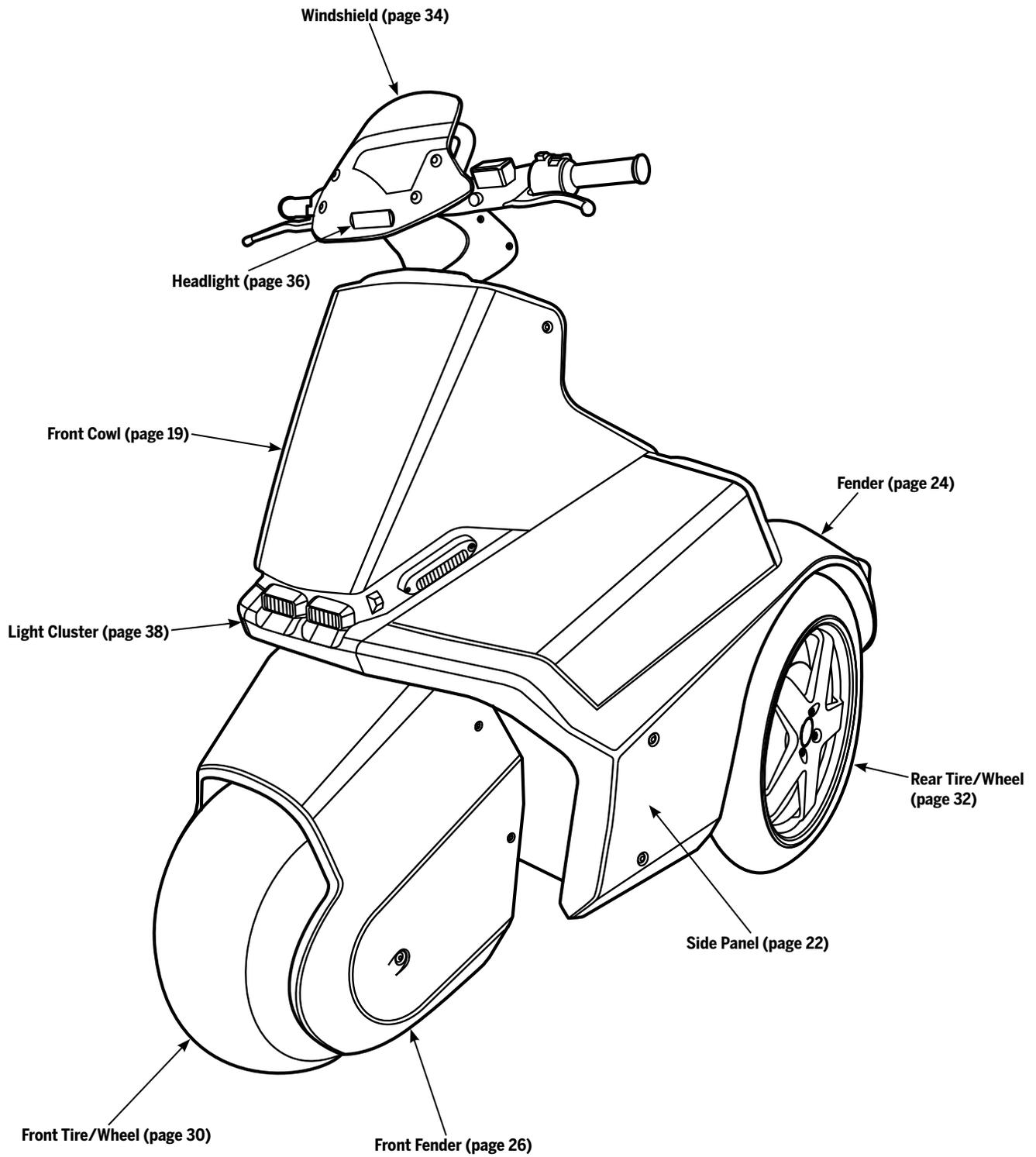


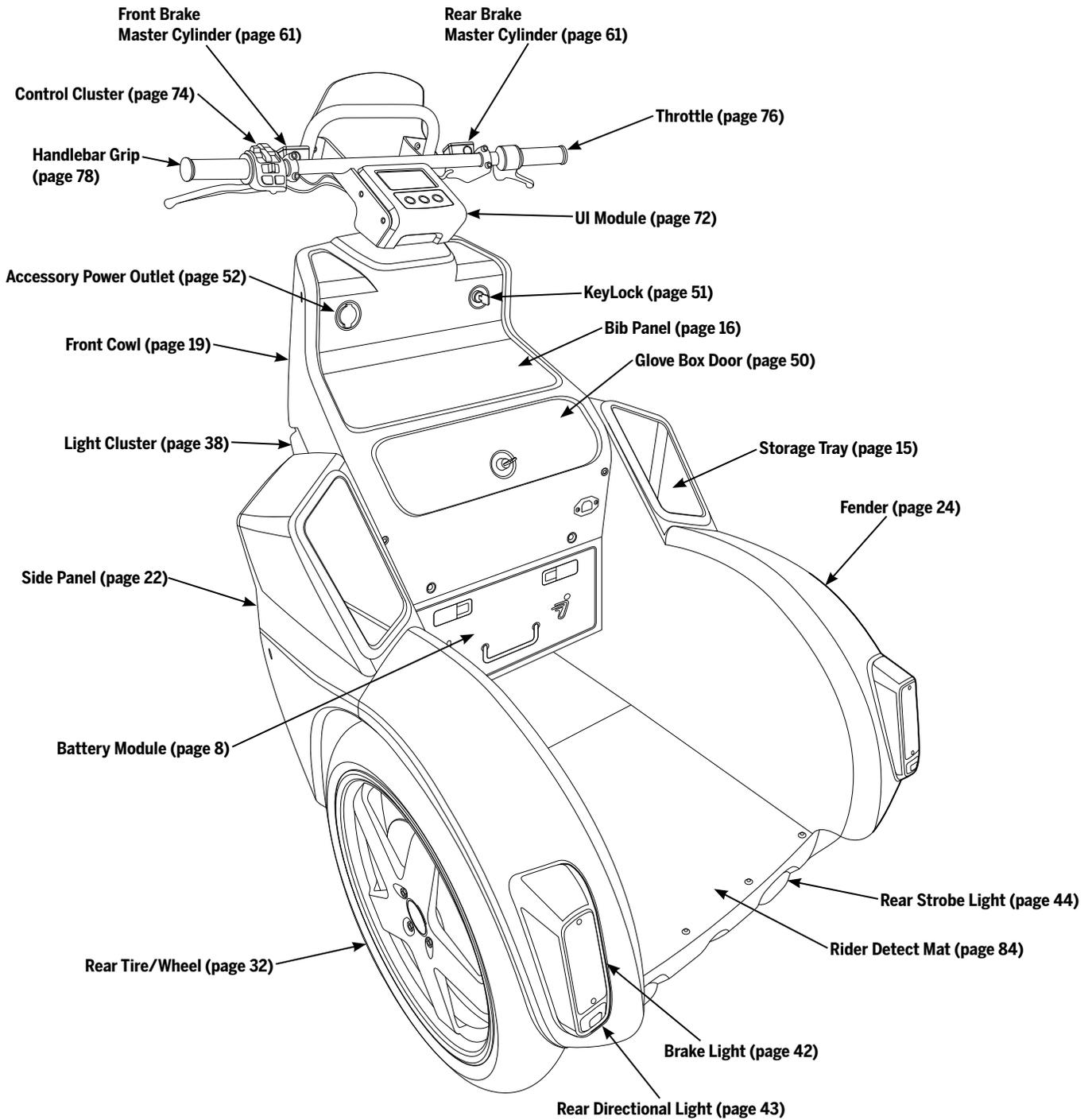
Service Manual



SEGWAY®

SE-3 Patroller





Copyright, Trademarks, Patent, and Contact Information

Document number & revision: 24538-00001 ae

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Segway Patent Information

The SE-3 Patroller is covered by U.S. and foreign patents.

For a patent listing, see <http://www.segway.com/downloads/pdfs/patents.pdf>.

Contact Information

For support, please contact the company from which you bought the Segway product. For a listing of Authorized Segway Dealers and Distributors, refer to the Segway website at <http://www.segway.com>.

Segway Customer Care: 866-4SEGWAY (866-473-4929)

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General Safety Precautions

Safety Conventions

The following safety messaging conventions are used throughout this document:

 WARNING!	Warns you about actions that could result in death or serious injury.
 CAUTION!	Warns you about actions that could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not related to personal injury. Examples include messages regarding possible damage to the SE-3 Patroller or other property, or usage tips.

Important Safety Notices

Read and follow all safety notices.

General

WARNING!

- Failure to follow these safety precautions could lead to electrical shock, serious injury, death, or damage to property.
- To replace parts on the SE-3 Patroller, you must read and follow all instructions and warnings in this manual.
- Always power off the SE-3 Patroller before performing any maintenance or installing any part or accessory.
- Always unplug the AC power cord before performing any maintenance or installing any part or accessory.
- Remove the Battery Module before performing any service on the SE-3 Patroller.
- Wait two minutes after removing the Battery Module before removing the Electronics Shield or touching any electrical components. This is how long it takes for the capacitors on the PI Board to self-discharge. Touching the PI Board before the capacitors have fully discharged could result in electric shock.

CAUTION!

- Always wear gloves when handling chemicals (such as lubricants, corrosion inhibitors, greases, or oils) to reduce the potential for skin damage or irritation.

Battery Module

WARNING!

- Do not use the Battery Module if the casing is broken or if the Battery Module emits an unusual odor, smoke, or excessive heat, or leaks any substance. Avoid contact with any substance seeping from the Battery Module. Batteries contain toxic and corrosive materials that could cause serious injury.
- Keep out of reach of children and pets. Exposure to battery voltage could result in death or serious injury.
- Unplug or disconnect the SE-3 Patroller from AC power before removing or attaching the Battery Module or performing any service. Never work on any part of the SE-3 Patroller when it is plugged into AC power. You risk serious bodily injury from electric shock as well as damage to the SE-3 Patroller.
- The cells within the Battery Module contain toxic substances. Do not attempt to open the Battery Module. Do not insert any object into the Battery Module or use any device to pry at the Battery Module casing. If you insert an object into any of the Battery Module ports or openings you could suffer electric shock, injury, burns, or cause a fire. Attempting to open the Battery Module casing will damage the casing and could release toxic and harmful substances, and will render the Battery Module unusable.
- Observe and follow all safety information on the warning label found on the Battery Module.

- Use only charging devices approved by Segway and never attempt to bypass or override their charging protection circuits.
- Do not wash the SE-3 Patroller with a power washer or high pressure hose. Avoid getting water into the Charge Port. Avoid exposure to heavy downpours or extended periods of heavy rain (including during riding, storage, or while being transported). Clean with soap and water and a soft cloth. Make sure that the Charge Port is dry before you plug in the Power Cord. Failure to follow these instructions could expose you to electric shock, injury, burns, or cause a fire.
- Do not submerge the SE-3 Patroller or Battery Module in water. If you suspect the Battery Module has been submerged or experienced water intrusion, call Segway Technical Support immediately at 1-866-473-4929, prompt #2. Until you receive further instructions, store the SE-3 Patroller outdoors and away from flammable objects. Failure to do so could expose you to electric shock, injury, burns, or cause a fire.
- As with all rechargeable batteries, do not charge near flammable materials. When charging, the batteries heat up and could ignite a fire.
- Failure to adhere to these warnings could lead to serious injury, death, fire, or damage to property.

NOTICE

- Failure to charge the Battery Module could result in permanent damage to the Battery Module. Left unplugged, the Battery Module could fully discharge over time, causing permanent damage.
- Comply with all local and federal or individual country laws when disposing of and transporting Battery Modules.

Fasteners

WARNING!

- Use only Segway-approved fasteners. Other fasteners may not perform as expected and may come loose.
- Do not tighten or reuse any lock nut. Instead, when any lock nut is loose or removed, replace the lock nut with a new Segway-approved lock nut.
- Before using a fastener, make certain the fastener is the correct size and type with any necessary washer and thread lock in place.
- Do not attempt to repair any stripped or damaged screw hole. Instead, replace the part. If a replacement part is not available, do not reassemble.
- Insert fasteners slowly and carefully. Do not cross-thread or over-tighten fasteners. Tighten only to the prescribed torque.
- Failure to adhere to these warnings could lead to serious injury or death or damage to property.

Cable Ties

CAUTION!

- When removing cable ties, be careful not to cut or nick harnesses. Damaged harnesses must be replaced.
- You must replace all cable ties that you remove. Loose wires can rub against sharp edges, which can cause them to break over time.

Eye Protection

WARNING!

- When procedures require the use of safety glasses (such as those in which a mallet or solvent is used), failure to wear eye protection could result in serious injury.

ESD Procedures

CAUTION!

- When a repair involves any electronic components or harnesses, best-practice electrostatic discharge (ESD) control procedures must be followed. Failure to follow ESD procedures could result in personal injury or damage to property.

Questions

WARNING!

- If you have any questions about the instructions in this guide, please contact a Segway Service Representative to avoid confusion leading to serious injury or death or damage to property.

Introduction

Purpose

The purpose of this manual is to provide instructions for servicing the Segway SE-3 Patroller.

Audience

This manual is written for Segway Certified Service Technicians working under agreement with Segway Inc.

Certification

Becoming a Segway Certified Service Technician, SE-3 Patroller, involves a two-level certification process. The service technician will be required to undergo training at each level. Upon satisfactory completion of this training, the service technician becomes certified to repair the SE-3 Patroller parts and assemblies according to the following scheme:

Table 1: Certification Levels

Level	Parts and Assemblies	Instructions
1	<ul style="list-style-type: none">• Body Panels• Tire/Wheel Assemblies• Windshield• Lights• Battery Compartment• Bib Components	<p>page 11</p> <p>page 29</p> <p>page 33</p> <p>page 35</p> <p>page 45</p> <p>page 49</p>
2	<ul style="list-style-type: none">• All Level 1 (see above)• Brakes• Controls• Siren• Rider Detect Mat• Drive Train• Steering Column• Power Interface• Harnesses	<p>See above</p> <p>page 53</p> <p>page 71</p> <p>page 79</p> <p>page 83</p> <p>page 87</p> <p>page 95</p> <p>page 101</p> <p>page 109</p>

General Service Procedure

Before performing any service on the SE-3 Patroller, you must first determine which components may be damaged or malfunctioning. In some cases this requires a simple visual inspection — as in the case of a cracked or damaged body panel. In other cases diagnostic equipment must be used to troubleshoot the problem — as when the vehicle turns on but won't drive. No matter what the problem is, the general service procedure is the same:

1. **Identify** — identify the symptoms.
2. **Diagnose** — determine which components may be malfunctioning.
3. **Replace** — replace the malfunctioning component(s).
4. **Verify** — operate the vehicle to verify the problem has been solved.

It may be the case that there are multiple problems affecting an SE-3 Patroller. Try to isolate the problems and solve them one at a time.

Reusing Fasteners

Before reusing any fastener, check if it has any threadlock residue on it. If so, you must remove the old threadlock and apply new threadlock before reusing the fastener. For more detailed instructions, see **page 131**.

Related User Materials

The following additional materials may be needed for reference during service:

- Segway SE-3 Patroller User Manual

Please check the Segway website (www.segway.com) for updates to the User Manual, or contact Segway to confirm you have on hand the most recent service publications.

