Form No. 3427-232 Rev E

TORO®

Count on it.

Operator's Manual

MH-400SH2 Material Handler

Model No. 44931—Serial No. 403350001 and Up
Model No. 44931—Serial No. 407200000 and Up
Model No. 44954—Serial No. 403350001 and Up
Model No. 44954—Serial No. 407600000 and Up

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

CE UK CA

3427-232

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

Electromagnetic Compatibility

Domestic: This device complies with FCC Rules Part 15. Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) this device must accept any interference that may be received, including interference that may cause undesirable operation.

This equipment generates and uses radio frequency energy and if not installed and used properly, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply within the limits of a FCC Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, as stated above. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:Reorient the receiving antenna, relocate the remote control receiver with respect to the radio/TV antenna or plug the controller into a different outlet so that the controller and radio/TV are on different branch circuits.If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00345-4.

FCC ID: W7OMRF24J40MDME-Base, OA3MRF24J40MA-Hand Held

IC: 7693A-24J40MDME-Base, 7693A-24J40MA-Hand Held

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Japan Electromagnetic Compatibility Certification

Handheld: R **204-520022**

RF2CAN: R **204-520297**

Mexico Electromagnetic Compatibility Certification

Handheld: IFETEL : RCPMIMR15-2209

RF2CAN: IFETEL : RCPMIMR15-0142

Korea Electromagnetic Compatibility Certification(Decal provided in separate kit)

Handheld: MSIP-CRM-TZQ-SMHH
해당 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없음

RF2CAN: MSIP-CRM-TZQ-MRF-E
MSIP-CRM-TZQ-
해당 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없음

Singapore Electromagnetic Compatibility Certification

Handheld: TWM240007_IDA_N4021–15

RF2CAN: TWM-240005_IDA_N4024–15

Morocco Electromagnetic Compatibility Certification

AGREE PAR L'ANRT MAROC

Numero d'agrement: MR 14092 ANRT 2017

Delivre d'agrement: 29/05/2017

⚠ WARNING

CALIFORNIA
Proposition 65 Warning

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

Introduction

This machine is intended to be used by professional, hired operators in commercial applications. It is primarily designed for transporting, metering, and dispersing materials. Using this product for purposes other than its intended use could prove dangerous to you and bystanders.

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.

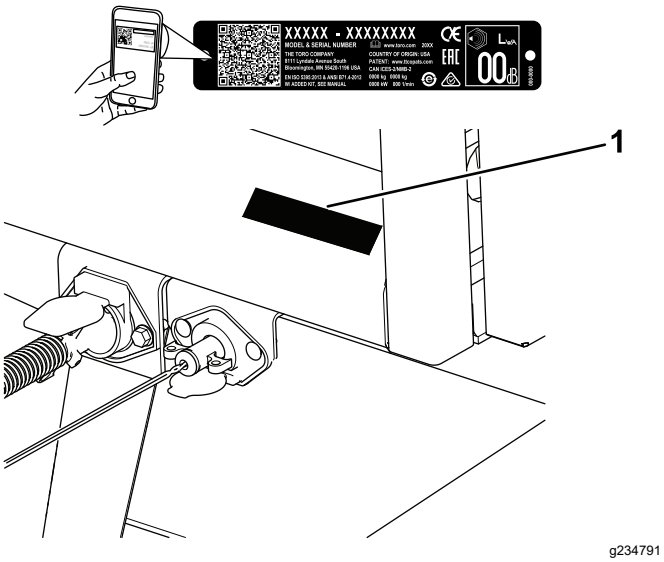
Visit www.Toro.com for product safety and operation training materials, accessory information, help finding a dealer, or to register your product.

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

Important: **With your mobile device, you can scan the QR code (if equipped) on the serial number plate to access warranty, parts, and other product information.**

8111 Lyndale Avenue South
Bloomington, MN 55420

Contact us at www.Toro.com.
Printed in the USA



g234791

Figure 1

1. Model and serial number location

Model No. _____

Serial No. _____

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

g000502

Figure 2

1. Safety-alert symbol

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

Contents

Safety

General Safety

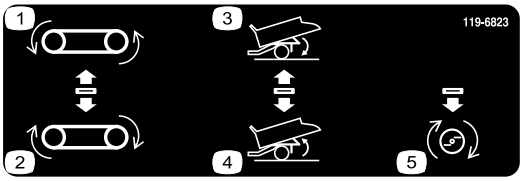
This product is capable of causing personal injury. Always follow all safety instructions to avoid serious personal injury.

- Read and understand the contents of this *Operator's Manual* before using this machine. Ensure that everyone using this product knows how to use it and understands the warnings.
- Do not put your hands or feet near moving components of the machine.
- Do not operate the machine without all guards and other safety protective devices in place and working on the machine.
- Keep the machine away from bystanders while it is moving.
- Keep children out of the operating area. Never allow children to operate the machine.
- Park the machine on a level surface; engage the parking brake; shut off the traction-unit engine; remove the key; and wait for all movement to stop before servicing or unclogging the machine.

Improperly using or maintaining this 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 these instructions may result in personal injury or death.

Safety and Instructional Decals

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



decal119-6823

119-6823

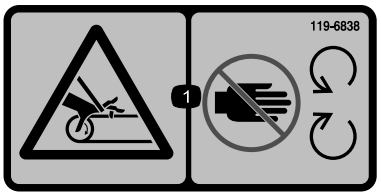
SH models only

1. Reverse conveyor belt
2. Advance conveyor belt
3. Lower hopper
4. Raise hopper
5. Option on

decal93-9899

93-9899

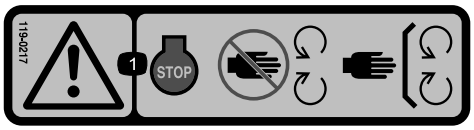
1. Crushing hazard—install the cylinder lock.



decal119-6838

119-6838

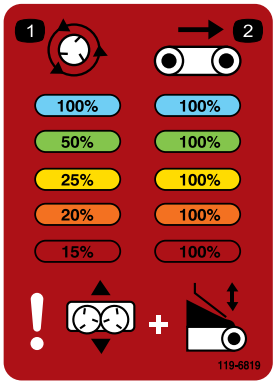
1. Entanglement hazard, belt—stay away from moving parts, keep all guards and shields in place.



decal119-0217

119-0217

1. Warning—shut off the engine; stay away from moving parts; keep all guards and shields in place.



decal119-6819

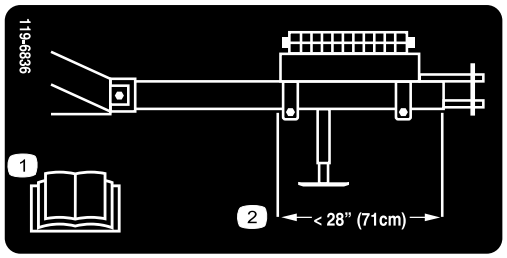
119-6819

1. Spinner speed percentage 2. Belt speed percentage

decal93-9852

93-9852

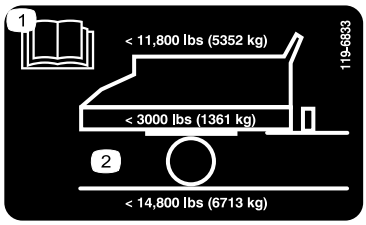
1. Warning—read the *Operator's Manual.*
2. Crushing hazard—install the cylinder lock.



decal119-6836

119-6836

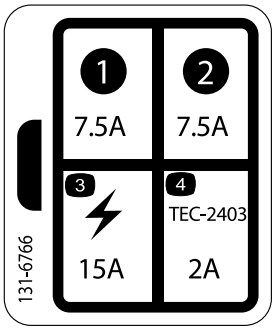
1. Read the *Operator's Manual.*
2. Locate weight so that rear of the weight case is 28 in (71 cm) from the front face of hitch tube.



decal119-6833

119-6833

1. Read the *Operator's Manual.*
2. Maximum load weight 11,800 lb (5.352 kg); vehicle weight 3,000 lb (1,361 kg), Maximum gross vehicle weight 14,800 lb (6,713 kg)



decal131-6766

131-6766

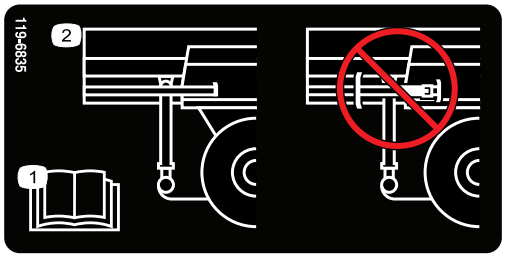
Model 44954 Only

1. 7.5A
2. 7.5A
3. Electrical accessory—15A
4. TEC-2403—2A

decal119-6806

119-6806

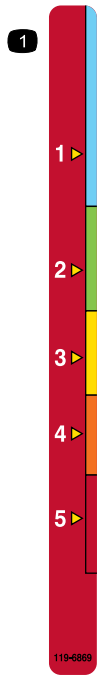
1. Warning—read the *Operator's Manual*.
2. Warning—all operators should be trained before operating the machine.
3. Thrown object hazard—keep bystanders away.
4. Warning—shut off the engine, remove the key, and read the *Operator's Manual* before performing maintenance.
5. Warning—do not carry passengers.
6. Warning—stay away from moving parts; keep all guards and shields in place.



decal119-6835

119-6835

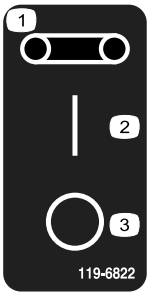
1. Read the *Operator's Manual.*
2. Do not store the jack on rear leg.



decal119-6869

119-6869

1. Tailgate height adjustment

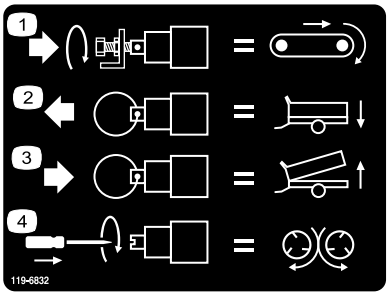


decal119-6822

119-6822

Model 44931 Only

1. Belt
2. On
3. Off

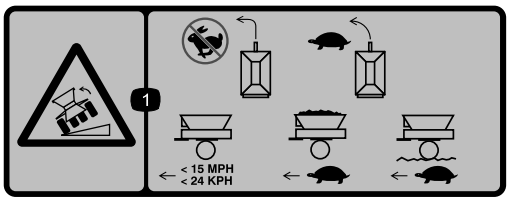


decal119-6832

119-6832

Model 44954 Only

1. Adjust floor speed
2. Lower the hopper
3. Raise the hopper
4. Adjust spinner speed



decal119-6812

119-6812

1. Tipping hazard—do not turn fast; turn slowly; when the hopper is empty, do not go faster than 15 mph (24 kph); when the hopper is loaded, move slowly; when moving over rough terrain, move slowly.

decal119-6863

119-6863

1. Tow a full hopper in the lowered position; do not tow a lowered hopper with the spinner attached in the lowered position.
2. Tow the full hopper in the middle position with the spinner attached and active.
3. Tow an empty hopper in the raised position; tow an empty hopper with a spinner attached in the raised position; do not tow a full hopper in the raised position; do not tow a full hopper with the spinner attached in the raised position.

decal133-8061

133-8061

Setup

Loose Parts

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

Procedure	Description	Qty.	Use
1	Bolt, 1 x 6-1/2 inches Locknut, 1 inch	2 2	Install the hitch
2	No parts required	–	Install the weight case.
3	No parts required	–	Adjust the mirror.
4	Foot controller Brake controller Harness assembly Socket bracket Screw, 5/16 x 1 inch Nut, 5/16 inch Wire splices Cable tie Bolt, #10 x 7/8 inch Nut, #10 Hose clamp Fuse (15 A)	1 1 1 1 4 4 6 10 2 2 1 1	Wire and Install to the traction unit.
5	Mounting bracket assembly Backing plate Flange head bolt, 5/16 x 1-1/2 inch Flange head locknut, 5/16	1 1 4 4	Install the EH wireless control mounting bracket on the traction unit (Model 44954 only).
6	Pendant switch SH wire harness	1 1	Install the pendant switch.
7	Handheld remote AA batteries Magnetic bracket Screws, small	1 4 1 6	Assemble the handheld remote.
8	No parts required	–	Attach the hydraulics to the traction unit.
9	7-pin coiled power cable	1	Connect the 7-pin coiled power cable.
10	No parts required	–	Set the electric brake adjustments.
11	Quick attach mounting clamp	2	Assemble an optional attachment to the machine.

Media and Additional Parts

Description	Qty.	Use
Operator's Manual	1	Read the manual before operating the machine.
Declaration of Conformity	1	The Declaration of Conformity serves as EU proof of certification.
Attachment clamps	2	Use to mount attachments.

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

1

Installing the Hitch

Parts needed for this procedure:

2	Bolt, 1 x 6-1/2 inches
2	Locknut, 1 inch

Procedure

1. Locate and remove the loose parts box shipped on the fender.
2. Remove the rear jack leg from the stowed position and assemble the jack leg in the vertical position; refer to Supporting the Machine with the Rear-Jack Leg (page 25).
3. Remove the hitch from the shipping position by cutting both straps securing the hitch to the fender (Figure 3). Remove both mounting brackets from the fender and discard.

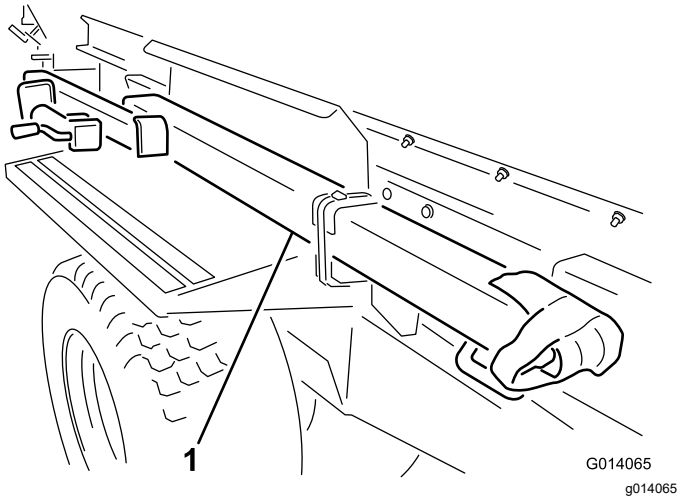


Figure 3

1. Remove hitch from shipping position

Note: Use 2 people to remove the hitch assembly.

4. Slide the hitch tube tongue into place at the front of the machine. Ensure that the jack mounting bracket faces out toward the left side.
5. Place a bolt (1 x 6-1/2 inches) through the frame and hitch tube and secure it with a locknut (Figure 4). Torque the locknut to 976 to 1,193 N-m (720 to 880 ft-lb).
6. Place a bolt (1 x 6-1/2 inches) through the top of the frame and down through the hitch tube and secure it with a locknut (Figure 4). Torque the locknut to 976 to 1,193 N-m (720 to 880 ft-lb).

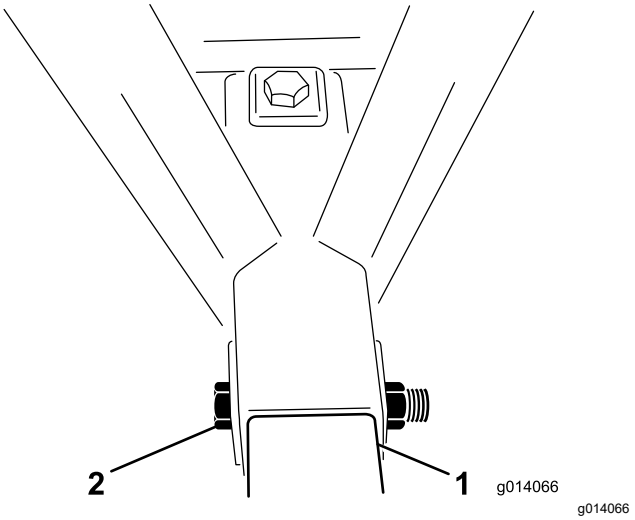


Figure 4

1. Hitch tube
2. Mounting bolt and nut

7. Remove the jack from the rear-jack leg and install the jack onto the hitch tube; refer to Supporting the Front of the Machine with the Jack (page 27).

Note: Do not insert the pin through the vertical hole of the jack, or you will not be able to remove the pin when the weight case is installed.

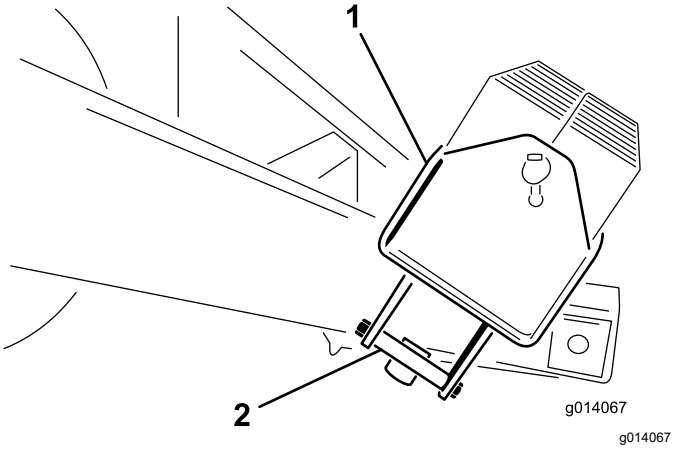
2

Installing the Weight Case

No Parts Required

Procedure

1. Remove the weights from the weight case.
2. Remove the bolts (1/2 x 5-1/2 inches) from the mounting bracket holding the weight case. Discard the mounting brackets (Figure 5).

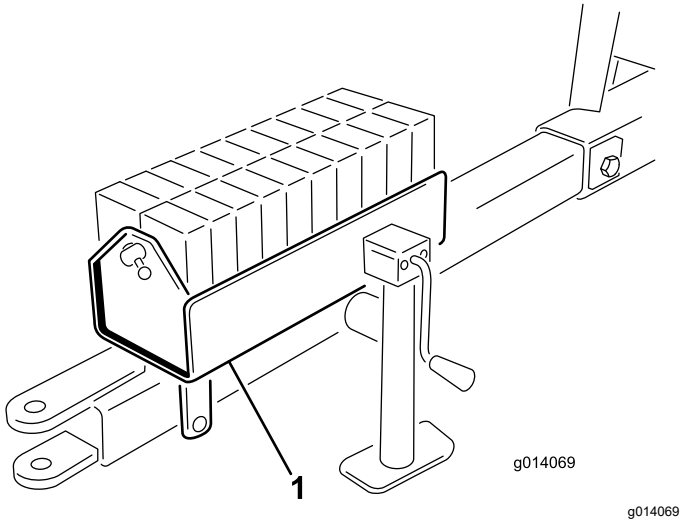


g014067

Figure 5

1. Weight case
2. Weight case mounting bracket

3. Position the weight case on the hitch, as far forward as possible.
4. Mount the weight case to the hitch with 2 bolts (1/2 x 5-1/2 inches) and locknuts. Torque the locknuts to 91 to 112 N-m (67 to 83 ft-lb).
5. Fill the weight case with the weights and install the bar and pin (Figure 6).



g014069

Figure 6

1. Fill weight case

3

Adjusting the Mirror

No Parts Required

Procedure

The mirror mounted on the front of the hopper allows you to monitor the load and the spreading action. Check the mirror frequently to monitor the operation of the machine.

Adjust the mirror (Figure 7) so that you can view the inside of the hopper from the operator position.

