



Form No. 3391-886 Rev B

Count on it.

Operator's Manual

Groundsmaster® 360 4-Wheel Drive Multi-Purpose Machine with Cab

Model No. 31202—Serial No. 315000001 and Up



⚠ 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 available as an option. If you require a spark arrester, contact your Authorized Toro Service Dealer.

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

Important: 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 machine 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. [Figure 1](#) identifies the location of the model and serial numbers

on the product. Write the numbers in the space provided.

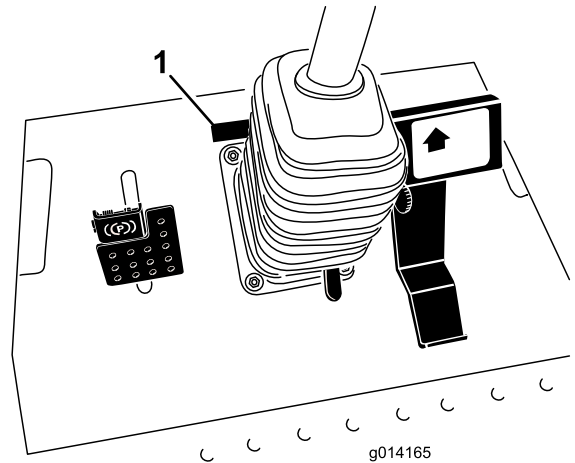


Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

This manual identifies potential hazards and has safety messages identified by the safety alert symbol ([Figure 2](#)), which signals a hazard that may cause serious injury or death if you do not follow the recommended precautions.



Figure 2

1. Safety alert symbol

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

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Safety

This machine has been designed in accordance with ANSI B71.4-2012.

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

Safe Operating Practices

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

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 the lawn machine. Local regulations can 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 should seek and obtain professional and practical instruction. 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, especially on wet grass;
 - ◇ 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 load distribution.

Preparation

- While mowing, always wear substantial footwear and long trousers. 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.
- Before using, always visually inspect to see that the blades, blade bolts and cutter assembly are not worn or damaged. Replace worn or damaged blades and bolts in sets to preserve balance.

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

- Be alert, slow down and use caution when making turns. Look behind and to the side before changing directions.
- Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.
- Mow only in daylight or in good artificial light.

- Before attempting to start the engine, disengage all blade attachment clutches and shift into neutral.
- 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 on a slope;
 - use slow speeds on slopes and during tight turns;
 - stay alert for humps and hollows and other hidden hazards;
- Watch out for traffic when crossing or near roadways.
- Stop the blades from 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.
- Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
- Before leaving the operator's position:
 - disengage the power take-off and lower the attachments;
 - set the parking brake;
 - stop the engine and remove the key.
- Disengage drive to attachments, stop the engine, and remove the ignition key:
 - before clearing blockages or unclogging chute;
 - before checking, cleaning or working on the machine;
 - after striking a foreign object. Inspect the machine for damage and make repairs before restarting and operating the equipment;
 - if the machine starts to vibrate abnormally (check immediately).
- Do not operate the machine 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.
- Disengage drive to attachments when transporting or not in use.
- Stop the engine and disengage drive to attachment before refueling.

Rollover Protection System (ROPS)/Cab—Use and Maintenance

- The ROPS/Cab is an integral and effective safety device. Use the seat belt when operating the machine.
- Be certain that the seat belt can be released quickly in the event of an emergency.
- Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.
- Keep the ROPS/Cab in safe operating condition by periodically thoroughly inspecting for damage and keeping all mounting fasteners tight.
- Replace a damaged ROPS/Cab. Do not repair or revise.
- **Do not** remove the ROPS/Cab.
- Any alterations to a ROPS/Cab must be approved by the manufacturer.

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.
- Replace worn or damaged parts for safety.
- If the fuel tank has to be drained, do this outdoors.
- On multi-bladed machines, take care as manually rotating one blade can cause other blades to rotate.
- When machine is to be parked, stored or left unattended, lower the mower deck.

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 standard.

- 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.
- Keep hands, feet, hair and loose clothing away from attachment discharge area, underside of mower and any moving parts while engine is running.
- Do not touch equipment or attachment parts which may be hot from operation. Allow to cool before attempting to maintain, adjust, or service.
- Battery acid is poisonous and can cause burns. Avoid contact with skin, eyes and clothing. Protect your face, eyes, and clothing when working with a battery.
- This machine is not designed or equipped for on-road use and is a "slow-moving vehicle." If you must cross or travel on a public road, you should be aware of and comply with local regulations, such as required lights, slow moving vehicle signs, and reflectors.
- Battery gases can explode. Keep cigarettes, sparks and flames away from battery.
- Use only genuine Toro replacement parts to ensure that original standards are maintained.
- Use only Toro approved attachments. Warranty may be voided if used with unapproved attachments.
- Watch for ditches, holes, rocks, dips, and rises that change the operating angle, as rough terrain could overturn the machine.
- Avoid sudden starts when mowing uphill because the machine may tip backwards.
- Be aware that loss of traction may occur going downhill. Weight transfer to the front wheels may cause drive wheels to slip and cause loss of braking and steering.
- Always avoid sudden starting or stopping on a slope. If tires lose traction, disengage the blades and proceed slowly off the slope.
- Follow the manufacturer's recommendations for wheel weights or counterweights to improve stability.
- Use extreme care with attachments. These can change the stability of the machine and cause loss of control.

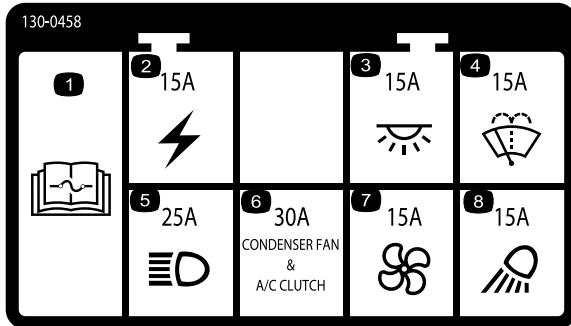
Slope Operation

- Do not mow near drop-offs, ditches, steep banks or water. Wheels dropping over edges can cause rollovers, which may result in serious injury, death, or drowning.
- Do not mow slopes when grass is wet. Slippery conditions reduce traction and could cause sliding and loss of control.
- Do not make sudden turns or rapid speed changes.
- Use a walk behind mower and/or a hand trimmer near drop-offs, ditches, steep banks or water.
- Reduce speed and use extreme caution on slopes.
- Remove or mark obstacles such as rocks, tree limbs, etc. from the mowing area. Tall grass can hide obstacles.

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.



130-0458

decal130-0458

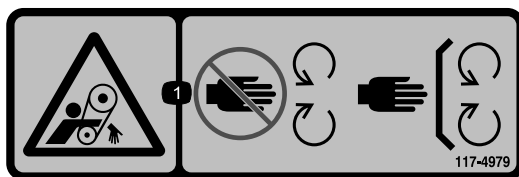
1. Read the *Operator's Manual* for more information on fuses
2. Electrical power accessory—15A
3. Dome light—15A
4. Windshield wiper fluid—15A
5. Head lights—25A
6. Condenser fan and A/C clutch—30A
7. Fan—15A
8. Work light—15A



93-6696

decal93-6696

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



117-4979

decal117-4979

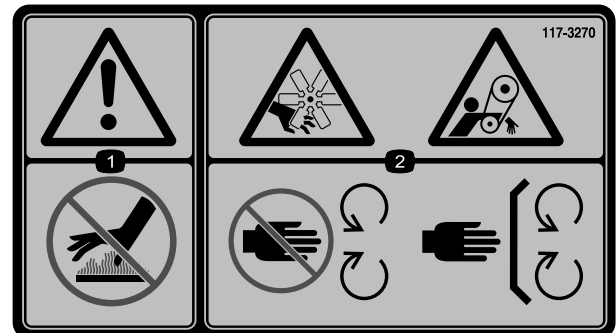
1. Rotating belt — Keep guard in place



117-3276

decal117-3276

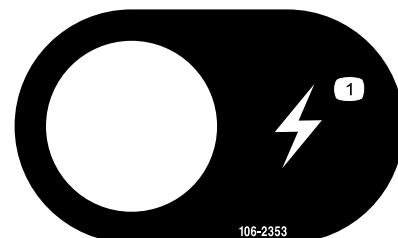
1. Engine coolant under pressure
2. Explosion hazard—read the *Operator's Manual*.
3. Warning—do not touch the hot surface.
4. Warning—read the *Operator's Manual*.



117-3270

decal117-3270

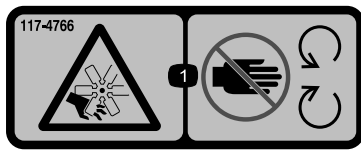
1. Warning—do not touch the hot surface.
2. Cutting/dismemberment hazard, hand; entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.



106-2353

decal106-2353

1. Electrical power point



117-4766

decal117-4766

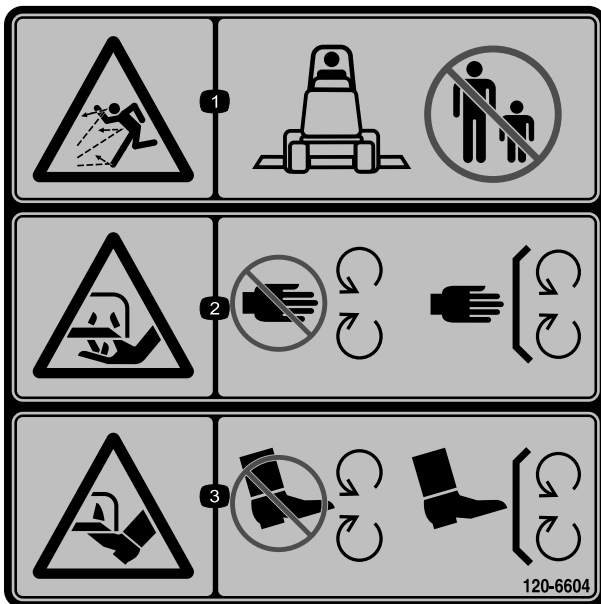
1. Cutting/dismemberment hazard; fan—stay away from moving parts, keep all guards and shields in place.



98-4387

decal98-4387

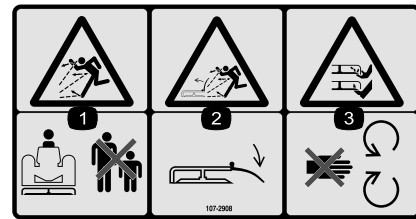
1. Warning—wear hearing protection.



120-6604

decal120-6604

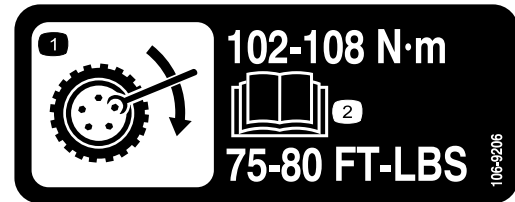
1. Thrown object hazard—keep bystanders away from the machine.
2. Cutting/dismemberment hazard of hand, mower blade—stay away from moving parts, keep all guards and shields in place.
3. Cutting/dismemberment hazard of foot, mower blade—stay away from moving parts, keep all guards and shields in place.



107-2908

decal107-2908

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



106-9206

decal106-9206

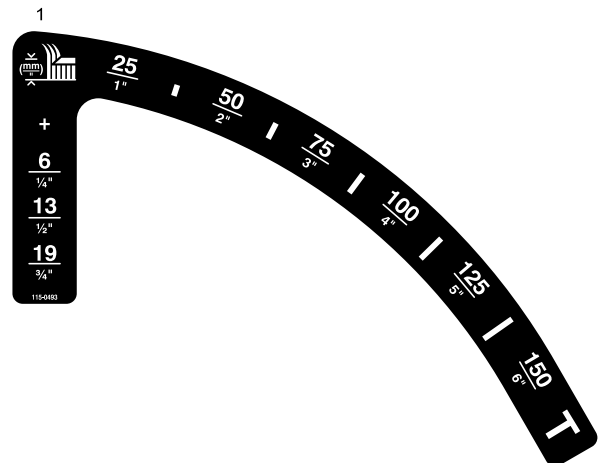
1. Wheel torque specifications
2. Read the *Operator's Manual*.

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

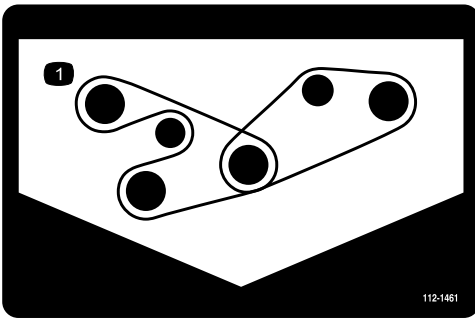
117-2718



115-0493

decal115-0493

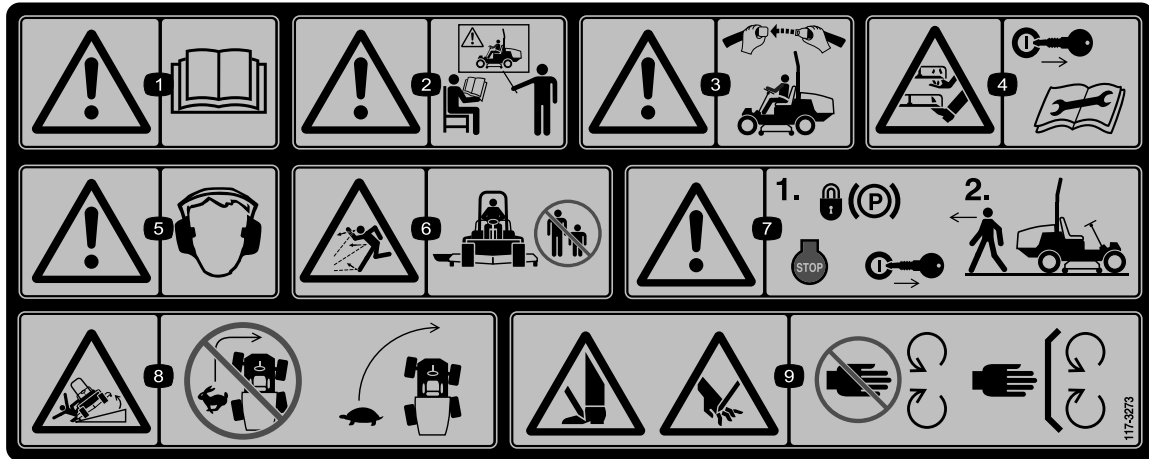
1. Height of cut (mm)



112-1461

decal112-1461

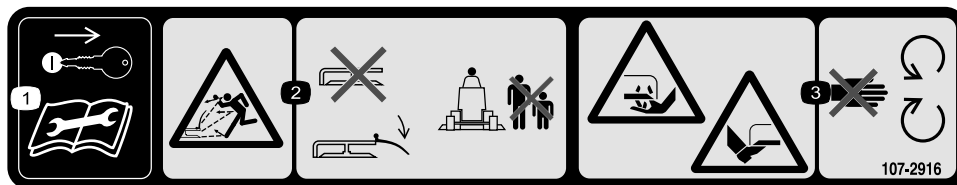
1. Belt routing



117-3273

decal117-3273

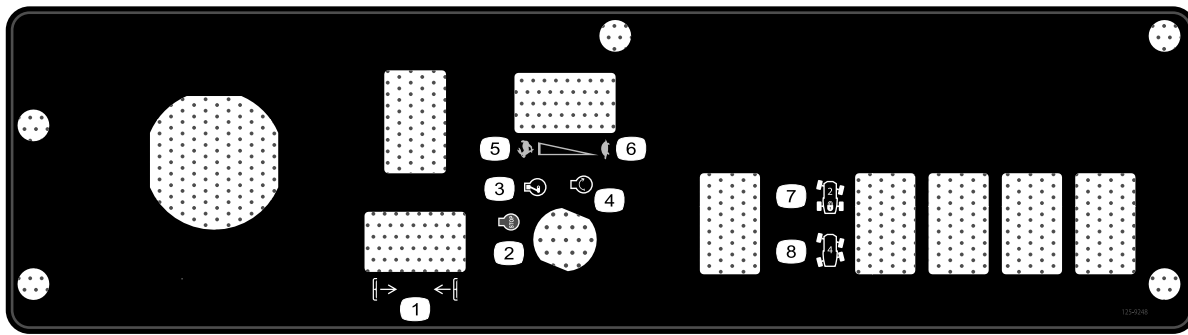
1. Warning—read the *Operator's Manual*.
2. Warning—do not operate this machine unless you are trained.
3. Warning—wear the seat belt when seated in the operator's position.
4. Cutting/dismemberment hazard of hand or foot—remove the ignition key and read the instructions before servicing or performing maintenance.
5. Warning—wear hearing protection.
6. Thrown object hazard—keep bystanders a safe distance from the machine.
7. Warning—lock the parking brake, stop the engine and remove the ignition key before leaving the machine.
8. Tipping hazard—lower the cutting unit when driving down slopes; slow machine before turning, do not turn at high speeds
9. Cutting hazard of hand or foot—stay away from moving parts; keep all guards in place.



