Form No. 3387-337 Rev B

TORO®

Count on it.

Operator's Manual

Groundsmaster® 4300-D Traction Unit

Model No. 30864—Serial No. 314000001 and Up
Model No. 30864A—Serial No. 314000001 and Up

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

CE

3387-337 B

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

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

This product contains a chemical or chemicals known to the State of California to cause cancer, birth defects, or reproductive harm.

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

Because in some areas there are local, state, or federal regulations requiring that a spark arrester be used on the engine of this machine, a spark arrester is incorporated with the muffler assembly.

Genuine Toro spark arresters are approved by the USDA Forestry Service.

Important: **This engine is equipped with a spark arrester muffler. It is a violation of California Public Resource Code Section 4442 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land without a spark arrester muffler maintained in working order, or the engine constricted, equipped, and maintained for the prevention of fire. Other states or federal areas may have similar laws.**

Introduction

This machine is a ride-on, rotary-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 parks, sports fields, and on commercial grounds. It is not designed for cutting brush, mowing grass and other growth alongside highways, or for agricultural uses.

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

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

Whenever you need service, genuine Toro parts, or additional information, contact an Authorized Service Dealer or Toro Customer Service and have the model and serial numbers of your product ready. The model and serial numbers are on a plate mounted on the left side of the frame under the foot rest. Write the numbers in the space provided.

Model No. _____

Serial No. _____

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



g000502

Figure 1

1. Safety alert symbol

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

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Contents

Safety 4
Safe Operating Practices 4
Toro Riding Mower Safety 6
Sound Power Level 7
Sound Pressure Level 7
Vibration Level 7
Safety and Instructional Decals 8
Setup 12
1 Adjusting the Tire Pressure 12
2 Adjusting the Step Height 12
3 Adjusting the Control Arm Position 13
4 Remove the Shipping Blocks and Pins 13
5 Adjusting the Height-of-Cut 13
6 Adjusting the Roller Scraper (Optional) 14
7 Installing the Mulching Baffle (Optional) 15
Product Overview 15
Controls 15
Specifications 21
Cutting Unit Specifications 21
Attachments/Accessories 21
Operation 22
Checking the Cooling System 22
Filling the Fuel Tank 22
Checking the Hydraulic-Fluid Level 24
Check the Torque of the Wheel Nuts 25
Breaking-in the Machine 25
Starting and Stopping the Engine 25
Cutting Grass with the Machine 25
Diesel Particulate Filter Regeneration 26
Pushing or Towing the Machine 34
Jacking Points 34
Tie Downs 34
Understanding the Diagnostic Light 35
Changing the Counterbalance Settings 35
Checking the Interlock Switches 36
Hydraulic Valve Solenoid Functions 36
Selecting a Blade 36
Choosing Accessories 38
Operating Tips 38
Maintenance 40
Recommended Maintenance Schedule(s) 40
Daily Maintenance Checklist 41
Service Interval Chart 42
Lubrication 42
Greasing the Bearings and Bushings 42
Engine Maintenance 44
Servicing the Air Cleaner 44
Servicing the Engine Oil 45
Servicing the Diesel-Oxidation Catalyst (DOC) and the Soot Filter 46
Fuel System Maintenance 47
Draining the Fuel Tank 47
Checking the Fuel Lines and Connections 47
Servicing the Water Separator 47
Servicing the Engine Fuel Filter 47
Fuel Pick-up Tube Screen 48
Electrical System Maintenance 48
Servicing the Battery 48
Fuses 49
Drive System Maintenance 49
Adjusting the Traction Drive for Neutral 49
Adjusting the Rear Wheel Toe-in 50
Cooling System Maintenance 50
Removing Debris from the Cooling System 50
Brake Maintenance 51
Adjusting the Parking Brakes 51
Adjusting the Parking Brake Latch 52
Belt Maintenance 52
Servicing the Alternator Belt 52
Hydraulic System Maintenance 53
Changing the Hydraulic Fluid 53
Replacing the Hydraulic Filters 53
Checking the Hydraulic Lines and Hoses 54
Hydraulic System Test Ports 54
Cutting Deck Maintenance 55
Separating the Cutting Decks from the Traction Unit 55
Mounting the Cutting Decks to the Traction Unit 55
Servicing the Blade Plane 55
Servicing the Cutter Blade 56
Servicing the Front Roller 58
Storage 59
Preparing the Traction Unit 59
Preparing the Engine 59
Cutting Deck 59

Safety

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

Safe Operating Practices

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 himself or herself, other people, or property.

Preparation

- While mowing, always wear substantial, slip-resistant footwear, long trousers, hard hat, safety glasses, and ear protection. Long hair, loose clothing, or jewelry may get tangled in moving parts. Do not operate the equipment when barefoot or wearing open sandals.
- Thoroughly inspect the area where the equipment is to be used and remove all objects which may be thrown by the machine.
- 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 gasoline. Gasoline 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 and exhaust gases 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 as identified 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 removing the grass catcher/catchers;
  - 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 decks.
- 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.
- Do not operate the mower 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 nuts, bolts and screws tight to be sure the equipment is in safe working condition.
- Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.
- Allow the engine to cool before storing in any enclosure.
- To reduce the fire hazard, keep the engine, silencer/muffler, battery compartment and fuel storage area free of grass, leaves, or excessive grease.
- Keep all parts in good working condition and all hardware and hydraulic fittings tightened. Replace all worn or damaged parts and decals.
- If the fuel tank has to be drained, do this outdoors.
- Be careful during adjustment of the machine to prevent entrapment of the fingers between moving blades and fixed parts of the machine.
- Disengage drives, lower the cutting decks, set parking brake, stop engine and remove key from ignition. Wait for all movement to stop before adjusting, cleaning or repairing.
- Clean grass and debris from cutting decks, drives, silencers/mufflers, and engine to help prevent fires. Clean up oil or fuel spillage.
- Use jack stands to support components when required.

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

Maintenance and Storage

- Make sure all hydraulic line connectors are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system.
- Keep your body and hands away from pin hole leaks or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, not your hands, to search for leaks. Hydraulic fluid escaping under pressure can have sufficient force to penetrate the skin and cause serious injury. Seek immediate medical attention if fluid is injected into skin.
- Before disconnecting or performing any work on the hydraulic system, all pressure in the system must be relieved by stopping the engine and lowering the cutting decks 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 decks, attachments, and any moving parts. Keep everyone away.

- To ensure safety and accuracy, have an Authorized Toro Distributor check the maximum engine speed with a tachometer.
- If major repairs are ever needed or if assistance is desired, contact an Authorized Toro Distributor.
- Use only Toro-approved attachments and replacement parts. The warranty may be voided if used with unapproved attachments.

Sound Power Level

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

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

Sound Pressure Level

This unit has a sound pressure level at the operator's ear of 93 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 = 2.4 m/s^2

Measured vibration level for left hand = 2.1 m/s^2

Uncertainty Value (K) = 1.18 m/s^2

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

Whole Body

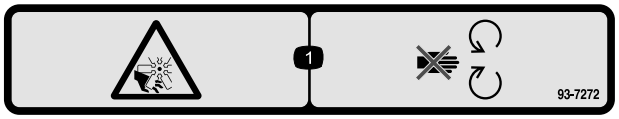
Measured vibration level = 0.9 m/s^2

Uncertainty Value (K) = 0.45 m/s^2

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

Safety and Instructional Decals

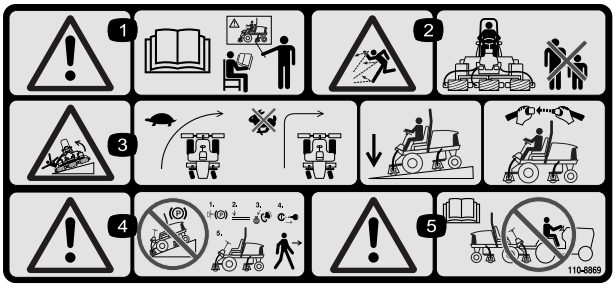
Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or lost.



decal93-7272

93-7272

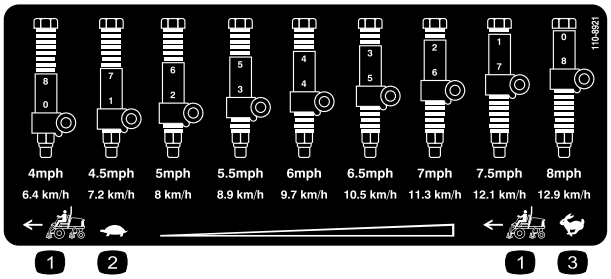
1. Cutting/dismemberment hazard; fan—stay away from moving parts.



r:\decal110-8869

110-8869

1. Warning—read the *Operator's Manual*, do not operate this machine unless you are trained.
2. Thrown object hazard—keep bystanders a safe distance from 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. Always wear a seat belt when a ROPS is in place.
4. Warning—do not park the machine on slopes; engage the parking brake, lower the cutting decks, stop the engine and remove the ignition key before leaving the machine.
5. Warning—read the *Operator's Manual*, do not tow the machine.



decal110-8921

110-8921

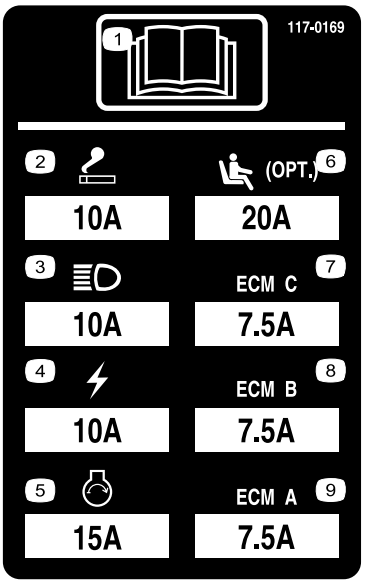
1. Traction unit speed
2. Slow
3. Fast

CALIFORNIA SPARK ARRESTER WARNING

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

decal117-2718

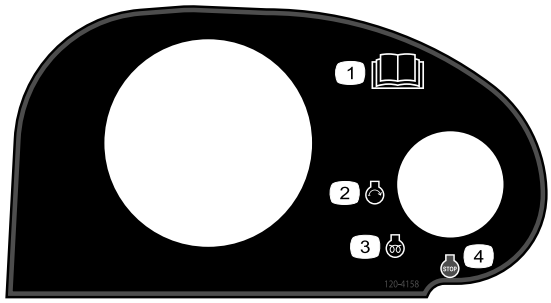
117–2718



decal117-0169

117–0169

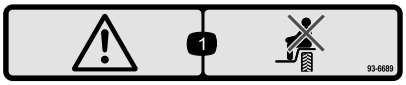
1. Read the *Operator's Manual.*
2. Power point—10 amp
3. Head lights—10 amp
4. Power—10 amp
5. Engine start—15 amp
6. Optional air ride seat suspension—20 amp
7. Engine computer management C—7.5 amp
8. Engine computer management B—7.5 amp
9. Engine computer management A—7.5 amp



decal120-4158

120–4158

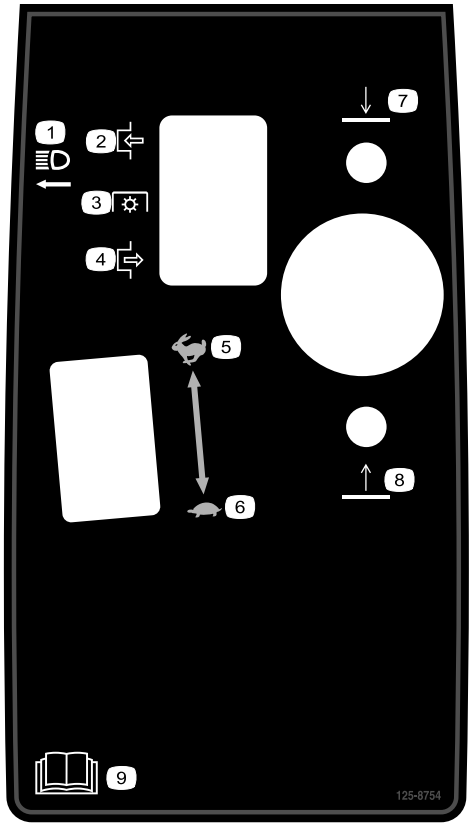
1. Read the *Operator's Manual*.
2. Engine—start
3. Engine—preheat
4. Engine—stop



decal93-6689

93-6689

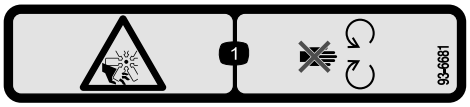
1. Warning—do not carry passengers.



decal125-8754

125–8754

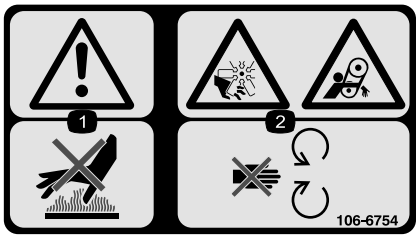
1. Head lights
2. Engage
3. Power take-off (PTO)
4. Disengage
5. Fast
6. Slow
7. Lower the cutting units
8. Raise the cutting units
9. Read the *Operator's Manual*.



decal93-6681

93-6681

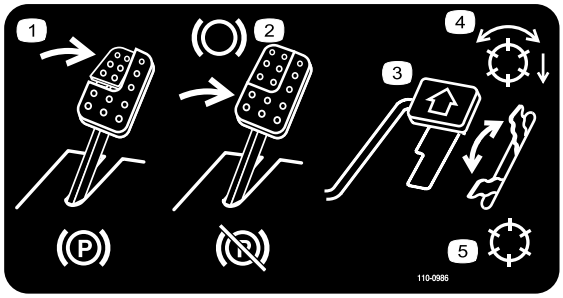
1. Cutting/dismemberment—hazard, fan-stay away from moving parts.



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.



decal110-0986

110-0986

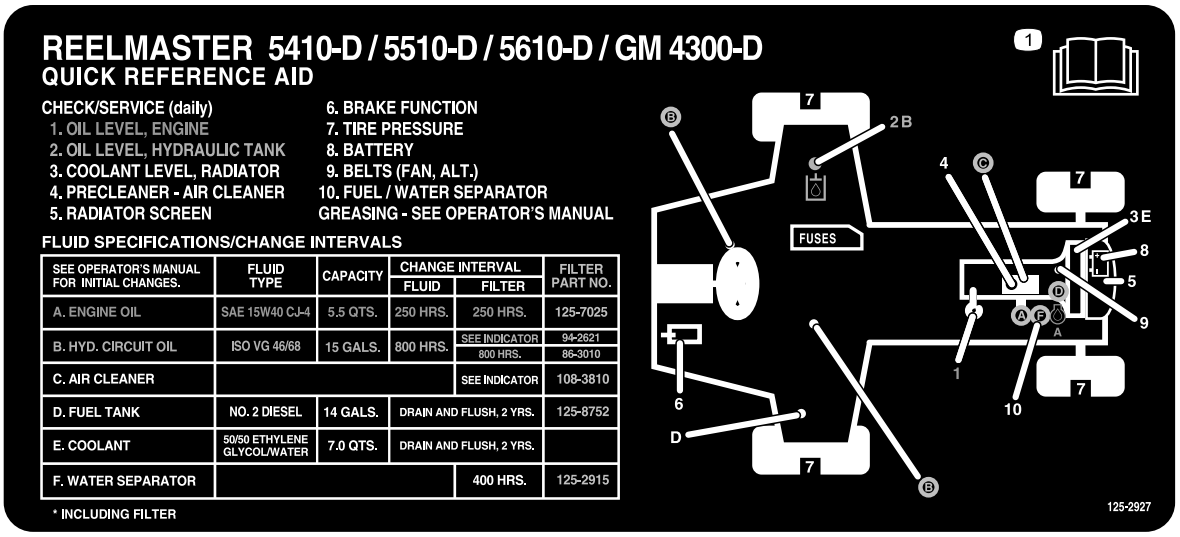
1. Press the brake pedal and parking brake pedal to set the parking brake.
2. Press the brake pedal to apply the brake.
3. Press the traction pedal to move the machine forward.
4. PTO enabled mode
5. Transport mode (No PTO)



