Form No. 3413-874 Rev A

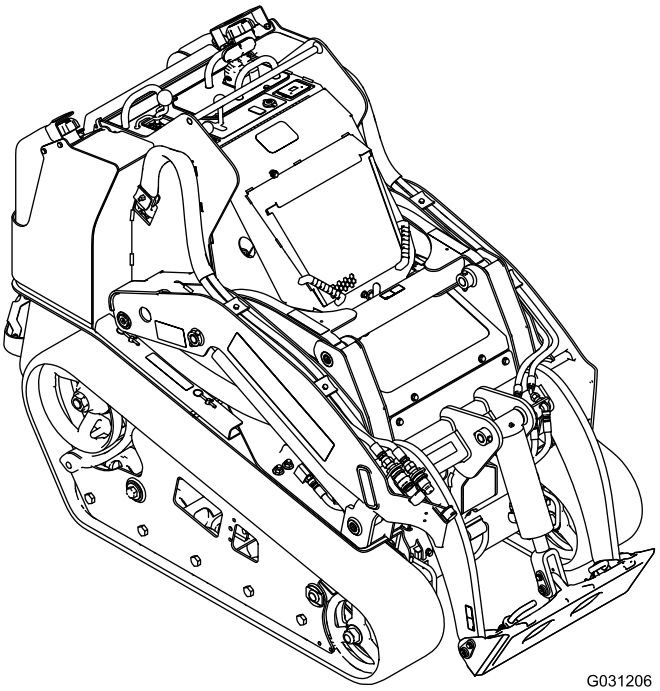
TORO®

Count on it.

Operator's Manual

TX 1000 Compact Tool Carrier

Model No. 22327—Serial No. 400414000 and Up
Model No. 22327G—Serial No. 400414000 and Up
Model No. 22327HD—Serial No. 400414000 and Up
Model No. 22328—Serial No. 400414000 and Up
Model No. 22328HD—Serial No. 400414000 and Up



G031206

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

CE

3413-874 A

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

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

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

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

⚠ 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).

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

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

Introduction

This machine is a compact tool carrier intended to move various earth and materials 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.

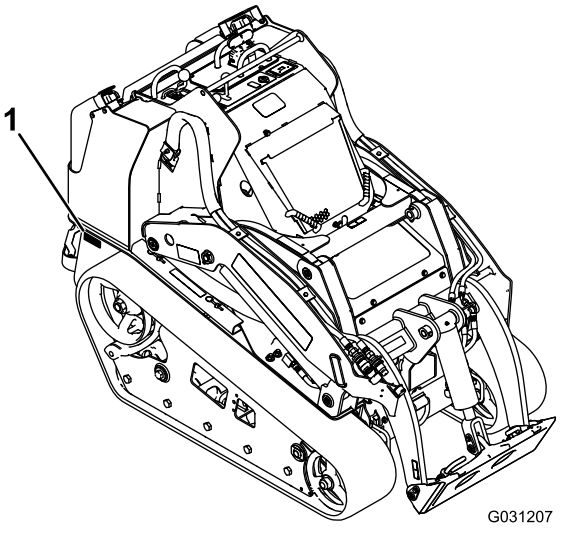


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Figure 1

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
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.

8111 Lyndale Avenue South
Bloomington, MN 55420

Contents

Safety

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

Safe Operating Practices

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 gas 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.

- Do not operate the machine on hillsides or slopes exceeding the angles recommended on Stability Data (page 7), and those in the attachment *Operator's Manual*. See also the Slope Indicator (page 8).
- **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, engaging the parking brake (if equipped), and chocking the tracks.
- On machines with an operator platform, 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 before making any repairs; refer to Using the Battery-Disconnect Switch (page 35).
- 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.

Stability Data

The following tables list the maximum slope recommended for the traction unit in the positions listed in the tables. Slopes over the listed degree may cause the traction unit to become unstable. The data in the tables assume that the loader arms are fully lowered; raised arms may affect the stability.

In each attachment manual is a set of 3 stability ratings, 1 for each hill position. To determine the maximum slope you can traverse with the attachment installed, find the degree of slope that corresponds to the stability ratings of the attachment. Example: If the attachment installed on a TX Model 22327 traction unit has a front uphill rating of B, a Rear Uphill rating of D, and a Side Uphill rating of C, then you could drive forward up a 19° slope, rearward up a 11° slope, or sideways on a 11° slope, as listed in the following table.

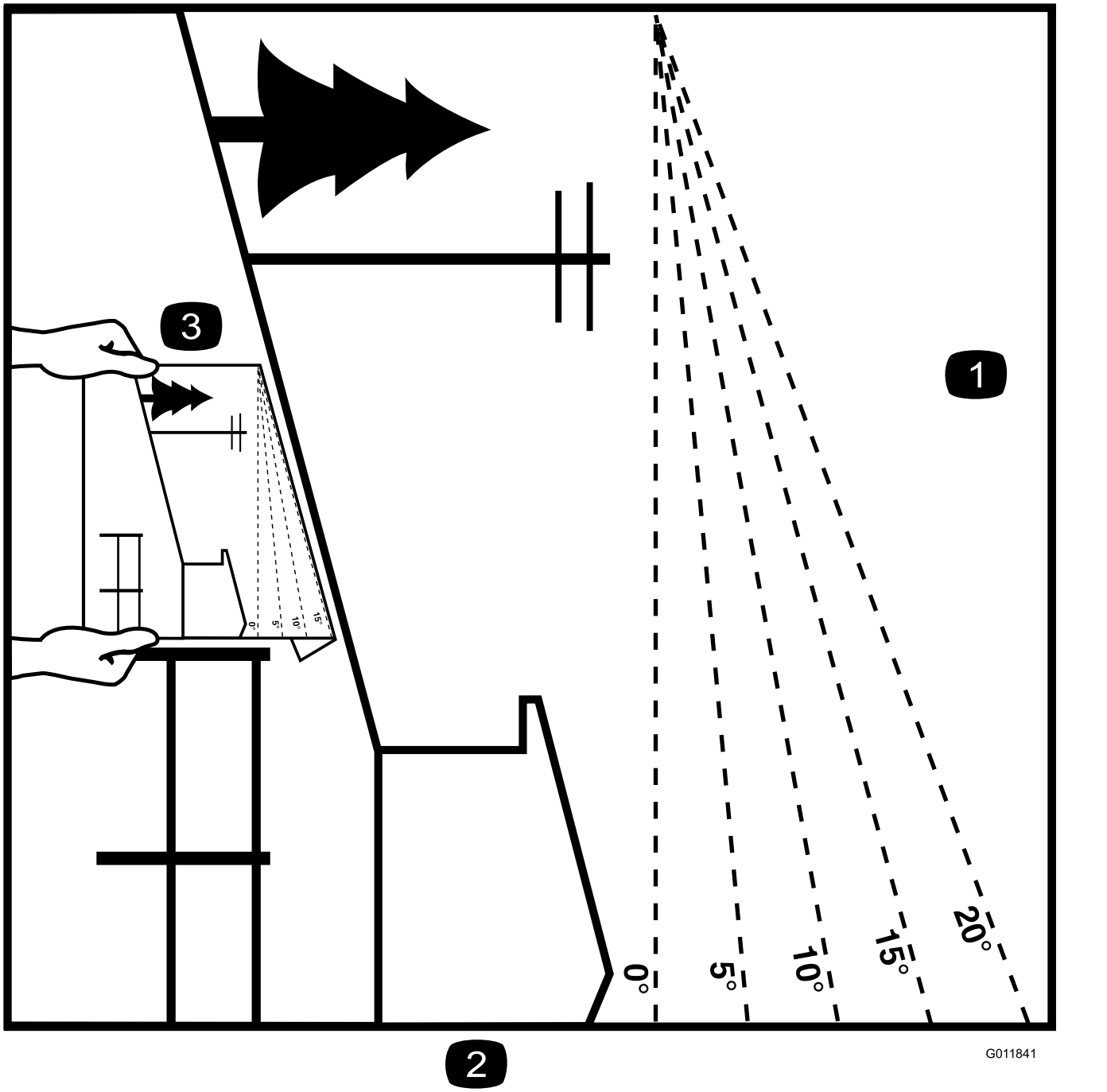
Models 22327, 22327G, and 22327HD

Configuration	Maximum Recommended Slope when Operating with: Front Uphill 	Rear Uphill 	Side Uphill 
Traction unit without attachment	15°	19°	16°
Traction unit with an attachment rated with 1 of the following stability ratings for each slope position:*			
A	25°	25°	20°
B	19°	20°	15°
C	16°	17°	11°
D	14°	11°	8°
E	5°	5°	5°

Model 22328 and 22328HD

Configuration	Maximum Recommended Slope when Operating with: Front Uphill 	Rear Uphill 	Side Uphill 
Traction unit without attachment	16°	19°	19°
Traction unit with an attachment rated with 1 of the following stability ratings for each slope position:*			
A	25°	25°	23°
B	21°	19°	18°
C	18°	15°	14°
D	15°	10°	10°
E	5°	5°	5°

Slope Indicator



g011841

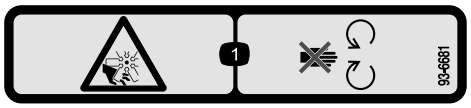
Figure 3

This page may be copied for personal use.

1. To determine the maximum slope you can safely operate the machine on, refer to the Stability Data section. Use the slope indicator to determine the degree of slope of hills before operating. **Do not operate this machine on a slope greater than that specified in the Stability Data section.** Fold along the appropriate line to match the recommended slope.
2. Align this edge with a vertical surface, a tree, building, fence pole, etc.
3. Example of how to compare slope with folded edge

Safety and Instructional Decals

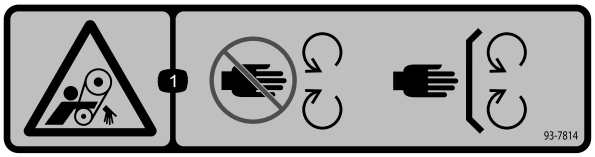
Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or missing.



decal93-6681

93-6681

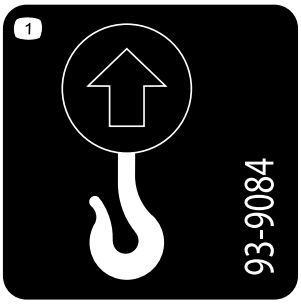
1. Cutting/dismemberment hazard, fan—stay away from moving parts.



decal93-7814

93-7814

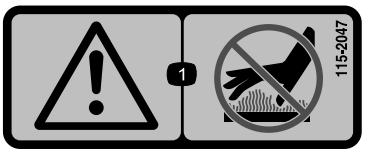
1. Entanglement hazard, belt—stay away from moving parts.



decal93-9084

93-9084

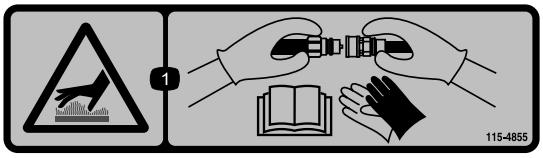
1. Lift point/Tie-down point



decal115-2047

115-2047

1. Warning—do not touch the hot surface.



decal115-4855

115-4855

1. Hot surface/burn hazard—wear protective gloves when handling the hydraulic couplers and read the *Operator's Manual* for information on handling hydraulic components.

decal115-4858

115-4858

1. Crushing hazard of hands or feet—install the cylinder lock.

decal115-4865

115-4865

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

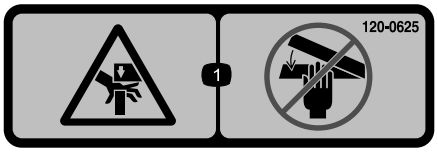
decal117-2718

117-2718

decal117-3276

117-3276

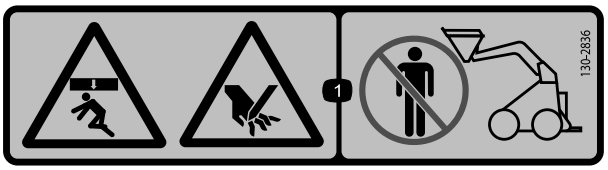
1. Engine coolant under pressure
2. Explosion hazard—read the *Operator's Manual*.
3. Warning—do not touch the hot surface.
4. Warning—read the *Operator's Manual*.



decal120-0625

120-0625

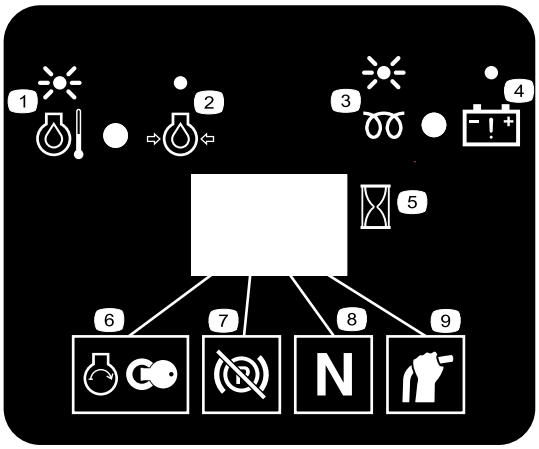
1. Pinch point, hand—keep hands away.



decal130-2836

130-2836

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



decal130-7637

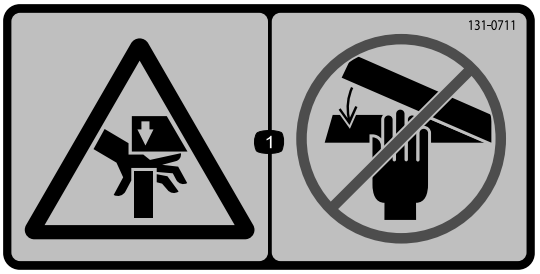
130-7637

1. Blinking light—engine-coolant temperature
2. Steady light—engine-oil pressure
3. Blinking light—glow plug
4. Steady light—battery warning
5. Hourmeter
6. Engine start
7. Parking brake disengaged
8. Traction neutral
9. Auxiliary lever neutral

decal131-0709

131-0709

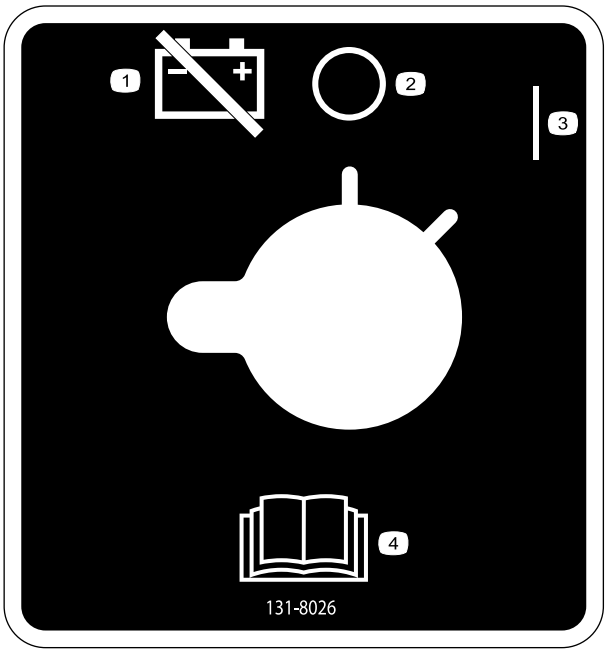
1. Parking brake—engage
2. Parking brake—disengage



decal131-0711

131-0711

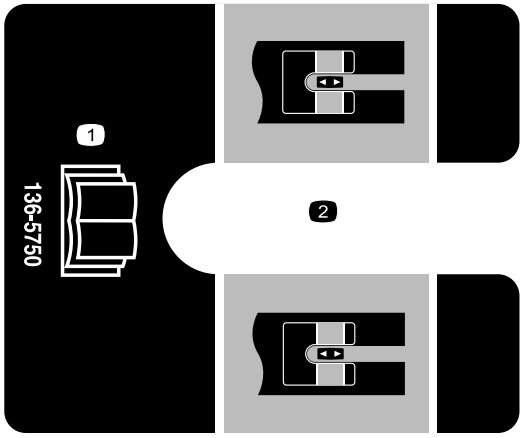
1. Crushing hazard—keep away from pinch points and actuating parts.



