Form No. 3398-993 Rev C

TORO®

Count on it.

Operator's Manual

Reelmaster® 7000-D 4-Wheel Drive Traction Unit

Model No. 03780—Serial No. 316000001 and Up

Register at www.Toro.com.
Original Instructions (EN)

CE UK CA

3398-993

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

It is a violation of California Public Resource Code Section 4442 or 4443 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land unless the engine is equipped with a spark arrester, as defined in Section 4442, maintained in effective working order or the engine is constructed, equipped, and maintained for the prevention of fire.

The enclosed engine owner's manual is supplied for information regarding the US Environmental Protection Agency (EPA) and the California Emission Control Regulation of emission systems, maintenance, and warranty. Replacements may be ordered through the engine manufacturer.

⚠ 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.

Use of this product may cause exposure to chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

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 safety and operation training materials, 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 identifies the location of the model and serial numbers on the right front frame member of the product. Write the numbers in the space provided.

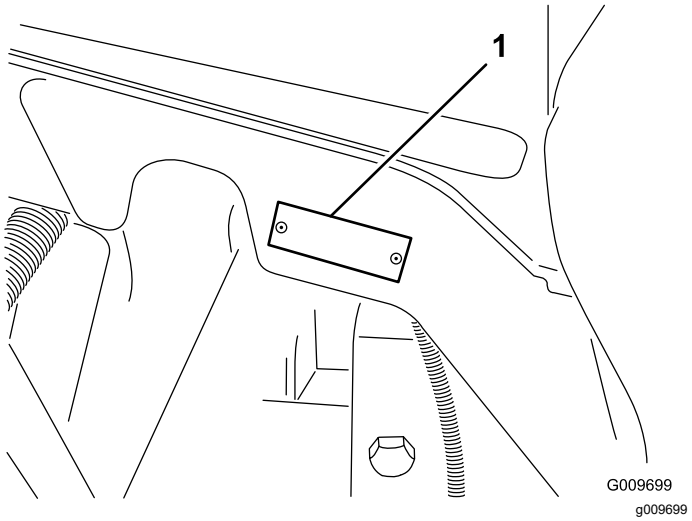


Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

This manual identifies potential hazards and has safety messages identified by the safety-alert symbol (Figure 2), 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 words to highlight information. **Important** calls attention to special mechanical information and **Note** emphasizes general information worthy of special attention.

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Safety

This machine meets or exceeds EN ISO 5395:2013 (when appropriate decals applied), and ANSI B71.4-2012.

Improperly using or maintaining the machine 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 EN ISO 5395:2013 and ANSI B71.4-2012.

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 people or damage to property.

Preparation

- While mowing, always wear appropriate clothing, including eye protection, substantial, slip-resistant footwear, long trousers, and ear protection.
- Tie back long hair. Do not wear jewelry.
- Thoroughly inspect the area where the equipment is to be used and remove all objects which may be thrown by the machine.
- 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.

Safe Handling of Fuels

- To avoid personal injury or property damage, use extreme care in handling fuel. Fuel is extremely flammable and the vapors are explosive.
- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only an approved fuel container.
- Never remove fuel cap or add fuel with the engine running.
- Allow engine to cool before refueling.
- Never refuel the machine indoors.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light such as on a water heater or on other appliances.
- Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.
- Remove equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment with a portable container, rather than from a fuel dispenser nozzle.
- Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock open device.
- If fuel is spilled on clothing, change clothing immediately.
- Never overfill fuel tank. Replace fuel cap and tighten securely.

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;
  - 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.
  - Use counterweight(s) or wheel weights when suggested in the operator's manual.
- Stay alert for holes in the terrain and other hidden hazards.
- 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 machine when ill, tired, or under the influence of alcohol or drugs.
- 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.
- Use care when loading or unloading the machine into a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

Maintenance and Storage

- Keep all fasteners tight to be sure that 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 risk of fire, keep the engine, silencer/muffler, battery compartment and fuel storage area free of grass, leaves, or excessive grease. Clean up oil or fuel spillage.
- 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.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect battery before making any repairs. Disconnect the negative terminal first and the

positive last. Reconnect 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.

Hauling

- Use care when loading or unloading the machine into a trailer or truck.
- Use full width ramps for loading machine into trailer or truck.
- Tie the machine down securely using straps, chains, cable, or ropes. Both front and rear straps should be directed down and outward from the machine

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.

⚠ 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.

- Know how to stop the engine quickly.
- 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, embankments, 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.
- When operating a machine with ROPS (roll-over protection system) never remove the ROPS and always use the seat belt.
- 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.
- On any hill, there is the possibility of tipping or rolling over, but the risk increases as the slope angle increases. Steep hills should be avoided.

  Cutting units must be lowered when going down slopes to maintain steering control
- Engage traction drive slowly, always keep foot on traction pedal, especially when traveling downhill.

  Use reverse on traction pedal for braking.
- If the machine stalls when climbing 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.
- To ensure safety and accuracy, have an Authorized Toro Distributor check the maximum engine speed with a tachometer.
- 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 100 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 83 dBA, which includes an Uncertainty Value (K) of 1 dBA.

Sound pressure level was determined according to the procedures outlined in EN ISO 5395:2013.

Vibration Level

Hand-Arm

Measured vibration level for right hand =0.3 m/s^2

Measured vibration level for left hand =0.3 m/s^2

Uncertainty Value (K) = 0.16 m/s^2

Measured values were determined according to the procedures outlined in EN ISO 5395:2013.

Whole Body

Measured vibration level = 0.2 m/s^2

Uncertainty Value (K) = 0.1 m/s^2

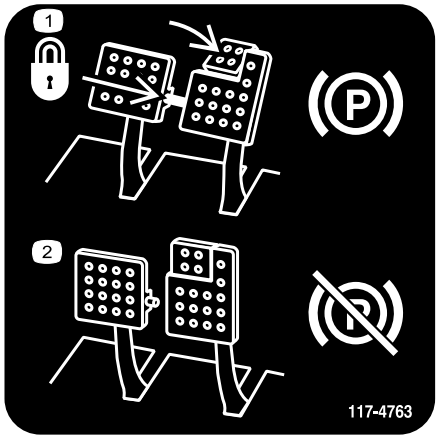
Measured values were determined according to the procedures outlined in EN ISO 5395:2013.

Engine-Emission Certification

The engine in this machine is EPA Tier 4 Final and EU Stage 3b compliant.

Safety and Instructional Decals

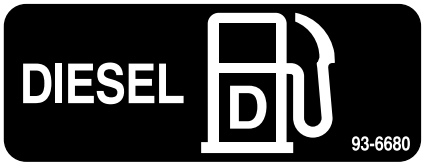
Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or lost.



decal117-4763

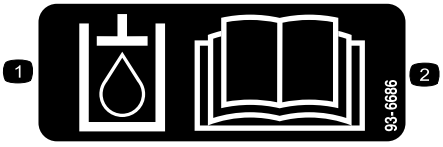
117-4763

1. To engage the parking brake, secure the brake pedals with the locking pin, press the parking brake pedals and engage the toe pedal.
2. To disengage the parking brake, disengage the locking pin and release the pedals.



decal93-6680

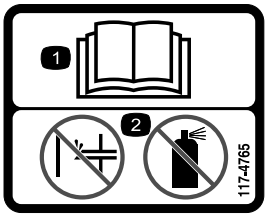
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decal93-6686

93-6686

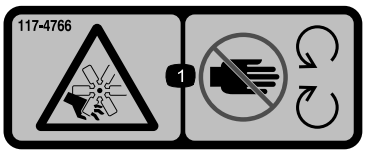
1. Hydraulic oil
2. Read the *Operator's Manual.*



decal117-4765

117-4765

1. Read the *Operator's Manual.*
2. Do not use starting aids.



decal117-4766

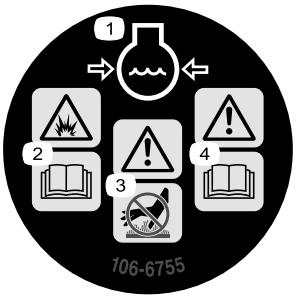
117-4766

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



decal117-2718

117–2718



decal106-6755

106-6755

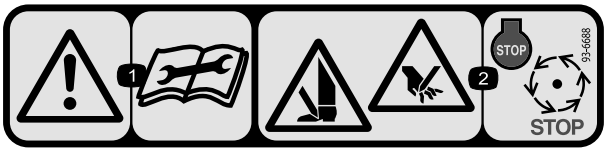
1. Engine coolant under pressure.
2. Explosion hazard—read the *Operator's Manual.*
3. Warning—do not touch the hot surface.
4. Warning—read the *Operator's Manual.*



decal98-4387

98-4387

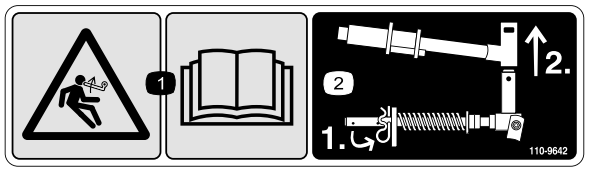
1. Warning—wear hearing protection.



decal93-6688

93-6688

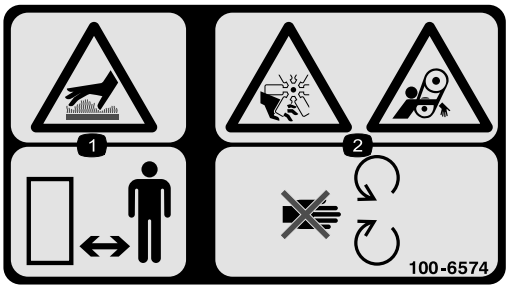
1. Warning—read the instructions before servicing or performing maintenance.
2. Cutting hazard of hand or foot—stop the engine and wait for moving parts to stop.



decal110-9642

110-9642

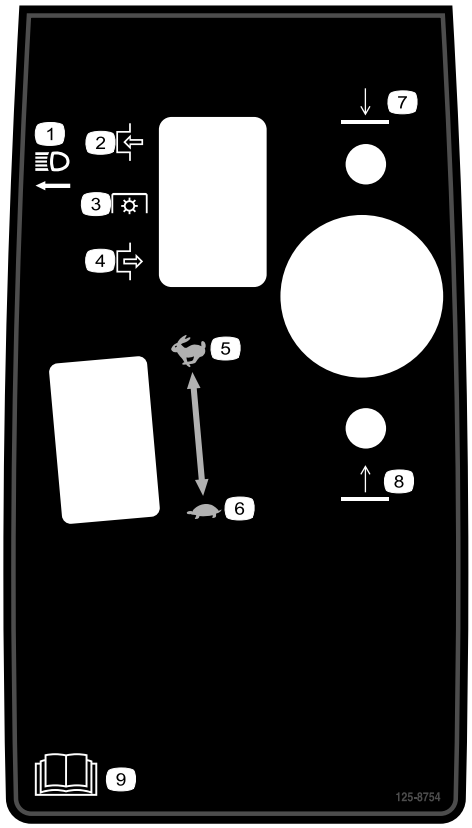
1. Stored energy hazard—read the *Operator's Manual.*
2. Move the cotter pin to the hole closest to the rod bracket and then remove the lift arm and pivot yoke.



decal100-6574

100-6574

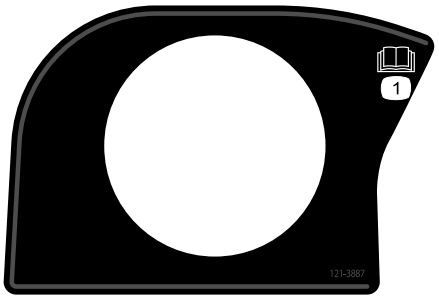
1. Hot surface hazard—keep bystanders away.
2. Severing hazard of hand, impeller; entanglement hazard, belt—keep away from moving parts.



decal125-8754

125–8754

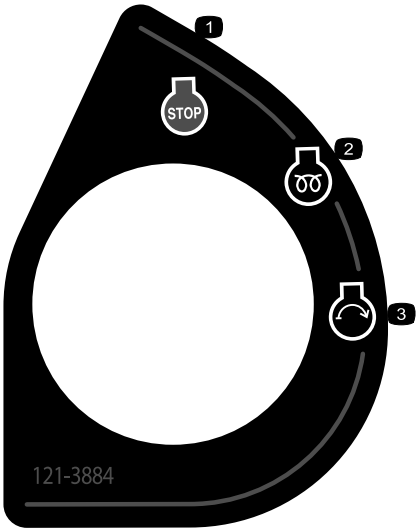
1. Headlights
2. Engage
3. Power take-off (PTO)
4. Disengage
5. Fast
6. Slow
7. Lower the cutting units
8. Raise the cutting units
9. Read the *Operator's Manual*.



decal121-3887

121–3887

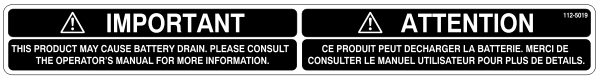
1. Read the *Operator's Manual*.



decal121-3884

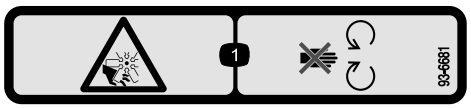
121–3884

1. Engine—stop
2. Engine—preheat
3. Engine—start



decal112-5019

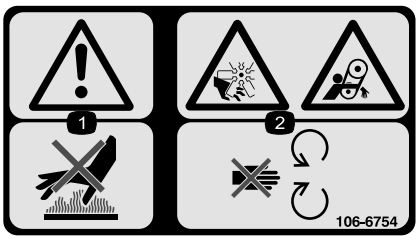
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decal93-6681

93–6681

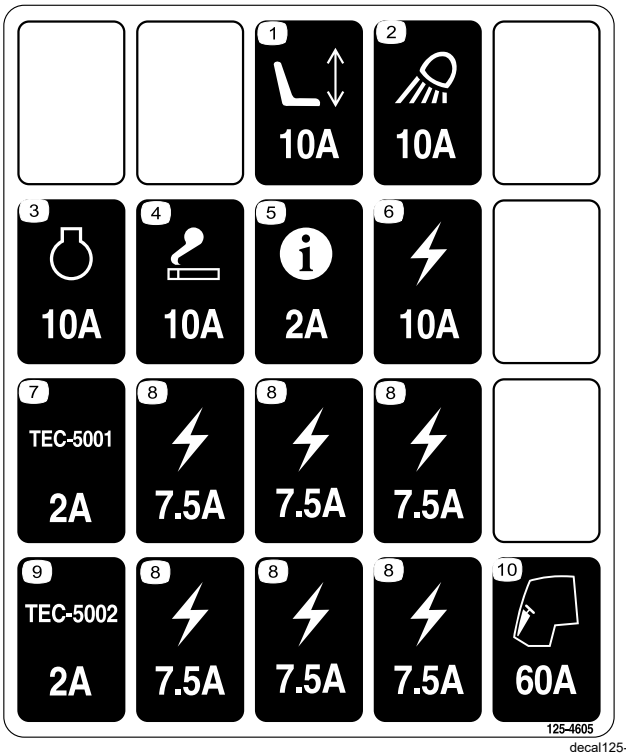
1. Cutting/dismemberment hazard—stay away from moving parts.



decal106-6754

106-6754

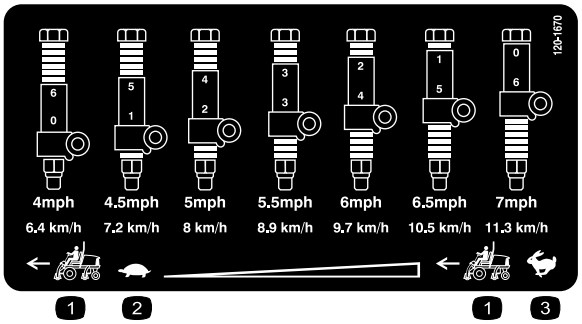
1. Warning—do not touch the hot surface.
2. Cutting/dismemberment hazard, fan and entanglement hazard, belt—stay away from moving parts.



decal125-4605

125-4605

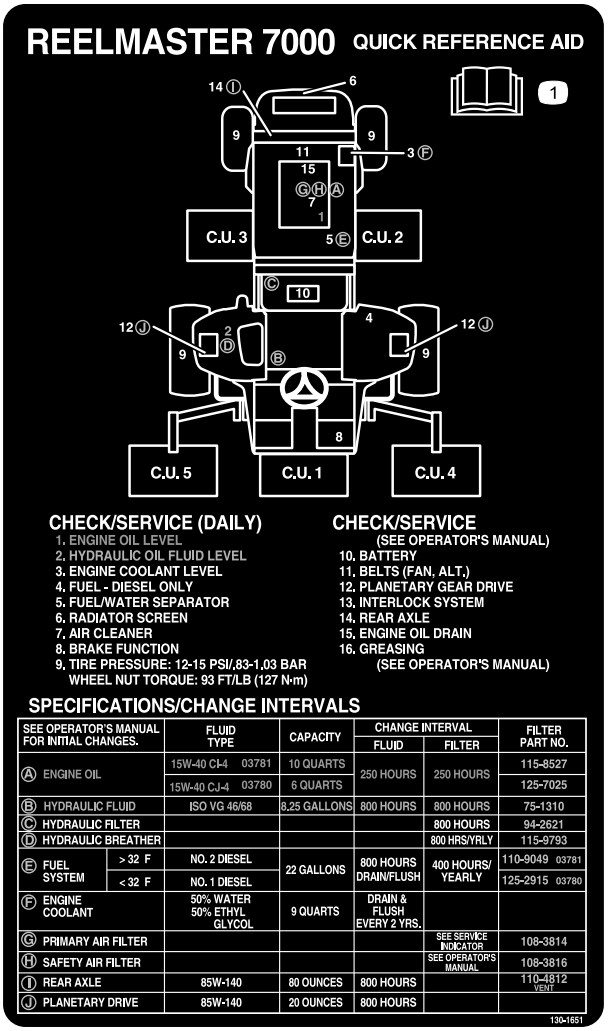
1. Power seat
2. Work light
3. Engine
4. Lighter
5. InfoCenter
6. Electric
7. Controller
8. Electric
9. Controller
10. Cab



decal120-1670

120-1670

1. Traction unit speed
2. Slow
3. Fast



decal130-1651

130-1651

1. Read the *Operator's Manual* for more information of servicing the machine.

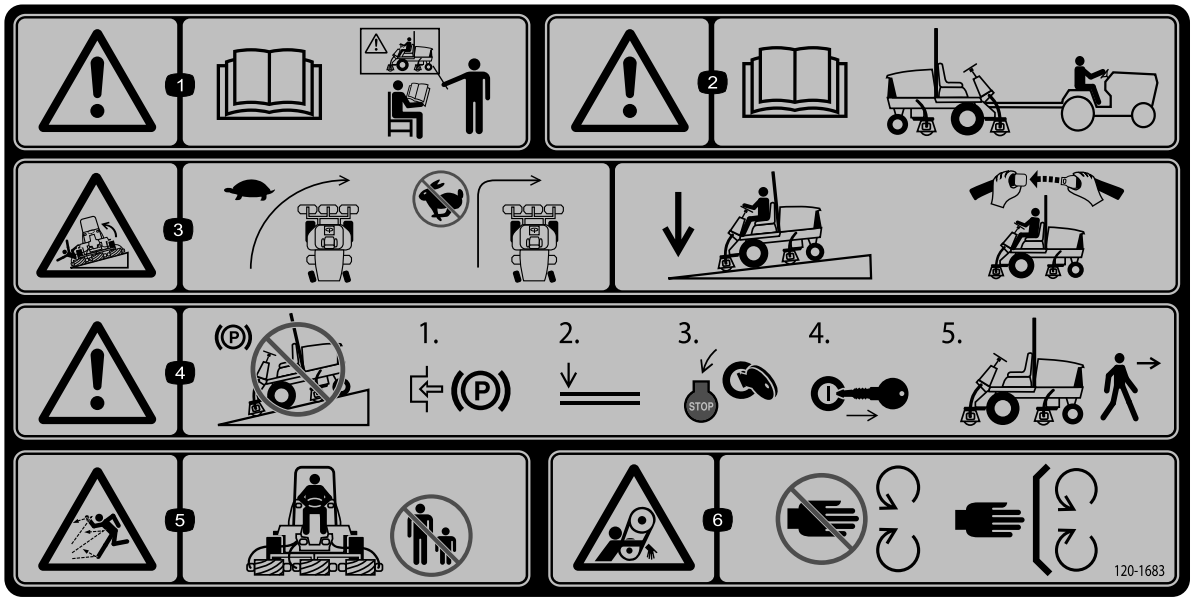


decalbatterysymbols

Battery Symbols

Some or all of these symbols are on your battery

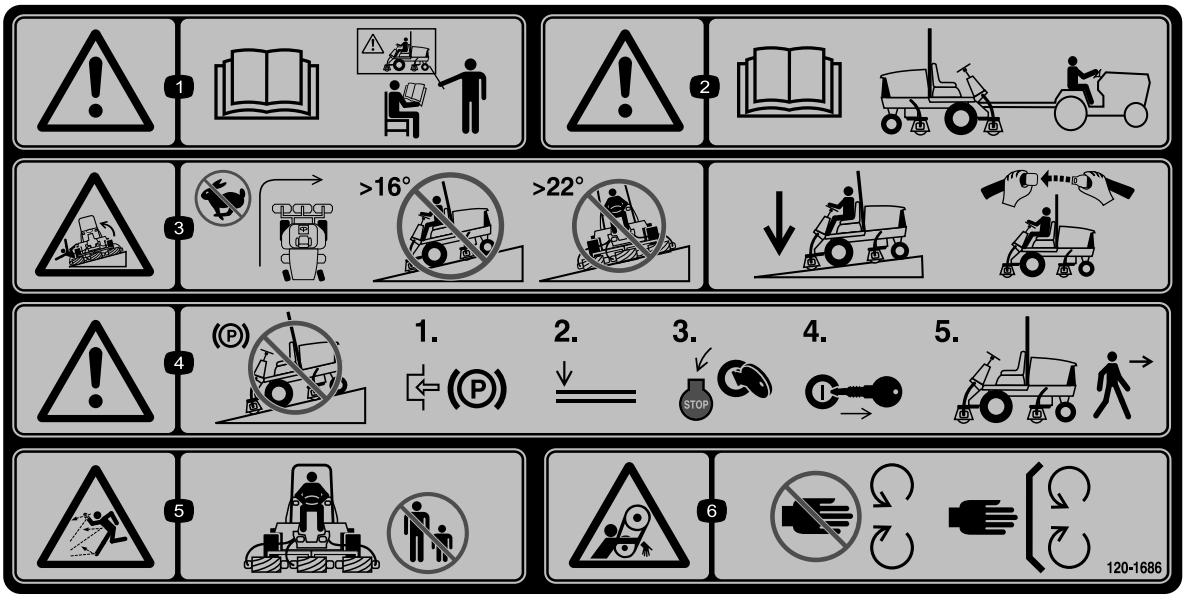
1. Explosion hazard
2. No fire, open flame, or smoking.
3. Caustic liquid/chemical burn hazard
4. Wear eye protection
5. Read the *Operator's Manual.*
6. Keep bystanders a safe distance from the battery.
7. Wear eye protection; explosive gases can cause blindness and other injuries
8. Battery acid can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



decal120-1683

120-1683

1. Warning—read the *Operator's Manual*, do not operate this machine unless you are trained.
2. Warning—read the *Operator's Manual* before towing the machine.
3. Tipping hazard—slow machine before turning, do not turn at high speeds; lower the cutting unit when driving down slopes; use a roll over protection system and wear the seat belt
4. Warning—do not park the machine on slopes; engage the parking brake, lower the cutting units, stop the engine and remove the ignition key before leaving the machine.
5. Thrown object hazard—keep bystanders a safe distance from the machine.
6. Entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.



decal120-1686

120-1686

Affix over part no. 120–1683 for CE*

*This safety decal includes a slope warning required on the machine fro compliance to the European Lawn Mower Standard EN ISO 5395:2013. The conservative maximum slope angles indicated for operation of this machine are prescribed by and required by this standard.

1. Warning—read the *Operator's Manual*, do not operate this machine unless you are trained.
2. Warning—read the *Operator's Manual* before towing the machine.
3. Tipping hazard—do not turn at high speeds, do not up and down slopes greater than 16 degrees, do not mow across slopes greater than 22 degrees; lower the cutting unit when driving down slopes; use a roll over protection system and wear the seat belt
4. Warning—do not park the machine on slopes; engage the parking brake, lower the cutting units, stop the engine and remove the ignition key before leaving the machine.
5. Thrown object hazard—keep bystanders a safe distance from the machine.
6. Entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.

Setup

Loose Parts

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

Procedure	Description	Qty.	Use
1	No parts required	–	Adjust the support rollers.
2	Warning decal	1	Replace the decal for CE Compliance.
3	Hood-lock bracket Rivet Screw, 1/4 x 2 inch Flat washer, 1/4 inch Locknut, 1/4 inch	1 2 1 2 1	Install the hood lock for European CE Compliance.
4	Front hose guide, right Front hose guide, left	1 1	Install the cutting units.
5	No parts required	–	Adjust the turf-compensation spring.
6	Cutting-unit kickstand	1	Use the cutting-unit kickstand.
7	No parts required	–	Grease the machine.
8	No parts required	–	Check the levels of the rear axle lubricant, hydraulic fluid, and engine oil.
9	Gauge bar	1	Use the gauge bar to adjust the cutting unit.

