Form No. 3363-382 Rev A

TORO®

Count on it.

Operator's Manual

Reelmaster® 4000-D 2-Wheel and 4-Wheel Drive Traction Unit

Model No. 03706—Serial No. 310000001 and Up

Model No. 03707—Serial No. 310000001 and Up

CE

Original Instructions (EN)

This product complies with all relevant European directives, for details please see the separate product specific Declaration of Conformity (DOC) sheet.

WARNING

CALIFORNIA
Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Important: This engine is not equipped with a spark arrester muffler. It is a violation of California Public Resource Code Section 4442 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land. Other states or federal areas may have similar laws.

Introduction

This machine is a ride-on, reel-blade lawn mower intended to be used by professional, hired operators in commercial applications. It is primarily designed for cutting grass on well-maintained lawns in golf courses, parks, sports fields, and on commercial grounds. It is not designed for cutting brush, mowing grass and other growth alongside highways, or for agricultural uses.

Read this information carefully to learn how to operate and maintain your product properly and to avoid injury and product damage. You are responsible for operating the product properly and safely.

You may contact Toro directly at www.Toro.com for product and accessory information, help finding a dealer, or to register your product.

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. Write the numbers in the space provided.

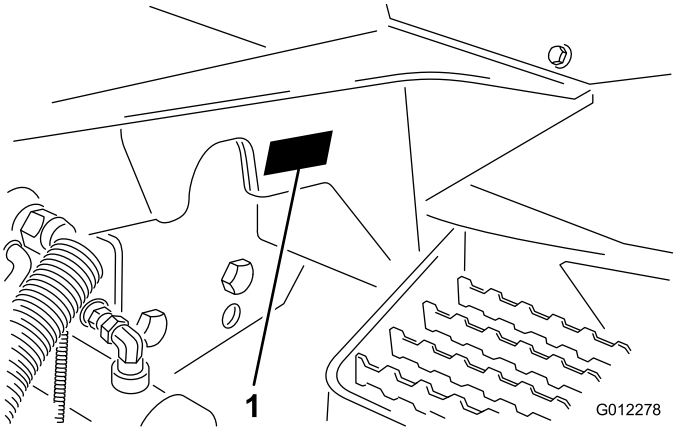


Figure 1

Model No. _____

Serial No. _____

This manual identifies potential hazards and has safety messages identified by the safety alert symbol (Figure 1), which signals a hazard that may cause serious injury or death if you do not follow the recommended precautions.

Figure 2

1. Safety alert symbol

This manual uses 2 other words to highlight information. **Important** calls attention to special mechanical information and **Note** emphasizes general information worthy of special attention.

Contents

8111 Lyndale Avenue South
Bloomington, MN 55420

Safety

This machine meets or exceeds CEN standard EN 836:1997, ISO standard 5395:1990, and ANSI B71.4-2004 specifications in effect at time of production, when equipped with rear weight. Refer to the section in this manual on Installing Rear Weight.

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 the CEN standard EN 836:1997, ISO standard 5395:1990, and ANSI B71.4-2004.

Training

- Read the operator's manual and other training material carefully. Be familiar with the controls, safety signs, and the proper use of the equipment.
- Never allow children or people unfamiliar with these instructions to use or service the mower. Local regulations may restrict the age of the operator.
- Never mow while people, especially children, or pets are nearby.
- Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.
- Do not carry passengers.
- All drivers and mechanics should seek and obtain professional and practical instruction. The owner is responsible for training the users. Such instruction should emphasize:
  - the need for care and concentration when working with ride-on machines;
  - control of a ride-on machine sliding on a slope will not be regained by the application of the brake. The main reasons for loss of control are:
    - ◊ insufficient wheel grip;
    - ◊ being driven too fast;
    - ◊ inadequate braking;
    - ◊ the type of machine is unsuitable for its task;
    - ◊ lack of awareness of the effect of ground conditions, especially slopes;
    - ◊ incorrect hitching and load distribution.
- The owner/user can prevent and is responsible for accidents or injuries occurring to himself or herself, other people, or property.

Preparation

- While mowing, always wear substantial footwear, long trousers, hard hat, safety glasses, and ear protection. Long hair, loose clothing, or jewelry may get tangled in moving parts. Do not operate the equipment when barefoot or wearing open sandals.
- Thoroughly inspect the area where the equipment is to be used and remove all objects which may be thrown by the machine.
- **Warning**—Fuel is highly flammable. Take the following precautions:
  - Store fuel in containers specifically designed for this purpose.
  - Refuel outdoors only and do not smoke while refuelling.
  - Add fuel before starting the engine. Never remove the cap of the fuel tank or add fuel while the engine is running or when the engine is hot.
  - If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapors have dissipated.
  - Replace all fuel tanks and container caps securely.
- Replace faulty silencers/mufflers.
- 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.
- Check that the operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.

Operation

- Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.
- Mow only in daylight or in good artificial light.
- Before attempting to start the engine, disengage all blade attachment clutches, shift into neutral, and engage the parking brake.

- Remember there is no such thing as a safe slope. Travel on grass slopes requires particular care. To guard against overturning:
  - do not stop or start suddenly when going up or downhill;
  - engage the traction pedal slowly, always keep the machine in gear, especially when travelling downhill;
  - machine speeds should be kept low on slopes and during tight turns;
  - stay alert for humps and hollows and other hidden hazards;
  - do not turn sharply. Use care when reversing;
  - never mow across the face of the slope, unless the mower is designed for this purpose.
- Stay alert for holes in the terrain and other hidden hazards.
- Use care when pulling loads or using heavy equipment.
  - Do not turn sharply. Use care when reversing.
  - Use counterweight(s) or wheel weights when suggested in the *Operator's Manual*.
- Watch out for traffic when crossing or near roadways.
- Stop the blades rotating before crossing surfaces other than grass.
- When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while in operation.
- Never operate the machine with damaged guards, shields, or without safety protective devices in place. Be sure all interlocks are attached, adjusted properly, and functioning properly.
- Do not change the engine governor settings or over-speed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
- Before leaving the operator's position:
  - stop on level ground;
  - disengage the power take-off and lower the attachments;
  - change into neutral and set the parking brake;
  - stop the engine and remove the key.
- Disengage drive to attachments when transporting or not in use.
- Stop the engine and disengage drive to attachment:
  - before refuelling;
  - before making height adjustment unless adjustment can be made from the operator's position;
  - before clearing blockages;
  - before checking, cleaning or working on the mower;
  - after striking a foreign object or if an abnormal vibration occurs. Inspect the mower for damage and make repairs before restarting and operating the equipment.
- Reduce the throttle setting during engine run-out and, if the engine is provided with a shut-off valve, turn the fuel off at the conclusion of mowing.
- Keep hands and feet away from the cutting units.
- Look behind and down before backing up to be sure of a clear path.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop cylinders/reels if not mowing.
- Do not operate the mower under the influence of alcohol or drugs.
- Use care when loading or unloading the machine into a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
- This machine is not designed or equipped for on–road use and is a "slow–moving vehicle." If you must cross or travel on a public road, you should be aware of and comply with local regulations, such as required lights, slow moving vehicle signs, and reflectors.
- Lightning can cause severe injury or death. If lightning is seen or thunder is heard in the area, do not operate the machine; seek shelter.

⚠ WARNING

Engine exhaust contains carbon monoxide, which is an odorless, deadly poison that can kill you.

Do not run engine indoors or in an enclosed area.

Maintenance and Storage

- Keep all nuts, bolts, and screws tight to be sure the equipment is in safe working condition.
- Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.
- Allow the engine to cool before storing in any enclosure.

- To reduce the fire hazard, keep the engine, silencer/muffler, battery compartment and fuel storage area free of grass, leaves, or excessive grease.
- Keep all parts in good working condition and all hardware and hydraulic fittings tightened. Replace all worn or damaged parts and decals.
- If the fuel tank has to be drained, do this outdoors.
- Be careful during adjustment of the machine to prevent entrapment of the fingers between moving blades and fixed parts of the machine.
- On multi-cylinder/multi-reel machines, take care as rotating one cylinder/reel can cause other cylinders/reels to rotate.
- Disengage drives, lower the cutting units, set parking brake, stop engine and remove key from ignition. Wait for all movement to stop before adjusting, cleaning or repairing.
- Clean grass and debris from cutting units, drives, silencers/mufflers, and engine to help prevent fires. Clean up oil or fuel spillage.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect the battery before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect the positive first and negative last.
- Use care when checking the cylinders/reels. Wear gloves and use caution when servicing them.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.

Toro Riding Mower Safety

The following list contains safety information specific to Toro products or other safety information that you must know that is not included in the CEN, ISO, or ANSI standard.

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

Use of this product for purposes other than its intended use could prove dangerous to user and bystanders.

- Know how to stop the engine quickly.
- Do not operate the machine while wearing tennis shoes or sneakers.
- Wearing safety shoes and long pants is advisable and required by some local ordinances and insurance regulations.
- Handle fuel carefully. Wipe up any spills.
- Check the safety interlock switches daily for proper operation. If a switch should fail, replace the switch before operating the machine.
- Before starting the engine, sit on the seat.
- Using the machine demands attention. To prevent loss of control:
  - Do not drive close to sand traps, ditches, creeks, or other hazards.
  - Reduce speed when making sharp turns. Avoid sudden stops and starts.
  - When near or crossing roads, always yield the right-of-way.
  - Apply the service brakes when going downhill to keep forward speed slow and to maintain control of the machine.
- Raise the cutting units when driving from one work area to another.
- Do not touch the engine, silencer/muffler, or exhaust pipe while the engine is running or soon after it has stopped because these areas could be hot enough to cause burns.
- If the engine stalls or loses headway and cannot make it to the top of a slope, do not turn the machine around. Always back slowly, straight down the slope.
- When a person or pet appears unexpectedly in or near the mowing area, **stop mowing**. Careless operation, combined with terrain angles, ricochets, or improperly positioned guards can lead to thrown object injuries. Do not resume mowing until the area is cleared.

Maintenance and Storage

- Make sure all hydraulic line connectors are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system.
- Keep your body and hands away from pin hole leaks or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, not your hands, to search for leaks. Hydraulic fluid escaping under pressure can have sufficient force to penetrate the skin and cause serious injury. Seek immediate medical attention if fluid is injected into skin.

- Before disconnecting or performing any work on the hydraulic system, all pressure in the system must be relieved by stopping the engine and lowering the cutting units and attachments to the ground.
- Check all fuel lines for tightness and wear on a regular basis. Tighten or repair them as needed.
- If the engine must be running to perform a maintenance adjustment, keep hands, feet, clothing, and any parts of the body away from the cutting units, attachments, and any moving parts. Keep everyone away.
- To ensure safety and accuracy, have an Authorized Toro Distributor check the maximum engine speed with a tachometer. Maximum governed engine speed should be 2900 RPM.
- If major repairs are ever needed or if assistance is desired, contact an Authorized Toro Distributor.
- Use only Toro-approved attachments and replacement parts. The warranty may be voided if used with unapproved attachments.

Sound Power Level

This unit has a guaranteed sound power level of 105 dBA, which includes an Uncertainty Value (K) of 1 dBA.

Sound power level was determined according to the procedures outlined in ISO 11094.

Sound Pressure Level

This unit has a sound pressure level at the operator's ear of 86 dBA, which includes an Uncertainty Value (K) of 1 dBA.

Sound pressure level was determined according to the procedures outlined in EN 836.

Vibration Level

Hand-Arm

Measured vibration level for right hand = 0.38 m/s^2

Measured vibration level for left hand = 0.34 m/s^2

Uncertainty Value (K) = 0.5 m/s^2

Measured values were determined according to the procedures outlined in EN 836.

Whole Body

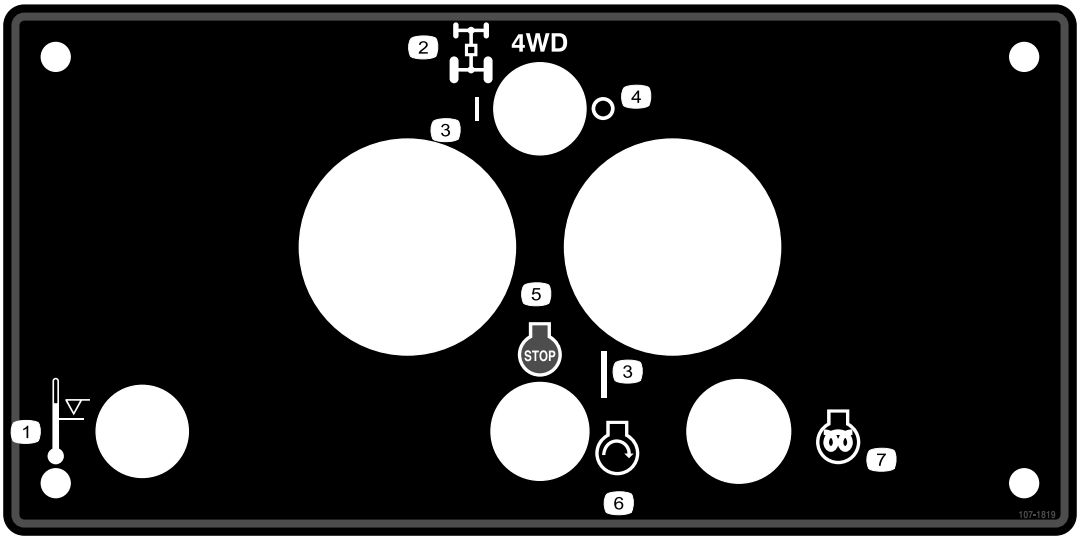
Measured vibration level = 0.53 m/s^2

Uncertainty Value (K) = 0.5 m/s^2

Measured values were determined according to the procedures outlined in EN 836.

Safety and Instructional 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.

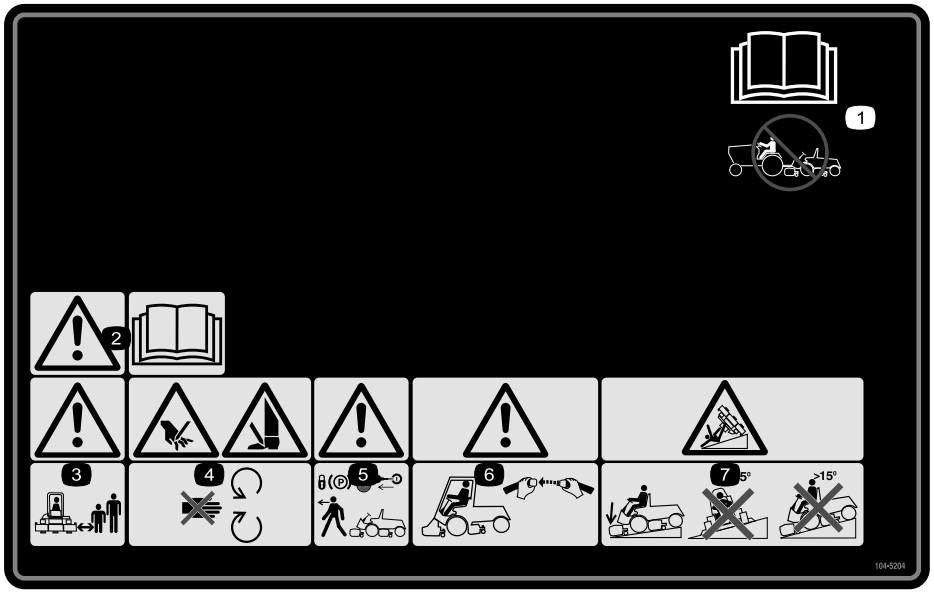


107-1819

1. Temperature level
2. Four wheel drive flow divider
3. On
4. Off
5. Engine—stop
6. Engine—start
7. Engine—preheat

104-5203

1. Read the *Operator's Manual*; do not tow the machine.
2. Warning—read the *Operator's Manual.*
3. Warning—keep bystanders a safe distance from the machine.
4. Cutting hazard of hand or foot—stay away from moving parts.
5. Warning—lock the parking brake, stop the engine, and remove the ignition key before leaving the machine.
6. Warning—use a rollover protection system and wear the seat belt.
7. Tipping hazard—lower the cutting unit when driving down slopes.

