Form No. 3396-642 Rev A

TORO®

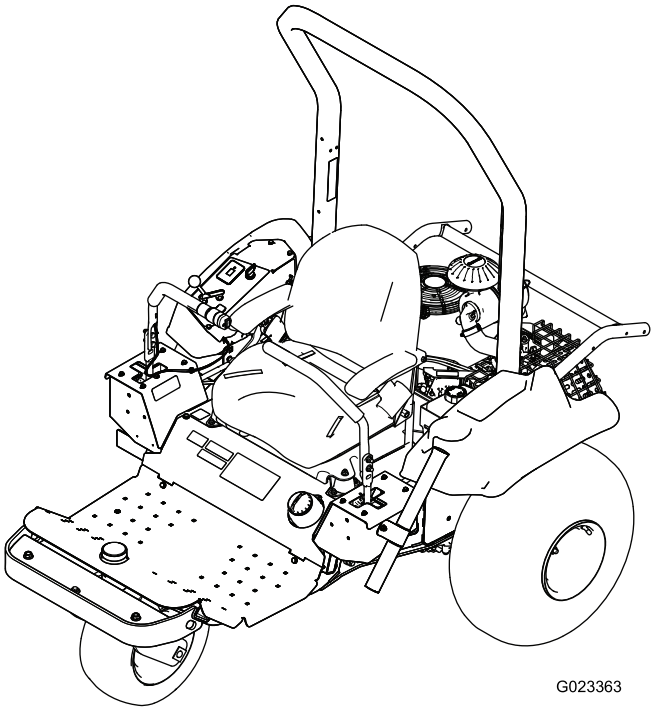
Count on it.

Operator's Manual

Sand Pro® 2040Z Traction Unit

Model No. 08706—Serial No. 314000001 and Up

Model No. 08706TC—Serial No. 314000001 and Up



G023363

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

CE

3396-642 A

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

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

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

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

This spark ignition system complies with Canadian ICES-002.

Because in some areas there are local, state, or federal regulations requiring that a spark arrester be used on the engine of this machine, a spark arrester is available as an option. If you require a spark arrester, contact your Authorized Toro Service Dealer.

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

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

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

Introduction

This machine is a ride-on piece of utility equipment intended to be used by professional, hired operators in commercial applications. It is primarily designed for conditioning sand traps on well-maintained golf courses and commercial grounds.

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

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

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

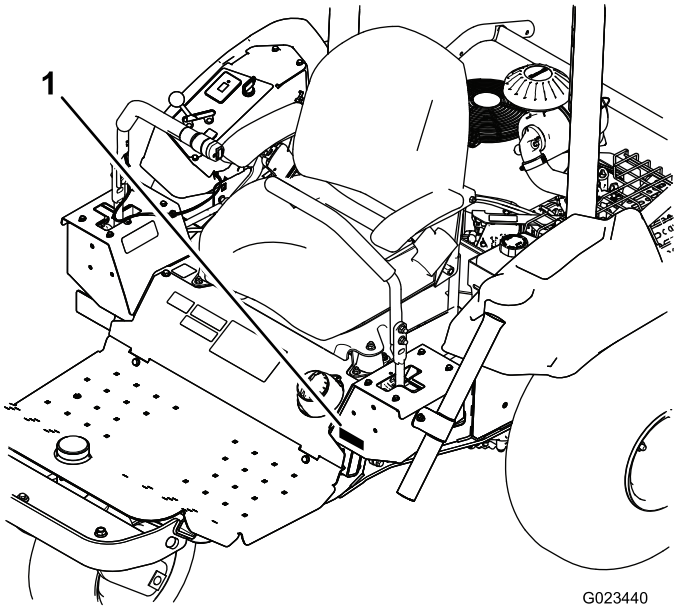


Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

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

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Bloomington, MN 55420

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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.

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Safety

This machine has been designed in accordance with ANSI B71.4-2012. However, when you install attachments on the machine, you must add additional weight to the machine, as specified, to comply to the standards.

Improperly using or maintaining the machine can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety alert symbol ⚠, which means **Caution**, **Warning**, or **Danger**—personal safety instruction. **Failure to comply with the instruction may result in personal injury or death.**

Safe Operating Practices

Training

- Read the *Operator's Manual* and other training material carefully. Become familiar with the controls, safety signs, and the proper use of the equipment. If the operator(s) or mechanic(s) cannot read or understand the information, it is the owner's responsibility to explain it to them.
- Never allow children or people unfamiliar with these instructions to use or service the machine. Local regulations may restrict the age of the operator.
- Never operate while people, especially children, or pets are nearby.
- Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.
- Do not carry passengers.
- All drivers and mechanics should seek and obtain professional and practical instruction. The owner is responsible for training the users. Such instruction should emphasize:
  - the need for care and concentration when working with ride-on machines;
  - control of a ride-on machine sliding on a slope will not be regained by the application of the brake. The main reasons for loss of control are:
    - ◊ insufficient wheel grip, especially on wet grass;
    - ◊ being driven too fast;
    - ◊ inadequate braking;
    - ◊ the type of machine is unsuitable for the task;
    - ◊ lack of awareness of the effect of ground conditions, especially slopes;
    - ◊ incorrect attachment and counterweight installation.
- The owner/user can prevent and is responsible for accidents or injuries occurring to people as well as damage to property.

Preparation

- While operating the machine, always wear substantial, slip-resistant footwear, long trousers, hard hat, safety glasses, and ear protection. Long hair, loose clothing, or jewelry may get tangled in moving parts. Do not operate the equipment when barefoot or wearing open sandals.
- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Use only accessories and attachments approved by the manufacturer.
- Ensure that the operator's presence controls, safety switches, and shields are attached and functioning properly. Do not operate unless they are functioning properly.

Operation

- Do not operate the engine in a confined space where dangerous carbon monoxide and other exhaust gasses can collect.
- Operate only in daylight or in good artificial light.
- Before attempting to start the engine, shift into neutral, and engage the parking brake.
- Do not put your hands or feet near or under rotating parts.
- Using the machine demands attention. To prevent tipping or loss of control:
  - Watch for holes or other hidden hazards.
  - Use caution when operating the machine on a steep slope. Reduce your speed when making sharp turns or when turning on hillsides.
  - Avoid sudden stops and starts. Do not go from reverse to full forward without first coming to a complete stop.
  - Before backing up, look to the rear and ensure that no one is behind the machine.
  - Watch out for traffic when near or crossing roads. Always yield the right of way.
- Use care when pulling loads or using heavy equipment.
  - Use only approved hitch points.
  - Limit loads to those that you can safely control.
  - Do not turn sharply. Use care when reversing.
- Never operate the machine with damaged guards, shields, or without protective safety devices in place. Be sure all interlocks are attached, adjusted properly, and functioning properly.
- Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
- Before leaving the operator's position:
  - stop on level ground;
  - move the control handles to the neutral position;
  - set the parking brake;
  - stop the engine and remove the key.
- Raise the attachment when you transport the machine.
- Stop the engine in the following situations:
  - before fuelling;
  - before checking, cleaning, or working on the machine;
  - after striking a foreign object or if an abnormal vibration occurs. Inspect the machine for damage and make repairs before starting again and operating the equipment.
- Reduce the throttle setting during engine run-out.
- Raise the attachment before backing up.
- Look behind and down before backing up, to be sure of a clear path.
- Slow down and use caution when making turns and crossing roads and sidewalks.
- Do not operate the machine under the influence of alcohol or drugs.
- Lightning can cause severe injury or death. If lightning is seen or thunder is heard in the area, do not operate the machine; seek shelter.
- Use care when loading or unloading the machine into a trailer or truck.
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

Rollover Protection System (ROPS)—Use and Maintenance

- The ROPS is an integral and effective safety device. Keep a folding ROPS in the raised and locked position and use the seat belt when operating the machine.
- Lower a folding ROPS temporarily only when absolutely necessary. Do not wear the seat belt when folded down.
- Be aware there is no rollover protection when a folded ROPS is in the down position.
- Be certain that the seat belt can be released quickly in the event of an emergency.
- Check the area to be mowed and never fold down a folding ROPS in areas where there are slopes, drop offs or water.
- Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.
- Keep the ROPS in safe operating condition by periodically thoroughly inspecting for damage and keeping all mounting fasteners tight.
- Replace a damaged ROPS. Do not repair or revise.
- **Do not** remove the ROPS.
- Any alterations to a ROPS must be approved by the manufacturer.

Safe Handling of Fuels

- To avoid personal injury or property damage, use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive.
- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only an approved fuel container.
- Never remove fuel cap or add fuel with the engine running.
- Allow engine to cool before refueling.
- Never refuel the machine indoors.
- Never store the machine or fuel container where there is an open flame, spark, or pilot light such as on a water heater or on other appliances.
- Never fill containers inside a vehicle or on a truck or trailer bed with a plastic liner. Always place containers on the ground away from your vehicle before filling.
- Remove equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment with a portable container, rather than from a fuel dispenser nozzle.
- Keep the nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete.
- Do not use a nozzle lock open device.
- If fuel is spilled on clothing, change clothing immediately.
- Never overfill fuel tank. Replace fuel cap and tighten securely.

Maintenance and Storage

- Keep all nuts, bolts, and screws tight to be sure that the equipment is in safe working condition.
- Never store the machine with fuel in the tank inside a building where fumes may reach an open flame or a spark.
- Allow the engine to cool before storing the machine in any enclosure.
- To reduce the fire hazard, keep the engine, muffler, battery area, and fuel-storage area free of grass, leaves, and excessive grease.
- Keep all parts in good working condition and all hardware and hydraulic fittings tightened. Replace all worn or damaged parts and decals.
- If the fuel tank has to be drained, do this outdoors.
- Be careful during adjustment of the machine, to prevent entrapment of the fingers between moving parts and fixed parts of the machine.
- Disengage drives, lower the attachment, set the parking brake, stop the engine, and remove the key. Wait for all movement to stop before adjusting, cleaning, or repairing the machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- Disconnect the battery and remove the spark-plug wires before making any repairs. Disconnect the negative battery terminal first and the positive terminal last. Connect the positive terminal first and the negative terminal last.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Charge the battery in an open well-ventilated area, away from any spark and flames. Unplug the charger before connecting or disconnecting it from the battery. Wear protective clothing, and use insulated tools.
- Make sure that all the hydraulic line connectors are tight and all the hydraulic hoses and lines are in good condition before applying pressure to the system.
- Keep your body and hands away from pinhole leaks or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, not your hands, to search for leaks. Hydraulic fluid escaping under pressure can have sufficient force to penetrate the skin and cause serious injury. Seek immediate medical attention if any fluid is injected into the skin.
- Before disconnecting or performing any work on the hydraulic system, relieve all pressure in the system by stopping the engine and lowering the attachment to the ground.
- Check all fuel lines for tightness and wear on a regular basis. Tighten or repair them as needed.
- If the engine must be running to perform a maintenance adjustment, keep hands, feet, clothing, and any parts of the body away from the attachments and any moving parts, especially the screen at the side of the engine. Keep everyone away.
- To ensure safety and accuracy, have an Authorized Toro Distributor check the maximum engine speed with a tachometer.
- The warranty may be voided if used with unapproved attachments.
- If major repairs are ever needed or if assistance is desired, contact an Authorized Toro Distributor.
- To best protect your investment and maintain optimal performance of your Toro equipment, count on Toro genuine parts. When it comes to reliability, Toro delivers replacement parts designed to the exact engineering specifications of our equipment. For peace of mind, insist on Toro genuine parts.

Hauling

- Use care when loading or unloading the machine into a trailer or truck.
- Use full width ramps for loading machine into trailer or truck.
- Tie the machine down securely using straps, chains, cable, or ropes. Both front and rear straps should be directed down and outward from the machine.

Sound Power Level

This unit has a guaranteed sound power level of 99 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 Level

This unit has a sound pressure level at the operator's ear of 88 dBA, which includes an Uncertainty Value (K) of 1 dBA.

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

Wear hearing protection.

Vibration Level

Hand-Arm

Measured vibration level for right hand = 1.1 m/s^2

Measured vibration level for left hand = 0.9 m/s^2

Uncertainty Value (K) = 0.6 m/s^2

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

Whole Body

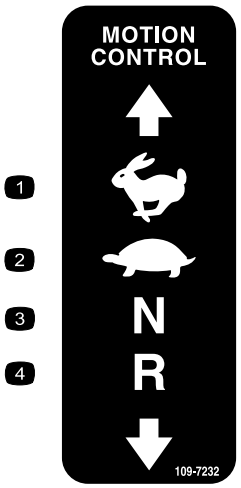
Measured vibration level = 0.39 m/s^2

Uncertainty Value (K) = 0.2 m/s^2

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

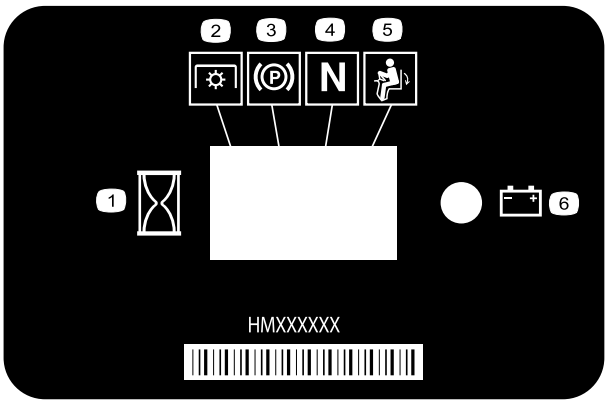
Safety and Instructional Decals

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.



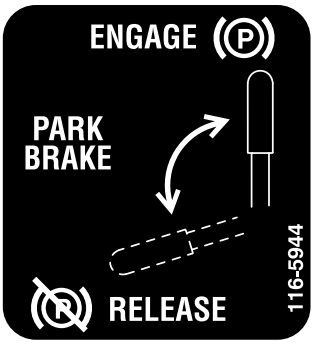
109-7232

1. Fast
2. Slow
3. Neutral
4. Reverse

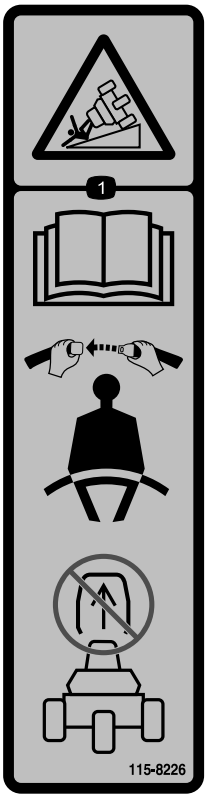


116–5610

1. Hour meter
2. Power take-off (PTO)
3. Parking brake
4. Neutral
5. Operator-presence switch
6. Battery



116-5944

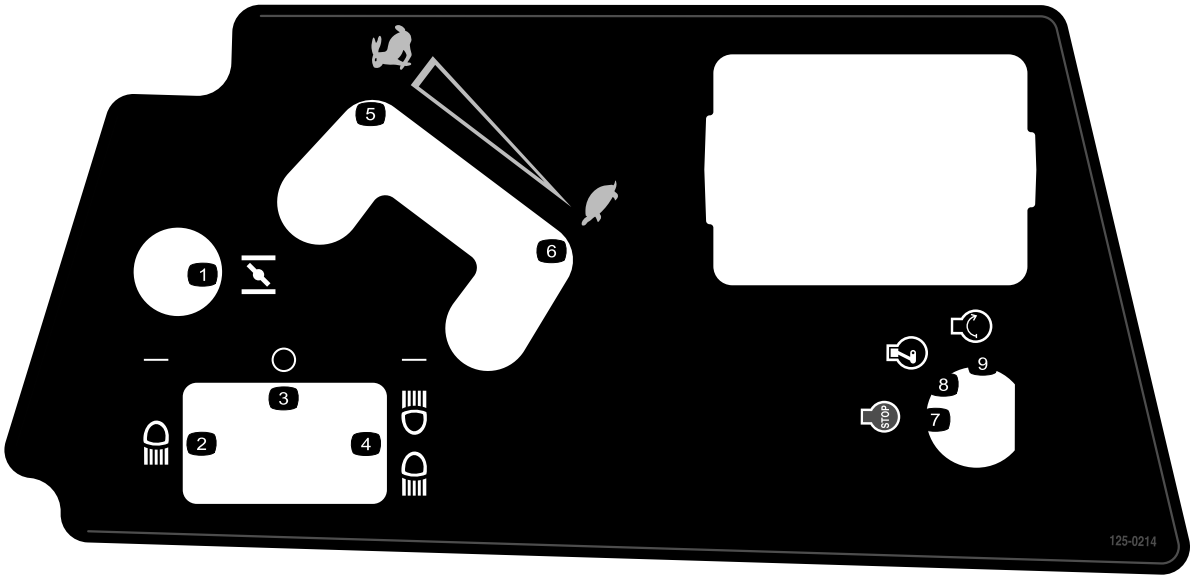


115-8226

1. Tipping hazard—read the *Operator's manual*; always wear a seat belt when operating; do not remove the rollover protection system (ROPS).

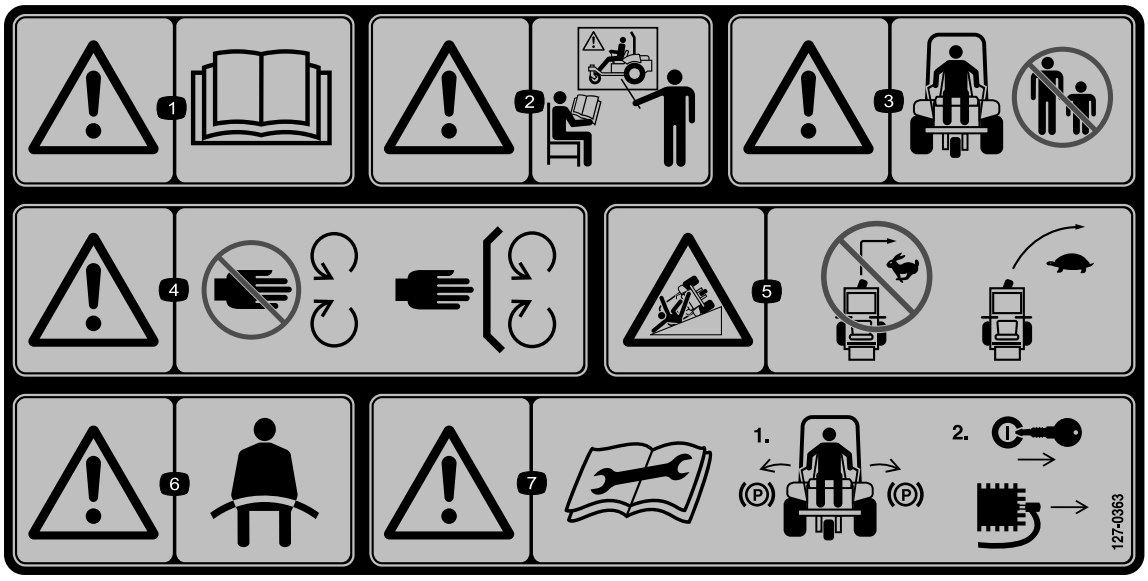


117–2718



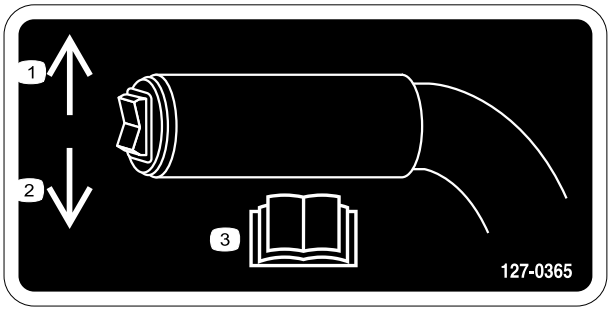
125–0214

1. Choke
2. Headlight
3. Off
4. Headlight and taillight
5. Fast
6. Slow
7. Engine—stop
8. Engine—run
9. Engine—start



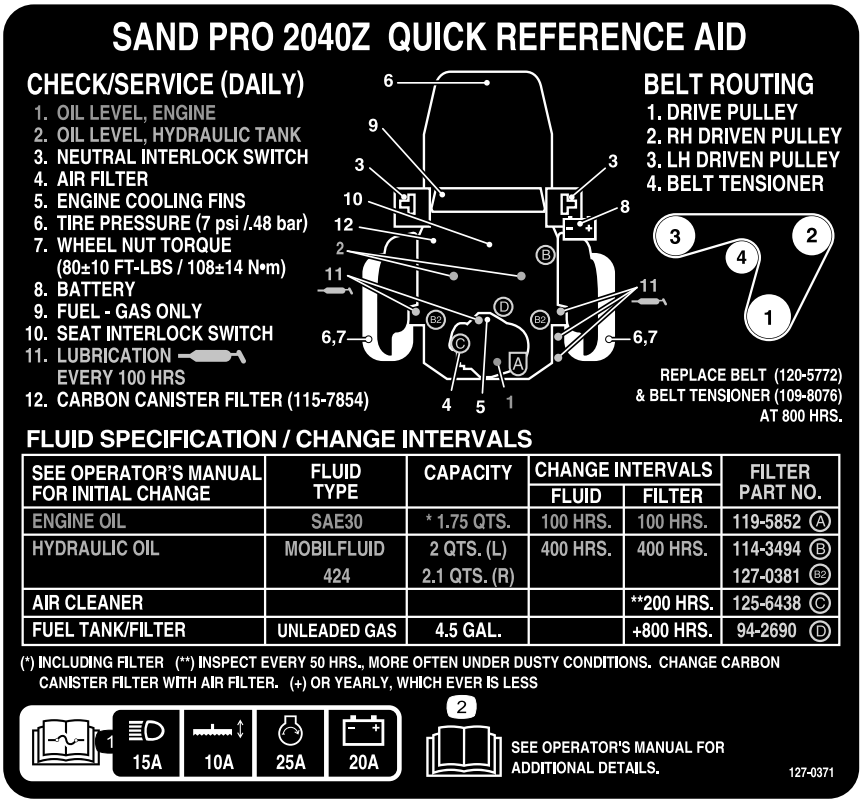
127–0363

1. Warning—read the *Operator's Manual*.
2. Warning—do not operate the machine unless you are trained.
3. Warning—keep bystanders away.
4. Warning—keep away from moving parts; keep all guards and shields in place.
5. Tipping hazard, slopes—do not turn at high speed; slow down and turn gradually.
6. Warning—wear a seat belt.
7. Warning—read the *Operator's Manual* before performing maintenance; 1) Engage the parking brakes, 2) Remove the key from the ignition and remove the wire from the spark plug.



