Form No. 3404-405 Rev B

# Controller Kit

## MH-400 Series Material Handler

**Model No. 131-4835**

**Installation Instructions**

## ⚠ WARNING

**CALIFORNIA**
**Proposition 65 Warning**

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

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

## 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: OA3MRF24J40MC-Base, OA3MRF24J40MA-Hand Held**

**IC: 7693A-24J40MC-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-LGHH
해당 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없음

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

### Singapore Electromagnetic Compatibility Certification

Handheld: TWM-240004_IDA_N4020–15

RF2CAN: TWM-240005_IDA_N4024–15


8111 Lyndale Avenue South
Bloomington, MN 55420

Register at www.Toro.com.

CE

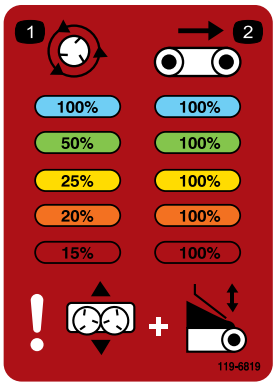
Original Instructions (EN)
Printed in the USA


*3404-405* B

# Safety

## 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.




decal119-6819

**119-6819**

1. Spinner speed percentage
2. Belt speed percentage

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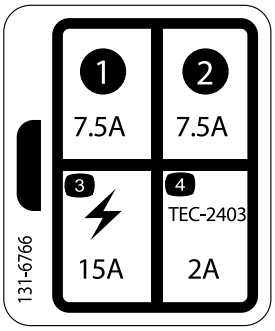


decal131-6766

**131-6766**

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

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decal136-7585

**136-7585**

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# Installation

## Loose Parts

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

| Procedure | Description | Qty. | Use |
|---|---|---|---|
| 1 | No parts required | – | Prepare the machine. |
| 2 | Cap screw (1/4 x 1-1/4 inches)<br>Nut (1/4 inch)<br>Controller<br>RF2CAN controller<br>Screw (#10)<br>Locknut<br>Cover<br>Relay<br>Bolt (1/4 x 3/4 inch)<br>Light | 8<br>11<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1 | Install the kit. |
| 3 | Wire harness<br>Fuse decal | 1<br>1 | Install the wire harness. |
| 4 | Handheld remote<br>AA batteries<br>Magnetic bracket | 1<br>4<br>1 | Assemble and mount the handheld remote. |
| 5 | No parts required | – | Complete the installation. |

# 1

# Preparing the Machine

### No Parts Required

## Procedure

1. Park the machine on a level surface.
2. Raise the hopper; refer to the *Operator's Manual* for your machine.

   **Note:** Make sure that you use the cylinder safety stop when raising the hopper.
3. Disconnect the power connector from the traction unit.
4. Ensure that the machine is secure from movement before you begin the installation.
5. Remove the cover as shown in Figure 1.

   **Note:** Retain the hardware for later installation.

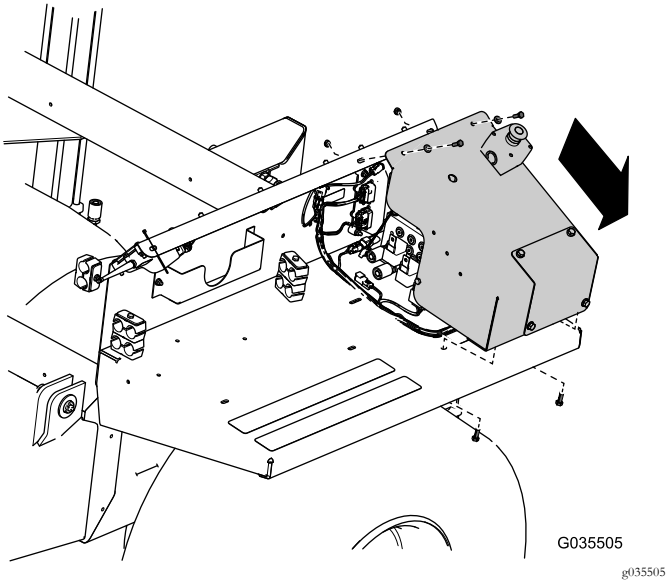



**Figure 1**

6. Remove the E-Stop button assembly and the manual override cover from the cover as shown in Figure 2.

**Note:** Retain the E-Stop button assembly, manual override cover, and corresponding hardware for later installation.

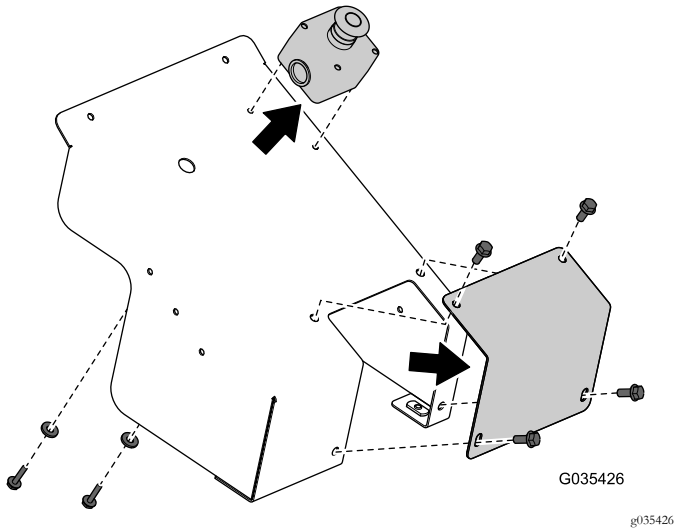



**Figure 2**

7. Remove the controller and wire harness from the fender guard (Figure 3).

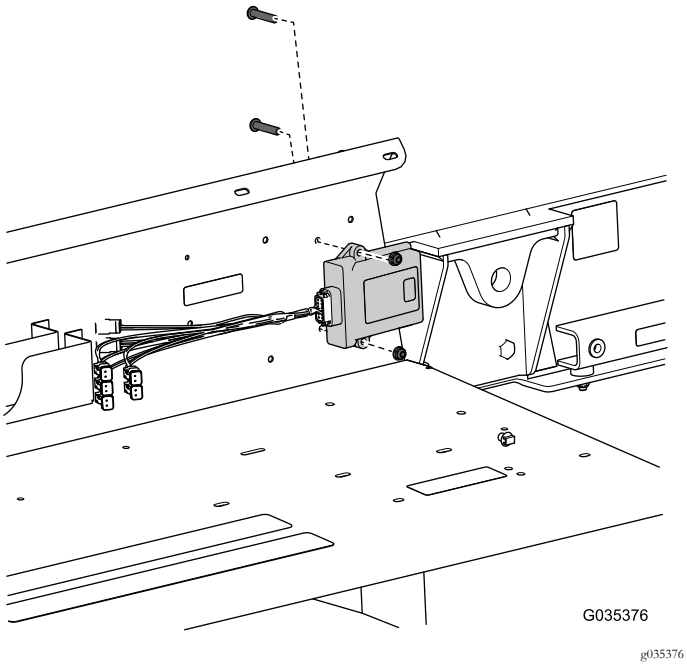



**Figure 3**

# 2

# Installing the Kit

### Parts needed for this procedure:

| | |
|---|---|
| 8 | Cap screw (1/4 x 1-1/4 inches) |
| 11 | Nut (1/4 inch) |
| 1 | Controller |
| 1 | RF2CAN controller |
| 1 | Screw (#10) |
| 1 | Locknut |
| 1 | Cover |
| 1 | Relay |
| 1 | Bolt (1/4 x 3/4 inch) |
| 1 | Light |