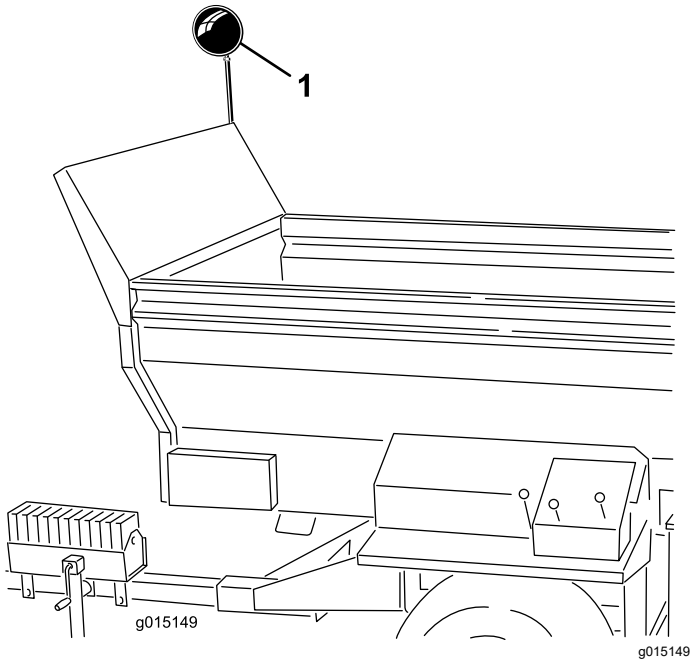


Figure 7

1. Mirror

4

Wiring and Installing to the Traction Unit

Parts needed for this procedure:

1	Foot controller
1	Brake controller
1	Harness assembly
1	Socket bracket
4	Screw, 5/16 x 1 inch
4	Nut, 5/16 inch
6	Wire splices
10	Cable tie
2	Bolt, #10 x 7/8 inch
2	Nut, #10
1	Hose clamp
1	Fuse (15 A)

Selecting a Traction Unit

Select a traction unit that meets the specifications and traction unit recommendations; refer to Specifications (page 20) and Selecting a Traction Unit (page 21).

Installing the Brake Controller

Outcross Traction Units

1. Mount the brake controller (Figure 8) to the lower left area of the dashboard with the 2 bolts (#10 x 7/8 inch) and nuts (#10).

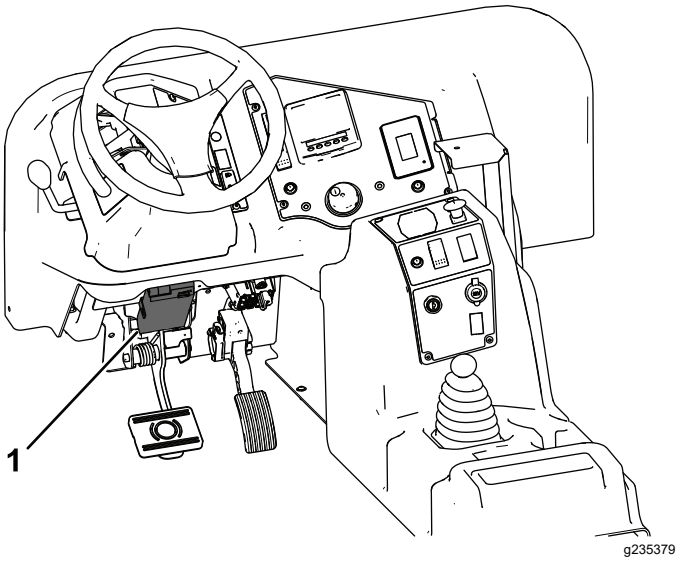


Figure 8

1. Brake controller

2. Connect the Outcross wire harness connector to the brake controller connector.

   Refer to the Outcross traction unit *Operator's Manual* for additional mounting and operating instructions.

Installing the Brake Controller

Tractor Type Traction Units

Mount the brake controller to the dash or the fender of the tractor with the 2 bolts (#10 x 7/8 inch) and nuts (#10).

Installing the Wire Harness and Brake Controller

Note: Lay out the harness on the traction unit to determine the mounting locations of the harness components. Use cable ties to bundle surplus cable lengths. Also, use the wire splices when altering the harness length (shortened or lengthened). Heat the shrink the connectors until they are tight to the wires.

Important: **If you add wire to the harness, ensure to use the proper gauge wire.**

1. Mount the socket bracket to the rear of the traction unit with 2 bolts (5/16 x 1 inch) and nuts.
2. Route the wire harness connector through the hole to the socket.

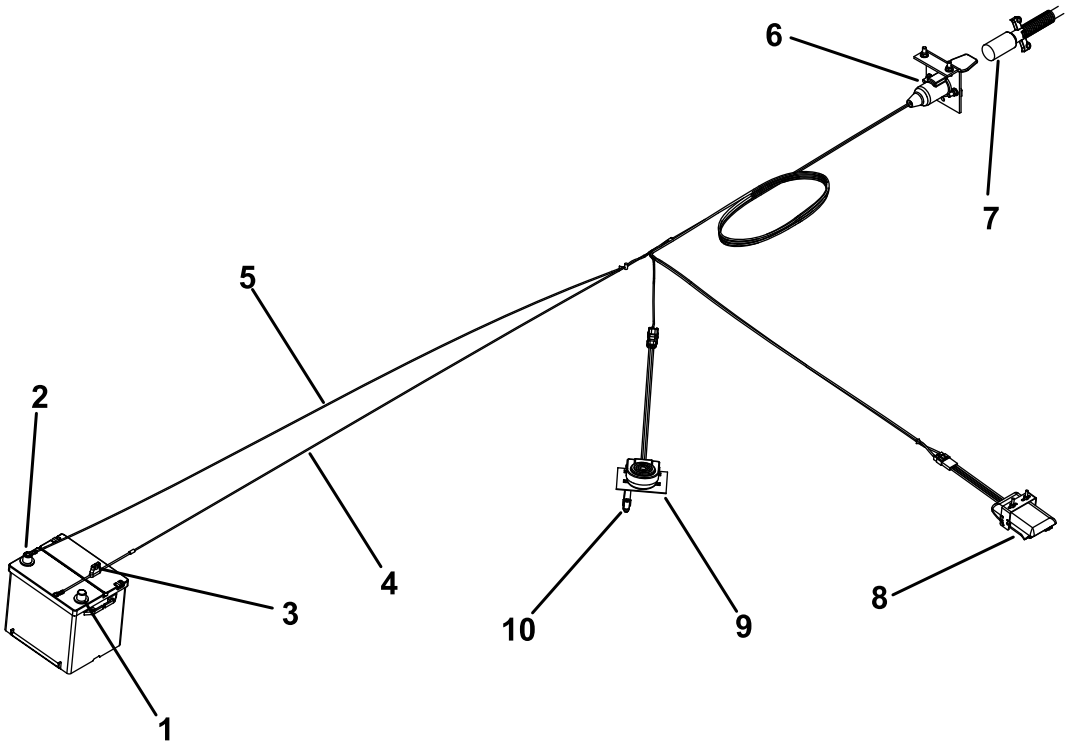
If the connector does not go through the hole, slide the boot down the harness.

3. Bolt the wire harness, with the socket connector, to the rear of the socket bracket with 2 bolts (5/16 x 1 inch) and nuts.
4. Route the harness along the traction unit.
5. Use the hose clamp to secure the foot controller to the pad on the brake pedal.
6. Connect the harness to the components (Figure 9) as follows:
   A. Plug the shorter wire from the harness into the foot controller wire connector.
   B. Connect the longer wire from the harness to the brake controller wire connector.
   C. Select one of the following procedures when connecting the ring terminal wire **(with the fuse)** to a positive electrical source:
      - To have the brake controller powered only when the traction unit is powered on, attach the ring terminal wire, **with the fuse,** to an open auxiliary-power source that has a rating of 15A or more.

        Use a 10A fuse for a 2 wheel brake system and a 15A fuse for a 4 wheel brake system.

        Note: You may need to remove the ring terminal and install a different terminal type to match the auxiliary power source connection.
      - To have the brake controller always powered, attach the ring terminal wire, **with the fuse**, to the positive battery terminal.

        Note: If you store the traction unit for an extended period, remove the fuse from the brake controller wire harness or disconnect the wire harness from the brake controller. This prevents the battery from discharging
   D. Connect the other ring terminal wire, **without the fuse**, to the negative (-) battery terminal.



g021113

Figure 9

1. Positive battery terminal (+)
2. Negative battery terminal (-)
3. Fuse
4. Wire harness (+)
5. Wire harness (–)
6. Socket connector
7. Power cable
8. Brake controller
9. Foot controller
10. Hose clamp

7. Secure the rubber boot to the connector and to the wire harness with a cable tie.
8. Secure all loose harness wires with cable ties.
9. If you are using a 4 wheel brake kit, remove the 10 amp fuse from the fuse holder and insert the 15 amp fuse.

5

Installing the EH Wireless Control Mounting Bracket on the Traction Unit

Model 44954 Only

Parts needed for this procedure:

1	Mounting bracket assembly
1	Backing plate
4	Flange head bolt, 5/16 x 1-1/2 inch
4	Flange head locknut, 5/16

Procedure

1. For traction unit mounting, determine an appropriate location for the handheld remote mounting bracket. The surface should be flat and solid.
2. Using the backing plate as a template, locate, mark, and drill 4 holes (11/32 inch diameter) in the traction unit mounting surface.
3. Attach the mounting bracket and backing plate with 4 flange head bolts (5/16 x 1-1/2 inches) and flange locknuts (Figure 10 and Figure 11).

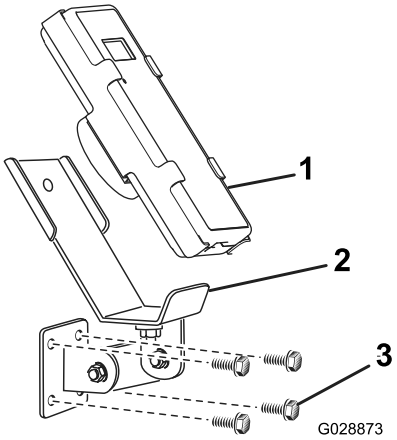


Figure 10

1. Handheld remote
2. EH handheld remote mount
3. Mounting bolts

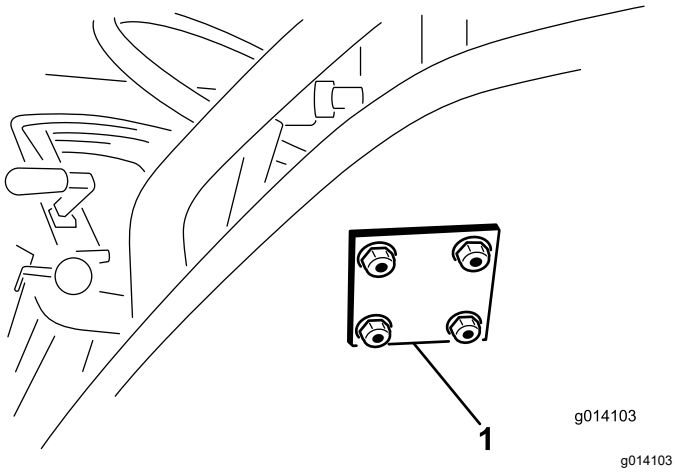


Figure 11

1. EH handheld remote backing plate

Note: The wireless remote magnet can stick to any metal component.

6

Installing the Pendant Switch

SH Models

Parts needed for this procedure:

1	Pendant switch
1	SH wire harness

Procedure

Plug the on/off pendant switch (4 prong end) into the socket at the front left corner of the machine (Figure 12).

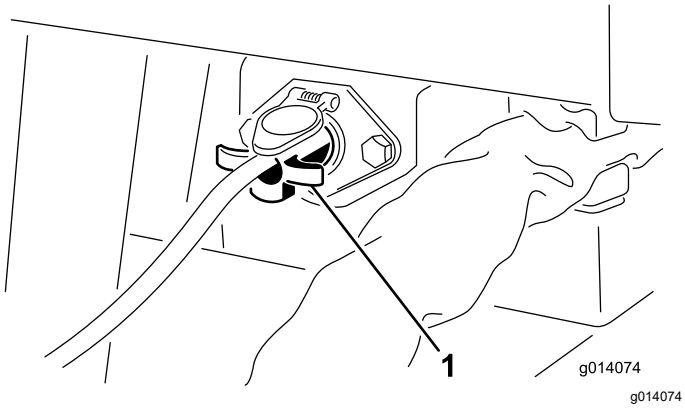


Figure 12

1. On/off pendant switch

Important: **Always unplug the pendant switch cord or disconnect the power-supply wire when the machine and traction unit are not used—otherwise the battery of the traction unit loses power.**

7

Assembling the Handheld Remote

EH Models

Parts needed for this procedure:

1	Handheld remote
4	AA batteries
1	Magnetic bracket
6	Screws, small

Procedure

1. Remove the rubber bands securing the remote halves together, and remove the back cover.
2. Plug each battery into a terminal cradle observing proper polarity. (If the batteries are improperly installed, the unit will not be damaged, but it will fail to operate.) The cradle is embossed with polarity markings for each terminal (Figure 13).

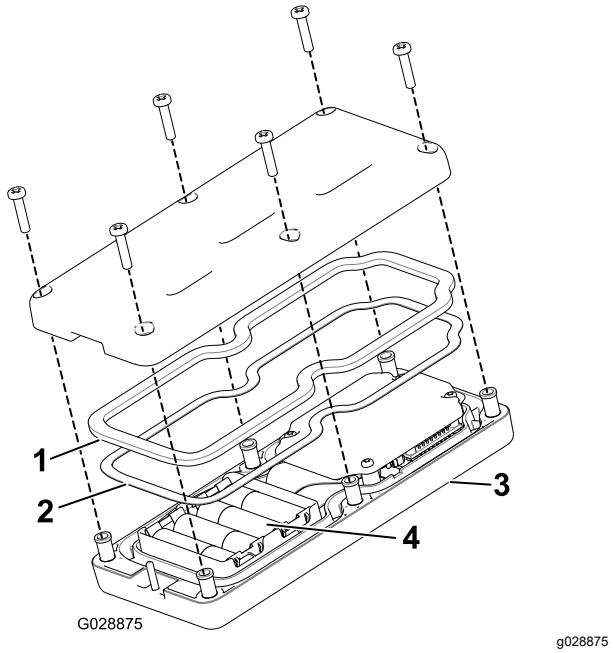


Figure 13

1. Rubber seal
2. Steel gasket
3. Handheld remote
4. 4 AA batteries

3. Ensure that the steel gasket and rubber seal are seated in the channel in the remote and set the back cover in place (Figure 13).

4. Secure the cover with 6 screws (Figure 13) and torque them to 1.5 to 1.7 N-m (13 to 15 in-lb).
5. Install the handheld remote into the magnetic remote bracket, slide the halves together to secure the remote, and tighten the bolt in the magnet (Figure 14).

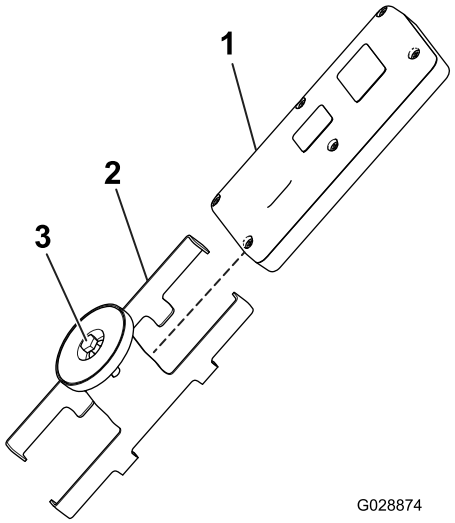


Figure 14

1. Handheld remote
2. Magnetic remote bracket
3. Bolt in the magnet

8

Attaching the Hydraulics to the Traction Unit

No Parts Required

Procedure

Attach the hydraulic hoses; refer to Connecting the Machine to the Traction Unit (page 21)

9

Connecting the 7-pin Coiled Power Cable

Parts needed for this procedure:

1	7-pin coiled power cable

Procedure

Connect the 7-pin coiled power cable; refer to Connecting the Machine to the Traction Unit (page 21).

10

Setting the Electric Brake Adjustments

No Parts Required

Procedure

Adjust the brake controller; refer to Adjusting the Brake Controller (page 22).

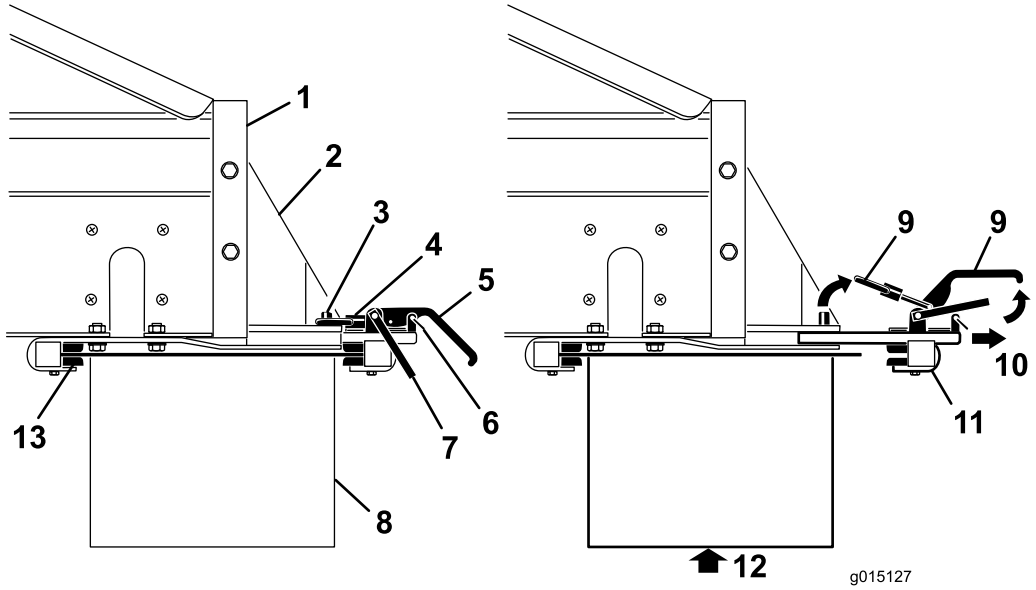
11

Assembling an Optional Attachment to the Machine

Parts needed for this procedure:

2	Quick attach mounting clamp

Procedure



g015127

Figure 15

1. Rear of the machine
2. Option attachment bracket
3. Lock pin
4. Lock ring
5. Clamp handle
6. Safety latch clip
7. Safety latch
8. Option
9. Lift
10. Pull
11. Rear clamp assembly
12. Support the option before removing the clamps
13. Front clamp brackets

Important: **The option attachments are heavy. Use an assistant to help lift them.**

Note: The machine comes equipped with 2 quick attach mounting clamps. Use these clamps to mount the optional accessory to the machine.

1. Remove the safety latch clips from the clamp handles (Figure 15).
2. Lift the safety latch, then lift the option attachment clamp handles, and release the lock rings from the lock pins (Figure 15).
3. Slide the rear option attachment clamp assembly out of the quick-attach slots (Figure 15).
4. With assistance, insert the front edge of the option attachment up and under the rear of the machine into the front clamps on the brackets (Figure 15).
5. While supporting the option attachment, slide the rear option attachment clamp assembly back into the slots in the brackets, and over the rear edge (Figure 15).
6. Ensure that the option attachment is centered between the brackets. Then assemble the lock rings over the lock pins and push down on the clamp handles.

Note: If the clamp assembly is too loose and the option attachment slides within the clamps, turn the lock rings into the clamps a few turns until the option attachment is secure.

Important: **Do not over-tighten the clamps. This may bend the edges of the option.**

7. Install the safety latch clips to the clamp handles (Figure 15).

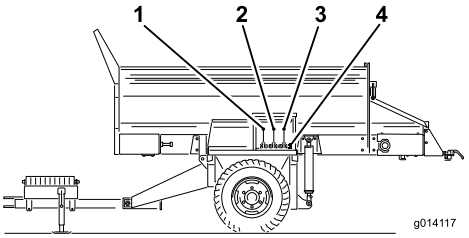
Important: **Ensure that you reinstall the safety latch clips into the clamps. Otherwise, the clamps may open during operation.**

Product Overview

Controls

Hydraulic Control Valves

SH Models



g014117

Figure 16

1. Conveyor belt direction (left control valve)
2. Raise and lower machine (center control valve)
3. Options on and off (right control valve)
4. Option hydraulic quick connectors

Left Valve

The left valve controls the machine conveyor belt direction (Figure 16).