decal131-8026

131-8026

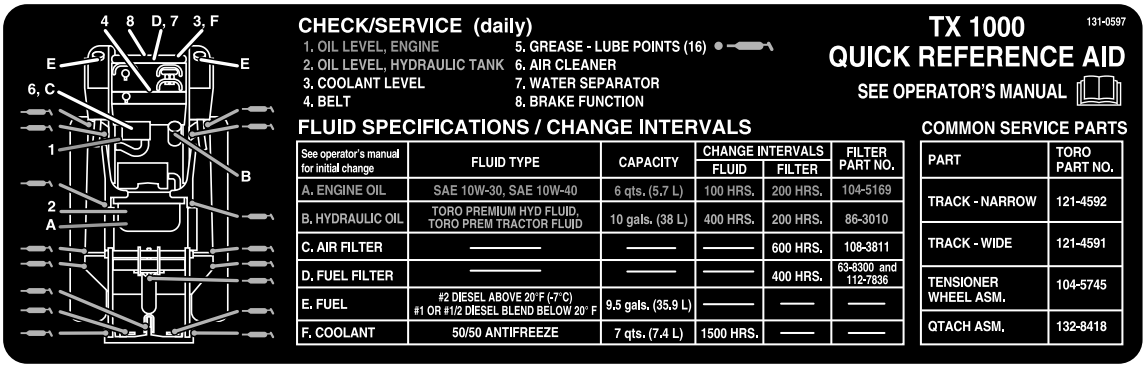
1. Battery power—disconnect
2. On
3. Off
4. Read the *Operator's Manual*.



decal136-5750

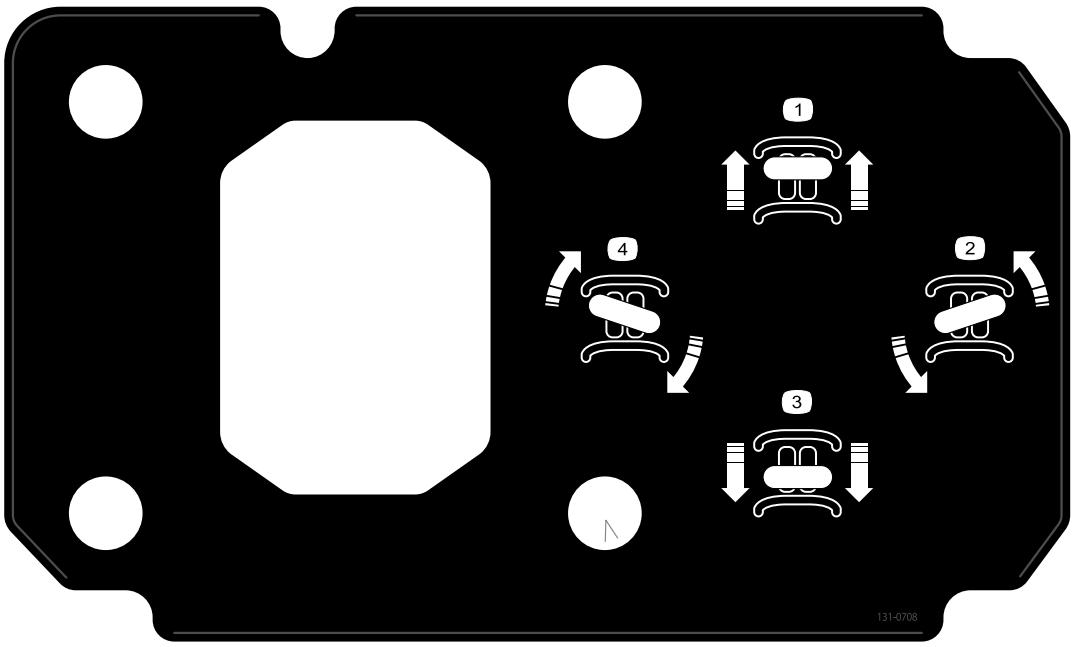
136-5750

1. Read the *Operator's Manual*.
2. Tension block guide



decal131-0597

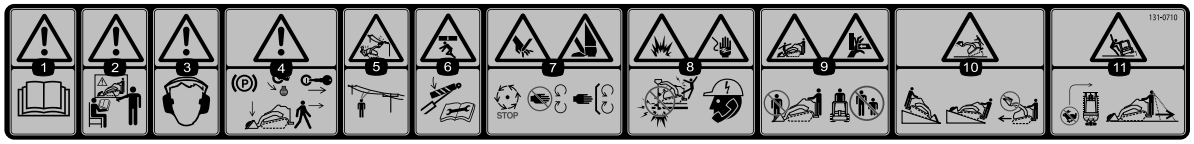
131-0597



decal131-0708

131-0708

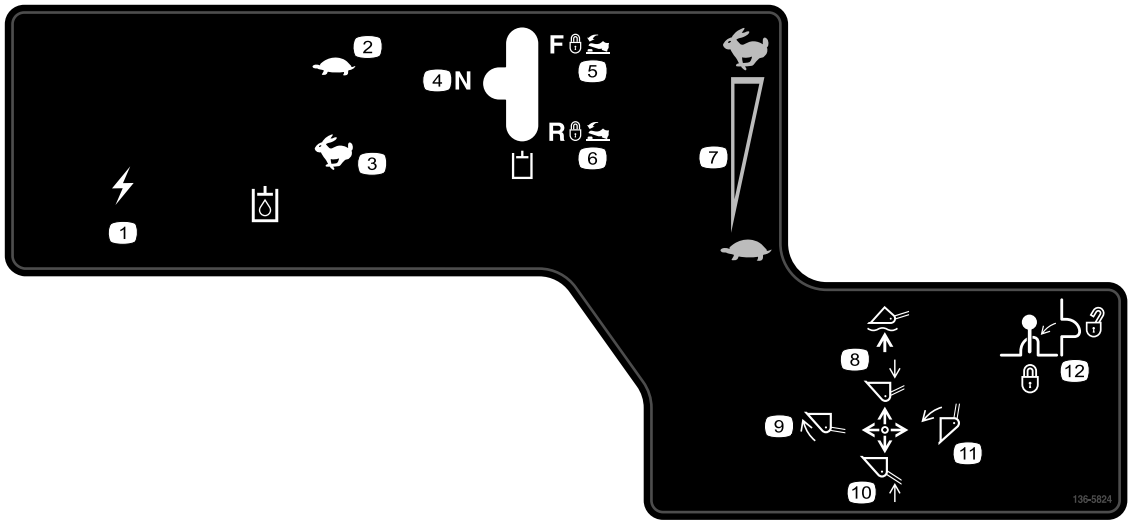
1. Move forward
2. Turn right
3. Move rearward
4. Turn left



decal131-0710

131-0710

1. Warning—read the *Operator's Manual*.
2. Warning—receive training before operating the machine.
3. Warning—wear hearing protection.
4. Warning—engage the parking brake, lower the bucket to the ground, shut off the engine, and remove the key from the ignition before leaving the machine.
5. Electrocution hazard, power lines—check for power lines in the area before using the machine.
6. Crushing hazard—keep away from pinch points; read the *Operator's Manual* before servicing or performing maintenance.
7. Cutting/severing hazard of hand or foot—wait for all moving parts to stop before servicing; keep away from moving parts; keep all guards and shields in place.
8. Explosion hazard; electrocution hazard—call the local utilities hotline before beginning work in an area.
9. Crushing hazard—keep away from the bucket when operating the machine; keep bystanders away from the machine.
10. Tipping hazard—always move up or down slopes with the bucket lowered; never drive on a slope with the bucket raised; always operate with the heavy end uphill; always carry loads low; never jerk the control levers; use a steady, even motion.
11. Tipping hazard—do not make fast turns; always check behind you before reversing the machine.

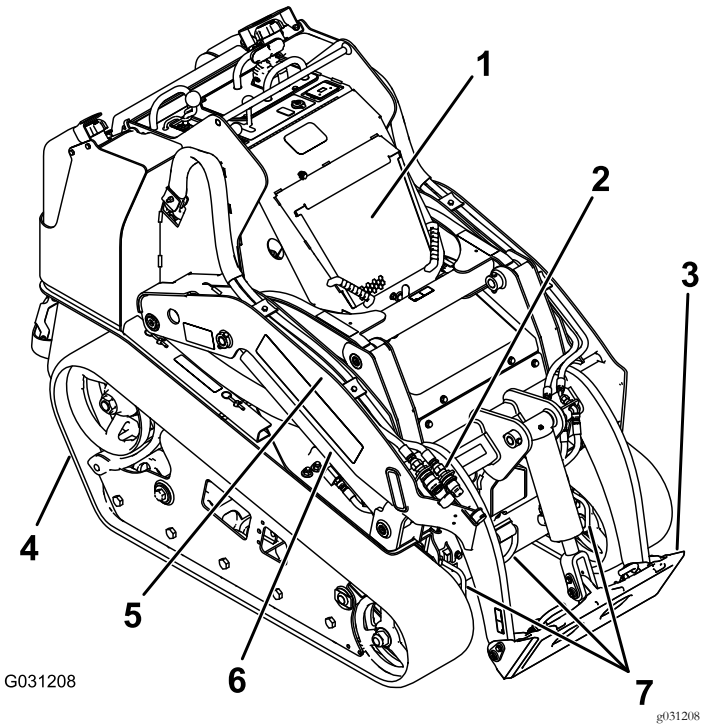


decal136-5824

136-5824

1. Power socket
2. Hydraulic fluid—slow
3. Hydraulic fluid—fast
4. Hydraulic attachment—neutral
5. Hydraulic attachment—forward
6. Hydraulic attachment—reverse
7. Engine speed
8. Lower/float the attachment.
9. Tilt the attachment forward.
10. Raise the attachment.
11. Tilt the attachment rearward.
12. Lever lock

Product Overview



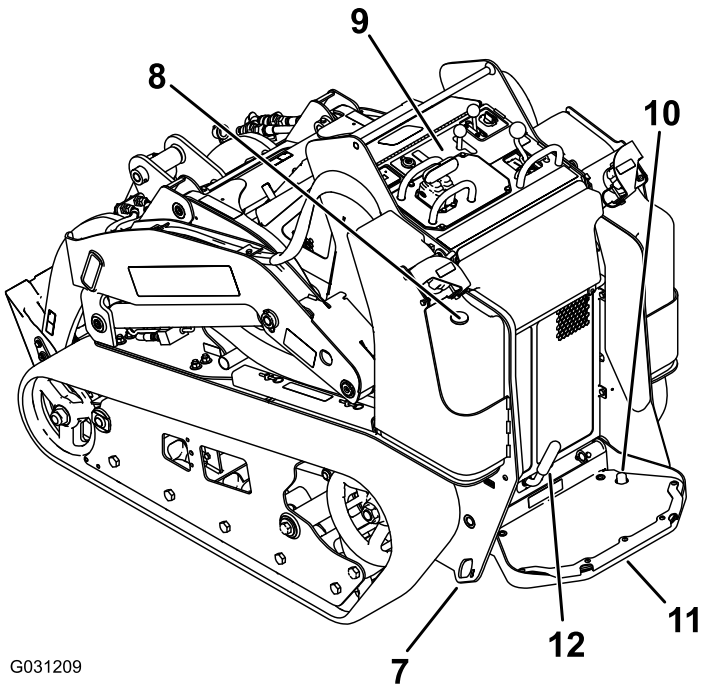


Figure 4

1. Hood
2. Auxiliary hydraulic couplers
3. Mount plate
4. Track
5. Loader arm
6. Lift cylinder
7. Tie-down/lift loop
8. Fuel gauge
9. Control panel
10. Auxiliary hydraulics lock switch
11. Operator platform
12. Parking brake

Controls

Become familiar with all the controls (Figure 5) before you start the engine and operate the traction unit.

Control Panel

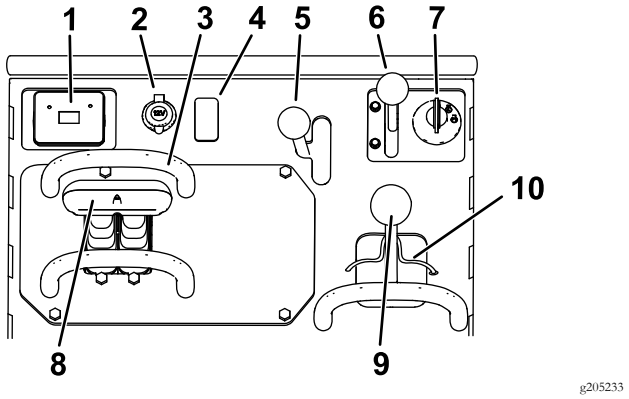


Figure 5

1. Message display
2. Power socket
3. Reference bar
4. Plug
5. Auxiliary hydraulics lever
6. Throttle lever
7. Key switch
8. Traction control
9. Loader-arm/attachment-tilt lever
10. Loader lock

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 20).

Throttle Lever

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

Reference Bar

When driving the traction unit, use the reference bar as a handle and a leverage point for controlling the traction control and the auxiliary-hydraulics lever. To ensure smooth, controlled operation, do not take both hands off the reference bar while operating the machine.

Traction Control

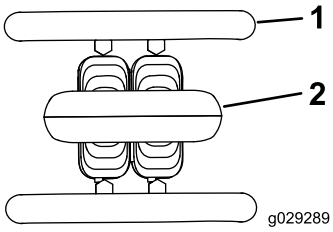


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Figure 6

1. Reference bar
2. Traction control

- To move forward, move the traction control forward (Figure 7).

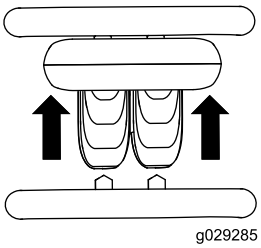

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Figure 7

- To move rearward, move the traction control rearward (Figure 8).

  Important: When reversing, look behind you for obstructions and keep your hands on the reference bar.

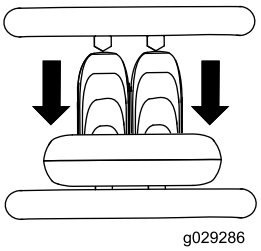

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Figure 8

- To turn right, rotate the traction control clockwise (Figure 9).

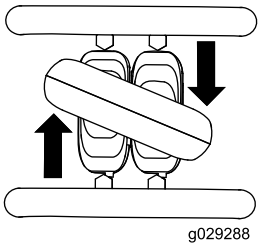

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Figure 9

- To turn left, rotate the traction control counterclockwise (Figure 10).

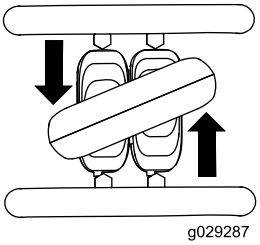

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Figure 10

- To stop the machine, release the traction control (Figure 6).

Note: The farther you move the traction control in any direction, the faster the machine moves in that direction.

Loader Arm/Attachment-Tilt Lever

- To tilt the attachment forward, slowly move the lever to the right (Figure 11).
- To tilt the attachment rearward, slowly move the lever to the left (Figure 11).
- To lower the loader arms, slowly move the lever forward (Figure 11).
- To raise the loader arms, slowly move the lever rearward (Figure 11).
- To lower the loader arms to a detent (float) position, push the lever fully forward (Figure 11).

Note: This allows attachments such as the leveler and the hydraulic blade to follow the contours of the ground (i.e., float) when grading.

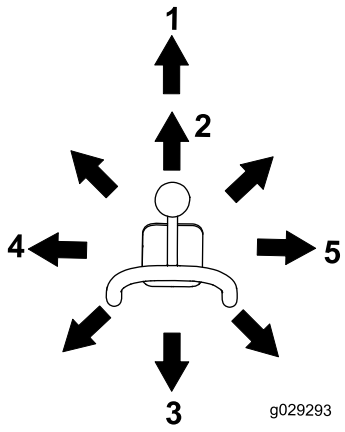

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Figure 11

1. Detent (float) position
2. Lower the loader arms.
3. Raise the loader arms.
4. Tilt the attachment rearward.
5. Tilt the attachment forward.

By moving the lever to an intermediate position (e.g., forward and left), you can move the loader arms and tilt the attachment at the same time.