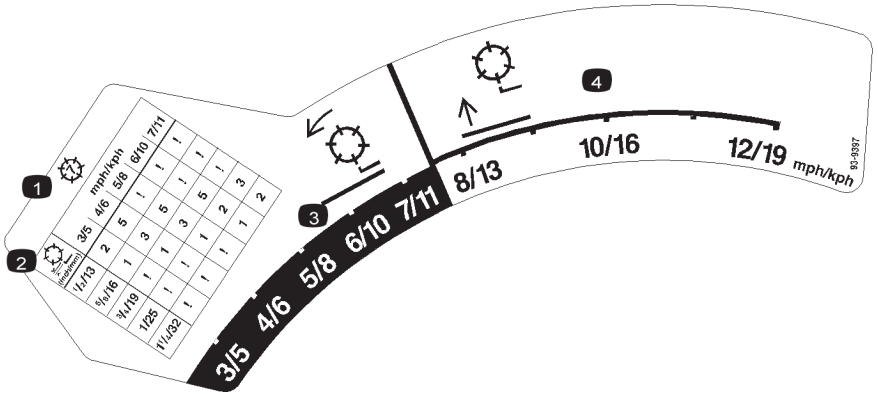


104-5204 for CE

(Affix over part no. 104–5203 for CE*

* This safety decal includes a slope warning required on the machine for compliance to the European Lawn Mower Safety Standard EN836:1997. The conservative maximum slope angles indicated for operation of this machine are prescribed by and required by this standard.

1. Read the *Operator's Manual*; do not tow the machine.
2. Warning—read the *Operator's Manual.*
3. Warning—keep bystanders a safe distance from the machine.
4. Cutting hazard of hand or foot—stay away from moving parts.
5. Warning—lock the parking brake, stop the engine, and remove the ignition key before leaving the machine.
6. Warning—use a rollover protection system and wear the seat belt.
7. Tipping hazard—lower the cutting unit when driving down slopes.



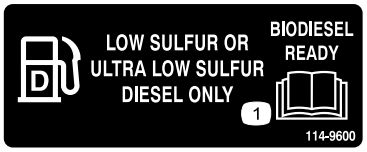
93-9397

1. 7-blade reel
2. Height of cut
3. Reel—mowing speeds
4. Reel—transport speeds

59-8440

1. Warning—contents under pressure.

67-7960



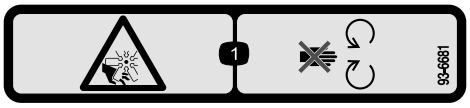
114-9600

1. Read the *Operator's Manual.*

93-9404

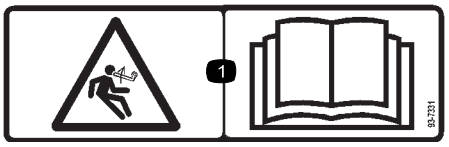
1. Engine coolant
2. Read the *Operator's Manual.*

85-6410



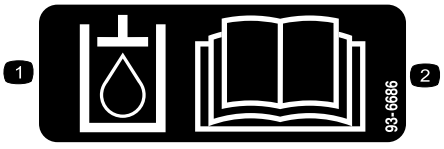
93-6681

1. Cutting/dismemberment—hazard, fan-stay away from moving parts.



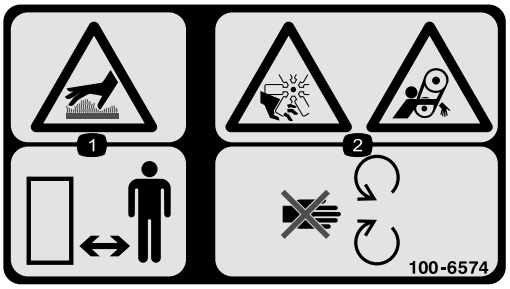
93-7331

1. Stored energy hazard—read the *Operator's Manual.*



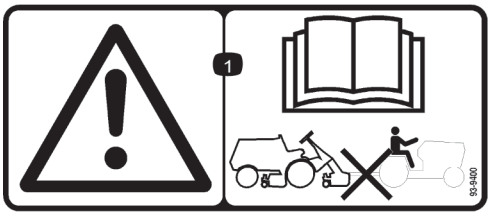
93-6686

1. Hydraulic oil
2. Read the *Operator's Manual.*



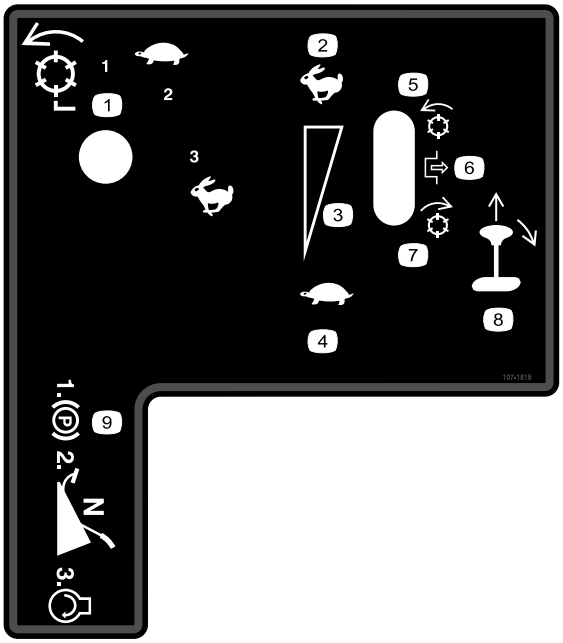
100-6574

1. Hot surface/burn hazard—stay a safe distance from the hot surface.
2. Cutting/dismemberment hazard, fan and entanglement hazard, belt—stay away from moving parts; keep all guards and shields in place.



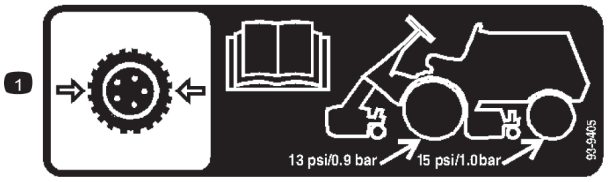
93-9400

1. Warning—read the *Operator's Manual*; do not tow the machine.



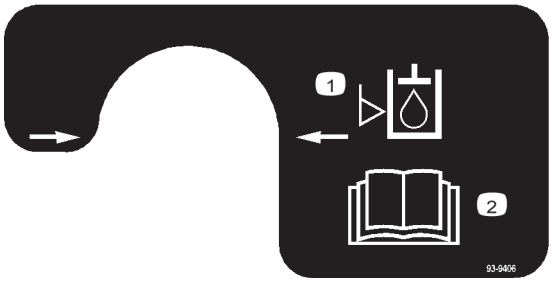
107-1818

1. Reel—mowing speeds, slow to fast.
2. Fast
3. Continuous variable setting
4. Fast
5. Reel—mowing
6. Disengage
7. Reel—backlapping
8. Pull and move the lever.
9. Set the parking brake, set the controls to neutral, and start the engine.



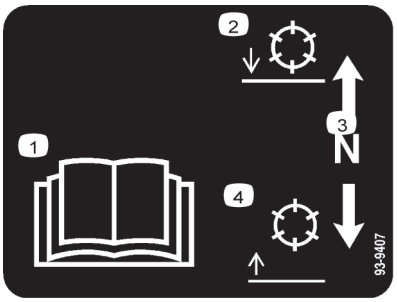
93-9405

1. Tire pressure—read the *Operator's Manual*; fill the front tires to 13 psi (0.9 bar) and the rear tires to 15 psi (1.0 bar).



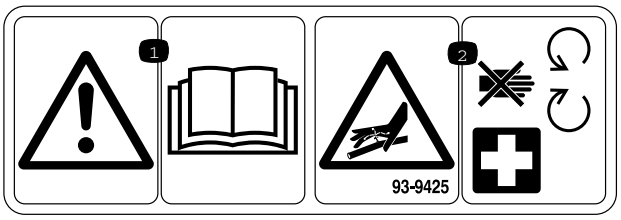
93-9406

1. Hydraulic oil level
2. Read the *Operator's Manual.*



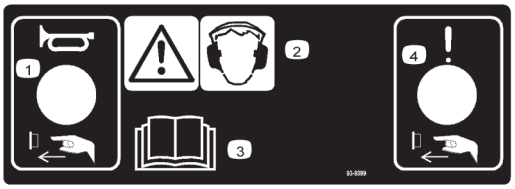
93-9407

1. Read the *Operator's Manual.*
2. Lower the reels.
3. Neutral
4. Raise the reels.



93-9425

1. Read the *Operator's Manual.*
2. Hydraulic hoses are under pressure—stay away from moving parts.

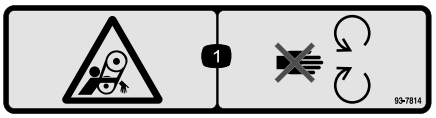


93-9399

1. Horn—press the button.
2. Warning—wear hearing protection.
3. Read the *Operator's Manual.*
4. Failure/malfunction—press the button.

93-6688

1. Warning—read the instructions before servicing or performing maintenance.
2. Cutting hazard of hand or foot—stop the engine and wait for moving parts to stop.

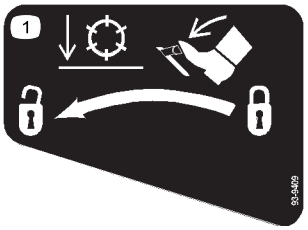


93-7814

1. Entanglement hazard, belt—stay away from moving parts.

58-6520

1. Grease



93-9409

1. To unlock the reels before lowering them, press the pedal.

CALIFORNIA SPARK ARRESTER WARNING

Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements. 117-2718

117–2718

Battery Symbols

Some or all of these symbols are on your battery

1. Explosion hazard
2. No fire, open flame, or smoking.
3. Caustic liquid/chemical burn hazard
4. Wear eye protection
5. Read the *Operator's Manual.*
6. Keep bystanders a safe distance from the battery.
7. Wear eye protection; explosive gases can cause blindness and other injuries
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.

Product Overview

Controls

Seat Adjusting Lever

The seat adjusting lever (Figure 3) allows 5.9 inch (15 cm) fore and aft adjustment in 19/32 inch (15 mm) increments.

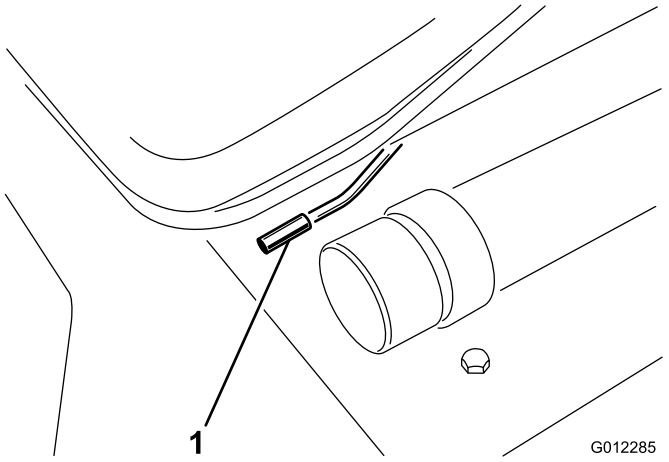


Figure 3

1. Seat adjusting lever

Arm Rest

Pivot the arm rest (Figure 4) up and down for operator comfort.

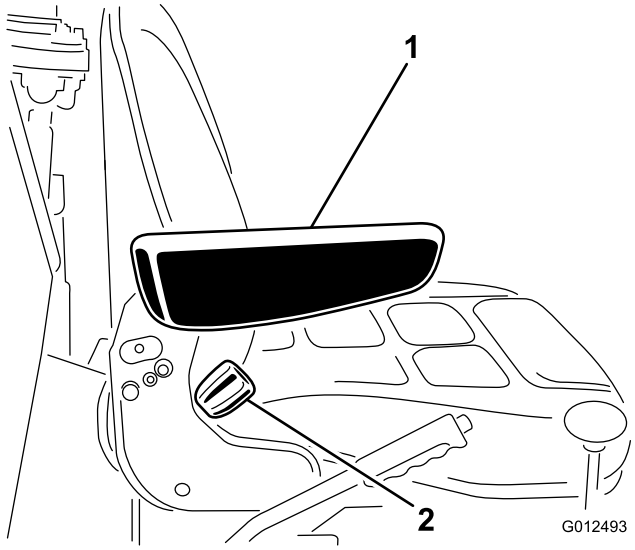


Figure 4

1. Arm rest
2. Backrest knob

Backrest Knob

The backrest knob (Figure 4) adjusts backrest angle from 5–20 degrees.

Suspension Knob

The suspension knob, located below the seat pan, allows you to set the seat for the weight of the operator.

Note: The backrest and bottom seat cushions are removable.

⚠ CAUTION

To ensure that the interlock switch operates properly, set the seat suspension for the weight of each operator. If the suspension is not set correctly, the engine will run intermittently and tend to stall. To correct this, set the suspension lighter.

Warning Light Test Button

Before operating machine, press the warning light test button (Figure 5). All lights on the steering tower should illuminate. Any light that does not come on indicates an electrical malfunction that should be repaired immediately. Oil pressure and electrical no charge indicator lights illuminate when turning the key switch On.

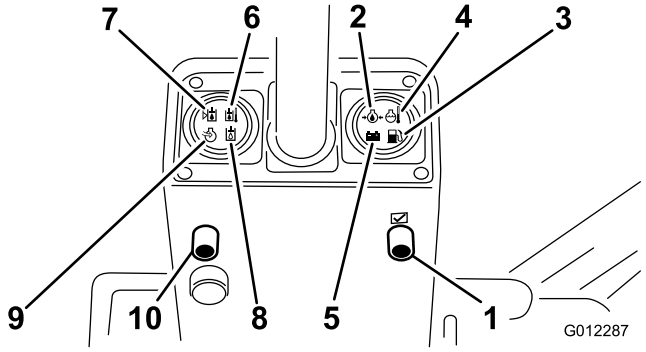


Figure 5

1. Warning light test button
2. Engine oil pressure warning light
3. Fuel system warning
4. Coolant temperature warning
5. Electrical no charge warning
6. Hydraulic oil temperature warning
7. Hydraulic oil level warning
8. Hydraulic oil filter warning
9. Air cleaner warning
10. Alarm silence button

Hydraulic and Engine Indicator Lights

If these lights come on (Figure 5), stop the machine and make repairs immediately.

Engine Oil Pressure Warning

Dangerously low engine oil pressure is indicated by both a warning indicator light and audible signal (Figure 5). When this occurs, stop the engine immediately and correct the problem.

Fuel System Warning

A warning indicator light and audible signal (Figure 5) warn of excess water in the fuel system. Remove water from the system.

Coolant Temperature Warning

If engine coolant temperature exceeds 221° F (105° C) a warning indicator light (Figure 5) illuminates and audible signal sounds. The engine shuts down if temperature of coolant exceeds 230° F (110° C). Switch resets automatically when system and engine cools down.