107-2916

decal107-2916

1. Remove the ignition key and read the *Operator's Manual* before servicing or performing maintenance.
2. Thrown object hazard—do not operate the mower with the deflector up or removed, keep the deflector in place; keep bystanders a safe distance from the machine.
3. Cutting/dismemberment hazard of hand or foot, mower blade—stay away from moving parts.



125-9248

decal125-9248

1. Raise/Lower decks
2. Engine—stop
3. Engine—run
4. Engine—start
5. Fast
6. Slow
7. 2-wheel steering
8. 4-wheel steering

GROUNDMASTER 360

QUICK REFERENCE AID

CHECK/SERVICE (daily)

1. OIL LEVEL, ENGINE
2. OIL LEVEL, HYDRAULIC TANK
3. COOLANT LEVEL, RADIATOR
4. FUEL /WATER SEPARATOR
5. PRECLEANER - AIR CLEANER
6. RADIATOR SCREEN
7. BRAKE FUNCTION
8. TIRE PRESSURE
9. BATTERY
10. BELTS - DECK, FAN, ALTERNATOR
11. GEARBOX

GREASING - SEE OPERATOR'S MANUAL

FLUID SPECIFICATIONS/CHANGE INTERVALS

SEE OPERATOR'S MANUAL FOR INITIAL CHANGES.	FLUID TYPE	CAPACITY	CHANGE INTERVAL*		FILTER PART NO.
			FLUID	FILTER	
A. ENGINE OIL	15W-40 CJ-4	5.5 QTS.	250 HRS.	250 HRS.	125-7025
B. HYDRAULIC CIRCUIT OIL	MOBIL 424	4.5 GALS. (17 LITERS)	800 HRS.	800 HRS.	108-5194
C. AIR CLEANER				SEE INDICATOR	108-3810
D. WATER SEPARATOR				400 HRS.	125-2915
E. FUEL TANK	NO. 2-DIESEL	13.5 GALS. (51.1 LITERS)	DRAIN AND FLUSH, 2 YRS.		
F. COOLANT	50/50 ETHYLENE GLYCOL/WATER	8 QTS. (7.5 LITERS)	DRAIN AND FLUSH, 2 YRS.		
G. GEARBOX	80W-90 GEAR OIL SYNTH Mobilube SHC 75W-90	14 fl. oz. (414 mL)	400 HRS.		

*SEE OPERATOR'S MANUAL FOR INITIAL CHANGES / WINTER USE.

131-1946

131-1946

decal131-1946

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



Battery Symbols

Some or all of these symbols are on your battery

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

Setup

Loose Parts

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

Procedure	Description	Qty.	Use
1	No parts required	–	Check the tire pressure.
2	No parts required	–	Check the hydraulic fluid, engine oil, and coolant levels.

Media and Additional Parts

Description	Qty.	Use
Operator's Manual	1	Read before operating the machine
Engine Operator's Manual	1	Read before operating the machine
Parts Catalog	1	Use reference part numbers
Operator Training Material	1	View the video before operating the machine

1

Checking the Tire Pressure

No Parts Required

Procedure

The tires are over inflated for shipping. Therefore, release some of the air to reduce the pressure. The correct air pressure for non-cab models is 103 kPa (15 psi) in the front tires and 172 kPa (25 psi) in the rear tires. If a cab is installed on the machine, the front and rear tires should be inflated to 172 kPa (25 psi).

2. Check the engine oil level before starting the engine, refer to [Checking the Engine-Oil Level \(page 45\)](#).
3. Check the cooling system before starting the engine; refer to [Checking the Cooling System \(page 50\)](#).

2

Checking the Fluid Levels

No Parts Required

Procedure

1. Check the hydraulic fluid level before starting the engine, refer to [Checking the Hydraulic System \(page 54\)](#).

Product Overview

Controls

Become familiar with all the controls before you start the engine and operate the machine.

Traction Pedal

The traction pedal (Figure 3) 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.

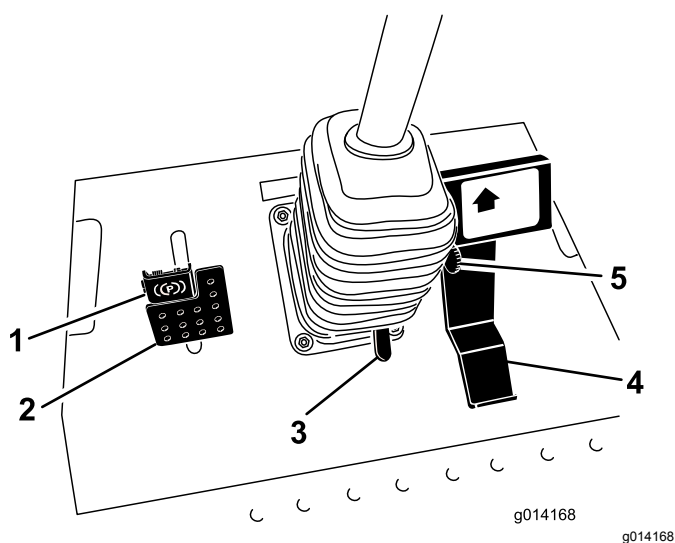


Figure 3

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

Mow Speed Limiter

The mow speed limiter lever (Figure 3) can be flipped forward to limit the traction speed while operating.

Brake Pedal

The brake pedal is used in conjunction with the brake pedal latch to engage and disengage the parking brake (Figure 3). To stop the machine, release the traction pedal and allow it to return to the center position. The brake can assist in stopping in an emergency situation.

Parking Brake

To engage the parking brake, push down on the brake pedal and press the top forward to latch (Figure 3). To release the parking brake, press the brake pedal until the parking brake latch retracts.

Tilt Steering Pedal

To tilt the steering wheel towards you, press the foot pedal down, and pull the steering tower toward you to the most comfortable position and then release the pedal (Figure 3).

Engine Speed Switch

The engine speed switch (Figure 4) 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.

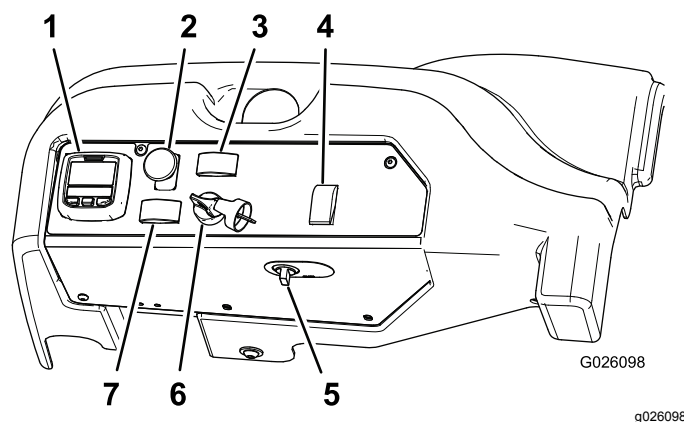


Figure 4

- | | |
|--------------------------------|---------------------|
| 1. InfoCenter | 5. Power point |
| 2. Power take off (PTO) Switch | 6. Ignition switch |
| 3. Engine speed switch | 7. Deck lift switch |
| 4. Steering selector switch | |

InfoCenter

The InfoCenter LCD display shows information about your machine such as the operating status, various diagnostics and other information about the machine (Figure 4).

Ignition Switch

The ignition switch has three positions: Off, On/Preheat, and Start (Figure 4).

Power Take Off (PTO) Switch

The power take off (PTO) switch starts and stops the mower blades (Figure 4).

Steering Selector Switch

Press the steering selector switch to the rear to engage 4 wheel steering and forward to return to 2 wheel steering (Figure 4).

Power Point

The power point is a 12 volt power supply for electronic devices (Figure 4).

Important: If the mower deck shuts down and the InfoCenter temperature warning icon is on, push PTO knob down, drive to a safe flat area, move the throttle lever to the Slow position, allow the traction pedal to move to the neutral position, and engage the parking brake. Allow the engine to idle for several minutes while it cools to a safe level. Stop the engine and check the cooling system; refer to Checking the Cooling System.

Fuel Gauge

The fuel gauge (Figure 5) indicates the fuel level remaining in the fuel tank.

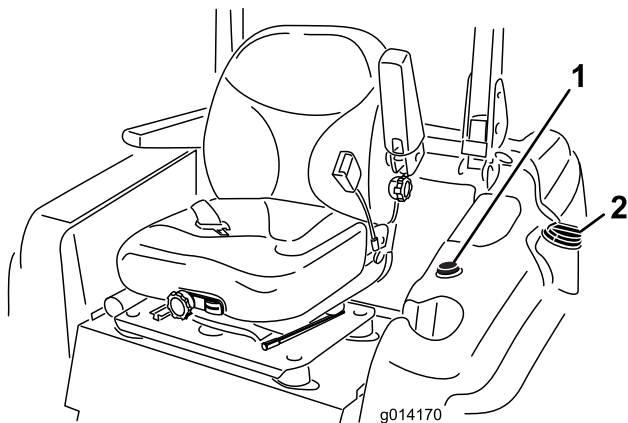


Figure 5

1. Fuel gauge 2. Fuel tank cap

Cab Controls

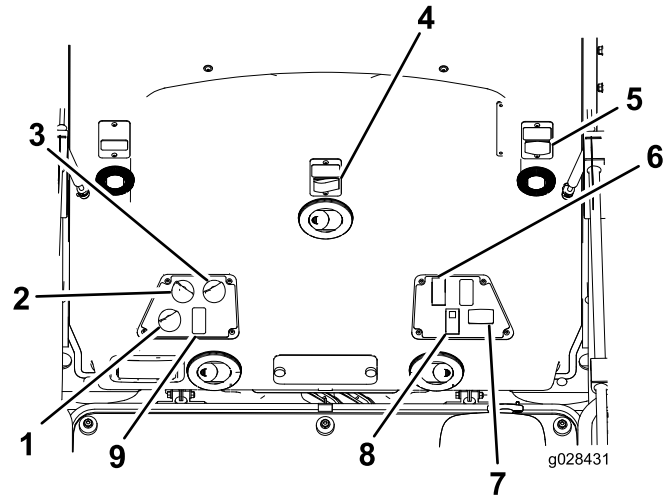


Figure 6

- | | |
|------------------------------|----------------------------|
| 1. Air recirculation control | 5. Power outlet |
| 2. Fan control | 6. Lights switch |
| 3. Temperature control | 7. Flashers switch |
| 4. Wind shield wiper switch | 8. Air conditioning switch |

Air Recirculation Control

Sets the cab to either recirculate the air in the cabin or to draw air into the cabin from outside (Figure 6).

- Set it to recirculate the air when using the air-conditioning.
- Set it to draw air in when using the heater or fan.

Fan Control

Rotate the fan control knob to regulate the speed of the fan (Figure 6).

Temperature Control

Rotate the temperature control knob to regulate the air temperature in the cab (Figure 6).

Wind Shield Wiper Switch

Use this switch to turn the wind shield wipers on or off (Figure 6).

Power Outlet

Use this 15 amp, 12 V DC power outlet to power compatible devices (Figure 6).

Lights Switch

Use this switch to turn the head lights and tail light on or off (Figure 6).

Flashers Switch

Use this switch to turn the flashers (hazard lights) on or off (Figure 6).

Air Conditioning Switch

Use this switch to turn the air conditioning on or off (Figure 6).

Wind Shield Latch

Lift up on latches to open the wind shield (Figure 7). Press in on latch to lock wind shield in open position. Pull out and down on latch to close and secure wind shield.

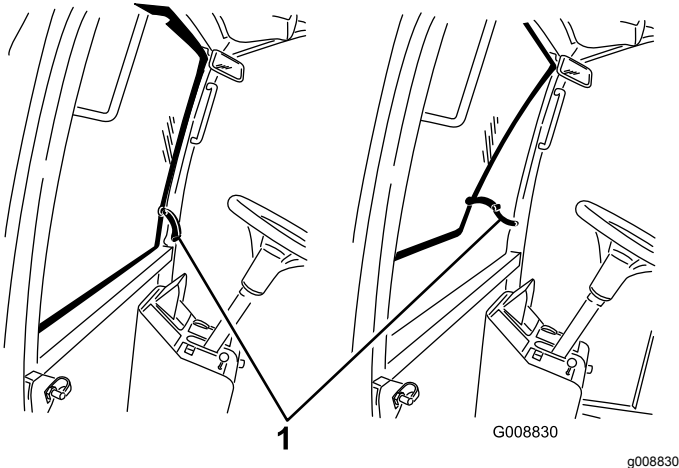


Figure 7

1. Wind shield latch

Rear Window Latch

Lift up on latches to open the rear window. Press in on latch to lock window in open position. Pull out and down on latch to close and secure window (Figure 7).

Important: The rear window must be closed before opening the hood or damage may occur.

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 8). 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.

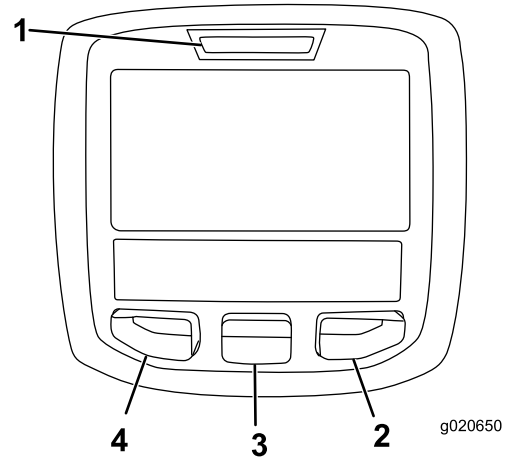


Figure 8

- | | |
|--------------------|------------------|
| 1. Indicator light | 3. Middle button |
| 2. Right 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 that 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
	Engine rpm/status—indicates the engine rpm
	Hour meter
	Info icon
	Fast
	Slow
	Stationary regeneration required
	Glow plugs are active
	AC
	2-wheel steer
	4-wheel steer
	Operator must sit in seat
	Parking brake indicator—indicates when the parking brake is set
	Coolant Temperature—indicates the engine coolant temperature in either °C or °F
	Temperature (hot)
	PTO is engaged
	Denied or not allowed
	Engine start
	Stop or shutdown
	Engine
	Key switch
PIN	PIN code
CAN	CAN bus

InfoCenter Icon Description (cont'd.)

	InfoCenter
Bad	Bad or failed
	Bulb
OUT	Output of TEC controller or control wire in harness
	Switch
	Operator must release switch
	Operator should change to indicated state
Symbols are often combined to form sentences. Some examples are shown below	
	Operator should put machine in Neutral
	Engine start denied
	Engine shutdown
	Engine coolant too hot
	DPF ash accumulation notification. Refer to Servicing the Diesel-Oxidation Catalyst (DOC) and the Soot Filter (page 46) for details.
	Sit down or engage parking brake

Using the Menus

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

Main Menu	
Menu Item	Description

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

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

Diagnostics	
Menu Item	Description
PTO	Indicates the inputs, qualifiers, and outputs for enabling the PTO circuit
Engine Run	Indicates the inputs, qualifiers, and outputs for starting the engine
Decks	Indicates the inputs, qualifiers, and outputs for lifting and lowering the deck
Steer Mode	Indicates the inputs, qualifiers, and outputs for switching between 2-wheel steer and 4-wheel steer
Machine Input	Indicates the state of other machine inputs such as accessories and A/C clutch

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.
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. The titles are in the selected language, but the 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 Stationary Regeneration. You can lock these settings by using the Protected Menu. Refer to [Diesel Particulate Filter Regeneration \(page 27\)](#).

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 9).

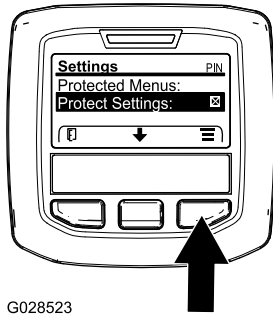


Figure 9

g028523

2. In the SETTINGS MENU, use the center button to scroll down to the PROTECTED MENU and press the right button (Figure 10A).

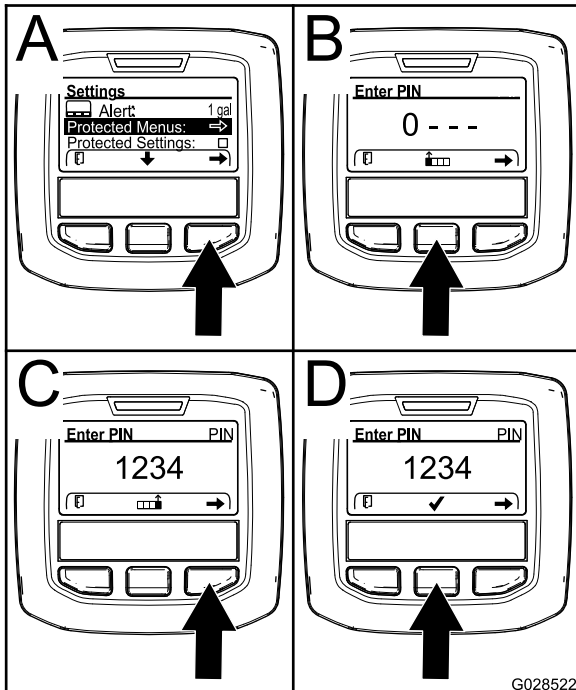


Figure 10

g028522

"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 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.

