT

- Do not operate machine on hillsides or slopes exceeding 15°.
- Avoid turning on slopes. If you must turn, turn slowly and gradually downhill, if possible.
- Do not mow near drop-offs, ditches, or embankments. The machine could suddenly turn over if a wheel goes over the edge of a cliff or ditch, or if an edge caves in.
- Do not mow on wet grass. Reduced traction could cause sliding.
- Do not try to stabilize the machine by putting your foot on the ground.
- Do not use a grass catcher on steep slopes. Heavy grass bags could cause loss of control or overturn the machine.

Children

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the machine and the mowing activity. Never assume that children will remain where you last saw them. The following requirements must be followed to prevent injury to children.

1. Keep children out of the mowing area and under the watchful care of another responsible adult.

2. Be alert and turn the machine off if children enter the area.

3. Before and while backing, look behind and down for small children.

4. Never carry children. They may fall off and be seriously injured or interfere with safe machine operation.

5. Never allow children to operate the machine.

6. Use extra care when approaching blind corners, shrubs, trees, the end of a fence or other objects that may obscure vision.

Service

1. Stop the engine and disconnect spark plug wire(s) before performing any service, repairs, maintenance or adjustments.

2. Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.

A. Use only an approved container.

B. Never remove the gas cap or add fuel when the engine is running. Allow the engine to cool before refueling. Do not smoke.

C. Never refuel the machine indoors.

D. Never store the machine or fuel container inside where there is an open flame, such as near a water heater or furnace.

3. Never run a machine inside a closed area.

4. Keep nuts and bolts tight, especially the blade attachment bolts. Keep equipment in good condition.

5. Never tamper with safety devices. Check safety systems for proper operation before each use.

6. Keep the machine free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage. Allow the machine to cool before storing.

7. Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.

8. Grass catcher components are subject to wear, damage and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check components and replace with manufacturer’s recommended parts, when necessary.

9. Mower blades are sharp and can cut. Wrap the blade(s) or wear gloves, and use extra caution when servicing them.

10. Use only genuine replacement parts to ensure that original standards are maintained.

11. Check brake operation frequently. Adjust and service as required.

12. Battery acid is poisonous and can cause burns. Avoid contact with skin, eyes and clothing. Protect your face, eyes and clothing when working with a battery.

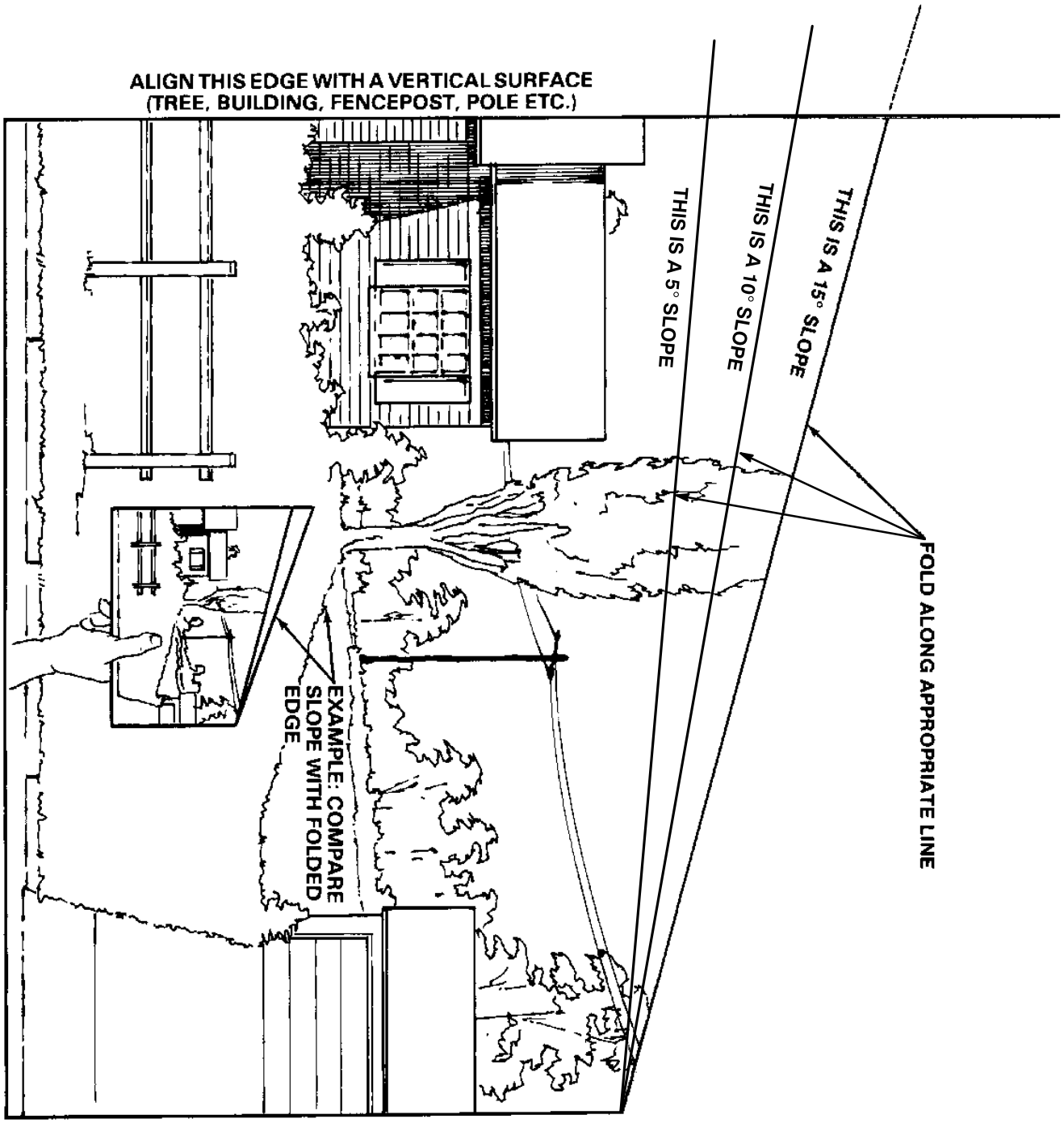
13. Battery gases can explode. Keep cigarettes, sparks and flames away from battery.

14. Hydraulic fluid escaping under pressure can penetrate the skin and cause injury. Use cardboard or paper to find hydraulic leaks.

15. Never modify ROPS (roll over protection) frames or structures because they are specifically designed, sized, located and tested for injury reduction. If a rollover occurs, a modified ROPS will not provide adequate protection.

Slope Chart

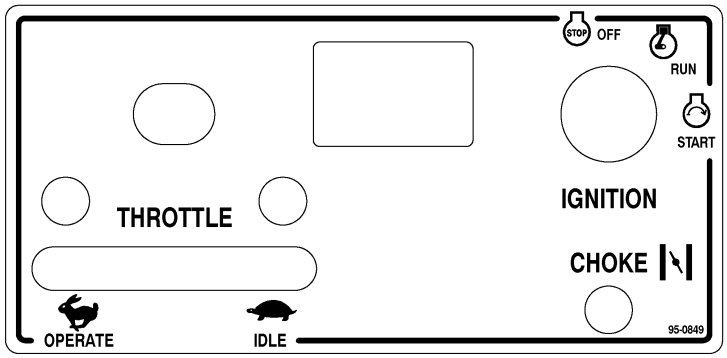
Read all safety instructions on pages 2–4.



Safety and Instruction Decals

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

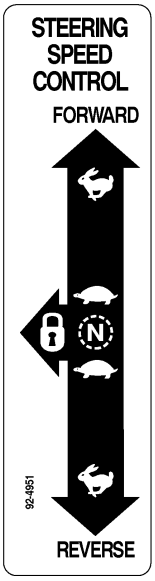
ON RIGHT SIDE CONTROL PANEL
(Part No. 95–0849)



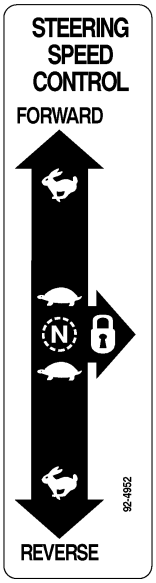
ON REAAR OF SEAT SUPPORT
(Part No. 88–2790)

ON PTO SWITCH
(Part No. 112845)

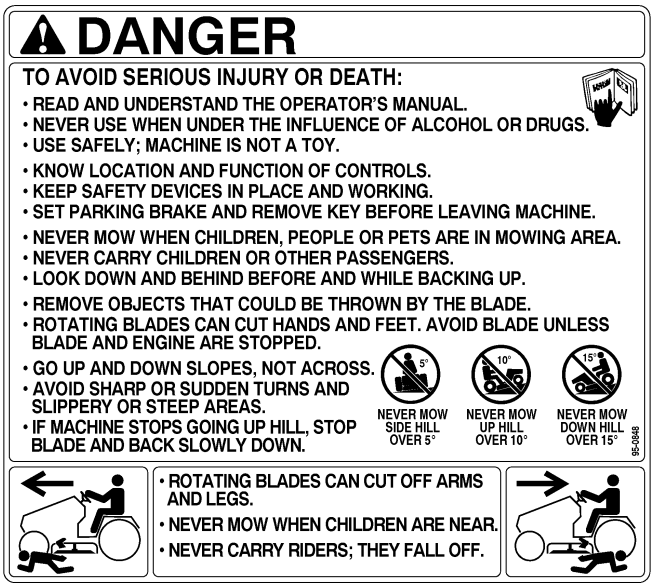
ON LEFT FENDER
(Part No. 92–4952)



ON RIGHT FENDER
(Part No. 92–4951)



ON CENTER OF FOOTREST
(Part No. 95–0848)



Gasoline and Oil

Recommended Gasoline

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

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

⚠ DANGER

POTENTIAL HAZARD

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

WHAT CAN HAPPEN

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

HOW TO AVOID THE HAZARD

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

Stabilizer/Conditioner

Add the correct amount of gas stabilizer/conditioner to the gas. Using a stabilizer/conditioner in the machine:

- Keeps gasoline fresh during storage
- Cleans the engine while it runs
- Eliminates gum-like buildup in the fuel system, which causes hard starting

IMPORTANT: Never use fuel additives containing methanol or ethanol.