Loader-Valve Lock

The loader-valve lock secures the loader arm/attachment-tilt lever so that you cannot push it 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, lift up on it so that it clears the hole in the control panel and swing it to the left, in front of the loader-arm lever, pushing it down into the locked position (Figure 12).

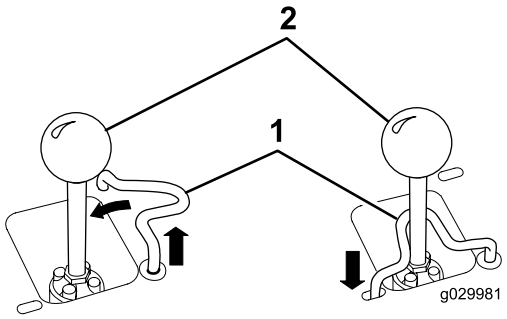

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Figure 12

1. Loader arm/attachment-tilt lever
2. Loader-valve lock

Loader-Control-Reference Bar

The loader-control-reference bar helps stabilize your hand while operating the loader arm/attachment-tilt lever (Figure 4).

Auxiliary-Hydraulics Lever

- To operate a hydraulic attachment in the forward direction, move the auxiliary-hydraulics lever forward (Figure 13).
- To operate a hydraulic attachment in the reverse direction, move the auxiliary-hydraulics lever rearward (Figure 13).

Note: If you release the lever while in the FORWARD or REVERSE position, the lever automatically returns to the NEUTRAL position (Figure 13).

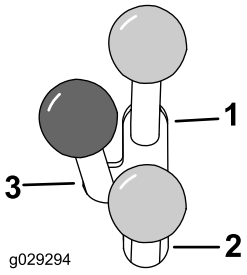

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Figure 13

1. Forward-flow hydraulics
2. Reverse-flow hydraulics
3. Neutral

Auxiliary-Hydraulics-Lock Switch

Use your right foot to press the auxiliary-hydraulics-lock switch to lock the auxiliary-hydraulics lever in the FORWARD or REARWARD position and free your hand for other controls (Figure 5).

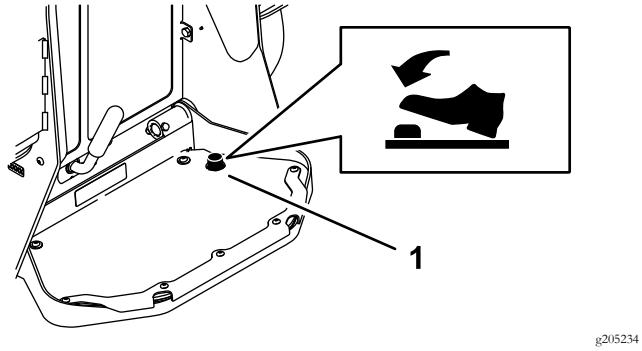

Figure 14

1. Auxiliary-hydraulics-lock

Parking-Brake Lever

- To engage the parking brake, rotate the lever to left (Figure 15).

  Note: The traction unit may roll slightly before the brakes engage in the drive sprocket.

- To release the brake, rotate the brake lever to the right.

  Note: You may need to adjust the traction control to release the brake pins and rotate the lever.

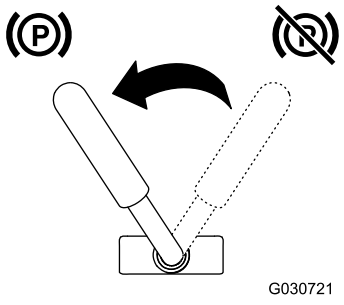

Figure 15

Fuel Gauge

This gauge measures the amount of fuel in the fuel tank(s).

Message Display

Engine-Coolant-Temperature Light

If the engine coolant becomes too hot, the light on the left flashes and the horn sounds (Figure 16). If this happens, disengage the auxiliary hydraulics and let the machine run at high idle to allow the cooling system to cool the machine. Check the coolant level when the engine has fully cooled.

Important: Do not shut off the engine, as this may cause the machine to overheat.

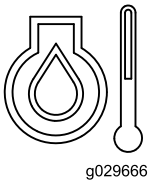

Figure 16

Engine-Oil-Pressure Light

If the engine-oil-pressure becomes too low, the light on the left illuminates steadily (Figure 17). If this happens, shut off the engine immediately and check the oil level. If it is low, add oil and look for possible leaks.

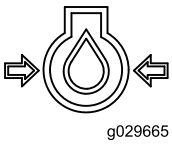

Figure 17

Glow-Plug Light

The light on the right flashes while the glow plugs are charged and warming the engine (Figure 18).

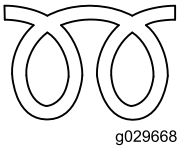

Figure 18

Battery-Charge Light

If the battery charge becomes too low, the light on the right illuminates steadily (Figure 19). If this happens, shut off the engine and charge or replace the battery. Refer to Servicing the Battery (page 34).

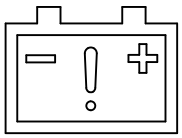

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Figure 19

Hour Meter

The hour meter displays the number of hours of operation that have been logged on the traction unit and the following indicators:

- Engine start—displays when you start the engine

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Figure 20

- Parking brake—displays when you disengage the parking brake

g030520

Figure 21

- Traction neutral—displays when the traction control is in the NEUTRAL position

g029211

Figure 22

- Auxiliary lever neutral—displays when the auxiliary lever is in the NEUTRAL position

g029975

Figure 23

Specifications

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

Model 22327	
Width	85 cm (33 inches)
Length	256 cm (101 inches)
Height	138 cm (54 inches)
Weight	1234 kg (2,720 lb)
Operating capacity (with standard bucket)	454 kg (1,000 lb)
Tipping capacity (with standard bucket)	1296 kg (2,857 lb)
Wheelbase	104 cm (41 inches)
Dump height (with standard bucket)	155 cm (61 inches)
Reach—fully raised (with standard bucket)	62 cm (25 inches)
Height to hinge pin (with standard bucket in highest position)	206 cm (81 inches)

Model 22328	
Width	103 cm (41 inches)
Length	256 cm (101 inches)
Height	138 cm (54 inches)
Weight	1297 kg (2,860 lb)
Operating capacity (with standard bucket)	454 kg (1,000 lb)
Tipping capacity (with standard bucket)	1296 kg (2,857 lb)
Wheelbase	104 cm (41 inches)
Dump height (with standard bucket)	155 cm (61 inches)
Reach—fully raised (with standard bucket)	62 cm (25 inches)
Height to hinge pin (with standard bucket in highest position)	206 cm (81 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 and remove debris from the traction unit. 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.

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.

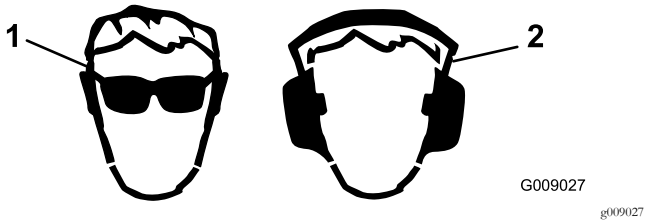

Figure 24

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 Tanks

Fuel tank capacity: 41 L (11 US gallons)

Fill the fuel tanks as shown in Figure 25.

Note: The fuel-tank caps click when you close them securely. Use the brackets to lock the fuel tanks.

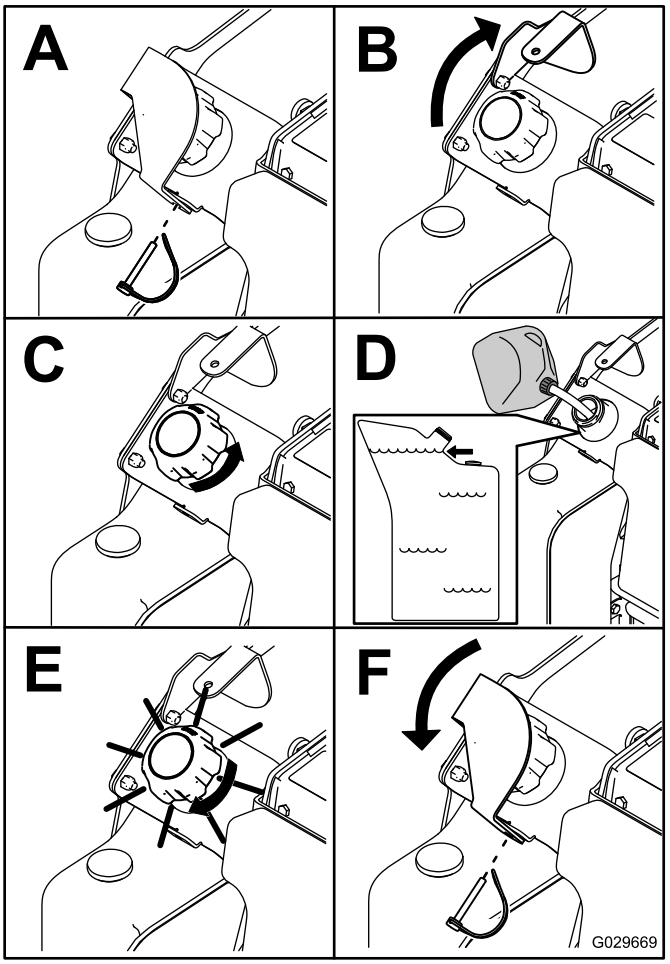

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Figure 25

Performing Daily Maintenance

Before starting the machine each day, perform the Each Use/Daily procedures listed in the Maintenance (page 25).

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 45) and Bleeding the Fuel System (page 34).

Starting the Engine

1. Ensure that the auxiliary-hydraulics lever and traction-control are in the NEUTRAL position.
2. Move the throttle lever midway between the SLOW and FAST positions.
3. Insert the key into the key switch and turn it to the ON position.
4. Wait for the glow-plug indicator light to stop blinking.
5. Turn the key to the START position. When the engines starts, release the key.

   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

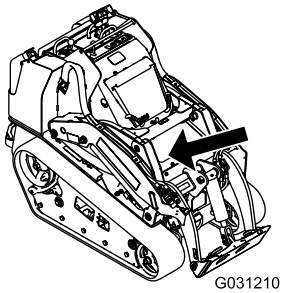
A child or untrained bystander could attempt to operate the traction unit and be injured.

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. Open the hood and secure the hood prop.
3. Remove the side screens; refer to Removing the Side Screens (page 28).
4. Using a wrench, turn the tow valves on the hydraulic pumps twice counterclockwise (Figure 26).



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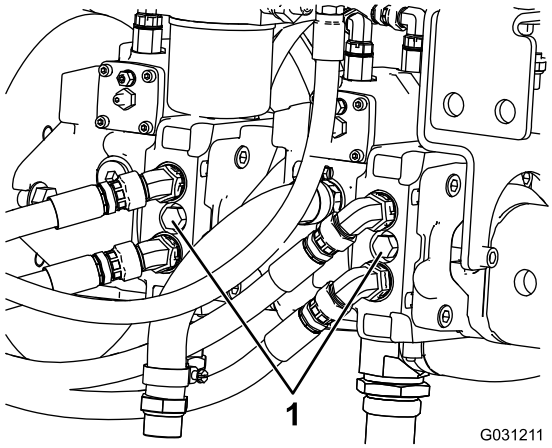

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Figure 26

1. Tow valve

5. Tow the machine as required.
6. After repairing the machine, close the tow valves before operating it.

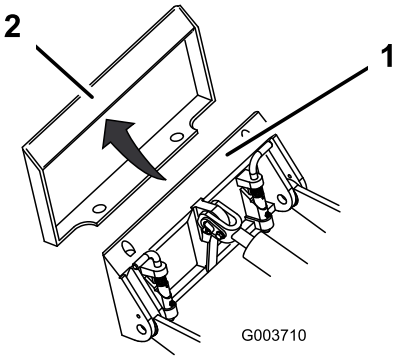
Using Attachments

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 27).



g003710

Figure 27

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 28).

   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.

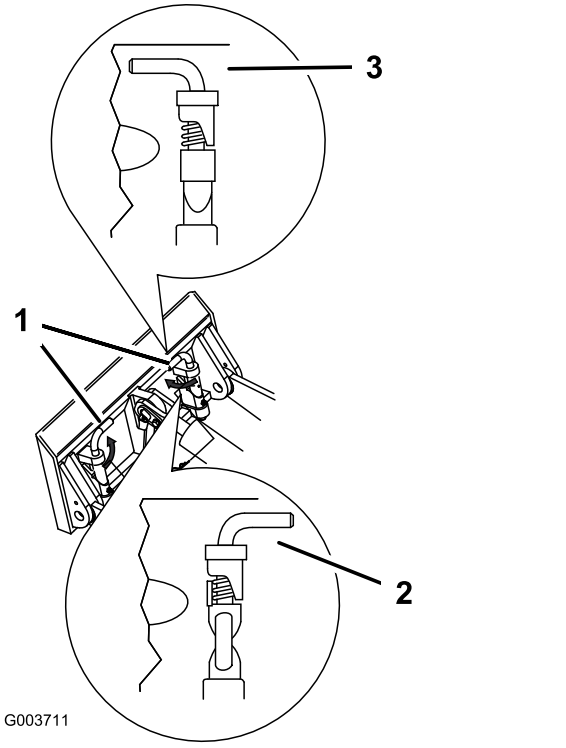


Figure 28

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 29).

- **Use only a full-width ramp; do not use individual ramps for each side of the machine.**
- **Do not exceed a 15-degree angle between the ramp and the ground or between the ramp and the trailer or truck.**
- **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. This ensures that ramp angle does not exceed 15 degrees on flat ground.**

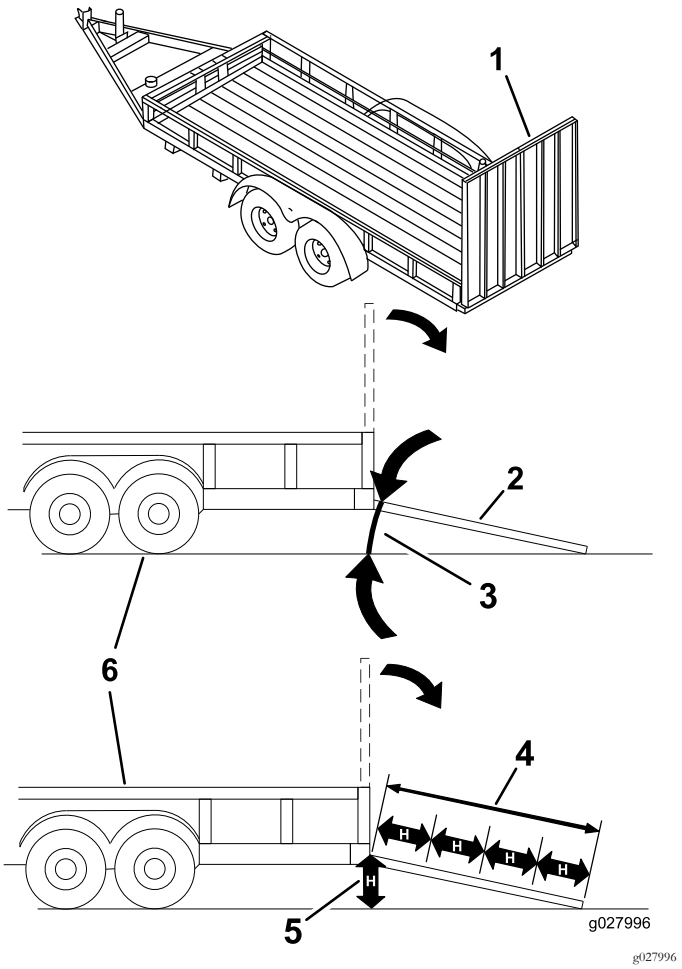


Figure 29

1. Full-width ramp in stowed position
2. Side view of full-width ramp in loading position
3. Not greater than 15 degrees
4. Ramp is at least 4 times as long as the height of the trailer or truck bed to the ground
5. H=height of the trailer or truck bed to the ground
6. 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, ensuring that the angle between the ramp and the ground does not exceed 15 degrees (Figure 29).
4. Lower the loader arms.
5. Load the machine onto the trailer with the heavy end up the ramp, carrying loads low (Figure 30).
   - 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.