Electrical No Charge Warning

No charge to the batteries is indicated by a warning indicator light and audible signal (Figure 5).

Hydraulic Oil Temperature Warning

A warning indicator light and audible signal warn (Figure 5) of excessively high hydraulic temperature.

Hydraulic Oil Level Warning

A warning indicator light and audible signal (Figure 5) warn of low hydraulic oil level. If oil level drops further, the engine will automatically be stopped. Engine cannot be restarted until oil supply is brought to a safe level.

Hydraulic Oil Filter Warning

A warning indicator light and audible signal (Figure 5) warn of a clogged hydraulic filter.

Air Cleaner Warning

A warning indicator light and audible signal (Figure 5) warn that the filter is clogged and in need of service.

Alarm Silence Button

Pressing button (Figure 5) silences alarm. Alarm system will disengage and automatically reset when the problem is corrected or the alarm silence button is pressed.

Traction Pedal

The traction pedal (Figure 6) controls forward and reverse operation. Press the top of the pedal to move

forward and the bottom to move backward. Ground speed depends on how far the pedal is pressed. For maximum ground speed, fully press the pedal while the throttle is in the Fast position. For maximum power under load or when going uphill, keep the engine rpm high by having the throttle in the Fast position and the traction pedal held stationary against the ground speed limiter. If the engine rpm begins to decrease due to load, gradually reduce the traction pedal pressure until the engine speed is increased.

To stop, reduce foot pressure on the traction pedal and allow it to return to the center position. On extreme downhill slopes, apply pressure to the reverse side of the pedal, or operate with your heel on the Reverse and toe on the Forward portion of the pedal.

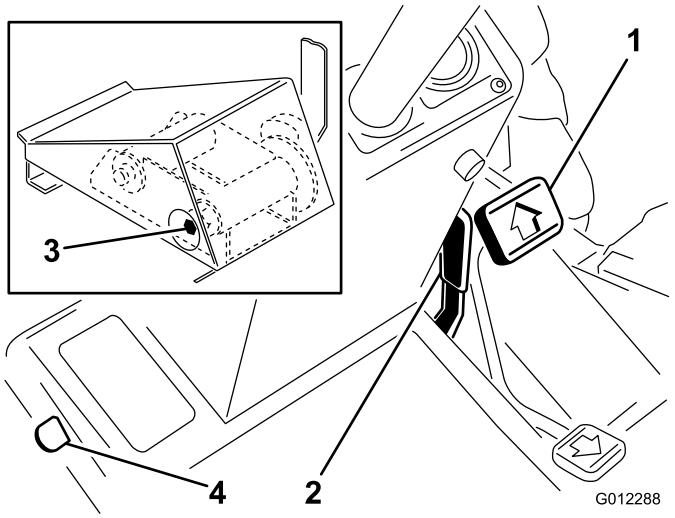


Figure 6

1. Traction pedal
2. Speed limiter
3. Cam lever nut
4. Transport latch

Ground Speed Limiter

The ground speed limiter (Figure 6) controls the traction pedal movement. The limiter lever helps control the rate of clip and eliminates sudden speed variations over rough terrain.

Important: The cam lever nut (Figure 6, Inset) can be tightened if the limiter stop will not hold the traction pedal in the desired position.

Transport Latches

These latches secure the cutting units in the upright position for transport operation. The latch for the front cutting units is foot–operated (Figure 6). The hand-operated latches control the center and outside cutting units (Figure 7).

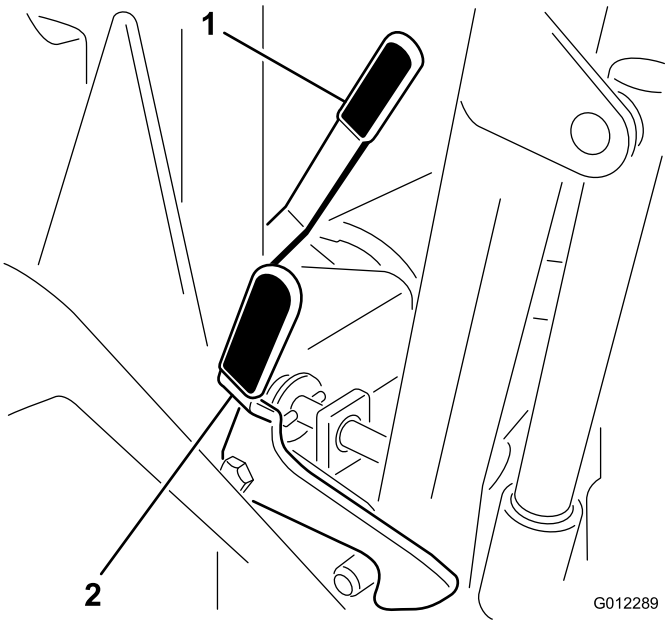


Figure 7

1. Center cutting unit latch
2. Outside cutting unit latch

Cutting Unit Lift Controls

The two outside levers (Figure 8) raise and lower the two outside cutting units. The center lever raises and lowers the two front and the center cutting units. The engine must be running to lower the cutting units. When the cutting units are lifted, the reels automatically stop. Do not allow the levers to snap back to neutral, or cutting units may not float freely.

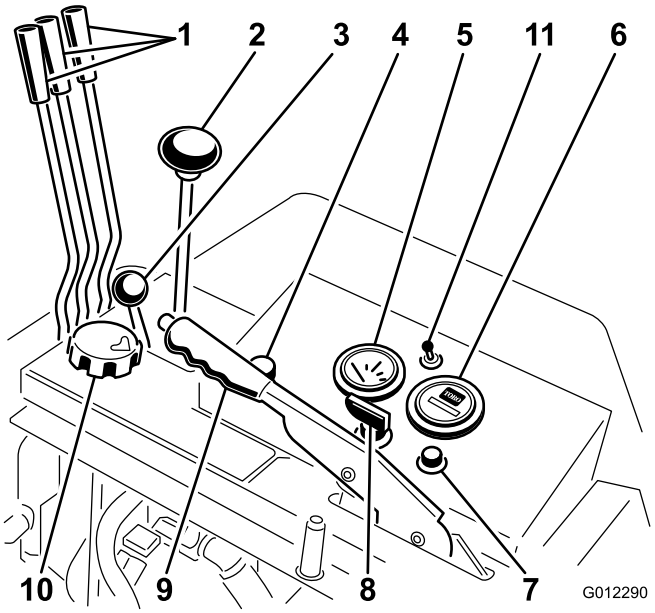


Figure 8

1. Cutting unit lift controls
2. Mow/backlap lever
3. Throttle
4. Engine override button
5. Fuel gauge
6. Hour meter
7. Engine preheat indicator light
8. Key switch
9. Parking brake
10. Reel speed control
11. 4 Wheel drive switch (4 wheel drive only)

Engine Override Button

When this button (Figure 8) is pressed, the engine can be operated after it has over heated and automatically been stopped by the electrical safety system. Use only for short intervals.

Fuel Level Gauge

Gauge (Figure 8) indicates the amount of fuel in tank.

Hour Meter

Hour meter (Figure 8) indicates the total hours that machine has been operated.

Note: Lines circling in the small window at left side of gauge indicate hour meter is operating.

Engine Preheat Indicator Light

This light (Figure 8) turns on when the key is moved to the On position. Glow plugs engage for 10 seconds, then, the light goes off when the engine is ready to start.

Key Switch

Three positions: Off, On, and Start. Rotate the key (Figure 8) to Start and release it when the engine begins running. To stop the engine, rotate the key to Off.

Parking Brake Lever

Pull this lever (Figure 8) up to lock the brake. To release the brake, pull up on the lever, press the button, and lower the lever. The brake must be engaged to start the engine. Always engage the parking brake before getting off of the seat.

Mow-Backlap Lever

Move this lever (Figure 8) forward to engage the cutting units. Move the lever to the center to stop the cutting units. To backlap cutting units, lift the lever over stop and hold it in the rear position.

Important: Do not move lever directly between the Mow and Backlap positions. Pause briefly in the Stop position.

Reel Speed Control

Rotate the knob (Figure 8) clockwise to increase the reel speed, counter–clockwise to decrease speed. Use in conjunction with the ground speed limiter to achieve the appropriate rate of clip.

Throttle Control

Move this control (Figure 8) forward to increase engine speed andbackward to decrease speed.

4 Wheel Drive Switch (4 wheel drive model only)

Move this switch (Figure 8) forward to engage 4 wheel drive. Move it to the rear position to disengage 4 wheel drive.

Specifications

Note: Specifications and design are subject to change without notice.

Width, cutting units raised	91.5 inches (232 cm)
Width, cutting units lowered	147 inches (373 cm)
Width of cut, 5 cutting units	137 inches (348 cm)
Width of cut, 4 cutting units	110 inches (279 cm)
Width of cut, 3 cutting units	83 inches (211 cm)
Width of cut, 1 cutting unit	29.5 inches (75 cm)
Length	110 inches (282 cm)
Height with ROPS	82 inches (208 cm)
Height without ROPS	55.5 inches (141 cm)
Weight (Dry)	4360 lb (1717 kg)
Fuel tank capacity	15 US gallons (56.8 l)

Attachments/Accessories

A selection of Toro approved attachments and accessories are available for use with the machine to enhance and expand its capabilities. Contact your Authorized Service Dealer or Distributor or go to www.Toro.com for a list of all approved attachments and accessories.

Operation

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

Checking the Engine Oil Level

The engine is shipped with oil in the crankcase; however, the oil level must be checked before and after the engine is first started.

Crankcase capacity is approximately 8 qt. (7.6 L) with the filter.

Use high-quality engine oil that meets the following specifications:

- API Classification Level Required: CH-4, CI-4 or higher
- Preferred oil: SAE 15W-40 (above 0 degrees F)
- Alternate oil: SAE 10W-30 or 5W-30 (all temperatures)

Toro Premium Engine oil is available from your distributor in either 15W-40 or 10W-30 viscosity.

1. Park the machine on a level surface, stop the engine, set the parking brake, and remove the key from the ignition switch.
2. Release the engine cover latches and open the hood.

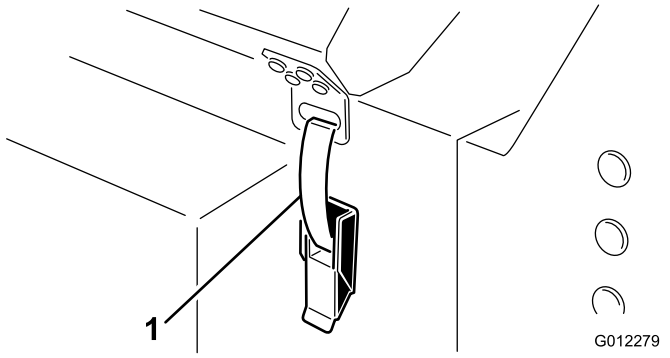


Figure 9

1. Engine cover latch

3. Remove the dipstick, wipe it clean, and install it (Figure 10).

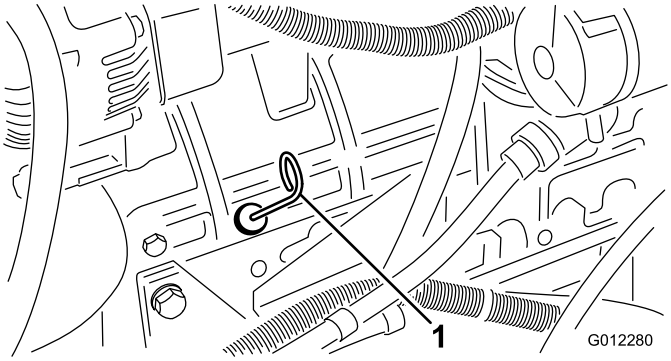


Figure 10

1. Dipstick

4. Remove dipstick and check oil level on dipstick.

   The oil level should be up to the Full mark .

5. If the oil level is below the Full mark, remove the fill cap (Figure 11) and add oil until level reaches the Full mark on dipstick.

   Do not overfill.

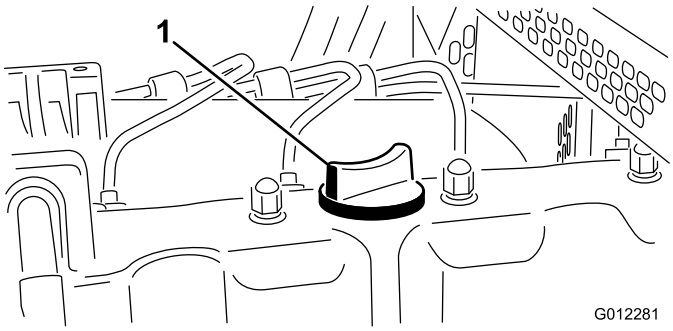


Figure 11

1. Oil fill cap

Important: Be sure to keep the engine oil level between the upper and lower limits on the oil gauge. Engine failure may occur as a result of over filling or under filling the engine oil.

6. Install the oil fill cap.
7. Close engine cover and secure with the latches.

Checking the Cooling System

Service Interval: Before each use or daily

Capacity of system is 3.7 US gallons (14 L).

1. Carefully remove the radiator cap (Figure 13) and expansion tank cap (Figure 12).

⚠ CAUTION

If the engine has been running, the pressurized, hot coolant can escape and cause burns.

- **Do not open the radiator cap when the engine is running.**
- **Use a rag when opening the radiator cap, and open the cap slowly to allow steam to escape.**

2. Check level of coolant in radiator. Radiator should be filled to the top of the filler neck and the expansion tank filled to the marks on its side (Figure 12).

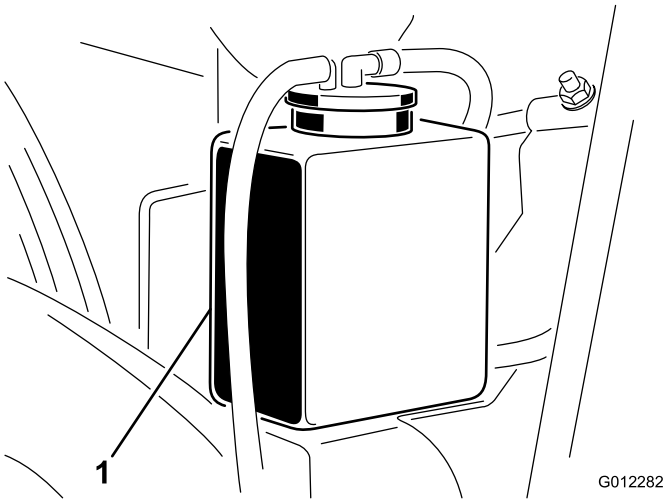


Figure 12

1. Expansion tank

3. If the coolant level is low, add a 50/50 mixture of water and ethylene glycol anti–freeze. **Do not overfill.**

   Important: Do not use water only or alcohol/methanol base coolants.

4. Install the radiator and expansion tank caps.

Adding Fuel

Use only clean, fresh diesel fuel or biodiesel fuels with low (<500 ppm) or ultra low (<15 ppm) sulfur content. The minimum cetane rating should be 40. Purchase fuel in quantities that can be used within 180 days to ensure fuel freshness.

Fuel tank capacity: 15 US gallons (56.8 L)

Use summer grade diesel fuel (No. 2-D) at temperatures above 20° F (-7° C) and winter grade (No. 1-D or No. 1-D/2-D blend) below that temperature. Use of winter grade fuel at lower temperatures provides lower flash point and cold flow characteristics which will ease starting and reduce fuel filter plugging.

Use of summer grade fuel above 20° F (-7° C) will contribute toward longer fuel pump life and increased power compared to winter grade fuel.

Important: Do not use kerosene or gasoline instead of diesel fuel. Failure to observe this caution will damage the engine.