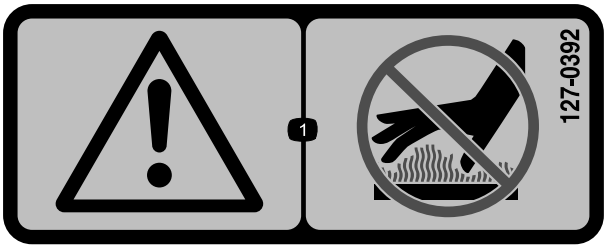
127–0365

1. Press up to raise the attachment.
2. Press down to lower the attachment.
3. Read the *Operator's Manual*.



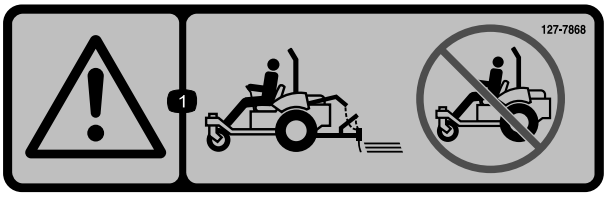
127–0371

1. Read the *Operator's Manual* for information on fuses—Headlights 15A; Attachment 10A; Engine start 25A; Battery 20A.
2. Read the *Operator's Manual*.



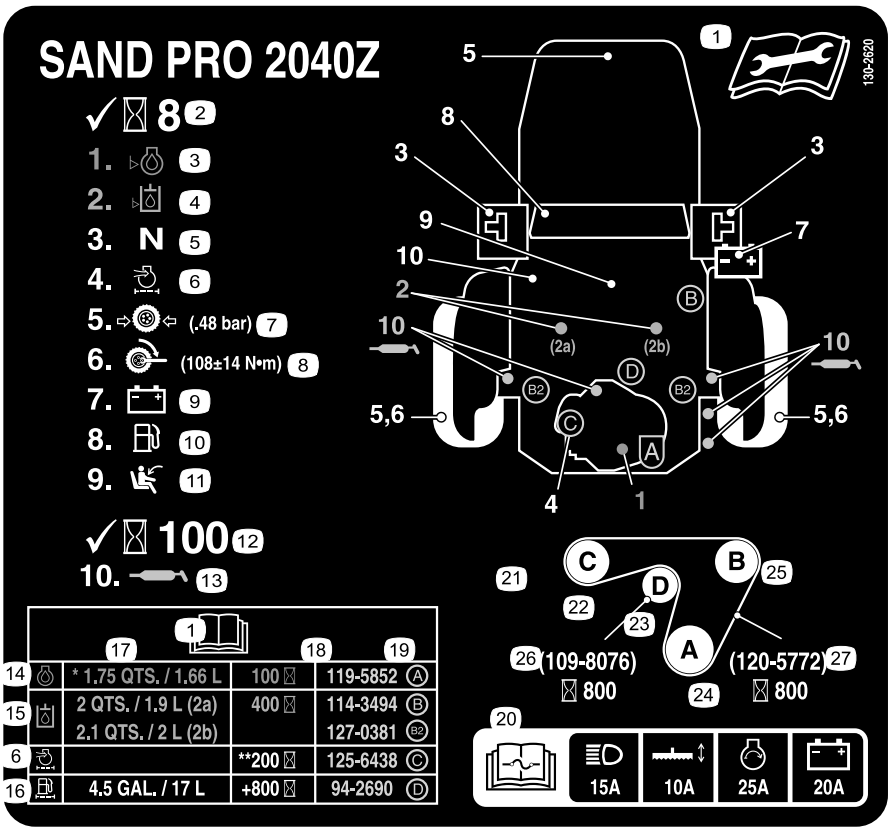
127–0392

1. Warning—keep away form hot surfaces.



127–7868

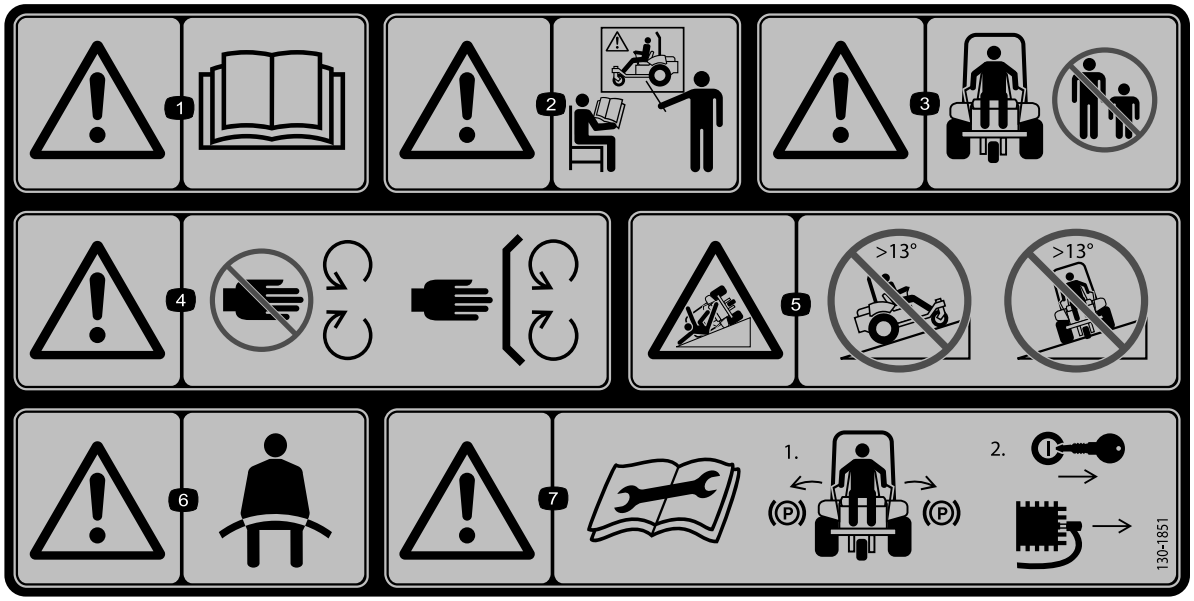
1. Warning—do not operate the machine without the attachment installed.



130–2620

CE only

1. Read the *Operator's Manual* for information on maintenance.
2. Check every 8 operating hours.
3. Oil level—engine
4. Oil level—hydraulic tank
5. Neutral interlock switch
6. Air filter
7. Tire pressure (0.48 bar)
8. Wheel nut torque (61 to 75 N-m)
9. Battery
10. Fuel—gasoline only
11. Seat interlock switch
12. Check every 100 operating hours.
13. Lubrication
14. Engine oil
15. Hydraulic oil
16. Fuel tank/filter
17. Capacity
18. Service interval
19. Filter part number
20. Read the *Operator's Manual* for information on fuses—Headlights 15A; Attachment 10A; Engine start 25A; Battery 20A.
21. Belt routing
22. Left-hand driven pulley
23. Belt tensioner
24. Drive pulley
25. Right-hand driven pulley
26. Belt tensioner—part number (replace every 800 operating hours)
27. Belt—part number (replace every 800 hours)



130–1851

CE only

1. Warning—read the *Operator's Manual*.
2. Warning—do not operate the machine unless you are trained.
3. Warning—keep bystanders away from the machine.
4. Warning—keep away from moving parts; keep all guards and shields in place.
5. Tipping hazard—do not drive up slopes greater than 13 degrees; do not drive across slopes greater than 13 degrees.
6. Warning—wear a seat belt.
7. Warning—read the *Operator's Manual* before performing maintenance; 1) Set the parking brake; 2) Remove the key from the ignition and remove the wire from the spark plug.



Battery Symbols

Some or all of these symbols are on your battery

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

Setup

Loose Parts

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

Procedure	Description	Qty.	Use
1	No parts required	–	Remove the shipping board.
2	Attachment and related parts (sold separately)	–	Install an attachment.
3	Front weights (as needed per attachment)	–	Install the front weights.
4	Bolt (5/16 x 3/4 inch) Nut (5/16 inch)	1 2	Connect the battery (Model 08706TC only).
5	Warning decal (130-1851)	1	Apply the CE warning decal, if required (Model 08706TC only).
6	Service decal (130-2620)	1	Apply the CE service decal, if required (Model 08706TC only).
7	Roll bar Bolt Flange locknut Spring washer Bracket	1 4 4 4 2	Install the ROPS (Model 08706TC only).

Media and Additional Parts

Description	Qty.	Use
Operator's Manual Engine operator's manual Operator training materials Pre-delivery inspection sheet	1 1 1 1	Read the sheet before operating.
Parts Catalog	1	Use the catalog to order parts.
Certificate of Compliance	1	The certificate indicates CE compliance.
Key	2	Start the engine.

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

Note: Remove and discard all the shipping brackets and fasteners.

1

Removing the Shipping Board

No Parts Required

Procedure

Before you can install an attachment on the machine, you must remove the shipping board.

1. Remove the nuts, bolts, and washers securing the shipping board to the rear of the machine (Figure 3).

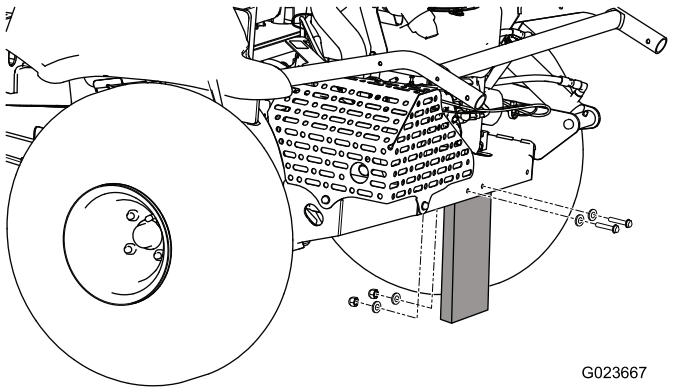


Figure 3

2. Discard the fasteners and the shipping board.

2

Installing an Attachment

Parts needed for this procedure:

–	Attachment and related parts (sold separately)

Procedure

⚠ WARNING

If you drive the machine without an attachment installed, it can tip over and injure someone or damage property.

Drive the machine only if there is an approved attachment installed.

Refer to the attachment *Installation Instructions* for information on installing the attachment.

3

Installing the Front Weights

Parts needed for this procedure:

–	Front weights (as needed per attachment)

Procedure

This machine has been designed in accordance with ANSI B71.4-2012. However, when you install attachments on the machine, you must add additional weight to the machine, as specified, to comply to the standards.

Use the chart below to determine the additional weight required. The machine comes with 4 weights. Each attachment comes with the necessary additional weights, if required.

Attachment	Number of weights required
Flex tooth rake	4
Flex tooth rake with finish brush	6
Nail drag	6
Nail drag with finish drag mat	8

Refer to Installing and Removing the Weights (page 21).

4

Connecting the Battery

Model 08706TC Only

Parts needed for this procedure:

1	Bolt (5/16 x 3/4 inch)
2	Nut (5/16 inch)

Procedure

1. Cut the cable tie securing the battery cables to the frame, and discard the cable tie (Figure 4).

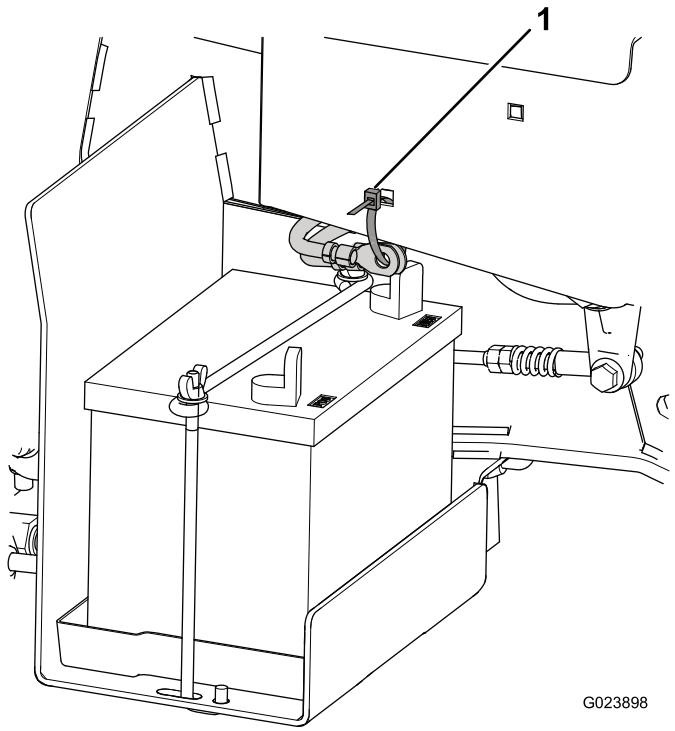


Figure 4

1. Cable tie

2. Remove the red plastic cover from the positive battery terminal (Figure 5).

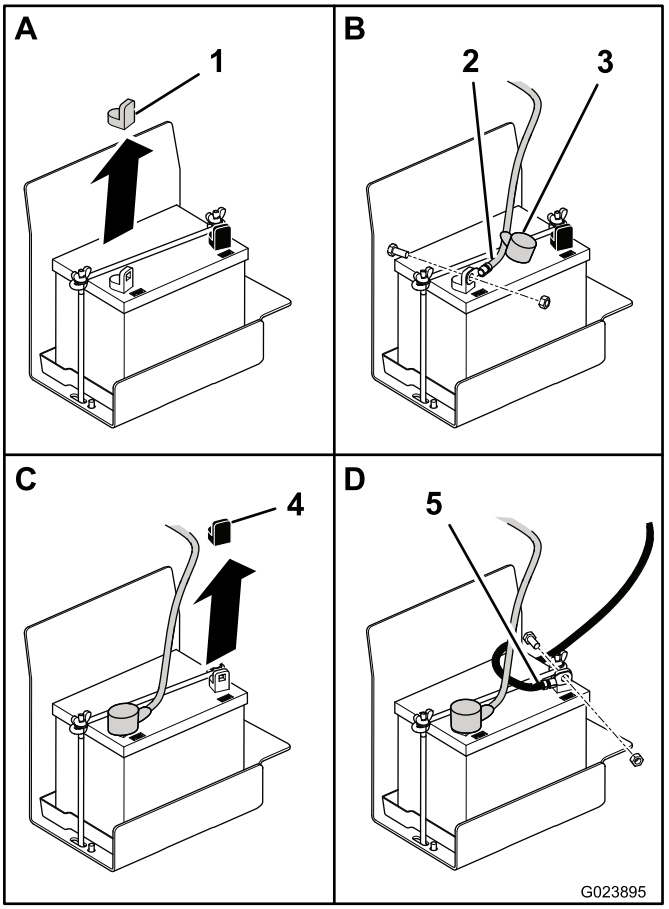


Figure 5

1. Red cover
2. Positive cable
3. Boot
4. Black cover
5. Negative cable

3. Slide the red boot away from the end of the positive battery cable, and use a bolt (5/16 x 3/4 inch) and a nut (5/16 inch) to mount the positive cable to the positive battery terminal.
4. Slide the red boot over the terminal and the fasteners.
5. Remove the black plastic cover from the negative battery terminal.
6. Use a bolt (5/16 x 3/4 inch) and a nut (5/16 inch) to mount the negative cable to the negative battery terminal.

5

Applying the CE Warning Decal

Model 08706TC Only

Parts needed for this procedure:

1	Warning decal (130-1851)

Procedure

If this machine must be CE compliant (Europe), apply the CE warning decal (130-1851) over the existing warning decal (127-0363).

6

Applying the CE Service Decal

Model 08706TC Only

Parts needed for this procedure:

1	Service decal (130-2620)

Procedure

If this machine must be CE compliant (Europe), apply the CE service decal (130-2620) over the existing service decal (127–0371).

7

Installing the ROPS

Model 08706TC Only

Parts needed for this procedure:

1	Roll bar
4	Bolt
4	Flange locknut
4	Spring washer
2	Bracket

Procedure

For Model 08706TC, install the ROPS as follows:

Note: Model 08706 has the ROPS installed at the factory.

1. Remove the roll bar from the crate.
2. Place the roll bar on the machine as shown in Figure 6.

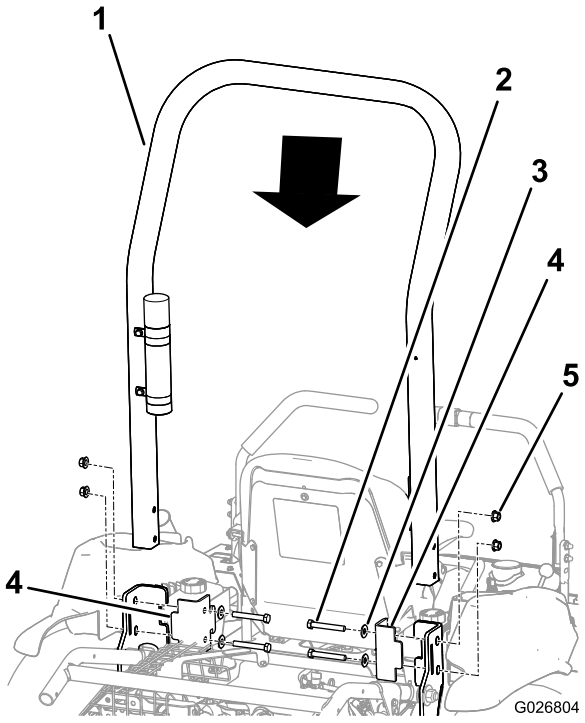


Figure 6

1. Roll bar
2. Bolt (4)
3. Spring washer (4)
4. Bracket (2)
5. Flange locknut (4)

3. Install the brackets on the frame of the machine.

Important: **Ensure that the throttle cable and the choke cable are out of the way, so that they do not get pinched by the roll bar or a bracket.**

4. Align the holes in the brackets, the roll bar, and the frame.
5. Install a bolt, with a spring washer, through each hole.

