Form No. 3394-667 Rev E

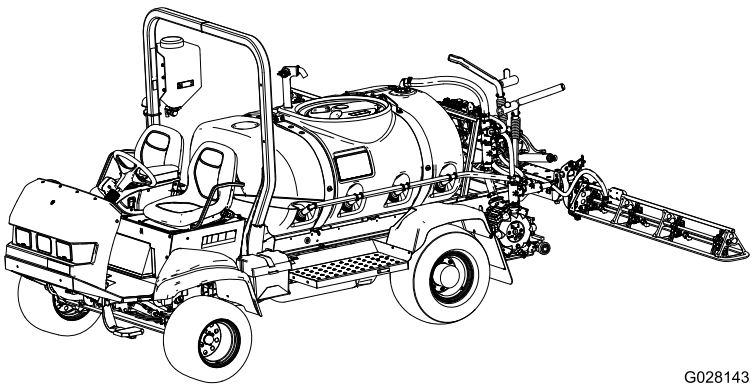
TORO®

Count on it.

Operator's Manual

Multi-Pro 5800 Turf Sprayer

Model No. 41593—Serial No. 315000001 and Up



G028143

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

CE

3394-667 E

The Multi-Pro® turf sprayer is a dedicated turf spray application vehicle and is intended to be used by professional, hired operators in commercial applications. It is primarily designed for spraying on well-maintained lawns in parks, golf courses, sports fields, and on commercial grounds.

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

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

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

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

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

Important: **This engine is not equipped with a spark arrester muffler. It is a violation of California Public Resource Code Section 4442 to use or operate the engine on any forest-covered, brush-covered, or grass-covered land. Other states or federal areas may have similar laws.**

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

Read this manual carefully to learn how to operate and maintain your product properly. The information in this manual can help you and others avoid injury and product damage. Although Toro designs and produces safe products, 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 illustrates the location of the model and serial numbers on the product.

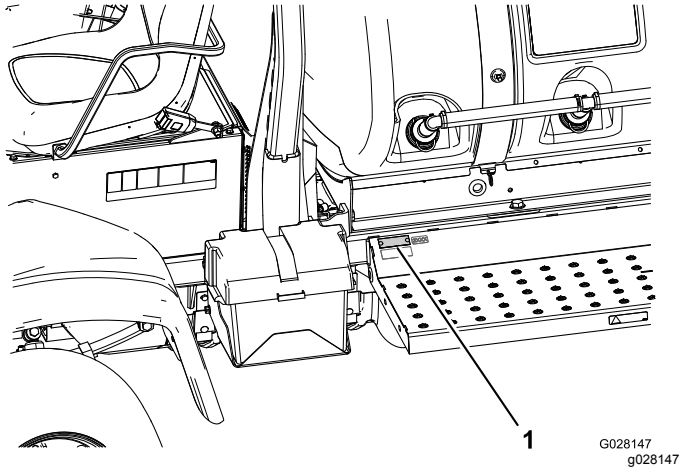


Figure 1

1. Location of the model and serial numbers

Model No. _____

Serial No. _____

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

Figure 2

1. Safety alert symbol.

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

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.

The machine meets the requirements of SAE J2258.

Safe Operating Practices

Important: **Important: The machine is designed primarily as an off-road vehicle and is not intended for extensive use on public roads. When using the machine on public roads, follow all traffic regulations and use any additional accessories that may be required by law, such as lights, turn signals, slow moving vehicle (SMV) sign, and others as required.**

The Multi-Pro 5800 Turf Sprayer was designed and tested to offer safe service when operated and maintained properly. Although hazard control and accident prevention partially are dependent upon the design and configuration of the machine, these factors are also dependent upon the awareness, concern, and proper training of the personnel involved in the operation, maintenance and storage of the machine. Improper use or maintenance of the machine can result in injury or death.

Not all of the attachments that adapt to the Multi-Pro 5800 Turf Sprayer are covered in this manual. See the specific Operator's Manual provided with each attachment for additional safety instructions. Read these manuals.

To reduce the potential for injury or death, comply with the following safety instructions:

Supervisor's Responsibilities

- Make sure that operators are thoroughly trained and familiar with the *Operator's Manual*, engine owner's manual, and all labels on the sprayer.
- Establish your own special procedures and work rules for unusual operating conditions (e.g. slopes too steep for sprayer operation).

Training

- Read the *Operator's Manual* and other training material before operating the machine.

  Note: If the operator(s) or mechanic(s) cannot read the manual language, 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 untrained people operate or service the equipment.

  Note: 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 damage to property.

Before Operating

- Operate the machine only after reading and understanding the contents of this manual.
- **Never** allow children to operate the sprayer.
- **Never** allow other adults to operate the sprayer without first reading and understanding the *Operator's Manual*. Only trained and authorized persons should operate this sprayer. Make sure that all operators are physically and mentally capable of operating the sprayer.
- This sprayer is designed to carry **only you**, the operator and **one passenger** in the seat provided by the manufacturer. **Never** carry any additional passengers on the sprayer.
- **Never** operate the sprayer when under the influence of drugs or alcohol. Even prescription drugs and cold medicines can cause drowsiness.
- Do not drive the sprayer when you are tired. Be sure to take occasional breaks. It is very important that you stay alert at all times.
- Become familiar with the controls and know how to stop the engine quickly.
- Keep all shields, safety devices, and decals in place. If a shield, safety device, or decal is malfunctioning, illegible, or damaged, repair or replace it before operating the machine.
- Wear appropriate clothing; including safety glasses, long pants, safety shoes, rubber boots, gloves, and hearing protection. Do not wear loose fitting clothing or jewelry which could get caught in moving parts and cause personal injury. Always wear substantial shoes.

⚠ CAUTION

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

Wear hearing protection when operating this machine.

- Avoid driving when it is dark, especially in unfamiliar areas. If you must drive when it is dark, be sure to drive cautiously, use the headlights, and even consider adding additional lights.
- Be extremely careful when operating around people. Always be aware of where bystanders might be located and keep them away from the work area.
- Before operating the sprayer, always check the designated areas of the sprayer that are stated in the Pre-Starting Checks in the Operation section. If the machine does not function correctly or is damaged in any way, do **not** use the sprayer. Make sure that the problem is corrected before the sprayer or attachment is operated.
- Make sure the operator and passenger area is clean and free from chemical residue and debris buildup.
- Ensure that all fluid line connectors are tight and all hoses are in good condition before applying pressure to the system.

  Note: Do not use the sprayer if it is leaking or damaged.
- Since fuel is highly flammable, handle it carefully.
  - Use an approved fuel container.
  - Do not remove the cap from the fuel tank when the engine is hot or running. Allow the engine to cool before fueling the machine.
  - Do not smoke while handling fuel.
  - Fill the fuel tank of the machine outdoors.
  - Fill the fuel tank of the machine to about 25 mm (1 inch) below the top of the tank (the bottom of the filler neck). Do not overfill the fuel tank.
  - Wipe up any spilled fuel.

Chemical Safety

⚠ WARNING

Chemical substances used in the spreader-sprayer system may be hazardous and toxic to you, bystanders, animals, plants, soils or other property.

- **Carefully read and follow the chemical warning labels and Material Safety Data Sheets (MSDS) for all chemicals used and protect yourself according to the chemical manufacturer's recommendations. Ensure that as little skin as possible is exposed while using chemicals. Use appropriate Personal Protective Equipment (PPE) to guard against personal contact with chemicals, such as:**
  - **safety glasses, goggles, and/or face shield**
  - **respirator or filter mask**
  - **chemical resistant gloves**
  - **rubber boots or other substantial footwear**
  - **hearing protection**
  - **clean change of clothes, soap, and disposable towels, to be kept on-hand, in the event of a chemical spill.**
- **Keep in mind that there may be more than one chemical used, and information on each chemical should be assessed.**
- **Refuse to operate or work on the sprayer if this information is not available!**
- **Before working on a sprayer system, make sure that the system has been triple rinsed and neutralized according to the recommendations of the chemical manufacturer(s) and all of the valves have been cycled 3 times.**
- **Verify there is an adequate supply of clean water and soap nearby, and immediately wash off any chemicals that contact you.**
- Obtain proper training before using or handling chemicals.
- Use the correct chemical for the job.
- Follow the chemical manufacturer's instructions for the safe application of the chemical. Do not exceed recommended system application pressure.
- Do not fill, calibrate, or clean the unit when people, especially children, or pets are in the area.

- Handle chemicals in a well ventilated area.
- Have clean water available especially when filling the spray tank.
- Do not eat, drink, or smoke while working with chemicals.
- Do not clean spray nozzles by blowing through them or placing in mouth.
- Always wash your hands and other exposed areas as soon as possible after you finish working with chemicals.
- Keep chemicals in their original packages and stored in a safe location.
- Properly dispose of unused chemicals and chemical containers as instructed by the chemical manufacturer and your local codes.
- Chemicals and fumes are dangerous; never enter the tank or place your head over or in the opening of a tank.
- Follow all local, state, federal regulations for spreading or spraying chemicals.

While Operating

⚠ WARNING

Engine exhaust contains carbon monoxide, which is an odorless, deadly poison that can kill you.

Do not run engine indoors or in an enclosed area.

- The operator (and passenger) should remain seated whenever the sprayer is in motion. The operator should keep both hands on the steering wheel whenever possible. Keep your arms and legs within the sprayer body at all times.
- Failure to operate the sprayer safely may result in an accident, tip over of the sprayer, and serious injury or death. Drive carefully. To prevent tipping or loss of control:
  - Use extreme caution, reduce speed, and maintain a safe distance around sand traps, ditches, creeks, ramps, unfamiliar areas, or any areas that have abrupt changes in ground conditions or elevation.
  - Watch for holes or other hidden hazards.
  - Use extra caution when operating the sprayer on wet surfaces, in adverse weather conditions, at higher speeds, or with a full load. Stopping time and distance will increase with a full load.
  - Avoid sudden stops and starts. Do not go from reverse to forward or forward to reverse without first coming to a complete stop.
  - Slow down before turning. Do not attempt sharp turns or abrupt maneuvers or other unsafe driving actions that may cause a loss of sprayer control.
  - Before backing up, look to the rear and ensure that no one is behind you. Back up slowly.
  - Watch out for traffic when you are near or crossing roads. Always yield the right of way to pedestrians and other vehicles. This sprayer is **not** designed for use on streets or highways. Always signal your turns or stop early enough so that other people know what you plan to do. Obey all traffic rules and regulations.
  - The electrical and exhaust systems of the sprayer can produce sparks capable of igniting explosive materials. Never operate the sprayer in or near an area where there is dust or fumes in the air which are explosive.
  - If you are ever unsure about safe operation, **stop work** and ask your supervisor.
- Do not touch the engine or muffler while the engine is running or soon after it has stopped. These areas may be hot enough to cause burns.
- If the machine ever vibrates abnormally, stop immediately, wait for all motion to stop, and inspect the sprayer for damage. Repair all damage before resuming operation.
- Before getting off of the seat:
  1. Stop the movement of the machine.
  2. Remove your foot from the traction pedal and set the parking brake.
  3. Turn the key for the starter switch to the Off position.
  4. Remove the key from the starter switch.

  Important: **Do not park the machine on an incline.**
- 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.

Braking

- Slow down before you approach an obstacle. This gives you extra time to stop or turn away. Hitting an obstacle can damage the sprayer and its contents. More important, it can injure you.
- Gross Vehicle Weight (GVW) has a major impact on your ability to stop and/or turn. Heavy loads and attachments make a sprayer harder to stop or turn. The heavier the load, the longer it takes to stop.
- Turf and pavement are much more slippery when they are wet. It can take 2 to 4 times as long to stop on wet surfaces as on dry surfaces. If you drive through standing water deep enough to get

the brakes wet, they will not work well until they are dry. After driving through water, you should test the brakes to make sure they work properly. If they do not, drive slowly while putting light pressure on the brake pedal. This will dry the brakes out.

ROPS Safety

Note: For each machine covered in this *Operator's Manual*, a cab installed by Toro is a ROPS.

- Do not remove the ROPS from the machine.
- Fasten the seat belt and ensure that you can release it quickly in an emergency. Always wear your seat belt when the roll bar is up or on a machine with a cab installed by Toro.
- Check carefully for overhead obstructions and do not contact them.
- Keep the ROPS in safe operating condition by thoroughly inspecting it periodically for damage and keeping all the mounting fasteners tight.
- Replace any damaged ROPS component. Do not repair or alter it.

Operating on Hills and Rough Terrain

Operating the sprayer on a hill may cause tipping or rolling of the sprayer, or the engine may stall and you could lose headway on the hill. This could result in personal injury.

- Do not accelerate quickly or slam on the brakes when backing down a hill, especially with a load.
- Never drive across a steep hill; always drive straight up or down or go around the hill.
- If the engine stalls or you begin to lose headway while climbing a hill, gradually apply the brakes and slowly back straight down the hill.
- Turning while traveling up or down hills can be dangerous. If you have to turn while on a hill, do it slowly and cautiously. Never make sharp or fast turns.
- Heavy loads affect stability. Reduce the weight of the load and your speed when operating on hills.
- Avoid stopping on hills, especially with a load. Stopping while going down a hill will take longer than stopping on level ground. If the sprayer must be stopped, avoid sudden speed changes, which may initiate tipping or rolling of the sprayer. Do not slam on the brakes when rolling backward, as this may cause the sprayer to overturn.
- Reduce speed and load when operating on rough terrain, uneven ground, and near curbs, holes, and other sudden changes in terrain. Loads may shift, causing the sprayer to become unstable.

⚠ WARNING

Sudden changes in terrain may cause abrupt steering wheel movement, possibly resulting in hand and arm injuries.

- Reduce your speed when operating on rough terrain and near curbs.
- Grip the steering wheel loosely around the perimeter. Keep your hands clear of the steering wheel spokes.

Loading

The weight of the cargo can change the sprayer center of gravity and sprayer handling. To avoid loss of control and personal injury, follow these guidelines:

- Reduce the weight of the load when operating on hills and rough terrain to avoid tipping or overturning of the sprayer.
- Liquid loads can shift. This shifting happens most often while turning, going up or down hills, suddenly changing speeds, or while driving over rough surfaces. Shifting loads can cause the sprayer to tip over.
- When operating with a heavy load, reduce your speed and allow for sufficient braking distance. Do not suddenly apply the brakes. Use extra caution on slopes.
- Be aware that heavy loads increase your stopping distance and reduce your ability to turn quickly without tipping over.

Maintenance

- Only permit qualified and authorized personnel to maintain, repair, adjust, or inspect the sprayer.
- Before performing any maintenance, ensure that the system has been thoroughly rinsed and cleaned.
- Before servicing or making adjustments to the machine, stop the engine, set the parking brake, and remove the key from the starter switch to prevent someone from accidentally starting the engine.
- To make sure that the entire machine is in good condition, keep all nuts, bolts, and screws properly tightened.
- To reduce the potential for fire, keep the engine area free of excessive grease, grass, leaves, and accumulation of dirt.
- Never use an open flame to check the level or leakage of fuel or battery electrolyte.

- If the engine must be running to perform a maintenance adjustment, keep your hands, feet, clothing, and any parts of your body away from the engine and any moving parts. Keep everyone away.
- Do not use open pans of fuel or flammable cleaning fluids when cleaning parts.
- **Do not adjust** the traction control speed. To ensure safety and accuracy, have an Authorized Toro Distributor check the ground speed.
- Keep your body and hands away from pin hole leaks or nozzles that eject high pressure fluid. Use cardboard or paper to find leaks. Fluid escaping under pressure can penetrate skin and cause injury requiring surgery within a few hours by a qualified surgeon or gangrene may result.
- If major repairs are ever needed or assistance is required, contact an Authorized Toro Distributor.
- To be sure of optimum performance and safety, always purchase genuine Toro replacement parts and accessories. Replacement parts and accessories made by other manufacturers could be dangerous. Altering this sprayer in any manner that may affect sprayer operation, performance, durability, or its use, may result in injury or death. Such use could void the product warranty.

Sound Power

This unit has a guaranteed sound power level of 101 dBA, which includes an Uncertainty Value (K) of 1 dBA.

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

Sound Pressure

This unit has a sound pressure level at the operator's ear of 90 dBA, which includes an Uncertainty Value (K) of 1 dBA.

Sound pressure level was determined according to the procedures outlined in EN ISO 11201.

Hand-Arm Vibration

Measured vibration level for right hand = 0.8 m/s^2

Measured vibration level for left hand = 0.8 m/s^2

Uncertainty Value (K) = 0.4 m/s^2

Measured values were determined according to the procedures outlined in EN 1032.

Whole Body Vibration

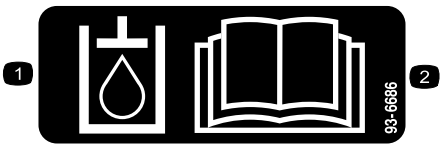
Measured vibration level = 0.28 m/s^2

Uncertainty Value (K) = 0.14 m/s^2

Measured values were determined according to the procedures outlined in EN 1032.

Safety and Instructional Decals

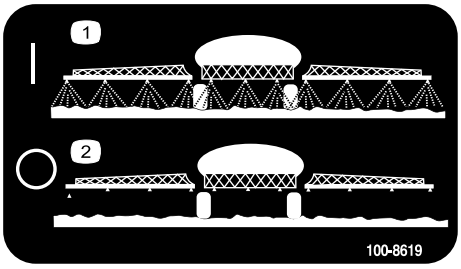
Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or lost.



decal93-6686

93–6686

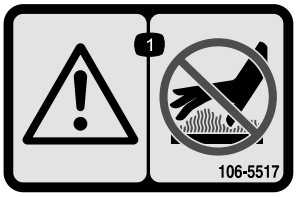
1. Hydraulic oil
2. Read the *Operator's Manual*.



decal100-8619

100-8619

1. Spray on
2. Spray off



decal106-5517

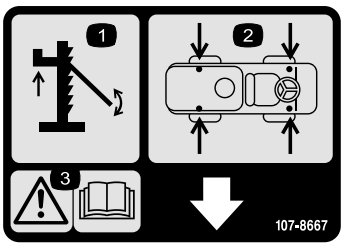
106-5517

1. Warning—do not touch the hot surface.

decal106-6755

106-6755

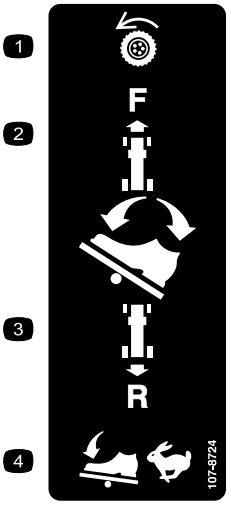
1. Engine coolant under pressure.
2. Explosion hazard—read the *Operator's Manual.*
3. Warning—do not touch the hot surface.
4. Warning—read the *Operator's Manual.*



decal107-8667

107-8667

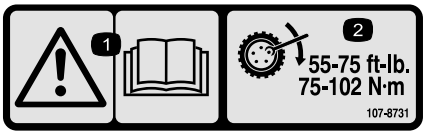
1. Jacking
2. Jack point locations
3. Warning—Read the *Operator's Manual* for more information on jacking the vehicle



decal107-8724

107-8724

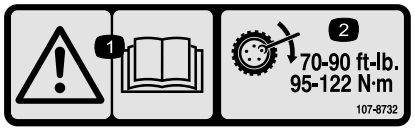
1. Traction drive
2. To drive forward, press the top of the traction pedal forward and down.
3. To drive in reverse, press the bottom of the pedal rearward and down.
4. Vehicle speed increases with more pedal pressure.



decal107-8731

107-8731

1. Warning—read the *Operator's Manual.*
2. Torque lug nuts to 75 to 102 N-m (55 to 75 ft-lb).



decal107-8732

107-8732

1. Warning—read the *Operator's Manual.*
2. Torque lug nuts to 95 to 122 N-m (75 to 90 ft-lb).

CALIFORNIA SPARK ARRESTER WARNING

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

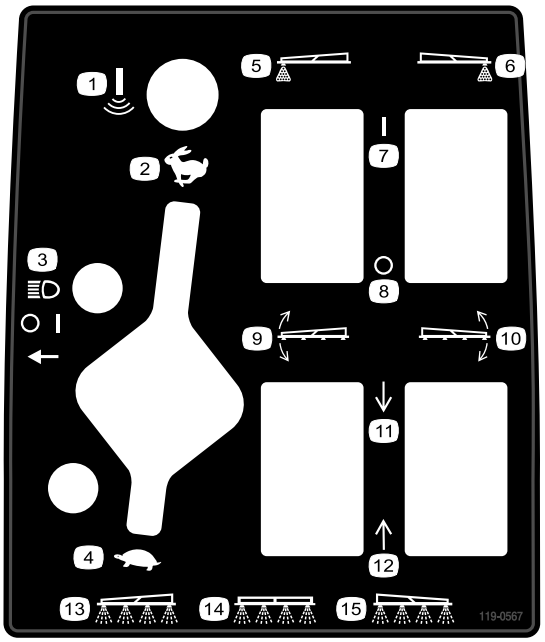
decal117-2718

117–2718

decal117-4955

117-4955

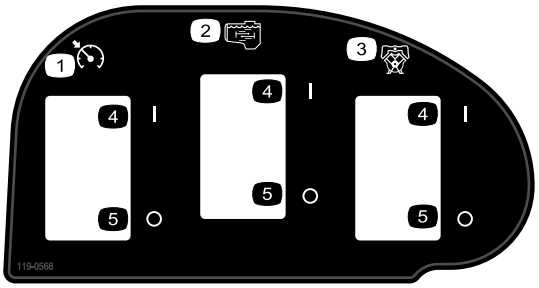
1. Warning—read the *Operator's Manual*; wear the seat belt when seated in the operator's position; avoid tipping the machine.
2. Warning—wear hearing protection.



decal119-0567

119-0567

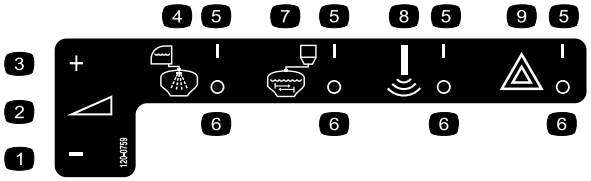
1. Sonic boom
2. Throttle—fast
3. Headlights
4. Throttle—slow
5. Foam marker, left boom
6. Foam marker, right boom
7. On
8. Off
9. Boom lift, left boom
10. Boom lift, right boom
11. Raise
12. Lower
13. Left boom spray switch
14. Center boom spray switch
15. Right boom spray switch



decal119-0568

119-0568

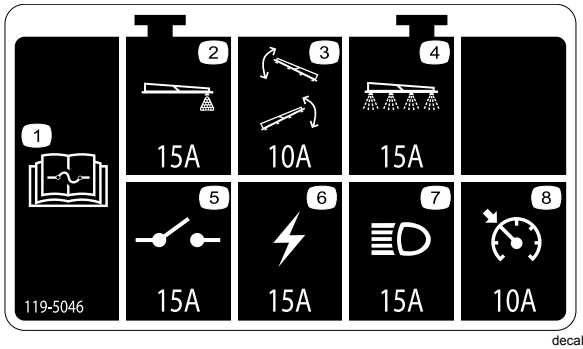
1. Ground-speed lock switch
2. Agitation
3. Pump
4. On
5. Off



decal120-0759

120-0759

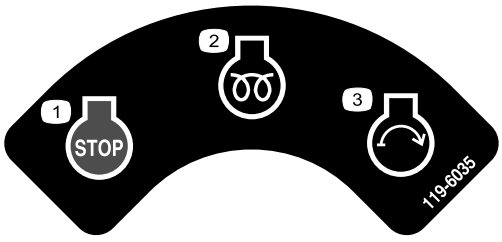
1. Decrease
2. Continuous variable setting, spray pressure
3. Increase
4. Rinse from clean water tank
5. Off
6. On
7. Mix eductor
8. Sonic boom
9. Hazard lights



decal119-5046

119-5046

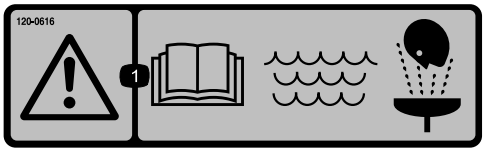
1. Read the *Operator's Manual* for information on fuses.
2. Foam marker—15 amp
3. Boom lift—10 amp
4. Spray system—15 amp
5. Breaker switch—15 amp
6. Ignition—15 amp
7. Headlights—15 amp
8. Ground-speed lock switch—10 amp



decal119-6035

119-6035

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



decal120-0616

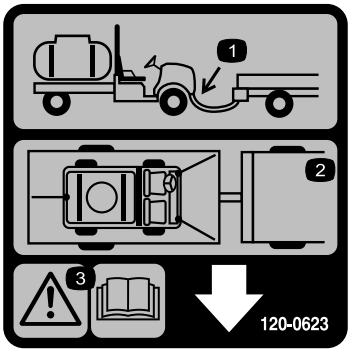
120–0616

1. Warning—read the *Operator's Manual*; use fresh, clean water for first-aid washing.

decal120-0622

120-0622

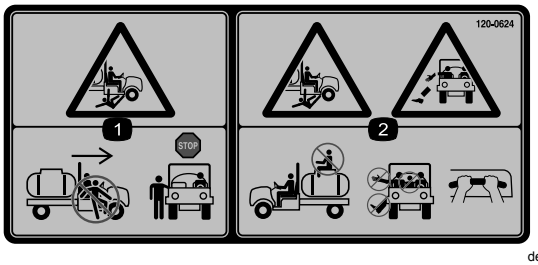
1. Warning—read the *Operator's Manual*.
2. Warning—do not enter the tank.
3. Caustic liquid/chemical burn and toxic gas inhalation hazards—wear hand, skin, eye, and respiratory protection.



decal120-0623

120-0623

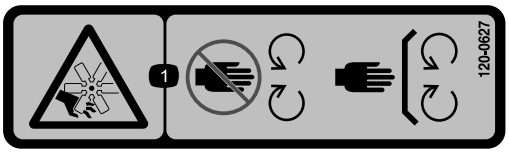
1. Tow hitch location
2. Tie down locations
3. Warning—Read the *Operator's Manual.*



decal120-0624

120-0624

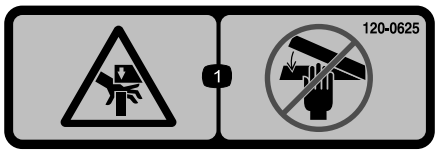
1. Crushing/dismemberment hazard of bystanders—do not exit or enter the machine while it is moving; stop the machine before entering or exiting.
2. Falling, crushing hazard—no riders on tank; keep arms and legs inside of the vehicle at all times, use passenger hand holds.



decal120-0627

120-0627

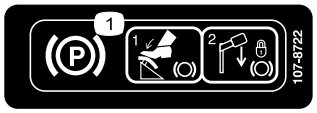
1. Cutting/dismemberment hazard, fan—stay away from moving parts, keep all guards and shields in place.



decal120-0625

120-0625

1. Pinch point, hand—keep hands away.



decal107-8722

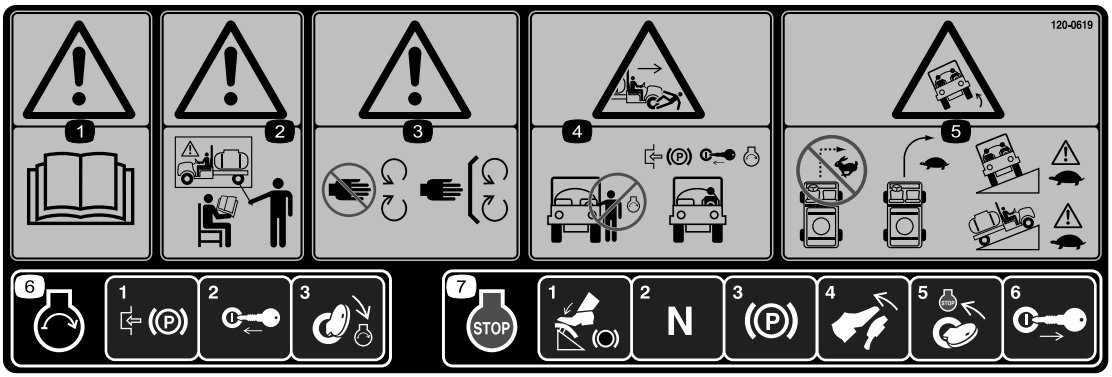
107-8722

1. Engaging the parking brake—1) Push down on the parking brake pedal; 2) Pull down on the parking brake lever to lock the parking brake.

decal120-0617

120-0617

1. Pinch point, hand—keep hands away from hinge.
2. Crushing hazard, boom—keep bystanders a safe distance from the machine.



decal120-0619

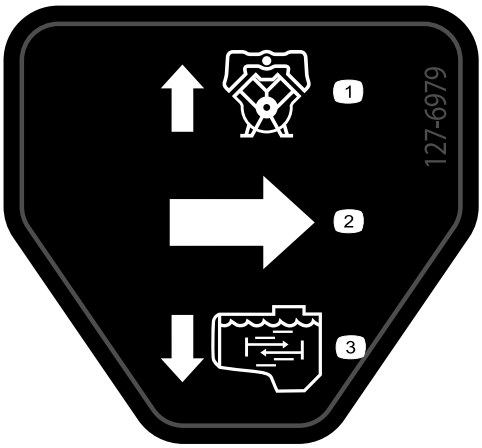
120-0619

1. Warning—read the *Operator's Manual*.
2. Warning—do not operate this machine unless you are trained.
3. Warning—stay away from moving parts, keep all guards and shields in place.
4. Crushing/dismemberment hazard of bystanders—do not start the engine while entering or exiting the vehicle; engage the parking brake, insert the key, and start the engine while seated in the driver's seat.
5. Tipping hazard—do not turn sharply while traveling fast, drive slowly when turning; use caution and drive slowly when traveling across or up and down slopes.
6. To start the engine, engage the parking brake, insert the ignition key and turn it to the start position.
7. To stop the engine, press the brake, put the gear selector in neutral, set the parking brake, release the brake, stop the engine, and remove the key.

decal127-6976

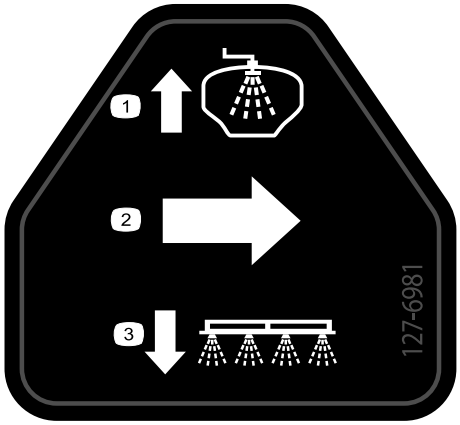
127-6976

1. Decrease
2. Increase



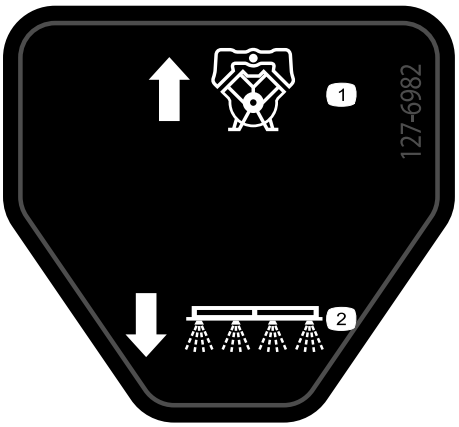
decal127-6979

127-6979



decal127-6981

127-6981



decal127-6982

127-6982

1. Pump
2. Boom spray

Setup

Loose Parts

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

Procedure	Description	Qty.	Use
1	No parts required	–	Check the boom hinge springs.
2	No parts required	–	Remove the shipping bumper.