## Procedure

1. Drill 13 holes into the fender guard; refer to Figure 4 for the appropriate hole locations and diameter.

   **Note:** Do not drill Item 11 in Figure 4 oversized as the wire harness will not hold with clips provided.

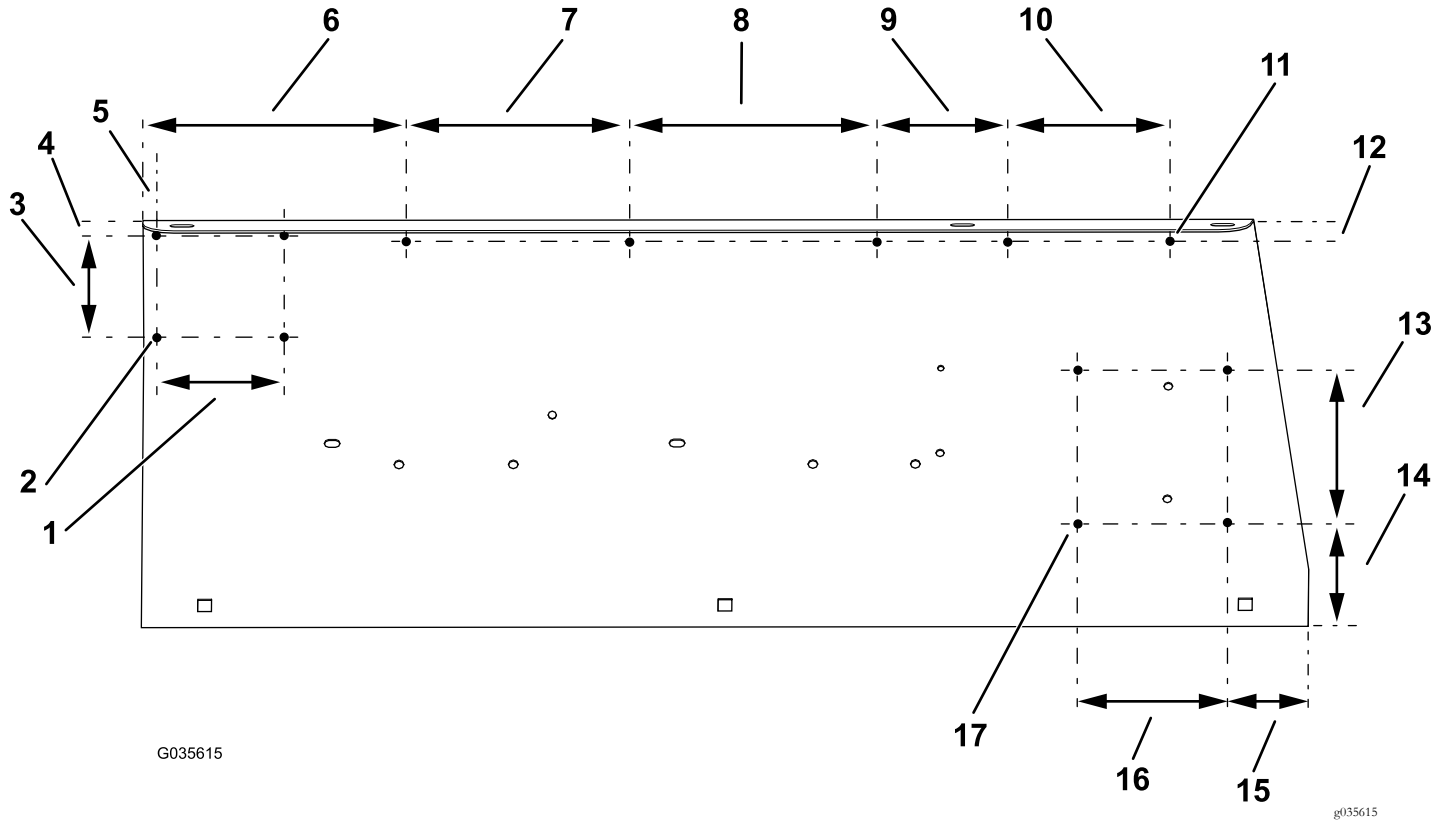



**Figure 4**

1. 10.26 cm (4.04 inches)
2. 0.71 cm (0.28 inch) diameter (4x)
3. 8.46 cm (3.33 inches)
4. 1.29 cm (0.51 inch)
5. 1.07 cm (0.42 inch)
6. 21.21 cm (8.35 inches)
7. 17.98 cm (7.08 inches)
8. 19.91 cm (7.84 inches)
9. 10.54 cm (4.15 inches)
10. 13.06 cm (5.14 inches)
11. 0.68 cm (0.266 inch) diameter (5x)
12. 1.91 cm (0.75 inch)
13. 13.77 cm (5.42 inches)
14. 9.32 cm (3.67 inches)
15. 6.68 cm (2.63 inches)
16. 12.04 cm (4.74 inches)
17. 0.71 cm (0.28 inch) diameter (4x)

2. Install the RF2CAN controller onto the fender guard with 4 cap screws (1/4 x 1–1/4 inches) and 4 nuts (1/4 inch) as shown in Figure 5.

   **Note:** Make sure that you install the screws in the appropriate direction; refer to Figure 5.

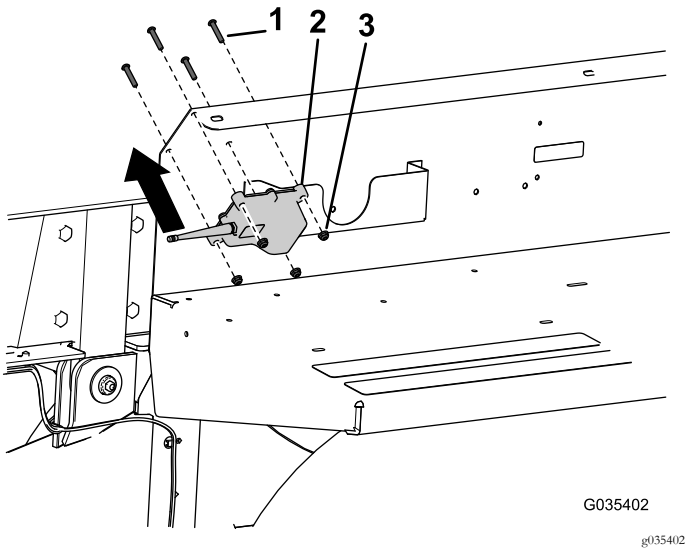



**Figure 5**

1. Cap screw (1/4 x 1–1/4 inches)
2. RF2CAN controller
3. Nut (1/4 inch)

3. Install the controller onto the fender guard with 4 cap screws (1/4 x 1–1/4 inches) and 4 nuts (1/4 inch) as shown in Figure 6.