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.*



decal125-2927

125–2927

1. Read the *Operator's Manual* for maintenance information.

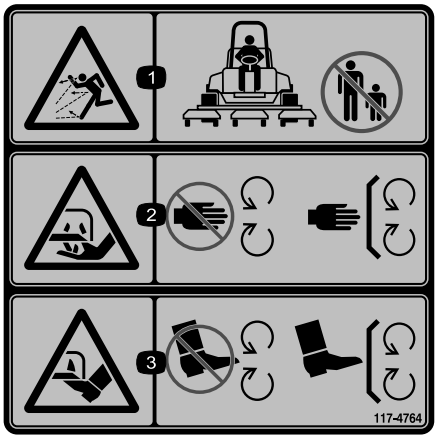


decalbatterysymbols

Battery Symbols

Some or all of these symbols are on your battery

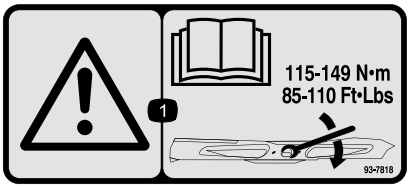
1. Explosion hazard
2. No fire, open flame, or smoking.
3. Caustic liquid/chemical burn hazard
4. Wear eye protection
5. Read the *Operator's Manual.*
6. Keep bystanders a safe distance from the battery.
7. Wear eye protection; explosive gases can cause blindness and other injuries
8. Battery acid can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



decal117-4764

117-4764

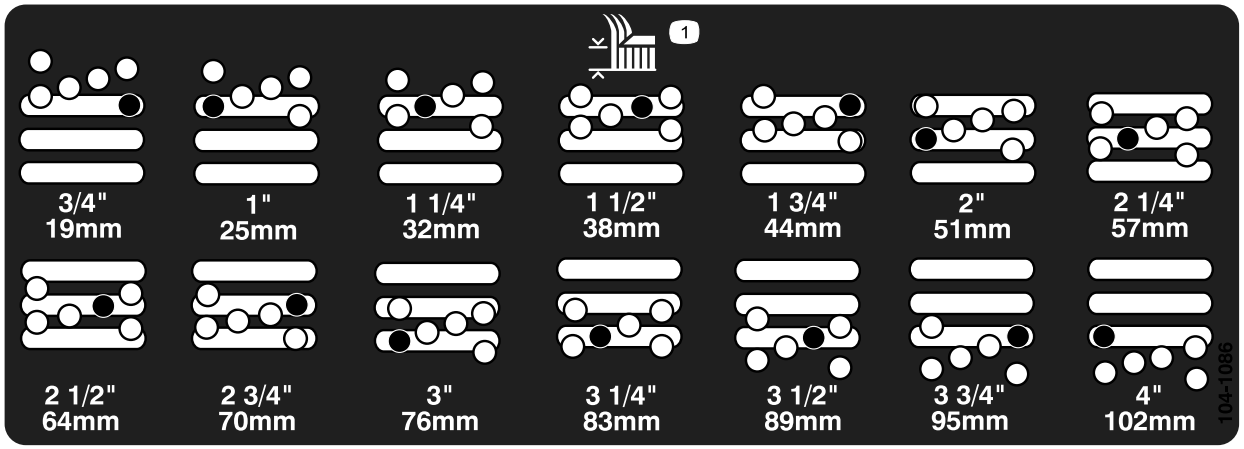
1. Thrown object hazard—keep bystanders a safe distance from the machine.
2. Cutting hazard of hand, mower blade—stay away from moving parts, keep all guards and shields in place.
3. Cutting hazard of foot, mower blade—stay away from moving parts, keep all guards and shields in place.



decal93-7818

93-7818

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



decal104-1086

104-1086

1. Height of cut

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 tire pressure.
2	No parts required	–	Adjust the step height.
3	No parts required	–	Adjust the control arm position.
4	No parts required	–	Remove shipping blocks and pins
5	No parts required	–	Adjust the height-of-cut
6	No parts required	–	Adjust the roller scraper (Optional)
7	No parts required	–	Install the mulching baffle (Optional)

Media and Additional Parts

Description	Qty.	Use
Operator's Manual	1	Review before operating machine
Engine Operator's Manual	1	
Parts Catalog	1	
Operator Training Material	1	

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

1

Adjusting the Tire Pressure

No Parts Required

Procedure

The tires are over-inflated for shipping. Therefore, release some of the air to reduce the pressure. Correct air pressure in the front and rear tires is 83 to 103 kPa (12 to 15 psi).

Important: **Maintain even pressure in all tires to ensure uniform contact with the turf.**

2

Adjusting the Step Height

No Parts Required

Procedure

The height of the steps can be adjusted for the operators comfort.

1. Remove the 2 bolts and nuts securing the step brackets to the traction unit frame (Figure 2)

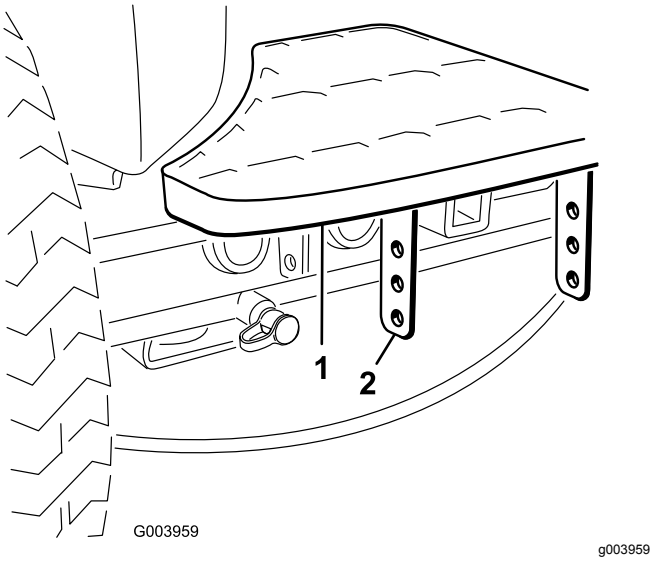


Figure 2

1. Step
2. Step brackets

2. Raise or lower the step to the desired height and re-secure the brackets to the frame with the 2 bolts and nuts.
3. Repeat the procedure on the other step.

3

Adjusting the Control Arm Position

No Parts Required

Procedure

The control arm position can be adjusted for the operators comfort.

1. Loosen the 2 bolts securing the control arm to the retaining bracket (Figure 3).

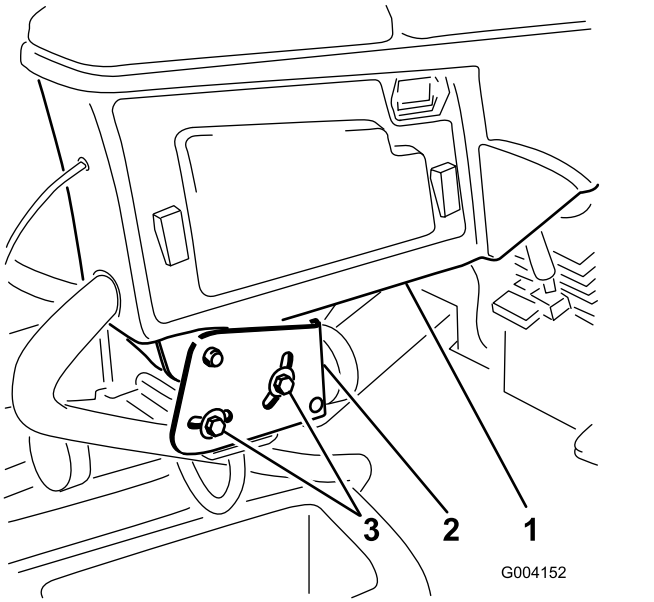


Figure 3

1. Control arm
2. Retaining brackets
3. Bolts (2)

2. Rotate the control arm to the desired position and tighten the 2 bolts.

4

Remove the Shipping Blocks and Pins

No Parts Required

Procedure

1. Remove and discard the shipping blocks from the cutting decks.
2. Remove and discard the shipping pins from the cutting deck suspension arms. The shipping pins stabilize the cutting decks during shipping and must be removed before operation.

5

Adjusting the Height-of-Cut

No Parts Required

Procedure

Important: **This cutting deck often cuts approximately 6 mm (1/4 inch) lower than a reel cutting unit with the same bench setting. It may be necessary to have these rotary cutting deck's bench set 6 mm (1/4 inch) above that of reels cutting in the same area.**

Important: **Access to the rear cutting units is greatly improved by removing the cutting unit from the tractor. If the unit is equipped with a Sidewinder®, sidewind the cutting units to the right, remove the rear cutting unit, and slide it out to the right side.**

1. Lower the cutting deck to the ground, stop the engine, and remove the key from ignition switch.
2. Loosen the bolt securing each height-of-cut bracket to the height-of-cut plate (front and each side) (Figure 4).
3. Beginning with front adjustment, remove the bolt.

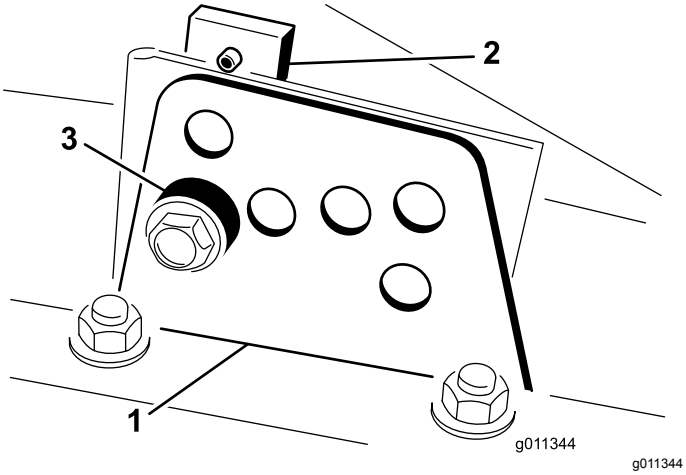


Figure 4

1. Height of cut bracket
2. Height of cut plate
3. Spacer

4. While supporting the chamber, remove the spacer (Figure 4).
5. Move the chamber to the desired height-of-cut and install a spacer into the designated height-of-cut hole and slot (Figure 5).

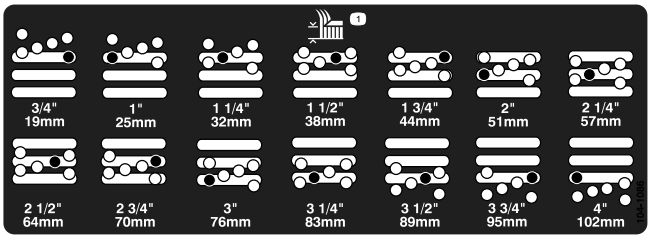


Figure 5

6. Position the tapped plate in line with the spacer.
7. Install the bolt finger tight.
8. Repeat steps 4-7 for each side adjustment.
9. Tighten all three bolts to 41 N-m (30 ft-lb). Always tighten the front bolt first.

   Note: Adjustments of more than 3.8 cm (1-1/2 inches) may require temporary assembly to an intermediate height to prevent binding (e.g. changing from 3.1 to 7 cm (1.25 to 2.75 inch) height-of-cut).

6

Adjusting the Roller Scraper (Optional)

No Parts Required

Procedure

The optional rear roller scraper is designed to work best when there is an even gap of 0.5 to 1 mm (0.020–0.040 inch) between the scraper and roller.

1. Loosen the grease fitting and the mounting screw (Figure 6).

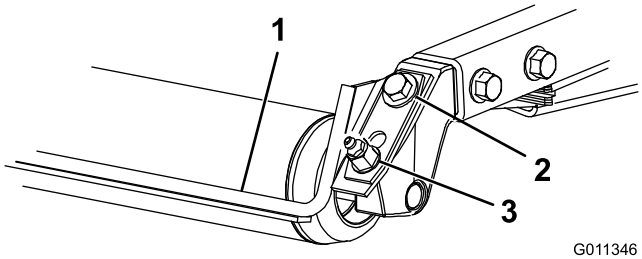


Figure 6

1. Roller scraper
2. Mounting screw
3. Grease fitting

2. Slide the scraper up or down until a gap of 0.5 to 1 mm (0.020 to 0.040 inch) is achieved between the rod and the roller.

3. Secure the grease fitting and screw to 41 N-m (30 ft-lb) in an alternating sequence.

7

Installing the Mulching Baffle (Optional)

No Parts Required

Procedure

1. Thoroughly clean debris from the mounting holes on the rear wall and left side wall of the chamber.
2. Install the mulching baffle in the rear opening and secure it with 5 flange head bolts (Figure 7).

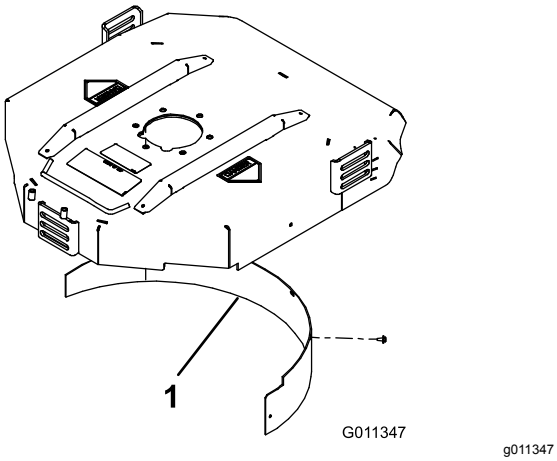


Figure 7

1. Mulching baffle

3. Verify that mulching baffle does not interfere with the tip of the blade and does not protrude inside the surface of the rear chamber wall.

⚠ WARNING

Do not use the high lift blade with the mulching baffle. The blade could break, resulting in personal injury or death.

Product Overview

Controls

Seat Adjusting Knobs

The seat adjusting lever (Figure 8) allows you to adjust the seat fore and aft. The weight adjusting knob adjusts the seat for the operator's weight. The weight gauge indicates when the seat is adjusted to the weight of the operator. The height adjusting knob adjusts the seat for the operator's height.

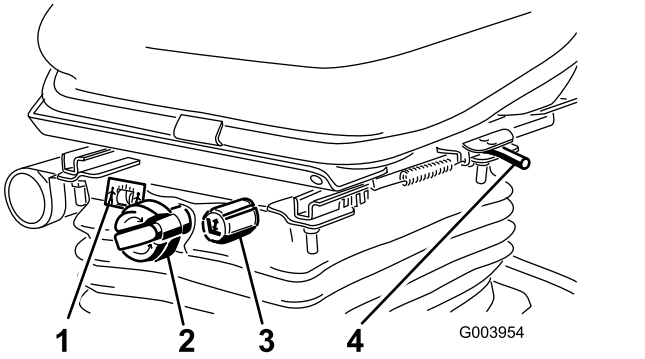


Figure 8

1. Weight gauge
2. Weight adjusting knob
3. Height adjusting knob
4. Adjusting lever (fore and aft)

Traction Pedal

The traction pedal (Figure 9) controls the forward and reverse operation. Press the top of the pedal to move forward and the bottom to move rearward. Ground speed depends on how far you press the pedal. For no load, maximum ground speed, fully press the pedal while the throttle is in the Fast position.

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

Mow Speed Limiter

When the mow speed limiter (Figure 9) is flipped up it will control the mow speed and allow the cutting decks 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.

Parking Brake

To engage the parking brake, (Figure 9) push down on the brake pedal and press the top forward to latch. To release the parking brake, press the brake pedal until the parking brake latch retracts.

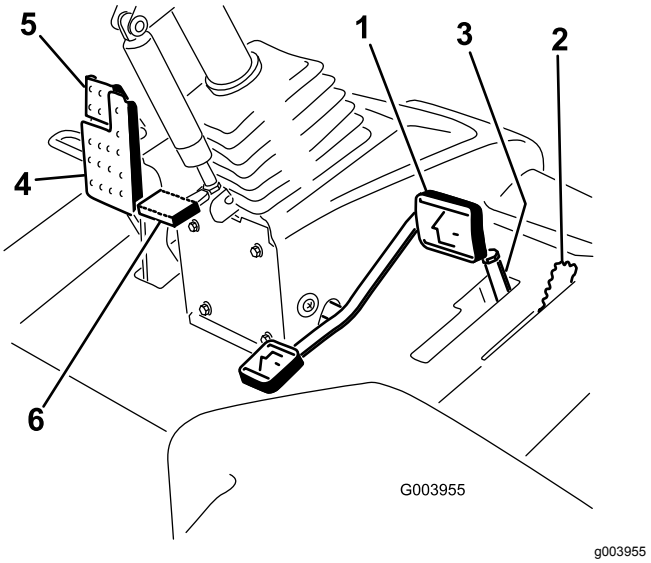


Figure 9

1. Traction pedal
2. Mow speed limiter
3. Spacers
4. Brake pedal
5. Parking brake
6. Tilt steering pedal

Brake Pedal

Press the brake pedal (Figure 9) to stop the machine.

Tilt Steering Pedal

To tilt the steering wheel towards you, press the foot pedal (Figure 9) down, and pull the steering tower toward you to the most comfortable position and then release the pedal.

Engine Speed Switch

The engine speed switch (Figure 10) has two 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 depressed.

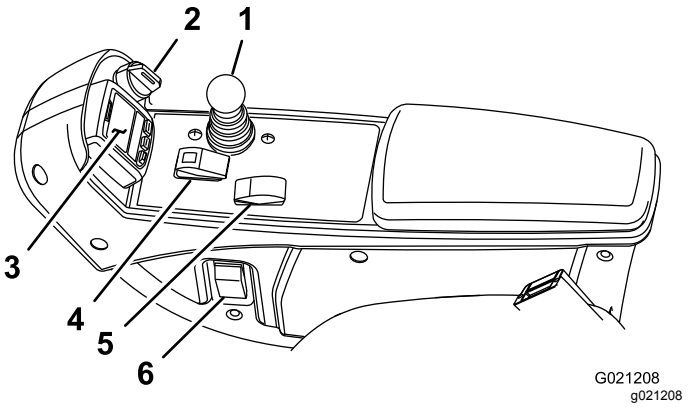


Figure 10

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

Key Switch

The key switch (Figure 10) has three positions: Off, On/Preheat, and Start.

Lower Mow/Raise Control Lever

This lever (Figure 10) raises and lowers the cutting decks and also starts and stops the mowers when the mowers are enabled in the mow mode. When starting the decks in the down position, this lever will turn the decks on if the PTO and the mow speed limiter are engaged.

Headlight Switch

Pivot the switch downward to turn on the headlights (Figure 10).

Enable/Disable Switch

Use the enable/disable switch (Figure 10) in conjunction with the lower mow/raise control lever to operate the mowers. The mowers cannot be lowered when the mow/transport lever is in the transport position.

InfoCenter

The InfoCenter LCD display shows information about your machine such as the operating status, various diagnostics and other information about the machine (Figure 10).

Hydraulic Filter Restriction Indicator

With the engine running at normal operating temperature, view the indicator (Figure 11), it should be in the Green zone. When the indicator is in the Red zone, change the hydraulic filters.