Media and Additional Parts

Description	Qty.	Use
Operator's Manual	1	Read the manual before operating the machine.
Engine operator's manual	1	Read the manual before operating the engine.
Parts Catalog	1	Use the catalog to reference part numbers.
Operator training material	1	View the training material before operating the machine.
Declaration of Conformity	1	This document indicates CE compliance.

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

1

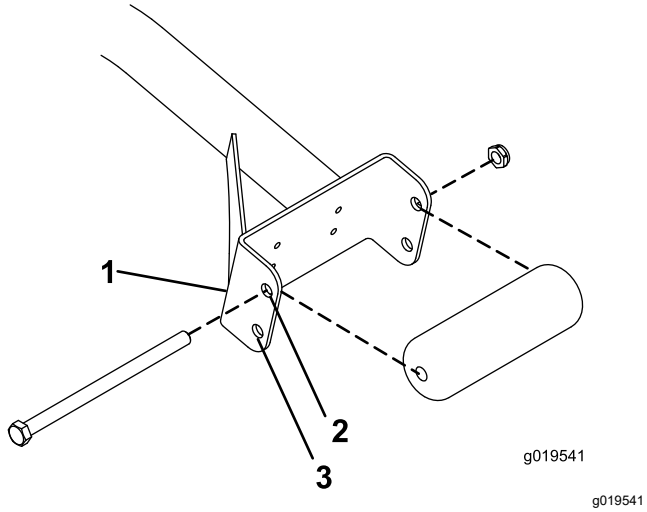
Adjusting the Support Rollers

No Parts Required

Procedure

Depending on what width cutting units are to be installed on the traction, adjust the support rollers as follows:

- If using 27 inch cutting units, the rollers are to be installed in the upper mounting holes of support assembly channels (Figure 3).
- If using 32 inch cutting units, the rollers are to be installed in the lower mounting holes of support assembly channels (Figure 3).



g019541

Figure 3

1. Support assembly channel
2. Use this hole for 27 inch cutting units.
3. Use this hole for 32 inch cutting units.

2

Replacing the Warning Decal for CE Compliance

Parts needed for this procedure:

1	Warning decal

Procedure

On machines requiring CE Compliance, affix the CE warning decal, Part No. 120-1683 over the standard warning decal, Part No. 120-1686.

3

Installing the Hood Lock for CE Compliance

Parts needed for this procedure:

1	Hood-lock bracket
2	Rivet
1	Screw, 1/4 x 2 inch
2	Flat washer, 1/4 inch
1	Locknut, 1/4 inch

Procedure

1. Unhook the hood latch from the hood-latch bracket (Figure 4).

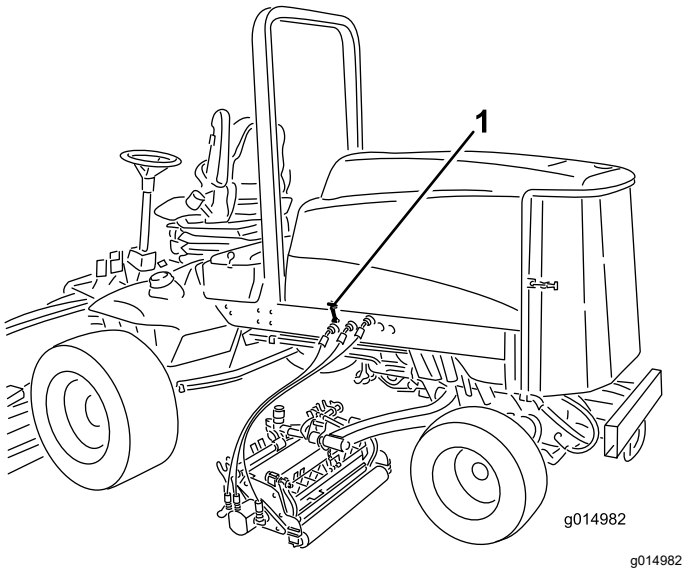


Figure 4

1. Hood latch

2. Remove the 2 rivets securing the hood-latch bracket to the hood (Figure 5).

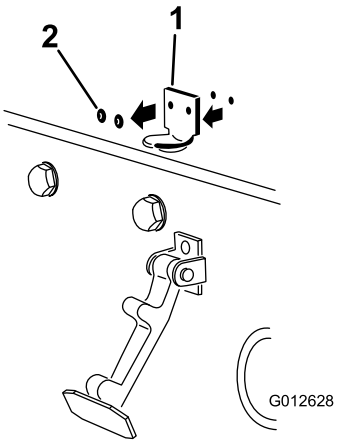


Figure 5

1. Hood-latch bracket 2. Rivets

3. Remove the hood-latch bracket from the hood.
4. While aligning the mounting holes, position the CE lock bracket and the hood-latch bracket onto the hood.

   Note: The lock bracket must be against the hood (Figure 5).

   Do not remove bolt and nut assembly from the lock-bracket arm.

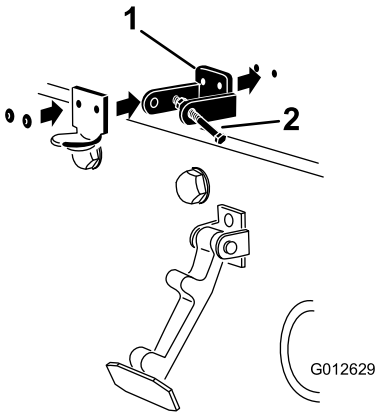


Figure 6

1. CE lock bracket 2. Bolt and nut assembly

5. Align the washers with the holes on the inside of the hood.
6. Rivet the brackets and the washers to the hood (Figure 6).
7. Hook the latch onto the hood-latch bracket (Figure 7).

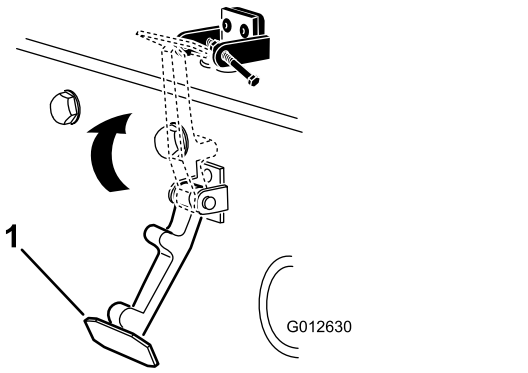
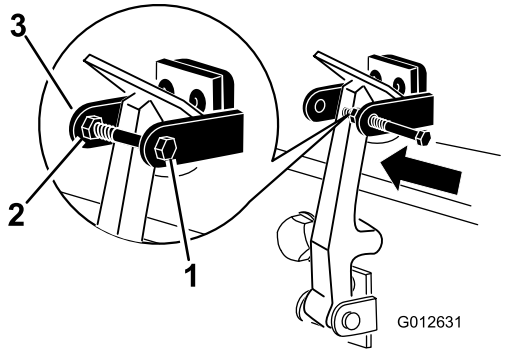


Figure 7

1. Hood latch

8. Screw the bolt into the other arm of hood-lock bracket to lock the latch in position (Figure 8).



g012631

Figure 8

1. Bolt
2. Nut
3. Arm of the hood-lock bracket

9. Tighten the bolt securely but do not tighten the nut.

4

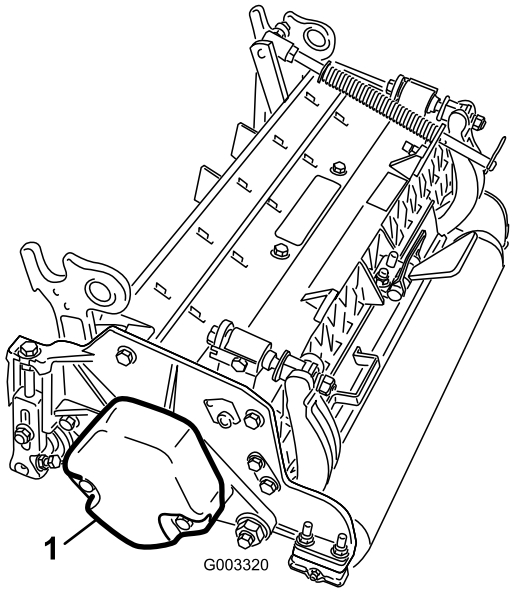
Installing the Cutting Units

Parts needed for this procedure:

1	Front hose guide, right
1	Front hose guide, left

Procedure

1. Remove the reel motors from the shipping brackets.
2. Remove the shipping brackets and discard.
3. Remove the cutting units from the cartons.
4. Assemble and adjust as described in the cutting unit *Operator's Manual*.
5. Make sure that the counter weight (Figure 9) is installed to the proper end of the cutting unit as described in the cutting unit *Operator's Manual*.

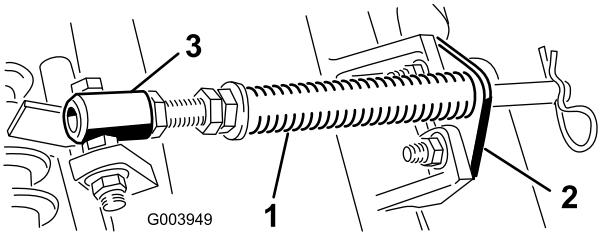


g003320

Figure 9

1. Counter weight

6. All of the cutting units are shipped with the turf compensation spring mounted to the right side of the cutting unit. The turf compensation spring must be mounted to the same side of the cutting unit as the reel drive motor. Reposition the turf compensation as follows:
   A. Remove the 2 carriage bolts and nuts securing the rod bracket to the cutting-unit tabs (Figure 10).



g003949

Figure 10

1. Turf compensation spring
2. Rod bracket
3. Spring tube

   B. Remove the flange nut securing the spring-tube bolt to the carrier-frame tab (Figure 10)
   C. Remove the assembly.
   D. Mount the spring-tube bolt to the opposite tab on the carrier frame and secure with the flange nut.

   Note: The bolt head is to be positioned to the outer side of the tab as shown in Figure 11.

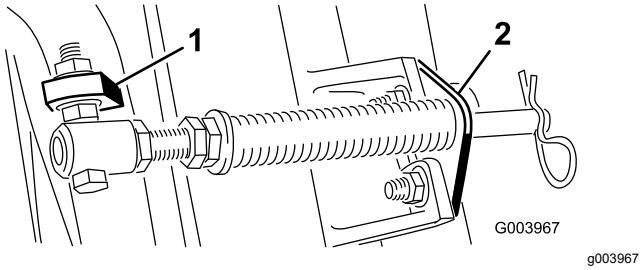


Figure 11

1. Opposite carrier frame tab
2. Rod bracket

E. Mount the rod bracket to the cutting unit tabs with the carriage bolts and nuts (Figure 11). On the cutting unit, mount the left hose guide to the front of the cutting unit tabs when reinstalling the rod bracket (Figure 13).

Important: **On Cutting Unit 4 (left front) and Cutting Unit 5 (right front), use the rod-bracket mounting nuts to install the hose guides to the front of the cutting-unit tabs. The hose guides should lean toward the center cutting unit (Figure 12 through Figure 14).**

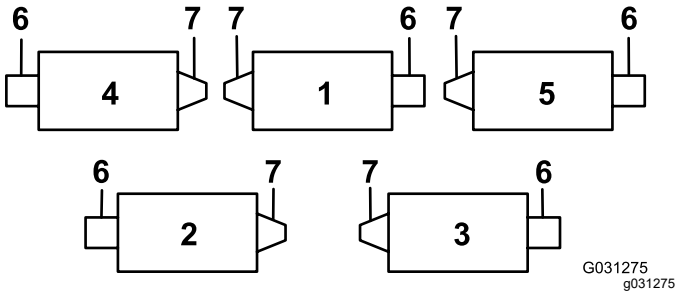


Figure 12

1. Cutting unit 1
2. Cutting unit 2
3. Cutting unit 3
4. Cutting unit 4
5. Cutting unit 5
6. Reel motor
7. Weight

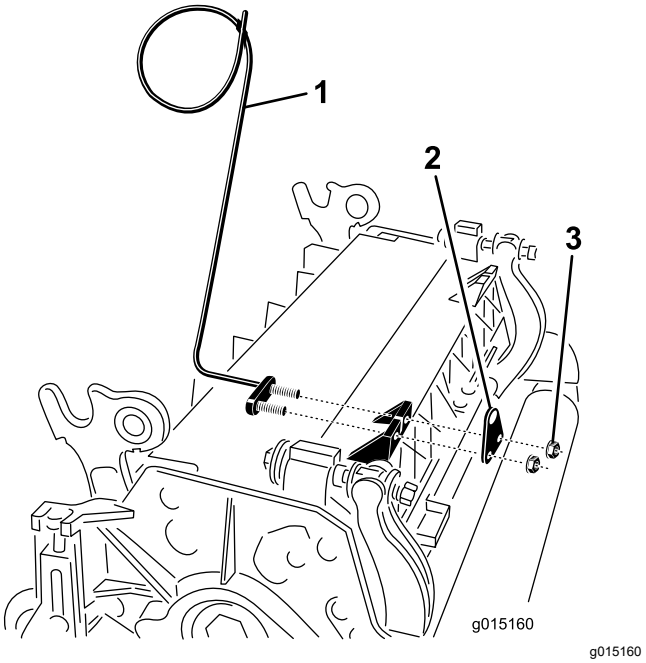


Figure 13

1. Hose guide (left side shown)
2. Rod bracket
3. Nuts

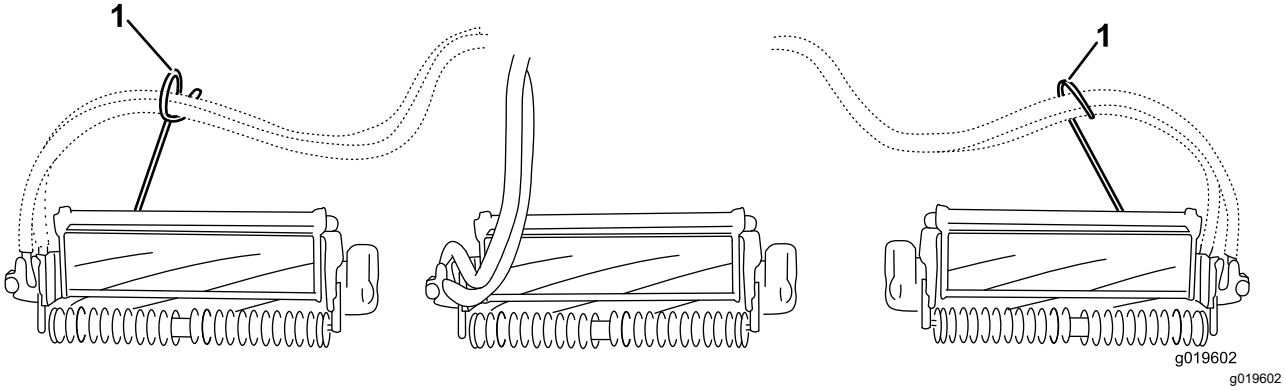


Figure 14

1. Hose guides (each must lean toward the center cutting unit)

Note: When installing or removing the cutting units, make sure that the hairpin cotter is installed in the spring-rod hole next to the rod bracket. Otherwise, the hairpin cotter must be installed in the hole in the end of the rod.

7. Increase the steering on the rear cutting units by removing the 2 pivot spacers, hex-socket screws, and flange locknuts (Figure 15) from the carrier frames of the rear cutting units (Cutting Units 2 and 3); refer to Figure 12.

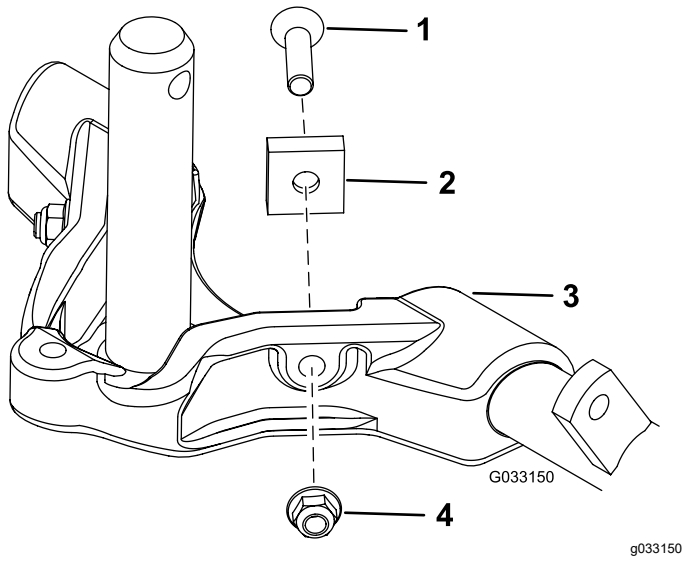


Figure 15

1. Hex-socket screw
2. Pivot spacer
3. Carrier frame
4. Flange locknut

8. Lower all of the lift arms completely.
9. Coat the carrier-frame shaft with clean grease (Figure 16).

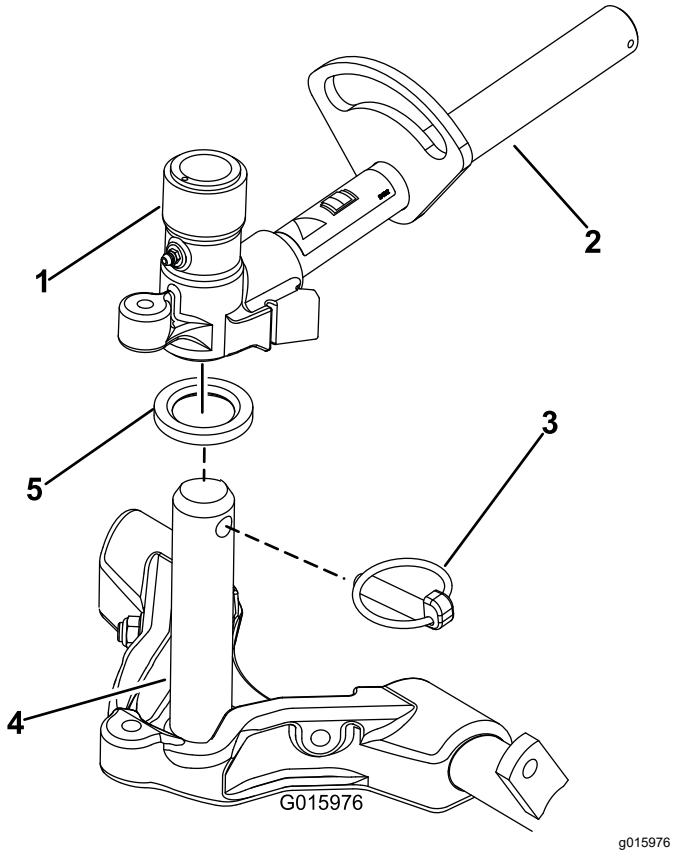


Figure 16

1. Lift-arm pivot yoke
2. Lift arm
3. Klik pin
4. Carrier-frame shaft
5. Thrust washer

10. For the front cutting units, slide a cutting unit under the lift arm while inserting the shaft of the carrier frame up into the lift-arm pivot yoke (Figure 16). Make sure that the thrust washer is in position on the carrier frame shaft.
11. Secure the carrier-frame shaft to the lift-arm yoke with the klik pin (Figure 16).
12. To lock (fix) the steering on the cutting units, secure the pivot yoke to the carrier frame with the snapper pin (Figure 17).

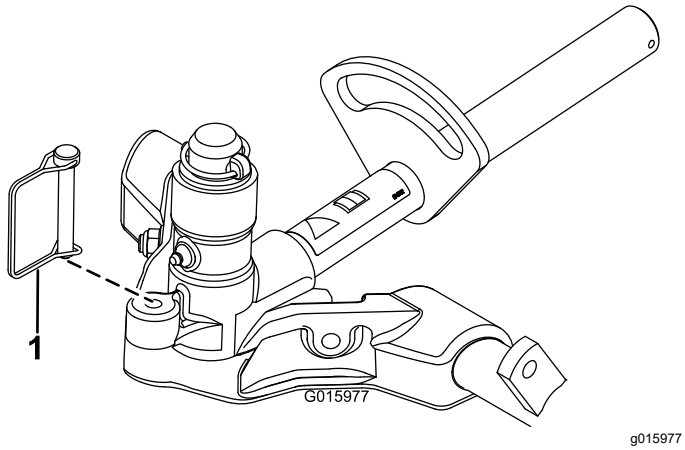


Figure 17

1. Snapper pin

Note: Fixed steering is recommended when cutting on side hills.

13. Use the following procedure on the rear cutting units when the height of cut is above 19 mm (3/4 inch).

    A. Remove the lynch pin and washer securing the lift-arm pivot shaft to the lift arm and slide the lift-arm pivot shaft out of the lift arm (Figure 18).

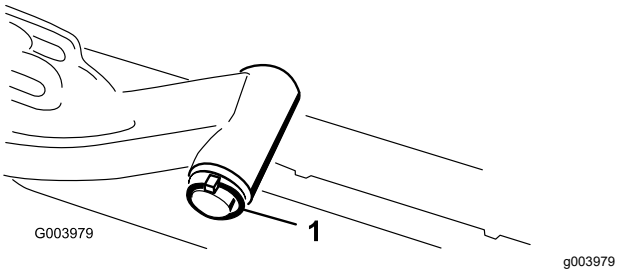


Figure 18

1. Lift-arm pivot-shaft lynch pin and washer

    B. Insert the lift-arm yoke onto the carrier frame shaft (Figure 16).

    C. Insert the lift-arm shaft into the lift arm and secure it with the washer and the lynch pin (Figure 18).

14. Secure the lift-arm chain to the chain bracket with the snapper pin (Figure 19).

    Note: Use the number of chain links described in the cutting unit *Operator's Manual*.

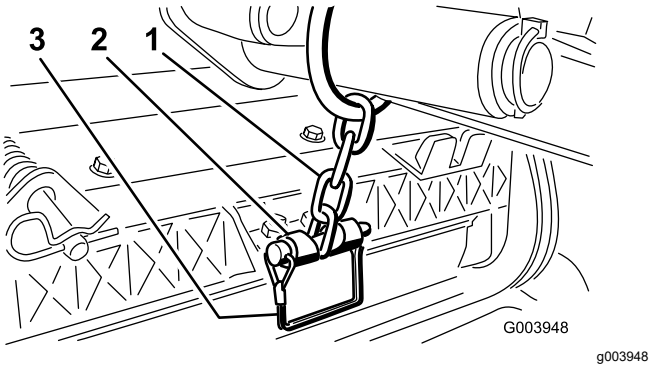


Figure 19

1. Lift-arm chain
2. Chain bracket
3. Snapper pin

15. Coat the spline shaft of the reel motor with clean grease.

16. Oil the reel motor O-ring and install it onto the motor flange.

17. Install the motor by rotating it clockwise so that the motor flanges clear the bolts (Figure 20).

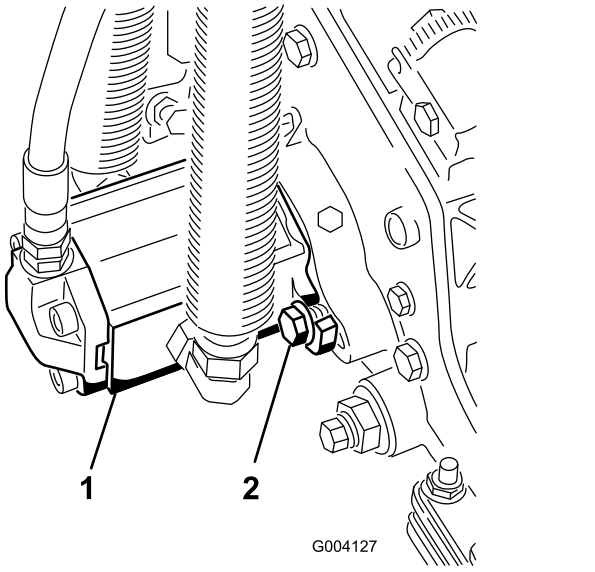


Figure 20

1. Reel-drive motor
2. Mounting bolts

18. Rotate the motor counterclockwise until the flanges encircle the bolts, and then tighten the bolts.

    Important: **Make sure that the reel motor hoses are not twisted, kinked, or at risk of being pinched.**

5

Adjusting the Turf-Compensation Spring

No Parts Required

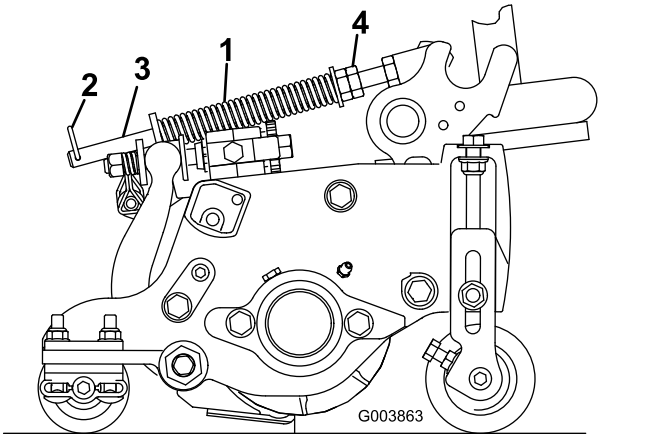
Procedure

The turf-compensation spring (Figure 21) transfers the weight from the front to the rear roller. This helps to reduce a wave pattern in the turf, also known as marcelling or bobbing.

Important: **Make spring adjustments with the cutting unit mounted to the traction unit, pointing straight ahead and lowered to the shop floor.**

1. Make sure that the hairpin cotter is installed in the rear hole in the spring rod (Figure 21).

   Note: When servicing the cutting unit, move the hairpin cotter to the spring-rod hole next to the turf-compensation spring.



g003863

Figure 21

1. Turf-compensation spring
2. Hairpin cotter
3. Spring rod
4. Hex nuts

2. Tighten the hex nuts on the front end of the spring rod until the compressed length of the spring is 15.9 cm (6.25 inches); refer to Figure 21.