Media and Additional Parts

Description	Qty.	Use
Starter key	2	Read the manuals and watch the training materials before operating the machine.
Operator's Manual	1	
Engine owner's Manual	1	
Parts Catalog	1	
Operator Training Materials	1	

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

Note: If you have questions or need additional information regarding the spray control system, refer to the *Operator's Manual* supplied with the system.

Important: **This sprayer is sold without nozzles and a application-rate controller. Either a *Manual Spray Operation Kit* or *ProControl™XPKit* is necessary for the proper function of the machine.**

To use the sprayer, *you must obtain and install nozzles*. Contact your Authorized Toro Distributor for information on the available boom kit and accessories.

After you install your nozzles and before using the sprayer for the first time (if you *do not* use Pro Control™XP Spray System), adjust the boom bypass valves so that the pressure and application rate remains the same for all booms when you turn one or more booms off. Refer to Calibrating the Boom Bypass Valves section in the Operation section.

1

Checking the Boom Hinge Springs

No Parts Required

Procedure

Important: **Operating the spray system with the boom hinge springs under the incorrect compression could damage the boom assembly. Measure the springs and use the jam nut to compress the springs to 3.96 cm (1.56 inches), if necessary.**

The sprayer is shipped with the boom extensions swung forward to facilitate packaging of the machine. The springs are not fully tightened at the time of manufacture to allow the booms to be in this position for transit. Before operating the machine, adjust the springs to the correct compression.

1. If necessary, remove the packing components that secure the right and left extension booms during shipping.
2. Support the booms while they are extended to the spray position.
3. At the boom hinge, measure the compression of the upper and lower springs while the booms are in their extended position (Figure 3).
   A. Compress all springs until they measure 3.96 cm (1.56 inches).
   B. Use the jam nut to compress any spring that measure greater than 3.96 cm (1.56 inches).

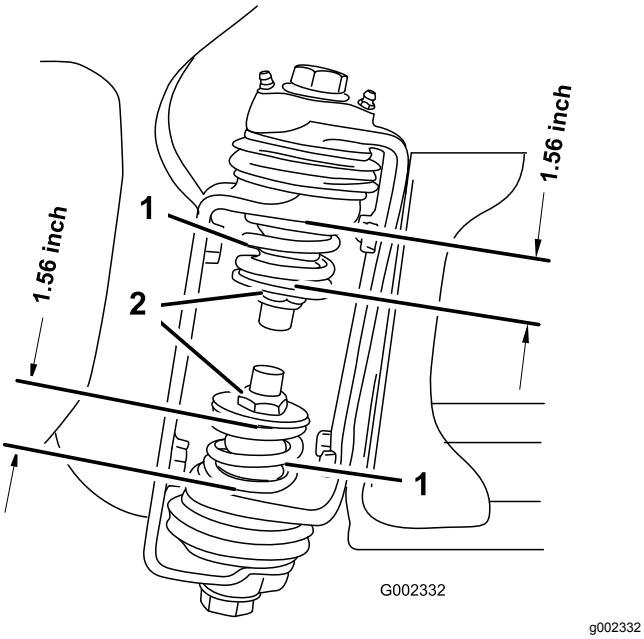


Figure 3

1. Boom hinge spring
2. Jam nut

4. Repeat the procedure for each spring on both boom hinges.
5. Move the booms into the transport “X” position; refer to Operating the Booms (page 30).

2

Removing the Shipping Bumper

No Parts Required

Procedure

1. Remove the bolts. washers, and nuts that secure the shipping bumper to the front chassis plate (Figure 4).

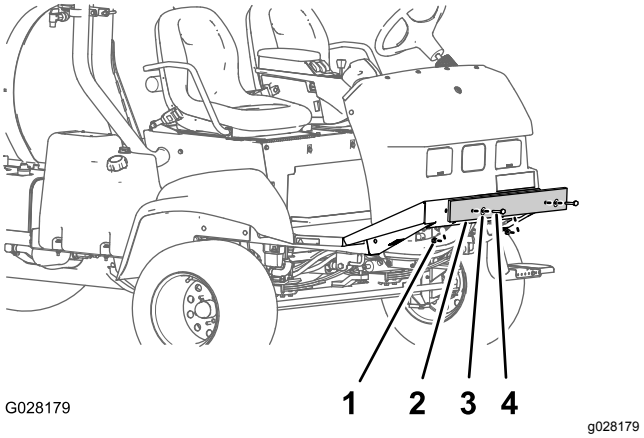


Figure 4

1. Nut
2. Shipping bumper
3. Washer
4. Bolt

2. Remove the shipping bumper from the machine (Figure 4).

   Note: Discard the bolts. washers, nuts, and shipping bumper.

Product Overview

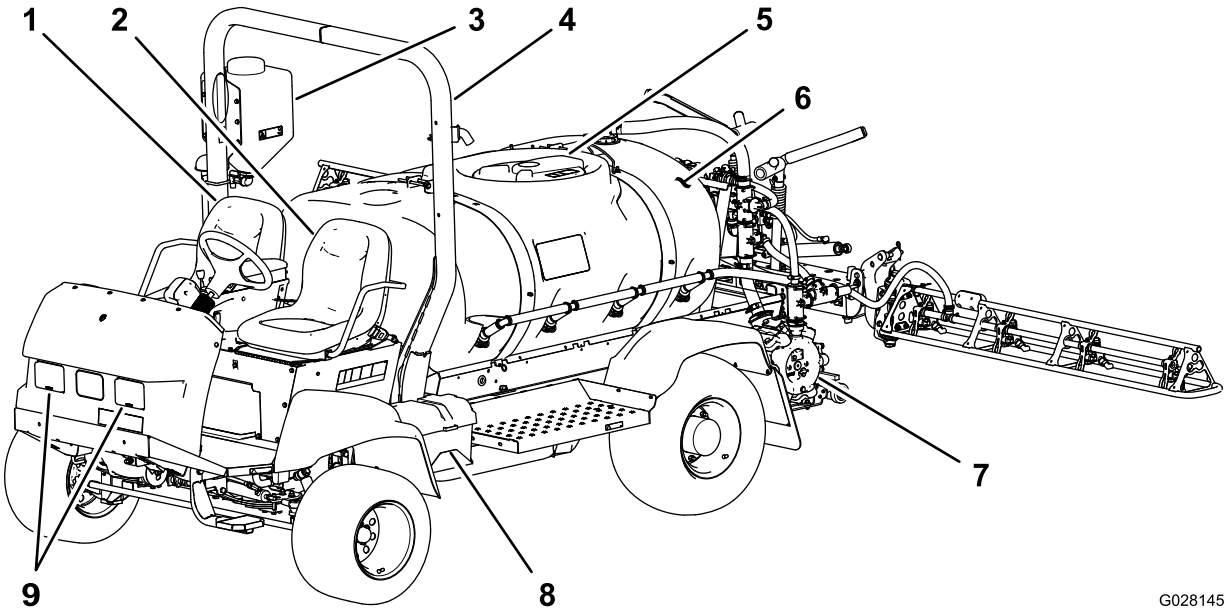


Figure 5

1. Passenger seat
2. Operator's seat
3. Fresh water tank
4. Roll Over Protection System (ROPS)
5. Tank lid
6. Chemical tank
7. Pump
8. Battery
9. Headlights

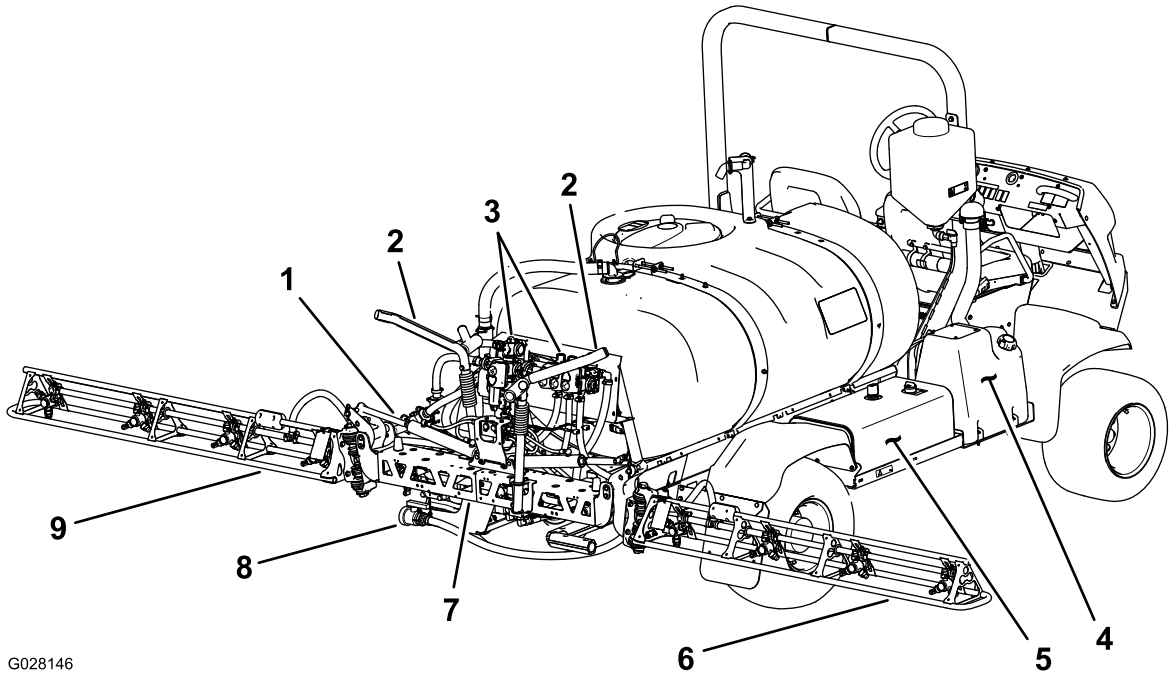


Figure 6

1. Boom control cylinder
2. Boom transport cradle
3. Valve cluster
4. Fuel tank
5. Hydraulic tank
6. Right boom section
7. Center boom section
8. Tank drain valve
9. Left boom section

Controls

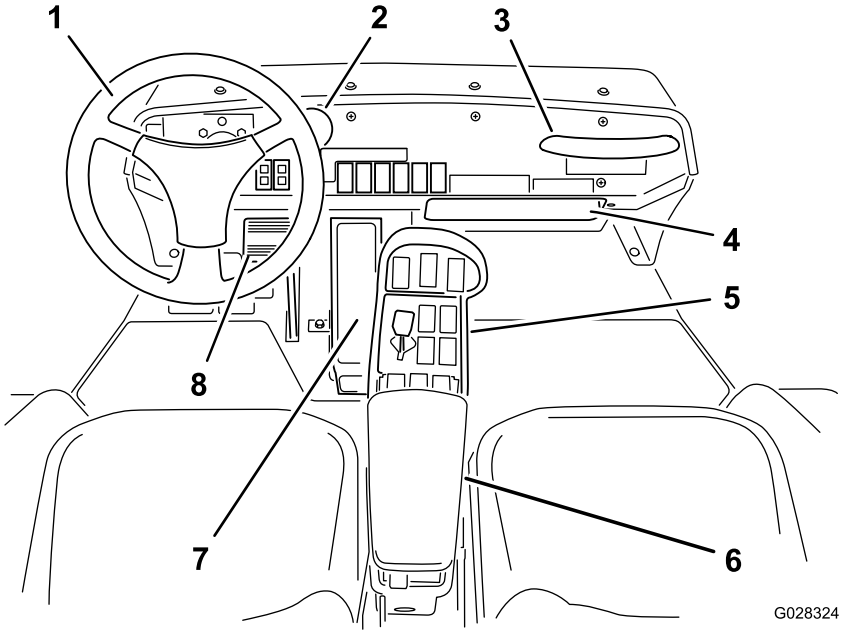


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Figure 7

1. Steering wheel
2. Pressure gauge
3. Passenger hand hold
4. Storage compartment
5. Center console
6. Arm rest
7. Traction pedal
8. Brake

Vehicle Controls

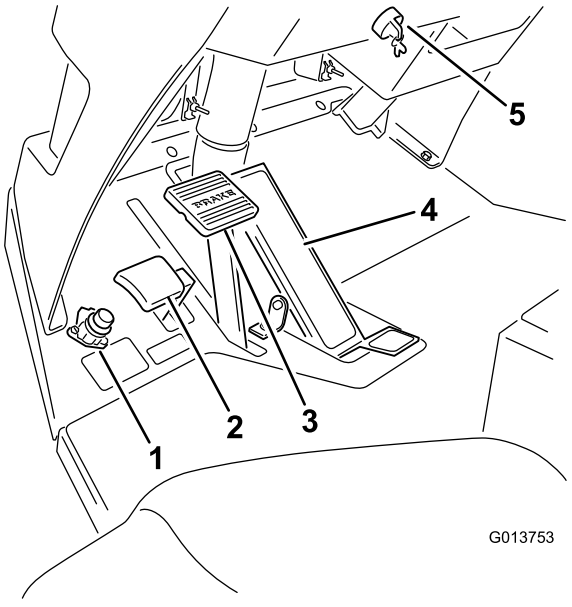
Traction Pedal

The traction pedal (Figure 8) controls the movement of the machine, both forward and reverse. Using the heel and toe of the right foot, press the top of the pedal to move forward or the bottom of the pedal to move in reverse. Release the pedal to slow and stop.

Important: **Ensure that you allow the sprayer to come to a stop before switching between the Forward and the Reverse positions.**

Note: The farther you press the pedal in either direction, the faster the sprayer will travel. To obtain maximum forward speed, set the throttle lever to the Fast position and press the traction pedal all the way forward.

Note: To get maximum power under heavy load or when ascending a hill, have the throttle in the Fast position while pressing traction pedal slightly to keep the engine speed high. When the engine speed begins to decrease, release the traction pedal slightly to allow the engine speed to increase.



g013753

Figure 8

1. Master-boom switch
2. Parking-brake pedal
3. Brake pedal
4. Traction pedal
5. Starter switch and key

Brake Pedal

Use the brake pedal to stop or slow the sprayer (Figure 8).

⚠ CAUTION

If you operate the sprayer with poorly adjusted or worn brakes, you could lose control of the sprayer, resulting in serious injury or death to you or bystanders.

Always check the brakes before operating the sprayer and keep them properly adjusted and repaired.

Parking Brake

The parking brake is a pedal to the left of the brake (Figure 8). Engage the parking brake whenever you plan on leaving the seat to prevent the sprayer from accidently moving. To engage the parking brake, press the brake pedal and, while holding the brake, press the parking brake pedal. To disengage, press and release the brake pedal. If the sprayer is parked on a steep grade, apply the parking brake and place blocks on the downhill side of the wheels.

Starter Switch

The starter switch (Figure 8), used to start and stop the engine, has 3 positions: Off, On/Preheat and Start.

Ground-Speed Lock Switch

The ground speed lock switch locks the position of the traction pedal at the time the switch is set (Figure 9). This ensures the sprayer travels at a constant speed while driving the machine on level ground.

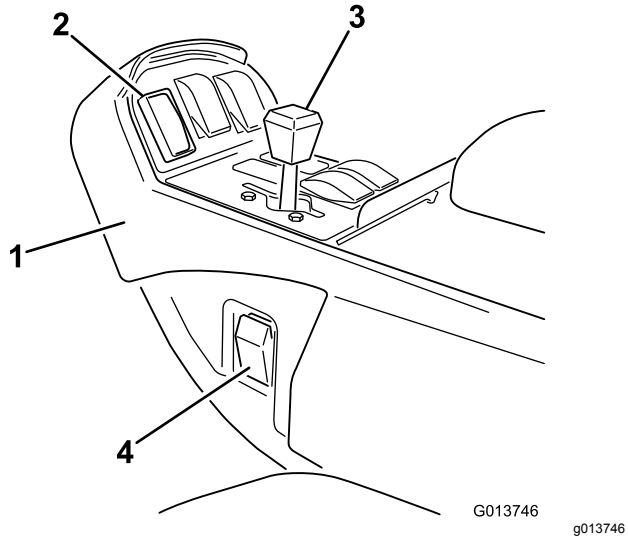


Figure 9

1. Center console
2. Ground speed lock switch
3. Throttle lever
4. Headlight switch

Throttle Lever

The throttle lever, located on the control panel between the seats (Figure 9), controls the speed of the engine. Push the lever forward to increase the engine speed and pull it rearward to decrease the engine speed.

Headlight Switch

Toggle the switch to operate the headlights (Figure 9). Push it forward to turn the lights on and rearward to turn them off.

Fuel Gauge

The fuel gauge is located on top of the fuel tank (Figure 10), on the left side of the machine and shows the amount of fuel in the tank.

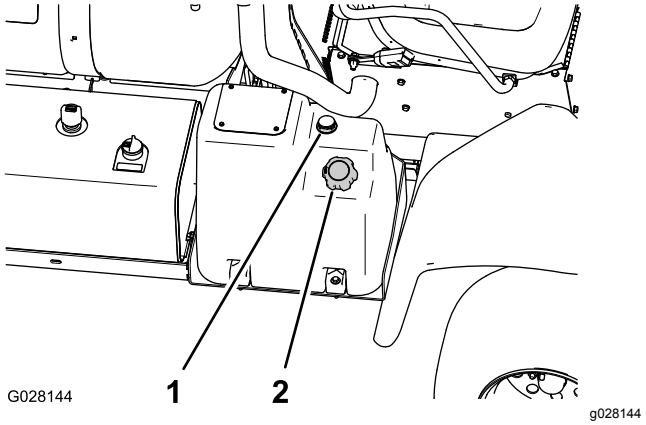


Figure 10

1. Fuel gauge
2. Fuel tank cap

Hour Meter

The hour meter (Figure 11) indicates the total number of hours the engine has run. The hour meter starts to function whenever the key is turned to the Run position.

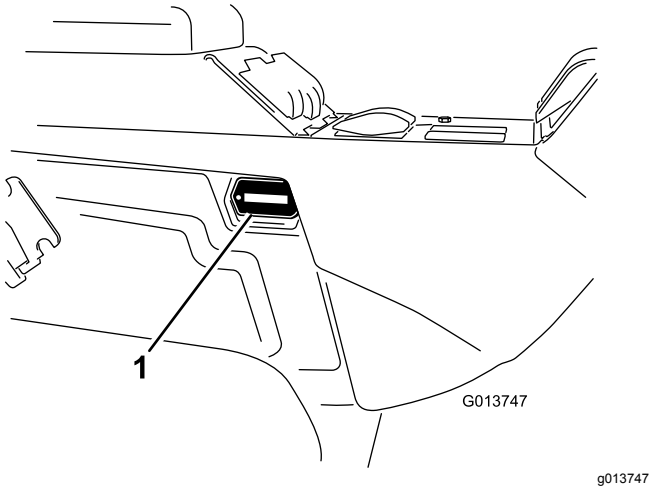


Figure 11

1. Hour Meter location

Sprayer Controls

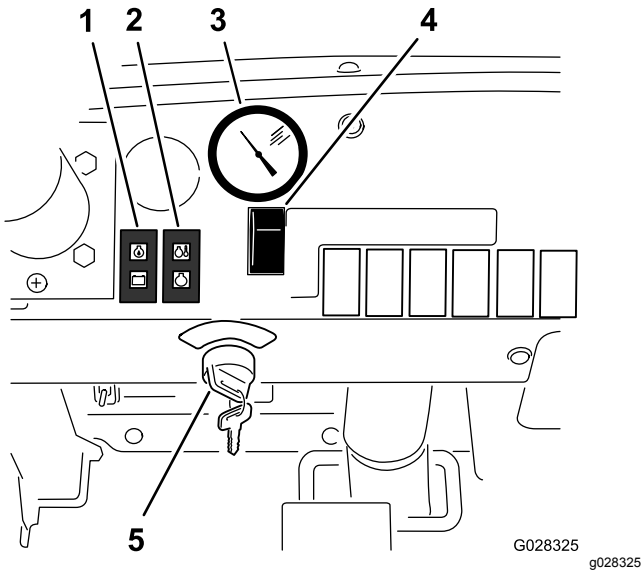


Figure 12

1. Oil pressure and battery light
2. Water temperature and glow plug light
3. Pressure gauge
4. Dash controls for optional kits
5. Key and key switch

Application Rate Switch

The application rate switch is located on the dash to the right of the steering wheel (Figure 14). Press and hold the switch forward to increase the spray system pressure, or press and hold it rearward to decrease pressure.

Pressure Gauge

The pressure gauge (Figure 12) is located on the dash. This gauge shows the pressure of the fluid in the system in psi and kPa.

Master Boom Switch

The master boom switch is located on the floor board of the machine cab and to the left of the operator. It allows you to start or stop the spray operation. Press the switch with your foot to enable or disable the spray system (Figure 13).

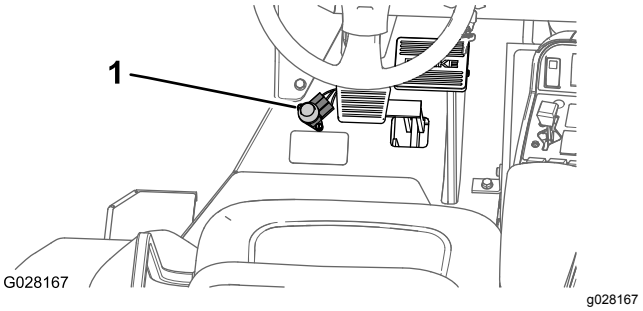


Figure 13

1. Master boom switch

Section Switches

The section switches are located on the control panel to the right of the seat (Figure 14). Toggle each switch forward to turn the corresponding boom section on and rearward to turn each off. When the switch is in the On position, a light will illuminate on the switch. These switches will only affect the spray system when the master boom switch is in the On position.

Pump Switch

The pump switch is located on the control panel to the right of the seat (Figure 14). Toggle this switch forward to run the pump or rearward to stop the pump. When the switch is turned on, a light on the switch illuminates.

Important: **Only engage the pump switch when the engine is at low idle to avoid damaging the pump drive.**

Boom Lift

The boom lift switches are located on the control panel to the right of the seat and used to raise the left and right booms respectively (Figure 14).

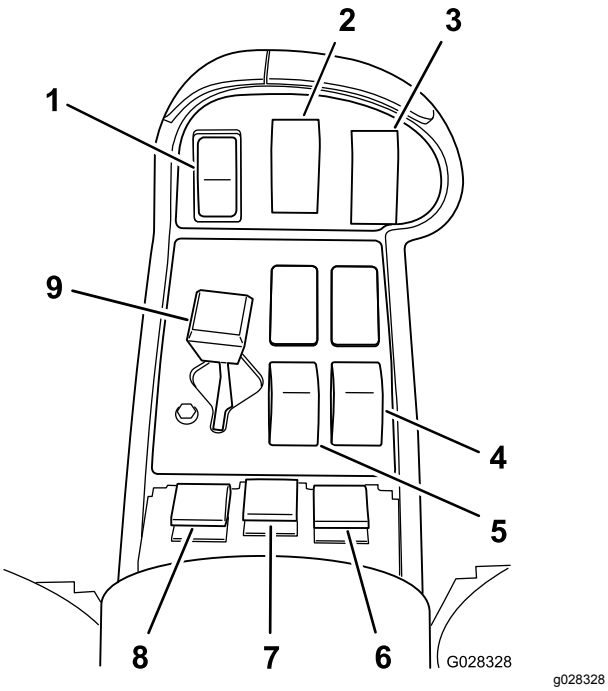


Figure 14

1. Ground-speed lock switch
2. Agitation
3. Pump switch
4. Boom lift switch, right boom
5. Boom lift switch, left boom
6. Boom switch, right boom
7. Boom switch, center boom
8. Boom switch, left boom
9. Throttle lever

Agitation Switch

The agitation switch is located on the control panel to the right of the seat (Figure 14). Toggle this switch forward to turn on the agitation in the tank or rearward to stop the agitation. When the switch is turned on, a light on the switch illuminates. To operate the agitation function, you must run the sprayer system pump and you must run the engine above an idle. The agitation valve is located behind the tank (Figure 15)

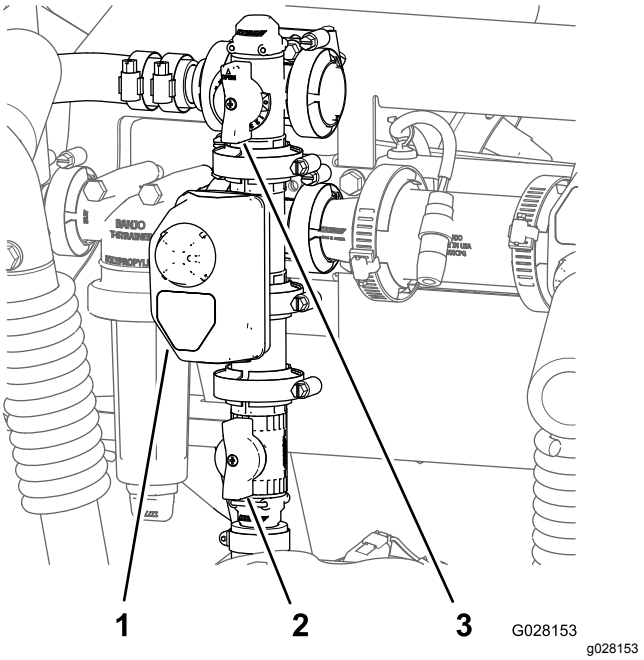


Figure 15

1. Actuator (agitation valve)
2. Handle (agitation throttle valve)
3. Handle (agitation bypass)

Agitation Bypass Valve

The agitation bypass valve redirects the flow of fluid to the sprayer system pump when you turn off the agitation function (Figure 15). The agitation bypass valve is located at the above of the agitation valve. You can adjust the bypass valve to ensure that pressure remains constant during agitation; refer to Calibrating the Agitation Bypass Valve (page 33).