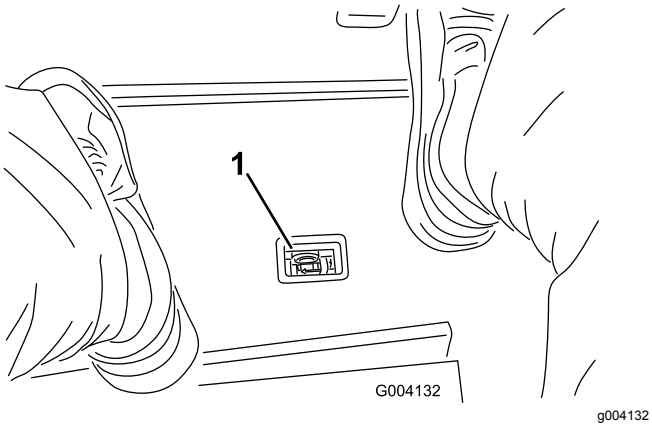


Figure 11

1. Hydraulic filter restriction indicator

Power Point

The power point is a 12 volt power supply for electronic devices (Figure 12).

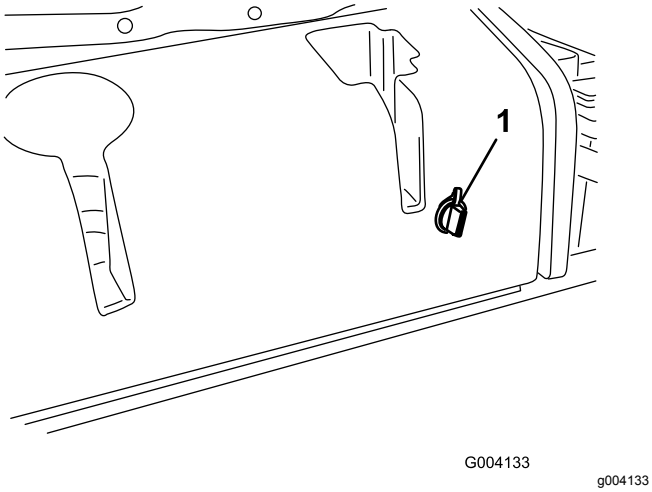


Figure 12

1. Power point

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 13) 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.

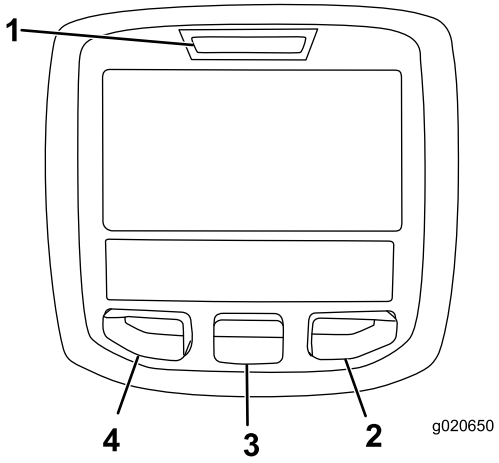


Figure 13

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.

Note: The purpose of each button may change depending on what is required at the time. Each button is 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 rpm
	Hour meter
i	Info icon
	Fast
	Slow
	Fuel level
	Stationary regeneration required
	The glow plugs are active
	Raise the cutting units
	Lower the cutting units
	Sit in the seat
(P)	The parking brake is engaged
H	The range is high (Transport)
N	Neutral
L	The range is low (Mow)
	Coolant Temperature (°C or °F)
	Temperature (hot)
	The PTO is engaged
	Not allowed
	Start the engine
STOP	Shut off the engine

InfoCenter Icon Description (cont'd.)

	Engine
	Key switch
	Cutting units are lowering
	Cutting units are raising
PIN	PIN code
CAN	CAN bus
	InfoCenter
Bad	Bad or failed
	Bulb
OUT	Output of TEC controller or control wire in harness
	Switch
	Release the switch
	Change to indicated state
Symbols are often combined to form sentences. Some examples are shown below	
N	Put the machine into neutral
	Engine start is denied
STOP	Engine shutdown
	Engine coolant is too hot
48.1g/l	DPF ash accumulation notification. Refer to Diesel Particulate Filter Regeneration (page 26) for details.
or (P)	Sit down or engage the 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 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.

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.
Protected Menus	Allows a person authorized by your company with the PIN code to access protected menus.
Counterbalance	Controls the amount of counterbalance applied to the cutting decks.
Auto Idle	Controls the amount of time allowed before returning the engine to low idle when the machine is stationary.

* 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 2 operating configuration settings that are adjustable within the Settings Menu of the InfoCenter: auto idle time delay and counterbalance. These settings can be locked by using the Protected Menu.

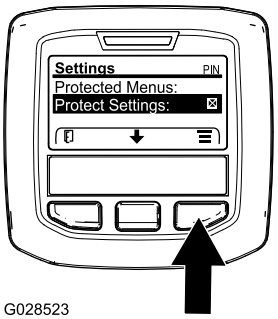
Note: At the time of delivery, the initial password code is programmed by your distributor.

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.

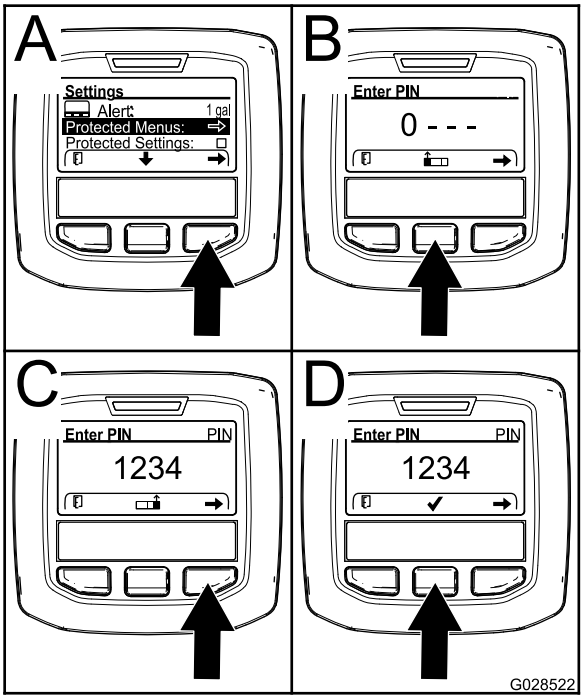
1. From the MAIN MENU, use the center button to scroll down to the SETTINGS MENU and press the right button (Figure 14).



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Figure 14

2. In the SETTINGS MENU, use the center button to scroll down to the PROTECTED MENU and press the right button (Figure 15A).



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Figure 15

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 15B and Figure 15C). 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 15D).

   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.

To Set the Counterbalance

- In the Settings Menu, scroll down to Counterbalance.
- Press the right button to select counterbalance and change between the low, medium, and high settings.

To Set the Auto Idle

- In the Settings Menu, scroll down to Auto Idle.
- Press the right button to change the auto idle time between OFF, 8S, 10S, 15S, 20S, & 30S.

Specifications

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

Transport Width	226 cm (89 inches)
Width of cut	229 cm (90 inches)
Length	320 cm (126 inches)
Height	218 cm (86 inches)
Fuel tank capacity	51 liters (13.5 US gallons)
Transport speed	0–16 kph (0–10 mph)
Mowing speed	0–13 kph (0–8 mph)
Net weight* * With cutting decks and fluids	1,492 kg (3,289 lb)

Cutting Unit Specifications

Length	86.4 cm (34 inches)
Width	86.4 cm (34 inches)
Height	24.4 cm (9.6 inches) to carrier mount 26.7 cm (10–1/2 inches) at 3/4 inch height of cut 34.9 cm (13–3/4 inches) at 4 inch height of cut
Weight	88 kg (195 pounds)

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 or go to www.Toro.com for a list of all approved attachments and accessories.

Operation

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

⚠ CAUTION

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

Lower the cutting decks to the ground, set the parking brake and remove the key from the ignition switch before servicing or making adjustments to the machine.

Checking the Cooling System

Clean debris off of the screen, oil cooler, and front of the radiator daily and more often if conditions are extremely dusty and dirty. Refer to the section on Removing Debris from the Cooling System in Maintenance.

The cooling system is filled with a 50/50 solution of water and permanent ethylene glycol antifreeze. Check the level of coolant in the expansion tank at the beginning of each day before starting the engine. The capacity of the cooling system is 9.5 liters (10.0 quarts).

⚠ 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.**

1. Check the level of coolant in the expansion tank (Figure 16).

   The coolant level should be between the marks on the side of the tank.

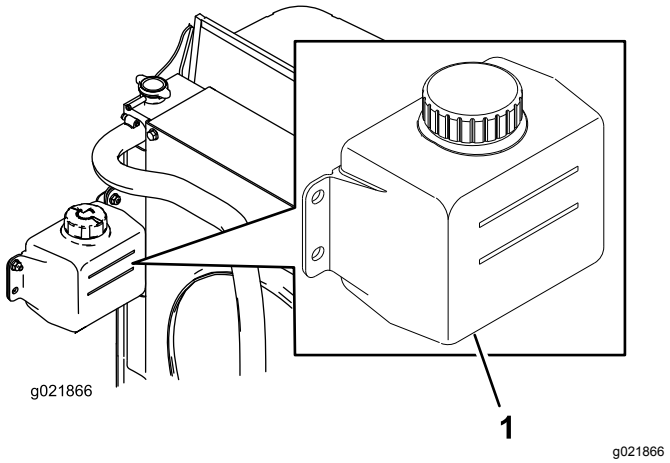


Figure 16

1. Expansion tank

2. If the coolant level is low, remove the expansion tank cap and replenish the system. **Do not overfill.**
3. Install the expansion tank cap.

Filling the Fuel Tank

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

Fuel tank capacity: 53 L (14 US gallons)

Adding Fuel

1. Park the machine on a level surface.
2. Using a clean rag, clean area around fuel tank cap.
3. Remove the cap from the fuel tank (Figure 17).

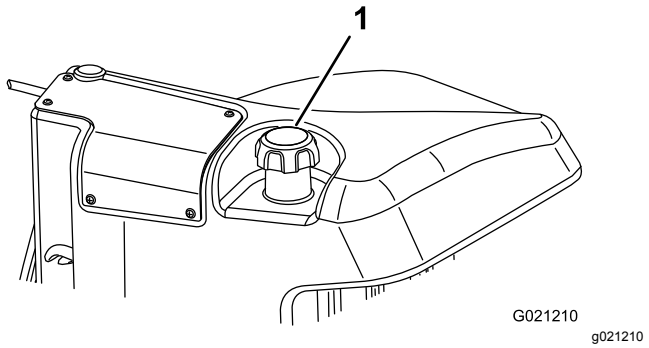


Figure 17

1. Fuel tank cap

4. Fill the tank until the level is 6 to 13 mm (1/4 to 1/2 inch) below the bottom of the filler neck.
5. Install fuel tank cap tightly after filling tank.

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

Fill the tank to about 6 to 13 mm (1/4 to 1/2 inch) below the top of the tank, not the filler neck, with Number 2-D diesel fuel.

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

Checking the Hydraulic-Fluid Level

Service Interval: Before each use or daily

The hydraulic tank of the machine is filled at the factory with approximately 37.8 L (10 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 as follows:

> **Toro Premium All Season Hydraulic Fluid** (Available in 18.9 L (5 US gallon) pails or 208 L (55 US gallon) drums. See the *Parts Catalog* or your Toro Distributor for part numbers.)

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

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

High Viscosity Index/Low Pour Point Anti-wear Hydraulic Fluid, ISO VG 46

Material Properties:

Viscosity, ASTM D445	cSt @ 40°C 44 to 50 cSt @ 100°C 7.9 to 8.5
Viscosity Index ASTM D2270	140 to 160
Pour Point, ASTM D97	-34°F to -49°F
Industry Specifications:	Vickers I-286-S (Quality Level), Vickers M-2950-S (Quality Level), Denison HF-0

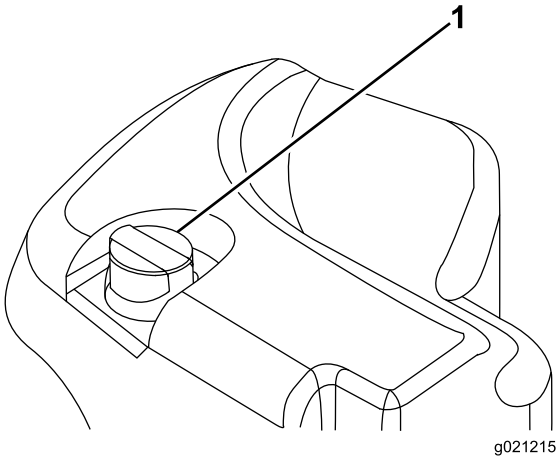
Important: **The ISO VG 46 Multigrade fluid has been found to offer optimal performance in a wide-range of temperature conditions. For operation in consistently high ambient temperatures, 18°C (65°F) to 49°C (120°F), ISO VG 68 hydraulic fluid may offer improved performance.**

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 mineral oils, but for maximum biodegradability and performance the hydraulic system should be thoroughly flushed of conventional fluid. The oil is available in 19 L (5 US gallons) containers or 55 gallon drums from your Mobil Distributor.**

Note: Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic system oil is available in 20 ml (2/3 oz) bottles. 1 bottle is sufficient for 15 to 22 L (4 to 6 US gallons) of hydraulic oil. Order Part Number 44-2500 from your Toro Distributor.

1. Position machine on a level surface, lower the cutting decks and stop the engine.
2. Clean area around filler neck and cap of hydraulic tank (Figure 18).



g021215

Figure 18

1. Hydraulic tank cap

3. Remove cap/dipstick from filler neck and wipe it with a clean rag. Insert dipstick into filler neck; then remove it and check level of fluid. Fluid level should be within operating range on dipstick. Do not overfill.
4. If level is low, add appropriate fluid to raise level to full mark.
5. Install cap/dipstick onto filler neck.

Check the Torque of the Wheel Nuts

Torque the wheel nuts to 94 to 122 N-m (70 to 90 ft-lb) after **1-4 hours** of operation and again after **10 hours** of operation. Torque every **250 hours** thereafter.

⚠ WARNING

Failure to maintain proper torque of the wheel nuts could result in personal injury.

Breaking-in the Machine

To ensure optimum performance of the parking brake system, burnish (break-in) the brakes before use. Set the forward traction speed to 4 mph to match the reverse traction speed. (All eight spacers moved to the top of the mow speed control.) With the engine at high idle, proceed forward with the mow speed control stop engaged and ride the brake for 15 seconds. Proceed backwards at full reverse speed and ride the brake for 15 seconds. Repeat this 5 times waiting 1 minute between each forward and reverse cycle to avoid overheating the brakes. An adjustment to the brakes may be required after break-in; refer to Adjusting the Parking Brakes.

Starting and Stopping the Engine

Important: **The fuel system will automatically bleed itself when any of the following situations occur:**

- Initial start up of a new machine.
- The engine has ceased running due to lack of fuel.
- Maintenance has been performed upon the fuel system components.

Starting the Engine

1. Sit on the seat, keep your foot off of the traction pedal so that it is in Neutral, engage the parking brake, set the engine speed switch to the Mid position, and ensure that the Enable/Disable switch is in the Disable position.
2. Turn the ignition key to the Run position.
3. When the glow indicator dims, turn the ignition key to the Start position. Release the key immediately when the engine starts and allow it to return to the Run position. Allow engine to warm up (without load), then move the throttle control to the desired position.

Stopping the Engine

1. Move all controls to Neutral, set the parking brake, move the engine speed switch to the low idle position and allow the engine to reach low idle speed.

   Important: **Allow the engine to idle for 5 minutes before shutting it off after a full load operation. Failure to do so may lead to trouble on a turbo-charged engine.**
2. Turn the key to the Off position and remove it from the switch.

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.
2. Whenever possible, set the engine-speed switch to high idle.
3. Engage the PTO switch.
4. Gradually move the traction pedal forward and slowly drive the machine over the mowing area.
5. Once the front of the cutting units are over the mowing area, lower the cutting units.
6. Cut grass so that the blades can cut and discharge clippings at a high rate while producing a good quality of cut.

   Note: If the cutting rate is too high, the quality of cut may deteriorate. Reduce the ground speed of the machine or reduce the width of cut to regain high idle engine speed.
7. When the cutting units are over the far edge of the mowing area, lift the cutting units.
8. 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

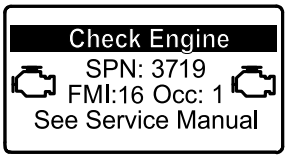
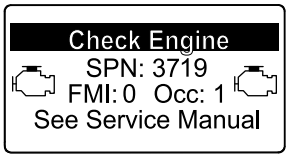
The exhaust temperature is hot (approximately 600°C (1112°F) during DPF parked regeneration or recovery regeneration. Hot exhaust gas can harm you or other people.

- **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.

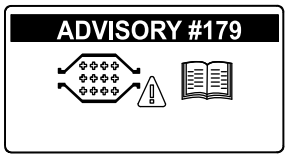
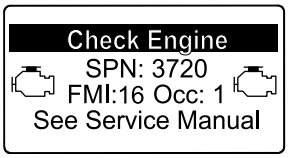
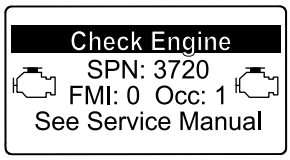
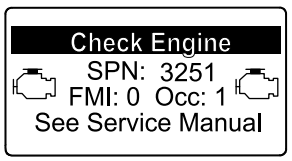
Engine Warning Messages—Soot Accumulation

Indication Level	Fault Code	Engine Power Rating	Recommended Action
Level 1: Engine Warning	 g213866 **Figure 19** 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 30).
Level 2: Engine Warning	 g213867 **Figure 20** 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 33).