Filling the Fuel Tank

1. Shut the engine off and set the parking brake.
2. Clean around each fuel tank cap and remove the cap. Close the right side fuel tank shut off valve. Add unleaded regular gasoline to both fuel tanks, until the level is 1/4 to 1/2 inch (6 mm to 13 mm) below the bottom of the filler neck. This space in the tank allows gasoline to expand. Do not fill the fuel tanks completely full.

   Note: For maximum efficiency when adding fuel, close the right side fuel shut off valve, then fill each tank separately.
3. Install fuel tank caps securely. Wipe up any gasoline that may have spilled.
4. Fuel gauge is located in right side tank.

Check Engine Oil Level

Before you start the engine and use the machine, check the oil level in the engine crankcase; refer to Checking Oil Level, page 23.

Assembly

Loose Parts

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

DESCRIPTION	QTY.	USE
Control rod–left	1	Install traction control rods
Control rod–right	1	
Spring washer 1/2”	6	
Locknut 1/2”–13	2	
Seat	1	Install armrests and manual tube
Armrest–left	1	
Armrest–right	1	
Manual tube	1	
R–clamps	2	
Allen head bolt 5/16–18 x 5/8” (16 mm)	6	
Seat assembly	1	Install seat
Bolt 5/16–18 x 3/4” (19 mm)	4	
Washer 5/16”	4	
Spacer 5/16	4	
Battery	1	Install battery
Battery clamp	1	
Battery support rod	2	
Washer 1/4”	2	
Wing nut 1/4–20	2	
Terminal boot	1	
Bolt 1/4–20 x 3/4” (19 mm)	2	
Locknut 1/4–20	2	
Key	2	Read before operating machine
Operator’s Manual	1	
Engine Operator’s Manual	1	
Parts Catalog	1	Fill out and return to Toro
Registration card	1	

Install Traction Control Rods

1. Locate index tab on left and right rods vertical and slide into control block (Fig. 1).
2. Position (3) 1/2” (13 mm) spring washers onto threaded end of rod, alternating as shown (Fig. 1). Secure with 1/2” locknut.

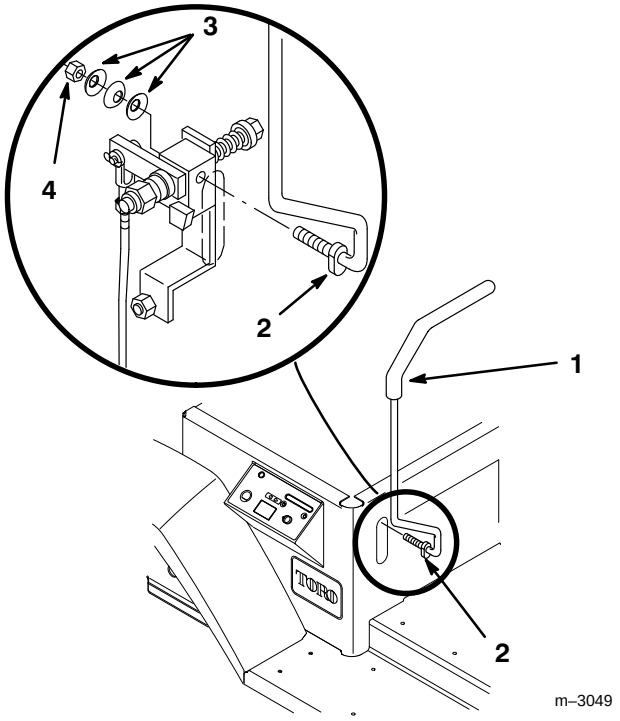


Figure 1

1. Control rod
2. Index tab
3. Spring Washer 1/2” (13mm)
4. Locknut 1/2–13

Install Seat

1. Tip seat pan up, place stop wire through hole and align seat with adjustment slots (Fig. 2).
2. Secure with (4) 5/16 x 3/4” (19 mm) bolts, 5/16” washers and 5/16” spacers (Fig. 2).
3. Slide seat to a convenient location and tighten mounting bolts securely.
4. Route stop switch wire through hole and press connector into wire harness connector (Fig. 2).

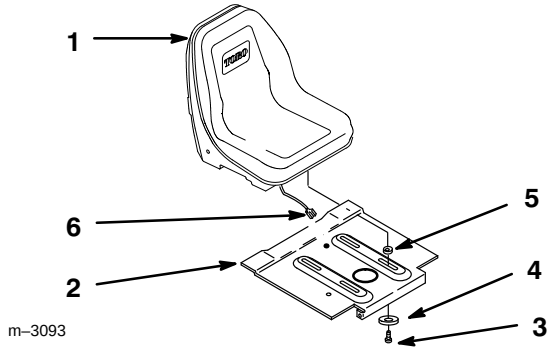


Figure 2

1. Seat
2. Seat pan
3. Bolt 5/16–18 x 3/4” (19mm)
4. Washer 5/16”
5. Spacer 5/16”
6. Stop switch connector

Install Armrests and Tube

1. Align left and right armrests to seat back and start outer bolts (Fig. 3).

2. Place (2) R–clamps around manual tube and space to align with inside armrest mounting holes (Fig. 3).

3. Insert inner armrest bolts through R–clamps and secure to seat (Fig. 3).

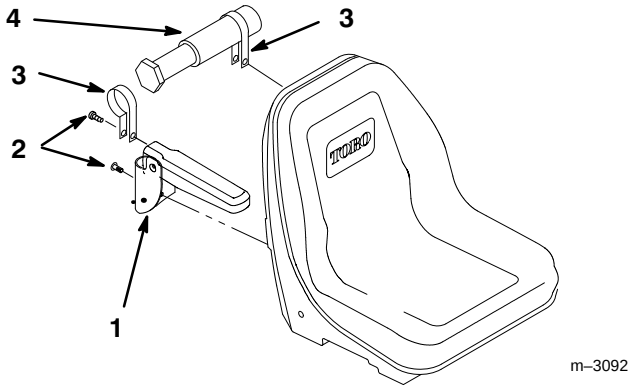


Figure 3

1. Armrest
2. Allen head Bolt 5/16–18 x 5/8” (16mm)
3. R–clamp
4. Manual tube

Tire Pressure

Check the air pressure in the front and rear tires (Fig. 23).

Pressure: 12 psi (83 kPa) rear and 6 psi (41 kPa) front tires.

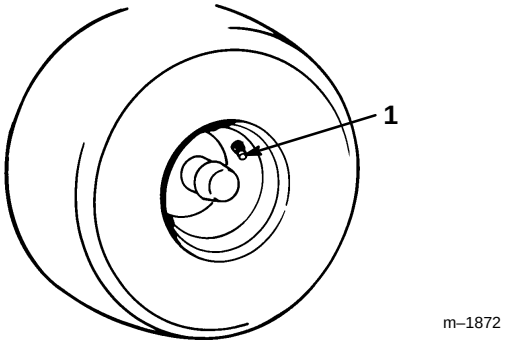


Figure 4

1. Valve stem

Activate 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 box.

⚠ DANGER

POTENTIAL HAZARD

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

WHAT CAN HAPPEN

- **If you carelessly drink electrolyte you could die or if it gets onto your skin you will be burned.**

HOW TO AVOID THE HAZARD

- **Do not drink electrolyte and avoid contact with skin, eyes or clothing. Wear safety glasses to shield your eyes and rubber 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. 5).

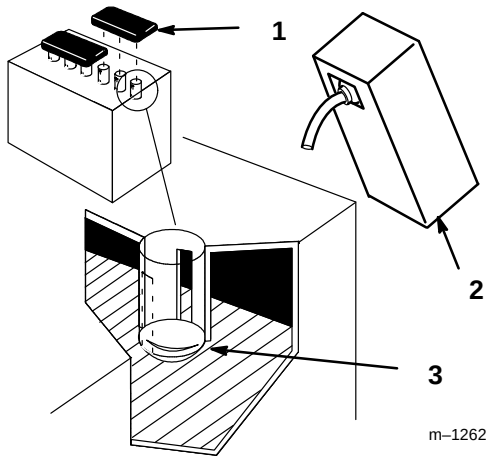


Figure 5

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. 6). Charge the battery at a rate of 4 amperes or less for 4 hours (12 volts).