Center Valve

The center valve raises and lowers the machine (Figure 16).

Right Valve

The right valve controls the option (Figure 16).

Option Hydraulic Quick Connectors

Connect the option hydraulic here (Figure 16).

E-Stop Button

EH Models

When finished working with the machine, always press the E-STOP button (Figure 17) to disable the electrical system. When beginning work with the machine you must pull the E-STOP button back out before turning on the handheld remote.

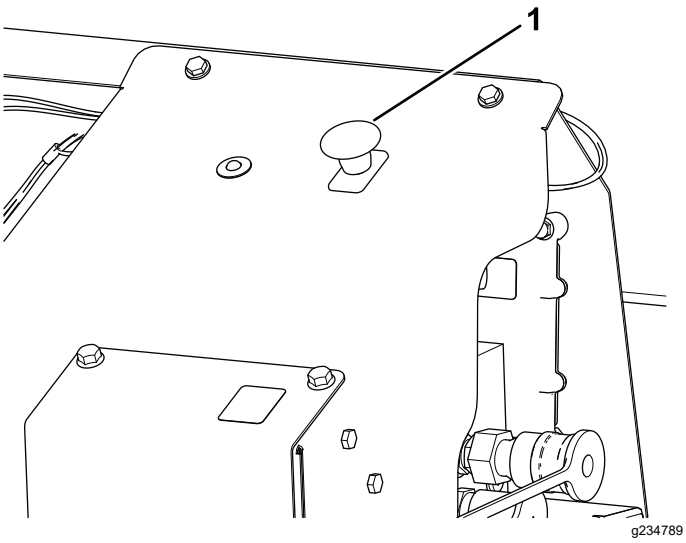


Figure 17

1. E-STOP Button

Diagnostic LED Function

EH Models

After you pull up the E-STOP button, the diagnostic LED (Figure 18) illuminates and remains on for 5 seconds, turn off for 5 seconds, and then begins flashing at 3 Hz (3 flashes a second) until you turn on the handheld remote. If the light turns on for 5 seconds and then starts blinking at 10 Hz (with or without a 5 second pause), there is a fault with the machine; refer to Checking Fault Codes (page 54).

Note: If you had the handheld remote on when you pulled up the E-STOP button, the light will not flash at 3 Hz (3 flashes per second) after turning off for 5 seconds.

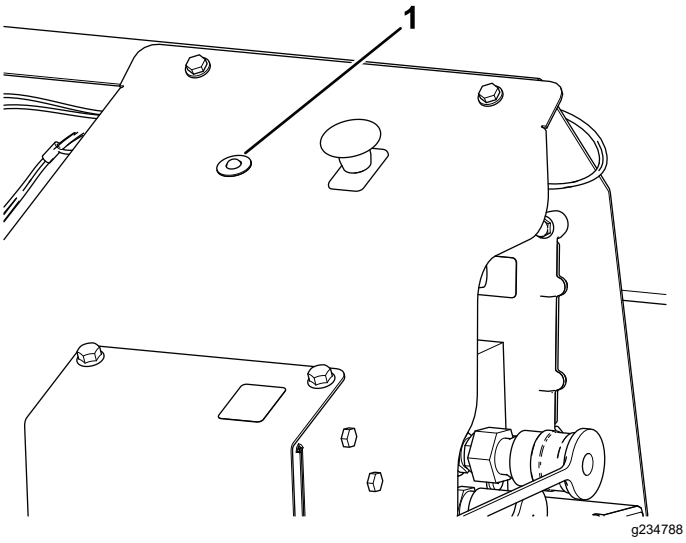


Figure 18

1. Diagnostic LED

Handheld Remote

EH Models

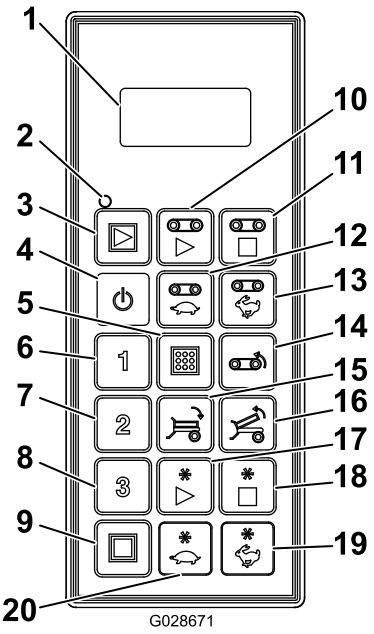


Figure 19

1. LCD display
2. Remote status LED
3. All start: starts floor and option
4. On/Off
5. Store: saves preset settings
6. Preset 1
7. Preset 2
8. Preset 3
9. All stop: stops all functions
10. Floor start
11. Floor stop
12. Decrease floor speed
13. Increase floor speed
14. Floor reverse
15. Tilt bed down
16. Tilt bed up
17. Option start
18. Option stop
19. Increase option speed
20. Decrease option speed

Specifications

Machine

Length	4.8 m (190 inches)
Width	1.98 m (78 inches)
Height	2.2 m (86 inches)
Net weight (empty with no options installed)	1,360 kg (3,000 lb)
Hopper volume	3.06 m^3 (4.0 yd^3)
Maximum material load	5,353 kg (11,800 lb)
Maximum tow speed (without a load)	24 km/h (15 mph)
Maximum tow speed (without a full)	13 km/h (8 mph)

Traction Unit Requirements

Towing capacity (maximum payload)		7,175 kg (15,850 lb)
Minimum power		34 kw (45 horsepower)
Rear-attachment hydraulic system		Open center hydraulic control valve
Hydraulic-flow rate	minimum—without options installed	32 L/min (6 US gal/min)
	minimum—with options installed	38 L/min (10 US gal/min)
Hydraulic pressure (minimum)		138 bar (2,000 psi)

Radio

Frequency	2.4 GHz
Max Output Power	19.59 dBm

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 authorized Toro distributor or go to www.Toro.com for a list of all approved attachments and accessories.

To ensure optimum performance and continued safety certification of the machine, use only genuine Toro replacement parts and accessories. Replacement parts and accessories made by other manufacturers could be dangerous, and such use could void the product warranty.

Operation

Before Operation

Before Operation Safety

- The machine has different balance, weight, and handling characteristics compared to some other types of towed equipment. Read and understand the contents of this *Operator's Manual* before operating the machine. Become familiar with all controls and know how to stop quickly.
- Never allow children to operate the machine. Do not allow adults to operate the machine without proper instructions. Only trained and authorized persons should operate this machine.
- Keep all shields and safety devices in place. If a shield, safety device or decal is illegible or missing, repair or replace it before operating the machine.
- The machine is designed only for off-road use. The maximum recommended speed is 24 km/h (15 mph) without a load and 13 km/h (8 mph) with a full load.
- Tighten any loose nuts, bolts, and screws to ensure that the machine is in safe operating condition. Ensure that the machine tongue mounting pins, hitch pins, and tongue jack are in place and secure.
- Do not modify this equipment in any manner.
- The tongue is the area on the machine where the hitch connects to the tow vehicle. The weight of the tongue affects the stability of the machine.
  - A negative or positive tongue weight can cause injury when connecting or disconnecting the machine to the tow vehicle. When installed, ensure that the jack-stands are properly engaged.
  - When the weight of the tongue is forced up into the hitch of the tow vehicle, this produces a negative tongue weight.

    Negative tongue weight may also result when attachments are mounted on the rear of the machine.
  - When the weight of the tongue is forced down onto the hitch of the tow vehicle, this produces a positive tongue weight.
- Never attach the machine to or remove the machine from the traction unit if there is material in the hopper. The tongue may flip up, causing injury.

Selecting a Traction Unit

The capabilities of the machine may vary depending on the size and type of traction unit.

Traction Unit Function	Requirements and Recommendations
Hydraulic system	The traction unit must have a rear-attachment hydraulic system with an open center auxiliary hydraulic valve.
	For best results, use a traction unit with a fixed displacement hydraulic pump with a power output of 138 bar @ 38 L/min (2,000 psi @ 10 gal/min). Performance will be reduced if the pump output is less.
Engine power	For best results, use a traction unit with at least 45 hp and 4-wheel drive. A traction unit with less than 45 hp will limit where you can go and how much payload you can deliver. For example, a 27 hp traction unit can tow a fully loaded machine over flat terrain, but not on steep hills.
Traction system	A 4-wheel-drive vehicle improves performance on hills.
Towing capacity	When fully loaded, the machine can weigh up to 7,000 kg (15,432 lb). Do not go beyond the limitations of the traction unit.
	The traction unit must have an adequate hitch and functional brakes.
	Ensure that the traction unit has enough power and traction to pull a full load. If not, reduce the load size.
	With a smaller traction unit, you may need to reduce the payload to 2 m3 (2.6 yd3) of material when spreading in difficult terrain. Another option is to tow a fully loaded machine to a spot near the job and then load smaller machines from the machine to complete the job.

Connecting the Machine to the Traction Unit

1. Chock front and back of the tires.
2. Adjust the hitch height by turning the jack handle; keep the machine level.

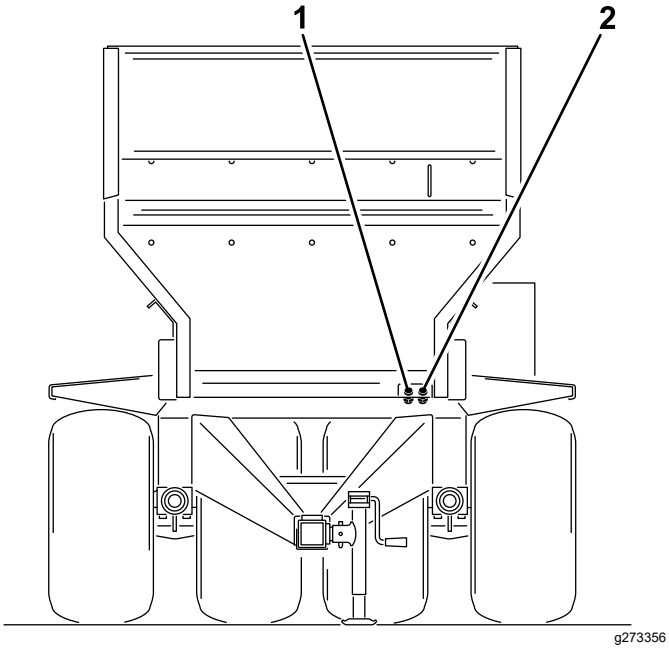
   Important: **To balance the tongue weight, raise or lower the rear of the machine by 10 to 15 cm (4 to 6 inches). Raising the machine increases the risk of tipping.**
3. Connect the hitch of the machine to the draw bar of the traction unit using a 25 mm (1 inch) diameter safety approved hitch pin and safety clip (not supplied).
4. Slowly raise the jack.
5. When the full tongue weight of the machine has transferred the draw bar of the traction unit, stow the jack; refer to Stowing the Jack (page 27).
6. Stow the rear-jack leg; refer to Stowing the Rear-Jack Leg (page 26)
7. Route the 2 hydraulic hoses from the machine to the traction unit.

   Important: **Do not allow the hydraulic hoses to drag on the ground when operating the machine. Avoid locations where they could become pinched or cut.**
8. Connect the 2 hydraulic hoses to the traction unit quick-connect fittings (Figure 20).

   Facing the front of the machine, connect the left hose to the pressure side and the right hose to the return side.

   Important: **The return hose has an in-line one-way check valve. The arrow on the check valve should face the traction unit return connector.**

   Note: You may need to relieve the pressure in the hydraulic hoses of the machine connecting them to the traction unit.



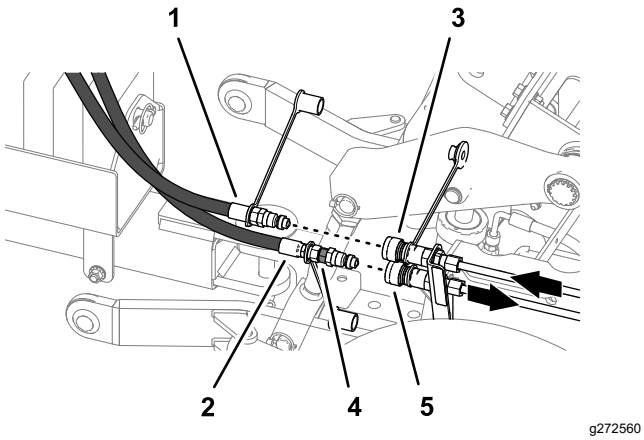


Figure 20

1. Return Hose (Out)
2. Pressure hose (In)
3. Quick-disconnect coupling—traction unit (example—pressure)
4. Check valve
5. Quick-disconnect coupling—traction unit (example—return)

9. On SH models place the on/off pendant within reach of the driver's seat. Ensure that the switch is off.
10. Connect the 7-pin coiled power cable to the socket on the machine and the traction unit (Figure 21).

   Important: **Do not allow the power cable to drag on the ground when operating the machine. Avoid locations where it could become pinched or cut.**

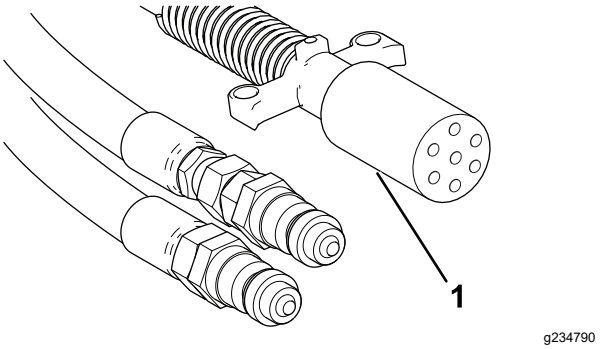


Figure 21

1. 7-pin coiled power cable

11. Test the hydraulic connections; refer to Testing the Hydraulic Connections (page 22).
12. Set the electric brake, refer to Adjusting the Brake Controller (page 22).

Testing the Hydraulic Connections

Important: **Test the hydraulic connections before hydraulics operating the machine for the first time.**

1. Check the hydraulic-fluid level in the reservoir of the traction unit and add fluid if needed; refer to the traction unit operator's manual.
2. Start the traction unit and operate the conveyor belt; refer to Turning the Machine Power On/Off (page 28) and Operating the Hydraulic Control Valves (page 29).

   Important: **If you hear a noise from the traction unit hydraulic system and the machine controls, immediately return the hydraulic controls to the Neutral position.**
3. If the conveyor belt does not function, perform one of the following:
   - Operate the machine by moving the handle for the rear-attachment hydraulic valve the other direction.
   - Shut off the engine, bleed the hydraulic pressure, and swap the hoses at the quick-disconnect fittings.

Adjusting the Brake Controller

When first set-up, the brake controller will seldom have the correct amperage flow to the brake magnets to provide comfortable, safe braking. Changing load weight, as well as uneven alternator and battery output, can also result in unstable current flow to the brake magnets.

Important: **Before operating the machine for the first time, set the electric brakes of the machine to the traction-unit brakes (synchronized—so that they operate at the same time).**

1. Read and understand the information in the installation and operating instructions of the brake controller.
2. Set up the brake controller; refer to the installation and operating instructions of the brake controller.

Before Operations Checks

Complete these checks daily before operating the machine. Report any safety problems to your supervisor. See the Safety Instructions in this manual for details.

- Check the tires and wheels; refer to Checking the Tire and Wheels (page 44).
- Check that the rear-jack leg is stowed and the jack is stowed to the hitch tube; refer to Stowing the Rear-Jack Leg (page 26) and Stowing the Jack (page 27).
- Check that the hitch pin and jacks are not damaged, and the safety pins are installed.

  Replace missing or damaged safety pins.
- Check the rear gate for wear, damage, and is secure; refer to Checking the Rear Gate (page 52) and Checking the Conveyor Seals and Rear Gate Seal (page 52)
- Check the optional attachments for wear, damage, and are secure; refer to Checking the Optional Attachments (page 48)

During Operation

During Operation Safety

- The owner/operator can prevent and is responsible for accidents that may cause personal injury or property damage.
- Do not operate the machine when tired, ill, or under the influence of alcohol or drugs.
- Use your full attention while operating the machine. Do not engage in any activity that causes distractions; otherwise, injury or property damage may occur.
- Wear appropriate clothing, including eye protection; long pants; substantial, slip-resistant footwear; and hearing protection. Tie back long hair and do not wear loose clothing or loose jewelry.
- Never carry passengers on the machine and keep bystanders and pets away from the machine during operation.
- Keep your hands and feet out of the hopper while the machine is operating, or while the engine is running on the tow vehicle.
- Remain seated whenever the tow vehicle is in motion.
- Using the machine demands attention. Failing to operate tow vehicle safely may result in an accident, tip-over of the tow vehicle, and serious injury or death. Drive carefully, and to prevent tipping or loss of control, do the following:
  - Use extreme caution, reduce the speed, and maintain a safe distance (twice the width of the machine) around sand traps, ditches, water hazards, ramps, unfamiliar areas, or other hazards.
  - Reduce the speed of a loaded machine when negotiating terrain undulations to avoid causing the machine to become unstable.
  - Watch for holes or other hidden hazards.
  - Use caution when operating on a slope. Travel straight up and down slopes. Reduce speed when making sharp turns or when turning on hillsides. Avoid turning on hillsides whenever possible.
  - Use extra caution when operating on wet surfaces, at higher speeds or with a full load. Stopping time increases with a full load. Shift into a lower gear before starting up or down a hill.
  - Avoid sudden stops and starts. Do not go from reverse to forward or forward to reverse without coming to a complete stop.
  - Do not attempt sharp turns or abrupt maneuvers or other unsafe driving actions that may cause a loss of control.
  - Be aware of your surroundings when turning or backing up the machine. Ensure that the area is clear and keep all bystanders out of the operating area. Proceed slowly.
  - Always watch out for and avoid low overhangs such as tree limbs, door jambs, overhead walkways, etc. Ensure that there is enough room over head to easily clear the tow vehicle and your head.
  - Do not operate the machine when there is the risk of lightning.
  - If you are ever unsure about safe operation, stop working and ask your supervisor.
  - Do not leave the machine unattended while it is running.
- Ensure that the machine is connected to the tow vehicle before loading.
- Do not carry loads that exceed the load limits of the machine or the tow vehicle.
- The stability of loads can vary—for example, high loads have a higher center of gravity. Reduce the

maximum load limits to ensure better stability, if necessary.

- To avoid causing the machine to tip over, do the following:
  - Carefully monitor the height and weight of the load. Higher and heavier loads can increase the risk of tipping.
  - Distribute the load evenly, from front to back and side to side.
  - Be careful when turning and avoid unsafe maneuvers.
  - Always ensure that the machine is connected to the tow vehicle before loading.
  - Do not put large or heavy objects into the hopper. This could damage the belt and rollers. Also ensure that the load has a uniform texture. Small rocks in the sand can become projectiles.
- Do not stand behind the machine when unloading or spreading. The optional twin spinner, cross conveyor, and processor can eject particles and dust at a high speed.
- Unload the machine or disconnect it from the tow vehicle while on a level surface.
- Ensure that the machine is connected to the tow vehicle before unloading.
- Do not travel with the machine in the fully raised position. This increases the risk of tipping over the machine.
- The machine has a safe range for traveling with attachments as shown by the green section in the decal.
- Do not travel with the machine in the caution range (yellow/black). When there are no attachments on the machine, travel with the machine in the lowered position.
- Shut off the machine when approaching people, vehicles, vehicle crossings, or pedestrian crossings.
- Do not operate the machine with the weight case removed or out of position.
- When equipped, hydraulic trailer brakes may overheat the fluid in the hydraulic circuit if the brakes remain activated continuously. Always use a lower speed gear selection when descending long hills. Activate the brakes intermittently to allow for cooling cycles for both the vehicle and the topdresser.