Battery Module

Overview

This component is not serviceable; if there is a problem with the Battery Module it must be replaced.

When to Replace

Replace when troubleshooting determines that the Battery Module is malfunctioning.

Safety

WARNING!

Always remove the Battery Module before servicing the SE-3 Patroller. Failure to remove the Battery Module could result in serious injury or death due to electric shock.

Contents

- Battery Module

Battery Module

Tools Required: None

Removal

1. ⚠ Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Flip out and twist the latches as shown in **Figure 1**.
3. Use the handle to slide the Battery Module part way out.
4. Grasp both the front handle and the top handle of the Battery Module (**Figure 2**). Slide the Battery Module completely out.

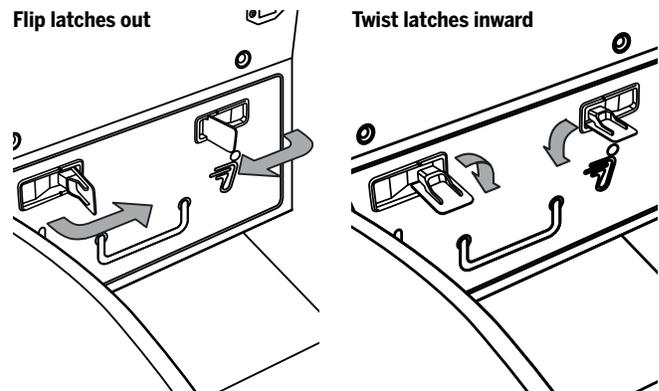


Figure 1: Flip Out and Twist the Battery Module Latches

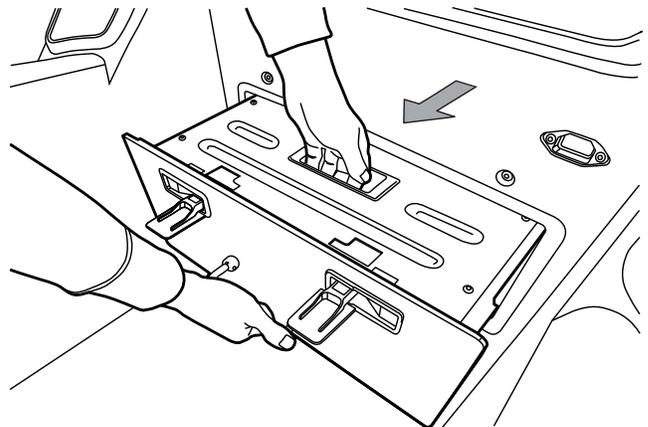


Figure 2: Slide the Battery Module out of the SE-3 Patroller

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Make sure the latches are configured as in **Figure 3**.
3. Holding the Battery Module by both front and top handles, slide it into the opening.
4. Twist the latches and fold them back (**Figure 4**) to lock the Battery Module.

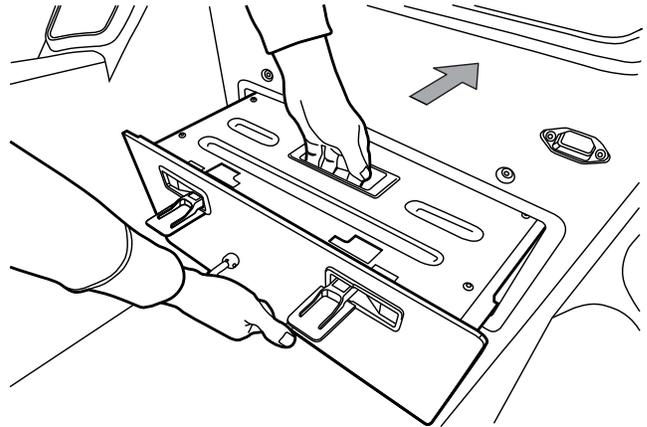


Figure 3: Slide the Battery Module into the SE-3 Patroller

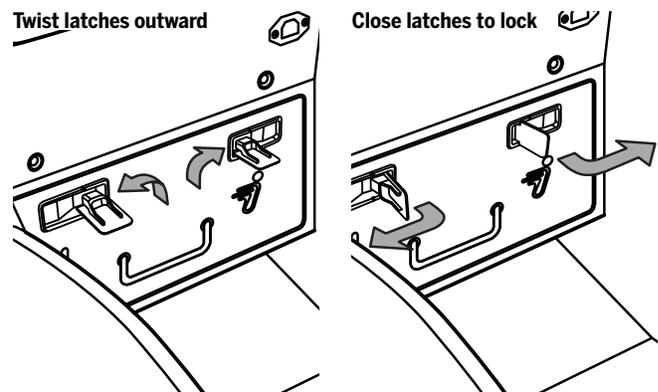


Figure 4: Twist and Close the Battery Module Latches

Body Panels

Overview

Body Panels attach to the frame to create the shape and style of the SE-3 Patroller. Body panels serve a number of functions. Among other things, they provide a mounting location for lights, they protect the internal components from the elements, and they protect the rider from touching the wheels.

When to Replace

Replace a Body Panel when it is cracked, bent, or otherwise broken.

Safety

WARNING!

Do not operate the SE-3 Patroller without all body panels installed.

CAUTION!

When removing body panels, place them on a soft, clean surface to prevent scratching or marring of the body panel.

Contents

- Exploded View
- Threaded Inserts
- Storage Tray
- Bib Panel
- Glove Box
- Front Cowl
- Light Cluster
- Side Panel
- Fender
- Front Fender (Boot)
- Front Splash Guard
- Main Splash Guard

Exploded View

The exploded view (below) identifies all of the body panels on the SE-3 Patroller.

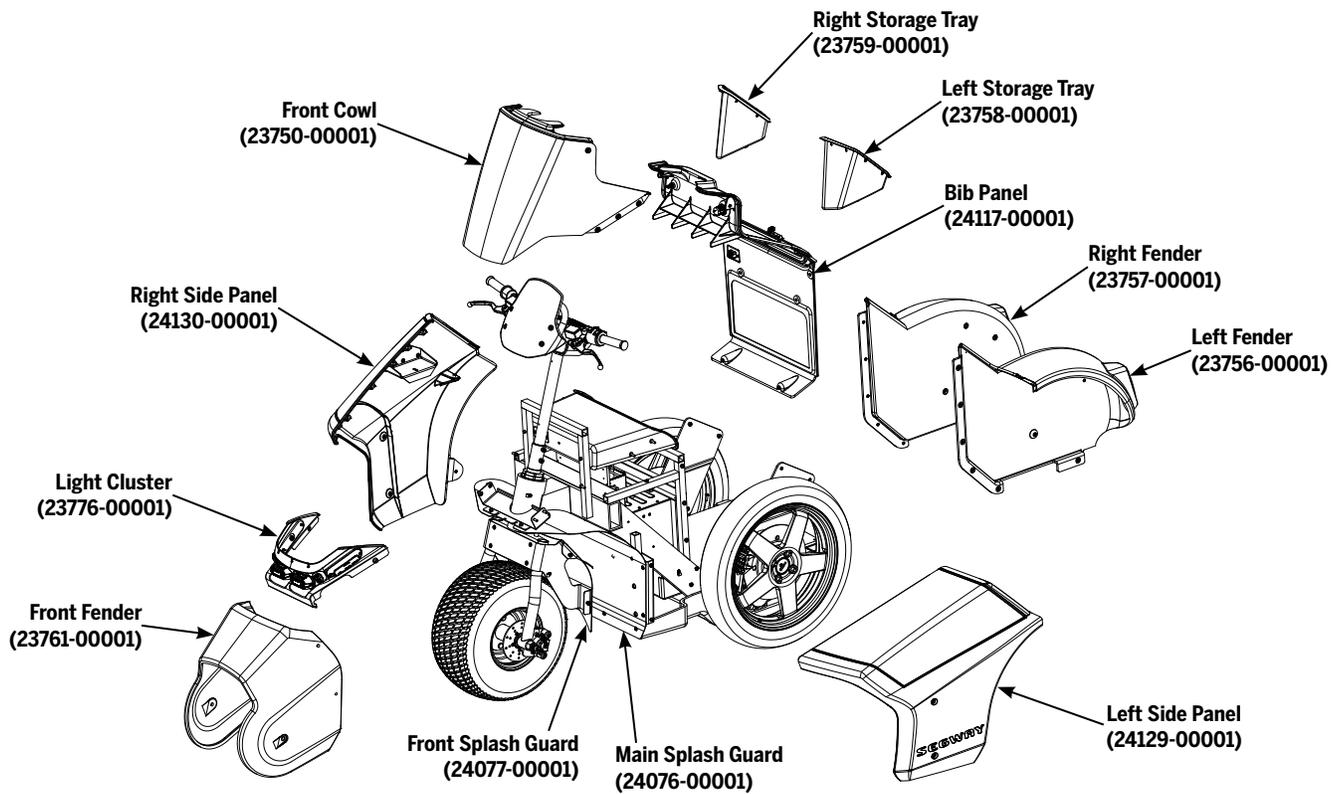


Figure 5: Body Panels, Exploded View

Threaded Inserts

The body panels have threaded inserts that provide a location to attach fasteners. These inserts occasionally come loose and need to be replaced.

- Tools Required:**
- 6 mm hex wrench
 - Locking pliers
 - 23/64 inch or 9.12 mm drill bit
 - Power drill
 - 5-minute epoxy (P/N 24750-00001)
 - Cotton swab

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Screw the fastener part-way into the threaded insert.
3. Use locking pliers to securely grip the fastener (**Figure 6**). Remove both the fastener and the insert by pulling forcefully with the pliers.
4. Discard both the fastener and threaded insert.



Figure 6: Remove the Threaded Insert

Alternate Removal Methods

If removal using locking pliers is not possible, try the following removal techniques, in order.

1. Use a reverse drill bit or screw removal bit and spin the insert out.
2. Use a slide hammer attached to the fastener head to pull the insert out.
3. Use a fastener, socket, and C-clamp to push the insert out (**Figure 7**).



Figure 7: Use a Clamp to Remove the Insert

Table 2: Replacement Inserts

Fastener Location	Insert Location	Replacement Insert	Figure
Storage Tray	Side Panel	Flanged	Figure 12, p. 15
Bib Panel / Front Cowl	Bib Panel	Flanged	Figure 13, p. 16
Front Cowl	Side Panel	Non-Flanged	Figure 22, p. 19
Light Cluster	Side Panel	Non-Flanged	Figure 23, p. 20
Side Panel / Floating Bracket	Side Panel	Non-Flanged	Figure 26, p. 22
Side Panel Bracket	Side Panel	Non-Flanged	Figure 29, p. 23

Flanged Insert (24742-00001) **Non-Flanged Insert (24741-00001)**



Figure 8: Replacement Inserts

Installation

1. Drill out the mounting hole in the panel using a 23/64 inch or 9.12 mm drill bit (**Figure 9**). If using the Non-flanged Inserts, be careful not to drill through the panel wall.
2. Mix the epoxy according to the manufacturer's instructions.
3. Using a cotton swab or similar instrument, apply the epoxy to the drilled hole and to the replacement insert (**Figure 10**).

NOTE

Depending on the mounting location use one of two different replacement inserts (**Table 2**):

4. Using a 6 mm hex wrench, install the epoxy-coated insert into the mounting hole (**Figure 11**). Flanged inserts should be screwed in until the flange is snugged securely against the top of the panel boss. Non-flanged inserts should be screwed in until they are flush with the top of the panel boss.
5. If the threaded insert protrudes through the panel, apply additional epoxy to the outside threads of the insert.
6. Wait for the epoxy to cure before reinstalling the panels on the SE-3.



Figure 9: Drill Out the Mounting Hole



Figure 10: Apply Epoxy

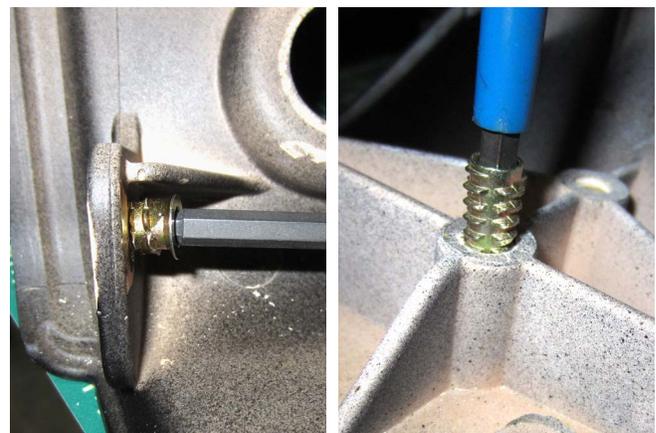


Figure 11: Install the Threaded Insert

Storage Tray

The Storage Tray is the first component to remove when removing body panels. Both Storage Trays must be removed before removing the Bib Panel.

Tools Required: 4 mm hex wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Using a 4 mm hex wrench, remove the fastener at the bottom of the Storage Tray.
3. Remove the Storage Tray.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Insert the Storage Tray and line up the hole in the bottom of the Storage Tray with the threaded hole in the vehicle's frame.
3. Using a 4 mm hex wrench, install the fastener. Torque to **1.0 N-m (0.74 ft-lbf)**. Do not over-tighten.

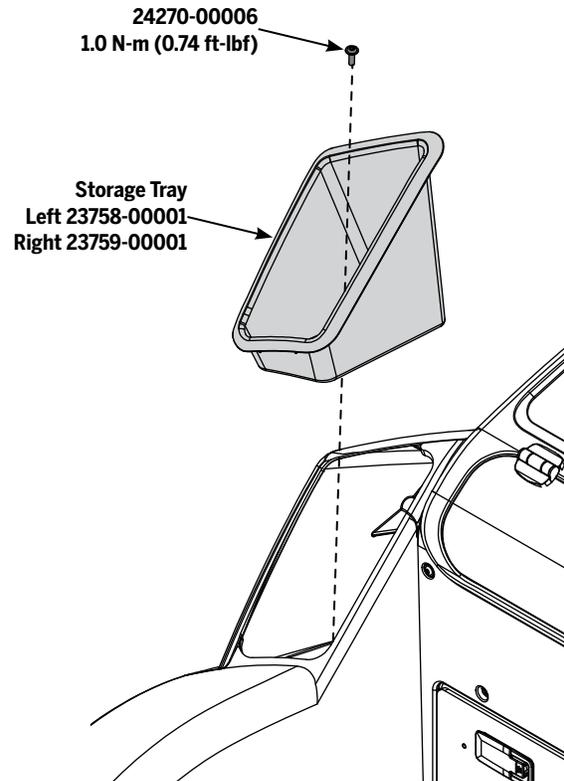


Figure 12: Storage Tray

Bib Panel

The Bib Panel is also known as the Front Tower Panel.

- Tools Required:** 4 mm hex wrench
 2.5 mm hex wrench
 Torque wrench
 Wire cutters

Removal

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
3. Using a 4 mm hex wrench, remove the eight fasteners as shown in **Figure 13**.
4. Gently pull the Bib Panel off the frame to access the cable harnesses connected to it.
5. Disconnect the two quick connect terminals from the back of the Accessory Power Outlet (**Figure 16**).
6. Using wire cutters, remove the cable tie on the KeyLock. See **Figure 15**.
7. Slide the rubber protector off the KeyLock.
8. Press the tab on the side of the Connector Block and pull it off the KeyLock (**Figure 17**).
9. Using a 2.5 mm hex wrench, remove the two fasteners on the Charge Port (IEC Socket). See **Figure 14**.
10. Pull the Bib Panel completely off the frame.

