Form No. 3402-775 Rev C

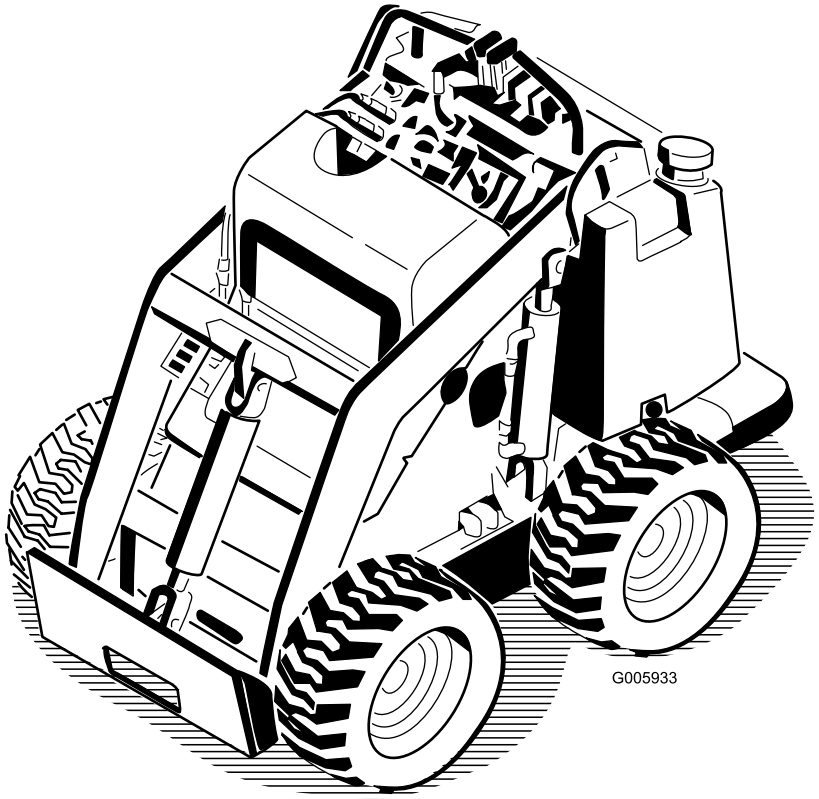
TORO®

Count on it.

Operator's Manual

320-D Tool Carrier

Model No. 22337CP—Serial No. 315000001 and Up



G005933

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

CE

3402-775 C

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

⚠ DANGER

There may be buried utility lines in the work area. Digging into them may cause a shock or an explosion.

Have the property or work area marked for buried lines and do not dig in marked areas. Contact your local marking service or utility company to have the property marked (for example, in the US, call 811 or in Australia, call 1100 for the nationwide marking service).

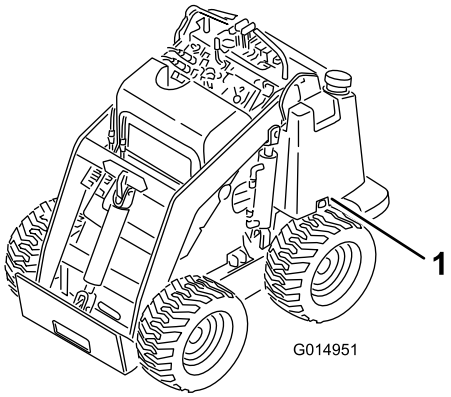
Introduction

This machine is a compact tool carrier intended for use in various earth and materials moving activities for landscaping and construction work. It is designed to operate a wide variety of attachments each of which perform a specialized function.

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

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

Whenever you need service, genuine Toro parts, or additional information, contact an Authorized Service Dealer or Toro Customer Service and have the model and serial numbers of your product ready. Figure 1 identifies the location of the model and serial numbers on the product. Write the numbers in the space provided.



g014951

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.



g000502

Figure 2

1. Safety-alert symbol

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

Contents

Safety 3
Safe Operating Practices 3
Safety and Instructional Decals 7
Setup 11
1 Installing the Valve Lever 11
2 Checking the Fluid Levels and Tire Pressure 11
3 Installing the Battery 12
4 Setting the Engine Speed 12
Product Overview 14
Controls 14
Specifications 18
Attachments/Accessories 18
Operation 19

© 2017—The Toro® Company
8111 Lyndale Avenue South
Bloomington, MN 55420

Contact us at www.Toro.com.
Printed in the USA
All Rights Reserved

Think Safety First 19
Adding Fuel 19
Performing Daily Maintenance 21
Starting the Engine 21
Driving the Machine 22
Shutting Off the Engine 22
Moving a Non-Functioning Machine 22
Using Attachments 23
Transporting the Machine 24
Lifting the Machine 26
Adjusting the Thigh Support 26
Maintenance 27
Recommended Maintenance Schedule(s) 27
Pre-Maintenance Procedures 28
Using the Cylinder Locks 28
Accessing Internal Components 28
Lubrication 29
Greasing the Machine 29
Engine Maintenance 30
Servicing the Air Cleaner 30
Servicing the Engine Oil 30
Fuel System Maintenance 32
Draining Water from the Fuel Filter 32
Changing the Fuel Filter 32
Bleeding the Fuel System 32
Draining the Fuel Tank 33
Electrical System Maintenance 34
Servicing the Battery 34
Drive System Maintenance 36
Checking the Tire Pressure 36
Cooling System Maintenance 36
Checking the Engine-Coolant Level 36
Brake Maintenance 37
Testing the Parking Brake 37
Hydraulic System Maintenance 38
Hydraulic Fluid Specifications 38
Checking the Hydraulic-Fluid Level 38
Replacing the Hydraulic Filter 39
Changing the Hydraulic Fluid 39
Checking the Hydraulic Lines 40
Cleaning 40
Removing Debris 40
Storage 41
Troubleshooting 42
Schematics 46

Safety

Improper use or maintenance by the operator or owner can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety-alert symbol (Figure 2), 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. Always follow all safety instructions to avoid serious injury or death.

⚠ WARNING

Engine exhaust contains carbon monoxide, an odorless poison that is fatal if inhaled.

Do not run the engine indoors or in an enclosed area.

Training

- Read the *Operator's Manual* and other training material. If the operator(s) or mechanic(s) cannot read English, it is the owner's responsibility to explain this material to them.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- All operators and mechanics should be trained. The owner is responsible for training the users.
- Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
- The owner/user can prevent and is responsible for accidents or injuries occurring to himself or herself, other people or property.

Preparation

⚠ DANGER

There may be buried power, gas, and/or telephone lines in the work area. Digging into them may cause a shock or an explosion.

Have the property or work area marked for buried lines and do not dig in marked areas. Contact your local marking service or utility company to have the property marked (for example, in the US, call 811 or in Australia, call 1100 for the nationwide marking service).

- Evaluate the terrain to determine what accessories and attachments you need to properly and safely perform the job. Use only the accessories and attachments that are approved by the manufacturer.
- Wear appropriate clothing including gloves, eye protection, long pants, substantial slip-resistant footwear, and hearing protection. Tie back long hair and do not wear jewelry.
- Inspect the area where you will use the equipment and remove all objects, such as rocks, toys, and wire, that the machine could throw.
- Use extra care when handling fuel. Fuel is flammable and its vapors are explosive.
  - Use only an approved container.
  - Never remove the fuel cap or add fuel with the engine running. Allow the engine to cool before refueling. Do not smoke.
  - Never refuel or drain the machine indoors.
- Check that the operator's presence controls, safety switches, and shields are attached and functioning properly. Do not operate the machine unless they are functioning properly.

Operation

- Never run an engine in an enclosed area.
- Operate the machine only in good light, keeping away from holes and hidden hazards.
- Ensure that all the drives are in neutral and the parking brake is engaged before starting the engine. Start the engine only from the operator's position.
- Slow down and use extra care on hillsides. Ensure to travel in the recommended direction on hillsides. Turf conditions can affect the stability of the machine.
- Slow down and use caution when making turns, crossing roads and sidewalks, and when changing directions on slopes.
- Never operate the machine without the guards securely in place. Ensure that all the interlocks are attached, adjusted, and functioning properly.
- Do not change the engine governor setting or overspeed the engine.
- Park the machine on a level surface, lower the implements, disengage the auxiliary hydraulics, engage the parking brake, shut off the engine, and remove the key before leaving the operator's position for any reason.
- Keep your hands and feet away from the moving attachments.
- Look behind and down before backing up to ensure that the path is clear.
- Never carry passengers and keep pets and bystanders away.
- Slow down and use caution when making turns and crossing roads and sidewalks.
- Do not operate the machine when you are tired, ill, or under the influence of alcohol or drugs.
- Use care when loading or unloading the machine into a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
- Read all the attachment manuals.
- Ensure that the area is clear of people before operating the machine. Stop the machine if anyone enters the area.
- Never leave a running machine unattended. Always lower the loader arms, shut off the engine, engage the parking brake, and remove the key before leaving.
- Do not exceed the rated operating capacity, as the machine may become unstable, which may result in loss of control.
- Do not carry a load with the arms raised. Always carry loads close to the ground.
- Do not overload the attachment and always keep the load level when raising the loader arms. Logs, boards, and other items could roll down the loader arms, injuring you.
- Never jerk the controls; use a steady motion.
- Watch for traffic when operating near or crossing roadways.
- Do not touch parts that may be hot from operation. Allow them to cool before attempting to maintain, adjust, or service the machine.
- Check for overhead clearances (i.e., branches, doorways, and electrical wires) before driving under any objects and do not contact them.
- Operate the machine in areas where there are no obstacles in close proximity to you. Failure to maintain adequate distance from trees, walls, and other barriers may result in injury as the machine backs up during operation if you are not attentive to the surroundings. Operate the machine only in areas where there is sufficient clearance for you to safely maneuver.
- Note the location of unmarked objects and structures, such as underground storage tanks, wells, and septic systems.
- Locate the pinch point areas marked on the machine and attachments and keep your hands and feet away from these areas.
- Before operating the machine with an attachment, ensure that the attachment is properly installed and that it is a genuine Toro attachment.

- Do not place your feet under the platform, if equipped on your machine.
- 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.

Slope Operation

Slopes are a major factor related to loss-of-control and tip-over accidents, which can result in severe injury or death. All slopes require extra caution.

- **Operate the machine up and down slopes with the heavy end of the machine uphill.** Weight distribution changes. An empty bucket makes the rear of the machine the heavy end, and a full bucket makes the front of the machine the heavy end. Most other attachments make the front of machine the heavy end.
- Raising the loader arms on a slope affects the stability of the machine. Whenever possible, keep the loader arms in the lowered position when on slopes.
- Do not remove or add attachments on a slope.
- Remove obstacles such as rocks, tree limbs, etc. from the work area. Watch for holes, ruts, or bumps, as uneven terrain could overturn the machine. Tall grass can hide obstacles.
- Use only Toro-approved attachments. Attachments can change the stability and the operating characteristics of the machine. You may void the warranty if you use the machine with unapproved attachments.
- Keep all movements on slopes slow and gradual. Do not make sudden changes in speed or direction.
- Avoid starting or stopping on a slope. If the machine loses traction, proceed slowly, straight down the slope.
- Avoid turning on slopes. If you must turn, turn slowly and keep the heavy end of the machine uphill.
- Do not operate near drop-offs, ditches, or embankments. The machine could suddenly turn over if a track goes over the edge of a cliff or ditch, or if an edge caves in.
- Use caution when operating on wet grass. Reduced traction could cause sliding.
- Do not park the machine on a hillside or slope without lowering the attachment to the ground and chocking the wheels.
- Do not try to stabilize the machine by putting your foot on the ground.

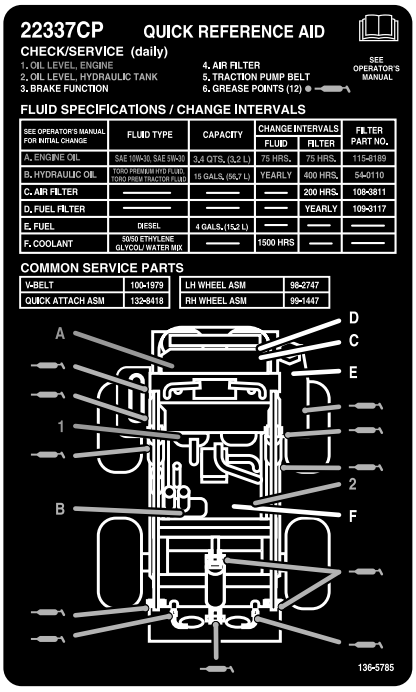
Maintenance and Storage

- Park the machine on a level surface, disengage the auxiliary hydraulics, lower the attachment, engage the parking brake (if equipped on your machine), shut off the engine, and remove the key. Wait for all movement to stop and allow the machine to cool before adjusting, cleaning, storing, or repairing it.
- Clean debris from the attachments, drives, mufflers, and engine to help prevent fires. Wipe up any spilled oil or fuel.
- Allow the engine to cool before storing and do not store near flames.
- Never allow untrained personnel to service the machine.
- Use jack stands to support the components when required.
- Carefully release pressure from components with stored energy.
- Keep your hands and feet away from the moving parts. If possible, do not make adjustments with the engine running.
- Disconnect the battery or remove the spark-plug wires before making any repairs. Disconnect the negative terminal first and the positive last; connect the positive first and the negative last.
- Charge the battery in an open, well-ventilated area, away from spark and flames. Unplug the charger before connecting or disconnecting it from the battery. Wear protective clothing and use insulated tools.
- 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.
- Battery gases can explode. Keep cigarettes, sparks, and flames away from the battery.
- Keep all parts in good working condition and all hardware tightened. Replace all worn or damaged decals.
- If any maintenance or repair requires the loader arms to be in the raised position, secure the arms in the raised position with the hydraulic-cylinder lock(s).
- Secure the loader-arm valve with the loader-valve lock (if equipped on your machine) anytime you need to stop the machine with the loader arms raised.
- Keep all nuts and bolts tight. Keep the equipment in good condition.

- Never tamper with the safety devices.
- Keep the machine free of grass, leaves, or other debris buildup. Wipe up any spilled oil or fuel. Allow the machine to cool before storing.
- Use extra care when handling fuel; it is flammable and its vapors are explosive.
  - Use only an approved container.
  - Never remove the fuel cap(s) or add fuel when the engine is running. Allow the engine to cool before refueling. Do not smoke.
  - Never refuel the machine indoors.
  - Never store the machine or fuel container inside where there is an open flame, such as near a water heater or furnace.
  - Never fill a container while it is inside a vehicle, trunk, pick-up bed, or any surface other than the ground.
  - Keep the container nozzle in contact with the tank during filling.
  - Do not store fuel near flames or drain indoors.
- Stop and inspect the equipment if you strike an object. Make any necessary repairs before starting.
- Use only genuine Toro replacement parts.
- Keep your body and hands away from pinhole leaks or nozzles that eject high-pressure hydraulic fluid. Use cardboard or paper to find hydraulic leaks; never use your hands. Hydraulic fluid escaping under pressure can penetrate skin and cause injury requiring surgery within a few hours by a qualified surgeon; otherwise, gangrene may result.