DPF Ash Accumulation

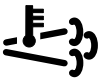
- The lighter ash is discharged through the exhaust system; the heavier ash collects in the soot filter.
- Ash is a residue of the regeneration process. Over time, the diesel particulate filter accumulates ash that does not discharge with the engine exhaust.
- The computer for the engine calculates the 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

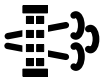
Indication Level	Advisory or Fault Code	Engine Speed Reduction	Engine Power Rating	Recommended Action
Level 1: System Advisory	 g213865 **Figure 21** Advisory #179	None	100%	Notify your service department that advisory #179 displays in the InfoCenter.
Level 2: Engine Warning	 g213863 **Figure 22** Check 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 46)
Level 3: Engine Warning	 g213864 **Figure 23** 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 46)
Level 4: Engine Warning	 g214715 **Figure 24** 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 46)

Types of Diesel Particulate Filter Regeneration

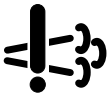
Types of diesel particulate filter regeneration that are performed while the machine is operating:

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 29).
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 29).
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 30).

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 30).

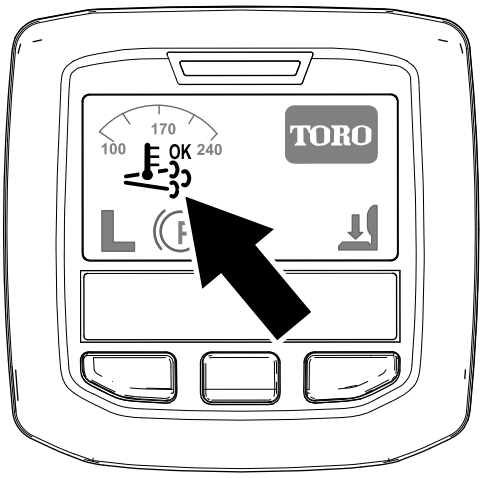
Types of diesel particulate filter regeneration that require you to park the machine: (cont'd.)

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 33).

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



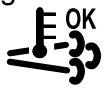
g214711

Figure 25
Assist/reset-regeneration icon

- The assist/reset-regeneration icon displays in the InfoCenter (Figure 25).
- 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 

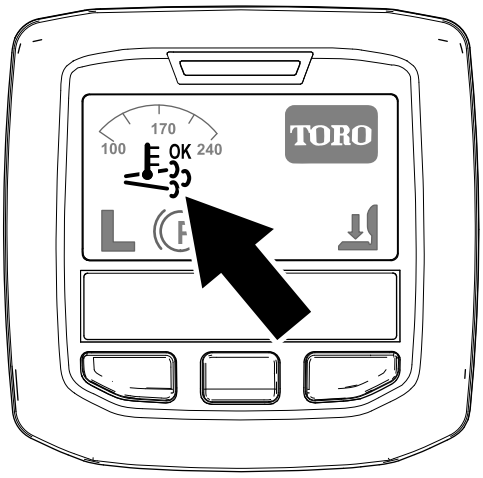
icon displays in the InfoCenter while the assist regeneration is processing.
- Whenever possible, do not shut off the engine or reduce engine speed while the assist regeneration is processing.

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 26

Assist/reset-regeneration icon

- The assist/reset-regeneration icon displays in the InfoCenter (Figure 26).
- 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 

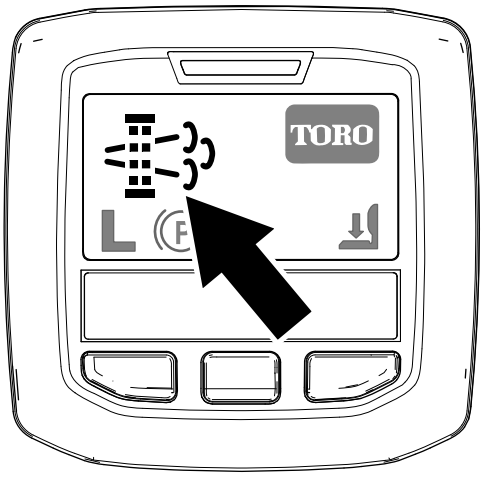
icon displays in the InfoCenter while the reset regeneration is processing.
- Whenever possible, do not shut off the engine or reduce engine speed while the reset regeneration is processing.

  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

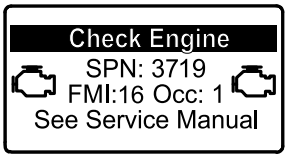


g214713

Figure 27

Parked-regeneration request icon

- The parked-regeneration requested icon displays in the InfoCenter (Figure 27).
- If a parked regeneration is needed, the InfoCenter displays engine warning SPN 3719, FMI 16 (Figure 28) and the engine computer derates engine power to 85%.



g213866

Figure 28

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

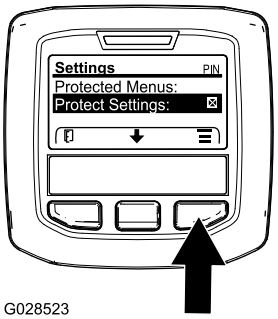
1. Ensure that the machine has at least 1/4 tank of fuel.
2. Move the machine outside to an area away from combustible materials.
3. Park the machine on a level surface.
4. Ensure that the traction control or motion-control levers are in the NEUTRAL position.
5. If applicable, lower the cutting units 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 20).

1. Access the protected menu and unlock the protected settings submenu (Figure 29); refer to Accessing Protected Menus (page 20).



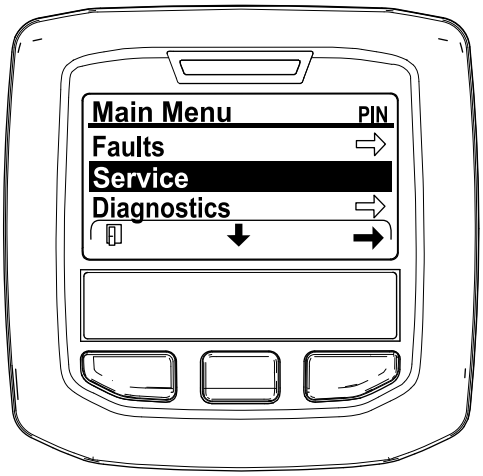
G028523

g028523

Figure 29

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 30).

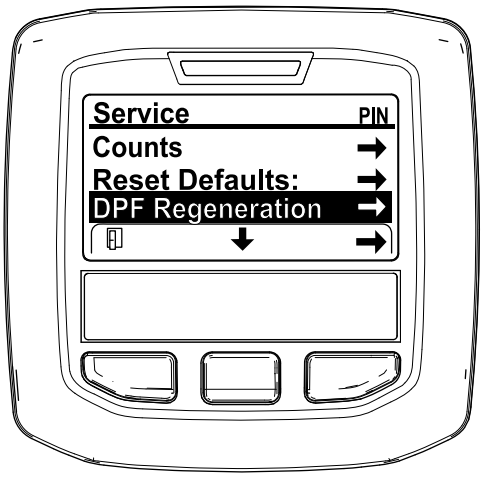
   Note: The InfoCenter should display the PIN indicator in the upper right corner of the display.



g212371

Figure 30

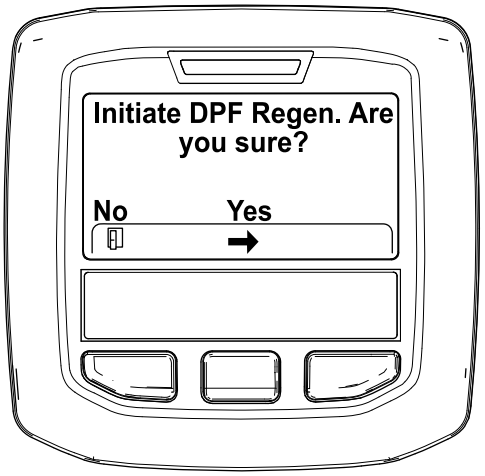
3. In the SERVICE MENU, press the middle button until the DPF REGENERATION options displays, and press the right button to select the DPF REGENERATION option (Figure 31).



g212138

Figure 31

4. When the “Initiate DPF Regen. Are you sure?” message displays, press the center button (Figure 32).



g212125

Figure 32

5. If the coolant temperature is below 60°C (140°F) the “Insure is running and above 60C/140F” message displays. (Figure 33).

   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.

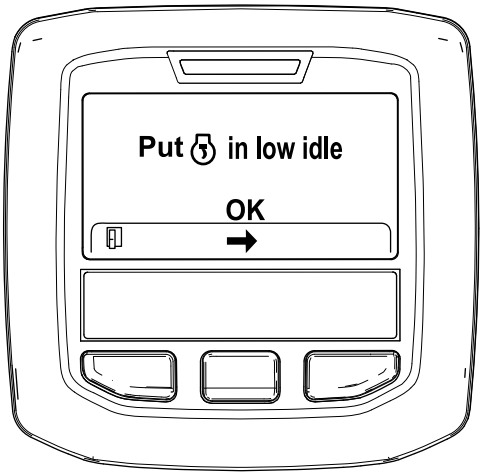
   Note: If the coolant temperature is above 60°C (140°F) this screen is skipped.



g211986

Figure 33

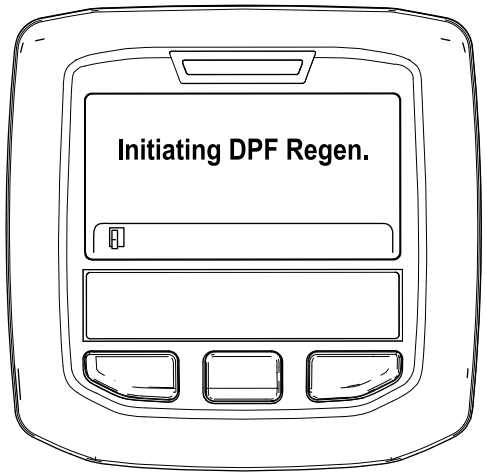
6. Move the throttle control to LOW IDLE and press the center button (Figure 34).



g212372

Figure 34

7. The following messages display as the parked regeneration process begins:
   A. The “Initiating DPF Regen.” message displays (Figure 35).



g212405

Figure 35

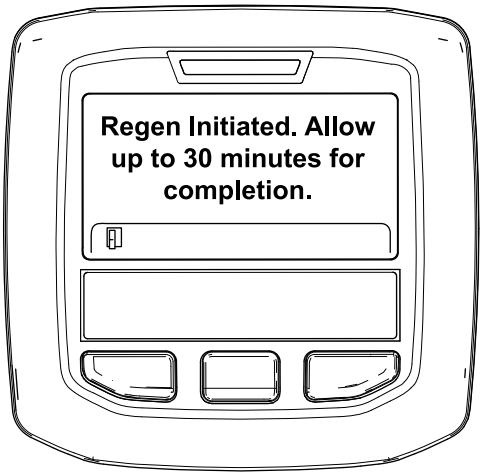
   B. The “Waiting on ” message displays (Figure 36).



g212406

Figure 36

   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 37).

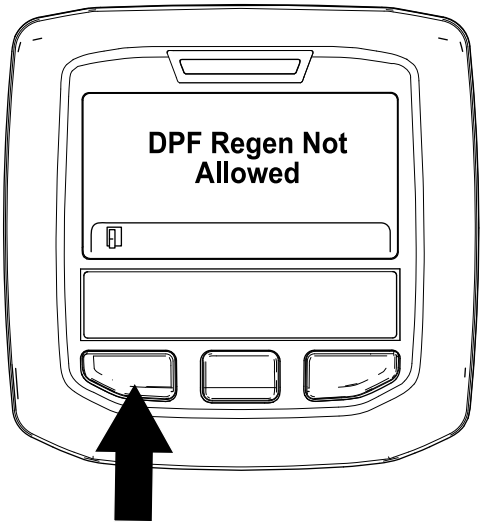


g213424

Figure 37

- If the regeneration process is not allowed by the engine computer, the “DPF Regen Not Allowed” message displays in the InfoCenter (Figure 38). 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 38

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



The engine is cold—wait.

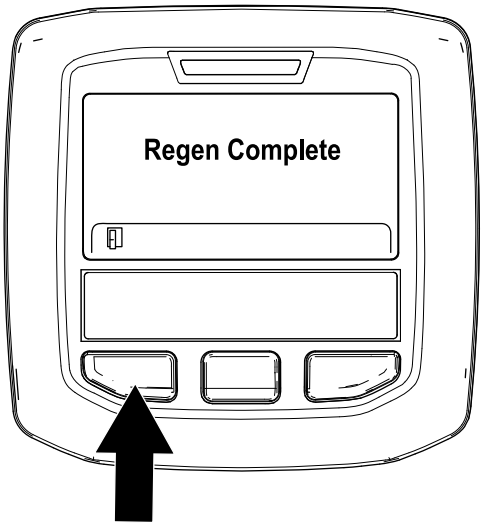


The engine is warm—wait.



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 39).

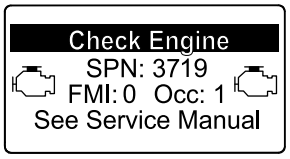


g212404

Figure 39

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 40) and the engine computer derates engine power to 85%.



g213867

Figure 40

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.

Pushing or Towing the Machine

In an emergency, the machine can be moved by actuating the bypass valve in the variable displacement hydraulic pump and pushing or towing the machine.

Important: **Do not push or tow the machine faster than 3-4.8 km/h (2-3 mph) because internal transmission damage may occur. The bypass valve must be open whenever the machine is pushed or towed.**

1. The bypass valve is located on the left side of the hydrostat (Figure 41). Rotate the bolt 1–1/2 turns to open and allow oil to bypass internally. Because fluid is bypassed, the machine can be moved slowly without damaging the transmission.

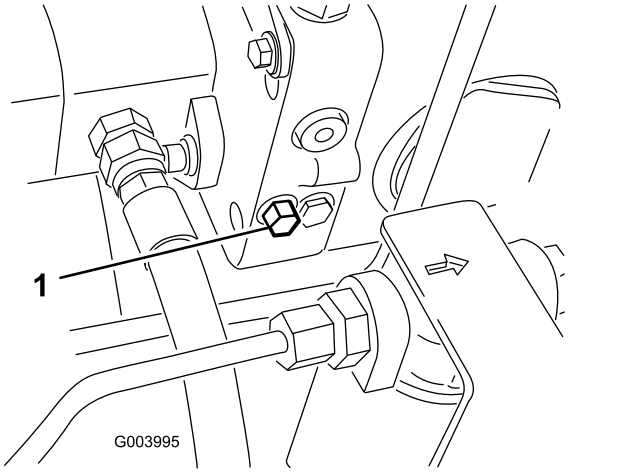


Figure 41

1. Bypass valve

2. Close the bypass valve before starting the engine. However, do not exceed 7-11 N-m (5-8 ft.-lb) torque to close the valve.

   Important: **Running the engine with the bypass valve open will cause the transmission to overheat.**

Jacking Points

Note: Use jack stands to support the machine when required.

- Front—rectangular pad, under the axle tube, inside each front tire (Figure 42).

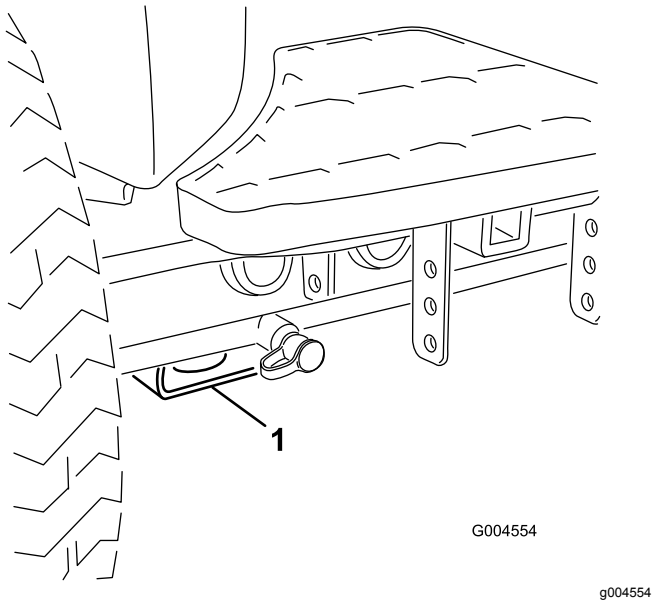


Figure 42

1. Front jacking point

- Rear—rectangular axle tube on the rear axle.

Tie Downs

- Front—the hole in the rectangular pad, under the axle tube, inside each front tire (Figure 43).

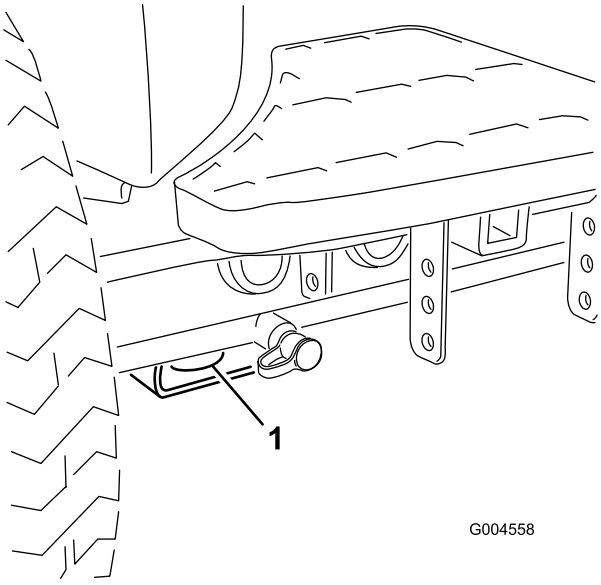


Figure 43

1. Front tie down

- Rear—each side of the machine on the rear frame (Figure 44).