   Note: When operating on rough terrain decrease the spring length by 13 mm (1/2 inch). Ground following will be slightly decreased.

   Note: The turf compensation setting will need to be reset if the HOC setting or the Aggressiveness of Cut setting is changed.

6

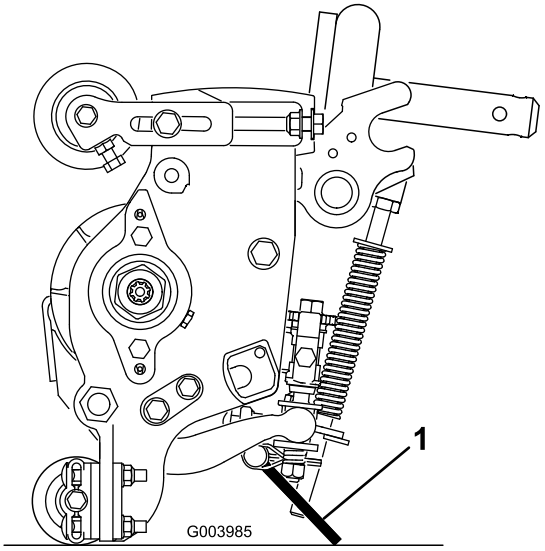
Using the Cutting-Unit Kickstand

Parts needed for this procedure:

1	Cutting-unit kickstand

Procedure

Whenever the cutting unit has to be tipped to expose the bedknife/reel, prop up the rear of the cutting unit with the kickstand to make sure that the nuts on the back end of the bedbar adjusting screws are not resting on the work surface (Figure 22).

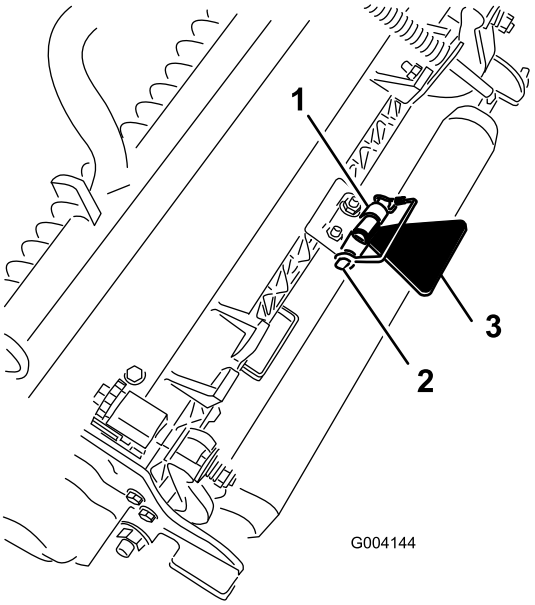


g003985

Figure 22

1. Cutting unit kickstand

Secure the kickstand to the chain bracket with the snapper pin (Figure 23).



g004144

Figure 23

1. Chain bracket
2. Snapper pin
3. Cutting-unit kickstand

7

Greasing the Machine

No Parts Required

Procedure

Before the machine is operated, it must be greased to ensure proper lubrication. Refer to Lubrication (page 52). Failure to properly grease the machine will result in premature failure of critical parts.

8

Checking the Fluid Levels

No Parts Required

Procedure

1. Check the level of the rear axle lubricant before the engine is first started, refer to Checking the Oil Level of the Rear Axle (page 62).
2. Check the level of the hydraulic fluid before the engine is first started, refer to Checking the Level of the Hydraulic Fluid (page 34).
3. Check the level of the engine oil before and after the engine is first started, refer to Checking the Engine-Oil Level (page 55).

9

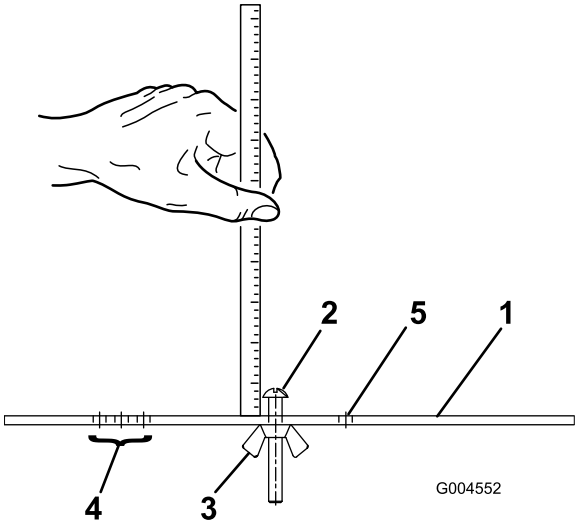
Using the Gauge Bar

Parts needed for this procedure:

1	Gauge bar

Procedure

Use the gauge bar to adjust the cutting unit. Refer to the cutting unit *Operator's Manual* for the adjustment procedures (Figure 24).



g004552

Figure 24

1. Gauge bar
2. Height-adjusting screw
3. Nut
4. Holes used for setting the groomer height of groom (HOG)
5. Hole not used

Product Overview

Controls

Brake Pedals

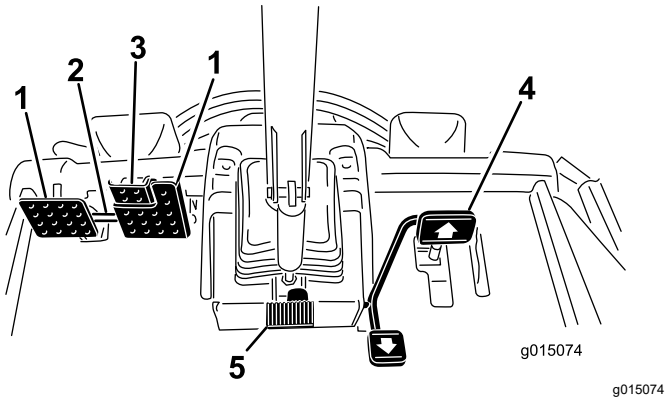
The 2 foot pedals (Figure 25) operate individual wheel brakes for turning assistance and to aid in obtaining better side hill traction.

Pedal-Locking Latch

The pedal-locking latch (Figure 25) connects the pedals together to engage the parking brake.

Parking-Brake Pedal

To engage the parking brake, (Figure 25) connect the pedals together with the pedal-locking latch, push down on the right brake pedal while engaging the toe pedal. To release the parking brake, press 1 of the brake pedals until the parking-brake latch retracts.



g015074

Figure 25

1. Brake pedal
2. Pedal-locking latch
3. Parking-brake pedal
4. Traction pedal
5. Tilt-steering pedal

Traction Pedal

The traction pedal (Figure 25) 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 no load, maximum ground speed, fully press the pedal while the throttle is in the fast position.

To stop, reduce your foot pressure on the traction pedal and allow it to return to the center position.

Tilt Steering Pedal

To tilt the steering wheel towards you, press the foot pedal (Figure 25) down, and pull the steering tower

toward you to the most comfortable position and then release the pedal.

Mow-Speed Limiter

When the mow-speed limiter (Figure 26) is flipped up it will control the mow speed and allow the cutting units to be engaged. Each spacer adjusts the mowing speed by ½ mile per hour. The more spacers you have, on the top of the bolt, the slower you will go. For transport, flip back the mow-speed limiter and you will have maximum transport speed.

Speed-Limiter Screws

Adjust the screw(s) (Figure 26) to limit the amount the traction pedal can be pressed in the forward or reverse direction to limit speed.

Important: **The speed-limiter screw must stop the traction pedal before the pump reaches full stroke or damage to the pump may occur.**

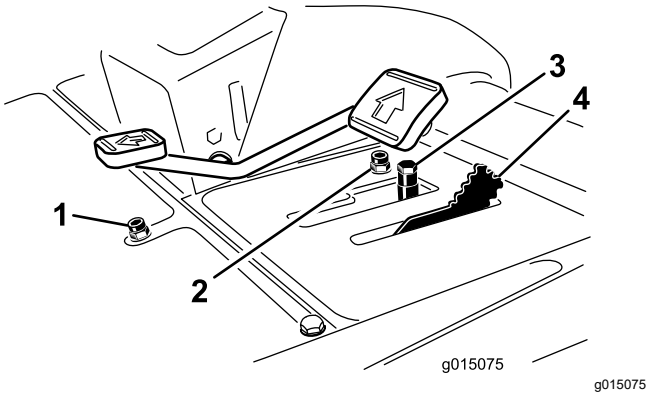


Figure 26

1. Reverse speed limiter screw
2. Forward speed limiter screw
3. Spacers
4. Mow speed limiter

Lower Mow/Raise Control Lever

This lever (Figure 27) raises and lowers the cutting units and also starts and stops the reels when the reels are enabled in the mow mode. The cutting units cannot be lowered when the mow/transport lever is in the transport position.

Key Switch

The key switch (Figure 27) has 3 positions: Off, On/Preheat, and Start.

InfoCenter

The InfoCenter LCD display shows information about your machine such as the operating status, various diagnostics and other information about the machine (Figure 27).

PTO Switch

The PTO switch (Figure 27) has 2 positions: Out (start) and In (stop). Pull the PTO button out to engage the cutting unit blades. Push in the button to disengage the cutting unit blades.

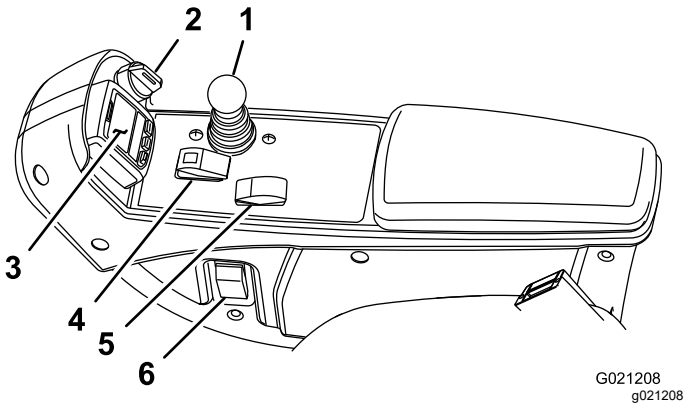


Figure 27

1. Lower mow/raise control lever
2. Key switch
3. InfoCenter
4. PTO switch
5. Engine-speed switch
6. Headlight switch

Engine-Speed Switch

The engine-speed switch (Figure 27) has 2 modes to change the engine speed. By momentarily tapping the switch, the engine speed can be increased or decreased in 100 rpm increments. By holding the switch down the engine will automatically move to High or Low idle, depending on which end of the switch is pressed.

Headlight Switch

Pivot the switch downward to turn on the headlights (Figure 27).

Power Point

Use the power point (Figure 28) to power optional 12-volt electrical accessories.

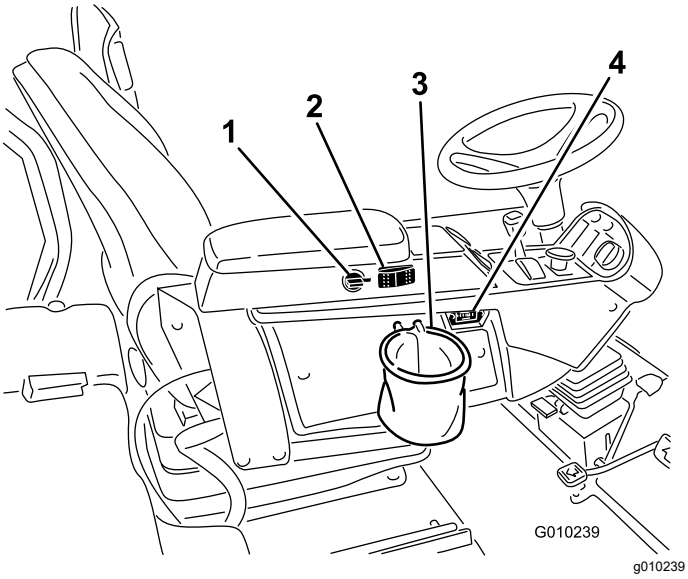


Figure 28

1. Power point
2. Fan reverse
3. Bag holder
4. Hour meter

Bag Holder

Use the bag holder (Figure 28) for storage.

Backlap Levers

Use the backlap levers for backlapping the reels (Figure 29).

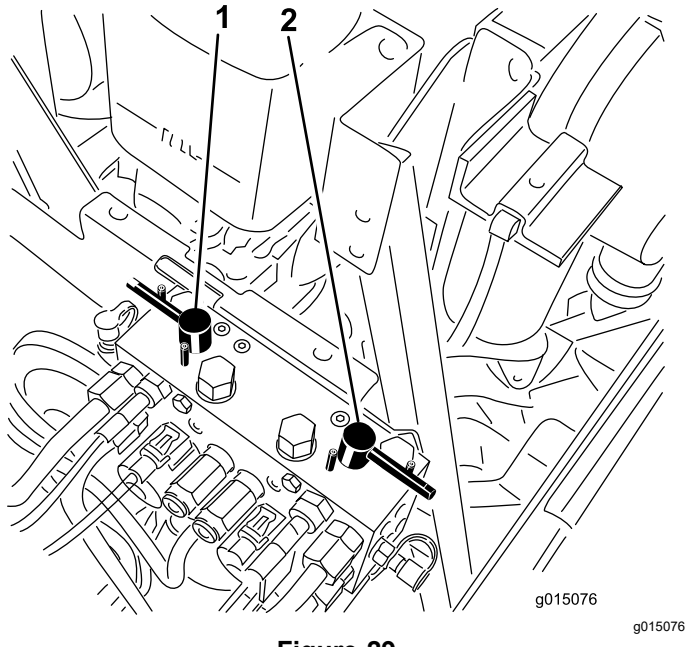


Figure 29

1. Front backlap lever
2. Rear backlap lever

Adjusting the Seat

Fore and Aft Adjusting Lever

Pull out on the lever to slide the seat fore or aft (Figure 30).

Seat Arm Rest Adjusting Knob

Rotate the knob to adjust the seat arm rest angle (Figure 30).

Seat Back Adjusting Lever

Move the lever to adjust the seat back angle (Figure 30).

Weight gauge

Indicates when the seat is adjusted to the weight of the operator (Figure 30). Height adjustment is made by positioning the suspension within the range of the green region.

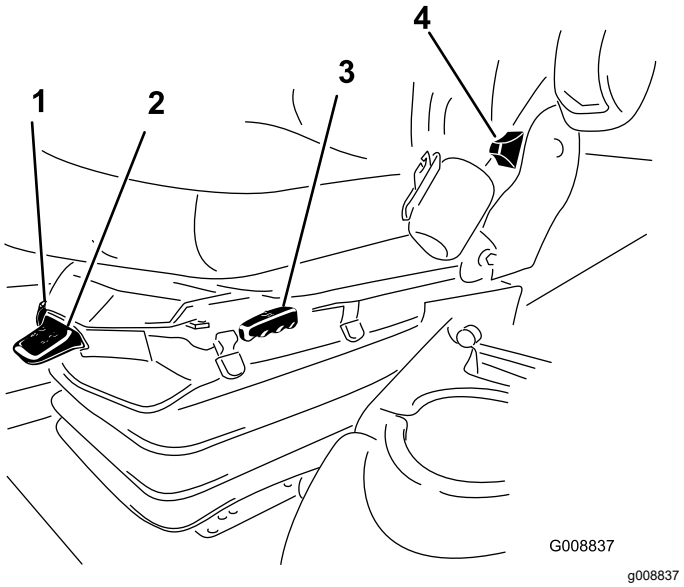


Figure 30

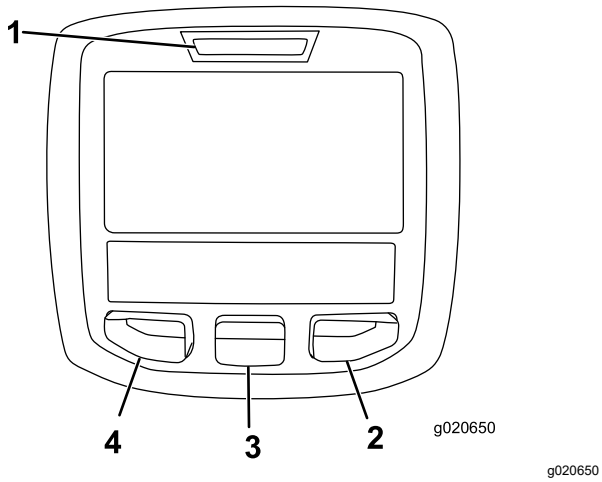
1. Weight gauge
2. Weight adjusting lever
3. Fore and Aft adjusting lever
4. Seat back adjusting lever
5. Arm rest adjusting knob

Weight Adjusting Lever

Adjust for operator weight (Figure 30). Pull up on the lever to increase the air pressure and push down to decrease the air pressure. The proper adjustment is attained when the weight gauge is in the green region.

Using the InfoCenter LCD Display

The InfoCenter LCD display shows information about your machine such as the operating status, various diagnostics, and other information about the machine (Figure 31) There is a splash screen and main information screen of the InfoCenter. You can switch between the splash screen and main information screen, at any time, by pressing any of the InfoCenter buttons and then selecting the appropriate directional arrow.



g020650

Figure 31

1. Indicator light
2. Right button
3. Middle button
4. Left button

- Left Button, Menu Access/Back Button—press this button to access the InfoCenter menus. You can use it to back out of any menu you are currently using.
- Middle Button—use this button to scroll down menus.
- Right Button—use this button to open a menu where a right arrow indicates additional content.
- Manual Fan Reversal—activated by pressing the left and right buttons simultaneously.
- Beeper—activated when lowering the decks or for advisories and faults.

  Note: The purpose of each button may change depending on what is required at the time. Each button will be labeled with an icon displaying its current function.

InfoCenter Icon Description

SERVICE DUE	Indicates when scheduled service should be performed
n min	Engine rpm/status—indicates the engine speed
i	Info icon
	Hour meter
	Fast
	Slow
	Fan reversal—indicates when the fan is reversed
	Stationary regeneration required
	Air intake heater is active
	Raise cutting units
	Lower cutting units
	Operator must sit in seat
(P)	Parking brake indicator—indicates when the parking brake is On
H	Identifies the range as High
N	Neutral
L	Identifies the range as Low
	Coolant temperature—indicates the engine coolant temperature in either °C or °F
	Temperature (hot)
	Denied or not allowed
	PTO is engaged
	Engine Start

STOP	Stop or shutdown
	Engine
	Key switch
	Indicates when the cutting units are being lowered
	Indicates when the cutting units are being raised
PIN	PIN code
	Hydraulic fluid temperature—indicates the temperature of the hydraulic fluid
CAN	CAN bus
	InfoCenter
Bad	Bad or failed
	Bulb
OUT	Output of TEC controller or control wire in harness
HI	High: over allowed range
LO	Low: under allowed range
HI / LO	Out of range
	Switch
	Operator must release switch
	Operator should change to indicated state
Symbols are often combined to form sentences. Some examples are shown below	
N	Operator should put machine in neutral
	Engine start denied
STOP	Engine shutdown

	Engine coolant too hot
	Hydraulic fluid too hot
48.1g/l	DPF ash accumulation notification. Refer to Servicing the Diesel-Oxidation Catalyst (DOC) and the Soot Filter (page 56) in the maintenance section for details.
or	Sit down or set parking brake

Using the Menus

To access the InfoCenter menu system, press the menu access button while at the main screen. This will bring you to the main menu. Refer to the following tables for a synopsis of the options available from the menus:

Main Menu	
Menu Item	**Description**
Faults	The Faults menu contains a list of the recent machine faults. Refer to the *Service Manual* or your Authorized Toro Distributor for more information on the Faults menu and the information contained there.
Service	The Service menu contains information on the machine such as hours of use counters and other similar numbers.
Diagnostics	The Diagnostics menu displays the state of each machine switch, sensor and control output. You can use this to troubleshoot certain issues as it will quickly tell you which machine controls are on and which are off.
Settings	The Settings menu allows you to customize and modify configuration variables on the InfoCenter display.
About	The About menu lists the model number, serial number, and software version of your machine.

Service	
Menu Item	**Description**

Hours	Lists the total number of hours that the machine, engine and PTO have been on, as well as the number of hours the machine has been transported and service due.
Counts	Lists numerous counts the machine has experienced.

Diagnostics	
Menu Item	**Description**
Cutting Units	Indicates the inputs, qualifiers, and outputs for raising and lowering the cutting units.
Hi/Low Range	Indicates the inputs, qualifiers, and outputs for driving in transport mode.
PTO	Indicates the inputs, qualifiers, and outputs for enabling the PTO circuit.
Engine Run	Indicates the inputs, qualifiers, and outputs for starting the engine.
Backlap	Indicates the inputs, qualifiers, and outputs for operating the backlap function.

Settings	
Menu Item	**Description**
Units	Controls the units used on the InfoCenter. The menu choices are English or Metric
Language	Controls the language used on the InfoCenter*.
LCD Backlight	Controls the brightness of the LCD display.
LCD Contrast	Controls the contrast of the LCD display.
Front Backlap Reel Speed	Controls the speed of the front reels in backlap mode.
Rear Backlap Reel Speed	Controls the speed of the rear reels in backlap mode.
Protected Menus	Allows a person authorized by your company with the PIN code to access protected menus.
Auto Idle	Controls the amount of time allowed before returning the engine to low idle when the machine is stationary.
Blade Count	Controls the number of blades on the reel for reel speed.
Mow Speed	Controls the ground speed for determining the reel speed.
Height of cut (HOC)	Controls the height of cut (HOC) for determining the reel speed.
F Reel RPM	Displays the calculated reel speed position for the front reels. The reels can also be manually adjusted.
R Reel RPM	Displays the calculated reel speed position for the rear reels. The reels can also be manually adjusted.

* Only "operator-faced" text is translated. Faults, Service, and Diagnostics screens are "service-faced". Titles will be in the selected language, but menu items are in English.

About	
Menu Item	**Description**
Model	Lists the model number of the machine.
SN	Lists the serial number of the machine.
Machine Controller Revision	Lists the software revision of the master controller.
InfoCenter Revision	Lists the software revision of the InfoCenter.
CAN Bus	Lists the machine communication bus status.

Protected Menus

There are 7 operating configuration settings that are adjustable within the Settings Menu of the InfoCenter: Auto Idle, Time Delay, Blade Count, Mow Speed, Height of Cut (HOC), F Reel RPM, and R Reel RPM. These settings can be locked by using the Protected Menu.

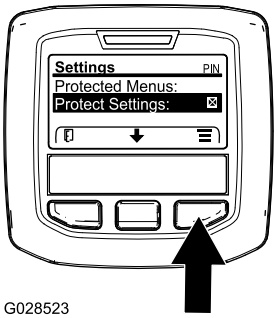
Note: At the time of delivery, the initial password code is programmed by your distributor.

Accessing Protected Menus

Note: The factory default PIN code for you machine is either 0000 or 1234.

If you changed the PIN code and forgot the code, contact your Authorized Toro Distributor for assistance.

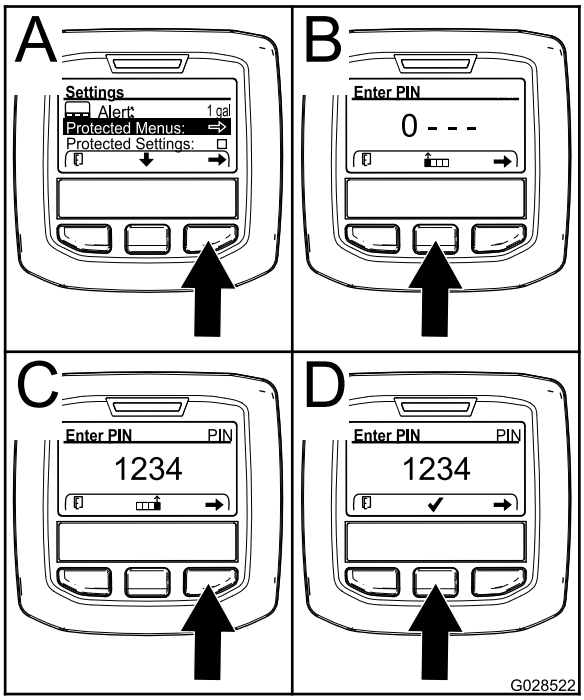
1. From the MAIN MENU, use the center button to scroll down to the SETTINGS MENU and press the right button (Figure 32).



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Figure 32

2. In the SETTINGS MENU, use the center button to scroll down to the PROTECTED MENU and press the right button (Figure 33A).



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Figure 33

3. To enter the PIN code, press the center button until the correct first digit appears, then press the right button to move on to the next digit (Figure 33B and Figure 33C). Repeat this step until the last digit is entered and press the right button once more.
4. Press the middle button to enter the PIN code (Figure 33D).

   Wait until the red indicator light of the InfoCenter illuminates.

   Note: If the InfoCenter accepts the PIN code and the protected menu is unlocked, the word "PIN" displays in the upper right corner of the screen.

Note: Rotate the key switch to the OFF position and then to the ON position locks the protected menu.

You have the ability to view and change the settings in the Protected Menu. Once you access the Protected Menu, scroll down to Protect Settings option. Use the right button to change the setting. Setting the Protect Settings to OFF allows you to view and change the settings in the Protected Menu without entering the PIN code. Setting the Protect Settings to ON hides the protected options and requires you to enter the PIN code to change the setting in the Protected Menu. After you set the PIN code, rotate the key switch OFF and back to the ON position to enable and save this feature.