Important: **Ensure that each spring washer is positioned so that the convex side faces the bolt head as shown in Figure 7.**

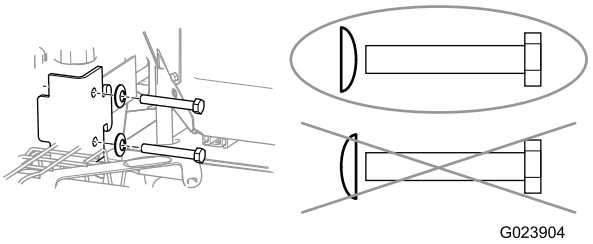


Figure 7

6. Install a flange locknut on each bolt, and torque each of them to 102 N-m (75 ft-lb).

Product Overview

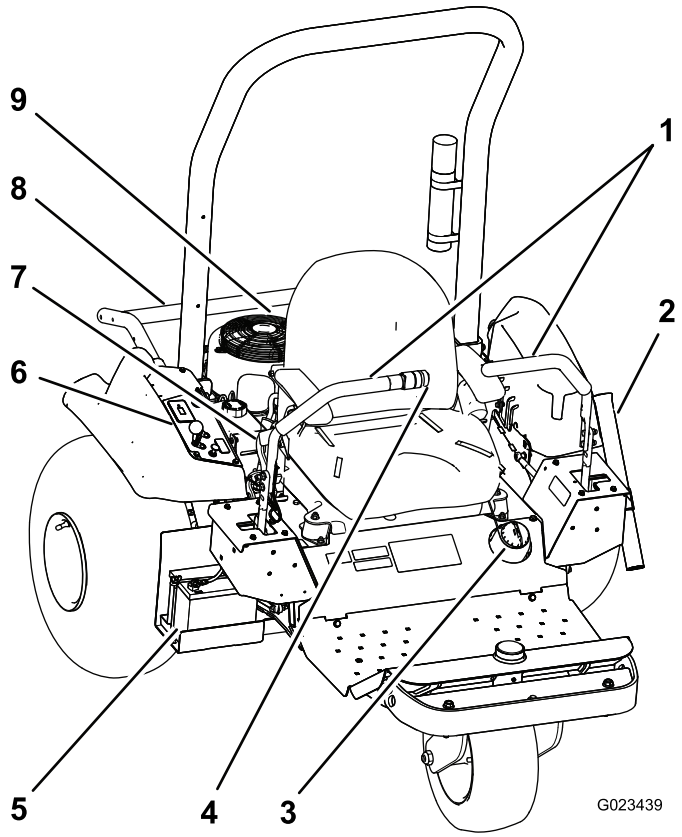


Figure 8

1. Control handles	4. Attachment switch	7. Parking brake
2. Rake tube	5. Battery	8. Attachment lift
3. Fuel-tank cap	6. Control panel	9. Engine

Controls

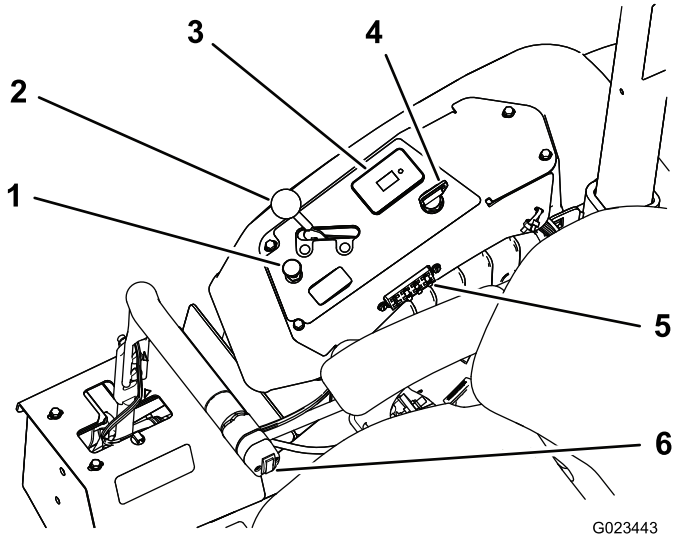


Figure 9

1. Choke control	4. Ignition switch
2. Throttle lever	5. Fuses
3. Hour meter; safety-interlock display	6. Attachment switch

Control Handles

Use the control handles (Figure 8) to drive the machine forward and backward, and to turn in either direction.

Ignition Switch

The ignition switch (Figure 9), used to start and stop the engine, has 3 positions: Off, Run, and Start. Rotate the key clockwise to the Start position to start the engine. Release the key when the engine starts. The key will move automatically to the Run position. To shut the engine off, rotate the key counterclockwise to the Off position.

Choke Control

To start a cold engine, close the carburetor choke by pulling the choke control (Figure 9) up to the Closed position. After the engine starts, regulate the choke to keep the engine running smoothly. As soon as possible, open the choke by pushing the control down to the Open position.

Note: A warm engine requires little or no choking.

Throttle Lever

The throttle lever (Figure 9) controls the speed of the engine. Moving the throttle lever forward toward the Fast position increases the engine speed. Moving it backward toward the Slow position decreases the engine speed.

Note: The throttle lever cannot stop the engine.

Attachment Switch

To raise the attachment, press the upper part of the attachment switch (Figure 10); to lower the attachment, press the lower part of the attachment switch.

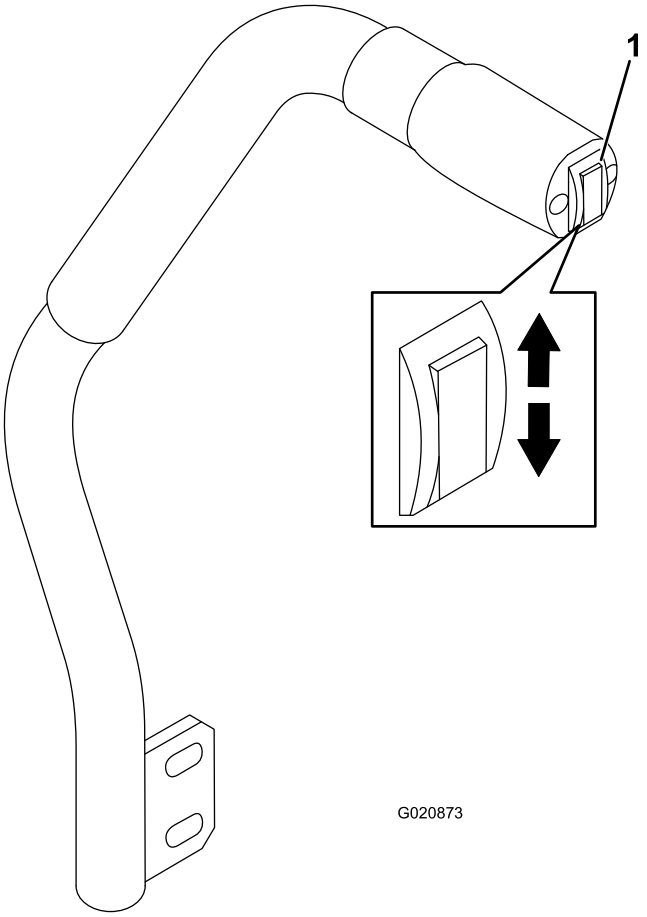


Figure 10

1. Attachment switch

Note: The machine has a double-acting lift cylinder. You can apply down pressure to the attachment for certain operating conditions.

Parking Brake

To set the parking brake (Figure 8), pull back on the lever of the parking brake. To release it, push the lever forward.

Hour Meter

The hour meter (Figure 9) indicates the total hours of machine operation. The hour meter runs whenever the ignition switch is in the On position.

An optional wireless hour meter is available through your Authorized Toro Distributor. To install it, refer to Installing a Wireless Hour Meter (page 31).

Seat-Adjustment Lever

While sitting on the seat, move the lever in front of the seat (Figure 11) to the left, and slide the seat to the desired position. Release the lever to lock the seat into position.

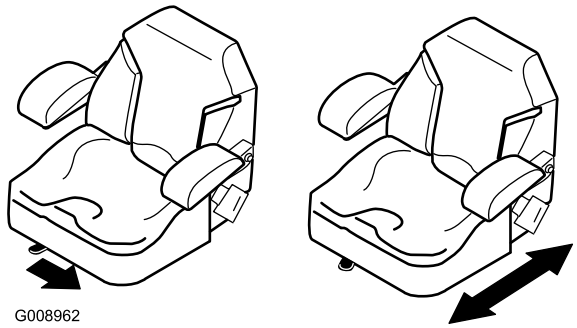


Figure 11

Specifications

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

	Machine only	With flex tooth rake	With nail drag	With nail drag and finish mat
Weight	399 kg (880 lb)*	417 kg (920 lb)**	439 kg (970 lb)**	445 kg (980 lb)**
Width	147 cm (58 inches)	213 cm (84 inches)	182 cm (71.5 inches)	198 cm (78 inches)
Length	186 cm (73.3 inches)	226 cm (89.0 inches)	215 cm (84.8 inches)	297 cm (117 inches)
Height	185 cm (73 inches)			
Wheelbase	147 cm (58 inches)			

* with 4 weights, empty fuel tank, and no operator

** with the attachment and weights, empty fuel tank, and no operator

Attachments/Accessories

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

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

Operation

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

Think Safety First

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

⚠ DANGER

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

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

Read and follow the rollover protection instructions and warnings.

To avoid loss of control and possibility of rollover:

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

⚠ CAUTION

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

Wear hearing protection when operating this machine.

The use of protective equipment for eyes, ears, hands, feet, and head is recommended.

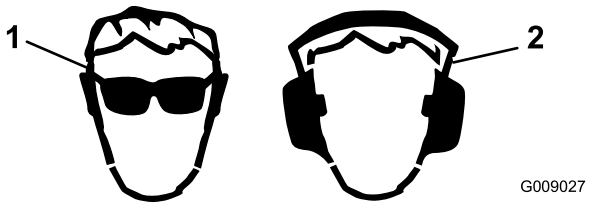


Figure 12

1. Wear safety glasses.
2. Wear hearing protection.

Installing and Removing the Weights

The machine complies with the ANSI B71.4-2012 standards at the time of production. However, when the following attachments are installed on the machine, additional weight is required to comply to the standards. Use the chart below to determine the additional weight required. The machine comes with 4 weights. Each attachment comes with the necessary additional weights, if required.

Attachment	Number of weights required
Flex tooth rake	4
Flex tooth rake with finish brush	6
Nail drag	6
Nail drag with finish drag mat	8

1. Remove the 2 bolts and 2 nuts securing the existing weights on the front of the machine (Figure 13).

   Note: If the machine is equipped with the light kit, remove the nut and the bolt securing the front light to the machine. Retain all of the parts; refer to the *Light Kit Installation Instructions*.

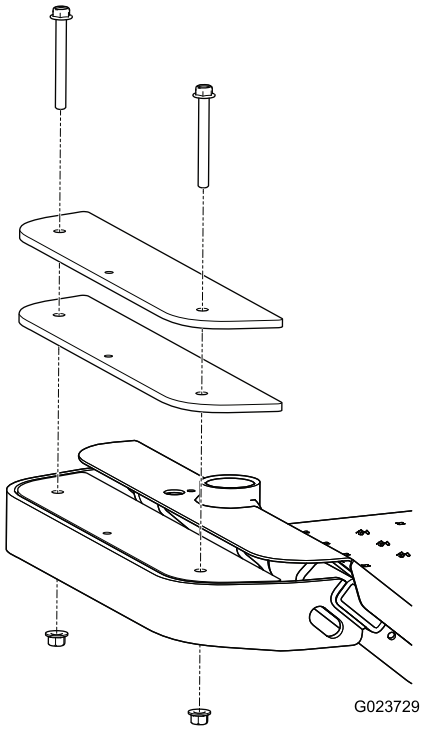


Figure 13

2. Add or remove weights as necessary.
3. Secure the weights with the 2 bolts and the 2 nuts.
   - For most of the attachments, use the existing bolts.
   - The finish drag mat includes 2 longer bolts to accommodate the additional weights that it requires.

   Note: If the machine is equipped with the light kit, install the front light by inserting the bolt through the weights and securing it with the nut; refer to the *Light Kit Installation Instructions*.

Checking the Level of the Engine Oil

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

Toro Premium Engine Oil is available from your Authorized Toro Distributor.

Crankcase Capacity: 1.8 L (1.7 US qt) with filter change

Use 4-cycle engine oil that meets or exceeds the following requirements:

- **API service category:** SJ, SL, SM, or higher
- **Viscosity:** SAE 30; refer to the following chart for other viscosities (Figure 14):

  Important: Using multi-viscosity oils, such as 10W-30, increases oil consumption. Check the oil level more frequently when using them.

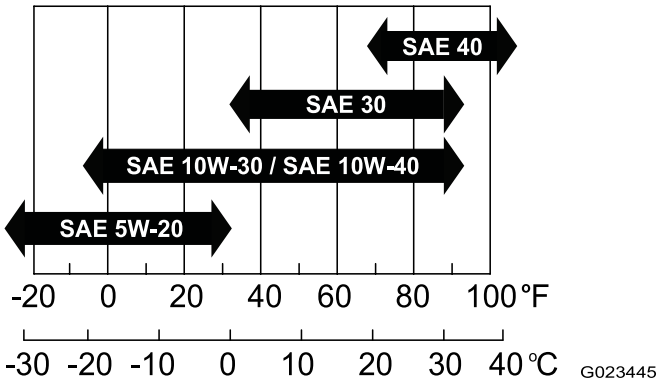


Figure 14

1. Position the machine on a level surface.
2. Stop the engine and remove the key.
3. Remove the dipstick (Figure 15) and wipe it with a clean cloth (Figure 16).

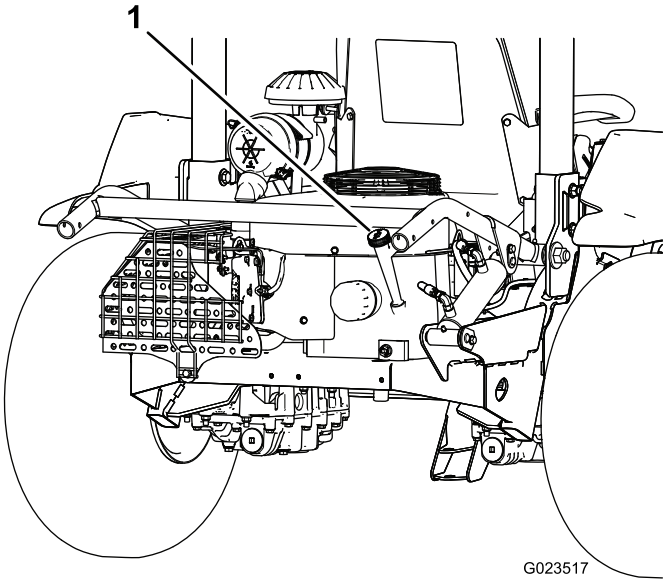


Figure 15

1. Dipstick

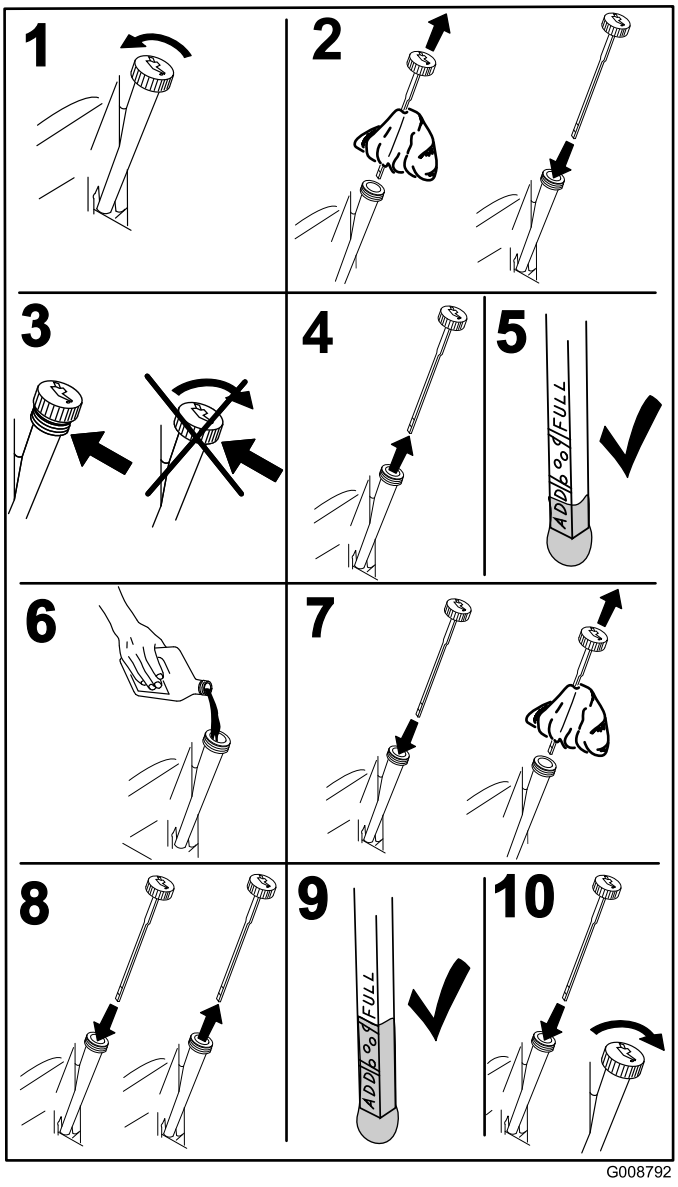


Figure 16

4. Insert the dipstick into the fill tube without threading it into the port.
5. Remove the dipstick from the tube and check the oil level. If the oil level is low, slowly pour only enough oil into the fill tube to raise the oil level to the upper-limit mark on the dipstick

   Important: Keep the engine oil level between the upper and lower limits on the dipstick. Engine failure may occur as a result of running the engine with too much or too little engine oil.
6. Install the dipstick firmly in place.

   Important: The dipstick must be fully seated in the tube to provide proper sealing of the engine crankcase. Failure to seal the crankcase may result in engine damage.

Filling the Fuel Tank

Fuel tank capacity: 17 L (4.5 US gallons)

Recommended Fuel:

- For best results, use only clean, fresh (less than 30 days old), unleaded gasoline with an octane rating of 87 or higher ((R+M)/2 rating method).
- Ethanol: Gasoline with up to 10% ethanol (gasohol) or 15% MTBE (methyl tertiary butyl ether) by volume is acceptable. Ethanol and MTBE are not the same. Gasoline with 15% ethanol (E15) by volume is not approved for use. **Never use** gasoline that contains more than 10% ethanol by volume, such as E15 (contains 15% ethanol), E20 (contains 20% ethanol), or E85 (contains 85% ethanol). Using unapproved gasoline may cause performance problems and/or engine damage which may not be covered under warranty.
- **Do not** use gasoline containing methanol.
- **Do not** store fuel either in the fuel tank or fuel containers over the winter unless a fuel stabilizer is used.
- **Do not** add oil to gasoline.

⚠ DANGER

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

- **Fill the fuel tank outdoors, in an open area, when the engine is cold. Wipe up any fuel that spills.**
- **Never fill the fuel tank inside an enclosed trailer.**
- **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 an approved container and keep it out of the reach of children. Do not buy more than a 30-day supply of fuel.**
- **Do not operate without the entire exhaust system in place and in proper working condition.**

⚠ DANGER

In certain conditions during fueling, static electricity can cause 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 fuel-powered equipment from the truck or trailer and fuel 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 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.**

⚠ WARNING

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

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

1. Clean the area around the fuel-tank cap (Figure 17).

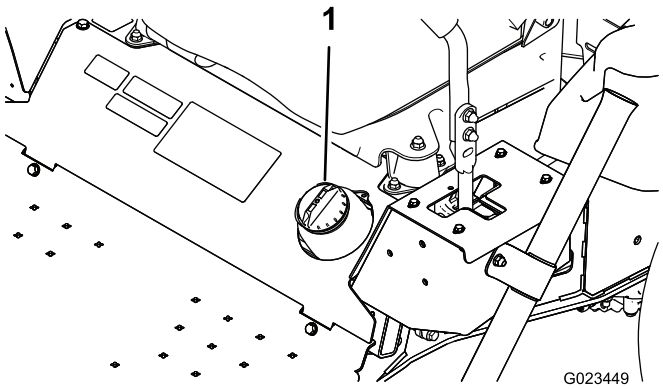


Figure 17

1. Fuel-tank cap

2. Remove the fuel-tank cap.

3. Fill the tank to about 25 mm (1 inch) below the top of the tank (bottom of the filler neck). **Do not overfill**.
4. Install the cap.
5. Wipe up any fuel that may have spilled, to prevent a fire hazard.

Important: Never use methanol, gasoline containing methanol, or gasohol containing more than 10% ethanol, because the fuel system could be damaged.

Important: Do not mix oil with fuel.

Checking the Level of the Hydraulic Fluid

Service Interval: Before each use or daily—Check the level of the hydraulic fluid.

Important: For accuracy, check the level of the hydraulic fluid only when the engine and the hydraulic system are cold.

The reservoirs of the machine are filled at the factory with high-quality hydraulic fluid. The best time to check the hydraulic fluid is when the fluid is cold. The machine should be in the transport configuration. If the fluid level is below the top of the horizontal part of the cut-out sight window on the rear of the hydraulic reservoirs (Figure 18), add fluid to bring the fluid to the acceptable level. **Do not overfill the reservoirs.** If the fluid level is at the top of the horizontal part of the sight window, no fluid addition is required. The recommended replacement fluid is:

Fluid Type: Toro Premium Transmission/Hydraulic Tractor Fluid or Mobilfluid® 424

Capacity:

- Left side—1.9 L (2.0 US qt)
- Right side—2.0 L (2.1 US qt)

Alternative fluids: If the specified fluid is not available, other universal tractor hydraulic fluids (UTHF) may be used, but they must be only **conventional, petroleum-based** products, not synthetics or biodegradable fluids. The specifications must fall within the listed range for all of the following material properties and the fluid should meet listed industry standards. Check with your fluid supplier to see if the fluid meets these specifications.

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

Material Properties:	
Viscosity, ASTM D445	cSt @ 40°C (104°F) 55 to 62
Viscosity Index ASTM D2270	140 to 152
Pour Point, ASTM D97	-37°C to -43°C (-35°F to -46°F)
Industry Specifications: API GL-4, AGCO Powerfluid 821 XL, Ford New Holland FNHA-2-C-201.00, Kubota UDT, John Deere J20C, Vickers 35VQ25, and Volvo WB-101/BM	

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

1. Look at the opening in each of the fluid-reservoir brackets, and check the level of the hydraulic fluid.

   Note: The fluid level should be at the bottom of each of the openings, as shown in Figure 18.