Agitation Throttle Valve

The agitation throttle valve is a manually operated ball valve that controls flow to the agitation nozzles in the main tank (Figure 15). Using this valve allows the user to control the sprayer system pressure at the agitation nozzles of the main tank when larger application rates are required.

Section Valves

The section valves control flow to the 3 boom sections (Figure 16). If you ever need to manually turn off a section, rotate the knob on the valve clockwise to turn the valve off or counterclockwise to turn it on.

Note: Turning the section valve manually can interfere with the function of the fuses. The fuses should be checked after manually rotating the valve.

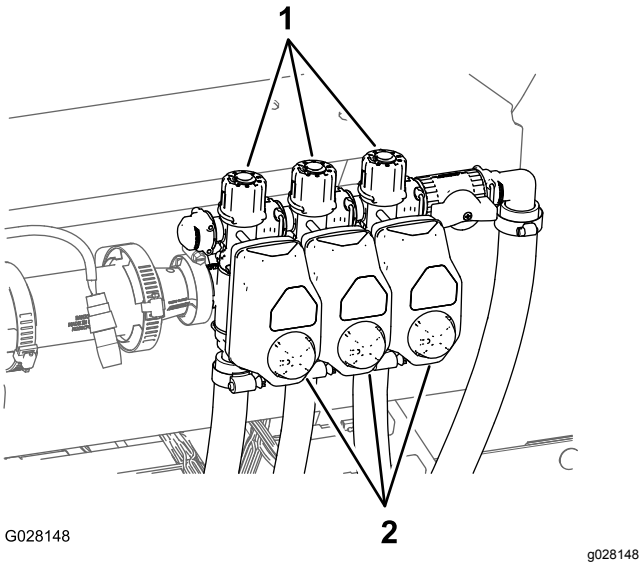


Figure 16

1. Knob (section bypass valve)
2. Actuators (section valve)

Pro Foam Marker Switch Locations (Optional)

If you install the Pro Foam Marker kit, you will add switches to the control panel for controlling their operation. The sprayer comes with plastic plugs in these locations.

Ultra Sonic Boom (Optional)

If you install the Ultra Sonic Boom, you will add a switch to the dash for controlling its operation. The sprayer comes with a plastic plug in this location.

Anti-siphon Fill Receptacle

To the front of the tank cover is a hose receptacle with a threaded fitting, a 90-degree barbed fitting, and a short hose which you can direct toward the tank opening. This receptacle allows you to connect a water hose to it and fill the tank with water without contaminating the hose with the chemicals in the tank.

Important: **Do not lengthen the hose to allow contact with the tank fluids. The distance from the end of the hose to the uppermost water level should be within local regulatory limits.**

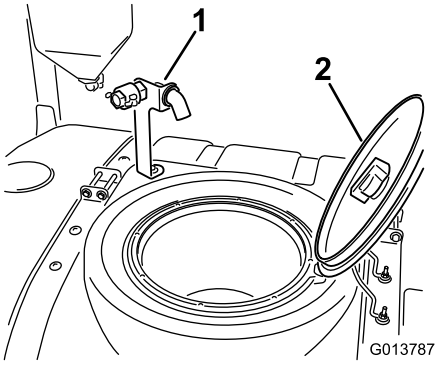


Figure 17

1. Anti-siphon fill receptacle
2. Tank cover

Tank Cover

The tank cover is located in the center of the top of the tank. To open it, turn off the engine, then turn the front half of the cover to the left and swing it open. You can remove the strainer inside for cleaning. To seal the tank, close the cover and rotate the front half toward the right.

Specifications

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

Base weight	1307 kg (2,882 lb)
Weight with standard spray system, empty, without operator	1307 kg (2,882 lb)
Weight with standard spray system, full, without operator	2,499 kg (5,510 lb)
Maximum gross vehicle weight (GVW) (on level ground)	3,023 kg (6,665 lb)
Tank capacity	1135.6 L (300 US gallons)
Overall width with standard spray system booms stored in the X position	189 cm (74-3/4 inches)

Overall length with standard spray system	391 cm (154 inches)
Overall length with standard spray system to the top of the booms stored in the X position	442 cm (174 inches)
Overall height with standard spray system	146 cm (57.5 inches)
Overall height with standard spray system to the top of the booms stored in the X position	231 cm (91 inches)
Ground clearance	18.4 cm (7.25 inches)
Wheel base	198 cm (78 inches)

Optional Equipment

The Toro Company has optional equipment and accessories that you can purchase separately and install on your sprayer. Contact your Authorized Service Dealer for a complete list of optional equipment that is currently available for your sprayer.

Operation

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

Think Safety First

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

Performing Pre-Starting Checks

Check the following items each time you begin using the sprayer for the day:

- Check the tire pressure.

  Note: These tires are different than car tires; they require less pressure to minimize turf compaction and damage.
- Check all fluid levels and add the appropriate amount of specified fluids, if any are found to be low.
- Check the brake pedal operation.
- Check to see that the lights are working.
- With the engine off, check for oil leaks, loose parts, and any other noticeable malfunctions.

If any of the above items are not correct, notify your mechanic or check with your supervisor before taking the sprayer out for the day. Your supervisor may want you to check other items on a daily basis, so ask what your responsibilities are.

Preparing to Drive the Machine

Checking the Tire Air Pressure

Service Interval: Before each use or daily

Check the tire air pressure to ensure proper levels. Fill the tires to 124 kPa (18 psi).

Note: Also, check the tires for wear or damage.

Checking the Engine Oil

Service Interval: Before each use or daily Check the engine oil level before you start the engine for the first time.

Engine oil specification:

- Oil type—API service CH-4, CI-4 or higher.
- Preferred oil viscosity—SAE 15W40 (above 0 degrees F)
- Alternate oil viscosity—SAE 10W30 or 5W30 (all temperatures)

Toro Premium Engine Oil is available from your distributor in either 15W40 or 10W30 viscosity. Refer to the *Parts Catalog* for part numbers.

Note: The best time to check the engine oil is when the engine is cool, before it has been started for the day. If it has already been run, allow the oil to drain back down to the sump for at least 10 minutes before checking.

The engine is shipped with oil in the crankcase; however, the level of oil must be checked before you first start the engine and after you have run it.

1. Position the machine on a level surface.
2. Remove the dipstick, located under the passenger seat, and wipe it with a clean rag (Figure 18).

   Note: Insert the dipstick into the tube and make sure it is seated fully. Remove the dipstick and check the oil level.

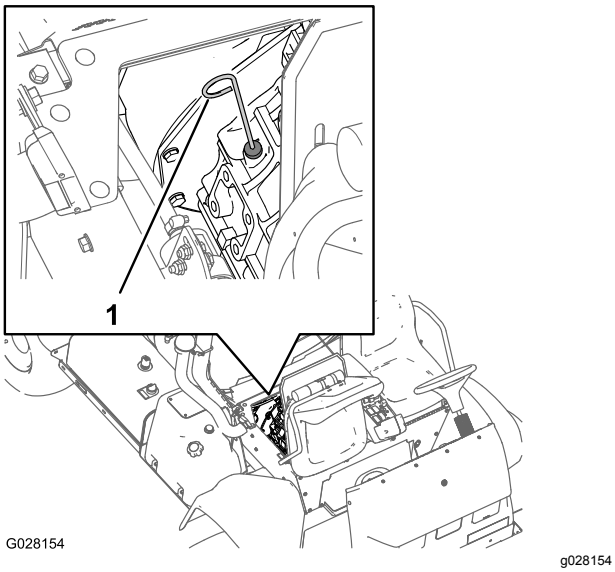


Figure 18

1. Dipstick

3. If the oil level is low, remove the filler cap from the valve cover (Figure 19) and pour oil into the filler neck until the oil level is up to the Full mark on the dipstick.

   Note: Add the oil slowly and check the level often during this process. Do not overfill.

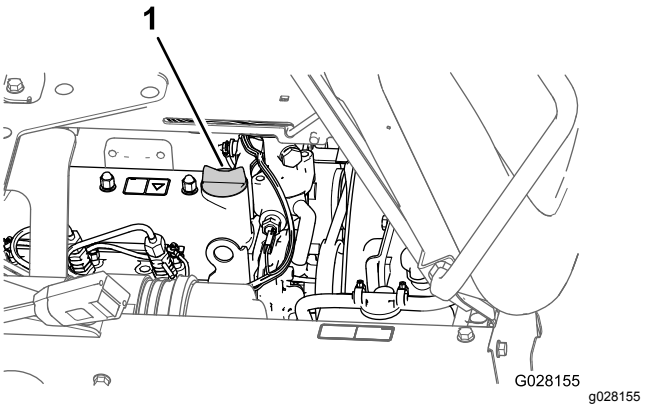


Figure 19

1. Oil filler cap

4. Install the filler cap.
5. Install the dipstick firmly in place.

Checking the Coolant Level

Service Interval: Before each use or daily Check the level of coolant in the radiator and the expansion tank at the beginning of each day before starting the engine.

Coolant type: a solution of 50% water and 50% permanent ethylene glycol antifreeze

⚠ CAUTION

If the engine has been running, the coolant may be hot and pressurized. If you open the radiator cap when the coolant is hot, it could spray out and severely burn you or bystanders.

Allow the engine to cool for at least 15 minutes before opening the radiator cap.

1. Position the sprayer on a level surface.
2. Set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
3. Carefully remove the radiator cap and the expansion tank cap (Figure 20).

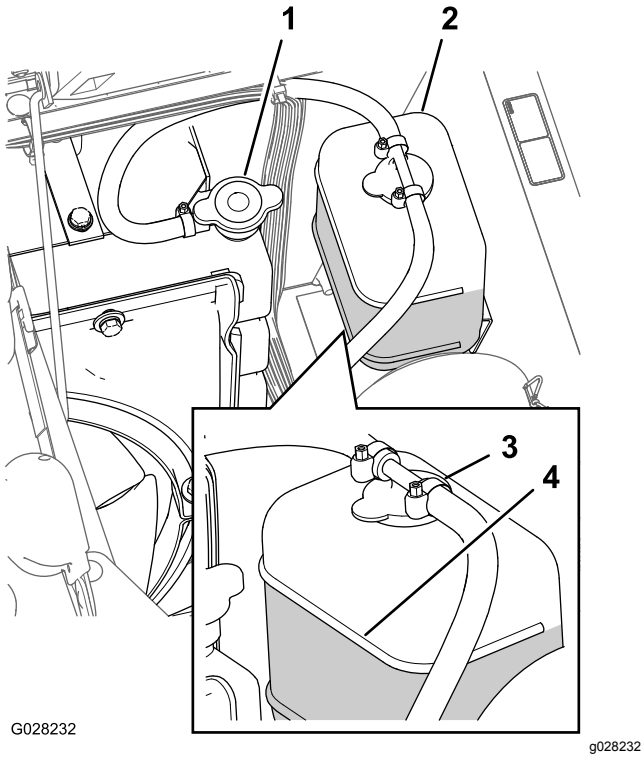


Figure 20

1. Radiator cap
2. Expansion tank
3. Expansion tank cap
4. Full line, expansion tank

4. Check the coolant level in the radiator and in the expansion tank.

   Note: The radiator should be filled to the top of the filler neck and the expansion tank filled to the Full mark on the tank (Figure 20).

5. If coolant level is low, remove the expansion tank cap and the radiator cap, and fill expansion tank to the Full mark and the radiator to the top of the filler neck (Figure 20).

   Important: **Do not overfill the expansion tank.**

   Important: **Do not use water only or an alcohol/methanol-based coolant.**

6. Install the radiator cap and the expansion tank cap (Figure 20).

Checking the Hydraulic Fluid

Service Interval: Before each use or daily Check the level of the hydraulic fluid before the engine is first started and daily thereafter.

Hydraulic fluid specifications:

Toro Premium All Season Hydraulic Fluid

Note: (Available in 5-gallon pails or 55-gallon drums. See parts catalog or Toro distributor for part numbers.)

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

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

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

Material Properties:

Viscosity, ASTM D445	cSt @ 40°C 44 to 48 cSt @ 100°C 7.9 to 8.5
Viscosity Index ASTM D2270	140 to 160
Pour Point, ASTM D97	-34°F to -49°F

Industry Specifications:

Vickers I-286-S (Quality Level), Vickers M-2950-S (Quality Level), Denison HF-0

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

Premium Biodegradable Hydraulic Fluid-Mobil EAL EnviroSyn 46H

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

1. Position the sprayer on a level surface, set the parking brake, stop the sprayer pump, stop the engine, and remove the key from the starter switch.
2. Clean the area around the hydraulic-oil-tank dipstick cap and remove it (Figure 21).

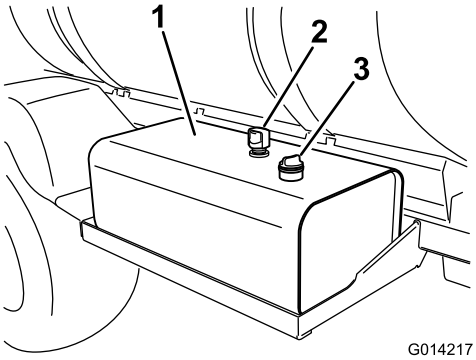


Figure 21

1. Hydraulic-oil tank
2. Vent
3. Dipstick cap

Important: **Be very careful not to get dirt or other contaminants into the opening when checking the oil.**

3. Wipe the dipstick clean with a cloth and replace it completely in the tank.
4. Remove the dipstick from the filler neck and check the fluid level. The fluid level should be within the safe operating range on the dipstick (Figure 22).

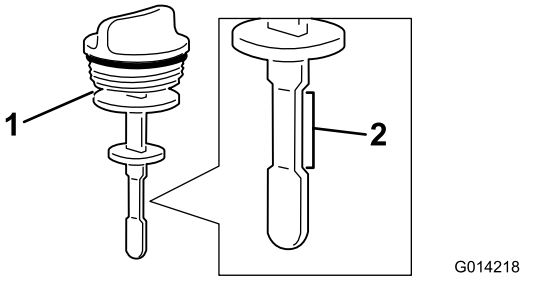


Figure 22

1. Dipstick
2. Safe operating range

5. If the oil is low, fill the tank with the specified hydraulic fluid or equivalent to raise the level to the upper mark.
6. Install the dipstick cap into the tank and secure.

Checking the Brakes

Service Interval: Before each use or daily

Before starting the sprayer, lightly press the brake pedal. If the pedal travels more than 2.5 cm (1 inch) before you feel resistance, adjust the brakes; refer to Adjusting the Brakes (page 56).

⚠ WARNING

If you operate the sprayer with poorly adjusted or worn brakes, you could lose control of the sprayer, resulting in serious injury or death to you or bystanders.

Always check the brakes before operating the sprayer and keep them properly adjusted and repaired.

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 tank outdoors, in an open area, when the engine is cold. Wipe up any fuel that spills.**
- **Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is 25 mm (1 inch) below the bottom of the filler neck. This empty space in the tank allows fuel to expand.**
- **Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.**
- **Store fuel in an approved container and keep it out of the reach of children. Never buy more than a 30-day supply of fuel.**

⚠ DANGER

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

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

Important: **Your engine runs on No. 2-D or 1-D automotive-type diesel fuel with a minimum cetane rating of 40.**

Note: Your engine may require a higher cetane-rated fuel if you operate the machine at high altitudes or in low atmospheric temperatures.

Using Biodiesel Fuel

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 be degraded over time.
- Fuel filter plugging may be expected for a time after converting to biodiesel blends.
- Contact your distributor if you wish for more information on biodiesel.

Filling the Fuel Tank

Fuel tank capacity: approximately 45 L (12 US gallons).

Note: The fuel tank features a fuel gauge which shows the level of fuel in the tank—check the fuel gauge frequently.

1. Position the sprayer on a level surface.
2. Set the parking brake, stop the pump, stop the engine, remove the key, and allow the engine to cool.
3. Clean the area around the fuel-tank cap (Figure 23).

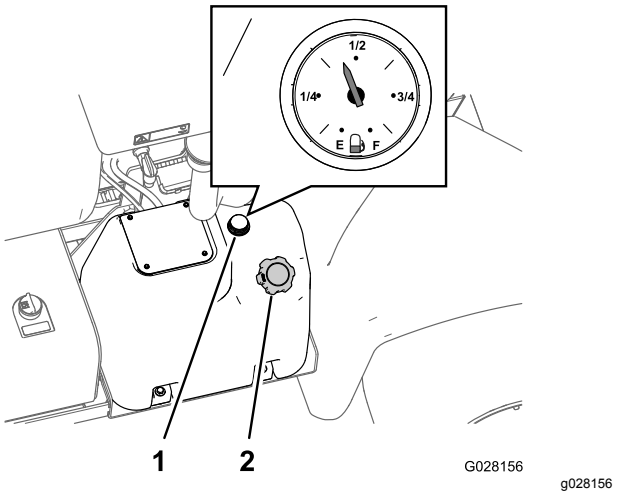


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Figure 23

1. Fuel gauge
2. Fuel-tank cap

4. Remove the fuel-tank cap.
5. Fill the tank to about 2.5 cm (1 inch) below the top of the tank, (bottom of the filler neck).

   Note: This space in the tank allows fuel to expand. **Do not overfill.**
6. Install the fuel tank cap securely.
7. Wipe up any fuel that may have spilled.

Preparing to Use the Sprayer

Cleaning the Suction Strainer

Service Interval: Before each use or daily Clean the suction strainer more often when using wettable powders.

1. Position the sprayer on a level surface, set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
2. At the top of the sprayer tank, remove the retainer that secures the hose fitting to attached

to the large hose and the strainer housing (Figure 24).

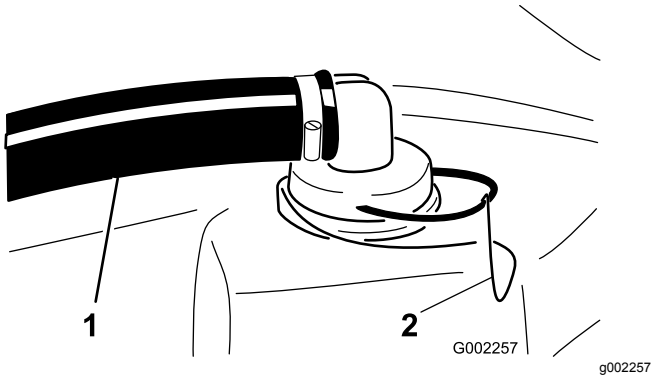

Figure 24

1. Suction hose
2. Retainer

3. Remove the hose and hose fitting from the strainer housing (Figure 24).
4. Pull the suction strainer out of the strainer housing in the tank (Figure 25).

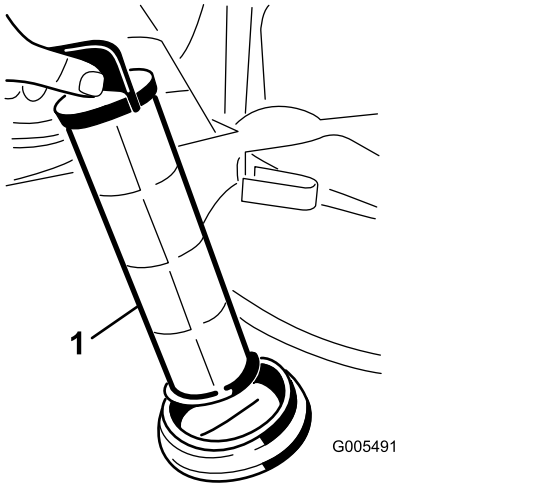

Figure 25

1. Suction strainer

5. Clean the suction strainer with clean water.
6. Insert the suction strainer into the strainer housing until the strainer is fully seated.
7. Align the hose and hose fitting to the strainer housing at the top of the tank to the and secure fitting and housing with the retainer that you removed in step 2.

Inspecting the Tank Straps

Service Interval: Before each use or daily—Check the tank straps.

Important: **Over tightening the tank strap fasteners can result in deforming and damaging the tank and straps.**

1. Fill the main tank with water.
2. Check to see if there is any movement between the tank straps and the tank (Figure 26).

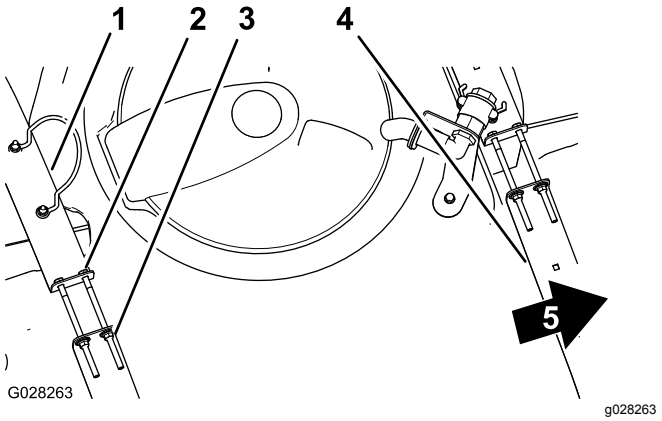

Figure 26

1. Rear tank strap
2. Bolt
3. Flanged locknut
4. Forward tank strap
5. Front of the machine

3. If the tank straps fit loose to the tank, tighten the flanged locknuts and bolts at the top of straps until the straps are flush with the surface of the tank (Figure 26).

   Note: Do not over tighten the tank strap hardware.

Operating the Machine

Starting the Engine

1. Sit on the operator's seat and keep your foot off the traction pedal.
2. Ensure that the parking brake is engaged, the traction pedal is in the Neutral position, the throttle is in the Slow position.
3. Turn the switch to the On/Preheat position.

   Note: An automatic timer will control the preheat for approximately 6 seconds.
4. After preheating, turn the key to the Start position.
5. Crank the engine for no longer than 15 seconds.
6. Release the key when the engine starts.
7. If the engine requires additional preheating, turn the key to the Off position, then to the On/Preheat position.

   Note: Repeat steps through as required.
8. Run the engine at idle speed or partial throttle until the engine warms up.

Driving the Machine

1. Press the traction pedal forward to drive the machine forward or press the pedal rearward to drive the machine in reverse.

   Important: **Ensure that you allow the sprayer to come to a stop before switching between the Forward and Reverse positions.**

2. To slowly stop the machine, release the traction pedal.

   Note: The traction pedal will return to the Neutral position.

3. To stop quickly, press the brake pedal.

   Note: The stopping distance of you machine may vary depending on the sprayer-tank load and ground speed of the machine.

Setting the Ground Speed Lock Switch

⚠ CAUTION

If you press the ground speed lock switch and do not have your foot on the traction pedal, the traction unit may suddenly stop and cause you to lose control, possibly injuring you or bystanders.

Ensure that you have your foot on the traction pedal when you disengage the ground speed lock switch.

1. Drive forward and attain the desired ground speed; refer to Driving the Machine (page 28).
2. Press the top of the ground speed lock switch.

   Note: The light on the switch illuminates.

3. Take your foot off the traction pedal.

   Note: The sprayer will maintain the speed you set.

4. To release the ground speed lock switch, either place your foot on the traction pedal and press the bottom of the switch or remove your foot from the traction pedal and press the brake pedal.

   Note: The light on the switch turns off and the traction control returns to the traction pedal.

Stopping the Engine

1. Move all the controls to the Neutral position.
2. Press the brake to stop the sprayer.
3. Set the parking brake.
4. Shift the throttle lever to the Idle position.
5. Turn the starter key to the Off position.
6. Remove the key from the switch to prevent someone from accidentally starting the engine.

Breaking in a New Sprayer

To provide proper performance and long sprayer life, follow these guidelines for the first 100 operating hours:

- Check the fluid and engine oil levels regularly and be alert for indications of overheating in any component of the sprayer.
- After filling the tank, check the tank straps for any play. Tighten as necessary.
- After starting a cold engine, let it warm up for about 15 seconds before accelerating.
- Avoid hard braking situations for the first several hours of new sprayer break-in operation. New brake linings may not be at optimum performance until several hours of use has caused the brakes to become burnished (broken-in).
- Avoid racing the engine.
- Refer to the Maintenance section for any special low hour checks.

Operating the Sprayer

To operate the Multi-Pro Sprayer first fill the spray tank, then apply the solution to the work area, and finally clean the tank. It is important that you complete all three of these steps in succession to avoid damaging the sprayer. For example, do not mix and add chemicals in the spray tank at night and then spray in the morning. This would lead to separation of the chemicals and possible damage to the sprayer components.

⚠ CAUTION

Chemicals are hazardous and can cause personal injury.

- **Read the directions on the chemical labels before handling the chemicals and follow all manufacturer recommendations and precautions.**
- **Keep chemicals away from your skin. Should contact occur, wash the affected area thoroughly with soap and clean water.**
- **Wear goggles and any other protective equipment recommended by the chemical manufacturer.**

The Multi-Pro Sprayer has been specifically designed to have high durability in order to give it the long sprayer life you need. Different materials have been chosen for specific reasons at different locations on

your sprayer to meet this goal. Unfortunately there is no single material which is perfect for all foreseeable applications.

Some chemicals are more aggressive than others and each chemical interacts differently with various materials. Some consistencies (e.g. wettable powders, charcoal) are more abrasive and lead to higher wear rates. If a chemical is available in a formulation that would provide increased life to the sprayer, use this alternative formulation.

As always, remember to clean your sprayer thoroughly after all applications. This will do the most to ensure your sprayer has a long and trouble free life.

Note: If you have questions or need additional information regarding the spray control system, refer to the Operators Manual supplied with the system.

Filling the Fresh Water Tank

Always fill the fresh water tank with clean water before handling or mixing any chemicals.

The fresh water tank is located on the ROPS, behind the passenger seat (Figure 27). It supplies a source of fresh water for you to wash chemicals off of your skin, eyes, or other surfaces in the case of accidental exposure.

To fill the tank, unscrew the cap on the top of the tank and fill the tank with fresh water. Replace the cap.

To open the fresh water tank spigot, turn the lever on the spigot.

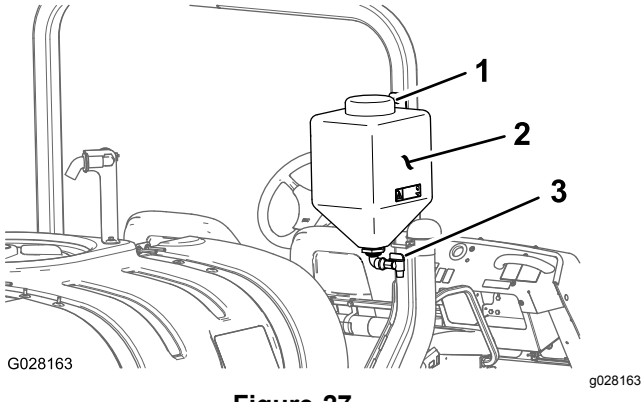

Figure 27

1. Filler cap
2. Fresh water tank
3. Spigot

Filling the Spray Tank

Important: **Ensure that the chemicals you will be using are compatible for use with Viton (see the manufacturer's label; it should indicate if it is not compatible). Using a chemical that is not compatible with Viton will degrade the O-rings in the sprayer, causing leaks.**

Important: **The tank markings are for reference only and cannot be considered accurate for calibration.**

Important: **After filling the tank for the first time, check the tank straps for any play. Tighten as necessary.**

1. Stop the sprayer on a level surface, stop the engine, and set the parking brake.
2. Determine the amount of water needed to mix the amount of chemical you need as prescribed by the chemical manufacturer.
3. Open the tank cover on the spray tank.

   The tank cover is located in the center of the top of the tank. To open it, turn the front half of the cover counterclockwise and swing it open. You can remove the strainer inside for cleaning. To seal the tank, close the cover and rotate the front half clockwise.
4. Add 3/4 of the required water to the spray tank using the anti-siphon fill receptacle.

   Important: **Always use fresh clean water in the spray tank. Do not pour concentrate into an empty tank.**
5. Start the engine, set the pump switch to the On position, and move the throttle lever to a higher idle.
6. Set the agitation switch to the On position.