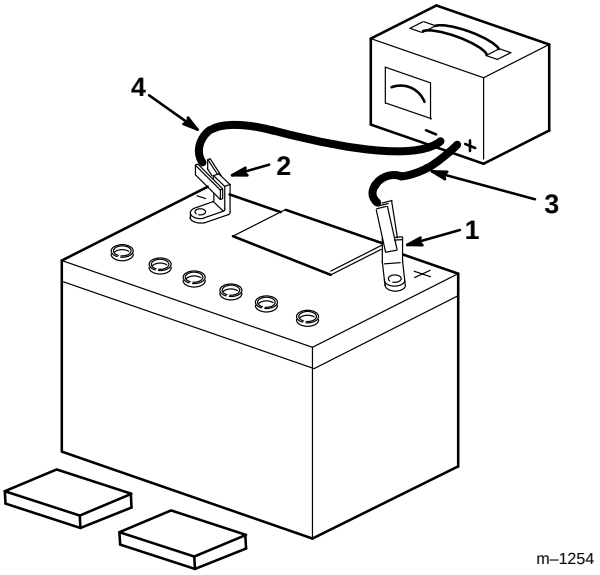


Figure 6

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

⚠ WARNING

POTENTIAL HAZARD
- **Charging battery produces gasses.**

WHAT CAN HAPPEN
- **Battery gasses can explode.**

HOW TO AVOID THE HAZARD
- **Keep cigarettes, sparks and flames away from battery.**

4. When the battery is fully charged, disconnect the charger from the electrical outlet then from the negative and positive battery posts (Fig. 6).

5. Slowly pour electrolyte into each cell until the level is once again up to the “UPPER” line on the battery case (Fig. 5) and install covers.

Install Battery

1. Fill battery with electrolyte and charge, refer to BATTERY, page 34.

2. Position battery in tray with terminal posts away from the engine (Fig. 7).

3. Slide the red terminal boot onto the red battery cable.

4. Install the positive (red) battery cable to positive (+) battery terminal then negative battery cable to the negative (–) battery terminal. Secure cables with (2) 1/4 x 3/4” (19 mm) bolts and 1/4” locknuts (Fig. 7).

5. Secure battery with (2) support rods, a battery clamp and (2) 1/4” washers and wing nuts. Position support rods in mounting holes (Fig. 7). Tighten wing nuts so battery is held securely in position and will not slide. DO NOT OVERTIGHTEN.

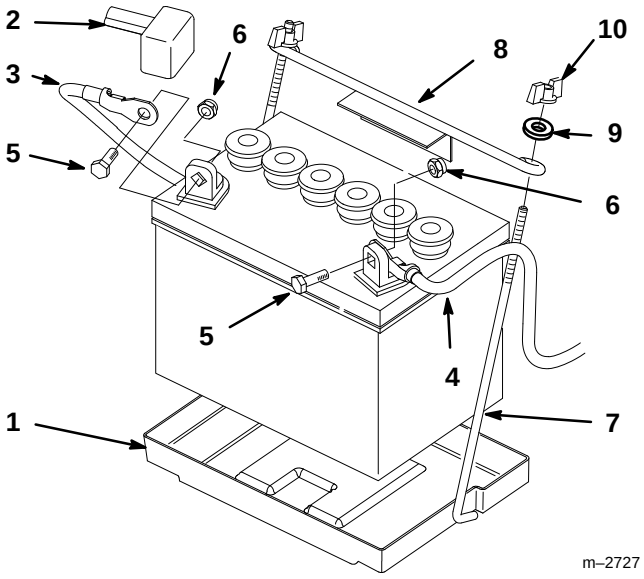


Figure 7

1. Battery tray
2. Terminal boot
3. Positive battery cable
4. Negative battery cable
5. Bolt 1/4–20 x 3/4” (19 mm)
6. Locknut 1/4”
7. Battery support rod
8. Battery clamp
9. Washer 1/4”
10. Wing nut 1/4”

Operation

Think Safety First

Please carefully read all the safety instructions on pages 2–8. Knowing this information could help you, your family, pets or bystanders avoid injury.

Controls

Become familiar with all the controls (Fig. 1) before you start the engine and operate the machine.

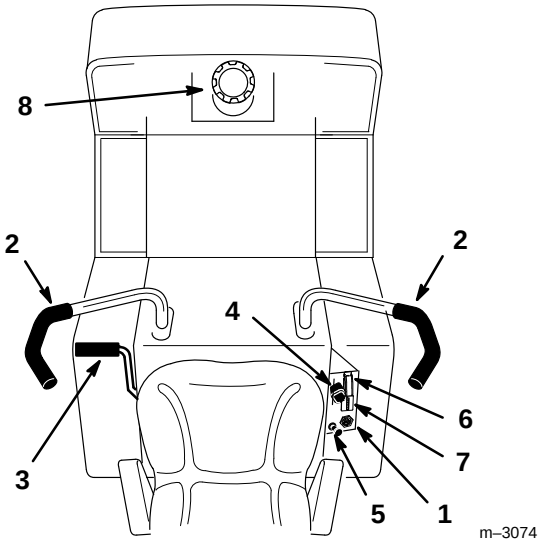


Figure 1

1. Ignition switch
2. Motion control lever
3. Parking brake lever
4. Throttle
5. Choke
6. Power take off (PTO)
7. Hourmeter
8. Fuel cap

Parking Brake

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

Setting the Parking Brake

1. Release pressure on the motion control levers they automatically return to neutral (Fig. 1).

2. Pull up on the parking brake lever, until it goes overcenter, to set the parking brake (Fig. 2). The parking brake lever should stay firmly in the “ENGAGED” position.

Releasing the Parking Brake

1. Push forward on the parking brake lever (Fig. 2). The parking brake is “DISENGAGED” and the lever rests against the front of the opening.

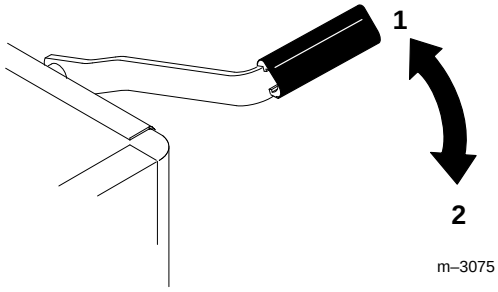


Figure 2

1. Parking brake-ON
2. Parking brake-OFF

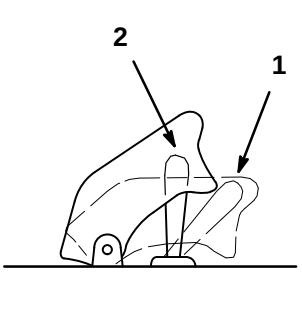
Starting and Stopping the Engine

Starting

1. Sit down on the seat and move the motion controls to neutral locked position.
2. Set the parking brake; refer to Setting the Parking Brake, page 13.
3. Move the PTO (power take off) to “OFF” (Fig. 3).
4. Move the choke control to “ON” position before starting a cold engine.

   Note: A warm or hot engine may require choking. After engine starts, move choke control to “RUN” position.
5. Move the throttle control to the “FAST” position before starting a cold engine.
6. Turn ignition key “START” to energize starter. When engines starts, release key.

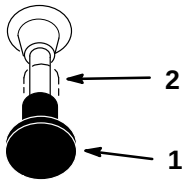
   IMPORTANT: Do not engage starter for more than 10 seconds at a time. If engine fails to start allow 30 second cool-down period between attempts. Failure to follow these instructions can burn out starter motor.
7. After the engine starts, move the choke to “OFF” (Fig. 4). If the engine stalls or hesitates, move the choke back to “ON” for a few seconds. Then move the throttle lever to desired setting. Repeat this as required.



m–2721

Figure 3

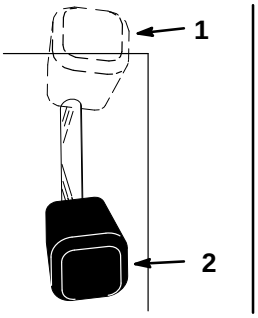
1. PTO-Off
2. PTO-On



m–2719

Figure 4

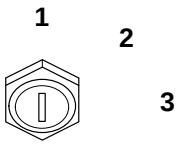
1. Choke–On
2. Choke–Off



m–3076

Figure 5

1. Fast
2. Slow



m–2718

Figure 6

1. Off
2. Run
3. Start

Stopping

1. Move the throttle lever to “SLOW” (Fig. 5).

2. Turn the ignition key to “OFF” (Fig. 6).

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.”

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

4. Close fuel shut off valve, under fuel tank, and cap vent before transporting or storing machine.

IMPORTANT: Make sure fuel shut off valve and cap vent are closed before transporting or storing machine, as fuel leakage may occur.

Operating the Power Take Off (PTO)

The power take off (PTO) engages and disengages power to the attachment clutch.

Engaging the Power Take Off (PTO)

1. Release pressure on the motion control levers to stop the machine.
2. Raise the cover and move the power take off (PTO) switch to the “ON” position to engage (Fig. 7).

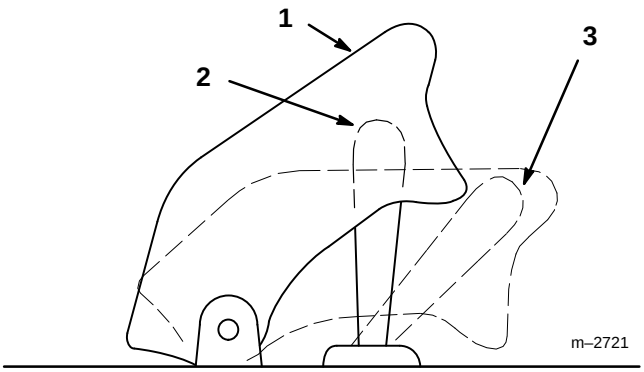


Figure 7

1. Cover
2. ON-Engaged
3. OFF-Disengaged

Disengaging the Power Take Off (PTO)

1. Release pressure on the motion control levers to stop the machine.
2. Lower the cover of the power take off (PTO) switch. This moves the switch to the “OFF” position to disengage (Fig. 7).