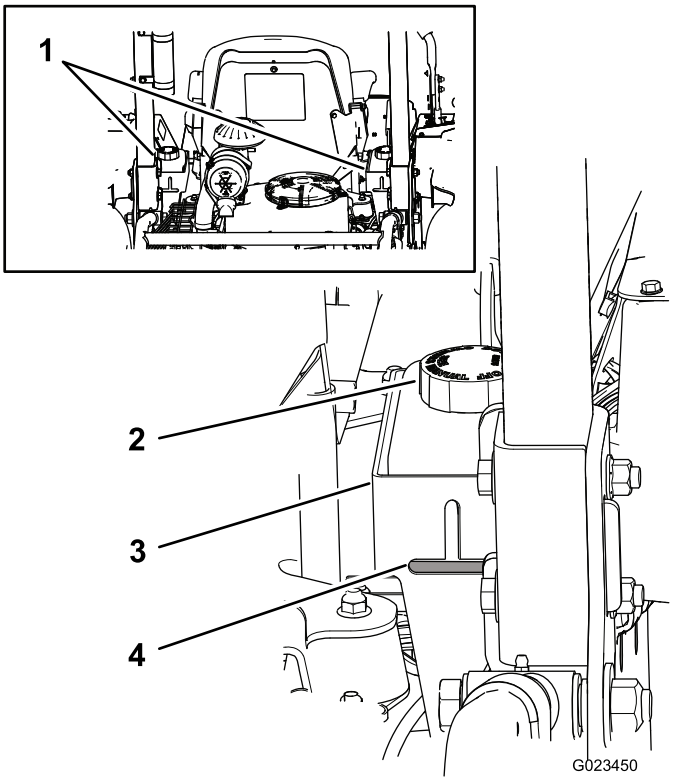


Figure 18

1. Hydraulic-fluid reservoirs
2. Fluid-reservoir cap
3. Bracket
4. Fluid level

2. If the fluid level is low in either of the reservoirs, add fluid as follows:
   A. Clean the area around the fluid-reservoir caps to prevent debris from entering the system (Figure 18).
   B. Remove the caps from the reservoirs.

C. Slowly fill the reservoir with the appropriate hydraulic fluid until the level reaches the bottom of the openings in the brackets.

Important: To prevent system contamination, clean the top of the fluid container before opening it. Ensure that the pour spout and the funnel are clean.

Important: Do not overfill the reservoirs.

D. Install the reservoir caps.

Checking the Tire Pressure

Service Interval: Before each use or daily

Check the tire pressure before operating the machine (Figure 19).

Pressure: 48 kPa (7 psi)

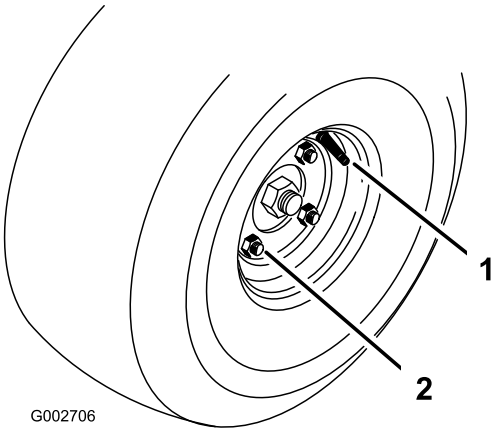


Figure 19

1. Valve stem
2. Lug nut

Torquing the Wheel Lug Nuts

Service Interval: After the first 8 hours

Every 100 hours

Torque the lugs nuts (Figure 19) to 61 to 75 N-m (45 to 55 ft-lb).

Using the Parking Brake

Always set the parking brake when you stop the machine or leave it unattended.

Setting the Parking Brake

⚠ WARNING

The parking brake may not hold the machine parked on a slope and could cause personal injury or property damage.

Do not park on slopes unless the wheels are chocked or blocked.

To set the parking brake, pull upward on the handle (Figure 20).

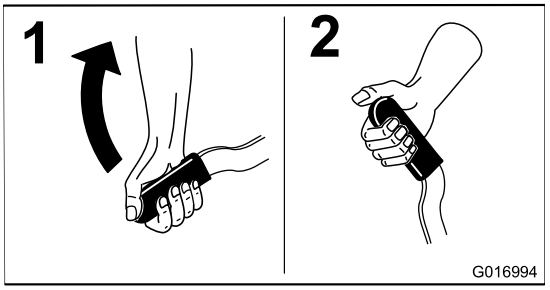


Figure 20

Releasing the Parking Brake

To release the parking brake, push downward on the handle (Figure 21).

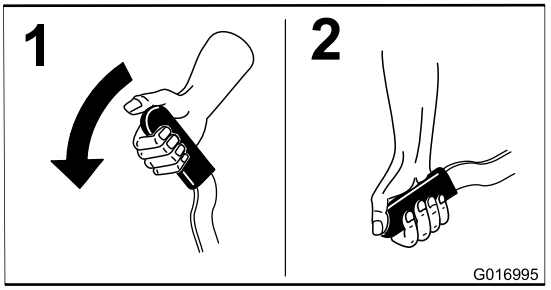


Figure 21

Starting and Stopping the Engine

1. Move the control handles to the neutral-locked position (Figure 22).

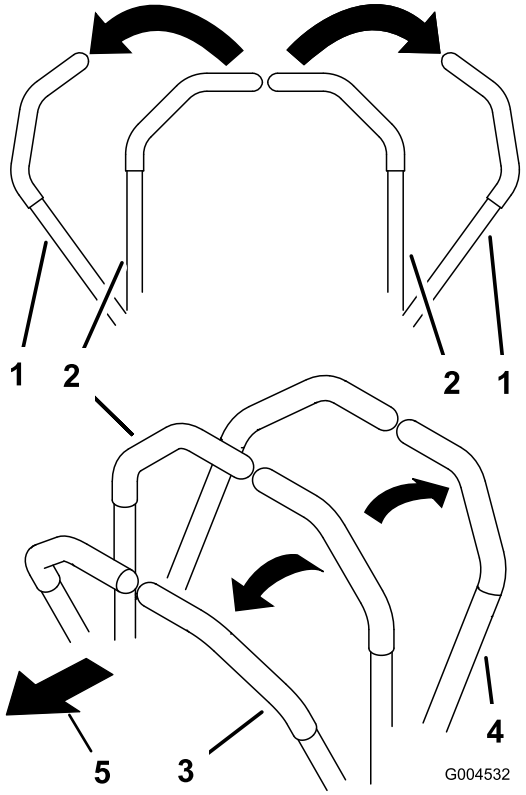


Figure 22

1. Control handle (neutral-locked position)
2. Center, unlocked position
3. Forward
4. Backward
5. Front of the machine

2. Set the parking brake; refer to Setting the Parking Brake (page 25).
3. Pull the choke control upward to the On position (when starting a cold engine), and move the throttle lever to the Slow position.

   Important: When operating the machine in temperatures less than 0°C (32°F) allow the machine time to warm up before using it. This prevents damage to the hydraulic system.

4. Insert the key into the ignition switch and rotate it clockwise to start the engine. Release the key when the engine starts. Regulate the choke to keep the engine running smoothly.

   Important: To prevent overheating of the starter motor, do not keep the ignition key in the Start position for longer than 10 seconds. After 10 seconds of continuous cranking, wait 60 seconds before using the starter motor again.

5. To stop the engine, move the throttle control to the Slow position, and turn the ignition key to the Off position. Remove the key from the switch to prevent accidental starting.

   Note: In an emergency, simply turn the ignition key to the Off position.

Using the Safety Interlock System

⚠ CAUTION

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

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

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

- The parking brake is engaged.
- The motion-control levers are in the neutral-locked position

The safety interlock system also stops the engine when you move the control handles out of the neutral-locked position while you are out of the seat or while the parking brake is set.

The hour meter has symbols to notify you when the interlock component is in the correct position. When the component is in the correct position, a triangle appears in the corresponding location (Figure 23).

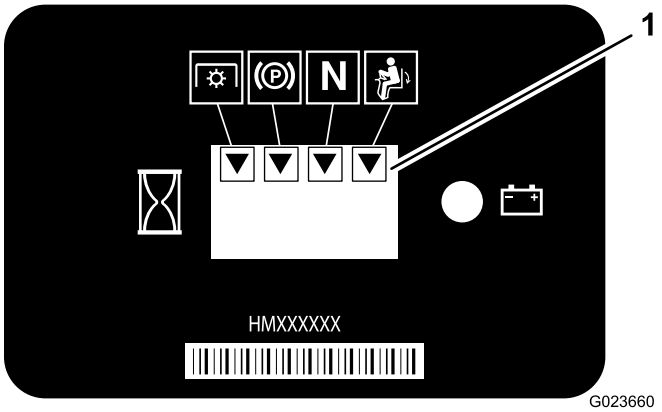


Figure 23

1. Triangles appear when the interlock components are in the correct position.

Note: The PTO (power take-off) interlock is not used on this machine.

Testing the Safety Interlock System

Service Interval: Before each use or daily

If the safety interlock system does not operate as described below, have an Authorized Toro Distributor repair it immediately.

1. Sit on the seat, move the control handles to the neutral position, and set the parking brake.
2. Start the engine.
3. Get off the seat and slowly move each control handle forward and backward.

   Note: The engine should stop in 1 to 3 seconds after moving either control handle in either direction. If it does not, correct the problem. Repeat steps 2 and 3 for the other control handle.
4. Sitting on the seat, engage the parking brake. Move either control handle out of the neutral-locked position. Try starting the engine; the engine should not crank. Repeat this step for the other control handle.

Driving the Machine

⚠ CAUTION

Operating the machine demands attention to prevent tipping or loss of control.

- **Use care when entering and leaving sand traps.**
- **Use extreme caution around ditches, creeks, or other hazards.**
- **Use caution when operating the machine on a steep slope.**
- **Reduce your speed when making sharp turns or when turning on hillsides.**
- **Avoid sudden stops and starts.**
- **Do not go from reverse to full forward without first coming to a complete stop.**

⚠ CAUTION

The machine can spin very rapidly. If you misuse the control handles, you may lose control of the machine and injure someone or damage the machine or other property.

- **Use caution when making turns.**
- **Slow the machine down before making sharp turns.**

Using the Control Handles

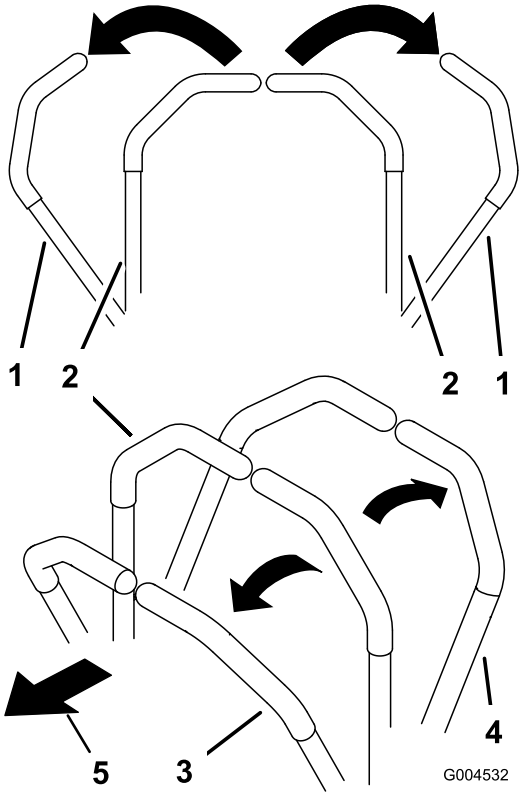


Figure 24

1. Control handle (neutral-locked position)
2. Center, unlocked position
3. Forward
4. Backward
5. Front of the machine

Driving the Machine Forward

Note: The engine stops if you move the control handles while the parking brake is set.

1. Release the parking brake; refer to Releasing the Parking Brake (page 25).
2. Move the control handles to the center, unlocked position.
3. To go forward, slowly push the control handles forward (Figure 25).

   To stop the machine, move the control handles to the neutral position.

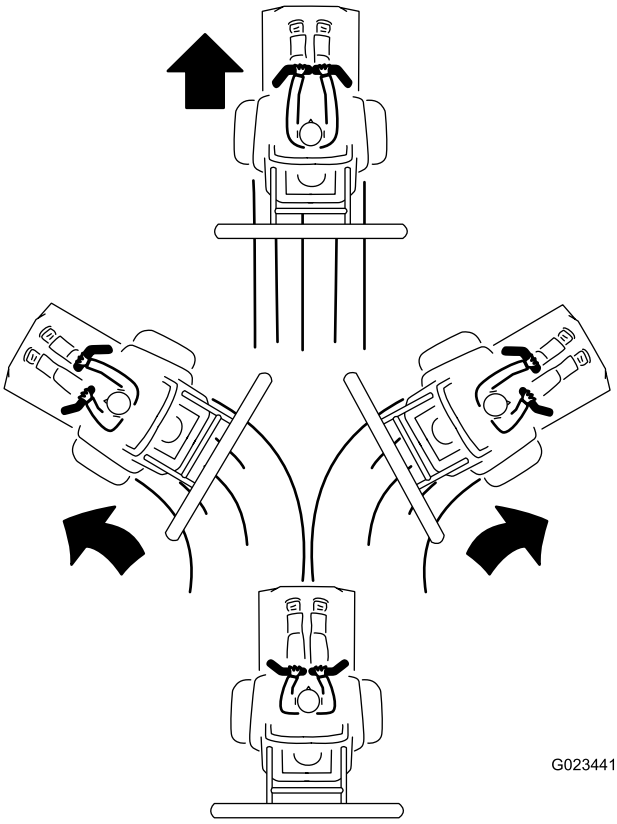


Figure 25

Driving the Machine Backward

1. Ensure that the attachment is in the desired position.
2. Move the control handles to the center, unlocked position.
3. To go backward, look behind and slowly pull the control handles backward (Figure 26).

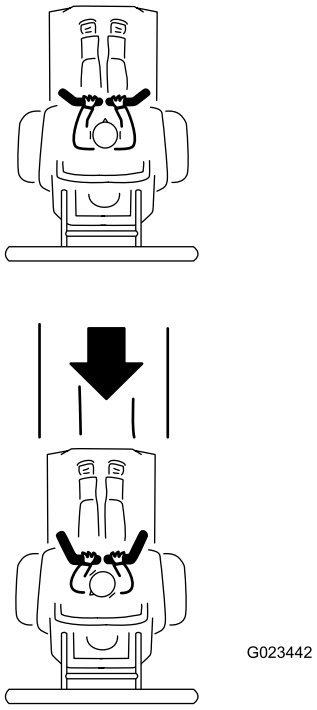


Figure 26

Raking a Sand Trap

Read this entire section on raking before raking a sand trap. There are many conditions that determine the adjustments necessary. The texture and depth of the sand, moisture content, weeds, and the amount of compaction are all factors that can vary from course to course, or even from trap to trap on the same course. Make the adjustments on the rake for optimum results in your particular area.

Learning How to Rake

Practice raking in a large and level trap on the course. Practice starting and stopping, turning, raising and lowering the rake, entering and leaving the trap, etc. Practice at a moderate engine speed and a slow ground speed. This training helps the operator to gain confidence in the performance of the machine.

The recommended pattern for raking a trap is shown in Figure 27. This pattern avoids unnecessary overlap, keeps compaction to a minimum, and leaves a neat, attractive pattern on the sand. This is the most efficient raking method, however, it is important to vary the raking pattern regularly to reduce the chance of creating a washboard effect.

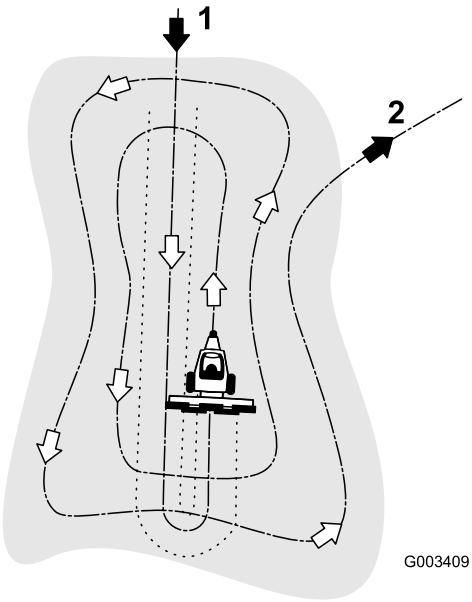


Figure 27

1. Enter a trap straight into the long dimension in a level area.
2. Exit a trap at a right angle in a level area.

Enter the trap straight into the long dimension, where the bank is the least steep. Drive through the center of the trap almost to the end, turn to either direction as sharp as you can, and come back right next to the first pass. Spiral outward as shown in Figure 27, and leave the trap at a right angle in a level area.

Leave steep, short banks and small pockets for touch-up with a hand rake.

Entering and Leaving the Trap

When entering the trap, do not lower the rake until it is over the sand. This avoids cutting the turf or dragging grass clippings or other debris into the trap. Lower the rake while the machine is moving.

When leaving the trap, start raising the rake when the front wheel leaves the trap. As the machine moves out, the rake will be lifting and will not drag sand out onto the grass.

Through experience and practice, the operator will soon understand the required timing for entering and leaving the trap properly.

Breaking in the Machine

New engines take time to develop full power. Drive systems have more friction when they are new, placing additional load on the engine.

Allow the first 8 hours of operating time for the break-in period.

Since the first hours of operation are critical to future dependability of the machine, monitor the functions and performance closely so that you can notice and correct minor difficulties, which could lead to major problems. Inspect the machine frequently during the break-in period, for signs of oil leakage, loose fasteners, or any other malfunction.

Pushing or Towing the Machine

⚠ WARNING

Hands may become entangled in the rotating drive components below the engine deck, which could result in serious injury.

Stop the engine, remove the key, and allow all moving parts to stop before accessing the bypass-valve levers.

⚠ WARNING

The engine and hydrostatic transmissions can become very hot and cause severe burns.

Allow the engine and hydrostatic transmissions to cool completely before accessing the bypass-valve levers.

Important: Do not tow the machine for long distances or at high speeds. Doing so could damage the machine. You can tow the machine slowly from the grooming surface to the on-site trailer.

The bypass-valve levers are located on the top of each hydrostatic transmission.

Important: Make sure that the bypass-valve levers are in the fully forward position when operating the machine, or severe damage to the hydraulic system can occur.

1. Stop the machine on a level surface and turn the ignition key to the Off position.
2. Move the levers to the neutral-locked position, set the parking brake, and remove the key.
3. From underneath the machine, rotate the bypass-valve levers (Figure 28 and Figure 29) so that they point inward, toward the center of the machine (Figure 30), and release the parking brake; refer to Releasing the Parking Brake (page 25).

   Note: This allows the hydraulic fluid to bypass the pumps, enabling the wheels to turn freely.

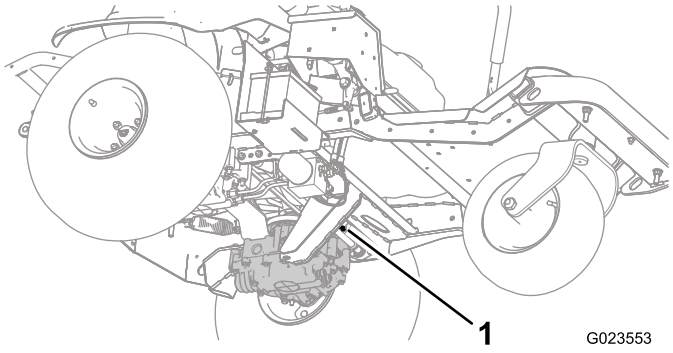


Figure 28
Left bypass-valve lever

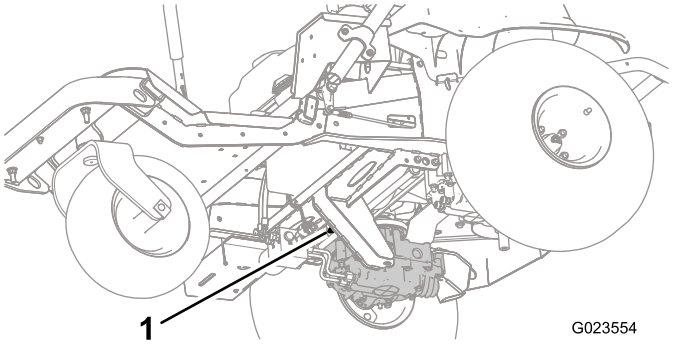


Figure 29
Right bypass-valve lever

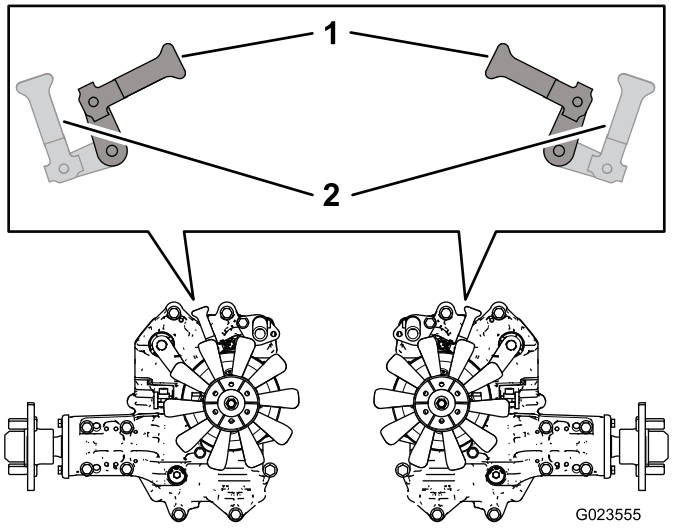


Figure 30

1. Inward to push or tow the machine
2. Forward to drive the machine

4. When you are finished pushing or towing the machine, rotate the bypass-valve levers so that they point toward the front of the machine, to allow the machine to drive (Figure 30).