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 10B and Figure 10C). 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 10D).

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

Specifications

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

Length	241.3 cm (95 inches)
Width (Rear Wheels)	147.3 cm (58 inches)
Height	221 cm (87 inches)
Weight	1435 kg (313 lb)

Attachments/Accessories

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

Operation

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

Checking the Engine-Oil Level

Before you start the engine and use the machine, check the oil level in the engine crankcase; refer to [Checking the Engine-Oil Level \(page 45\)](#).

Filling the Fuel Tank

⚠ WARNING

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

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

⚠ DANGER

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

- Fill the fuel tank outdoors, in an open area, when the engine is cold. Wipe up any fuel that spills.
- Never fill the fuel tank inside an enclosed trailer.
- Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.
- Store fuel in an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of fuel.
- Do not operate without entire exhaust system in place and in proper working condition.

▲ DANGER

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

- Always place fuel containers on the ground away from your vehicle before filling.
- Do not fill fuel containers inside a vehicle or on a truck or trailer bed because interior carpets or plastic truck bed liners may insulate the container and slow the loss of any static charge.
- When practical, remove equipment from the truck or trailer and refuel the equipment with its wheels on the ground.
- If this is not possible, then refuel such equipment on a truck or trailer from a portable container, rather than from a fuel dispenser nozzle.
- If a fuel dispenser nozzle must be used, keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.

Fuel Tank Capacity

Fuel tank capacity: 51.1 L (13.5 US gallons)

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.

Adding Fuel

1. Park the machine on a level surface.
2. Shut off the engine and set the parking brake.
3. Clean around the fuel tank cap and remove the cap (Figure 11).

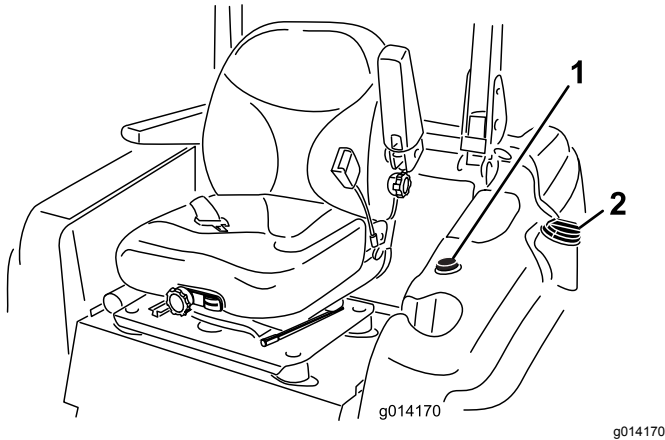


Figure 11

1. Fuel gauge
2. Fuel-tank cap

Important: Do not open the fuel tank when parked on a hill. The fuel could spill out.

4. Add fuel to the fuel tank, until the level is even with the bottom of the filler neck. **Do not over fill the fuel tank.**
5. Install the fuel tank cap and secure. Wipe up any fuel that may have spilled.

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

Think Safety First

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

⚠ DANGER

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

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

Always use the seat belt when operating the machine.

Read and follow the rollover protection instructions and warnings.

To avoid loss of control and possibility of rollover:

- Do not operate near drop-offs or near water.
- Reduce speed and use extreme caution on slopes.
- Avoid sudden turns or rapid speed changes.

⚠ CAUTION

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

Wear hearing protection when operating this machine.

Starting and Stopping the Engine

Starting the Engine

1. Raise the roll bar up and lock it into place, sit on the seat, and fasten the seat belt.
2. Make sure the traction pedal is in the neutral position.
3. Set the parking brake.
4. Move the PTO (power take off) switch to the off position (Figure 12).

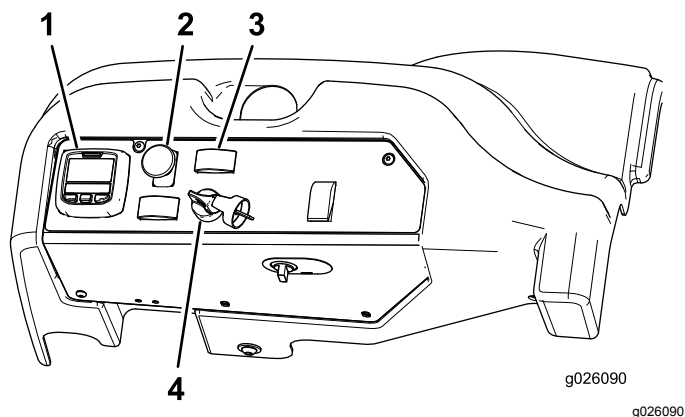


Figure 12

- | | |
|--------------------------------|------------------------|
| 1. InfoCenter | 3. Ignition switch |
| 2. Power take off switch (PTO) | 4. Engine speed switch |

- Turn the ignition key clockwise to the Run position.
The InfoCenter glow plug icon will turn on for 6 seconds.
- After the InfoCenter glow plug icon goes out, turn the key to the Start position. When the engine starts release the key.

Important: Use starting cycles of no more than 15 seconds per minute to avoid overheating the starter motor.

Note: Additional starting cycles may be required when starting the engine for the first time after the fuel system has been completely drained.

Important: When engine is started for the first time, or after an engine oil change, or an overhaul of the engine, transmission, or wheel motor, operate the machine with the engine speed switch in the Slow position in both the forward and reverse directions for one to two minutes. Also operate the lift switch and PTO switch to ensure proper operation of all parts. Then shut the engine off and check fluid levels, check for oil leaks, loose parts, and any other noticeable malfunctions.

⚠ CAUTION

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

brake, and move the engine speed switch to the idle position.

- Let the engine idle for 60 seconds.
- Turn the ignition key to the Off position. Wait for all moving parts to stop before leaving the operating position.
- Remove the key before transporting or storing machine.

Important: Make sure to remove the key as the fuel pump or accessories may run and cause the battery to lose charge.

⚠ CAUTION

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

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

Driving the Machine

The throttle control regulates the engine speed as measured in rpm (revolutions per minute). Place the throttle control in the Fast position for best performance. Always operate in the Fast throttle position when mowing.

Steering Selection

For maximum trimming and minimum turf damage the machine should always be operated in 4 wheel steering. However, when it is desired to transport the machine on roads or trails, the machine can be switched into 2 wheel steering.

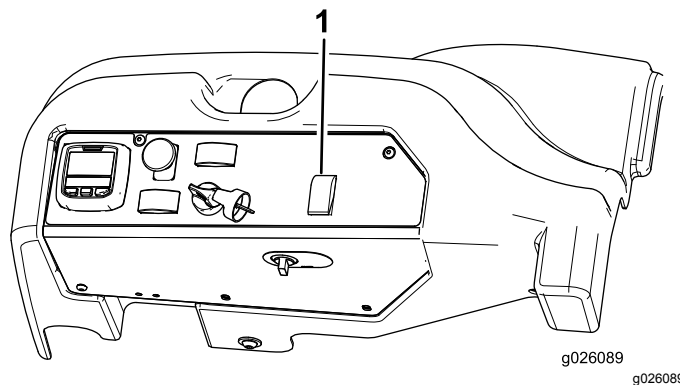


Figure 13

- Steering selector switch

Stopping the Engine

- Disengage the PTO, make sure the traction pedal is in the neutral position, set the parking

Switching from 4 wheel steering to 2 wheel steering

Press the steering selector switch (Figure 13) to the forward position. If the wheels are not aligned in the forward position, the green light will flash and the machine will remain in 4 wheel steering until the four tires are directed straight ahead. The operator should turn the steering wheel slowly to straighten out the wheels until the green light ceases to flash and remains ON. When the switch light is solid green, the machine is in 2 wheel steering.

Note: If the steering wheel is turned too briskly, steering misalignment may occur.

Switching from 2 wheel steering to 4 wheel steering

Press the steering selector switch (Figure 13) to the rearward position. If the front wheels are not aligned in the forward position, the green light will flash and the machine will remain in 2 wheel steering until the four tires are directed straight ahead. The operator should turn the steering wheel slowly to straighten out the wheels until the green light ceases to flash and remains OFF. If the steering wheel is turned too briskly, steering misalignment may occur. When the switch light is continuously OFF, the machine is in 4 wheel steering.

Note: If the steering system is misaligned after repeated 2 wheel steering to 4 wheel steering engagements, refer to Correcting Steering Misalignment in the Maintenance Section.

Stopping the Machine

To stop the machine, release the traction pedal to the neutral position.

Set the parking brake whenever you leave the machine. Remember to remove the key from the ignition switch.

⚠ CAUTION

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

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

Operating the Mower

Raising and Lowering the Mower

The deck lift switch raises and lowers the mower deck (Figure 14). The engine must be running for you to use this switch.

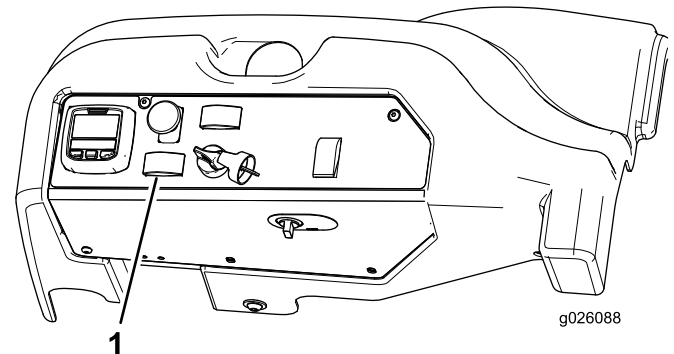


Figure 14

1. Deck lift switch

- To lower the mower deck, push the switch forward.
- To raise the mower deck, push the switch rearward.

Important: Do not continue to hold the switch back after the mower has fully raised. Doing so will damage the hydraulic system.

Note: To lock the mower deck in a raised position, raise the deck past the 15 cm (6 inch) position, remove the height of cut stop pin, and place the pin in the 15 cm (6 inch) height-of-cut position.

Engaging the Power Take Off (PTO)

The power take off (PTO) switch starts and stops the mower blades and some powered attachments.

1. If the engine is cold, allow the engine to warm up 5 to 10 minutes before engaging the PTO.
2. While seated in the seat, make sure the traction pedal is in the neutral position and the engine is at full throttle.
3. Pull up on the PTO switch to engage it (Figure 15).

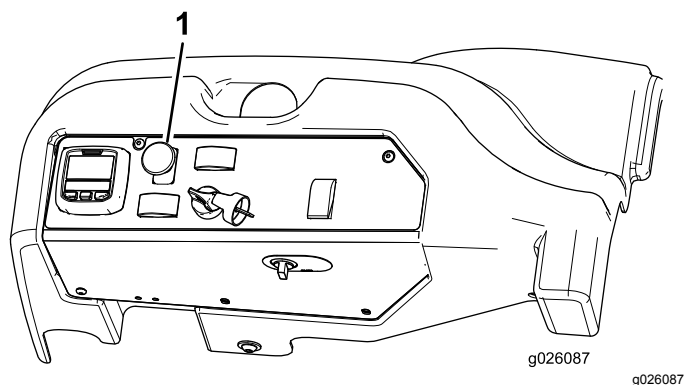


Figure 15

1. PTO switch

Disengaging the PTO

To disengage, push the PTO switch to the off position.

The Safety Interlock System

⚠ CAUTION

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

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

Understanding the Safety Interlock System

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

- You are sitting on the seat or the parking brake is engaged.
- The power take off (PTO) is disengaged.
- The traction pedal is in the neutral position
- The engine temperature is below the maximum operating temperature.

The safety interlock system also is designed to stop the engine when the traction pedal is moved from the neutral position with the parking brake engaged. If you rise from the seat when the PTO is engaged there is a 1 second delay and then the engine stops.

Testing the Safety Interlock System

Service Interval: Before each use or daily

Test the safety interlock system before you use the machine each time. If the safety system does not operate as described below, have an Authorized Service Dealer repair the safety system immediately.

1. Sitting on the seat, engage the parking brake and move the PTO to on. Try starting the engine; the engine should not crank.
2. Sitting on the seat, engage the parking brake and move the PTO to off. Engage the traction pedal. Try starting the engine; the engine should not crank.
3. Sitting on the seat, engage the parking brake, move the PTO switch to off and allow the traction pedal to return to the neutral position. Now start the engine. While the engine is running, release the parking brake, engage the PTO and rise slightly from the seat. On two wheel drive machines, the engine should stop within 2 seconds. On four wheel drive machines, the mower deck will shut off. The engine will continue to run.
4. Without an operator on the seat, engage the parking brake, move the PTO switch to off and move the traction pedal to the neutral position. Now start the engine. While the engine is running, engage the traction pedal; the engine should stop within 2 seconds.
5. Without an operator on the seat, disengage the parking brake, move the PTO switch to off, and allow the traction pedal to return to the neutral position. Try starting the engine; the engine should not crank.

Positioning the Standard Seat

Changing the Seat Position

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

1. To adjust, move the lever sideways to unlock the seat ([Figure 16](#)).

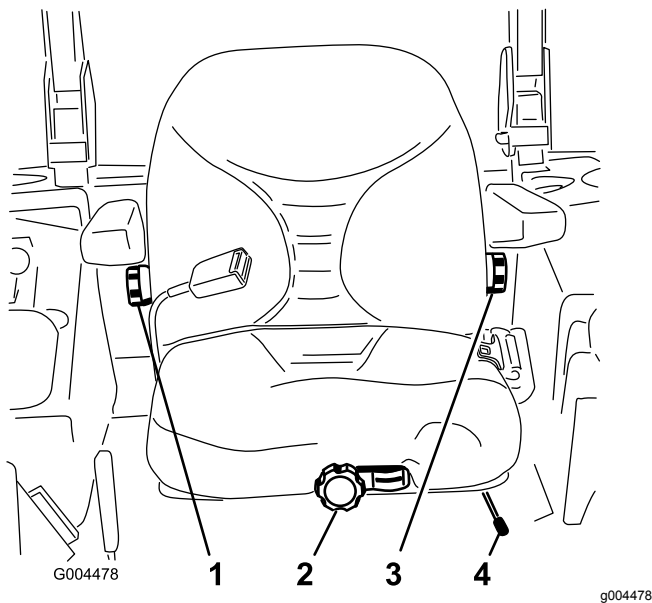


Figure 16

- | | |
|-------------------------|-----------------------------------|
| 1. Back rest knob | 3. Lumbar support adjustment knob |
| 2. Seat suspension knob | 4. Seat position adjustment lever |

2. Slide the seat to the desired position and release lever to lock in position.
3. Verify that the seat has locked into place by attempting to move it back and forth.

Changing the Seat Suspension

The seat can be adjusted to provide a smooth and comfortable ride. Position the seat where you are most comfortable.

Without sitting on the seat, turn the knob in front either direction to provide the best comfort (Figure 16).

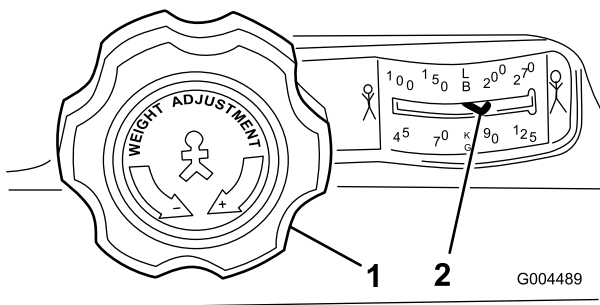


Figure 17

- | | |
|-------------------------|----------------------------|
| 1. Seat suspension knob | 2. Operator weight setting |
|-------------------------|----------------------------|

Changing the Back Position

The back of the seat can be adjusted to provide a comfortable ride. Position the back of the seat where it is most comfortable.

To adjust it, turn the knob, under the right-side arm rest, in either direction to provide the best comfort (Figure 16).

Changing the Lumbar Support

The back of the seat can be adjusted to provide a customized lumbar support for your lower back.

To adjust it, turn the knob, under the left-side arm rest, in either direction to provide the best comfort (Figure 16).

Positioning the Deluxe Seat

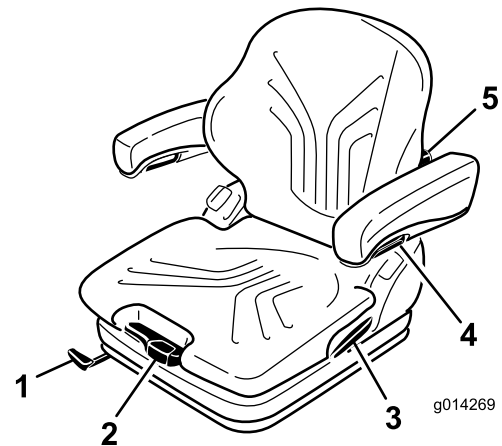


Figure 18

- | | |
|------------------------------|----------------------------------|
| 1. Fore/Aft adjustment lever | 4. Armrest adjustment knob |
| 2. Weight adjustment lever | 5. Lumbar support adjusting knob |
| 3. Backrest locking lever | |

Changing the Weight Adjustment

The seat can be adjusted to provide a smooth and comfortable ride.