Setting the Auto Idle

1. In the Settings Menu, scroll down to Auto Idle.
2. Press the right button to change the auto idle time between Off, 8S, 10S, 15S, 20S, and 30S.

Setting the Blade Count

1. In the Settings Menu, scroll down to Blade Count
2. Press the right button to change the blade count between 5, 8, or 11 blades.

Setting the Mow Speed

1. In the Settings Menu, scroll down to Mow Speed.
2. Press the right button to select mow speed.
3. Use the center and right button to select the appropriate mow speed set on the mechanical mow-speed limiter on the traction pedal.
4. Press the left button to exit mow speed and save the setting.

Setting the Height of Cut (HOC)

1. In the Settings Menu, scroll down to HOC.
2. Press the right button to select HOC.
3. Use the center and right button to select the appropriate HOC setting.

   Note: If the exact setting is not displayed, select the nearest HOC setting from the list displayed.
4. Press the left button to exit HOC and save the setting.

Setting the Front and Rear Reel Speeds

Although the front and rear reel speeds are calculated by inputting the number of blades, mow speed and HOC into the InfoCenter, you can manually change the setting to accommodate different mowing conditions.

1. Scroll down to the F Reel RPM, R Reel RPM, or both.
2. Press the right button to change the reel speed value. As the speed setting is changed, the display will continue to show the calculated reel speed based on blade count, mow speed, and HOC which was previously entered, but the new value will also be displayed.

Specifications

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

Traction Unit Specifications

Width of cut, 27-inch cutting units	307 cm (121 inches)
Width of cut, 32-inch cutting units	320 cm (126 inches)
Overall width, 27-inch cutting units down	345 cm (136 inches)
Overall width, 32-inch cutting units down	358 cm (141 inches)
Overall width, cutting units up (transport)	239 cm (94 inches)
Overall length	370 cm (145.8 inches)
Height with ROPS	220 cm (87 inches)
Track width, front	229 cm (90 inches)
Track width, rear	141 cm (55.5 inches)
Wheelbase	171 cm (67.5 inches)
Net weight (with no cutting units and no fluids)	1574 kg (3470 lb)

Attachments/Accessories

A selection of Toro approved attachments and accessories is available for use with the machine to enhance and expand its capabilities. Contact your Authorized Service Dealer or Distributor.

To best protect your investment and maintain optimal performance of your Toro equipment, count on Toro genuine parts. When it comes to reliability, Toro delivers replacement parts designed to the exact engineering specification of our equipment. For peace of mind, insist on Toro genuine parts.

Operation

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

⚠ 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.

Think Safety First

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

⚠ DANGER

Operating on wet grass or steep slopes can cause sliding and loss of control.

Wheels dropping over edges can cause rollovers, which may result in serious injury, death, or drowning.

Read and follow the rollover protection instructions and warnings.

To avoid loss of control and possibility of rollover:

- **Do not operate near drop-offs or near water.**
- **Do not operate on slopes greater than specified for your machine model.**
- **Reduce speed and use extreme caution on slopes.**
- **Avoid sudden turns or rapid speed changes.**

⚠ CAUTION

This machine produces sound levels that can cause hearing loss through extended periods of exposure.

Wear hearing protection when operating this machine.

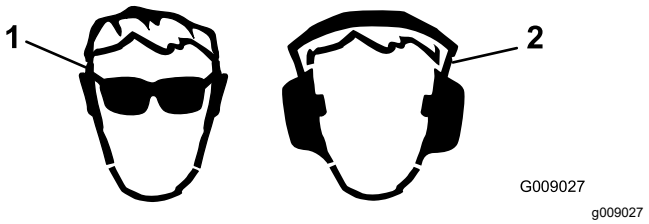


Figure 34

1. Wear eye protection.
2. Wear hearing protection.

Checking the Engine-Oil Level

Before you start the engine and use the machine, check the oil level in the engine crankcase; refer to Checking the Engine-Oil Level (page 55).

Checking the Cooling System

Service Interval: Before each use or daily

Check the level of the coolant at the beginning of each day. The capacity of the system is 12.3 L (13 US qt).

1. Carefully remove the radiator cap.

⚠ 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.**

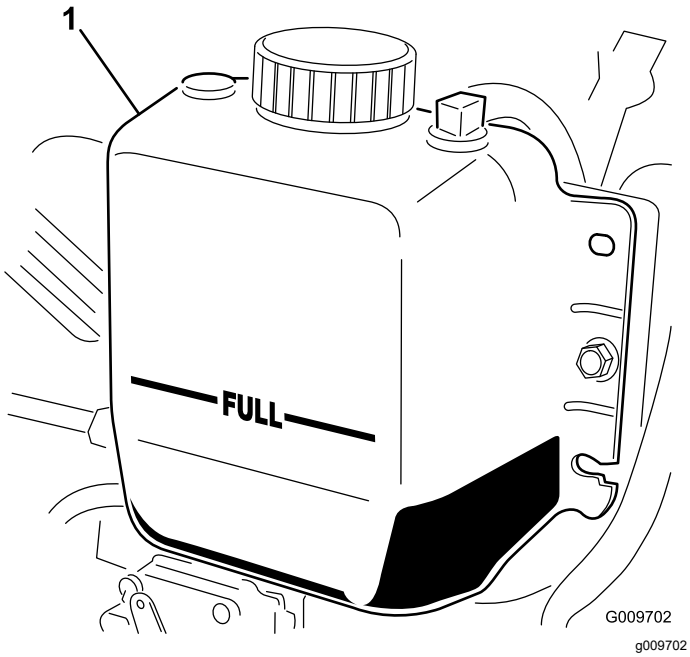


Figure 35

1. Expansion tank

2. Check the coolant level in the radiator.

   Note: The radiator should be filled to the top of the filler neck and the expansion tank filled to the Full mark (Figure 35).

3. If the coolant is low, add a 50/50 mixture of water and ethylene glycol antifreeze.

   Note: Do not use water only or alcohol/methanol-based coolants.

4. Install the radiator cap and the expansion-tank cap.

Filling the Fuel Tank

⚠ DANGER

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

- **Fill the fuel tanks outdoors, in an open area, when the engine is cold. Wipe up any fuel that spills.**
- **Never fill the fuel tanks inside an enclosed trailer.**
- **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 an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of fuel.**
- **Do not operate without entire exhaust system in place and in proper working condition.**

⚠ DANGER

In certain conditions during fueling, static electricity can be released, causing a spark that 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 you must use a fuel-dispenser nozzle, keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.**

⚠ 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 your face away from the nozzle and fuel tank opening.**
- **Keep fuel away from your eyes and skin.**

Fuel Specification

Important: **Use only ultra-low sulphur diesel fuel. Fuel with higher rates of sulfur degrades the diesel oxidation catalyst (DOC), which causes operational problems and shortens the service life of engine components.**

Failure to observe the following cautions may damage the engine.

- Never use kerosene or gasoline instead of diesel fuel.
- Never mix kerosene or used engine oil with the diesel fuel.
- Never keep fuel in containers with zinc plating on the inside.
- Do not use fuel additives.

Petroleum Diesel

Cetane rating: 45 or higher

Sulfur content: Ultra-low sulfur (<15 ppm)

Fuel Table

Diesel fuel specification	Location
ASTM D975 No. 1-D S15 No. 2-D S15	USA
EN 590	European Union
ISO 8217 DMX	International
JIS K2204 Grade No. 2	Japan
KSM-2610	Korea

- Use only clean, fresh diesel fuel or biodiesel fuels.
- Purchase fuel in quantities that can be used within 180 days to ensure fuel freshness.

Use summer-grade diesel fuel (No. 2-D) at temperatures above -7°C (20°F) and winter-grade fuel (No. 1-D or No. 1-D/2-D blend) below that temperature.

Note: Use of winter-grade fuel at lower temperatures provides lower flash point and cold flow characteristics which eases starting and reduces fuel filter plugging.

Using summer-grade fuel above -7°C (20°F) contributes toward longer fuel pump life and increased power compared to winter-grade fuel.

Biodiesel

This machine can also use a biodiesel blended fuel of up to B20 (20% biodiesel, 80% petroleum diesel).

Sulfur content: Ultra-low sulfur (<15 ppm)

Biodiesel fuel specification: ASTM D6751 or EN14214

Blended fuel specification: ASTM D975, EN590, or JIS K2204

Important: **The petroleum diesel portion must be ultra-low sulfur.**

Observe the following precautions:

- Biodiesel blends may damage painted surfaces.
- 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 blends.
- Contact your Authorized Toro Distributor if you wish for more information on biodiesel.

Fuel Tank Capacity

83 L (22 US gallons)

Adding Fuel

1. Position the machine on a level surface, lower the cutting units, stop the engine, and remove the key.
2. Using a clean rag, clean the area around the fuel-tank cap.
3. Remove the cap from the fuel tank (Figure 36).

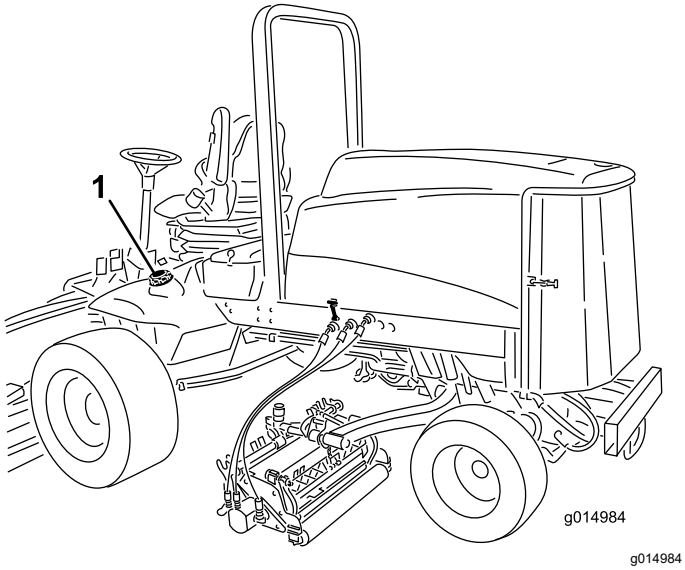


Figure 36

1. Fuel-tank cap

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

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

Checking the Level of the Hydraulic Fluid

Service Interval: Before each use or daily

The reservoir is filled at the factory with approximately 28.4 L (7.5 US gallons) of high-quality hydraulic fluid. Check the level of the hydraulic fluid before the engine is first started and daily thereafter.

The recommended replacement fluid is **Toro Premium All Season Hydraulic Fluid** (available in 5-gallon pails or 55-gallon drums. See parts catalog or Toro distributor for part numbers).

Alternative fluids: If the Toro fluid is not available, other conventional, petroleum-based fluids may be used, provided that they meet all of the following material properties and industry specifications. Check with your oil supplier to see whether the fluid meets these specifications.

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.

High Viscosity Index/Low Pour Point Antiwear Hydraulic Fluid, ISO VG 46 Multigrade

Material Properties:

Viscosity, ASTM D445	cSt @ 40°C (104°F) 44 to 50 cSt @ 100°C (212°F) 7.9 to 9.1
Viscosity index, ASTM D2270	140 or higher (high viscosity index indicates a multiweight fluid)
Pour point, ASTM D97	-37°C to -45°C (-34°F to -49°F)
FZG, fail stage	11 or better
Water content (new fluid)	500 ppm (maximum)

Industry Specifications:

Vickers I-286-S, Vickers M-2950-S, Denison HF-0, Vickers 35 VQ 25 (Eaton ATS373-C)

The proper hydraulic fluids must be specified for mobile machinery (as opposed to industrial plant usage), multiweight-type, with ZnDTP or ZDDP anti-wear additive package (not an ashless-type fluid).

Important: **The ISO VG 46 Multigrade fluid has been found to offer optimal performance in a wide range of temperature conditions. For operation in consistently high ambient temperatures, 18° C (65° F) to 49° C (120° F), ISO VG 68 hydraulic fluid may offer improved performance.**

Premium Biodegradable Hydraulic Fluid-Mobil EAL EnviroSyn 46H

Important: **Mobil EAL EnviroSyn 46H is the only synthetic biodegradable fluid approved by Toro. This fluid is compatible with the elastomers used in Toro hydraulic systems and is suitable for a wide range of temperature conditions. This fluid is compatible with conventional fluids, but for maximum biodegradability and performance the hydraulic system should be thoroughly flushed of conventional fluid. The fluid is available in 19 L (5 US gallon) containers or 208 L (55 US gallon) drums from your Mobil Distributor.**

Important: **Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic fluid is available in 20 ml (2/3 fl oz) bottles. A bottle is sufficient for 15 to 22 L (4 to 6 US gallons) of hydraulic fluid. Order part 44-2500 from your Authorized Toro Distributor.**

1. Position the machine on a level surface, lower the cutting units, stop the engine, and remove the key.
2. Clean the area around the filler neck and cap of the hydraulic tank (Figure 37).

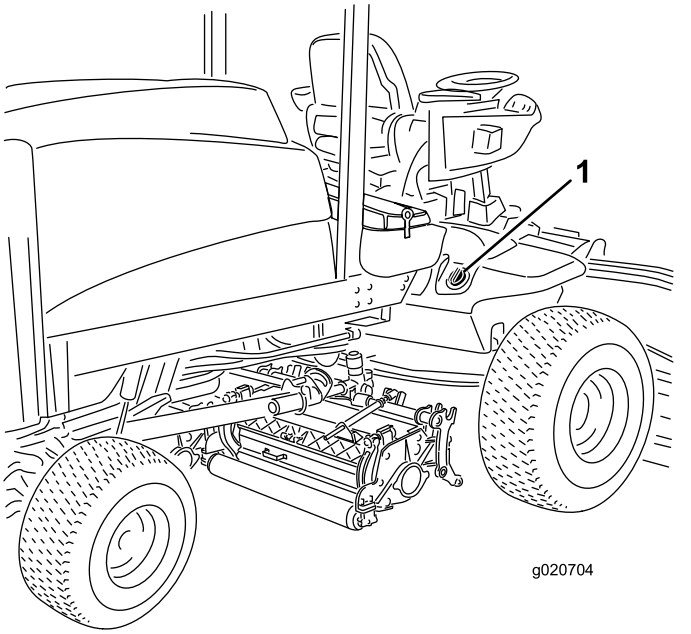


Figure 37

1. Hydraulic-tank cap

3. Remove the cap from the filler neck.
4. Remove the dipstick from the filler neck and wipe it with a clean rag.
5. Insert the dipstick into the filler neck; then remove it and check the fluid level.

   The fluid level should be between the 2 marks on the dipstick.
6. If the level is low, add the appropriate fluid to raise the level to the upper mark.
7. Install the dipstick and cap onto the filler neck.

Checking the Tire Pressure

Service Interval: Before each use or daily

The tires are overinflated for shipping. Therefore, release some of the air to reduce the pressure. The correct air pressure in the tires is 83 to 103 kPa (12 to 15 psi). Check the tire pressure daily.

Important: **Maintain the recommended pressure in all tires to ensure a good quality of cut and proper machine performance. Do not underinflate the tires.**

Starting and Stopping the Engine

Starting the Engine

Important: **Bleed the fuel system if any of the following situations have occurred:**

- The engine has ceased running due to lack of fuel.
- Maintenance has been performed upon the fuel system components.

1. Remove your foot from the traction pedal and ensure that the pedal is in the neutral position.

   Note: Ensure that the parking brake is set.
2. Move the engine-speed switch to the low idle position.
3. Turn the ignition key to the Run position.

   Note: The glow indicator will light.
4. When the glow indicator dims, turn the ignition key to the Start position.
5. Release the key immediately when the engine starts and allow it to return to the Run position.
6. Adjust the engine speed.

   Important: **Do not run the starter motor more than 15 seconds at a time or premature starter failure may result. If the engine fails to start after 15 seconds, turn the key to the Off position, recheck the controls and procedures, wait 15 additional seconds, and repeat the starting procedure.**

   When the temperature is less than -7°C (20°F), the starter motor can be run for 30 seconds on then 60 seconds off for 2 attempts.

⚠ CAUTION

Contact with moving parts could cause injury.

Shut the engine off and wait for all moving parts to stop before checking for oil leaks, loose parts, and other malfunctions.

Stopping the Engine

Important: **Allow the engine to idle for 5 minutes before shutting it off after a full-load operation. This allows the turbocharger to cool down before shutting the engine off. Failure to do so may lead to turbocharger trouble.**

Note: Lower the cutting units to the ground whenever you park the machine. This relieves the hydraulic load

from the system, prevents wear on system parts, and also prevents accidental lowering of the cutting units.

1. Return the engine speed to low idle.
2. Move the PTO switch to the Off position.
3. Set the parking brake.
4. Rotate the ignition key to Off.
5. Remove the key from the switch to prevent accidental starting.

Engine Speed Switch

The engine speed switch has 2 modes to change the engine speed. Momentarily tapping the switch increases or decreases the engine speed in 100-rpm increments. Holding the switch down moves the engine speed directly to high or low idle, depending on which side of the switch you press.

Checking the Interlock Switches

Service Interval: Before each use or daily

⚠ CAUTION

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

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

The machine has interlock switches in the electrical system. These switches are designed to stop the engine when operator gets off of the seat when the traction pedal is pressed. However, the operator may get off of the seat while the engine is running and the traction pedal is in neutral. Although the engine will continue to run if the PTO switch is disengaged and the traction pedal is released, it is strongly recommended that the engine be stopped before rising from the seat.

To check the operation of the interlock switches, perform the following procedure:

1. Drive the machine slowly to a large, relatively open area.
2. Lower the cutting units, stop the engine, and apply the parking brake.
3. Sit on the seat and press the traction pedal.
4. Try to start the engine.

   Note: The engine should not crank. If the engine cranks, there is a malfunction in the interlock system that should be corrected before beginning operation.
5. Sit on the seat and start the engine.
6. Rise from the seat and move the PTO switch to the On position.

   Note: The PTO should not engage. If the PTO engages, there is a malfunction in the interlock system that should be corrected before beginning operation.
7. Sit on the seat, engage the parking brake, and start the engine.
8. Move the traction pedal out of the Neutral position.

   Note: The engine should kill. If the engine does not kill, there is a malfunction in the interlock system that should be corrected before beginning operation.

Cutting Grass with the Machine

Note: Cutting grass at a rate that loads the engine promotes DPF regeneration.

1. Move the machine to the job site and align the machine outside the cutting area for the first cutting pass.
2. Ensure that the PTO switch is set to the DISABLE position.
3. Move the lever for the mow-speed limiter forward.
4. Press the throttle-speed switch to set the engine speed to HIGH IDLE.
5. Use the joystick to lower the cutting units to the ground.
6. Press the PTO switch to prepare cutting units for operation.
7. Use the joystick to raise the cutting units off the ground.
8. Begin moving the machine toward the cutting area and lower the cutting units.

   Note: Cutting grass at a rate that loads the engine promotes DPF regeneration.
9. When you complete the mowing pass, use the joystick to lift the cutting units.
10. Perform a tear-shaped turn to quickly line up for your next pass.

Diesel Particulate Filter Regeneration

The diesel particulate filter (DPF) is part of the exhaust system. The diesel-oxidation catalyst of the DPF reduces harmful gasses and the soot filter removes soot from the engine exhaust.

The DPF regeneration process uses heat from the engine exhaust to incinerate the soot accumulated on the soot filter, converting the soot to ash, and clears the channels of the soot filter so that filtered engine exhaust flows out the DPF.

The engine computer monitors the accumulation of soot by measuring the back pressure in the DPF. If the back pressure is too high, soot is not incinerating in the soot filter through normal engine operation. To keep the DPF clear of soot, remember the following:

- Passive regeneration occurs continuously while the engine is running—run the engine at full engine speed when possible to promote DPF regeneration.
- If the back pressure is too high, the engine computer signals you through the InfoCenter when additional processes (assist and reset regeneration) are running.
- Allow the assist and reset regeneration process to complete before shutting off the engine.

Operate and maintain your machine with the function of the DPF in mind. Engine load at high idle engine speed generally produce adequate exhaust temperature for DPF regeneration.

Important: **Minimize the amount of time that you idle the engine or operate the engine at low-engine speed to help reduce the accumulation of soot in the soot filter.**

⚠ CAUTION

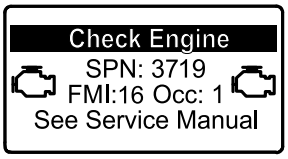
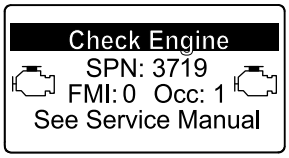
The exhaust temperature is hot (approximately 600°C (1112°F) during DPF parked regeneration or recovery regeneration. Hot exhaust gas can harm you or other people.

- **Never operate the engine in an enclosed area.**
- **Make sure that there are no flammable materials around the exhaust system.**
- **Never touch a hot exhaust system component.**
- **Never stand near or around the exhaust pipe of the machine.**

DPF Soot Accumulation

- Over time, the DPF accumulates soot in the soot filter. The computer for the engine monitors the soot level in the DPF.
- When enough soot accumulates, the computer informs you that it is time to regenerate the diesel particulate filter.
- DPF regeneration is a process that heats the DPF to convert the soot to ash.
- In addition to the warning messages, the computer reduces the power produced by the engine at different soot-accumulation levels.

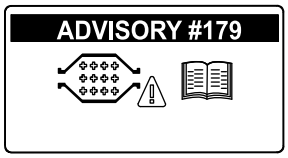
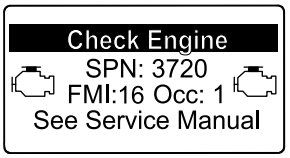
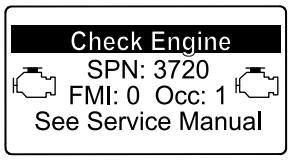
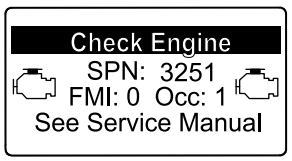
Engine Warning Messages—Soot Accumulation

Indication Level	Fault Code	Engine Power Rating	Recommended Action
Level 1: Engine Warning	 g213866 **Figure 38** Check Engine SPN 3719, FMI 16	The computer de-rates the engine power to 85%	Perform a parked regeneration as soon as possible; refer to Parked Regeneration (page 41).
Level 2: Engine Warning	 g213867 **Figure 39** Check Engine SPN 3719, FMI 0	The computer de-rates the engine power to 50%	Perform a recovery regeneration as soon as possible; refer to Recovery Regeneration (page 44).

DPF Ash Accumulation

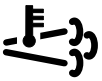
- The lighter ash is discharged through the exhaust system; the heavier ash collects in the soot filter.
- Ash is a residue of the regeneration process. Over time, the diesel particulate filter accumulates ash that does not discharge with the engine exhaust.
- The computer for the engine calculates the amount of ash accumulated in the DPF.
- When enough ash accumulates, the engine computer sends information to the InfoCenter in the form of a system advisory or an engine fault to indicate the accumulation of ash in the DPF.
- The advisory and faults are indications that it is time to service the DPF.
- In addition to the warnings, the computer reduces the power produced by the engine at different ash-accumulation levels.

InfoCenter Advisory and Engine Warning Messages—Ash Accumulation

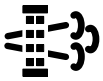
Indication Level	Advisory or Fault Code	Engine Speed Reduction	Engine Power Rating	Recommended Action
Level 1: System Advisory	 g213865 **Figure 40** Advisory #179	None	100%	Notify your service department that advisory #179 displays in the InfoCenter.
Level 2: Engine Warning	 g213863 **Figure 41** Check Engine SPN 3720, FMI 16	None	The computer de-rates the engine power to 85%	Service the DPF; refer to Servicing the Diesel-Oxidation Catalyst (DOC) and the Soot Filter (page 56)
Level 3: Engine Warning	 g213864 **Figure 42** Check Engine SPN 3720, FMI 0	None	The computer de-rates the engine power to 50%	Service the DPF; refer to Servicing the Diesel-Oxidation Catalyst (DOC) and the Soot Filter (page 56)
Level 4: Engine Warning	 g214715 **Figure 43** Check Engine SPN 3251, FMI 0	Engine speed at max torque + 200 rpm	The computer de-rates the engine power to 50%	Service the DPF; refer to Servicing the Diesel-Oxidation Catalyst (DOC) and the Soot Filter (page 56)

Types of Diesel Particulate Filter Regeneration

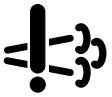
Types of diesel particulate filter regeneration that are performed while the machine is operating:

Type of Regeneration	Conditions for DPF regeneration	DPF description of operation
Passive	Occurs during normal operation of the machine at high-engine speed or high-engine load	The InfoCenter does not display an icon indicating passive regeneration. During passive regeneration, the DPF processes high-heat exhaust gasses; oxidizing harmful emissions and burning soot to ash. Refer to Passive DPF Regeneration (page 40).
Assist	Occurs as a result of low-engine speed, low-engine load, or after the computer detects back pressure in the DPF	 When the assist/reset-regeneration icon is displayed in the InfoCenter, an assist regeneration is in progress. During assist regeneration, the computer controls the intake throttle to increase the exhaust temperature, enabling assist regeneration to occur. Refer to Assist DPF Regeneration (page 40).
Reset	Occurs after assist regeneration only if the computer detects that assist regeneration did not sufficiently reduce the soot level Also occurs every 100 hours to reset baseline sensor readings	 When the assist/reset-regeneration icon is displayed in the InfoCenter, a regeneration is in progress. During reset regeneration, the computer controls the intake throttle and fuel injectors to increase the exhaust temperature during regeneration. Refer to Reset Regeneration (page 41).