Transporting the Machine

Use a heavy-duty trailer or truck to transport the machine. Ensure that the transport vehicle (trailer or truck) has all the necessary brakes, lighting, and marking as required by law. Carefully read and understand all the safety instructions. Knowing this information could help you, your family, pets, or bystanders avoid injury.

⚠ WARNING

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

Do not drive the machine on a public street or roadway.

Use extreme caution when loading the machine onto the transport vehicle. Use a full-width ramp that is wide enough to extend beyond the rear tires, instead of individual ramps for each side of the machine. The attachment serves as a stop for tipping backward. Using a full-width ramp provides a larger surface for the attachment to contact if the machine starts to tip backward.

Ensure that the ramp is long enough so that the angle does not exceed 13 degrees. A steeper angle may cause machine components to get caught as the machine moves from the ramp to the transport vehicle. Steeper angles may also cause the machine to tip backward. If loading on or near a slope, position the transport vehicle so that it is on the down side of the slope and the ramp extends up the slope; this will minimize the ramp angle. The transport vehicle should be as level as possible.

⚠ WARNING

Loading the machine onto a transport vehicle increases the possibility of tipping over and could cause serious injury or death.

- **Align the machine appropriately, and slowly drive straight up the ramp.**
- **Ensure that the ROPS is installed and secure.**
- **Ensure that there is adequate space for the machine.**
- **Do not exceed a 13-degree angle between the ramp and the ground or between the ramp and the transport vehicle.**
- **Avoid sudden acceleration while driving the machine up a ramp, to avoid tipping backward.**
- **Avoid sudden deceleration while backing the machine down a ramp, to avoid tipping backward.**
- **Ensure that an attachment is installed and in the raised position when loading the machine onto a transport vehicle.**

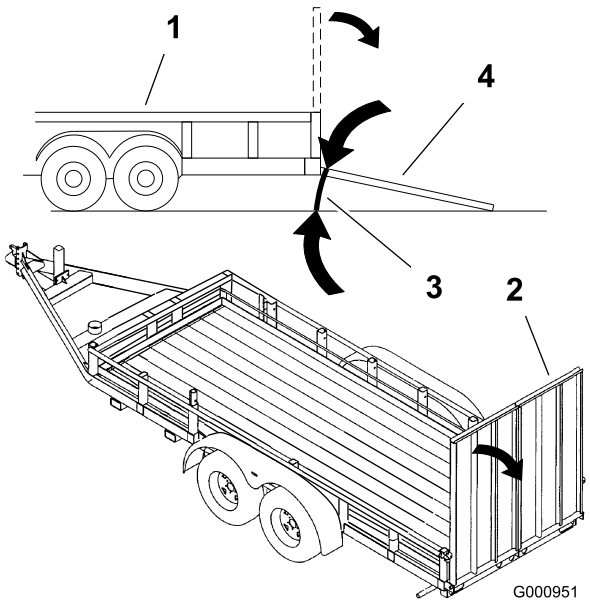


Figure 31

1. Trailer
2. Full-width ramp
3. Not greater than 13 degrees
4. Full-width ramp—side view

Use the tie-down points on the machine (Figure 32) to securely fasten the machine to the transport vehicle with proper straps, chains, cable, or ropes.

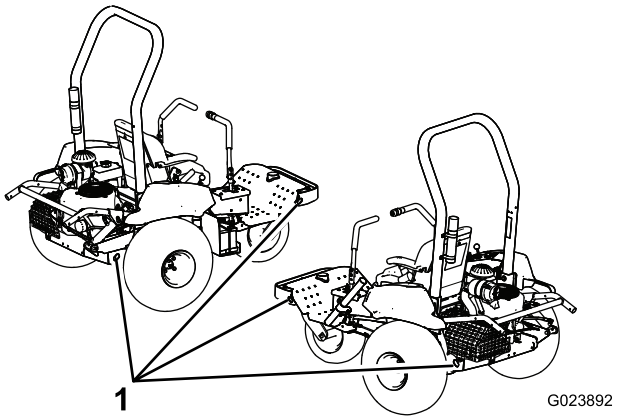


Figure 32

1. Tie-down points

Installing a Wireless Hour Meter

An optional wireless hour meter is available through your Authorized Toro Distributor.

Refer to the *Wireless Hourmeter System* guide.

1. Remove the control panel (Figure 33).

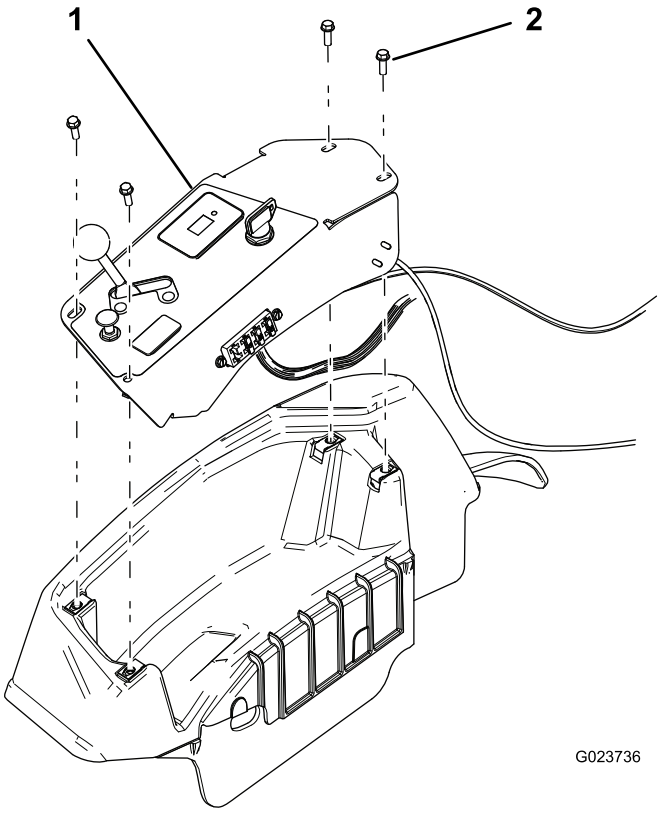


Figure 33

1. Control panel
2. Screw (4)

2. Locate the wireless hour-meter jumper.

   Note: The jumper is labeled.

3. Attach the wireless hour meter.
4. Tie the wireless hour meter to the existing harness to prevent excessive motion in the console.
5. Install the control panel.

Operating Tips

- If the sand is deep enough, you can rake right up to the edge of the trap in level areas.
- If the sand feathers out to the turf, stay far enough away from the edge to avoid disturbing the underlying soil.
- Do not rake too close to a short, steep bank. The sand will merely flow down into the bottom of the trap.
- Some touch-up with a hand rake may be necessary on steep banks, small pockets, etc.

Maintenance

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

⚠ CAUTION

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

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

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 8 hours	• Torque the wheel lug nuts. • Change the engine oil. • Change the engine oil filter. • Change the hydraulic fluid and filters.
Before each use or daily	• Check the level of the engine oil. • Check the level of the hydraulic fluid. • Check the tire pressure. • Check the safety interlock system. • Check the condition of the hydraulic lines and hoses. • Inspect and clean the machine.
Every 100 hours	• Torque the wheel lug nuts. • Grease the machine. • Change the engine oil (more often in extremely dusty or dirty operating conditions). • Change the engine oil filter (more often in extremely dusty or dirty operating conditions). • Service the spark plugs. • Check the battery cable connections.
Every 200 hours	• Replace the air filter (more often in dusty conditions). • Replace the carbon-canister filter.
Every 300 hours	• Check and adjust the valve clearance. • Clean and lap the valve-seating surface.
Every 400 hours	• Change the hydraulic fluid and filters.
Every 800 hours	• Replace the fuel filter.

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

Daily Maintenance Checklist

Duplicate this page for routine use.

Maintenance Check Item	For the week of:						
	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check the safety interlock operation.							
Check the parking brake operation.							
Check the operation of the control handles .							
Check the fuel level.							
Check the engine oil level.							
Check the air filter condition.							
Clean the engine cooling fins.							
Check unusual engine noises.							
Check unusual operating noises.							
Check the level of the hydraulic fluid.							
Check hydraulic hoses for damage.							
Check for fluid leaks.							
Check the tire pressure.							
Check the instrument operation.							
Lubricate all grease fittings.[1]							
Touch-up damaged paint.							
1. Immediately after every washing, regardless of the interval listed.							

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

Premaintenance Procedures

Lifting the Machine

⚠ WARNING

Mechanical or hydraulic jacks may fail to support the machine and cause serious injury.

Use jack stands when supporting the machine.

Refer to Figure 34 for the support points.

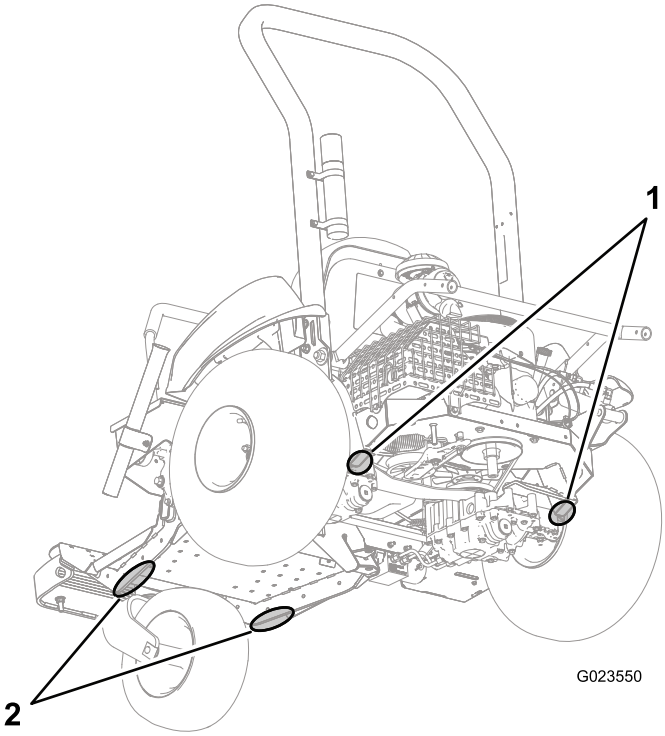


Figure 34

1. Support points (rear)
2. Support points (front)

Lubrication

Greasing the Machine

Service Interval: Every 100 hours

Grease Type: No. 2 lithium grease

Grease each grease fitting located on the front wheel hub, the belt tensioner, and the attachment lift as follows:

1. Wipe the grease fitting clean so that foreign matter cannot be forced into the bearing or bushing.
2. Attach a grease gun to the fitting, and pump grease into the fitting.
3. Wipe up any excess grease.

- Front wheel bearing (1)—Figure 35

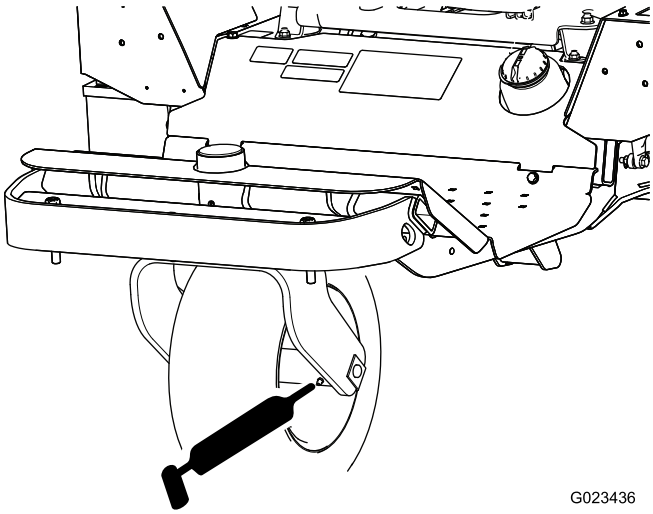


Figure 35

- Belt tensioner (1)—Figure 36

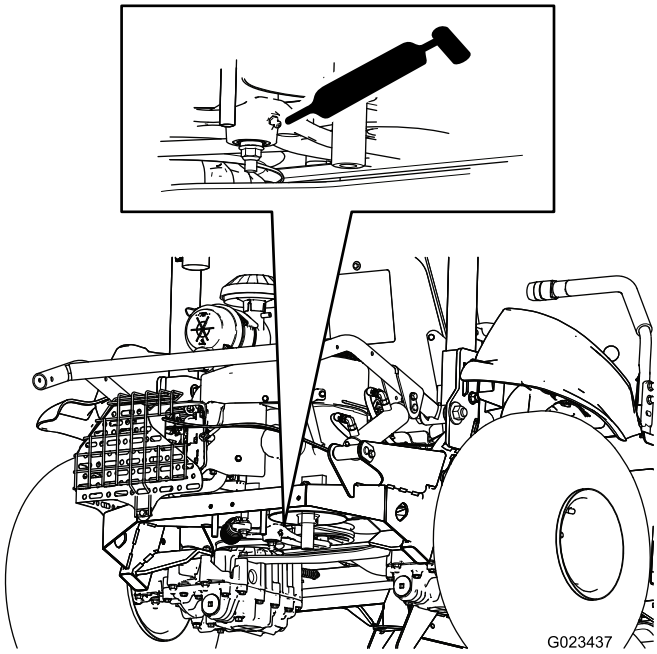


Figure 36

- Attachment lift (4)—Figure 37

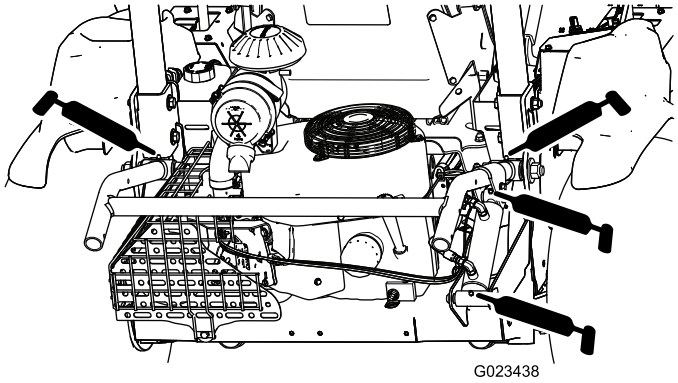


Figure 37

Engine Maintenance

Servicing the Engine Oil and Filter

Changing the Engine Oil

Service Interval: After the first 8 hours—Change the engine oil.

Every 100 hours—Change the engine oil (more often in extremely dusty or dirty operating conditions).

Toro Premium Engine Oil is available from your Authorized Toro Distributor.

Crankcase Capacity: 1.66 L (1.75 US qt) with filter change

Use 4-cycle engine oil that meets or exceeds the following requirements:

- **API service category:** SJ, SL, SM, or higher
- **Viscosity:** SAE 30; refer to the following chart for other viscosities (Figure 38):

Important: Using multi-viscosity oils, such as 10W-30, increases oil consumption. Check the oil level more frequently when using them.

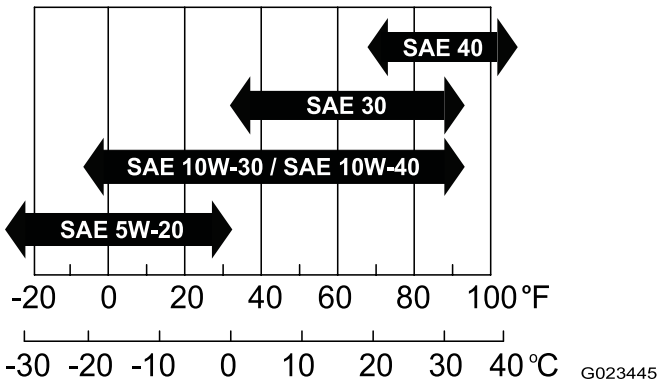


Figure 38

1. Run the engine for a few minutes to warm the oil.
2. Park the machine on a level surface, stop the engine, set the parking brake, and remove the key.
3. Remove the drain plug (Figure 40) and let the oil drain into a suitable container. When the oil stops draining, install the drain plug.

   Note: Insert a piece of paper or light cardboard into the drain hole to channel the oil away from the engine mounting plate (Figure 39).

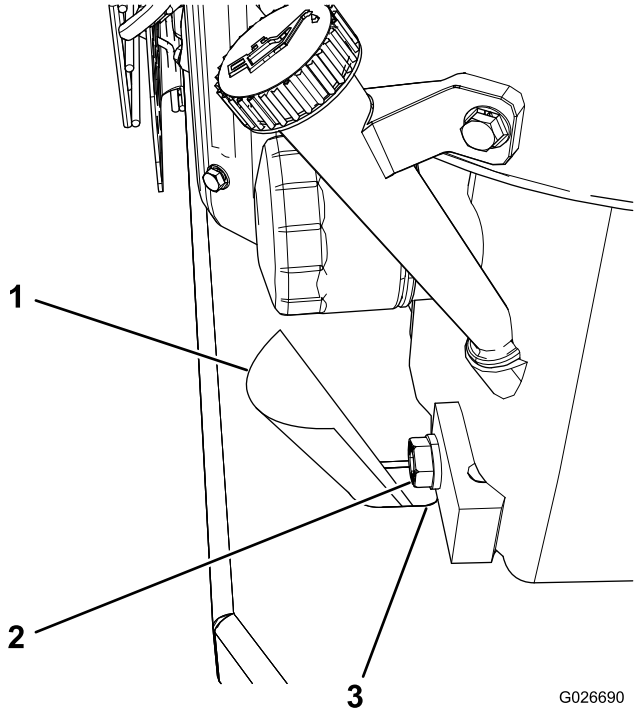


Figure 39

1. Cardboard
2. Drain plug
3. Drain hole

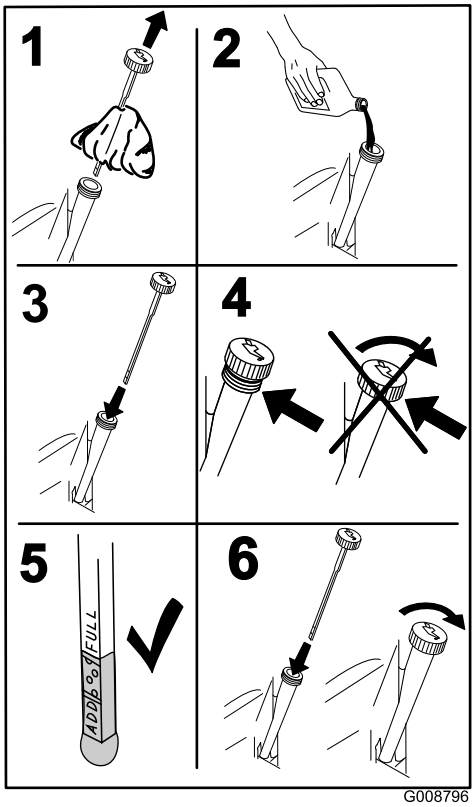


Figure 41

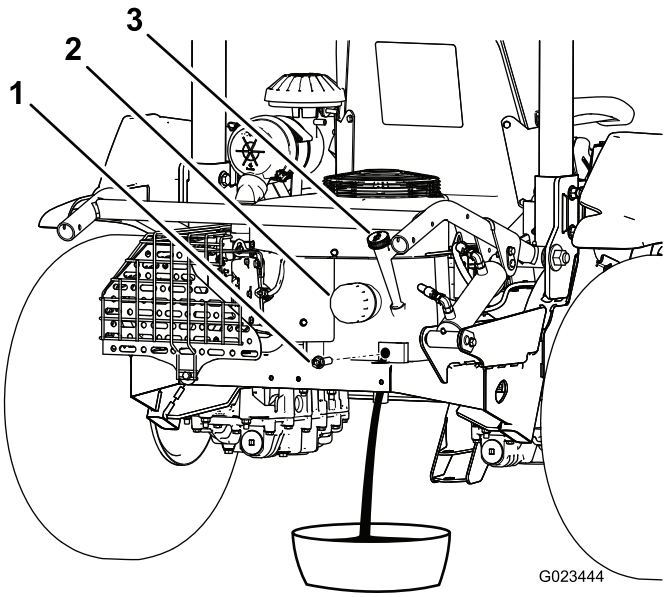


Figure 40

1. Drain plug
2. Oil filter
3. Dipstick

4. Remove the dipstick and wipe it with a clean cloth (Figure 41).
5. Pour fresh oil into the fill tube.
6. Start the engine and let it run for about 3 minutes, and ensure that there are no leaks.
7. Stop the engine.
8. Check the oil level, and add oil if necessary.
9. Install the dipstick.
10. Dispose of the used oil according to local codes.