   Important: **Prior to introducing wettable powders into any Toro Spray System mix the powders in a suitable container with sufficient fresh water to create a free flowing slurry. Failure to do so may result in chemical deposits on the bottom of the tank, degraded agitation, clogging of filters and improper agitation rates.**

   Toro recommends using the approved Eductor Kit for this machine. Contact your Authorized Toro Dealer for more information.
7. Add the proper amount of chemical concentrate to the tank, as directed by the chemical manufacturer.
8. Add the remaining water to the tank.

Operating the Booms

The boom lift switches on the sprayer control panel allows you to move the booms between transport position and spray position without leaving the Operator's seat. It is recommended to change boom positions while the machine is stationary.

To change the boom position:

1. Stop the sprayer on level ground.
2. Use the boom lift switches to lower booms. Wait until the booms reach the full, extended spray position.
3. When the booms need to be retracted, stop the sprayer on level ground.
4. Use the boom lift switches to raise the booms. Raise the booms until they have moved completely into boom transport cradle forming the “X” transport position and the boom cylinders are fully retracted.

Important: **To prevent damage to the boom actuator cylinder, make sure the actuators are fully retracted before transport.**

Important: **Release the actuator switch once the booms have reached the desired position. Running the actuators against the stops may cause damage to the cylinders and or other hydraulic components.**

Operating the Boom Transport Cradle

The sprayer is equipped with a boom transport cradle that has a unique safety feature. In the event of accidental boom contact with a low overhead object while in the transport position, the boom(s) can be pushed out of the transport cradles. If this occurs, the booms will come to rest in a near horizontal position to the rear of the vehicle. While the booms will not be damaged due to this movement, they should be immediately put back into the transport cradle.

Important: **The booms can be damaged by transporting them in any position other than the “X” transport position using the boom transport cradle.**

To put the booms back into the transport cradle, lower the boom(s) to the spray position, and then raise the boom(s) back into the transport position. Make sure the boom cylinders are fully retracted to prevent actuator rod damage during storage.

Spraying

Important: **In order to ensure that your solution remains well mixed, use the agitation feature whenever you have solution in the tank. For agitation to work, the pump must be on and the engine must be running above an idle.**

Note: This procedure assumes that the pump is on; refer to Filling the Spray Tank (page 29).

1. Set the master boom switch to the Off position.
2. Adjust the throttle to the desired position to spray at.
3. Drive to the location where you will be spraying.
4. Lower the booms into position.
5. Set the individual section switches, as needed, to the On positions.
6. Use the application rate switch to achieve the desired pressure as indicated in the nozzle selection guide provided with the sprayer.
7. Drive at the desired speed and then set the master boom switch to the On position to begin spraying.

   Note: When the tank is nearly empty, the agitation may cause foaming in the tank. In this case, turn the agitation switch off. Alternatively, you can use an anti-foaming agent in the tank.
8. When finished spraying, set the master boom switch to the Off position to turn off all booms, then set the pump switch to the Off position.

   Note: Return the booms to the transport position and drive the sprayer to the cleaning area.

   Important: **Always raise the booms until they have moved completely into boom transport cradle forming the “X” transport position and the boom cylinders are fully retracted whenever you move the sprayer from one spraying area to another or move to a storage or cleaning area.**

Turf Care Precautions while Operating in Stationary Modes

Important: **Under some conditions, heat from the engine, radiator, and muffler can potentially damage grass when operating the sprayer in a stationary mode. Stationary modes include tank agitation, hand spraying with a spray gun, or using a walking boom.**

Use the following precautions:

- **Avoid** stationary spraying when conditions are very hot and/or dry, as turf can be more stressed during these periods.
- **Avoid** parking on the turf while stationary spraying. Park on a cart path whenever possible.
- **Minimize** the amount of time the machine is left running over any particular area of turf. Both time and temperature affect how much the grass may be damaged.
- **Set the engine speed as low as possible** to achieve the desired pressure and flow. This will minimize the heat generated and the air velocity from the cooling fan.
- **Allow heat to escape** upward from the engine compartment by raising the seat assemblies during stationary operation rather than being forced out under the vehicle.

Spraying Tips

- Do not overlap areas that you have previously sprayed.
- Watch for plugged nozzles. Replace all worn or damaged nozzles.
- Use the master boom switch to stop the spray flow before stopping the sprayer. Once stopped, use the neutral engine speed control to hold the engine speed up to keep the agitation running.
- You will obtain better results if the sprayer is moving when you turn the booms on.

Unclogging a Nozzle

If a nozzle becomes clogged while you are spraying, you can clean it using a hand spray bottle of water or a toothbrush.

1. Stop the sprayer on a level surface, stop the engine, and set the parking brake.
2. Set the master boom switch to the Off position and then set the pump switch to the Off position.
3. Remove the clogged nozzle and clean it using a spray bottle of water or a toothbrush.

Selecting a Nozzle

Note: Refer to the nozzle selection guide that is available through your Authorized Toro Dealer.

The turret bodies can accept up to 3 different nozzles. To select the desired nozzle:

1. Stop the sprayer on a level surface, stop the engine, and set the parking brake.
2. Set the master boom switch to the Off position and set the pump switch to the Off position.
3. Rotate the turret of the nozzles in either direction to the correct nozzle.

Cleaning the Sprayer

Important: **You must always empty and clean the sprayer immediately after each use. Failure to do so may cause the chemicals to dry or thicken in the lines, clogging the pump and other components.**

Toro recommends using the approved rinse kit for this machine. Contact your Authorized Toro Dealer for more information.

Clean the spray system after **each** spraying session. To properly clean the spray system:

- Use three separate rinses.
- Use the cleaners and neutralizers as recommended by the chemical manufacturers.
- Use pure clean water (no cleaners or neutralizers) for the **last** rinse.

1. Stop the sprayer, set the parking brake, and turn off the engine.
2. Locate the tank drain valve on the rear of the machine (Figure 28).

   Note: The valve is to the rear of pump, attached to the support bracket.

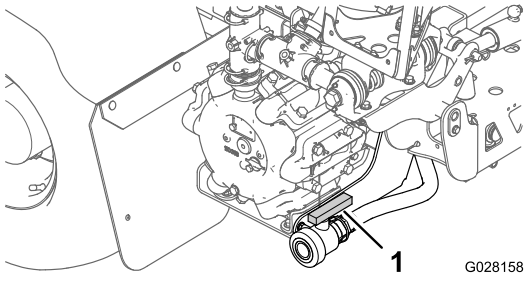

Figure 28

1. Tank drain handle

Open the valve to drain any unused material from the tank and dispose of it according to local codes and the material manufacturer's instructions (Figure 29). After draining, remove the lynch pin on the bracket securing the drain valve to the machine and let the valve rest on the ground . This allows any residual material in the line to drain.

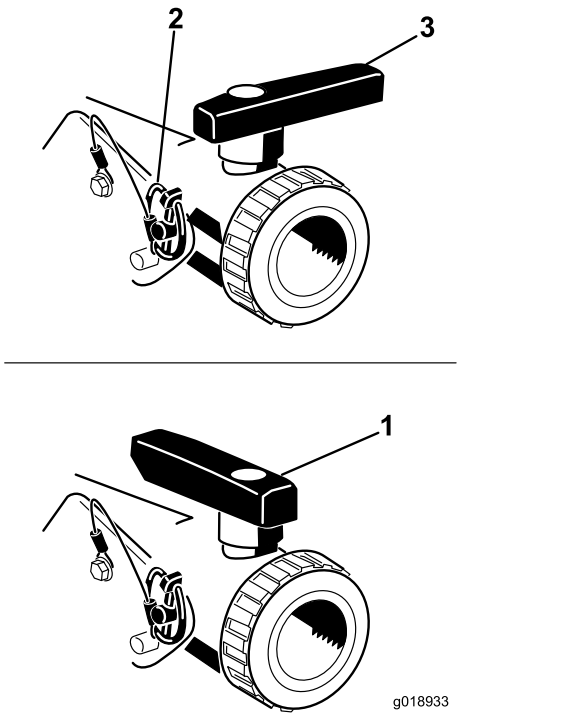

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Figure 29

1. Valve open
2. Lynch pin
3. Valve closed

3. When the tank has drained completely, install the valve to frame with the lynch pin removed previously and close the drain valve (Figure 29).
4. Fill the tank with at least 190 L (50 US gallons) of clean fresh water and close the cover.

   Note: You can use a cleaning/neutralizing agent in the water as needed. On the final rinse, use only clean, clear water.
5. Lower the booms into the spray position.
6. Start the engine and move the throttle lever to a higher idle.
7. Ensure that the agitation switch is in the On position.
8. Set the pump switch to the On position and use the application rate switch to increase the pressure to a high setting.
9. Set the master boom switch and boom control switches to the On positions to begin spraying.
10. Allow all of the water in the tank to spray out though the nozzles.
11. Check the nozzles to ensure that they are all spraying correctly.
12. Set the master boom switch to the Off position, set the pump switch to the Off position, and stop the engine.
13. Repeat steps 4 through 12 at least 2 more times to ensure that the spray system is fully cleaned.

   Important: **You must always complete this procedure at least 3 times to ensure that the spray system is fully clean, preventing damage to the system.**
14. Clean the strainer; refer to Cleaning the Suction Strainer (page 26).

    Important: **If you used wettable powder chemicals, clean the strainer after each tank.**
15. Using a garden hose, rinse off the outside of the sprayer with clean water.
16. Remove the nozzles and clean them by hand. Replace damaged or worn nozzles.

Calibrating the Section Valves

Important: **If you have the Pro Control™ Spray System installed, the boom bypass valves must be closed. Use the following adjustment only when you are not using the Pro Control Spray System.**

Before using the sprayer for the first time or if the nozzles are changed, adjust the section valves so that the pressure and application rate remains the same for all boom sections when you turn one or more sections off.

Note: The section valves must be calibrated each time the nozzles are changed.

Important: **If machine is equipped with a Pro Control™ Spray System, disregard the following steps below this important note for calibrating the section valves and read this notice: When using a Pro Control™ system, the section valves are not used; close the section valves by rotating the red bypass knobs clockwise. The valve is closed once you feel a slight resistance while rotating the knob. Applying excessive torque to the bypass knob could damage the valve. The bypass knob may require 3 to 4 full rotations (360° = 1 rotation) to completely close the valve. The numbers printed on the valve are for reference only; setting the knob to "0" does not guarantee the valve is closed. If you are using the Pro Control™ system, you do not need to adjust the section valves once they are closed. If you use the machine to spray manually (without the Pro Control™ system), refer to the steps for calibrating the boom bypass valves prior to using the machine.**

1. Select an open flat area to perform this procedure.
2. Fill the spray tank with clean water.
3. Lower the left and right boom sections.
4. Set the parking brake and start the engine.

5. Set all three section switches and the master boom switch to the On position.
6. Use the application rate switch to adjust the pressure, as read on the pressure gauge, until it is in the correct range for the nozzles that you installed on the boom sections (typically 276 kPa or 40 psi); refer to the nozzle selection guide that is available through your Authorized Toro Dealer.
7. Record the reading on the pressure gauge.
8. Turn off 1 of the boom section using the appropriate section switch.
9. Adjust the section bypass valve (Figure 30) at the top of the section control valve for the boom section you turned off until the pressure reading on the gauge is the same as the pressure reading that you recorded in step 7.

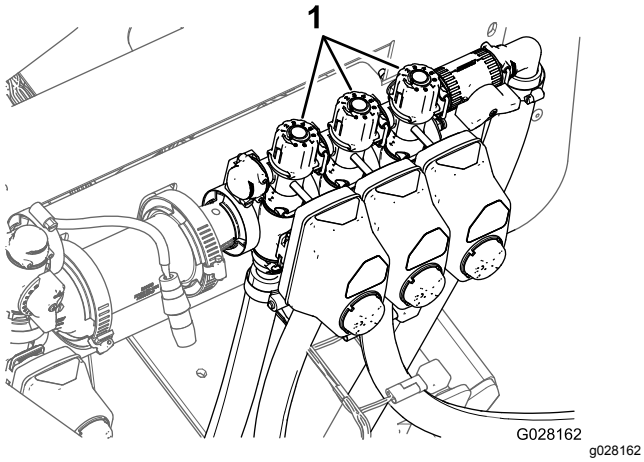

Figure 30

1. Section bypass valves

10. Turn the boom on and off to verify the pressure does not change.
11. Repeat steps 9 through 10 for the other boom sections.
12. Drive the sprayer at the desired speed while spraying and turn each boom section off individually.

    Note: The pressure on the gauge should not change.

Agitation Bypass Valve Knob Position

- The agitation bypass valve is in the full Open position as shown in A of Figure 31.
- The agitation bypass valve is in the Close (0) position as shown in B of Figure 31.
- The agitation bypass valve is in an intermediate (adjusted relative to the pressure gauge for the sprayer system) position as shown in C of Figure 31

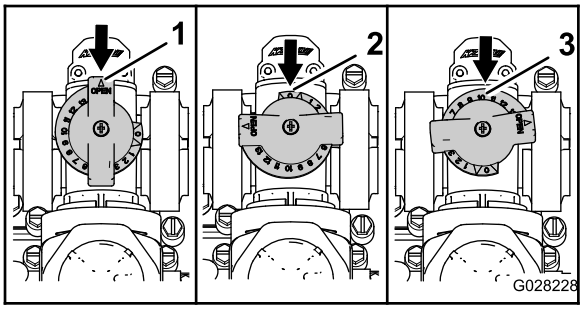

Figure 31

1. Open
2. Closed (0)
3. Intermediate position

Calibrating the Agitation Bypass Valve

Service Interval: Yearly—Calibrate the agitation bypass valve.

Important: **If you have the Pro Control™ XP Spray System installed turn the power switch to Off now. The following procedure should be performed only when the controller is not powered.**

1. Select an open flat area to perform this procedure.
2. Fill the spray tank with clean water.
3. Verify the agitation control valve is open.

   Note: If it has been adjusted open it completely at this time.
4. Set the parking brake and start the engine .
5. Move the throttle lever to the Fast position.
6. Set the pump switch and the agitation switch to the On position.
7. Use the application rate switch to adjust the sprayer system pressure on the gauge reads 689 kPa (100 psi).
8. Turn the agitation switch to the Off position and read the pressure gauge.
   - If the pressure gauge indicates 689 kPa (100 psi), the agitation bypass valve is properly calibrated.
   - If the pressure gauge indicates differently, continue to the next step.
9. Adjust the agitation bypass valve (Figure 32) on the backside of the agitation valve until the sprayer system pressure indicated on the gauge indicates 689 kPa (100 psi).

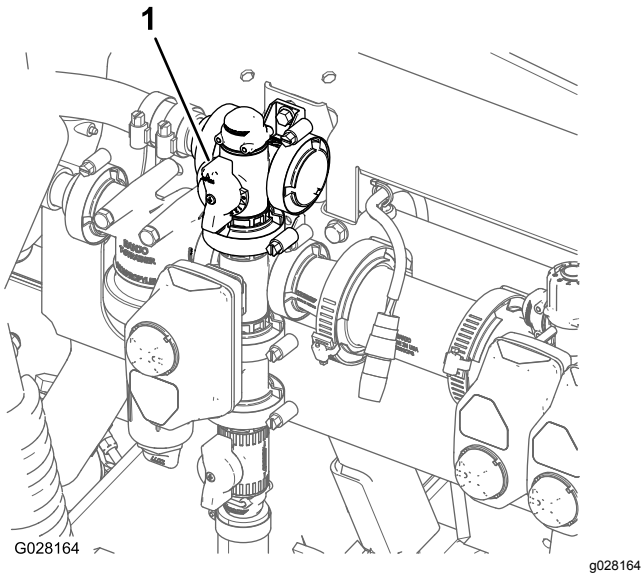

Figure 32

1. Agitation bypass valve

10. Turn the pump switch to the Off position. Shift the throttle lever to the Idle position and turn the switch to the Off position.

Pump

The pump is located near the back of the tank on the left side (Figure 33).

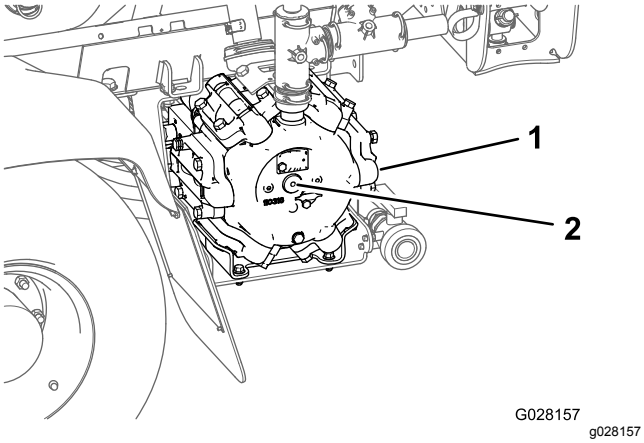

Figure 33

1. Pump
2. Grease fitting

Transporting the Sprayer

For moving the sprayer long distances, use a trailer. Secure the sprayer to the trailer. Also, make sure the booms are tied down and secure. Figure 34 and Figure 35 illustrate the tie-down points.

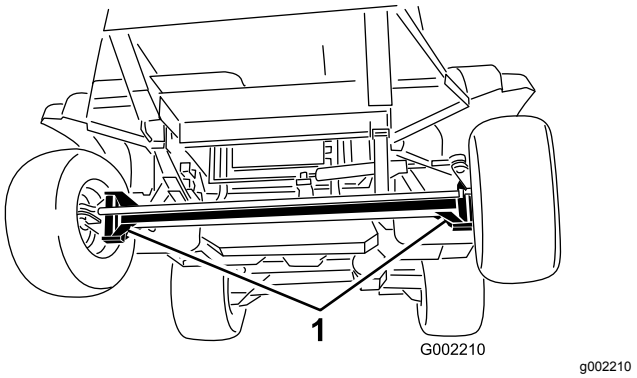

Figure 34

1. Tie-down points

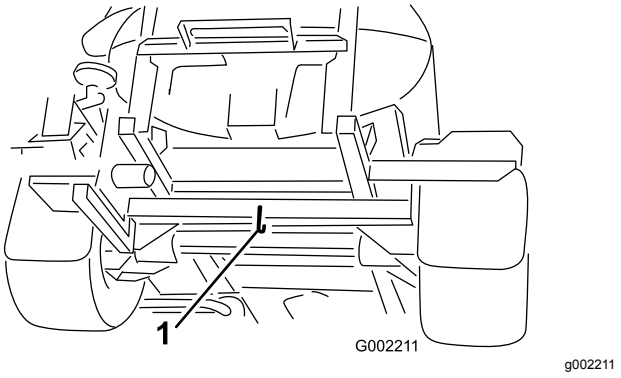

Figure 35

1. Rear tie-down point

Towing the Sprayer

In case of an emergency, the sprayer can be towed for a short distance after you open the tow valve. However, we do not recommend this as a standard procedure.

⚠ WARNING

Towing at excessive speeds could cause a loss of steering control, resulting in personal injury.

Never tow the sprayer faster than 4.8 kph (3 mph).

Towing the sprayer is a 2-person job. If the machine must be moved a considerable distance, transport it on a truck or trailer; refer to Transporting the Sprayer (page 34).

1. Rotate the tow valve (Figure 36) 90 degrees in either direction to open it.

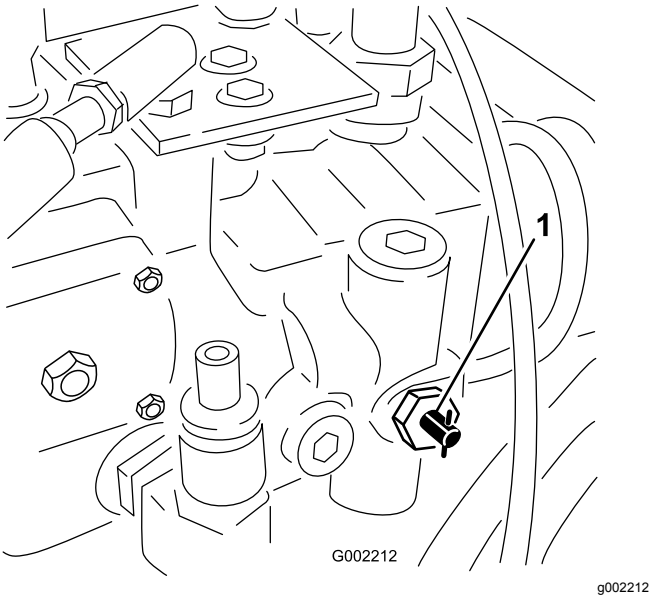

Figure 36

1. Tow valve

Important: **If you do not open the tow valve before towing the sprayer you will damage the transmission.**

2. Affix a tow line to the frame. Refer to the front and rear towing points in Figure 37 and Figure 38.

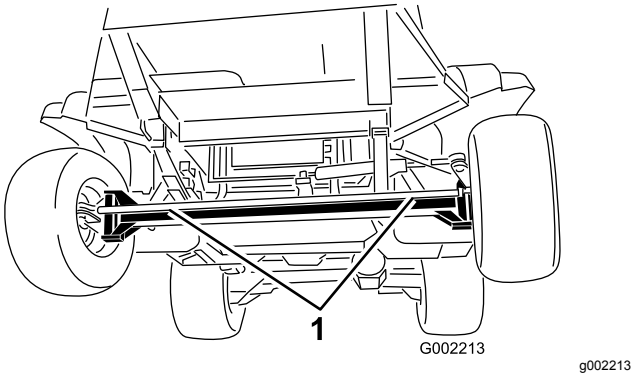

Figure 37

1. Front towing points

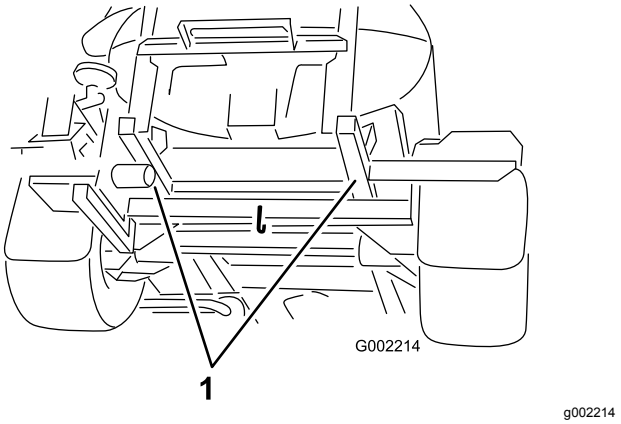

Figure 38

1. Rear towing points

3. Release the parking brake.
4. Tow the sprayer at less than 4.8 kph (3 mph).
5. When finished, close the tow valve and torque it to no more than 7 to 11 N-m (5 to 8 ft-lb).

Maintenance

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

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 5 hours	• Replace the hydraulic oil filter.
After the first 8 hours	• Torque the wheel lug nuts. • Change the rear planetary gearbox fluid. • Check the fan/alternator belt
After the first 50 hours	• Change the engine oil and oil filter • Check the fuel lines and connections.
After the first 200 hours	• Pack the front wheel bearings.
Before each use or daily	• Check the tire air pressure. • Check the engine oil. • Check the coolant level. • Check the hydraulic oil level. • Check the brakes. • Clean the suction strainer. • Check the tank straps. • Check the air cleaner.
Every 50 hours	• Lubricate the pump. • Lubricate all grease fittings. • Check the battery cable connections.
Every 100 hours	• Lubricate the boom hinges. • Replace the air filter element. • Torque the wheel lug nuts. • Inspect the condition and wear of the tires. • Check the cooling system hoses for wear and damage. • Check the fan/alternator belt
Every 150 hours	• Change the engine oil (including synthetic oil) and oil filter
Every 200 hours	• Check front wheel toe-in. • Inspect all hoses and connections for damage and proper attachment. • Clean the radiator fins.

Maintenance Service Interval	Maintenance Procedure
Every 400 hours	• Grease the actuator rod bearings. • Complete all yearly maintenance procedure specified in the engine operator's manual. • Check the fuel lines and connections. • Replace the fuel filter canister. • Replace the in-tank fuel filter. • Replace the in-tank fuel filter. • Drain and clean the fuel tank. • Pack the front wheel bearings. • Change the planetary gearbox fluid. • Check the coolant (as directed by the manufacturer) and change if necessary. • Replace the hydraulic oil filter. • Change the hydraulic oil. • Inspect the O-rings in the valve assemblies and replace them if necessary. • Change the pressure filter. • Inspect the pump diaphragm and replace if necessary • Inspect the pump check valves and replace if necessary • Inspect the nylon pivot bushings.
Yearly	• Flush the sprayer with clean water. • Calibrate the agitation bypass valve.

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

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

Daily Maintenance Checklist

Duplicate this page for routine use.

Maintenance Check Item	For the week of:						
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check the brake and parking brake operation.							
Check the neutral lockout switch operation.							
Check the fuel level.							
Check the engine oil level.							
Check the hydraulic oil level.							
Check the coolant level.							
Inspect the air filter.							
Inspect the radiator and oil cooler for debris.							
Check any unusual engine noises.							
Check any unusual operating noises.							
Check the tire pressure.							
Check for fluid leaks.							
Check all hydraulic and fluid hoses for damage, kinks, or wear.							
Check the instrument operation.							
Check the accelerator operation.							
Clean the suction strainer.							
Lubricate all grease fittings[1]							
Touch up any damaged paint.							

[1]Immediately after **every** washing, regardless of the interval listed

Notation for Areas of Concern

Inspection performed by:		
Item	**Date**	**Information**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

⚠ CAUTION

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

Remove the key from the starter switch before you do any maintenance.

Pre-Maintenance Procedures

Jacking the Sprayer Up

Whenever the engine is run for routine maintenance and/or engine diagnostics, the rear wheels of the sprayer should be 25 mm (1 inch) off the ground with the rear axle supported on jack stands.

⚠ DANGER

A sprayer on a jack may be unstable and slip off of the jack, injuring anyone beneath it.

- **Always remove the key from the starter switch before getting off the sprayer.**
- **Block the tires when the sprayer is on a jack.**
- **Support the machine with jack stands.**

The jacking point at the front of the sprayer is under the front axle, directly under the leaf springs (Figure 39).

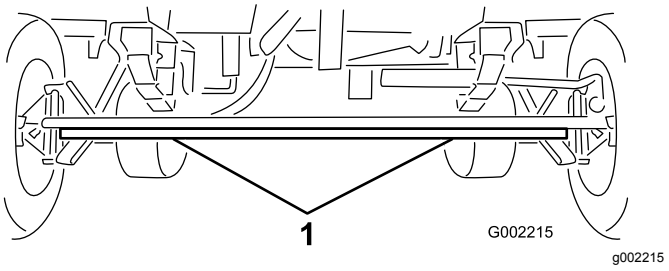

Figure 39

1. Front jacking points

The jacking point at the rear of the sprayer is on the rear side where the boom supports are (Figure 40).

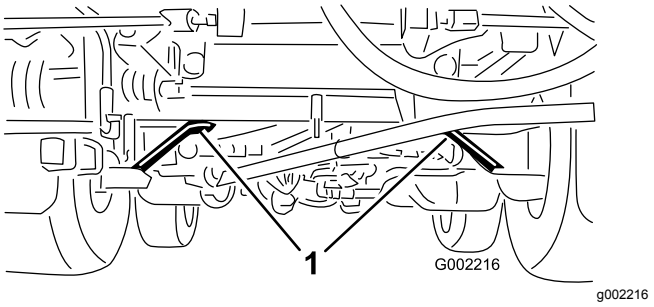

Figure 40

1. Rear jacking points

Accessing the Engine

Removing the Forward Heat Shield

1. Start the engine and let it run until warm; this warms the oil so that it drains better.
2. Set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
3. Raise the front and back of the machine and support it with jack stands; refer to Jacking the Sprayer Up (page 39).
4. Remove the 6 hex-head bolts and 6 washers that secure the front forward heat shield to the chassis and remove the shield (Figure 41).

   Note: Retain the bolts, washers and heat shield for installation in Installing the Engine Heat Shield (page 40).