Important: To adjust the seat for the driver's weight the driver must be seated and the ignition key moved to the On position.

The seat is adjusted for the driver's weight by pulling or pressing the weight adjustment lever (Figure 18).

The driver's weight is adjusted correctly when the arrow is in the middle clear area of the viewing window.

Within this viewing area, the seat can be adjusted to a minimum spring movement.

When the minimum/maximum weight adjustment has been reached, you can hear it reaching the upper or lower end stop.

Important: To prevent injury to the operator and/or damage to the machine, the setting for the

driver's weight and the seat must be checked and adjusted before the machine is operated.

Note: To avoid compressor damage during weight adjustment, the compressor must be operated no longer than 1 minute.

Changing the Seat Position

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

1. To adjust, lift the lever to unlock the seat (Figure 18).
2. Slide the seat to the desired position and release lever to lock in position.
3. Verify that the seat has locked into place by attempting to move it back and forth.

Note: Do not operate the locking lever while operating the machine.

Changing the Lumbar Support

The lumbar support increases both the seating comfort and the performance of the driver.

The back of the seat can be adjusted to provide a customized lumbar support for your lower back.

By turning the adjustment knob upwards, the curvature in the upper part of the backrest cushion can be adjusted. By turning the knob downwards, the curvature in the lower part of the backrest cushion can be adjusted (Figure 18).

0 = No curvature

1 = Maximum curvature at the top

2 = Maximum curvature at the bottom

Adjusting the Armrests

The armrests can be folded back if required and the height individually adjusted.

To adjust the armrests for height, separate the round cap (Figure 18) from the cover, loosen the hexagon nut (13 mm) behind it and adjust the armrests to the desired position and tighten the nut. Replace the cap onto the nut.

⚠ WARNING

Do not install the armrest in the lowest position as the seat belt roller might not function properly.

Changing the Armrest Angle

The angle of the armrests can be adjusted for operator comfort.

To adjust the angle of the armrests, turn the adjustment knob (Figure 18).

When turning the knob to the outside (+) the front part of the armrest will be lifted, when turning the knob to inside (-) it will be lowered.

Changing the Backrest Position

The back of the seat can be adjusted to provide a more comfortable ride. Position the back of the seat where it is most comfortable.

Pull up the locking lever to release the backrest catch (Figure 18). When releasing the backrest catch, do not apply load to the backrest by pressing against it.

By exerting pressure on or off the front or rear of the seat it can be moved to the desired position. Release the locking lever to lock the backrest.

Note: The backrest should not be able to move the into another position after it has been locked.

Raising/Lowering the Seat

To access the hydraulic and other systems under the seat, you need to unlatch the seat and swing it forward.

1. Move the seat latch, located on the left side of the seat, rearward to unlatch the seat and pull forward on the top of the seat (Figure 19).

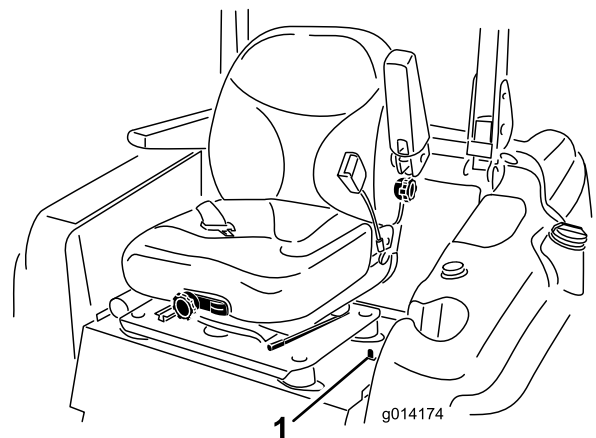


Figure 19

1. Seat latch
-
2. To lower the seat, pull up on the seat latch release bar and lower the seat into the locked position.

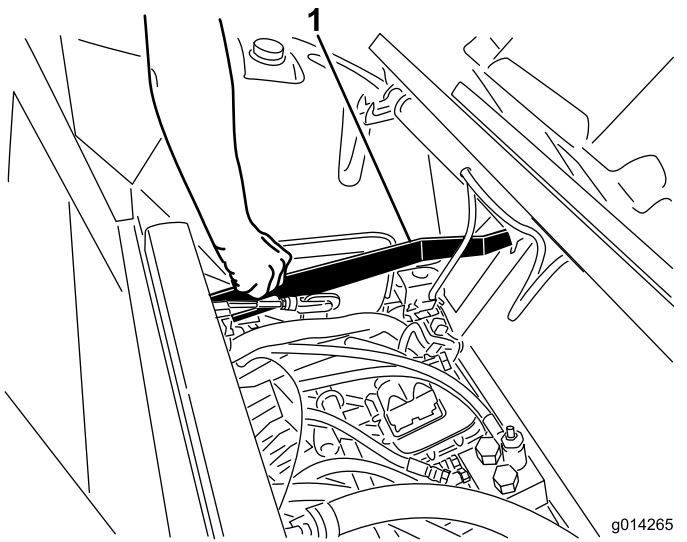


Figure 20

1. Seat latch release bar

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

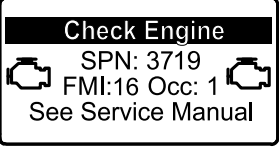
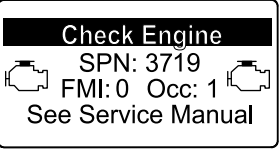
The exhaust temperature is hot (approximately 600°C (1112°F) during DPF parked regeneration or recovery regeneration. Hot exhaust gas can harm you or other people.

- **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.

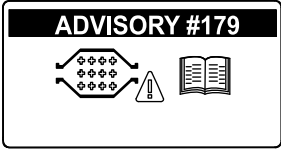


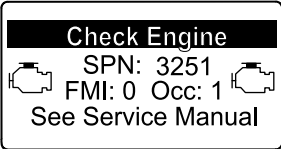
Engine Warning Messages—Soot Accumulation

Indication Level	Fault Code	Engine Power Rating	Recommended Action
Level 1: Engine Warning	 <p>Check Engine SPN: 3719 FMI:16 Occ: 1 See Service Manual</p> <p><small>g213866</small></p> <p>Figure 21 Check Engine SPN 3719, FMI 16</p>	The computer de-rates the engine power to 85%	Perform a parked regeneration as soon as possible; refer to Parked Regeneration (page 32) .
Level 2: Engine Warning	 <p>Check Engine SPN: 3719 FMI: 0 Occ: 1 See Service Manual</p> <p><small>g213867</small></p> <p>Figure 22 Check Engine SPN 3719, FMI 0</p>	The computer de-rates the engine power to 50%	Perform a recovery regeneration as soon as possible; refer to Recovery Regeneration (page 35) .

DPF Ash Accumulation


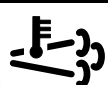
- The lighter ash is discharged through the exhaust system; the heavier ash collects in the soot filter.
- Ash is a residue of the regeneration process. Over time, the diesel particulate filter accumulates ash that does not discharge with the engine exhaust.
- The computer for the engine calculates the 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	 <p>g213865</p> <p>Figure 23 Advisory #179</p>	None	100%	Notify your service department that advisory #179 displays in the InfoCenter.
Level 2: Engine Warning	 <p>g213863</p> <p>Figure 24 Check Engine SPN 3720, FMI 16</p>	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	 <p>g213864</p> <p>Figure 25 Check Engine SPN 3720, FMI 0</p>	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	 <p>g214715</p> <p>Figure 26 Check Engine SPN 3251, FMI 0</p>	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	<p>The InfoCenter does not display an icon indicating passive regeneration.</p> <p>During passive regeneration, the DPF processes high-heat exhaust gasses; oxidizing harmful emissions and burning soot to ash.</p> <p>Refer to Passive DPF Regeneration (page 31).</p>
Assist	Occurs as a result of low-engine speed, low-engine load, or after the computer detects back pressure in the DPF	<p>When the assist/reset-regeneration icon  is displayed in the InfoCenter, an assist regeneration is in progress.</p> <p>During assist regeneration, the computer controls the intake throttle to increase the exhaust temperature, enabling assist regeneration to occur.</p> <p>Refer to Assist DPF Regeneration (page 31).</p>
Reset	<p>Occurs after assist regeneration only if the computer detects that assist regeneration did not sufficiently reduce the soot level</p> <p>Also occurs every 100 hours to reset baseline sensor readings</p>	<p>When the assist/reset-regeneration icon  is displayed in the InfoCenter, a regeneration is in progress.</p> <p>During reset regeneration, the computer controls the intake throttle and fuel injectors to increase the exhaust temperature during regeneration.</p> <p>Refer to Reset Regeneration (page 32).</p>

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	<p>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</p> <p>The computer detects back pressure due to soot buildup and requests a parked regeneration</p>	<p>When the parked-regeneration icon  is displayed in the InfoCenter, a regeneration is requested.</p> <ul style="list-style-type: none"> • 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. <p>Refer to Parked Regeneration (page 32).</p>

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	<div> is displayed in the InfoCenter, a recovery regeneration is requested.</div> <p>Contact your Authorized Toro Distributor to have a service technician perform the recovery regeneration.</p> <ul style="list-style-type: none">• 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. <p>Refer to Recovery Regeneration (page 35).</p>

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.

- While operating the machine, run the engine at full engine speed when possible to promote DPF regeneration.

Assist DPF Regeneration

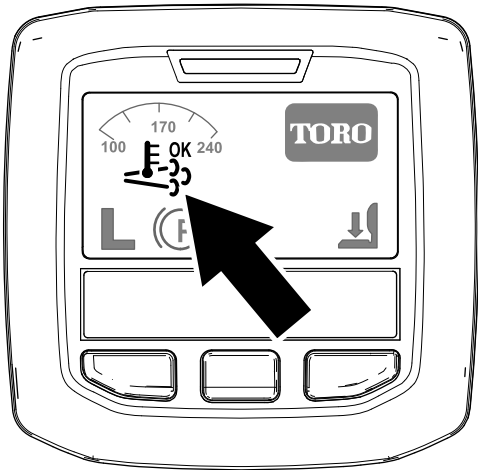




Figure 27
Assist/reset-regeneration icon

- 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.

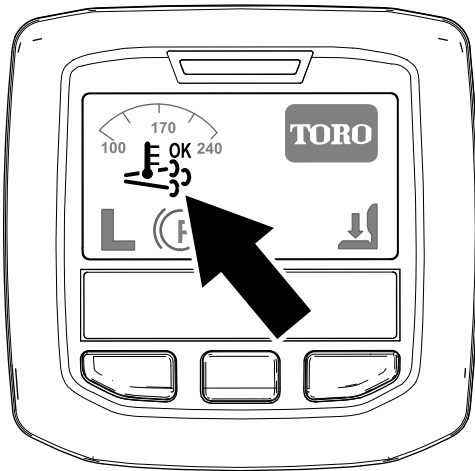
Important: Allow the machine to complete the assist regeneration process before shutting off the engine.

Note: The assist regeneration is finished

processing when the  icon disappears from the InfoCenter.

- The assist/reset-regeneration icon displays in the InfoCenter ([Figure 27](#)).
- The computer takes control of the intake throttle to increase the temperature of the engine exhaust.

Reset Regeneration

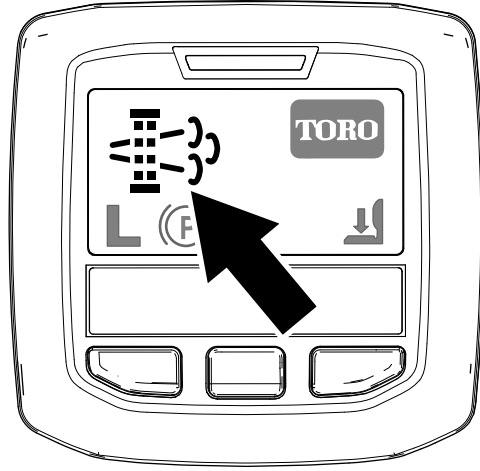


g214711

Figure 28

Assist/reset-regeneration icon

Parked Regeneration



g214713

Figure 29

Parked-regeneration request icon

- The assist/reset-regeneration icon displays in the InfoCenter ([Figure 28](#)).
- 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.

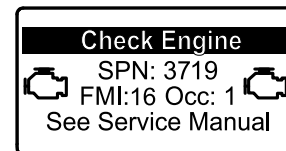
Important: Allow the machine to complete the reset regeneration process before shutting off the engine.

Note: The reset regeneration is finished

processing when the icon disappears from the InfoCenter.



- The parked-regeneration requested icon displays in the InfoCenter ([Figure 29](#)).
- If a parked regeneration is needed, the InfoCenter displays engine warning SPN 3719, FMI 16 ([Figure 30](#)) and the engine computer derates engine power to 85%.



g213866

Figure 30

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

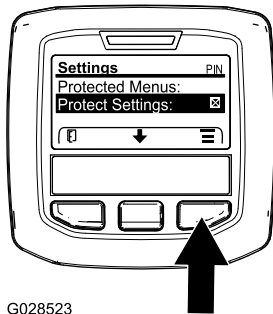
1. Ensure that the machine has at least 1/4 tank of fuel.
2. Move the machine outside to an area away from combustible materials.
3. Park the machine on a level surface.
4. Ensure that the traction control or motion-control levers are in the NEUTRAL position.
5. If applicable, lower the cutting units 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 \(page 17\)](#).

1. Access the protected menu and unlock the protected settings submenu ([Figure 31](#)); refer to [Accessing Protected Menus \(page 17\)](#).



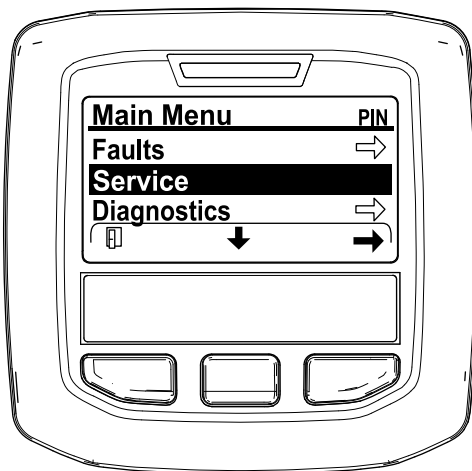
G028523

Figure 31

g028523

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 32](#)).

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



g212371

Figure 32

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 33](#)).

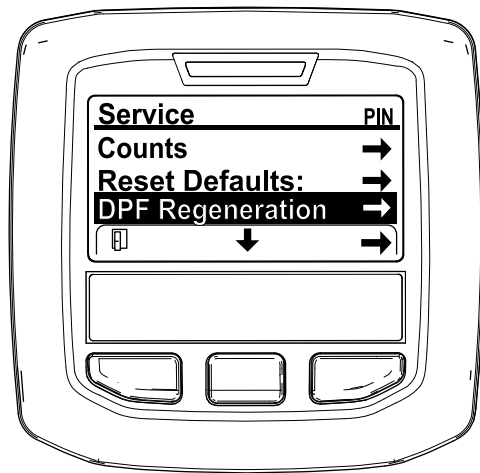


Figure 33

g212138

4. When the "Initiate DPF Regen. Are you sure?" message displays, press the center button ([Figure 34](#)).

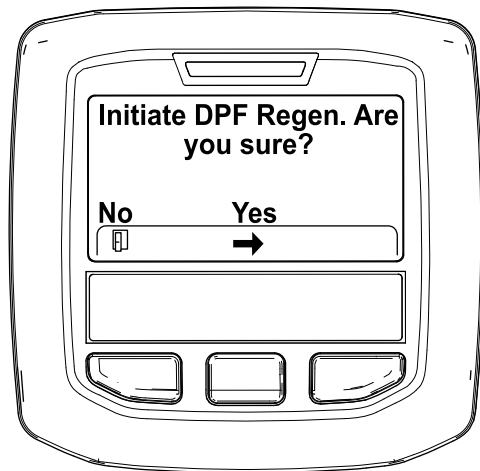



Figure 34

g212125

5. If the coolant temperature is below 60°C (140°F) the "Insure  is running and above 60C/140F" message displays. ([Figure 35](#)).

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.