Slope Safety

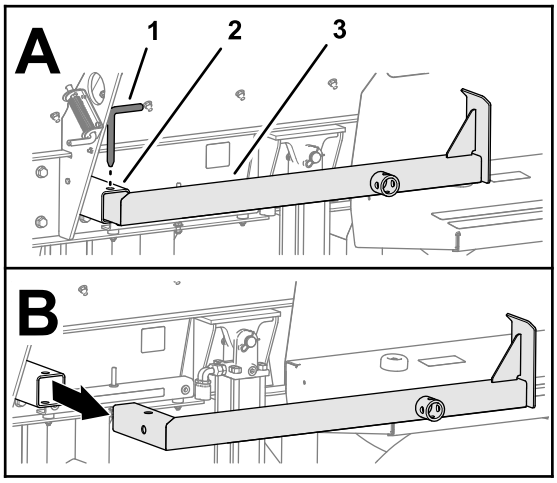
- Slopes are a major factor related to loss of control and rollover accidents, which can result in severe injury or death. You are responsible for safe slope operation. Operating the machine on any slope requires extra caution. Before using the machine on a slope, do the following:
- Evaluate the site conditions to determine if the slope is safe for machine operation, including surveying the site. Always use common sense and good judgment when performing this survey.
- Review the slope instructions listed below for operating the machine on slopes and to determine whether you can operate the machine in the conditions on that day and at that site. Changes in the terrain can result in a change in slope operation for the machine.
- Use extreme caution when traveling on hills, especially when turning.
  - Traveling across hills with the machine could result in a tip-over, or a loss of traction for the traction unit or the machine.
  - Always travel straight up and down hills—do not travel sideways or diagonally. When traveling down a hill, do not exceed the speed at which you can travel up the same hill. Stopping distance increases when traveling down hills.
  - Reduce the weight of the load when traveling on steep hills and avoid piling the load high.
- Identify hazards at the base of the slope. Use extreme caution when operating the machine near drop-offs, ditches, embankments, water, or other hazards. The machine could suddenly roll over if a wheel goes over the edge or the edge collapses. Keep a safe distance (twice the width of the machine) between the machine and any hazard.
- Remove or mark obstacles such as ditches, holes, ruts, bumps, rocks, or other hidden hazards. Tall grass can hide obstacles. Uneven terrain could overturn the machine.
- Avoid starting, stopping, or turning the machine on slopes. Avoid making sudden changes in speed or direction; turn slowly and gradually.
- Do not operate a machine under any conditions where traction, steering, or stability is in question. Be aware that operating the machine on wet grass, across slopes, or downhill may cause the machine to lose traction. Loss of traction to the drive wheels may result in sliding and a loss of braking and steering. The machine can slide even if the drive wheels are stopped.
- Be aware that operating the machine on wet grass, across slopes, or downhill may cause the machine to lose traction. Loss of traction to the drive wheels may result in sliding and a loss of braking and steering.
- Always keep the traction unit in gear when going down slopes. Do not coast downhill (applicable only to gear-drive units).

Using the Rear-Jack Leg

Use the rear jack leg to support the machine when you disconnect it from the traction unit.

Supporting the Machine with the Rear-Jack Leg

1. Unload all material from the hopper.
2. Park the machine on a level surface, engage the parking brake, shut of the engine, remove the key, and wait for all moving parts to stop before leaving the operator's seat.
3. Chock the tires.
4. Remove the jack-leg pin from the rear-jack leg, and remove the jack leg from the leg tube (Figure 22).

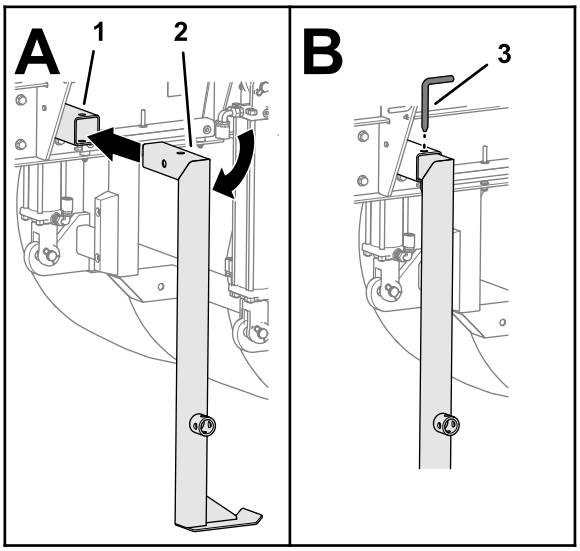


g272499

Figure 22

1. Jack-leg pin
2. Leg tube
3. Rear-jack leg

5. Rotate the rear-jack leg down and insert it into the leg tube (Figure 23).



g272498

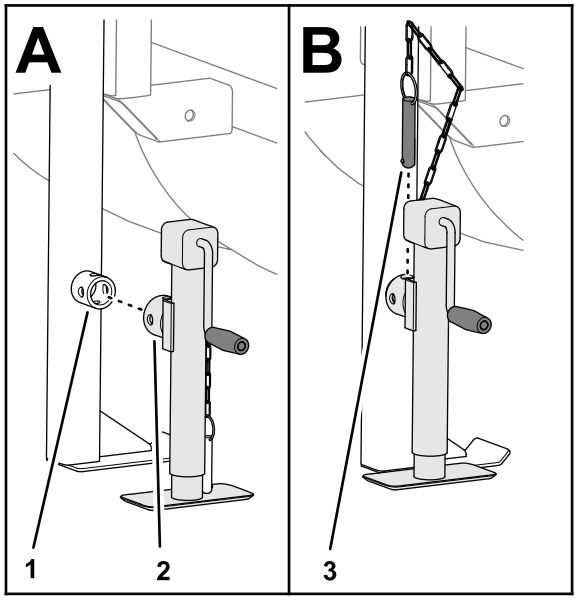
Figure 23

1. Leg tube
2. Rear-jack leg
3. Jack-leg pin

6. Align the holes in the jack leg and tube, and secure the jack leg with the jack-leg pin (Figure 23).
7. If you see a 5 cm (2 inches) or larger gap between the jack leg and the ground, fill the gap with a spacer or piece of wood.

Assembling the Jack to the Rear-Jack Leg

1. Remove the pin that secure the jack to the hitch tube, and remove the jack; refer to Figure 27 in Supporting the Front of the Machine with the Jack (page 27).
2. Assemble the jack vertically onto the rear-jack leg and secure the jack with the pin (Figure 24).



g272497

Figure 24

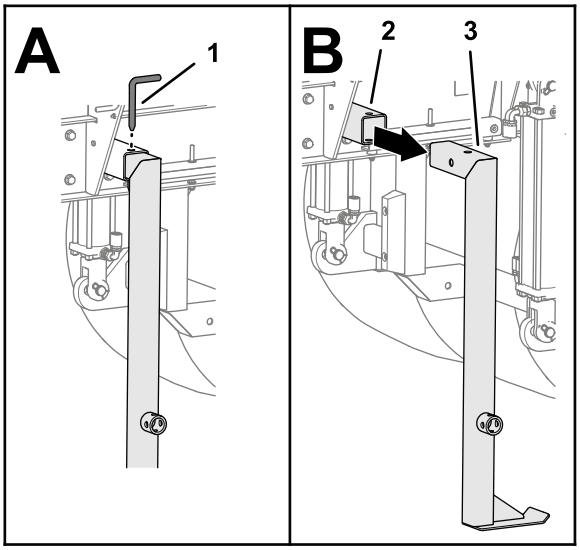
1. Rear-jack leg
2. Jack
3. Pin

3. Lower the jack to support the machine.

Stowing the Rear-Jack Leg

1. Align the drawbar of the traction unit with the hitch tube of the machine, engage the parking brake, shut of the engine, remove the key, and wait for all moving parts to stop before leaving the operator's seat.
2. Secure the hitch tube to the drawbar of the traction unit with the hitch pin.
3. If assembled to the rear-jack leg, raise the jack, remove it from the jack leg, and stow it on the hitch tube; refer to Assembling the Jack to the Rear-Jack Leg (page 25) and Stowing the Jack (page 27).

   Note: Do not store the jack on the rear-jack leg.
4. Remove the jack-leg pin from the rear-jack leg, and remove the jack leg from the leg tube (Figure 25).

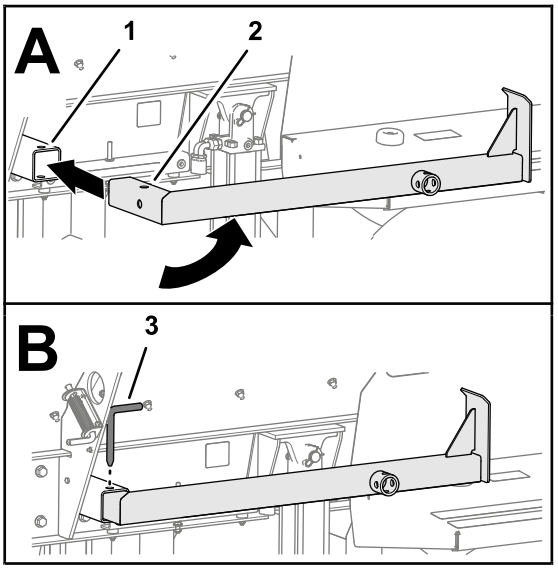


g272503

Figure 25

1. Jack-leg pin
2. Leg tube
3. Rear-jack leg

5. Rotate the rear-jack leg horizontal and insert it into the leg tube (Figure 26).



g272500

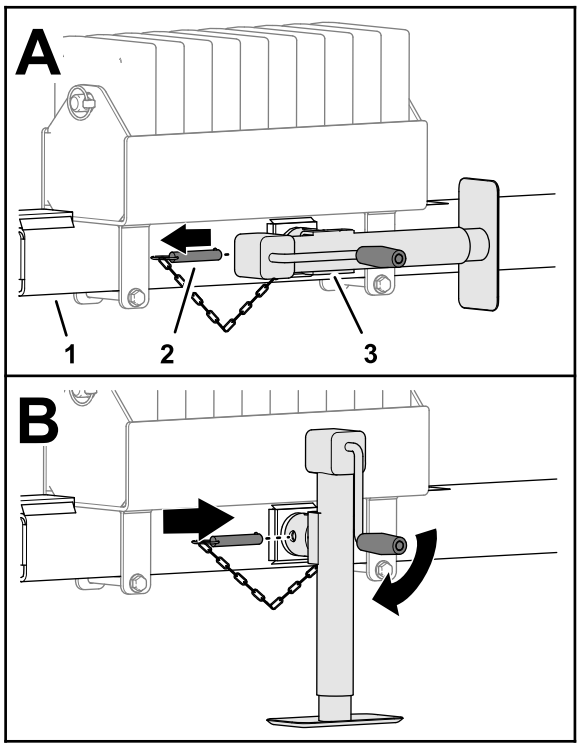
Figure 26

1. Leg tube
2. Rear-jack leg
3. Jack-leg pin

6. Align the holes in the jack leg and tube, and secure the jack leg with the jack-leg pin (Figure 26).

Supporting the Front of the Machine with the Jack

1. Unload all material from the hopper.
2. Park the machine on a level surface, engage the parking brake, shut of the engine, remove the key, and wait for all moving parts to stop before leaving the operator's seat.
3. Chock the tires.
4. Remove the pin that secure the jack to the hitch tube (Figure 27).



g272502

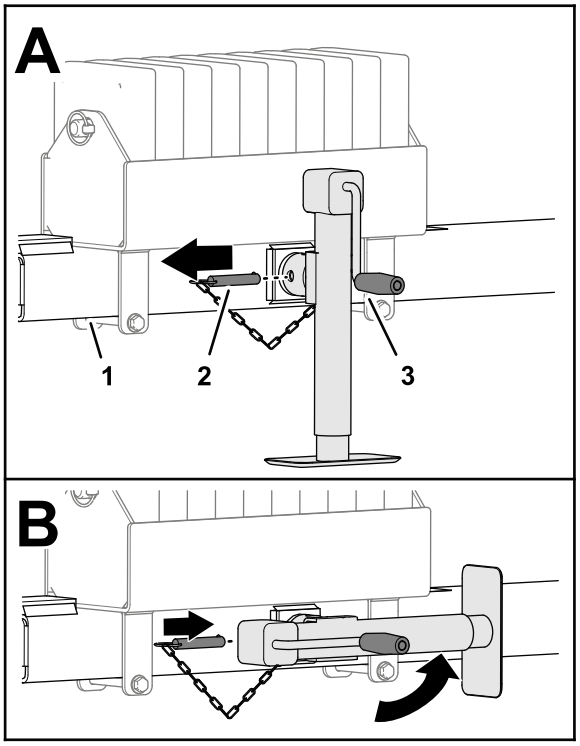
Figure 27

1. Hitch tube
2. Pin
3. Jack

5. Rotate the jack vertical (Figure 27).
6. Insert the pin through the horizontal holes on the jack and hitch tube (Figure 27).
7. Lower the jack to support the machine.

Stowing the Jack

1. Align the drawbar of the traction unit with the hitch tube of the machine, engage the parking brake, shut of the engine, remove the key, and wait for all moving parts to stop before leaving the operator's seat.
2. Secure the hitch tube to the drawbar with the hitch pin.
3. Raise the jack.
4. Remove the pin (Figure 28).



g272501

Figure 28

1. Hitch tube
2. Pin
3. Jack

5. Rotate the jack horizontal (Figure 28).
6. Insert the pin through the horizontal holes on the jack and hitch tube (Figure 28).

Towing the Machine

Perform the following steps when towing the machine:

- Before operating the machine, stow the jack and rear jack leg.
- Do not allow the hydraulic hoses, the power cable, and the pendant cables to drag on the ground during operation. Avoid locations where they could become pinched or cut.
- When making sharp turns, the hydraulic hoses may contact the traction unit wheels. Avoid making sharp turns, if necessary, use a bungee cord (a rubber strap with hooks on both ends) to pull back the hoses and cables toward the center.

Electric Brake Operating Tips

The load control compensates for trailer load variations by limiting the maximum torque output of the brakes by adding dropping resistance in the electrical control line. Consider the following operating conditions:

- When towing a trailer loaded to brake rated capacity, set the brake control for maximum braking.
- When pulling an empty or partially loaded trailer, set the brake control between maximum and minimum braking at a position, just before the point at which the machine tire skids when actuating the hand control fully on.

Failure to install and use the electric brake control results in excessive brake torque when stopping a machine loaded to less than brake capacity.

Turning the Machine Power On/Off

EH Models

When finished working with the machine, always press the E-STOP button (Figure 29) to disable the electrical system. When beginning work with the machine, you must pull the E-STOP button back out before turning on the handheld remote.

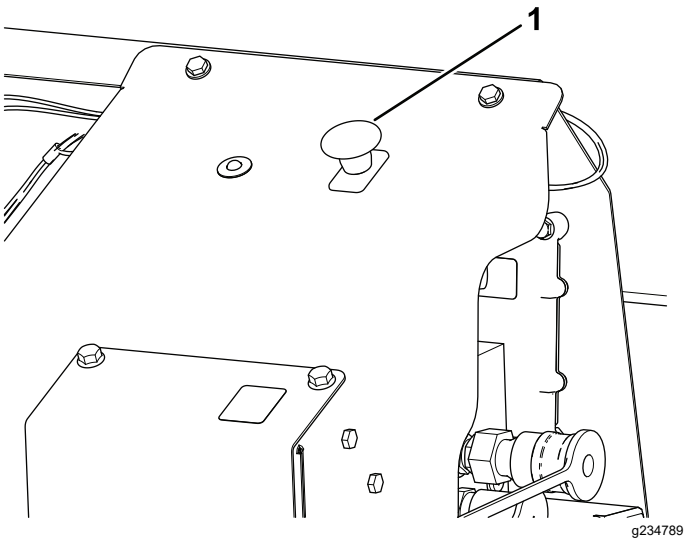


Figure 29

1. E-STOP Button

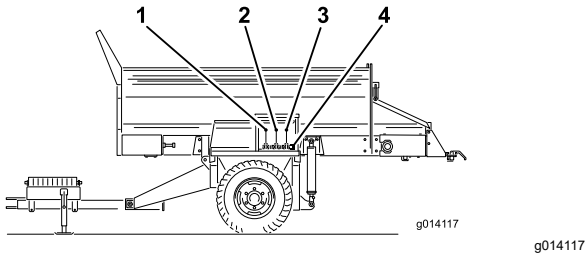
Important: **When done operating the machine, press the E-STOP button to prevent the traction unit battery from discharging.**

Important: **When using an attachment, be aware that the machine has only 15 cm (6 inches) of ground clearance. When the machine begins to travel up a hill the ground clearance decreases.**

Operating the Hydraulic Control Valves

SH Models

There are three hydraulic control valves located on the left fender of the machine (Figure 30).



g014117

Figure 30

1. Conveyor belt direction (left control valve)
2. Raise and lower machine (center control valve)
3. Options on and off (right control valve)
4. Option hydraulic quick connectors

Note: Return all control valve handles to their center position after use to avoid unintended starting.

Left Valve

The left valve controls the machine conveyor belt direction.

- To unload the machine, pull the control lever toward you. This moves material to the rear along the conveyor belt.
- To load the machine, push the control lever away from you. This moves material to the front along the conveyor belt.
- To stop the conveyor belt, move the control lever to the center position.

Center Valve

The center valve raises and lowers the machine.

- To raise the machine, pull on the control lever until the desired height is reached, then release it.
- To lower the machine, push on the control until the desired height is reached, then release it.

  Important: **Do not keep holding the control lever in the raised or lowered position once the lift cylinders have reached their maximum travel position.**

Right Valve

The right valve controls optional attachments.

- To turn on the optional attachment, pull on the control lever.

  Important: **Do not pull the option lever into the ON position without an option mounted. This can damage the floor motor and stop the machine.**

- To turn off the option, return the control lever to the center position.

  Note: Pushing the control lever does not cause a function—optional attachments cannot reverse direction of operation.

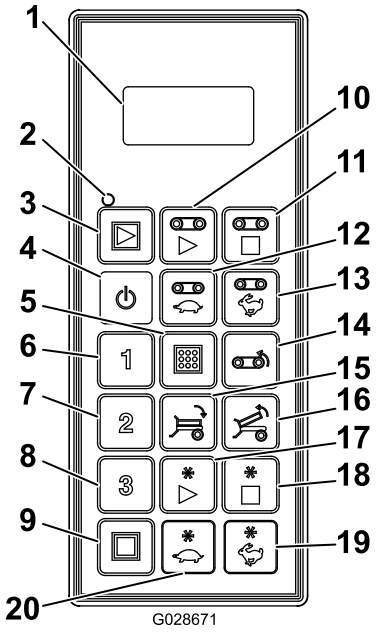
Operating the Hydraulic Controls and Options

EH Models

Remote Control System

The remote control system consists of a handheld remote, a +12 to +14.4 VDC Base Unit, and a wire harness. The system is specifically designed to be used with and to control a MH-400 Material Handler.

Handheld Remote



g028671

Figure 31

1. LCD display
2. Remote status LED
3. All start: starts floor and option
4. On/Off
5. Store: saves preset settings
6. Preset 1
7. Preset 2
8. Preset 3
9. All stop: stops all functions
10. Floor start
11. Floor stop
12. Decrease floor speed
13. Increase floor speed
14. Floor reverse
15. Tilt bed down
16. Tilt bed up
17. Option start
18. Option stop
19. Increase option speed
20. Decrease option speed

Button Functions

Button	Name	Primary Function
	ON/OFF	Power the remote on and off.
	ALL START	Provides functional control on both the Floor and Option including on/off and displaying the speed.
	FLOOR START	Provides functional control of the hopper conveyor floor belt including on/off and displaying the floor speed.
	FLOOR STOP	Stops the Floor.
	FLOOR DEC	Decreases the Floor speed.