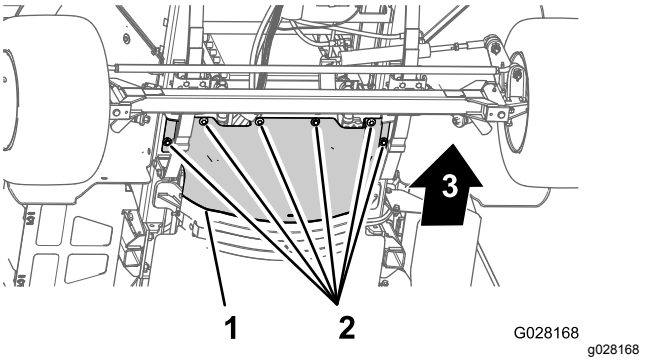

Figure 41

1. Forward heat shield
2. Hex-head bolts and washers

Installing the Engine Heat Shield

1. Align the rear flange of the forward heat shield over the forward flange of the rear heat shield (Figure 42).

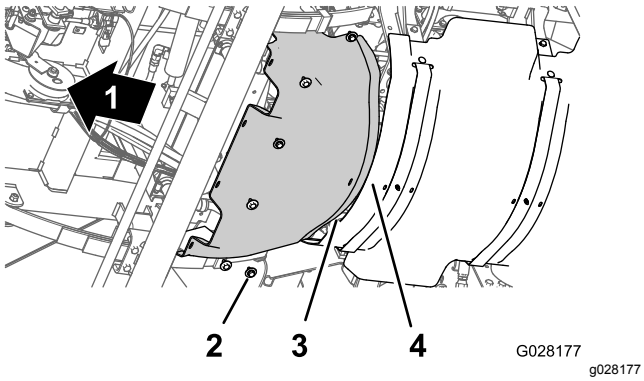

Figure 42

1. Front of the machine
2. Hex-head bolts and washers
3. Rear flange (forward heat shield)
4. Forward flange (rear heat shield)

2. Align the holes in the forward heat shield with the threaded holes in the chassis (Figure 42).
3. Assemble the forward heat shield to the machine with the 6 hex-head bolts and 6 washers (Figure 42) that you removed in step 4 of Removing the Forward Heat Shield (page 39).
4. Torque the bolts to 1129 to 1582 N·cm (100 to 140 in-lb).
5. Lower the machine and remove the jack stands.

Removing the Seat Base Access Panel

1. Remove the 2 flanged-head bolts that secure the seat base access cover to the seat base (Figure 43).

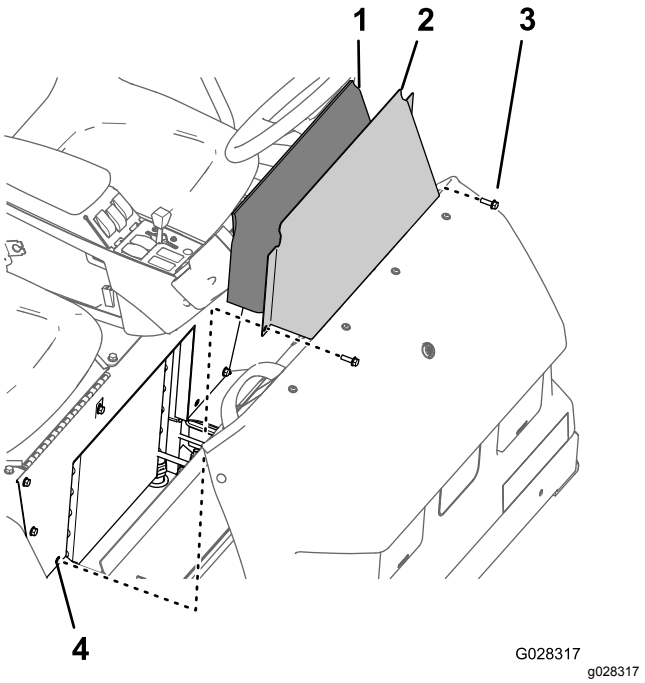

Figure 43

1. Acoustic panel
2. Seat base access cover
3. Flanged-head bolt
4. Hole (seat base)

2. Remove the seat base cover and the acoustic panel from the machine (Figure 43).

Installing the Seat Base Access Panel

1. Align the acoustic panel to the opening in the seat base for the seat base access cover (Figure 43).
2. Align the holes in the seat base access cover with the holes in the seat base (Figure 43).
3. Assemble the seat base access cover to the seat base with the 2 flanged-head bolts (Figure 43) that you removed in 1 in Removing the Seat Base Access Panel (page 40).
4. Torque the bolts to 1975 to 2542 N-cm (175 to 225 in-lb).

Lubrication

Greasing the Sprayer

Service Interval: Every 50 hours—Lubricate the pump.

Every 50 hours/Yearly (whichever comes first)

Grease Type: No. 2 general-purpose, lithium-base grease. Toro Premium All Purpose Grease is available from your Toro Distributor.

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

   The grease fittings positions are illustrated in Figure 44 and Figure 45.

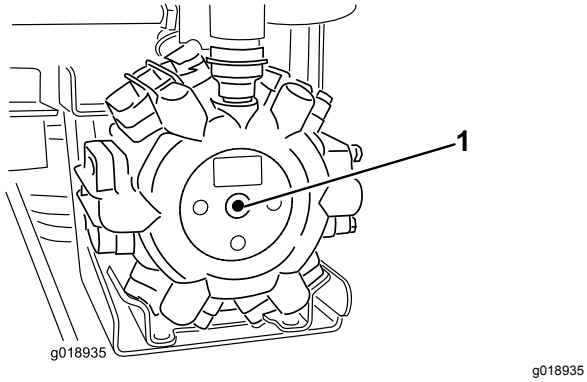

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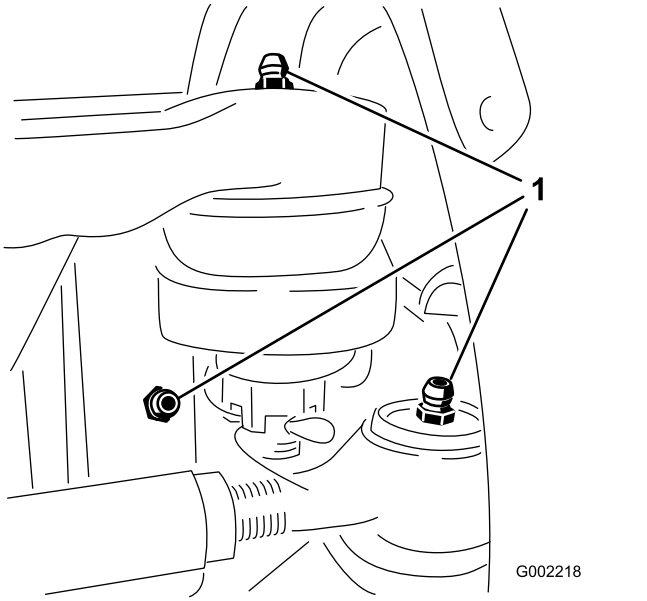
Figure 44

Pump center

1. Grease point



g002218

Figure 45

Three fittings inside each front wheel

1. Grease point

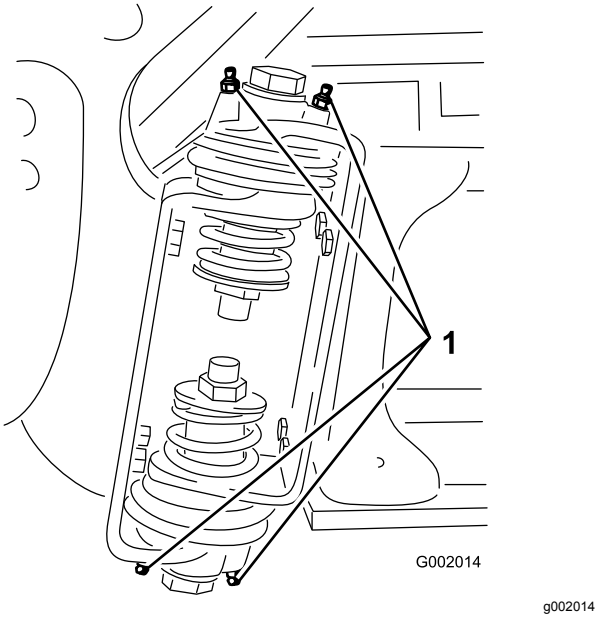
Greasing the Boom Hinges

Service Interval: Every 100 hours

Important: **If the boom hinge is washed with water, all water and debris must be cleared from the hinge assembly and fresh grease must be applied.**

Grease Type: No. 2 general-purpose, lithium-base grease.

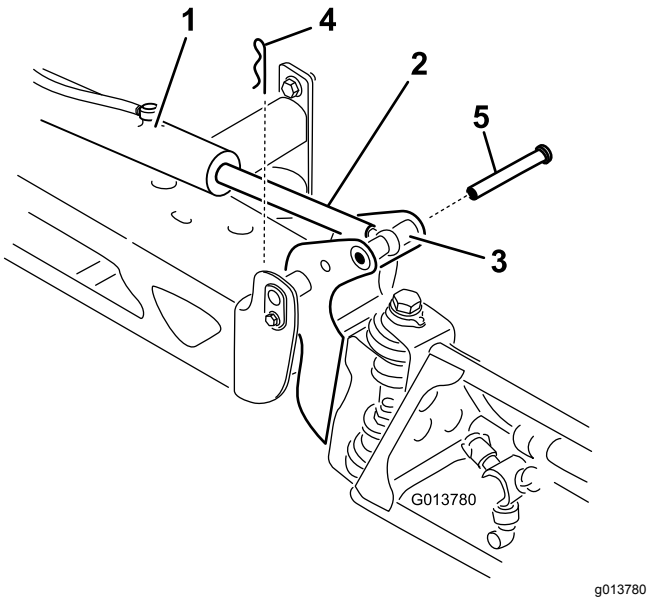
1. Wipe the grease fittings clean so that foreign matter cannot be forced into the bearing or bushing.
2. Pump grease into the bearing or bushing at each fitting Figure 46.



g002014

Figure 46
Right boom

1. Grease fitting



g013780

Figure 47

1. Actuator
2. Actuator rod
3. Boom pivot pin housing
4. Cotter
5. Pin

3. Wipe off excess grease.
4. Repeat the procedure for each boom pivot.

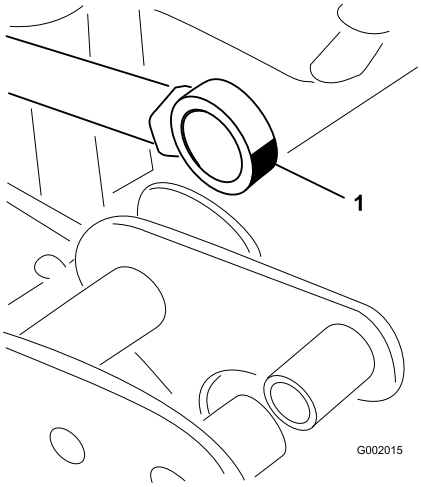
Greasing the Actuator Rod Bearings

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

Grease Type: No. 2 general-purpose, lithium-base grease.

1. Extend the booms to the spray position.
2. Remove the cotter pin from the pivot pin (Figure 47).
3. Lift up on the boom and remove the pin (Figure 47). Slowly lower the boom to the ground.
4. Inspect the pin for any damage, replace if necessary.
5. Manipulate the actuator rod bearing end and apply grease into the bearing (Figure 48).

   Note: Wipe off excess grease.



g002015

Figure 48
Right boom

1. Grease bearing

6. Lift up on the boom to align the pivot with the actuator rod.
7. While holding the boom, insert the pin through both boom pivot and actuator rod (Figure 47).
8. With the pin in place, release the boom and secure the pin with the cotter removed previously.

9. Repeat the procedure for each actuator rod bearing.

Engine Maintenance

Checking the Air Cleaner

Service Interval: Before each use or daily Service the air cleaner more frequently if operating conditions are extremely dusty or sandy.

1. Set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
2. Tilt the passenger seat forward and align the prop rod into the detent in the prop rod guide slot.
3. Wipe clean the dust cap and air cleaner body (Figure 49).

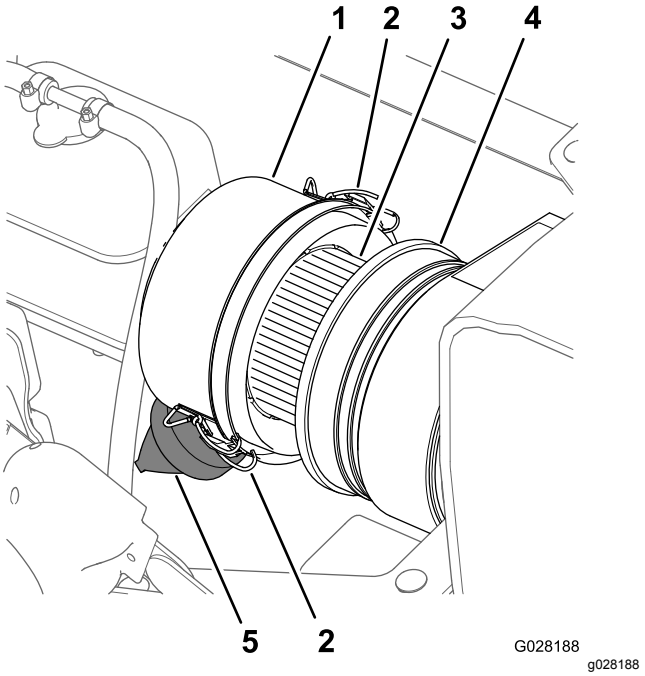


Figure 49

1. Dust cap
2. Latch (dust cap)
3. Air filter element
4. Air cleaner body
5. Dust valve

4. Check the air cleaner body for damage that could cause an air leak (Figure 49).

   Note: Replace the dust cap and air cleaner body if either is damaged.
5. Squeeze the dust valve to clear it of dirt, dust, and debris (Figure 49).
6. Loosen the 2 latches that secure the dust cap to the air cleaner body.
7. Check the air filter element for excessive accumulation of dust, dirt , and debris (Figure 49).

Note: Do not clean the air filter element if it is dirty, replace the air filter element if it is dirty.

8. Install the dust cap onto the air cleaner body and secure the cap with the 2 latches (Figure 49).

   Note: Ensure that the dust valve os aligned between 5 to 7 o'clock position when viewed from the end.

9. Lower the passenger seat.

Replacing a the Filter Element

Service Interval: Every 100 hours Replace the air filter element more often in dusty, dirty conditions.

1. If you are installing a new filter, inspect the new air filter element for shipping damage, including the sealing end of the filter.

   Important: **Do not install a damaged filter.**

2. Wipe clean the dust cap and air cleaner body (Figure 49).
3. Lift the coolant overflow tank up and off of the tank-support bracket(Figure 50).

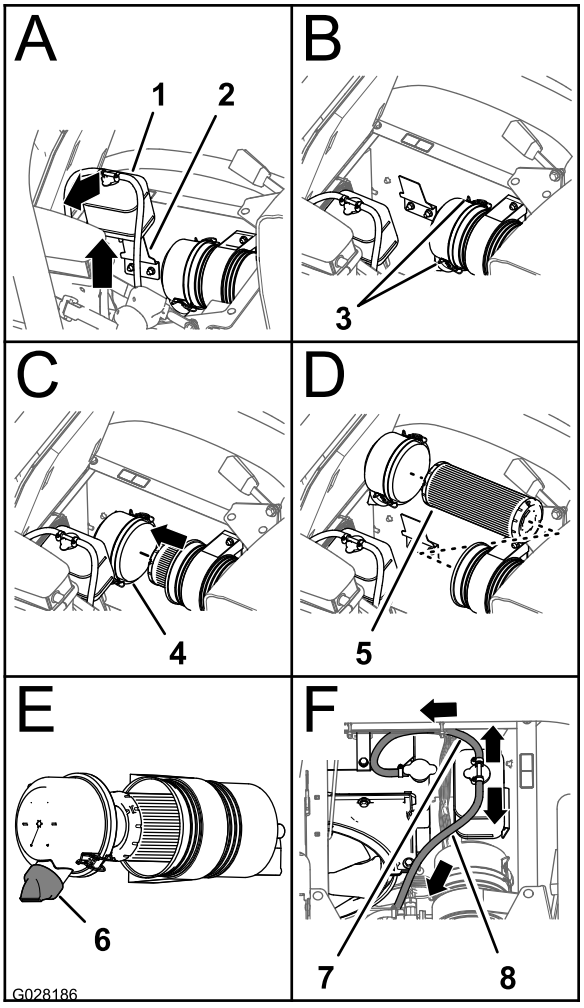


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Figure 50

1. Coolant overflow tank
2. Tank-support bracket
3. Latch (dust cap)
4. Dust cap
5. Air filter element
6. Dust valve (5 to 7 o'clock position)
7. Pressure relief hose
8. Tank-vent hose

4. Loosen the 2 latches that secure the dust cap to the air cleaner body (Figure 50).
5. Gently slide the old filter element out of the air cleaner body to reduce the amount of dust dislodged.

   Note: Avoid knocking the filter element against the air cleaner body.

6. Wipe clean the inside of the dust cap, air cleaner body, and dust valve with a damp rag (Figure 49 and Figure 50).
7. Insert the air filter element into the air cleaner body (Figure 50).

   Note: Ensure that the filter is seated in the air cleaner body properly by applying pressure to the outer rim of the filter element when you install it. Do not press on the flexible center part of the filter.

8. Install the cover onto air cleaner body and secure the cover with the 2 latches (Figure 50).

   Note: Ensure that the dust valve os aligned between 5 to 7 o'clock position when viewed from the end (Figure 50).

9. Align the coolant overflow tank to the tank-support bracket and seat the tank firmly (Figure 50).

   Important: **Ensure that the pressure relief hose is routed forward and down and tank-vent hose is routed rearward as shown in Figure 50.**

10. Lower the passenger seat.

Servicing the Engine Oil

Service Interval: After the first 50 hours—Change the engine oil and oil filter

Every 150 hours—Change the engine oil (including synthetic oil) and oil filter (more often when operating under heavy load or in high temperature).

Every 400 hours/Yearly (whichever comes first)—Complete all yearly maintenance procedure specified in the **engine operator's manual.**

Crankcase oil capacity: 4.6 L (4.9 US qt) with the filter.

Engine oil specification:

- Oil type—API service CH-4, CI-4 or higher.
- Preferred oil viscosity—SAE 15W40 (above 0 degrees F)
- Alternate oil viscosity—SAE 10W30 or 5W30 (all temperatures)

Toro Premium Engine Oil is available from your distributor in either 15W40 or 10W30 viscosity. Refer to the *Parts Catalog* for part numbers.

Changing the Engine Oil Filter

1. Remove the forward heat shield; refer to Removing the Forward Heat Shield (page 39)
2. Raise the seats.

⚠ CAUTION

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

Allow the sprayer to cool before performing maintenance or touching components under the hood.

3. Align a drain pan under the engine oil filter (Figure 51).

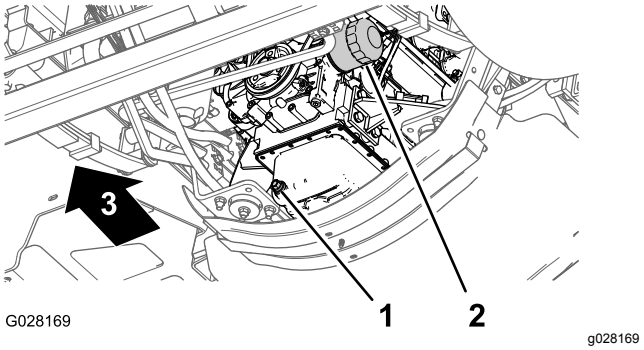

Figure 51

1. Drain plug
2. Engine oil filter

4. Remove the old oil filter (Figure 51).

   Note: Dispose of the used oil filter at a certified recycling center.

5. Wipe clean the surface of the oil filter adapter of the engine with a rag.
6. Fill the oil filter with the specified oil.

   Note: Allow the filter element to saturate with oil.

7. Apply a thin coat of the specified oil to the rubber gasket on the replacement oil filter.
8. Install the oil filter to the filter adapter and turn the oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/2 turn (Figure 51).

   Note: Do not over tighten the oil filter.

9. Wipe clean any residual oil.

Changing the Engine Oil

1. Align a drain pan with a 5.6 L (6 US qt) capacity or greater under the drain plug (Figure 51).
2. Remove the drain plug (Figure 51) and allow the oil to drain completely.

   Note: Check the drain plug seal for wear and damage; replace the seal if it is worn or damaged.

   Note: Dispose of the used oil at a certified recycling center.
3. Install the drain plug into the drain port of the engine oil pan and tighten the plug to 33 to 37 N-m (24 to 27 ft-lb).
4. Tilt the passenger seat forward and align the prop rod into the detent in the prop rod guide slot.
5. Remove the oil filler cap from filler neck of the valve cover of the engine (Figure 52) and slowly pour approximately 80% of the specified amount of oil into filler neck.

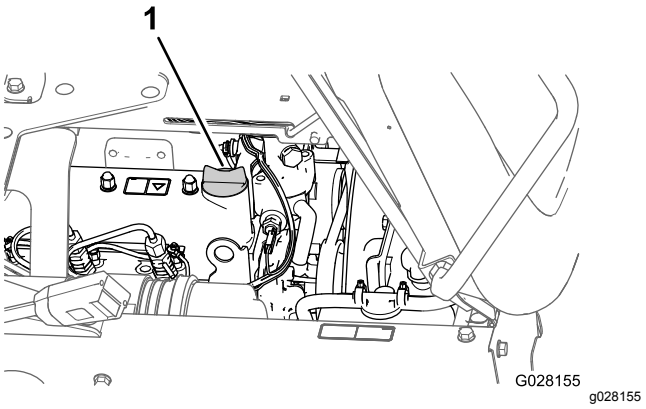

Figure 52

1. Oil filler cap

6. Remove the dipstick and check the oil level in the engine (Figure 53).

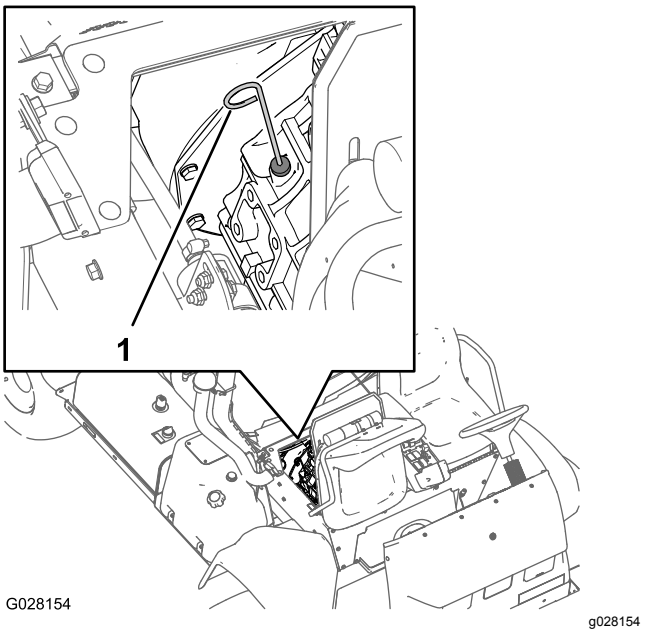

Figure 53

1. Dipstick

7. Slowly add additional the specified oil to bring the oil level to the full mark on the dipstick (Figure 53).

   Important: **Overfilling the engine with oil may cause damage to the engine.**
8. Install the oil filler cap into the filler neck (Figure 52).
9. Install the engine heat shield; refer to Installing the Engine Heat Shield (page 40)

Fuel System Maintenance

⚠ DANGER

Under certain conditions, diesel fuel and fuel vapors are highly flammable and explosive. A fire or explosion from fuel can burn you and others and can cause property damage.

- **Use a funnel and fill the tank outdoors, in an open area, when the engine is off and is cold. Wipe up any fuel that spills.**
- **Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is 25 mm (1 inch) below the bottom of the filler neck. This empty space in the tank allows the fuel to expand.**
- **Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.**
- **Store fuel in a clean, safety-approved fuel container and keep the cap in place.**

Checking the Fuel Line and Connections

Service Interval: After the first 50 hours

Every 400 hours/Yearly (whichever comes first)

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

Bleeding the Fuel System

Note: Ensure that the fuel tank is at least half full.

1. Set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
2. Remove the forward heat shield; refer to Removing the Forward Heat Shield (page 39).
3. Tilt the passenger seat forward and align the prop rod into the detent in the prop rod guide slot.
4. Align a drain pan under the fuel filter; refer to Figure 56 in Replacing the Water Separator Filter Canister (page 48).
5. Loosen the vent plug at the top of the fuel/water separator (Figure 54)

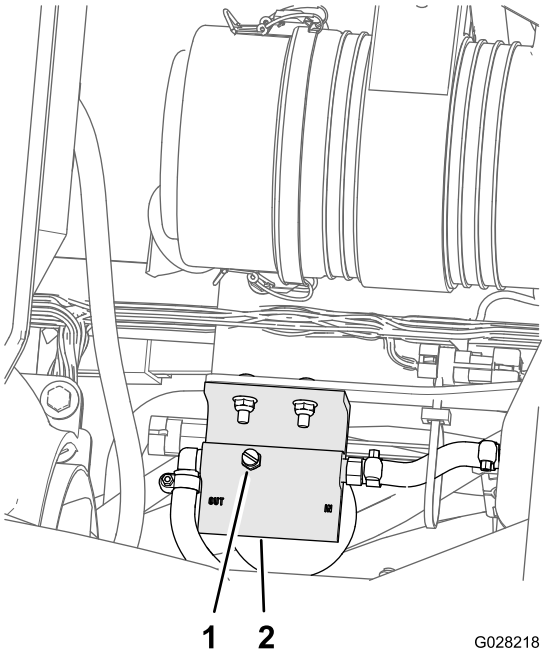

Figure 54

1. Vent plug

6. Turn the key in the starter switch to the On position.

   Note: The electric fuel pump will begin forcing air out around the vent plug. Leave key in the On position until a solid stream of fuel flows out around the vent plug.
7. Tighten vent plug (Figure 54) and turn the starter switch to the Off position.
8. Align the drain pan under the fuel injection pump portion of the engine (Figure 55).

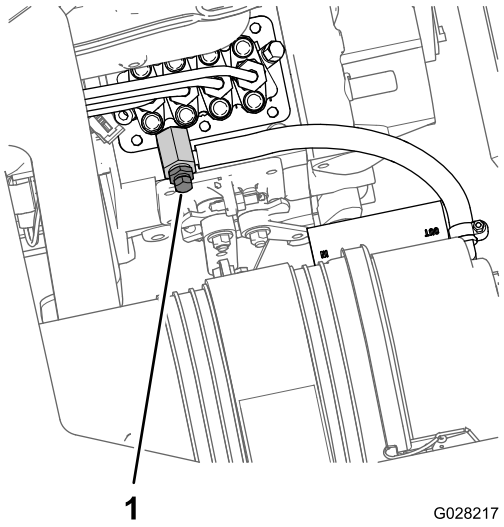

Figure 55

1. Bleed screw (fuel-injection-pump)

9. Open the air bleed screw at the fuel injection pump (Figure 55).
10. Turn key in starter switch to the On position.

    Note: Electric fuel pump will begin operation, thereby forcing air out around air bleed screw on fuel injection pump.
11. Leave the key in the On position until a solid stream of fuel flows out around the bleed screw (Figure 55).
12. Tighten the bleed screw (Figure 55) and turn the key to the Off position.

Note: Normally, the engine should start after you bleed the fuel system. However, if the engine does not start, there may be air trapped between the injection pump and the injectors; refer to Bleeding Air from the Injectors (page 48).

Bleeding Air from the Injectors

You should perform this procedure only after you have purged the air in the fuel system and the engine does not start; refer to Bleeding the Fuel System (page 47).

1. Align a drain pan under the right side of the engine
2. Loosen the tube nut at the No. 1 fuel injector nozzle and holder assembly.
3. Move the throttle to the Fast position.
4. Turn the key in the key switch to the Start position and watch the fuel flow around the connector. Turn the key to the Off position when you observe a solid flow of fuel.
5. Tighten the tube nut securely.
6. Clean residual fuel from area around the fuel injector
7. Repeat steps 2 through 6 for the remaining fuel injector nozzles.
8. Install the forward heat shield; refer to Installing the Engine Heat Shield (page 40).