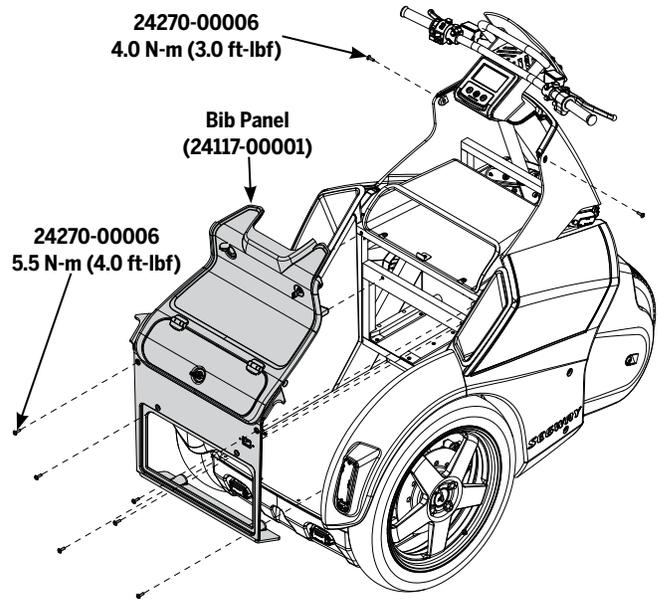


Figure 13: Bib Panel

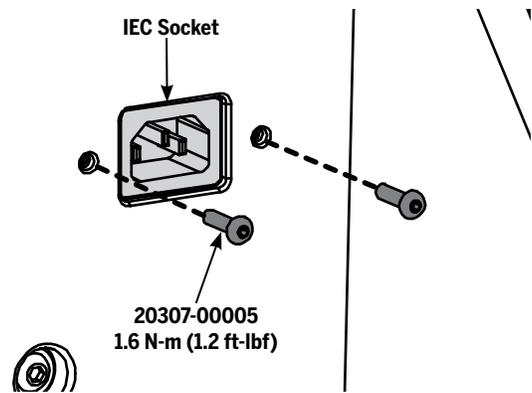


Figure 14: Charge Port



Figure 15: Rubber Protector Covering the KeyLock

Glove Box

The Gove Box fastens to the frame at the opening and rests on studs on the frame at its other end.

Tools Required: 3 mm hex wrench
4 mm hex wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
3. Using a 4 mm hex wrench, remove the three fasteners and Lock Plate as shown in **Figure 19**.
4. Gently lift the Glove Box off of the Frame.
5. Using a 3 mm hex wrench, remove the two fasteners connecting the Service Port to the back of the Glove Box (**Figure 20**).
6. Remove the Splash Shield (**Figure 21**).

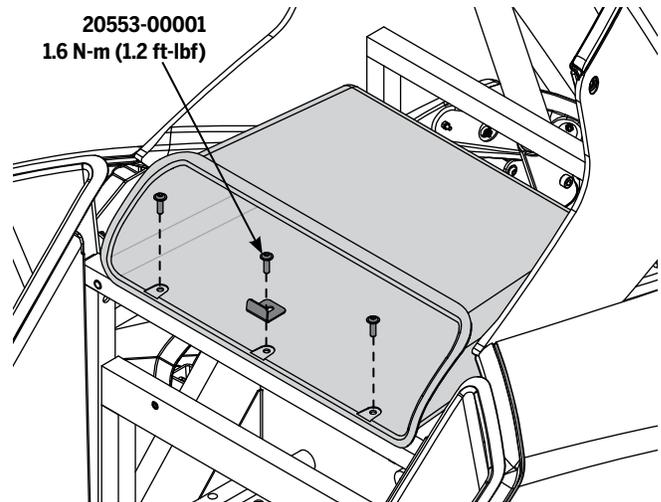


Figure 19: Glove Box Fasteners

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Install the Splash Shield (**Figure 21**).
3. Using a 3 mm hex wrench, attach the Service Port harness to the back of the Glove Box (**Figure 20**). Orient the connector with the narrow side down. Torque to **1.6 N-m (1.2 ft-lbf)**.
4. Align the Glove Box on the frame. The back of the Glove Box has holes which slide over studs in the frame. The Glove Box opening has holes that line up with the holes in the frame.
5. Using a 4 mm hex wrench, install the three fasteners and Lock Plate as shown in **Figure 19**. Torque to **1.6 N-m (1.2 ft-lbf)**.
6. Install the following components:
 - a. Bib Panel ([page 16](#))
 - b. Storage Trays ([page 15](#))
 - c. Battery Module ([page 8](#))
7. Perform post-service tests ([page 129](#)).

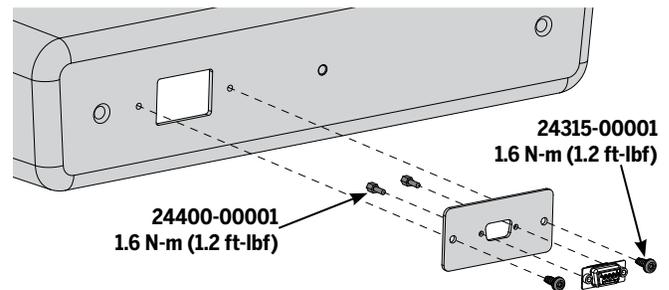


Figure 20: Service Port

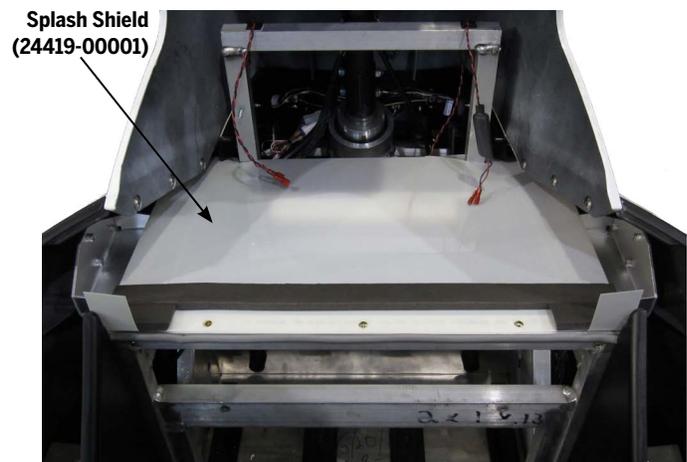


Figure 21: Splash Shield

Front Cowl

The Front Cowl fastens to the left and right Side Panels.

Tools Required: 4 mm hex wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
3. Using a 4 mm hex wrench, remove the six fasteners as shown in **Figure 22**.
4. Lift the Front Cowl off of the frame.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Place the Front Cowl onto the SE-3 so that it rests on the Light Cluster and the Side Panels.
3. Using a 4 mm hex wrench, install the six fasteners as shown in **Figure 22**.
Torque to **4.0 N-m (3.0 ft-lbf)**.
4. Install the following components:
 - a. Glove Box ([page 18](#))
 - b. Bib Panel ([page 16](#))
 - c. Storage Trays ([page 15](#))
 - d. Battery Module ([page 8](#))
5. Perform post-service tests ([page 129](#)).

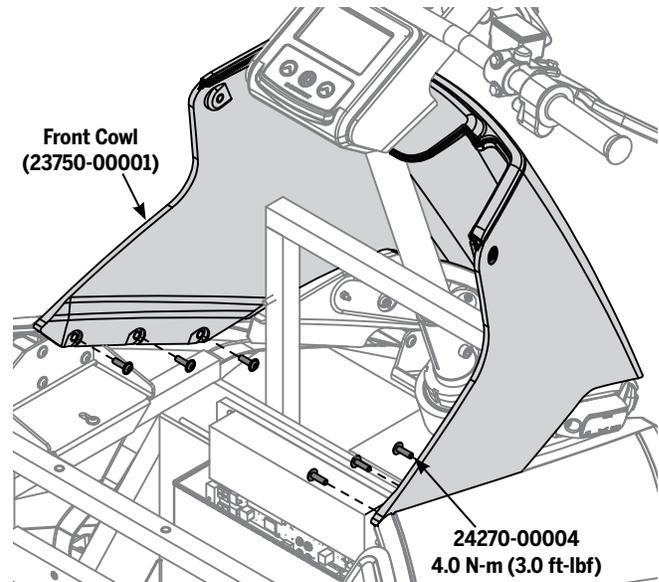


Figure 22: Fasten the Front Cowl

Light Cluster

These instructions describe how to remove and install the Light Cluster body panel. For instructions on replacing individual lights, see **page 35**.

Tools Required: 4 mm hex wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module (**page 8**)
 - b. Storage Trays (**page 15**)
 - c. Bib Panel (**page 16**)
 - d. Glove Box (**page 18**)
 - e. Front Cowl (**page 19**)
3. Using a 4 mm hex wrench, remove the two fasteners as shown in **Figure 23**.
4. Remove the two cable ties around the light cluster harnesses.
5. Detach the wire harnesses (**Figure 24**).
6. Slide the Light Cluster forward and lift it off the frame.

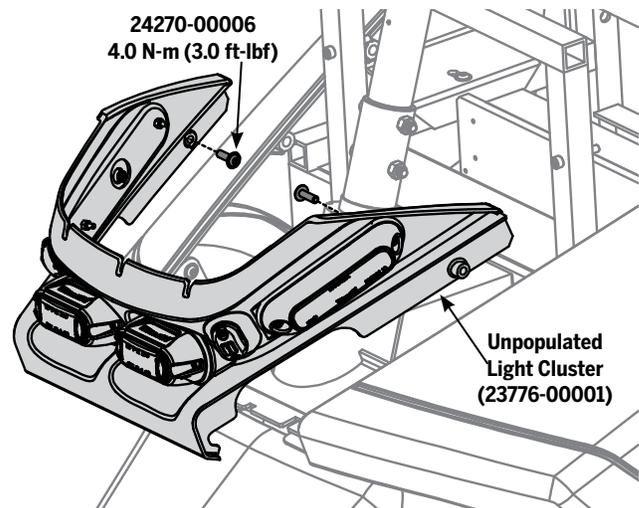


Figure 23: Light Cluster

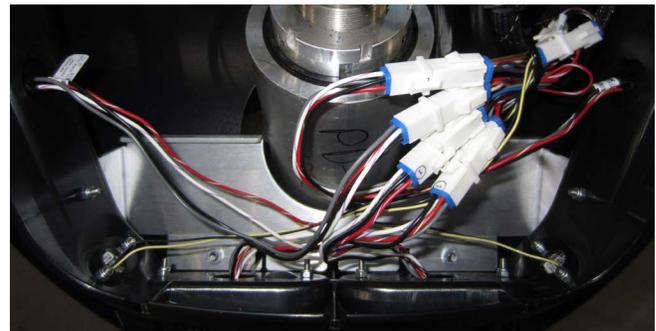


Figure 24: Light Harnesses with Cable Ties

Installation

1. ⚠ Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Slide the Light Cluster onto the frame.

NOTICE

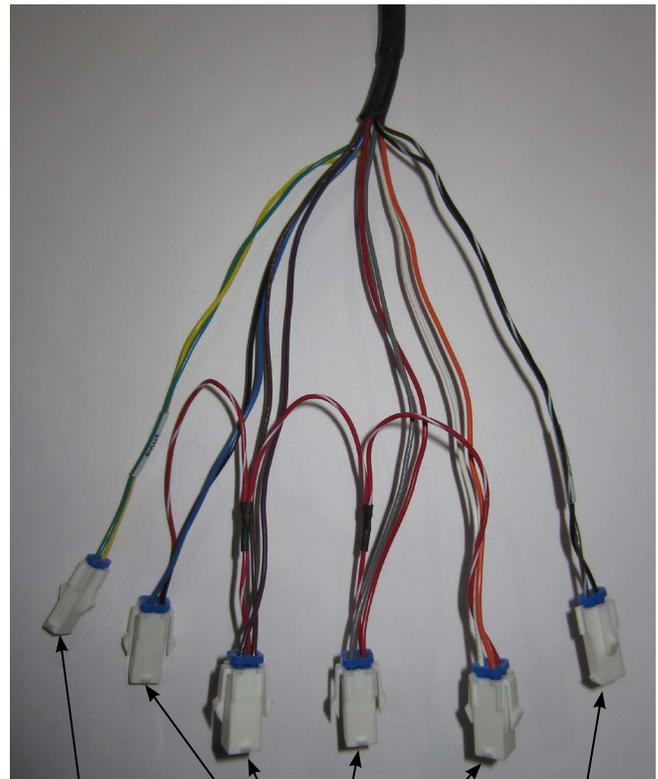
You may need to loosen the fasteners holding the Side Panels to the floating bracket. See **Figure 26, p. 22**. Be sure to torque the fasteners after installing the Light Cluster.

3. Using a 4 mm hex wrench, install the two fasteners as shown in **Figure 23**. Torque to **4.0 N-m (3.0 ft-lbf)**.

4. Connect the wire harnesses. Connect the left and right directionals to the labeled harnesses. The strobe lights can be connected to any of the strobe light harnesses. See **Figure 25**.

Right Directional	Yellow + Green
Left Directional	Black/White + Brown/White

5. Install two cable ties around the light harnesses to keep them neat and safe from sharp corners. See **Figure 24**.
6. Install the following components:
 - a. Front Cowl (**page 19**)
 - b. Glove Box (**page 18**)
 - c. Bib Panel (**page 16**)
 - d. Storage Trays (**page 15**)
 - e. Battery Module (**page 8**)
7. Perform post-service tests (**page 129**).



Right Directional Light Strobe Lights (Order Not Important) Left Directional Light

Figure 25: Light Harness Connectors

Side Panel

The Side Panels attach to a floating bracket at the front of the steering column.

Tools Required: 4 mm hex wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))
 - f. Light Cluster ([page 20](#))
3. Using a 4 mm hex wrench, remove the four front fasteners (two each side) as shown in **Figure 26**.
4. Using a 4 mm hex wrench, remove the three side fasteners as shown in **Figure 27**.
5. Using a 4 mm hex wrench, remove the bracket fastener as shown in **Figure 28**.
6. Lift the Side Panel off of the frame. Pull the bottom out then lift up.