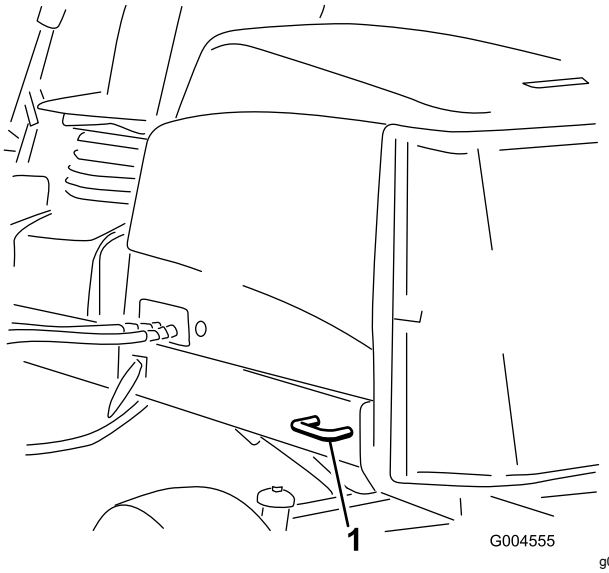


Figure 44

1. Rear tie down

Understanding the Diagnostic Light

The machine is equipped with a diagnostic light which indicates if the machine detects a malfunction. The diagnostic light is located on the InfoCenter, above the display screen (Figure 45). When the machine is functioning properly and the key switch is moved to the On/Run position, the diagnostic light will turn on briefly to indicate the light is working properly. When a machine advisory message is displayed, the light will illuminate when the message is present. When a fault message is displayed, the light will blink until the fault is resolved.

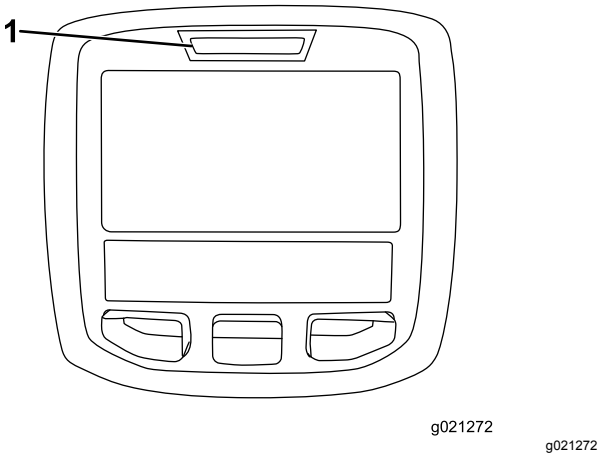


Figure 45

1. Diagnostic light

Changing the Counterbalance Settings

During different times of the mowing season or when turf conditions vary, the amount of counterbalance (upward lift) required on the cutting decks can be changed to meet the conditions.

1. Position the machine on a level surface, lower the cutting decks, stop the engine, engage the parking brake, and remove the key from the ignition switch.
2. In the InfoCenter Settings Menu, scroll down to Counterbalance.
3. Press the right button to select counterbalance and change between the low, medium, and high settings.

   Note: Once the adjustment has been completed, move the machine to a test area and operate the machine with the new setting. The new counterbalanced setting may change the effective height of cut.

Checking the Interlock Switches

The purpose of the interlock switches is to prevent the engine from cranking or starting unless the traction pedal is in the Neutral position, the Enable/Disable switch is in the Disable position, and the Lower Mow/Raise control is in the Neutral position. In addition, the engine should stop when the traction pedal is pressed with operator off of the seat or if the parking brake is left engaged.

⚠ 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.**

Verifying the Interlock Switch Function

1. Park the machine on a level surface, lower the cutting units, stop the engine, and engage the parking brake.
2. Turn the key switch to the On position, but do not start the machine.
3. Locate the appropriate switch function in the diagnostics menu on the InfoCenter.
4. Individually, change each of the switches from open to closed (i.e., sit on seat, engage traction pedal, etc.), and note that the appropriate state of the switch changes. Repeat this for all switches that you can change by hand.
5. If a switch is closed and the appropriate indicator does not change, check all wiring and connections to the switch and/or check the switches with an ohm meter. Replace any defective switches and repair any defective wiring.

Note: The InfoCenter display also has the ability to detect which output solenoids or relays are turned on. This is a quick way to determine if a machine malfunction is electrical or hydraulic.

Verifying Output Function

1. Park the machine on a level surface, lower the cutting units, stop the engine, and engage the parking brake.
2. Turn the key switch to the On position and start the machine.
3. Locate the appropriate output function in the diagnostics menu on the InfoCenter.
4. Sit on the seat and attempt to operate the desired function of the machine. The appropriate outputs should change state to indicate that the ECM is turning on that function.

Note: If the correct outputs do not illuminate, verify that the required input switches are in the necessary positions to allow that function to occur. Verify correct switch function.

If the output displays are on as specified, but the machine does not function properly, this indicates a non-electrical problem. Repair as necessary.

Hydraulic Valve Solenoid Functions

Use the list below to identify and describe the different functions of the solenoids in the hydraulic manifold. Each solenoid must be energized to allow function to occur.

Solenoid	Function
PRV2	Front mower circuit
PRV1	Rear mower circuit
PRV	Lift/lower cutting decks
S1	Lower cutting decks
S2	Lower cutting decks

Selecting a Blade

Standard Combination Sail

This blade was designed to provide excellent lift and dispersion in almost any condition. If more or less lift and discharge velocity is required, consider a different blade.

Attributes: Excellent lift and dispersion in most conditions.

Angled Sail

The blade generally performs best in lower heights of cut - 1.9 to 6.4 cm (3/4 to 2–1/2 inch).

Attributes:

- Discharge remains more even at lower heights of cut.
- Discharge has less tendency to throw left and thus a cleaner look around bunkers and fairways.
- Lower power requirement at lower heights and dense turf.

High Lift Parallel Sail

The blade generally performs better in the higher heights of cut - 7 to 10 cm (2 to 4 inch).

Attributes:

- More lift and higher discharge velocity.
- Sparse or limp turf is picked up significantly at higher heights of cut.
- Wet or sticky clippings are discharged more efficiently reducing congestion in the deck.
- Requires more horsepower to run.
- Tends to discharge further left and can tend to windrow at lower heights of cut.

⚠ WARNING

Do not use the high lift blade with the mulching baffle. The blade could break, resulting in personal injury or death.

Atomic Blade

This blade was designed to provide excellent leaf mulching.

Attributes: Excellent leaf mulching

Choosing Accessories

Optional Equipment Configurations

	Angle Sail Blade	**High Lift Parallel Sail Blade *(Do not use with the mulching baffle)***	**Mulching Baffle**	**Roller Scraper**
Grass Cutting: 1.9 to 4.4 cm (0.75 to 1.75 inch) Height-of-Cut	Recommended in most applications	May work well in light or sparse turf	Has been shown to improve dispersion and after cut performance on northern grasses that are cut at least three times per week and less than 1/3 of the grass blade is removed. ***Do not use with the high lift parallel sail blade***	Can be used any time that rollers build up with grass or large flat grass clumps of grass are seen. The scrapers may actually increase clumping in certain applications.
Grass Cutting: 5 to 6.4 cm (2.00 to 2.50 inch) Height-of-Cut	Recommended for thick or lush turf	Recommended for light or sparse turf		
Grass Cutting: 7 to 10 cm (2.75 to 4.00 inch) Height-of-Cut	May work well in lush turf	Recommended in most applications		
Leaf Mulching	Recommended for use with the mulching baffle	**Not Allowed**	Use with combination sail or angle sail blade only	
Pros	Even discharge at lower height of cut Cleaner look around bunkers and fairways Lower power requirements	More lift and higher discharge velocity Sparse or limp turf is picked up at high height of cut Wet or sticky clippings are discharged efficiently	May improve dispersion and appearance in certain grass cutting applications Very good for leaf mulching	Reduces roller buildup in certain applications
Cons	Does not lift the grass well in high height of cut applications Wet or sticky grass has a tendency to build up in the chamber, leading to poor quality of cut and higher power requirements	Requires more power to run in some applications Tends to windrow at lower height of cut in lush grass Do not use with the mulching baffle	Grass will build up in the chamber if attempting to remove too much grass with baffle in place	

Operating Tips

Familiarization

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 decks and engage and disengage the mowers. When you feel familiar with the machine, practice operating up and down slopes at different speeds.

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

Start the engine and move the throttle to the Fast position. Move the Enable/Disable switch to the Enable position and use the Lower Mow/Raise lever to control the cutting decks. To move forward and cut grass, press the traction pedal forward.

Note: Allow the engine to idle for 5 minutes before shutting it off after a full load operation. Failure to do so may lead to turbo-charger trouble.

Mow when the Grass is Dry

Mow either in the late morning to avoid the dew, which causes grass clumping, or in late afternoon to avoid the damage that can be caused by direct sunlight on the sensitive, freshly mowed grass.

Select the Proper Height-of-Cut Setting to Suit Conditions

Remove approximately one inch or no more than 1/3 of the grass blade when cutting. In exceptionally lush and dense grass you may have to raise the height–of–cut setting.

Always Start Mowing with Sharp Blades

A sharp blade cuts cleanly and without tearing or shredding the grass blades like a dull blade. Tearing and shredding causes the grass to turn brown at the edges which impairs growth and increases susceptibility to diseases. Make sure blade is in good condition and a full sail is present.

Check the Condition of the Decks

Make sure that the cutting chambers are in good condition. Straighten any bends in the chamber components to ensure the correct blade tip/chamber clearance.

After Operating

To ensure optimum performance, clean the underside of mower housing. If you allow residue to build up in mower housing, cutting performance will decrease.

Transport

Move the Enable/Disable switch to the Disable position and raise the cutting decks to the transport position. Move the Mow/Transport lever to the transport position. Be careful when driving between objects so you do not accidentally damage the machine or cutting decks. Use extra care when operating the machine on slopes. Drive slowly and avoid sharp turns on slopes to prevent roll overs. Lower the cutting decks 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 hour	• Torque the wheel lug nuts to 94 to 122 N-m (70 to 90 ft-lb).
After the first 10 hours	• Torque the wheel lug nuts to 94 to 122 N-m (70 to 90 ft-lb). • Check the alternator belt tension.
After the first 50 hours	• Change the engine oil and filter.
Before each use or daily	• Check the cooling system. • Check the hydraulic-fluid level. • Check the operation of the interlock switches. • Check the engine-oil level. • Remove debris from the screen and radiator/oil cooler (more frequently in dirty operating conditions). • Check the hydraulic lines and hoses for leaks, kinked lines, loose mounting supports, wear, loose fittings, weather deterioration, and chemical deterioration. • Check the blade stopping time
Every 50 hours	• Grease the bearings and bushings. (Grease them immediately after every washing regardless of the interval listed.) • Check the condition of and clean the battery. • Check the battery cable connections.
Every 100 hours	• Inspect the cooling system hoses. • Check the alternator belt tension.
Every 250 hours	• Torque the wheel lug nuts to 94 to 122 N-m (70 to 90 ft-lb). • Change the engine oil and filter.
Every 400 hours	• Service the air cleaner. (Service the air cleaner earlier if the air cleaner 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.
Every 800 hours	• Drain and clean the fuel tank • Check the rear wheel toe-in. • Change the hydraulic fluid. • Change the hydraulic filters (sooner if the service interval indicator is in the Red zone). • Pack the rear wheel bearings
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
Every 2 years	• Flush and replace the cooling system fluid. • Drain and flush the hydraulic tank. • Replace all moving hoses.

Daily Maintenance Checklist

Duplicate this page for routine use.

Maintenance Check Item	For the week of:						
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check the safety interlock operation.							
Check the brake operation.							
Check the engine oil and fuel level.							
Drain the water/fuel separator.							
Check the air filter restriction indicator.							
Check the radiator and screen for debris.							
Check unusual engine noises.[1]							
Check unusual operating noises.							
Check the hydraulic system oil level.							
Check the hydraulic filter indicator. [2]							
Check hydraulic hoses for damage.							
Check for fluid leaks.							
Check the tire pressure.							
Check the instrument operation.							
Check the Height of Cut adjustment							
Check Condition of Blades							
Check all grease fittings for lubrication.[3]							
Touch-up damaged paint.							

1. Check the glow plug and injector nozzles if hard starting, excess smoke, or rough running is noted.
2. Check with the engine running and the oil at operating temperature
3. Immediately after every washing, regardless of the interval listed

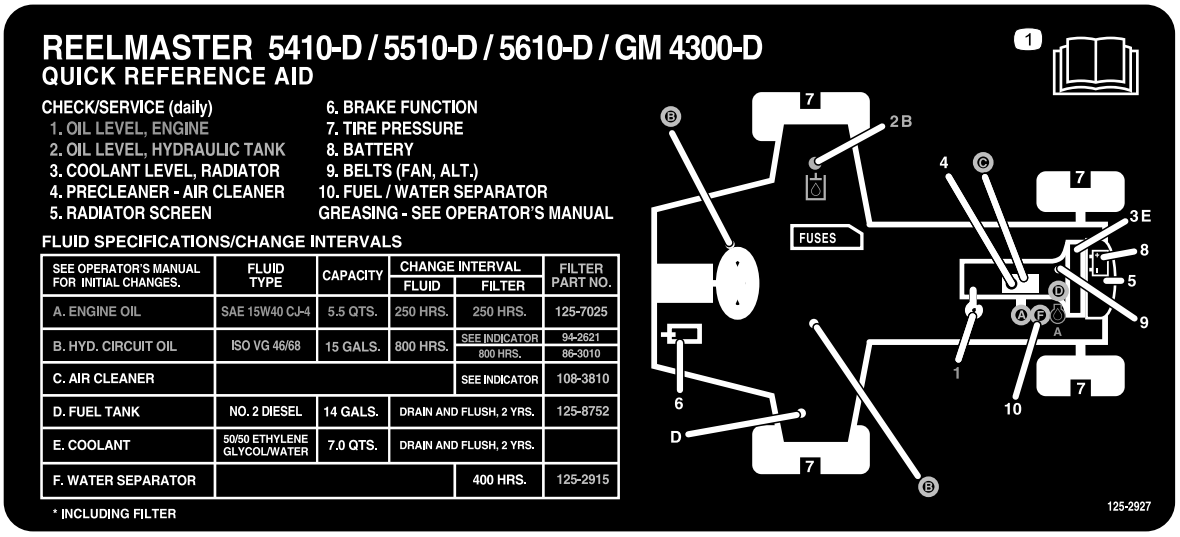
Notation for Areas of Concern

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

Important: **Refer to your *Engine Operator's Manual* for additional maintenance procedures.**

Note: Looking for an *Electrical Schematic* or *Hydraulic Schematic* for your machine? Download a free copy of the schematic by visiting www.Toro.com and searching for your machine from the Manuals link on the home page.

Service Interval Chart



decal125-2927

Figure 46

⚠ CAUTION

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

Remove the key from the ignition before you do any maintenance.