Button	Name	Primary Function
	FLOOR INC	Increases the Floor speed.
	FLOOR REVERSE	Momentary button that reverses the floor direction. Reverse floor speed can be modified using the FLOOR INCREASE and FLOOR DECREASE SPEED buttons while pressing the FLOOR REVERSE button. Upon release of the FLOOR REVERSE button, the floor turns off.
	TILT BED DOWN	Momentary button for lowering the bed.
	TILT BED UP	Momentary button for raising the bed.
	PRESET 1 PRESET 2 PRESET 3	Three separate preset values may be stored for both floor and option speeds.
	STORE	Used in conjunction with the PRESET button to store or establish a preset memory.
	OPTION START	Provides functional control of the rear option including on/off and displaying the option speed.
	OPTION STOP	Stops the option.
	OPTION DEC	Decreases the option speed.
	OPTION INC	Increases the option speed.
	ALL STOP	Stops both floor and option.

Starting the Handheld Remote

Press the ON/OFF button on the remote and wait for the it to find the base. Do not press any buttons on the hand held while it is performing its startup routine.

Understanding the Remote Status LED

EH Models

The remote status LED blinks slowly at 2 Hz (twice per second) when the handheld remote is transmitting but no buttons are pressed, when the floor and option buttons are active. When you press a button, the light blinks at 10 Hz.

Key Functionality Elements

- When you turn on the handheld remote, the display should read **FLR OFF** and **OPT OFF** in approximately 5 seconds. If the words “waiting for base” are in the display, ensure that there is electrical power to the base unit and that the E-STOP button on the base unit is pulled out.
- There is always a **current working memory**. Current working memory is not a preset. When you turn on the handheld remote, it uses the last saved work settings from current working memory.
- The operational sequence of the handheld remote start buttons is as follows:
    1. Press the start button once (ALL START, FLOOR START, or OPTION START) calls up the

current working memory setting stored in the handheld remote.

2. Press the same start button a second time to turn on the component if the hydraulics are engaged (it shows numbers ramping up in the display).
3. Press the same start button a third time to store the new setting established in the working memory of the remote.

- After pressing a start button once to view the current working memory setting in a non-working mode, you have approximately 10 seconds to begin adjusting the setting or the element before the remote reverts to off. In a working mode, the 10-second rule does not apply.
- To program a preset, you must have the elements **activated or engaged** first.
- To operate from a preset, the you see the element speed percentages in the display to activate or engage them. If you see the word **OFF** in the display, you must recall the preset.

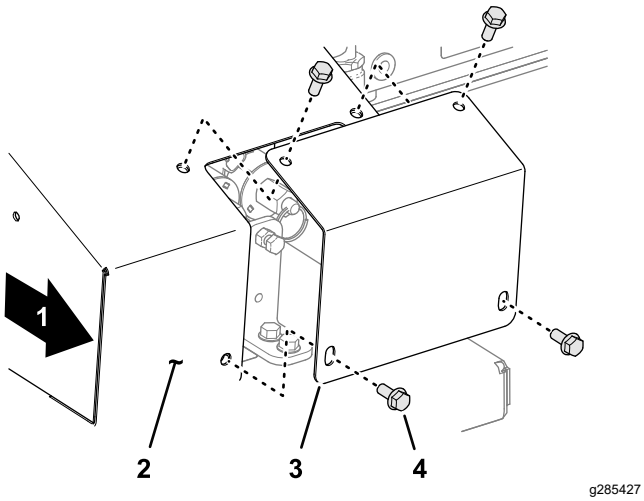
Manually Overriding the Hydraulic Controls

EH Models

If the handheld remote is missing, damaged, or fails, you can still operate the machine to complete tasks or continue a spreading job.

Preparing the Machine

1. At the right side of the machine, remove the 4 flange-head capscrews that secure the cover plate to the override cover (Figure 32).

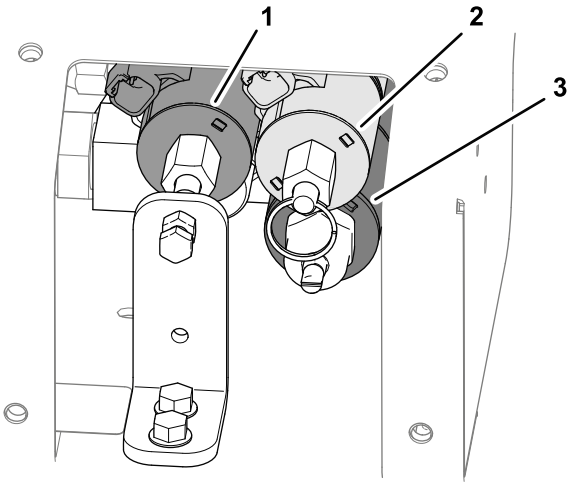


g285427

Figure 32

1. Right side of the machine
2. Override cover
3. Cover plate
4. Flange-head capscrew

2. Ensure that the parking brake is engaged, start the traction unit, and supply hydraulic pressure to the machine.
3. Locate the 3 control valves (Figure 33).

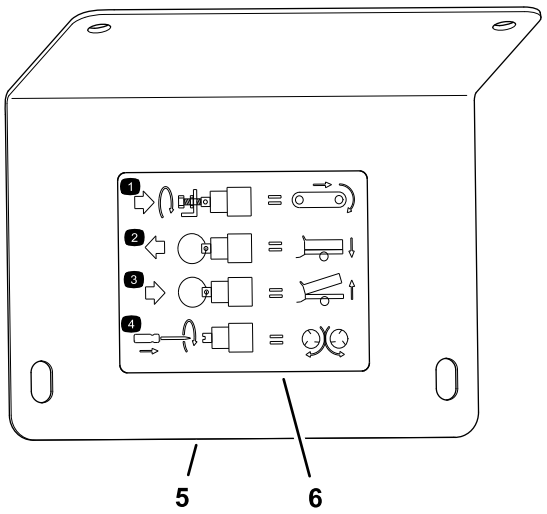


g285426

Figure 33

1. Floor-speed solenoid
2. Raise/lower hopper solenoid
3. Attachment-speed solenoid

Note: Refer to the decal located on the cover plate (Figure 34).



g285596

Figure 34

1. Adjust floor speed
2. Lower the hopper
3. Raise the hopper
4. Adjust spinner speed
5. Cover plate
6. Decal

Adjusting the Floor Speed

1. Loosen the jam nut at the manual-override bracket (Figure 35).

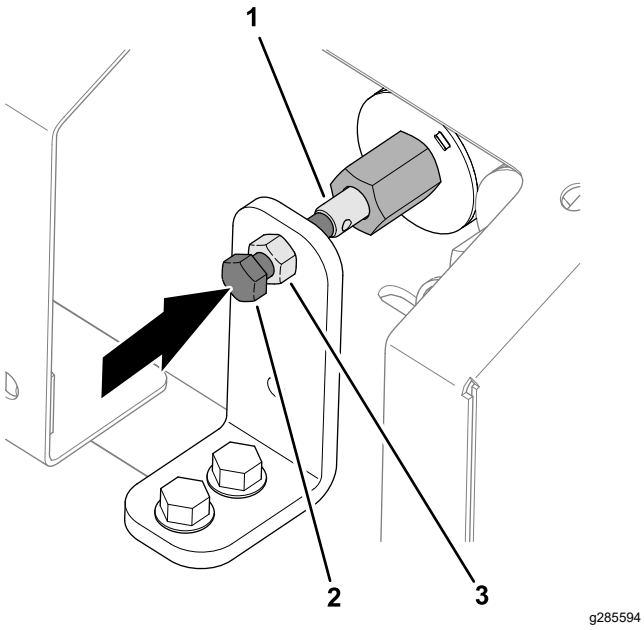


Figure 35

1. Stem (floor-speed solenoid)
2. Hex-head screw (valve override)
3. Jam nut

2. Rotate the hex-head screw for the valve override clockwise to increase the floor speed (Figure 35).

   Note: Use the maximum-floor speed of the color-coded operation system when you have no hydraulic flow. This setting is also helpful when the hopper is full of sand.

3. When the machine is running at the correct floor speed, tighten the jam nut.

Adjusting the Position of the Hopper

- To lower the hopper (Figure 36), pull the ring on the valve stem.

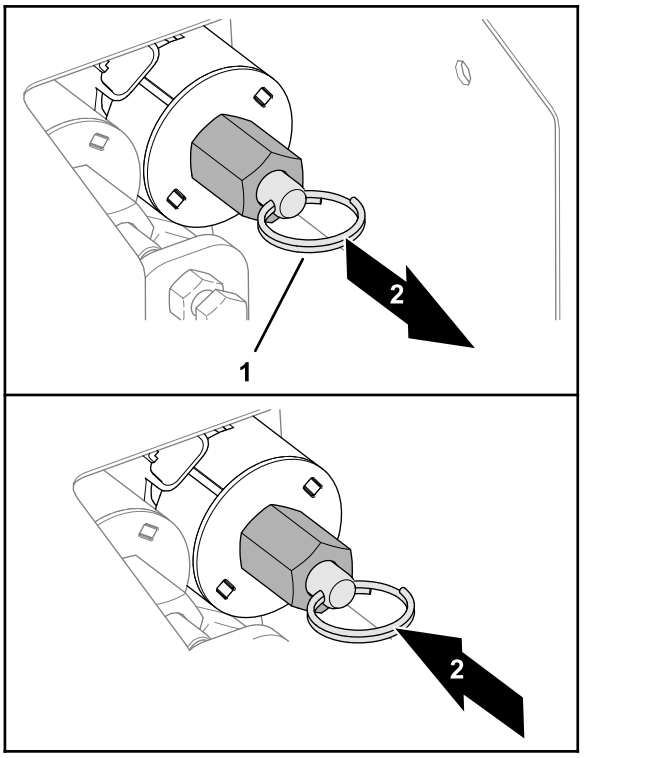


Figure 36

1. Split ring (valve stem)
2. Lower the hopper
3. Raise the hopper

- To raise the hopper (Figure 36), push the split ring on the valve stem.

Adjusting Accessory Attachment Speed

1. Rotate the hex-head screw for the valve override clockwise to increase the floor speed (Figure 37).

   Note: If you are adjusting the machine with the hydraulic flow active and do not want sand spread as you adjust, ensure that the floor is turned off.

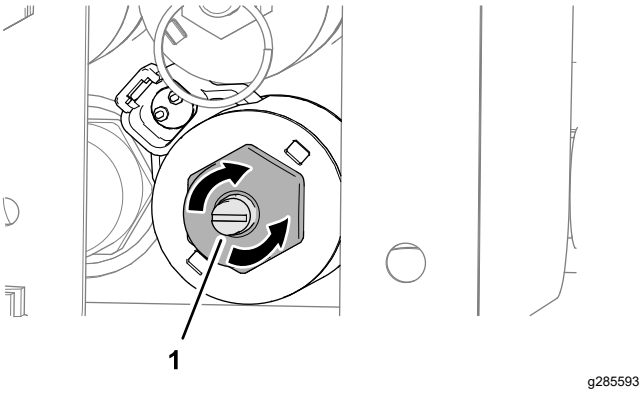


Figure 37

1. Hex-head screw (valve override)

2. Once your settings are acceptable, use the hydraulic flow control on your tow vehicle to turn the system on and off during operation.

Resetting Manually Overridden Hydraulic Controls

EH Models

If you found, repaired, or replaced the handheld remote, reset the floor-speed solenoid, attachment-speed solenoid, or both before controlling the machine with the handheld remote.

Reset the Floor-Speed Solenoid

EH Models

1. Loosen the jam nut at the manual-override bracket (Figure 38).

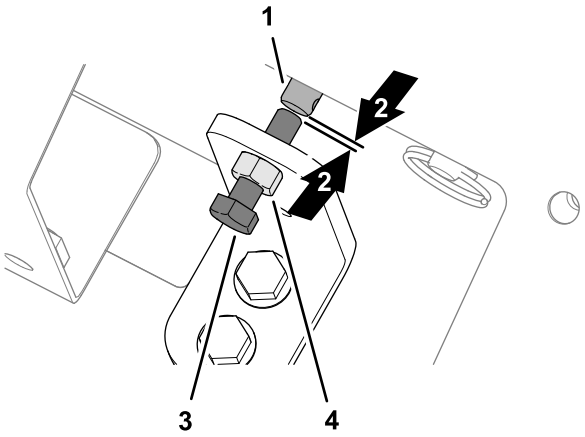


Figure 38

1. Stem (floor-speed solenoid)
2. Gap
3. Hex-head screw (valve override)
4. Jam nut

2. Rotate the hex-head screw for the valve override counter clockwise until you see a small gap between the end of the screw and the end of the stem of the floor-speed solenoid (Figure 38).
3. Tighten the jam nut (Figure 38).

Reset the Attachment-Speed Solenoid

Rotate the flat-head screw counterclockwise until the valve in the solenoid is fully open (Figure 39).

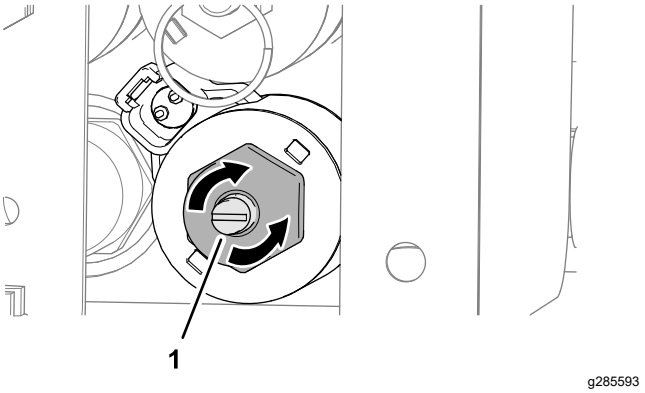


Figure 39

1. Hex-head screw (valve override)

Installing the Cover Plate

Secure the cover plate to the override cover with the 4 flange-head capscrews (Figure 40).

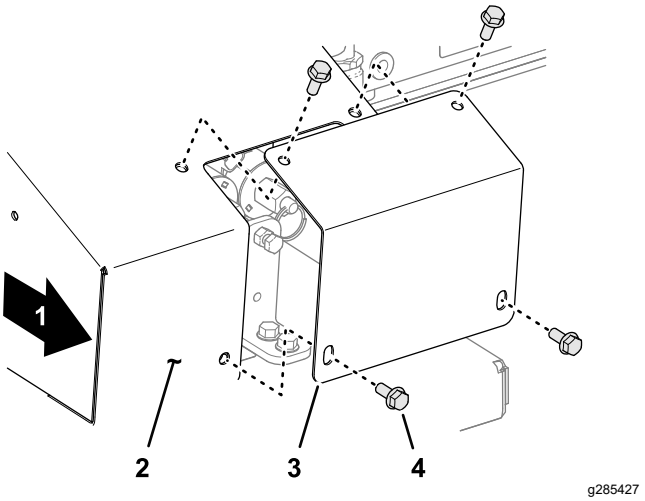


Figure 40

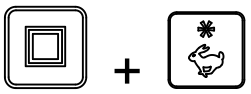
1. Right side of the machine
2. Override cover
3. Cover plate
4. Flange-head capscrew

Liquid Crystal Display (LCD)

The 2-line, 8 character-per-line LCD (liquid crystal display) shows status and activity as you press the buttons of the handheld remote. It features user adjustable backlighting and contrast. The changes are saved in the current working memory of the remote. After the unit is powered down, the display uses the last settings for contrast and backlighting when you turn on the unit.

Increasing the Contrast

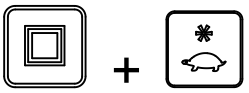
Hold the ALL STOP and the OPTION INCREASE buttons simultaneously while observing the display until the contrast is as desired.



Note: There are 3 settings: OFF, LOW, and HIGH.

Decreasing the Contrast

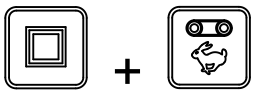
Hold the ALL STOP and the OPTION DECREASE buttons simultaneously while observing the display until the contrast is as desired.



Note: There are 3 settings: OFF, LOW, and HIGH.

Increasing Backlighting

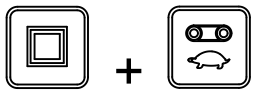
Press the ALL STOP and the FLOOR INCREASE buttons simultaneously while observing the display until the backlighting is as desired.



Note: Display backlighting consumes the most energy of all handheld remote functions. Increasing the backlighting increases power consumption, and shortens the life of the batteries; the decrease the handheld remote backlighting for longer battery life.

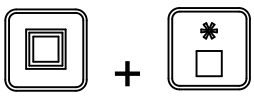
Decreasing Backlighting

Press the ALL STOP and the FLOOR DECREASE buttons simultaneously while observing the display until the backlighting is as desired.



Checking the Battery Life, Operating Frequency, Base and Remote ID Display

Hold down the ALL STOP and OPTION STOP buttons simultaneously to display multiple points of information.



As you hold the buttons down, the display cycles approximately every 2 seconds displaying first the battery life expectancy in percent remaining or current battery voltage, the operating frequency (channel) on which the units communicate, then the handheld remote ID number, and finally the associated BASE Unit ID.

Caring for the Handheld Remote

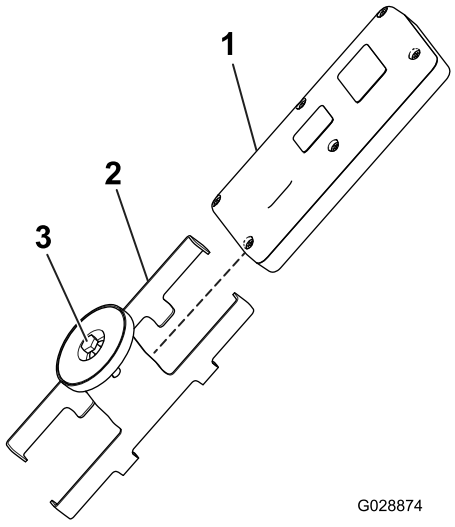
Though the handheld remote is rugged, do not to drop it on hard surfaces. Wipe the handheld remote clean using a soft cloth moistened with water or a mild cleaning solution. Avoid scratching the LCD screen.

Replacing the Batteries in the Handheld Remote

The handheld remote is powered by 4 batteries (size AA alkaline, 1.5 V each) and operates between 2.4 to 3.2 V. Battery life is approximately 300 hours (continuous operation with the backlight off), but battery life longevity is affected by usage factors, particularly backlight intensity setting—the higher the backlight setting, the more power consumed resulting in shorter battery life.

Important: **When using the handheld remote, always keep fresh spare batteries at hand.**

1. Loosen the bolt in the magnet on the magnetic remote bracket (Figure 41).



g028874

Figure 41

1. Handheld remote
2. Magnetic remote bracket
3. Bolt in the magnet

2. Slide the bracket sides apart and remove the remote (Figure 41).
3. Remove the 6 screws from the back of the remote and remove the cover (Figure 42).

Note: If possible, leave the rubber seal and steel gasket in the channel when removing the cover and batteries.

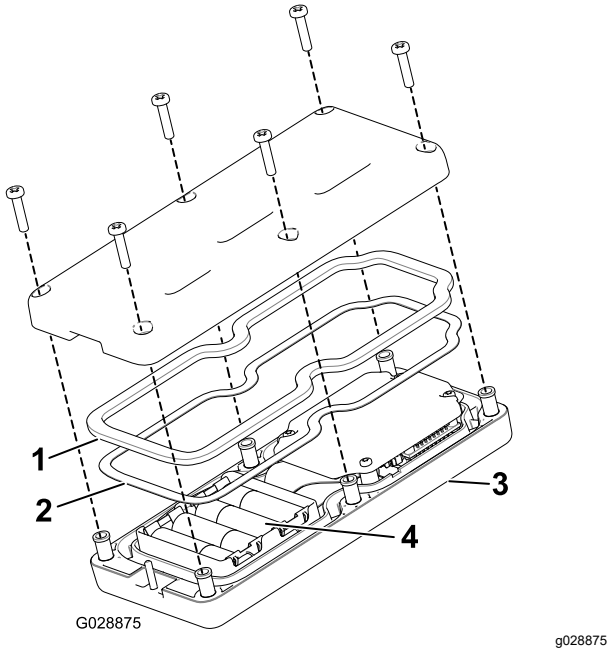


Figure 42

1. Rubber seal
2. Steel gasket
3. Handheld remote
4. 4 AA batteries

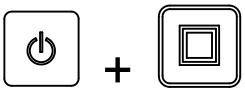
4. Remove the discharged batteries and properly dispose in accordance with local regulations.
5. Install the batteries into the terminal cradle observing proper polarity. The cradle is embossed with polarity markings for each terminal (Figure 42).