⚠ WARNING

Fuel 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 fuel away from eyes and skin.**

Biodiesel Ready

This machine can also use a biodiesel blended fuel of up to B20 (20% biodiesel, 80% petrodiesel). The petrodiesel portion should be low or ultra low sulfur. Observe the following precautions:

- The biodiesel portion of the fuel must meet specification ASTM D6751 or EN14214.
- The blended fuel composition should meet ASTM D975 or EN590.
- Painted surfaces may be damaged by biodiesel blends.
- Use B5 (biodiesel content of 5%) or lesser blends in cold weather.
- Monitor seals, hoses, gaskets in contact with fuel as they may be degraded over time.
- Fuel filter plugging may be expected for a time after converting to biodiesel blended.
- Contact your distributor if you wish for more information on biodiesel.

⚠ DANGER

Under certain conditions, diesel fuel and fuel vapors are highly flammable and explosive. A fire or explosion from fuel can burn you and others and can cause property damage.

- **Use a funnel and fill the fuel tank outdoors, in an open area, when the engine is off and is cold. Wipe up any fuel that spills.**
- **Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is 1 inch (25 mm) below the bottom of the filler neck. This empty space in the tank allows the fuel to expand.**
- **Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.**
- **Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.**
- **Store fuel in a clean, safety-approved container and keep the cap in place.**

⚠ DANGER

In certain conditions during fueling, static electricity can be released causing a spark which can ignite the fuel vapors. A fire or explosion from fuel can burn you and others and can damage property.

- **Always place fuel containers on the ground away from your vehicle before filling.**
- **Do not fill fuel 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 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 fuel dispenser nozzle.**
- **If a fuel 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.**

1. Park the machine on a level surface.
2. Using a clean rag, clean area around fuel tank cap.
3. Remove cap from the fuel tank (Figure 13).

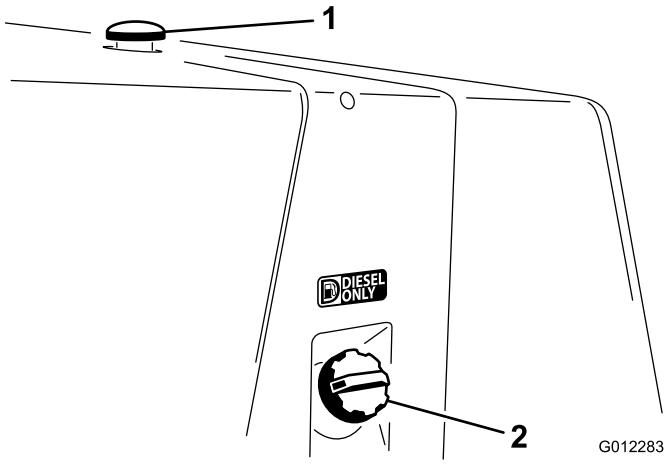


Figure 13

1. Radiator cap
2. Fuel tank cap

4. Fill the tank until the level is to the bottom of the filler neck with diesel fuel.
5. Install fuel tank cap tightly after filling tank.

Note: If possible, fill the fuel tank after each use. This will minimize possible buildup of condensation inside the fuel tank.

Checking/Adding Hydraulic Fluid

The hydraulic system and reservoir is filled at the factory with approximately 18.2 US gallons (69 L) of high quality hydraulic fluid. The hydraulic fluid reservoir holds 9.3 US gallons (35.2 L) of the total.**Check the level of the hydraulic fluid before the engine is first started and daily thereafter.** The recommended replacement fluid is as follows:

Toro Premium All Season Hydraulic Fluid (Available in 5 gallon pails or 55 gallon drums. See parts catalog or Toro distributor for part numbers.)

Alternate fluids: If the Toro fluid is not available, other fluids may be used provided they meet all the following material properties and industry specifications. We do not recommend the use of synthetic fluid. Consult with your lubricant distributor to identify a satisfactory product.

Note: Toro will not assume responsibility for damage caused by improper substitutions, so use only products from reputable manufacturers who will stand behind their recommendation.

Anti-wear Hydraulic Fluid, ISO VG 46

Material Properties:

Viscosity, ASTM D445	cSt @ 40°C 65 to 71
	cSt @ 100°C 8.4 to 8.9

Viscosity Index ASTM D2270 97 to 107
Pour Point, ASTM D97 -18°F to -30°F

Industry Specifications:
Vickers I-286-S (Quality Level), Vickers M-2950-S (Quality Level), Denison HF-0

Note: Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic system oil is available in 2/3 oz (20 ml) bottles. One bottle is sufficient for 4–6 US gallons (15-22 L) of hydraulic oil. Order part number 44-2500 from your authorized Toro distributor.

1. Park the machine on a level surface.
2. Look into the sight glass (Figure 14). The oil level should be even with the arrows when checking warm oil. The oil will be 1/4 to 1/2 inch (6 to 12 mm) below the arrows when cold.

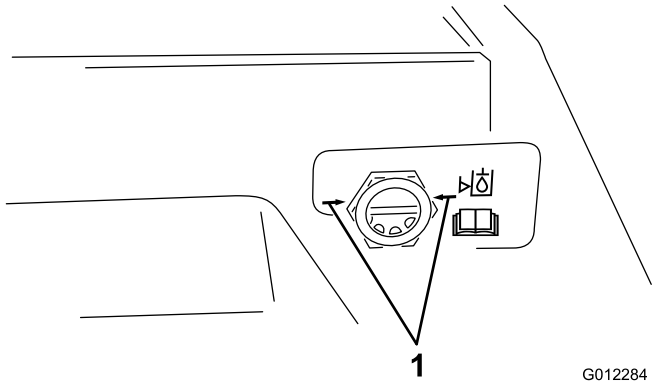


Figure 14

1. Sight glass arrows

3. If the oil level is low, add hydraulic oil to the reservoir, as follows:
   A. Remove the seat lock pin, raise the seat and hold it open with the support rod.
   B. Clean around reservoir cover (Figure 15).

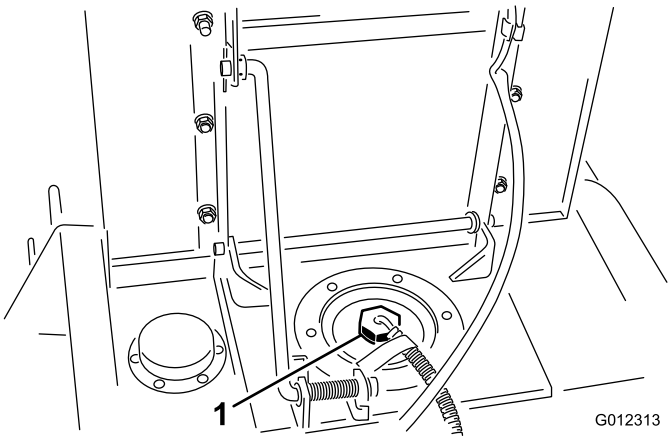


Figure 15

1. Reservoir cover

   C. Remove cover and add hydraulic oil until it is even with arrows on sight glass (Figure 14).

Checking the Reel to Bedknife Contact

Each day before operating, check reel to bedknife contact, regardless if the quality of cut had previously been acceptable. There must be light contact across the full length of the reel and the bedknife (refer to Adjusting the Reel to Bedknife in the cutting unit *Operator's Manual*).

Checking the Tire Pressure

For normal mowing conditions and a wide variety of turf grasses, use these tire pressures: 13 psi (90 kPa) front and 15 psi (103.4 kPa) rear. However, when turf is either wetter or drier than normal, tire pressure may need to be changed. On hard turf, use high tire pressure (18 psi (124 kPa) front and rear). When turf is soft, use low pressure (9 psi (62 kPa) front and 12 psi (82.7 kPa) rear).

Important: Maintain even pressure in two front tires, i.e., 13 psi (90 kPa) and both rear tires, i.e., 15 psi (103.4 kPa), to ensure excellent quality-of-cut.

Rear Ballast

This unit complies with the ANSI B71.4–2004 Standard when rear tires are filled with calcium chloride and a rear wheel weight kit (Part Number 11-0440) is installed.

Important: If a puncture occurs in a tire with calcium chloride, remove unit from turf area as quickly as possible. To prevent possible damage to turf, immediately soak affected area with water.

Starting and Stopping

1. Sit on the seat, keep your foot off of the traction pedal. Ensure that the parking brake is engaged And that the traction pedal and mow/backlap lever are in neutral.
2. Turn the key switch to the On position. When the glow plug indicator light goes off, the engine is ready to Start.
3. Turn the key to the Start position. Release the key when the engine starts.

To stop, disengage and move all controls to neutral and set the parking brake. Raise and latch all cutting units

in the transport position. Turn the key to the Off and remove it from the switch.

Bleeding the Fuel System

1. Park the machine on a level surface. Ensure that the fuel tank is at least half full.
2. Raise the engine cover.
3. Open the vent plug on the fuel filter/water separator (Figure 16).

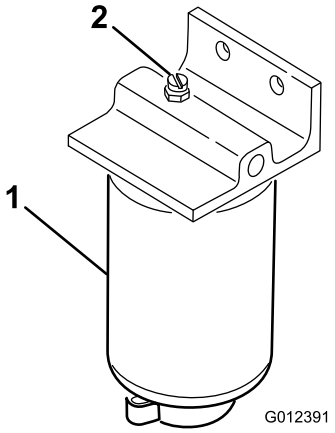


Figure 16

1. Fuel filter/water separator 2. Vent plug

4. Turn the key in the ignition switch to the On position. The electric fuel pump will begin operation, thereby forcing air out around the vent plug. Leave the key in the On position until a solid stream of fuel flows out around plug. Tighten the plug and turn key to the Off position.
5. Open the air bleed screw on the fuel injection pump (Figure 17).

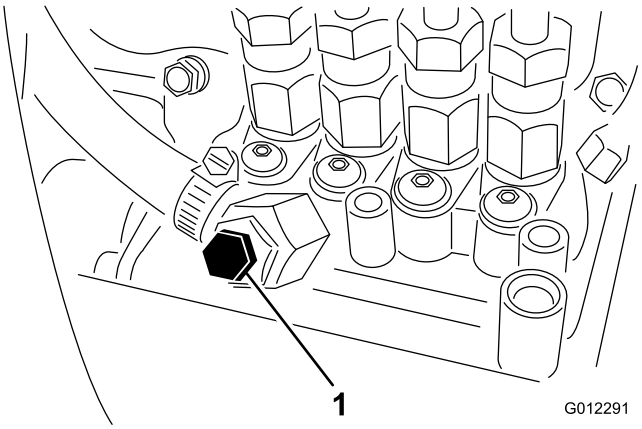


Figure 17

1. Fuel injection pump bleed screw

6. Turn the key in the ignition switch to the On position. The electric fuel pump will begin operation, thereby forcing air out around the air bleed screw. Leave the key in the On position until a solid stream of fuel flows out around the screw. Tighten the screw and turn the key to the Off position.

Note: Normally, the engine should start after performing the above bleeding procedures. However, if engine does not start, air may be trapped between the injection pump and the injectors; refer to Bleeding Air from the Injectors.

Checking the Warning Indicator Lights

Each day before operating, ensure that all warning lights are working.

Note: An alarm will continue to sound until a problem is corrected or until you press the alarm silence button. If you encounter a second problem, the alarm will not sound but the indicator light will illuminate.

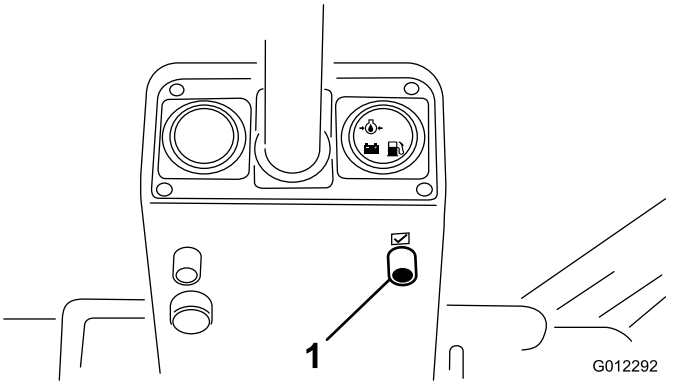


Figure 18

1. Warning indicator light test button

Checking the Safety Interlock System

⚠ CAUTION

If the 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.**

1. In a wide open area free of debris and bystanders, lower the cutting units to the ground. Stop the engine.

2. Sit on the seat and engage the parking brake. Turn the key and try to start the engine with the Mow-Backlap lever in both the Mow and Backlap positions. If the engine cranks, there is a malfunction that must be repaired immediately. If engine does not crank, the cutting unit drive switch is operating properly.
3. Sit on the seat and disengage the parking brake. Turn the key and try to start engine with the Mow-Backlap lever in the Stop position. If the engine cranks, there is a malfunction that must be repaired immediately. If engine does not crank, the brake switch is operating properly.
4. Engage the parking brake, start the engine, and lower the cutting units. Move the Mow-Backlap lever to the Mow position. Raise off the seat; the engine should stop within a few seconds, which indicates the interlock system is operating. Also raise off the seat with the lever in the Backlap position. The engine should stop, indicating interlock system is operating. If engine does not stop, there is a malfunction that must be repaired immediately.

   Note: There is a 1 to 2 second delay between rising off the seat and engine shutting off.
5. Engage the parking brake, move the Mow-Backlap lever to the Neutral position, start the engine, disengage the parking brake, and raise off the seat. If the engine stops, the interlock system is operating. If engine does not stop, there is a malfunction that must be repaired immediately.

Pushing or Towing the Machine

In an emergency, the machine can be pushed or towed for a very short distance, by using the traction pump by–pass valve.

Important: Do not push or tow the machine faster than 2-3 mph (3-4.8 km/h) because the hydraulic system may be damaged. If the traction unit must be moved a considerable distance, transport it on a truck or trailer.

⚠ DANGER

The machine will roll with the front wheel motors disengaged. The machine must be on a level surface or the wheels must be blocked. There is no effective braking with the wheel motors disengaged.

1. Remove the retainer clip from the seat lock rod (Figure 19).

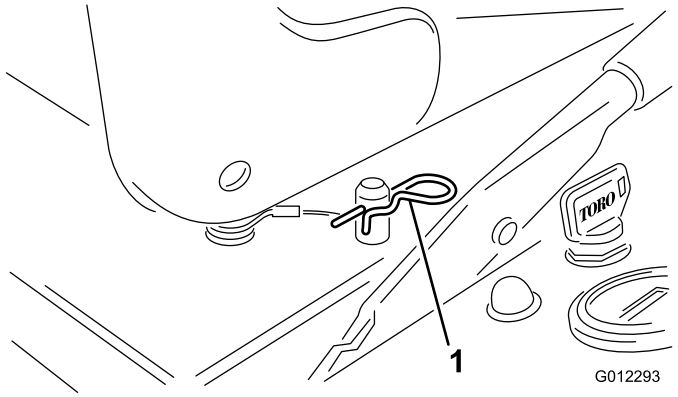


Figure 19

1. Retainer clip

2. Raise the seat and support it in and upright position with the seat support rod (Figure 20).

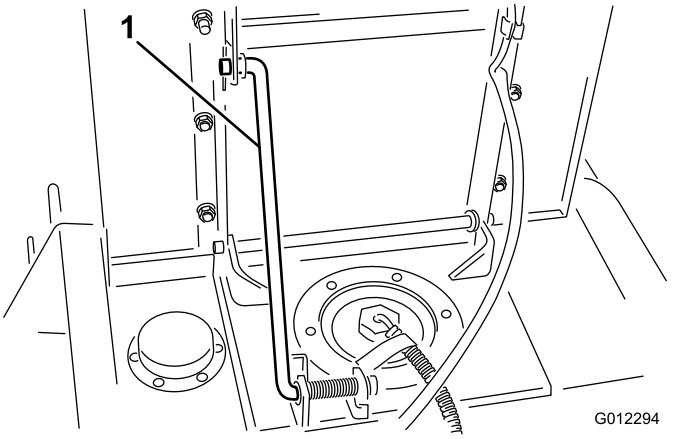


Figure 20

1. Seat support rod

3. Rotate the by-pass valve 90 degrees (Figure 21).

   Opening the valve opens an internal passage in the traction pump, thereby by-passing hydraulic oil. Because oil is by-passed, the traction unit can be moved without damaging the hydraulic system.