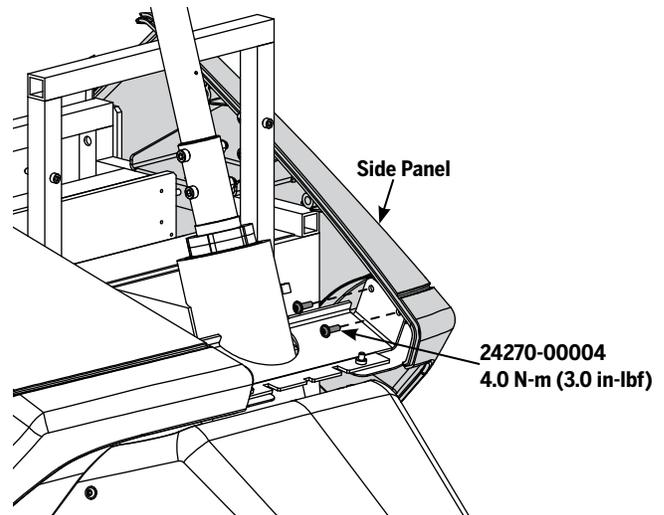


Figure 26: Front Fasteners

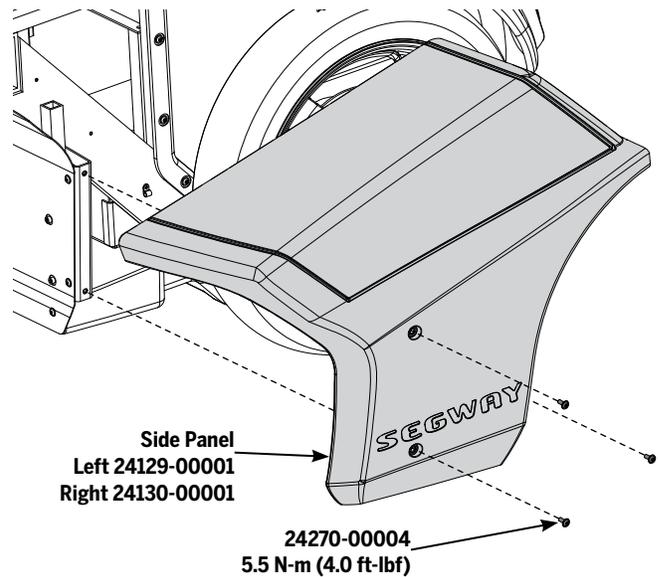


Figure 27: Side Fasteners

Installation

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. If the Side Panel Bracket is not already installed, install it now. Using a 4 mm hex wrench, install the four fasteners as shown in **Figure 29**. Torque to **4.0 N-m (3.0 in-lbf)**.
3. Place the Side Panel onto the frame so that the bracket rests on the frame. Align the holes in the Side Panel with the holes in the frame.
4. Using a 4 mm hex wrench, install the three side fasteners as shown in **Figure 27**. Torque to **5.5 N-m (4.0 ft-lbf)**.
5. Using a 4 mm hex wrench, install the four front fasteners (two each side) as shown in **Figure 26**. Loosely install these fasteners on both Side Panels before tightening. Torque to **4.0 N-m (3.0 ft-lbf)**.
6. Using a 4 mm hex wrench, install the bracket fastener as shown in **Figure 28**. Torque to **5.5 N-m (4.0 ft-lbf)**.
7. Install the following components:
 - a. Light Cluster (**page 20**)
 - b. Front Cowl (**page 19**)
 - c. Glove Box (**page 18**)
 - d. Bib Panel (**page 16**)
 - e. Storage Trays (**page 15**)
 - f. Battery Module (**page 8**)
8. Perform post-service tests(**page 129**).

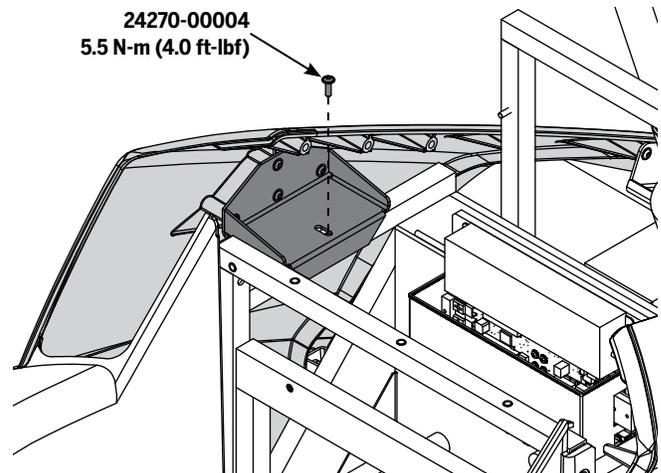


Figure 28: Bracket Fastener

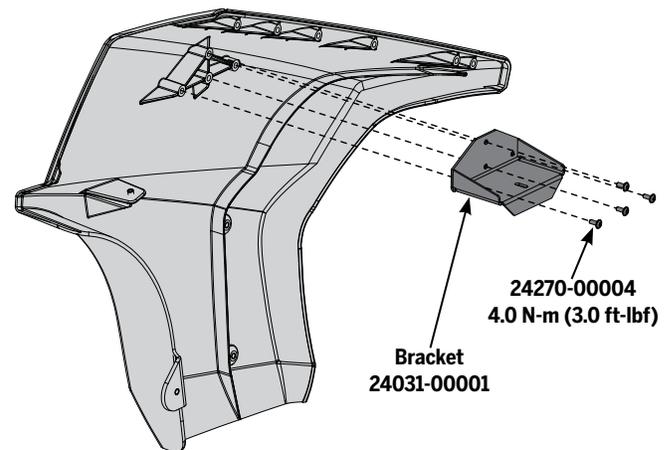


Figure 29: Side Panel Bracket

Fender

The Fender attaches to the frame and gearbox bracket.

Tools Required: 4 mm hex wrench
10 mm socket wrench
Wire cutters
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
3. Using a 4 mm hex wrench, remove the six outside fasteners and P-clip (**Figure 30**).
4. Using a 10 mm socket wrench, remove the lock nut and P-clip on the back of the upper inside fastener.
5. Using a 4 mm hex wrench, remove the three inside fasteners (**Figure 31**).
6. Reach inside the wheel well and disconnect the Tail Light Harness from the Brake Light and Rear Directional Light.
7. Lift the Fender off the frame.
Reach between the Fender and the Bracket; push the center of the Fender away from the Bracket.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Place the Fender on the frame.
3. Connect the Tail Light Harness to the Brake Light and Rear Directional Light.
4. Using a 4 mm hex wrench, install the three inside fasteners (**Figure 31**). Place the longer fastener through the upper hole.
Torque to **5.5 N-m (4.0 ft-lbf)**.
5. Install a P-clip around the Tail Light Harness and slide it onto the back of the long fastener just installed.
6. Using a 10 mm socket wrench, install a lock nut to hold the P-clip in place.
Torque to **5.5 N-m (4.0 ft-lbf)**.
7. Install a P-clip around the Tail Light Harness and orient it as shown in **Figure 30**.
8. Using a 4 mm hex wrench, install the six outside fasteners and the P-clip (see **Figure 30**).
Torque to **5.5 N-m (4.0 ft-lbf)**.

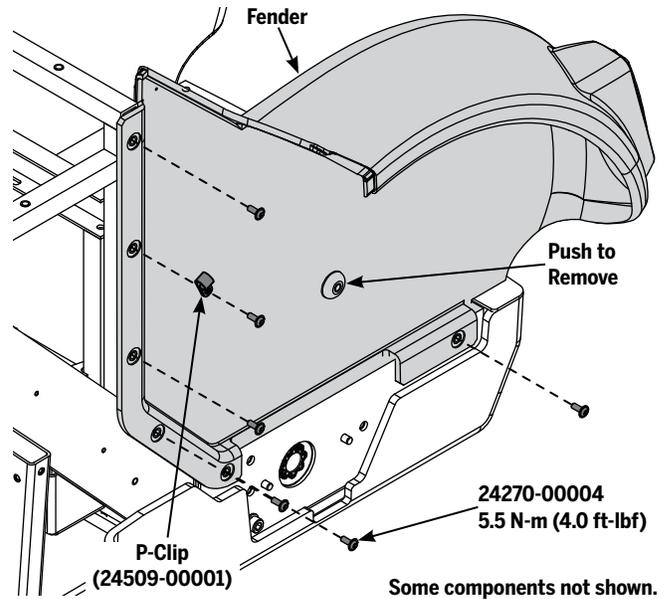


Figure 30: Outside Fasteners

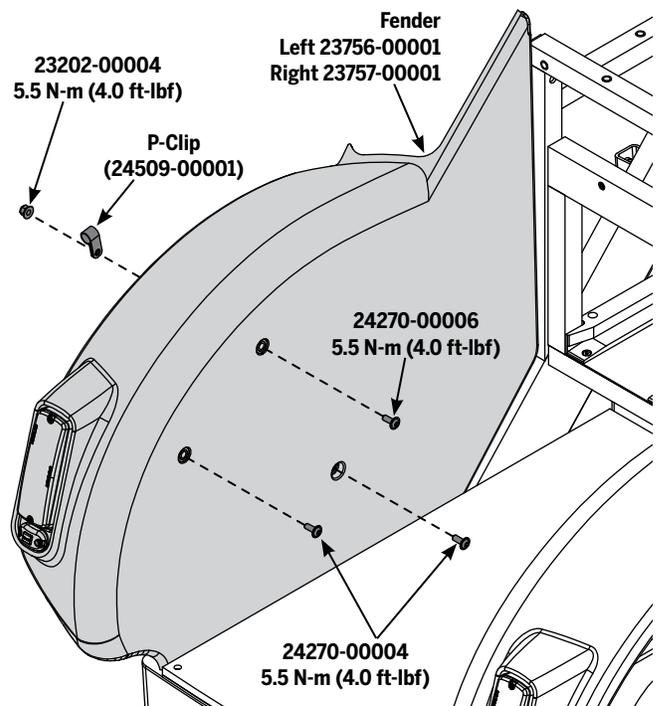


Figure 31: Inside Fasteners

Installation (cont.)

9. Install the following components:
 - a. Bib Panel ([page 16](#))
 - b. Storage Trays ([page 15](#))
 - c. Battery Module ([page 8](#))
10. Perform post-service tests ([page 129](#)).

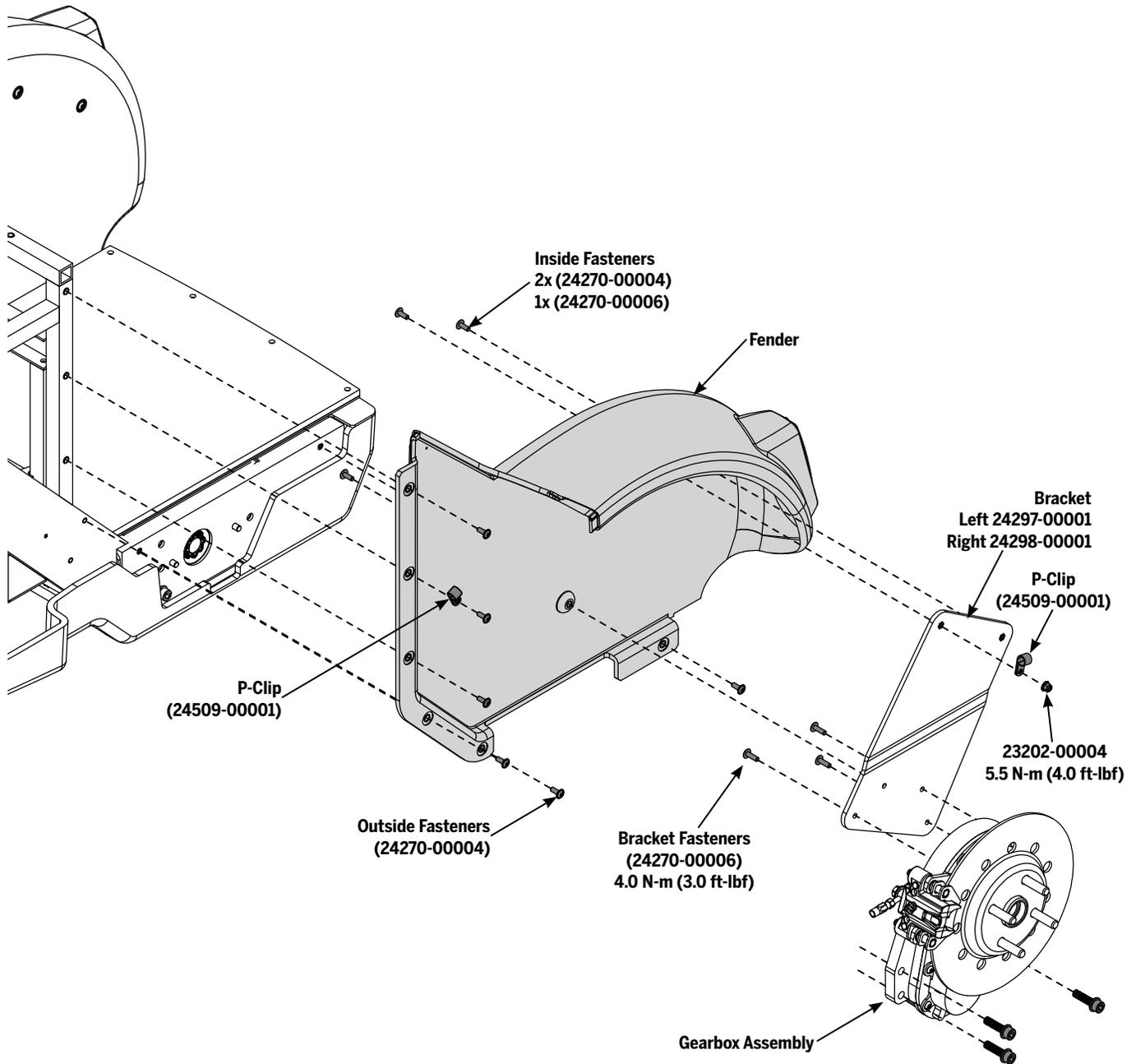


Figure 32: Exploded View of Fender

Front Fender (Boot)

The Front Fender must be removed any time Front Fork components need to be accessed.

Tools Required: 4 mm hex wrench
6 mm hex wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Using a 6 mm hex wrench, remove the two large fasteners (one per side). See **Figure 33**.
3. Using a 4 mm hex wrench, remove the four small fasteners (two per side).
4. Remove the Front Fender.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Place the Front Fender over the front wheel so that it rests on the bracket.
3. Using a 6 mm hex wrench, install the two large fasteners (one per side). See **Figure 33**. Torque to **5.5 N-m (4.0 ft-lbf)**.
4. Using a 4 mm hex wrench, install the four small fasteners (two per side). Torque to **5.5 N-m (4.0 ft-lbf)**.

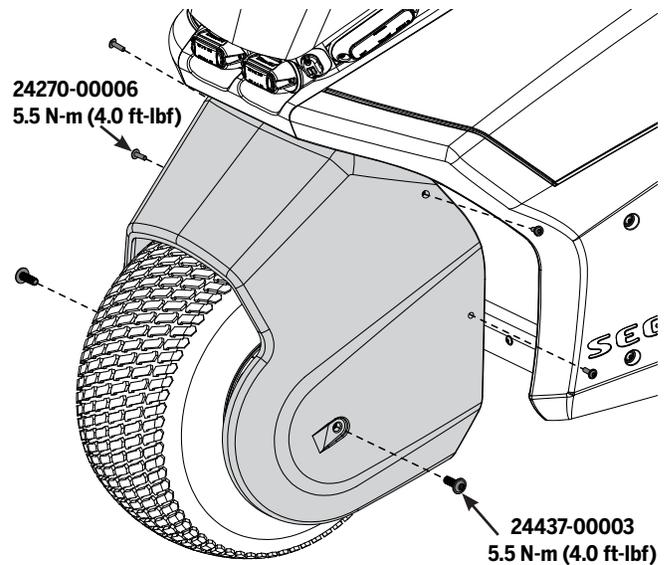


Figure 33: Front Fender Fasteners

Front Splash Guard

The Front Splash Guard is flexible and bends around the bracket on the Front Fork.

Tools Required: 4 mm hex wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the Front Fender ([page 26](#)).
3. Using a 4 mm hex wrench, remove the eight fasteners as shown in [Figure 34](#).
4. Remove the Front Splash Guard.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Align the Front Splash Guard against the bracket on. Orient the part number toward the wheel.
3. Using a 4 mm hex wrench, install the eight fasteners as shown in [Figure 34](#). Torque to **5.5 N-m (4.0 ft-lbf)**.
4. Install the Front Fender ([page 26](#)).