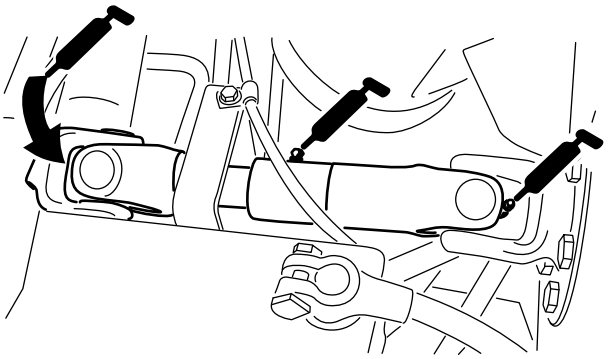
Lubrication

Greasing the Bearings and Bushings

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

The grease fitting locations and quantities are as follows:

- Pump drive shaft U-joint (3) (Figure 47)



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Figure 47

- Cutting unit lift arm cylinders (2 each) (Figure 48)

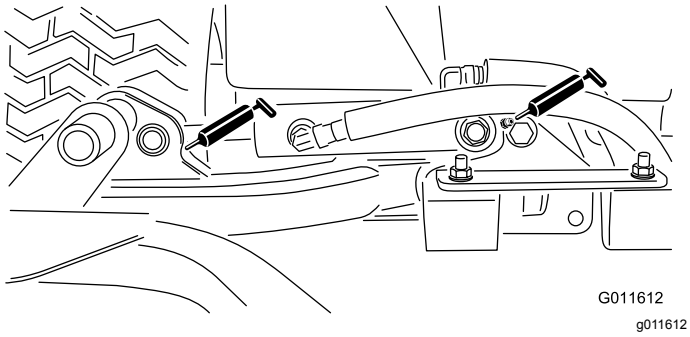


Figure 48

- Lift arm pivots (1 each) (Figure 48)
- Cutting unit carrier frame pivot (1 each) (Figure 49)

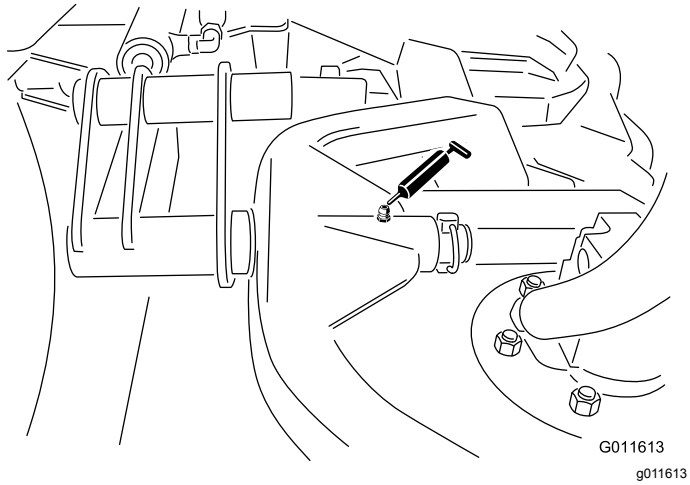


Figure 49

- Lift arm pivot shaft (1 each) (Figure 50)

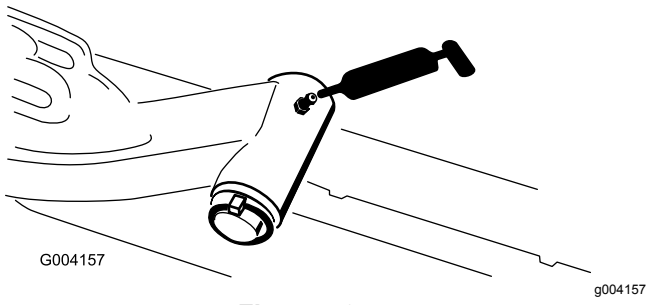


Figure 50

- Rear axle tie rod (2) (Figure 51)

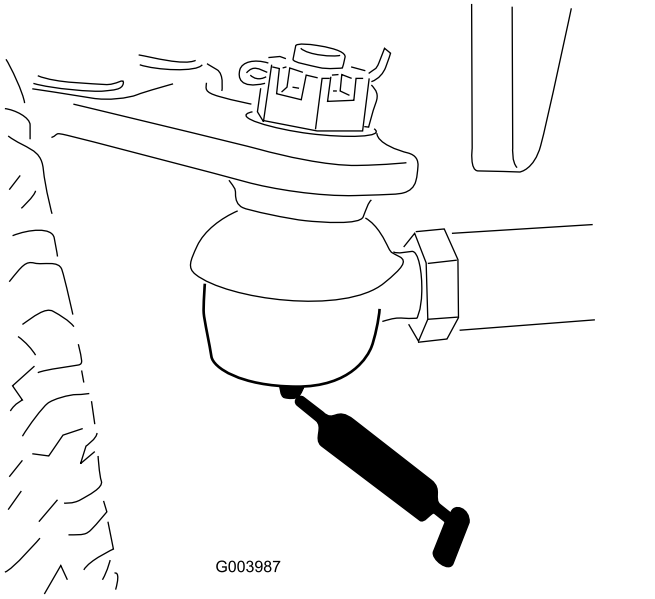


Figure 51

- Axle steering pivot (1) (Figure 52)

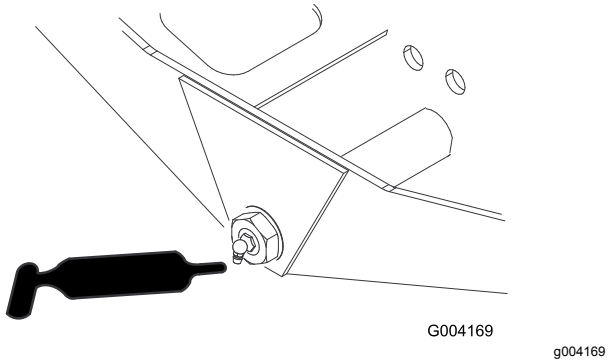


Figure 52

- Steering cylinder ball joints (2) and rear axle (1) (Figure 53)

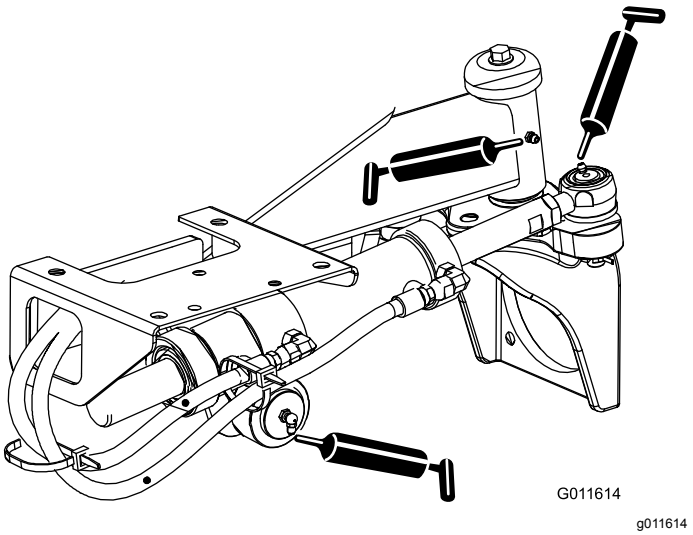


Figure 53

- Brake pedal (1) (Figure 54)

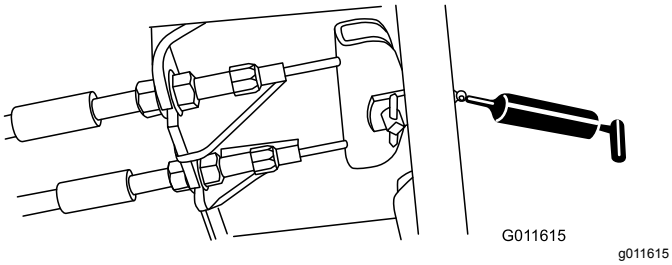


Figure 54

- Cutting unit spindle shaft bearings (2 per cutting unit) (Figure 55)

  Note: Either fitting can be used, which ever is more accessible. Pump grease into the fitting until a small amount appears at bottom of the spindle housing (under the deck).

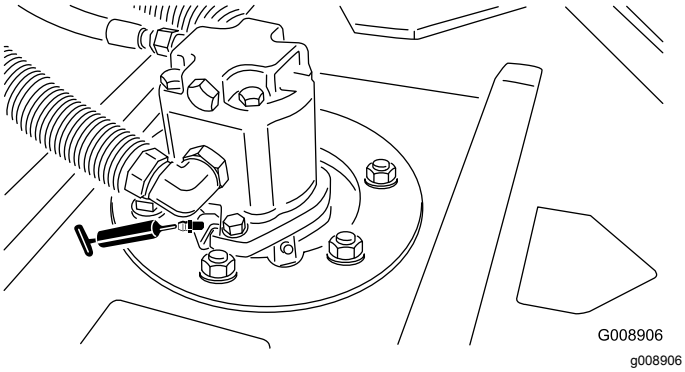


Figure 55

- Rear roller bearings (2 per cutting unit) (Figure 56)

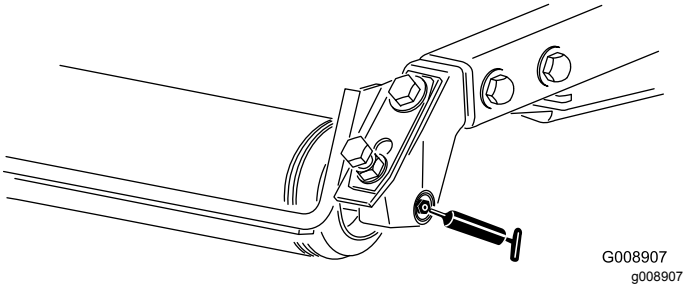


Figure 56

Note: Make sure the grease groove in each roller mount aligns with the grease hole in each end of the roller shaft. To help align the groove and hole, there is also an alignment mark on one end of the roller shaft.

Engine Maintenance

Servicing the Air Cleaner

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

Service the air cleaner filter only when the service indicator (Figure 57) requires it. Changing the air filter before it is necessary only increases the chance of dirt entering the engine when the filter is removed.

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

1. Release the latches securing the air cleaner cover to the air cleaner body (Figure 57).

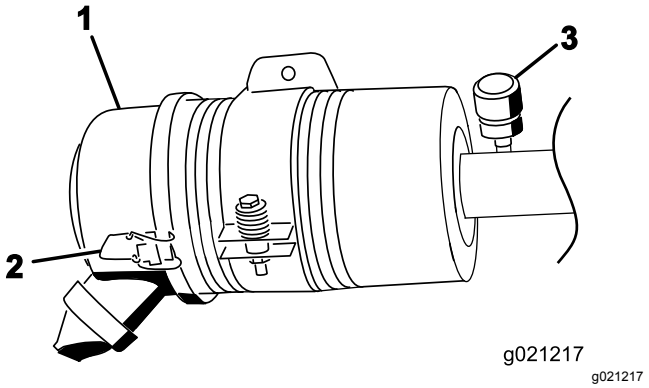


Figure 57

1. Air cleaner cover
2. Air cleaner cover latch
3. Air cleaner service indicator

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

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

3. Remove and replace the filter (Figure 58).

   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.**

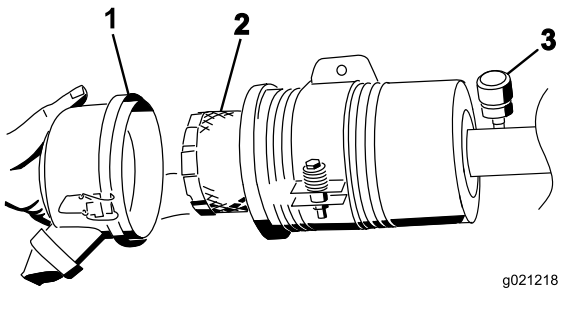


Figure 58

1. Air cleaner cover
2. Air cleaner filter
3. Air cleaner indicator

4. Clean the dirt ejection port located in the removable cover. Remove the rubber outlet valve from the cover, clean the cavity and replace the outlet valve.
5. Install the cover orienting the rubber outlet valve in a downward position—between approximately 5:00 to 7:00 when viewed from the end.
6. Secure the latches.

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. Unlock the engine cover latches.
2. Open the engine cover.
3. Remove the dipstick, wipe it clean, install the dipstick into the tube, and pull it out again. The oil level should be between the full and add marks (Figure 59).

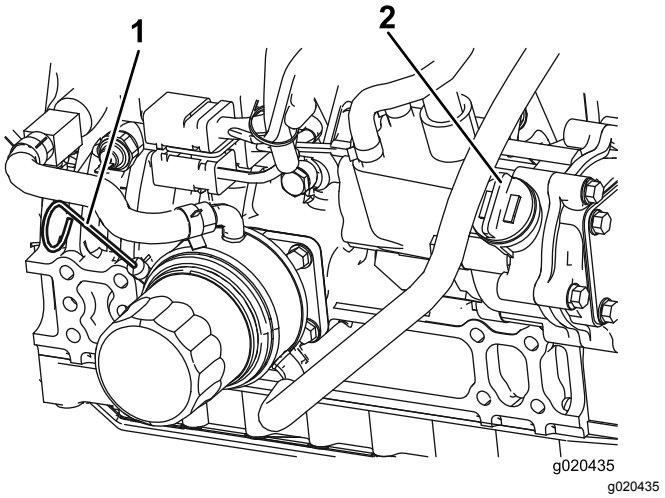


Figure 59

1. Dipstick
2. Oil fill cap

4. If the oil level is low, remove the fill cap (Figure 59) and add oil until it is between the full and add marks. **Do not overfill.**
5. Install the oil fill cap and dipstick.
6. Close the engine cover and secure it with the latches.

Crankcase Oil Capacity

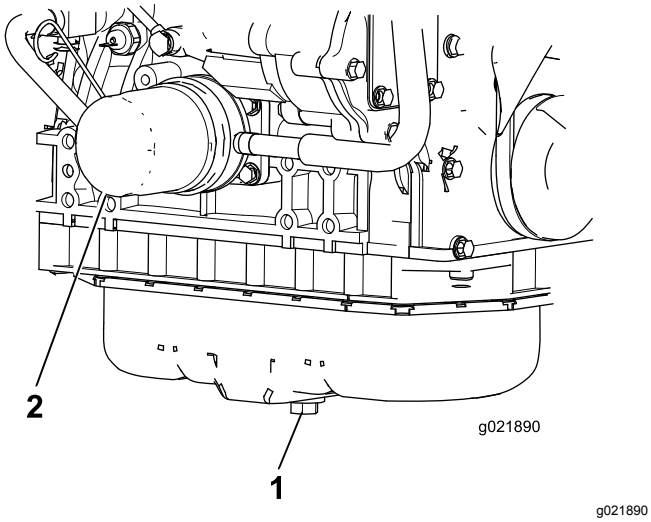
Approximately 5.2 L (5.5 US qt) with the filter.

Changing the Engine Oil and Filter

Service Interval: After the first 50 hours

Every 250 hours

1. Remove the drain plug (Figure 60) and let the oil flow into a drain pan. When all the oil is drained, install the drain plug.



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Figure 60

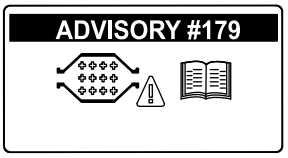
1. Engine oil drain plug 2. Oil filter

2. Remove the oil filter (Figure 60). Apply a light coat of clean oil to the new filter seal before screwing it on. **Do not overtighten.**
3. Add oil to the crankcase; refer to Checking the Engine Oil.

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.

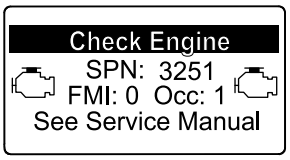
- If advisory message ADVISORY 179 displays in the InfoCenter, the DPF is nearing the recommended point for servicing the diesel-oxidation catalyst and the soot filter.



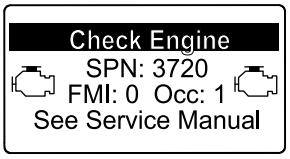
g213865

Figure 61

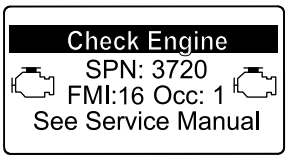
- If engine faults CHECK ENGINE SPN 3251 FMI 0, CHECK ENGINE SPN 3720 FMI 0, or CHECK ENGINE SPN 3720 FMI 16in the InfoCenter (Figure 62) display in the InfoCenter, clean the soot filter using the steps that follow:



g214715



g213864



g213863

Figure 62

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.

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

Draining the Fuel Tank

Service Interval: Every 800 hours

Before storage

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

Checking the Fuel Lines and Connections

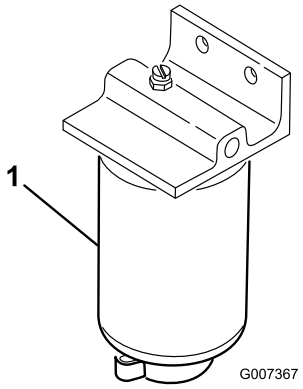
Check the fuel lines and connections every 400 hours or yearly, whichever comes first. Inspect them for deterioration, damage, or loose connections.

Servicing the Water Separator

Service Interval: Every 400 hours

Drain water or other contaminants from water separator (Figure 63) daily. Replace filter canister after every 400 hours of operation.

1. Place a clean container under the fuel filter.
2. Loosen the drain plug on the bottom of the filter canister and open the vent on the top of the canister mount.



g007367

Figure 63

1. Water separator filter canister

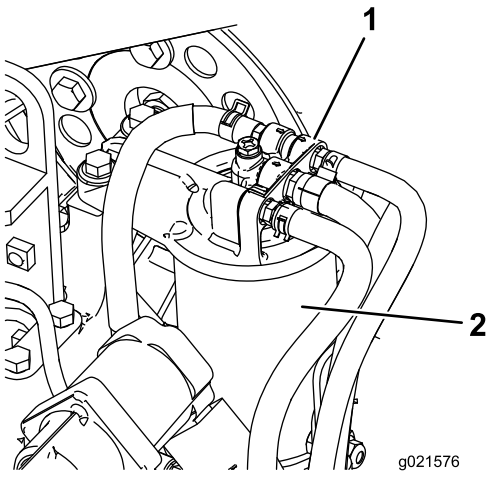
3. Clean the area where the filter canister mounts.
4. Remove the filter canister and clean the mounting surface.
5. Lubricate the gasket on the filter canister with clean oil.
6. Install the filter canister by hand until the gasket contacts mounting surface, then rotate it an additional 1/2 turn.
7.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

Servicing the Engine 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 64).



g021576

Figure 64

1. Fuel Filter head
2. Fuel Filter

2. Remove the filter and clean the filter head mounting surface (Figure 64).
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.

Fuel Pick-up Tube Screen

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

Electrical System Maintenance

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

Servicing the Battery

WARNING

CALIFORNIA
Proposition 65 Warning

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

⚠ DANGER

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

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

⚠ WARNING

Charging the battery produces gasses that can explode.

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

Check the battery condition weekly or after every 50 hours of operation. Keep the terminals and the entire battery case clean because a dirty battery will discharge slowly. To clean the battery, wash the entire case with a solution of baking soda and water. Rinse it with clear water.

Fuses

There are 8 fuses in the electrical system. The fuse block (Figure 65) is located behind the control arm access panel.