   **Important: Make sure that you install the screws in the appropriate direction; refer to Figure 6. If the screws are installed in the wrong direction the hopper will hit them when it is lowered.**

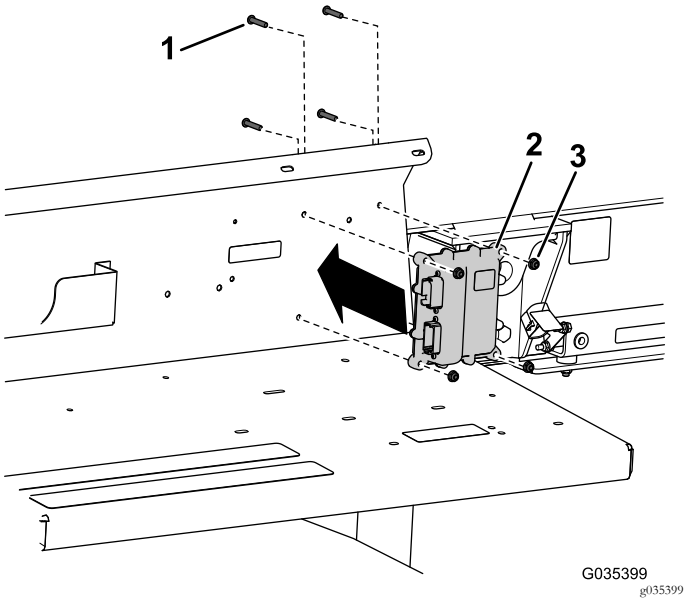



**Figure 6**

1. Cap screw (1/4 x 1-1/4 inches)
2. Controller
3. Nut (1/4 inch)

4. Remove the wire-harness cap (Figure 7) from the wire harness.
5. Mount the wire-harness cap on the fender guard with a screw (#10) and locknut as shown in Figure 7.

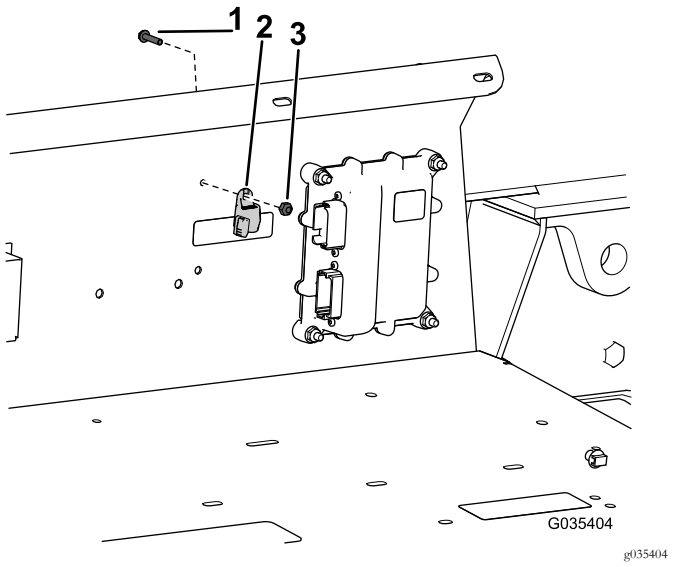



**Figure 7**

1. Screw (#10)
2. Wire-harness cap
3. Locknut

6. Mount the relay onto the inside of the cover with a bolt (1/4 x 3/4 inch) and nut (1/4 inch) as shown in Figure 8.

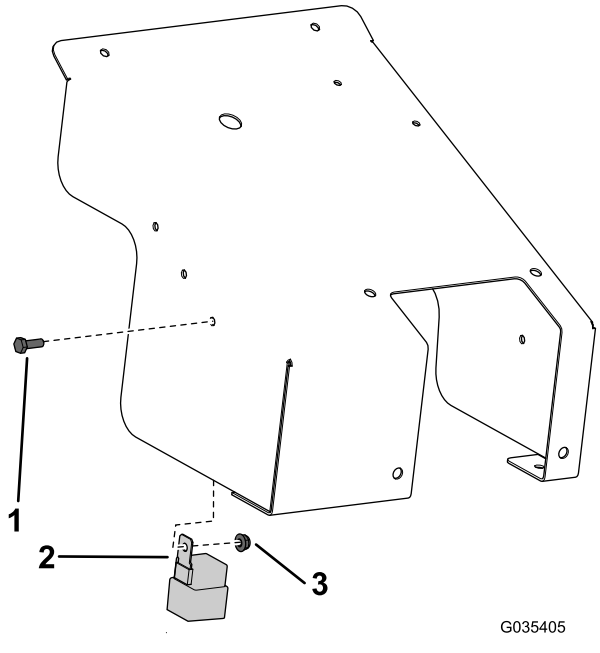



**Figure 8**

1. Bolt (1/4 x 3/4 inch)
2. Relay
3. Nut (1/4 inch)

7. Remove the fuse-block cap (Figure 9) from the wire harness.
8. Mount the fuse-block cap to the inside of the cover with 2 screws (1/4 x 3/4 inch) and 2 nuts (1/4 inch) as shown in Figure 9.