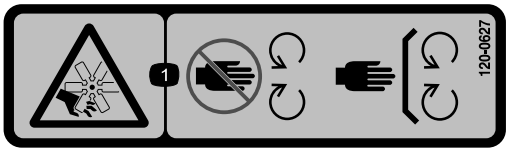
Safety and Instructional Decals

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.



decal136-5785

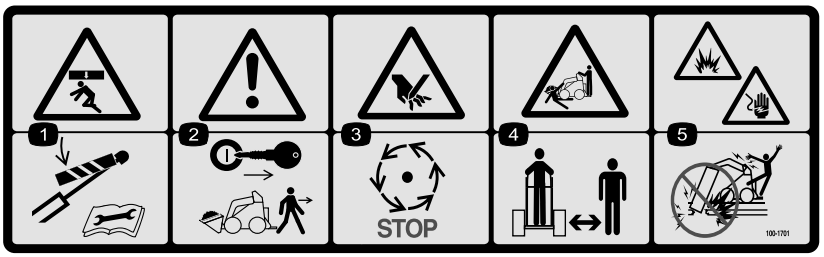
136-5785



decal120-0627

120-0627

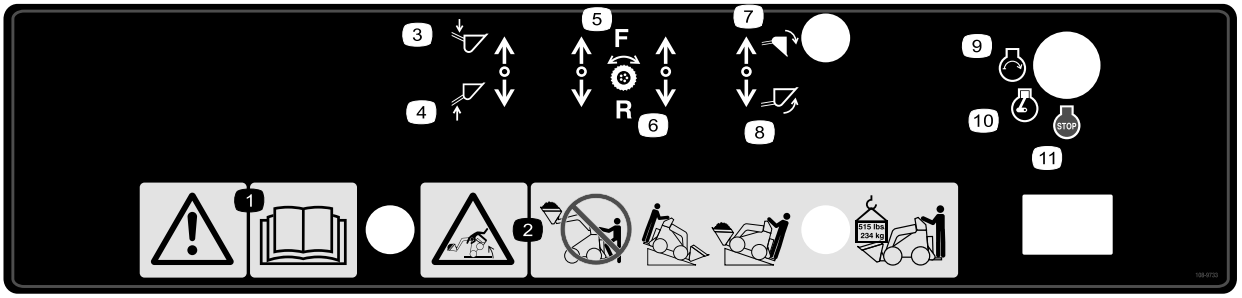
1. Cutting/dismemberment hazard, fan—stay away from moving parts; keep all guards and shields in place.



decal100-1701

100-1701

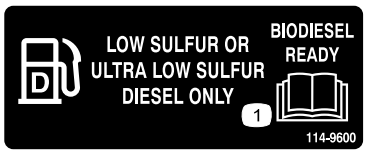
1. Crushing hazard—install the cylinder lock and read the instructions before servicing or performing maintenance.
2. Warning—remove the ignition key and lower the loader arms before leaving the machine.
3. Cutting hazard of hand—wait for moving parts to stop.
4. Crushing/dismemberment hazard of bystanders—keep bystanders a safe distance away from the machine.
5. Explosion and electrical shock hazards—do not dig in areas with buried gas or electrical lines.



decal108-9733

108-9733

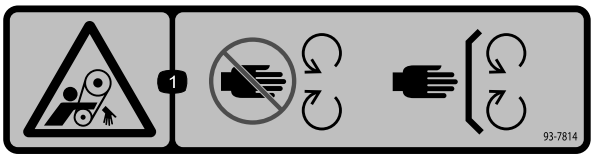
1. Warning—read the *Operator's Manual.*
2. Tipping hazard—do not step off operator platform with load raised; always operate with the heavy end of the machine pointed uphill; carry loads low; never jerk the controls; use a steady, even motion; maximum load is 234 kg (515 lb).
3. Arm lift—down
4. Arm lift—up
5. Wheel drive—forward
6. Wheel drive—reverse
7. Bucket tilt— down
8. Bucket tilt—up
9. Engine—start
10. Engine—run
11. Engine—stop



decal114-9600

114-9600

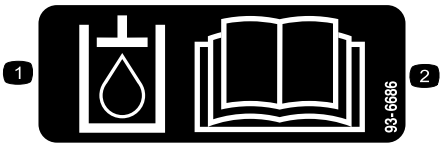
1. Read the *Operator's Manual.*



decal93-7814

93-7814

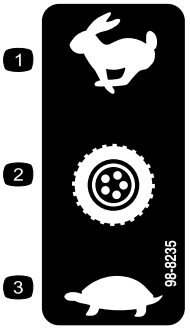
1. Entanglement hazard, belt—stay away from moving parts.



decal93-6686

93-6686

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



decal98-8235

98-8235

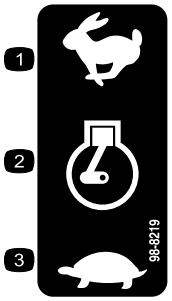
1. Fast
2. Traction drive
3. Slow



decal100-1703

100-1703

1. Speed selector



decal98-8219

98-8219

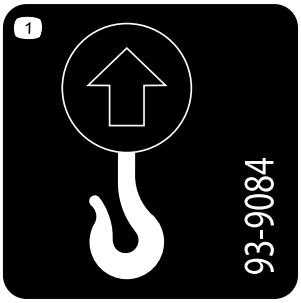
1. Fast
2. Throttle
3. Slow



decal100-1692

100-1692

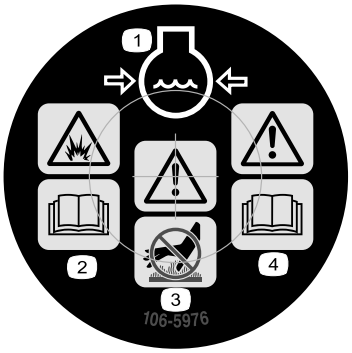
1. Brake engaged
2. Parking brake
3. Brake disengaged



decal93-9084

93-9084

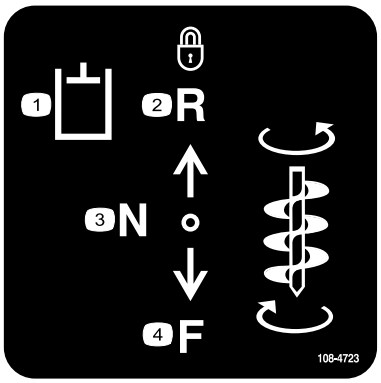
1. Lift point/Tie-down point



decal106-5976

106-5976

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.*



decal108-4723

108-4723

1. Auxiliary hydraulics
2. Locked reverse (detent)
3. Neutral (off)
4. Forward



decal98-4387

98-4387

1. Warning—wear hearing protection.



decal130-2836

130-2836

1. Crushing hazard; cutting hazard—keep away from the bucket and the lift arm.



decal130-2837

130-2837

1. Warning—do not carry passengers in the bucket.



decalbatterysymbols

Battery Symbols

Some or all of these symbols are on your battery.

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

Setup

1

Installing the Valve Lever

Parts needed for this procedure:

1	Speed-selector valve lever

Procedure

1. Remove and discard the nut securing the bolt and lock washer to the speed-selector lever.
2. Secure the lever to the speed-selector valve using the bolt, lock washer, and nut as illustrated in Figure 3.

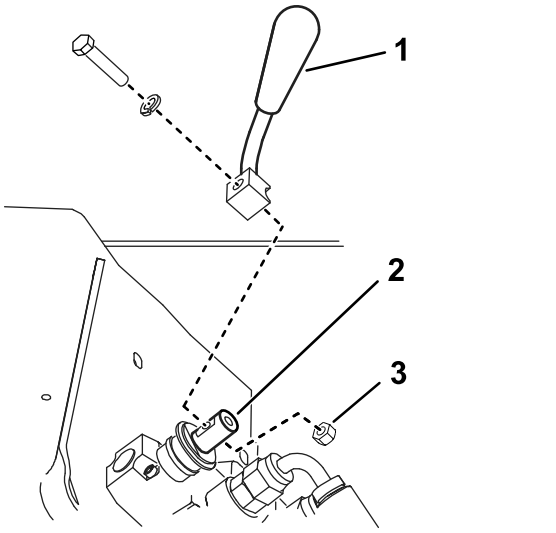


Figure 3

1. Speed-selector valve lever
2. Speed-selector valve
3. Nut

2

Checking the Fluid Levels and Tire Pressure

No Parts Required

Procedure

Before starting the engine for the first time, check the engine-oil level, hydraulic-fluid level, engine-coolant level, and the tire pressure. Refer to the following sections for more information:

- Checking the Engine-Oil Level (page 30)
- Checking the Hydraulic-Fluid Level (page 38)
- Checking the Engine-Coolant Level (page 36)
- Checking the Tire Pressure (page 36)

3

Installing the Battery

Parts needed for this procedure:

1	Maintenance-free battery

Procedure

The traction unit comes without a battery. Your dealer will provide a maintenance-free battery with the product.

⚠ WARNING

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

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

1. Remove the 4 bolts securing the battery cover and remove the cover (Figure 4).

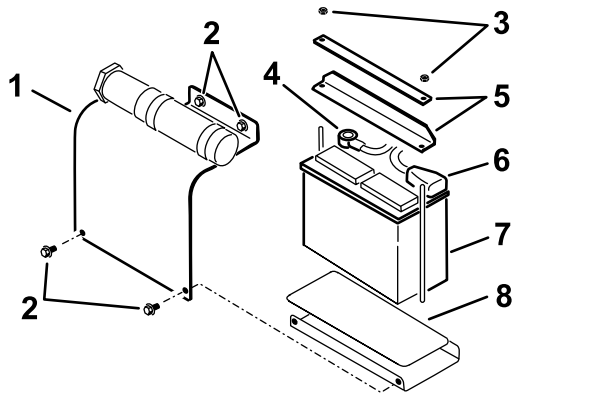


Figure 4

1. Battery cover
2. Bolts
3. Nuts
4. Negative cable
5. Bars
6. Positive cable
7. Battery
8. Battery pad

2. Remove the nuts and bars securing the battery (Figure 4).
3. Charge the battery for 10 to 15 minutes at 25 to 30 A or 30 minutes at 4 to 6 A. Do not overcharge the battery.

⚠ WARNING

Charging the battery produces gasses that can explode.

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

4. When the battery is fully charged, unplug the charger from the electrical outlet, then disconnect the charger leads from the battery posts.
5. Install the battery onto the platform (Figure 4).
6. Secure the battery in the chassis with the bars and nuts removed previously (Figure 4).
7. Connect the positive (red) cable to the positive (+) battery post (Figure 4). Slide the rubber cover over the battery post.

⚠ WARNING

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

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

8. Connect the negative (black) cable to the negative (-) battery post (Figure 4).

Important: **Ensure that the battery cables do not contact any sharp edges or each other.**

9. Install the battery cover with the 4 bolts you removed previously (Figure 4).

4

Setting the Engine Speed

CE Machines Only

Parts needed for this procedure:

1	Aluminum tube

Procedure

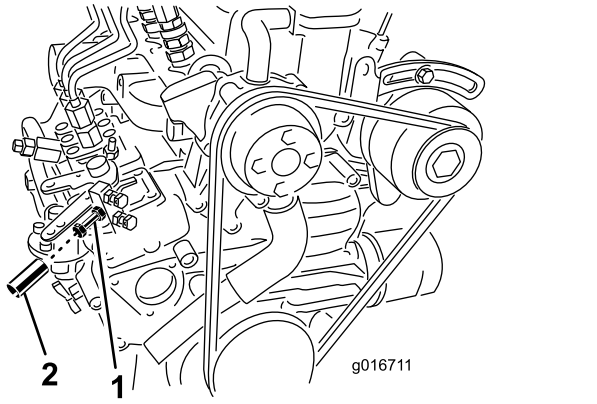
If you are setting up this machine for use in the European Community (CE), you must permanently adjust the engine speed so that it is no more than 3,200 rpm, as follows:

1. Start the engine and run it at half throttle for 5 to 10 minutes to warm it up.

   Important: **The engine must be warm before making this adjustment.**

2. Move the throttle to the FAST position.
3. Using a tachometer and the throttle-adjustment screw on the engine (Figure 5), set the engine speed to 3,200 rpm maximum, then tighten the jam nut on the adjusting screw.

   Important: **If the engine speed exceeds 3,200 rpm, the engine is not in compliance with CE regulations and cannot be legally sold or used in the European Community.**



g016711

Figure 5

1. Throttle-adjustment screw 2. Aluminum tube

4. Shut off the engine.
5. Slide an aluminum tube over the throttle-adjustment screw and jam nut (Figure 5) and crimp it down over the screw so that the screw cannot be adjusted again.

   Important: **The tube must be fully over the jam nut to prevent access to it.**

6. Close the rear-access cover and secure it with the lanyard fastener.

Product Overview

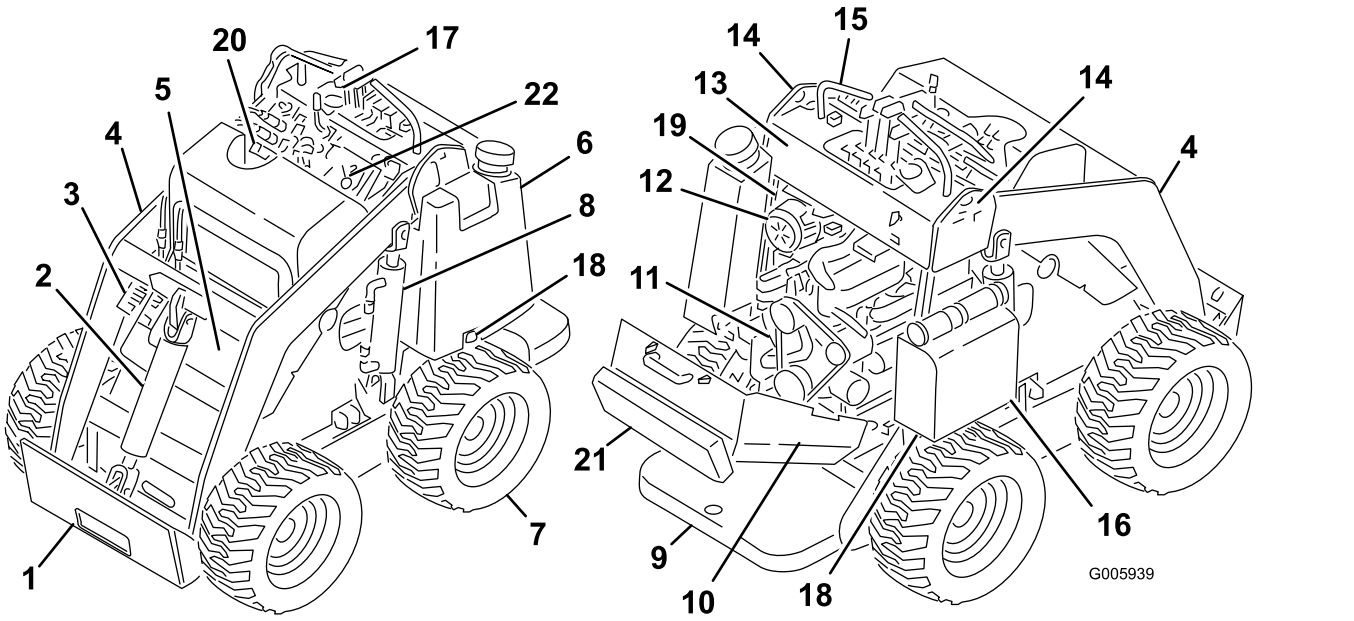


Figure 6

1. Mount plate
2. Tilt cylinder
3. Auxiliary-hydraulic couplers
4. Loader arms
5. Front-access cover
6. Fuel tank
7. Wheel
8. Lift cylinder
9. Operator platform (removable counterweight not shown)
10. Rear-access cover (open)
11. Engine
12. Air filter
13. Control panel
14. Lift points
15. Handle
16. Battery
17. Indicator lights
18. Tow valves (under fuel tank and battery)
19. Parking-brake lever
20. Radiator-fill cap
21. Thigh support
22. Flow-divider control

Controls

Become familiar with all the controls (Figure 7) before you start the engine and operate the traction unit.