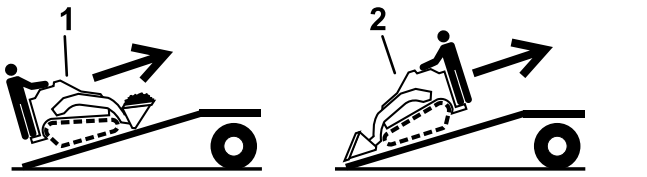


Figure 30

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 31). Refer to local regulations for tie-down requirements.

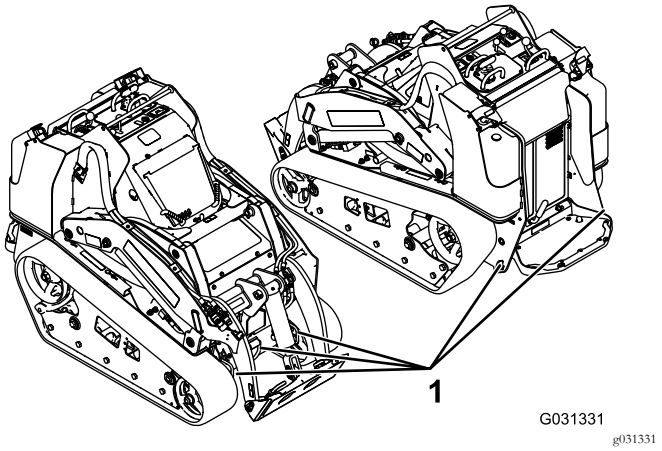


Figure 31

1. Tie-down loops

Unloading the Machine

1. Lower the ramp, ensuring that the angle between the ramp and the ground does not exceed 15 degrees (Figure 30).
2. Unload the machine from the trailer with the heavy end up the ramp, carrying loads low (Figure 32).
   - 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.

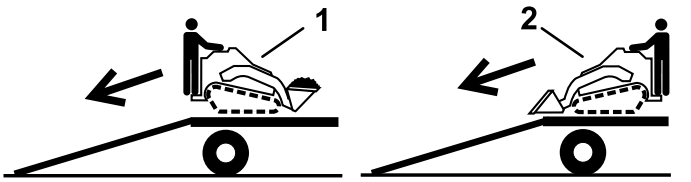


Figure 32

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 31.

Maintenance

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

Remove the key from the key switch and disconnect the wires from the spark plugs before you do any maintenance. Set the wires aside so that they do not accidentally contact the spark plugs.

⚠ 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.

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 8 hours	• Replace the hydraulic filter.
After the first 50 hours	• Change the engine oil and filter. • Check and adjust the track tension.
Before each use or daily	• Grease the machine. (Grease immediately after every washing.) • Check the air-filter-service indicator. • Check the engine-oil level. • Drain water and other contaminants from the fuel filter/water separator. • Clean the tracks. • Check the tracks for excessive wear and proper tension. • Clean the screen, oil cooler, and front of the radiator (more often in dirty or dusty conditions). • Check the coolant level in the expansion tank. • Test the parking brake. • Remove debris from the machine. • Check for loose fasteners.
Every 25 hours	• Remove the air-cleaner cover, clean out debris, and check the air-filter-service indicator. • Check the hydraulic-fluid level.
Every 50 hours	• Check the battery condition.
Every 100 hours	• Change the engine oil. (Service more frequently if conditions are extremely dusty or sandy.) • Check and adjust the track tension. • Check the cooling system hoses. • Check the alternator/fan belt tension (refer to the engine owner's manual for instructions). • Check the hydraulic lines for leaks, loose fittings, kinked lines, loose mounting supports, wear, weather, and chemical deterioration. • Check for dirt buildup in the chassis.
Every 200 hours	• Change the oil filter. (Service more frequently if conditions are extremely dusty or sandy.) • Replace the hydraulic filter.

Maintenance Service Interval	Maintenance Procedure
Every 400 hours	• Replace the fuel filter canister and in-line filter. • Check the fuel lines and connections for deterioration, damage, or loose connections. • Change the hydraulic fluid.
Every 500 hours	• Replace the alternator/fan belt (refer to the engine owner's manual for instructions).
Every 1,500 hours	• Replace all moving hydraulic hoses.
Yearly	• Change the engine coolant (Authorized Service Dealer only).
Yearly or before storage	• Check and adjust the track tension. • Touch up chipped paint.
Every 2 years	• Drain and clean the fuel tank (Authorized Service Dealer only).

Pre-Maintenance Procedures

Using the Cylinder Locks

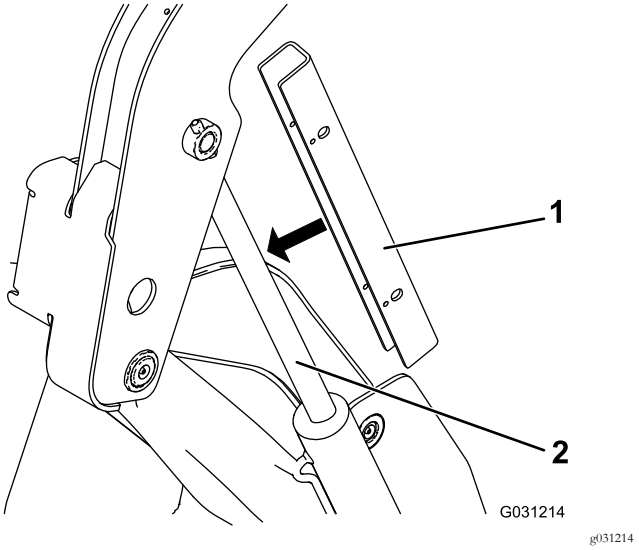
⚠ WARNING

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. Remove the 2 pins securing the cylinder lock to the posts on the side of the machine.
5. Slide the cylinder lock over the lift-cylinder rod (Figure 33).



g031214

Figure 33

1. Cylinder lock
2. Lift-cylinder rod

6. Repeat step 4 and 5 for the other side of the machine.
7. **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 pins securing the cylinder locks.
5. Place the cylinder locks on the posts on the sides of the machine and secure with the pins.
6. Lower the loader arms.

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.

Opening the Hood

1. Loosen the hood-locking screw (Figure 34)

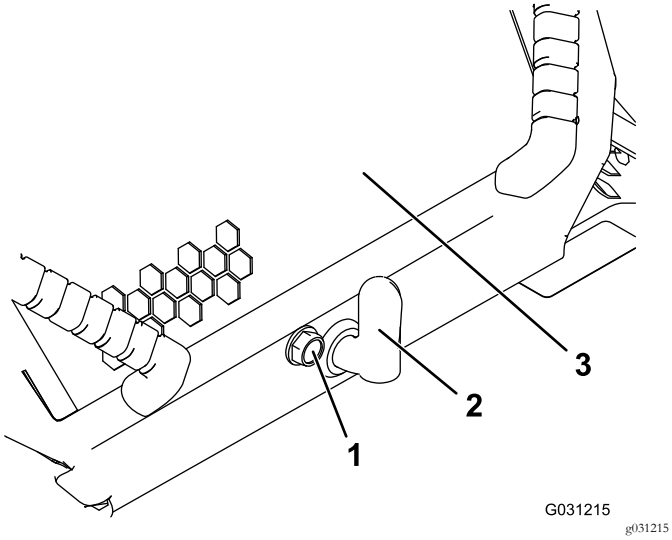


Figure 34

1. Hood-locking screw
2. Hood-latch lever
3. Hood

2. Turn the hood latch clockwise (Figure 34).
3. Lift up on the handles and swing the hood up (Figure 34).
4. Secure the prop rod.

Closing the Hood

1. Lift up on the tab securing the prop rod (Figure 35)

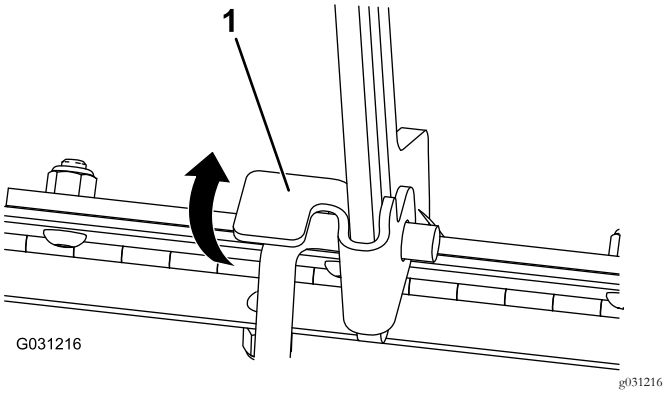


Figure 35

1. Prop-rod tab

2. Lower the hood and secure it by pushing down on the front of the hood until it locks in place.
3. Tighten the hood-locking screw to secure the latch (Figure 34).

Opening the Rear-Access Cover

1. Remove the fastener (Figure 36).

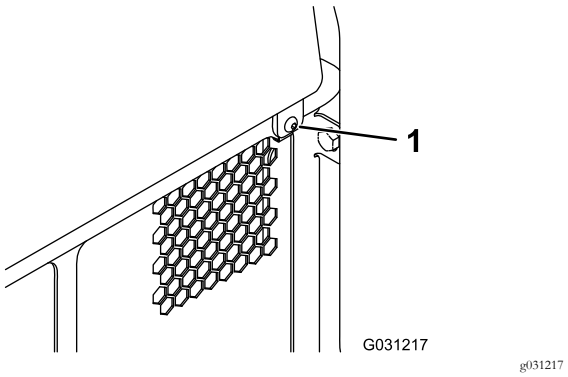


Figure 36

1. Fastener

2. Lift the rear-access cover up to access the internal components (Figure 36).
3. Lower the rear-access cover and install the fastener to close the cover.

Removing the Side Screens

1. Open the hood and secure the hood prop.
2. Slide the side screens (Figure 37) up and out of the slots in the front screen and frame.

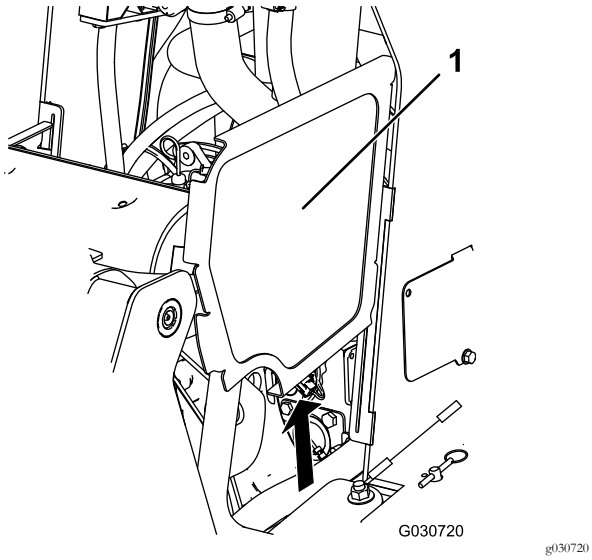


Figure 37

Loader arms not shown for clarity

1. Side screen

Removing the Front Screen

1. Open the hood and secure the hood prop.
2. Loosen the 2 top bolts and 2 front bolts.

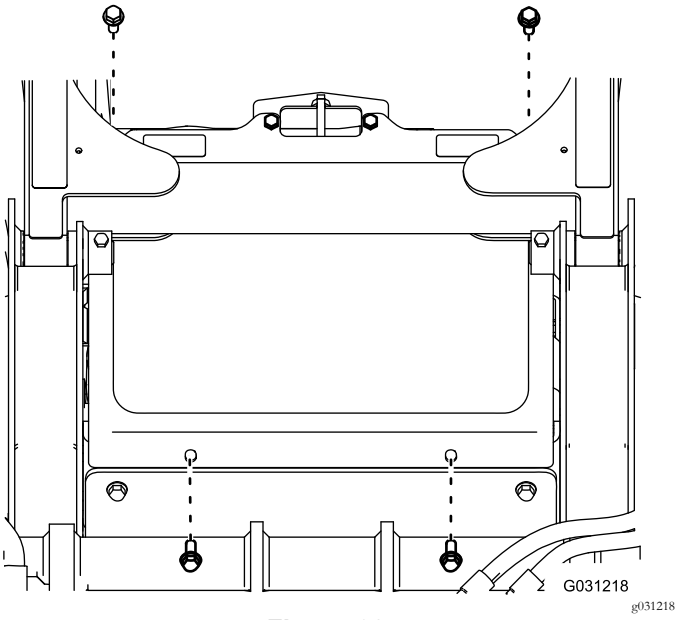


Figure 38

1. Bolt

3. Remove the screen.

Removing the Front Cover

1. Remove the 2 upper bolts (3/8 x 1 inch), 2 washers, and 2 lower bolts (5/16 x 5/8 inch) from the front cover.
2. Remove the front cover.

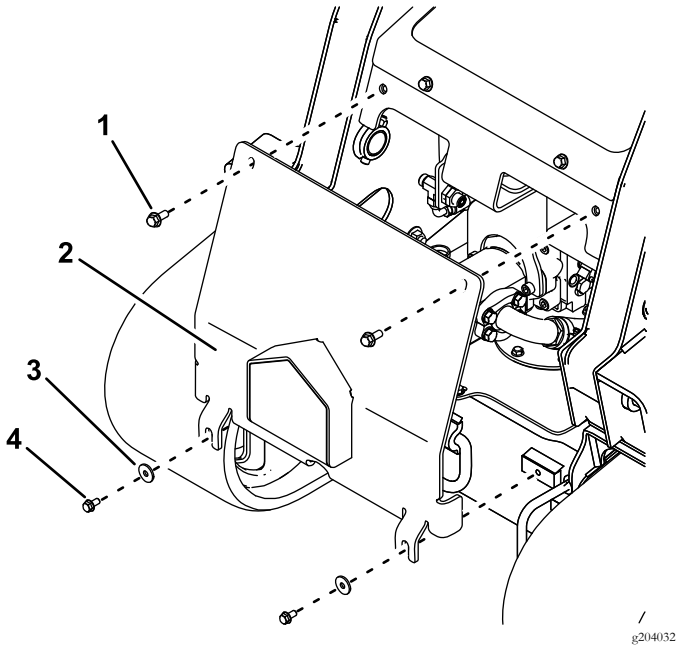


Figure 39

1. Upper bolt—3/8 x 1 inch (2)
2. Front cover
3. Washer (2)
4. Lower bolt—5/16 x 5/8 inch (2)

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, 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 40, Figure 41, and Figure 42).

   Note: Raise the loader arms before greasing the fittings in Figure 42.

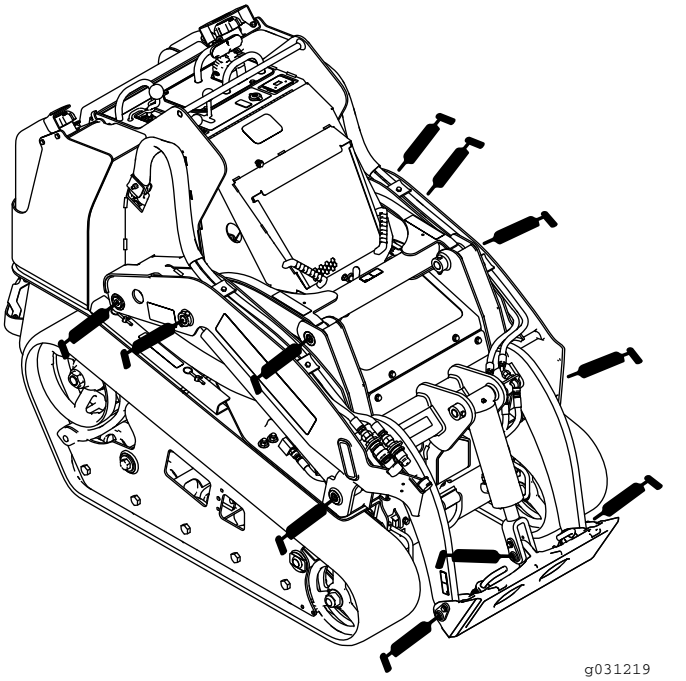


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Figure 40

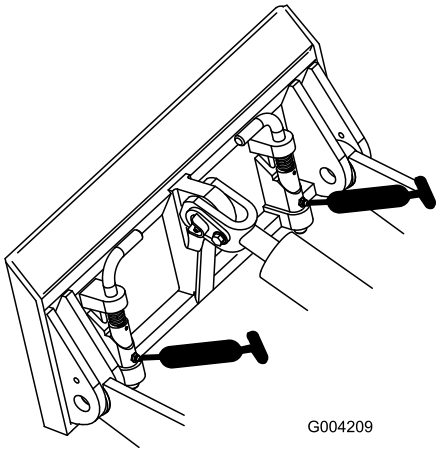

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Figure 41

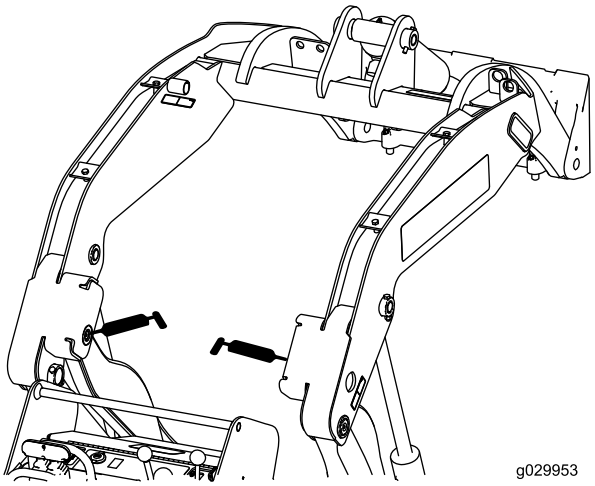

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Figure 42

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: Before each use or daily—Check the air-filter-service indicator.