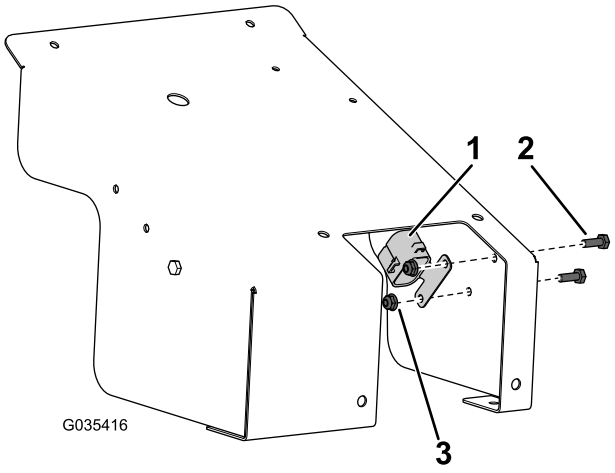



**Figure 9**

1. Fuse-block cap
2. Screw (1/4 x 3/4 inch)
3. Nut (1/4 inch)

9. Install the previously removed E-Stop button assembly onto the cover (Figure 10).

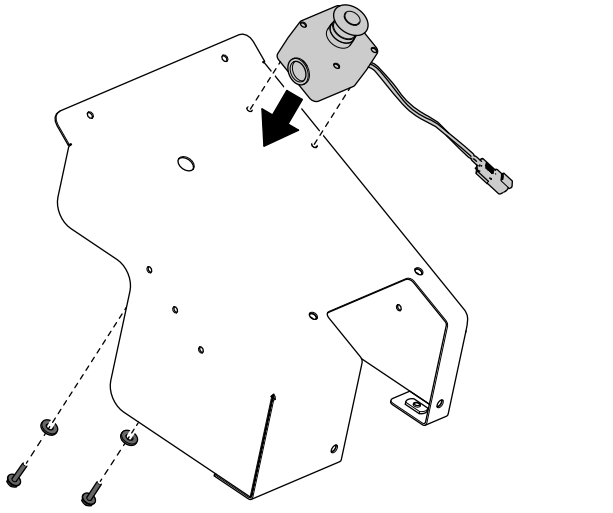



**Figure 10**

10. Mount the light onto the top of the cover; refer to Figure 11 for the correct orientation.

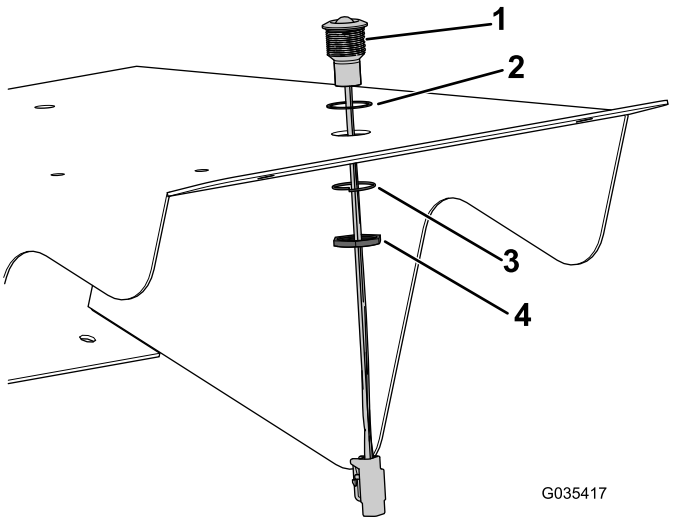



**Figure 11**

1. Light
2. Gasket
3. Washer
4. Nut

# 3

# Installing the Wire Harness

### Parts needed for this procedure:

| | |
|---|---|
| 1 | Wire harness |
| 1 | Fuse decal |

## Procedure

1. Locate the RF2CAN controller end of the wire harness and plug it into the RF2CAN controller (Figure 12).

   **Note:** Plug is keyed and has a specific orientation.

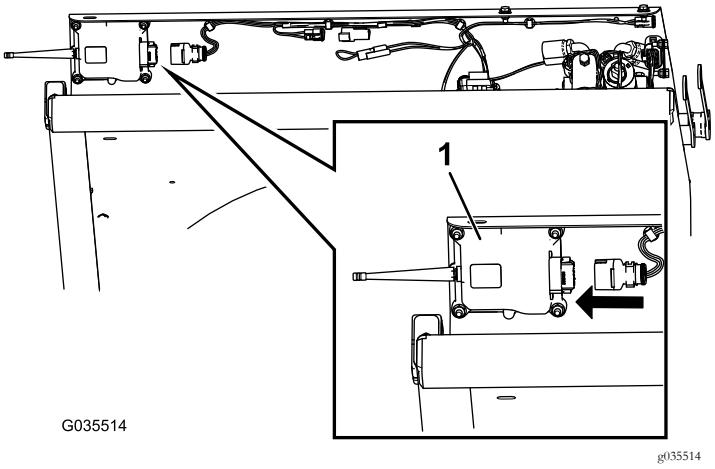



**Figure 12**

1. RF2CAN controller

2. Route the harness along the underside of the fender guard.

   **Note:** Place clips in the holes drilled in the underside of the fender guard to help install the harness.

3. Route the E-Stop connection end of the wire harness along the underside of the fender guard as shown in Figure 13.

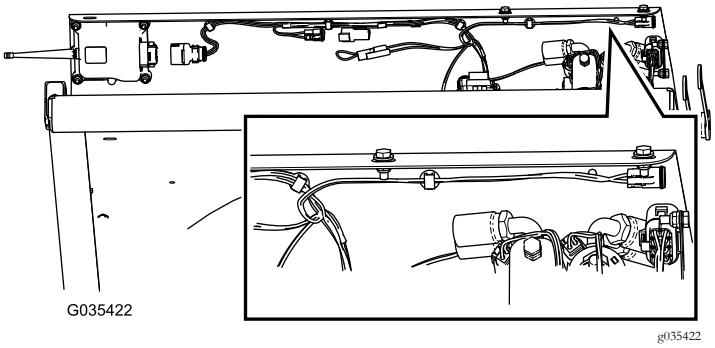



**Figure 13**

4. Route the remaining harness down the back of the fender guard.

5. Plug the CAN diagnostics connection into the previously installed wire-harness cap (Figure 14).

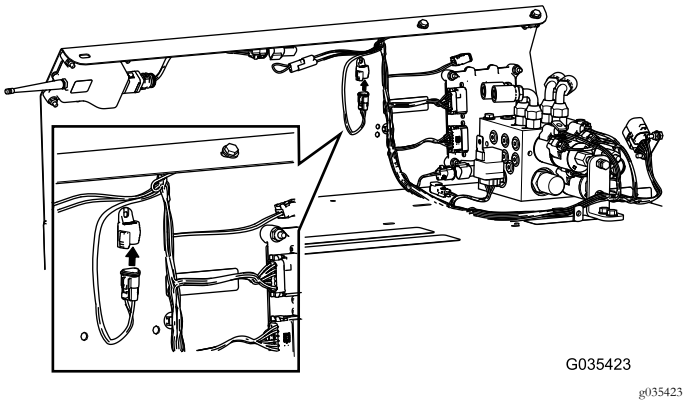



**Figure 14**

6. Plug the controller connections into the controller adapters (Figure 15).

   **Note:** Plugs are keyed, colored, and have a specific orientation.

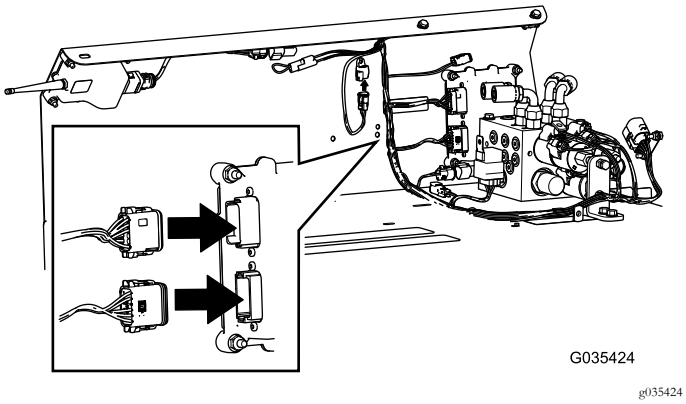



**Figure 15**

7. Route the remaining harness on the top of the left fender and in front of the hydraulic block.

   **Note:** Do not plug the E-Stop connection, relay connection, or diagnostic light connection into an adapter at this time.

8. Plug the 5 harness connections into the appropriate locations on the hydraulic block; refer to Figure 16 and Figure 17.