Control Panel

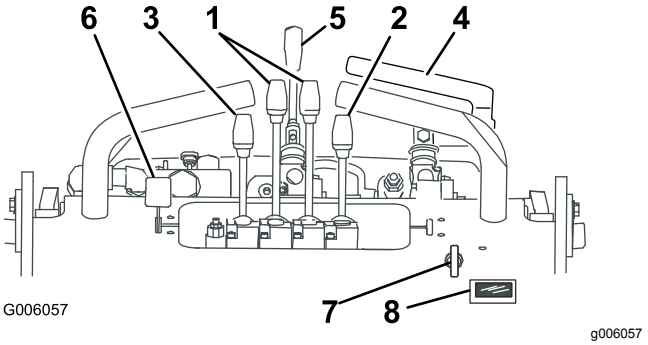


Figure 7

1. Traction-control levers
2. Attachment-tilt lever
3. Loader-arm lever
4. Auxiliary-hydraulics lever
5. Speed-selector lever
6. Throttle lever
7. Key switch
8. Hour meter

Key Switch

The key switch, used to start and shut off the engine, has 3 positions: OFF, RUN, and START. Refer to Starting the Engine (page 21).

Throttle Lever

Move the control forward to increase the engine speed and rearward to decrease speed.

Traction-Control Levers

- To move forward, move the traction-control levers forward.
- To move rearward, move the traction-control levers rearward.
- To turn, move the lever located on the side you want to turn back toward the NEUTRAL position while keeping the other lever engaged.

  Note: The farther you move the traction-control levers in either direction, the faster the machine moves in that direction.
- To slow or stop, move the traction-control levers to the NEUTRAL position.

Attachment-Tilt Lever

- To tilt the attachment forward, slowly push the attachment-tilt lever forward.
- To tilt the attachment rearward, slowly pull the attachment-tilt lever rearward.

Loader-Arm Lever

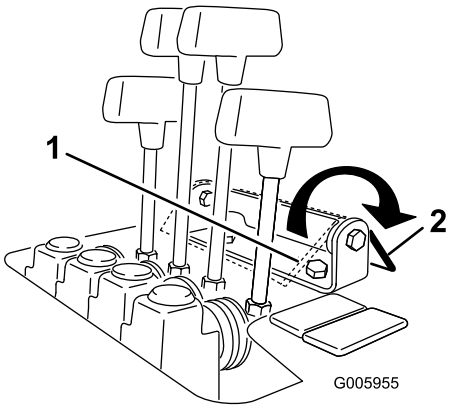
- To lower the loader arms, slowly push the loader-arm lever forward.
- To raise the loader arms, slowly pull the loader-arm lever rearward.

Loader-Valve Lock

The loader-valve lock secures the loader-arm and attachment-tilt levers so that you cannot push them forward. This helps to ensure that no one accidentally lowers the loader arms during maintenance. Secure the loader arms with the lock anytime you need to shut off the machine with the loader arms raised.

To set the lock, pull it back and all the way down against the levers (Figure 8).

Note: You must move the levers rearward to engage or disengage the loader-valve lock.



g005955

Figure 8

1. Loader-valve lock (engaged)
2. Loader-valve lock (disengaged)

Auxiliary-Hydraulics Lever

- To operate a hydraulic attachment in forward direction, slowly pull the auxiliary-hydraulics lever upward and then rearward.
- To operate a hydraulic attachment in reverse direction, slowly pull the auxiliary-hydraulics lever upward and then push it forward. This is also called the DETENT position because it does not require operator presence.

Speed-Selector Lever

- To set the traction drive, loader arms, and attachment tilt to high speed and the auxiliary hydraulics to low speed, move the speed-selector lever to the FORWARD position.
- To set the auxiliary hydraulics to high speed and the traction drive, loader arms, and attachment tilt to low speed, move the speed-selector lever to the REARWARD position.

⚠ WARNING

If you move the speed-selector lever while the traction unit is in motion, the traction unit will either stop suddenly or accelerate quickly. If you operate the traction unit with the speed-selector lever in an intermediate position, the traction unit will operate erratically and may be damaged. You could lose control of the traction unit and injure bystanders or yourself.

- **Do not move the speed-selector lever when the traction unit is in motion.**
- **Do not operate the traction unit when the speed selector is in any intermediate position (i.e., any position other than fully forward or fully rearward).**

Hour Meter

The hour meter displays the number of hours of operation logged on the traction unit.

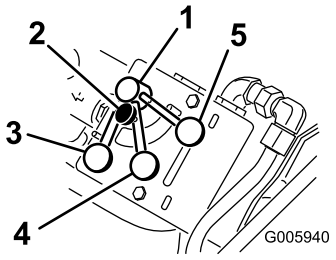
After 50 hours and every 75 hours thereafter (i.e., 50, 125, 200, etc.) the hour meter displays SVC on the lower left side of the screen to remind you to change the engine oil and perform the required maintenance.

After every 400 hours (i.e., 400, 800, 1200, etc.), the hour meter displays SVC on the lower right side of the screen to remind you to perform the other maintenance procedures based on a 400-hour schedule.

Note: These reminders come on starting 3 hours prior to the service interval time and flash at regular intervals for 6 hours.

Flow-Divider Control

The traction unit hydraulics (i.e., the traction drive, loader arms, and attachment tilt) work on a separate hydraulic circuit from the auxiliary hydraulics for powering attachments; however, the 2 systems share the same hydraulic pumps. Using the flow-divider control (Figure 9), you can vary the speed of the traction unit hydraulics by diverting hydraulic flow to the auxiliary-hydraulics circuit. Therefore, the more hydraulic flow you divert to the auxiliary hydraulics, the slower the traction unit hydraulics move.



g005940

Figure 9

1. Flow-divider control
2. Knob
3. 12 o'clock position
4. 10 to 11 o'clock position
5. 9 o'clock position

- Move the flow-divider control to the 12 o'clock position to provide maximum speed to the traction unit hydraulics.

  Use this setting for fast operation of the traction unit.

- Move the flow-divider control between the 12 o'clock and 9 o'clock positions to slow the traction unit hydraulics and fine-tune the speed.

  Use a setting in this range with attachments with hydraulics where you need to both run the attachment and move the traction unit hydraulics, such as the auger, boring unit, hydraulic blade, and tiller.

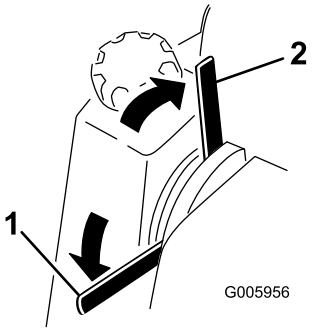
- Move the control to the 9 o'clock position to transfer all hydraulic flow to the auxiliary hydraulics of the attachment.

  In this setting, the traction unit hydraulics do not work. Use this setting with hydraulic attachments that do not require the traction unit hydraulics. The trencher works best if you set it close to 9 o'clock so that the traction unit creeps slowly when trenching.

Note: The flow-divider control can be fixed in place by turning the knob on the control clockwise until it contacts the dial (Figure 9).

Parking-Brake Lever

- To engage the parking brake, rotate the lever down (Figure 10).
- To release the parking brake, rotate the lever up (Figure 10).



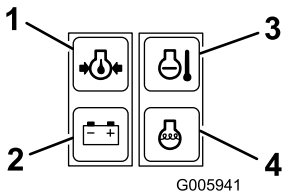
g005956

Figure 10

1. Parking-brake lever—engaged
2. Parking-brake lever—disengaged

Indicator Lights

The indicator lights warn you in the case of a system malfunction and, in the case of the glow-plug light, indicate that the glow plugs are on. Figure 11 illustrates the 4 indicator lights.



g005941

Figure 11

1. Oil-pressure light
2. Battery light
3. Engine-temperature light
4. Glow-plug light

- Engine-Temperature Light

  If the engine-temperature light is on, the engine is overheating. Shut off the engine and allow the traction unit to cool down. Check the coolant level and the belts to the fan and water pump. Fill the coolant as required and replace any worn or slipping belts. If the problem persists, contact your Authorized Toro Dealer for diagnostics and repair.

- Oil-Pressure Light

  This light is on for a few seconds whenever you start the engine. If the oil-pressure light is on while the engine is running, the engine-oil pressure is low. Shut off the engine and allow the traction unit to cool down. Check the oil level and fill the crankcase with oil as needed. If the problem persists, contact your Authorized Toro Dealer for diagnostics and repair.

- Battery Light

  This light is on for a few seconds whenever you start the engine. If the battery light is on while the engine is running, the alternator, battery, or electrical system is broken. Contact your Authorized Toro Dealer for diagnostics and repair.

- Glow-Plug Light

  This light is on when the key is turned to RUN before starting the engine. The glow-plug light remains on for up to 10 seconds, indicating that the glow plugs are warming the engine. If the glow-plug light is on while the engine is running, the glow plugs are broken. Contact your Authorized Toro Dealer for diagnostics and repair.

Specifications

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

Width	103 cm (41 inches)
Length	152 cm (60 inches)
Height	125 cm (49 inches)
Weight (without attachment or counterweight)	783 kg (1,722 lb)
Operating capacity—with 90.7 kg (200 lb) operator, the standard bucket, and without the counterweight	238 kg (524 lb)
Tipping capacity—with 90.7 kg (200 lb) operator, the standard bucket, and without the counterweight	476 kg (1,048 lb)
Wheelbase	71 cm (28 inches)
Dump height (with standard bucket)	120 cm (47 inches)
Reach—fully raised (with standard bucket)	66 cm (26 inches)
Height to hinge pin (narrow bucket in standard position)	168 cm (66 inches)

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.

Important: **Use only Toro approved attachments. Other attachments may create an unsafe operating environment or damage the traction unit.**

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

Operation

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

Important: **Before operating, check the fluid levels, remove debris from the traction unit, test the parking brake, and check the tire pressure. Also, ensure that the area is clear of people and debris. You should also know and have marked the locations of all the utility lines.**

⚠ CAUTION

You could fall off the platform and be seriously injured during operation.

Do not move the control levers unless you are standing with both feet on the platform and your hands are holding the handles.

Think Safety First

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

⚠ CAUTION

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

Wear hearing protection when operating this machine.

Use protective equipment for your eyes, ears, hands, feet, and head.

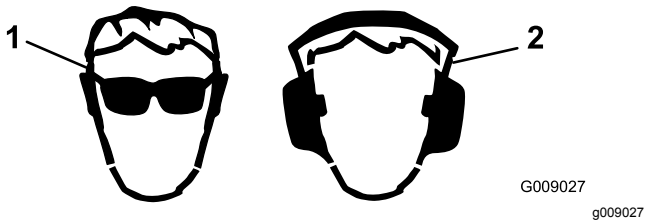


Figure 12

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

⚠ WARNING

You could fall off the platform and be seriously injured during operation.

Do not move the machine unless you are standing with both feet on the platform and your hands are holding onto the handles.

Adding Fuel

⚠ DANGER

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

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

⚠ DANGER

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

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

⚠ WARNING

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

- **Avoid prolonged breathing of vapors.**
- **Keep your face away from the nozzle and fuel tank opening.**
- **Keep fuel away from your eyes and skin.**

Fuel Recommendations

Use only clean, fresh diesel fuel or biodiesel fuels with low (<500 ppm) or ultra low (<15 ppm) sulfur content. The minimum cetane rating should be 40. Purchase fuel in quantities that you can use 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 (No. 1-D or No. 1-D/2-D blend) below that temperature. Using 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.

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

Biodiesel Ready

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

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

Filling the Fuel Tank(s)

1. Park the machine on a level surface, engage the parking brake (if equipped), and lower the loader arms.
2. Shut off the engine, remove the key, and allow the engine to cool.
3. Clean around the fuel-tank cap and remove it (Figure 13).

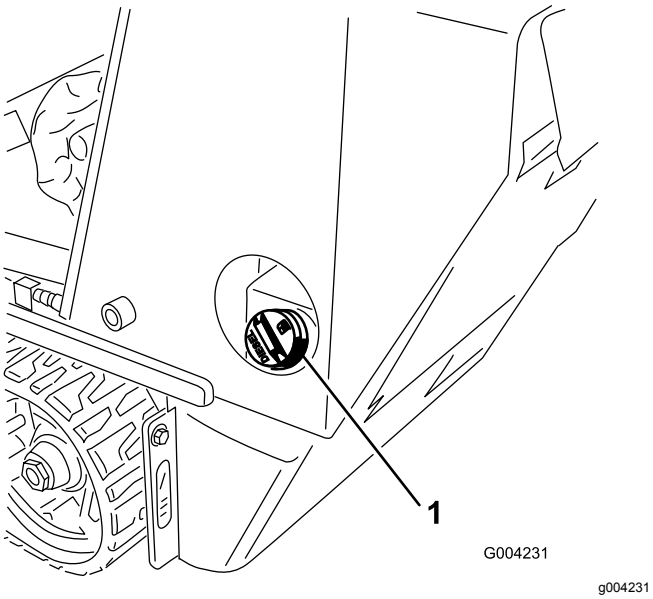


Figure 13

1. Fuel-tank cap

4. Fill the tank to about 2.5 cm (1 inch) below the top of the tank, not the filler neck, with fuel.

   Important: **This space in the tank allows fuel to expand. Do not fill the fuel tank completely full.**
5. Install the fuel-tank cap securely, turning it until it clicks.
6. Wipe up any spilled fuel.

Performing Daily Maintenance

Before starting the machine each day, perform the Each Use/Daily procedures listed in the Maintenance (page 27).