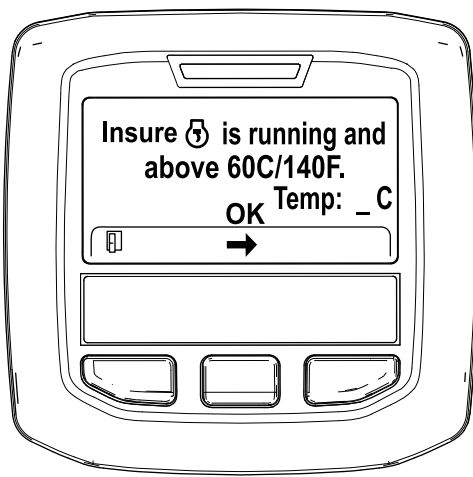


Figure 35

g211986

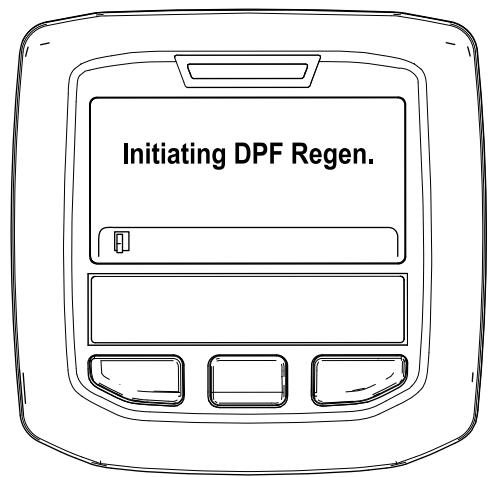


Figure 37

g212405

6. Move the throttle control to LOW IDLE and press the center button (Figure 36).

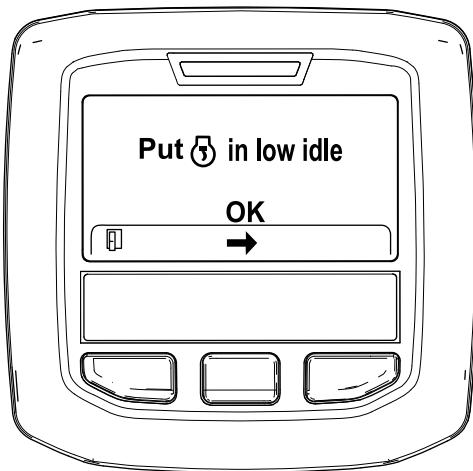


Figure 36

g212372

- B. The "Waiting on [engine icon]" message displays (Figure 38).

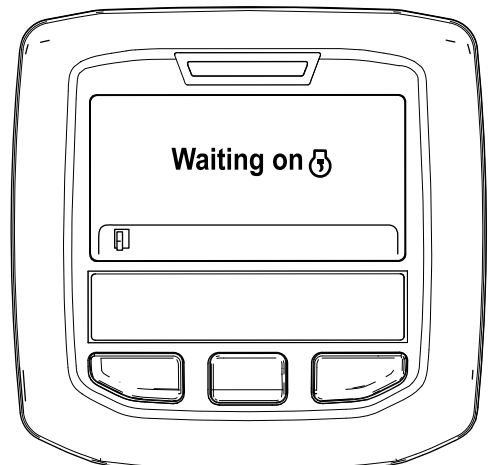


Figure 38

g212406

7. The following messages display as the parked regeneration process begins:

- A. The "Initiating DPF Regen." message displays (Figure 37).

- 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 39).

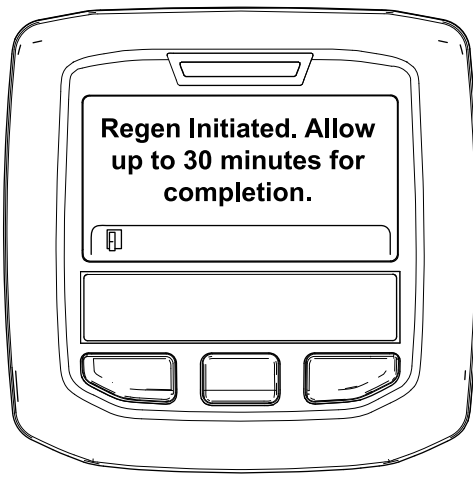


Figure 39

g213424

- If the regeneration process is not allowed by the engine computer, the "DPF Regen Not Allowed" message displays in the InfoCenter (Figure 40). 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.

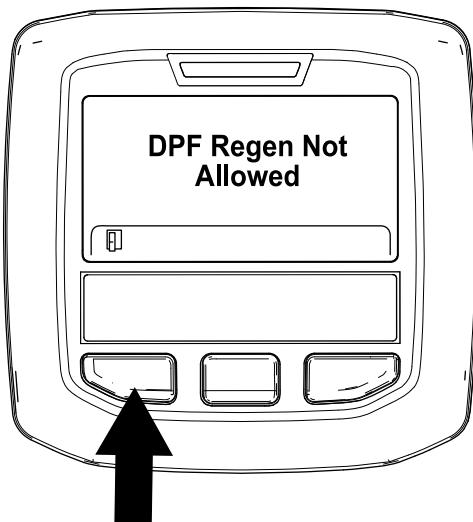
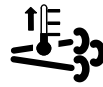


Figure 40

g212410

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 41).

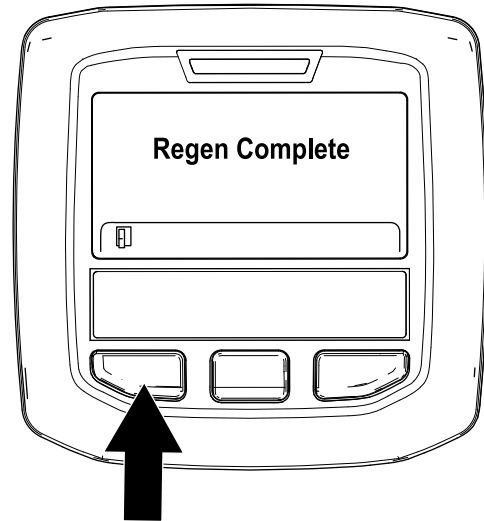


Figure 41

g212404

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

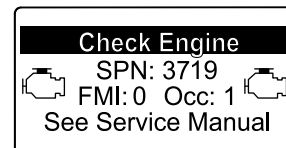


Figure 42

g213867

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 the Machine by Hand

If the machine stalls, runs out of fuel, etc. you may need to push it. To do so, you first need to open both of the hydraulic by-pass valves.

Important: Always push the machine by hand and never a long distance. Never tow the machine because hydraulic damage may occur.

Pushing the Machine

1. Disengage the power take off (PTO), turn the ignition key to off and apply the parking brake.
2. Remove the key from the ignition switch. **Both by-pass valves must be opened.**
3. Lift the seat.
4. Rotate each by-pass valve counterclockwise 1 turn (Figure 43).

This allows hydraulic fluid to by-pass the pump enabling the wheels to turn.

Important: Do not rotate the by-pass valves more than 1 turn. This prevents valves from coming out of the body and causing fluid to run out.

5. Disengage the parking brake before pushing.

Changing to Machine Operation

Rotate each by-pass valve clockwise 1 turn and hand tighten them (torque of approximately 8 N-m [71 in-lb]) (Figure 43).

Note: Do not over tighten the by-pass valves.

The machine will not drive unless the by-pass valves are turned in.

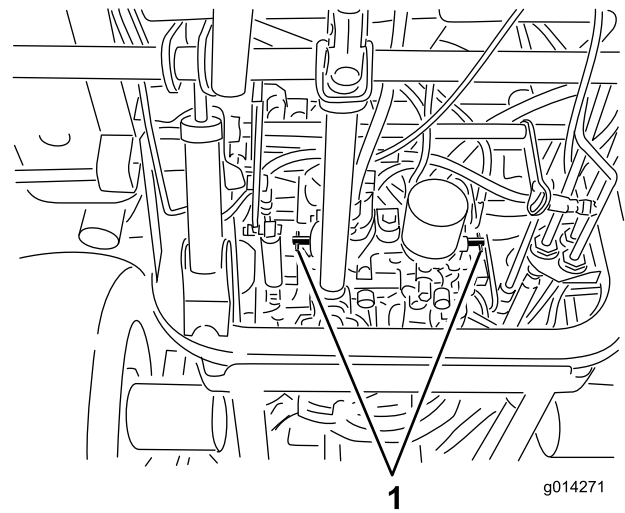


Figure 43

1. By-pass valves

Loading Machines

Use extreme caution when loading units on trailers or trucks. One full width ramp that is wide enough to extend beyond the rear tires is recommended instead of individual ramps for each side of the unit (Figure 44). The lower rear section of the tractor frame extends back between the rear wheels and serves as a stop for tipping backward. Having a full width ramp provides a surface for the frame members to contact if the unit starts to tip backward. If it is not possible to use one full width ramp, use enough individual ramps to simulate a full width continuous ramp.

The ramp should be long enough so that the angles do not exceed 15 degrees (Figure 44). A steeper angle may cause machine components to get caught as the unit moves from ramp to trailer or truck. Steeper angles may also cause the unit to tip backward. If loading on or near a slope, position the trailer or truck so it is on the down side of the slope and the ramp extends up the slope. This will minimize the ramp angle. The trailer or truck should be as level as possible.

Important: Do not attempt to turn the unit while on the ramp; you may lose control and drive off the side.

Avoid sudden acceleration when driving up a ramp and sudden deceleration when backing down a ramp. Both maneuvers can cause the unit to tip backward.

⚠ WARNING

Loading a unit onto a trailer or truck increases the possibility of backward tip-over and could cause serious injury or death.

- Use extreme caution when operating a unit on a ramp.
- Use only a single, full width ramp; Do not use individual ramps for each side of the unit.
- If individual ramps must be used, use enough ramps to create an unbroken ramp surface wider than the unit.
- Do not exceed a 15 degree angle between ramp and ground or between ramp and trailer or truck.
- Avoid sudden acceleration while driving unit up a ramp to avoid tipping backward.
- Avoid sudden deceleration while backing unit down a ramp to avoid tipping backward.

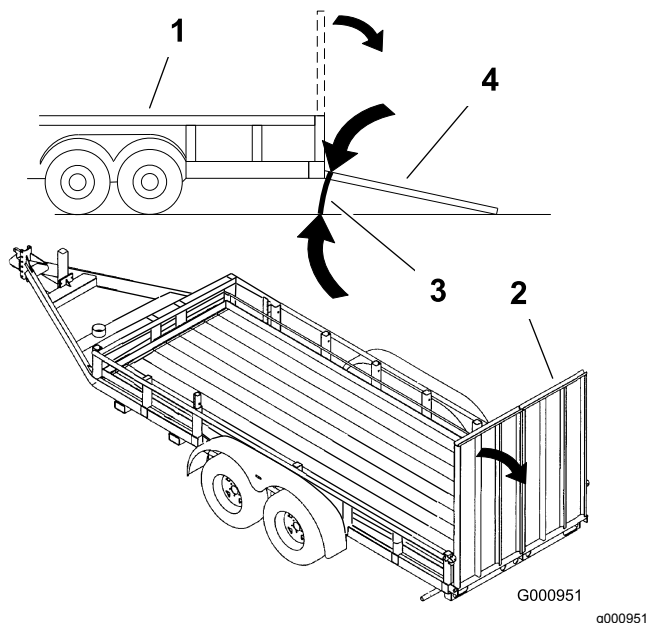


Figure 44

- | | |
|--------------------|--------------------------------|
| 1. Trailer | 3. Not greater than 15 degrees |
| 2. Full width ramp | 4. Full width ramp—side view |

Transporting Machines

⚠ WARNING

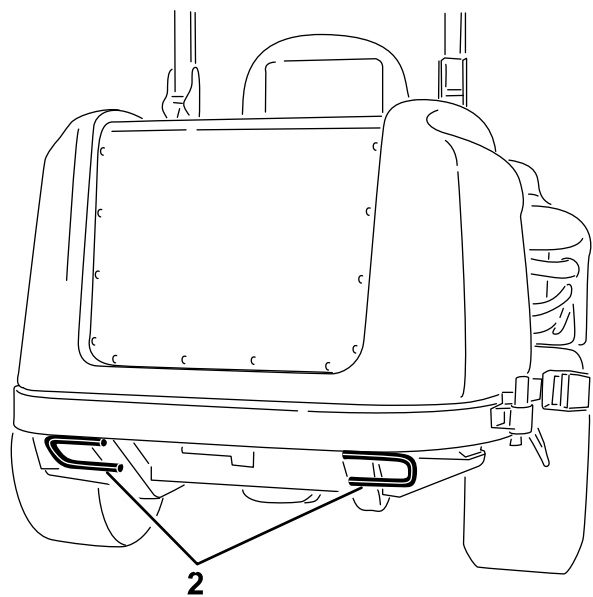
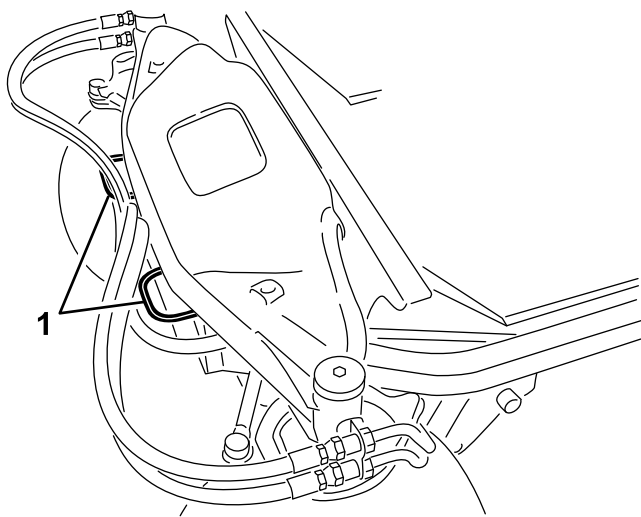
Driving on the street or roadway without turn signals, lights, reflective markings, or a slow moving vehicle emblem is dangerous and can lead to accidents causing personal injury.

Do not drive machine on a public street or roadway without signs, lights, and/or markings required by local regulations.

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

To transport the machine:

- Ensure that your vehicle, hitch, safety chains, and trailer are adequate for the load you are pulling and that they meet all local traffic regulations for your area.
- Lock the brake and block the wheels.
- Securely fasten the machine to the trailer or truck with straps, chains, cable, or ropes as required by local traffic regulations in your area ([Figure 45](#)).



g014264

g014264

Figure 45

1. Front tie-down

2. Rear tie-downs

Operating Tips

Fast Throttle Setting/Ground Speed

To maintain enough power for the machine and deck while mowing, operate the engine at the fast throttle position and adjust your ground speed for conditions. A good rule to follow is: decrease ground speed as the load on the cutting blades increases; and increase ground speed as load on the blades decreases.

Mowing Direction

Alternate mowing direction to avoid making ruts in the turf over time. This also helps disperse clippings which enhances decomposition and fertilization.

Cutting Speed

To improve cut quality, use a slower ground speed.

Avoid Cutting Too Low

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

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

Remove approximately 25 mm (1 inch) or no more than 1/3 of the grass blade when cutting. In exceptionally lush and dense grass, you may have to slow down the forward speed and/or raise the height-of-cut to the next higher setting.

Important: If cutting more than 1/3 of the grass blade off, or in sparse long grass or dry conditions, the use of flat sail blades is recommended to reduce air-borne chaff, debris, and deck drive component strain.

Long Grass

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

Keep the Mower Clean

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

To reduce the risk of fire hazard, keep the engine, muffler, battery compartment, parking brake, cutting units, and fuel storage compartment free of grass, leaves, or excessive grease. Clean up any spilled oil or fuel.

Blade Maintenance

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

Maintenance

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

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 10 hours	<ul style="list-style-type: none"> • Check the alternator belt tension. • Torque wheel lug nuts.
After the first 200 hours	<ul style="list-style-type: none"> • Change the hydraulic oil and filter.
Before each use or daily	<ul style="list-style-type: none"> • Test the safety system. • Check the engine-oil level. • Check the engine coolant level. • Clean the radiator with compressed air (do not use water) • Check the hydraulic fluid level.
Every 50 hours	<ul style="list-style-type: none"> • Grease the bearing and bushing grease fittings. • Check battery cable connections. • Check the tire pressure.
Every 100 hours	<ul style="list-style-type: none"> • Check the alternator belt tension.
Every 200 hours	<ul style="list-style-type: none"> • Inspect cooling system hoses and seals. Replace them if cracked or torn. • Torque wheel lug nuts.
Every 250 hours	<ul style="list-style-type: none"> • Change the engine oil and filter. • Clean the cab air filters. (Replace them if they are torn or excessively dirty.) • Clean the air conditioning coil. (Clean more frequently in extremely dusty or dirty conditions)
Every 400 hours	<ul style="list-style-type: none"> • 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.) • Replace the fuel filter canister. • Replace the engine fuel filter. • Check the fuel lines and connections for deterioration, damage, or loose connections.
Every 800 hours	<ul style="list-style-type: none"> • Change the hydraulic oil and filter. • Inspect engine valve clearance. Refer to your Engine Operator's Manual.
Every 1,500 hours	<ul style="list-style-type: none"> • Replace moving hoses
Every 6,000 hours	<ul style="list-style-type: none"> • 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.
Every 2 years	<ul style="list-style-type: none"> • Flush and replace cooling system fluid.

Important: Refer to your *Engine Operator's Manual* for additional maintenance procedures. A detailed Service Manual is also available for purchase from your Authorized Toro Distributor.