Servicing the Fuel Filters

Replacing the Water Separator Filter Canister

Service Interval: Every 400 hours

1. Remove the forward heat shield; refer to
2. Place a drain pan under the water-separator-filter canister (Figure 56).

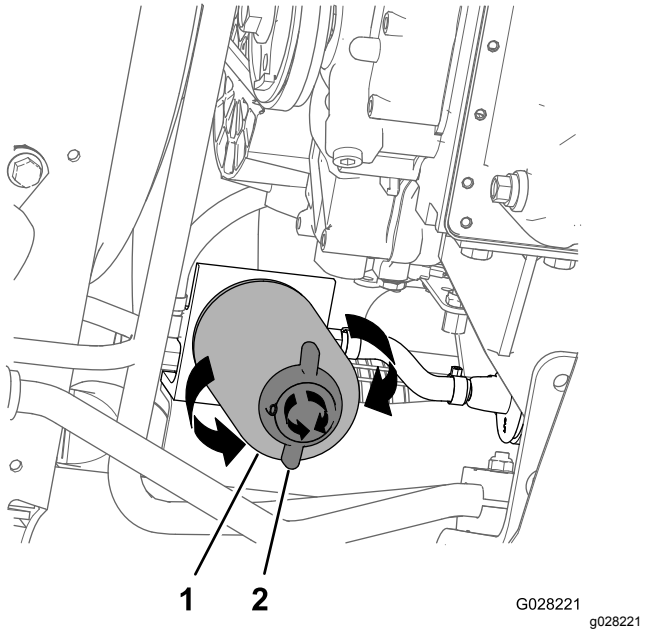

Figure 56

1. Water-separator-filter canister
2. Drain valve

3. Rotate the drain valve at the bottom of the Water-separator-filter canister counterclockwise (Figure 56).

   Note: Allow the fuel to drain from the filter canister completely and then close the valve.
4. Clean the area around the water-separator-filter canister and filter adapter mount (Figure 56).
5. Remove the water-separator-filter canister (Figure 56).

   Note: Dispose of the used fuel and filter canister at a certified recycling center.
6. Clean the mounting surface of the filter adapter.
7. Lubricate the gasket on the water-separator-filter canister with clean engine oil.
8. Install the filter canister by hand until the gasket contacts mounting surface, then rotate the filter an additional 1/2 turn.
9. Ensure that the drain valve at the bottom of the water-separator-filter canister is rotated clockwise tightly (Figure 56).

Replacing the In-Tank Fuel Filter

Service Interval: Every 400 hours

Removing the In-Tank Fuel Filter

Service Interval: Every 400 hours

Note: The fuel filter is a part of the standpipe assembly.

1. Set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
2. At the fuel tank, remove the 4 screws (#10 x 3/4 inch) that secure the cover to the top of the fuel tank, and remove the cover (Figure 57).

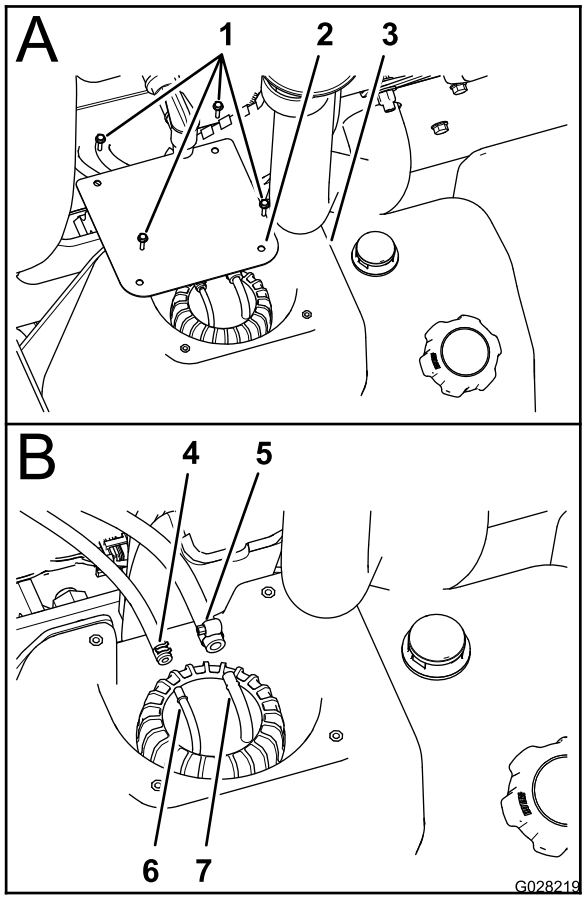

Figure 57

1. Screws (#10 x 3/4 inch)
2. Cover
3. Fuel tank
4. Clamp—6.4 mm (1/4 inch) fuel hose
5. Clamp—8 mm (5/16 inch) fuel hose
6. Hose fitting—6.4 mm (1/4 inch)
7. Hose fitting—8 mm (5/16 inch)

3. Loosen the clamps that secure the 2 fuel hoses to the 2 hose fittings at the top of the standpipe assembly (Figure 57).
4. Disconnect the 2 hoses from the hose fittings, and allow any fuel in the hoses to drain into an approved fuel container (Figure 57).
5. Rotate the standpipe cap counterclockwise the remove the cap (Figure 58).

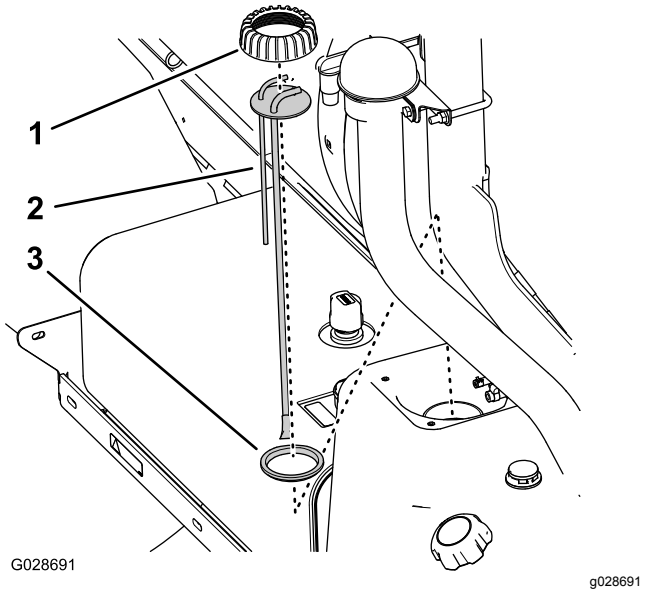

Figure 58

1. Standpipe cap
2. Standpipe assembly
3. Seal

6. Lift the standpipe assembly from the fuel tank (Figure 58).

   Note: Discard the old standpipe assembly.

Installing the In-Tank Fuel Filter

Note: Obtain the new stand pipe assemble from your local Authorized Toro Dealer. You may need a new seal to secure the elbow fitting and standpipe assembly to the top of the fuel tank.

1. Assemble the standpipe cap over the stand pipe and the standpipe to the seal as shown in Figure 58.
2. Align the cap, standpipe, and seal to the tank and carefully insert the new stand pipe assemble into the fuel tank (Figure 58).

   Note: Align the hose fittings toward the center line of the machine.
3. Thread the cap onto the neck of the fuel tank and tighten the cap hand tight (Figure 58).
4. Assemble the 6.4 mm (1/4 inch) fuel hose onto the 6.4 mm (1/4 inch) hose fitting, and secure the hose to the fitting with the hose clamp (Figure 57).
5. Assemble the 8 mm (5/16 inch) fuel hose onto the 8 mm (5/16 inch) hose fitting, and secure the

hose to the fitting with the hose clamp (Figure 57).

6. Assemble the cover to the tank with the 4 screws (#10 x 3/4 inch) that you removed in step 2 of Removing the In-Tank Fuel Filter (page 49).
7. Torque the screws to 10 in-lbs.

Draining the Fuel Tank

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

Drain and clean the fuel tank if the fuel system becomes contaminated or if you plan to store the machine for an extended period. When cleaning the fuel tank, use fresh, clean fuel to flush out the tank.

1. Transfer the fuel from the tank into an approved fuel container using a siphon pump, or remove the tank from the machine and pour the fuel out of the tank fill spout into the fuel container.

   Note: If you remove the fuel tank, you will need to remove the fuel supply and return hoses from the standpipe assembly before removing the tank, refer to steps 1 though 4 Removing the In-Tank Fuel Filter (page 49).
2. Replace the fuel filters; refer to the Replacing the Water Separator Filter Canister (page 48) .
3. Flush the tank with fresh, clean fuel, if necessary.
4. Install the tank if you removed it; refer to step 1 through 5 in Removing the In-Tank Fuel Filter (page 49) .
5. Fill the tank with fresh, clean fuel.

Electrical System Maintenance

Replacing the Fuses

The fuse block for the electrical system is located beneath the operator's seat (Figure 59).

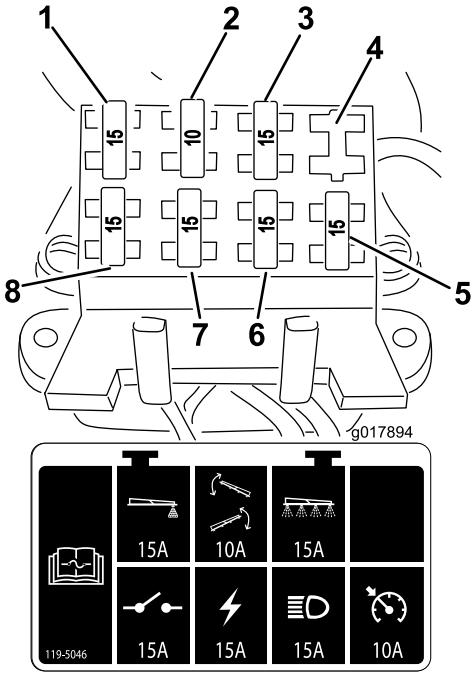

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Figure 59

1. Foam marker
2. Boom actuators
3. Spray system
4. Open slot
5. Traction-pedal locking switch
6. Headlights
7. Power
8. Breaker switch

Servicing the Battery

WARNING

CALIFORNIA
Proposition 65 Warning

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

Always keep the battery clean and fully charged. Use a paper towel to clean the battery and battery box. If the battery terminals are corroded, clean them with

a solution of 4 parts water and 1 part baking soda. Apply a light coating of grease to the battery terminals to prevent corrosion.

Voltage: 12 volts with 690 cold cranking Amps at 0 degrees F (-18 degrees C)

Removing the Battery

1. Move the sprayer on a level surface, set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
2. Remove the cover on the battery (Figure 18) and disconnect the negative (black) ground cable from the battery post.

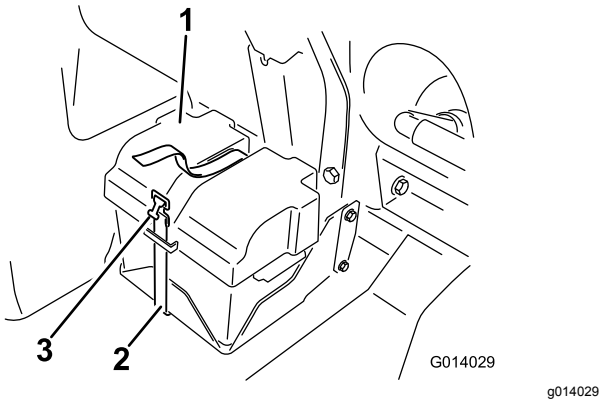

Figure 60

1. Battery cover
2. Strap
3. Buckle

⚠ WARNING

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

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

⚠ WARNING

Battery terminals or metal tools could short against metal sprayer 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 sprayer.**
- **Do not allow metal tools to short between the battery terminals and metal parts of the sprayer.**
- **Always keep the battery strap in place to protect and secure the battery.**

3. Disconnect the positive (red) cable from the battery post.
4. Remove the battery.

Installing the Battery

1. Set the battery on the battery box so that the battery posts are away from the sprayer.
2. Connect the positive (red) cable to the positive (+) battery post and the negative (black) cable to the negative (–) battery post using the bolts and nuts. Slide the rubber boot over both battery posts.
3. install the battery cover and secure it with the strap removed previously (Figure 60).

Important: **Always keep the battery retainer in place to protect and secure the battery.**

Charging the Battery

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

1. Remove the battery from the chassis; refer to Removing the Battery.
2. Connect a 3 to 4 amp battery charger to the battery posts. Charge the battery at a rate of 3 to 4 amperes for 4 to 8 hours (12 volts).

Important: **Do not overcharge the battery.**

⚠ WARNING

Charging the battery produces gasses that can explode.

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

3. Install the battery in the chassis; refer to Installing the Battery (page 51).

Storing the Battery

If the machine will be stored for more than 30 days, remove the battery and charge it fully. Either store it on the shelf or on the machine. Leave the cables disconnected if it is stored on the machine. Store the battery in a cool atmosphere to avoid quick deterioration of the charge in the battery. To prevent the battery from freezing, ensure that it is fully charged.

Drive System Maintenance

Inspecting the Wheels/Tires

Service Interval: After the first 8 hours—Torque the wheel lug nuts.

Every 100 hours—Torque the wheel lug nuts.

Every 100 hours—Inspect the condition and wear of the tires.

Torque the front lug nuts to 75 to 102 N-m (55 to 75 ft-lb) and the rear lug nuts to 95 to 122 N-m (75 to 90 ft-lb).

Operating accidents, such as hitting curbs, can damage a tire or rim and also disrupt wheel alignment, so inspect tire condition after an accident.

Changing the Planetary Gearbox Fluid

Service Interval: After the first 8 hours

Every 400 hours

Change the planetary gearbox fluid in each rear wheel after the first 8 hours and then after every 400 hours thereafter.

Use high quality, SAE 85W-140 weight gear lube.

1. Position the sprayer on a level surface with the rear wheels positioned for draining as illustrated in Figure 61.

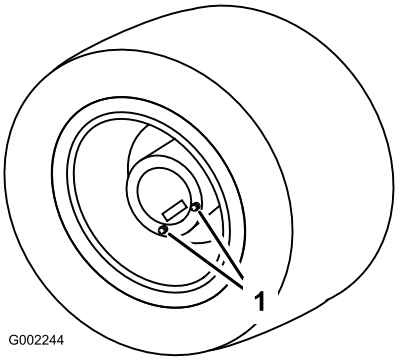

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Figure 61

1. Drain plugs, positioned for draining

2. Set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
3. Place a pan under the drain plugs and remove them from the wheel (Figure 61).
4. Place a pan under the inner drain plug and remove it (Figure 62).

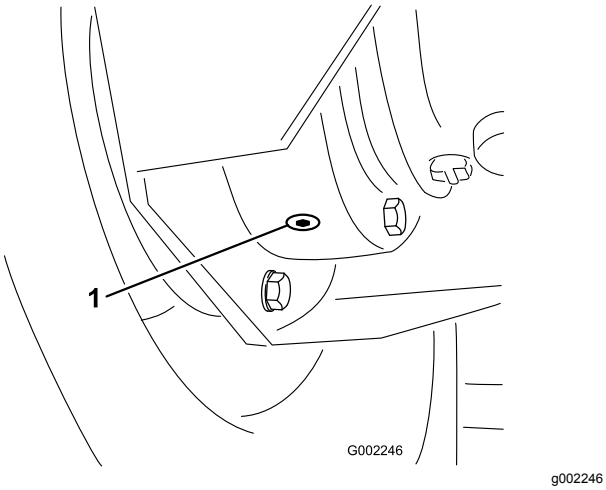

Figure 62

1. Inner drain plug

5. Move the vehicle slowly until the wheel is positioned for filling as illustrated in Figure 63

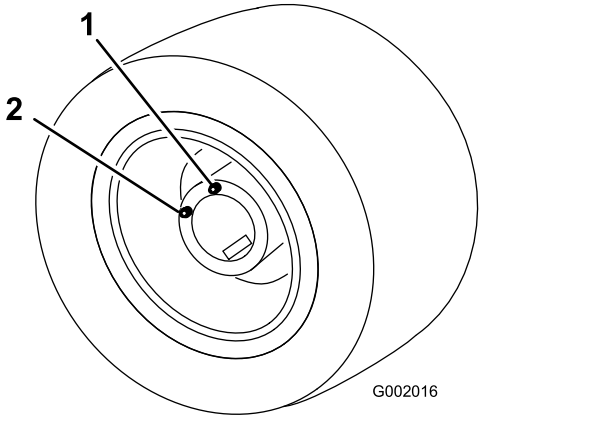

Figure 63

1. Upper hole, add fluid here 2. Lower hole

6. Set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
7. Pour SAE 85W-140 weight gear lube into the upper hole until it begins to come out of the lower hole.
8. Replace and tighten all drain plugs.
9. Repeat 3 through 9 for the other rear wheel.
10. Dispose of the used oil at a certified recycling center.

Adjusting the Front Wheel Toe-in

Service Interval: Every 200 hours/Yearly (whichever comes first)

The toe-in should be 0 to 3 mm (0 to 1/8 inch).

1. Check and fill all tires; refer to Checking Tire Pressure.
2. Measure the distance between both of the front tires at the axle height at both the front and rear of the front tires (Figure 64).

   The distance between the front of the tires should be 0 to 3 mm (0 to 1/8 inch) less than the distance between the back side of the front tires.

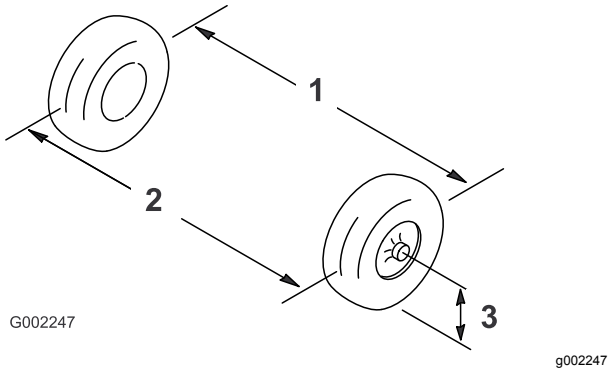

Figure 64

1. Tire center line-back
2. Tire center line-front
3. Axle center line

3. If the measurement does not fall within the specified range, loosen the jam nuts at both ends of the tie rod (Figure 65).

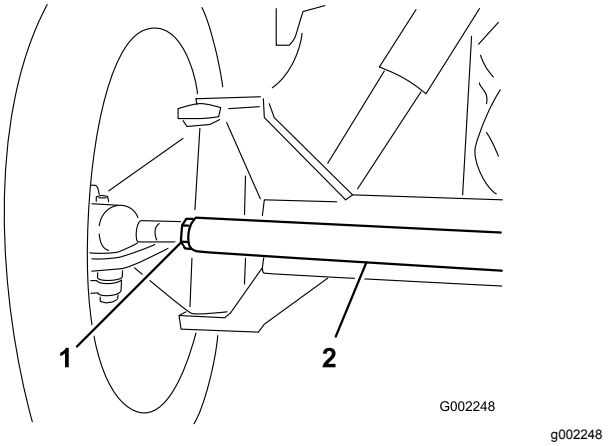

Figure 65

1. Jam nut 2. Tie rod

4. Rotate the tie rod to move the front of the tire inward or outward.
5. Tighten the tie rod jam nuts when the adjustment is correct.

6. Ensure that there is full travel of the steering wheel in both directions.

Cooling System Maintenance

Servicing the Cooling System

Service Interval: Every 100 hours—Check the cooling system hoses for wear and damage.

Every 400 hours/Yearly (whichever comes first)—Check the coolant (as directed by the manufacturer) and change if necessary.

Cooling system capacity: 5.5 L (5.8 US qt)

Coolant type: a solution of 50% water and 50% permanent ethylene glycol antifreeze

Important: **Do not add coolant to an overheated engine until the engine has fully cooled. Adding coolant to an overheated engine may crack the engine block.**

Check the engine coolant concentration as directed by the coolant manufacturer.

1. Position the sprayer on a level surface, set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.

   ⚠ CAUTION

   If the engine has been running, the coolant may be hot and pressurized. If you open the radiator cap when the coolant is hot, it could spray out and severely burn you or bystanders.

   Allow the engine to cool for at least 15 minutes before opening the radiator cap. The radiator cap must be cool to the touch.

2. When the engine is cool, remove the radiator cap (Figure 66).

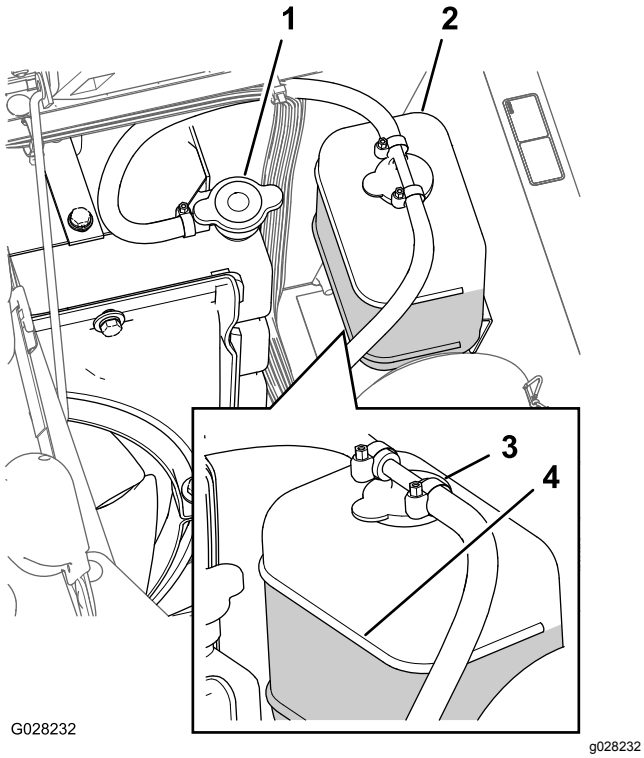

Figure 66

1. Radiator cap
2. Expansion tank
3. Expansion tank cap
4. Full line, expansion tank

3. Place a large drain pan under the radiator.
4. Open the drain (Figure 67) and drain the coolant into the pan.

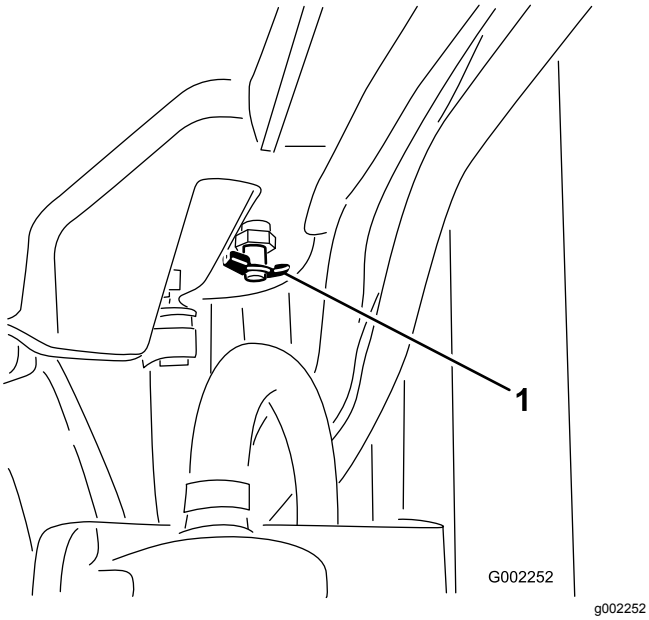

Figure 67

5. Close the drain (Figure 67).
6. Remove the radiator cap (Figure 66).
7. Slowly fill the radiator with coolant to approximately 2.5 cm (1 inch) below the sealing surface of the cap.

   Note: Use enough coolant to fill the engine and the system lines. This will allow for the coolant to expand without it overflowing while the engine is warming up.
8. Start the engine with the cap loosely on the radiator (Figure 66).
9. Allow the engine to warm up until the thermostat opens.

   Note: This usually occurs between 175 and 190 degrees F.

⚠ CAUTION

As the engine continues to run, the coolant will become hot and pressurized. If you open the radiator cap when the coolant is hot, it could spray out and severely burn you or bystanders.

- **Allow the engine to cool for at least 15 minutes before opening the radiator cap. The radiator cap must be cool to the touch.**
- **Wear protective clothing and avoid contact with hot coolant as you open the radiator cap.**

10. Once the coolant has warmed up, top off the coolant level to the sealing surface of the cap and tighten the cap (Figure 66).
11. Open the expansion tank cap and fill the tank with coolant to the Cold level (Figure 66).
12. Check the coolant levels after several engine start up and shut down cycles.

    Note: Add coolant to the radiator and expansion tank as needed.

Brake Maintenance

Adjusting the Brakes

If the brake pedal travels more than 2.5 cm (1 inch) before you feel resistance, adjust the brakes as follows:

1. Position the sprayer on a level surface, stop the pump, stop the engine, and remove the key from the starter switch.
2. Set the parking brake.
3. Put the blocks under the wheels to prevent the machine from rolling.
4. Release the parking brake.
5. Loosen the front nuts on the brake cables under the front end of the sprayer (Figure 68).

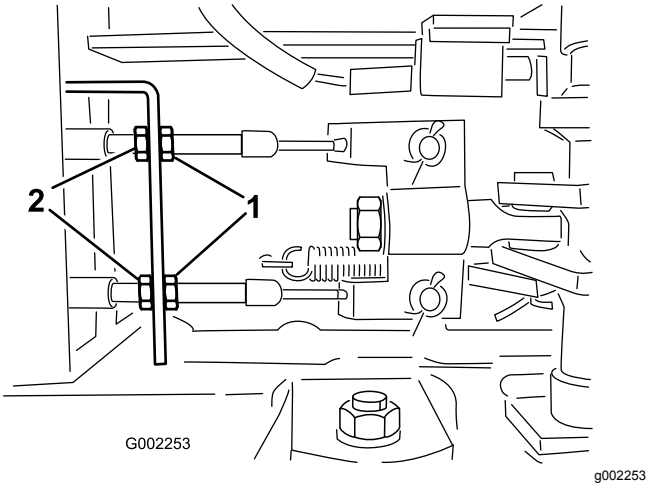

Figure 68

1. Front nuts
2. Rear nuts

6. Tighten the rear nuts equally until the brake pedal moves between 1 to 2 cm (1/2 to 1 inch) before you feel resistance (Figure 68).

   Important: **Ensure that you tighten both rear nuts equally so that the threaded ends of the brake cables in front of the front nuts are the same length.**

7. Tighten the front nuts.

Belt Maintenance

Servicing the Alternator Belt

Service Interval: After the first 8 hours

Every 100 hours

Check the condition and tension of the alternator/cooling fan belt. Replace the belt as necessary.

1. Position the sprayer on a level surface, set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
2. Check the tension by depressing the belt midway between the alternator and the crankshaft pulleys with 10 kg (22 lb) of force.

   Note: The belt should deflect 10 to 12 mm (0.39 to 0.47 inches). If the deflection is not correct, go to 3. If it is correct, you may skip the remainder of this procedure and resume operating the sprayer.

3. Loosen the bolts that secure the brace to the engine and the bolt that secures the alternator to the brace (Figure 69).

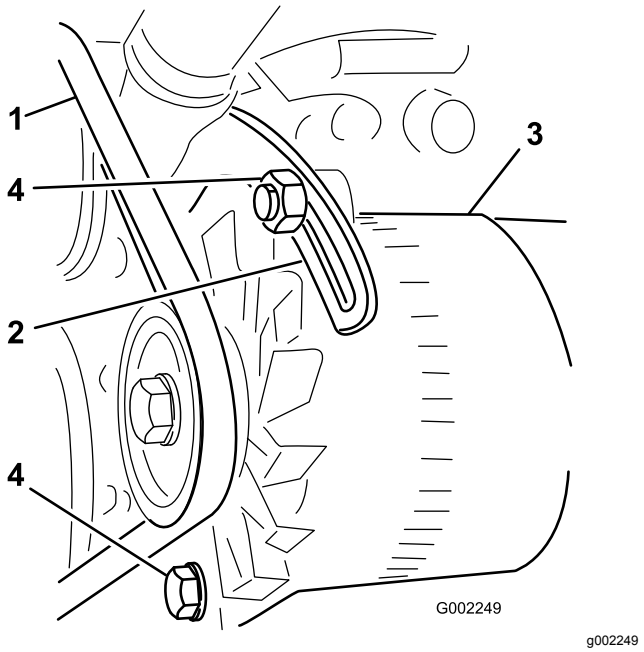

Figure 69

1. Alternator belt
2. Brace
3. Alternator
4. Bolts

4. Insert a pry bar between the alternator and the engine and carefully pry on the alternator outward.

5. When you achieve the proper tension, tighten the alternator and the bolts to secure the adjustment.
6. Tighten the locknut to secure the adjustment.

Hydraulic System Maintenance

Hydraulic Fluid Specification

The machines reservoir is filled at the factory with approximately 56 L (15 US gallons) of high quality hydraulic fluid. Check the level of the hydraulic fluid before the engine is first started and daily thereafter. The recommended replacement fluid is as follows:

Toro Premium All Season Hydraulic Fluid (Available in 5-gallon pails or 55-gallon drums. See parts catalog or Toro distributor for part numbers.)