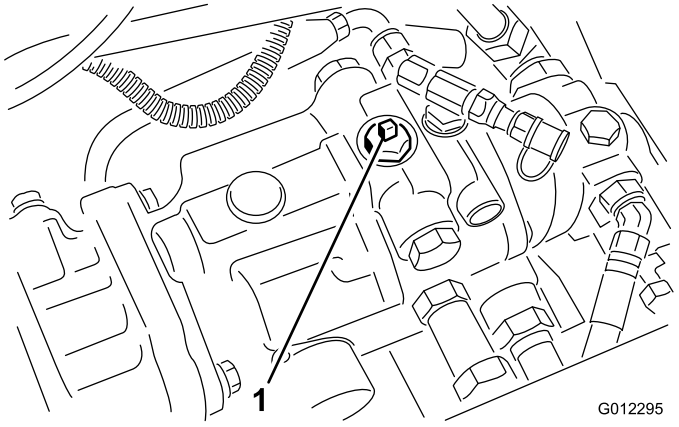


Figure 21

Important: Ensure that the parking brake is engaged before opening the by-pass valve.

4. Before starting the engine, close the by-pass valve. Do not start the engine when the valve is open.

Important: Running the machine with the by-pass valve open will cause the hydraulic system to overheat.

Operating Tips

Familiarization

Before mowing grass practice operating in an open area. Start and stop the engine. Operate in forward and reverse. Lower and raise cutting units simultaneously and individually. Engage and disengage reels. Operate with all cutting units down, then with only an individual cutting unit. When you feel familiar with the machine, practice operating around trees and obstacles. Also drive up and down slopes using both mowing and transport speeds.

⚠ DANGER

When operating the machine, always use the seat belt and ROPS together. Do not use a seat belt without a ROPS.

Warning System

If a warning light comes on during operation, stop the machine immediately and correct the problem before continuing operation. Serious damage could occur if the machine is operated with a malfunction. For short intervals, however, the emergency engine override button can be used to operate the engine if it stops because of overheating.

Mowing Preparation

When you are at the area to be mowed, release the front, center and outside cutting unit transport latches, lower the cutting units, engage the parking brake, and stop the engine.

Cutting Unit Grass Deflectors

Adjust grass deflectors to the horizontal position (Figure 22), so the clippings disperse backward; out and away from the cutting units. This will prevent clumps of clippings, especially wet clippings, dropping off the machine or cutting units, which affects the visual appearance of the turf.

Note: Generally you can adjust the deflectors down slightly in dry grass and up slightly in wet grass.

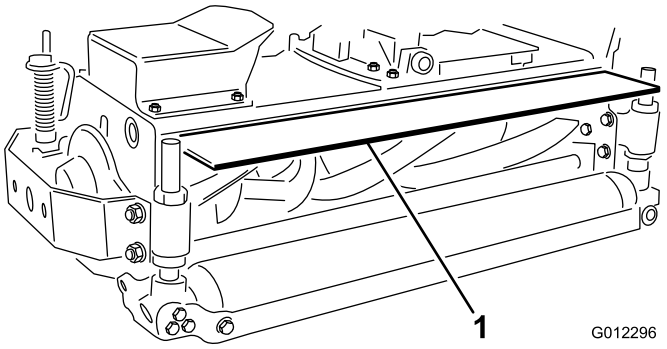


Figure 22

1. Grass deflector

Mowing

Match the ground speed limiter (Figure 23) and reel speed control knob (Figure 24) to desired height-of-cut; refer to Cutting Chart in Matching the Ground Speed and Reel Speed. Use the decal at the side of the steering column as a guide only.

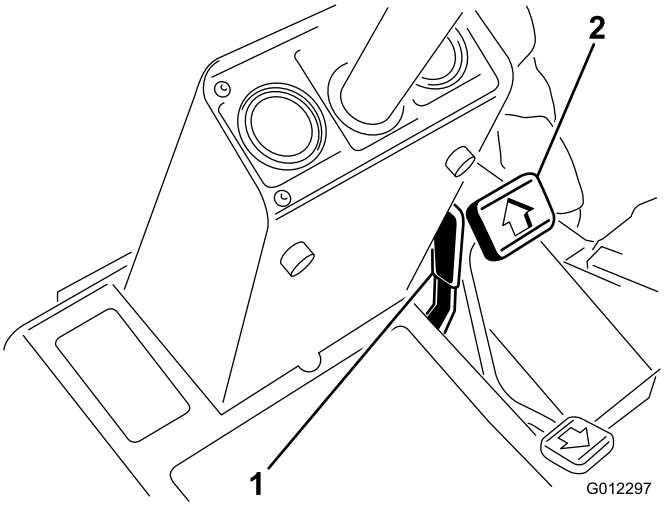


Figure 23

1. Ground speed limiter
2. Traction pedal

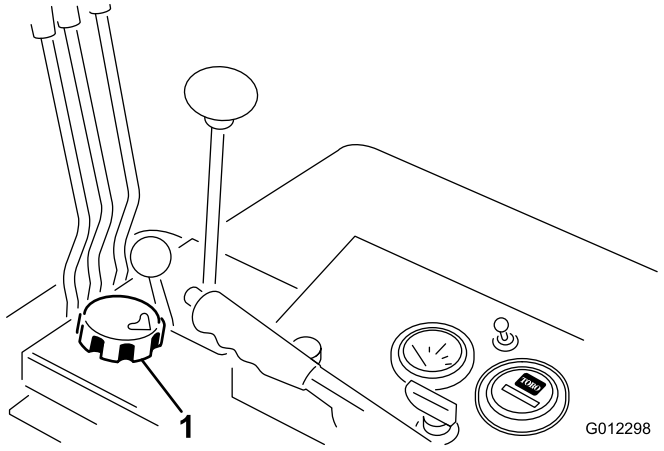


Figure 24

1. Reel speed control

Start the engine and move the throttle to the Fast position. Disengage the parking brake. To move forward, press the traction pedal forward (Figure 23). Move the Mow-Backlap lever to the Mow position. The reels are now spinning. Maintain traction pedal contact with the ground speed limiter (Figure 23) to ensure consistent clip and quality-of-cut.

⚠ CAUTION

This product may exceed noise levels of 85 dB(A) at the operator position. Ear protectors are recommended for prolonged exposure to reduce the potential of permanent hearing damage.

Transport

When mowing is complete, move the Mow-Backlap lever to the Stop position. Raise the cutting units by pulling back on the lift control levers. Hold the levers back until the cutting units are fully raised (a squeal from the hydraulic system means the cutting units are fully raised). Lock the cutting units in place with the transport latches. Be careful when driving between objects so you do not accidentally damage the machine or cutting units.

Matching Ground Speed and Reel Speed

Vary reel speed (while maintaining constant ground speed) to establish the best quality of cut for the area being mowed. Reel speeds either too fast or too slow for conditions may effect the quality of cut. Use the appropriate cutting chart (below) and the decal on steering console as a guide for initial adjustment of ground and reel speeds.

Relate HOC and ground speed to required reel speed setting on a 1 thru 5 scale on reel speed knob.

Note: 1 = 800 RPM; 2 = 900 RPM; 3 = 1000 RPM; 4 = 1100 RPM; and 5 = 1200 RPM. (Speeds are approximate)

Note: In the following tables, N/R means Not Recommended.

Note: Positions 4 and 5 are only attainable with a special coupler (Part Number 58-1530). Contact your Toro Dealer for information.

Recommended Reel Speed Settings: 5 Blade Reel

HOC	Ground Speed In MPH				
	3	4	5	6	7
1	1	3	5	N/R	N/R
1.25	N/R	1	3	5	N/R
1.5	N/R	N/R	2	3	4
2	N/R	N/R	N/R	1	2
2.5	N/R	N/R	N/R	N/R	1

Recommended Reel Speed Settings: 7 Blade Reel

HOC	Ground Speed In MPH				
	3	4	5	6	7
1/2	2	5	N/R	N/R	N/R
5/8	1	3	5	N/R	N/R
3/4	N/R	1	3	5	N/R
1	N/R	N/R	1	2	3
1.25	N/R	N/R	N/R	1	2

Recommended Reel Speed Settings: 11 Blade Reel

Recommended Reel Speed Settings: 11 Blade Reel (cont'd.)

HOC	Ground Speed In MPH				
	3	**4**	**5**	**6**	**7**
3/8	1	3	5	N/R	N/R
1/2	N/R	1	3	4	N/R
5/8	N/R	N/R	1	2	4
3/4	N/R	N/R	N/R	1	2

Maintenance

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

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 10 hours	• Check the fan and alternator belt tension. • Torque the wheel lug nuts.
After the first 50 hours	• Change the engine oil and filter. • Check the planetary gear drive oil level. • Change the hydraulic filter. • Lubricate the reel speed valve with oil. • Check the engine RPM (idle and full throttle).
Before each use or daily	• Check the engine oil level. • Check the level of the coolant in the cooling system. • Check the hydraulic fluid level. • Check the reel to bedknife contact. • Check the warning indicator lights. • Check the safety interlock system. • Drain the fuel filter/water separator. • Remove debris from the screen, oil coolers, and radiator (more frequently in dirty operating conditions). • Check the hydraulic lines and hoses for leaks, kinked lines, loose mounting supports, wear, loose fittings, weather deterioration, and chemical deterioration.
Every 50 hours	• Grease the bearings and bushings. (Grease them immediately after every washing regardless of the interval listed.) • Check the condition of and clean the battery. • Check the battery cable connections.
Every 100 hours	• Inspect the cooling system hoses. • Check the condition and tension of the alternator belt. • Drain water from the hydraulic reservoir.
Every 150 hours	• Change the engine oil and filter.
Every 200 hours	• Service the air cleaner. (More frequently in extremely dirty or dusty conditions) • Torque the wheel lug nuts. • Drain moisture from the fuel and hydraulic fluid tanks. • Check the cutting unit reel drive belts.
Every 400 hours	• Check the fuel lines and connections for deterioration, damage, or loose connections. • Replace the fuel filter canister. • Check the engine RPM (idle and full throttle).
Every 800 hours	• Drain and clean the fuel tank • Check the rear wheel toe-in. • Check the planetary gear drive oil level. • Flush and replace the cooling system fluid. • Change the hydraulic filter. • Change the hydraulic system breather. (More often in extremely dusty or dirty conditions) • Pack the rear wheel bearings • Adjust the engine valves (refer to the engine Operator's Manual)
Every 1,500 hours	• Change the hydraulic fluid.
Before storage	• Drain and clean the fuel tank
Every 2 years	• Replace all moving hoses.

Daily Maintenance Checklist

Duplicate this page for routine use.

Maintenance Check Item	For the week of:						
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check the safety interlock operation.							
Check the brake operation.							
Check the engine oil and fuel level.							
Check cooling system fluid level.							
Drain the water/fuel separator.							
Check the air filter restriction indicator.							
Check the radiator, oil cooler, and screen for debris.							
Clean traction pedal lockout							
Check unusual engine noises.[1]							
Check unusual operating noises.							
Check the hydraulic system oil level.							
Check hydraulic hoses for damage.							
Check for fluid leaks.							
Check the tire pressure.							
Check the instrument operation.							
Check warning lamps operation							
Check the reel-to-bedknife adjustment.							
Check the height-of-cut adjustment.							
Lubricate all grease fittings.[2]							
Touch-up damaged paint.							

1. Check the glow plug and injector nozzles if hard starting, excess smoke, or rough running is noted.

2. Immediately after **every** washing, regardless of the interval listed

⚠ 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 before you do any maintenance.

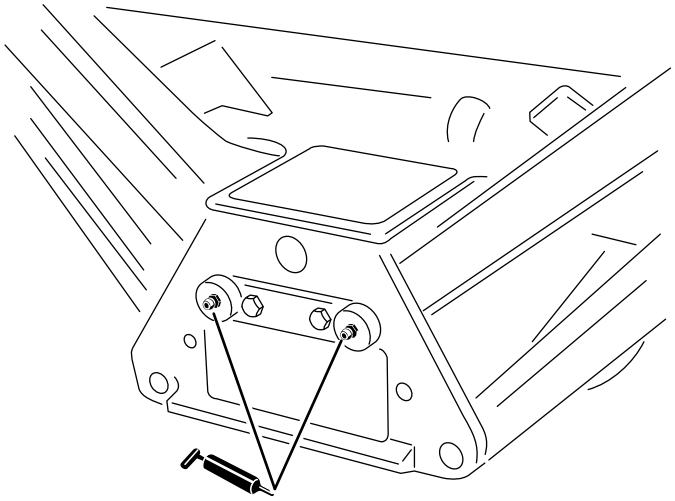
Lubrication

Greasing the Bearings and Bushings

If you operate the machine under normal conditions, lubricate all grease fittings for the bearings and bushings after **every 50 hours of operation** with No. 2 General Purpose Lithium Base Grease. Lubricate bearings and bushings **immediately** after every washing, regardless of the interval listed.