The Safety Interlock System

Understanding the Safety Interlock System

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

- The parking brake is on “ENGAGED”
- The power take off (PTO) is disengaged “OFF”

The safety interlock system also is designed to stop the engine if you rise from the seat when the power take off (PTO) is “ON” engaged or the parking brake is not on “ENGAGED”.

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. Sitting in the seat, “ENGAGE” parking brake and move power take off (PTO) “ON”. Try starting the engine; the engine should not crank.
2. Sitting in the seat, “DISENGAGE” parking brake and move power take off (PTO) “OFF”. Try starting the engine; the engine should not crank.
3. Sitting in the seat, “ENGAGE” parking brake, move power take off (PTO) “OFF”. Now start the engine. While the engine is running, release the parking brake and rise slightly from the seat, the engine should stop.
4. Sitting in the seat, “ENGAGE” parking brake, move power take off (PTO) “OFF”. Now start the engine. While the engine is running, engage the power take off (PTO) and rise slightly from the seat, the engine should stop.

   IMPORTANT: The unit can be started when all controls are in a safe position, without the operator in the seat, for servicing.

Driving Forward or Backward

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

Forward

1. Release the parking brake; refer to Setting the Parking Brake, page 13.
2. Move levers to the center, un-locked position.
3. To go forward, slowly push the motion control levers forward (Fig. 8).

   Note: Engine will kill if traction control levers are moved with parking brake engaged.

To go straight, apply equal pressure to both motion control levers (Fig. 8).

To turn, release pressure on the motion control lever toward the direction you want to turn (Fig. 8).

The farther you move the traction control levers in either direction, the faster the machine will move in that direction.

For quick stops release pressure on the motion control levers, they automatically return to neutral.

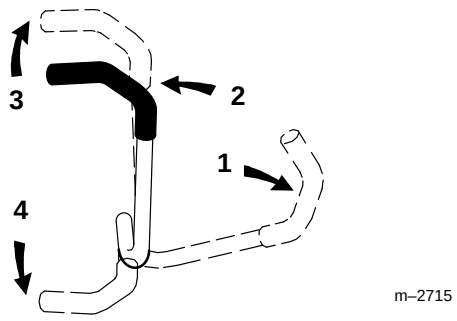


Figure 8

1. Motion control lever-neutral lock position
2. Center un-lock position
3. Forward
4. Backward

Backward

1. Move levers to the center, un-locked position.
2. To go backward, slowly pull the motion control levers rearward (Fig. 8).

To go straight, apply equal pressure to both motion control levers (Fig. 8).

To turn, release pressure on the motion control lever toward the direction you want to turn (Fig. 8).

For quick stops release pressure on the motion control levers, they automatically return to neutral.

Stopping the Machine

To stop the machine, move the traction control levers to neutral and separate to lock, disengage the power take off (PTO), and turn the ignition key to “OFF” to stop the engine. Also set the parking brake when you leave the machine; refer to Setting the Parking Brake, page 13. Remember to remove the key from the ignition switch.

⚠ CAUTION

POTENTIAL HAZARD

- **Someone could move or attempt to operate the tractor while it is unattended.**

WHAT CAN HAPPEN

- **Children or bystanders may be injured if they use the tractor.**

HOW TO AVOID THE HAZARD

- **Always remove the ignition key and set the parking brake when leaving the machine, even if just for a few minutes.**

Hour Meter

The hour meter records the number of hours the engine has operated (Fig. 9). It operates when the engine is running. Use these times for scheduling regular maintenance.

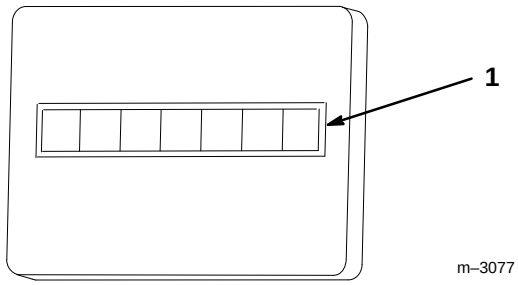


Figure 9

1. Hour meter

Fuel Tank

The unit fuel tank is mounted under the front of the machine. The tank has a fuel shut off valve at the bottom left and a cap with air vent on top (Fig. 10).

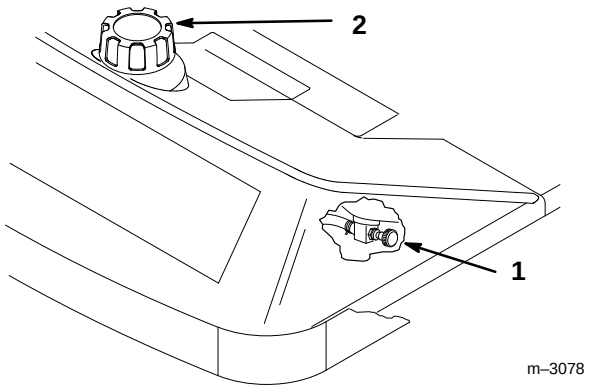


Figure 10

1. Shut off valve
2. Cap

Positioning the Seat

The seat can move forward and backward. Position the seat where you have the best control of the machine and are most comfortable.

1. To adjust tip seat forward and loosen the seat mounting bolts (Fig. 11).

2. Slide the seat to the desired position in the adjusting slots and tighten the mounting bolts.

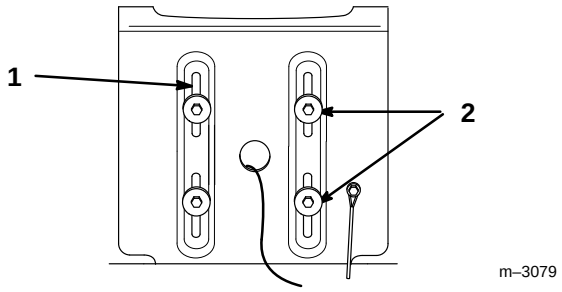


Figure 11

1. Adjusting slot
2. Bolts

Pushing the Machine by Hand

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” to stop the engine.
2. Lift the drive control rods (dump valves), on front of hydrostatic pumps, up and latch into hooked slot. This allows hydraulic fluid to by-pass the pump enabling the wheels to turn (Fig. 12).

To Operate the Machine

1. Unhook the drive control rods (dump valves) and drop down into slot to operate (Fig. 12).

   Note: The machine will not drive unless drive control rods (dump valves) are down in the slots.

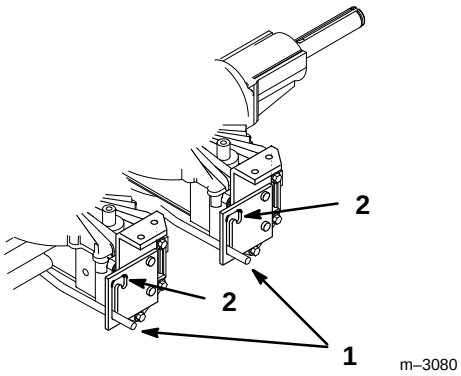


Figure 12

1. Drive control rod
2. Latch hook

Maintenance

Service Interval Chart

Service Operation	Each Use	8 Hours	25 Hours	50 Hours	100 Hours	200 Hours	Storage Service
Transaxle fluid–check level	Initial				X		X
Oil—check level	X						X
Oil—change*		Initial			X		X
Oil Filter–change (200 hours or every other oil change)						X	X
Safety System—check	X						X
Chassis—grease*		X					X
Foam Air Cleaner—service*			X				X
Paper Air Cleaner—replace*					X		X
Spark Plug(s)—check						X	X
Belts—check for wear/cracks				X			X
Electric clutch—check for wear				X			X
Gasoline—drain							X
Cooling systems–clean	X				X		X
Battery–check electrolyte	X	X					X
Battery–charge, Disconnect cables							X
Fuel Filter—replace						X	X
Tires—check pressure				X			X
Chipped Surfaces—paint							X
* More often in dusty, dirty conditions							

⚠ CAUTION

POTENTIAL HAZARD

- **If you leave the key in the ignition switch, someone could start the engine.**

WHAT CAN HAPPEN

- **Accidental starting of the engine could seriously injure you or other bystanders.**

HOW TO AVOID THE HAZARD

- **Remove the key from the ignition switch and pull the wire(s) off the spark plug(s) before you do any maintenance. Also push the wire(s) aside so it does not accidentally contact the spark plug(s).**

Air Cleaner

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

Paper Element: Replace after every 100 operating hours.

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

Removing the Foam and Paper Elements

1. Disengage the power take off (PTO), set the parking brake, and turn the ignition key to "OFF" to stop the engine. Remove the key.

2. Clean around the air cleaner to prevent dirt from getting into the engine and causing damage. Unhook latches and remove the air cleaner cover (Fig. 13).