Every 25 hours—Remove the air-cleaner cover, clean out debris, and check the air-filter-service indicator.

Servicing the Air-Cleaner Cover and Body

Important: Replace the air-cleaner filter only when the service indicator shows red (Figure 43). Changing the air filter before it is necessary only increases the chance of dirt entering the engine when you remove the filter.

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. Open the hood and secure the prop rod (if applicable).
4. Check the air-cleaner body for damage that could cause an air leak. Check the whole intake system for leaks, damage, or loose hose clamps.

   Replace or repair any damaged components.
5. Release the latches on the air cleaner and pull the air-cleaner cover off the air-cleaner body (Figure 43).

   Important: Do not remove the air filter.

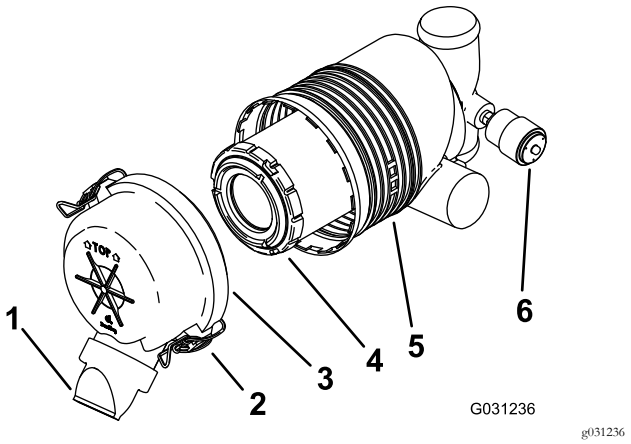

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Figure 43

1. Dust cap
2. Latch
3. Air-cleaner cover
4. Primary filter
5. Air-filter body
6. Service indicator

6. Squeeze the dust cap sides to open it and knock the dust out.
7. Clean the inside of the air-cleaner cover with compressed air that is under 205 kPa (30 psi).
8. Check the service indicator.
   - If the service indicator is clear, install the air-cleaner cover with the dust cap oriented downward and secure the latches (Figure 43).
   - If the service indicator is red, replace the air filter as described in Replacing the Filter (page 30).

Replacing the Filter

Important: To prevent engine damage, always operate the engine with the air filter and cover installed.

1. Gently slide the filter out of the air-cleaner body (Figure 43).

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

   Important: Do not attempt to clean the filter.
2. 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.
3. Carefully install the filter (Figure 43).

   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.
4. Install the air-cleaner cover with the dust cap oriented downward and secure the latches (Figure 43).
5. Close the hood.

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 100 hours—Change the engine oil. (Service more frequently if conditions are extremely dusty or sandy.)

Every 200 hours—Change the oil filter. (Service more frequently if conditions are extremely dusty or sandy.)

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

Crankcase Capacity: with filter 5.7 L (1.5 US gallons)

Viscosity: See the table below.

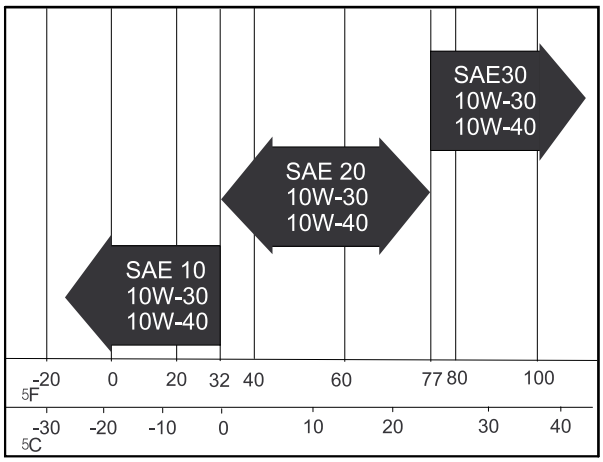

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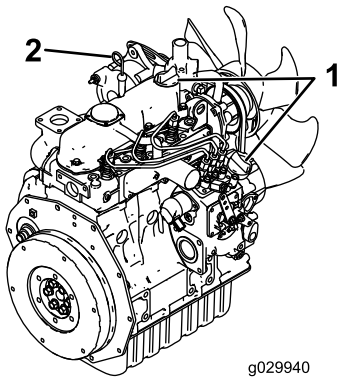
Figure 44

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 hood and secure the prop rod.
4. Clean the area around the oil dipstick and oil-fill cap (Figure 45).



g029940

Figure 45

1. Oil-fill cap
2. Oil dipstick

5. Check the oil and add additional oil as needed (Figure 46).

Important: Do not overfill the crankcase with oil; if the oil in the crankcase is too high and you run the engine, you may damage the engine.

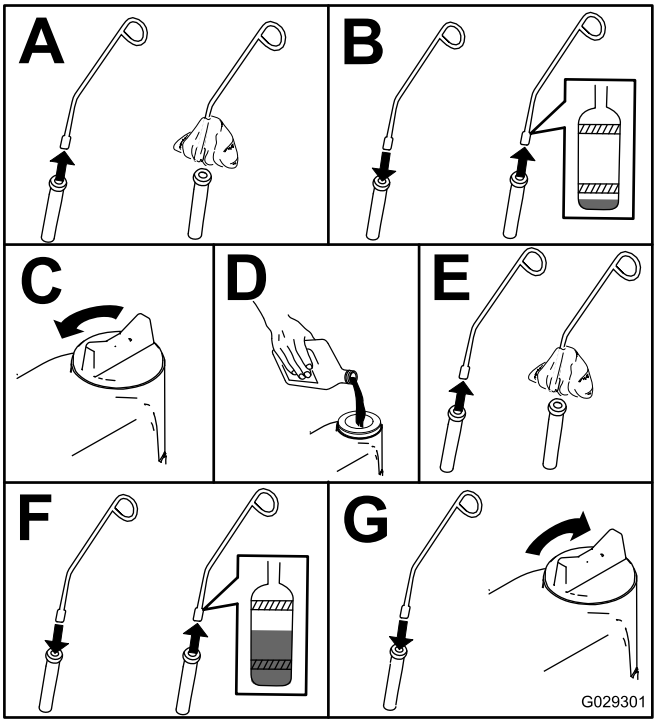


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Figure 46

Changing the Engine Oil

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

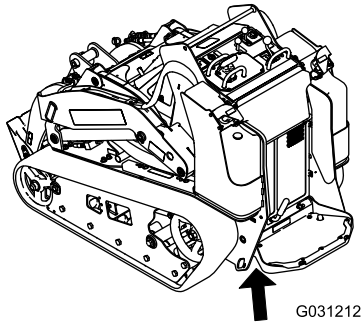
   Note: This warms the oil so that it drains better.
2. Park the machine on a level surface.
3. Raise the loader arms and secure with the cylinder locks; refer to Installing the Cylinder Locks (page 26).

4. Engage the parking brake, shut off the engine, and remove the key.
5. Drain the oil beneath the platform (Figure 47).

⚠ 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.



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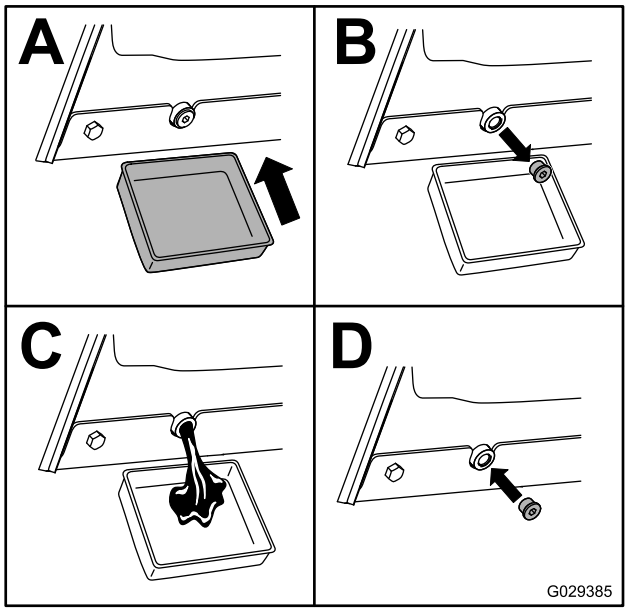

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Figure 47

6. Remove the oil-fill cap and slowly pour approximately 80% of the specified amount of oil in through the valve cover.
7. Check the oil level.
8. Slowly add additional oil to bring the level to the upper hole on the dipstick.
9. Replace the fill cap.

Changing the Oil Filter

1. Raise the loader arms and secure with the cylinder locks; refer to Installing the Cylinder Locks (page 26).
2. Engage the parking brake, shut off the engine, and remove the key.
3. Remove the front cover; refer to Removing the Front Cover (page 28).
4. Drain the oil from the engine; refer to Changing the Engine Oil (page 31).
5. Place a shallow pan or rag under the filter to catch oil.
6. Change the oil filter (Figure 48).

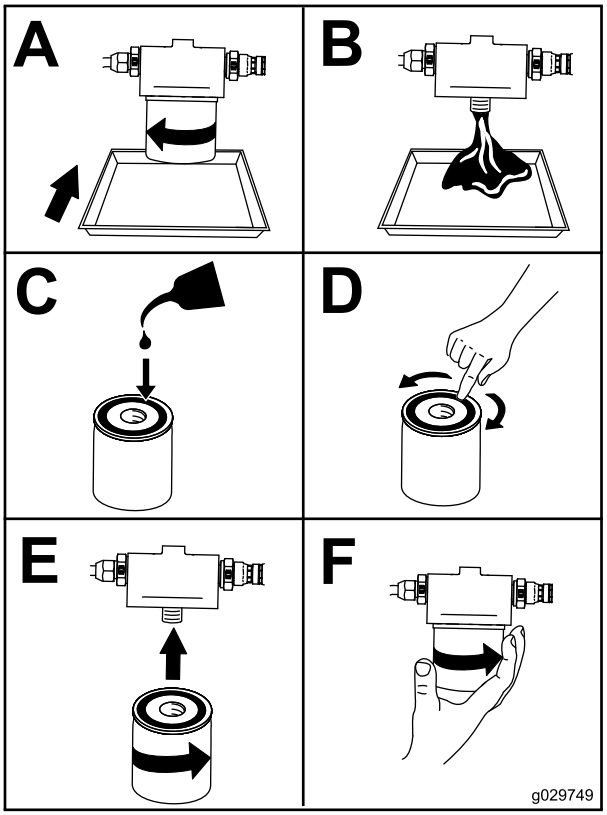

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Figure 48

7. Remove the oil-fill cap and slowly pour approximately 80% of the specified amount of oil in through the valve cover.
8. Check the oil level.
9. Slowly add additional oil to bring the level to the upper hole on the dipstick.
10. Replace the fill cap.
11. Install the front cover; refer to Removing the Front Cover (page 28).

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 18) for a complete list of fuel related precautions.

Draining the Fuel Filter/Water Separator

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; refer to Opening the Rear-Access Cover (page 27).
4. Locate the fuel filter on the rear side of the engine (Figure 49) and place a clean container under it.

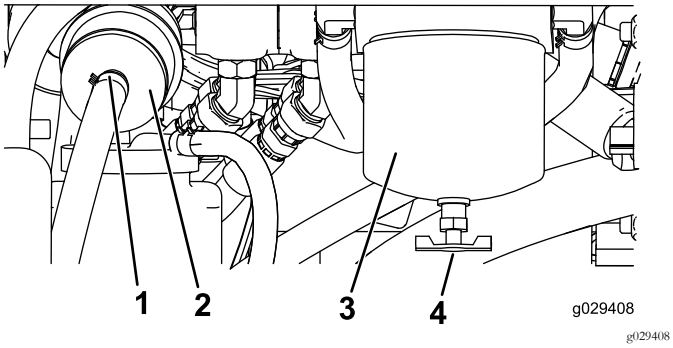

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Figure 49

1. Hose clamp
2. In-line filter
3. Fuel-filter canister/water separator
4. Drain valve

5. Loosen the drain valve on the bottom of the filter canister and allow the water to drain.
6. When finished, tighten the drain valve.
7. Close the rear-access cover and secure with the fastener.

Replacing the Fuel Filter Canister and In-Line Filter

Service Interval: Every 400 hours

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; refer to Opening the Rear-Access Cover (page 27).
4. Locate the fuel filters on the right side of the engine (Figure 49) and place a clean container under it.
5. Clean the area where the filter canister mounts (Figure 49).
6. Remove the filter canister and clean the mounting surface (Figure 49).
7. Lubricate the gasket on the new filter canister with clean oil.
8. Fill the canister with fuel.
9. Install the filter canister by hand until the gasket contacts the mounting surface, then rotate it an additional 1/2 turn (Figure 49).
10. Locate the in-line filter to the left of the fuel filter canister (Figure 49) and note the direction of flow arrow on the side of the in-line filter.
11. Open the clamps on each end of the in-line filter and slide the hoses off it (Figure 49). Discard the filter.
12. Slide the hoses over the end of a new filter (Figure 49), ensuring that the arrow on the filter is pointing toward the engine or electric fuel pump.
13. Secure the hoses to the filter with the hose clamps.
14. Close the rear-access cover and secure with the fastener.

Checking the Fuel Lines and Connections

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

Inspect the fuel lines and connections for deterioration, damage, or loose connections. Tighten any loose connections and contact your Authorized Service Dealer for assistance in fixing damaged fuel lines.

Bleeding the Fuel System

You must bleed the fuel system before starting the engine if any of the following situations have occurred:

- Initial startup of a new machine
- The engine has ceased running due to a lack of fuel.
- Maintenance has been performed upon fuel-system components (e.g., filter replaced).

1. Turn the key to the RUN position.
2. Let the fuel pump run for 2 minutes prior to starting the machine.

Draining the Fuel Tanks

Service Interval: Every 2 years

Have an Authorized Service Dealer drain and clean the fuel tanks.

Electrical System Maintenance

Servicing the Battery

Service Interval: Every 50 hours

⚠ 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.

Important: Before welding on the machine, disconnect the negative cable from the battery.

⚠ 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.**

Using the Battery-Disconnect Switch

⚠ WARNING

Contact with hot surfaces may cause personal injury.

Keep hands, feet, face, clothing and other body parts away the muffler and other hot surfaces.

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 hood, secure the prop rod, and remove the left side screen.
4. Turn the battery-disconnect switch to the ON or OFF position to perform the following:
   - To energize the machine electrically, rotate the battery-disconnect switch clockwise to the ON position (Figure 50).
   - To de-energize the machine electrically, rotate the battery-disconnect switch counterclockwise to the OFF position (Figure 50).