The grease fitting locations and quantities are as follows:

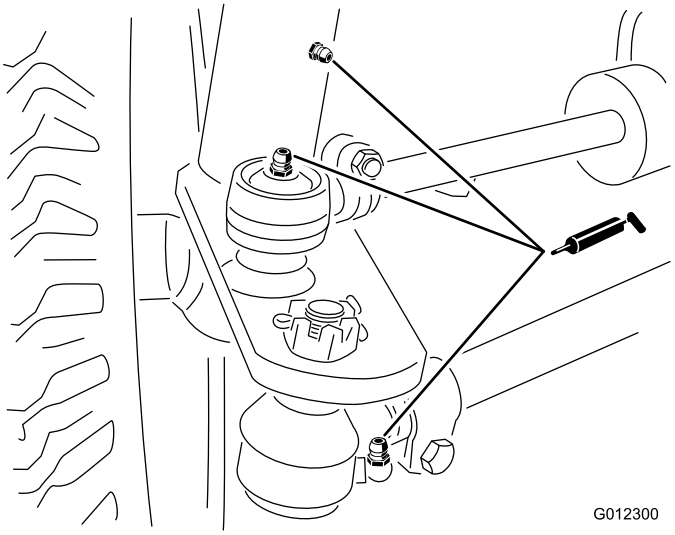
- Lift arms (5) (Figure 25)



G012299

Figure 25

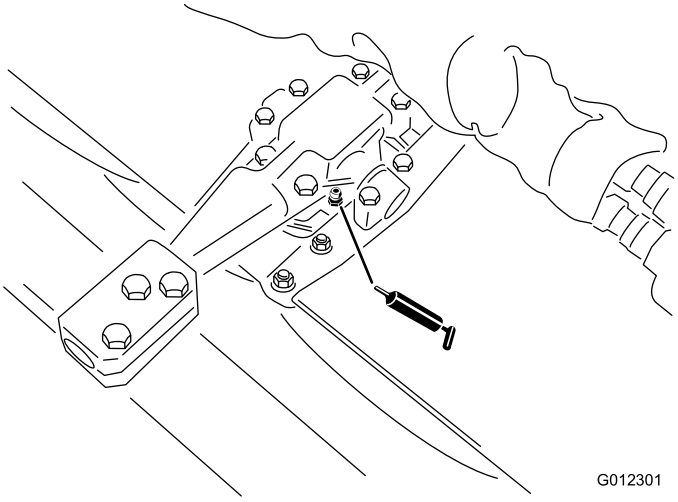
- Rear axle (6) (Figure 26)



G012300

Figure 26

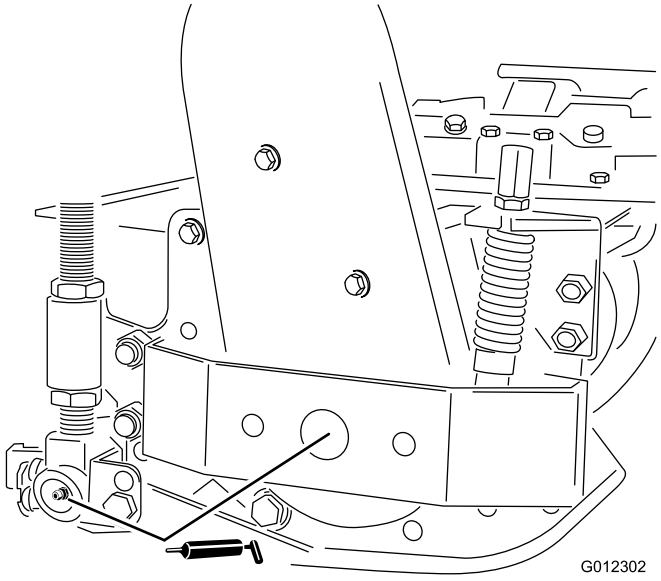
- Floating or fixed head kit pivots (Figure 27)



G012301

Figure 27

- Cutting unit reel and roller bearings (Figure 28)



G012302

Figure 28

- Reel control valve (not shown), located under right hand console.

Engine Maintenance

Servicing the Air Cleaner

Service Interval: Every 200 hours (More frequently in extremely dirty or dusty conditions)

Check the air cleaner body for damage which could cause an air leak. Replace if damaged. Check the whole intake system for leaks, damage or loose hose clamps.

Changing the air filter before it is necessary only increases the chance of dirt entering the engine when the filter is removed.

Important: Be sure the cover is seated correctly and seals with the air cleaner body.

1. Remove the knobs securing the rear screen to the frame (Figure 29). Remove the screen.

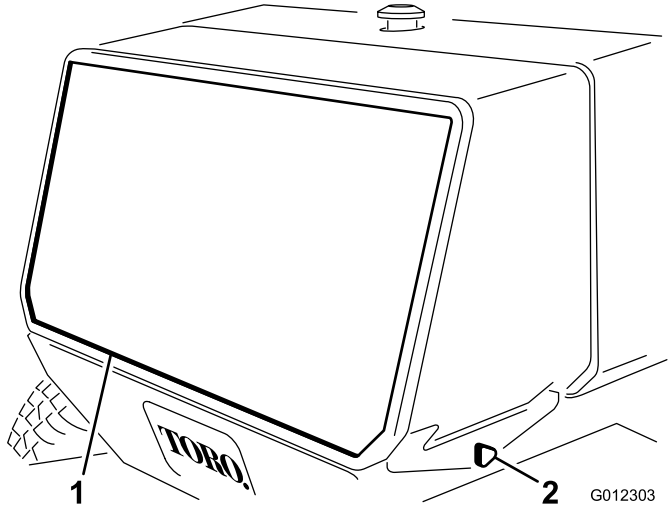


Figure 29

1. Rear screen 2. Knob

2. Release the latches securing the air cleaner cover to the air cleaner body (Figure 30).

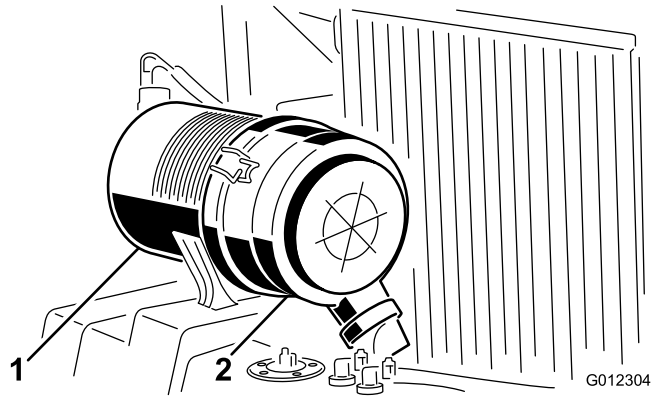


Figure 30

1. Air cleaner body 2. Air cleaner cover

3. Remove the cover from the air cleaner body. Before removing the filter, use low pressure air (40 psi, clean and dry) to help remove large accumulations of debris packed between the outside of the filter and the canister. **Avoid using high pressure air which could force dirt through the filter into the intake tract.**

   This cleaning process prevents debris from migrating into the intake when the primary filter is removed.

4. Remove and replace the primary filter.

   Cleaning of the used element is not recommended due to the possibility of damage to the filter media. Inspect the new filter for shipping damage, checking the sealing end of the filter and the body. **Do not use a damaged element.** Insert the new filter by applying pressure to the outer rim of the element to seat it in the canister. **Do not apply pressure to the flexible center of the filter.**

5. Clean the dirt ejection port located in the removable cover. Remove the rubber outlet valve from the cover, clean the cavity and replace the outlet valve.

6. Install the cover orienting the rubber outlet valve in a downward position—between approximately 5:00 to 7:00 when viewed from the end.

7. Secure the latches And replace and secure the rear screen.

Changing the Engine Oil and Filter

Service Interval: After the first 50 hours

Every 150 hours

1. Remove the drain plug (Figure 31) and let the oil flow into a drain pan.

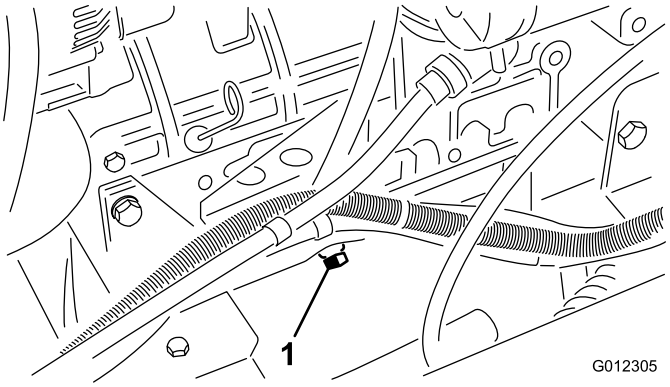


Figure 31

1. Oil drain plug

2. When the oil stops, install the drain plug.

3. Remove the oil filter (Figure 32).

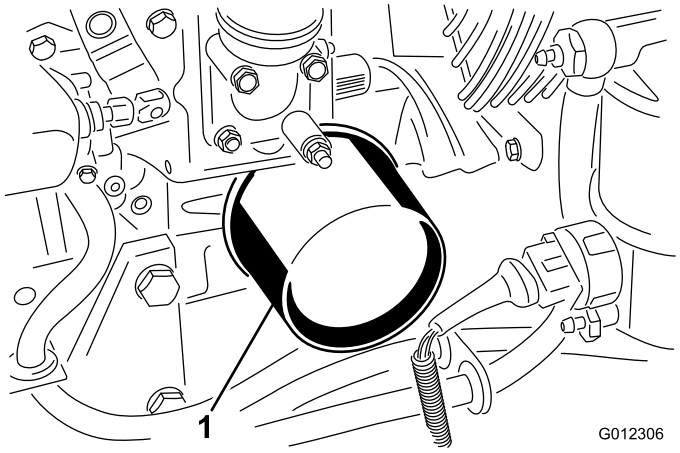


Figure 32

1. Oil filter

4. Apply a light coat of clean oil to the new filter seal.
5. 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.

   Important: Do not over-tighten the filter.
6. Add oil to the crankcase; refer to Checking the Engine Oil in Operation (page 17).

Fuel System Maintenance

⚠ DANGER

Under certain conditions, diesel fuel and fuel vapors are highly flammable and explosive. A fire or explosion from fuel can burn you and others and can cause property damage.

- **Use a funnel and fill the fuel tank outdoors, in an open area, when the engine is off and is cold. Wipe up any fuel that spills.**
- **Do not fill the fuel tank completely full. Add fuel 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 the fuel to expand.**
- **Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.**
- **Store fuel in a clean, safety-approved container and keep the cap in place.**

Draining the Fuel Tank

Service Interval: Every 800 hours

Before storage

Drain and clean the fuel tank if the fuel system becomes contaminated or if the machine is to be stored for an extended period. Use clean fuel to flush out the tank.

Checking the Fuel Lines and Connections

Service Interval: Every 400 hours/Yearly (whichever comes first)

Inspect the fuel lines for deterioration, damage, or loose connections.

Draining the Fuel Filter/Water Separator

Service Interval: Before each use or daily

1. Place a clean container under the fuel filter (Figure 33).
2. Loosen the drain plug on the bottom of the filter canister and allow it to drain.

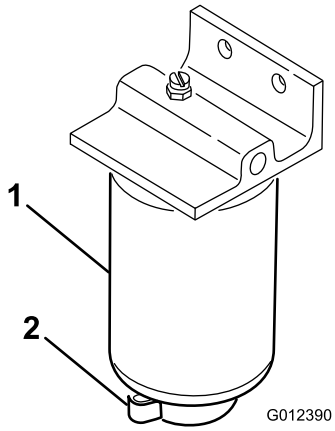


Figure 33

1. Water separator filter canister

3. Tighten the drain plug.

Replacing the Fuel Filter Canister

Service Interval: Every 400 hours

1. Clean the area where the filter canister mounts (Figure 33).
2. Remove the filter canister and clean the mounting surface.
3. Lubricate the gasket on the filter canister with clean oil.
4. Install the new filter canister by hand until the gasket contacts mounting surface, then rotate it an additional 1/2 turn.

Bleeding Air from the Fuel Injectors

Note: This procedure should be used only if the fuel system has been purged of air through normal priming procedures and the engine will not start; refer to Bleeding the Fuel System in Operation (page 17).

1. Loosen the pipe connection to the No. 1 nozzle and holder assembly (Figure 34).

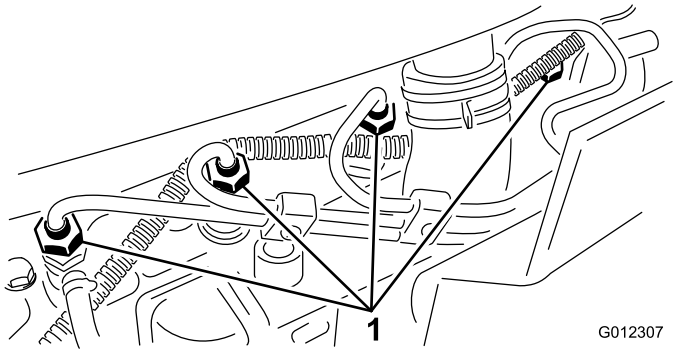


Figure 34

1. Fuel injectors

2. Move throttle to the Fast position.
3. Turn the key in the key switch to the Start position and watch the fuel flow around the connector. The engine will crank. When you observe a solid flow of fuel, turn the key to the Off position.
4. Tighten the pipe connector securely.
5. Repeat steps 1 through 4 on the remaining nozzles.

Electrical System Maintenance

Important: **Before welding on the machine, disconnect both cables from the battery, both wire harness plugs from the electronic control module, and the terminal connector from the alternator to prevent damage to the electrical system.**

Servicing the Battery

WARNING

CALIFORNIA
Proposition 65 Warning

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

⚠ 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 rubber gloves to protect your hands.**
- **Fill the battery where clean water is always available for flushing the skin.**

⚠ WARNING

Charging the battery produces gasses that can explode.

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

⚠ 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 machine.**
- **Do not allow metal tools to short between the battery terminals and metal parts of the machine.**

⚠ 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 *connect* the positive (red) battery cable before connecting the negative (black) cable.**

Check the battery condition weekly or after every 50 hours of operation. Keep the terminals and the entire battery case clean because a dirty battery will discharge slowly. To clean the battery, wash the entire case with a solution of baking soda and water. Rinse it with clear water. Coat the battery posts and cable connectors with Grafo 112X (skin-over) grease (Toro Part No. 505-47) or petroleum jelly to prevent corrosion.

Drive System Maintenance

Checking/Adjusting the Rear Wheel Toe-in

Service Interval: Every 800 hours

1. Measure the center-to-center distance (at axle height) at front and rear of the steering tires (Figure 35). The front measurement must be 1/8 inch (3 mm) less than the rear measurement.

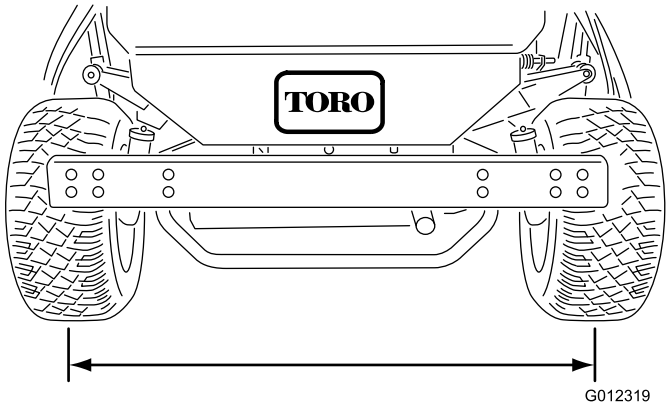


Figure 35

2. Loosen the clamps at both ends of the tie rods (Figure 36).

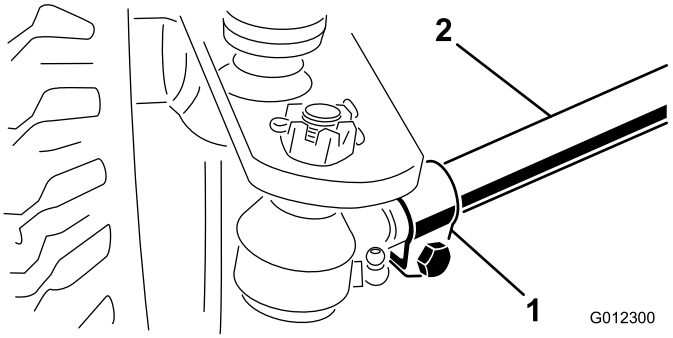


Figure 36

1. Clamp
2. Tie rod

3. Rotate each tie rod to move the front of the tire inward or outward.
4. Tighten the tie rod clamps when the adjustment is correct.

   Note: Ensure that the tie rod clamps are positioned so they do not interfere with the steering linkage.

Checking the Planetary Gear Drive Oil Level

Service Interval: After the first 50 hours

Every 800 hours

The oil capacity is approximately 30 oz (885 ml) of high quality SAE 80–90 weight Gear Lube (ISO 150/220).

1. Park the machine on a level surface with the check/drain plug hole (Figure 37) at the 3 o'clock or 9 o'clock position.