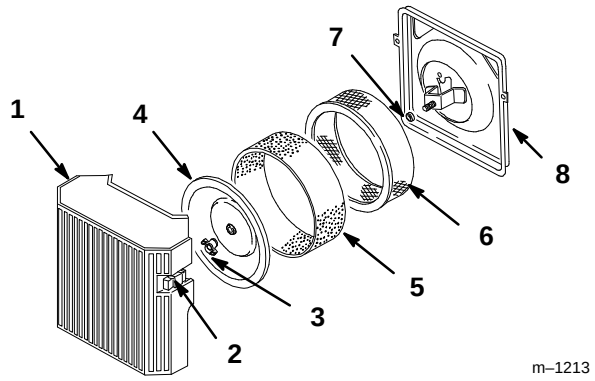


Figure 13

1. Air cleaner cover
2. Latches
3. Cover nut
4. Cover
5. Foam element
6. Paper element
7. Rubber seal
8. Air cleaner base

3. Carefully slide the foam element off the paper element (Fig. 13).

4. Unscrew the cover nut and remove the cover and paper element (Fig. 13).

Cleaning the Foam and Paper Elements

1. Foam Element

A. Wash the foam element in liquid soap and warm water. When the element is clean, rinse it thoroughly.

B. Dry the element by squeezing it in a clean cloth (do not wring).

C. Put one or two ounces of oil on the element (Fig. 14). Squeeze the element to distribute the oil.

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

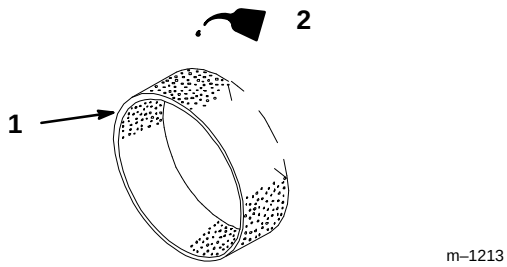


Figure 14

1. Foam element
2. Oil

2. Paper Element

A. Lightly tap the element on a flat surface to remove dust and dirt (Fig. 15).

B. Inspect the element for tears, an oily film, and damage to the rubber seal.

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

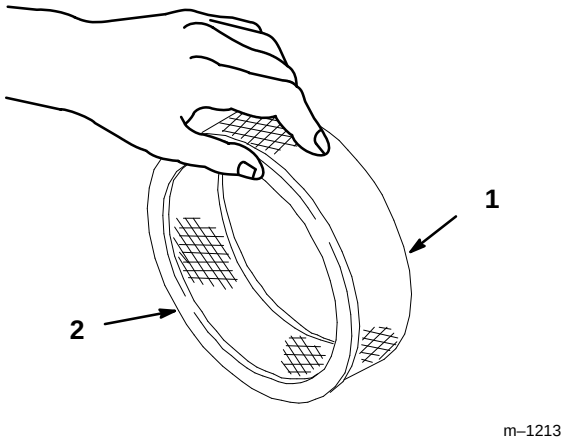


Figure 15

1. Paper element 2. Rubber seal

Installing the Foam and Paper Elements

1. Installing the Foam and Paper Elements

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

1. Carefully slide the foam element onto the paper air cleaner element (Fig. 13).

2. Place the air cleaner assembly onto the air cleaner base (Fig. 13).

3. Install the air cleaner cover and secure with cover nuts (Fig. 13).

Engine Oil

Change oil:

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

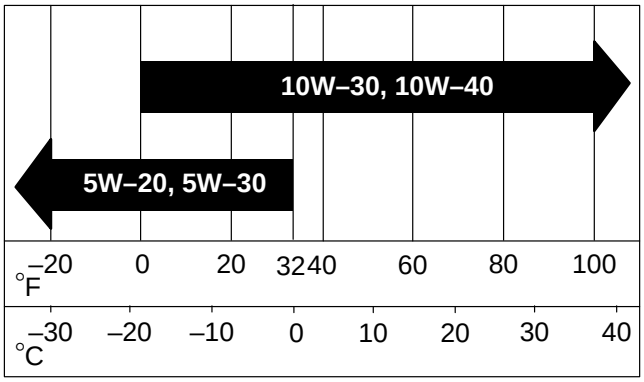
Note: Change oil more frequently when operating conditions are extremely dusty or sandy.

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

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

Viscosity: See table below

USE THESE SAE VISCOSITY OILS



Checking Oil Level

1. Park the machine on a level surface, disengage the power take off (PTO) and turn the ignition key to “OFF” to stop the engine. Remove the key.
2. Clean around the oil dipstick (Fig. 16) so dirt cannot fall into the filler hole and damage the engine.
3. Unscrew the oil dipstick and wipe the metal end clean (Fig. 16).
4. Slide the oil dipstick fully into the filler tube, do not thread onto tube (Fig. 16). 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.

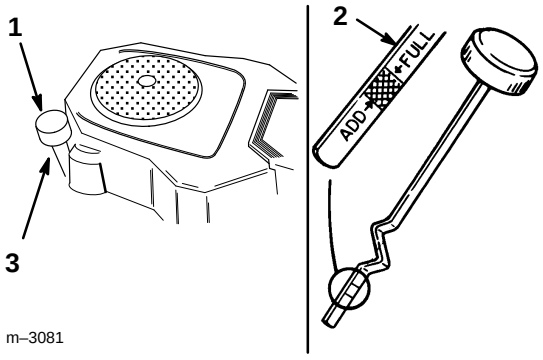


Figure 16

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

Changing/Draining Oil

1. Start the engine and let it run five minutes. This warms the oil so it drains better.
2. Park the machine so that the drain side is slightly lower than the opposite side to assure the oil drains completely. Then disengage the power take off (PTO), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
3. Place a pan below the oil drain. Open the drain cap (Fig. 17).
4. When oil has drained completely, close the drain cap.

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

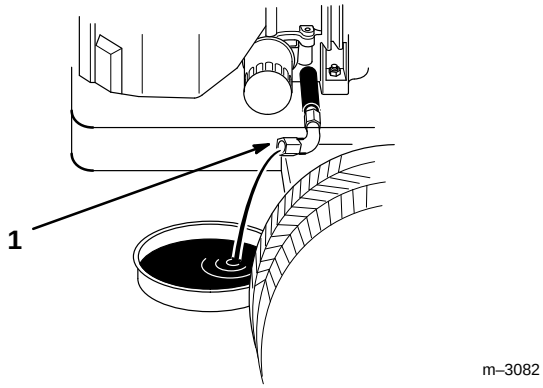


Figure 17

1. Oil drain

5. Slowly pour approximately 80% of the specified amount of oil specified, page 22, into the filler tube (Fig. 16). Now check the oil level; refer to Checking Oil Level, page 23. Slowly add additional oil to bring to “FULL” mark on dipstick.

Change 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 23.
2. Remove the old filter and wipe the filter adapter (Fig. 18) gasket surface.
3. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Fig. 18).

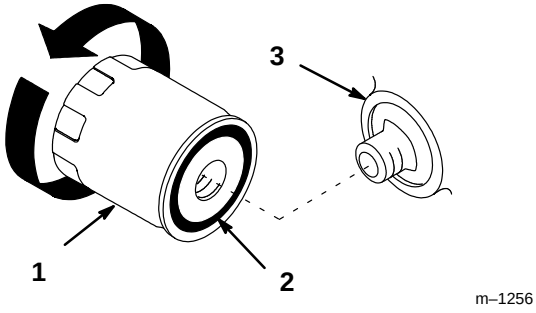


Figure 18

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. 18).
5. Fill the crankcase with the proper type of new oil; refer to Changing/Draining Oil, page 23.

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” to stop the engine. Remove the key.
2. Pull the wire(s) off the spark plug(s) (Fig. 19). 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.

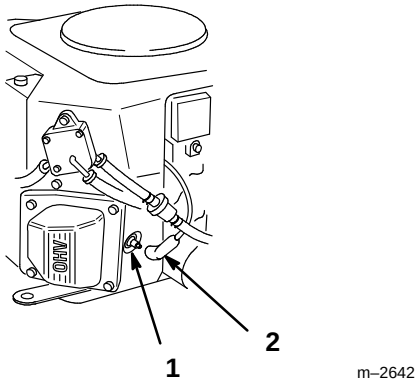


Figure 19

1. Spark plug wire
2. Spark plug

Checking the Spark Plug

1. Look at the center of the spark plug(s) (Fig. 20). 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. 20). Bend the side electrode (Fig. 20) if the gap is not correct.

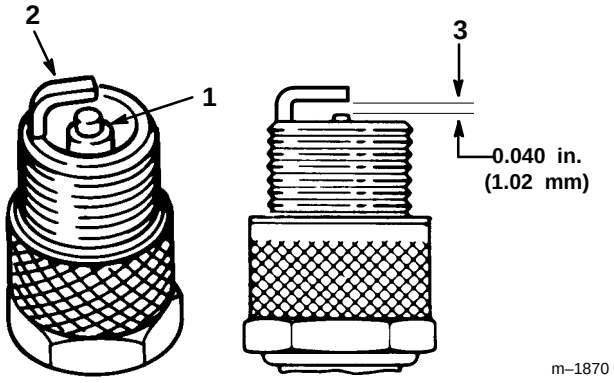


Figure 20

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. 19).

Greasing and Lubrication

Grease the wheel bearings and control lever pivots every 8 operating hours. Grease more frequently when operating conditions are extremely dusty or sandy.

Grease Type: General-purpose grease.

How to Grease

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

Where to Add Grease

1. Lubricate the wheel bearings and front spindles until grease begins to ooze out of the bearings (Fig. 21).

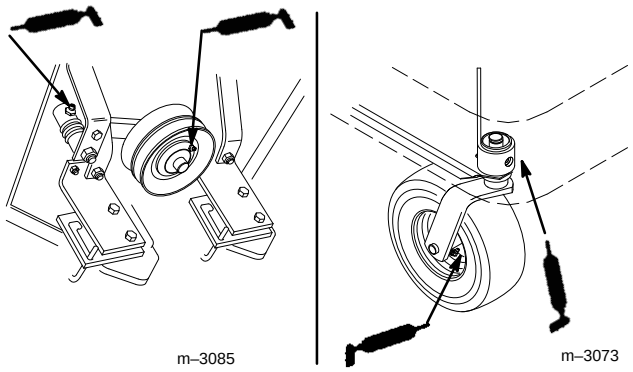


Figure 21

Cleaning the Cooling Systems

Before each use, check and clean engine cooling systems. Remove any build–up of grass, dirt or other debris from the engine air intake. Every 100 hours clean hydrostatic pump fans and cooling fins, engine cylinder and cylinder head cooling fins. Also clean around carburetor, governor levers and linkage. This will help insure adequate cooling to hydrostatic pumps and engine and will reduce the possibility of overheating and mechanical damage.