Types of diesel particulate filter regeneration that require you to park the machine:

Type of Regeneration	Conditions for DPF regeneration	DPF description of operation
Parked	Soot buildup occurs as a result of prolonged operation at low-engine speed or low-engine load. May also occur as a result of using incorrect fuel or oil The computer detects back pressure due to soot buildup and requests a parked regeneration	 When the parked-regeneration icon is displayed in the InfoCenter, a regeneration is requested. • Perform the parked regeneration as soon as possible to avoid needing a recovery regeneration. • A parked regeneration requires 30 to 60 minutes to complete. • You must have at least a 1/4 tank of fuel in the tank. • You must park the machine to perform a recovery regeneration. Refer to Parked Regeneration (page 41).

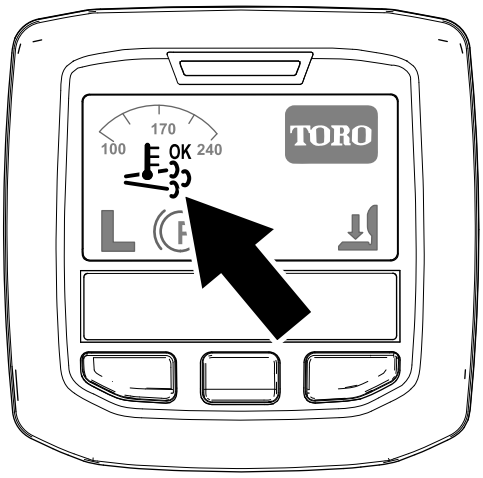
Types of diesel particulate filter regeneration that require you to park the machine: (cont'd.)

Type of Regeneration	Conditions for DPF regeneration	DPF description of operation
Recovery	Occurs as a result of ignoring parked regeneration requests and continuing operation, adding more soot when the DPF is already in need of a parked regeneration	When the recovery-regeneration icon  is displayed in the InfoCenter, a recovery regeneration is requested. Contact your Authorized Toro Distributor to have a service technician perform the recovery regeneration. • A recovery regeneration requires up to 4 hours to complete. • You must have at least a 1/2 tank of fuel in the machine. • You must park the machine to perform a recovery regeneration. Refer to Recovery Regeneration (page 44).

Passive DPF Regeneration

- Passive regeneration occurs as part of normal engine operation.
- While operating the machine, run the engine at full-engine speed when possible to promote DPF regeneration.

Assist DPF Regeneration



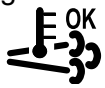
g214711

Figure 44
Assist/reset-regeneration icon

- The assist/reset-regeneration icon displays in the InfoCenter (Figure 44).
- The computer takes control of the intake throttle to increase the temperature of the engine exhaust.
- While operating the machine, run the engine at full engine speed when possible to promote DPF regeneration.
- The 

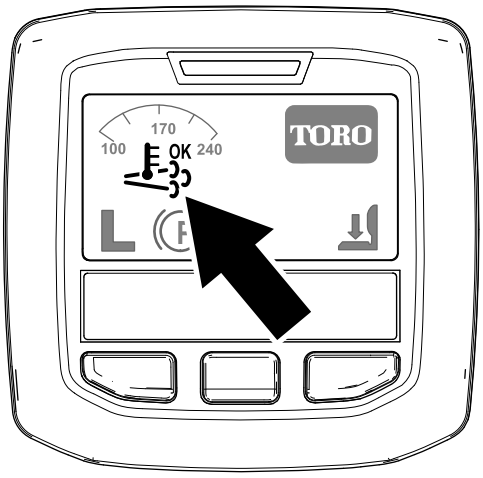
icon displays in the InfoCenter while the assist regeneration is processing.
- Whenever possible, do not shut off the engine or reduce engine speed while the assist regeneration is processing.

Important: **Allow the machine to complete the assist regeneration process before shutting off the engine.**

Note: The assist regeneration is finished processing when the 

icon disappears from the InfoCenter.

Reset Regeneration



g214711

Figure 45
Assist/reset-regeneration icon

- The assist/reset-regeneration icon displays in the InfoCenter (Figure 45).
- The computer takes control of the intake throttle and changes the fuel injection operation to increase the temperature of the engine exhaust.

  Important: **The assist/reset-regeneration icon indicates that the exhaust temperature discharged from of your machine may be hotter than during regular operation.**
- While operating the machine, run the engine at full engine speed when possible to promote DPF regeneration.
- The 

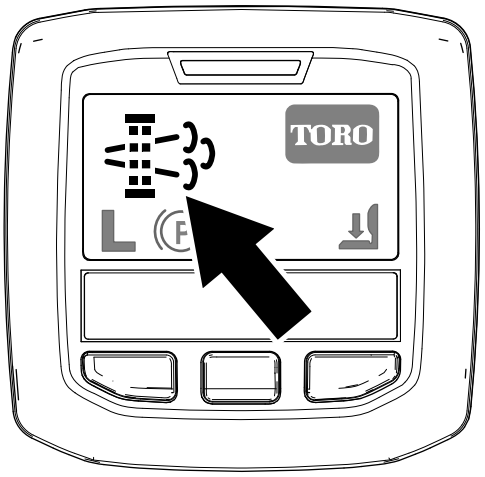
icon displays in the InfoCenter while the reset regeneration is processing.
- Whenever possible, do not shut off the engine or reduce engine speed while the reset regeneration is processing.

  Important: **Allow the machine to complete the reset regeneration process before shutting off the engine.**

  Note: The reset regeneration is finished processing when the 

icon disappears from the InfoCenter.

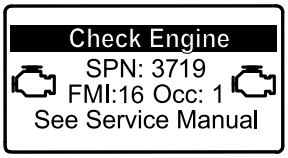
Parked Regeneration



g214713

Figure 46
Parked-regeneration request icon

- The parked-regeneration requested icon displays in the InfoCenter (Figure 46).
- If a parked regeneration is needed, the InfoCenter displays engine warning SPN 3719, FMI 16 (Figure 47) and the engine computer derates engine power to 85%.



g213866

Figure 47

Important: **If you do not complete a parked regeneration within 2 hours, the engine computer derates engine power to 50%.**

- A parked regeneration requires 30 to 60 minutes to complete.
- If you are authorized by your company, you need the PIN code to perform the parked-regeneration process.

Preparing to Perform a Parked or Recovery Regeneration

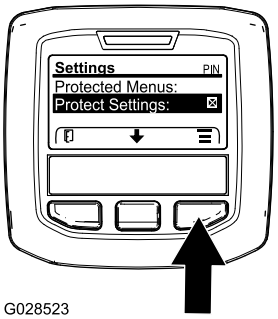
1. Ensure that the machine has at least 1/4 tank of fuel.
2. Move the machine outside to an area away from combustible materials.
3. Park the machine on a level surface.
4. Ensure that the traction control or motion-control levers are in the NEUTRAL position.
5. If applicable, lower the cutting units and shut them off.

6. Engage the parking brake.
7. Set the throttle to the low IDLE position.

Performing a Parked Regeneration

Note: For instructions on unlocking protected menus, refer to Accessing Protected Menus (page 28).

1. Access the protected menu and unlock the protected settings submenu (Figure 48); refer to Accessing Protected Menus (page 28).

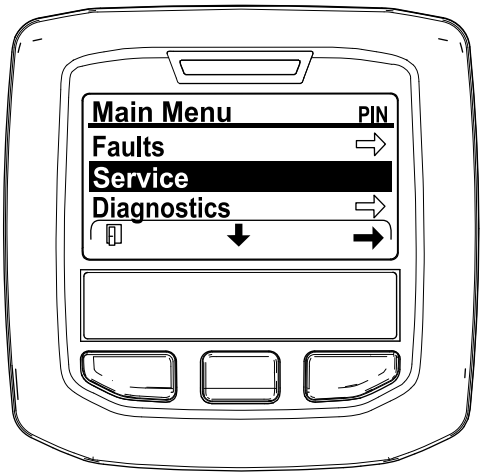


g028523

Figure 48

2. Navigate to the MAIN MENU, press the center button to scroll down to the SERVICE MENU, and press the right button to select the SERVICE option (Figure 49).

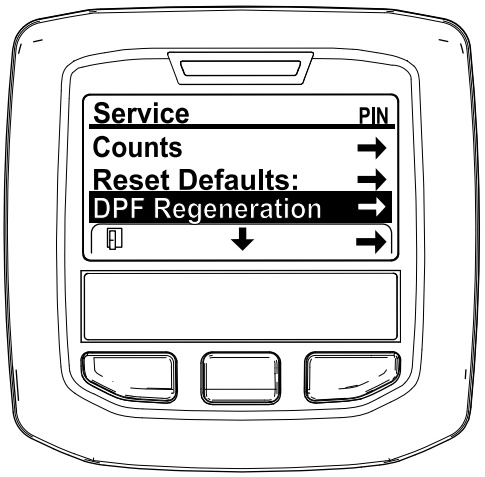
   Note: The InfoCenter should display the PIN indicator in the upper right corner of the display.



g212371

Figure 49

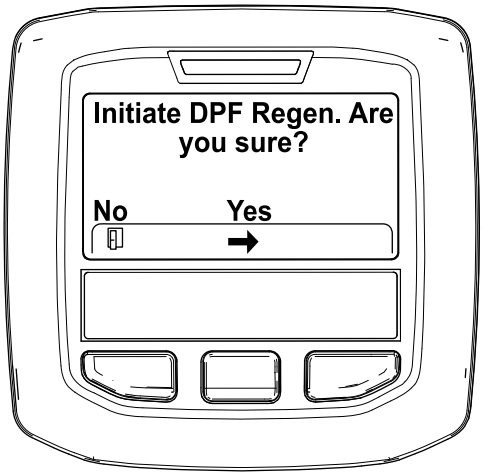
3. In the SERVICE MENU, press the middle button until the DPF REGENERATION options displays, and press the right button to select the DPF REGENERATION option (Figure 50).



g212138

Figure 50

4. When the “Initiate DPF Regen. Are you sure?” message displays, press the center button (Figure 51).



g212125

Figure 51

5. If the coolant temperature is below 60°C (140°F) the “Insure is running and above 60C/140F” message displays. (Figure 52).

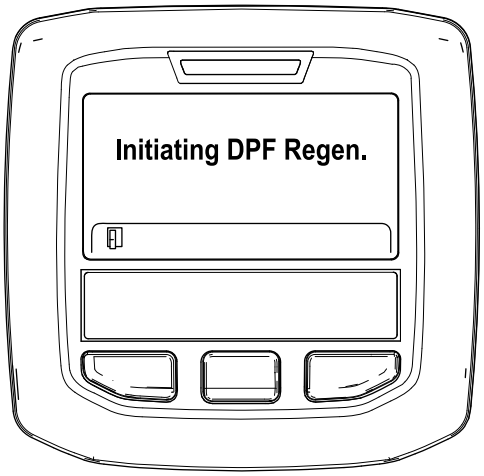
   Observe the temperature in the display, and run the machine at full throttle until the temperature reaches 60°C (140°F), then press the center button.

   Note: If the coolant temperature is above 60°C (140°F) this screen is skipped.



g211986

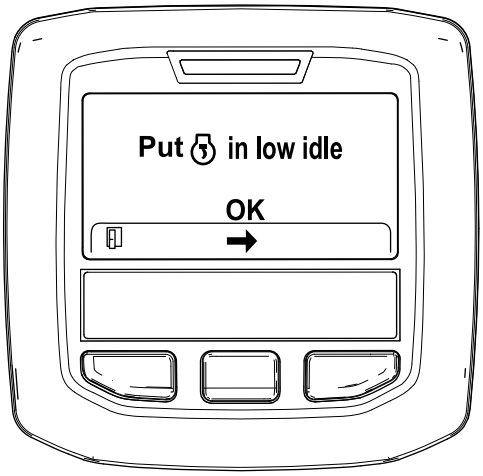
Figure 52



g212405

Figure 54

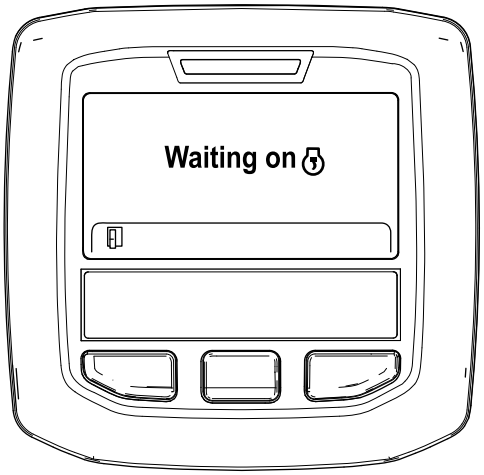
6. Move the throttle control to LOW IDLE and press the center button (Figure 53).



g212372

Figure 53

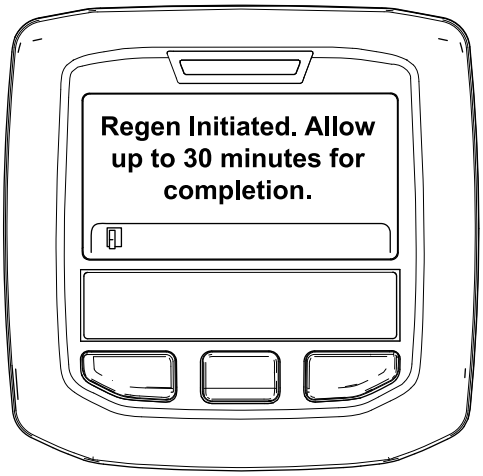
7. The following messages display as the parked regeneration process begins:
   A. The “Initiating DPF Regen.” message displays (Figure 54).
   B. The “Waiting on ” message displays (Figure 55).



g212406

Figure 55

   C. The computer determines whether the regeneration runs. One of the following messages displays in the InfoCenter:
      - If the regeneration is allowed, the “Regen Initiated. Allow up to 30 minutes for completion” message displays in the InfoCenter, wait for the machine to complete the parked regeneration process (Figure 56).

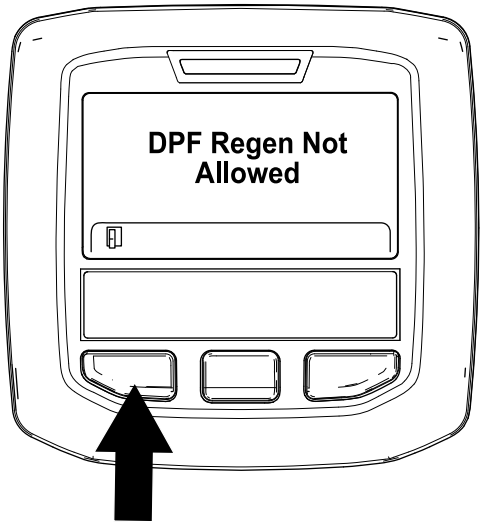


g213424

Figure 56

- If the regeneration process is not allowed by the engine computer, the “DPF Regen Not Allowed” message displays in the InfoCenter (Figure 57). Press the left button to exit to the home screen

  Important: **If you did not meet all the requirements for regeneration or if less than 50 hours have passed since the last regeneration, the “DPF Regen Not Allowed” message appears.**



g212410

Figure 57

8. While the regeneration is running, the InfoCenter returns to the home screen and shows the following icons:



The engine is cold—wait.

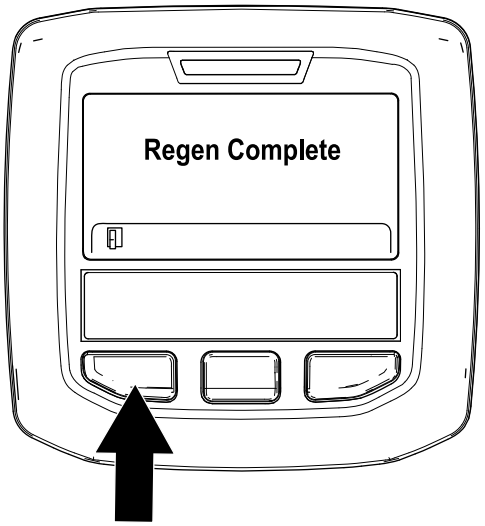


The engine is warm—wait.



The engine hot—regeneration in progress (percent complete).

9. The parked regeneration is complete when the “Regen Complete” message displays in the InfoCenter. Press the left button to exit to the home screen (Figure 58).

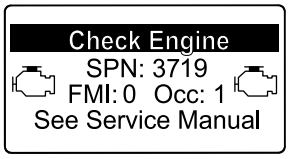


g212404

Figure 58

Recovery Regeneration

- If you ignore the request for a parked regeneration (displayed in the InfoCenter) and continue to operate the machine, a critical amount of soot builds up in the DPF.
- If a recovery regeneration is needed, the InfoCenter displays engine warning SPN 3719, FMI 16 (Figure 59) and the engine computer derates engine power to 85%.



g213867

Figure 59

Important: **If you do not complete a recovery regeneration within 15 minutes, the engine computer derates engine power to 50%.**

- Perform a recovery-regeneration whenever there is a loss of engine power and a parked regeneration cannot effectively clean the DPF of soot.
- A recovery regeneration requires up to 4 hours to complete.
- You need a distributor technician to perform the recovery regeneration process; contact your Authorized Toro Distributor.

Adjusting the Lift-Arm Counterbalance

You can adjust the counterbalance on the rear cutting-unit lift arms to compensate for different turf conditions and to maintain a uniform height of cut in rough conditions or in areas of thatch buildup.

You can adjust each counterbalance spring to 1 of 4 settings. Each increment increases or decreases the counterbalance on the cutting unit by 2.3 kg (5 lb). The springs can be positioned on the back side of the spring actuator to remove all counterbalance (fourth position).

1. Position the machine on a level surface, lower the cutting units, stop the engine, engage the parking brakes, and remove the key from the ignition switch.
2. Insert a tube or similar object onto the long spring end to relieve the spring tension during the adjustment (Figure 60).

⚠ CAUTION

The springs are under tension and could cause personal injury.

Use caution when adjusting the springs.

3. While relieving the spring tension, remove the bolt and locknut securing the spring actuator to the bracket (Figure 60).

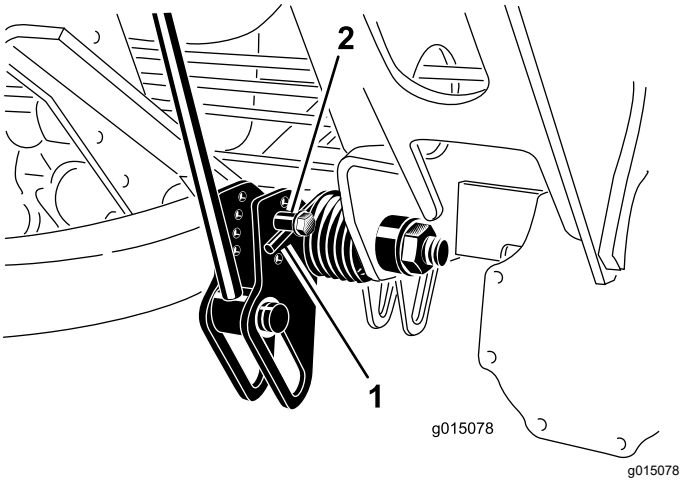


Figure 60

1. Spring
2. Spring actuator

4. Move the spring actuator to the desired hole location and secure it with the locknut.
5. Repeat the procedure on the remaining spring.

Adjusting the Lift-Arm Turnaround Position

1. Position the machine on a level surface, lower the cutting units, stop the engine, engage the parking brakes, and remove the key from the ignition switch.
2. The lift-arm switch is located behind the front right lift arm (Figure 61).

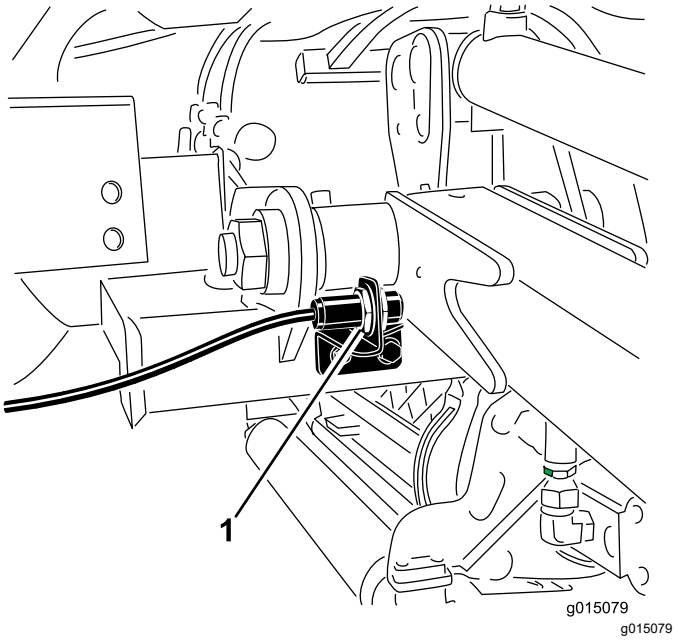


Figure 61

1. Switch

3. Loosen the switch mounting screws (Figure 61) and move the switch up to increase the lift-arm turnaround height or move the switch down to decrease the lift-arm turnaround height.
4. Tighten the mounting screws.

Pushing or Towing the Machine

In an emergency, you can move the machine by actuating the bypass valve in the variable displacement hydraulic pump and installing a hydraulic hose to bypass the check valve, and then pushing or towing the machine.

Important: **Do not push or tow the machine faster than 3 to 4.8 km/h (2 to 3 mph) or for more than 0.4 km (1/4 mile), because internal transmission damage may occur. The bypass valve must be open whenever you push or tow the machine. Additionally, you need to install a hydraulic hose to bypass the check valve whenever you push or tow the machine in reverse.**

If you need to push or tow your machine, you will likely need to move it both forward and in reverse. To ensure that the drive system does not become damaged from pushing or towing, it is best to prepare the machine for both forward and reverse pushing or towing.

Preparing the Machine for Pushing or Towing in Reverse

Important: **If you need to push or tow the machine in reverse, you must first bypass the check valve in the 4-wheel-drive manifold.**

The following Toro parts are needed to bypass the check valve:

- 59-7410, diagnostic fitting
- 354-79, diagnostic-fitting cap
- 95-8843, hydraulic hose
- 95-0985, coupler fitting (2)
- 340-77, hydraulic fitting (2)

1. Install a diagnostic fitting in the unmarked port located between ports M8 and P2 on the rear traction manifold (Figure 62).

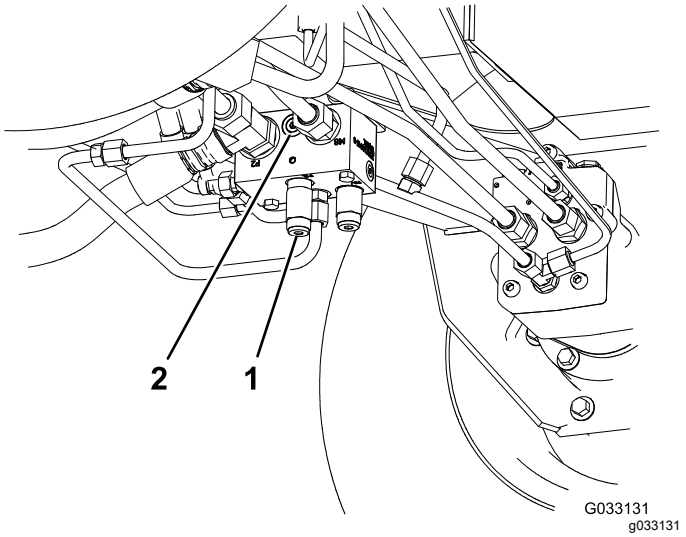


Figure 62

1. Rear traction manifold (behind front left wheel)
2. Unmarked port

2. Connect a hydraulic hose between the diagnostic fitting installed in the rear traction manifold and the reverse traction pressure test port (Figure 63).

   Note: Use the hydraulic fittings and coupler fittings as needed to install the hose.

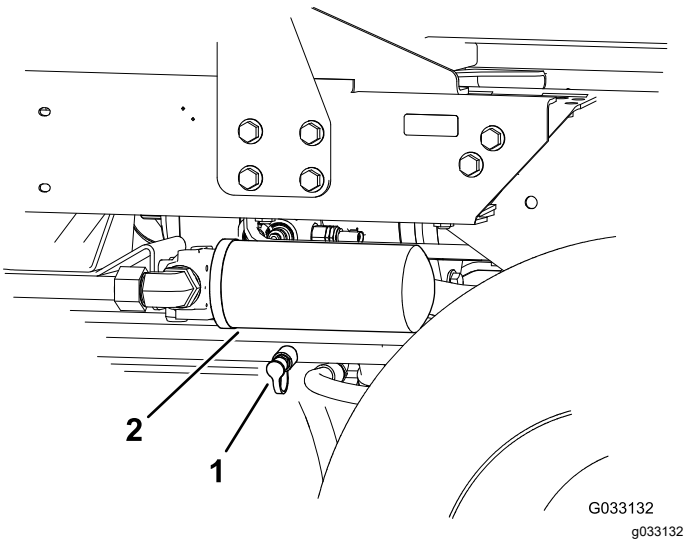


Figure 63

1. Reverse traction pressure test port
2. Hydraulic fluid return filter

3. Rotate the bypass valve 90° (1/4 turn) in either direction to open it and allow fluid to bypass internally (Figure 64).

   Note: Because the fluid bypasses the transmission, you can move the machine slowly without damaging the transmission.

   Note the position of the valve when opening and closing it.