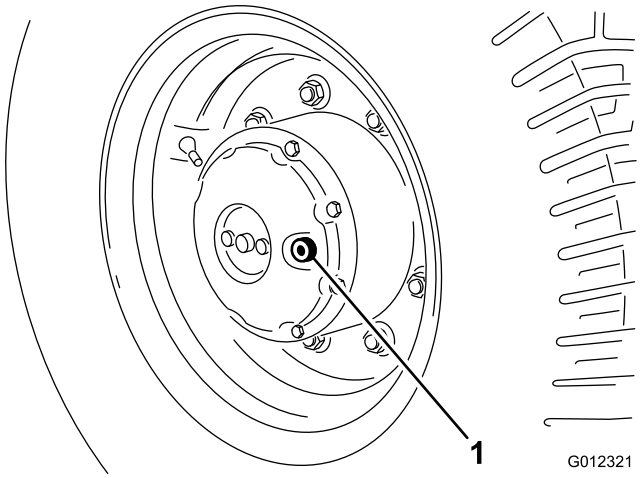


Figure 37

1. Check/drain plug

2. Remove the check/drain plug. The oil level should be at the bottom of the hole; if not, add oil.
3. Replace the check/drain plug.

Cooling System Maintenance

Capacity of the cooling system is 3.7 US gallons (14 L). Always protect the cooling system with a 50/50 solution of water and ethylene glycol anti-freeze. **Do not use water only in the cooling system.**

- After every 100 operating hours, tighten hose connections. Replace any deteriorated hoses.
- After every 800 operating hours, drain and flush the cooling system. Add anti-freeze (refer to Checking the Cooling System).

Removing Debris from the Cooling System

Service Interval: Before each use or daily—Remove debris from the screen, oil coolers, and radiator (more frequently in dirty operating conditions).

1. Turn the engine off and remove the key from the ignition switch.
2. Release the front engine cover latches and raise the engine cover.
3. Thoroughly clean all debris out of the engine area.
4. Remove the knobs securing the rear screen to the frame and remove the screen (Figure 38).

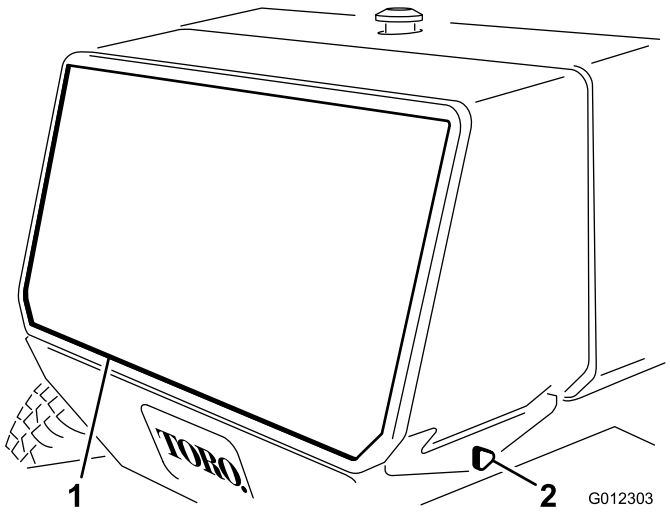


Figure 38

1. Rear screen
2. Knob

5. Lift up on the oil cooler handles and pivot it rearward in the mounting slot. Clean both sides of the oil cooler, radiator and rear engine area thoroughly with compressed air (Figure 39).

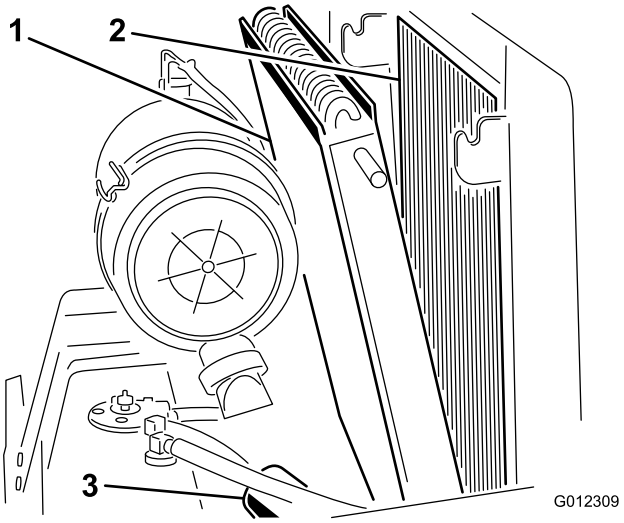


Figure 39

1. Oil cooler
2. Radiator
3. Inline fuel filter

6. Pivot oil cooler back into position and install rear screen.
7. Lower the engine cover and secure the latches.

Brake Maintenance

Adjusting the Parking Brake and Traction Switches

In time, the parking brake cable may stretch, causing the engine not to start. If this happens, adjust the cable (Figure 40).

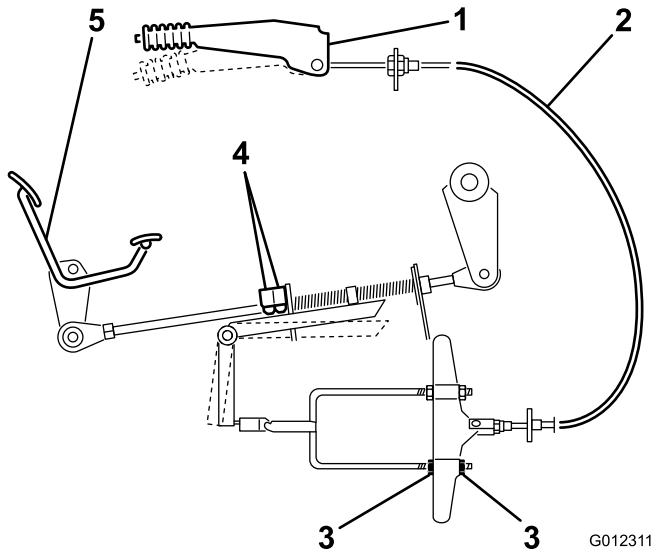


Figure 40

1. Parking brake
2. Brake cable
3. U-bracket nuts
4. Traction switches
5. Traction pedal

1. Pull the brake lever to the 3rd click.
2. Pull the brake lever up one additional click.
3. Adjust the four U-bracket nuts equally so the spring has tension.

   Note: This adjustment affects operation of traction switches.
4. Adjust the four U-bracket nuts so engine will start and run when hand brake is at the fourth click, but will not start or run when hand brake is at the second click.

Belt Maintenance

Check the condition and tension of the alternator belt after the first day of operation and every 100 operating hours thereafter.

Checking the Condition and Tension of the Alternator Belt

Service Interval: Every 100 hours

- Proper tension will allow a 3/8 inch (10 mm) deflection when a force of 10 lb (4.5 kg) is applied on the belt midway between the pulleys.
- If the deflection is not 3/8 inch (10 mm), loosen the alternator mounting bolts (Figure 41). Increase or decrease the alternator belt tension and tighten the bolts. Check deflection of belt again to ensure that the tension is correct.

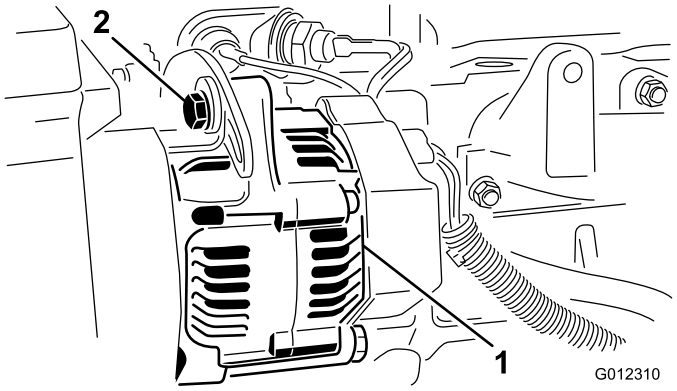


Figure 41

1. Alternator
2. Mounting bolt

Hydraulic System Maintenance

Draining Water from the Hydraulic Reservoir

Service Interval: Every 100 hours

Before draining, allow machine to set about 8 hours to allow water to settle to bottom of reservoir.

1. Open the drain plug (Figure 42) one-half turn and allow the fluid to flow into drain pan until you do not notice water in the hydraulic fluid.

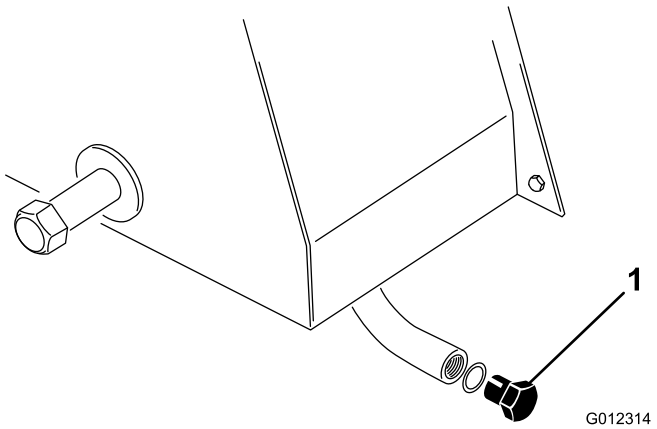


Figure 42

1. Drain plug

2. Tighten the drain plug and add hydraulic fluid; refer to Checking and Adding Hydraulic Fluid.

Changing the Hydraulic Fluid

Service Interval: Every 1,500 hours/Every 2 years (whichever comes first)

If fluid becomes contaminated, contact your local Toro distributor because the system must be flushed. Contaminated fluid looks milky or black when compared to clean oil.

1. Remove the drain plug (Figure 42) from the reservoir and let the hydraulic oil flow into a drain pan. Tighten the plug when the hydraulic oil stops draining.
2. Fill the reservoir with hydraulic fluid; refer to Checking/Adding the Hydraulic Fluid.

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

3. Install the reservoir cover, lower the seat, and secure it with the lock pin.
4. Start the engine, run it slowly, and use all of the hydraulic controls to distribute hydraulic fluid throughout the system. Also check for leaks, then stop the engine.
5. With cutting units up and oil warm, look into the sight glass (Figure 43). If the hydraulic fluid is not even with the arrows, add enough fluid to raise it to the proper level. **Do not fill full if the fluid is cold.**

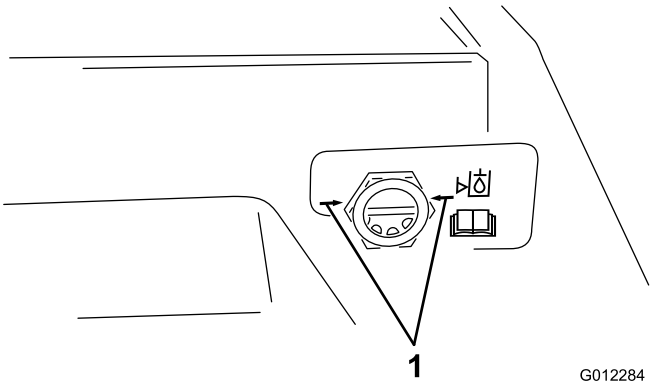


Figure 43

1. Sight glass arrows

Changing the Hydraulic Filter

Service Interval: After the first 50 hours

Every 800 hours/Yearly (whichever comes first)

Use Toro replacement filter Part No. 86-6110.

Important: Use of any other filters may void the warranty on some components.

Note: Under certain conditions, a bypass valve in the filter mounting plate allows oil to bypass the filter. Before the filter starts to bypass, a warning light on the steering console will illuminate. The warning light may come on momentarily when the oil is cold. If the light does not go out after the oil is warm, the filter is clogged or an electrical problem exists. Correct the problem before commencing operation.

1. Remove the seat lock pin, raise the seat, and hold it open with the support rod. Also, remove the panel (secured with magnets) ahead of the seat.
2. Clean around the filter mounting area (Figure 44). Place a drain pan under the filter and remove the filter.

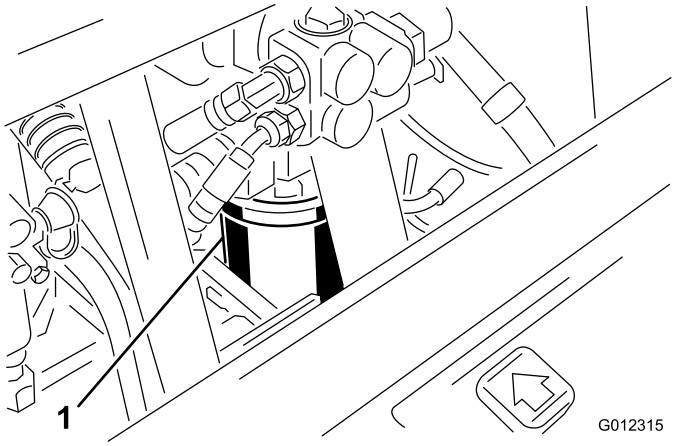


Figure 44

3. Lubricate the new filter gasket and fill the new filter with hydraulic oil.
4. Ensure that the filter mounting area is clean. Screw the filter on until the gasket contacts the mounting plate, then tighten the filter one-half turn.
5. Start the engine and let it run slowly for about two minutes to purge air from the system. Stop the engine and check for leaks.
6. Look into sight glass (Figure 43). The hydraulic oil level should be even with arrows when oil is warm. If level is low, add hydraulic oil to the reservoir.

Replacing the Hydraulic System Breather

Service Interval: Every 800 hours/Yearly (whichever comes first) (More often in extremely dusty or dirty conditions)

1. Release the latches and open the engine cover.
2. Clean around the breather and unscrew it with a wrench (Figure 45).

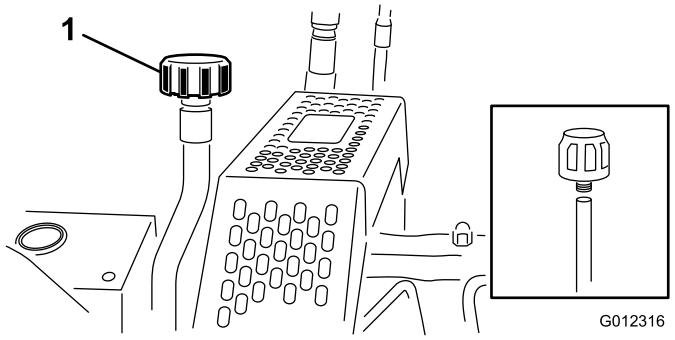


Figure 45

1. Breather

3. Install a new breather.
4. Close the engine cover and latch it securely.

Checking the Hydraulic Lines and Hoses

Daily, check hydraulic lines and hoses for leaks, kinked lines, loose mounting supports, wear, loose fittings, weather deterioration, and chemical deterioration. Make all necessary repairs before operating.

⚠ WARNING

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

- **Make sure all hydraulic fluid hoses and lines are in good condition and all hydraulic connections and fittings are tight before applying pressure to the hydraulic system.**
- **Keep your 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.**
- **Get immediate medical help if fluid is injected into skin.**

Hydraulic System Test Ports

The test ports (Figure 46 and Figure 47) are used to test the hydraulic circuits. Check all pressures when engine is at full speed and hydraulic oil is at normal operating temperature. Contact your local Toro distributor for assistance.