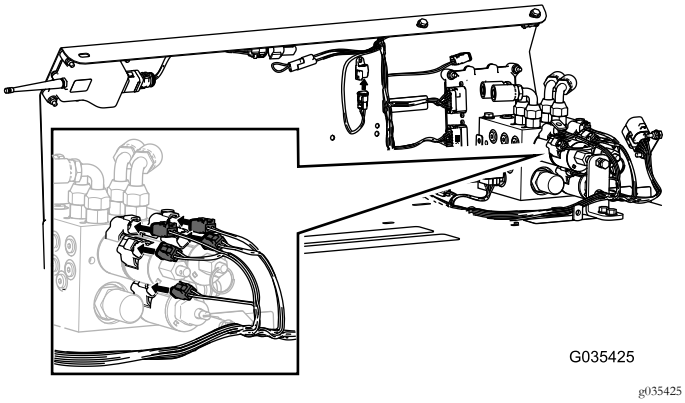



**Figure 16**

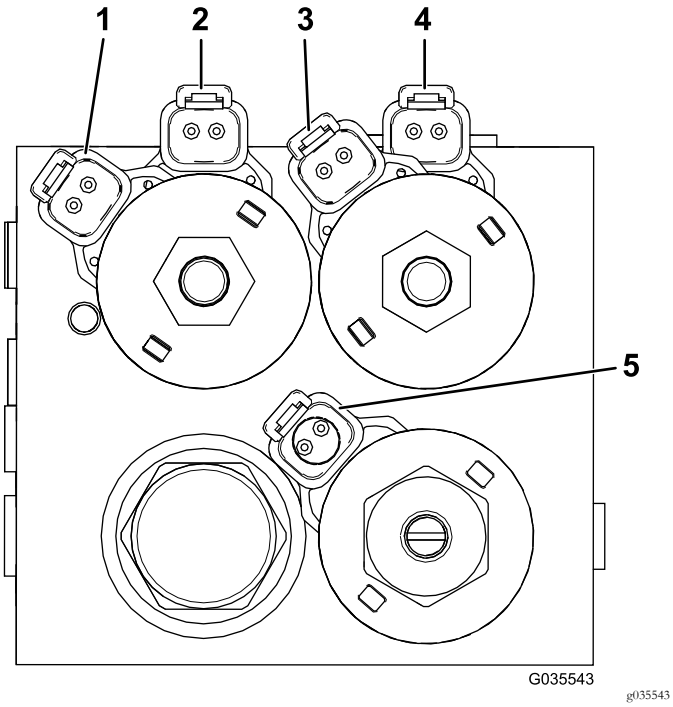



**Figure 17**

1. Floor reverse
2. Floor forward
3. Bin lower
4. Bin raise
5. Option forward

9. Place the cover, with the previously installed relay, fuse-block cap, light, and E-Stop button assembly, onto the fender guard (Figure 18).

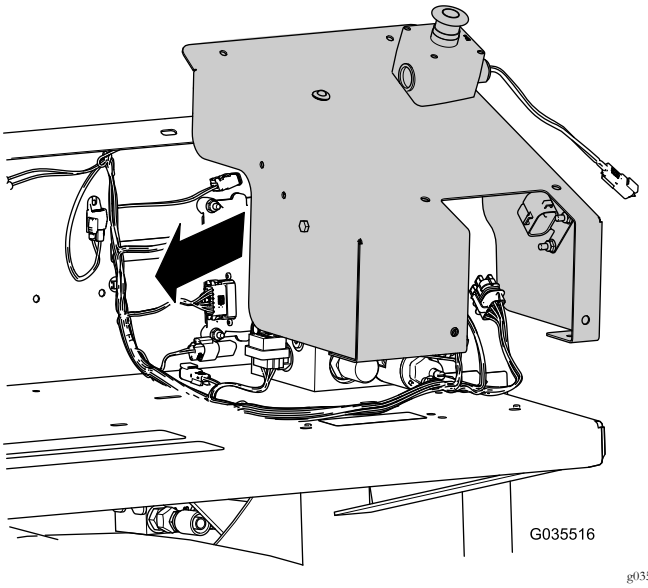



**Figure 18**

10. Connect the wire harness E-Stop connection, relay connection, diagnostic light connection, and fuse block into the appropriate adapters as shown in Figure 19.