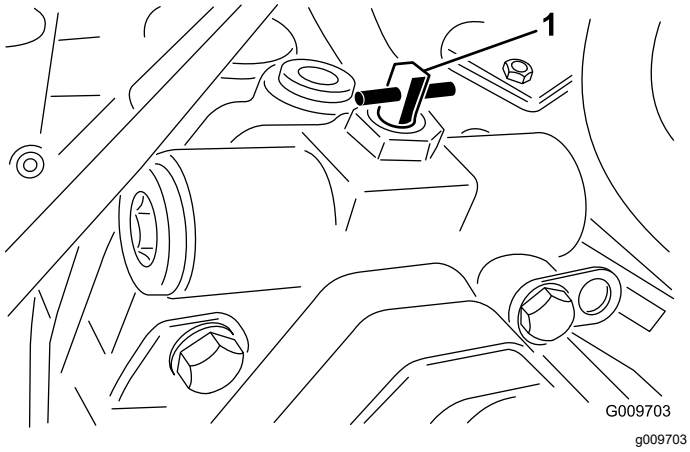


Figure 64

1. Bypass valve

4. When you are finished pushing or towing the machine, remove the hydraulic hose that you installed.
5. Install the existing cap onto the reverse traction pressure test port.
6. Install the diagnostic-fitting cap onto the fitting that you installed on the manifold.
7. Rotate the bypass valve 90° (1/4 turn) back before starting the engine.

   Note: Do not exceed 7 to 11 N·m (5 to 8 ft-lb) torque to close the valve.

Pushing or Towing the Machine Forward Only

If you need to push or tow the machine forward only, you can just rotate the bypass valve.

Important: **If you need to push or tow the machine in reverse, refer to Preparing the Machine for Pushing or Towing in Reverse (page 46).**

1. Open the hood and remove the center shroud.
2. Rotate the bypass valve 90° (1/4 turn) in either direction to open it and allow fluid to bypass internally (Figure 64).

   Note: Because the fluid bypasses the transmission, you can move the machine forward slowly without damaging the transmission.

   Note the position of the valve when opening and closing it.
3. Rotate the bypass valve 90° (1/4 turn) back before starting the engine.

   Note: Do not exceed 7 to 11 N·m (5 to 8 ft-lb) torque to close the valve.

Hauling the Machine

- Use care when loading or unloading the machine into or out of a trailer or a truck.
- Use a full-width ramp for loading or unloading the machine into or out of a trailer or a truck.
- Tie the machine down securely using straps, chains, cable, or ropes. Both front and rear straps should be directed down and outward from the machine.

Identifying the Jacking Points

The jacking points are in the following locations:

- On the front of the machine on the frame on the inside of each drive tire
- On the rear of the machine at the center of the axle

Identifying the Tie-Down Points

The tie-down points are in the following locations:

- On each side of the frame under the front steps
- The rear bumper

Operating Characteristics

Practice driving the machine because it has a hydrostatic transmission and its characteristics are different than many turf-maintenance machines. Some points to consider when operating the traction unit and cutting units are the transmission, engine speed, load on the cutting blades, and the importance of the brakes.

To maintain enough power for the machine while operating, regulate the traction pedal to keep the engine speed high and somewhat constant. A good rule to follow is to decrease the ground speed as the load on the cutting units increases, and increase the ground speed as the load decreases.

Therefore, allow the traction pedal to move backward as the engine speed decreases, and press the pedal slowly as the speed increases. By comparison, when driving from one work area to another, with no load and the cutting unit raised, have the throttle in the Fast position and press the traction pedal slowly but fully to attain maximum ground speed.

Another characteristic to consider is the operation of the pedals that are connected to the brakes. You

can use the brakes to assist in turning the machine. However, use them carefully, especially on soft or wet grass, because the turf may be torn accidentally. Another benefit of the brakes is to maintain traction. For example, in some slope conditions, the uphill wheel slips and loses traction. If this situation occurs, press the uphill turn pedal gradually and intermittently until the uphill wheel stops slipping, thus increasing traction on the downhill wheel.

Use extra care when operating the machine on slopes. Make sure that the seat latch is properly secured and the seat belt is buckled. Drive slowly and avoid sharp turns on slopes to prevent rollovers. For steering control, the cutting unit must be lowered when going downhill.

Important: **Allow engine to idle for 5 minutes before shutting it off after a full load operation. This allows the turbocharger to cool down before shutting the engine off. Failure to do so may lead to turbocharger trouble.**

Before stopping the engine, disengage all controls and move the throttle to Slow. Moving the throttle to Slow reduces high engine speed, noise, and vibration. Turn the key to Off to stop the engine.

Operating Tips

Becoming Familiar with the Machine

Before mowing grass, practice operating the machine in an open area. Start and stop the engine. Operate in forward and reverse. Lower and raise the cutting units and engage and disengage the reels. When you feel familiar with the machine, practice operating up and down slopes at different speeds.

Understanding the 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 you operate the machine with a malfunction.

Mowing Grass

Start the engine and move the engine speed switch to the Fast position. Move the Mow Speed Limiter to the mow position. Move the PTO switch to the On position and use the Lift Switch to control the cutting units (the front cutting units are timed to lower before the rear cutting units). To move forward and cut grass, press the traction pedal forward.

Driving the Machine in Transport Mode

Move the PTO switch to the Off position and raise the cutting units to the transport position. Move the Mow Speed Limiter to the transport position. Be careful when driving between objects so that you do not accidentally damage the machine or cutting units. Use extra care when operating the machine on slopes. Drive slowly and avoid sharp turns on slopes to prevent rollovers. Lower the cutting units when going downhill for steering control.

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 8 hours	• Torque the wheel nuts.
After the first 200 hours	• Change the planetary gear drive oil. • Change the oil in the rear axle. • Change the hydraulic filters.
Before each use or daily	• Check the cooling system. • Check the level of the hydraulic fluid. • Check the tire pressure. • Check the interlock switches. • Check the engine-oil level. • Drain water or other contaminants from the water separator. • Remove debris from the engine area, oil cooler, and radiator. • Inspect 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. • Check the battery condition.
Every 100 hours	• Check the condition and tension of the alternator belt.
Every 200 hours	• Torque the wheel nuts.
Every 250 hours	• Change the engine oil and filter.
Every 400 hours	• Service the air cleaner (Service the air cleaner earlier if the service indicator shows red. Service it more frequently in extremely dirty or dusty conditions.). • Check the fuel lines and connections for deterioration, damage, or loose connections. • Replace the fuel filter canister. • Replace the engine fuel filter. • Check the oil level of the planetary gear drive (also, check for external leakage). • Check the oil level of the rear axle. • Check the lubricant in the gear box of the rear axle.
Every 800 hours	• Drain and clean the fuel tank. • Change the planetary gear drive oil (or yearly, whichever comes first). • Change the oil in the rear axle. • Check the rear-wheel toe-in. • Change the hydraulic fluid. • Change the hydraulic filters.
Every 6,000 hours	• Disassemble, clean, and assemble the soot filter of the DPF. or clean the soot filter if engine faults SPN 3720 FMI 16, SPN 3720 FMI 0, or SPN 3720 FMI 16 display in the InfoCenter.
Before storage	• Drain and clean the fuel tank. • Check the tire pressure. • Check all fasteners. • Grease or oil all grease fittings and pivot points. • Paint chipped surfaces.

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 levels of the engine oil and fuel.							
Check the cooling-system fluid level.							
Drain the water/fuel separator.							
Check the air-filter service indicator.							
Check the radiator, oil cooler, and screen for debris.							
Check unusual engine noises.[1]							
Check unusual operating noises.							
Check the fluid level of the hydraulic system.							
Check the hydraulic hoses for damage.							
Check for fluid leaks.							
Check the tire pressure.							
Check the instrument 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

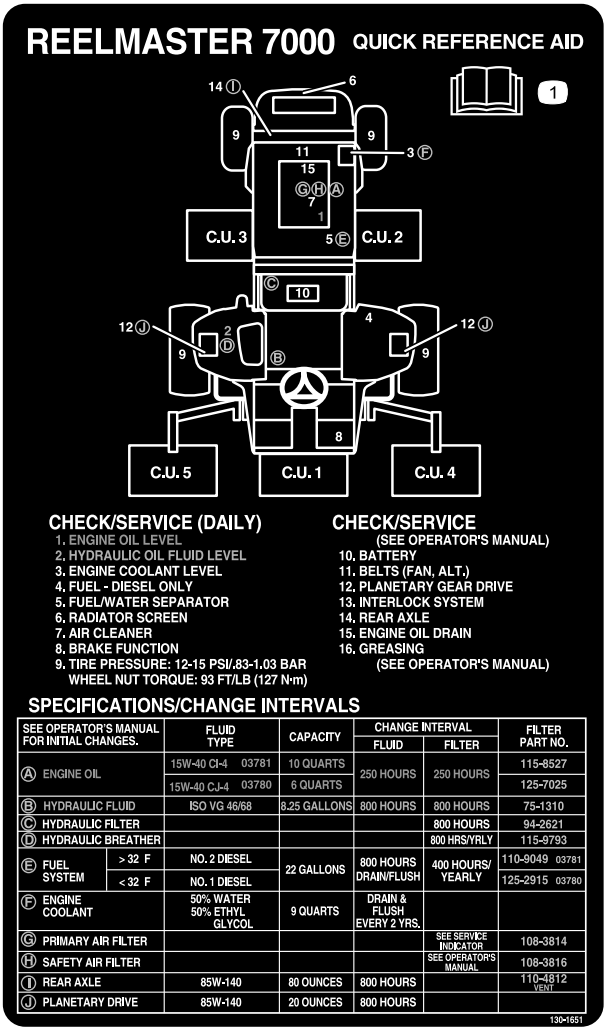
Notation for Areas of Concern

Inspection performed by:		
Item	**Date**	**Information**
1		
2		
3		
4		
5		
6		
7		
8		

Important: **Refer to your engine operator's manual and cutting unit *Operator's Manual* for additional maintenance procedures.**

Note: To obtain an electrical schematic or a hydraulic schematic for your machine, visit www.Toro.com.

Service Interval Chart



decal130-1651

Figure 65

⚠ 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.

Pre-Maintenance Procedures

Removing the Hood

1. Release the hood latches (Figure 66) and pivot open the hood.

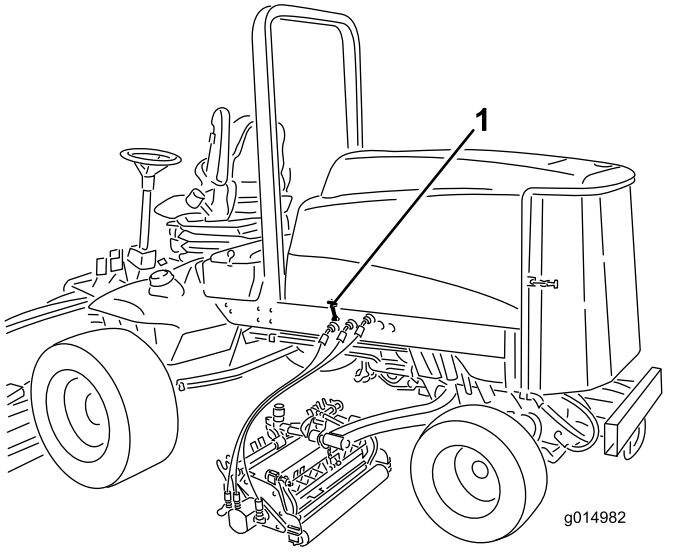


Figure 66

1. Hood latch (2)

2. Remove the cotter pins securing the rear hood brackets to the frame pins and lift off the hood.

Lubrication

Greasing the Bearings and Bushings

Service Interval: Every 50 hours

The machine has grease fittings that must be lubricated regularly with No. 2 lithium grease. If the machine is operated under normal conditions, lubricate all bearings and bushings after every 50 hours of operation or immediately after every washing.

The grease fitting locations and quantities are as follows:

- Brake shaft pivot bearings (5) (Figure 67)

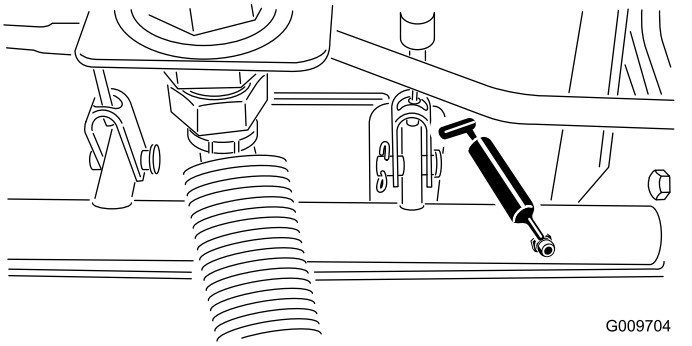


Figure 67

- Rear axle pivot bushings (2) (Figure 68)

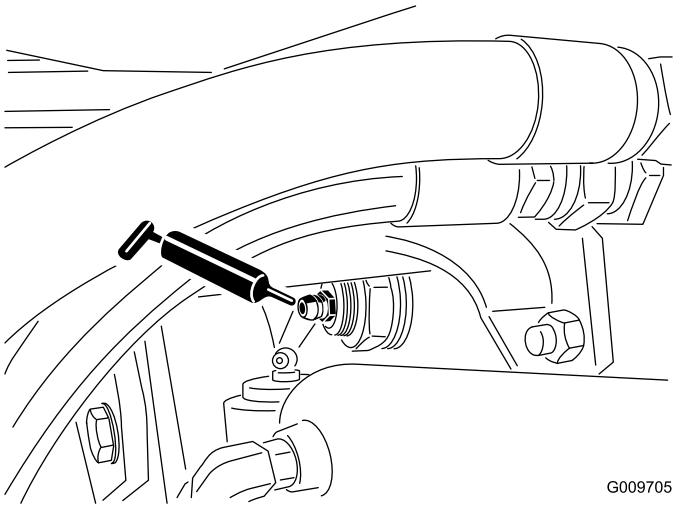


Figure 68

- Steering cylinder ball joints (2) (Figure 69)

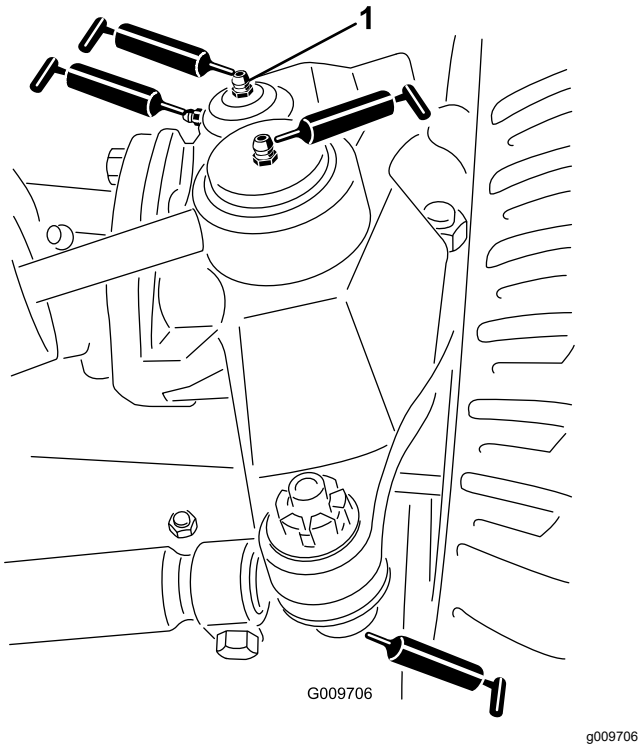


Figure 69

1. Top fitting on king pin

- Tie rod ball joints (2) (Figure 69)
- King pin bushings (2) (Figure 69). **The top fitting on the king pin should only be lubricated annually (2 pumps).**
- Lift arm bushings (1 per cutting unit) (Figure 70)

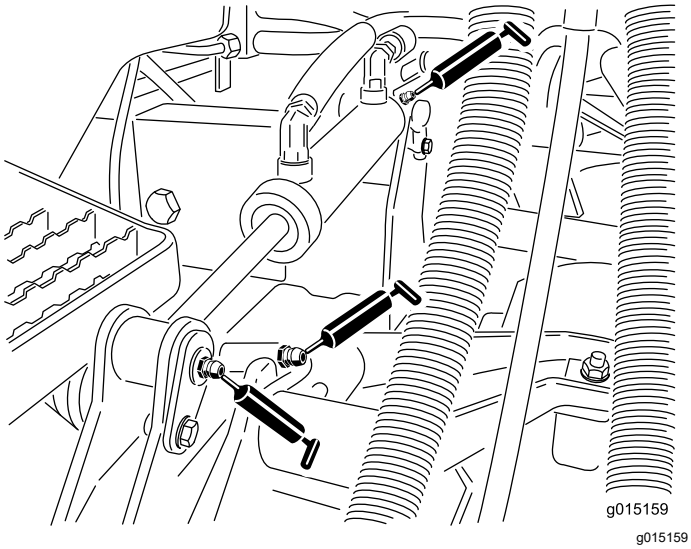


Figure 70

- Lift cylinder bushings (2 per cutting unit) (Figure 70)
- Lift arm pivot bushings (1 per cutting unit) (Figure 71)
- Cutting unit carrier frame (2 per cutting unit) (Figure 71)
- Cutting unit lift arm pivot (1 per cutting unit) (Figure 71)

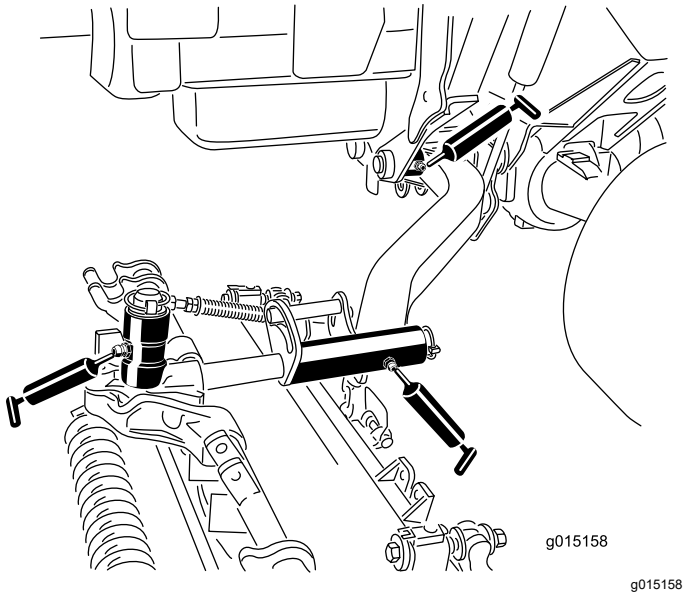


Figure 71

Servicing the Air Cleaner

Service Interval: Every 400 hours

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

Service the air-cleaner filter only when the service indicator (Figure 72) requires it. Changing the air filter before it is necessary only increases the chance of dirt entering the engine when the filter is removed.

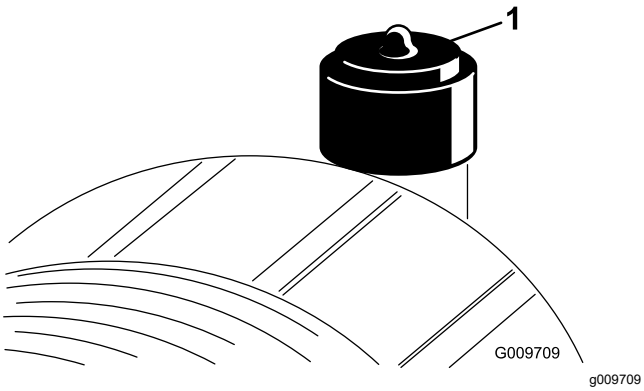


Figure 72

1. Service indicator

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

1. Pull the latch outward and rotate the air-cleaner cover counterclockwise (Figure 73).

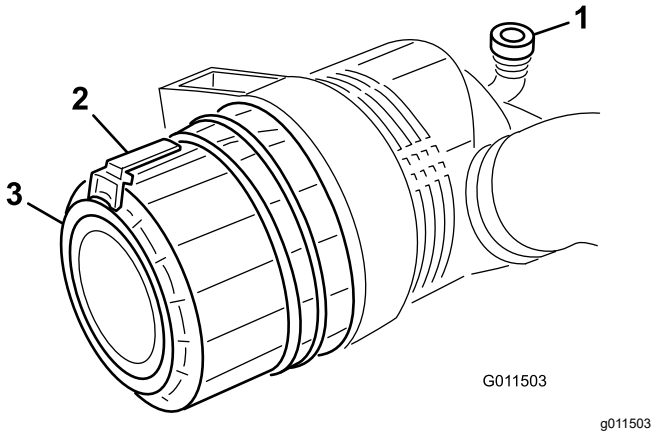


Figure 73

1. Service indicator
2. Latch
3. Cover

2. Remove the cover from the air-cleaner body.
3. Before removing the filter, use low-pressure air—275 kPa (40 psi), clean and dry—to help remove large accumulations of debris packed between outside of primary 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 (Figure 74).

   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.**

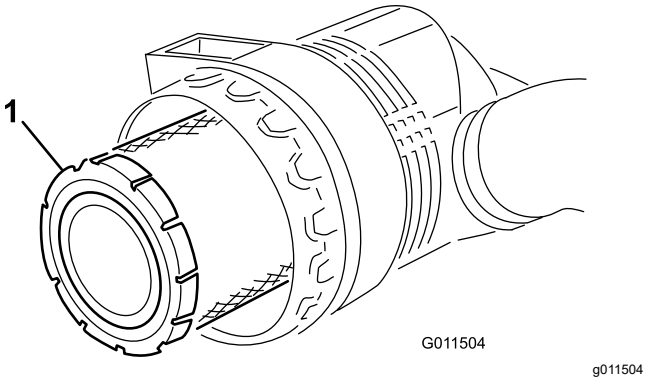


Figure 74

1. Primary filter

Important: **Never attempt to clean the safety filter (Figure 75). Replace the safety filter with a new one after every 3 primary filter services.**

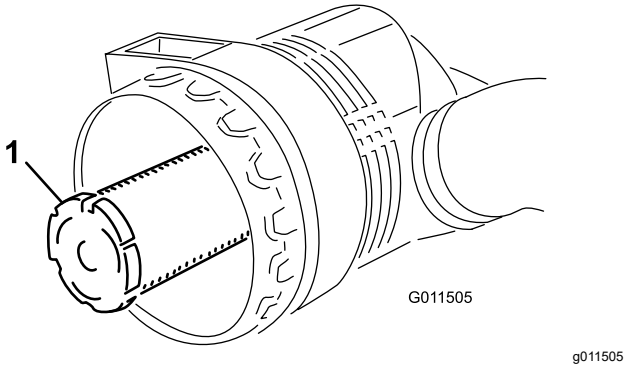


Figure 75

1. Safety filter

5. Clean the dirt-ejection port located in the removable cover.

6. Remove the rubber outlet valve from the cover, clean the cavity, and install the outlet valve.
7. Install the cover, orienting the rubber outlet valve in a downward position—between approximately 5:00 to 7:00 when viewed from the end.
8. Reset the indicator (Figure 72) if it shows red.

Servicing the Engine Oil

Oil Specification

Use high-quality, low-ash engine oil that meets or exceeds the following specifications:

- API service category CJ-4 or higher
- ACEA service category E6
- JASO service category DH-2

Important: **Using engine oil other than API CJ-4 or higher, ACEA E6, or JASO DH-2 may cause the diesel particulate filter to plug or cause engine damage.**

Use the following engine oil viscosity grade:

- Preferred oil: SAE 15W-40 (above 0°F)
- Alternate oil: SAE 10W-30 or 5W-30 (all temperatures)

Toro Premium Engine Oil is available from your Authorized Toro Distributor in either 15W-40 or 10W-30 viscosity grades. See the parts catalog for part numbers.

Checking the Engine-Oil Level

Service Interval: Before each use or daily

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

Important: **Check the engine oil daily. If the engine-oil level is above the Full mark on the dipstick, the engine oil may be diluted with fuel; If the engine oil level is above the Full mark, change the engine oil.**

The best time to check the engine oil is when the engine is cool before it has been started for the day. If it has already been run, allow the oil to drain back down to the sump for at least 10 minutes before checking. If the oil level is at or below the Add mark on the dipstick, add oil to bring the oil level to the Full mark. **Do not overfill the engine with oil**.

Important: **Keep the engine oil level between the upper and lower limits on the dipstick; the engine may fail if you run it with too much or too little oil.**

1. Park the machine on a level surface.
2. Unlock the hood latches and open the hood.
3. Remove the dipstick, wipe it clean, install the dipstick into the tube, and pull it out again.

   The oil level should be in the safe range (Figure 76).

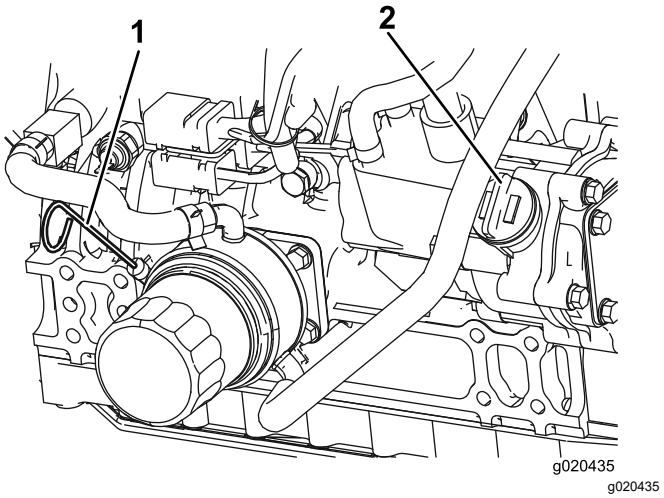


Figure 76

1. Dipstick
2. Oil-fill cap

4. If the oil is below the safe range, remove the fill cap (Figure 76) and add oil until the level reaches the Full mark.