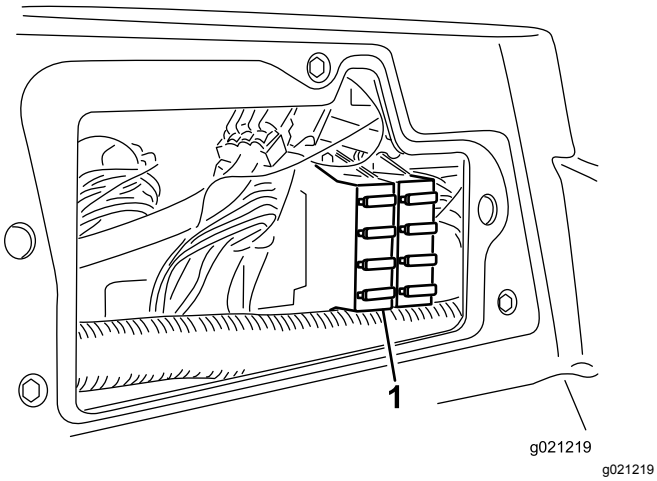


Figure 65

1. Fuse block

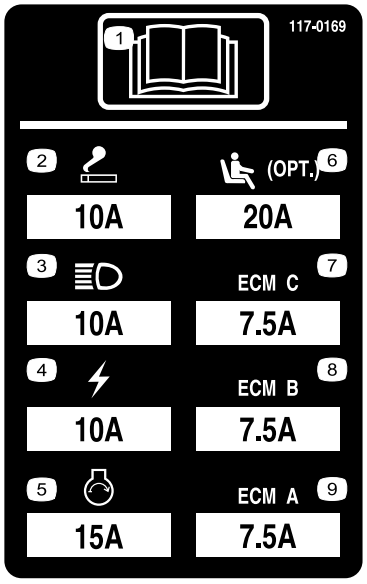


Figure 66

Drive System Maintenance

Adjusting the Traction Drive for Neutral

The machine must not creep when the traction pedal is released. If it does creep, adjust as follows:

1. Park the machine on a level surface, stop the engine, and lower the cutting decks to the floor.
2. Jack up the machine until all the tires are off the shop floor. Support the machine with jack stands to prevent it from falling accidentally.
3. On the right side of the hydrostat, loosen the locknut on the traction adjustment cam (Figure 67).

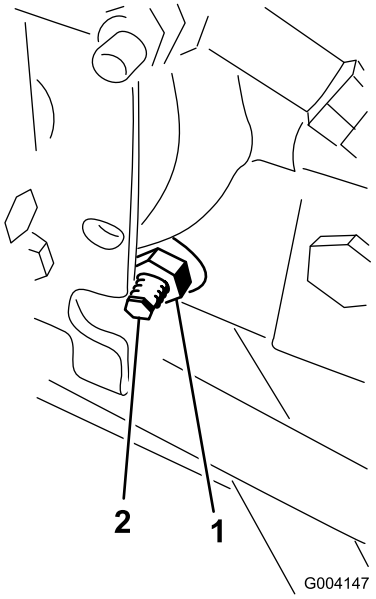


Figure 67

1. Locknut
2. Traction adjustment cam

⚠ WARNING

The engine must be running so the final adjustment of the traction adjustment cam can be performed. This could cause personal injury.

Keep hands, feet, face, and other body parts away from the muffler, other hot parts of the engine, and any rotating parts.

4. Start the engine and rotate the cam hex in either direction until the wheels cease rotation.
5. Tighten the locknut to secure the adjustment.

6. Stop the engine. Remove the jack stands and lower the machine to the shop floor.
7. Test drive the machine to make sure it does not creep.

Adjusting the Rear Wheel Toe-in

1. Rotate the steering wheel so that the rear wheels are straight ahead.
2. Loosen the jam nut on each end of the tie rod (Figure 68).

   Note: The end of the tie rod with the external groove is a left hand thread.

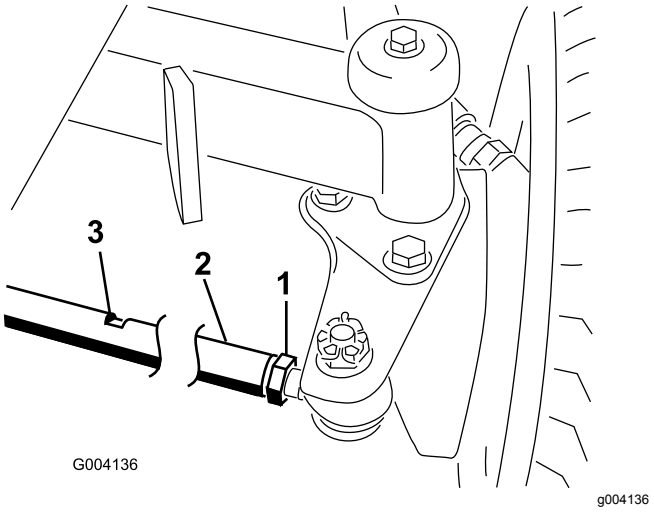


Figure 68

1. Jam nut
2. Tie rod
3. Wrench slot

3. Using the wrench slot, rotate the tie rod
4. Measure the distance at the front and rear of the rear wheels at axle height. The distance at the front of the rear wheels should be less than 6 mm (1/4 inch) of the distance measured at the rear of the wheels.
5. Repeat procedure as required.

Cooling System Maintenance

Removing Debris from the Cooling System

Remove debris from the screen and radiator/oil cooler daily (clean more frequently in dirty conditions).

1. Turn the engine off and remove the key from the ignition switch.
2. Thoroughly clean all debris out of the engine area.
3. Unlatch the clamp and pivot open the rear screen (Figure 69).

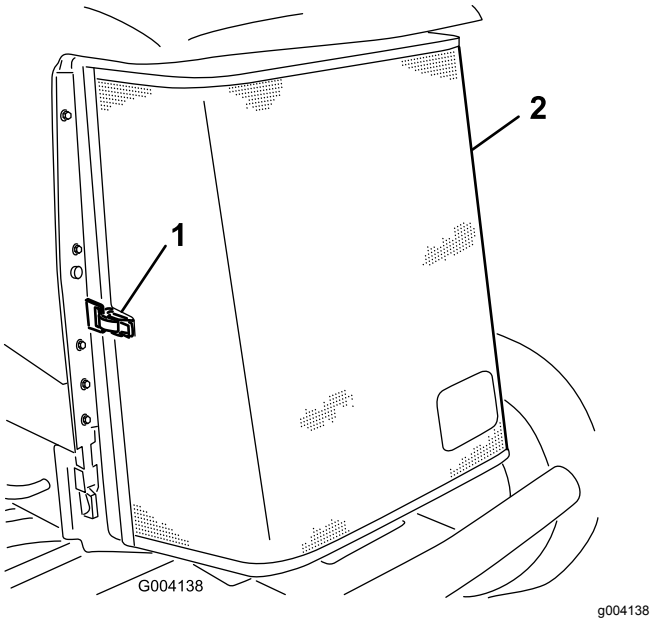


Figure 69

1. Rear screen latch
2. Rear screen

4. Thoroughly clean both sides of the and the radiator/oil cooler (Figure 70) with compressed air.

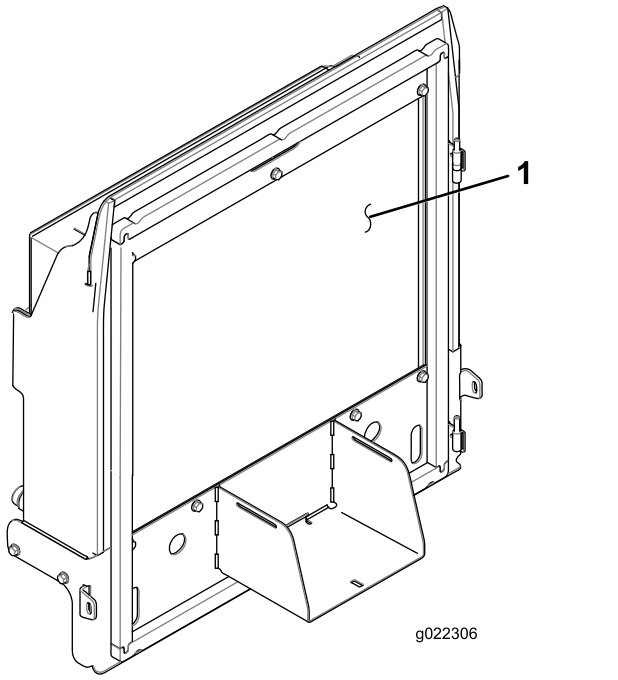


Figure 70

1. Radiator/oil cooler

5. Close the screen and secure the latch.

Brake Maintenance

Adjusting the Parking Brakes

Adjust the brakes when there is more than 2.5 cm (1 inch) of free travel (Figure 71) of the brake pedal, or when more holding force is required. Free travel is the distance the brake pedal moves before you feel braking resistance.

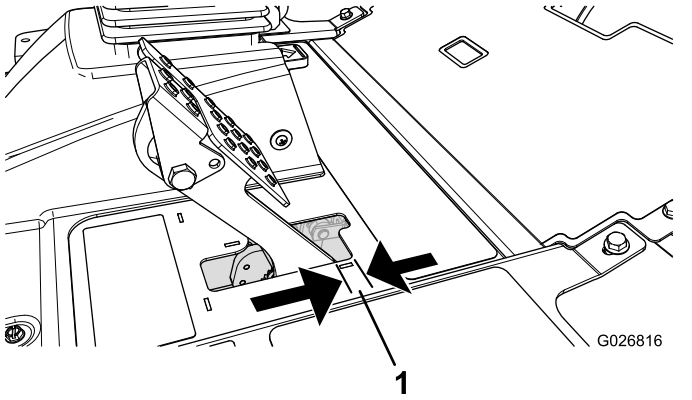


Figure 71

1. Free travel

Note: Use the wheel motor backlash to rock the drums back and forth to ensure that the drums are free prior to and after adjustment.

1. To reduce free travel of the brake pedals, tighten the brakes by loosening the front nut on the threaded end of the brake cable (Figure 72).

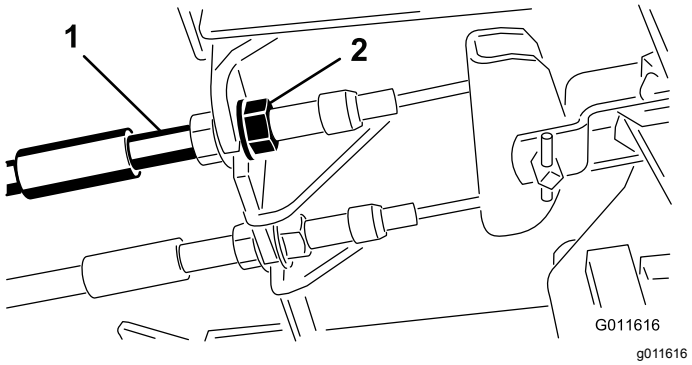


Figure 72

1. Brake cables
2. Front nuts

2. Tighten the rear nut to move the cable backward until brake pedals have .63 to 1.27 cm (1/4 to 1/2 inch) of free travel (Figure 71), before wheel lock up is achieved.
3. Tighten the front nuts, ensuring that both cables actuate the brakes simultaneously. Ensure

that the cable conduit does not rotate during tightening procedure.

Adjusting the Parking Brake Latch

If the parking brake fails to engage and latch, an adjustment to the brake pawl is required.

1. Loosen the 2 screws securing the parking brake pawl to the frame (Figure 73).

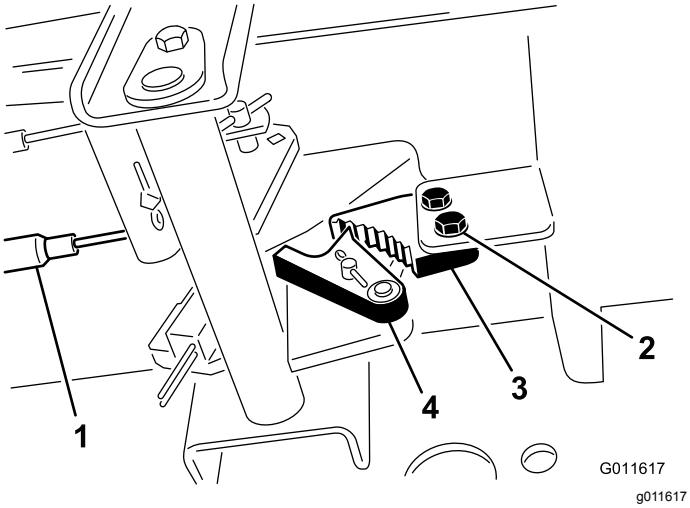


Figure 73

1. Brake cables
2. Screws (2)
3. Parking brake pawl
4. Brake detent

2. Press the parking brake pedal forward until the brake detent completely engages on the brake pawl (Figure 73).
3. Tighten the 2 screws locking the adjustment.
4. Press the brake pedal to release the parking brake.
5. Check the adjustment and readjust as required.

Belt Maintenance

Servicing the Alternator Belt

Service Interval: After the first 10 hours

Every 100 hours

Check the condition and tension of the belt (Figure 74) after every 100 operating hours.

1. Proper tension will allow 10 mm (3/8 inch) deflection when a force of 44 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 74). Increase or decrease the alternator belt tension and tighten the bolts. Check the deflection of the belt again to ensure that the tension is correct.

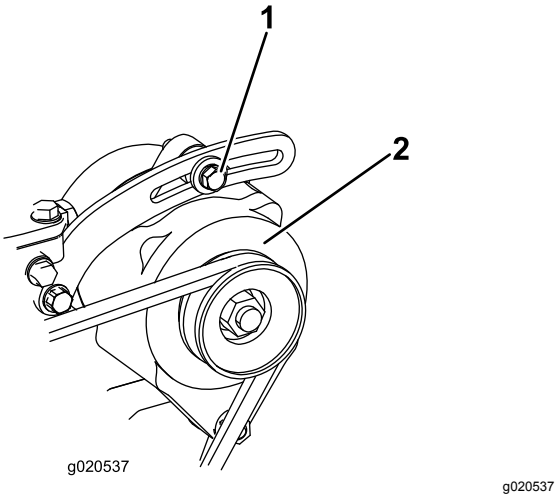


Figure 74

1. Mounting bolt
2. Alternator

Hydraulic System Maintenance

Changing the Hydraulic Fluid

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

1. Stop the engine and raise the hood.
2. Place a large drain pan under the fitting secured to the bottom of the hydraulic fluid reservoir (Figure 75).

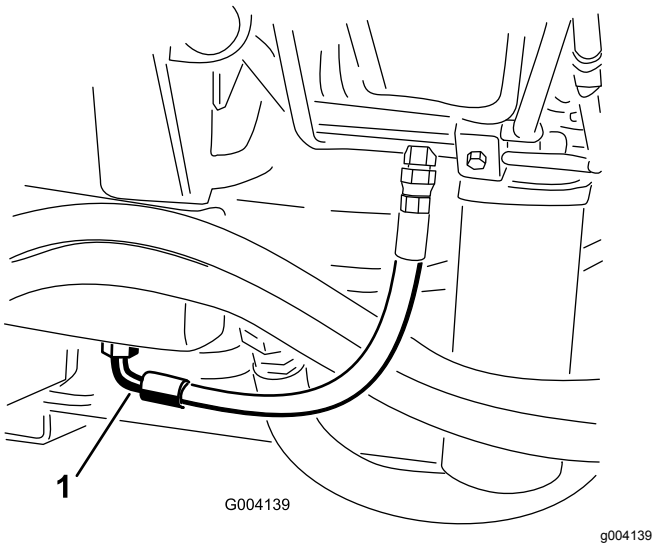


Figure 75

1. Hose

3. Disconnect the hose from the bottom of the fitting and let the hydraulic fluid flow into the drain pan.
4. Install the hose when hydraulic fluid stops draining.
5. Fill the reservoir with approximately 45 liters (12 U.S. gallons) of hydraulic fluid; refer to Checking the Hydraulic Fluid.

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

   Important: **Do not over-fill.**

Replacing the Hydraulic Filters

The hydraulic system is equipped with a service interval indicator (Figure 76). With the engine running, view the indicator, it should be in the Green zone. When the indicator is in the Red zone, change the hydraulic filters.

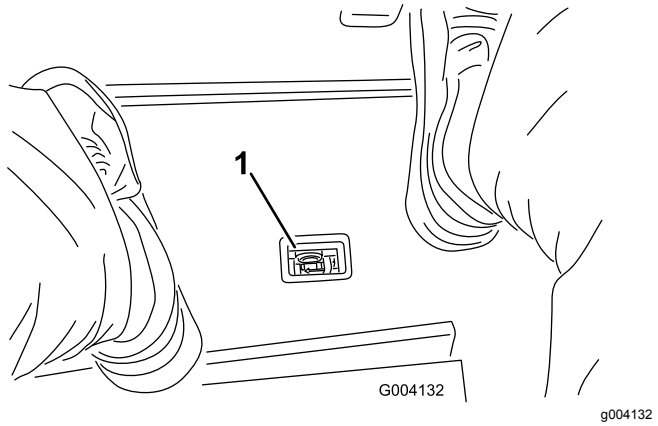


Figure 76

1. Hydraulic filter restriction indicator

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

1. Position the machine on a level surface, lower the cutting decks, stop the engine, engage the parking brake, and remove the key from the ignition switch.
2. Clean the area around the filter mounting area and place a drain pan under filter (Figure 77) and (Figure 78).