Alternate fluids: If the Toro fluid is not available, other fluids may be used provided they meet all the following material properties and industry specifications. We do not recommend the use of synthetic fluid. Consult with your lubricant distributor to identify a satisfactory product Note: Toro will not assume responsibility for damage caused by improper substitutions, so use only products from reputable manufacturers who will stand behind their recommendation.

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

Material Properties:

Viscosity, ASTM D445	cSt @ 40°C 44 to 48 cSt @ 100°C 7.9 to 8.5
Viscosity Index ASTM D2270	140 to 160
Pour Point, ASTM D97	-34°F to -49°F

Industry Specifications:

Vickers I-286-S (Quality Level), Vickers M-2950-S (Quality Level), Denison HF-0

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

Premium Biodegradable Hydraulic Fluid-Mobil EAL EnviroSyn 46H

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

Important: **Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic system oil is available in 20 ml (2/3 oz) bottles. One bottle is sufficient for 15 to 22 L (4 to 6 US gallons) of hydraulic oil. Order part no. 44-2500 from your authorized Toro distributor. This red dye is not recommended for use with biodegradable fluids; use food coloring.**

Servicing the Hydraulic Oil

If the oil becomes contaminated, contact an Authorized Toro Distributor to have the system flushed.

Note: Contaminated oil looks milky or black when compared to clean oil.

Replacing the Hydraulic Oil Filter

Service Interval: After the first 5 hours

Every 400 hours/Yearly (whichever comes first)

Use the Toro replacement filter (See your *Parts Manual* for the correct part number.)

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

⚠ WARNING

Hot hydraulic fluid can cause severe burns.

Allow the hydraulic oil to cool before performing any maintenance to the hydraulic system.

1. Position the sprayer on a level surface, set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
2. Locate the 2 hydraulic filters on the machine. One below the hydraulic oil tank and the other at the rear of the machine on the frame.
   - Forward filter, below the hydraulic tank.

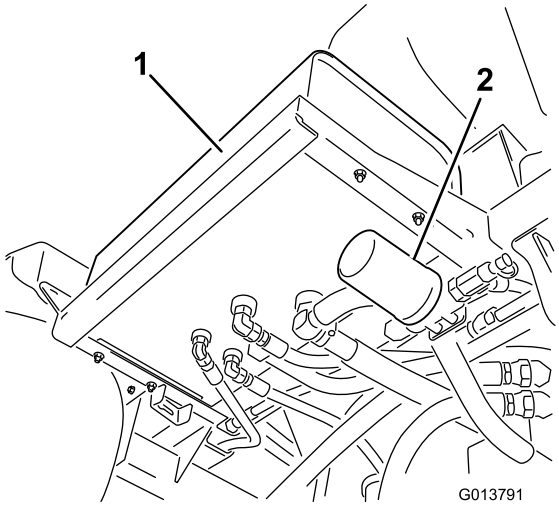

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Figure 70

1. Hydraulic tank
2. Forward filter

   - Rear filter, located on the machine frame.

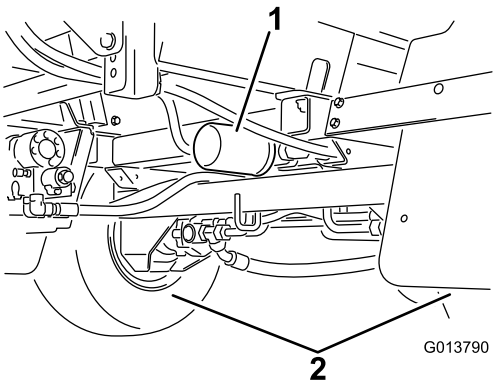

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Figure 71

1. Hydraulic filter
2. Rear wheels

3. Clean the area around the filter mounting area.
4. Place a drain pan under the filter.
5. Remove the filter.
6. Lubricate the new filter gasket.
7. Ensure that the filter mounting area is clean.
8. Screw the filter on until the gasket contacts the mounting plate, then tighten the filter 1/2 turn.
9. Start the engine and let it run for about two minutes to purge air from the system. Stop the engine and check the hydraulic oil level and for leaks.
10. Dispose of the used filter at a certified recycling center.

Changing the Hydraulic Oil

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

Hydraulic fluid capacity: 56 L (15 US gallons) of the specified hydraulic fluid or equivalent; refer to Hydraulic Fluid Specification (page 57).

Important: **Using any other oil may void the warranty on some components.**

⚠ WARNING

Hot hydraulic fluid can cause severe burns.

Allow the hydraulic oil to cool before performing any maintenance to the hydraulic system.

1. Replace the hydraulic oil filter; refer to Replacing the Hydraulic Oil Filter (page 58).
2. Clean the area around 1 hydraulic hose fitting on the bottom of the hydraulic oil tank (Figure 72).

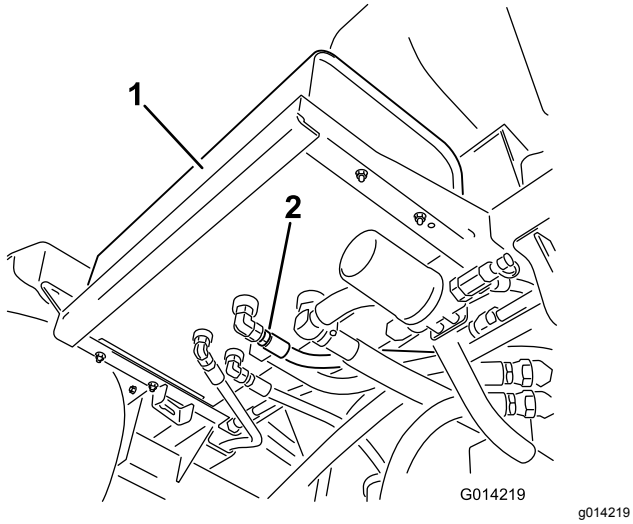

Figure 72

1. Hydraulic tank
2. Hydraulic hose and fitting

3. Place a large pan under the fitting.
4. Remove the hose fitting from the tank, allowing the oil to drain into the pan (Figure 72).
5. Install the hose and fitting to the tank and tighten it securely.
6. Fill the hydraulic reservoir with approximately 53 L (14 US gallons) of specified hydraulic fluid or equivalent, see Hydraulic Fluid Specification (page 57).
7. Start the machine and run it at idle for 3 to 5 minutes to circulate the fluid and remove any air trapped in the system.
8. Stop the engine, check the hydraulic oil level, and check for leaks.
9. Dispose of the used oil at a certified recycling center.

Checking the Hydraulic Lines and Hoses

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

⚠ WARNING

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

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

Spray System Maintenance

⚠ WARNING

Chemical substances used in the spray system may be hazardous and toxic to you, bystanders, animals, plants, soils or other property.

- **Carefully read and follow the chemical warning labels and Material Safety Data Sheets (MSDS) for all chemicals used and protect yourself according to the chemical manufacturer's recommendations. For example, use appropriate Personal Protective Equipment (PPE) including face and eye protection, gloves, or other equipment to guard against personal contact with the chemical.**
- **Keep in mind that there may be more than one chemical used and information on each should be assessed.**
- ***Refuse to operate or work on the sprayer if this information is not available!***
- **Before working on a spray system make sure the system has been triple rinsed and neutralized according to the recommendations of the chemical manufacturer(s) and all of the valves have been cycled three times.**
- **Verify there is an adequate supply of clean water and soap nearby, and immediately wash off any chemicals that contact you.**

Inspecting the Hoses

Service Interval: Every 200 hours—Inspect all hoses and connections for damage and proper attachment.

Every 400 hours/Yearly (whichever comes first)—Inspect the O-rings in the valve assemblies and replace them if necessary.

Examine each hose in the spray system for cracks, leaks or other damage. At the same time, inspect the connections and fittings for similar damage. Replace any hoses and fittings if damaged.

Changing the Pressure Filter

Service Interval: Every 400 hours

1. Move the machine to a level surface, shut off the sprayer pump, shut off the engine, and remove the key from the starter switch.
2. Align a drain pan under the pressure filter (Figure 73).

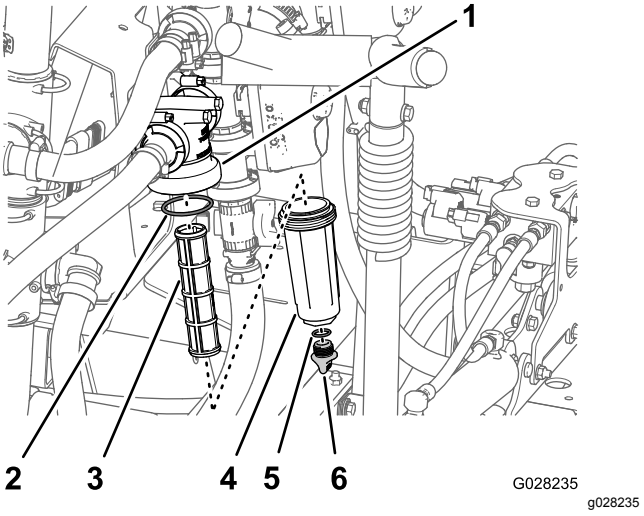

Figure 73

1. Filter head
2. O-ring (bowl)
3. Filter element
4. Bowl
5. O-ring (drain plug)
6. Drain plug

3. Rotate the drain plug counterclockwise and remove it from the bowl of the pressure filter (Figure 73).

   Note: Allow the bowl to drain completely.
4. Rotate the bowl counterclockwise and remove it filter head (Figure 73).
5. Remove the old pressure filter element (Figure 73).

   Note: Discard the old filter.
6. Check the O-ring for the drain plug (located inside the bowl) and the O-ring for bowl (located inside the filter head) for damage and wear (Figure 73).

   Note: Replace any damaged or worn O-rings for the plug, bowl, or both.
7. Install the new pressure filter element into the filter head (Figure 73).

   Note: Ensure that the filter element is firmly seated into the filter head.
8. Install the bowl onto the filter head hand tight (Figure 73).

9. Install the plug into the bowl hand tight (Figure 73).

Pump Maintenance

Inspecting the Pump

Service Interval: Every 400 hours/Yearly (whichever comes first)—Inspect the pump diaphragm and replace if necessary (see an Authorized Toro Service Distributor).

Every 400 hours/Yearly (whichever comes first)—Inspect the pump check valves and replace if necessary (see an Authorized Toro Service Distributor).

Note: The following machine components are considered parts subject to consumption through use unless found defective and are not covered by the Warranty associated with this machine.

Have an Authorized Toro Service Distributor check following internal pump components for damage:

- Pump diaphragm
- Pump check valves assemblies

Replace any components if necessary.

Adjusting the Actuators

The following procedure can be used to adjust the length of the actuator rods.

1. Extend the booms to the spray position.
2. Remove the cotter pin from the pivot pin (Figure 74).

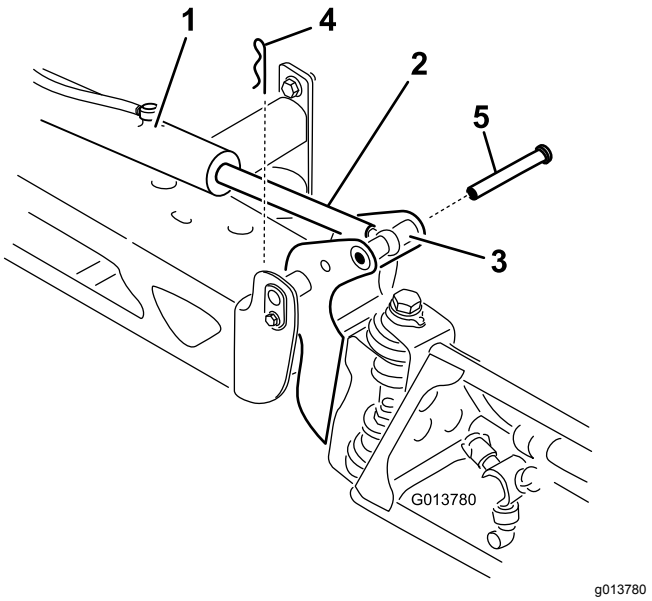

Figure 74

1. Actuator
2. Actuator rod
3. Boom-pivot-pin housing
4. Cotter
5. Pin

3. Lift up on the boom and remove the pin (Figure 74). Slowly lower the boom to the ground.
4. Inspect the pin for any damage, replace if necessary.
5. Use a wrench on the flat sides of the actuator rod to immobilize it then loosen the jam nut to allow for the eyelet rod to be manipulated (Figure 75).

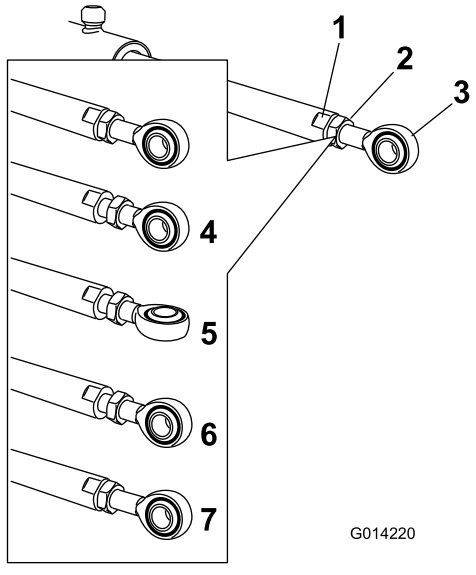

Figure 75

1. Flat on the actuator rod
2. Jam nut
3. Eyelet
4. Jam nut loosened
5. Eyelet adjusted
6. Eyelet position for reassembly
7. Jam nut tightened to lock new position.

6. Turn the eyelet rod in the actuator rod to shorten or lengthen the extended actuator to the desired position (Figure 75).

   Note: The eyelet rod must be turned in half or complete revolutions to allow the reassembly of the rod to the boom.

7. Once the desired position has been achieved, tighten the jam nut to secure the actuator and eyelet rod.
8. Raise the boom to align the pivot with the actuator rod. While holding the boom, insert the pin through both boom pivot and actuator rod (Figure 74).
9. With the pin in place, release the boom and secure the pin with the cotter removed previously.
10. Repeat the procedure for each actuator rod bearing if necessary.

Inspecting the Nylon Pivot Bushings

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

1. Position the sprayer on a level surface, set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
2. Extend the booms to the spray position and support the booms using stands or straps from a lift.
3. With the weight of the boom supported, remove the bolt and nut securing the pivot pin to the boom assembly (Figure 76).

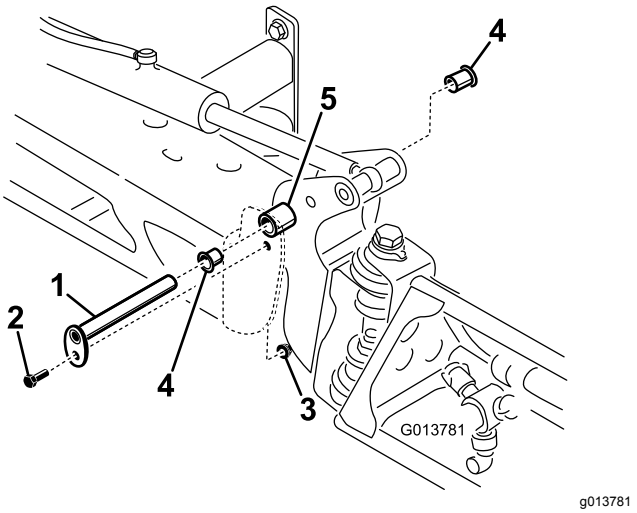

Figure 76

1. Pivot pin
2. Bolt
3. Nut
4. Nylon bushing
5. Pivot bracket

4. Remove the pivot pin (Figure 76).
5. Remove the boom and pivot bracket assembly from the center frame to access the nylon bushings.
6. Remove and inspect the nylon bushings from the front and back sides of the pivot bracket (Figure 76).

   Note: Replace any damaged bushings.

7. Place a small amount of oil on the nylon bushings and install them into pivot bracket.
8. Install the boom and pivot bracket assembly into the center frame, aligning the openings (Figure 76).
9. Install the pivot pin and secure it with the bolt and nut removed previously.
10. Repeat this procedure for each boom.

Cleaning

Cleaning the Radiator Cooling Fins

Service Interval: Every 200 hours—Clean the radiator fins.

Important: **Do not spray water into a hot engine compartment.**

1. Position the sprayer on a level surface, set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
2. Tilt the driver and passenger seats forward and align the prop rod into the detent in the prop rod guide slot.
3. Allow the cooling system to cool.
4. Remove the seat base access cover; refer to Removing the Seat Base Access Panel (page 40).
5. Using a soft brush and low-pressure compressed air, clean the fins of the radiator.

   Note: Clean the radiator fines more often if needed. Check all coolant hoses and replace any that are worn, leaking, or damaged.
6. Lower the driver and passenger seats.
7. Install the seat base access cover; refer to Installing the Seat Base Access Panel (page 40).

Cleaning the Agitation and Section Valves

- To clean the agitation valve; refer to the following sections:
  1. Removing the Valve Actuator (page 63)
  2. Removing the Agitation Manifold Valve (page 63)
  3. Cleaning the Manifold Valve (page 66)
  4. Assembling the Manifold Valve (page 67)
  5. Installing the Agitation Manifold Valve (page 68)
  6. Installing the Valve Actuator (page 69)
- To clean the 3 section valves; refer to the following sections:
  1. Removing the Valve Actuator (page 63)
  2. Removing the Section Manifold Valve (page 64)
  3. Cleaning the Manifold Valve (page 66)
  4. Assembling the Manifold Valve (page 67)
  5. Installing the Section Manifold Valve (page 68)
  6. Installing the Valve Actuator (page 69)

Removing the Valve Actuator

1. Position the sprayer on a level surface, set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
2. Remove the retainer that secures the a actuator to the manifold valve for the section valve or agitation valve (Figure 77).

   Note: Squeeze the 2 legs of the retainer together while pushing it down.

   Note: Retain the actuator and retainer for installation in Installing the Valve Actuator (page 69).

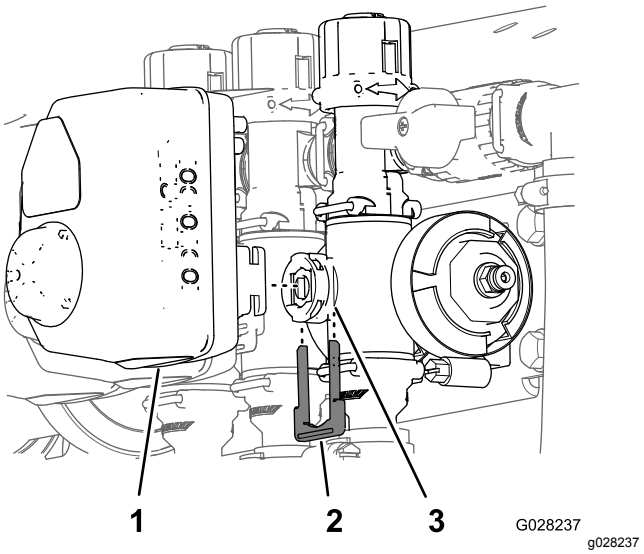

Figure 77

Section Valve Actuator shown (the agitation valve actuator is similar)

1. Actuator (section valve)
2. Retainer
3. Stem port

3. Remove the actuator from the manifold valve.

Removing the Agitation Manifold Valve

1. Remove clamps and gaskets that secure the manifold for the agitation valve (Figure 78) to the agitation bypass valve, pressure filter head, reducer coupling, and adapter fitting (agitation throttle valve).

   Note: Retain the clamp(s) and gasket(s)for installation in Installing the Agitation Manifold Valve (page 68).

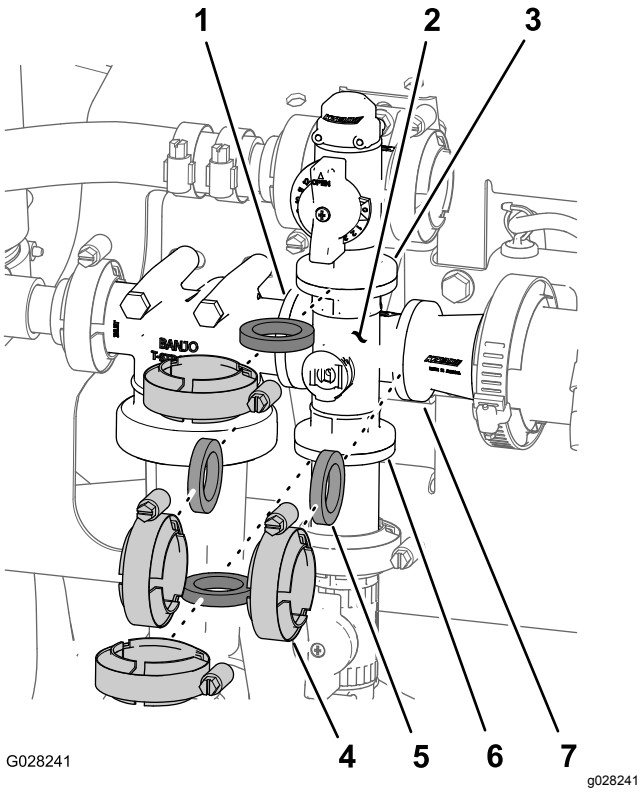

Figure 78
Agitation Valve

1. Flange (pressure filter head)
2. Manifold (agitation valve)
3. Flange (agitation bypass valve)
4. Flange clamp
5. Gasket
6. Flange (adapter fitting—agitation throttle valve)
7. Flange (reducer coupling)

2. Remove the agitation valve manifold from the machine (Figure 79).

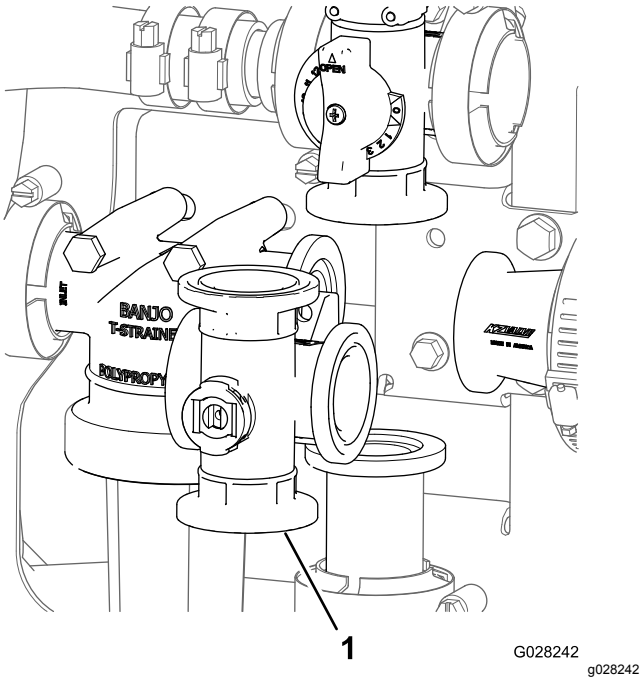

Figure 79

1. Agitation valve manifold

Removing the Section Manifold Valve

1. Remove clamps and gaskets that secure the manifold for the section valve (Figure 80) to the adjacent section valve (if left section valve, and the reducer coupling).

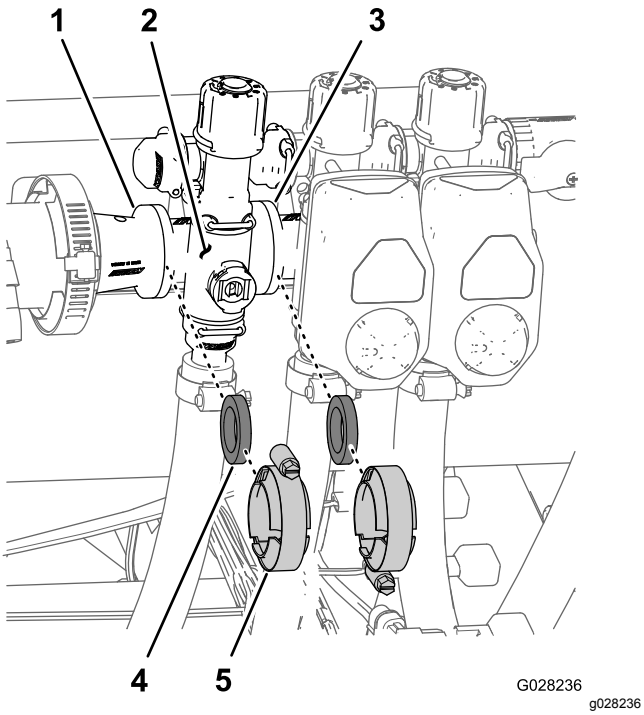

Figure 80

1. Flange (reducer coupling)
2. Manifold (section valve)
3. Flange (adjacent section valve)
4. Gasket
5. Flange clamp

2. Remove the retainer that secures the section valve manifold to the bypass fitting (Figure 81).

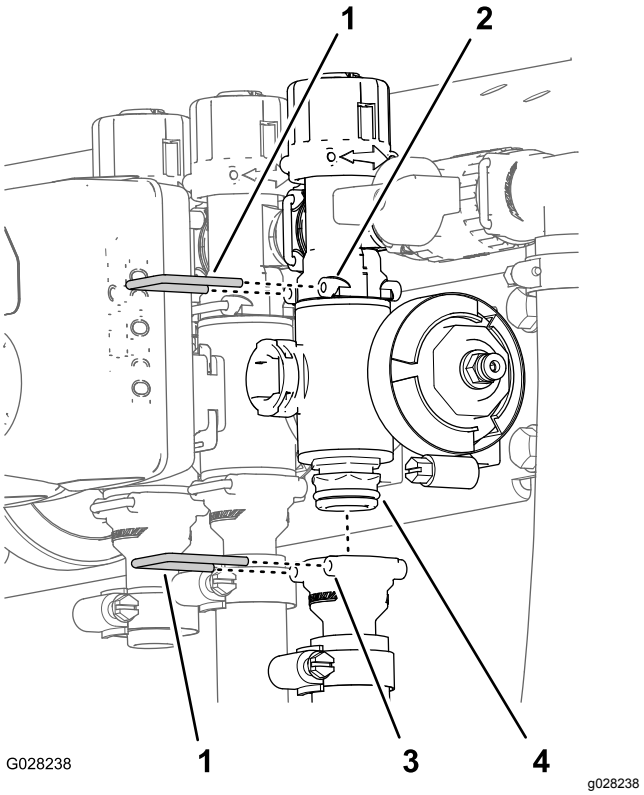

Figure 81

1. Retainer
2. Socket (bypass fitting)
3. Socket (outlet fitting)
4. Manifold valve assembly

3. Remove the section valve manifold from the machine (Figure 82).

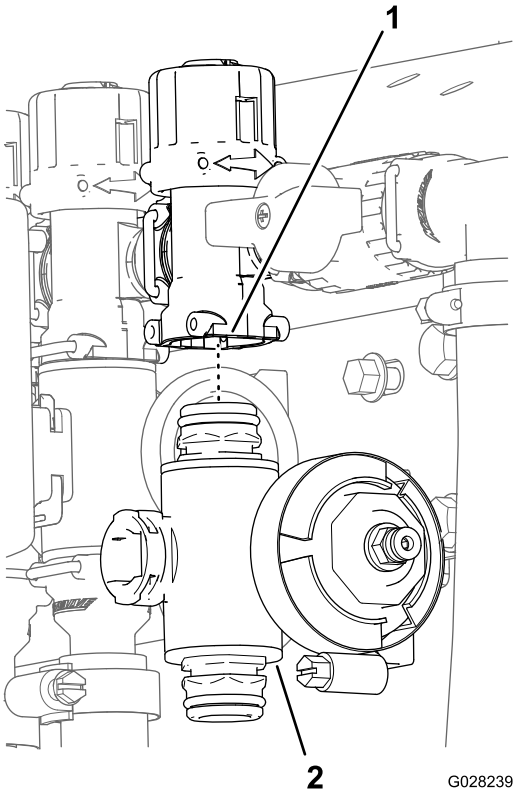

Figure 82

1. Bypass fitting
2. Section valve manifold

Cleaning the Manifold Valve

1. Position the valve stem so that it is in the closed position (B of Figure 83).

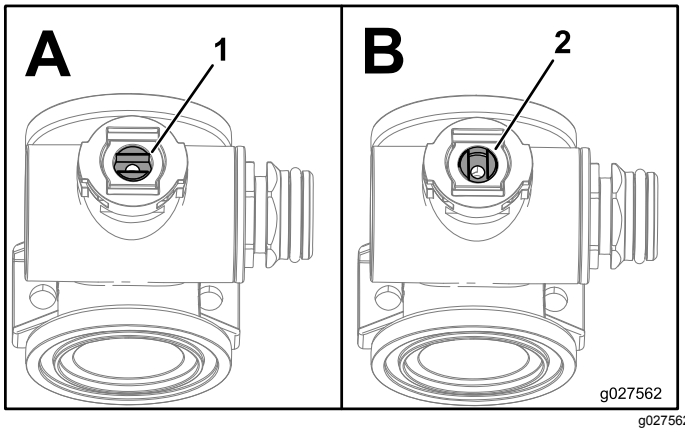

Figure 83

1. Valve open
2. Valve closed

2. Remove the 2 endcap fitting assembly from each end of the manifold body (Figure 84 and Figure 85).

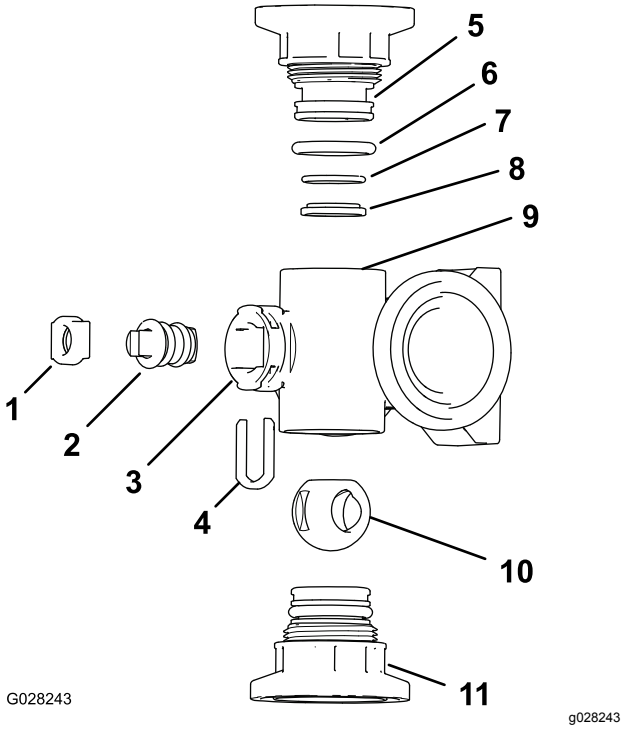

Figure 84

Agitation Valve Manifold

1. Stem retainer
2. Valve stem
3. Stem port
4. Stem capture retainer
5. Endcap fitting
6. Endcap seal O-ring (0.796 inch / 0.139 inch)
7. Back seating O-ring (0.676 inch / 0.07 inch)
8. Valve seat ring
9. Mainfold body
10. Ball valve
11. Endcap fitting assembly