   Important: **Do not overfill the engine with oil.**

   Note: When using different oil, drain all old oil from the crankcase before adding new oil.
5. Install the oil-fill cap and dipstick.
6. Close the hood and secure it with the latches.

Crankcase Oil Capacity

5.7 L (6.0 US qt) with the filter.

Changing the Engine Oil and Filter

Service Interval: Every 250 hours

1. Park the machine on a level surface, lower the cutting units, engage the parking brake, shut off the engine, and remove the key.
2. Remove the drain plug (Figure 77) and let the oil flow into a drain pan.

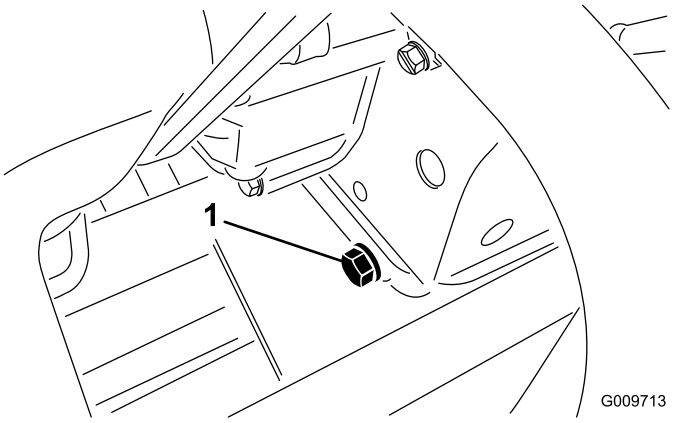


Figure 77

1. Drain plug

3. Install the drain plug when the oil stops.
4. Remove the oil filter (Figure 78).

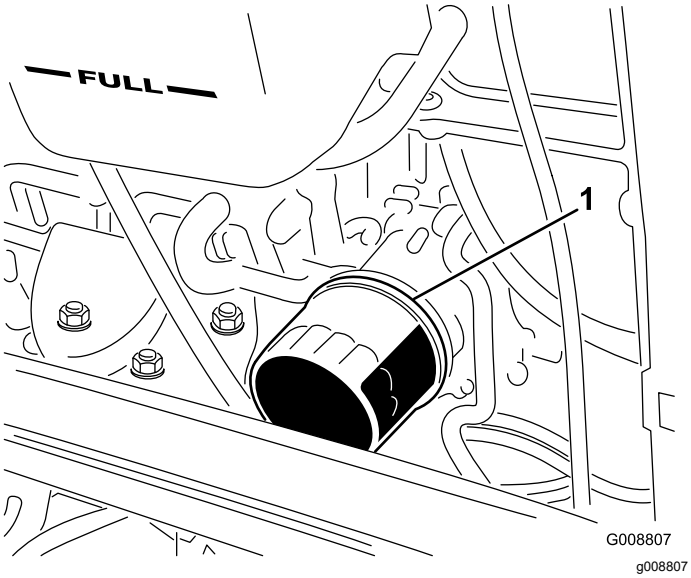


Figure 78

1. Oil filter

5. Apply a light coat of clean oil to the new filter seal before installing it.

   Note: Do not overtighten the filter.

6. Add oil to the crankcase; refer to Checking the Engine-Oil Level (page 55).

Servicing the Diesel-Oxidation Catalyst (DOC) and the Soot Filter

Service Interval: Every 6,000 hours or clean the soot filter if engine faults SPN 3720 FMI 16, SPN 3720 FMI 0, or SPN 3720 FMI 16 display in the InfoCenter.

- If advisory message ADVISORY 179 displays in the InfoCenter, the DPF is nearing the recommended point for servicing the diesel-oxidation catalyst and the soot filter.

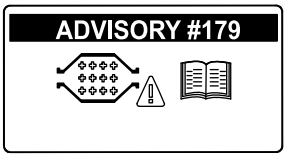


Figure 79

- If engine faults CHECK ENGINE SPN 3251 FMI 0, CHECK ENGINE SPN 3720 FMI 0, or CHECK ENGINE SPN 3720 FMI 16in the InfoCenter (Figure 80) display in the InfoCenter, clean the soot filter using the steps that follow:

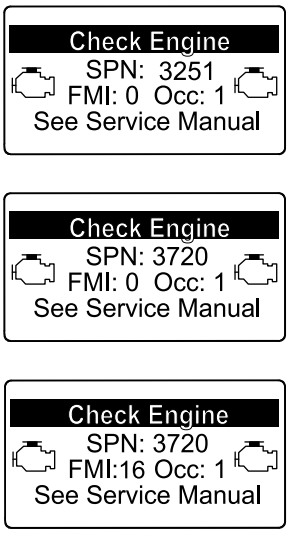


Figure 80

1. Refer to the Engine section in the *Service Manual* for information on disassembling and assembling the diesel-oxidation catalyst and the soot filter of the DPF.
2. Refer to your Authorized Toro Distributor for diesel-oxidation catalyst and the soot filter replacement parts or service.
3. Contact your Authorized Toro Distributor to have them reset the engine ECU after you install a clean DPF.

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.

- **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 25 mm (1 inch) below the top of the tank, not 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)

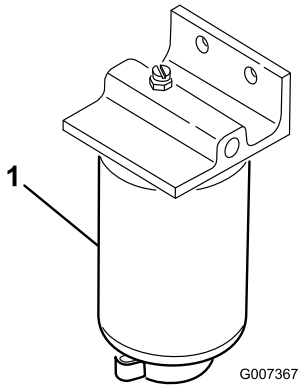
Inspect the fuel lines for deterioration, damage, or loose connections.

Servicing the Water Separator

Service Interval: Before each use or daily—Drain water or other contaminants from the water separator.

Every 400 hours—Replace the fuel filter canister.

1. Place a clean container under the fuel filter.
2. Loosen the drain plug on the bottom of the filter canister.



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Figure 81

1. Filter canister

3. Clean the area where the filter canister mounts.
4. Remove the filter canister and clean the mounting surface.
5. Lubricate the gasket on the filter canister with clean oil.
6. Install the filter canister by hand until the gasket contacts mounting surface, then rotate it an additional 1/2 turn.
7. Tighten the drain plug on the bottom of the filter canister.

Servicing the Fuel Filter

Service Interval: Every 400 hours

The engine fuel filter should be replaced after every 400 hours of operation.

1. Clean the area around the fuel-filter head (Figure 82).

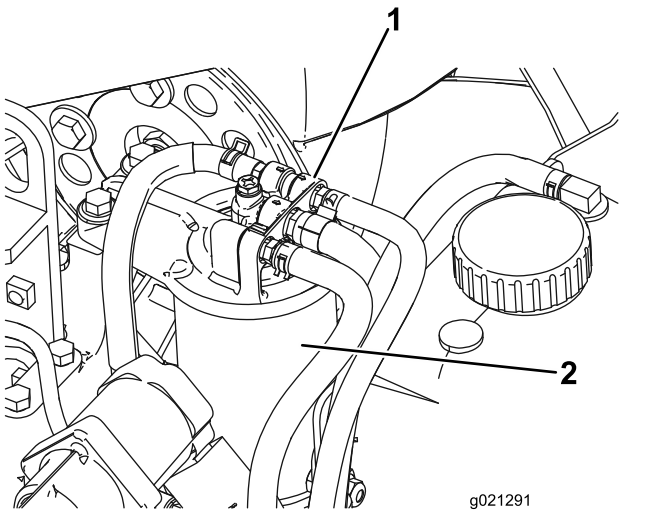


Figure 82

1. Fuel-filter head
2. Fuel filter

2. Remove the filter and clean the filter-head mounting surface (Figure 82).
3. Lubricate the filter gasket with clean lubricating engine oil. Refer to the engine operator's manual, included with the machine, for additional information.
4. Install the dry filter canister, by hand, until the gasket contacts the filter head, then rotate it an additional 1/2 turn.
5. Start the engine and check for fuel leaks around the filter head.

Cleaning the Fuel-Intake Screen

The fuel-intake tube, located inside the fuel tank, is equipped with a screen to help prevent debris from entering the fuel system. Remove the fuel-intake tube and clean the screen as required.

Electrical System Maintenance

Charging and Connecting 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.

1. Unlatch and raise the operator's console panel (Figure 83).

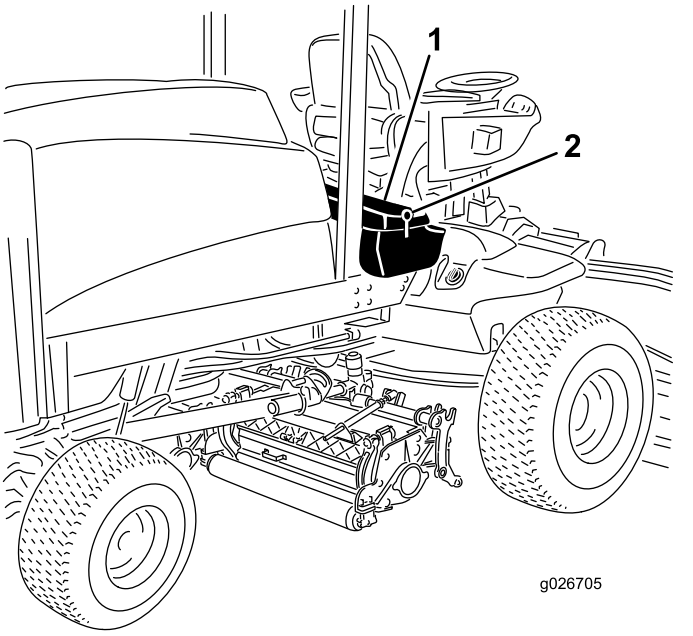


Figure 83

1. Operator's console panel
2. Latch

⚠ 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.**

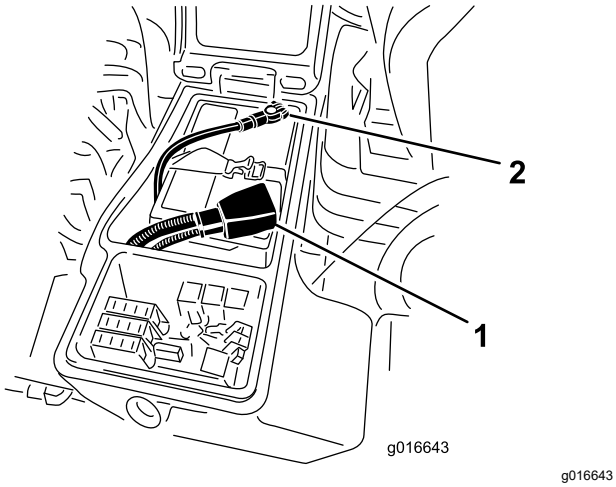
2. Connect a 3 to 4 A battery charger to the battery posts.
3. Charge the battery at a rate of 3 to 4 amperes for 4 to 8 hours.
4. When the battery is charged, disconnect the charger from the electrical outlet and battery posts.

⚠ WARNING

Charging the battery produces gasses that can explode.

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

5. Install the positive cable (red) to the positive (+) terminal and the negative cable (black) to the negative (-) terminal of the battery (Figure 84).



g016643

Figure 84

1. Positive battery cable
2. Negative battery cable

6. Secure the cables to the posts with capscrews and nuts.

   Make sure that the positive (+) terminal is all of the way onto the post and the cable is positioned snug to the battery. The cable must not contact the battery cover.

7. Slide the rubber boot over the positive terminal to prevent a possible short from occurring.

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.

8. Coat both battery connections with Grafo 112X (skin-over) grease, Toro Part No. 505-47, petroleum jelly, or light grease to prevent corrosion.
9. Slide the rubber boot over the positive terminal.
10. Close the console panel and secure the latch.

⚠ WARNING

Battery terminals or metal tools could short against metal 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 machine 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.**

Servicing the Battery

Service Interval: Every 50 hours

Important: **Before welding on the machine, disconnect the negative cable from the battery to prevent damage to the electrical system.**

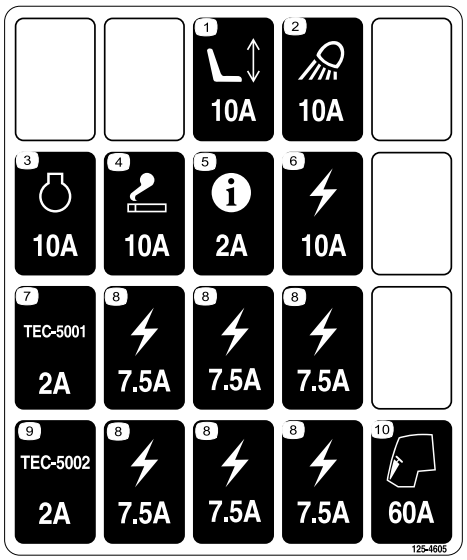
Note: Check the battery condition weekly or after every 50 hours of operation. Keep the terminals and the entire battery case clean because a dirty battery will discharge slowly. .

Clean the battery as follows:

1. Remove the battery from the machine.
2. Wash the entire case with a solution of baking soda and water.
3. Rinse the case with clean water.
4. Coat the battery posts and cable connectors with Grafo 112X (skin-over) grease (Toro Part No. 505-47) or petroleum jelly to prevent corrosion.

Locating the Fuses

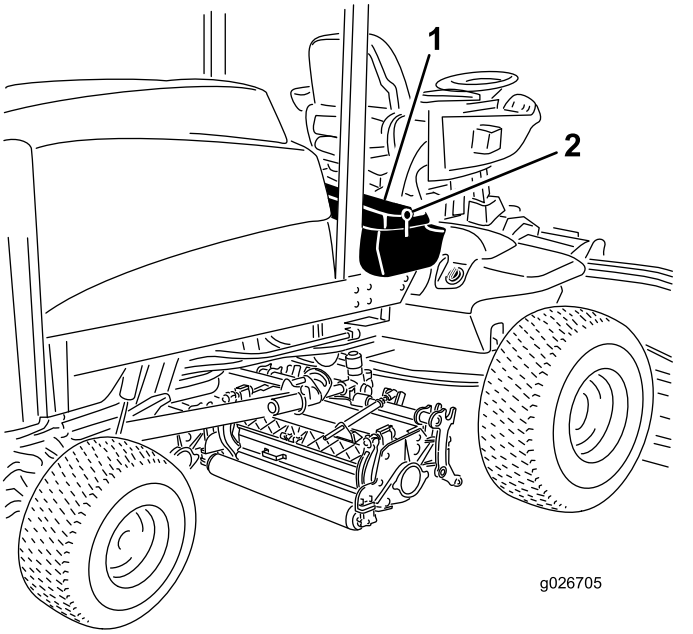
The fuses are located under the operator’s control panel.



decal125-4605

Figure 85

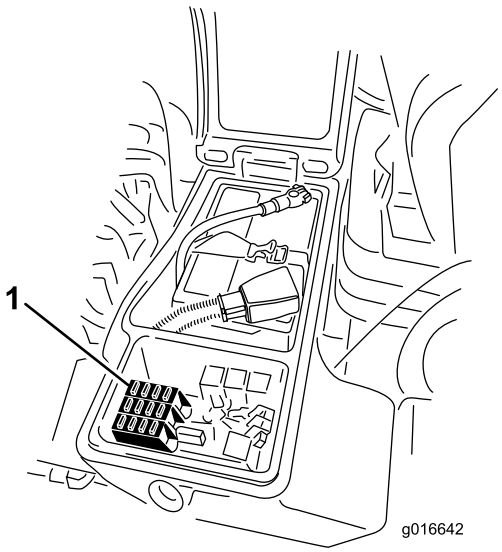
Unhook the latch and raise the operator's console panel (Figure 86) to expose the fuses (Figure 87).



g026705

Figure 86

1. Operator's console panel 2. Latch



g016642

Figure 87

1. Fuses

Drive System Maintenance

Checking the Torque of the Wheel Nuts

Service Interval: After the first 8 hours

Every 200 hours

⚠ WARNING

Failure to maintain proper torque of the wheel nuts could result in failure or loss of a wheel and may result in personal injury.

Torque the front and rear wheel nuts to 115 to 136 N·m (85 to 100 ft-lb) after 1 to 4 hours of operation and again after 8 hours of operation. Torque the wheel nuts every 200 hours thereafter.

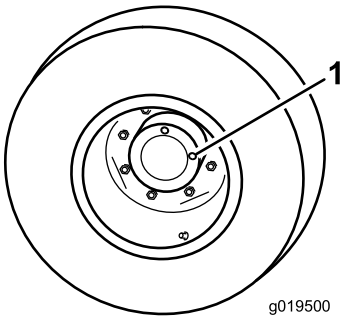
Note: The front wheel nuts are 1/2–20 UNF. The rear wheel nuts are M12 x 1.6-6H (metric).

Checking the Planetary Gear Drive Oil

Service Interval: Every 400 hours

Check the oil level after every 400 hours of operation. Use high-quality SAE 85W-140 gear lube as a replacement.

1. With the machine on a level surface, position the wheel so that 1 check plug (Figure 88) is at the 12 o'clock position and the other is at the 3 o'clock position.



g019500

Figure 88

1. Check/drain plug (2)

2. Remove the plug at the 3 o'clock position (Figure 88).

Note: The oil level should be at the bottom of the hole.

3. If the oil level is low, remove the plug at the 12 o'clock position and add oil until it begins to flow out of the hole at the 3 o'clock position.
4. Install both plugs.
5. Repeat steps 1 through 4 on the opposite planetary gear assembly.

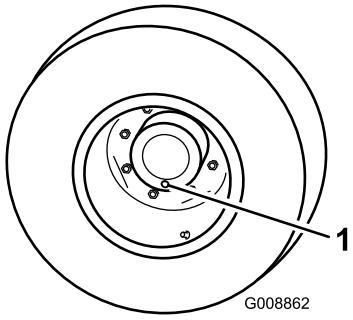
Changing the Planetary Gear Drive Oil

Service Interval: After the first 200 hours

Every 800 hours (or yearly, whichever comes first).

Change the oil initially after first 200 hours of operation. Thereafter, change the oil every 800 hours, or yearly, whichever occurs first. Use a high-quality SAE 85W-140 gear lube as a replacement.

1. With the machine on a level surface, position a wheel so that 1 of the check plugs is at the lowest (6 o'clock) position (Figure 89).



g008862

Figure 89

1. Check/drain plug

2. Place a drain pan under the planetary hub, remove the plug, and allow the oil to drain.
3. Place a drain pan under the brake housing, remove the drain plug, and allow the oil to drain (Figure 90).

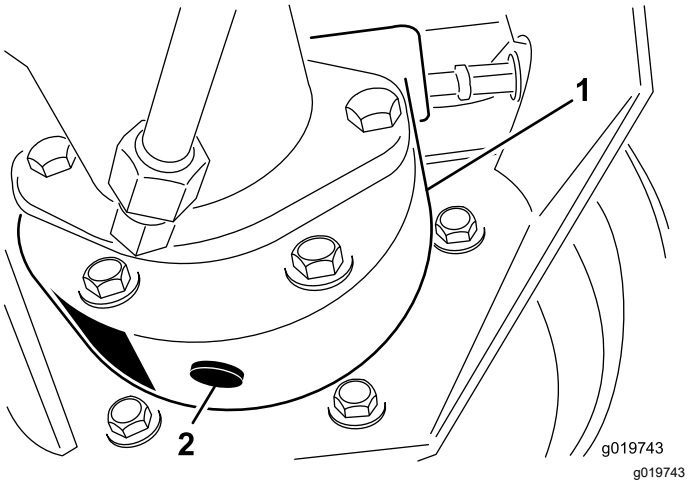


Figure 90

1. Brake housing
2. Drain plug

4. When all of the oil has drained from both locations, install the plug in the brake housing.
5. Rotate the wheel until the open plug hole in the planetary is at the 12 o'clock position.
6. Through the open hole, slowly fill the planetary with 0.65 liters (22 ounces) of high quality SAE 85W-140 wt. gear lube.

   Important: **If the planetary fills before the 0.65 liters (22 ounces) of oil is added, wait one hour or install the plug and move the machine approximately ten feet to distribute the oil through the brake system. Then, remove the plug and add the remaining oil.**
7. Install the plug.
8. Repeat the procedure on the opposite planetary/brake assembly.

Checking the Oil Level of the Rear Axle

Service Interval: Every 400 hours

The rear axle is shipped from the factory filled with SAE 85W-140 gear lube. Check the oil level before the engine is first started and every 400 hours thereafter. The capacity is 2.4 L (80 fl oz). Visually inspect for leaks daily.

1. Position the machine on a level surface.
2. Remove a check plug from 1 end of the axle (Figure 91) and make sure that the oil is up to the bottom of the hole. If the level is low, remove the fill plug (Figure 91) and add enough oil to bring the level up to the bottom of the check-plug holes.

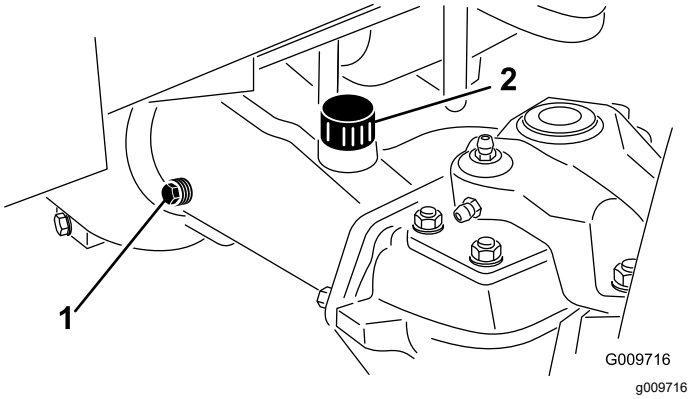


Figure 91

1. Check plug
2. Fill plug

Changing the Oil in the Rear Axle

Service Interval: After the first 200 hours

Every 800 hours

1. Position the machine on a level surface.
2. Clean the area around the 3 drain plugs, 1 on each end and 1 in the center (Figure 92).

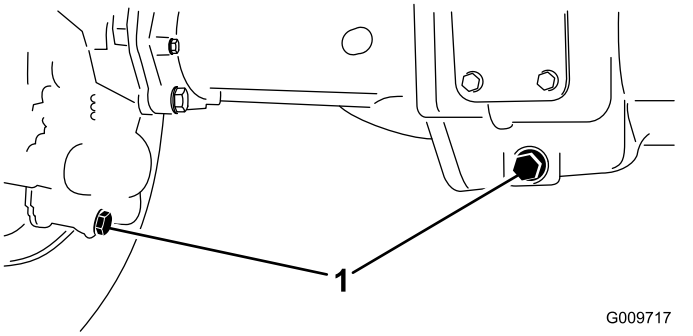


Figure 92

1. Drain plugs

3. Remove the oil-level-check plugs and the main axle vent cap to ease in draining of the oil.
4. Remove the drain plugs and allow the oil to drain into the pans.
5. Install the plugs.
6. Remove a check plug and fill the axle with approximately 2.37 L (80 fl oz) of 85W-140 gear lube or until the oil is up to the bottom of the hole.
7. Install the check plug.

Checking the Lubricant in the Gear Box of the Rear Axle

Service Interval: Every 400 hours

The gear box is filled with SAE 85W-140 gear lube. Check the oil level before the engine is first started and every 400 hours thereafter. The capacity is 0.5 L (16 fl oz). Visually inspect for leaks daily.

1. Position the machine on a level surface.
2. Remove the check/fill plug from the left side of the gear box (Figure 93) and make sure that lubricant is up to the bottom of the hole. If the level is low, add enough lubricant to bring the level up to the bottom of the hole.

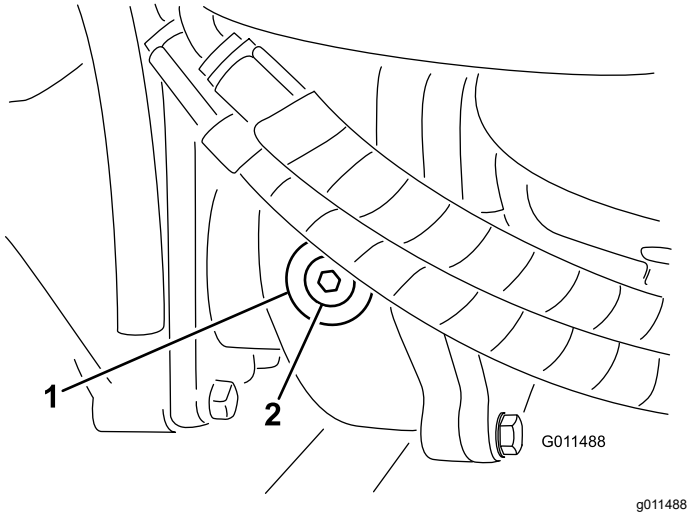


Figure 93

1. Gear box
2. Check/fill plug

Adjusting the Traction Drive for Neutral

The machine must not creep when the traction pedal is released. If it does creep, an adjustment is required.

1. Park the machine on a level surface, shut the engine off, position the speed control into the Low range, and lower the cutting units to the floor.
2. Press only the right brake pedal and engage the parking brake.
3. Jack up the left side of the machine until the left front tire is off the shop floor. Support the machine with jack stands to prevent it from falling accidentally.
4. Start the engine and allow it run at low idle.
5. Adjust the jam nuts on the pump rod end to move the pump control tube forward to eliminate forward creep or rearward to eliminate rearward creep (Figure 94).