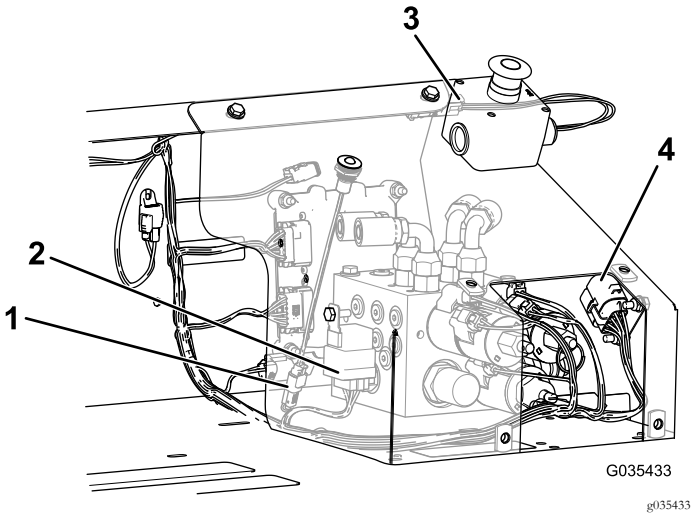



**Figure 19**

1. Diagnostic light connection
2. Relay connection
3. E-Stop connection
4. Fuse block connection

11. Secure the cover to the fender guard with the appropriate bolts, washers, and nuts (Figure 20).

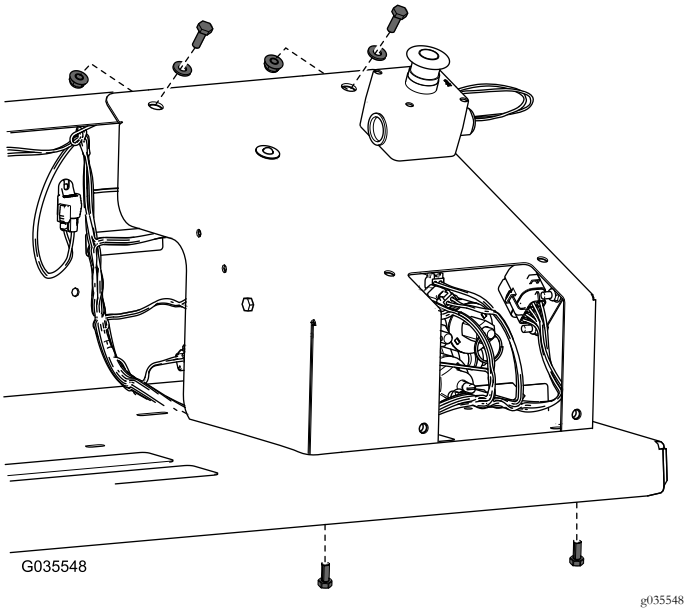



**Figure 20**

12. Install the previously removed manual override cover onto the cover with the corresponding hardware (Figure 21).

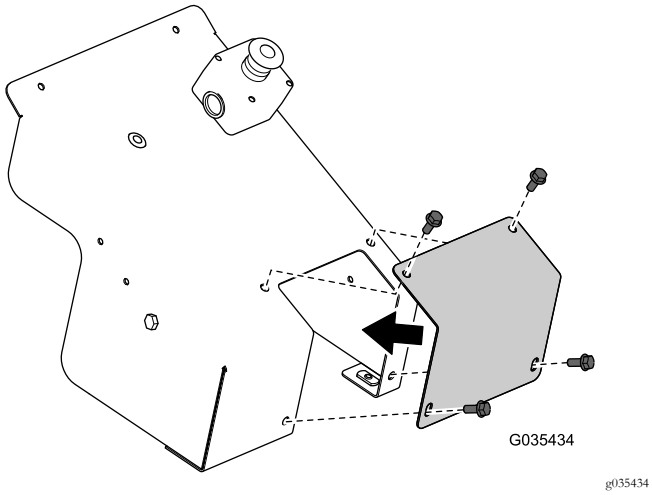



**Figure 21**

13. Place the fuse decal on the manual override cover (Figure 22).

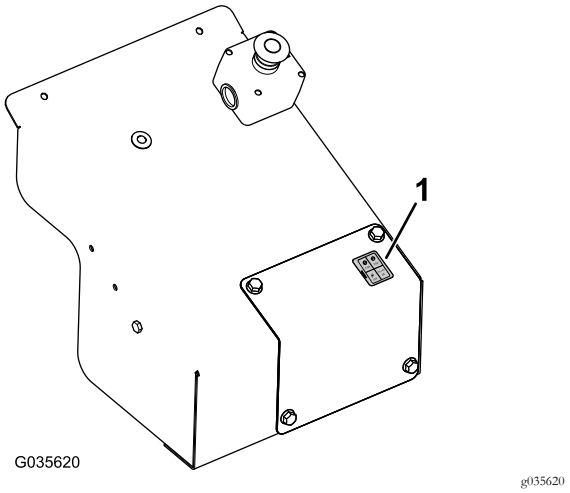



**Figure 22**

1. Fuse decal

14. Install decal 136-7585 near the serial tag on the front left of the unit (Figure 23).

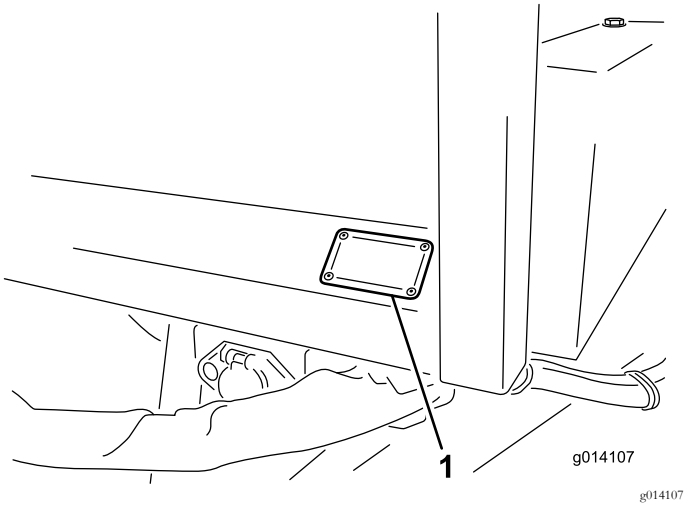



**Figure 23**

1. Serial tag

# 4

# Assembling and Mounting the Handheld Remote

### Parts needed for this procedure:

| | |
|---|---|
| 1 | Handheld remote |
| 4 | AA batteries |
| 1 | Magnetic bracket |

## Procedure

1. Remove the rubber bands securing the remote halves together, and remove the back cover.
2. Install the batteries into the terminal cradle observing proper polarity.

   **Note:** If you install the batteries improperly, the unit is not damaged, but it fails to operate. The cradle is embossed with polarity markings for each terminal (Figure 24).

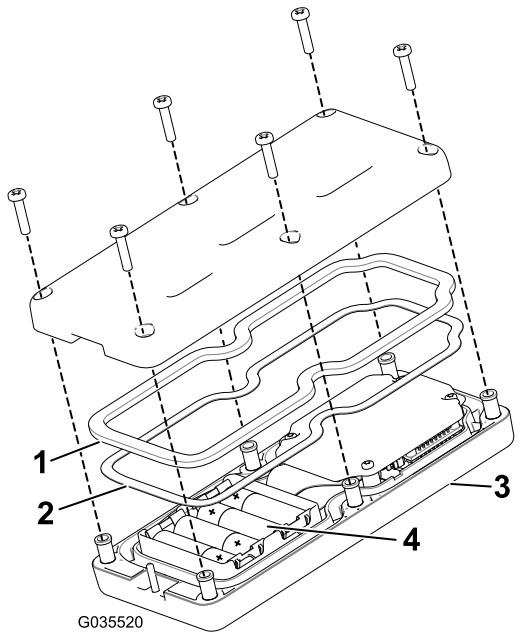



**Figure 24**

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

3. Ensure that the steel gasket and rubber seal are seated in the channel in the remote before you set the back cover in place (Figure 24).
4. Secure the cover with 6 screws (Figure 24) 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 25).

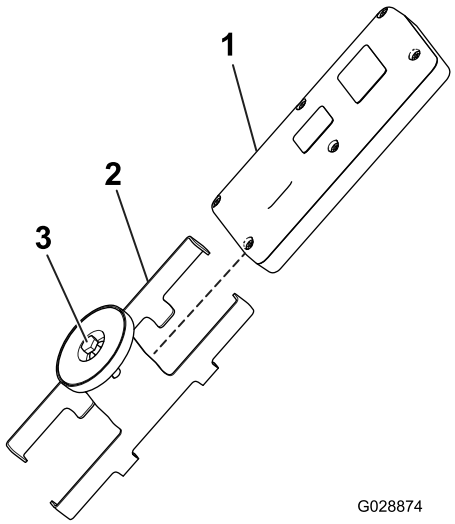



**Figure 25**

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

6. If desired, install the controller mount assembly on the tow vehicle to store the wireless remote. Otherwise, use the magnet on the back of the remote to stick the remote to any metal component.

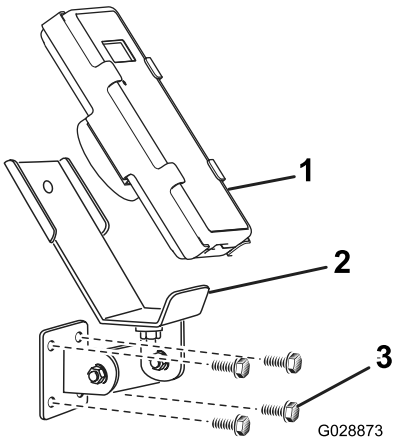



**Figure 26**

1. Handheld remote
2. Controller mount assembly
3. Mounting bolts

# 5

# Completing the Installation

**No Parts Required**

## Procedure

1. Connect the power connector from the traction unit.
2. Lower the hopper; refer to the *Operator's Manual* for your machine.