Important: **Check the hydraulic-fluid level and bleed the fuel system before starting the engine for the first time; refer to Checking the Hydraulic-Fluid Level (page 38) and Bleeding the Fuel System (page 32).**

Starting the Engine

1. Stand on the platform.
2. Ensure that the auxiliary hydraulics lever is in the NEUTRAL position.
3. Move the throttle lever midway between the SLOW and FAST positions.
4. Insert the key into the key switch and turn it to the RUN position.

   Note: The battery, oil pressure, and glow-plug lights come on.
5. When the glow-plug light turns off, turn the key to the START position. When the engines starts, release the key.

   Note: A warm engine may be started without waiting for the light to turn off.

   Important: **Do not engage the starter for more than 10 seconds at a time. If the engine fails to start, wait 30 seconds for the starter to cool down between attempts. Failure to follow these instructions could burn out the starter motor.**
6. Move the throttle lever to the desired setting.

   Important: **Running the engine at high speeds when the hydraulic system is cold (i.e., when the air temperature is at or below freezing) could damage the hydraulic system. When starting the engine in cold conditions, allow it to run in the middle throttle position for 2 to 5 minutes before moving the throttle to the FAST position.**

   Note: If the outdoor temperature is below freezing, store the traction unit in a garage to keep it warmer and to aid in starting.

Driving the Machine

Use the traction controls to move the machine. The farther you move the traction controls in any direction, the faster the machine moves in that direction. Release the traction controls to stop the machine.

⚠ CAUTION

When reversing, you may back into stationary objects or over bystanders and cause serious personal injury or death.

Look behind you for obstructions or bystanders and keep your hands on the reference bar.

The throttle control regulates the engine speed as measured in rpm (revolutions per minute). Place the throttle lever in the FAST position for best performance. You can, however, use the throttle position to operate at slower speeds.

Shutting Off the Engine

1. Park the machine on a level surface, engage the parking brake (if equipped), and lower the loader arms.
2. Ensure that the auxiliary hydraulics lever is in the NEUTRAL position.
3. Move the throttle lever to the SLOW position.
4. If the engine has been working hard or is hot, let it idle for a minute before turning the key switch to the OFF position.

   Note: This helps to cool the engine before you shut it off. In an emergency, you can shut off the engine immediately.
5. Turn the key switch to the OFF position and remove the key.

⚠ CAUTION

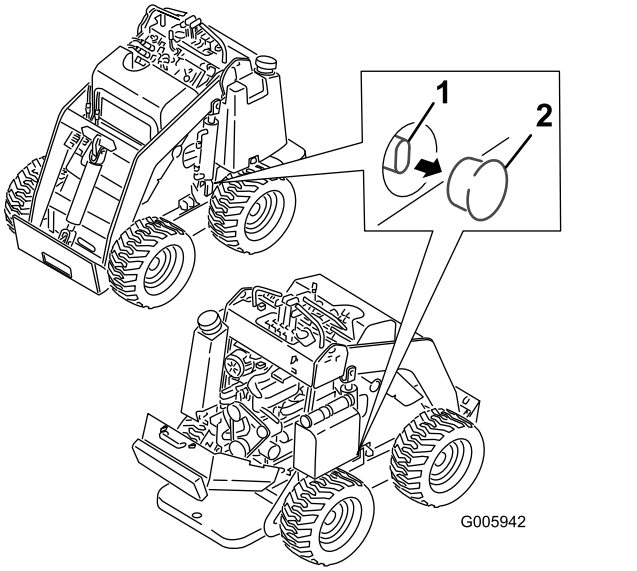
A child or untrained bystander could attempt to operate the traction unit and be injured.

Remove the key from the key switch when leaving the traction unit, even if just for a few seconds.

Moving a Non-Functioning Machine

Important: **Do not tow or pull the machine without first opening the tow valves, or you will damage the hydraulic system.**

1. Shut off the engine.
2. Remove the plug covering each tow valve (Figure 14).



g005942

Figure 14

3. Loosen the jam nut on each tow valve.
4. Turn each valve counterclockwise 1 turn with a hex wrench to open them.
5. Tow the machine as required.

   Important: **Do not exceed 4.8 km/h (3 mph) when towing.**
6. After repairing the machine, close the tow valves and tighten the jam nuts.

   Important: **Do not overtighten the tow valves.**
7. Replace the plugs.

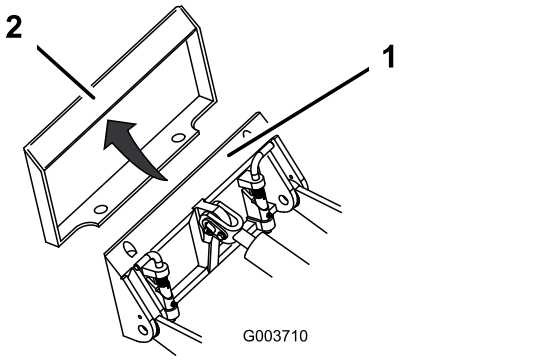
Using Attachments

Installing an Attachment

Important: **Use only Toro-approved attachments. Attachments can change the stability and the operating characteristics of the machine. The warranty of the machine may be voided if you use the machine with unapproved attachments.**

Important: **Before installing the attachment, ensure that the mount plates are free of any dirt or debris and that the pins rotate freely. If the pins do not rotate freely, grease them.**

1. Position the attachment on a level surface with enough space behind it to accommodate the machine.
2. Start the engine.
3. Tilt the attachment mount plate forward.
4. Position the mount plate into the upper lip of the attachment receiver plate (Figure 15).



g003710

Figure 15

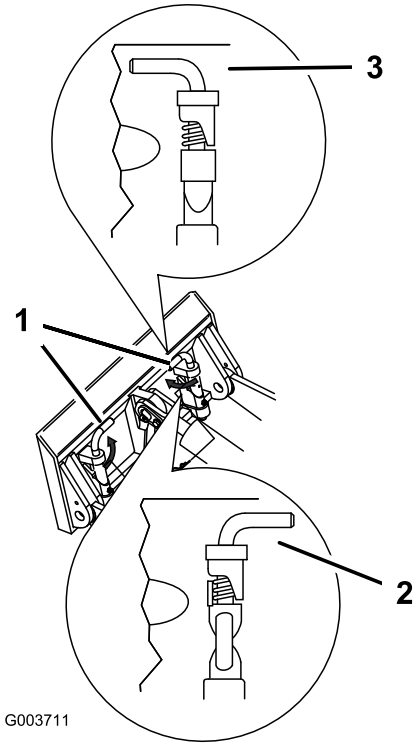
1. Mount plate
2. Receiver plate

5. Raise the loader arms while tilting back the mount plate at the same time.

   Important: **Raise the attachment enough to clear the ground and tilt the mount plate all the way back.**

6. Shut off the engine and remove the key.
7. Engage the quick-attach pins, ensuring that they are fully seated in the mount plate (Figure 16).

   Important: **If the pins do not rotate to the engaged position, the mount plate is not fully aligned with the holes in the attachment receiver plate. Check the receiver plate and clean it if necessary.**



g003711

Figure 16

1. Quick-attach pins (engaged position)
2. Disengaged position
3. Engaged position

⚠ WARNING

If you do not fully seat the quick-attach pins through the attachment mount plate, the attachment could fall off the machine, crushing you or bystanders.

Ensure that the quick-attach pins are fully seated in the attachment mount plate.

Connecting the Hydraulic Hoses

⚠ WARNING

Hydraulic fluid escaping under pressure can penetrate skin and cause injury. Fluid injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury; otherwise, gangrene may result.

- **Keep your body and hands away from pinhole leaks or nozzles that eject high-pressure hydraulic fluid.**
- **Use cardboard or paper to find hydraulic leaks; never use your hands.**

⚠ CAUTION

Hydraulic couplers, hydraulic lines/valves, and hydraulic fluid may be hot. If you contact hot components, you may be burned.

- **Wear gloves when operating the hydraulic couplers.**
- **Allow the machine to cool before touching hydraulic components.**
- **Do not touch hydraulic fluid spills.**

If the attachment requires hydraulics for operation, connect the hydraulic hoses as follows:

1. Shut off the engine and remove the key.
2. Move the auxiliary-hydraulics lever forward, backward, and back to the NEUTRAL position to relieve pressure at the hydraulic couplers.
3. Remove the protective covers from the hydraulic connectors on the machine.
4. Ensure that all foreign matter is cleaned from the hydraulic connectors.
5. Push the attachment male connector into the female connector on the machine.

   Note: When you connect the attachment male connector first, you relieve any pressure built up in the attachment.
6. Push the attachment female connector onto the male connector on the machine.
7. Confirm that the connection is secure by pulling on the hoses.

Removing an Attachment

1. Park the machine on a level surface.
2. Lower the attachment to the ground.
3. Shut off the engine and remove the key.
4. Disengage the quick-attach pins by turning them to the outside.
5. If the attachment uses hydraulics, move the auxiliary-hydraulics lever forward, backward, and back to the NEUTRAL position to relieve pressure at the hydraulic couplers.
6. If the attachment uses hydraulics, slide the collars back on the hydraulic couplers and disconnect them.

   Important: **Connect the attachment hoses together to prevent hydraulic system contamination during storage.**
7. Install the protective covers onto the hydraulic couplers on the machine.
8. Start the engine, tilt the mount plate forward, and back the machine away from the attachment.

Transporting the Machine

Use a heavy-duty trailer or truck to transport the machine. Use full-width ramps. Ensure that the trailer or truck has all the necessary brakes, lighting, and marking as required by law. Please carefully read all the safety instructions. Knowing this information could help you, your family, pets, or bystanders avoid injury. Refer to your local ordinances for trailer and tie-down requirements.

⚠ 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 the machine on a public street or roadway.

Selecting a Trailer

⚠ WARNING

Loading a machine onto a trailer or truck increases the possibility of tip-over and could cause serious injury or death (Figure 17).

- **Use only a full-width ramp; do not use individual ramps for each side of the machine.**
- **Ensure that the length of ramp is at least 4 times as long as the height of the trailer or truck bed to the ground.**

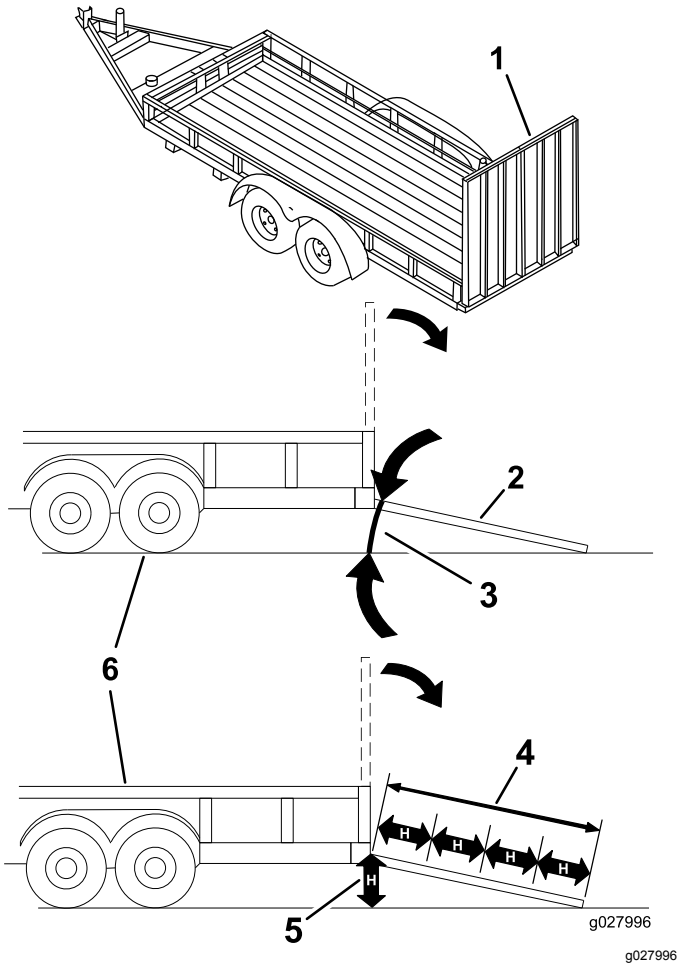


Figure 17

1. Full-width ramp in stowed position
2. Ramp is at least 4 times as long as the height of the trailer or truck bed to the ground
3. H=height of the trailer or truck bed to the ground
4. Trailer

Loading the Machine

⚠ WARNING

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

- **Use extreme caution when operating a machine on a ramp.**
- **Load and unload the machine with the heavy end up the ramp.**
- **Avoid sudden acceleration or deceleration while driving the machine on a ramp as this could cause a loss of control or a tip-over situation.**

1. If using a trailer, connect it to the towing vehicle and connect the safety chains.
2. If applicable, connect the trailer brakes.
3. Lower the ramp (Figure 17).
4. Lower the loader arms.
5. Load the machine onto the trailer with the heavy end up the ramp, carrying loads low (Figure 18).
   - If the machine has a **full** load-carrying attachment (e.g., bucket or adjustable forks) or a non-load-carrying attachment (e.g., stump grinder), drive the machine forward up the ramp.
   - If the machine has an **empty** load-carrying attachment or no attachment, back the machine up the ramp.

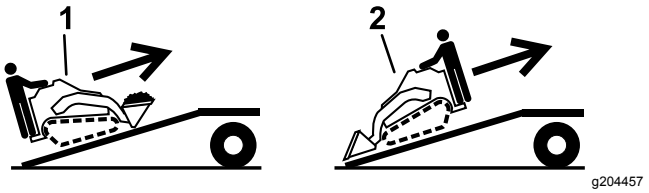


Figure 18

1. Machine with full attachment or non-load-carrying attachment—drive the machine forward up the ramp.
2. Machine with empty or no attachment—back the machine up the ramp.

6. Lower the loader arms all the way down.
7. Shut off the engine, remove the key, and engage the parking brake.
8. Use the metal tie-down loops on the machine to securely fasten the machine to the trailer or truck with straps, chains, cable, or ropes (Figure 19). Refer to local regulations for tie-down requirements.

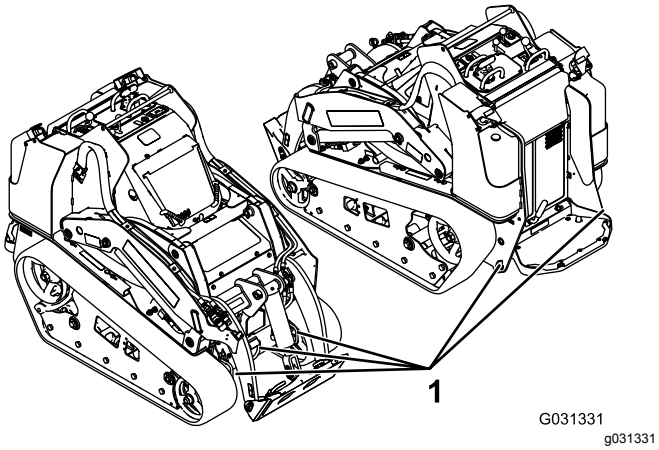


Figure 19

1. Tie-down loops

Unloading the Machine

1. Lower the ramp (Figure 17).
2. Unload the machine from the trailer with the heavy end up the ramp, carrying loads low (Figure 20).
   - If the machine has a **full** load-carrying attachment (e.g., bucket or adjustable forks) or a non-load-carrying attachment (e.g., stump grinder), back it down the ramp.
   - If the machine has an **empty** load-carrying attachment or no attachment, drive it forward down the ramp.