   Note: If you install the batteries incorrectly, the handheld remote will not operate.
6. If you accidentally removed the rubber seal and the steel gasket, replace them carefully into the channel in the handheld remote (Figure 42).
7. Replace the cover and secure it with the 6 screws removed previously (Figure 42) and torque them to 1.5 to 1.7 N·m (13 to 15 in-lb).
8. Install the handheld remote into the magnetic remote bracket, slide the halves together to secure the handheld remote, and tighten the bolt in the magnet (Figure 41).

Associating the Handheld Remote with the Base

The factory initially associates the handheld remote to the base allowing them to communicate; however, there may be instances in the field when you must associate a remote and a base unit again.

1. Press the E-Stop button to remove power from the base unit and ensure that the handheld remote is off.
2. Stand near the base unit in clear line of sight.
3. Simultaneously press and continue to hold the ON/OFF and the ALL STOP buttons.

   The handheld remote goes through its initialization screens and settles on **ASSOC PENDING**.
4. Continue to hold both buttons and then quickly release them when **ASSOC ACTIVE** is displayed (approximately 4 seconds).

   The display shows **PRESS STORE**.
5. Press and hold the STORE button.

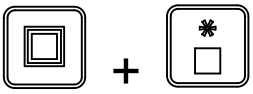
   

   The remote displays **POW UP BASE**.
6. While continuing to hold the STORE button, pull out on the E-STOP button to power up the base unit.

   The handheld remote associates (links) with the base unit. Upon success, the display shows **ASSOC PASS.**
7. Release the STORE button.

Important: **If the display shows *ASSOC EXIT*, the association failed.**

Note: View the handheld remote and base unit link by holding down the ALL STOP and OPTION STOP buttons at the same time.
The display cycles and indicates the selected channel and the ID of the Base Unit.



Operating the Floor and Option Using the Handheld Remote

EH Models

Use the following procedures to set and operate the machine floor and option (such as the twin spinner or other attachment) as follows:

- Setting and operating the floor alone
- Setting and operating the option alone
- Setting and operating both floor and option together

Setting and Operating the Floor Alone

Upon initially pressing the FLOOR START button (when the floor is not running), the remote display shows the stored setting and an S is displayed after FLR (i.e. **FLRS**), indicating that the handheld remote is in a set-only mode. In this set-only mode, you can adjust the setting up or down, but the floor does not activate, remaining off. This allows you to set a desired floor speed or use the stored setting without causing unwanted movement. After setting the speed, press the FLOOR START button to activate the floor at the chosen setting (if you engage the hydraulics, the floor starts). Press FLOOR START a third time to store the current value in memory.

Note: Changes to the floor settings while the floor is running are immediately effective, but they are temporary unless you store the new setting by pressing FLOOR START again after changing the setting. For instance, you make an adjustment while the display shows **FLRS**, press Floor Start starting the floor at the adjusted setting, and then turn the handheld remote off without pressing FLOOR START again, storing the change. The next time you use the remote, the setting reverts to the previously stored value.

Note: A 10-second timer starts when you press FLOOR START and FLRS (set-only mode) displays. If you do not press a button during the 10-second interval, the display reverts to FLR and the previous state/value displays and is enforced. The timer resets to 10 seconds if you press any button while the handheld remote is in the set-only.

1. Press the FLOOR START button.

The preview value and FLRS displays.

2. Adjust the speed setting using the INCREASE FLOOR SPEED button or the DECREASE FLOOR SPEED button.


or


3. Press the FLOOR START button to start the floor.

4. Press the FLOOR START button to store the floor value.

The display shows **FLOOR STORE**. The set value is used whenever the floor is started in the future until you change the setting again.

Setting and Operating the Option Alone

Upon initially pressing the OPTION START button

(when the option is not running), the handheld remote display shows the stored setting and an S is displayed after OPT (i.e. **OPTS**), indicating that the remote is in a set-only mode. In this set-only mode, you can adjust the setting up or down, but the option does not activate, remaining off. This allows you to set a desired option speed or use the stored setting without causing unwanted movement. After setting the speed, press the OPTION START button to activate the option at the chosen setting (if you engage the hydraulics , the option starts). Press OPTION START a third time to store the current value in memory.

Note: Changes to the option settings while the option is running are immediately effective, but they are temporary unless you store the new setting by pressing OPTION START again after changing the setting. For instance, you make an adjustment while the display shows **OPTS**, press OPTION START starting the option at the adjusted setting, and then turn the handheld remote off without pressing OPTION START again, storing the change. The next time you use the remote, the setting reverts to the previously stored value.

Note: A 10-second timer starts when you press OPTION START and FLRS (set-only mode) displays. If you do not press a button during the 10-second interval, the display reverts to FLR and the previous state/value displays and is enforced. The timer resets to 10 seconds if you press any button while the handheld remote is in the set-only.

1. Press the OPTION START button.

The preview value and FLRS displays.

2. Adjust the speed setting using the INCREASE OPTION SPEED button or the DECREASE OPTION SPEED button.

3. Press the OPTION START button to start the option.

4. Press the OPTION START button to store the option value.

The display shows **OPTION STORE**. The set value is used whenever the option is started in the future until you change the setting again.

Setting and Operating the Floor and Option Together

Upon initially pressing the ALL START button (when the option is not running), the remote display shows the floor and option stored settings and an S is displayed after FLR and OPT (in other words, **FLRS** and **OPTS**), indicating that the handheld remote is in a set-only mode. In this set-only mode, you can adjust either setting up or down, but the floor and option do not activate, remaining off. This allows you to set the desired speeds or use the stored settings without causing unwanted movement. After setting the speeds, press the ALL START button to activate the floor and option at the chosen setting (if the hydraulics are engaged, the floor and option start). Press ALL START a third time to store the current value in memory.

Note: Changes to the settings while the floor and option are running are immediately effective, but they are temporary unless you store the new setting by pressing ALL START again after changing the setting. For instance, you make an adjustment while the display shows **FLRS** and **OPTS**, press ALL START starting the floor and option at the adjusted setting, and then turn the handheld remote off without pressing ALL START again, storing the change. The next time you use the remote, the settings revert to the previously stored values.

Note: A 10-second timer starts when you press ALL START and set-only mode displays. If you do not press a button during the 10-second interval, the display reverts to FLR and OPT, the previous state/value displays, and uses the previous state/value. The timer resets to 10 seconds if any button is pressed while the handheld remote is in the set-only.

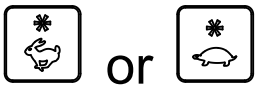
1. Press the ALL START button.

The preview values and FLRS and OPTS display.

2. Adjust the speed settings as follows:

   - Adjust the floor speed setting using the using the INCREASE FLOOR SPEED button or the DECREASE FLOOR SPEED button.

   - Adjust the option speed setting using the using the INCREASE OPTION SPEED button or the DECREASE OPTION SPEED button.



3. Press the ALL START button to run the floor and option.

4. Press the ALL START button to store the values.

The display shows **ALL STORE**. The set value is used whenever the option is started in the future until you change the setting again.

Note: You must run both the floor and option to store the settings using the ALL START button. If neither or only 1 is running, pressing the ALL START button either starts them both or starts the 1 that was not running. Nothing is stored, and the previously stored floor and the option settings display.

It is important to realize that the stored command for the floor and option are used twice, once in the event of an individual command using the

FLOOR START or OPTION START buttons, and once in the event of a combined action using ALL START; in either case, it is the same number.

Handheld Remote Preset Modes

EH Models

Setting the Preset 1, 2, and 3 Buttons

The handheld remote has 3 PRESET buttons which you can program with floor and option speed settings. Each PRESET button acts like a preview mode for the ALL START button, except that they use different, user defined quick reference speed values.

If the floor and/or the option happen to be running at the time you press a PRESET button, a preview value of both floor and option settings is displayed; if you then press the ALL START button, the current operating values are replaced by the preset values. If you do not press the ALL-START button within 10 seconds, the system reverts to the previously stored values.

Use the following procedure to set the values of a PRESET button:

1. Start both the floor and option either individually or by using the ALL START button.

2. Set the desired speeds of both floor and option by using the appropriate INCREASE and DECREASE speed buttons for each output.
3. Press and hold the STORE button and then press the desired PRESET button (1, 2, or 3).

The screen displays PRESET SAVED.

Note: If you hold the STORE button and press a PRESET button while either the floor or option are off, no new value is stored for either floor or option; the preset holds the values previously stored.

Using a Preset Mode

1. Press the desired PRESET button (1, 2 or 3) to display the floor and option settings.
2. Press the ALL START button to start the floor and option (if the hydraulics are turned on).
3. Use the START and STOP buttons to control the floor and option as desired.

Loading the Hopper

Important: **Do not carry passengers in the hopper.**

Important: **Do not carry loads that exceed the load limits of the machine, or the tow vehicle; refer to Specifications (page 20).**

Important: **The stability of loads can vary—for example, high loads have a higher center of gravity. Reduce the maximum load limits to ensure better stability, if necessary.**

1. Connect the machine to the tow vehicle.
2. Load the hopper with material.
   - Load the machine from the top or from the rear.
   - For most materials, such as sand or gravel, you can use a front-end bucket loader. For materials such as landscaping timbers or fertilizer bags, load from the rear by placing the material on the conveyor belt and setting the hydraulics in the load position.
   - You may need to remove the rear gate for easier access.
   - If sacks of material are used, empty the sacks into the loader's bucket before loading the material into the hopper. To ensure stability, distribute the load evenly, front to back and side to side.

   Important: **Do not put large or heavy objects into the hopper. Material that is larger than the rear gate opening may damage the belt and rear gate assembly. Also ensure that the load has a uniform texture. The machine can unpredictably throw small rocks in the sand.**

   To avoid causing the machine to tip over (see safety decals in this manual):

   - Carefully monitor the height and weight of the load. Higher and heavier loads can increase the risk of tipping.
   - Distribute the load evenly, front to back and side to side.
   - Be careful when turning and avoid an unsafe maneuver.

Unloading Material

⚠ WARNING

The machine is capable of amputating hands and feet.

Keep your hands and feet away from the conveyor and optional attachments when the machine is operating and when the traction unit is running.

⚠ WARNING

Unloading the machine when it is not connected to the tow vehicle may cause the load to shift and the machine to tip over.

Ensure that the machine is connected to the tow vehicle before unloading.

- Do not stand behind the machine when unloading.
- Do not unload the machine while it is on a slope.

Bulk Unloading

1. Back the machine into the location where you want the material deposited.
2. Release the rear gate latches and turn on the conveyor belt.
3. If desired, raise the rear of the machine. This unloads material at a different angle, and allows quick unloading of the entire load.

Controlled Unloading

1. Close the rear gate latches.
2. Use the jack handle to open or close the adjustable section of the rear gate (Figure 43 and Figure 44). This restricts the flow of materials when using an option.

   Important: **Use the adjustable section of the rear gate only when unloading material smaller than 1 inch (25 mm) in diameter, such as sand or gravel.**

   Important: **Open the rear gate completely if material does not flow through the adjustable section. Test each new material first.**

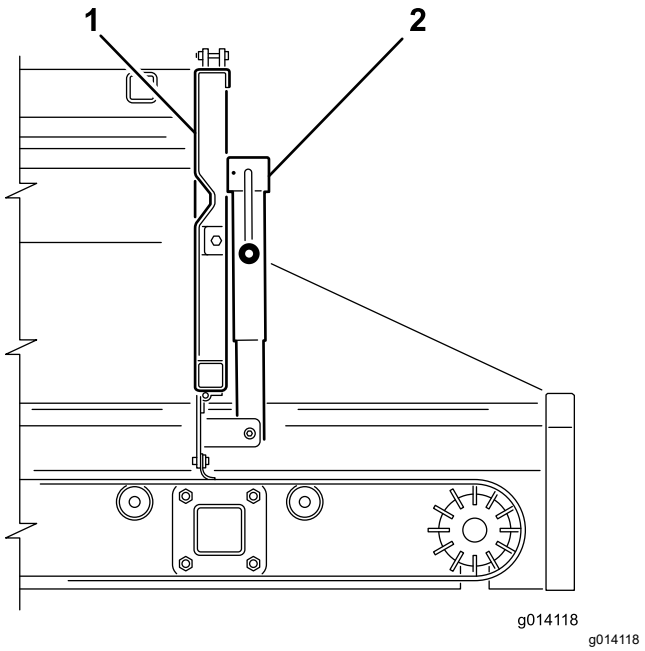


Figure 43

1. Rear gate
2. Feed gate jack

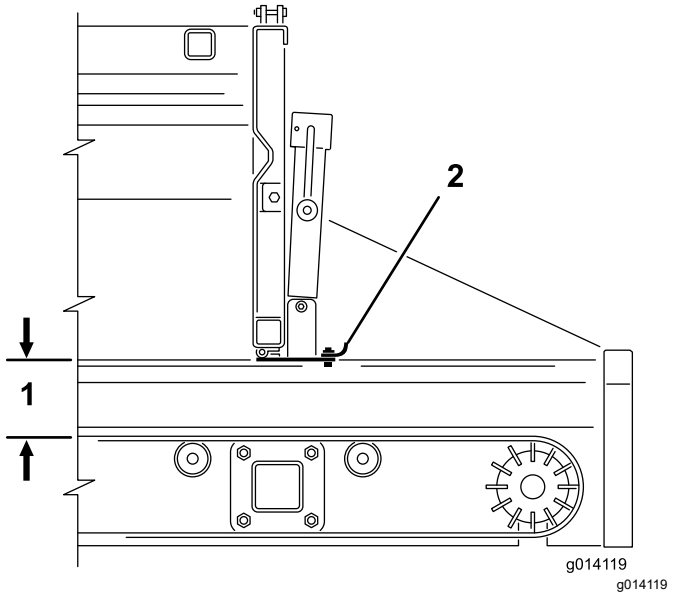


Figure 44

1. 12.5 cm (5 inches) maximum opening
2. Feed gate

Operating the Optional Attachment

1. Shut off the engine of the traction unit.
2. On SH models, using the control levers, turn on the option and the conveyor belt (unload position).
3. For both the SH and EH models, adjust the settings, spread pattern, and flow rate.

Note: You may have to experiment until you get the desired flow and spread depth. Other variables include ground speed and the type of material. Different materials vary in particle size, which can vary the spread pattern.

Always test new materials by spreading them in an open area away from people.

4. Start the engine of the traction unit and turn on the traction unit hydraulics.
5. On the SH model turn on the on/off pendant switch to start spreading. On the EH model turn on the option then the conveyor belt with the handheld remote.
6. On the SH model turn off the on/off pendant switch to stop spreading—the option attachment continues to operate. On the EH model turn off the conveyor belt and then the attachment.
7. For EH models you can use the ALL START function in place of the OPTION START and BELT START functions as a single operation start feature. The attachment will start first, followed by the belt.
8. When the machine is empty, turn off the hydraulics before transporting the machine.

Note: When driving over uneven terrain, raise the machine to the maximum safe traveling range. This provides more ground clearance for the optional attachment.

⚠ WARNING

The optional attachment may be able throw material at high speeds up to 12 m (40 ft), and injure bystanders.

Watch for people and other objects while spreading.

Important: **While traveling but not spreading, raise the machine to the maximum safe traveling distance, and turn off the option attachments.**

After Operation

After Operation Safety

- Park the machine on a firm, level surface; engage the parking brake; shut off the engine; remove the key; and wait for all movement to stop before leaving the machine.
- Avoid soft ground because the jack leg could sink and cause the machine to tip over.
- Do not disconnect the machine from the tow vehicle on hills, or without engaging the jack and rear-jack leg.
- When disconnecting the machine, always chock the wheels to prevent movement.
- Keep all parts of the machine in good working condition and all hardware tightened.
- Replace all worn or damaged decals.

Disconnecting the Machine from the Traction Unit

1. Park the machine on dry, level ground; engage the parking brake on the traction unit; shut off the engine and remove the key.
2. Chock front and back of the tires of the machine.
3. Relieve the pressure from the hydraulic system.
4. Disconnect the 2 hydraulic hoses and the 7-pin coiled power cable from the traction unit; refer to Figure 21 in Connecting the Machine to the Traction Unit (page 21).

   Coil and store the hoses and cable on the front of the machine.
5. On SH models, disconnect and remove the control pendant for dry storage. On EH models, store the handheld remote in a dry safe place. Ensure that you have pressed the E-STOP button in.
6. Rotate the rear-jack leg to the vertical position; refer to Supporting the Machine with the Rear-Jack Leg (page 25).

   Important: **Always use the rear jack leg when disconnecting the machine from a traction unit.**
7. Assemble the jack as follows:
   - If the weight of the tongue is forced **up** into the hitch of the tow vehicle (negative tongue weight), assemble the jack to the rear jack leg; refer to Assembling the Jack to the Rear-Jack Leg (page 25).
   - If the weight of the tongue is forced **down** onto the hitch of the tow vehicle (positive tongue weight), rotate the jack vertical at the hitch tube; refer to Supporting the Front of the Machine with the Jack (page 27).
8. Lift the machine with the jack until the machine is fully supported with the jack, and remove the hitch pin.
9. Ensure that there is no further connection between the machine and the traction unit. Start the traction unit and drive it unit away from the machine.

Maintenance

Maintenance Safety

- Before servicing or adjusting the machine, stop the machine, shut off the engine, engage the parking brake, remove the key, and wait for all moving parts to stop.
- Perform only those maintenance instructions described in this manual. If major repairs are ever needed or assistance is desired, contact an authorized Toro distributor.
- Before doing any maintenance work under the hopper, install the hydraulic cylinder supports.
- Ensure that the machine is in safe operating condition by keeping nuts, bolts, and screws tight.
- If possible, do not perform maintenance while the engine is running. Keep away from moving parts.
- Do not check or adjust the chain tension when the tow vehicle engine is running.
- Carefully release pressure from components with stored energy.
- Support the machine with blocks or jack stands when working beneath it.
- After maintaining or adjusting the machine, ensure that all guards are installed.

Recommended Maintenance Schedule(s)

Maintenance Service Interval	Maintenance Procedure
After the first 100 hours	• Adjust the electric brakes or sooner depending on use or performance.
Before each use or daily	• Check the tires and wheels. • Check the hydraulic system • Check the optional attachments. • Check the belt and rear gate seals. • Check the rear gate.
Every 40 hours	• Check the conveyor belt and rollers.
Every 50 hours	• Lubricate all bearings and bushings. When operating the machine in extremely dusty and dirty conditions, lubricate the bearings and bushings daily. Lubricate grease fittings immediately after every washing, regardless of the interval specified.
Monthly	• Inspect the brake shoes and linings. • Conduct a simple visual inspection of your brake shoes and linings. • Check the idler rollers.
Yearly	• Inspect and service the electric brakes. • Inspect and service your electric brakes. More often with heavy use and wear.

Pre-Maintenance Procedures

⚠ WARNING

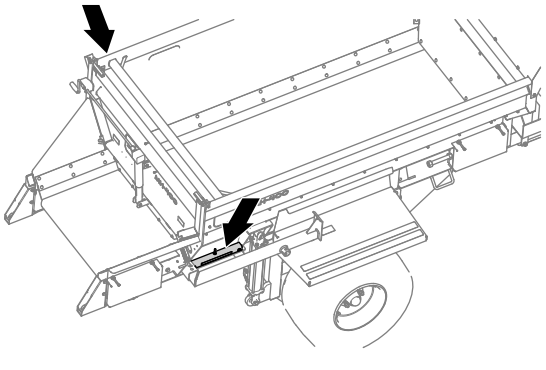
Disconnect all power sources to the machine before doing maintenance work.