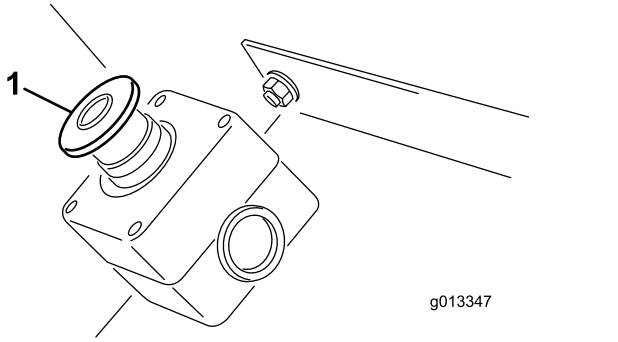
# Product Overview

## Controls

### E-Stop Button

When finished working with the machine, always press the E-STOP button (Figure 27) 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.

**Note:** Failure to push the E-Stop button can result in battery discharge if left connected to the tow vehicle.




g013347

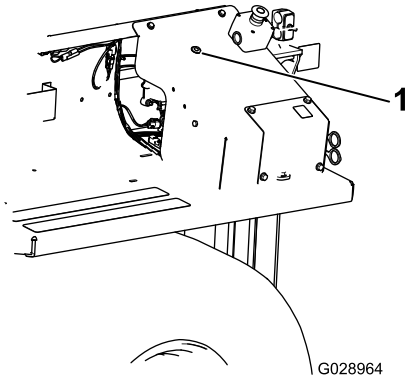
**Figure 27**

1. E-STOP button

### Diagnostic LED Function

After pulling up the E-STOP button, the diagnostic LED (Figure 28) illuminates and remains on for 5 seconds, turns off for 5 seconds, and then begins flashing at 3 Hz (3 flashes per second) until you turn the handheld remote on. 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 Entering Diagnostic Mode and Checking the Codes (page 20).

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

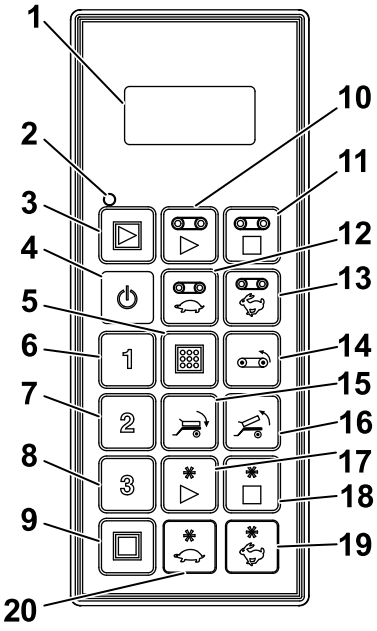



g028964

**Figure 28**

1. Diagnostic LED

### Handheld Remote




g188312

**Figure 29**

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. |
|  | 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<br>PRESET 2<br>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. |

# Operation

## Turning On the Handheld Remote

Press the ON/OFF button on the remote and wait for it to find the base. Ensure that there are no buttons being pressed on the remote while it is performing its startup routine.

## Key Functionality Elements

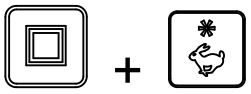
- When the controller is first powered on, the display should read "FLR OFF and OPT OFF" in approximately 5 seconds. If the words "waiting for base" are in the display, check to ensure there is electrical power to the base unit and ensure the E-Stop button on the base unit is pulled out.
- There is always a current working memory. This is not the same as a preset. The last saved work settings will be in the current working memory when the controller is powered on.
- Operational sequence of the controller start buttons:
  - Pressing a start button once (All Start, Floor Start or Option Start) calls up the current working memory setting stored in the controller
  - By pressing the same start button a second time the component is activated if the hydraulics are not engaged (it shows numbers ramping up in display), or the component is turned on if the hydraulics are engaged.
  - Pressing the same start button a third time will store the new setting established in the controller's working memory.
- After pressing a start button once to view the current working memory setting in a non-working mode, there is approximately 10 seconds to begin adjusting the setting or the element will revert back to OFF. In a working mode, the 10 second rule is gone.
- To program a preset, the key to remember is the elements must be activated or engaged.
- To operate from a preset, the element speed percentages must be in the display to activate or engage them. If the word OFF is in the display, the preset must be recalled.

## Using the Liquid Crystal Display (LCD)

The 2 line, 8 character-per-line LCD (Liquid Crystal Display) shows status and activity as the remote buttons are pressed. It features user adjustable backlighting and contrast. Changes are saved in the remote current working memory. When the unit is turned on after being powered down, the last settings for contrast and backlighting are used for the display.

### To Increase the Contrast:

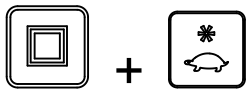
Hold the ALL STOP and the OPTION INCREASE buttons simultaneously while observing the display until the contrast is as desired.



**Note:** There are three settings: OFF, LOW, and HIGH.

### To Decrease the Contrast:

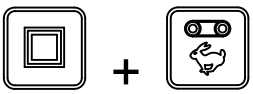
Hold the ALL STOP and the OPTION DECREASE buttons simultaneously while observing the display until the contrast is as desired.



**Note:** There are three settings: OFF, LOW, and HIGH.

### To Increase the Backlighting:

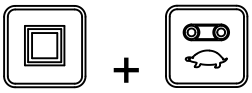
Hold the ALL STOP and the FLOOR INCREASE buttons simultaneously while observing the display until the backlighting is as desired.



**Note:** There are three settings: OFF, LOW, and HIGH.

### To Decrease the Backlighting:

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



**Note:** There are three settings: OFF, LOW, and HIGH.

Backlighting consumes the most energy of all Handheld Remote functions. Increasing the backlighting increases power consumption and will shorten the life span of the batteries; the lower the backlighting, the longer the battery life span.

# Understanding the Remote Status LED

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

# Replacing the Remote Batteries

The handheld remote is powered by 4, AA Alkaline batteries (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: Keep fresh spare batteries at hand at all times that the system is in use.**

1. Loosen the bolt in the magnet on the magnetic remote bracket (Figure 30).

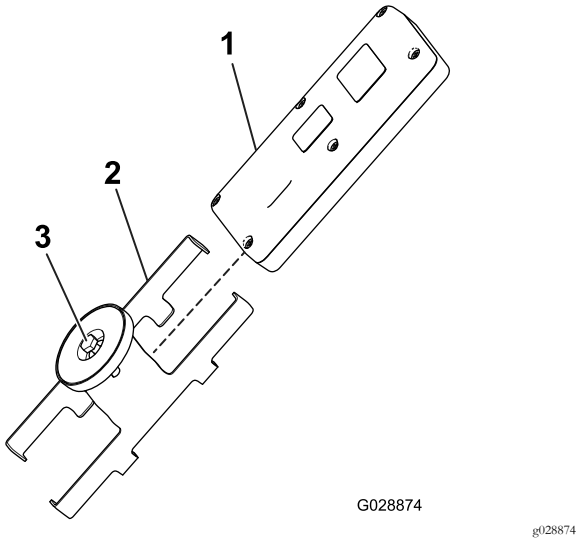



**Figure 30**

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

2. Slide the bracket sides apart and remove the remote (Figure 30).
3. Remove the 6 screws from the back of the remote and remove the cover (Figure 31).