Changing the Engine Oil Filter

Service Interval: After the first 8 hours—Change the engine oil filter.

Every 100 hours—Change the engine oil filter (more often in extremely dusty or dirty operating conditions).

1. Run the engine for a few minutes to warm the oil.
2. Park the machine on a level surface, stop the engine, set the parking brake, and remove the key.
3. Drain the engine oil; refer to Changing the Engine Oil (page 36).
4. Place a drain pan under the oil filter, and turn the filter counterclockwise to remove it (Figure 42).

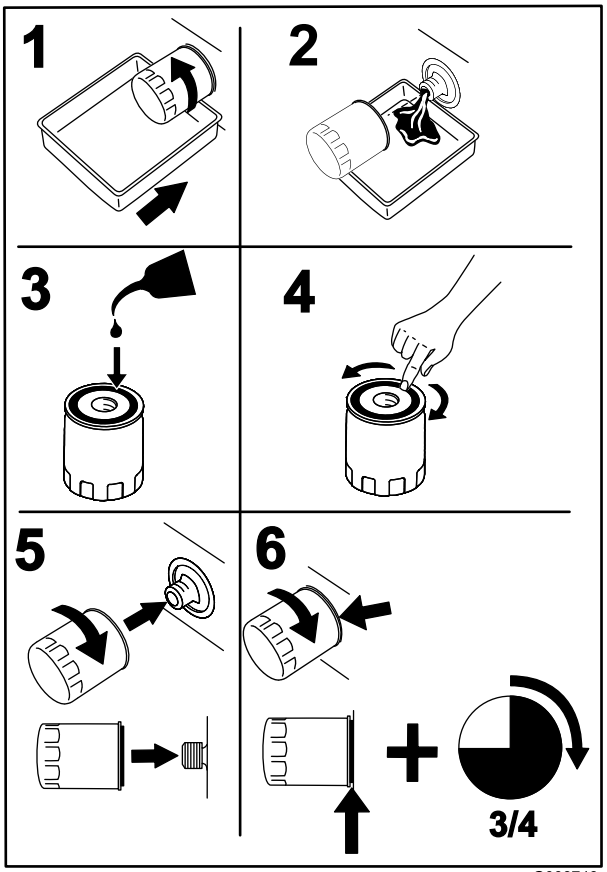


Figure 42

5. Apply a light coat of clean oil to the gasket of the new filter.
6. Install the new filter, turning it by hand until the gasket contacts the filter adapter; then tighten it 3/4 turn more.

   Important: Do not overtighten the filter.
7. Check the oil level; refer to Checking the Level of the Engine Oil (page 21).
8. If necessary, add oil into the fill tube.
9. Start the engine and let it run for about 3 minutes, and ensure that there are no leaks.
10. Stop the engine.
11. Check the oil level, and add oil if necessary.

    Note: The filter holds some oil, so the oil level may decrease when installing a new filter.
12. Install the dipstick.
13. Dispose of the used oil according to local codes.

Servicing the Air Cleaner

Replacing the Air Filter

Service Interval: Every 200 hours (more often in dusty conditions).

Note: Changing the air filter before it is necessary only increases the chance of dirt entering the engine when the filter is removed.

1. Park the machine on a level surface, stop the engine, set the parking brake, and remove the key.
2. Release the latches securing the air-cleaner cover to the air-cleaner body (Figure 43).

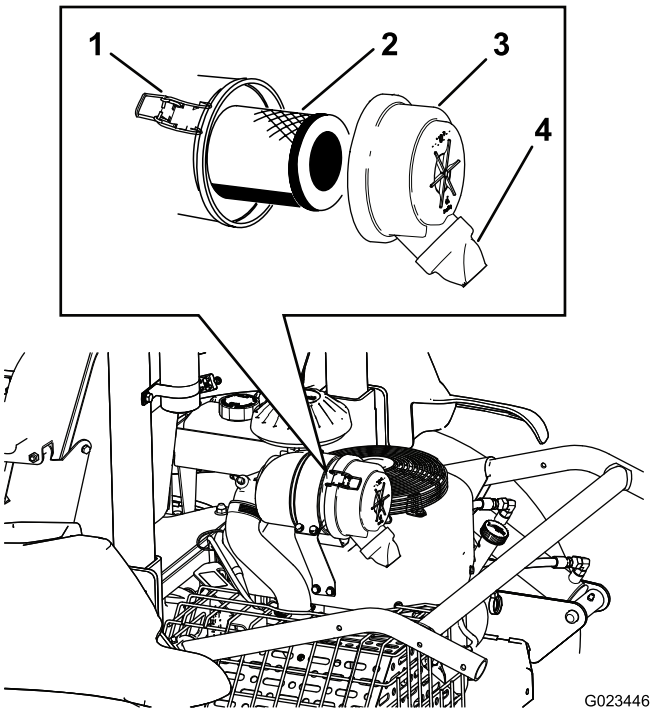


Figure 43

1. Latch (2)
2. Air filter
3. Cover
4. Dirt-ejection port

3. Remove the cover from the air-cleaner body.
4. Remove the old filter, and install the new filter.

   Note: Inspect the new filter for shipping damage, checking the sealing end of the filter and the body. Do not use a damaged element. Insert the new filter by applying pressure to the outer rim of the element to seat it in the canister. Do not apply pressure to the flexible center of the filter.

   Note: Do not clean the used element, because it can damage the filter media.
5. Clean the dirt-ejection port located in the removable cover.
6. Install the cover so that the dirt-ejection port points downward.

7. Secure the latches.
8. Check the whole intake system for leaks, damage, or loose hose clamps.

Servicing the Spark Plugs

Service Interval: Every 100 hours

Type: NGK BPR4ES (or equivalent)

Gap: 0.76 mm (0.030 inch)

Note: The spark plugs usually last a long time; however, you should check them whenever the engine malfunctions.

1. Clean the area around each of the spark plugs so that foreign matter cannot fall into the cylinders when you remove the spark plugs.

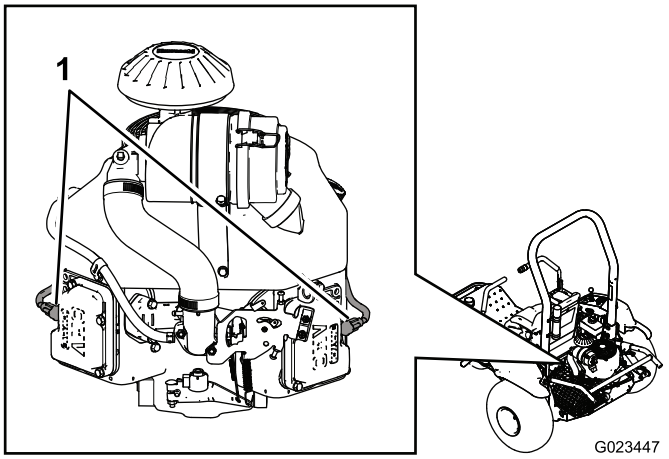


Figure 44

1. Spark-plug wires

2. Disconnect the spark-plug wires from the spark plugs, and remove the plugs from the cylinder heads.
3. Check the condition of the side electrode, the center electrode, and the insulator to ensure that there is no damage.

   Important: Replace the spark plugs if they are cracked, fouled, dirty, or otherwise malfunctioning. Do not clean the electrodes, because grit entering the cylinder may damage the engine.
4. For each spark plug, set the gap between the center electrode and the side electrode to 0.76 mm (0.030 inch); refer to Figure 45. Install each of the correctly gapped spark plugs with a gasket seal, and tighten the plugs to 22 N-m (16 ft-lb).

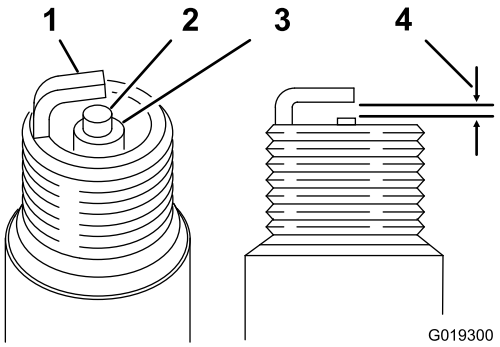


Figure 45

1. Side electrode
2. Center electrode
3. Insulator
4. 0.76 mm (0.030 inch) gap

Checking and Adjusting the Valve Clearance

Service Interval: Every 300 hours

This procedure must be performed with the proper tools. See your authorized Kawasaki engine dealer for service, unless you have the proper equipment and adequate mechanical proficiency.

Cleaning and Lapping the Valve-Seating Surface

Service Interval: Every 300 hours

This procedure must be performed with the proper tools. See your authorized Kawasaki engine dealer for service, unless you have the proper equipment and adequate mechanical proficiency.

Fuel System Maintenance

Replacing the Carbon-Canister Filter

Service Interval: Every 200 hours

1. Remove the fasteners securing the seat assembly to the machine.

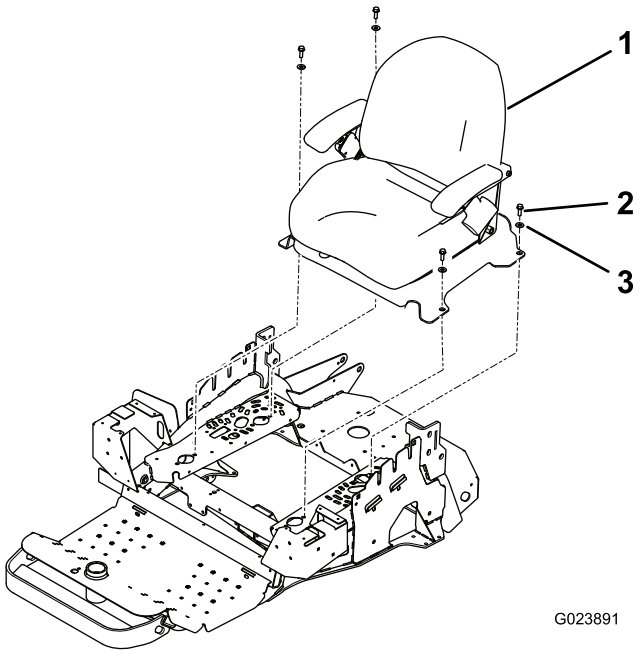


Figure 46

1. Seat assembly
2. Bolt (4)
3. Washer (4)

2. Disconnect the filter from the carbon canister (Figure 47).

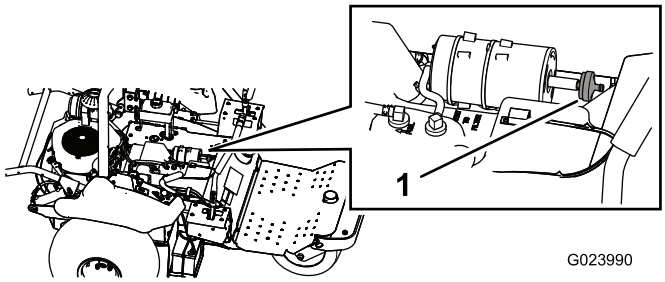


Figure 47

1. Carbon-canister filter

3. Connect the new filter to the carbon canister.
4. Install the seat support plate and the seat.

Replacing the Fuel Filter

Service Interval: Every 800 hours

The fuel line has an in-line filter. Replace it as follows:

1. Loosen the hose clamp on the carburetor side of the filter, and remove the fuel line from the filter (Figure 48 and Figure 49).

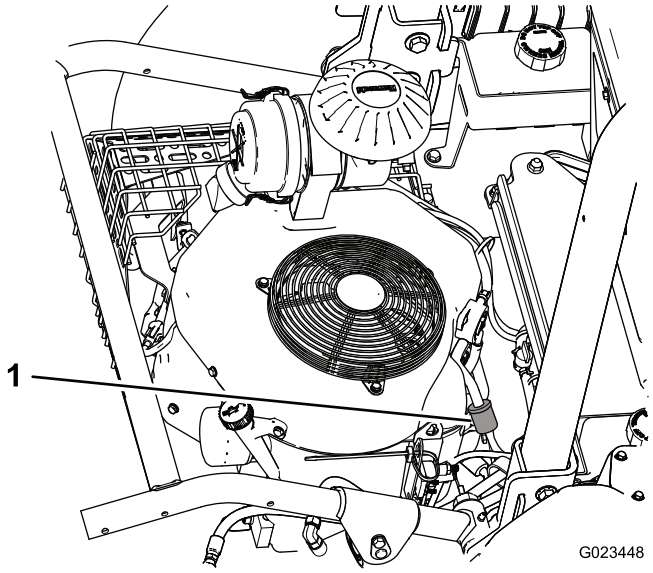


Figure 48

1. Fuel filter

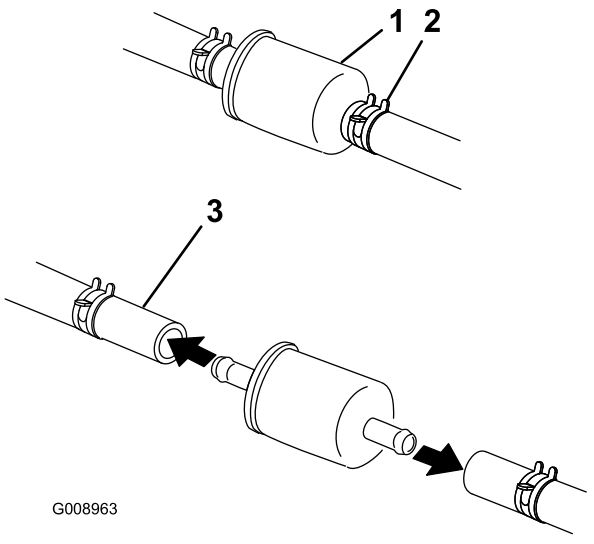


Figure 49

1. Fuel filter
2. Hose clamp (2)
3. Fuel line

2. Place a drain pan under the filter, loosen the remaining hose clamp, and remove the filter.
3. Slide the hose clamps onto the ends of the fuel lines.
4. Push the fuel lines onto the new fuel filter, and secure them with the hose clamps.

Note: Install the new filter with the arrow on the filter body pointing away from the fuel tank (toward the carburetor).

Electrical System Maintenance

⚠ 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.

Jump-Starting the Machine

1. Remove any corrosion from the battery terminals, and ensure that the connections are tight before jump-starting the machine.

   Important: Corrosion or loose connections can cause unwanted electrical voltage spikes at any time during the jump-starting procedure, which could damage the engine.

   Do not attempt to jump-start the machine if the battery terminals are loose or corroded.

   ⚠ DANGER

   Jump-starting a weak battery that is cracked or frozen, or has a low electrolyte level or an open/shorted battery cell, can cause an explosion resulting in serious personal injury.

   Do not jump-start a weak battery if these conditions exist.

2. Ensure that the booster battery is a good, fully charged lead-acid battery with at least 12.6 V. Use properly sized jumper cables with short lengths to reduce the voltage drop between the systems. Make sure that the cables are color coded or labeled for the correct polarity.

   Note: Be sure that the vent caps are tight and level. Place a damp cloth, if available, over the vent caps on each battery. Be sure that the machines do not touch and that both electrical systems are turned off and have the same rated system voltage. These instructions are for negative-ground systems only.

3. Connect the positive (+) cable to the positive (+) terminal of the discharged battery that is wired to the starter or solenoid as shown in Figure 50.

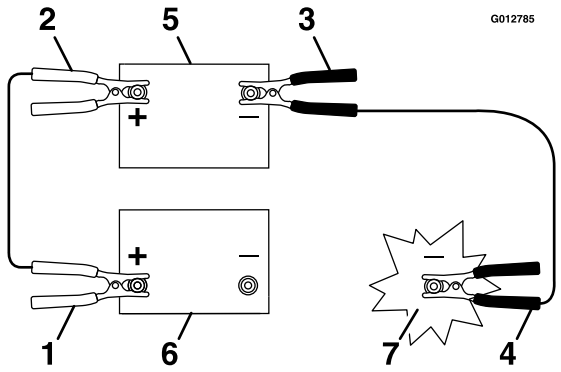


Figure 50

1. Positive (+) cable on discharged battery
2. Positive (+) cable on booster battery
3. Negative (–) cable on the booster battery
4. Negative (–) cable on the engine block
5. Booster battery
6. Discharged battery
7. Engine block

4. Connect the other end of the positive cable to the positive terminal of the booster battery.
5. Connect the black negative (–) cable to the other terminal (negative) of the booster battery.
6. Make the final connection on the **engine block** (not on the negative battery post) of the machine with the discharged battery, away from the battery, and stand back (Figure 51).

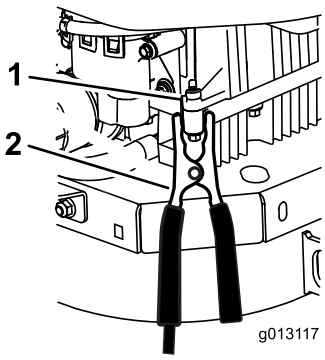


Figure 51

1. Engine block
2. Negative (–) cable

7. Start the engine, and remove the cables in the reverse order of connection.

   Note: Disconnect the cable connected to the engine block (black cable) first.

Replacing the Fuses

The fuse block (Figure 52) is located near the control panel.

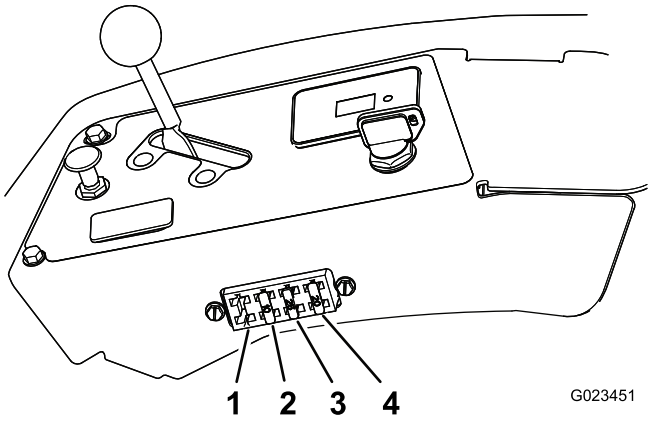


Figure 52

1. Lights (sold separately)
2. Attachment—10A
3. Engine start—25A
4. Battery—20A

To replace a fuse, remove it by simply pulling it out from the fuse block, and install a new fuse

Important: Always use a fuse of the same type and amperage as the one you are replacing; otherwise, you could damage the electrical system. Refer to the decal on the back of the seat for the function and amperage of each fuse.

Servicing the Battery

Charging the Battery

⚠ WARNING

Charging the battery produces gases that can explode, seriously injuring you or bystanders.

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

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

1. Charge the battery for 10 to 15 minutes at 25 to 30 A, or 30 minutes at 10 A.
2. When the battery is fully charged, unplug the charger from the electrical outlet, and disconnect the charger leads from the battery posts (Figure 53).
3. Install the battery in the machine and connect the battery cables; refer to Installing the Battery (page 44).

Important: **Do not run the machine with the battery disconnected; electrical damage may occur.**

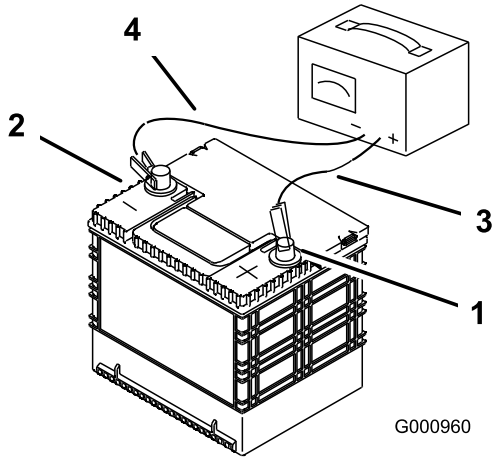


Figure 53

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

If the battery no longer holds a charge, replace it; refer to Removing the Battery (page 43) and Installing the Battery (page 44).

Removing the Battery

1. Move the machine to a level surface, set the parking brake, stop the engine, and remove the key.
2. Remove the wing nuts and washers securing the battery hold-down (Figure 54).