1. Clean off engine air intake (Fig. 22).

2. Blow out fins of engine and hydrostatic pumps with compressed air. If area between screen and fins is tightly packed, remove engine shroud.

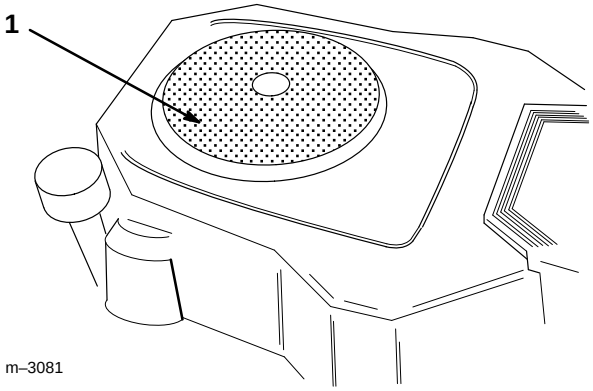


Figure 22

1. Engine air intake

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

Pressure: 8 psi (57 kPa) rear and 12 psi (81 kPa) castor tires.

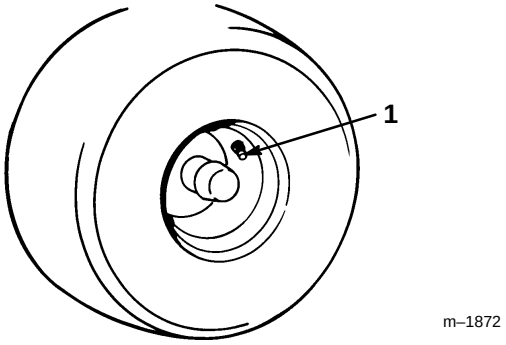


Figure 23

1. Valve stem

Fuel Tank

⚠ DANGER

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

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

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

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” to stop the engine. Remove the key.

2. Close fuel shut–off valve at fuel tank (Fig. 24).

3. Squeeze the ends of the hose clamp together and slide it up the fuel line away from valve (Fig. 24).

4. Pull the fuel line off the valve (Fig. 24). 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 28.

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

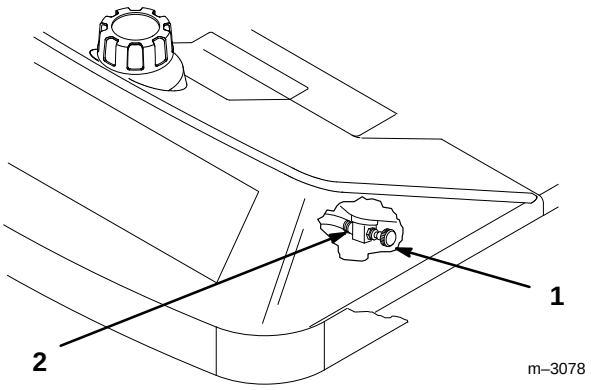


Figure 24

1. Fuel shut-off valve
2. Clamp

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), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
2. Close fuel shut–off valve at fuel tank (Fig. 24).
3. Squeeze the ends of the hose clamps together and slide them away from the filter (Fig. 25).
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. 24).

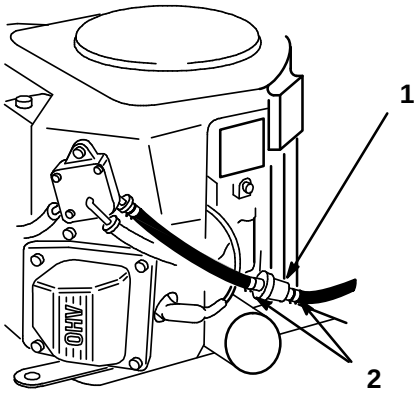


Figure 25

1. Hose clamp
2. Fuel line
3. Filter

Transaxle Fluid

Service Interval/Specification

Check fluid level initial use and after every 100 hours or yearly whichever comes first. Always keep the fluid level at the full level when the transaxle is cold. The transaxle is a sealed system and no changing of the fluid is required.

Fluid Type: Mobilube 424

Quantity: 3-1/2 qt (3.3 l)

Checking Fluid Level

1. Park the machine on a level surface, disengage the power take off (PTO), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
2. Clean around the fluid reservoir (Fig. 26) so level is clearly visible and so dirt cannot fall into the reservoir if fluid is added.
3. When transaxle is cold add oil to “Full Cold” line on reservoir (Fig. 26).

   IMPORTANT: Do not fill above the full cold line as fluid may overflow.

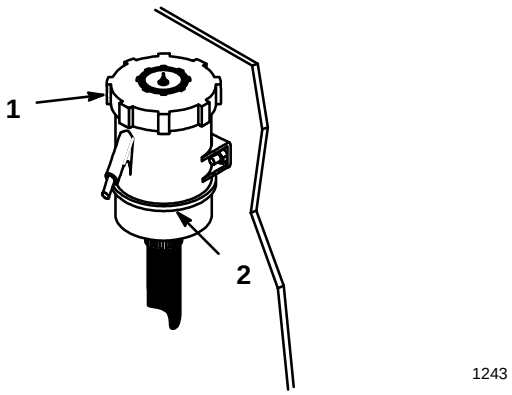


Figure 26

1. Fluid reservoir
2. Full cold level

Adjusting Neutral

If wheels turn when control bars are in neutral, adjustment is required

1. Apply parking brake to set neutral lock.

2. Check that roller is centered in “V” notch of left and right control plates (Fig. 27).

3. Check compressed length of left and right neutral return springs (Fig. 27).

4. Adjust jam nuts until springs are compressed 2-1/8” to 2-3/16” (54 -56 cm) (Fig. 27).

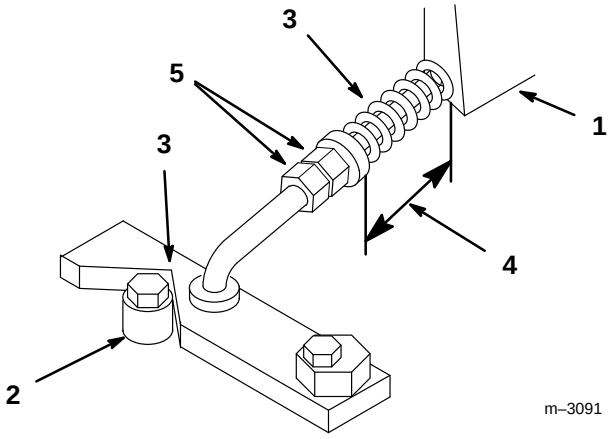


Figure 27

1. Neutral lock
2. Roller
3. “V” notch
4. Spring
5. 2-1/8” to 2-3/16” (54–56 cm)
6. Jam nut

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

6. Start engine and run for 5 minutes at 3/4 throttle, to warm hydraulic fluid.

7. Release parking brake with traction controls in neutral position. If either wheel rotates on its own, adjustment is required.

8. Loosen lock bolt in cam. Rotate cam until wheel rotation stops (Fig. 28). Hold cam and tighten lock bolt securely.

9. Cycle traction controls forward and reverse to confirm proper neutral adjustment.

10. Repeat on other wheel, if necessary.

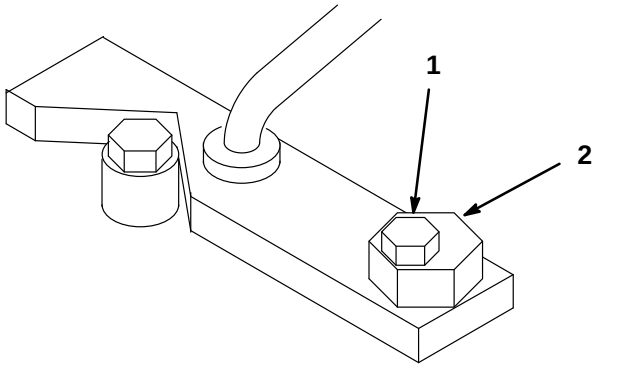


Figure 28

1. Lock bolt
2. Cam

Parking Brake

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

Checking the Brake

1. Park the machine on a level surface, disengage the power take off (PTO), set the parking brake, and turn the ignition key to “OFF” to stop the engine. Remove the key.
2. Set the parking brake and move the drive control rods (dump valves) to the “PUSH” position; refer to Pushing the Machine by Hand, page 19. Rear wheels must lock and skid when you try to push the tractor forward. Adjustment is required if the wheels turn and do not lock; refer to Adjusting the Brake, page 30.
3. Release the parking brake and move the drive control rods (dump valves) to the “PUSH” position; refer to Pushing the Machine by Hand, page 19. Wheels should rotate freely.
4. If both conditions are met no adjustment is required.

Adjusting the Brake

The brake lever is on top of the transaxles (Fig. 29). If the parking brake does not hold securely, an adjustment is required.

1. Check the brake before you adjust it; refer to Checking the Brake, page 30.
2. Release the parking brake; refer to Releasing the Parking Brake, page 13.
3. To adjust the brake remove the cotter pin, and washer from the brake rod (Fig. 29).
4. Rotate rod, one turn at a time, and install onto brake plate (Fig. 29). Tighten jam nut securely.
5. Check the brake operation again; refer to Checking the Brake, page 30.