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

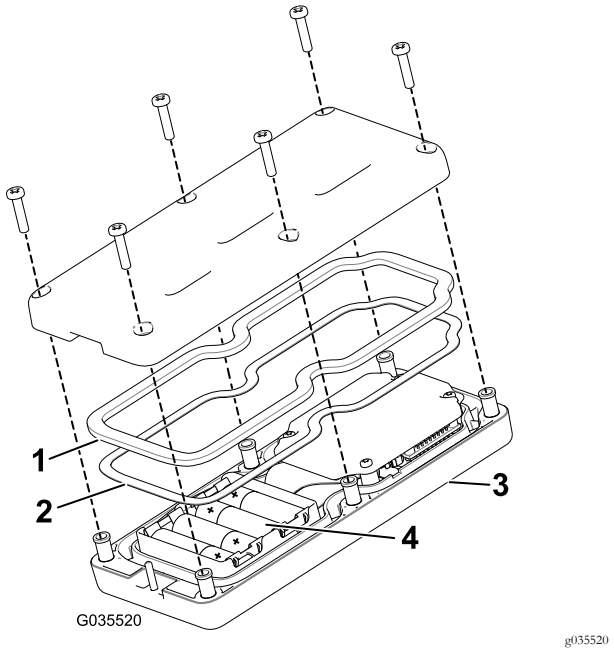



**Figure 31**

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. Plug each fresh 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 31).
6. If you accidentally removed the rubber seal and the steel gasket, replace them carefully into the channel in the handheld remote (Figure 31).
7. Replace the cover and secure it with the 6 screws removed previously (Figure 31) 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 remote, and tighten the bolt in the magnet (Figure 30).

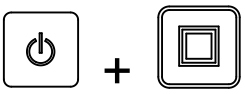
# Caring for the Handheld Remote

Though the handheld remote is rugged, care should be taken not to drop the unit onto hard surfaces. To clean it, use a soft cloth moistened with water or a mild cleaning solution to wipe it paying particular attention to avoid scratching the LCD screen.

# Associating the Handheld Remote with the Base

The factory initially associates the remote to the base allowing them to communicate; however, there may be instances in the field when you must reassociate a remote and a base unit, as follows:

1. Press the E-Stop button to remove power from the base unit and make sure the handheld 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 will show **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.

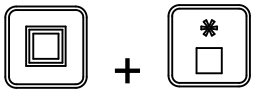
   The handheld remote will associate (link) with the base unit. Upon success, the display will show **ASSOC PASS.**

7. Release the STORE button.

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

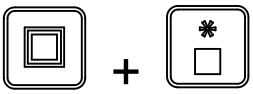
**Note:** The Handheld Remote and Base Unit link can be viewed by holding down the ALL STOP and OPTION STOP buttons at the same time.

The display will cycle and indicate the selected channel and the ID of the Base Unit.



# 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.

# Operating the Floor and Option

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 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 the hydraulics are engaged, the floor will start). 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 remote off without pressing FLOOR START again, storing the change. The next time you use the remote, the setting will revert 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 ten seconds if any button is pressed while the 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.


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 will be 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 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 the hydraulics are engaged, the option will start). 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 remote off without pressing OPTION START again, storing the change. The next time you use the remote, the setting will revert 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 ten seconds if any button is pressed while the 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 will be 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 (i.e. **FLRS** and **OPTS**), indicating that the 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 will 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

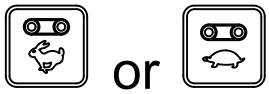
setting, and then turn the remote off without pressing ALL START again, storing the change. The next time you use the remote, the settings will revert to the previously stored values.

**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 and the previous state/value displays and is enforced. The timer resets to ten seconds if any button is pressed while the 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 will be used whenever the option is started in the future until you change the setting again.

**Note:** Both the floor and option must be running to store the settings using the ALL START button. If only one or neither are running, pressing the ALL START button will either start them both or start the one that was not running. Nothing is stored and the commands previewed are the previously stored floor and the option settings.

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.

# Setting the Preset 1, 2, and 3 Buttons

The remote has three 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 STARTbutton, the current operating values are replaced by the preset values. If you do not press the ALL-START button within 10 seconds, the system will revert back 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 will display 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

# Troubleshooting

## Checking Fault Codes

If the Diagnostic LED indicates that there is a system fault, 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 of the 2 diagnostic, shunt connectors (Figure 32, A).
3. Connect the diagnostic, shunt connectors together (Figure 32, B).

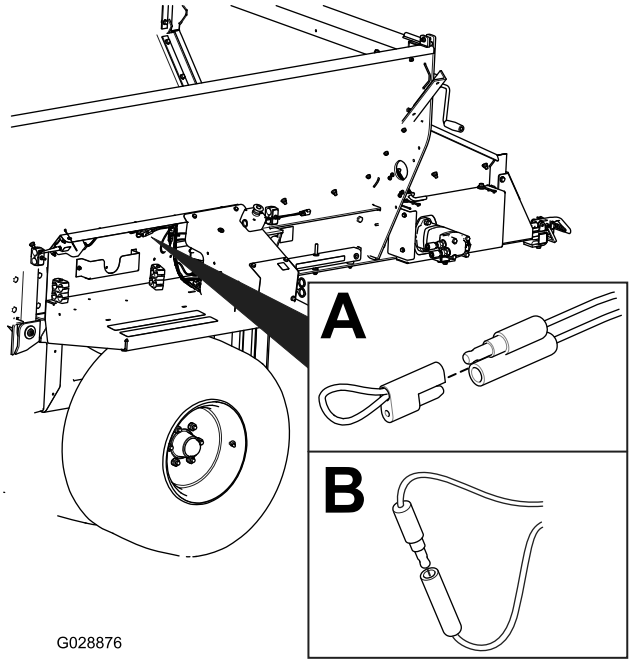



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**Figure 32**

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 flash, then a long pause, then the flash sequences 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 Toro Distributor. |
| | | | BASE is bad; contact your 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 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 operate ProPass unit with a MH–400 handheld) |

## Resetting the Fault Code

After solving the problem, reset the fault codes by disconnecting and reconnecting diagnostic connectors. The diagnostic light flashes 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 13).
2. Disconnect the diagnostic, shunt connectors (Figure 32, B).
3. Push the tethered cap onto the 2 diagnostic, shunt connectors (Figure 32, A).
4. Pull the E-STOP up to turn on the power.

# Handheld Remote Messages

| 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%<br>Battery X.X V | Remaining battery life in percentage.<br>Remaining battery life in voltage. |
| CHANNEL X | Channel currently being used by the system. |
| HH ID XXXXXX | Identity of the Handheld Remote |
| BASE ID XXXXXX | Identity of the Base Unit |
| FLR XX%<br>OPT XX% | The current Floor speed in percent.<br>The current Option speed in percent. |
| FLRS XX%<br>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<br>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:


**Count on it.**