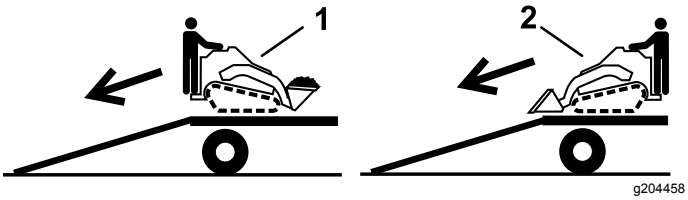


Figure 20

1. Machine with full attachment or non-load-carrying attachment—back the machine down the ramp.
2. Machine with empty or no attachment—drive the machine forward down the ramp.

Lifting the Machine

You can lift the machine using the tie-down/lift loops as lift points; refer to Figure 19.

Adjusting the Thigh Support

To adjust the thigh support (Figure 21), loosen the knobs and raise or lower the support pad to the desired height. You can also obtain additional adjustment by loosening the nut securing the pad to the adjustment plate, moving the plate up or down as needed. Tighten all fasteners securely when finished.

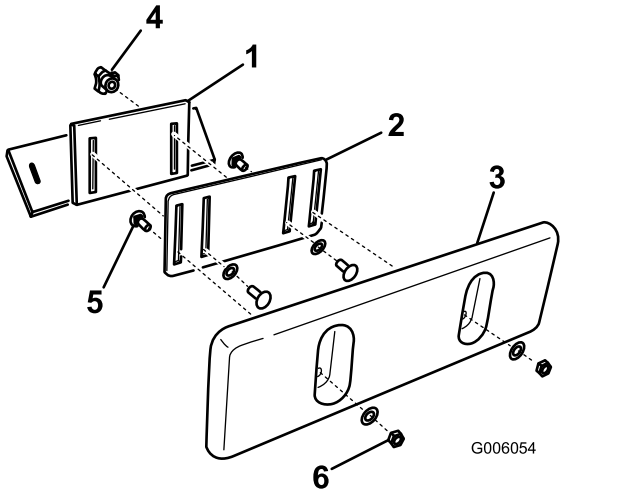


Figure 21

1. Thigh-support bracket
2. Adjustment plate
3. Thigh-support pad
4. Knob and flat washer
5. Carriage bolt
6. Locknut and flat washer

Maintenance

⚠ WARNING

Failure to properly maintain the machine could result in premature failure of machine systems causing possible harm to you or bystanders.

Keep the machine well maintained and in good working order as indicated in these instructions.

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

Important: **Refer to your engine owner's manual for additional maintenance procedures.**

⚠ CAUTION

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

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

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 8 hours	• Replace the hydraulic filter. • Torque the wheel lug nuts to 68 N·m (50 ft-lb).
After the first 50 hours	• Change the engine oil and filter.
Before each use or daily	• Grease the machine. (Grease immediately after every washing.) • Check the engine-oil level. • Drain water from the fuel filter. • Check the tire pressure. • Check the engine-coolant level. • Test the parking brake. • Remove debris from the machine. • Check for loose fasteners.
Every 25 hours	• Check the hydraulic-fluid level.
Every 75 hours	• Change the engine oil and filter (more frequently when operating conditions are extremely dusty or sandy).
Every 100 hours	• Check the hydraulic lines for leaks, loose fittings, kinked lines, loose mounting supports, wear, weather, and chemical deterioration. • Torque the wheel lug nuts to 68 N·m (50 ft-lb).
Every 200 hours	• Service the air cleaner. (Service more frequently if conditions are extremely dusty or sandy.)
Every 400 hours	• Replace the hydraulic filter.
Every 1,500 hours	• Replace all moving hydraulic hoses.
Yearly	• Change the fuel filter. • Change the hydraulic fluid.
Yearly or before storage	• Touch up chipped paint.

Pre-Maintenance Procedures

Using the Cylinder Locks

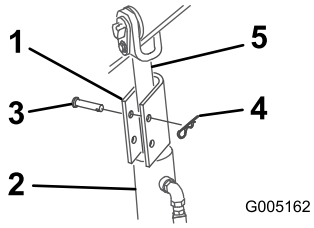
⚠ WARNING

The loader arms may lower when in the raised position, crushing anyone under them.

Install the cylinder lock(s) before performing maintenance that requires raised loader arms.

Installing the Cylinder Locks

1. Remove the attachment.
2. Raise the loader arms to the fully raised position.
3. Shut off the engine and remove the key.
4. Position a cylinder lock over each lift-cylinder rod (Figure 22).



g005162

Figure 22

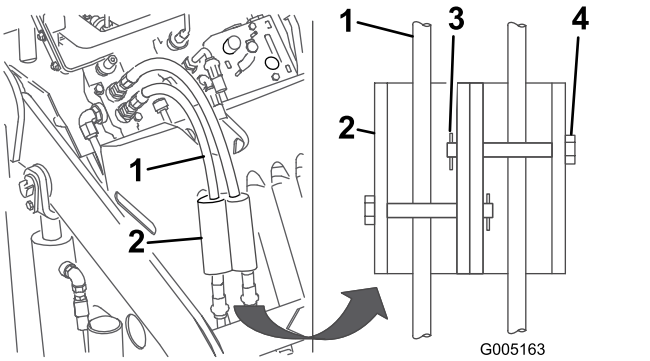
1. Cylinder lock
2. Lift cylinder
3. Hairpin cotter
4. Clevis pin
5. Lift-cylinder rod

5. Secure each cylinder lock with a clevis pin and cotter pin (Figure 22).
6. **Slowly** lower the loader arms until the cylinder locks contact the cylinder bodies and rod ends.

Removing and Storing the Cylinder Locks

Important: **Remove the cylinder locks from the rods and fully secure them in the storage position before operating the machine.**

1. Start the engine.
2. Raise the loader arms to the fully raised position.
3. Shut off the engine and remove the key.
4. Remove the clevis pin and cotter pin securing each cylinder lock.
5. Remove the cylinder locks.
6. Lower the loader arms.
7. Install the cylinder locks over the hydraulic hoses and secure them with the clevis pins and cotter pins (Figure 23).



g005163

Figure 23

1. Hydraulic hoses
2. Cylinder locks
3. Hairpin cotter
4. Clevis pin

Accessing Internal Components

⚠ WARNING

Opening or removing covers, hoods, and screens while the engine is running could allow you to contact moving parts, seriously injuring you.

Before opening any of the covers, hoods, and screens, shut off the engine, remove the key from the key switch, and allow the engine to cool.

Removing the Front-Access Cover

1. Park the machine on a level surface and engage the parking brake.
2. Raise the loader arms and install the cylinder locks.

   Note: If you must remove the front-access cover without raising the loader arms, be very careful not to damage the cover or hydraulic hoses as you maneuver the cover out from under the arms.
3. Shut off the engine and remove the key.
4. Release the 2 locking tabs (Figure 24, top, left tab illustrated).

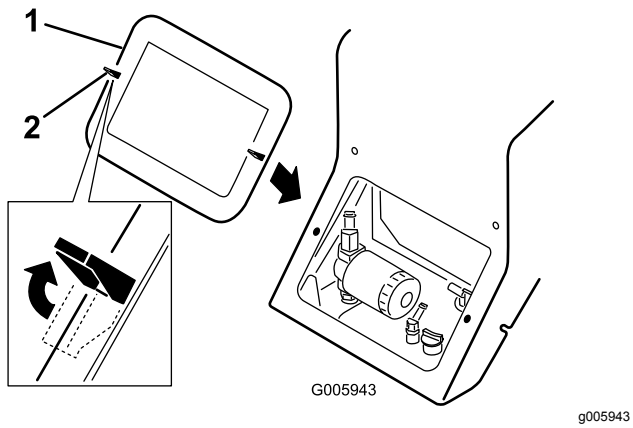


Figure 24

1. Cover
2. Locking tab

5. Pull the cover off the machine.
6. When finished, replace the front-access cover and secure it with the 2 locking tabs.

Opening the Rear-Access Cover

1. Shut off the engine and remove the key.
2. Release the 2 locking tabs on top of the rear-access cover (Figure 25).

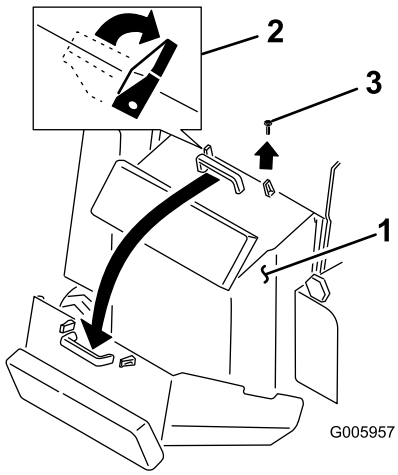


Figure 25

1. Rear-access cover
2. Locking tabs
3. Bolt

3. Remove the bolt located next to the right locking tab (Figure 25).
4. Grasping the handle, pull the cover up and back to swing it open (Figure 25).
5. When finished, close the rear-access cover by swinging it up and seating it in place.
6. Secure it with the 2 locking tabs and bolt.

Lubrication

Greasing the Machine

Service Interval: Before each use or daily (Grease immediately after every washing.)

Grease Type: General-purpose grease.

1. Park the machine on a level surface, engage the parking brake (if equipped), and lower the loader arms.
2. Shut off the engine and remove the key.
3. Clean the grease fittings with a rag.
4. Connect a grease gun to each fitting (Figure 26 and Figure 27).

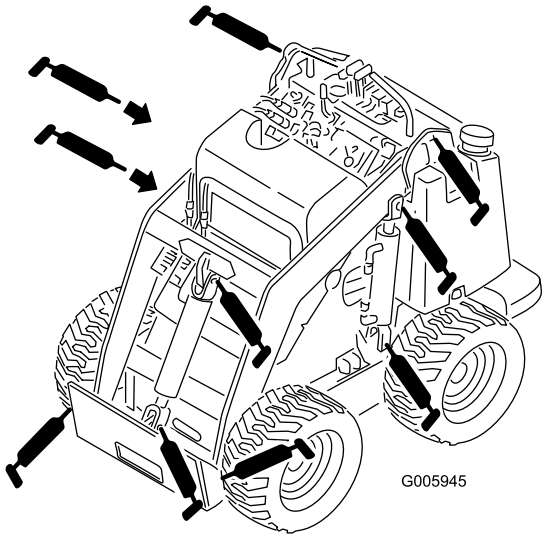


Figure 26

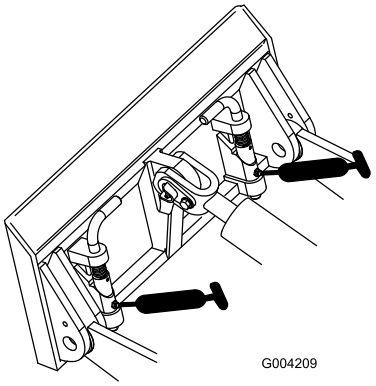


Figure 27

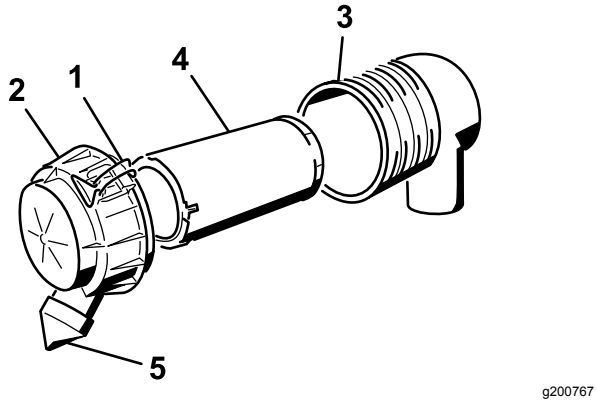
5. Pump grease into the fittings until grease begins to ooze out of the bearings (approximately 3 pumps).
6. Wipe up any excess grease.

Engine Maintenance

Servicing the Air Cleaner

Service Interval: Every 200 hours—Service the air cleaner. (Service more frequently if conditions are extremely dusty or sandy.)

1. Park the machine on a level surface, engage the parking brake (if equipped), and lower the loader arms.
2. Shut off the engine and remove the key.
3. Release the latches on the air cleaner and pull the air-cleaner cover off the air-filter body (Figure 28).



g200767

Figure 28

1. Latches
2. Air-cleaner cover
3. Air-filter body
4. Primary filter
5. Dust cap

4. Squeeze the dust cap sides to open it and knock the dust out.
5. Clean the inside of the air-cleaner cover with compressed air that is under 205 kPa (30 psi).
6. Gently slide the filter out of the air-filter body (Figure 28).

   Note: Avoid knocking the filter into the side of the body.

   Important: **Do not attempt to clean the filter.**
7. Inspect the new filter for tears, an oily film, or damage to the rubber seal. Look into the filter while shining a bright light on the outside of the filter; holes in the filter appear as bright spots.

   If the filter is damaged, do not use it.
8. Carefully install the filter (Figure 28).

   Note: Ensure that the filter is fully seated by pushing on the outer rim of the filter while installing it.

   Important: **Do not press on the soft inside area of the filter.**
9. Install the air-cleaner cover with the dust cap oriented downward and secure the latches (Figure 28).

Servicing the Engine Oil

Service Interval: Before each use or daily—Check the engine-oil level.

After the first 50 hours—Change the engine oil and filter.

Every 75 hours—Change the engine oil and filter (more frequently when operating conditions are extremely dusty or sandy).

Oil Type: Detergent diesel engine oil (API service CH-4, CI-4 or higher)

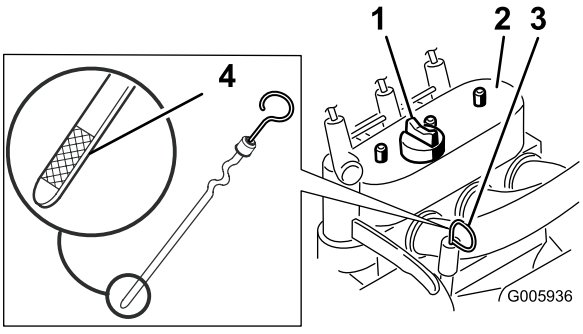
Crankcase Capacity: with filter, 3.2 L (0.84 US gallons)

Viscosity:

- For temperatures above -18°C (0°F), use 15W-40 (preferred) or 10W-30.
- For temperatures below 0°C (32°F), use 5W-30.