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

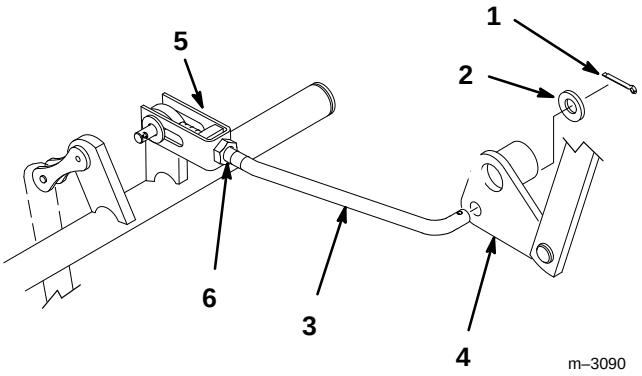


Figure 29

1. Cotter pin
2. Washer
3. Brake rod
4. Brake plate
5. Trunnion
6. Jam nut

Adjusting Neutral Lock-out

Before neutral lock-out can be adjusted the parking brake must be adjusted, refer to: Parking Brake.

1. Apply parking brake.
2. Lock-out lever should press firmly down between left and right neutral return rods (Fig. 30).
3. If adjustment is required, remove cotter pin and washer from lock-out adjusting rod and remove from brake arm (Fig. 30).
4. Adjust length of rod at trunnion, one turn at a time, shorten or lengthen and tighten jam nut (Fig. 30).
5. Secure adjusting rod to brake arm with washer and cotter pin (Fig. 30).

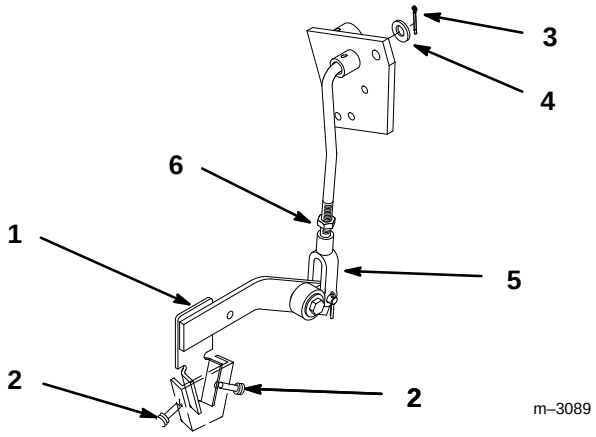


Figure 30

1. Lock-out lever
2. Neutral return rod
3. Cotter pin
4. Washer
5. Trunnion
6. Jam nut

Replacing the Traction Belt

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

1. Raise the rear of the machine and support with jack stands.
2. Remove mower drive belt; refer to mower Operator's Manual.
3. Remove PTO belt; refer to Replacing the PTO Belt.
4. Unhook idler spring from frame tab (Fig. 31).
5. Move idler pulley sideways and remove traction belt from the engine and hydro pump pulleys (Fig. 31). Remove belt over clutch.
6. Install new belt over clutch and around engine and hydro pump pulleys (Fig. 31).
7. Move idler into belt and hook idler spring onto frame tab (Fig. 31).
8. Replace the mower drive belt.

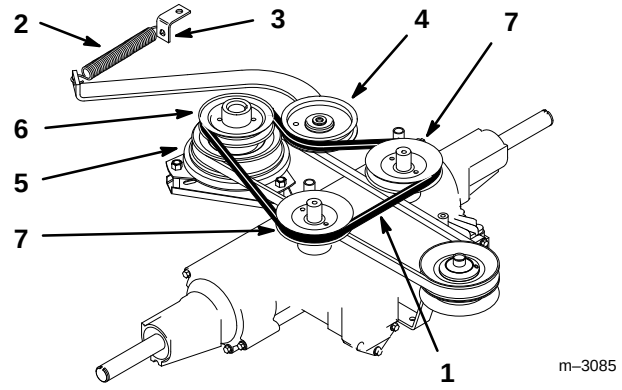


Figure 31

1. Traction belt
2. Idler spring
3. Frame tab
4. Idler pulley
5. Clutch
6. Engine pulley
7. Hydro pump pulley

Replacing the PTO (Power Take Off) Belt

Check PTO (Power Take Off) belt for wear after every 50 hours of operation.

1. Raise the rear of the machine and support with jack stands.
2. Remove mower drive belt; refer to mower Operator's Manual.
3. Remove front mounting bolts and loosen rear mounting bolts from clutch stop plate, allowing plate to swing down (Fig. 32).
4. Push PTO idler pulley rearward and remove PTO belt from idler and clutch pulleys (Fig. 32).
5. Install new belt over clutch pulley (Fig. 32).
6. Move idler rearward and loop belt into top idler pulley groove (Fig. 32).
7. Swing clutch stop plate up and secure in position with previously removed hardware (Fig. 32).
8. Replace the mower drive belt.

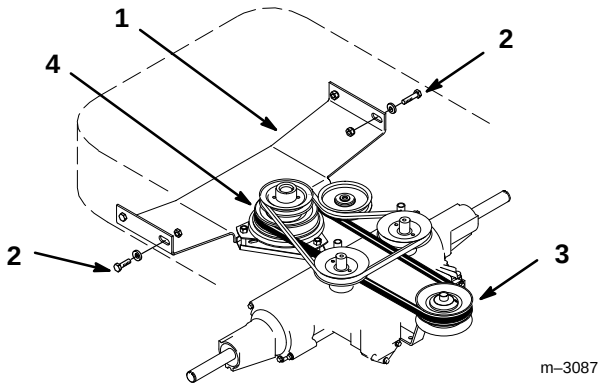


Figure 32

1. Clutch stop plate
2. Front mounting bolt
3. PTO Idler pulley
4. Clutch

Adjust Electric Clutch

Check the electric clutch for wear after every 50 hours of operation.

The electric clutch, mounted on the engine, has three (3) adjustment nuts that all must be adjusted the same (Fig. 33).

1. Insert a 0.010 inch (.25 mm) feeler gauge into the slot, between the clutch disc and magnet (Fig. 33).
2. Turn the nut until light resistance is felt on the feeler gauge.
3. Repeat for all three adjusting nuts.

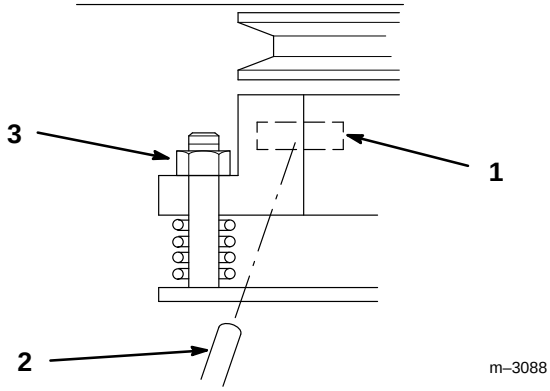


Figure 33

1. Slot
2. 0.010" (25 mm) Feeler gauge
3. Adjusting nut

Fuse

Service Interval/Specification

The electrical system is protected by fuses. It requires no maintenance, however, if a fuse blows check component/circuit for malfunction or short. To replace fuses pull up on the fuse (Fig. 34) to remove or replace it.

Fuse: Main/Starter F1–30 amp, blade-type
Alternator F2–25 amp, blade-type
Hour meter/Clutch F3–10 amp, blade-type
Starter relay F4–7.5 amp, blade-type

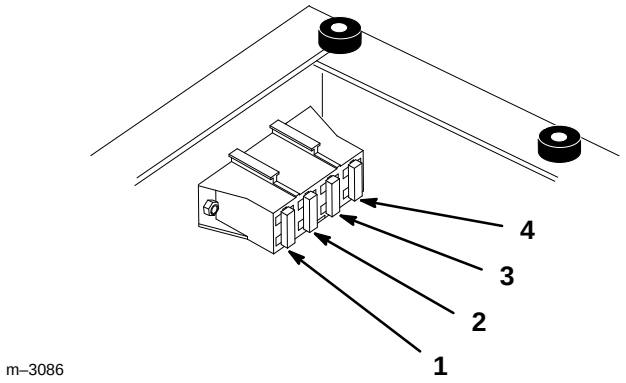


Figure 34

1. Main/Starter-30 amp
2. Alternator-25 amp
3. Hour meter/Clutch-10 Amp
4. Starter relay-7.5 Amp

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 Electrolyte Level

1. Open covers to see into the cells. The electrolyte must be up to the lower part of the tube (Fig. 35). Do not allow the electrolyte to get below the plates. (Fig. 35).

2. If the electrolyte is low, add the required amount of distilled water; refer to Adding Water to the Battery, page 34.

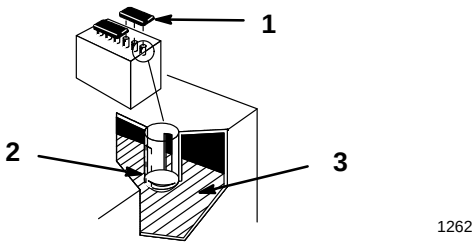


Figure 35

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. 35).

3. Slowly pour distilled water into each battery cell until the level is up to the lower part of the tube (Fig. 35).

   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).

1. Check the electrolyte level; refer to Checking Electrolyte Level, page 34.

2. 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.