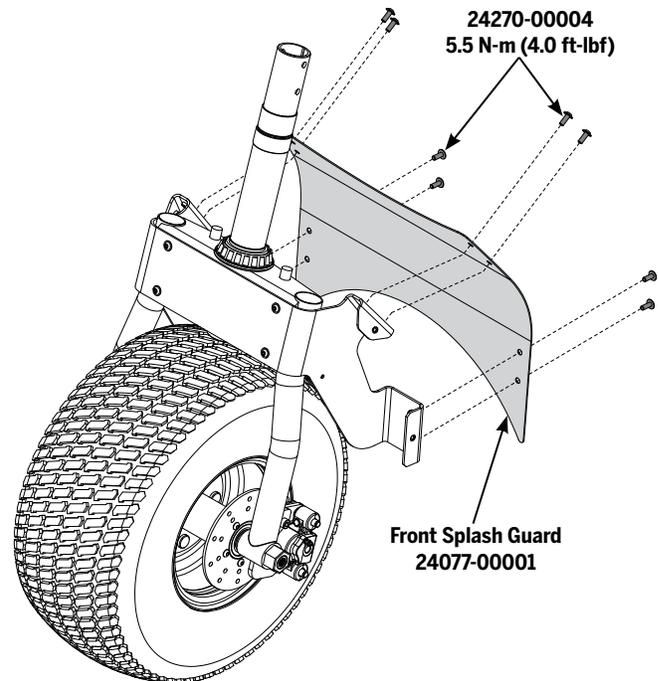


Figure 34: Front Splash Guard

Main Splash Guard

The Main Splash Guard is flexible and attaches to the frame and to the floating bracket that holds the Front Panels together.

Tools Required: 4 mm hex wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Front Fender (**page 26**)
 - b. Front Splash Guard (**page 27**)
 - c. Front Fender Bracket (**page 100**)
3. Using a 4 mm hex wrench, remove the eight fasteners as shown in **Figure 35**.
4. Starting at the top, bend one side of the Main Splash Guard out from behind the Side Panel. Work from top to bottom until the entire side is released.
5. Slide the Main Splash Guard off the vehicle.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Slide the Main Splash Guard on the frame.
3. Starting at the top, bend the Main Splash Guard to fit behind the Side Panels. Work from top to bottom.
4. Using a 4 mm hex wrench, install the eight fasteners as shown in **Figure 35**.
Torque to **5.5 N-m (4.0 ft-lbf)**.
5. Install the following components:
 - a. Front Fender Bracket (**page 100**)
 - b. Front Splash Guard (**page 27**)
 - c. Front Fender (**page 26**)

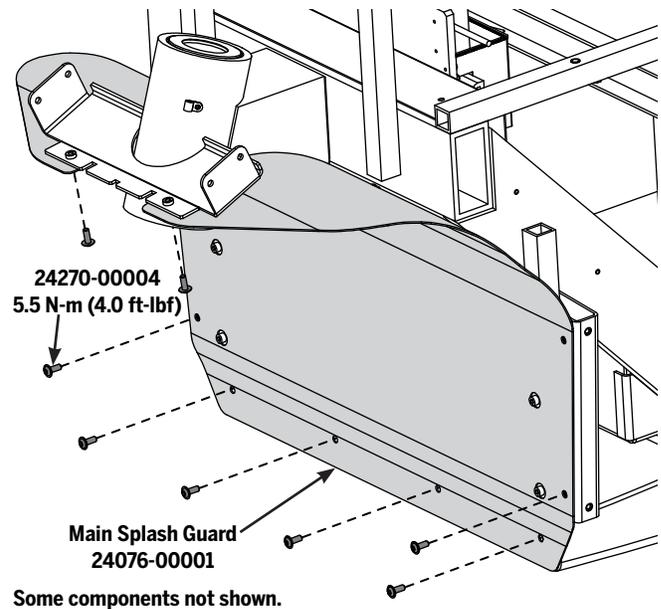


Figure 35: Main Splash Guard

Tire/Wheel Assemblies

Overview

The SE-3 Patroller has three wheels: one front wheel and two rear wheels. For general tire care information, refer to the *Segway SE-3 Patroller User Manual*.

When to Replace

Replace a Tire/Wheel Assembly under any of the following conditions, including, but not limited to:

- Persistent leak in tire after reinflation.
- Wheel is cracked or bent.
- Tire is flat, cracked, or excessively worn.
Excess wear is determined as follows:
 - Front tire tread depth is less than 2 mm.
 - Rear tire tread depth is less than 3.8 mm
or tread is worn down flush with the tread wear indicators.

Tire inflation pressure can dramatically affect range, traction, and tread wear. Ensure tires are properly inflated as follows:

- Front: 22 psi (1.52 Bar; 152 kPa)
- Rear: 25 psi (1.72 Bar; 172 kPa)

Safety

WARNING!

When jacking up the SE-3 Patroller, make sure the SE-3 Patroller is stable or use a jack stand to stabilize it while the wheel is off the ground. Failure to stabilize the SE-3 Patroller could result in death or serious injury from the vehicle falling over.

Contents

- Front Tire/Wheel
- Rear Tire/Wheel

Front Tire/Wheel

Replacing the Front Tire/Wheel involves removing the Front Fender (Boot), removing the caliper and rotor, and removing the Front Spindle off of the Front Fork.

Tools Required: Vehicle jack
4-inch bar clamp
6 mm hex wrench
30 mm socket wrench (2)
Wheel nut key
19 mm or 21 mm socket wrench
Torque wrench

Setup

When removing or installing the front Tire/Wheel, prepare the SE-3 Patroller by following these steps:

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Place a vehicle jack under the center front of the skid plate. Raise the SE-3 Patroller until the front wheel is off the ground (**Figure 36**).

⚠ WARNING!

Make sure the SE-3 Patroller is stable or use a jack stand to stabilize it while the wheel is off the ground. Failure to stabilize the SE-3 Patroller could result in death or serious injury from the vehicle falling over.

Removal

1. Prepare the SE-3 Patroller by following the Setup instructions (**above**).
2. Remove the Front Fender (**page 26**).
3. Using a bar clamp and socket, compress the caliper as shown in **Figure 37**, then remove the bar clamp.

NOTICE

If you don't have a bar clamp, you will need to remove the rotor fasteners. See **page 60**.

4. Using a 6 mm hex wrench, remove the two fasteners holding the caliper in place. See **Figure 38**. Slide the caliper off the rotor.

NOTICE

Secure the caliper so that it doesn't fall or otherwise stress the brake line.

5. Using a 30 mm socket wrench, remove the axle and slide it out. See **Figure 39**.
6. Slide the wheel assembly out of the front fork.
7. Using the wheel nut key, remove the four fasteners holding the wheel onto the Spindle. See **Figure 40**.
8. Slide the wheel off the Spindle.

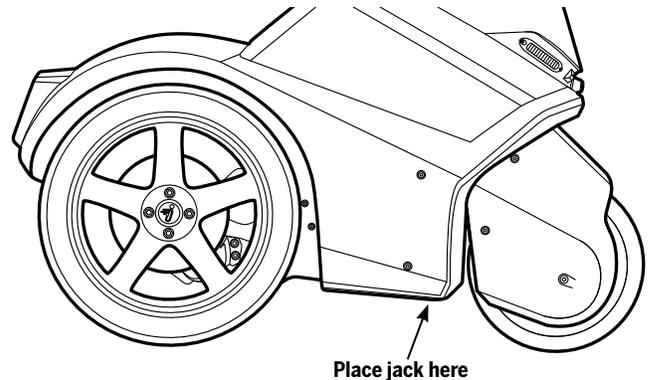


Figure 36: Front Lifting Point



Figure 37: Compress the Caliper

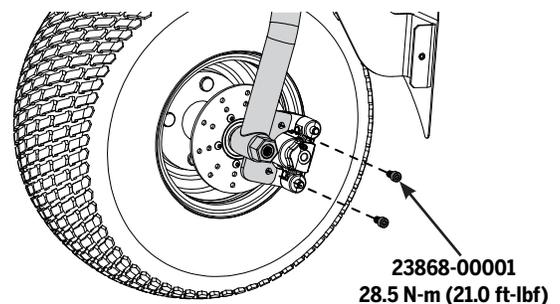


Figure 38: Front Caliper Bolts

Installation

1. Prepare the SE-3 Patroller by following the Setup instructions (**page 30**).
2. Slide the wheel onto the spindle. Orient the wheel so the valve stem is away from the rotor.
See **Figure 40**.
3. Using the wheel nut key, install the four fasteners attaching the wheel to the spindle.
Torque to **67 N-m (49 ft-lbf)**.
4. Slide the wheel assembly onto the front fork. Orient the Wheel assembly so the rotor is toward the left side of the SE-3.
5. Slide the axle through the forks and wheel assembly.
See **Figure 39**.
6. Using a pair of 30 mm socket wrenches, fasten the nut onto the axle.
Torque to **85 N-m (63 ft-lbf)**.
7. Using a bar clamp and socket, compress the caliper as shown in **Figure 37**, then remove the bar clamp.
8. Slide Caliper onto the Rotor so that the Rotor rests between the two brake pads.
9. Using a 6 mm hex wrench, install the two fasteners holding the Caliper in place. See **Figure 38**.
Torque to **28.5 N-m (21 ft-lbf)**.
10. Install the Front Fender (**page 26**).
11. Perform post-service tests (**page 129**).

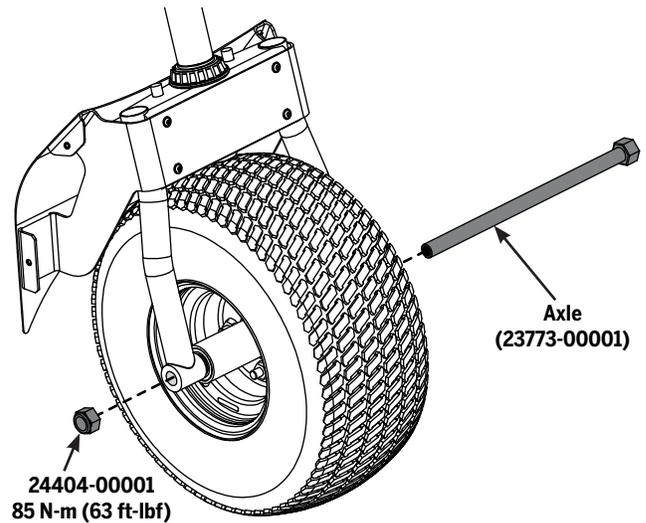


Figure 39: Front Axle Removal

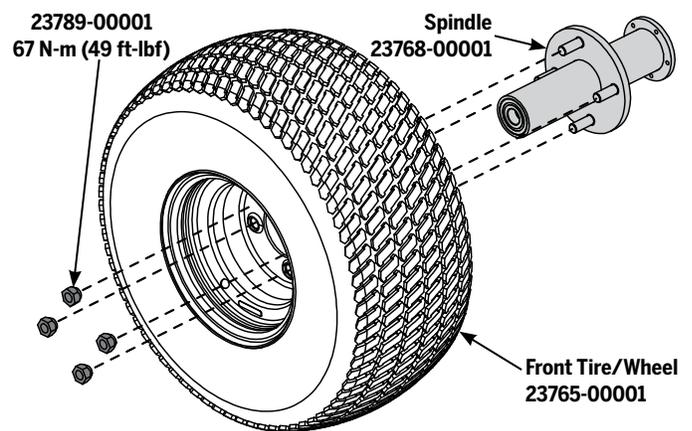


Figure 40: Front Wheel on Spindle

Rear Tire/Wheel

Tools Required: Vehicle jack
Wheel nut key
19 mm or 21 mm socket wrench
torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Using the wheel nut key, loosen but do not remove the four Wheel Nuts.
3. Place the vehicle jack under the back of the SE-3 Patroller skid plate, close to the wheel being changed (**Figure 41**). Raise the SE-3 Patroller until the wheel is just off the ground.

⚠ WARNING!

Do not lift both rear wheels off the ground. Two wheels must always remain in contact with the ground to reduce the possibility of the SE-3 Patroller tipping over while it is on the jack.

4. Using the wheel nut key, remove all four Wheel nuts.
5. Pull the wheel off the studs.

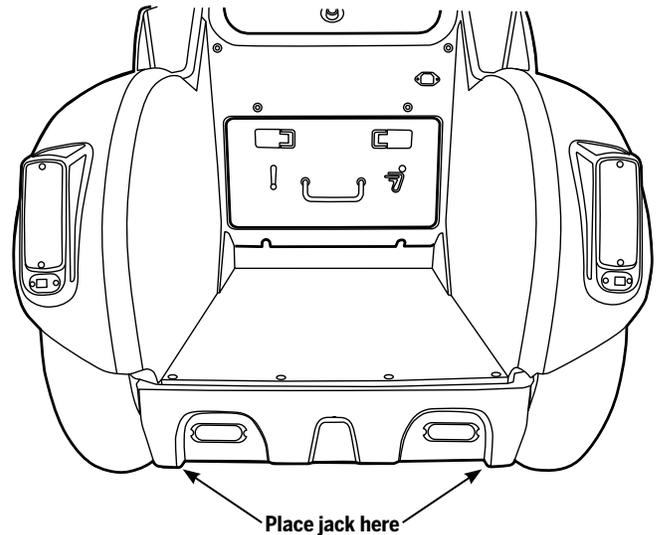


Figure 41: Rear Lifting Points

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Jack up the SE-3 Patroller (**Figure 41**).
3. Make sure all mounting surfaces are clean and free of debris.
4. Slide the wheel onto the studs.
5. Using the wheel nut key, install the four Wheel Nuts. Ensure the wheel nuts are fully seated and are a little more than hand tight.
6. Lower the SE-3 Patroller and remove the jack.
7. Using the wheel nut key, torque the four Wheel Nuts to **67 N-m (49 ft-lbf)**. Torque nuts in a cross pattern: top, bottom, left, right (**Figure 42**).
8. Perform post-service tests (**page 129**).

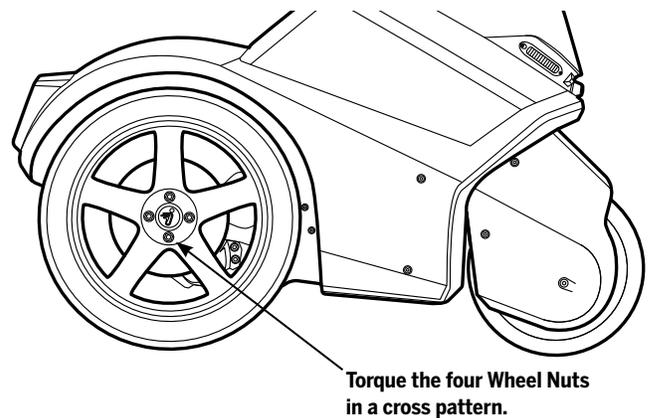


Figure 42: Installing a Rear Wheel

Windshield

Overview

The Windshield protects the UI Module.

When to Replace

Replace the Windshield when it is cracked or otherwise broken.

Contents

- Windshield

Windshield

Tools Required: 4 mm hex wrench
10 mm socket wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Using both a 4 mm hex wrench and a 10 mm socket wrench, remove the four hex nuts on the underside of the Windshield. See **Figure 43**.
3. Remove the fasteners and lift the Windshield off the handlebar frame.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Install four grommets into the holes in the handlebar frame. These grommets protect the Windshield from vibration.
3. Orient the Windshield on the SE-3 Patroller so that the holes in the Windshield align with the holes in the handlebar frame.
4. Insert fasteners from above. Hand tighten hex nuts from underneath.
5. Using both a 4 mm hex wrench and a 10 mm socket wrench, tighten the fasteners. Torque to **1.5 N-m (1.1 ft-lbf)**.