Installing the Hydraulic-Cylinder Support

⚠ WARNING

Before preforming maintenance under the hopper when it is raised, install the 2 hydraulic-cylinder supports (Figure 46).

1. Remove the hydraulic-cylinder support located at each side of the hopper (Figure 45).



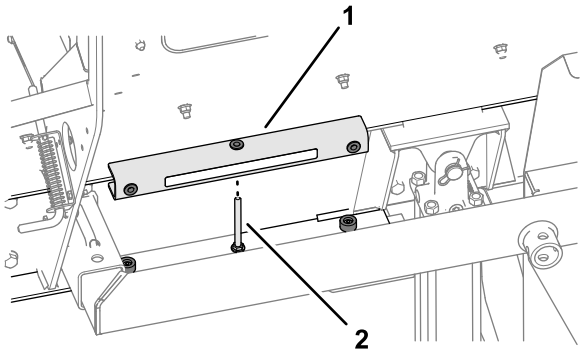


Figure 45

1. Hydraulic-cylinder support

2. Fully tilt the hopper.
3. Assemble the hydraulic-cylinder supports onto the rods of the hydraulic cylinders (Figure 46).

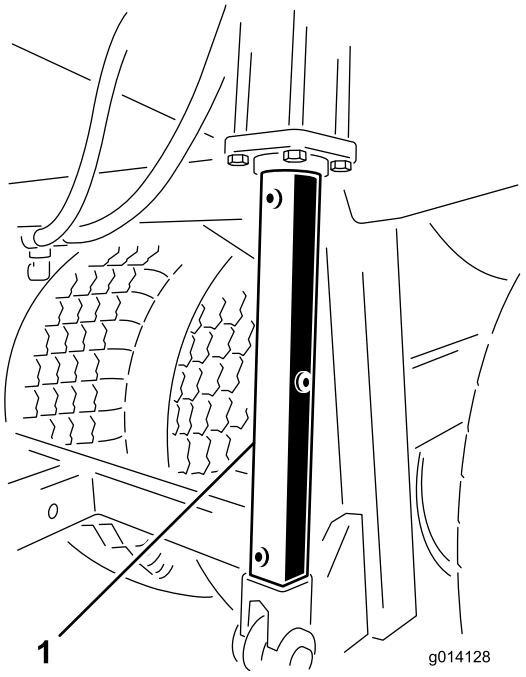


Figure 46

1. Hydraulic cylinder support

Lubrication

Grease Specification

No. 2 lithium grease

Lubricating the Bearings and Bushings

Service Interval: Every 50 hours When operating the machine in extremely dusty and dirty conditions, lubricate the bearings and bushings daily. Lubricate grease fittings immediately after every washing, regardless of the interval specified.

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

The bearing and bushing lubrication points are as follows:

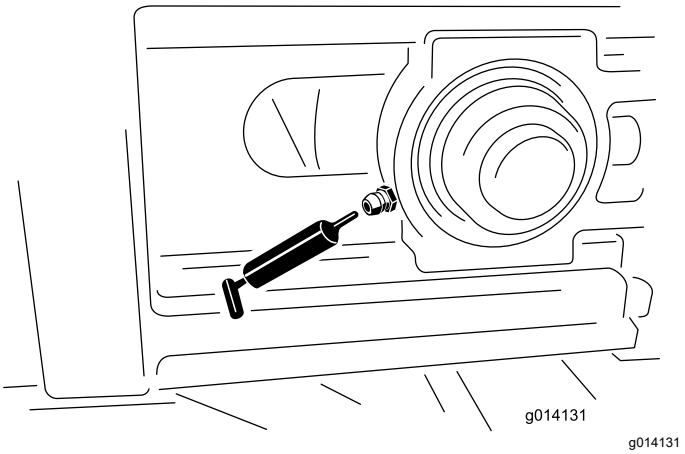
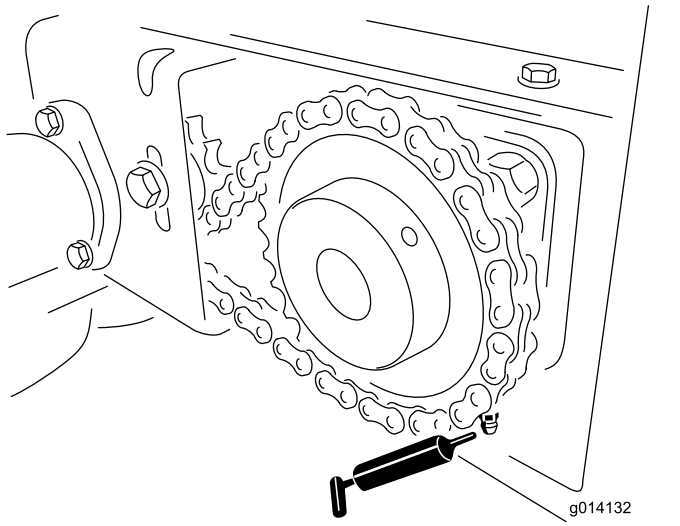
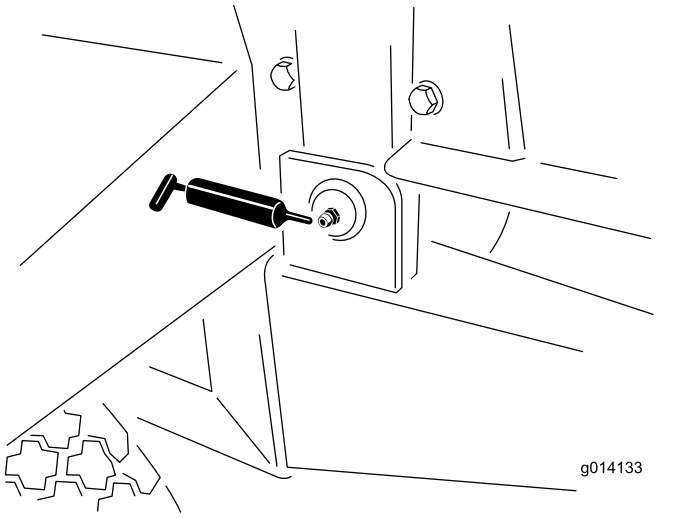


Figure 47



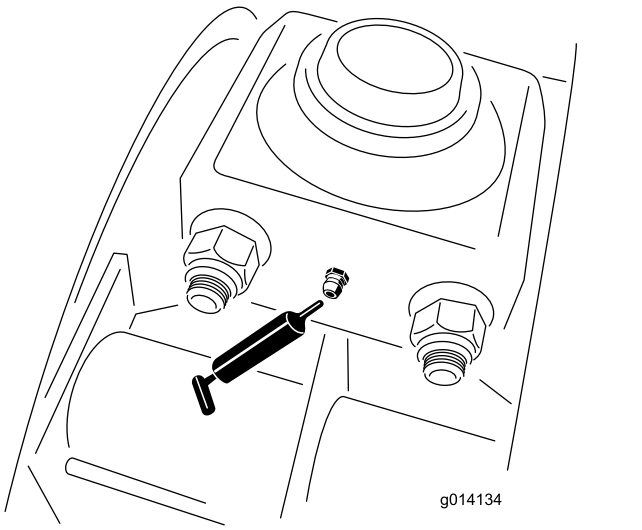
g014132

Figure 48



g014133

Figure 49



g014134

Figure 50

Drive System Maintenance

Checking the Tire and Wheels

Service Interval: Before each use or daily

1. Check the tire air pressure is 172 kPa (25 psi) for 84 cm (33 inch) tires and 207 kPa (30 psi) for 81 cm (32 inch) tires, or as recommended by the tire manufacturer.
2. Check the tires for excessive wear or visible damage.
3. Check that the wheel bolts are tight, and none are missing.

Changing Tires

Changing an Outside Tire

1. Engage the parking brake of the traction unit.
2. Remove any optional attachments from the machine.
3. Remove all material from the hopper.
4. Chock the tires at the opposite side of the damaged tire.
5. Loosen the 6 lug nuts on the flat tire, but do not remove them.
6. Hoist or jack the machine until the tire is off the floor or ground, and support the machine with jack stands.

   Ensure that the machine is stable.
7. Remove the loose lug nuts and remove the tire.
8. Repair or replace the damaged tire.
9. Install the wheel onto the machine by reversing the above steps.

   Note: Ensure that the wheel is centered on the hub and all six wheel bolts are tight. Torque in a crossover pattern to 135 N·m (100 ft-lb).

Changing an Inside Tire

Important: **Keep the machine attached to the traction unit.**

1. Engage the parking brake of the traction unit.
2. Remove any optional attachments from the machine.
3. Remove all material from the hopper.

4. Chock the tires at the opposite side of the damaged tire.
5. On the side with the damaged tire, remove the 4 bolts and 4 locknuts securing the walking beam suspension bearings to the chassis.

   Loosen but do not remove the outside wheel nuts to provide clearance for bearing bolts.
6. Hoist or jack the machine until you can roll the inside tire and walking beam axle assembly away from the machine and support the machine with jack stands.

   Ensure that the machine is stable.
7. Remove the damaged tire.
8. Repair or replace the damaged tire.
9. Install the tire onto the machine by reversing the above steps.

   Note: Ensure that the wheel is centered on the hub and all six wheel bolts and the bearing bolts are tight to 135 N·m (100 ft-lb).

Brake Maintenance

Inspecting the Electric Brakes

Service Interval: Monthly

Yearly

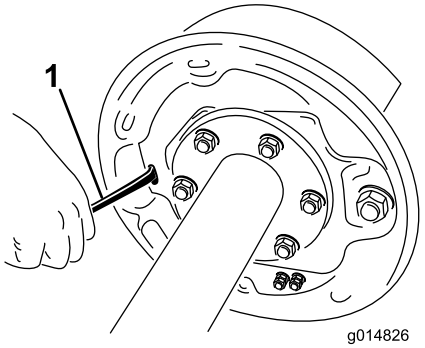
- Visual inspection of your brake shoes and linings.
- Inspect and service your electric brakes.

Adjusting the Electric Brakes

Service Interval: After the first 100 hours or sooner depending on use or performance.

1. Raise the machine and secure it with jack stands.
2. Ensure that the wheel and drum rotate freely.
3. Remove the adjusting hole cover from the slot at the back side of the brake-backing plate.
4. With a screwdriver, rotate the star wheel of the adjuster assembly to expand the brake shoes (Figure 51).

   Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel difficult to turn.



g014826

Figure 51

1. Screwdriver

5. Rotate the star wheel in the opposite direction until the wheel turns freely with a slight drag on the lining.
6. Install the adjusting hole cover.
7. Repeat steps 2 through each brake.

Inspecting the Brake Shoes and Linings

Service Interval: Monthly

When a brake shoe becomes worn, replace both shoes on each brake, and both brakes on the same axle. This ensures that the brakes remain balanced.

Replace the brake linings under the following conditions:

- They are worn to 1/16 inch (1.6 mm) or less remaining thickness.
- They are contaminated with grease or oil.
- They are abnormally scored or gouged.

  Note: Hairline heat cracks are normal in the brake linings.

Brake Cleaning and Inspection

Service Interval: Yearly More often with heavy use and wear.

- Change magnets and shoes when they become worn or scored.
- Clean the backing plate, magnet arm, magnet, and brake shoes with an automotive brake cleaner.
- Ensure that all parts removed are replaced in the same brake and drum assembly that they were removed from.
- Inspect the magnet arm for any loose or worn parts.
- Check the shoe return springs, the hold down springs, and the adjuster springs for stretch or deformation and replace them if required.

⚠ CAUTION

Brake dust can be hazardous to your health if inhaled; take the following precautions when servicing brakes:

- **Do not create or breathe dust.**
- **Do not machine, file, or grind the brake linings.**
- **Do not use compressed air or dry brushing for cleaning.**

Brake Lubrication

Before reassembling the electric brakes, apply a light film of anti-seize compound, or grease such as Lubriplate™ on the following:

- Brake anchor pin
- Actuating arm bushing and pin
- Areas on the backing plate that are in contact with the brake shoes and magnet lever arm
- Actuating block on the actuating arm

Important: **Do not allow grease to contact the brake linings, drums, or magnets.**

Inspecting the Magnets

The electromagnets of the brakes are designed to provide the proper input force and friction.

Inspect the magnets regularly, and replace if they become unevenly worn. Use a tool with a straight edge to check wear.

Even if the wear is normal, replace the magnets if any part of the magnet coil is visible through the friction material on the magnet face. Replace the magnets in pairs (both sides of an axle).

When replacing the magnets, also resurface the drum armature surface.

Hydraulic System Maintenance

Hydraulic System Safety

- Seek immediate medical attention if fluid is injected into skin. Injected fluid must be surgically removed within a few hours by a doctor.
- Ensure that all hydraulic-fluid hoses and lines are in good condition and all hydraulic connections and fittings are tight before applying pressure to the hydraulic system.
- Keep your body and hands away from pinhole leaks or nozzles that eject high-pressure hydraulic fluid.
- Use cardboard or paper to find hydraulic leaks.
- Safely relieve all pressure in the hydraulic system before performing any work on the hydraulic system.

Hydraulic Fluid Specification

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

Alternate fluids: If the Toro fluid is not available, other petroleum-based Universal Tractor Hydraulic Fluids (UTHF) may be used provided its specifications fall within the listed range for all the following material properties and it meets industry standards. We do not recommend the use of synthetic fluid. Consult with your lubricant distributor to identify a satisfactory product.

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

Material Properties:

Viscosity, ASTM D445	cSt @ 40°C 55 to 62
Viscosity Index ASTM D2270	140 to 152
	cSt @ 100°C 9.1 to 9.8
Pour Point, ASTM D97	-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

Checking the Hydraulic System

Service Interval: Before each use or daily

1. Check the hydraulic system for oil leaks.

   If you find a leak, tighten the fitting, or replace or repair the damaged part.

2. Check the hydraulic hoses for wear or damage.

   Replace worn or damaged hoses

3. Check the hydraulic-fluid level of the traction unit.

   Add hydraulic-fluid level to the reservoir if needed; refer to the *Operator's Manual* for your traction unit.

Optional Attachments

Checking the Optional Attachments

Service Interval: Before each use or daily

- Check that the quick attach brackets are secure and that the safety clips are installed.

  Replace any missing safety clips.

- Check that the optional attachment is securely clamped and does not move or slide out.

  Adjust clamps if required.

- Check the paddles on the Twin Spinner disks for wear.

  Replace the paddles when they wear thin.

- Check the Twin Spinner housing for signs of cracking or corrosion.

Maintaining the Conveyor Belt

Checking the Conveyor Belt and Rollers

Service Interval: Every 40 hours

Monthly

- Check that the conveyor belt tracks straight on the rollers and it does not slip.

  Adjust the conveyor belt tracking if required; refer to Adjusting the Conveyor Belt Tracking (page 48).

- Check that the idler rollers between the front and rear rollers are not bent or seized.

  Replace or repair worn or damaged idler rollers if required.

Adjusting the Conveyor Belt Tracking

If the conveyor belt is not centered and tracks to one side, it needs to be adjusted (Figure 52). The best time to do this is between loads during operation.

1. Go to the rear of the machine and determine which side of the belt is touching.
2. Go to the front on the same side, loosen the locking nut, and tighten the adjuster nut by one quarter turn.
3. Tighten both locking nuts before running the machine.
4. Load the machine with material and run the load through until empty. Repeat multiple times.
5. Stop the belt and go to the rear of the machine to observe the results.

   You may need to repeat the above steps several times until the belt begins to move and track properly.

   Note: The belt may move slightly depending on the type of load and its position. If the belt is not touching the side rails, you do not need to track the belt.

   Important: **Do not adjust the rear drive roller of the conveyor belt. It is set to factory specifications. Contact your authorized Toro distributor it needs an adjustment.**

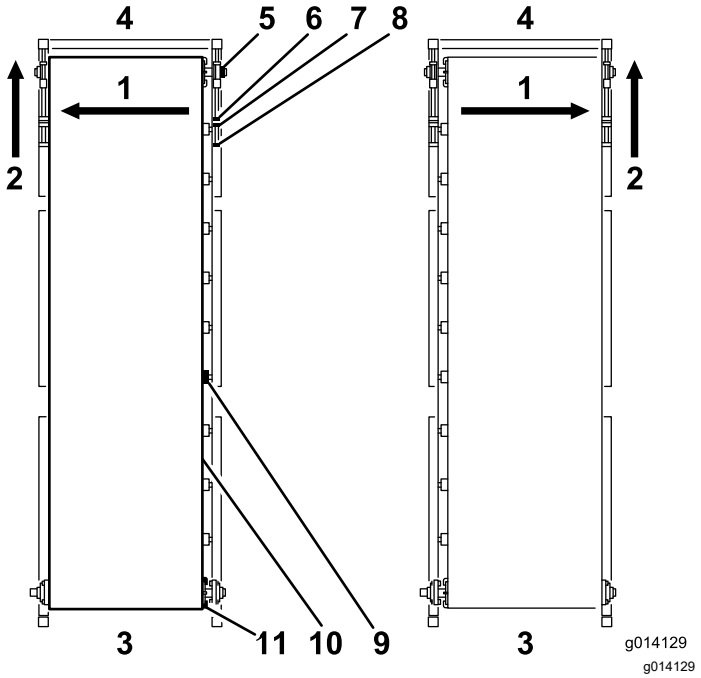


Figure 52

1. If belt is tracking toward this side—
2. Then adjust this tensioner to the front on the same side.
3. Rear
4. Front
5. Take up bearing
6. Adjuster nut
7. Locking nut
8. Tensioner rod
9. Belt roller
10. Conveyor belt
11. Drive roller

Adjusting the Conveyor Belt Tension

Check and adjust the belt tension frequently (Figure 52). All rubber conveyor belts stretch, especially when they are new or have not been used for a while.

1. Park the machine on level ground with the rear gate and feed gate at least 6.25 mm (1/4 inch) off the floor (depending on the material).
2. Fully load the machine with sand that you expect the machine to use.
3. Remove the black front covers on either side of the machine.
4. Using two wrenches, hold the end of the tensioner rod stationary, while loosening the locking nut closest to the end of the rod.
5. Move the locking nut back 2 to 5 cm (1 to 2 inches).

⚠ WARNING

Operating the conveyor belt with the guards and covers removed can cause serious injury.

Use extreme caution around moving parts with safety guards removed.

6. Turn on the conveyor belt.
7. If belt slips, tighten the tension bolts evenly (with machine off) half a turn and check if the belt slips again. Continue until the belt moves without any slippage.
8. Give both tensioning bolts another half turn. At this point you should have proper tension.
9. To verify belt tension, look underneath the machine at the chassis cross member. The middle of the belt should just clear the chassis cross member when the machine is in the down position. If the middle of the belt is touching the cross member, tighten both tensioning bolts another quarter of a turn.

Important: **Be patient. Do not over-tension the belt.**

Important: **Do not use air tools on the belt tensioning bolts.**

Changing the Conveyor Belt

Read these instructions before removing the belt. If the belt is destroyed, use a knife to cut the belt in an undamaged area. If you intend to make a warranty claim, the belt supplier must inspect the belt to evaluate the damage and make recommendations for a replacement.

Removing the Belt

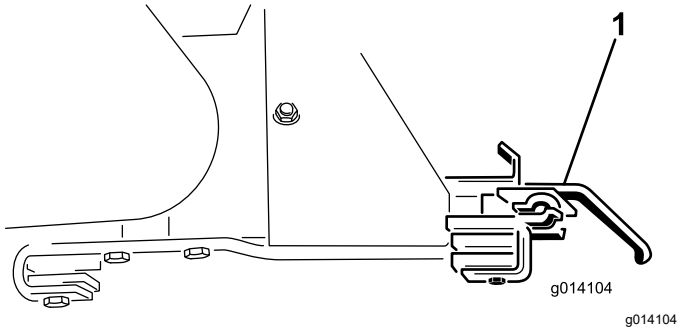
1. Remove the black safety covers located on the four outer corners of the machine.
2. Remove the guides for the inner rubber liner from the front and both sides of the hopper, with the metal rails attached.
3. Remove the silicone sealer on the rear of the metal rails (but remember to apply the silicone sealer when re installing them).
4. At both front corners, use two wrenches to hold the end of the tensioner rod stationary.
5. Loosen the nut closest to the end of the tensioning rod.
6. Move the inside adjusting nut back until the tensioning rod clears the pillow block bearing.