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.

Daily Maintenance Checklist

Duplicate this page for routine use.

Maintenance Check Item	For the week of:						
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check Safety Interlock Operation							
Check Parking Brake Operation							
Check Fuel Level							
Check Hydraulic Oil Level							
Check Engine Oil Level							
Check Cooling System Fluid Level							
Check Drain Water/Fuel Separator							
Check Air Filter Restriction Indicator ³							
Check Radiator & Screen for Debris							
Check Unusual Engine Noises ¹							
Check Unusual Operating Noises							
Check Hydraulic Hoses for Damage							
Check Fluid Leaks							
Check Tire Pressure							
Check Instrument Operation							
Lubricate All Grease Fittings ²							
Touch-up Damaged Paint							

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

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

3. If indicator shows red

Notation for Areas of Concern		
Inspection performed by:		
Item	Date	Information

⚠ CAUTION

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

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

CHECK/SERVICE (daily)

1. OIL LEVEL, ENGINE
2. OIL LEVEL, HYDRAULIC TANK
3. COOLANT LEVEL, RADIATOR
4. FUEL /WATER SEPARATOR
5. PRECLEANER - AIR CLEANER

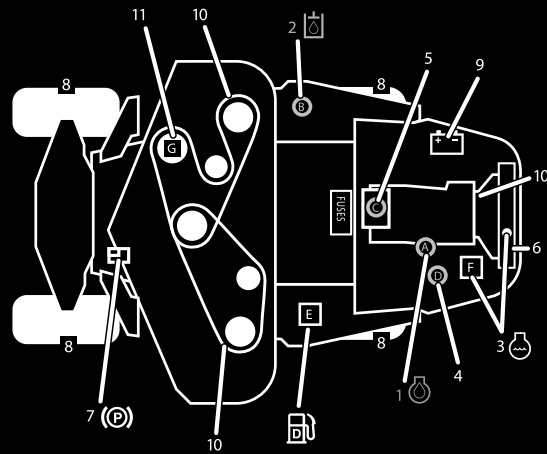
6. RADIATOR SCREEN
7. BRAKE FUNCTION
8. TIRE PRESSURE
9. BATTERY
10. BELTS - DECK, FAN, ALTERNATOR
11. GEARBOX
- GREASING - SEE OPERATOR'S MANUAL

FLUID SPECIFICATIONS/CHANGE INTERVALS

SEE OPERATOR'S MANUAL FOR INITIAL CHANGES.	FLUID TYPE	CAPACITY	CHANGE INTERVAL*		FILTER PART NO.
			FLUID	FILTER	
A. ENGINE OIL	15W-40 CJ-4	5.5 QTS.	250 HRS.	250 HRS.	125-7025
B. HYDRAULIC CIRCUIT OIL	MOBIL 424	4.5 GALS. (17 LITERS)	800 HRS.	800 HRS.	108-5194
C. AIR CLEANER				SEE INDICATOR	108-3810
D. WATER SEPARATOR				400 HRS.	125-2915
E. FUEL TANK	NO. 2-DIESEL	13.5 GALS. (51.1 LITERS)	DRAIN AND FLUSH 2 YRS.		
F. COOLANT	50/50 ETHYLENE GLYCOL/WATER	8 QTS. (7.5 LITERS)	DRAIN AND FLUSH 2 YRS.		
G. GEARBOX	80W-90 GEAR OIL SYNTH: Mobilube SHC 75W-90	14 fl oz. (414 mL)	400 HRS.		

*SEE OPERATOR'S MANUAL FOR INITIAL

CHANGES / WINTER USE.



131-1946

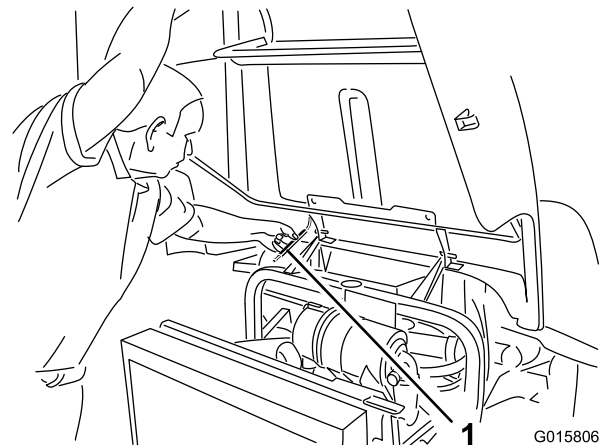
Figure 46
Service Interval Chart

decal131-1946

Pre-Maintenance Procedures

Using the Hood Prop Rod

1. Release the hood latches.
2. Lift up on the hood until the prop rod can be positioned behind the frame tube ([Figure 47](#)).
3. Lower the hood until the rod is in front of and resting against the frame tube.
4. To lower the hood, raise the hood until the prop rod can be raised above the frame tube, then lower the hood.
5. Secure the hood latches



G015806

g015806

Figure 47

1. Prop rod

Lubrication

Greasing the Bearings and Bushings

Service Interval: Every 50 hours

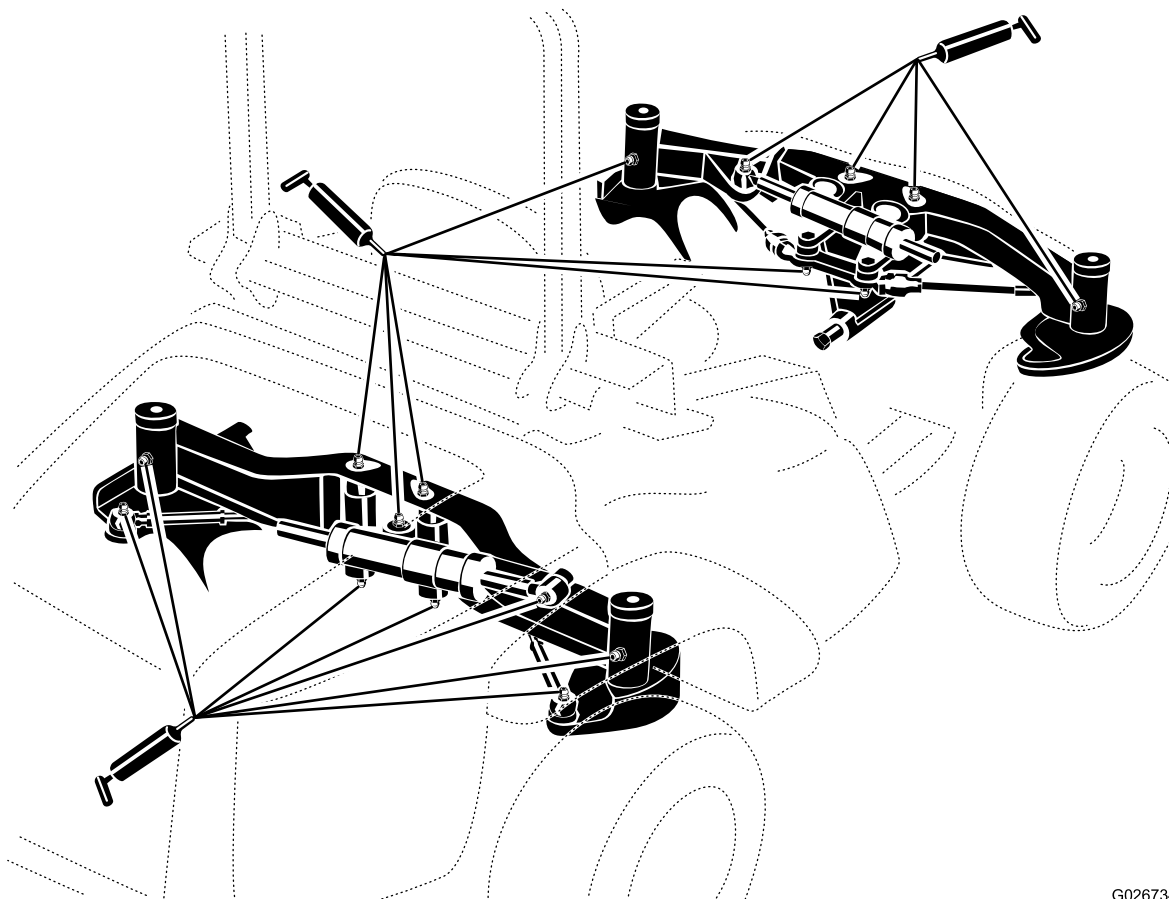
The machine has grease fittings that must be lubricated regularly with No. 2 General Purpose Lithium Base Grease. If the machine is operated under normal conditions, lubricate all bearings and bushings after every 50 hours of operation. Bearings and bushings must be lubricated daily when operating conditions are extremely dusty and dirty. Dusty and dirty operating conditions could cause dirt to get into the bearings and bushings, resulting in accelerated

wear. Lubricate the grease fittings immediately after every washing, regardless of interval specified.

1. Wipe the grease fittings clean so foreign matter cannot be forced into the bearing or bushing.
2. Pump grease into the fittings.
3. Wipe off excess grease.

Note: To access the rear steering linkage grease fittings, the storage compartment needs to be removed.

Note: Jack the machine off the floor to allow better grease migration through both the upper and lower king pin bushings. Grease must be observed purging out of both the top and the bottom of the axle casting/bushing assembly areas of all four kingpin assemblies.



G026734

g026734

Figure 48

Note: Bearing life can be negatively affected by improper wash down procedures. Do not wash down the unit when it is still hot and avoid directing high-pressure or high volume spray at the bearings or seals.

Engine Maintenance

Servicing the Air Cleaner

Service Interval: Every 400 hours

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 49) 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. Pull the latch outward and rotate the air cleaner cover counter-clockwise (Figure 49).

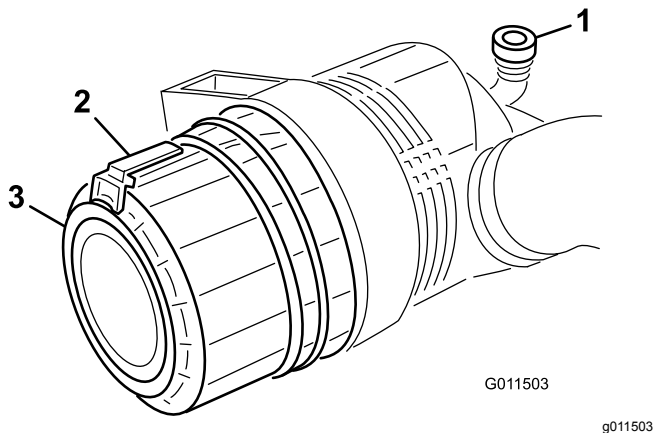


Figure 49

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

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 50).

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.**

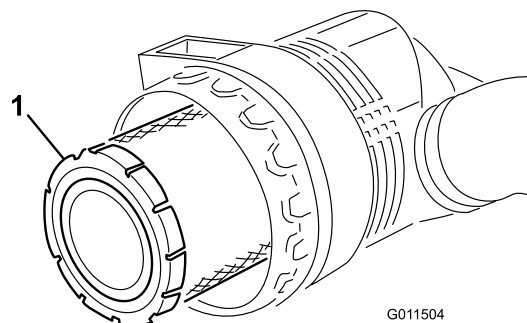


Figure 50

1. Air cleaner filter
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 latch.

Servicing the Engine Oil

Oil Specification

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

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

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

Use the following engine oil viscosity grade:

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

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

Checking the Engine-Oil Level

Service Interval: Before each use or daily

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

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

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

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

1. Park the machine on a level surface.
2. 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 51).

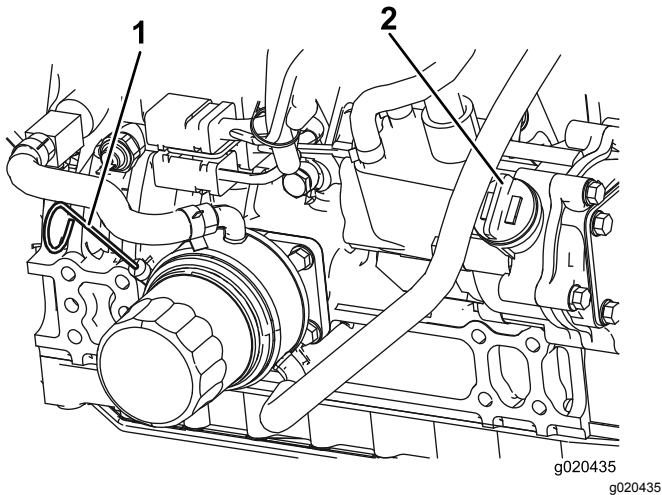


Figure 51

1. Dipstick
2. Oil-fill cap

Crankcase Oil Capacity

Approximately 5.2 liters (5.5 quarts) with the filter.

Changing the Engine Oil and Filter

Service Interval: Every 250 hours

Change the oil and filter every 250 hours.

1. Remove the drain plug (Figure 52) and let the oil flow into a drain pan. When all the oil is drained, install the drain plug.

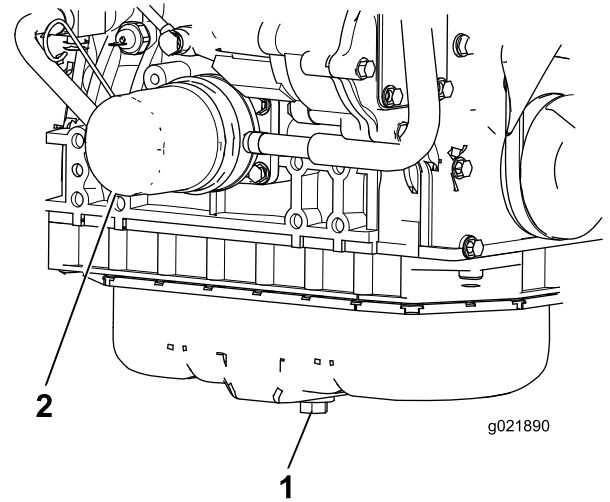


Figure 52

1. Engine oil drain plug
2. Oil filter

2. Remove the oil filter (Figure 52). 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.

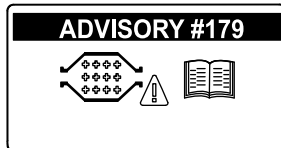
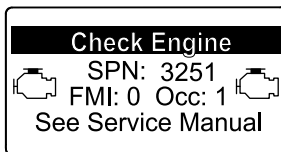


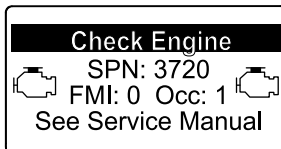
Figure 53

g213865

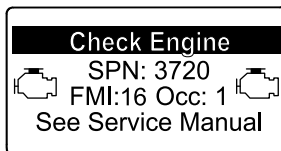
- If engine faults CHECK ENGINE SPN 3251 FMI 0, CHECK ENGINE SPN 3720 FMI 0, or CHECK ENGINE SPN 3720 FMI 16 in the InfoCenter (Figure 54) display in the InfoCenter, clean the soot filter using the steps that follow:



g214715



g213864



g213863

Figure 54

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

Note: Refer to Adding Fuel for proper fuel recommendations.

⚠ 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.

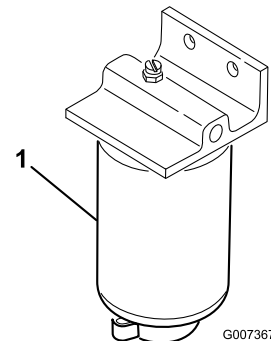
- Use a funnel and fill the fuel tank outdoors, in an open area, when the engine is off and is cold. Wipe up any fuel that spills.
- Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is to the bottom of the filler neck.
- Never smoke when handling fuel, and stay away 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.

Servicing the Water Separator

Service Interval: Every 400 hours

Drain water or other contaminants from water separator (Figure 55) 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 55

g007367

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 56).

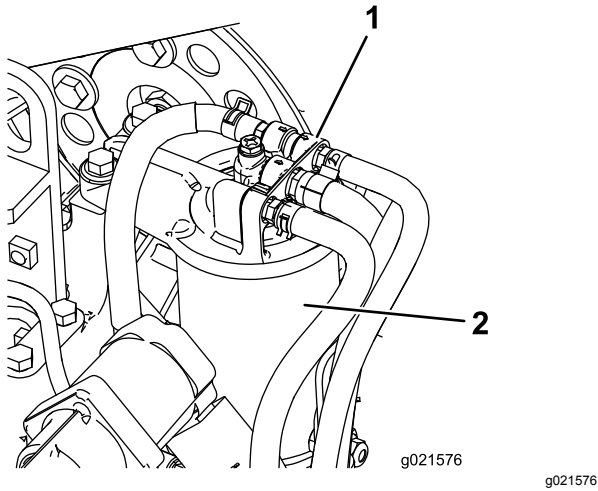


Figure 56

- | | |
|---------------------|----------------|
| 1. Fuel Filter head | 2. Fuel Filter |
|---------------------|----------------|

2. Remove the filter and clean the filter head mounting surface (Figure 56).
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.