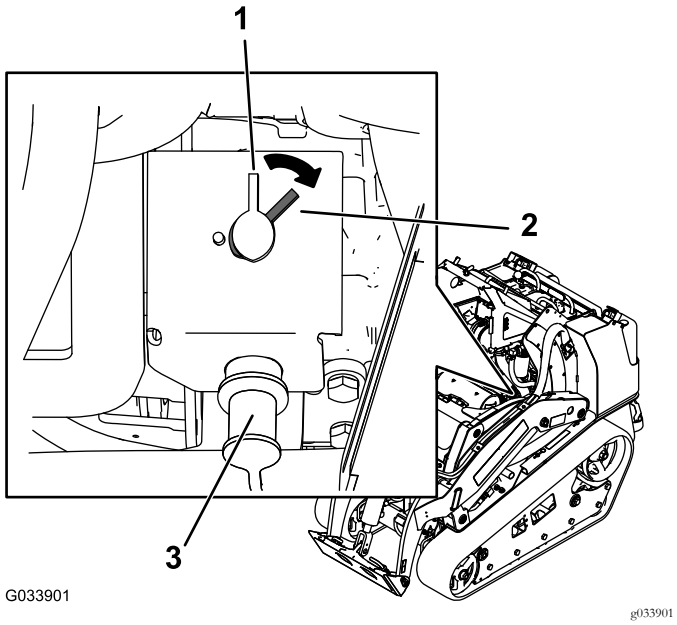

Figure 50

1. Battery-disconnect switch—OFF position
2. Battery-disconnect switch—ON position
3. Jump post

Removing the Battery

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 as shown in Figure 51.

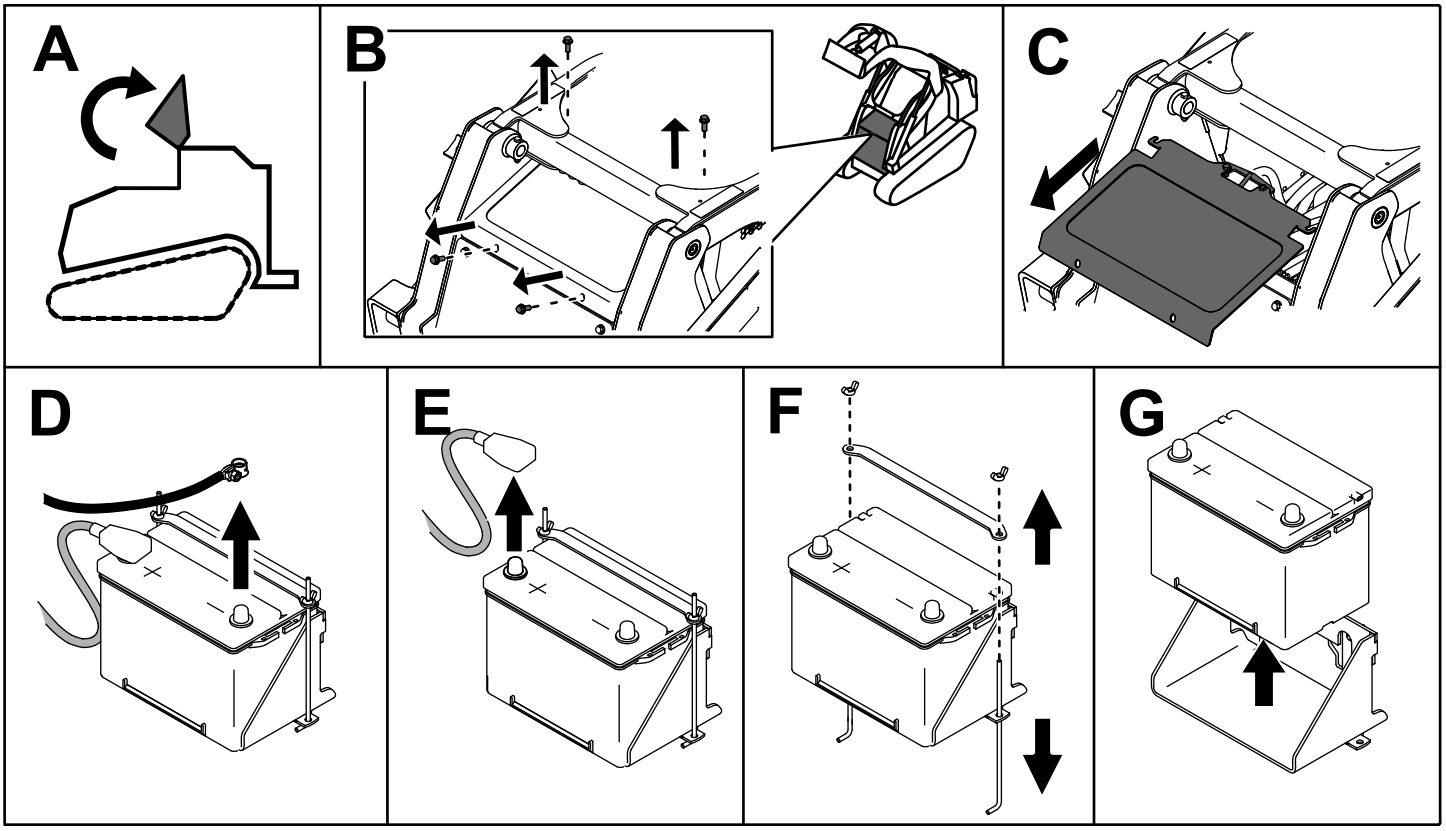

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Figure 51

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 36).
2. Charge the battery for 4 to 8 hours at a rate of 3 to 4 A (Figure 52). Do not overcharge the battery.

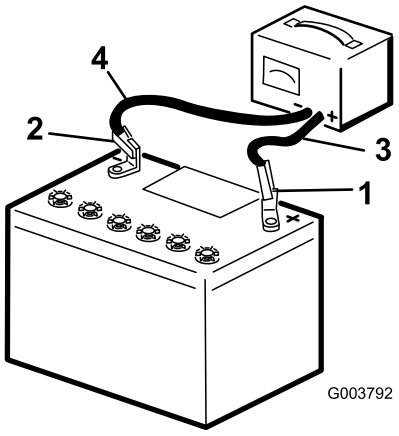

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Figure 52

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 52).

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 36).
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 37).

Installing the Battery

Install the battery as shown in Figure 53.

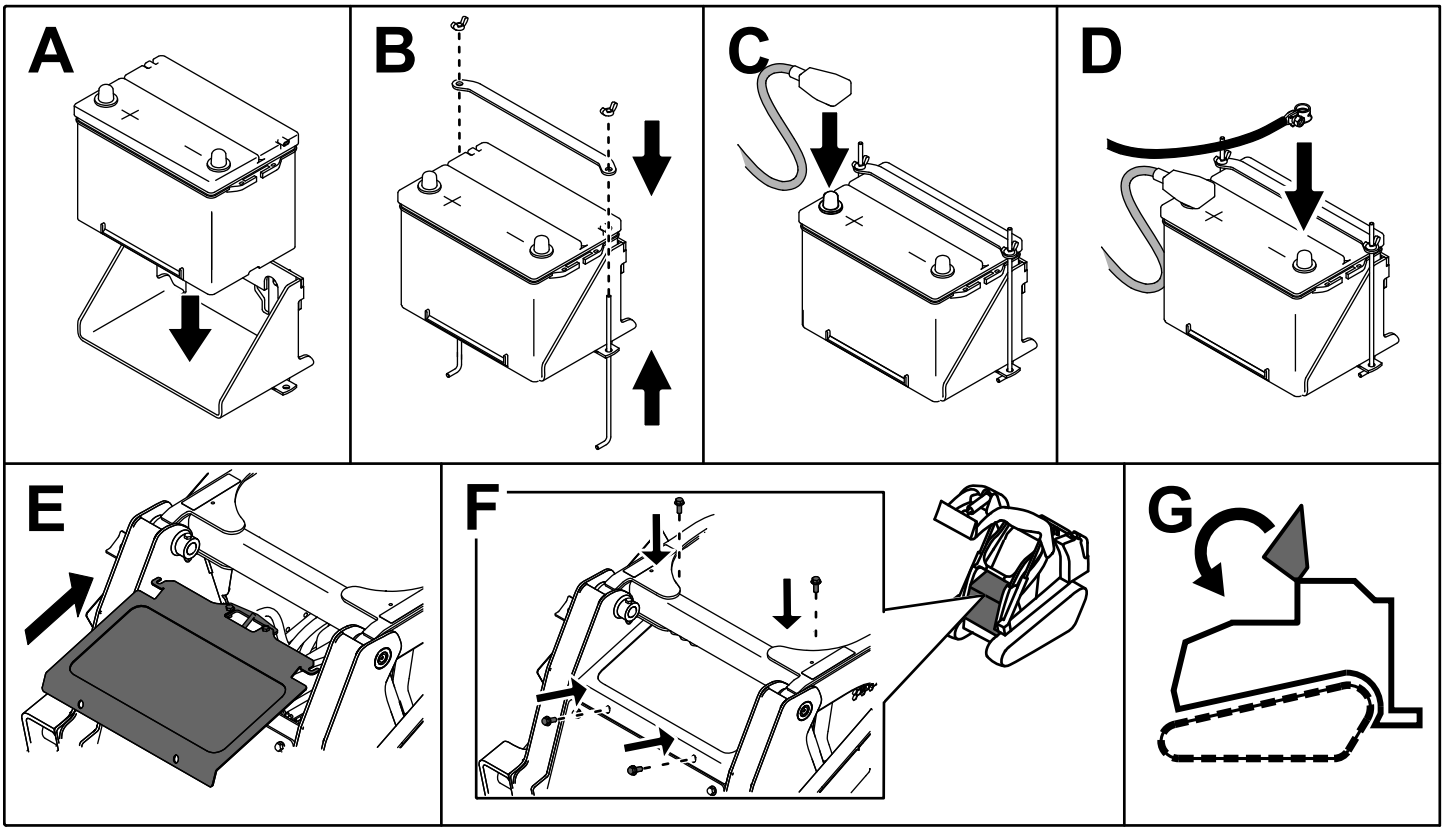

Figure 53

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.

Jump-Starting the Machine

⚠ WARNING

Contact with hot surfaces may cause personal injury.

Keep hands, feet, face, clothing and other body parts away the muffler and other hot surfaces.

⚠ WARNING

Jump-starting the battery can produce gasses that can explode.

Do not smoke near the battery, and keep sparks and flames away from battery.

1. Open the hood, secure the prop rod, and remove the left side screen.
2. Remove the cover from the jump post (Figure 54).

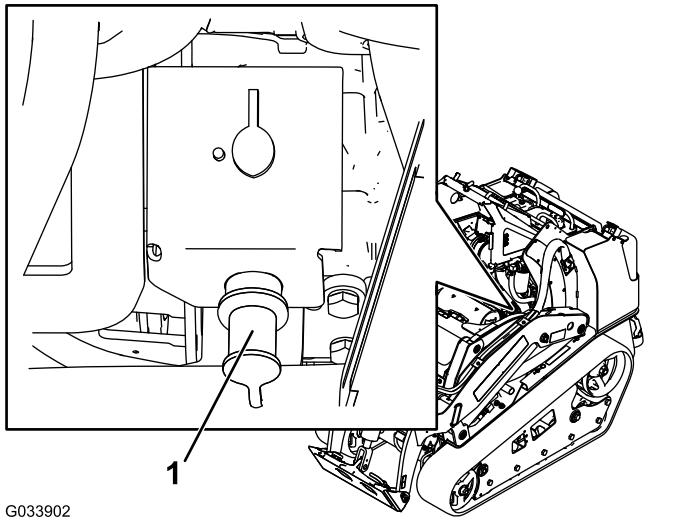

Figure 54

1. Jump post

3. Connect an end of the positive (+) jumper cable to the jump post (Figure 54).
4. Connect the other end of the positive (+) jumper cable to the positive terminal of the battery in the other machine.
5. Connect an end of the negative (-) jumper cable to the negative post of the battery in the other machine.
6. Connect the other end of the negative (-) jumper cable to a ground point, such as an unpainted bolt or chassis member.
7. Start the engine in the other machine. Let it run a few minutes, then start your engine.
8. Remove the cables in the reverse order of connection.
9. Install the cover to the jump post.

Servicing the Fuses

The electrical system is protected by fuses. It requires no maintenance; however, if a fuse blows, check the component/circuit for a malfunction or a short. Figure 55 illustrates the fuse block and identifies the fuse positions.

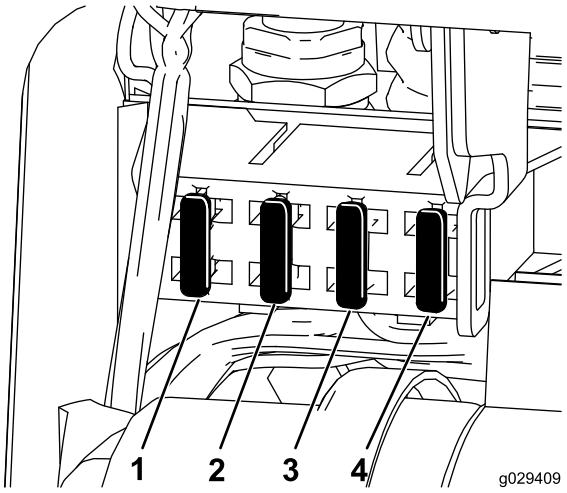

Figure 55

1. Fuse (20 A)
2. Fuse (15 A)
3. Fuse (10 A)
4. Fuse (7.5 A)

Note: If the machine does not start, either the main circuit or the control panel/relay fuse could be blown.

There is also a fuse (50 A) located on the right side of the machine. Raise the loader arms, install the cylinder lock, and remove the right access cover. The fuse is located just inside the frame.

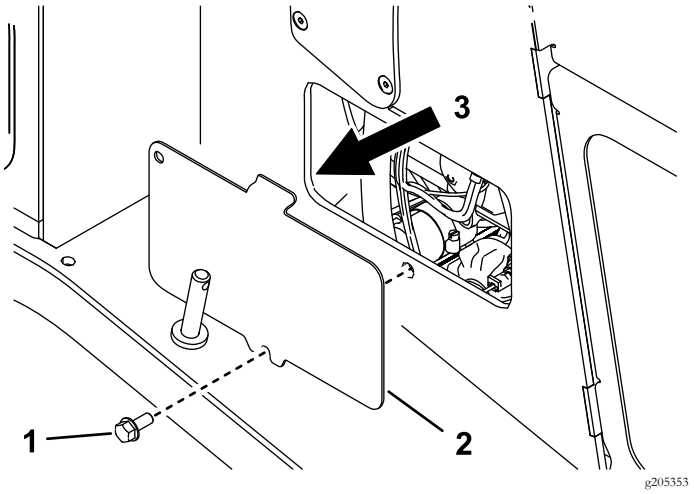

Figure 56

1. Bolt
2. Right access cover
3. Fuse location

Drive System Maintenance

Servicing the Tracks

Service Interval: After the first 50 hours—Check and adjust the track tension.

Before each use or daily—Clean the tracks.

Before each use or daily—Check the tracks for excessive wear and proper tension.

Every 100 hours—Check and adjust the track tension.

Cleaning the Tracks

1. Park the machine on a level surface and engage the parking brake.
2. With the bucket installed and pointing down, lower it into the ground so that the front of the traction unit lifts off the ground a few centimeters (inches).
3. Shut off the engine and remove the key.
4. Using a water hose or pressure washer, remove dirt from each track system.

Important: Ensure that you use high-pressure water to wash only the track area. Do not use a high-pressure washer to clean the rest of the traction unit. Do not use high pressure water between the drive sprocket and the traction unit or you may damage the motor seals. High-pressure washing can damage the electrical system and hydraulic valves or deplete grease.

Important: Ensure that you fully clean the road wheels, the front wheel, and the drive sprocket (Figure 57). The road wheels should rotate freely when clean.