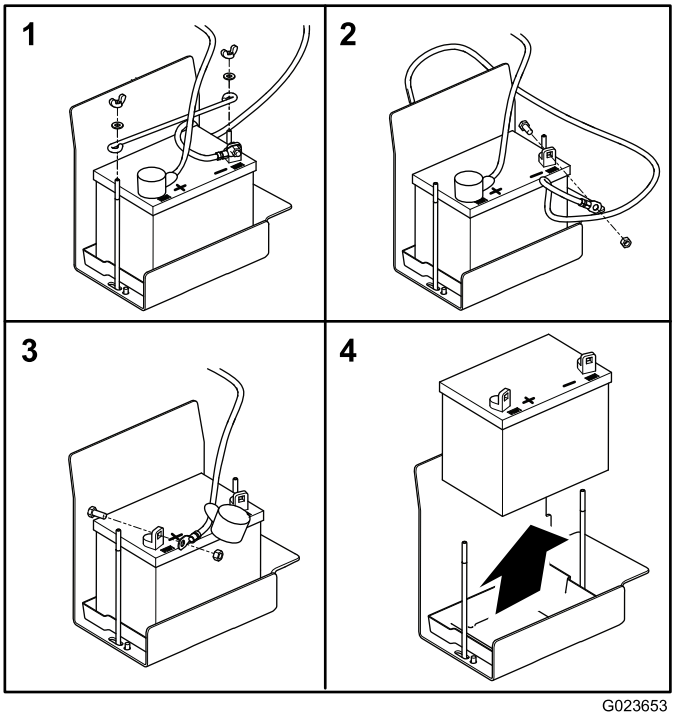


Figure 54

3. Disconnect the negative (black) ground cable from the battery post.

⚠ WARNING

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

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

⚠ WARNING

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

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

4. Slide the red terminal boot off the positive (+) battery terminal, and remove the positive (red) battery cable.
5. Remove the battery.

Installing the Battery

1. Place the battery in the tray.

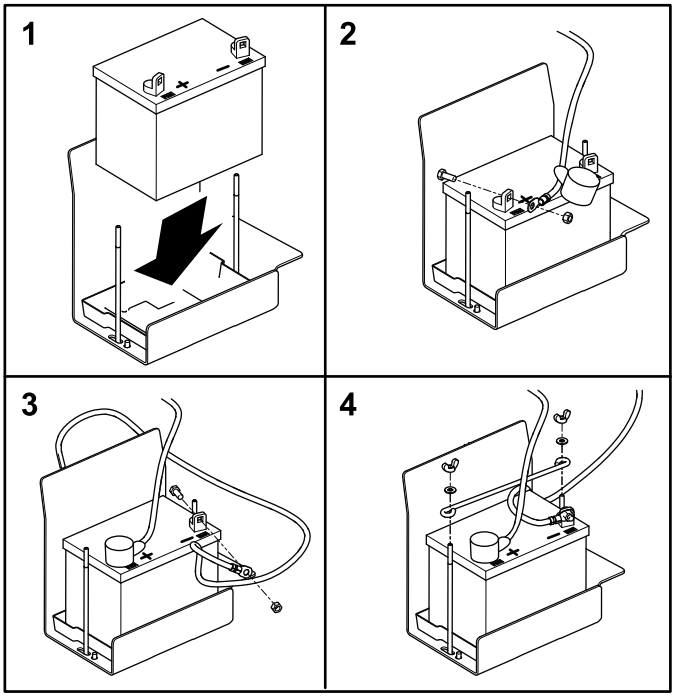


Figure 55

2. Install the positive (red) battery cable to the positive (+) battery terminal, and tighten the nut onto the bolt.

   Important: The red cable may be covered by a wire loom. The positive cable is the one with the red boot.

3. Install the negative (black) ground cable to the negative (-) battery terminal, and tighten the nut onto the bolt.
4. Slide the red terminal boot onto the positive (+) battery post.
5. Install the hold-down, and secure it with the wing nuts and washers.

Checking and Cleaning the Battery

Service Interval: Every 100 hours—Check the battery cable connections.

Keep the top of the battery clean. If the machine is stored in a location where temperatures are extremely high, the battery will discharge more rapidly than if the machine is stored in a cooler location.

Keep the top of the battery clean by washing it with a brush dipped in ammonia or a solution of sodium bicarbonate. Flush the top surface with water after cleaning. Do not remove the fill cap while cleaning the battery.

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

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

Drive System Maintenance

Adjusting the Tracking

1. Drive to a flat, open area, and move the control handles to the neutral-locked position.
2. Move the throttle midway between the Fast and Slow positions.
3. Move both control handles all the way forward until they both hit the stops in the T-slot.
4. Check which way the machine tracks.
   - If it tracks to the right, loosen the bolts and adjust the left stop plate rearward until the machine tracks straight (Figure 56).
   - If it tracks to the left, loosen the bolts and adjust the right stop plate rearward until the machine tracks straight (Figure 56).

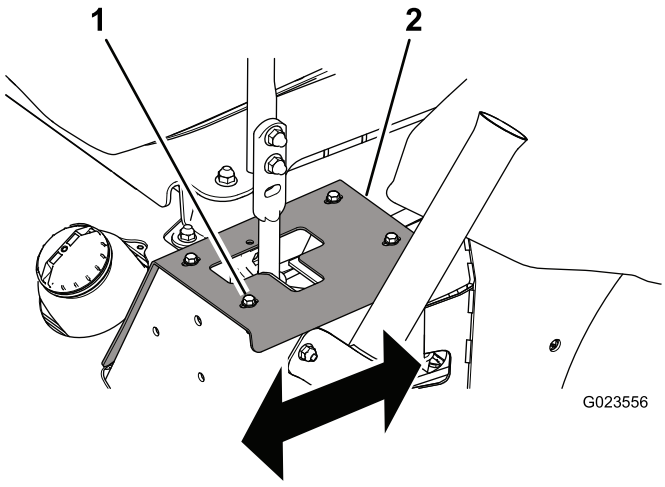


Figure 56
Left control handle shown

1. Bolt (4)
2. Stop plate

5. Tighten the bolts to secure the stop plate (Figure 56).

Important: Ensure that each control handle stops against the stop plate and not against the transmission internal stop.

Replacing the Drive Belt and the Tensioner Pulley

1. Park the machine on a level surface, stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
2. Raise the rear of the machine and support it with jack stands; refer to Lifting the Machine (page 35).

⚠ WARNING

Mechanical or hydraulic jacks may fail to support the machine and cause serious injury.

Use jack stands when supporting the machine.

3. Use a ratchet in the square hole in the tensioner arm to counteract against the tensioner spring (Figure 57), and remove the belt from the tensioner pulley.

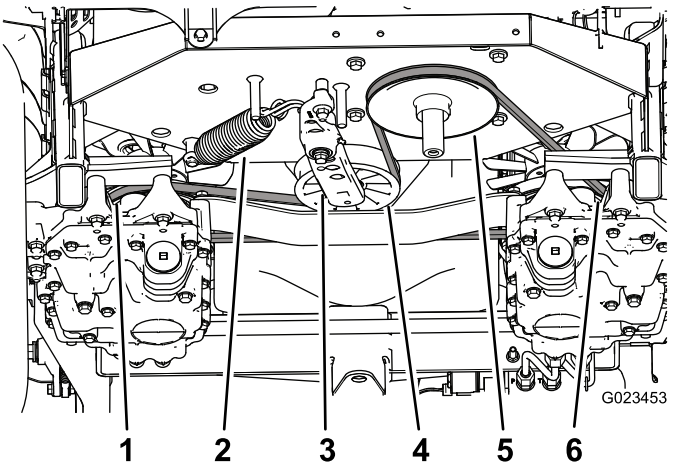


Figure 57

1. Left-hand transmission pulley
2. Tensioner spring
3. Tensioner arm
4. Tensioner pulley
5. Engine pulley
6. Right-hand transmission pulley

4. Unhook the tensioner spring from the tensioner arm and the frame (Figure 57).
5. Remove the nut that secures the tensioner assembly to the frame (Figure 58).

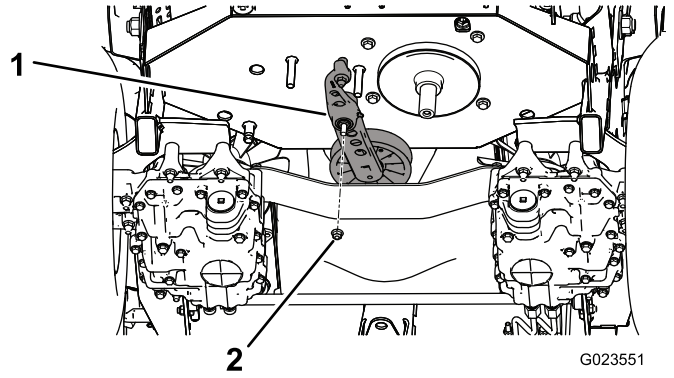


Figure 58

1. Tensioner assembly
2. Nut

6. Remove the bolt securing the old tensioner pulley to the tensioner arm, and install a new pulley (Figure 59).

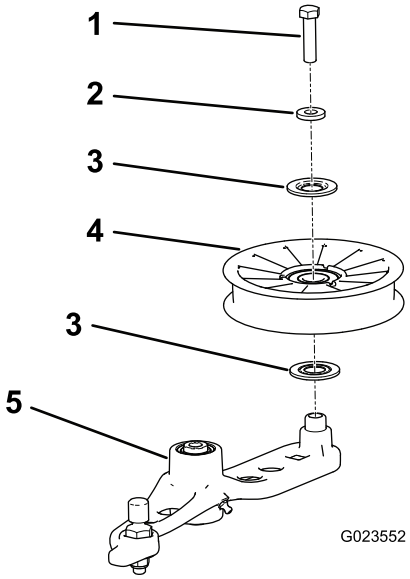


Figure 59

1. Bolt
2. Spacer
3. Seal
4. Pulley
5. Tensioner arm

7. Remove the belt from the transmission pulleys and the engine pulley.
8. Install the new belt around the engine pulley and the 2 transmission pulleys.
9. Install the spring on the tensioner arm and the frame (Figure 57).
10. Use a ratchet in the square hole in the tensioner arm to temporarily stretch the tensioner spring, and align the belt to the tensioner pulley.

Controls System Maintenance

Adjusting the Control-Handle Position

There are 2 height positions for the control handles; high and low.

1. Move the control handles to the neutral-locked position, and set the parking brake.
2. Stop the engine, remove the key, and wait for all moving parts to stop before leaving the operating position.
3. Loosen the bolts and flange nuts that attach the handles to the levers (Figure 60).

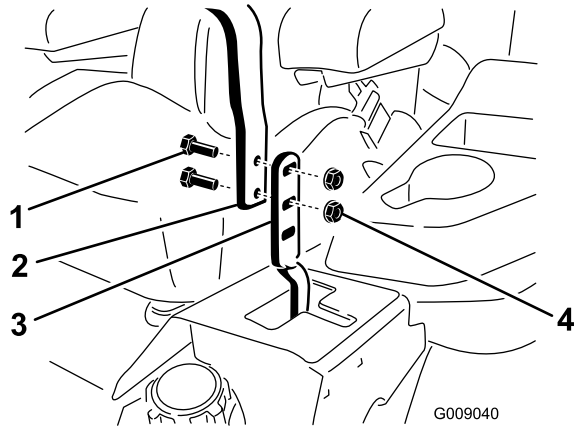


Figure 60

1. Bolt
2. Control handle
3. Lever
4. Flange nut

4. Align the front-to-rear position of the handles by bringing them together to the neutral position, and sliding them until they are aligned (Figure 61).

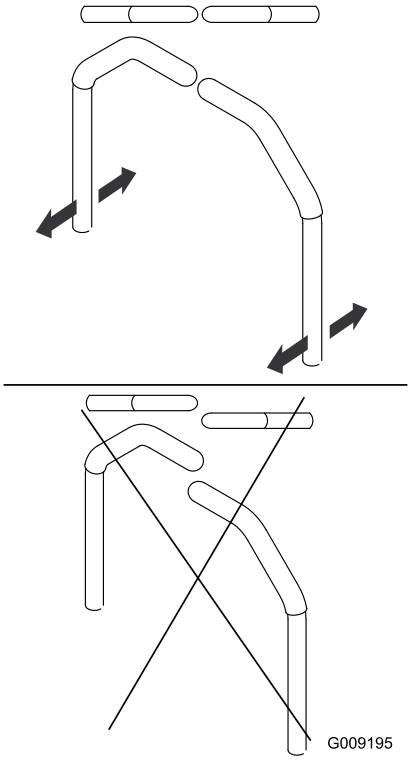


Figure 61

5. Tighten the bolts and flange nuts to secure the handles to the levers.

Adjusting the Control-Handle Linkage

Turning the double nuts on the control-handle linkage allows you to fine-tune the adjustment so that the machine does not move in neutral. Make adjustments for neutral positioning only.

⚠ WARNING

To adjust the control-handle linkage, the engine must be running and the drive wheels must be able to turn. Contact with moving parts or hot surfaces may cause personal injury.

Keep hands, feet, other body parts, and clothing away from rotating parts and hot surfaces.

1. Park the machine on a level surface, turn the engine off, remove the key, and set the parking brake.
2. Raise all 3 wheels of the machine up off the floor, and support the machine with jack stands just high enough to allow the drive wheels to turn freely; refer to Lifting the Machine (page 35).

⚠ WARNING

Mechanical or hydraulic jacks may fail to support the machine and cause serious injury.

Use jack stands when supporting the machine.

3. Press down on the seat, or place a weight on the seat, to press the interlock switch down.
4. Start the engine and move the throttle lever to the Fast position.
5. Remove the pressure (or weight) from the seat.
6. Release the parking brake.
7. On 1 side of the machine, slowly turn the double nuts on the linkage (Figure 62) until the wheel on that side starts to rotate, then turn the double nuts in the opposite direction until the wheel rotates in the other direction.

Note: The control handles need to be in the neutral position while making any necessary adjustments.

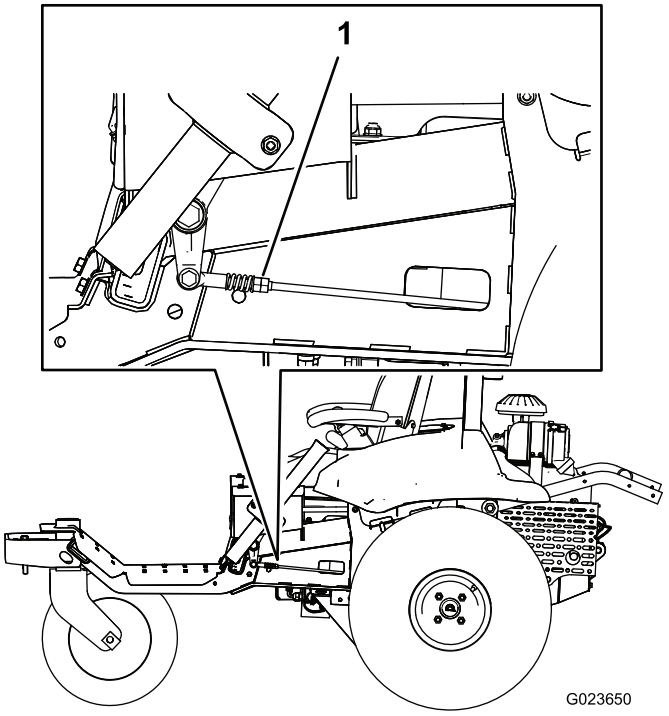


Figure 62

1. Double nuts

8. Turn the double nuts back the other way until they are at the **midpoint** between the 2 positions.
9. Repeat steps 7 and 8 for the other side.
10. Stop the engine.
11. Remove the jack stands, and carefully lower the machine to the ground.
12. Start the engine again, and ensure that the machine does not creep in neutral with the parking brake released.

Adjusting the Control-Handle Dampers

You can adjust the top damper-mounting bolt to change the control-handle resistance.

1. To access the damper-mounting bolts, remove the bolts that secure the stop plates to the frame (Figure 63).

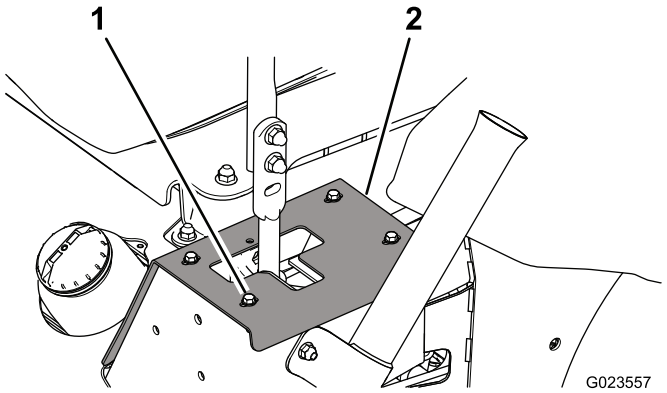


Figure 63
Left-hand side shown

1. Bolt (4)
2. Stop plate

2. Remove the locknut, move the damper-mounting bolt to the desired position, and install the locknut. Refer to Figure 64 for the mounting options.

   Note: Torque the locknut to 22.6 N-m (16.7 ft-lb). The bolt must protrude past the end of the locknut when it is tight.

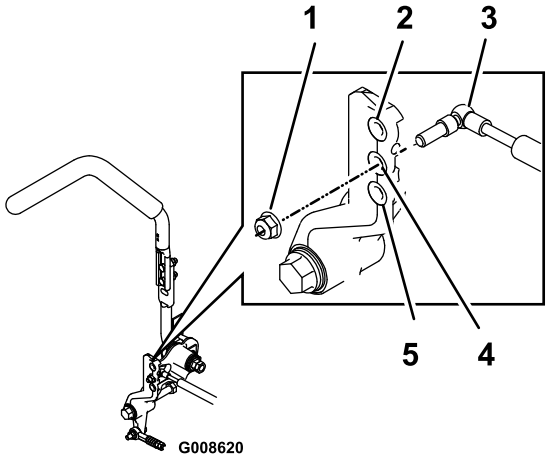


Figure 64
Right-hand side shown

1. Locknut
2. Most resistance (firmest feel)
3. Damper
4. Medium resistance (medium feel)
5. Least resistance (softest feel)

3. Adjust the tracking; refer to Adjusting the Tracking (page 45).

Adjusting the Neutral-Lock Resistance

If you prefer a different amount of side-to-side resistance in the control handles when you move them into and out of the neutral-locked position, you can adjust it as follows:

1. Loosen the jam nut (Figure 65).

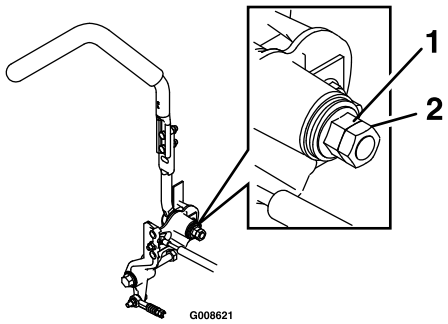


Figure 65

1. Flanged nut
2. Jam nut

2. Tighten or loosen the flanged nut to the desired feel.
   - For more resistance, tighten the flanged nut.
   - For less resistance, loosen the flanged nut.
3. Tighten the jam nut.
4. Repeat this procedure for the other control handle.

Adjusting the Engine Controls

Adjusting the Throttle Control

Proper throttle operation depends upon proper adjustment of the throttle control. Before adjusting the carburetor, ensure that the throttle control is operating properly.

1. Loosen the clamp screw securing the throttle-cable housing to the engine (Figure 66).

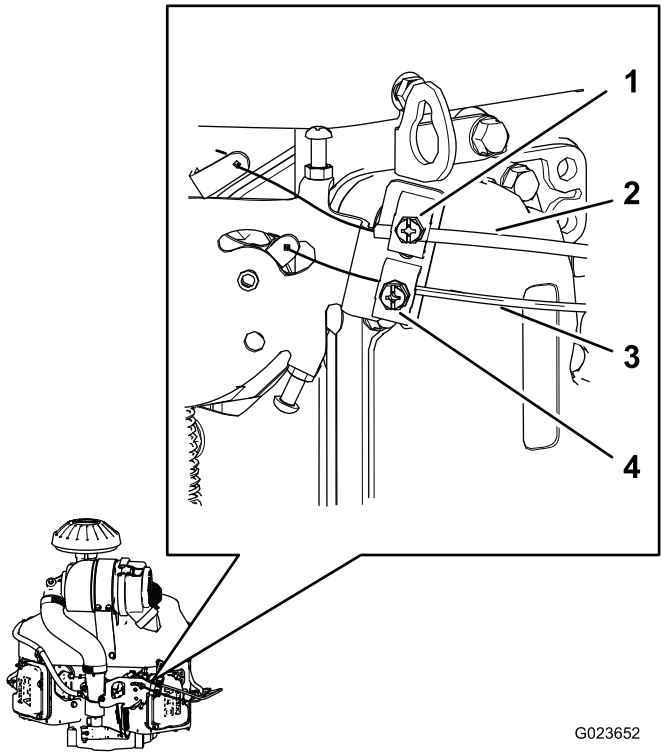


Figure 66

1. Clamp screw (choke-cable housing)
2. Choke-cable housing
3. Throttle-cable housing
4. Clamp screw (throttle-cable housing)

2. Move the throttle control forward to the Fast position.
3. Pull up the cable housing of the throttle cable (Figure 66) until the throttle cable has almost no slack, and tighten the clamp screw.
4. Tighten the clamp screw and check the engine speed:
   - High idle: 2750 to 2950 rpm
   - Low idle: 1450 to 1650 rpm

Adjusting the Choke Control

1. Loosen the clamp screw securing the choke-cable housing to the engine (Figure 66).
2. Push the choke control down to the Open position; refer to Choke Control (page 18).
3. Ensure that the choke valve on the carburetor is fully opened.
4. Pull up the cable housing of the choke cable (Figure 66) until the choke cable has almost no slack, and tighten the clamp screw.
5. Ensure that the choke valve moves to the fully closed position when you pull the choke control outward and to the fully opened position when you push the choke control downward.