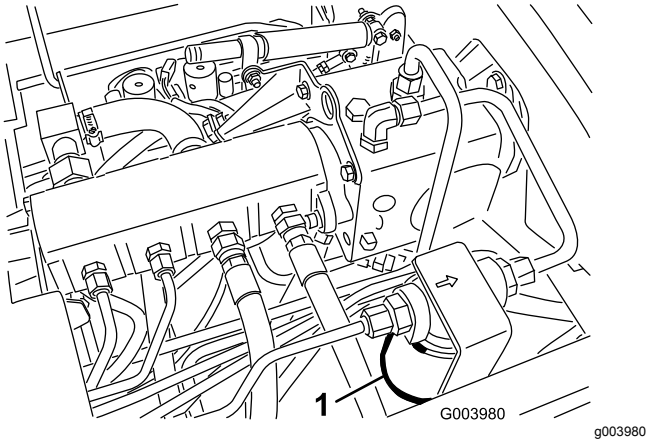


Figure 77

1. Hydraulic filter

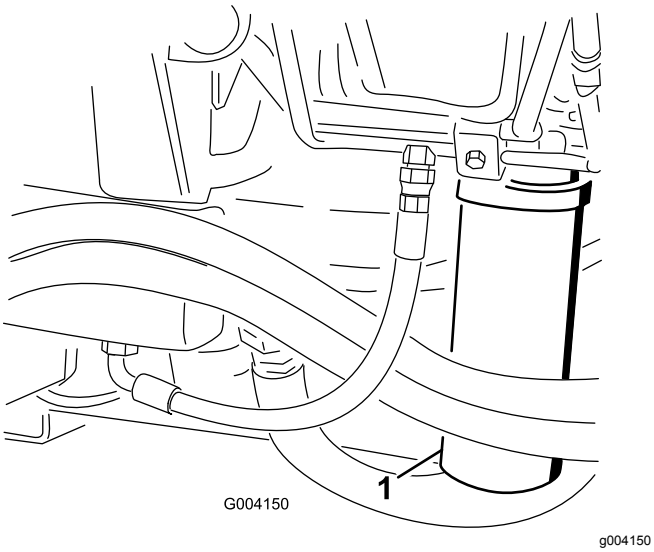


Figure 78

1. Hydraulic filter

3. Remove the filter.
4. Lubricate the gasket on the new filter with hydraulic oil.
5. Ensure that the filter mounting area is clean.
6. Install the filter by hand until the gasket contacts the mounting surface, then rotate it an additional 1/2 turn.
7. Repeat the procedure on the other filter.
8. Start the engine and let it run for about two minutes to purge air from the system.
9. Stop the engine and check for leaks.

Checking the Hydraulic Lines and Hoses

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

⚠ WARNING

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

- **Make sure all hydraulic fluid hoses and lines are in good condition and all hydraulic connections and fittings are tight before applying pressure to the hydraulic system.**
- **Keep your body and hands away from pin hole leaks or nozzles that eject high pressure hydraulic fluid.**
- **Use cardboard or paper to find hydraulic leaks.**
- **Safely relieve all pressure in the hydraulic system before performing any work on the hydraulic system.**
- **Get immediate medical help if fluid is injected into skin.**

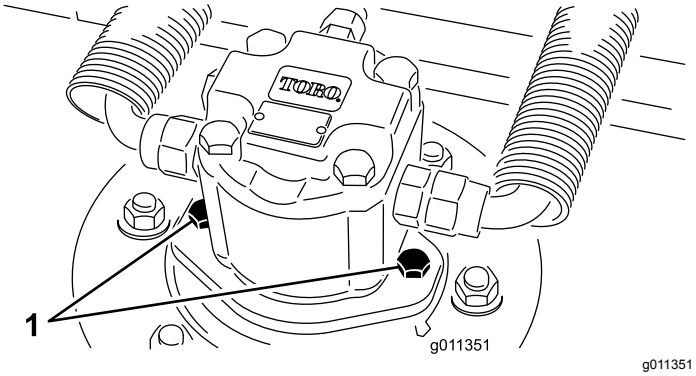
Hydraulic System Test Ports

Use the hydraulic system test ports to test the pressure in the hydraulic circuits. Contact your local Toro distributor for assistance.

Cutting Deck Maintenance

Separating the Cutting Decks from the Traction Unit

1. Position the machine on a level surface, lower the cutting decks to the floor, shut the engine off, and engage the parking brake.
2. Disconnect and remove the hydraulic motor from the deck (Figure 79). Cover the top of the spindle to prevent contamination.

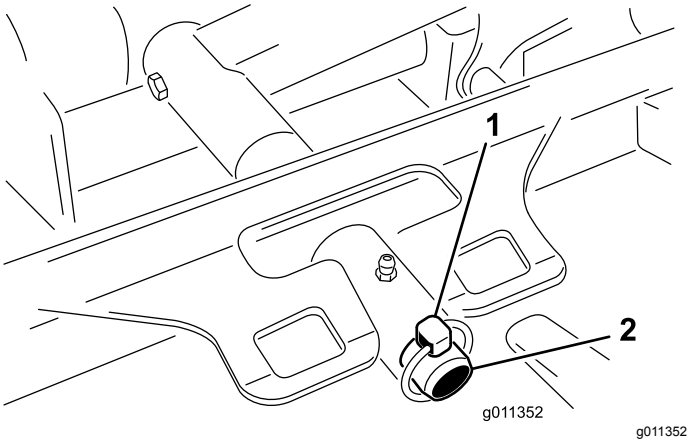


g011351

Figure 79

1. Motor mounting screws

3. Remove the lynch pin securing the deck carrier frame to the lift arm pivot pin (Figure 80).



g011352

Figure 80

1. Lynch pin
2. Lift arm pivot pin

4. Roll the cutting deck away from the traction unit.

Mounting the Cutting Decks to the Traction Unit

1. Position machine on a level surface and shut engine off.
2. Move cutting deck into position in front of traction unit.
3. Slide deck carrier frame onto lift arm pivot pin. Secure with lynch pin (Figure 80).
4. Install the hydraulic motor to the deck (Figure 79). Make sure that the O-ring is in position and not damaged.
5. Grease the spindle.

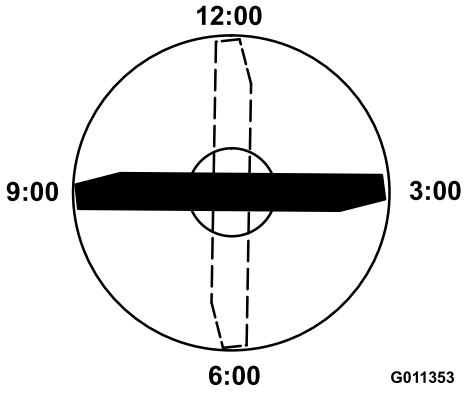
Servicing the Blade Plane

The rotary deck comes from the factory preset at 5 cm (2.00 inch) height-of-cut and blade rake of 7.9 mm (0.310 inch). The left-hand and right-hand heights are also preset to within ± 0.7 mm (0.030 inch) of the other.

The cutting deck is designed to withstand blade impacts without deformation of the chamber. If a solid object is struck, inspect the blade for damage and the blade plane for accuracy.

Inspecting the Blade Plane

1. Remove the hydraulic motor from the cutting deck and remove the cutting deck from the tractor.
2. Use a hoist (or minimum of two people) and place the cutting deck on a flat table
3. Mark one end of the blade with a paint pen or marker. Use this end of the blade to check all heights.
4. Position the cutting edge of the marked end of the blade at 12 o'clock (straight ahead in the direction of mowing) (Figure 81) and measure height from table to cutting edge of blade.



g011353

Figure 81

5. Rotate the marked end of the blade to the 3 and 9 o'clock positions (Figure 81) and measure the heights.
6. Compare the 12 o'clock measured height to the height-of-cut setting. It should be within 0.7 mm (0.030 inch). The 3 and 9 o'clock heights should be 3.8±2.2 mm (0.150±.090 inch) higher than the 12 o'clock setting and within 2.2 mm (0.090 inch) of each other.

If any of these measurements are not within specification, proceed to Adjusting the Blade Plane.

Adjusting the Blade Plane

Start with the front adjustment (change one bracket at a time).

1. Remove the height-of-cut bracket, (front, left, or right) from the deck frame (Figure 82).
2. Adjust 1.5 mm (0.060 inch) shims and/or 0.7 mm (0.030 inch) shim between the deck frame and bracket to achieve the desired height setting (Figure 82).

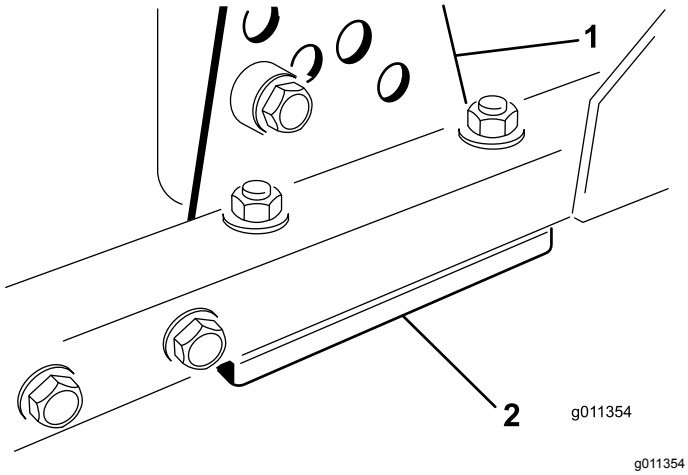


Figure 82

1. Height of cut bracket
2. Shims

3. Install the height-of-cut bracket to the deck frame with the remaining shims assembled below the height-of-cut bracket.
4. Secure the socket head bolt/spacer and flange nut.

   Note: Socket head bolt/spacer are held together with Loctite to prevent the spacer from falling inside the deck frame.
5. Verify the 12 o'clock height and adjust if needed.
6. Determine if only one or both (right-hand and left-hand) height-of-cut brackets need to be adjusted. If the 3 or 9 o'clock side is 3.8±2.2 mm (0.150±0.090 inch) higher than the new front height then no adjustment is needed for that side. Adjust the other side to within ±2.2 mm (0.090 inch) of the correct side.
7. Adjust the right and/or left height-of-cut brackets by repeating steps 1 through 3.
8. Secure the carriage bolts and flange nuts.
9. Again, verify the 12, 3, and 9 o'clock heights.

Servicing the Cutter Blade

Removing the Cutter Blade

The blade must be replaced if a solid object is hit, the blade is out of balance, or if the blade is bent. Always use genuine Toro replacement blades to be sure of safety and optimum performance. Never use replacement blades made by other manufacturers because they could be dangerous.

1. Raise the cutting deck to the highest position, shut the engine off, and engage the parking brake. Block the cutting deck to prevent it from falling accidentally.
2. Grasp the end of the blade using a rag or thickly padded glove. Remove the blade bolt, anti-scalp cup, and blade from the spindle shaft (Figure 83).

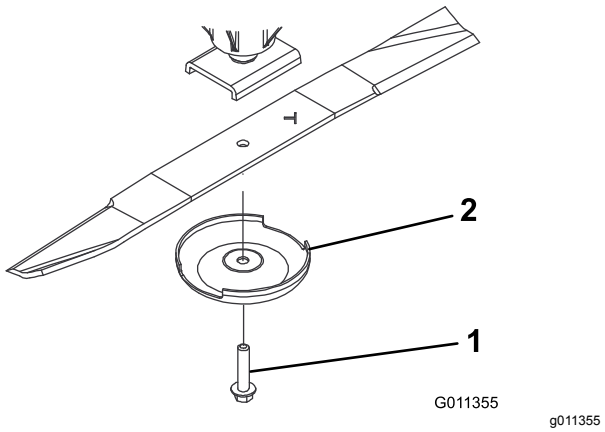


Figure 83

1. Blade bolt
2. Anti-scalp cup

3. Install the blade, sail facing toward the cutting deck, with the anti-scalp cup and blade bolt (Figure 83). Tighten blade bolt to 115–149 N-m (85–110 ft-lb).

⚠ DANGER

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

- **Inspect the blade periodically for wear or damage.**
- **Never weld a broken or cracked blade.**
- **Always replace a worn or damaged blade.**

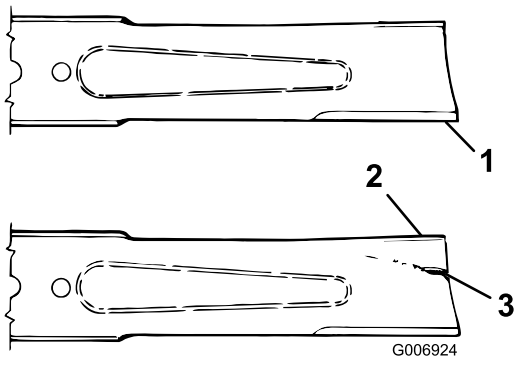
Inspecting and Sharpening the Blade

1. Raise the cutting deck to the highest position, shut the engine off, and engage the parking brake. Block the cutting deck to prevent it from falling accidentally.
2. Examine the cutting ends of the blade carefully, especially where the flat and curved parts of the blade meet (Figure 84). Since sand and abrasive material can wear away the metal that connects the flat and curved parts of the blade, check the blade before using the machine. If wear is noticed (Figure 84), replace the blade; refer to Removing the Cutter Blade.

⚠ DANGER

If the blade is allowed to wear, a slot will form between the sail and flat part of the blade (Figure 84). Eventually a piece of the blade may break off and be thrown from under the housing, possibly resulting in serious injury to yourself or bystanders.

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



g006924

Figure 84

1. Cutting edge
2. Sail
3. Wear/slot/crack

3. Inspect the cutting edges of all blades. Sharpen the cutting edges if they are dull or nicked. Sharpen only the top of the cutting edge and maintain the original cutting angle to make sure of sharpness (Figure 85). The blade will remain balanced if the same amount of metal is removed from both cutting edges.



g006926

Figure 85

1. Sharpen at this angle only

4. To check the blade for being straight and parallel, lay the blade on a level surface and check its ends. The ends of the blade must be slightly lower than the center, and the cutting edge must be lower than the heel of the blade. This blade will produce good quality of cut and require minimal power from the engine. By contrast a blade that is higher at the ends than the center, or if cutting edge is higher than the heel, the blade is bent or warped and must be replaced.
5. Install the blade, sail facing toward cutting deck, with the anti-scalp cup and blade bolt. Tighten the blade bolt to 115–149 N-m (85–110 ft-lb).

Checking the Blade Stopping Time

Service Interval: Before each use or daily

The blades of the cutting deck should come to a complete stop in approximately 5 seconds after you shut down the cutting deck engagement switch.

Note: Make sure the decks are lowered onto a clean section of turf or hard surface to avoid thrown dust and debris.

To verify this stopping time, have a second person stand back from the deck at least 6 m (20 feet) and watch the blades on one of the cutting decks. Have the operator shut the cutting decks down and record the time it takes for the blades to come to a complete stop. If this time is greater than 7 seconds, the braking valve needs adjustment. Call your Toro Distributor for assistance in making this adjustment.

Servicing the Front Roller

Inspect the front roller for wear, excess wobble, or binding. Service or replace the roller or components if any of these conditions exist.

Disassembling the Front Roller

1. Remove the roller mounting bolt (Figure 86).
2. Insert a punch through the end of the roller housing and drive the opposite bearing out by alternating taps to the opposite side of inner bearing race. There should be a 1.5 mm (0.060 inch) lip of inner race exposed.

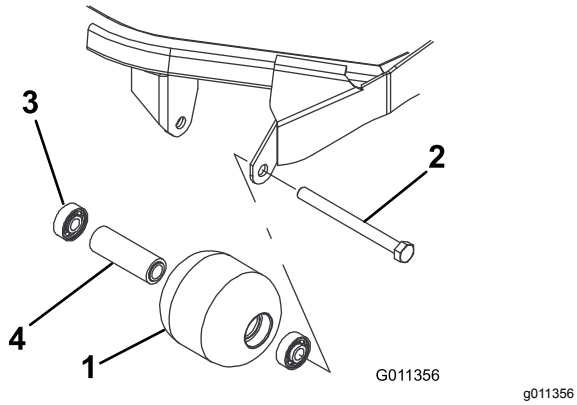


Figure 86

1. Front roller
2. Mounting bolt
3. Bearing
4. Bearing spacer

3. Push the second bearing out in press.
4. Inspect the roller housing, bearings, and bearing spacer for damage (Figure 86). Replace damaged components and assemble.

Assembling the Front Roller

1. Press the first bearing into the roller housing (Figure 86). Press on the outer race only or equally on the inner and outer race.
2. Insert the spacer (Figure 86).
3. Press the second bearing into the roller housing (Figure 86) pressing equally on the inner and outer race until the inner race comes in contact with the spacer.
4. Install the roller assembly into the deck frame.

   Important: **Securing the roller assembly with a gap larger than 1.5 mm (0.060 inch) creates a side load on the bearing and can lead to premature bearing failure**
5. Verify that there is no more than a 1.5 mm (0.060 inch) gap between roller assembly and the roller mount brackets of the deck frame. If there is a gap over 1.5 mm (0.060 inch), install enough 5/8 inch diameter washers to take up the slop.
6. Secure the mounting bolt to 108 N-m (80 ft-lb).

Storage

Preparing the Traction Unit

1. Thoroughly clean the traction unit, cutting decks, and engine.
2. Check the tire pressure. Inflate all traction unit tires to 83 to 103 kPa (12 to 15 psi).
3. Check all fasteners for looseness and tighten them as necessary.
4. Grease all grease fittings and pivot points. Wipe up any excess lubricant.
5. Lightly sand and use touch-up paint on painted areas that are scratched, chipped, or rusted. Repair any dents in the metal body.
6. Service the battery and cables as follows:
   A. Remove the battery terminals from the battery posts.
   B. Clean the battery, terminals, and posts with a wire brush and baking soda solution.
   C. Coat the cable terminals and battery posts with Grafo 112X skin-over grease (Toro Part No. 505-47) or petroleum jelly to prevent corrosion.
   D. Slowly recharge the battery every 60 days for 24 hours to prevent lead sulfation of the battery.

Preparing the Engine

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

Cutting Deck

If the cutting deck is separated from the traction unit for any length of time, install a spindle plug in the top of the spindle to protect the spindle from dust and water.

The Toro Total Coverage Guarantee

A Limited Warranty

Conditions and Products Covered

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

Instructions for Obtaining Warranty Service

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

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.