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.

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: Whenever working with the electrical system, always disconnect the battery cables, negative (-) cable first, to prevent possible wiring damage from short-outs.

Checking the Fuses

If the machine stops or has other electrical system issues, check the fuses. Grasp each fuse in turn and remove them one at a time, checking to see if any are blown. If you need to replace a fuse, always use the **same type and amperage rated fuse** as the one you are replacing, **otherwise you could damage the electrical system** (refer to the decal next to the fuses for a diagram of each fuse and its amperage).

The traction unit fuses are located under the seat (Figure 57).

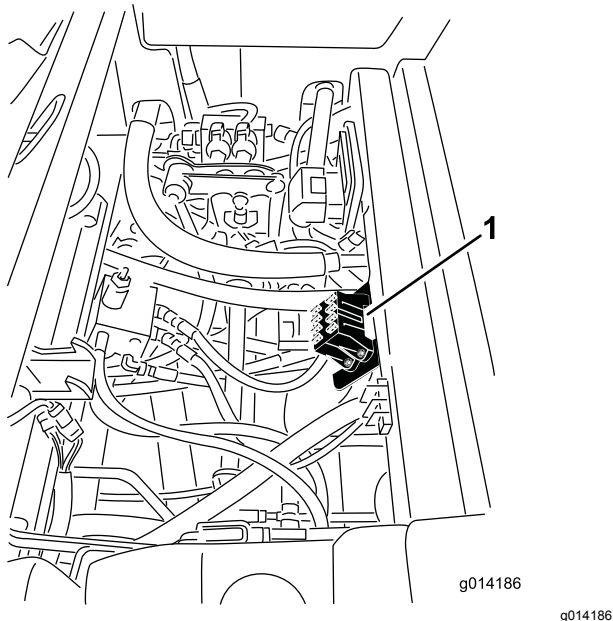


Figure 57

1. Fuse block location

Servicing the Battery

Service Interval: Every 50 hours

Keep the top of the battery clean. If you store the machine in a location where temperatures are extremely high, the battery will run down more rapidly than if the machine is stored in a location where temperatures are cool.

Keep the top of the battery clean by washing it periodically with a brush dipped in ammonia or bicarbonate of soda solution. Flush the top surface

with water after cleaning it. Do not remove the fill caps while cleaning the battery.

The battery cables must be tight on the terminals to provide good electrical contact.

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.

If corrosion occurs at the terminals, disconnect the cables, negative (-) cable first, and scrape the clamps and terminals separately. Reconnect the cables, positive (+) cable first, and coat the terminals with petroleum jelly.

⚠ WARNING

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

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

⚠ WARNING

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

- Always disconnect the negative (black) battery cable before disconnecting the positive (red) cable.
- Always connect the positive (red) battery cable before connecting the negative (black) cable.

Storing the Battery

If the machine will be stored more than 30 days, remove the battery and charge it fully. Either store

it on a shelf or on the machine. Leave the cables disconnected if it is stored on the machine. Store the battery in a cool atmosphere to avoid quick deterioration of the charge in the battery. To prevent the battery from freezing, make sure it is fully charged. The specific gravity of a fully charged battery is 1.265-1.299.

Drive System Maintenance

Checking the Tire Pressure

Service Interval: Every 50 hours

Check the pressure after every 50 operating hours or monthly, whichever occurs first.

Maintain the air pressure in the front and rear tires. The correct air pressure is 172 kPa (25 psi) in the rear tires and 103 kPa (15 psi) in the front tires. If a cab is installed on the machine, the front and rear tires should be inflated to 172 kPa (25 psi). Uneven tire pressure can cause uneven cut. Check the tires when they are cold to get the most accurate pressure reading.

Correcting Steering Misalignment

1. Press the steering selector switch to the rearward (four wheels steer) position ([Figure 58](#)).

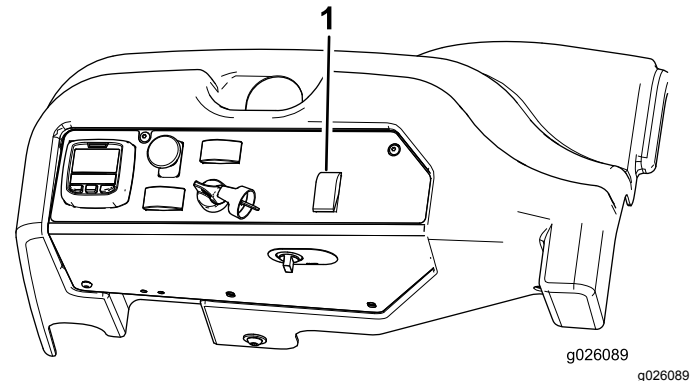


Figure 58

1. Steering selector switch

2. On a paved or dirt surface, turn the steering wheel to the left or right and continue turning until all 4 wheels have stopped turning. Automatic synchronization of wheel alignment should occur.

Important: Doing this procedure on turf can result in turf damage directly under each of the turning tires.

Cooling System Maintenance

⚠ DANGER

Discharge of hot pressurized coolant or touching hot radiator and surrounding parts can cause severe burns.

- Do not remove the radiator cap when the engine is hot. Always allow the engine to cool at least 15 minutes or until the radiator cap is cool enough to touch without burning your hand before removing the radiator cap.
- Do not touch radiator and surrounding parts that are hot.

⚠ DANGER

The rotating fan and drive belt can cause personal injury.

- Do not operate the machine without the covers in place.
- Keep fingers, hands and clothing clear of rotating fan and drive belt.
- Shut off the engine and remove the ignition key before performing maintenance.

⚠ CAUTION

Swallowing engine coolant can cause poisoning.

- Do not swallow engine coolant.
- Keep out of reach from children and pets.

Checking the Cooling System

Service Interval: Before each use or daily

The cooling system is filled with a 50/50 solution of water and permanent ethylene glycol anti freeze. Check the level of the coolant in the expansion tank at the beginning of each day before starting the engine. The capacity of the cooling system is 7.5 liters (6 quarts).

1. Check the level of the coolant in the expansion tank (Figure 59). The coolant level should be between the marks on the side of the tank.

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

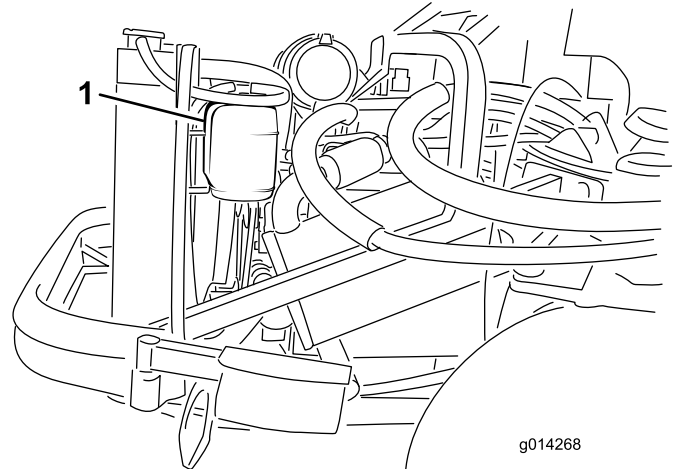


Figure 59

1. Expansion tank

Cleaning the Radiator

Service Interval: Before each use or daily

To prevent the engine from overheating, the radiator must be kept clean. Normally, check the radiator daily and, if necessary, clean any debris off these parts. However, it will be necessary to check and clean the radiator frequently in extremely dusty and dirty conditions.

Note: If the mower deck or engine shuts off due to overheating, first check the radiator for excessive buildup of debris.

Clean the radiator as follows:

1. Open the hood and secure the prop rod.
2. Loosen the flange nut securing the clean out cover to the underside of the rear frame (Figure 60). Rotate the cover to the side to expose the clean out hole in the frame.

Brake Maintenance

Adjusting the Service Brakes

Adjust the service brakes when there is more than 25 mm (1 inch) of free travel of the brake pedal, or when the brakes do not work effectively. Free travel is the distance the brake pedal moves before you feel braking resistance.

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 61](#)).

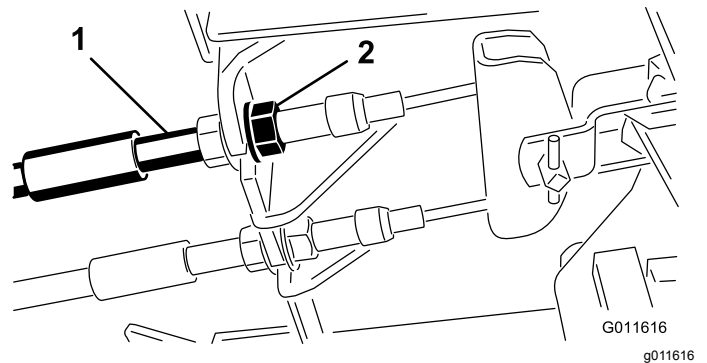


Figure 61

1. Brake cables
2. Front nuts

2. Tighten the rear nut to move the cable backward until brake pedals have 1.27 to 1.9 cm (1/2 to 3/4 inch) of free travel, before wheel lock up is achieved.
3. Tighten the front nuts, ensuring that both cables actuate the brakes simultaneously.

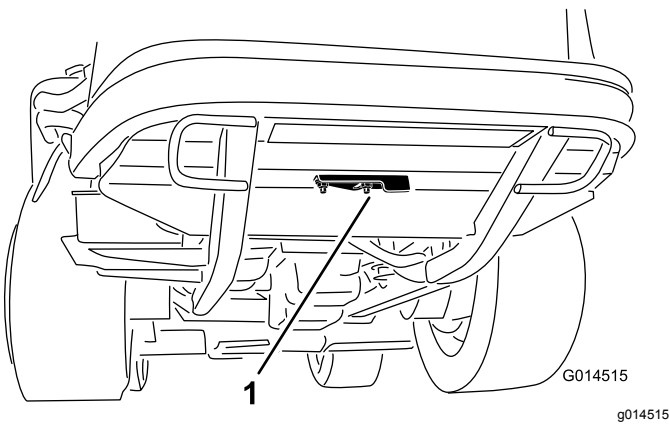


Figure 60

1. Clean out cover
3. Working from the fan side of the radiator, blow out debris with low pressure (50 psi) compressed air (**do not use water**). Repeat the step from the front of the radiator and again from the fan side.
4. After the radiator is thoroughly cleaned, clean out debris that may have collected in the channel at the radiator base and around the frame. Also, clean out the engine compartment and brake linkage to assure optimum performance.
5. Close the clean out cover and secure the flange nut.
6. Close the hood.

Adjusting the Parking Brake

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

1. Loosen the 2 screws securing the parking brake pawl to the frame (Figure 62).

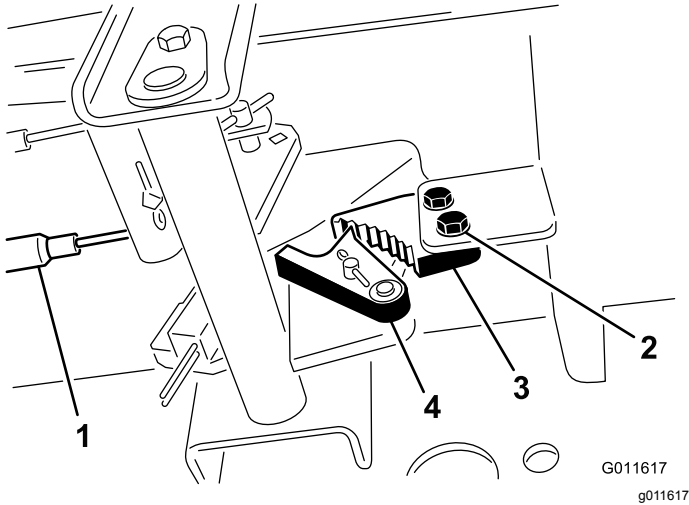


Figure 62

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

2. Press the parking brake pedal forward until the brake detent completely engages on the brake pawl (Figure 62).
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

Checking the Alternator Belt

Service Interval: After the first 10 hours

Every 100 hours

Check the condition and tension of the belt (Figure 63) 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 63). 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.

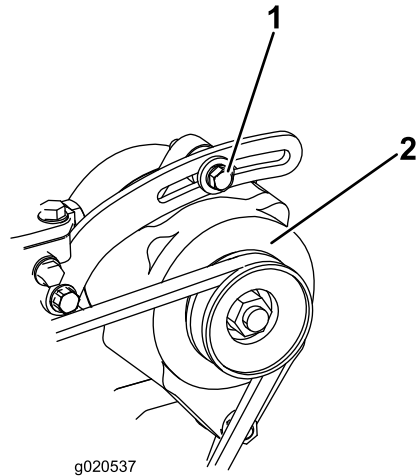


Figure 63

- | | |
|------------------|---------------|
| 1. Mounting bolt | 2. Alternator |
|------------------|---------------|

Controls System Maintenance

Adjusting the Traction Drive for Neutral

Note: If the machine has recently had the hydraulic oil changed or the traction motors or hoses replaced, any air trapped in the system will have to be worked out prior to performing this procedure. This can be accomplished by operating the machine in forward and reverse for a few minutes and then replenishing the oil as required.

When positioned on a level surface, 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 unit to the floor.
2. Jack up the rear of the machine until the rear tires are off the shop floor. Support the machine with jack stands to prevent it from falling accidentally.

Note: On 4 wheel drive models, the front tires must also be off the shop floor and supported by jack stands.

⚠ WARNING

The engine must be running so this adjustment can be performed. This could cause personal injury.

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

3. Start the engine, set the throttle to the Slow position and observe which direction the rear tires rotate.

Important: Make sure that the traction pedal is in the neutral position.

- If the left rear tire is rotating, loosen the jam nuts on the left side transmission control rod (Figure 64).

Note: The forward end of the control rod has a left hand thread. The rear end of the rod, which is connected to the transmission, has a right hand thread.

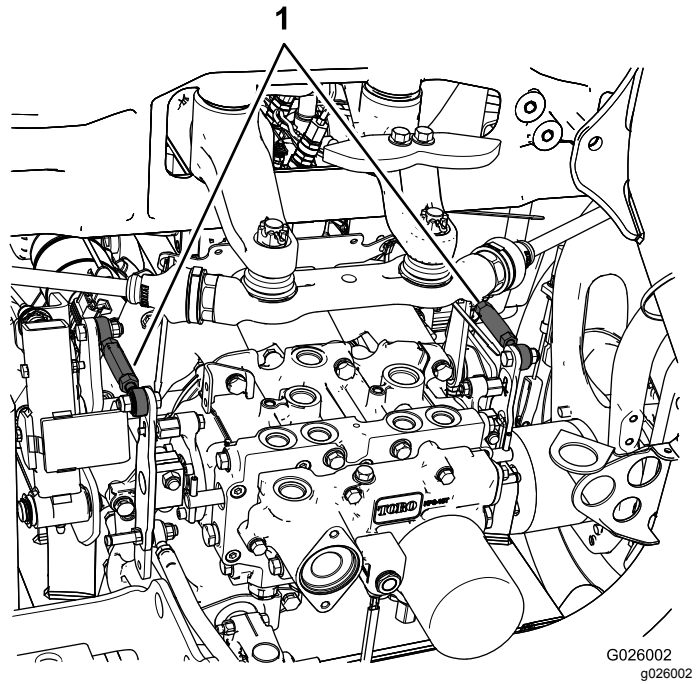


Figure 64

1. Transmission control rods

- If the left rear tire is rotating in reverse, lengthen the rod by slowly turning the rod counter-clockwise (as viewed from the front) until the left rear tire stops rotating or minimal rotation is detected in reverse
 - If the left rear tire is rotating forward, shorten the rod by slowly turning the rod clockwise (as viewed from the front) until the left rear tire stops rotating.
4. Move the throttle to the Fast position. Make sure the wheel remains stopped or minimal creep is detected in reverse. Adjust as required.
 5. Tighten the jam nuts.
 6. Repeat the procedure for the right rear tire, if required, by using the right side transmission control rod .
 7. Stop the engine. Remove the jack stands and lower the machine to the shop floor.
 8. Test drive the machine to make sure it does not creep.

Adjusting the Maximum Ground Speed

1. Disengage the PTO, release the traction pedal to the neutral position and set the parking brake.
2. Move the throttle lever to the Slow position, stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.

- Loosen the jam nut on the stop bolt for the traction pedal (Figure 65).