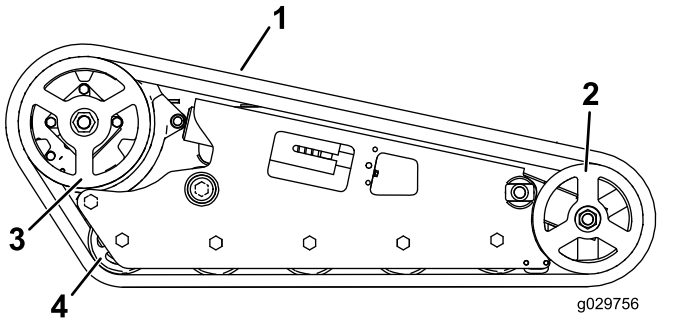

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Figure 57

1. Track
2. Front wheel
3. Drive sprocket
4. Road wheel

Adjusting the Track Tension

Verify that the tension block is aligned with the green guide on the decal or that the block is 1.3 cm (1/2 inch) away from the rear of the tension tube slot (Figure 58). If it is not, adjust the track tension using the following procedure:

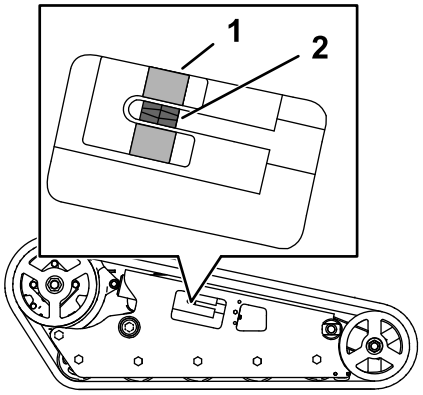

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Figure 58

1. Green guide on decal
2. Tension block

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 locking bolt and nut (Figure 59).

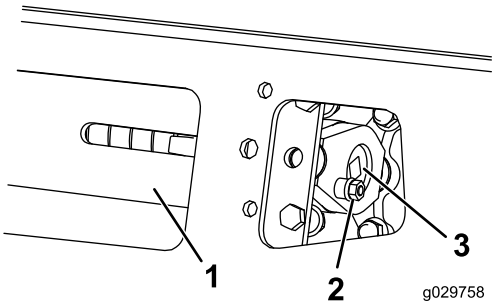

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Figure 59

1. Tension tube
2. Locking bolt
3. Tensioning screw

4. Using a 1/2 inch drive ratchet, turn the tensioning screw counter-clockwise until the tension block aligns with the green guide on the decal or is 1.3 cm (1/2 inch) away from the rear of the tension tube slot (Figure 58).
5. Align the closest notch in the tension screw to the locking-bolt hole and secure the screw with the locking bolt and nut (Figure 59).
6. Repeat the procedure for the other track.

Replacing Narrow-Width Tracks

Replace the tracks when they are badly worn.

Note: You have narrow-width tracks if the tracks are less than 15.5 cm (6 inches) wide.

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. Lift/support the side of the machine that you will work on so that the track is 7.6 to 10 cm (3 to 4 inches) off the ground.
4. Remove the locking bolt and nut (Figure 59).
5. Using a 1/2-inch drive ratchet, release the drive tension by turning the tensioning screw clockwise (Figure 59 and Figure 60).

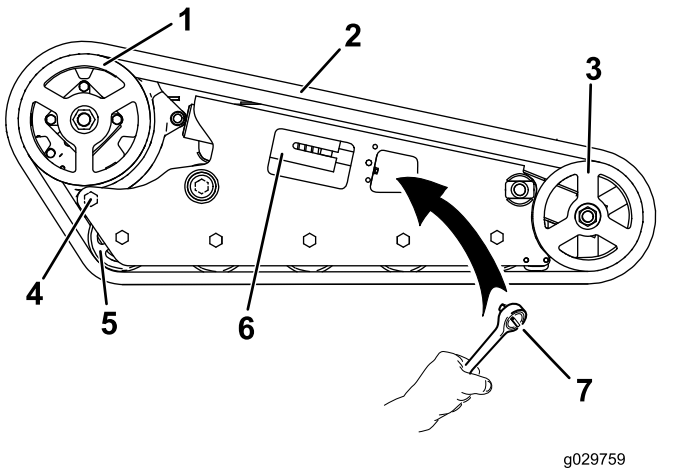

Figure 60

1. Drive sprocket
2. Track
3. Front wheel
4. Rear bolt
5. Road wheel
6. Pivot tensioner
7. Ratchet (1/2 inch)

6. Loosen the rear bolt, near the drive wheel (Figure 60).

   Note: This enables the drive wheel to pivot forward and release the tension of the track. If it does not pivot, turn on the engine and briefly move the traction control forward.
7. Remove the track at the top of the front wheel, peeling it off the wheel while rotating the track forward.
8. When the track is off the front wheel, remove it from the drive sprocket and road wheels (Figure 60).
9. Beginning at the drive sprocket, coil the new track around the sprocket, ensuring that the lugs on the track fit between the spacers on the sprocket (Figure 60).
10. Push the track under and between the road wheels (Figure 60).
11. Starting at the bottom of the front wheel, install the track around the wheel by rotating the track rearward while pushing the lugs into the wheel.
12. Using a 1/2 inch drive ratchet, turn the tensioning screw counter-clockwise until the tensioning screw bottoms out (Figure 61).

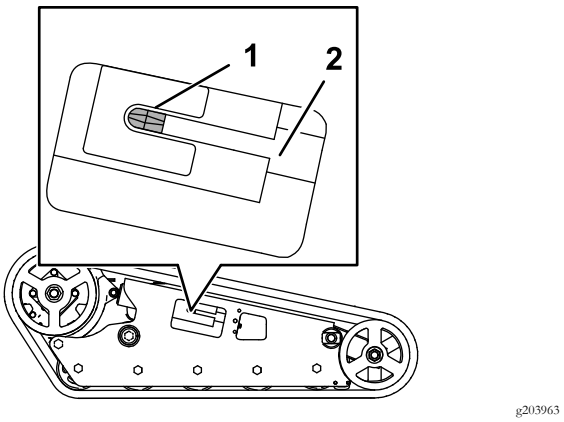

Figure 61

1. Tension nut
2. Tension screw

13. Align the closest notch in the tension screw to the locking bolt hole and secure the screw with the locking bolt and nut.
14. Torque the rear bolt to 108 to 122 N·m (80 to 90 ft-lb).
15. Lower the machine to the ground.
16. Repeat the procedure to replace the other track.
17. Drive the machine, then park the machine on a level surface, engage the parking brake, shut off the engine, and remove the key.
18. Verify that the tension screw is bottomed out.

    Note: The track tension loosens after some use.
19. Adjust the track tension so that the tension block aligns with the green guide on the decal or is 1.3 cm (1/2 inch) away from the rear of the tension tube slot; refer to Adjusting the Track Tension (page 39).

Replacing Wide-Width Tracks

Replace the tracks when they are badly worn.

Note: You have wide-width tracks if the tracks are more than 23 cm (9 inches) wide.

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. Lift/support the side of the unit to be worked on so that the track is 7.6 to 10 cm (3 to 4 inches) off the ground.
4. Remove the locking bolt and nut (Figure 59).
5. Using a 1/2-inch drive ratchet, release the drive tension by turning the tensioning screw clockwise (Figure 59 and Figure 60).
6. Loosen the rear bolt, near the drive wheel (Figure 60).
7. Remove the nut securing the outer front wheel and remove the wheel (Figure 62).

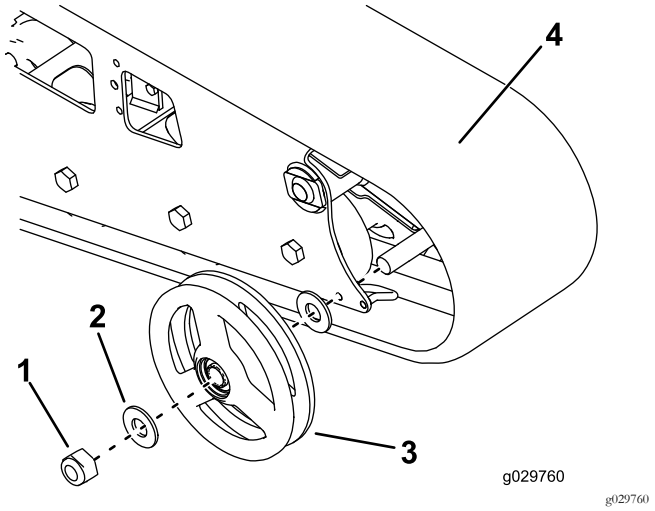

Figure 62

1. Nut
2. Washer
3. Outer front wheel
4. Track

8. Remove the track (Figure 62).
9. Pull the 2 large washers out of the outer wheels, 1 on each side of each wheel (Figure 62).
10. Clean the old grease and dirt out of the area between where the washers were installed and the bearings inside the wheels, then fill this area on each side of each wheel with grease.
11. Install the large washers on the wheels over the grease.
12. Install the new track. (Figure 62).

    Note: Ensure that the lugs in the track fit between the spacers in the middle of the drive sprocket.
13. Install the outer front wheel and secure it with the nut removed previously (Figure 62).
14. Torque the nut to 300 ft-lb (407 N·m).
15. Turn the tensioning screw counter-clockwise until the tensioning screw bottoms out.
16. Align the closest notch in the tension screw to the locking bolt hole and secure the screw with the locking bolt and nut.
17. Torque the rear bolt to 108 to 122 N·m (80 to 90 ft-lb).
18. Lower the machine to the ground.
19. Repeat the procedure to replace the other track.
20. Drive the machine, then park the machine on a level surface, engage the parking brake, shut off the engine, and remove the key.
21. Verify that the tension screw is bottomed out (Figure 61).

    Note: The track tension loosens after some use.
22. Adjust the track tension so that the tension block aligns with the green guide on the decal or is 1.3 cm (1/2 inch) away from the rear of the tension tube slot; refer to Adjusting the Track Tension (page 39).

Cooling System Maintenance

Servicing the Cooling System

Service Interval: Before each use or daily—Clean the screen, oil cooler, and front of the radiator (more often in dirty or dusty conditions).

Before each use or daily—Check the coolant level in the expansion tank.

Every 100 hours—Check the cooling system hoses.

Yearly—Change the engine coolant (Authorized Service Dealer only).

⚠ 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.**

⚠ CAUTION

Swallowing engine coolant can cause poisoning.

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

Cleaning the Radiator Screen

Before each use, check and clean the radiator screen, located in front of the operator platform. Remove any buildup of grass, dirt or other debris from the radiator screen with compressed air.

Checking the Engine-Coolant Level

The cooling system is filled with a 50/50 solution of water and permanent ethylene-glycol antifreeze.

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. Check the coolant level in the expansion tank (Figure 63).

   The coolant level should be at or above the mark on the side of the tank.

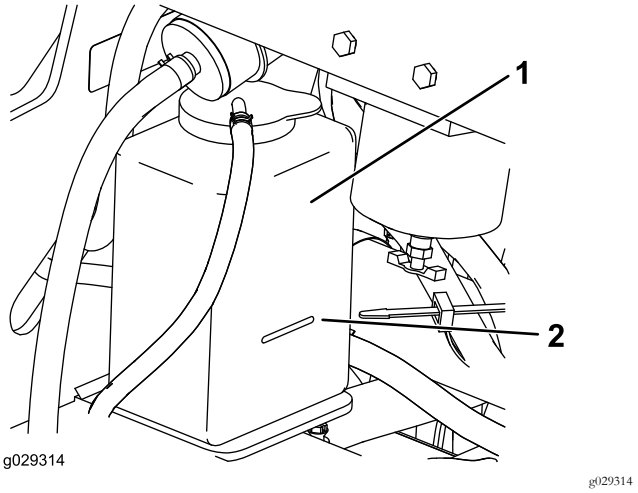

Figure 63

1. Expansion tank
2. Full mark

4. If the coolant level is low, remove the expansion tank cap and add a 50/50 mixture of water and permanent ethylene-glycol antifreeze.

   Important: Do not overfill the expansion tank.
5. Install the expansion-tank cap.

Changing the Engine Coolant

Have an Authorized Service Dealer change the engine coolant yearly.

If you need to add engine coolant, refer to Checking the Engine-Coolant Level (page 42).

Brake Maintenance

Testing the Parking Brake

Service Interval: Before each use or daily

1. Engage the parking-brake; refer to Parking-Brake Lever (page 16).
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.

Belt Maintenance

Checking the Alternator/Fan Belt Tension

Service Interval: Every 100 hours—Check the alternator/fan belt tension (refer to the engine owner's manual for instructions).

Every 500 hours—Replace the alternator/fan belt (refer to the engine owner's manual for instructions).

Controls System Maintenance

Adjusting the Controls

The factory adjusts the controls before shipping the machine. However, after many hours of use, you may need to adjust the traction control alignment, the NEUTRAL position of the traction control, and the tracking of the traction control in the full forward position.

Contact your Authorized Service Distributor to adjust the controls of your machine.

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

Hydraulic-Tank Capacity: 37.9 L (10 US gallons)

Refer to Hydraulic Fluid Specifications (page 44) for hydraulic-fluid specifications.

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

1. Remove any attachments.
2. Park the machine on a level surface.
3. Raise the loader arms and install the cylinder locks.
4. Shut off the engine and remove the key.
5. Open the hood and secure the prop rod.
6. Remove the right side screen.
7. Clean the area around the filler neck of the hydraulic tank (Figure 64).

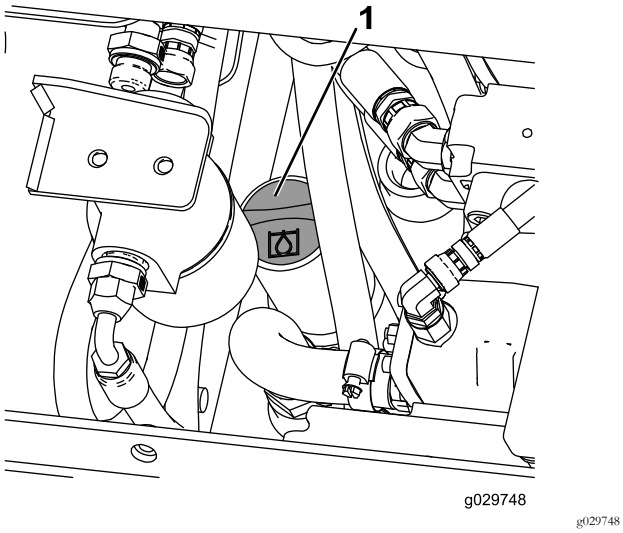

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Figure 64

1. Filler-neck cap

8. Remove the filler-neck cap and check the fluid level on the dipstick (Figure 65).

   Note: The fluid level should be between the 2 notches of the dipstick while the arms are lowered or at the lower notch while the arms are raised.

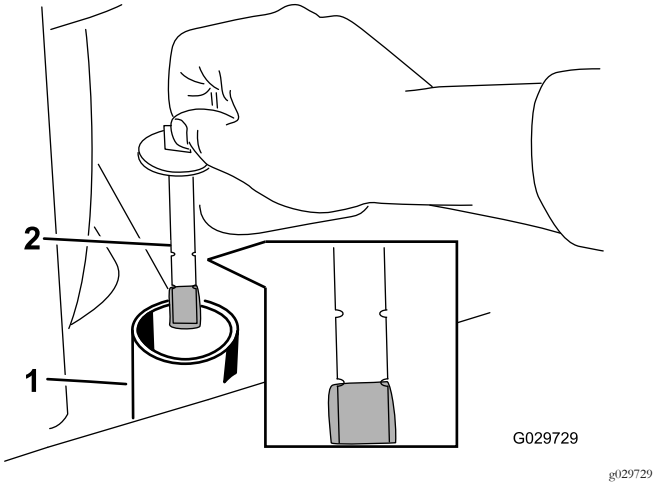

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Figure 65

1. Filler neck
2. Dipstick

9. If the level is low, add enough fluid to raise it to the proper level.
10. Install the filler-neck cap.
11. Install the side screen.
12. Close the hood.
13. Remove and store the cylinder locks and lower the loader arms.

Replacing the Hydraulic Filter

Service Interval: After the first 8 hours

Every 200 hours

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

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 hood and secure the prop rod.
4. Place a drain pan under the filter and replace the filter (Figure 66).