NOTICE

Do not over tighten. Over tightening could damage the Windshield.

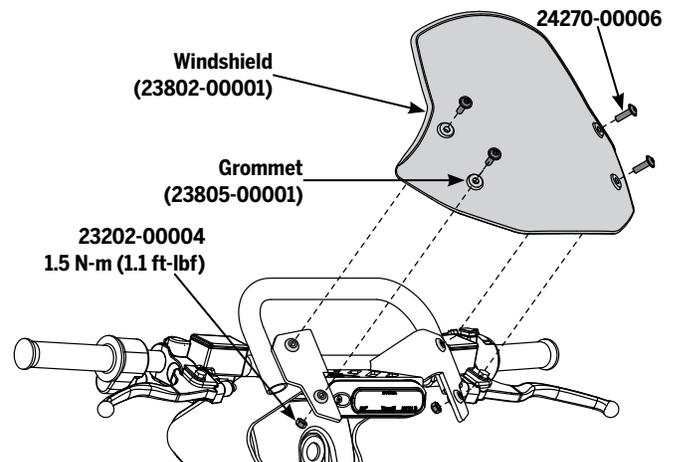


Figure 43: Windshield

Lights

Overview

The SE-3 Patroller has a headlight, brake lights, directional lights, and strobe lights. There are two colors of strobe lights: red/blue for police, and amber for security.

When to Replace

Replace a light when diagnostic testing indicates that a light is malfunctioning.

NOTICE

When connecting light harnesses, make sure the connectors snap firmly into place.

Contents

- Headlight
- Headlight Alignment
- Accessing the Light Cluster
- Front Strobe Light
- Side Strobe Light
- Front Directional Light
- Brake Light
- Rear Directional Light
- Rear Strobe Light

Headlight

The Headlight rests on an adjustable bracket behind the Windshield.

Tools Required: 3 mm hex wrench
Wire cutters
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))
 - f. Windshield ([page 34](#))
3. Disconnect the harness. See [Figure 45](#).
4. Remove the two cable ties.
5. Using a 3 mm hex wrench, remove the two fasteners as shown in [Figure 44](#).
6. Remove the Headlight.

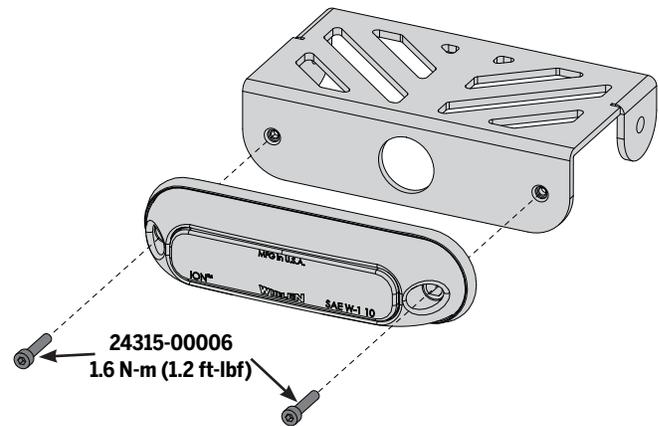


Figure 44: Headlight

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Slide the Headlight harness through the hole in the bracket.
3. Using a 3 mm hex wrench, attach the headlight to the bracket as shown in [Figure 44](#). Torque to **1.6 N-m (1.2 ft-lbf)**.
4. Connect the Harness. See [Figure 45](#).
5. Install two cable ties.
6. Align the Headlight ([page 37](#)).
7. Install the following components:
 - a. Windshield ([page 34](#)).
 - b. Front Cowl ([page 19](#))
 - c. Glove Box ([page 18](#))
 - d. Bib Panel ([page 16](#))
 - e. Storage Trays ([page 15](#))
 - f. Battery Module ([page 8](#))
8. Perform post-service tests ([page 129](#)).

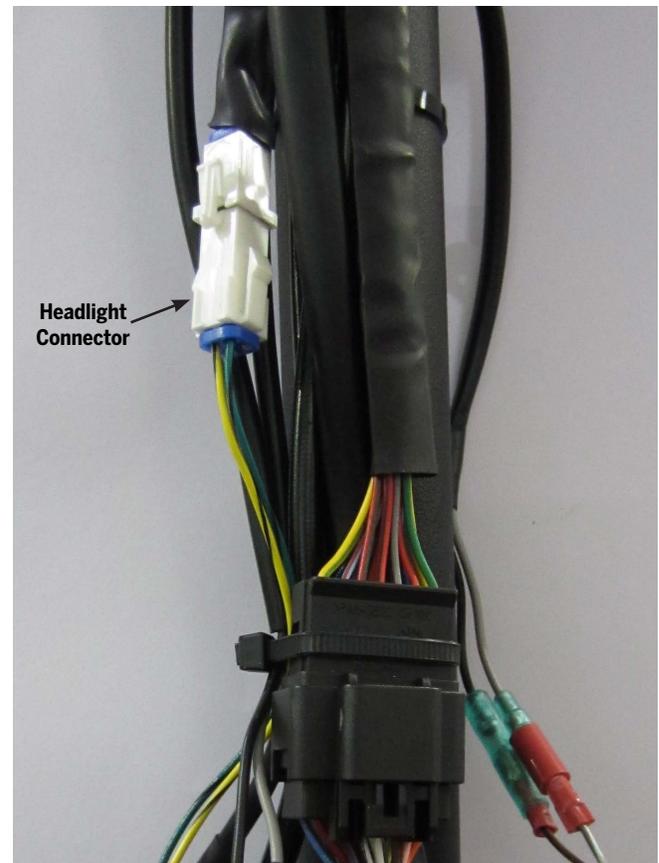


Figure 45: Headlight Harness

Headlight Alignment

Always align the Headlight after performing any service that affects the Headlight.

Tools Required: 4 mm hex wrench
10 mm socket wrench
Digital level
Torque wrench

Procedure

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Using a 4 mm hex wrench and a 10 mm socket wrench, loosen the Headlight Bracket fasteners as shown in **Figure 46**. Loosen just enough to adjust the headlight angle.
3. Place a digital level on top of the bracket. Adjust the bracket until it is at **12°**.
4. Tighten the Headlight Bracket fasteners and torque to **6.0 N-m (4.4 ft-lbf)**.

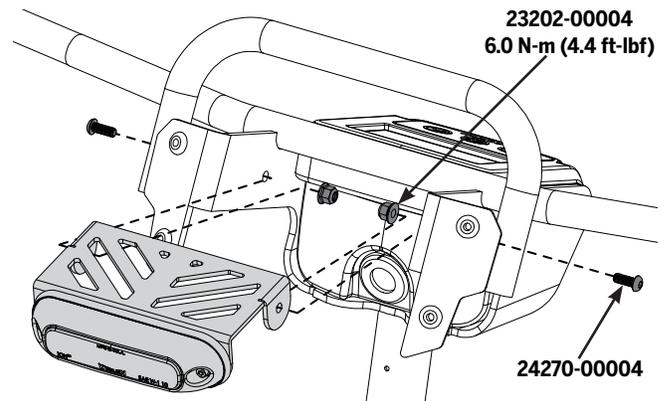


Figure 46: Headlight Bracket

Accessing the Light Cluster

To access the Light Cluster, remove the body panels listed below.

Remove Body Panels

1. ⚠ Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))

NOTICE

Some of the lights require plastic sleeves to be installed on the fasteners. See [Figure 49](#).

Install Body Panels

1. ⚠ Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Install the following components:
 - a. Front Cowl ([page 19](#))
 - b. Glove Box ([page 18](#))
 - c. Bib Panel ([page 16](#))
 - d. Storage Trays ([page 15](#))
 - e. Battery Module ([page 8](#))

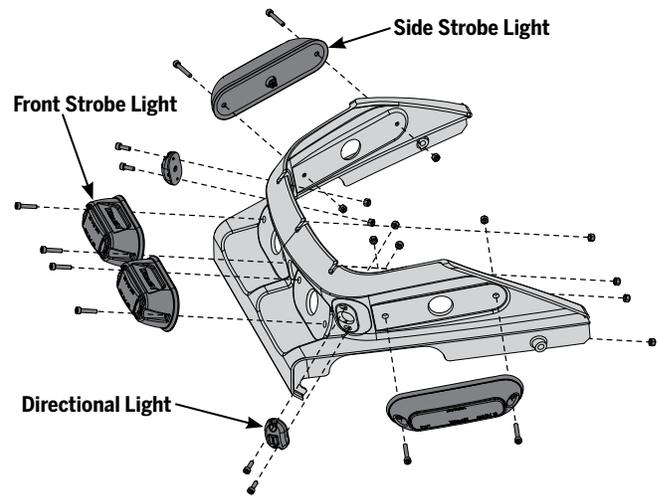


Figure 47: Light Cluster Components

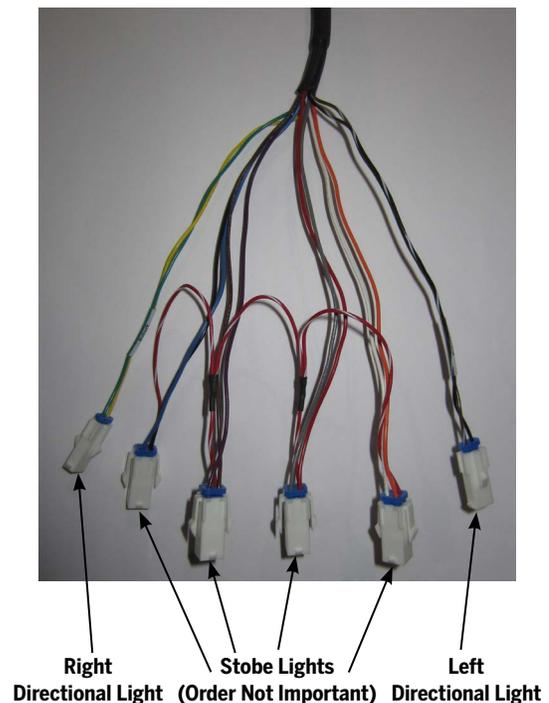


Figure 48: Light Cluster Harness



Figure 49: Fastener with Plastic Sleeve

Front Strobe Light

Tools Required: 3 mm hex wrench
7 mm socket wrench
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Access the Light Cluster by following the instructions to Remove Body Panels on **page 38**.
3. Disconnect the wire harness.
4. Using a 3 mm hex wrench and a 7 mm socket wrench, remove the two fasteners securing the light. See **Figure 50**.
5. Remove the light.

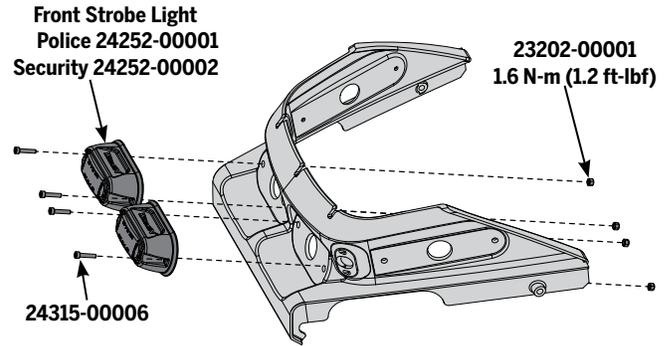


Figure 50: Front Strobe Lights

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Feed the wire harness through the hole in the Light Cluster and connect it to the Front Light Harness. See **Figure 51**.
3. Orient the light.
 - Police: Red toward center
Blue toward outside
 - Security: Locate the heat vent (**Figure 52**)
Right light = heat vent down
Left light = heat vent up.
4. Slide the plastic sleeves onto the fasteners, then install the fasteners and lock nuts (**Figure 50**).
5. Using a 3 mm hex wrench and a 7 mm socket wrench, tighten the fasteners. Torque to **1.6 N-m (1.2 ft-lbf)**.

CAUTION!

Do not overtighten. Overtightening may damage the rubber seal around the light.

6. Reassemble the SE-3 Patroller by following the instructions to Install Body Panels on **page 38**.
7. Perform post-service tests (**page 129**).



Figure 51: Light Harnesses

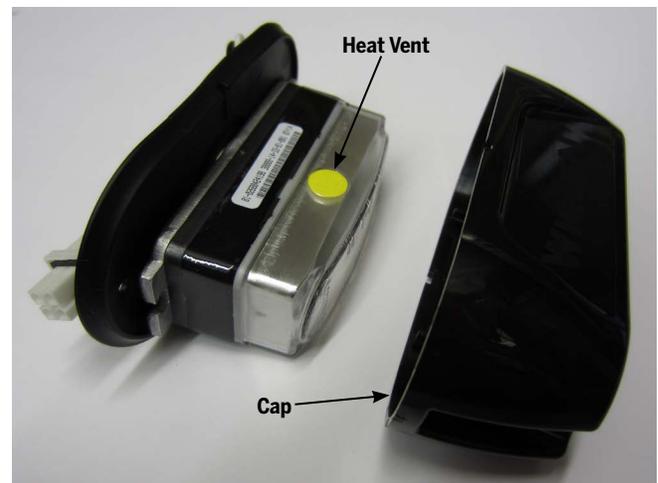


Figure 52: Heat Vent Location

Side Strobe Light

Tools Required: 3 mm hex wrench
7 mm socket wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Access the Light Cluster by following the instructions to Remove Body Panels on **page 38**.
3. Disconnect the wire harness.
4. Using a 3 mm hex wrench and a 7 mm socket wrench, remove the two fasteners securing the light. See **Figure 53**.
5. Remove the light.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Feed the wire harness through the hole in the Light Cluster and connect it to the Front Light Harness.
3. Orient the light. The pigtail is offset where it connects with the light. Orient the lights so the pigtail is toward the top on one light and toward the bottom on the other light. See **Figure 54**.
4. Slide the plastic sleeves onto the fasteners, then install the fasteners and lock nuts (**Figure 53**).
5. Using a 3 mm hex wrench and a 7 mm socket wrench, tighten the fasteners. Torque to **1.6 N-m (1.2 ft-lbf)**.

⚠ CAUTION!

Do not overtighten. Overtightening may damage the rubber seal around the light.

6. Reassemble the SE-3 Patroller by following the instructions to Install Body Panels on **page 38**.
7. Perform post-service tests (**page 129**).