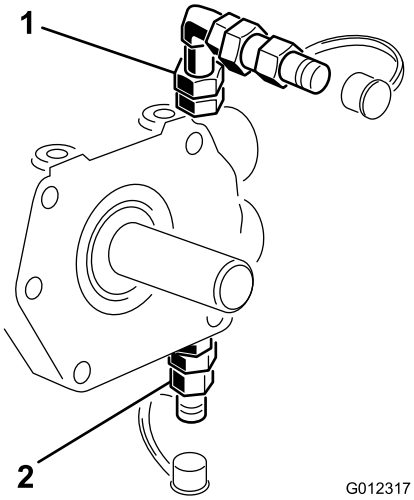


Figure 46

1. Traction forward
2. Traction reverse

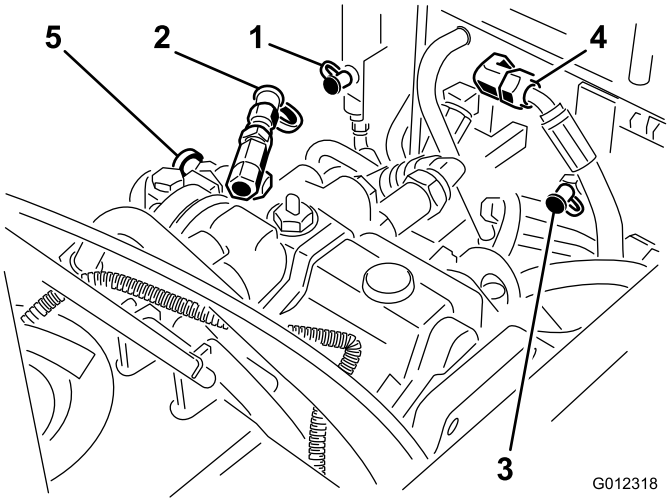


Figure 47

1. Lift relief circuit
2. Charge pressure circuit
3. Cutting unit counterbalance
4. Cutting unit circuit
5. Steering circuit

- Traction Forward and Reverse (Figure 46) (behind the wheel motors) has a normal relief setting of approximately 5300 psi and 50 to 150 psi charge pressure. Use a gauge with 7500 to 10,000 psi full scale rating.
- Cutting unit Counterbalance has adjustable pressure:

Normal Setting	Hot Oil: 500–550 psi
	Cold Oil: 600–650 psi
Maximum Hill Climbing Setting	Hot Oil: 550+ psi
	Cold Oil: 650+ psi
Maximum Quality of Cut Setting	Hot Oil: 500 psi
	Cold Oil: 600 psi
Lift circuit relief pressure is approximately 2650 psi when counterbalance setting is 550 psi.	

Note: Changes in counterbalance setting will effect the lift circuit relief pressure.

- Cutting Unit Circuit has a normal relief setting of approximately 2700–3000 psi.
- Steering Circuit has a normal relief setting of approximately 1500 psi.
- Lift/relief Circuit has a normal relief setting of approximately 2650–2750 psi.
- Charge Pressure Circuit has a normal relief setting of approximately 100–150 psi.

Storage

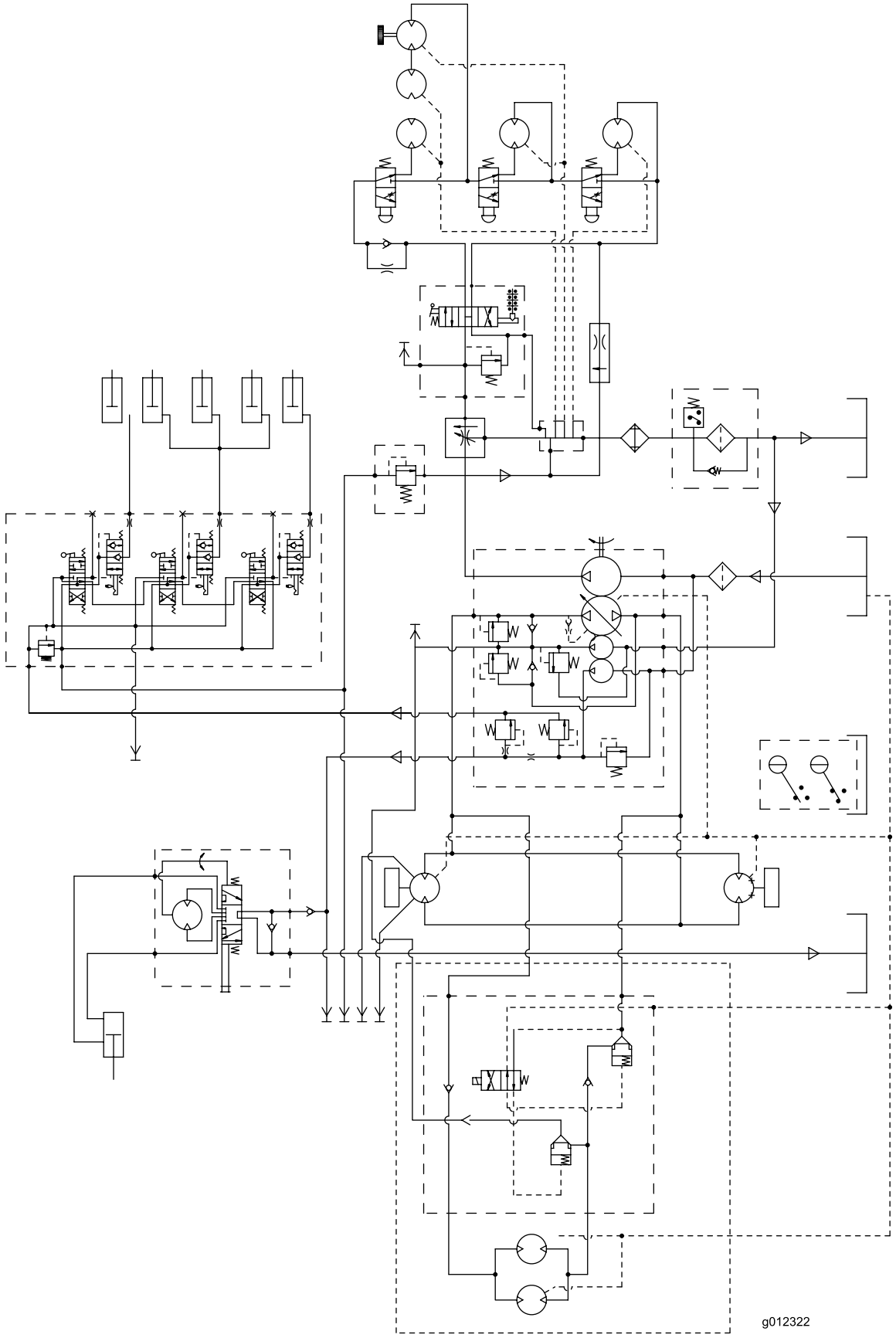
Preparing the Traction Unit

1. Thoroughly clean the traction unit, cutting units, and engine.
2. Check the tire pressure.
3. Check all fasteners for looseness and tighten them as necessary.
4. Grease all grease fittings and pivot points. Wipe up any excess lubricant.
5. Lightly sand and use touch-up paint on painted areas that are scratched, chipped, or rusted. Repair any dents in the metal body.
6. Service the battery and cables as follows:
   A. Remove the battery terminals from the battery posts.
   B. Clean the battery, terminals, and posts with a wire brush and baking soda solution.
   C. Coat the cable terminals and battery posts with Grafo 112X skin-over grease (Toro Part No. 505-47) or petroleum jelly to prevent corrosion.
   D. Slowly recharge the battery every 60 days for 24 hours to prevent lead sulfation of the battery.

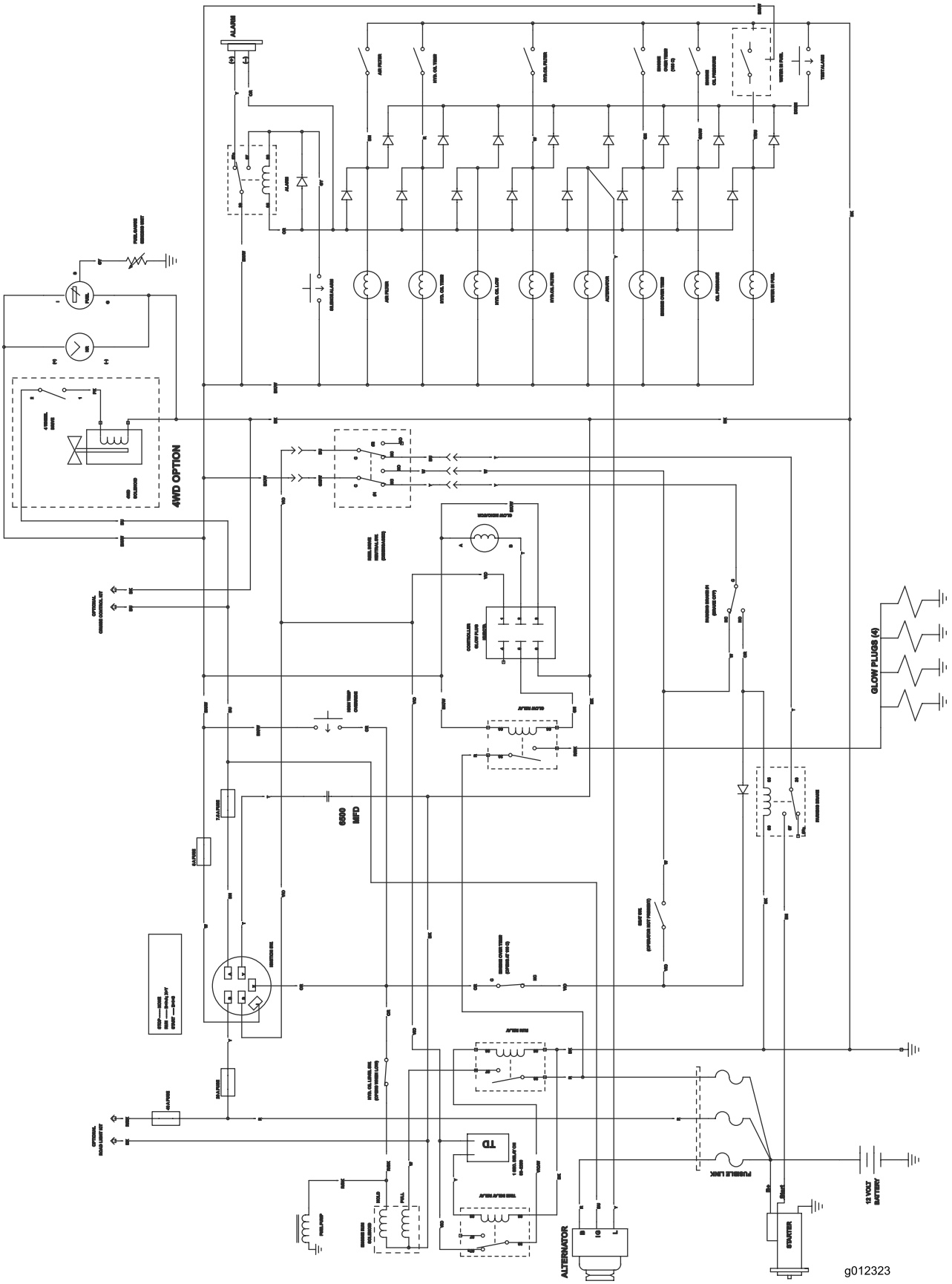
Preparing the Engine

1. Drain the engine oil from the oil pan and replace the drain plug.
2. Remove and discard the oil filter. Install a new oil filter.
3. Refill the oil pan with designated quantity of motor oil.
4. Start the engine and run it at idle speed for approximately two minutes.
5. Stop the engine.
6. Thoroughly drain all fuel from the fuel tank, lines, and the fuel filter/water separator assembly.
7. Flush the fuel tank with fresh, clean diesel fuel.
8. Secure all fuel system fittings.
9. Thoroughly clean and service the air cleaner assembly.
10. Seal the air cleaner inlet and the exhaust outlet with weatherproof tape.
11. Check the antifreeze protection and add as needed for expected minimum temperature in your area.

Schematics



Hydraulic Schematic (Rev. A)



Electrical Schematic (Rev. -)

Notes:

Notes:

Notes:

The Toro Total Coverage Guarantee

A Limited Warranty

Conditions and Products Covered

The Toro® Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrant your Toro Commercial product ("Product") to be free from defects in materials or workmanship for two years or 1500 operational hours*, whichever occurs first. This warranty is applicable to all products with the exception of Aerators (refer to separate warranty statements for these products). Where a warrantable condition exists, we will repair the Product at no cost to you including diagnostics, labor, parts, and transportation. This warranty begins on the date the Product is delivered to the original retail purchaser.
* Product equipped with an hour meter.

Instructions for Obtaining Warranty Service

You are responsible for notifying the Commercial Products Distributor or Authorized Commercial Products Dealer from whom you purchased the Product as soon as you believe a warrantable condition exists. If you need help locating a Commercial Products Distributor or Authorized Dealer, or if you have questions regarding your warranty rights or responsibilities, you may contact us at:

Commercial Products Service Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196
E-mail: commercial.warranty@toro.com

Owner Responsibilities

As the Product owner, you are responsible for required maintenance and adjustments stated in your Operator's Manual. Failure to perform required maintenance and adjustments can be grounds for disallowing a warranty claim.

Items and Conditions Not Covered

Not all product failures or malfunctions that occur during the warranty period are defects in materials or workmanship. This warranty does not cover the following:

- Product failures which result from the use of non-Toro replacement parts, or from installation and use of add-on, or modified non-Toro branded accessories and products. A separate warranty may be provided by the manufacturer of these items.
- Product failures which result from failure to perform recommended maintenance and/or adjustments. Failure to properly maintain your Toro product per the Recommended Maintenance listed in the *Operator's Manual* can result in claims for warranty being denied.
- Product failures which result from operating the Product in an abusive, negligent or reckless manner.
- Parts subject to consumption through use unless found to be defective. Examples of parts which are consumed, or used up, during normal Product operation include, but are not limited to, brakes pads and linings, clutch linings, blades, reels, bed knives, tines, spark plugs, castor wheels, tires, filters, belts, and certain sprayer components such as diaphragms, nozzles, and check valves, etc.
- Failures caused by outside influence. Items considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved coolants, lubricants, additives, fertilizers, water, or chemicals, etc.
- Normal noise, vibration, wear and tear, and deterioration.
- Normal "wear and tear" includes, but is not limited to, damage to seats due to wear or abrasion, worn painted surfaces, scratched decals or windows, etc.

Parts

Parts scheduled for replacement as required maintenance are warranted for the period of time up to the scheduled replacement time for that part. Parts replaced under this warranty are covered for the duration of the original product warranty and become the property of Toro. Toro will make the final decision whether to repair any existing part or assembly or replace it. Toro may use remanufactured parts for warranty repairs.

Note Regarding Deep Cycle Battery Warranty:

Deep cycle batteries have a specified total number of kilowatt-hours they can deliver during their lifetime. Operating, recharging, and maintenance techniques can extend or reduce total battery life. As the batteries in this product are consumed, the amount of useful work between charging intervals will slowly decrease until the battery is completely worn out. Replacement of worn out batteries, due to normal consumption, is the responsibility of the product owner. Battery replacement may be required during the normal product warranty period at owner's expense.

Maintenance is at Owner's Expense

Engine tune-up, lubrication cleaning and polishing, replacement of Items and Conditions Not Covered filters, coolant, and completing Recommended Maintenance are some of the normal services Toro products require that are at the owner's expense.

General Conditions

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

Neither The Toro Company nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of the Toro Products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty. Except for the Emissions warranty referenced below, if applicable, there is no other express warranty.

All implied warranties of merchantability and fitness for use are limited to the duration of this express warranty. Some states do not allow exclusions of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you.

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

Note regarding engine warranty:

The Emissions Control System on your Product may be covered by a separate warranty meeting requirements established by the U.S. Environmental Protection Agency (EPA) and/or the California Air Resources Board (CARB). The hour limitations set forth above do not apply to the Emissions Control System Warranty. Refer to the Engine Emission Control Warranty Statement printed in your *Operator's Manual* or contained in the engine manufacturer's documentation for details

Countries Other than the United States or Canada

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