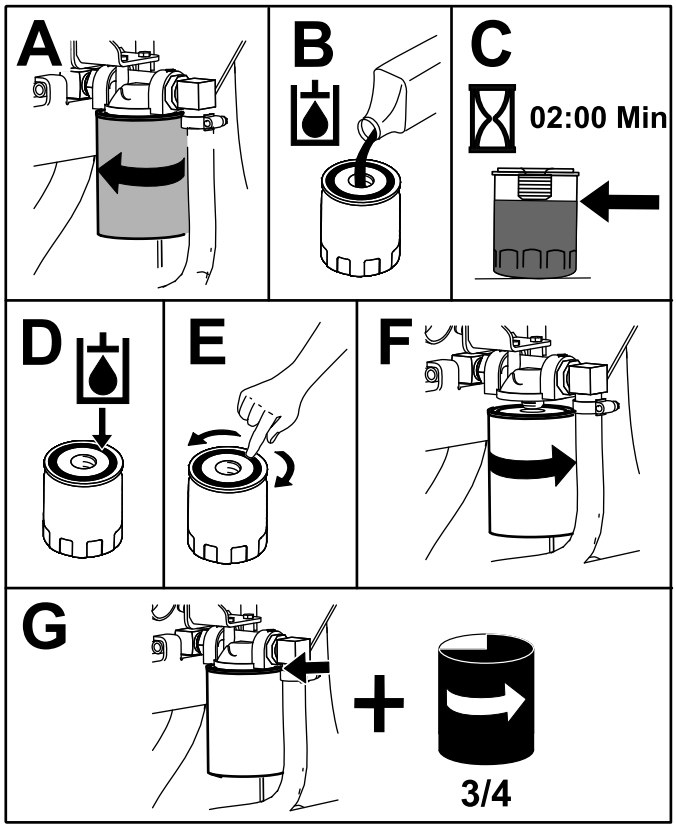

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Figure 66

5. Clean up any spilled fluid.
6. Start the engine and let it run for about 2 minutes to purge air from the system.
7. 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.**

8. Check the fluid level in the hydraulic tank; refer to Checking the Hydraulic-Fluid Level (page 45) and add fluid to raise the level to mark on dipstick.

   Important: Do not over fill the tank.

9. Close the hood.

Changing the Hydraulic Fluid

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

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. Open the hood and secure the hood prop.
5. Remove the right side screen; refer to Removing the Side Screens (page 28).
6. Remove the hydraulic-tank cap and dipstick (Figure 67).

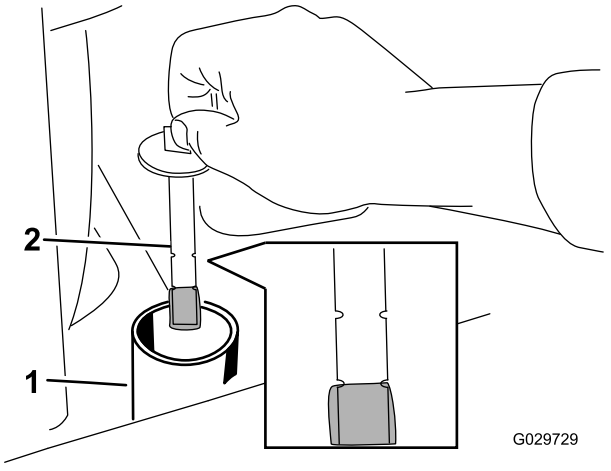

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Figure 67

1. Filler neck
2. Dipstick

7. Place a large drain pain capable of holding 57 L (15 US gallons) under the drain plug on the front of the machine (Figure 68).

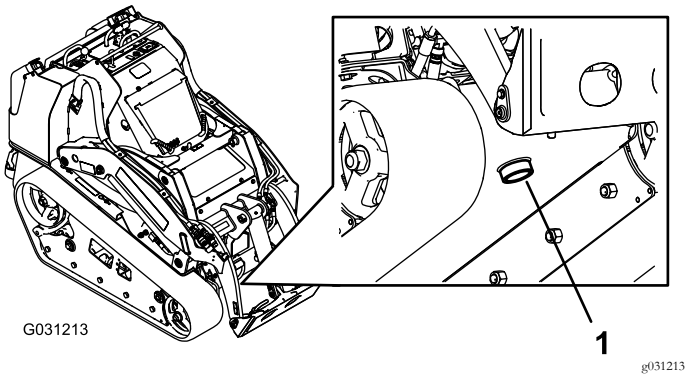


Figure 68

1. Drain plug

8. Remove the drain plug and allow the oil to drain into the pan (Figure 68).
9. When the oil is finished draining, install and tighten the drain plug.

   Note: Dispose of the used oil at a certified recycling center.
10. Fill the hydraulic tank with approximately 38 L (10 US gallons) of hydraulic fluid as specified previously.
11. Start the engine and let it run for a few minutes.
12. Shut off the engine.
13. Check the hydraulic-fluid level and add fluid to fill the tank if necessary; refer to Checking the Hydraulic-Fluid Level (page 45).
14. Close the hood.

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 from overheating.

1. Park the machine on a level surface and lower the loader arms.
2. Shut off the engine, remove the key, and allow the engine to cool.
3. Open the hood and secure the prop rod.
4. Clean any debris from the front and side screens.
5. Wipe away debris from the air cleaner.
6. Clean any debris buildup on the engine and in the oil cooler fins with a brush or blower.

   Important: Operating the engine with blocked screens and/or cooling shrouds removed will result in engine damage due to overheating.
7. Clean debris from the hood opening, muffler, heat shields, and radiator screen (if applicable).
8. Close the hood.

Cleaning the Chassis

Service Interval: Every 100 hours—Check for dirt buildup in the chassis.

Over time, the chassis under the engine collects dirt and debris that must be removed. Using a flashlight, open the hood and inspect the area under the engine regularly. When the debris is 2.5 to 5 cm (1 to 2 inches) deep, clean the chassis.

1. Park the machine on a level surface, engage the parking brake, and lower the loader arms.
2. Raise the front of the machine so that the machine is angled backward.
3. Shut off the engine and remove the key.
4. Remove the 2 bolts securing the bottom plate and remove the bottom plate (Figure 69).

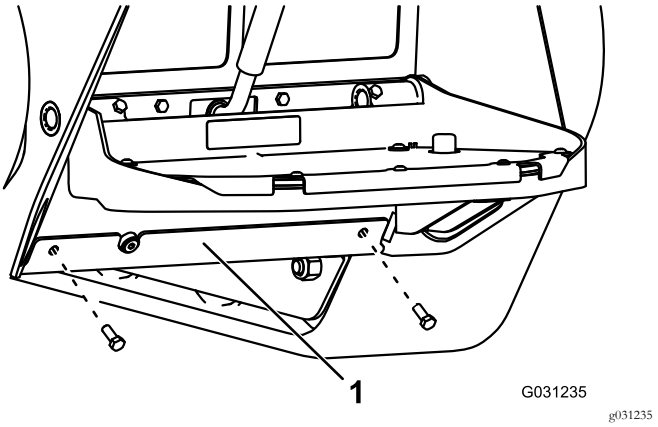


Figure 69

1. Bottom plate

5. Remove the front screen; refer to Removing the Front Screen (page 28).
6. Spray water into the chassis to clean out the dirt and debris.

   Note: The water will drain at the back of the machine.

   Important: Do not spray water into the engine.
7. Grease the machine; refer to Greasing the Machine (page 29).
8. Install the bottom plate (Figure 69).
9. Install the front screen.
10. Lower the machine.

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 entire machine.

   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. Change the engine oil; refer to Changing the Engine Oil (page 31).
7. Charge the battery; refer to Charging the Battery (page 36).
8. Check and adjust the track tension; refer to Adjusting the Track Tension (page 39).
9. Check and tighten all bolts, nuts, and screws. Repair or replace any part that is damaged.
10. Paint all scratched or bare metal surfaces. Paint is available from your Authorized Service Dealer.
11. Store the machine in a clean, dry garage or storage area. Remove the key from the ignition switch and keep it in a memorable place.
12. Cover the machine to protect it and keep it clean.

Troubleshooting

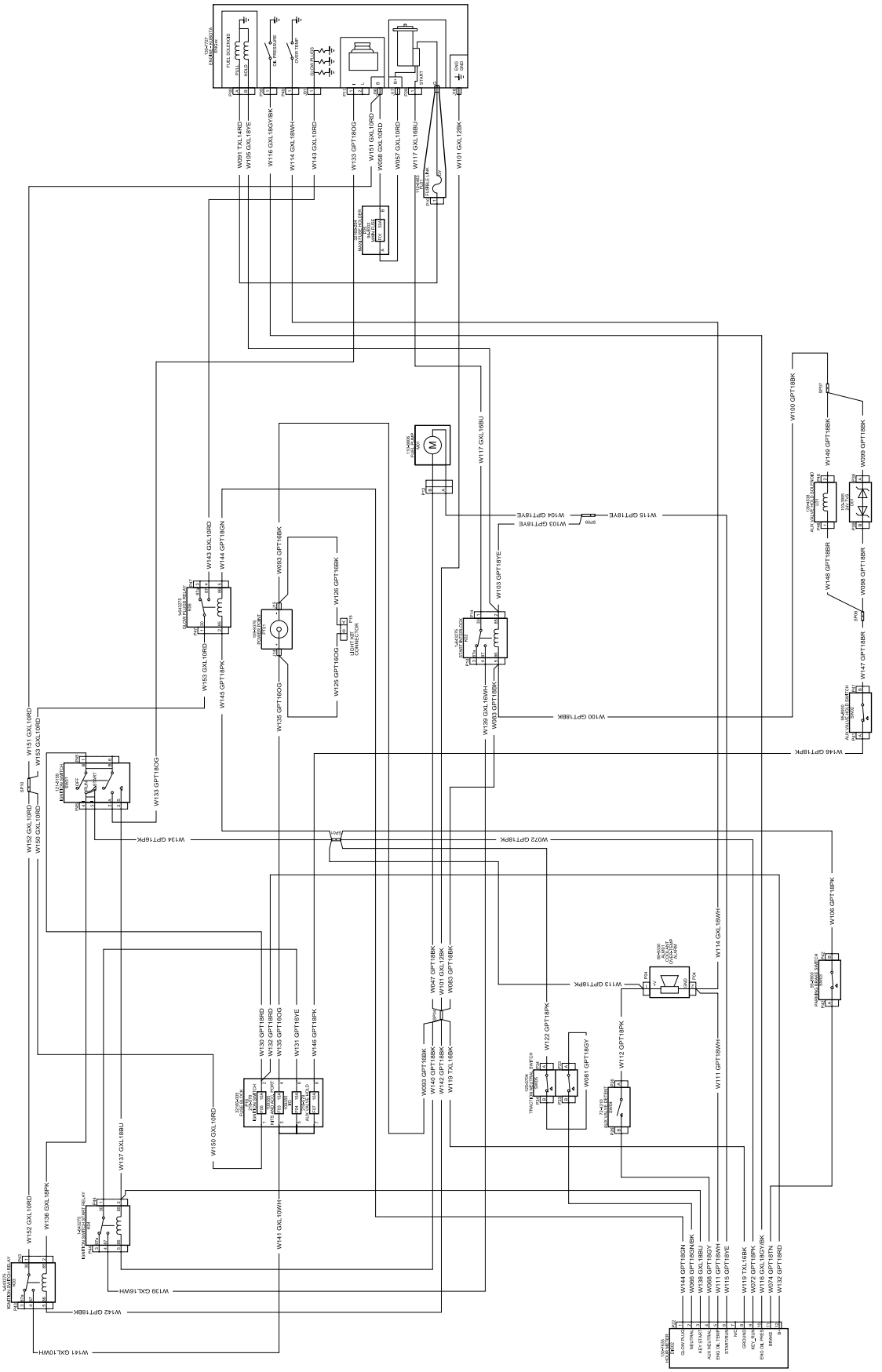
Problem	Possible Cause	Corrective Action
The starter does not crank.	1. The electrical connections are corroded or loose. 2. A fuse is blown or loose. 3. The battery is discharged. 4. The relay or switch is damaged. 5. A starter or starter solenoid is damaged. 6. Internal engine components have seized. 7. The safety interlock is engaged.	1. Check the electrical connections for good contact. 2. Correct 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. 7. Check the neutral setting on the traction and auxiliary controls.
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 Starting the Engine. 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 crankcase-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 crankcase-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



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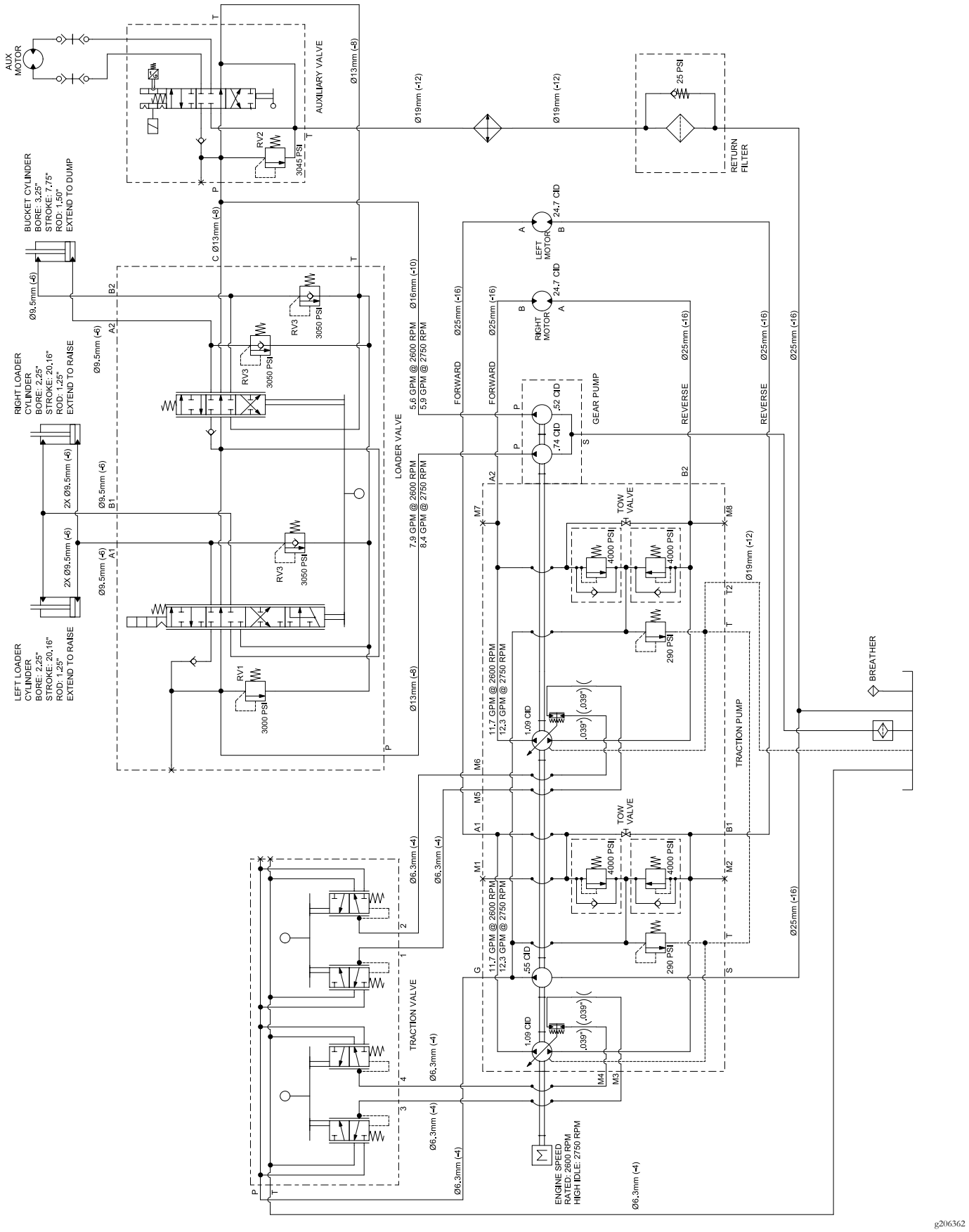
Electrical Schematic (Rev. B)



Hydraulic Schematic (Rev. B)

Notes:

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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.