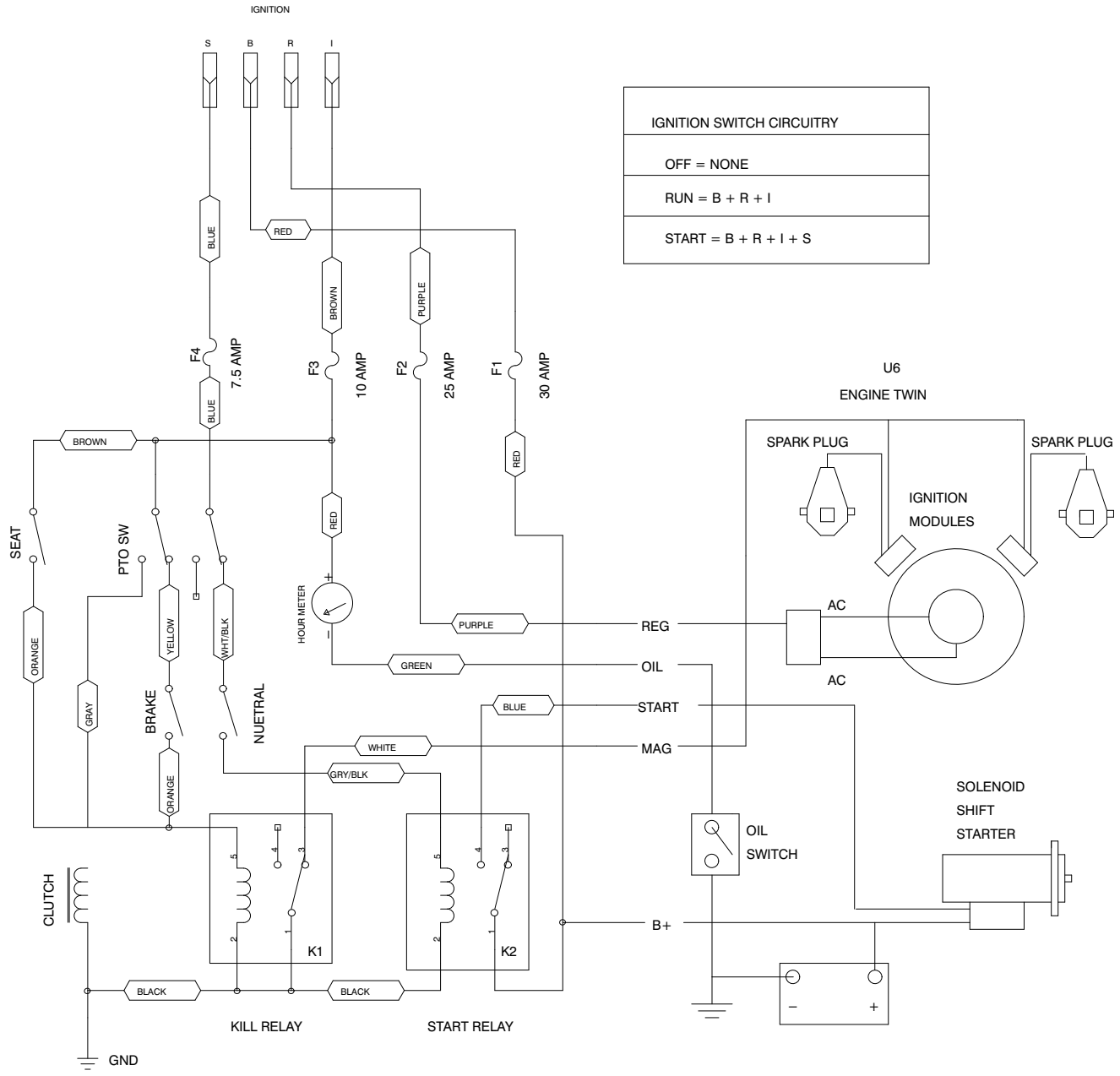
⚠ WARNING

POTENTIAL HAZARD
- **Charging the battery produces gasses.**

WHAT CAN HAPPEN
- **Battery gasses can explode.**

HOW TO AVOID THE HAZARD
- **Keep cigarettes, sparks and flames away from battery.**

Wiring Diagram



Cleaning and Storage

1. Disengage the power take off (PTO), set the parking brake and turn the ignition key to “OFF” to stop the engine. Remove the key.

2. Remove grass clippings, dirt, and grime from the external parts of the entire machine, especially the engine. Clean dirt and chaff from the outside of the engine’s cylinder head fins and blower housing.

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

3. Service the air cleaner; refer to Air Cleaner, page 21.

4. Grease the machine; refer to Greasing and Lubrication, page 25.

5. Change the crankcase oil; refer to Engine Oil, page 22.

6. Change the hydraulic fluid; refer to Hydraulic System, page NO TAG.

7. Remove the spark plug(s) and check its condition; refer to Spark Plug, page 24. With the spark plug(s) removed from the engine, pour two tablespoons of engine oil into the spark plug hole. Now use the starter to crank the engine and distribute the oil inside the cylinder. Install the spark plug(s). Do not install the wire on the spark plug(s).

8. Check the tire pressure; refer to Tire Pressure, page 26.

9. During long-term storage, either drain gasoline from the fuel tank (step 10) or add a fuel stabilizer/conditioner additive to a full tank of gasoline (step A).

10. Drain gasoline from the fuel tank; refer to Fuel Tank, page 27. After fuel is drained, start the engine and let it idle until all gasoline is consumed and the engine stops. This eliminates gum-like buildup in the fuel system, which causes hard starting. Try to start the engine two more times to assure that no gasoline is in the fuel system.

    A. Add the correct amount of a fuel stabilizer/conditioner or an isopropyl-based stabilizer/conditioner to a full tank of gasoline. Operate engine for 5 minutes to distribute stabilizer/conditioner throughout fuel system.

    Note: Stabilizer/conditioners normally preserve gasoline for six to eight months.

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

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

13. 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
Starter does not crank	1. Blade control (PTO) is ENGAGED. 2. Parking brake is not on. 3. Operator is not seated. 4. Battery is dead. 5. Electrical connections are corroded or loose. 6. Fuse is blown. 7. Relay or switch is defective.	1. Move blade control (PTO) to DISENGAGED. 2. Set parking brake. 3. Sit on the seat. 4. Charge the battery. 5. Check electrical connections for good contact. 6. Replace fuse. 7. Contact Authorized Service Dealer.
Engine will not start, starts hard, or fails to keep running.	1. Fuel tank is empty. 2. Choke is not ON. 3. Air cleaner is dirty. 4. Spark plug wire(s) is loose or disconnected. 5. Spark plugs are pitted, fouled, or gap is incorrect. 6. Dirt in fuel filter. 7. Dirt, water, or stale fuel is in fuel system.	1. Fill fuel tank with gasoline. 2. Move choke lever to ON. 3. Clean or replace air cleaner element. 4. Install wires on spark plug. 5. Install new, correctly gapped spark plugs. 6. Replace fuel filter. 7. Contact Authorized Service Dealer.
Engine loses power.	1. Engine load is excessive. 2. Air cleaner is dirty. 3. Oil level in crankcase is low. 4. Cooling fins and air passages under engine blower housing are plugged. 5. Spark plugs are pitted, fouled, or gap is incorrect. 6. Vent in fuel cap is closed. 7. Dirt in fuel filter. 8. Dirt, water, or stale fuel is in fuel system.	1. Reduce ground speed. 2. Clean air cleaner element. 3. Add oil to crankcase. 4. Remove obstruction from cooling fins and air passages. 5. Install new, correctly gapped spark plugs. 6. Open vent in fuel cap. 7. Replace fuel filter. 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. Engine mounting bolts are loose. 2. Loose engine pulley, idler pulley, or blade pulley. 3. Engine pulley is damaged.	1. Tighten engine mounting bolts. 2. Tighten the appropriate pulley. 3. Contact Authorized Service Dealer.
Machine does not drive.	1. Traction belt is worn, loose or broken. 2. Traction belt is off pulley. 3. Hydro fluid level low.	1. Contact Authorized Service Dealer. 2. Contact Authorized Service Dealer. 3. Add hydro fluid to reservoir.

LCG

THE TORO TOTAL COVERAGE GUARANTEE

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

What Is Covered By This Express Warranty?

The Toro Company promises to repair any TORO product used for commercial, institutional, or rental purposes if defective in materials or workmanship for a period of one year from the date of purchase. The cost of parts and labor are included, but the customer pays the transportation cost. Transportation within a 15-mile radius of a TORO ProLine Service Dealer is covered under this warranty for Riding Products, Mid-size Mowers and Turf Maintenance Equipment.

What Products Are Covered By This Warranty?

The following products and their attachments are covered by this warranty:

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

How About Residential Use?

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

How Do You Get Warranty Service?

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

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

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

What Must You Do To Keep The Warranty In Effect?

You must maintain your TORO Product by following the maintenance procedures described in the operator's manual. Such routine maintenance, whether performed by a dealer or by you, is at your expense.

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

There is no other express warranty except as described above. This express warranty does not cover:

- Cost of regular maintenance service or parts, such as filters, fuel, lubricants, tune-up parts, blade sharpening, brake and clutch adjustments.
- Any product or part which has been altered or misused or required replacement or repair due to normal wear, accidents, or lack of proper maintenance.
- Repairs necessary due to improper fuel, contaminants in the fuel system, or failure to properly prepare the fuel system prior to any period of non-use over three months.
- Pickup and delivery charges for distances beyond a 15-mile radius from a TORO ProLine Service Dealer.

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

The Toro Company is not liable for indirect or consequential damages in connection with the use of the TORO Products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty. Some states do not allow exclusions of incidental or consequential damages, so the above exclusion may not apply to you.

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

COUNTRIES OTHER THAN THE UNITED STATES OR CANADA

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

Rev 12/96