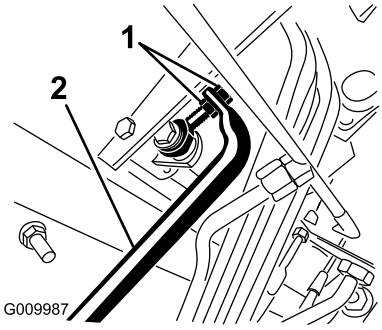


Figure 94

1. Pump-rod jam nuts
2. Pump control tube

6. After the wheel rotation ceases, tighten the jam nuts to secure the adjustment.
7. Stop the engine and release the right brake.
8. Remove the jack stands and lower the machine to the shop floor.
9. Test drive the machine to make sure that it does not creep.

Checking the Rear-Wheel Toe-In

Service Interval: Every 800 hours/Yearly (whichever comes first)

1. Measure the center-to-center distance (at axle height) at the front and rear of the steering tires.

   Note: The front measurement must be 3 mm (1/8 inch) less than the rear measurement (Figure 95).

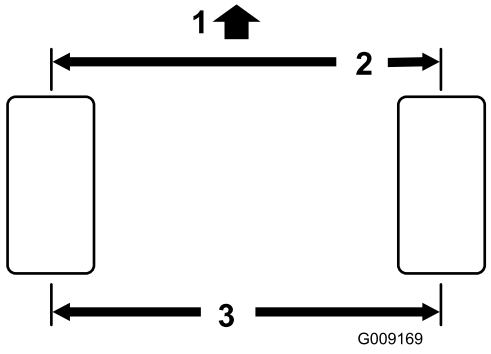


Figure 95

1. Front of the traction unit
2. 3 mm (1/8 inch) less than the rear of the tire
3. Center-to-center distance

2. To adjust the toe-in, remove the cotter pin and the nut from either tie-rod ball joint (Figure 96).

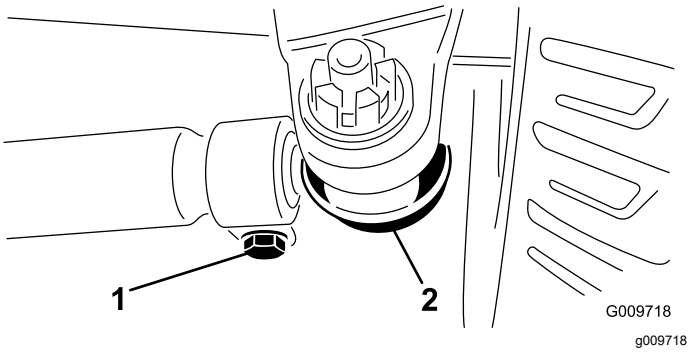


Figure 96

1. Tie-rod clamp
2. Tie-rod ball joint

3. Remove the tie-rod ball joint from the axle case support.
4. Loosen the clamps at both ends of the tie rods (Figure 96).
5. Rotate the detached ball joint inward or outward 1 complete revolution.
6. Tighten the clamp at the loose end of the tie rod.
7. Rotate the entire tie-rod assembly the same direction (inward or outward) 1 complete revolution.
8. Tighten the clamp at the connected end of the tie rod.
9. Install the ball joint in the axle case support and tighten the nut finger tight.
10. Measure the toe-in.
11. Repeat the procedure if necessary.
12. Tighten the nut and install a new cotter pin when the adjustment is correct.

Cooling System Maintenance

Servicing the Engine Cooling System

Service Interval: Before each use or daily

Remove debris from the engine area, oil cooler, and radiator daily. Clean them more frequently in dirty conditions.

1. Unlatch and swing open the rear screen (Figure 97).

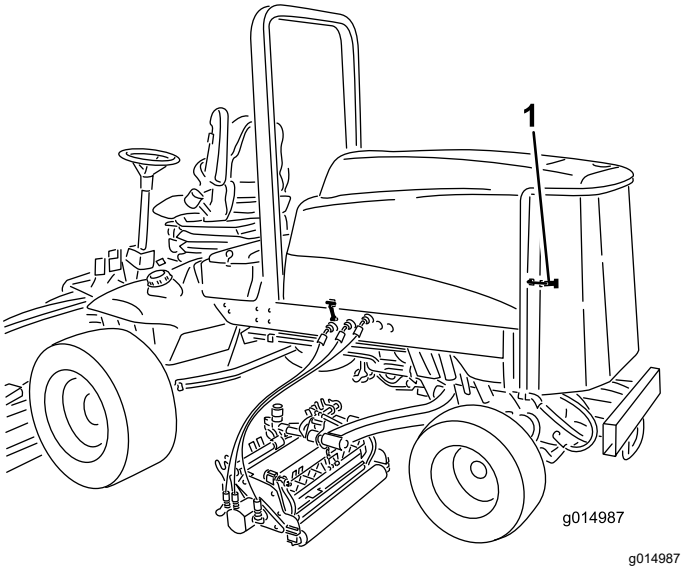


Figure 97

1. Rear screen latch

2. Clean the screen thoroughly of all debris.

   Note: To remove the screen, lift off the hinge pins.

3. Clean both sides of the oil cooler/radiator area (Figure 98) thoroughly with compressed air. Start from the front and blow the debris out toward the back. Then clean from the back side and blow toward the front. Repeat the procedure several times until all chaff and debris is removed.

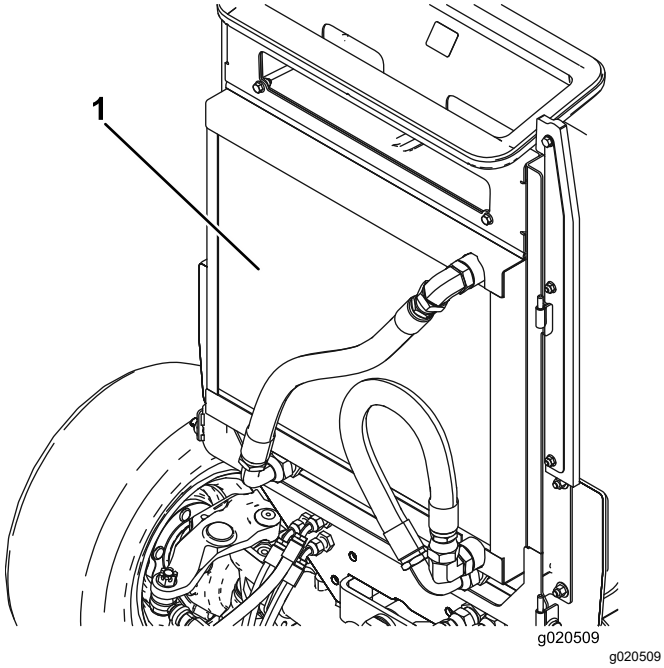


Figure 98

1. Oil cooler/radiator

Important: **Cleaning the oil cooler/radiator with water will promote premature corrosion damage to components and compact debris.**

4. Close the rear screen and secure it with the latch.

Brake Maintenance

Adjusting the Service Brakes

Adjust the service brakes when there is more than 13 mm (1/2 inch) of free travel of the brake pedal, or when the brakes do not work effectively. Free travel is the distance the brake pedal moves before braking resistance is felt.

1. Disengage the locking latch from the brake pedals so that both pedals work independently of each other.
2. To reduce free travel of the brake pedals, tighten the brakes as follows:
   A. Loosen the front nut on the threaded end of the brake cable (Figure 99).

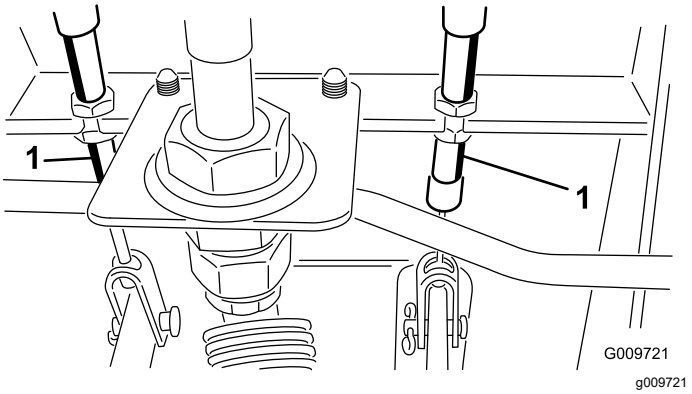


Figure 99

1. Brake cable

   B. Tighten the rear nut to move the cable backward until the brake pedals have 0 to 13 mm (0 to 1/2 inch) of free travel.

      Note: Make sure that there is no brake tension when the pedal is released.

   C. Tighten the front nuts after the brakes are adjusted correctly.

Belt Maintenance

Servicing the Alternator Belt

Service Interval: Every 100 hours

Check the condition and tension of the belts (Figure 100) after every 100 operating hours.

1. Proper tension will allow 10 mm (3/8 inch) deflection when a force of 45 N (10 lb) is applied on the belt midway between the pulleys.
2. If the deflection is not 10 mm (3/8 inch), loosen the alternator mounting bolts (Figure 100).

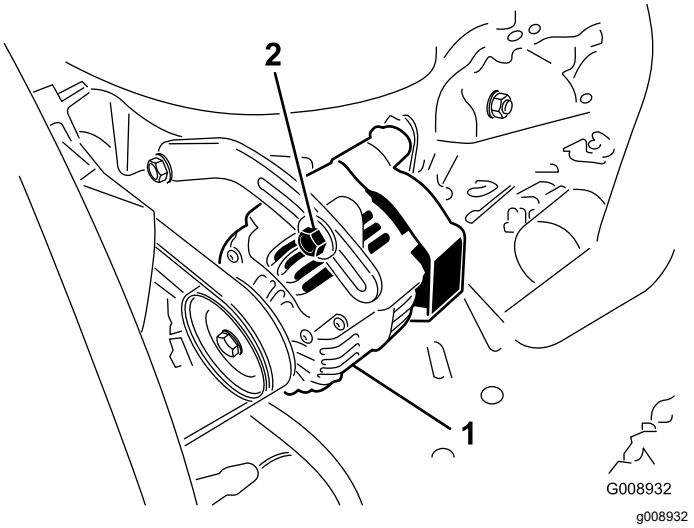


Figure 100

1. Alternator
2. Mounting bolt

3. Increase or decrease the tension of the alternator belt and tighten the bolts.
4. Check the deflection of the belt again to ensure that the tension is correct.

Hydraulic System Maintenance

Changing the Hydraulic Fluid

Service Interval: Every 800 hours

Change the hydraulic fluid after every 800 operating hours, in normal conditions. If the fluid becomes contaminated, contact your local Toro distributor because the system must be flushed. Contaminated fluid looks milky or black when compared to clean fluid.

1. Turn the engine off and raise the hood.
2. Disconnect the case return line from the bottom of the reservoir and let the hydraulic fluid flow into a large drain pan.
3. Connect the line when the hydraulic fluid stops draining.
4. Fill the reservoir with approximately 28.4 L (7.5 US gallons) of hydraulic fluid; refer to Checking the Level of the Hydraulic Fluid (page 34).

   Important: **Use only the hydraulic fluids specified. Other fluids could cause system damage.**
5. Install the reservoir cap.
6. Start the engine and use all of the hydraulic controls to distribute hydraulic fluid throughout the system.
7. Check for leaks and stop the engine.
8. Check the fluid level and add enough to raise the level to the Full mark on the dipstick.

   Note: Do not overfill the hydraulic system.

Replacing the Hydraulic Filters

Service Interval: After the first 200 hours

Every 800 hours

Change the 2 hydraulic filters initially after the first 200 operating hours. Thereafter, change the filters after every 800 operating hours, in normal conditions.

Use Toro replacement filters Part No. 94-2621 for the rear (cutting unit) of the machine and 75-1310 for the front (charge) of the machine.

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

1. Position the machine on a level surface, lower the cutting units, stop the engine, engage the parking brakes, and remove the ignition key.
2. Clean the area around the filter mounting area.
3. Place a drain pan under the filter and remove the filter (Figure 101 and Figure 102).
4. Lubricate the new filter gasket and fill the filter with hydraulic fluid.

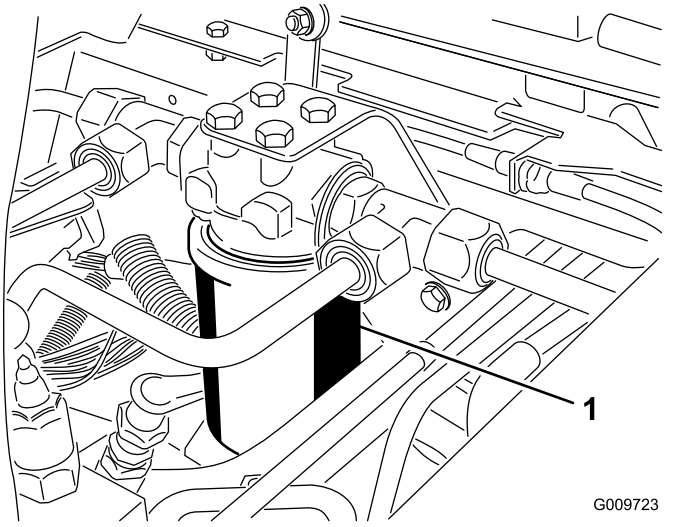


Figure 101

1. Hydraulic filter

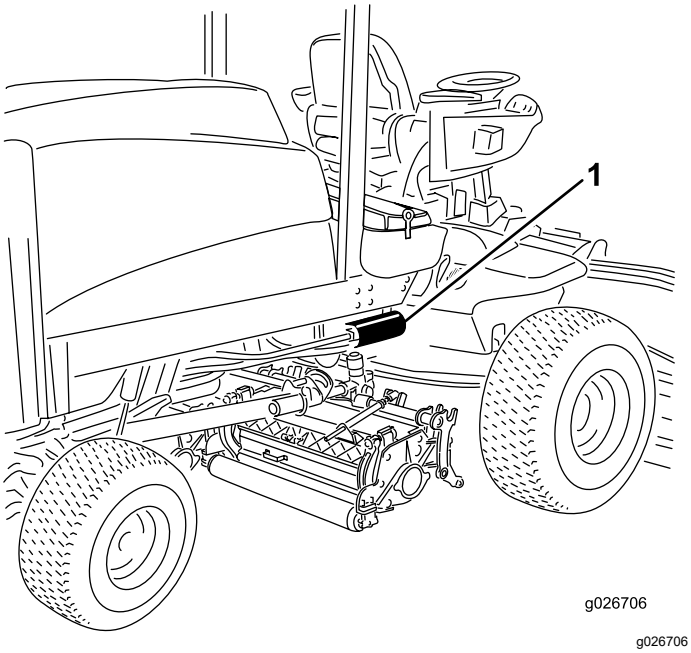


Figure 102

1. Hydraulic filter

5. Ensure that the filter mounting area is clean.
6. Screw the filter on until the gasket contacts the mounting plate; then tighten the filter an additional 1/2 turn.
7. Start the engine and let it run for about 2 minutes to purge air from the system.
8. Stop the engine and check for leaks.

Checking the Hydraulic Lines and Hoses

Service Interval: Before each use or daily

Inspect the hydraulic lines and hoses daily 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 that 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 pinhole 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.**
- **Seek immediate medical attention if fluid is injected into skin.**

Cutting Unit Maintenance

Backlapping the Cutting Units

⚠ WARNING

Contact with the reels or other moving parts can result in personal injury.

- **Keep fingers, hands, and clothing away from the reels or other moving parts.**
- **Never attempt to turn the reels by hand or foot while the engine is running.**

Note: When backlapping, the front units all operate together, and the rear units operate together.

1. Position the machine on a level surface, lower the cutting units, stop the engine, engage the parking brake, and move the PTO switch to the Off position.
2. Unlock and raise the hood to expose the controls.
3. Make initial reel-to-bedknife adjustments appropriate for backlapping on all cutting units which are to be backlapped; refer to the cutting unit *Operator's Manual*.
4. Select either front, rear, or both backlap levers to determine which units to backlap (Figure 103).
5. Start the engine and run at low idle speed.

⚠ DANGER

Changing the engine speed while backlapping may cause the reels to stall.

- **Never change the engine speed while backlapping.**
- **Only backlap at low idle engine speed.**

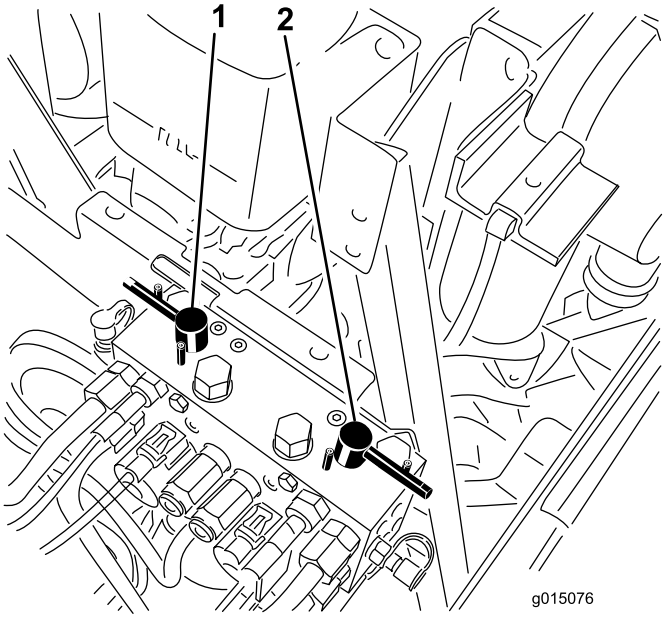
⚠ DANGER

Contact with the cutting units could cause personal injury.

Be certain that you are clear of the cutting units before proceeding.

6. With the mow-speed limiter in the Mow position, move the PTO switch to the On position.
7. Press the Lift Switch to start the backlapping operation on the designated reels.
8. Apply lapping compound with a long-handled brush.

Note: Do not use a short-handled brush.



g015076

Figure 103

1. Front-backlap lever
2. Rear-backlap lever

9. If the reels stall or become erratic while backlapping, increase the throttle speed until the reel stabilizes.
10. To make an adjustment to the cutting units while backlapping, turn the reels off by pressing the rear of the lift switch; move the PTO switch to the Off position and stop the engine. After completing any adjustments, repeat steps 5 through 9.
11. Repeat the procedure for all cutting units that you want to backlap.
12. When finished, return the backlap levers to the Mow position, lower the hood, and wash all lapping compound off the cutting units. Adjust the cutting unit reel-to-bedknife as needed. Move the cutting unit reel-speed controls to the desired mowing position.

Important: **If you do not return the backlap switch to the Off position after backlapping, the cutting units will not raise or function properly.**

Note: Additional instructions and procedures on backlapping are available in the Toro *Sharpening Reel and Rotary Mowers Manual*, Form No. 80-300SL.

Note: For a better cutting edge, run a file across the front face of the bedknife after lapping. This will remove any burrs or rough edges that may have built up on the cutting edge.

Storage

Preparing the Engine

1. Drain the engine oil from the oil pan and install the drain plug.
2. Remove and discard the oil filter. Install a new oil filter.
3. Fill the engine with specified motor oil.
4. Start the engine and run it at idle speed for approximately 2 minutes.
5. Stop the engine.
6. Flush the fuel tank with fresh, clean fuel.
7. Secure all of the fuel-system fittings.
8. Thoroughly clean and service the air-cleaner assembly.
9. Seal the air-cleaner inlet and the exhaust outlet with weatherproof tape.
10. Check the antifreeze protection and add a 50/50 solution of water and ethylene glycol antifreeze as needed for the expected minimum temperature in your area.

Preparing the Traction Unit

1. Thoroughly clean the traction unit, cutting units, and the engine.
2. Check the tire pressure; refer to Checking the Tire Pressure (page 35).
3. Check all fasteners for looseness; tighten them as necessary.
4. Grease or oil 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 charge the battery every 60 days for 24 hours to prevent lead sulfation of the battery.

Notes:

International Distributor List

Distributor:	Country:	Phone Number:	Distributor:	Country:	Phone Number:
Agrolanc Kft	Hungary	36 27 539 640	Maquiver S.A.	Colombia	57 1 236 4079
Asian American Industrial (AAI)	Hong Kong	852 2497 7804	Maruyama Mfg. Co. Inc.	Japan	81 3 3252 2285
B-Ray Corporation	Korea	82 32 551 2076	Mountfield a.s.	Czech Republic	420 255 704 220
Brisa Goods LLC	Mexico	1 210 495 2417	Mountfield a.s.	Slovakia	420 255 704 220
Casco Sales Company	Puerto Rico	787 788 8383	Munditol S.A.	Argentina	54 11 4 821 9999
Ceres S.A.	Costa Rica	506 239 1138	Norma Garden	Russia	7 495 411 61 20
CSSC Turf Equipment (pvt) Ltd.	Sri Lanka	94 11 2746100	Oslinger Turf Equipment SA	Ecuador	593 4 239 6970
Cyril Johnston & Co.	Northern Ireland	44 2890 813 121	Oy Hako Ground and Garden Ab	Finland	358 987 00733
Cyril Johnston & Co.	Republic of Ireland	44 2890 813 121	Parkland Products Ltd.	New Zealand	64 3 34 93760
Fat Dragon	China	886 10 80841322	Perfetto	Poland	48 61 8 208 416
Femco S.A.	Guatemala	502 442 3277	Pratoverde SRL.	Italy	39 049 9128 128
FIVEMANS New-Tech Co., Ltd	China	86-10-6381 6136	Prochaska & Cie	Austria	43 1 278 5100
ForGarder OU	Estonia	372 384 6060	RT Cohen 2004 Ltd.	Israel	972 986 17979
G.Y.K. Company Ltd.	Japan	81 726 325 861	Riversa	Spain	34 9 52 83 7500
Geomechaniki of Athens	Greece	30 10 935 0054	Lely Turfcare	Denmark	45 66 109 200
Golf international Turizm	Turkey	90 216 336 5993	Lely (U.K.) Limited	United Kingdom	44 1480 226 800
Hako Ground and Garden	Sweden	46 35 10 0000	Solvert S.A.S.	France	33 1 30 81 77 00
Hako Ground and Garden	Norway	47 22 90 7760	Spypros Stavrinides Limited	Cyprus	357 22 434131
Hayter Limited (U.K.)	United Kingdom	44 1279 723 444	Surge Systems India Limited	India	91 1 292299901
Hydroturf Int. Co Dubai	United Arab Emirates	97 14 347 9479	T-Markt Logistics Ltd.	Hungary	36 26 525 500
Hydroturf Egypt LLC	Egypt	202 519 4308	Toro Australia	Australia	61 3 9580 7355
Irrimac	Portugal	351 21 238 8260	Toro Europe NV	Belgium	32 14 562 960
Irrigation Products Int'l Pvt Ltd.	India	0091 44 2449 4387	Valtech	Morocco	212 5 3766 3636
Jean Heybroek b.v.	Netherlands	31 30 639 4611	Victus Emak	Poland	48 61 823 8369

European Privacy Notice

The Information Toro Collects
Toro Warranty Company (Toro) respects your privacy. In order to process your warranty claim and contact you in the event of a product recall, we ask you to share certain personal information with us, either directly or through your local Toro company or dealer.

The Toro warranty system is hosted on servers located within the United States where privacy law may not provide the same protection as applies in your country.

BY SHARING YOUR PERSONAL INFORMATION WITH US, YOU ARE CONSENTING TO THE PROCESSING OF YOUR PERSONAL INFORMATION AS DESCRIBED IN THIS PRIVACY NOTICE.

The Way Toro Uses Information
Toro may use your personal information to process warranty claims, to contact you in the event of a product recall and for any other purpose which we tell you about. Toro may share your information with Toro's affiliates, dealers or other business partners in connection with any of these activities. We will not sell your personal information to any other company. We reserve the right to disclose personal information in order to comply with applicable laws and with requests by the appropriate authorities, to operate our systems properly or for our own protection or that of other users.

Retention of your Personal Information
We will keep your personal information as long as we need it for the purposes for which it was originally collected or for other legitimate purposes (such as regulatory compliance), or as required by applicable law.

Toro's Commitment to Security of Your Personal Information
We take reasonable precautions in order to protect the security of your personal information. We also take steps to maintain the accuracy and current status of personal information.

Access and Correction of your Personal Information
If you would like to review or correct your personal information, please contact us by email at legal@toro.com.

Australian Consumer Law

Australian customers will find details relating to the Australian Consumer Law either inside the box or at your local Toro Dealer.

The Toro Warranty

A Two-Year 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:

Toro Commercial Products Service Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196

952–888–8801 or 800–952–2740
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, brake pads and linings, clutch linings, blades, reels, rollers and bearings (sealed or greasable), bed knives, spark plugs, castor wheels and bearings, tires, filters, belts, and certain sprayer components such as diaphragms, nozzles, and check valves, etc.
- Failures caused by outside influence. Conditions considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved fuels, coolants, lubricants, additives, fertilizers, water, or chemicals, etc.
- Failure or performance issues due to the use of fuels (e.g. gasoline, diesel, or biodiesel) that do not conform to their respective industry standards.
- 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.

Deep Cycle and Lithium-Ion Battery Warranty:

Deep cycle and Lithium-Ion 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. Note: (Lithium-Ion battery only): A Lithium-Ion battery has a part only prorated warranty beginning year 3 through year 5 based on the time in service and kilowatt hours used. Refer to the *Operator's Manual* for additional information.

Maintenance is at Owner's Expense

Engine tune-up, lubrication, cleaning and polishing, replacement of 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 supplied with your product 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.

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