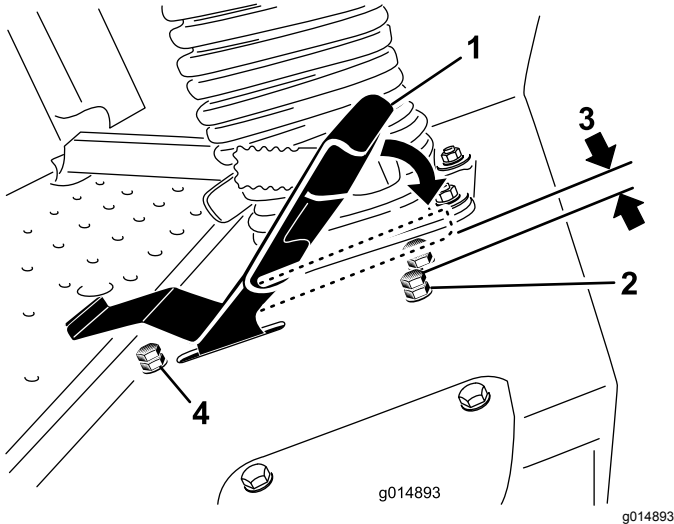


Figure 65

- | | |
|-----------------------------------|-----------------------------------|
| 1. Traction pedal | 3. 1.5 mm (0.060 inch) |
| 2. Stop bolt w/ jam nut (forward) | 4. Stop bolt w/ jam nut (reverse) |

- Adjust the stop bolt all the way in (away from the traction pedal).
- Using your hand, push the traction pedal all the way forward, with light pressure, until it stops and hold it there. Maintain only light pressure on the pedal when pushing it to the full forward position.
- With the seat in the raised position, verify that you are not over loading the linkage by making sure the transmission does not move when the pedal is depressed to the stop.
- Adjust the stop bolt out (towards the traction pedal) until there is a gap of 1.5 mm (0.060 inch) between the head of the stop bolt and the bottom of the traction pedal.
- Tighten the jam nut to secure the stop bolt in place.
- The reverse stop bolt may be adjusted if the maximum reverse speed is not acceptable. For a faster reverse speed, adjust the stop bolt in. For a slower reverse speed, adjust the stop bolt out.

Hydraulic System Maintenance

The reservoir is filled at the factory with approximately 17 liters (18 quarts) of high quality tractor transmission/hydraulic fluid. The recommended replacement fluid is as follows:

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

Alternate fluids: If the Toro fluid is not available, Mobil® 424 hydraulic fluid may be used.

Note: Toro will not assume responsibility for damage caused by improper substitutions.

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. One bottle is sufficient for 15-22 liters (4-6 gallons) of hydraulic oil. Order part number 44-2500 from your authorized Toro distributor.

Checking the Hydraulic System

Service Interval: Before each use or daily

Check the level of the hydraulic fluid before the engine is first started and daily thereafter.

- Position the machine on a level surface. Release the traction pedal to the neutral position and start the engine. Run engine at lowest possible RPM to purge the system of air. **Do not engage the PTO.** Raise the deck to extend lift cylinders, stop the engine, and remove the key.
- Remove the hydraulic fill cap (Figure 66) from filler neck.
- Remove the dipstick and wipe it with a clean rag (Figure 66).
- Screw the dipstick all the way into the filler neck; then remove it and check level of fluid (Figure 66).

If level is not within notched area of the dipstick, add enough high quality hydraulic fluid to raise level to within the notched area. **Do not overfill.**
- Replace the dipstick and thread the fill cap finger-tight onto filler neck.
- Check all hoses and fittings for leaks.

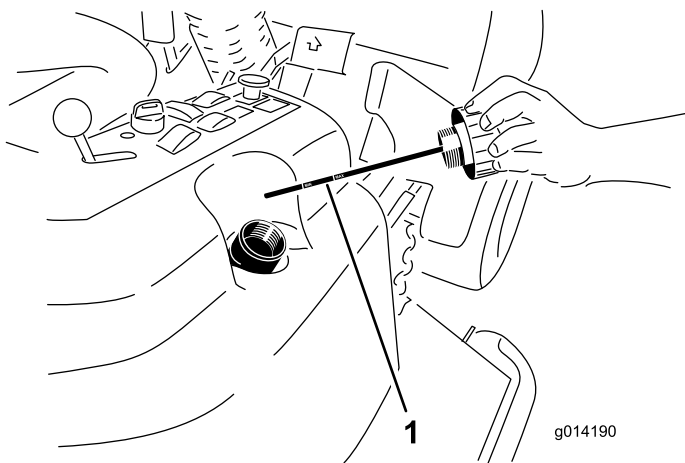


Figure 66

1. Dipstick

Changing the Hydraulic Oil And Filter

Service Interval: After the first 200 hours

Every 800 hours

1. Disengage the PTO, release the traction pedal to the neutral position and set the parking brake.
2. Move the throttle lever to the Slow position, stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Place a large pan under the hydraulic reservoir and transmission case and remove the plugs, draining all of the hydraulic fluid ([Figure 67](#)).

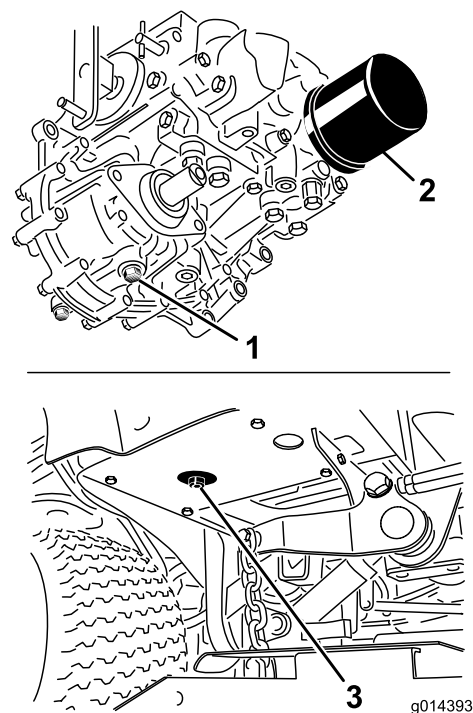


Figure 67

1. Transmission case drain plug
2. Filter
3. Hydraulic reservoir drain plug

4. Clean the area around the hydraulic oil filter and remove it ([Figure 67](#)).
5. Immediately install a new hydraulic oil filter.
6. Install the hydraulic reservoir and transmission case drain plugs.
7. Fill the reservoir to the proper level (approximately 17 liters [18 quarts]); refer to Checking the Hydraulic Fluid.
8. Start the engine and check for oil leaks. Allow the engine to run for about five minutes, then shut it off.
9. After two minutes, check the level of the hydraulic fluid; refer to Checking the Hydraulic Fluid.

Cab Maintenance

Filling the Washer Fluid Bottle

1. Stop the machine on a level surface, stop the engine, set the parking brake, and remove the ignition key.
2. Open the hood.
3. Locate the washer fluid bottle (Figure 68).

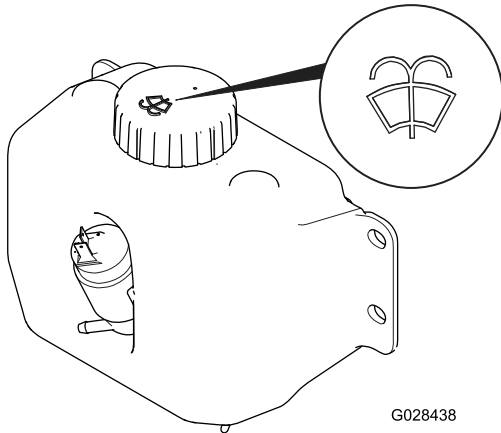


Figure 68

Washer Fluid Bottle with Washer Fluid Symbol

4. Fill the bottle with washer fluid as needed.
5. Close the hood.

Cleaning the Cab Air Filters

Service Interval: Every 250 hours (Replace them if they are torn or excessively dirty.)

1. Remove the screws and grates from over both the in-cab and rear cab air filters (Figure 69).

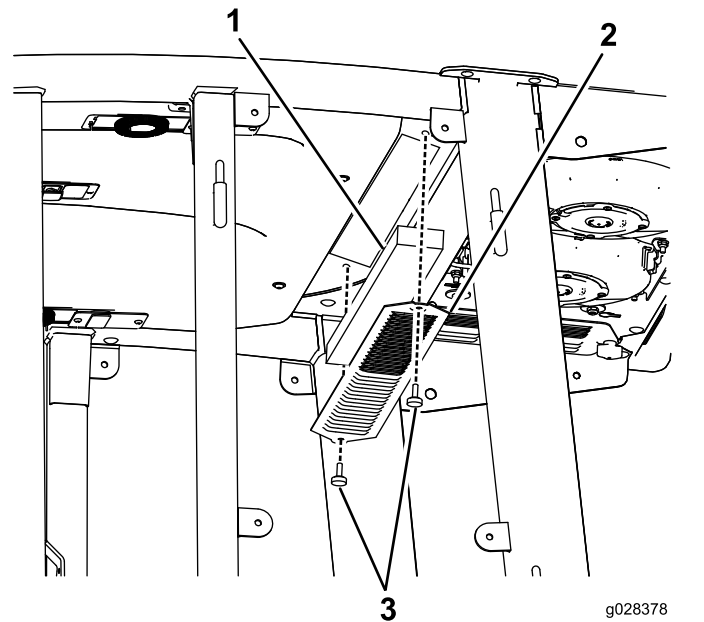


Figure 69

1. Filter
2. Grate
3. Screw

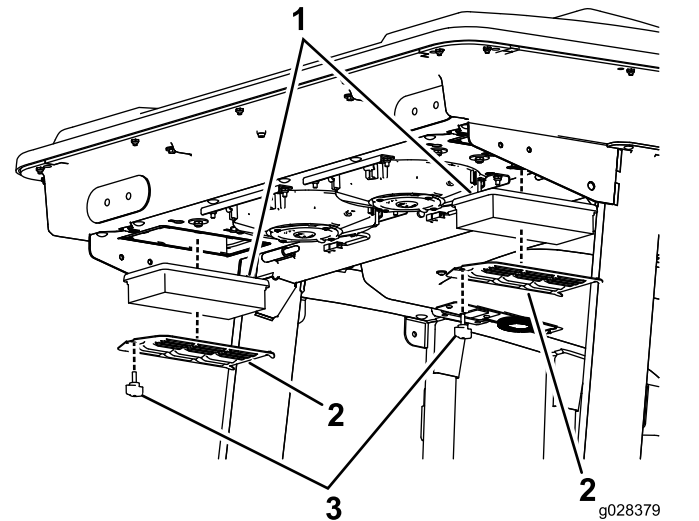


Figure 70

1. Filter
2. Grate
3. Screw

2. Clean the filters by blowing clean, oil free, compressed air through them.

Important: If either filter has a hole, tear, or other damage, replace it.

3. Install the filters and grate, securing them with the thumb screws.

Cleaning the Air Conditioning Coil

Service Interval: Every 250 hours (Clean more frequently in extremely dusty or dirty conditions)

1. Stop the engine and remove the key.
2. Remove the 6 nuts and washers from the bottom of the rear of the cab ([Figure 71](#)).

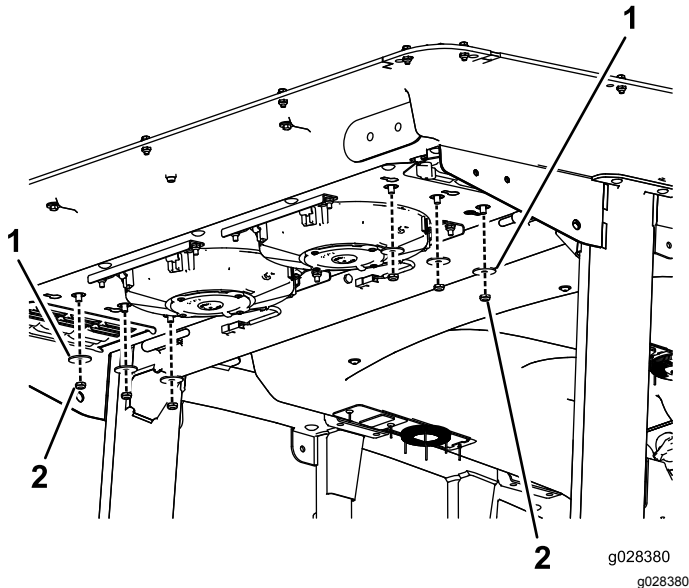


Figure 71

1. Washer
2. Nut

3. Remove the cabin roof of the cab by removing the 22 bolts that secure the roof ([Figure 72](#)).

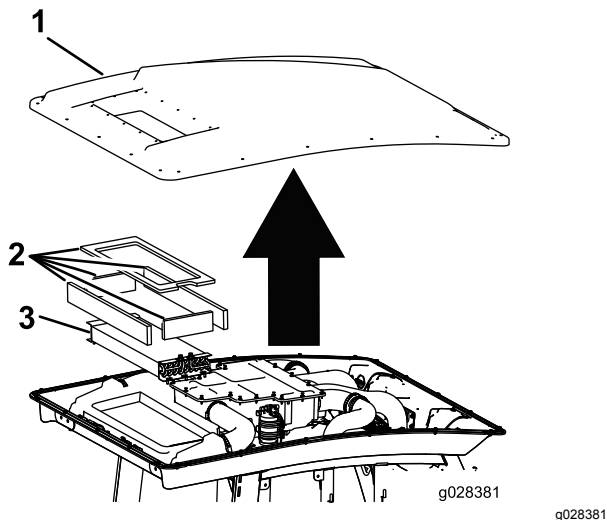


Figure 72

1. Cabin roof
2. Air filters
3. Air conditioning coils

4. Remove the air filters ([Figure 72](#)).

Cleaning

Waste Disposal

Engine oil, batteries, hydraulic oil, and engine coolant are pollutants to the environment. Dispose of these according to your state and local regulations.

Storage

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 filter.
3. Refill the engine with the designated quantity of motor oil. Refer to Changing the Engine Oil.
4. Start the engine and run it at idle speed for two minutes.
5. Drain the fuel from the fuel tank, fuel lines, pump, filter, and separator. Flush the fuel tank with clean diesel fuel and connect all fuel lines.
6. Thoroughly clean and service the air cleaner assembly.
7. Seal the air cleaner inlet and the exhaust outlet with weather proof masking tape.
8. Check the oil filler cap and fuel tank cap to ensure they are securely in place.

Machine

1. Thoroughly clean the machine, deck and the engine, paying special attention to these areas:
 - Radiator and radiator screen
 - Counterbalance springs
 - PTO shaft assembly
 - All grease fittings and pivot points
 - Remove the control panel and clean out inside of the control box
 - Beneath the seat plate and top of the transmission
2. Check and adjust front and rear tire pressure; refer to Checking Tire Pressure.
3. Check all fasteners for looseness and tighten them as necessary.
4. Grease or oil all grease fittings, pivot points, and transmission by-pass valve pins. Wipe off 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 for 24 hours every 60 days to prevent lead sulfation of the battery.



Toro General Commercial Product Warranty

A Two-Year Limited Warranty

Conditions and Products Covered

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

* Product equipped with an hour meter.

Instructions for Obtaining Warranty Service

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

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

952-888-8801 or 800-952-2740
E-mail: commercial.warranty@toro.com

Owner Responsibilities

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

Items and Conditions Not Covered

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

- Product failures which result from the use of non-Toro replacement parts, or from installation and use of add-on, or modified non-Toro branded accessories and products. A separate warranty may be provided by the manufacturer of these items.
- Product failures which result from failure to perform recommended maintenance and/or adjustments. Failure to properly maintain your Toro product per the Recommended Maintenance listed in the *Operator's Manual* can result in claims for warranty being denied.
- Product failures which result from operating the Product in an abusive, negligent, or reckless manner.
- Parts subject to consumption through use unless found to be defective. Examples of parts which are consumed, or used up, during normal Product operation include, but are not limited to, brake pads and linings, clutch linings, blades, reels, rollers and bearings (sealed or greasable), bed knives, spark plugs, castor wheels and bearings, tires, filters, belts, and certain sprayer components such as diaphragms, nozzles, and check valves, etc.
- Failures caused by outside influence. Conditions considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved fuels, coolants, lubricants, additives, fertilizers, water, or chemicals, etc.
- Failure or performance issues due to the use of fuels (e.g. gasoline, diesel, or biodiesel) that do not conform to their respective industry standards.

- Normal noise, vibration, wear and tear, and deterioration.
- Normal "wear and tear" includes, but is not limited to, damage to seats due to wear or abrasion, worn painted surfaces, scratched decals or windows, etc.

Parts

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

Deep Cycle and Lithium-Ion Battery Warranty:

Deep cycle and Lithium-Ion batteries have a specified total number of kilowatt-hours they can deliver during their lifetime. Operating, recharging, and maintenance techniques can extend or reduce total battery life. As the batteries in this product are consumed, the amount of useful work between charging intervals will slowly decrease until the battery is completely worn out. Replacement of worn out batteries, due to normal consumption, is the responsibility of the product owner. Battery replacement may be required during the normal product warranty period at owner's expense. Note: (Lithium-Ion battery only): A Lithium-Ion battery has a part only prorated warranty beginning year 3 through year 5 based on the time in service and kilowatt hours used. Refer to the *Operator's Manual* for additional information.

Maintenance is at Owner's Expense

Engine tune-up, lubrication, cleaning and polishing, replacement of filters, coolant, and completing recommended maintenance are some of the normal services Toro products require that are at the owner's expense.

General Conditions

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

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

Some states do not allow exclusions of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Note regarding engine warranty:

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

Countries Other than the United States or Canada

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