Checking the Engine-Oil Level

1. Park the machine on a level surface, engage the parking brake, and lower the loader arms.
2. Shut off the engine, remove the key, and allow the engine to cool.
3. Open the rear-access cover.
4. Clean the area around the oil dipstick (Figure 29).



g005936

Figure 29

1. Fill cap
2. Valve cover
3. Oil dipstick
4. Metal end

5. Pull out the dipstick and wipe the metal end clean (Figure 29).

6. Slide the dipstick fully into the dipstick tube (Figure 29).
7. Pull the dipstick out and look at the metal end.
8. If the oil level is low, clean the area around the oil-fill cap and remove the cap (Figure 29).
9. Slowly pour only enough oil into the valve cover to raise the level to the upper mark on the dipstick.

   Note: Use diesel engine oil, API service CH-4, CI-4, or higher; refer to Changing the Engine Oil and Filter (page 31).

   Important: **Do not overfill the crankcase with oil because it may damage the engine.**
10. Replace the fill cap and dipstick.
11. Close the rear-access cover.

Changing the Engine Oil and Filter

1. Start the engine and let it run for 5 minutes.

   Note: This warms the oil so that it drains better.
2. Park the machine so that the drain side is slightly lower than the opposite side to ensure that the oil drains completely.
3. Lower the loader arms, engage the parking brake, shut off the engine, and remove the key.

   ⚠ CAUTION

   Components will be hot if the machine has been running. If you touch hot components, you may be burned.

   Use care to avoid touching hot components while changing the oil and/or filter.
4. Place a pan under the oil-drain tube (Figure 30).

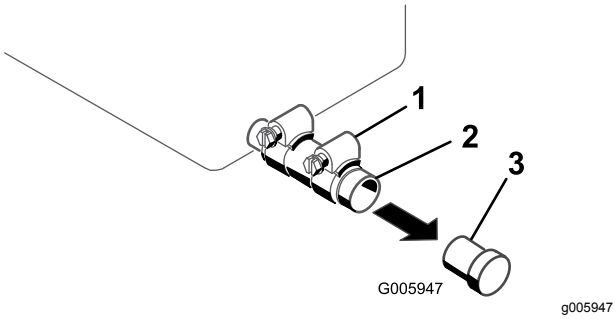


Figure 30

1. Clamp
2. Oil-drain tube
3. Plug

5. Loosen the clamp and remove the plug (Figure 30).
6. When the oil has drained completely, replace the plug and tighten the clamp.

   Note: Dispose of the used oil at a certified recycling center.
7. Open the rear-access cover.
8. Remove the old filter and wipe the filter adapter (Figure 31) gasket surface.

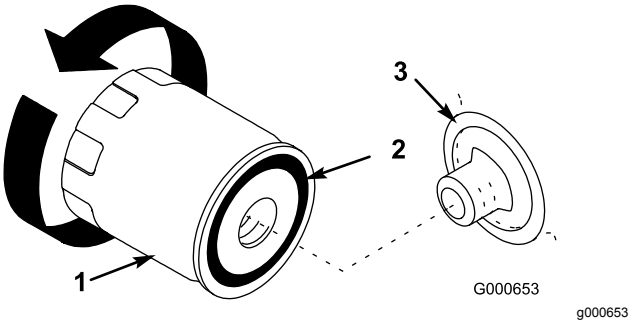


Figure 31

1. Oil filter
2. Gasket
3. Adapter

9. Pour new oil of the proper type in through the center hole of the filter. Stop pouring when the oil reaches the bottom of the threads.
10. Allow 1 to 2 minutes for the oil to be absorbed by filter material, then pour off the excess oil.
11. Apply a thin coat of new oil to the rubber gasket on the replacement filter (Figure 31).
12. Install the replacement oil filter to the filter adapter. Turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/2 turn (Figure 31).
13. Remove the fill cap (Figure 29) and slowly pour approximately 80% of the specified amount of oil in through the valve cover.
14. Check the oil level.
15. Slowly add additional oil to bring the level to the upper mark on the dipstick.
16. Replace the fill cap.
17. Close the rear-access cover.

Fuel System Maintenance

⚠ 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.

Refer to Adding Fuel (page 19) for a complete list of fuel related precautions.

Draining Water from the Fuel Filter

Service Interval: Before each use or daily

1. Park the machine on a level surface, engage the parking brake, and lower the loader arms.
2. Shut off the engine and remove the key.
3. Open the rear-access cover.
4. Turn the drain valve until the water runs out of the filter (Figure 32).

   Note: The fuel filter is located near the bottom of the fuel tank.

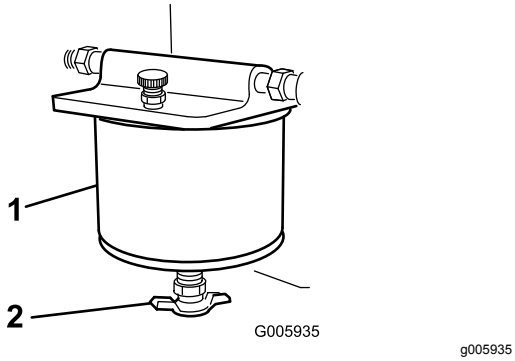


Figure 32

1. Fuel filter
2. Drain valve

5. Close the valve.
6. Close the rear-access cover.

Changing the Fuel Filter

Service Interval: Yearly

Important: **Never install a dirty filter.**

1. Park the machine on a level surface, engage the parking brake, and lower the loader arms.
2. Shut off the engine and remove the key.
3. Shut off the fuel valve on the bottom of the fuel tank (Figure 35).
4. Open the rear-access cover.
5. Open the drain valve (Figure 33) and drain the fuel from the fuel filter into a suitable container and dispose of it properly.

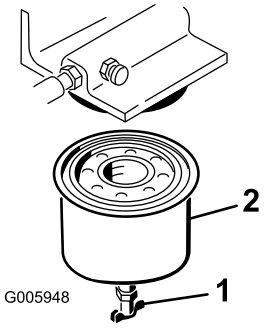


Figure 33

1. Drain valve
2. Fuel filter

6. Remove the fuel filter with a filter wrench (Figure 33).
7. Clean the mounting surface.
8. Lubricate the gasket on the new filter with clean engine oil.
9. Screw on the new filter by hand until the gasket contacts the housing, then tighten it another 1/2 turn.
10. Open the fuel valve on the bottom of the fuel tank (Figure 35).
11. Bleed the fuel system; refer to Bleeding the Fuel System (page 32).
12. Start the engine and check for leaks.

Bleeding the Fuel System

Bleed the air from the fuel system in any of the following situations:

- Initial start-up of a new traction unit or a traction unit that has been stored
- After the engine has ceased running due to lack of fuel
- After maintenance has been performed on the fuel system components

1. Park the machine on a level surface, engage the parking brake, and lower the loader arms.
2. Shut off the engine and remove the key.
3. Open the rear-access cover.
4. Place a drain pan under the fuel filter to catch fuel spills.
5. Open the bleed screw on top of the fuel filter to fill the bowl with fuel (Figure 34).

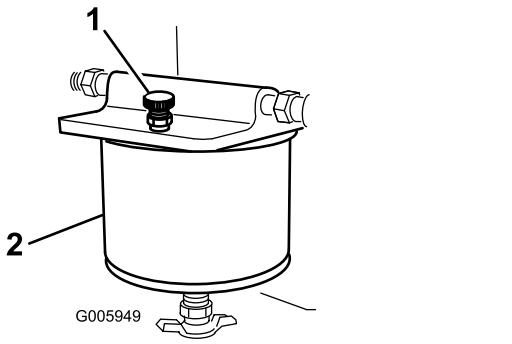


Figure 34

1. Fuel filter
2. Bleed screw

6. Close the bleed screw when fuel comes out in a steady stream.
7. On left side of the engine, locate the air vent plug on top of the fuel-injection pump and connect a hose to it, leading to a drain pan.
8. Open the vent plug and crank the engine until fuel comes out a steady stream.
9. Close the vent plug.
10. Close the rear-access cover.

Draining the Fuel Tank

⚠ DANGER

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

- **Drain fuel from the fuel tanks when the engine is cold. Do this outdoors in an open area. Wipe up any fuel that spills.**
- **Never smoke when draining fuel, and stay away from an open flame or where a spark may ignite the fumes.**

1. Park the machine on a level surface, engage the parking brake, and lower the loader arms.
2. Shut off the engine and remove the key.
3. Shut off the fuel valve in the hose near the bottom of the fuel tank (Figure 35).

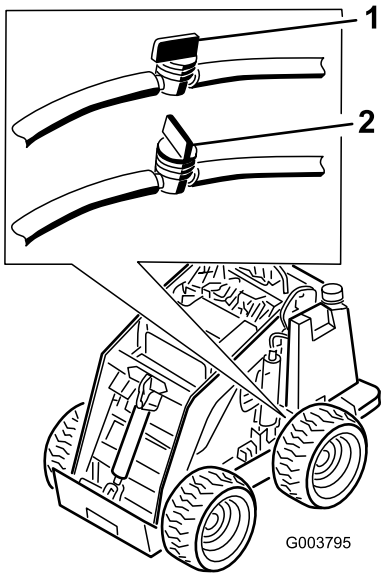


Figure 35

1. Fuel valve (open)
2. Fuel valve (closed)

4. Open the rear-access cover.
5. Loosen the hose clamp at the fuel filter and slide it up the fuel line away from the filter.
6. Pull the fuel line off the fuel filter, open the fuel valve, and allow the fuel to drain into a fuel can or drain pan.
7. Install the fuel line onto the fuel filter.
8. Slide the hose clamp close to the fuel filter to secure the fuel line.
9. Close the rear-access cover.
10. Open the fuel valve in the hose near the bottom of the fuel tank as illustrated in Figure 35.

Note: Now is the best time to install a new fuel filter because the fuel tank is empty.

Electrical System Maintenance

Servicing the Battery

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

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

Always keep the battery clean and fully charged. Use a paper towel to clean the battery case. If the battery terminals are corroded, clean them with a solution of 4 parts water and 1 part baking soda. Apply a light coating of grease to the battery terminals to reduce corrosion.

Specifications: 12 V, 450 A (cold cranking)

⚠ 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) cable before disconnecting the positive (red) cable.**
- **Always connect the positive (red) cable before connecting the negative (black) cable.**

⚠ WARNING

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

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

Removing the Battery

⚠ DANGER

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

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

1. Remove the nuts and bars securing the battery (Figure 4).
2. Disconnect the negative (black) cable to the negative (-) battery post (Figure 4).

   ⚠ WARNING

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

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

3. Disconnect the positive (red) cable to the positive (+) battery post (Figure 4).
4. Lift the battery off the platform.

Charging the Battery

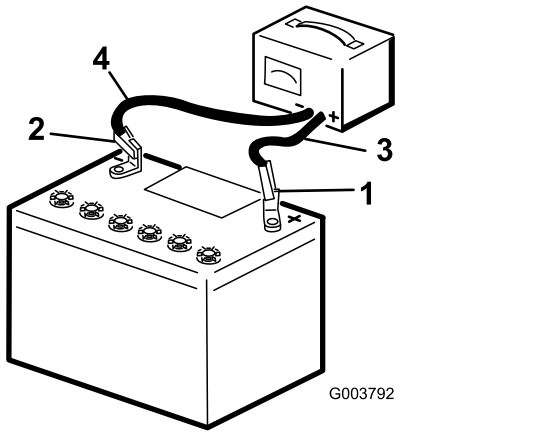
⚠ WARNING

Charging the battery produces gasses that can explode.

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

Important: **Always keep the battery fully charged (1.265 specific gravity). This is especially important to prevent battery damage when the temperature is below 0°C (32°F).**

1. Remove the battery from the machine; refer to Removing the Battery (page 34).
2. Charge the battery for 10 to 15 minutes at 25 to 30 A or 30 minutes at 4 to 6 A (Figure 36). Do not overcharge the battery.



g003792

Figure 36

1. Positive battery post
2. Negative battery post
3. Red (+) charger lead
4. Black (-) charger lead

3. When the battery is fully charged, unplug the charger from the electrical outlet, then disconnect the charger leads from the battery posts (Figure 36).

Cleaning the Battery

Note: Keep the terminals and the entire battery case clean, because a dirty battery discharges slowly.

1. Park the machine on a level surface, engage the parking brake, and lower the loader arms.
2. Shut off the engine and remove the key.
3. Remove the battery from the machine; Removing the Battery (page 34).
4. Wash the entire case with a solution of baking soda and water.
5. Rinse the battery with clear water.
6. Coat the battery posts and cable connectors with Grafo 112X (skin-over) grease (Toro Part No. 505-47) or petroleum jelly to prevent corrosion.
7. Install the battery; refer to Installing the Battery (page 35).

Servicing a Replacement Battery

The original battery is maintenance-free and does not require service. For servicing a replacement battery, refer to the battery manufacturer's instructions.

Installing the Battery

1. Install the battery onto the platform (Figure 4).
2. Secure the battery in the chassis with the bars and nuts removed previously (Figure 4).
3. Connect the positive (red) cable to the positive (+) battery post (Figure 4). Slide the rubber cover over the battery post.
4. Connect the negative (black) cable to the negative (-) battery post (Figure 4).

   Important: **Ensure that the battery cables do not contact any sharp edges or each other.**
5. Install the battery cover (Figure 4).

Drive System Maintenance

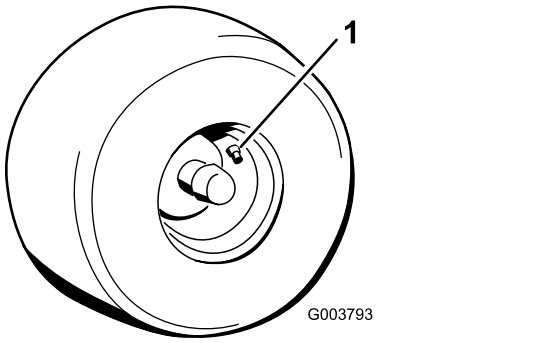
Checking the Tire Pressure

Service Interval: Before each use or daily

Maintain the air pressure in the tires as specified. Check the tires when they are cold to get the most accurate reading.

Pressure: 103 to 138 kPa (15 to 20 psi)

Note: Use a lower tire pressure, 103 kPa (15 psi), when operating in sandy soil conditions to provide better traction in the loose soil.



g003793

Figure 37

1. Valve stem

Cooling System Maintenance

Checking the Engine-Coolant Level

Service Interval: Before each use or daily

The cooling system is filled with a 50/50 solution of water and permanent ethylene glycol antifreeze. Check the level of coolant at the beginning of each day, before starting the engine.

⚠ DANGER

If the engine is running, the pressurized, hot coolant can escape and 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 the radiator and surrounding parts that are hot.**
- **Use a rag when opening the radiator cap and open the cap slowly to allow steam to escape.**

⚠ DANGER

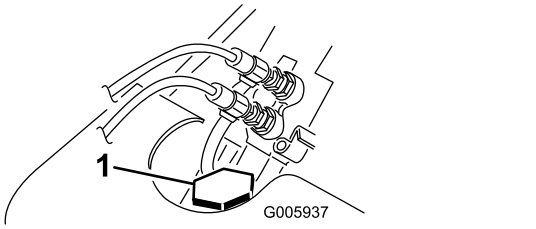
The rotating shaft and fan can cause personal injury.