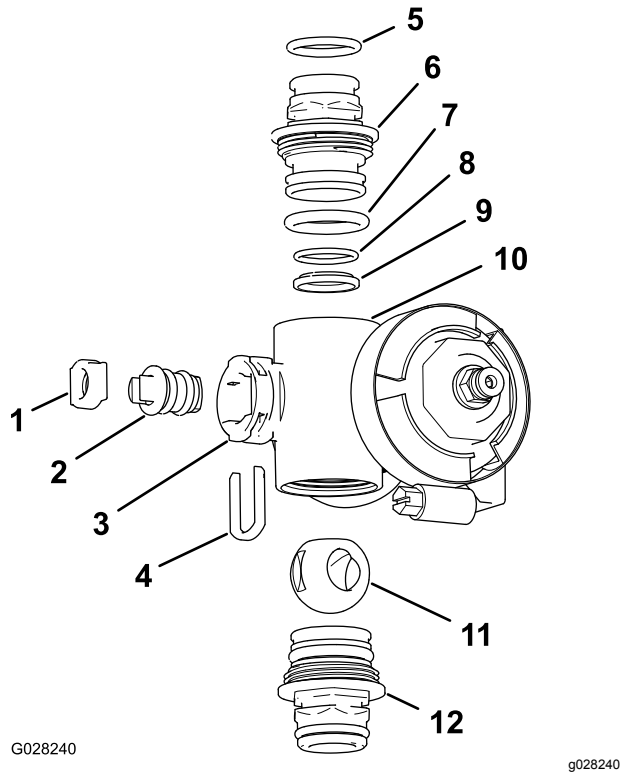

Figure 85

Section Valve Manifold

1.	Valve stem seat	7.	Endcap O-ring (0.796 inch / 0.139 inch)
2.	Valve stem assembly	8.	Back seating O-ring (0.676 inch / 0.07 inch)
3.	Stem port	9.	Ball seat
4.	Stem retainer	10.	Mainfold body
5.	Outlet fitting O-ring (0.737 inch / 0.103 inch)	11.	Ball valve
6.	Endcap fitting	12.	Endcap fitting assembly

3. Turn the valve stem so that the ball is in the open position (A of Figure 83).

   Note: The valve stem will be parallel with the valve flow and the ball will slide out.

4. Remove the stem retainer from the slots in the stem port in the manifold (Figure 84 and Figure 85).
5. Remove the stem retainer and valve stem seat from the manifold (Figure 84 and Figure 85).
6. Reach into the manifold body and remove the valve stem assembly (Figure 84 and Figure 85).
7. Clean the inside of the manifold and exterior of the ball valve, valve stem assembly, stem capture, and end fittings.

Assembling the Manifold Valve

1. Check the condition of the outlet fitting O-rings (section valve manifold only), endcap O-rings, back seating O-rings, ball seat for damage or wear (Figure 84 and Figure 85).

   Note: Replace any damaged or worn O-rings or seats.

2. Apply grease to the valve stem and insert it into the valve stem seat (Figure 84 and Figure 85).
3. Install the valve stem and seat into the manifold and secure the stem and seat with the stem retainer (Figure 84 and Figure 85).
4. Ensure that the back seating O-ring and the ball seat are aligned and seated into the endcap fitting (Figure 84 and Figure 85)
5. Install the endcap fitting assembly onto the manifold body until the flange of the endcap fitting touches the manifold body (Figure 84 and Figure 85), then turn the endcap fitting an additional 1/8 to 1/4 turn.

   Note: Use caution so as not to damage the end of the fitting.

6. Insert the ball into the valve body (Figure 86).

   Note: The valve stem should fit inside the ball drive slot. If the valve stem does not fit, adjust the position of the ball (Figure 86).

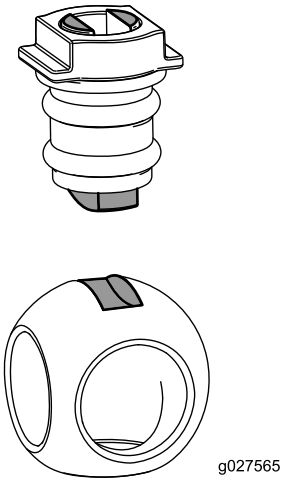

Figure 86

7. Turn the valve stem assembly so that the valve is closed (B of Figure 83)
8. Repeat steps 4 and 5 for the other endcap fitting assembly.

Installing the Agitation Manifold Valve

1. Align the flange of the agitation bypass valve, 1 gasket, and the endcap fitting flange of the agitation valve manifold (A of Figure 87).

   Note: If needed, loosen the mounting hardware for the pressure filter head as needed to provide clearance.

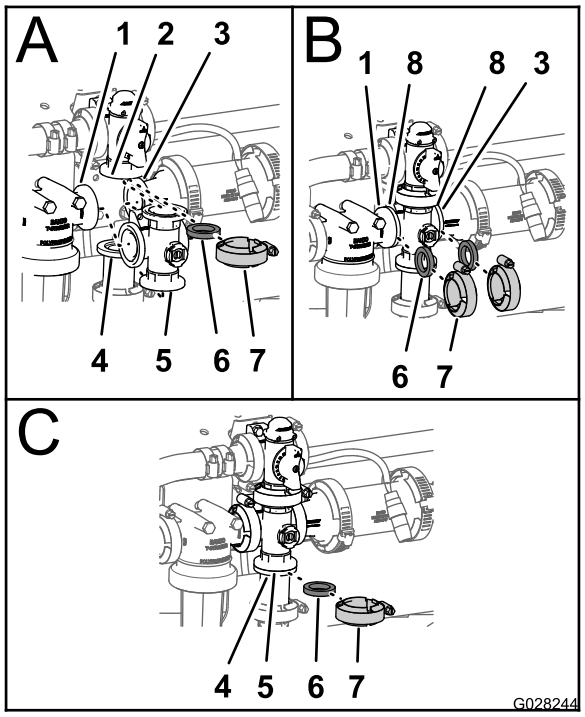

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Figure 87

1. Flange (pressure filter head)
2. Flange (agitation bypass valve)
3. Flange (reducer coupling)
4. Flange (adapter fitting—agitation throttle valve)
5. Manifold (agitation valve)
6. Gasket
7. Flange clamp
8. Flange (manifold—agitation valve)

2. Assemble the agitation bypass valve, gasket, and agitation valve manifold with a clamp tightened hand tight (A of Figure 87).
3. Align a 1 gasket between the flanges of the pressure filter head and the agitation valve manifold (B of Figure 87).
4. Assemble the pressure filter head, gasket, and agitation valve manifold with a clamp tightened hand tight (B ofFigure 87).
5. Align a 1 gasket between the flanges of the agitation valve manifold and the reducer coupling (B ofFigure 87).
6. Assemble the agitation valve manifold, gasket, and reducer coupling with a clamp tightened hand tight (B of Figure 87).
7. Align a 1 gasket between the flanges of the agitation valve manifold and the adapter fitting for the agitation throttle valve (C of Figure 87).
8. Assemble the agitation valve manifold, gasket, and adapter fitting with a clamp tightened hand tight (C of Figure 87).
9. If you loosened the mounting hardware for the pressure filter head, tighten the nut and bolt to 1978 to 2542 N-cm (175 to 225 in-lb).

Installing the Section Manifold Valve

1. Insert the upper endcap fitting of the manifold valve into the bypass fitting (A of Figure 88).

   Note: If needed, loosen the mounting hardware for the bypass valve as needed to provide clearance.

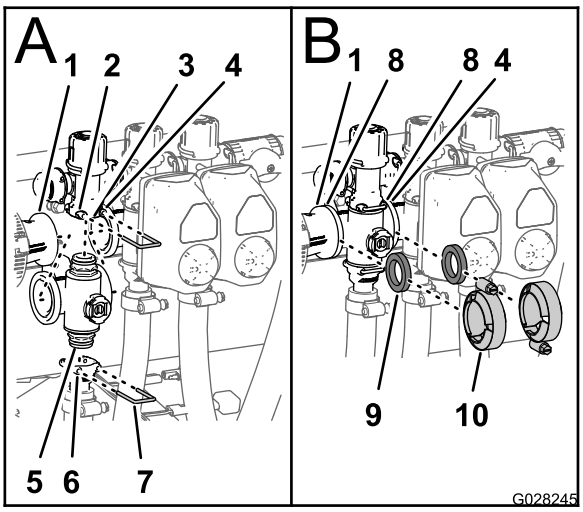

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Figure 88

1. Flange (reducer coupling)
2. Socket (bypass fitting)
3. Bypass valve
4. Flange (adjacent manifold—agitation valve)
5. Endcap fitting (manifold valve assembly)
6. Socket (outlet fitting)
7. Retainer
8. Flange (manifold—section valve)
9. Gasket
10. Flange clamp

2. Secure the endcap fitting to the bypass fitting by inserting a retainer into the socket of the bypass fitting (A of Figure 88).
3. Assemble the outlet fitting onto the lower endcap fitting of the manifold valve (A of Figure 88).

4. Secure the endcap fitting to the outlet fitting by inserting a retainer into the socket of the outlet fitting (A of Figure 88)
5. Align a 1 gasket between the flanges of the reducer coupling and the section valve manifold (B of Figure 88).
6. Assemble the reducer coupling, gasket, and section valve manifold with a clamp tightened hand tight (B of Figure 88).
7. If installing the 2 left most section valves, align a 1 gasket between the flanges of the 2 adjacent section valve manifolds (B of Figure 88).
8. Assemble the and 2 adjacent section valve manifolds and gasket with a clamp tightened hand tight (B of Figure 88).
9. If you loosened the mounting hardware for the bypass valve, tighten the nut and bolt to 1017 to 1243 N-cm (90 to 110 in-lb).

Installing the Valve Actuator

1. Align the actuator to the manifold valve and (Figure 77).
2. Secure the actuator and valve with the retainer that you removed in step 2 of Removing the Section Manifold Valve (page 64)

Storage

1. Position the sprayer on a level surface, set the parking brake, stop the pump, stop the engine, and remove the key from the starter switch.
2. Clean dirt and grime from the entire machine, including the outside of the engine's cylinder head fins and blower housing.

   Important: **You can wash the machine with mild detergent and water. *Do not* use *high pressure water* to wash the machine. Pressure washing may damage the electrical system or wash away necessary grease at friction points. Avoid excessive use of water, especially near the control panel, lights, engine, and the battery.**
3. Condition the sprayer system as follows:
   A. Drain the fresh water tank.
   B. Drain the spray system as completely as possible.
   C. Prepare rust inhibiting, non-alcohol based, RV antifreeze solution per the manufacturer's instructions.
   D. Add the RV antifreeze solution to the fresh water tank and the sprayer tank.
   E. Run the sprayer pump for a few minutes to circulate the RV antifreeze throughout the sprayer system and any installed spray accessories.
   F. Drain the fresh water tank and spray system as completely as possible.
4. Use the boom lift switches to raise the booms. Raise the booms until have moved completely into boom transport cradle forming the “X” transport position and the boom cylinders are fully retracted.

   Note: Make sure that the boom cylinders are fully retracted to prevent actuator rod damage.
5. Perform the following maintenance steps for short-term or long-term storage
   - **Short-term storage** (less than 30 days), clean the sprayer system; refer to Cleaning the Sprayer (page 31).
   - **Long-term storage** (longer then 30 days), perform the following:
     A. Clean the agitation valve and the 3 section valves; refer to Cleaning the Agitation and Section Valves (page 63).
     B. Check the brakes; refer to Checking the Brakes (page 25).
     C. Service the air cleaner; refer to Checking the Air Cleaner (page 43).

D. Grease the sprayer; refer to Greasing the Sprayer (page 41).

E. Change the engine-oil filter and oil; refer to Changing the Engine Oil Filter (page 45) and Changing the Engine Oil (page 46).

F. Check the tire pressure; refer to Checking the Tire Air Pressure (page 22).

G. Prepare the fuel system as follows:

   i. Start the engine and run it at idle speed for approximately 2 minutes.

   ii. Stop the engine.

   iii. Flush the fuel tank with fresh, clean fuel.

   iv. Secure all the fuel system fittings.

H. Use the starter to crank the engine and distribute the oil inside the cylinder.

I. Check and tighten all bolts, nuts, and screws.

   Note: Repair or replace any parts that are worn or damaged.

J. Check the condition of all spray hoses

   Note: Replace any hoses that are worn or damaged.

K. Tighten all hose fittings.

L. Paint all scratched or bare metal surfaces with paint is available from your Authorized Service Dealer.

M. Store the machine in a clean, dry garage or storage area.

N. Remove the battery from the chassis, check the electrolyte level, and charge the battery fully; refer to Charging the Battery (page 51).

   Important: **The battery must be fully charged to prevent it from freezing and being damaged at temperatures below 32 degrees F (0 degrees C). A fully charged battery maintains its charge for about 50 days at temperatures lower than 40 degrees F (4 degrees C). If the temperatures will be above 40 degrees F (4 degrees C), check the water level in the battery and charge it every 30 days.**

   Note: Do not connect the battery cables to the battery posts during storage.

O. Remove the key from the starter switch and put the key in a safe place out of the reach of children.

P. Cover the machine to protect it and keep it clean.

Troubleshooting

Troubleshooting the Engine and Vehicle

Problem	Possible Cause	Corrective Action
The starter does not rotate the engine.	1. The electrical connections are corroded or loose. 2. A fuse is blown or loose. 3. The battery is discharged. 4. A broken starter or starter solenoid. 5. Seized internal engine components.	1. Check the electrical connections for good contact. 2. Correct or replace fuse. 3. Charge or replace the battery. 4. Contact your Authorized Service Dealer. 5. Contact your Authorized Service Dealer.
The engine cranks, but will not start.	1. The fuel tank is empty. 2. Dirt, water, or stale fuel is in the fuel system. 3. Clogged fuel line. 4. The kill relay is not energized. 5. The starter switch is broken.	1. Fill the tank with fresh fuel. 2. Drain and flush the fuel system; add fresh fuel. 3. Clean or replace. 4. Contact your Authorized Service Dealer. 5. Contact your Authorized Service Dealer.
The engine starts, but does not keep running.	1. The fuel tank vent is restricted. 2. Dirt or water in the fuel system. 3. The fuel filter is clogged. 4. A fuse is blown or loose. 5. The fuel pump is broken. 6. Loose wires or poor connections. 7. The cylinder head gasket is broken.	1. Replace the fuel cap. 2. Drain and flush the fuel system; add fresh fuel. 3. Replace the fuel filter. 4. Correct or replace the fuse. 5. Contact your Authorized Service Dealer. 6. Check and tighten wire connections. 7. Contact your Authorized Service Dealer.
The engine runs, but knocks or misses.	1. Dirt, water, or stale fuel is in the fuel system. 2. Loose wires or poor connections. 3. The engine is overheating.	1. Drain and flush the fuel system; add fresh fuel. 2. Check and tighten wire connections. 3. See “The engine overheats” below.
The engine will not idle.	1. The fuel tank vent is restricted. 2. Dirt, water, or stale fuel is in the fuel system. 3. The fuel pump is broken. 4. Low compression. 5. The air cleaner element is dirty.	1. Replace the fuel cap. 2. Drain and flush the fuel system; add fresh fuel. 3. Contact your Authorized Service Dealer. 4. Contact your Authorized Service Dealer. 5. Replace the air-filter element.
The engine overheats.	1. The crankcase oil level is incorrect. 2. The coolant level is low. 3. Excessive loading. 4. The air intake screens are dirty. 5. The cooling fins and air passages under the engine blower housing and/or the rotating air intake screen are plugged.	1. Fill or drain to the Full mark. 2. Check the coolant level and replenish it as needed. 3. Reduce load; use lower ground speed. 4. Clean with the air intake screens with every use. 5. Clean the cooling fins and air passages with every use.

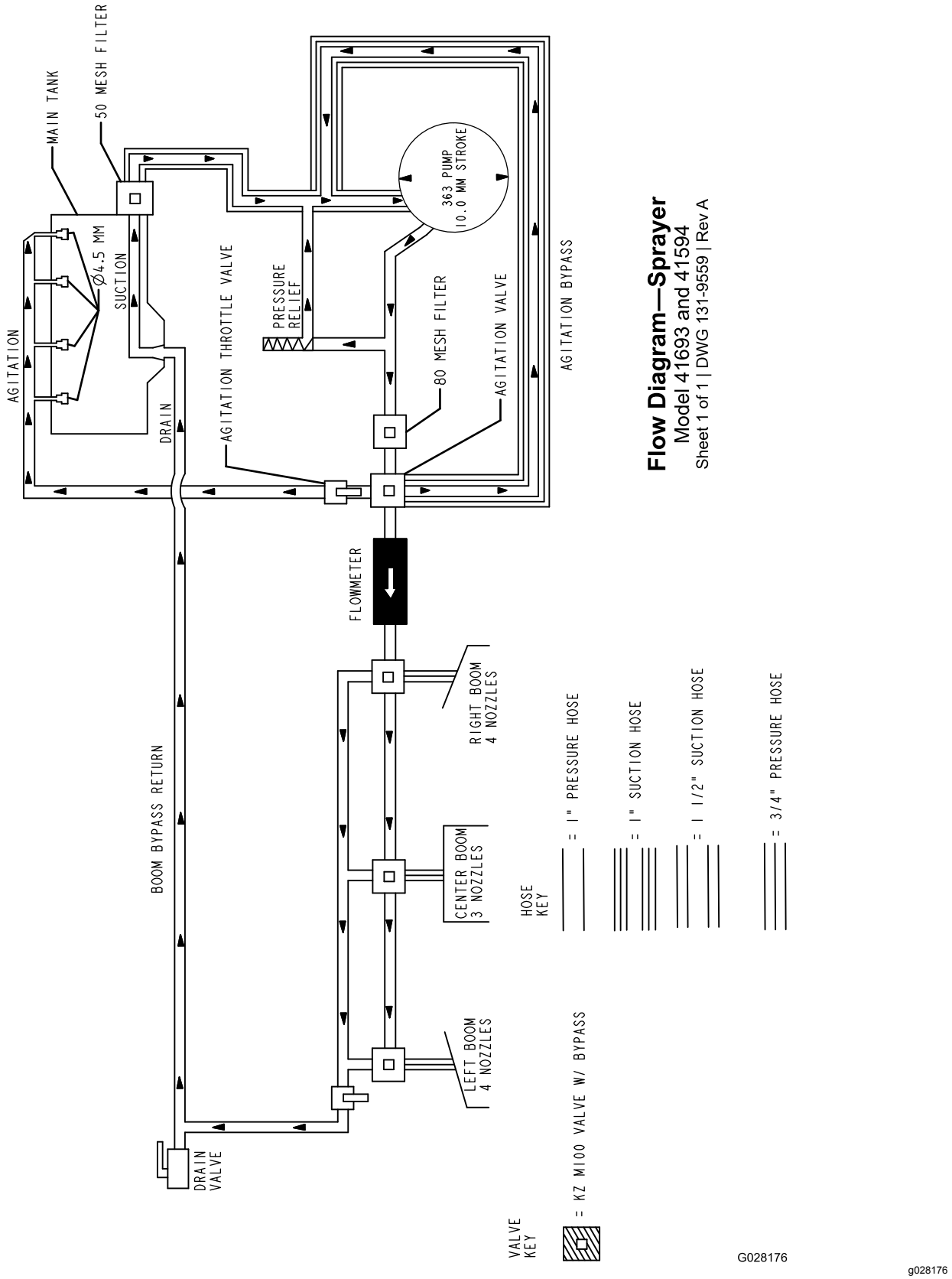
Problem	Possible Cause	Corrective Action
The engine loses power.	1. The crankcase oil level is incorrect. 2. The air cleaner element is dirty. 3. Dirt, water, or stale fuel is in the fuel system. 4. The engine is overheated. 5. The vent hole in the fuel tank vent fitting is plugged. 6. Low compression.	1. Fill or drain to the Full mark. 2. Replace.the air cleaner element. 3. Drain and flush the fuel system; add fresh fuel. 4. See Engine Overheats. 5. Replace the fuel cap. 6. Contact your Authorized Service Dealer.
There is abnormal vibration or noise.	1. The engine mounting bolts are loose. 2. There is a problem with the engine.	1. Tighten the engine mounting bolts. 2. Contact your Authorized Service Dealer.
The machine will not operate or is sluggish in either direction because the engine bogs down or stalls.	1. The parking brake is set.	1. Release the parking brake.
The machine will not operate in either direction.	1. The parking brake was not released or the parking brake is not releasing. 2. The transmission is broken. 3. The control linkage needs adjustment or replacement. 4. The drive shaft or wheel hub key has been damaged.	1. Release the parking brake or check the linkage. 2. Contact your Authorized Service Dealer. 3. Contact your Authorized Service Dealer. 4. Contact your Authorized Service Dealer.

Troubleshooting the Spray System

Problem	Possible Cause	Corrective Action
A boom section does not spray.	1. The electrical connection on the boom valve is dirty or disconnected. 2. Blown fuse. 3. Pinched hose. 4. A boom by-pass valve is improperly adjusted. 5. Damaged boom valve. 6. Damaged electrical system.	1. Turn the valve off manually. Disconnect the electrical connector on the valve and clean all leads, then reconnect it. 2. Check the fuses and replace them as necessary. 3. Repair or replace the hose. 4. Adjust the boom by-pass valves. 5. Contact your Authorized Service Dealer. 6. Contact your Authorized Service Dealer.
A boom section does not turn off.	1. The valve is damaged.	1. Disassemble the boom-section valve; refer to the section Cleaning the Sprayer Valves. Inspect all of the parts and replace any that are damaged.
A boom valve is leaking.	1. An O-ring is deteriorated.	1. Disassemble the valve and replace the seals using the Valve Repair Kit; contact your Authorized Service Dealer.
The pressure drops when you turn on a boom.	1. The boom bypass valve is improperly adjusted. 2. There is an obstruction in the boom valve body. 3. A nozzle filter is damaged or clogged.	1. Adjust the boom bypass valve. 2. Remove the inlet and outlet connections to the boom valve and remove any obstructions. 3. Remove and inspect all nozzles.

Problem	Possible Cause	Corrective Action
A boom actuator is not operating properly.	1. A thermal breaker in the fuse block responsible for powering the actuator has tripped due to overheating.	1. Wait for the system to cool down before resuming operation. If the thermal breakers trip repeatedly, contact your Authorized Service Dealer.
	2. A thermal breaker in the boom actuator responsible for powering the actuator has tripped or malfunctioned.	2. Contact your Authorized Service Dealer.

Schematics



Flow Diagram (Rev. A)

International Distributor List

Distributor:	Country:	Phone Number:	Distributor:	Country:	Phone Number:
Agrolanc Kft	Hungary	36 27 539 640	Maquiver S.A.	Colombia	57 1 236 4079
Balama Prima Engineering Equip.	Hong Kong	852 2155 2163	Maruyama Mfg. Co. Inc.	Japan	81 3 3252 2285
B-Ray Corporation	Korea	82 32 551 2076	Mountfield a.s.	Czech Republic	420 255 704 220
Casco Sales Company	Puerto Rico	787 788 8383	Mountfield a.s.	Slovakia	420 255 704 220
Ceres S.A.	Costa Rica	506 239 1138	Munditol S.A.	Argentina	54 11 4 821 9999
CSSC Turf Equipment (pvt) Ltd.	Sri Lanka	94 11 2746100	Norma Garden	Russia	7 495 411 61 20
Cyril Johnston & Co.	Northern Ireland	44 2890 813 121	Oslinger Turf Equipment SA	Ecuador	593 4 239 6970
Cyril Johnston & Co.	Republic of Ireland	44 2890 813 121	Oy Hako Ground and Garden Ab	Finland	358 987 00733
Equiver	Mexico	52 55 539 95444	Parkland Products Ltd.	New Zealand	64 3 34 93760
Femco S.A.	Guatemala	502 442 3277	Perfetto	Poland	48 61 8 208 416
ForGarder OU	Estonia	372 384 6060	Pratoverde SRL.	Italy	39 049 9128 128
G.Y.K. Company Ltd.	Japan	81 726 325 861	Prochaska & Cie	Austria	43 1 278 5100
Geomechaniki of Athens	Greece	30 10 935 0054	RT Cohen 2004 Ltd.	Israel	972 986 17979
Golf international Turizm	Turkey	90 216 336 5993	Riversa	Spain	34 9 52 83 7500
Guandong Golden Star	China	86 20 876 51338	Lely Turfcare	Denmark	45 66 109 200
Hako Ground and Garden	Sweden	46 35 10 0000	Solvert S.A.S.	France	33 1 30 81 77 00
Hako Ground and Garden	Norway	47 22 90 7760	Spypros Stavrinides Limited	Cyprus	357 22 434131
Hayter Limited (U.K.)	United Kingdom	44 1279 723 444	Surge Systems India Limited	India	91 1 292299901
Hydroturf Int. Co Dubai	United Arab Emirates	97 14 347 9479	T-Markt Logistics Ltd.	Hungary	36 26 525 500
Hydroturf Egypt LLC	Egypt	202 519 4308	Toro Australia	Australia	61 3 9580 7355
Irrimac	Portugal	351 21 238 8260	Toro Europe NV	Belgium	32 14 562 960
Irrigation Products Int'l Pvt Ltd.	India	0091 44 2449 4387	Valtech	Morocco	212 5 3766 3636
Jean Heybroek b.v.	Netherlands	31 30 639 4611	Victus Emak	Poland	48 61 823 8369

European Privacy Notice

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

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

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

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

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

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

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

Australian Consumer Law

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

Toro General Commercial Product Warranty

A Two-Year Limited Warranty

Conditions and Products Covered

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

Instructions for Obtaining Warranty Service

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

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

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

Owner Responsibilities

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

Items and Conditions Not Covered

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

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

Parts

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

Deep Cycle and Lithium-Ion Battery Warranty:

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

Maintenance is at Owner's Expense

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

General Conditions

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

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

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

Note regarding engine warranty:

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

Countries Other than the United States or Canada

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

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