Adjusting the Engine Governor Speed Control

⚠ WARNING

The engine must be running during adjustment of the engine governor speed control. Contact with moving parts or hot surfaces may cause personal injury.

- **Ensure that the control handles are in the neutral-locked position, and set the parking brake before performing this procedure.**
- **Keep hands, feet, clothing, and other body parts away from any rotating parts, the muffler, and other hot surfaces.**

Adjust the low-idle speed as follows:

1. Start the engine and let it run at half throttle for approximately 5 minutes to warm up.
2. Move the throttle control to the Slow setting.
3. Push the spring end of the governor arm downward (Figure 67).

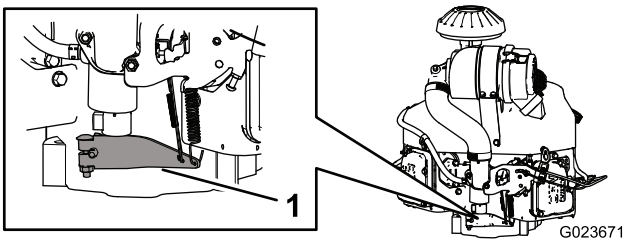


Figure 67

1. Governor arm

4. Adjust the stop screw on the carburetor (Figure 68) so that the idle speed is 1350 to 1550 rpm.

   Note: Check the speed with a tachometer.

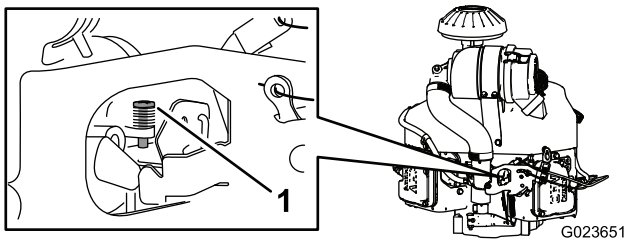


Figure 68

1. Stop screw

5. Allow the governor arm to return to the original position.
6. Loosen the jam nut on the low-idle speed setscrew.
7. Adjust the low-idle speed setscrew so that the idle speed is 1450 to 1650 rpm.
8. Tighten the jam nut.

Adjust the high-idle speed as follows:

Important: Do not adjust the high-idle speed with the air cleaner removed.

1. Start the engine and allow it to warm up thoroughly.
2. Loosen the jam nut on the high-idle speed setscrew a few turns.
3. Move the throttle control so that the idle speed is 2750 to 2950 rpm.
4. Tighten the high-idle speed setscrew so that it just touches the tab on the speed-control lever.

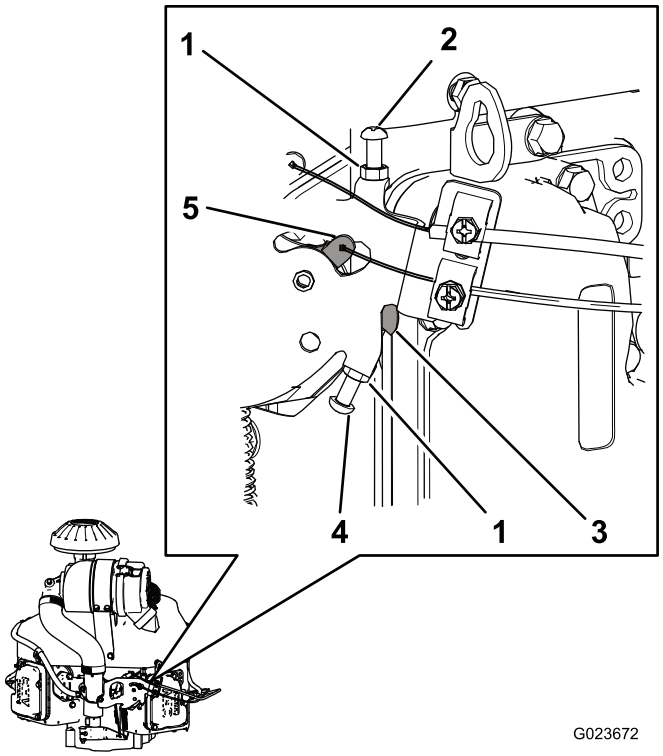


Figure 69

1. Jam nut
2. Low-idle speed setscrew
3. Tab (on the speed-control lever)
4. High-idle speed setscrew
5. Speed-control lever

5. Tighten the jam nut.

Hydraulic System Maintenance

Checking the Hydraulic System

Whenever you repair or replace a hydraulic component, you should replace the hydraulic-fluid filters and check the hydraulic system to ensure that it works properly.

Important: Make sure that the hydraulic reservoirs and the manifold filter are filled with fluid at all times when checking the hydraulic system.

1. Park the machine on a level surface and turn the engine off.
2. Raise all 3 wheels of the machine up off the floor, and support the machine with jack stands just high enough to allow the drive wheels to turn freely; refer to Lifting the Machine (page 35).

⚠ WARNING

Mechanical or hydraulic jacks may fail to support the machine and cause serious injury.

Use jack stands when supporting the machine.

3. Start the engine and set the throttle to allow the engine to run at low idle.
4. Move the control handles to the full-forward position, and watch for the drive wheels to turn smoothly.
5. Move the control handles to the full-reverse position, and watch for the drive wheels to turn smoothly.
6. Press the attachment switch until the lift-cylinder rod moves in and out several times.

   If the cylinder rod does not move after 10 to 15 seconds, or if the pump makes abnormal sounds, stop the engine immediately and determine the cause or problem.

   Inspect for the following conditions, and make the necessary repairs or see your Authorized Toro Distributor:

   - The belt is removed or severely worn.
   - The fluid level is inadequate.
   - A hydraulic filter is loose.
   - The charge pump is worn.
   - The charge relief filter is worn.
   - There is an issue with the switch or the wiring.
   - The solenoid valve is plugged.

Changing the Hydraulic Fluid and Filters

Service Interval: After the first 8 hours

Every 400 hours

Capacity:

- Left side—1.9 L (2.0 US qt)
- Right side—2.0 L (2.1 US qt)

Fluid Type: Toro Premium Transmission/Hydraulic Tractor Fluid or Mobilfluid® 424

1. Park the machine on a level surface, stop the engine, and remove the key.
2. Lower the attachment lift.
3. Place a drain pan under the left hydrostatic transmission.
4. Remove the drain plug on the pump side and the drain plug on the gear side (Figure 70), and allow the oil to drain completely.

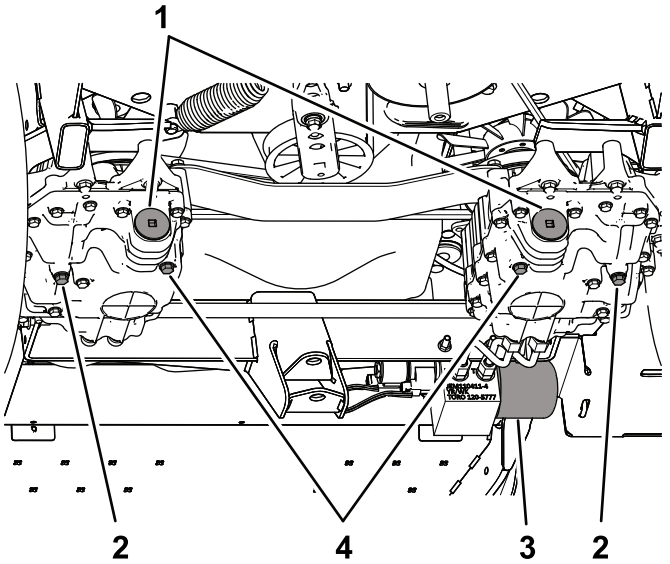


Figure 70

1. Filter caps
2. Drain plug—gear side
3. Manifold filter
4. Drain plug—pump side

5. Remove the filter cap, and pull the filter out of the transmission (Figure 71).

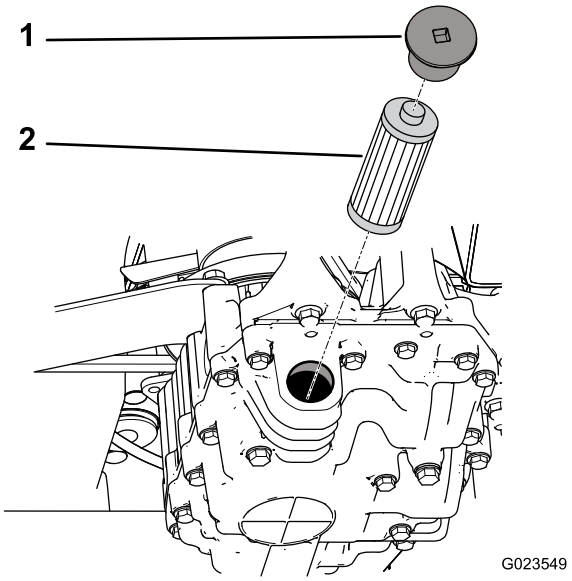


Figure 71

1. Cap
2. Filter

6. Install a new filter, and install the filter cap.
7. Repeat steps 3 through 6 for the right hydrostatic transmission.
8. Clean the area around the manifold filter, which is located on the right side of the machine.
9. Place a drain pan under the manifold filter (Figure 72).

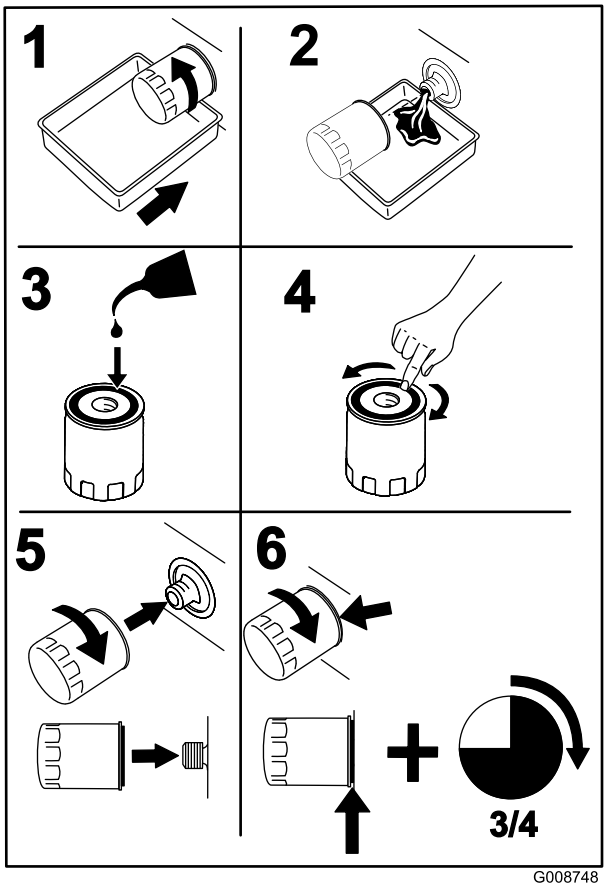


Figure 72

10. Slowly loosen the manifold filter until fluid flows past the gasket and drips out.
11. Remove the filter when the fluid flow slows.
12. Lubricate the sealing gasket on the replacement filter with clean hydraulic fluid, and install it by hand until the gasket contacts the mounting surface.
13. Tighten the filter 3/4 turn further.
14. Fill each of the hydraulic reservoirs with fresh hydraulic fluid until the level is at the bottom of the sight windows in the reservoir brackets.

Important: Do not overfill the hydraulic system. Refer to Checking the Level of the Hydraulic Fluid (page 24).

Note: To allow the fluid to flow into the system more quickly, you can remove the plug (Figure 73) on top of each hydrostatic transmission. When fluid starts to come out of the hole, install the plug and continue filling the reservoir until the fluid is at the correct level.

Important: Ensure that the plugs are in place and secure before starting the engine.

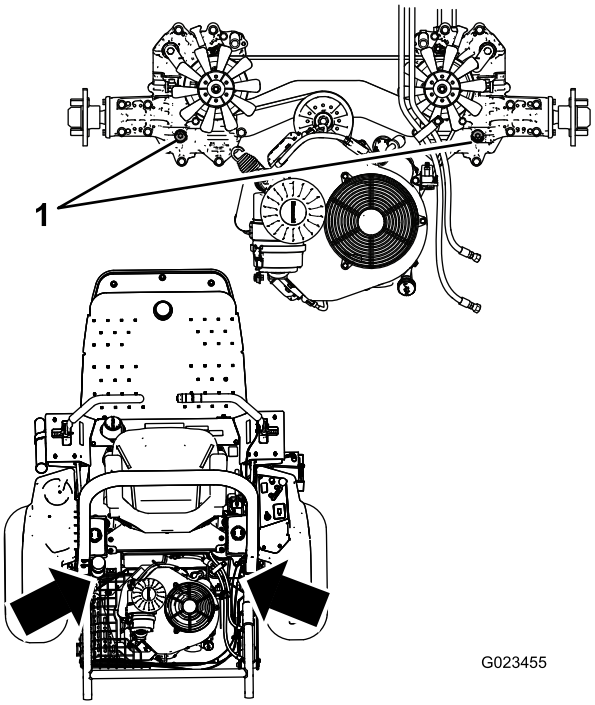


Figure 73

1. Top plugs

15. Start and run the engine. Operate the lift cylinder until it extends and retracts.
16. Check to ensure that the machine can drive forward and backward.
17. Stop the engine and check the fluid level in reservoir, add fluid if necessary.
18. Check the connections for leaks, and ensure that the hydraulic system works properly; refer to Checking the Hydraulic System (page 51).
19. Dispose of the used fluid properly.

Checking the Hydraulic Lines and Hoses

Service Interval: Before each use or daily

Check 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. Fluid injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury, or gangrene may result.

- **Make sure 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 pinhole leaks or nozzles that eject high-pressure hydraulic fluid.**
- **Use cardboard or paper to find hydraulic leaks; never use your hands.**
- **Safely relieve all pressure in the hydraulic system before performing any work on the hydraulic system.**
- **Seek immediate medical attention if fluid is injected into skin.**

Cleaning

Inspecting and Cleaning the Machine

Service Interval: Before each use or daily

1. At the completion of operation, thoroughly wash the machine with a garden hose—without a nozzle—so that excessive water pressure does not cause contamination and damage to the seals and bearings.
2. Make sure that the cooling fins and the area around the engine-cooling air intake are free of debris. After cleaning, inspect the machine for possible hydraulic-fluid leaks, damage, or wear to hydraulic and mechanical components.

Storage

Storing the Machine

1. Thoroughly clean the machine, the attachments, and the engine.
2. Check the tire pressure. Inflate the tires to 48 kPa (7 psi).
3. Check all fasteners for looseness; tighten as necessary.
4. Grease or oil all grease fittings and pivot points. Wipe off any excess lubricant.
5. Lightly sand and use touch-up paint on painted areas that are scratched, chipped, or rusted.
6. Change the engine oil and filter; refer to Changing the Engine Oil Filter (page 37).
7. Condition the fuel system as follows:
   A. Add a petroleum-based stabilizer/conditioner to fuel in the tank. Follow the mixing instructions from the stabilizer manufacturer. **Do not** use an alcohol-based stabilizer (ethanol or methanol).

      Toro fuel stabilizer is available from your Authorized Toro Distributor.

      Important: Do not store stabilizer/conditioned fuel over 90 days.

      Note: Fuel stabilizer/conditioner is most effective when mixed with fresh fuel and used at all times.

   B. Run the engine for 5 minutes to distribute the conditioned fuel through the fuel system.
   C. Stop the engine, allow it to cool, and drain the fuel tank using a pump-type siphon. Dispose of fuel properly; recycle it according to local codes.
   D. Start the engine and run it until it stops.
   E. Choke the engine.
   F. Start and run the engine until it does not start again.
8. Thoroughly clean and service the air-cleaner assembly. Refer to Servicing the Air Cleaner (page 38).
9. Seal the air cleaner inlet and the exhaust outlet with weatherproof masking tape.
10. Check the dipstick and fuel-tank cap to ensure that they are securely in place.
11. Service the battery and cables as follows:
    A. Remove the battery terminals from the battery posts.
    B. Clean the battery, terminals and posts with a wire brush and baking soda solution.
    C. Coat the cable terminals and battery posts with Grafo 112X skin-over grease (Toro Part No. 505-47), or petroleum jelly to prevent corrosion.

D. Slowly recharge the battery for 24 hours every 60 days to prevent lead sulfation of the battery.

Note: The specific gravity of a fully charged battery is 1.250.

Note: Store the battery in a cool environment to avoid quick deterioration of the charge in the battery. To prevent the battery from freezing, make sure that it is fully charged.

Troubleshooting

Problem	Possible Cause	Corrective Action
The starter does not crank.	1. The parking brake is not set. 2. The control handles are not in the neutral-locked position. 3. The operator is not seated. 4. The battery is dead. 5. There are corroded or loose electrical connections. 6. A fuse is blown. 7. A relay or switch is worn.	1. Set the parking brake. 2. Move the control handles to the neutral-locked position. 3. Sit on the seat. 4. Charge the battery. 5. Check the electrical connections for good contact. 6. Replace the blown fuse. 7. Contact an Authorized Service Dealer.
The engine does not start, starts hard, or fails to keep running	1. The fuel tank is empty. 2. The oil level in the crankcase is low. 3. The throttle is not in the correct position. 4. There is dirt in fuel filter. 5. Dirt, water, or stale fuel is in the fuel system. 6. The air cleaner is dirty. 7. The seat switch is not functioning properly. 8. There are corroded or loose electrical connections. 9. A relay or switch is worn. 10. The spark plugs are worn. 11. A spark-plug wire is not connected.	1. Fill the fuel tank with fresh fuel. 2. Add oil to the crankcase. 3. Ensure that the throttle control is midway between the Slow and Fast positions. 4. Replace the fuel filter. 5. Contact an Authorized Service Dealer. 6. Clean or replace the air-cleaner element. 7. Check the seat-switch indicator. Replace the seat switch if needed. 8. Check the electrical connections for good contact. Clean the connector terminals thoroughly with electrical-contact cleaner, apply dielectric grease, and connect the terminals again. 9. Contact an Authorized Service Dealer. 10. Adjust or replace the spark plugs. 11. Connect the spark-plug wires.
The engine loses power.	1. The engine load is excessive. 2. The air cleaner is dirty. 3. The oil level in the crankcase is low. 4. Cooling fins and air passages above the engine are plugged. 5. There is dirt in the fuel filter. 6. Dirt, water, or stale fuel is in the fuel system.	1. Reduce the ground speed. 2. Clean the air-cleaner element. 3. Add oil to the crankcase. 4. Remove the obstruction from the cooling fins and air passages. 5. Replace the fuel filter. 6. Contact an Authorized Service Dealer.
The engine overheats.	1. The engine load is excessive. 2. The oil level in the crankcase is low. 3. The cooling fins and air passages above the engine are plugged.	1. Reduce the ground speed. 2. Add oil to the crankcase. 3. Remove the obstruction from the cooling fins and air passages.
The machine pulls to the left or the right (with the levers fully forward).	1. The tracking needs adjustment. 2. The tire pressure in the drive tires is not correct.	1. Adjust the tracking. 2. Adjust the tire pressure in the drive tires.

Problem	Possible Cause	Corrective Action
The machine does not drive.	1. One or both of the bypass valves is not closed tight.	1. Tighten the bypass valves.
	2. The drive belt is worn, loose, or broken.	2. Change the belt.
	3. The drive belt is off a pulley.	3. Change the belt.
	4. The tensioner spring is broken or missing.	4. Replace the spring.
	5. The hydraulic-fluid level is low.	5. Add hydraulic fluid to the reservoirs.
	6. The hydraulic fluid is too hot.	6. Allow the hydraulic fluid to cool down.
The machine vibrates abnormally.	1. One or several engine mounting bolts are loose.	1. Tighten the engine mounting bolts.
	2. The engine pulley or tensioner pulley is loose.	2. Tighten the appropriate pulley.
	3. The engine pulley is damaged.	3. Contact an Authorized Service Dealer.

Notes:

International Distributor List

Distributor:	Country:	Phone Number:	Distributor:	Country:	Phone Number:
Agrolanc Kft	Hungary	36 27 539 640	Maquiver S.A.	Colombia	57 1 236 4079
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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