Note: The front idler roller is supported by two pillow block bearings sitting in an upper and lower guide (one set on each side of the machine).

7. Support the front idler roller.
8. Go to the right front corner and remove the locking collar that holds the pillow block bearing on the shaft. Do this by backing off the set screws and turning the locking collar counterclockwise. Using a hammer and punch, tap the locking collar counterclockwise until it releases from the shaft.
9. Repeat this step for the left front corner.
10. Remove the pillow block bearings by sliding the idler roller back so the pillow block bearings slide out of their guides.
11. Remove the two safety brackets and slide the roller down through the open hole.
12. Go to the rear of the machine and loosen the tensioning sprocket.
13. Remove the chain from the drive sprocket.
14. Loosen the set screws on the drive sprocket and remove the drive sprocket and key from the drive roller shaft.
15. Support the rear drive roller.

Important: **Do not disturb the rear roller adjustment bracket assembly. It is designed to adjust the rear roller automatically if the belt is not tracking accurately.**

16. Remove the four bolts in the flange bearings on both sides.
17. Remove the locking collars next to the flange bearings on the shaft, and slide both bearings off the shaft.
18. Remove the two option attachment brackets (Figure 53).

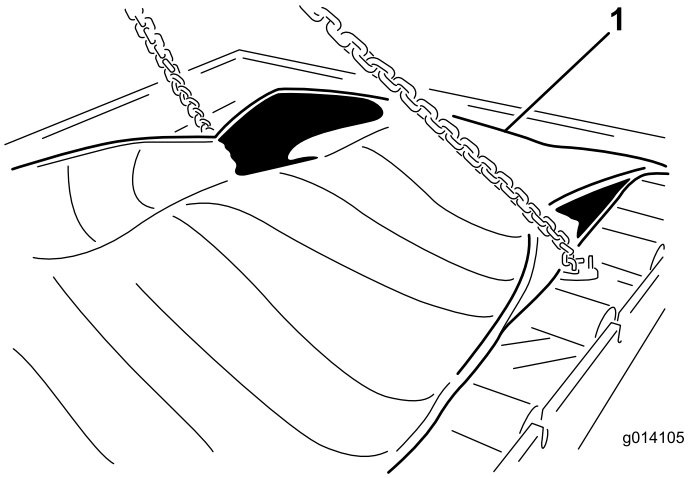


g014104

Figure 53

1. Option attachment bracket

19. Lower the drive roller down through the slots.
20. Remove the rear gate for a better view.
21. Note the position of the cartridge inside the hopper, so that you can re install it in the same position and direction. It is bolted in six places along the side of the machine (three 4 bolt plates on each side).
22. Secure the cartridge by using straps from a lifting device on each of the four corners.
23. Remove the 24 bolts to release the cartridge (Figure 54).

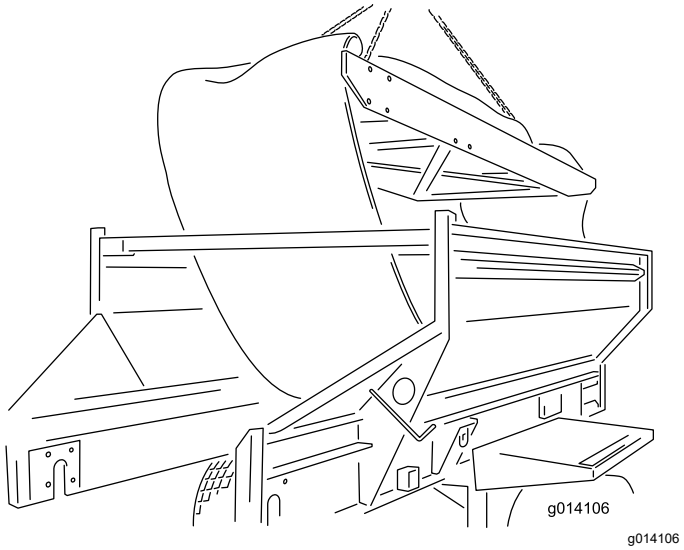


g014105

Figure 54

1. Secure and remove the belt cartridge

24. Remove the cartridge by lifting it out from the top of the machine. Place it on the ground (Figure 55).



g014106

Figure 55

Installing the Belt

To install a new belt, reverse the above instructions, but keep in mind the following important notes and instructions.

Important: **The conveyor belt is designed to work primarily in one direction. Ensure that the painted arrow in the middle of the belt is pointing toward the rear of the machine (looking down from above).**

Note: Before sliding the rear drive roller back up through the slot and into place, ensure that you have already installed the four bolts (from the inside facing out) for connecting the pillow block bearings. Otherwise, you must remove the drive roller to gain enough clearance to install these bolts.

- When installing the rear drive roller, ensure that the shaft connecting to the motor is on the left side. It has a keyhole cut into it for securing the drive sprocket.
- Before applying tension with the tensioner rods at the front of the machine, use your hands to manually center the belt at the front and rear.
- Track and tension the belt by following the instructions in Adjusting the Conveyor Belt Tracking (page 48) and Adjusting the Conveyor Belt Tension (page 49).
- The front idler and rear drive rollers provide excellent traction for pulling the belt under load.

  Important: **Do not overtighten or stretch the belt.**
- Apply silicone sealer to the rear side of the metal rails and at the two front corners of the floor where the rails meet. The sealer deflects any material from getting past the rails.

Adjusting the Conveyor Drive Chain Tension

If the conveyor drive chain is loose, it needs to be tightened (Figure 56).

1. Shut off the engine of the traction unit and engage the parking brake.
2. Remove the rear conveyor drive guard.
3. Loosen the bolt that goes through the tensioner sprocket.
4. Tighten the positive locking screw using moderate force.
5. Tighten the tensioner sprocket bolt.

   Important: **Do not over tension the chain. Leave just enough tension to take up the extra slack.**
6. Check that the chain is sufficiently lubricated, and the sprockets are secure to the shafts.
7. Replace the rear conveyor drive guard.

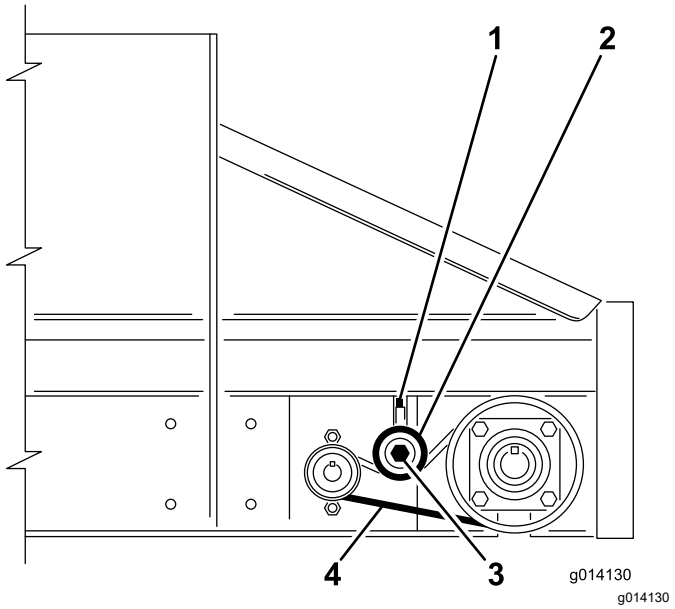


Figure 56

1. Positive locking screw
2. Tensioner sprocket—push down to tighten, do not over tension
3. Sprocket bolt
4. Slack side, about 1/4 inch (6.25 mm) movement

Maintaining the Hopper and Rear Gate

Checking the Conveyor Seals and Rear Gate Seal

Service Interval: Before each use or daily

Check all rubber seals for damage or wear.

Replace or repair the seals if they are damaged or excessively worn.

Checking the Rear Gate

Service Interval: Before each use or daily

- Check that the rear gate closes and latches securely.
- Check that the adjustable section of the rear gate opens and closes without sticking.

Cleaning

Washing the Machine

Salts, road tar, tree sap, fertilizers, or chemicals may damage the painted finish of the machine. Wash off these deposits as soon as possible with detergent and water. Additional cleaners or solvents may be needed, but ensure that they are safe for painted surfaces.

⚠ WARNING

Flammable fluids and cleaners with toxic vapors are hazardous to your health.

Do not use flammable fluids or cleaners with toxic vapors. Follow the manufacturer's recommendations.

Important: **Do not use a high-pressure washer. This can remove paint, safety decals, and grease, and can also damage components.**

1. Remove the option before cleaning and wash it separately.
2. Remove the handheld remote.
3. Wash the body of the machine with warm water and a mild detergent
4. Completely rinse off the detergent residue with clean water before it dries.
5. Remove the belt cleaning scraper assembly from the rear of the machine (Figure 57).

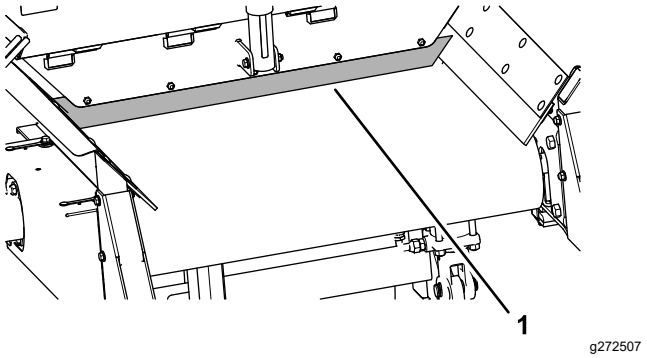


Figure 57

1. Belt cleaning scraper assembly

6. Raise the back of the machine if needed.
7. Fully open the rear gate and spray water inside the hopper assembly and the rear gate area. Inspect the side seals and replace if necessary.
8. Inspect the hopper, bottom guard, conveyor belt, bed, and rollers to ensure that all trapped material is gone.
9. Lower the machine to the normal operating position.

10. If removed, install the belt cleaning scraper assembly.

    Ensure that the scraper is as vertical as possible but contacts the belt.

Storage

Before storing the machine for the season:

1. Park the machine on a hard, level surface; engage the parking brake; shut off the engine; remove the key; and wait for all movement to stop before leaving the machine.
2. Remove the handheld remote.
3. Remove the batteries from the remote.
4. Thoroughly wash the machine; refer to Washing the Machine (page 52).

   Remove optional accessories if necessary.
5. Check all fasteners and tighten them if necessary.
6. Grease all fittings and pivot points; refer to Lubricating the Bearings and Bushings (page 43).

   Wipe off any excess lubricant.
7. Lightly sand any painted areas that are scratched, chipped, or rusted, and apply touch up paint.
8. Store the machine indoors if possible.

Troubleshooting

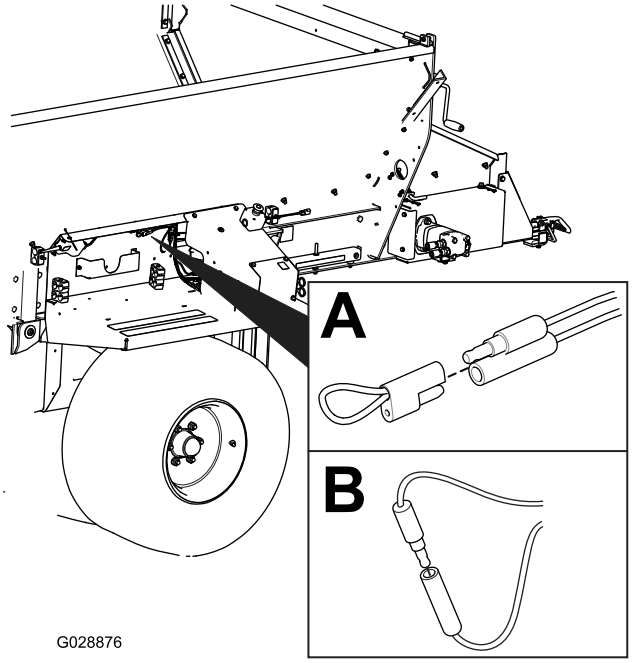
Checking Fault Codes

EH Models

If the Diagnostic LED indicates that there is a system fault (refer to Diagnostic LED Function (page 19)), check the fault codes to determine what is wrong with the machine.

Entering Diagnostic Mode and Checking the Codes

1. Push the E-STOP button down to turn off the power.
2. Pull the tethered cap off the two diagnostic, shunt connectors (Figure 58, A).
3. Connect the diagnostic, shunt connectors together (Figure 58, B).



g028876

Figure 58

4. Pull the E-STOP up to turn on the power.
5. Count the number of flashes to determine the fault code, then consult the following table:

   Note: If there are multiple faults, both faults will flash, then a long pause, then the flash sequences will repeat.

Code	LED Flash Pattern	Behavior	Details
Machine Specific Faults			
11	Blink once, pause, blink once, long pause, then repeat	Lost communication with BASE.	Connector not plugged in; locate the loose or disconnected harness connector and connect it.
			Something wrong in the wiring; contact your authorized Toro distributor.
			BASE is bad; contact your authorized Toro distributor.
12	Blink once, pause, blink twice, long pause, then repeat	Version incompatibility of the BASE and/or HH	Wrong software (install the correct software from TORODIAG); contact your authorized Toro distributor.
13	Blink once, pause, blink 3 times, long pause, then repeat	Wrong HH—not implemented on RevA	Wrong product association (i.e. trying to update software on a MH–400 with a ProPass handheld)

Resetting the Fault Code

After solving the problem, reset the fault codes by disconnecting and reconnecting diagnostic connectors. The diagnostic light will flash continuously at 1 Hz (1 flash per second).

Exiting Diagnostic Mode

1. Push the E-STOP button down to turn off the power; refer to E-Stop Button (page 18).
2. Disconnect the diagnostic, shunt connectors.
3. Push the tethered cap onto the two diagnostic, shunt connectors.
4. Pull the E-STOP up to turn on the power.

Handheld Remote Messages

EH Models

Displayed Message	Description
ASSOC PENDING	Association yet to be made.
ASSOC ACTIVE	Association attempt in progress.
POWER UP BASE	Power up the Base Unit.
ASSOC PASS	Association attempt was successful.
ASSOC EXIT	Exiting Association mode
ASSOC FAIL	Association attempt failed.
PRESS STORE	Press the STORE button.
ALL STORE	Store all current set values in current working memory.
OPTION STORE	Store the current Option settings in current working memory.
BELT STORE	Store the current Floor settings in current working memory.
PRESET 1 STORE	Store the current Preset 1 setting in current working memory.
PRESET 2 STORE	Store the current Preset 2 setting in current working memory.
PRESET 3 STORE	Store the current Preset 3 setting in current working memory.
WAITING FOR BASE	Remote is waiting for a Base Unit response.
HOPPER UP	Remote is sending Hopper Raise command.
HOPPER DOWN	Remote is sending Hopper Lower command.
PROPASS REV XX	Product to which the system is set to control.
MH400 REV XX	Product to which the system is set to control.
BAT XX% Battery X.X V	Remaining battery life in percentage. Remaining battery life in voltage.
CHANNEL X	Channel in GHz currently used by the system.
HH ID XXXXXX	Identity of the Handheld Remote
BASE ID XXXXXX	Identity of the Base Unit
FLR XX% OPT XX%	The current Floor speed in percent. The current Option speed in percent.
FLRS XX% OPTS XX%	Display of the stored regular Floor speed and Option speed with 0% command to the output allowing the operator to decide to use the current setting or change it.
FLR OFF OPT OFF	Displays the status of the floor and option when they are off.
SERVICE ACTIVE	The service tool is active.
SERVICE NO APP	Service has no valid application to run.

Notes:

Notes:

California Proposition 65 Warning Information

What is this warning?

You may see a product for sale that has a warning label like the following:

WARNING: Cancer and Reproductive Harm—www.p65Warnings.ca.gov.

What is Prop 65?

Prop 65 applies to any company operating in California, selling products in California, or manufacturing products that may be sold in or brought into California. It mandates that the Governor of California maintain and publish a list of chemicals known to cause cancer, birth defects, and/or other reproductive harm. The list, which is updated annually, includes hundreds of chemicals found in many everyday items. The purpose of Prop 65 is to inform the public about exposure to these chemicals.

Prop 65 does not ban the sale of products containing these chemicals but instead requires warnings on any product, product packaging, or literature with the product. Moreover, a Prop 65 warning does not mean that a product is in violation of any product safety standards or requirements. In fact, the California government has clarified that a Prop 65 warning "is not the same as a regulatory decision that a product is 'safe' or 'unsafe.'" Many of these chemicals have been used in everyday products for years without documented harm. For more information, go to https://oag.ca.gov/prop65/faqs-view-all.

A Prop 65 warning means that a company has either (1) evaluated the exposure and has concluded that it exceeds the "no significant risk level"; or (2) has chosen to provide a warning based on its understanding about the presence of a listed chemical without attempting to evaluate the exposure.

Does this law apply everywhere?

Prop 65 warnings are required under California law only. These warnings are seen throughout California in a wide range of settings, including but not limited to restaurants, grocery stores, hotels, schools, and hospitals, and on a wide variety of products. Additionally, some online and mail order retailers provide Prop 65 warnings on their websites or in catalogs.

How do the California warnings compare to federal limits?

Prop 65 standards are often more stringent than federal and international standards. There are various substances that require a Prop 65 warning at levels that are far lower than federal action limits. For example, the Prop 65 standard for warnings for lead is 0.5 µg/day, which is well below the federal and international standards.

Why don't all similar products carry the warning?

- Products sold in California require Prop 65 labelling while similar products sold elsewhere do not.
- A company involved in a Prop 65 lawsuit reaching a settlement may be required to use Prop 65 warnings for its products, but other companies making similar products may have no such requirement.
- The enforcement of Prop 65 is inconsistent.
- Companies may elect not to provide warnings because they conclude that they are not required to do so under Prop 65; a lack of warnings for a product does not mean that the product is free of listed chemicals at similar levels.

Why does Toro include this warning?

Toro has chosen to provide consumers with as much information as possible so that they can make informed decisions about the products they buy and use. Toro provides warnings in certain cases based on its knowledge of the presence of one or more listed chemicals without evaluating the level of exposure, as not all the listed chemicals provide exposure limit requirements. While the exposure from Toro products may be negligible or well within the "no significant risk" range, out of an abundance of caution, Toro has elected to provide the Prop 65 warnings. Moreover, if Toro does not provide these warnings, it could be sued by the State of California or by private parties seeking to enforce Prop 65 and subject to substantial penalties.

The Toro Warranty

Two-Year or 1,500 Hours 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 2 years or 1,500 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*. Repairs for product issues caused by failure to perform required maintenance and adjustments are not covered under this warranty.

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.
- Product failures which result from failure to perform recommended maintenance and/or adjustments.
- Product failures which result from operating the Product in an abusive, negligent, or reckless manner.
- Parts consumed through use that are not 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.
- Failures caused by outside influence, including, but not limited to, weather, storage practices, contamination, use of unapproved fuels, coolants, lubricants, additives, fertilizers, water, or chemicals.
- 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.

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. Note: (Lithium-Ion battery only): Pro-rated after 2 years. Refer to the battery warranty for additional information.

Lifetime Crankshaft Warranty (ProStripe 02657 Model Only)

The Prostripe which is fitted with a genuine Toro Friction Disc and Crank-Safe Blade Brake Clutch (integrated Blade Brake Clutch (BBC) + Friction Disc assembly) as original equipment and used by the original purchaser in accordance with recommended operating and maintenance procedures, are covered by a Lifetime Warranty against engine crankshaft bending. Machines fitted with friction washers, Blade Brake Clutch (BBC) units and other such devices are not covered by the Lifetime Crankshaft Warranty.

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 Emissions 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.

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 your Authorized Toro Service Center.