- **Do not operate the machine without the covers in place.**
- **Keep your fingers, hands, and clothing clear of the rotating fan and drive shaft.**
- **Park the machine on a level surface, lower the loader arms, engage the parking brake, shut off the engine, and remove the key from the key switch before performing maintenance.**

1. Park the machine on a level surface, lower the loader arms, engage the parking brake, and shut off the engine.

2. Remove the key from the key switch and allow the engine to cool.
3. Remove the radiator cap and check the coolant level (Figure 38).

   The coolant should be up to the filler neck.



g005937

Figure 38

1. Radiator cap

4. If the coolant level is low, add coolant up to the bottom of the filler neck.

   Important: **Do not overfill the radiator.**
5. Replace the radiator cap, ensuring that it is tightly sealed.

Brake Maintenance

Testing the Parking Brake

Service Interval: Before each use or daily

1. Engage the parking-brake; refer to Parking-Brake Lever (page 17).
2. Start the engine.
3. Slowly attempt to drive the machine forward or rearward.
4. If the machine moves, contact your Authorized Toro Dealer for service.

Hydraulic System Maintenance

Hydraulic Fluid Specifications

Use only 1 of the following fluids in the hydraulic system:

- **Toro Premium Transmission/Hydraulic Tractor Fluid** (refer to your Authorized Toro Dealer for more information)
- **Toro Premium All Season Hydraulic Fluid** (refer to your Authorized Toro Dealer for more information)
- If either of the above Toro fluids are not available, you may use another **Universal Tractor Hydraulic Fluid (UTHF**), but they must be only **conventional, petrolium-based** products. The specifications must fall within the listed range for all the following material properties and the fluid should meet the listed industry standards. Check with your hydraulic fluid supplier to determine if the fluid meets these specifications.

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

Material Properties	
Viscosity, ASTM D445	cSt at 40°C: 55 to 62
	cSt at 100°C: 9.1 to 9.8
Viscosity index, ASTM D2270	140 to 152
Pour Point, ASTM D97	-37 to -43°C (-35 to -46°F)
Industry Standards	
API GL-4, AGCO Powerfluid 821 XL, Ford New Holland FNHA-2-C-201.00, Kubota UDT, John Deere J20C, Vickers 35VQ25 and Volvo WB-101/BM	

Note: Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic system fluid is available in 20 ml (2/3 fl oz) bottles. One bottle is sufficient for 15 to 22 L (4 to 6 US gallons) of hydraulic fluid. Order Part No. 44-2500 from your Authorized Toro Dealer.

Checking the Hydraulic-Fluid Level

Service Interval: Every 25 hours

Check the hydraulic-fluid level before the engine is first started and after every 25 operating hours.

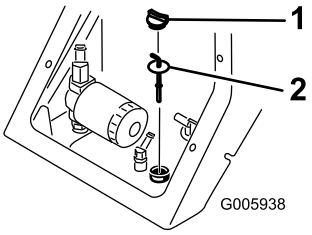
Hydraulic Tank Capacity: 56 L (14.8 US gallons)

Refer to Hydraulic Fluid Specifications (page 38) for hydraulic-fluid specifications.

Important: **Always use the correct hydraulic fluid. Unspecified fluids will damage the hydraulic system.**

1. Remove the attachment, if one is installed.
2. Park the machine on a level surface, raise the loader arms, and install the cylinder locks.
3. Shut off the engine, remove the key, and allow the engine to cool.
4. Remove the front-access cover.
5. Clean the area around the filler neck of the hydraulic tank (Figure 39).
6. Remove the filler-neck cap and check the fluid level on the dipstick (Figure 39).

   Note: The fluid level should be between the marks on the dipstick.



g005938

Figure 39

1. Filler-neck cap
2. Dipstick

7. If the fluid level is low, add enough fluid to raise it to the proper level.
8. Install the filler-neck cap.
9. Install the front-access cover.
10. Remove and store the cylinder locks and lower the loader arms.

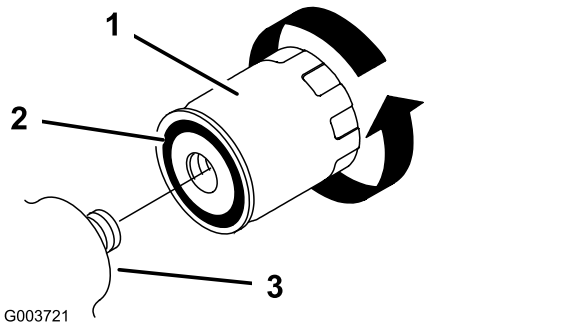
Replacing the Hydraulic Filter

Service Interval: After the first 8 hours

Every 400 hours

Important: **Do not substitute an automotive oil filter or severe hydraulic system damage may result.**

1. Park the machine on a level surface and engage the parking brake (if equipped).
2. Raise the loader arms and install the cylinder locks.
3. Shut off the engine and remove the key.
4. Remove the hood/front access cover (if equipped).
5. Place a drain pan under the filter.
6. Remove the old filter (Figure 40) and wipe the surface of the filter adapter clean.



g003721

Figure 40

1. Hydraulic filter
2. Gasket
3. Filter adapter

7. Apply a thin coat hydraulic fluid to the rubber gasket on the replacement filter (Figure 40).
8. Install the replacement hydraulic filter onto the filter adapter (Figure 40). Tighten it clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/2 turn.
9. Clean up any spilled fluid.
10. Start the engine and let it run for about 2 minutes to purge air from the system.
11. Shut off the engine and check for leaks.

⚠ WARNING

Hydraulic fluid escaping under pressure can penetrate skin and cause injury. Fluid injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury; otherwise, gangrene may result.

- **Keep your body and hands away from pinhole leaks or nozzles that eject high-pressure hydraulic fluid.**
- **Use cardboard or paper to find hydraulic leaks; never use your hands.**

12. Check the fluid level in the hydraulic tank (refer to Checking the Hydraulic-Fluid Level (page 38) and add fluid to raise the level to mark on dipstick. Do not overfill the tank.
13. Install the hood/front access cover (if equipped).
14. Remove and store the cylinder locks and lower the loader arms.

Changing the Hydraulic Fluid

Service Interval: Yearly

1. Park the machine on a level surface.
2. Raise the loader arms and install the cylinder locks.
3. Shut off the engine, remove the key, and allow the engine to cool.
4. Remove the hood/front-access cover (if equipped).
5. Place a large drain pan under the machine that can hold at least 57 L (15 US gallons).
6. Remove the drain plug from the bottom of the hydraulic tank and allow the fluid to completely drain out.
7. Install the drain plug.
8. Fill the hydraulic tank with approximately 57 L (15 US gallons) of hydraulic fluid; refer to Hydraulic Fluid Specifications (page 38).

   Note: Dispose of used oil at a certified recycling center.
9. Install the hood/front-access cover (if equipped).
10. Remove and store the cylinder locks and lower the loader arms.

Checking the Hydraulic Lines

Service Interval: Every 100 hours—Check the hydraulic lines for leaks, loose fittings, kinked lines, loose mounting supports, wear, weather, and chemical deterioration. (Make necessary repairs before operating.)

Every 1,500 hours/Every 2 years (whichever comes first)—Replace all moving hydraulic hoses.

⚠ WARNING

Hydraulic fluid escaping under pressure can penetrate skin and cause injury. Fluid injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury; otherwise, gangrene may result.

- **Keep your body and hands away from pinhole leaks or nozzles that eject high-pressure hydraulic fluid.**
- **Use cardboard or paper to find hydraulic leaks; never use your hands.**

Cleaning

Removing Debris

Service Interval: Before each use or daily

Important: **Operating the engine with blocked screens and/or cooling shrouds removed will result in engine damage due to overheating.**

1. Park the machine on a level surface, raise the loader arms, and install the cylinder locks.
2. Shut off the engine and remove the key.
3. Remove the front-access cover.
4. Clean any debris from the grill.
5. Open the rear-access cover.
6. Wipe away debris from the air cleaner.
7. Clean any debris buildup on the engine with a brush or blower.

   Important: **Blow the dirt out rather than wash it out. If you use water, keep it away from electrical items and hydraulic valves. Do not use a high-pressure washer. High-pressure washing can damage the electrical system and hydraulic valves or deplete grease.**
8. Replace and secure the front and rear-access covers.
9. Remove and store the cylinder locks and lower the loader arms.

Storage

1. Park the machine on a level surface, engage the parking brake, and lower the loader arms.
2. Shut off the engine and remove the key.
3. Remove dirt and grime from the external parts of the entire machine, especially the engine. Clean dirt and chaff from the radiator.

   Important: **You can wash the machine with mild detergent and water. Do not pressure wash the machine. Avoid excessive use of water, especially near the control panel, engine, hydraulic pumps, and motors.**
4. Service the air cleaner; refer to Servicing the Air Cleaner (page 30).
5. Grease the machine; refer to Greasing the Machine (page 29).
6. Drain water from the fuel filter; refer to Draining Water from the Fuel Filter (page 32).
7. Torque the wheel lug nuts to 68 N·m (50 ft-lb).
8. Check the hydraulic fluid level; refer to Checking the Hydraulic-Fluid Level (page 38).
9. Check the tire pressure; refer to Checking the Tire Pressure (page 36).
10. Charge the battery; refer to the Charging the Battery (page 35).
11. Flush the fuel tank with fresh, clean diesel fuel.
12. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged or defective.
13. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
14. Check antifreeze protection and fill the radiator with a 50/50 solution of water and permanent ethylene glycol antifreeze. Refer to your engine owners manual or Authorized Service Dealer for details on checking and maintaining the cooling system.
15. Store the machine in a clean, dry garage or storage area. Remove the key from the key switch and keep it in a memorable place.
16. Cover the machine to protect it and keep it clean.

Important: **When removing the machine from storage, charge the battery; refer to Charging the Battery (page 35).**

Troubleshooting

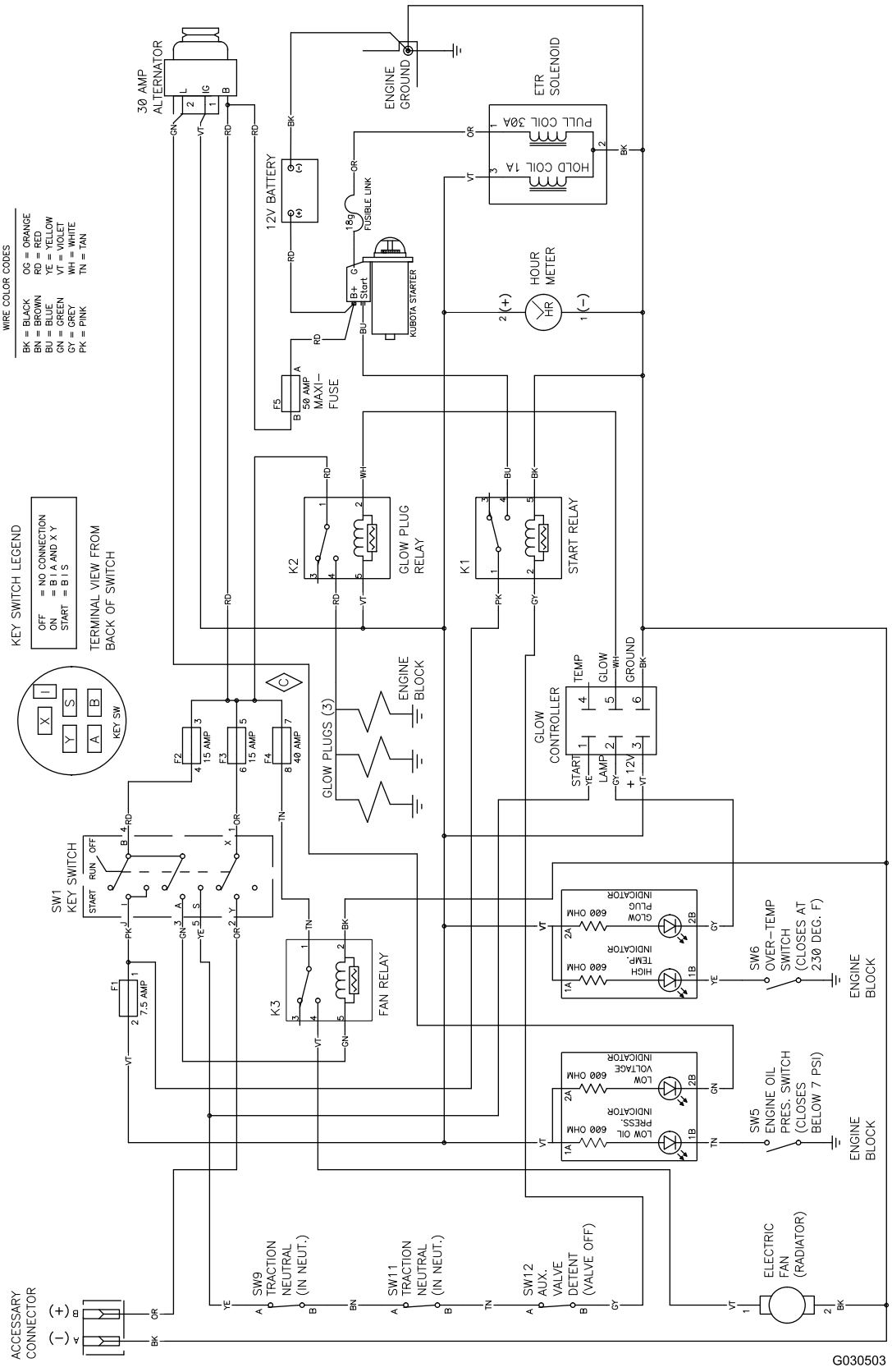
Problem	Possible Cause	Corrective Action
The starter does not crank.	1. The electrical connections are corroded or loose. 2. A fuse is loose or blown. 3. The battery is discharged. 4. The relay or switch is damaged. 5. A starter or starter solenoid is damaged. 6. Internal engine components have seized.	1. Check the electrical connections for good contact. 2. Connect or replace the fuse. 3. Charge the battery or replace it. 4. Contact your Authorized Service Dealer. 5. Contact your Authorized Service Dealer. 6. Contact your Authorized Service Dealer.
The engine cranks but does not start.	1. The starting procedure is incorrect. 2. The fuel tank is empty. 3. The fuel-shutoff valve is closed. 4. Dirt, water, stale fuel, or incorrect fuel is in the fuel system. 5. The fuel line is clogged. 6. There is air in the fuel. 7. The glow plugs are inoperative. 8. The cranking speed is slow. 9. The air-cleaner filters are dirty. 10. The fuel filter is clogged. 11. The improper fuel grade for cold weather is in the machine. 12. There is low compression. 13. The injection nozzles are damaged. 14. The injection pump timing is incorrect. 15. The injection pump is damaged. 16. The ETR solenoid is damaged.	1. Refer to . 2. Fill the tank with fresh fuel. 3. Open the fuel-shutoff valve. 4. Drain and flush the fuel system; add fresh fuel. 5. Clean or replace the fuel line. 6. Bleed the nozzles and check for air leaks at the fuel hose connections and fittings between the fuel tank and engine. 7. Check the fuse, glow plugs, and wiring. 8. Check the battery, oil viscosity, and starting motor (contact your Authorized Service Dealer). 9. Service the air filters. 10. Replace the fuel filter. 11. Drain the fuel system and replace the fuel filter. Add fresh fuel of proper grade for ambient temperature conditions. You may need to warm the entire traction unit. 12. Contact your Authorized Service Dealer. 13. Contact your Authorized Service Dealer. 14. Contact your Authorized Service Dealer. 15. Contact your Authorized Service Dealer. 16. Contact your Authorized Service Dealer.