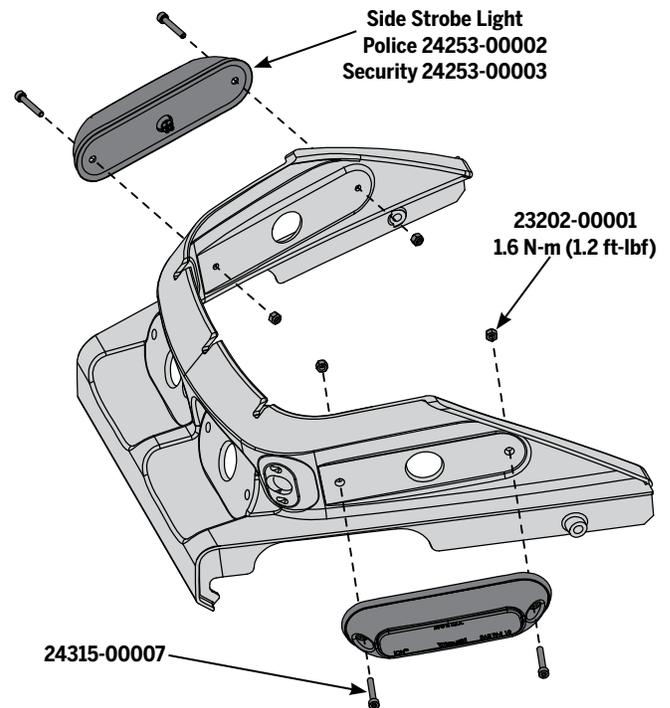


Figure 53: Side Strobe Lights

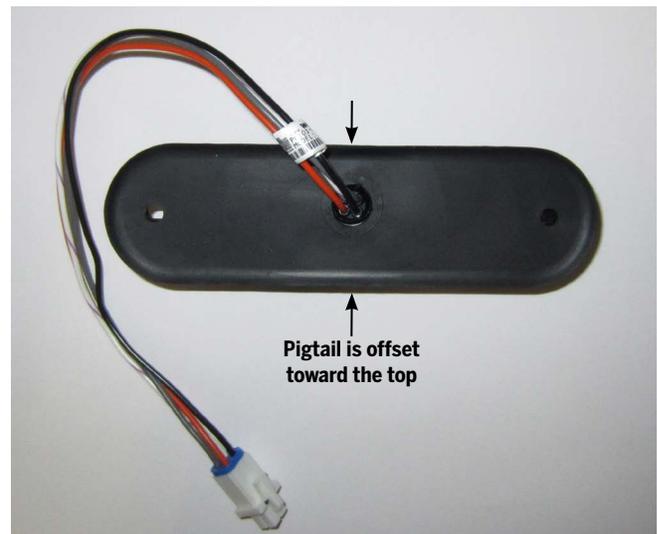


Figure 54: Harness Offset

Front Directional Light

Tools Required: 3 mm hex wrench
7 mm socket wrench
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Access the Light Cluster by following the instructions to Remove Body Panels on **page 38**.
3. Disconnect the wire harness.
4. Using a 3 mm hex wrench and a 7 mm socket wrench, remove the two fasteners securing the light. See **Figure 55**.
5. Remove the light.

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Feed the wire harness through the hole in the Light Cluster and connect it to the Front Light Harness.

NOTICE

Connect the left-hand light to the connector labeled "Left" and the right-hand light to the connector labeled "Right."

3. Slide the plastic sleeves onto the fasteners, then install the fasteners and lock nuts (**Figure 55**).
4. Using a 3 mm hex wrench and a 7 mm socket wrench, tighten the fasteners. Torque to **1.6 N-m (1.2 ft-lbf)**.

CAUTION!

Do not overtighten. Overtightening may damage the rubber seal around the light.

5. Reassemble the SE-3 Patroller by following the instructions to Install Body Panels on **page 38**.
6. Perform post-service tests (**page 129**).

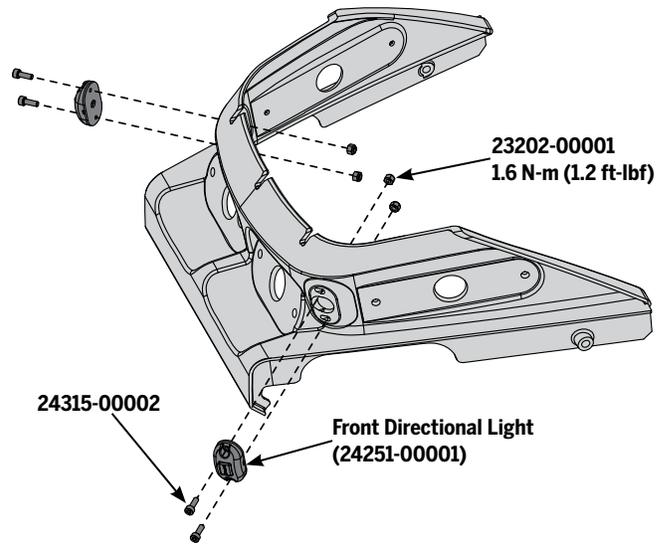


Figure 55: Front Directional Lights

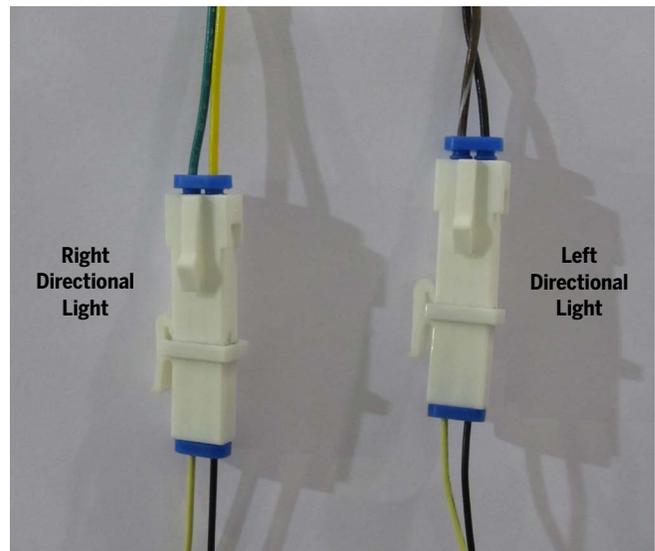


Figure 56: Directional Light Connectors

Brake Light

Tools Required: 3 mm hex wrench
7 mm socket wrench
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Reach into the wheel well and disconnect the Brake Light harness. See **Figure 60**.
3. Use a 7 mm socket wrench, remove the lock nut and P-clip on the back of the Brake Light. See **Figure 58**.
4. Using a 3 mm hex wrench, remove the two Brake Light fasteners. See **Figure 57**.
5. Remove the Brake Light.

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Feed the Brake Light harness through the hole in the Fender.
3. Reach into the wheel well and connect the harness.
4. Slide the plastic sleeves onto the fasteners, then install the fasteners and (**Figure 57**).
5. Using a 3 mm hex wrench, tighten the fasteners. Torque to **1.0 N-m (0.74 ft-lbf)**.

⚠ CAUTION!

Do not overtighten. Overtightening may damage the rubber seal around the light.

6. Install a P-clip around the pigtails from both the Brake Light and Directional Light (see **Figure 58**). Slide the P-clip onto the upper Brake Light fastener.
7. Using a 7 mm socket wrench, install a lock nut to hold the P-clip in place. Torque to **1.6 N-m (1.2 ft-lbf)**.
8. Perform post-service tests (**page 129**).

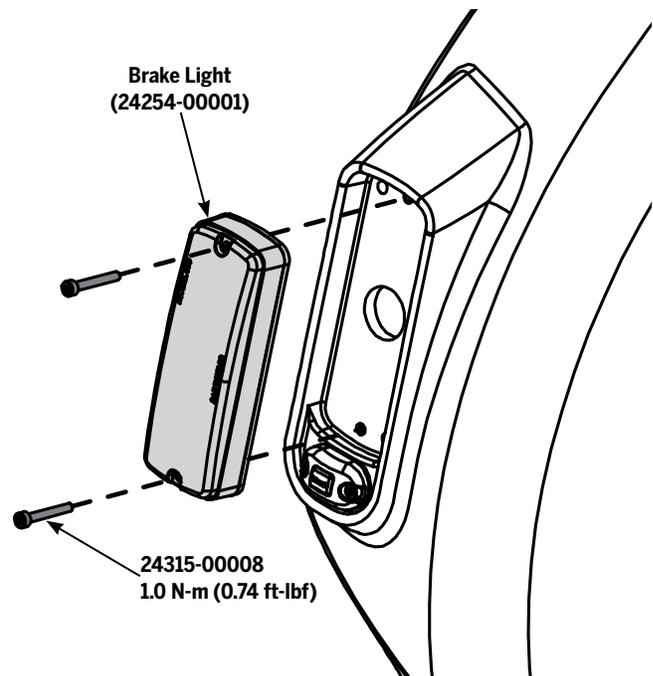


Figure 57: Brake Light

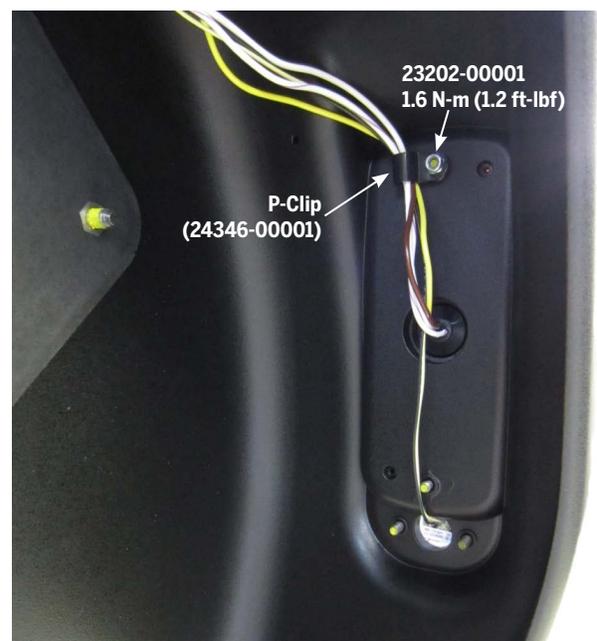


Figure 58: Tail Light Harnesses

Rear Directional Light

Tools Required: 3 mm hex wrench
7 mm socket wrench
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Reach into the wheel well and disconnect the Rear Directional Light harness. See **Figure 60**.
3. Use a 7 mm socket wrench, remove the lock nut and P-clip on the back of the Brake Light. See **Figure 58**.
4. Using a 3 mm hex wrench, remove the two fasteners. See **Figure 59**.
5. Remove the Rear Directional Light.

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
 2. Feed the Rear Directional Light harness through the hole in the Fender.
 3. Reach into the wheel well and connect the harness.
 4. Slide the plastic sleeves onto the fasteners, then install the fasteners (**Figure 59**).
 5. Using a 3 mm hex wrench, tighten the fasteners. Torque to **1.0 N-m (0.74 ft-lbf)**.
- CAUTION!**
Do not overtighten. Overtightening may damage the rubber seal around the light.
6. Install a P-clip around the pigtails from both the Brake Light and Directional Light (see **Figure 58**). Slide the P-clip onto the upper Brake Light fastener.
 7. Using a 7 mm socket wrench, install a lock nut to hold the P-clip in place. Torque to **1.6 N-m (1.2 ft-lbf)**.
 8. Perform post-service tests (**page 129**).

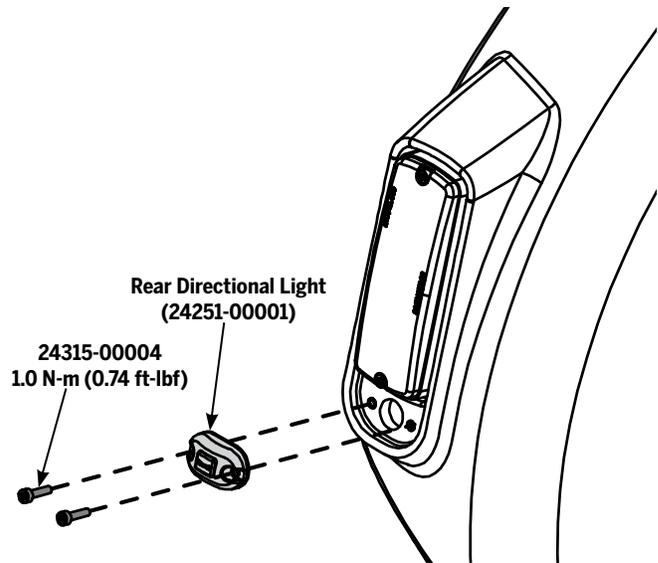


Figure 59: Rear Directional Light

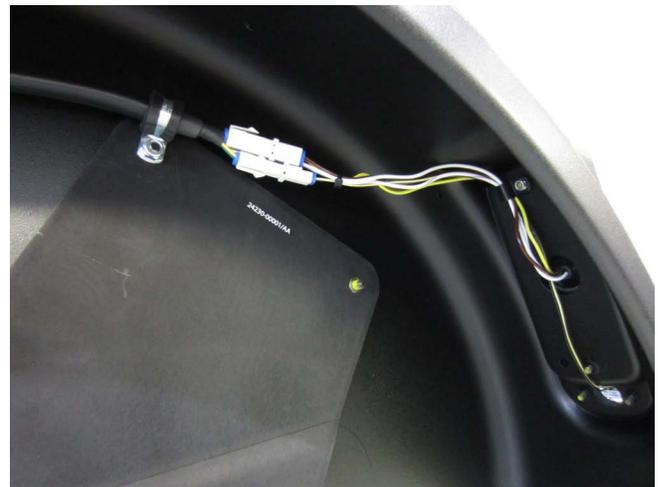


Figure 60: Wire Harnesses

Rear Strobe Light

Tools Required: 3 mm hex wrench
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Access the Motor Cavity ([page 91](#)).
3. Disconnect the Rear Strobe Light harness. See [Figure 61](#).
4. Using a 3 mm hex wrench, remove the two fasteners. See [Figure 62](#).
5. Remove the Rear Strobe Light.

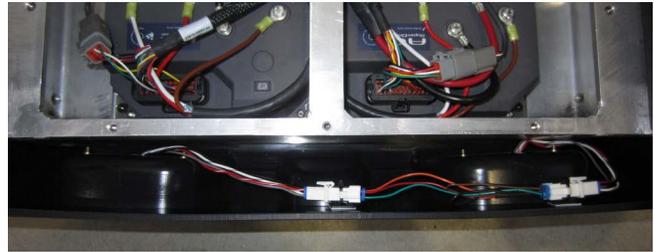


Figure 61: Rear Strobe Light Harnesses

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Feed the Rear Strobe Light harness through the hole in the Skid Plate.
3. Connect the Rear Strobe Light harness. See [Figure 61](#).
4. Orient the light.
 - Police: Red toward center
Blue toward outside
 - Security: Locate the heat vent ([Figure 63](#))
Right light = heat vent down
Left light = heat vent up.
5. Using a 3 mm hex wrench, install the two fasteners. See [Figure 62](#). Torque to **1.6 N-m (1.2 ft-lbf)**.
6. Secure the Motor Cavity ([page 91](#)).
7. Perform post-service tests ([page 129](#)).