Problem	Possible Cause	Corrective Action
The engine starts but does not keep running.	1. The fuel-tank vent is restricted.	1. Loosen the cap. If the engine runs with the cap loosened, replace the cap.
	2. Dirt or water is in the fuel system.	2. Drain and flush the fuel system; add fresh fuel.
	3. The fuel filter is clogged.	3. Replace the fuel filter.
	4. There is air in the fuel.	4. Bleed the nozzles and check for air leaks at fuel hose connections and fittings between the fuel tank and engine.
	5. Improper fuel grade for cold weather was used in the machine.	5. Drain the fuel system and replace the fuel filter. Add fresh fuel of proper grade for ambient temperature conditions.
	6. The spark-arrestor screen is clogged.	6. Clean or replace the spark-arrestor screen.
	7. The fuel pump is damaged.	7. Contact your Authorized Service Dealer.
The engine runs but knocks or misses.	1. Dirt, water, stale fuel, or incorrect fuel is in the fuel system.	1. Drain and flush the fuel system; add fresh fuel.
	2. The engine is overheating.	2. Refer to “The engine overheats.”
	3. There is air in the fuel.	3. Bleed the nozzles and check for air leaks at the fuel hose connections and fittings between the fuel tank and engine.
	4. The injection nozzles are damaged.	4. Contact your Authorized Service Dealer.
	5. There is low compression	5. Contact your Authorized Service Dealer.
	6. The injection-pump timing is incorrect.	6. Contact your Authorized Service Dealer.
	7. There is excessive carbon buildup.	7. Contact your Authorized Service Dealer.
	8. There is internal wear or damage.	8. Contact your Authorized Service Dealer.
The engine does not idle.	1. The fuel-tank vent is restricted.	1. Loosen the cap. If the engine runs with the cap loosened, replace the cap.
	2. Dirt, water, stale fuel, or incorrect fuel is in the fuel system.	2. Drain and flush the fuel system; add fresh fuel.
	3. The air-cleaner filters are dirty.	3. Service the air filters.
	4. The fuel filter is clogged.	4. Replace the fuel filter.
	5. There is air in the fuel.	5. Bleed the nozzles and check for air leaks at fuel hose connections and fittings between the fuel tank and engine.
	6. The fuel pump is damaged.	6. Contact your Authorized Service Dealer.
	7. There is low compression	7. Contact your Authorized Service Dealer.

Problem	Possible Cause	Corrective Action
The engine overheats.	1. More coolant is needed.	1. Check and add coolant.
	2. There is restricted air flow to the radiator.	2. Inspect and clean the radiator screen with every use.
	3. The engine-oil level is incorrect.	3. Fill or drain to the Full mark.
	4. The engine load is excessive.	4. Reduce the load; use a lower ground speed.
	5. Incorrect fuel is in the fuel system.	5. Drain and flush the fuel system; add fresh fuel.
	6. The thermostat is damaged.	6. Contact your Authorized Service Dealer.
	7. The fan belt is loose or broken.	7. Contact your Authorized Service Dealer.
	8. Injection timing is incorrect.	8. Contact your Authorized Service Dealer.
	9. The coolant pump is damaged.	9. Contact your Authorized Service Dealer.
The engine loses power.	1. The engine load is excessive.	1. Reduce the load; use a lower ground speed.
	2. The engine-oil level is incorrect.	2. Fill or drain to the Full mark.
	3. The air-cleaner filters are dirty.	3. Service the air filters.
	4. Dirt, water, stale fuel, or incorrect fuel is in the fuel system.	4. Drain and flush the fuel system; add fresh fuel.
	5. The engine is overheating.	5. Refer to “The engine overheats.”
	6. The spark-arrestor screen is clogged.	6. Clean or replace the spark-arrestor screen.
	7. There is air in the fuel.	7. Bleed the nozzles and check for air leaks at fuel hose connections and fittings between the fuel tank and engine.
	8. There is low compression	8. Contact your Authorized Service Dealer.
	9. The fuel-tank vent is restricted.	9. Contact your Authorized Service Dealer.
	10. The injection-pump timing is incorrect.	10. Contact your Authorized Service Dealer.
	11. The injection pump is damaged.	11. Contact your Authorized Service Dealer.
Exhaust produces excessive black smoke.	1. The engine load is excessive.	1. Reduce the load; use a lower ground speed.
	2. The air-cleaner filters are dirty.	2. Service the air filters.
	3. Incorrect fuel is in the fuel system.	3. Drain and flush the fuel system; add fresh fuel.
	4. The injection-pump timing is incorrect.	4. Contact your Authorized Service Dealer.
	5. The injection pump is damaged.	5. Contact your Authorized Service Dealer.
	6. The injection nozzles are damaged.	6. Contact your Authorized Service Dealer.

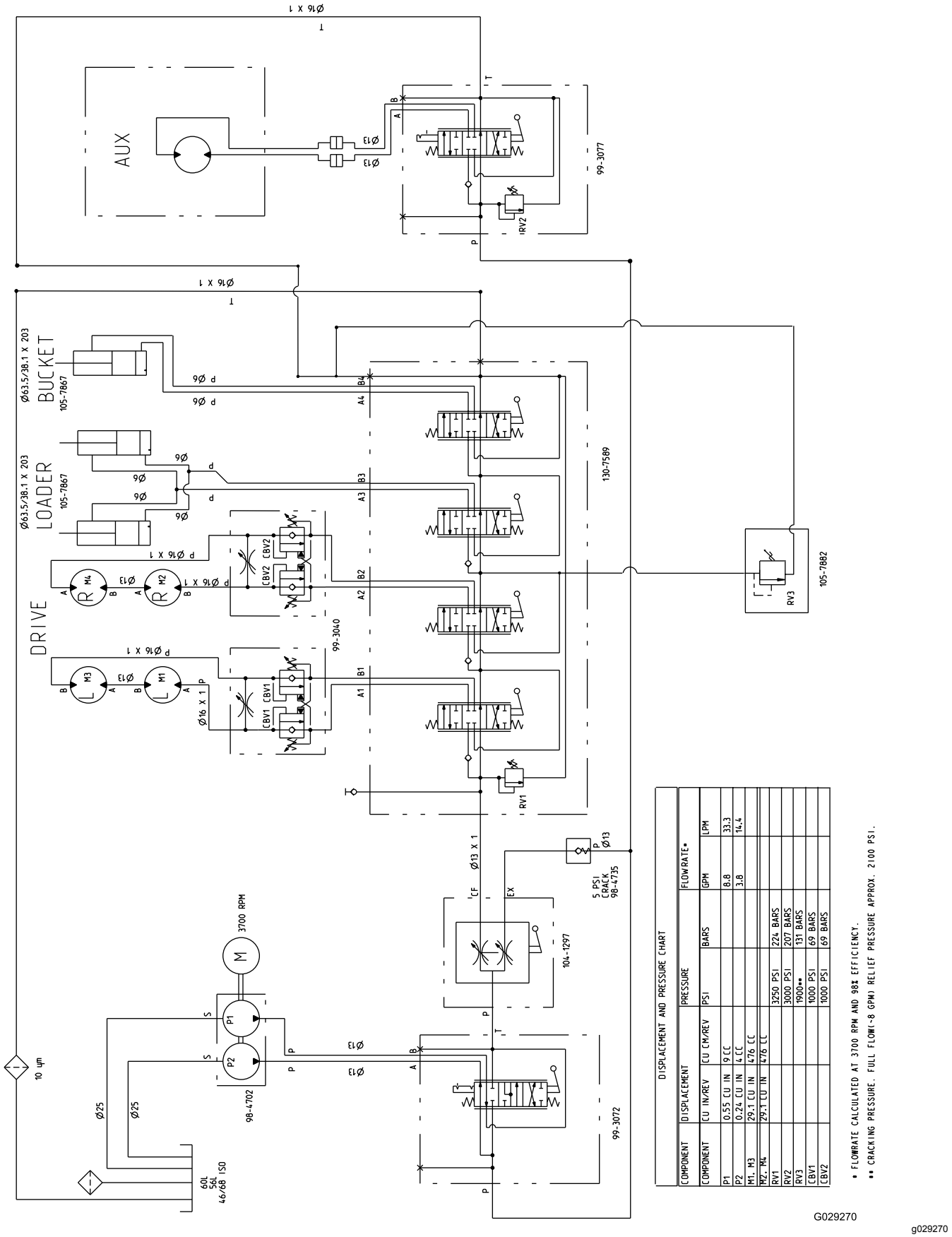
Problem	Possible Cause	Corrective Action
Exhaust produces excessive white smoke.	1. The key was turned to the START position before the glow-plug light turned off.	1. Turn the key to the RUN position and allow the glow-plug light to turn off before starting the engine.
	2. The engine temperature is low.	2. Check the thermostat.
	3. The glow plugs are inoperative.	3. Check the fuse, glow plugs and wiring.
	4. The injection-pump timing is incorrect.	4. Contact your Authorized Service Dealer.
	5. The injection nozzles are damaged.	5. Contact your Authorized Service Dealer.
	6. There is low compression.	6. Contact your Authorized Service Dealer.
The machine does not drive.	1. The parking brake is engaged.	1. Disengage the parking brake.
	2. The hydraulic-fluid level is low.	2. Add hydraulic fluid to the reservoir.
	3. The hydraulic system is damaged.	3. Contact your Authorized Service Dealer.
	4. The tow valves are open.	4. Close the tow valves.
	5. The flow-divider valve lever is in 9 o'clock position.	5. Move the lever to the 12 o'clock to 10 o'clock position.
	6. A traction pump drive coupler is loose or broken.	6. Contact your Authorized Service Dealer.
	7. Pump and/or wheel motor is damaged.	7. Contact your Authorized Service Dealer.
	8. The control valve is damaged.	8. Contact your Authorized Service Dealer.
	9. The relief valve is damaged.	9. Contact your Authorized Service Dealer.

Schematics



g030503

Electrical Schematic (Rev. C)



DISPLACEMENT AND PRESSURE CHART						
COMPONENT	DISPLACEMENT		PRESSURE		FLOWRATE•	
COMPONENT	CU IN/REV	CU CM/REV	PSI	BARS	GPM	LPM
P1	0.55 CU IN	9 CC			8.8	33.3
P2	0.24 CU IN	4 CC			3.8	14.4
M1, M3	29.1 CU IN	476 CC				
M2, M4	29.1 CU IN	476 CC				
RV1			3250 PSI	224 BARS		
RV2			3000 PSI	207 BARS		
RV3			1900••	131 BARS		
CBV1			1000 PSI	69 BARS		
CBV2			1000 PSI	69 BARS		

• FLOWRATE CALCULATED AT 3700 RPM AND 98% EFFICIENCY.
•• CRACKING PRESSURE. FULL FLOW(~8 GPM) RELIEF PRESSURE APPROX. 2100 PSI.

g029270

Hydraulic Schematic (Rev. B)

Notes:

Notes:

Notes:

International Distributor List

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

European Privacy Notice

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

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

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

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

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

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

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

Australian Consumer Law

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

The Toro Warranty

A One-Year Limited Warranty

Compact Utility Equipment (CUE) Products

Conditions and Products Covered

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrant your Toro Compact Utility Equipment ("Product") to be free from defects in materials or workmanship. The following time periods apply from the date of purchase:

Products	Warranty Period
Pro Sneak Compact Tool Carriers, Trenchers, Stump Grinders, and Attachments	1 year or 1000 operating hours, whichever occurs first
Kohler Engines	3 years*
All other Engines	2 years*

Where a warrantable condition exists, we will repair the Product at no cost to you including diagnosis, labor, and parts.

*Some engines used on Toro Products are warranted by the engine manufacturer.

Instructions for Obtaining Warranty Service

If you think that your Toro Product contains a defect in materials or workmanship, follow this procedure:

1. Contact any Authorized Toro Compact Utility Equipment (CUE) Service Dealer to arrange service at their dealership. To locate a dealer convenient to you, access our website at www.Toro.com. You may also call our Toro Customer Care Department toll free at the number below.
2. Bring the product and your proof of purchase (sales receipt) to the Service Dealer.
3. If for any reason you are dissatisfied with the Service Dealer's analysis or with the assistance provided, contact us at:

   SWS Customer Care Department
   Toro Warranty Company
   8111 Lyndale Avenue South
   Bloomington, MN 55420-1196
   Toll Free: 888-384-9940

Owner Responsibilities

You must maintain your Toro Product by following the maintenance procedures described in the *Operator's Manual*. Such routine maintenance, whether performed by a dealer or by you, is at your expense. Parts scheduled for replacement as required maintenance ("Maintenance Parts"), are warranted for the period of time up to the scheduled replacement time for that part. 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 express 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, modified, or unapproved accessories
- Product failures which result from failure to perform required maintenance and/or adjustments
- 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, belts, wipers, spark plugs, tires, filters, gaskets, wear plates, seals, O-rings, drive chains, clutches.
- Failures caused by outside influence. Items considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved coolants, lubricants, additives, or chemicals, etc.
- Normal "wear and tear" items. Normal "wear and tear" includes, but is not limited to, worn painted surfaces, scratched decals, etc.
- Repairs necessary due to failure to follow recommended fuel procedure (consult *Operator's Manual* for more details)
  - Removing contaminants from the fuel system is not covered
  - Use of old fuel (more than one month old) or fuel which contains more than 10% ethanol or more that 15% MTBE
  - Failure to drain the fuel system prior to any period of non-use over one month
- Any component covered by a separate manufacturer's warranty
- Pickup and delivery charges

General Conditions

Repair by an Authorized Toro Compact Utility Equipment (CUE) Service 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. 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.

Except for the engine warranty coverage and the Emissions warranty referenced below, if applicable, there is no other express 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) 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 California 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 outside the United States or Canada should contact their Toro Distributor (Dealer) to obtain guarantee policies for your country, province, or state. If for any reason you are dissatisfied with your Distributor's service or have difficulty obtaining guarantee information, contact the Toro importer. If all other remedies fail, you may contact us at Toro Warranty Company.

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