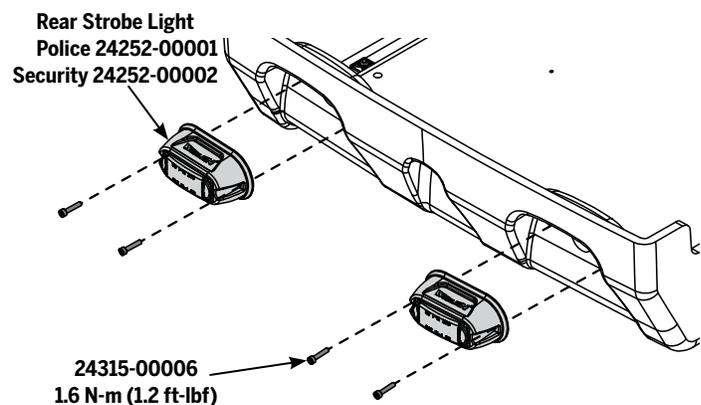


Figure 62: Rear Strobe Lights

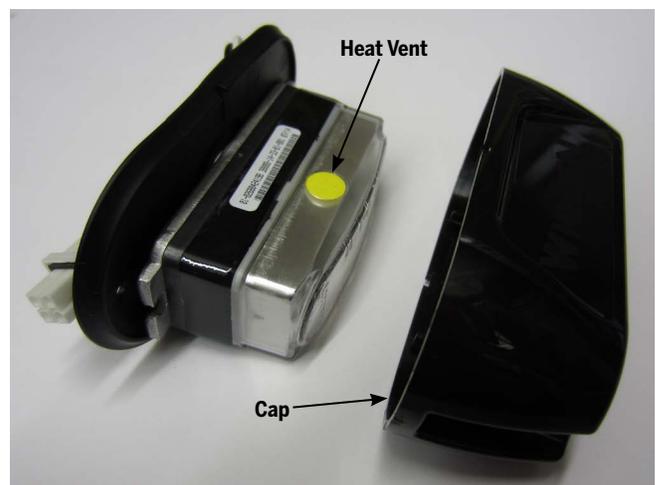


Figure 63: Heat Vent Location

Battery Compartment

Overview

Inside the Battery Compartment are the Battery Slides and Battery Bumpers, which together position the Battery Module correctly against the PI Board.

When to Replace

Replace the Battery Slides or Battery Bumpers when they are cracked, excessively worn, or otherwise broken.

Contents

- Battery Slides
- Battery Bumpers

Battery Slides

The Battery Slides orient the Battery Module in the frame. They also allow the Battery Module to slide smoothly when being installed or removed.

Tools Required: 2.5 mm hex wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the Battery Module ([page 8](#)).
3. Using a 2.5 mm hex wrench, remove the fasteners from the Battery Slides. See [Figure 64](#).
4. Remove the Battery Slides.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Align the Battery Slides in the battery compartment.
3. Using a 2.5 mm hex wrench, install the fasteners. Torque to **1.0 N-m (0.74 ft-lbf)**.
4. Install the Battery Module ([page 8](#)).

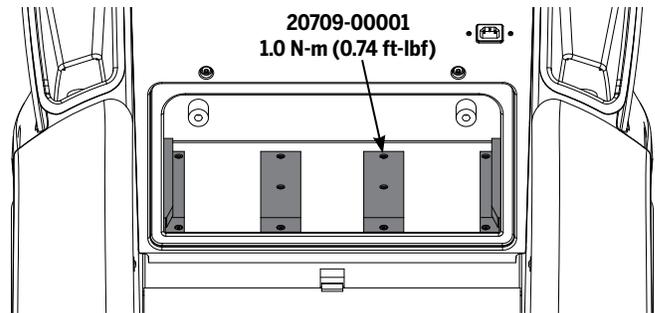


Figure 64: Battery Slides

Battery Bumpers

The Battery Bumpers position the Battery Module at the correct distance from the frame so that there is a good connection between the Battery Module and the PI Board.

Tools Required: 4 mm hex wrench
8 mm socket wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Front Fender ([page 26](#))
 - c. Front Splash Guard ([page 27](#))
 - d. Front Fender Bracket ([page 100](#))
 - e. Main Splash Guard ([page 28](#))
3. Using an 8 mm socket wrench, remove the lock nuts holding the three brake line P-Clips to the front of the frame. See [Figure 65](#).
4. Slide the P-Clips off the threaded studs.
5. Using a 4 mm hex wrench, remove the Battery Bumpers. See [Figure 66](#).

NOTICE

Keep track of how many washers go with each bumper. Bumper alignment is critical for maintaining a solid battery connection. Because of variations in the frame, different SE-3 Patrollers may have different quantities of washers installed with the bumpers.



Figure 65: Brake Line P-Clips



Figure 66: Battery Bumpers

Installation

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Assemble the Battery Bumper. Slide the fastener through the bumper, then slide washers onto the fastener. See **Figure 67**.

NOTICE

Use the same number of washers as were removed when the Battery Bumper was disassembled.

3. Using a 4 mm hex wrench, attach the Battery Bumpers to the frame.
Torque to **2.0 N-m (1.5 ft-lbf)**.
4. Slide the three brake line P-Clips onto the threaded studs on the front of the frame. See **Figure 65**.
5. Using an 8 mm socket wrench, install the lock nuts on the threaded studs.
Torque to **1.4 N-m (1.0 ft-lbf)**.
6. Install the following components:
 - a. Main Splash Guard (**page 28**)
 - b. Front Fender Bracket (**page 100**)
 - c. Front Splash Guard (**page 27**)
 - d. Front Fender (**page 26**)
 - e. Battery Module (**page 8**)
7. Perform post-service tests (**page 129**).

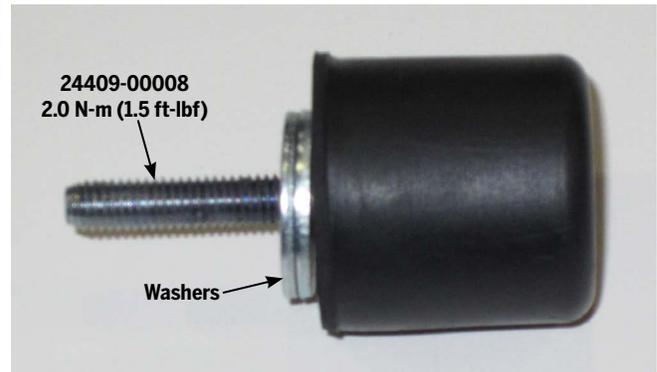


Figure 67: Assembled Battery Bumper

Bib Panel Components

Overview

These are replaceable components that attach to the Bib Panel.

When to Replace

Replace the Glove Box Door when it is cracked, excessively worn, or otherwise broken. Replace the KeyLock or Accessory Power Outlet when troubleshooting determines that the component is malfunctioning.

Bib Panel Components

- Glove Box Door
- KeyLock
- Accessory Power Outlet

Glove Box Door

Tools Required: 2.5 mm hex wrench
7 mm socket wrench
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Pop off the top hinge caps (**Figure 68**).
3. Open the Glove Box Door and locate the fasteners on the inside top of the Glove Box.
4. Using a 2.5 mm hex wrench and a 7 mm socket wrench, remove the four fasteners.
5. Remove the Glove Box Door.

NOTICE

Do not operate the SE-3 Patroller without the Glove Box Door installed. The warning label on the Glove Box Door must be visible.

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Align the Glove Box Door on the Bib Panel.
3. Insert the four fasteners from above: through the hinges and into the holes in the Bib Panel.
4. Slide an O-ring onto the fasteners from underneath, then slide a washer and a nut onto the fasteners.
5. Using a 2.5 mm hex wrench and a 7 mm socket wrench, install the fasteners. Torque to **1.6 N-m (1.2 ft-lbf)**.
6. Close the Glove Box Door and verify that the latch works properly.

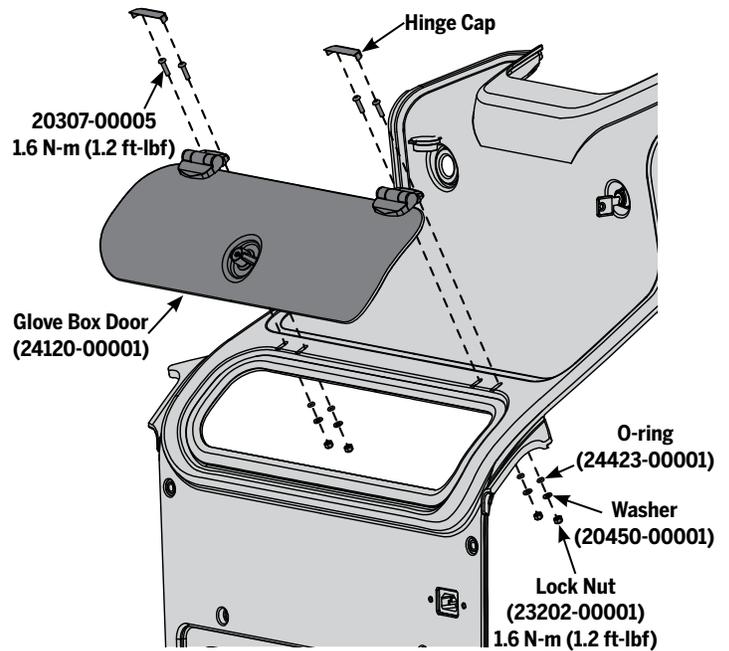


Figure 68: Glove Box Door

KeyLock

Tools Required: Loctite 425
KeyLock nut tool

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module (page 8)
 - b. Storage Trays (page 15)
 - c. Bib Panel (page 16)
3. Press the tab on the side of the connector block and pull it off the back side of the KeyLock. See Figure 70.
4. Unscrew the plastic nut on the back of the KeyLock. See Figure 69.
5. Remove the KeyLock.

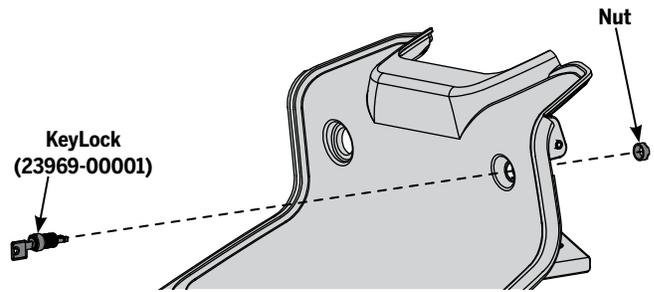


Figure 69: KeyLock

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Insert the KeyLock through the hole on the right hand side of the Bib Panel. See Figure 69.
3. Apply 1 drop of Loctite 425 (P/N 24620-00001) to the threads of the KeyLock. See Figure 71.

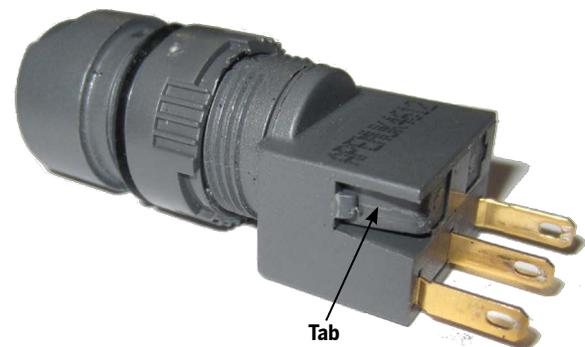


Figure 70: KeyLock Closeup

NOTE

Loctite 425 is specially formulated for plastics. Do not use any other threadlock compounds — they may react with the plastic, causing it to deform or crack.

NOTE

Please allow 24 hours for the Loctite to fully cure before operating the SE-3 Patroller.

4. Screw the plastic nut back onto the Keylock until it is finger tight.
5. Verify the alignment of the KeyLock. In the OFF position, the key slot should be vertical.
6. Using the KeyLock nut tool (P/N 24630-00001), tighten the plastic nut. Torque to **0.8 N-M (0.6 ft-lbf)**.
7. Slide the connector block onto the back of the KeyLock until it snaps in place.
8. Install the following components:
 - a. Bib Panel (page 16)
 - b. Storage Trays (page 15)
 - c. Battery Module (page 8)
9. Perform any post-service tests (page 129).



Figure 71: Apply Loctite 425



Figure 72: KeyLock Nut Tool

Accessory Power Outlet

Tools Required: None

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
3. Unscrew the plastic nut on the back of the Accessory Power Outlet. See **Figure 73**.
4. Remove the Accessory Power Outlet.

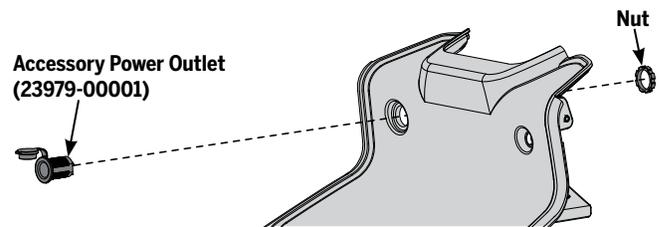


Figure 73: Accessory Power Outlet

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Insert the Accessory Power Outlet through the hole on the left hand side of the Bib Panel.
3. Thread the plastic nut onto the back of the Accessory Power Outlet.
Tighten finger tight, then turn an additional 1/8 turn.
4. Install the following components:
 - a. Bib Panel ([page 16](#))
 - b. Storage Trays ([page 15](#))
 - c. Battery Module ([page 8](#))
5. Perform any post-service tests ([page 129](#)).

Brakes

Overview

There are two brake systems: front and rear. Each brake system includes a master cylinder (with brake lever), brake line, caliper(s), and rotor(s).

When to Replace

Replace rotors at or before they reach the wear limit (**3.2 mm**).

Replace caliper when less than **1 mm** of brake pad material remains.

Replace a master cylinder when diagnostic testing indicates it is malfunctioning.

Replace the brake lines when they are punctured, leaking, or otherwise malfunctioning.

NOTICE

Avoid spilling brake fluid on plastic, rubber, or painted parts. Protect these parts with a shop towel when servicing the brake system.

Contents

- Brake Fluid
- Draining Brake Lines
- Bleeding Brake Lines
- Front Caliper
- Front Rotor
- Master Cylinder
- Brake Lever
- Rear Caliper & Rotor
- Front Brake Line
- Rear Brake Line

Brake Fluid

Check the Brake Fluid level as part of your regular maintenance routine. Be sure to check both the left and right master cylinders.

Checking the Fluid Level

⚠ WARNING

Do not operate the SE-3 Patroller if the brake fluid level is low. The brakes may not activate properly and the vehicle may not stop as intended.

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Make sure the brake fluid reservoir is level.
3. Inspect the sight glass and determine if fluid is below the "low" mark (**Figure 74**). If fluid is below the "low" mark, brake fluid needs to be added.

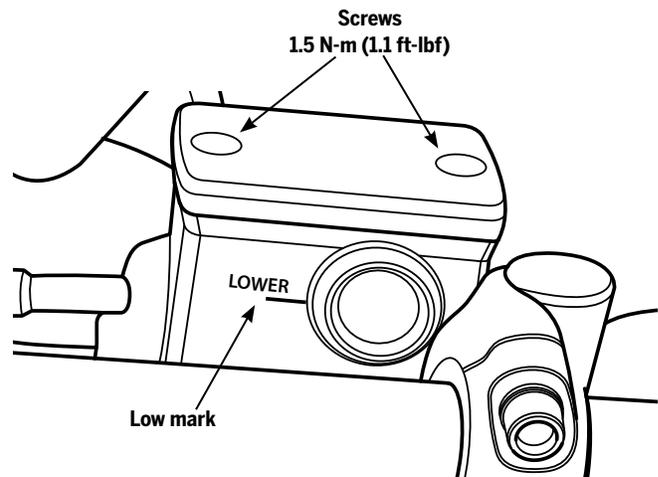


Figure 74: Checking the Brake Fluid Level

Adding Brake Fluid

Tools Required: Phillips screwdriver
Torque wrench

1. Use a Phillips screwdriver to remove the two screws on top of the brake fluid reservoir.
2. Remove the reservoir cap and gasket.
3. Add DOT 4 brake fluid; do not overfill the reservoir.

NOTICE

Use only fresh DOT 4 brake fluid from a new container. Avoid getting any brake fluid on hands, clothing, or painted parts. Immediately wipe up any spilled fluid.

4. Replace the gasket and the reservoir cap.
5. Use a Phillips screwdriver to install the two screws on top of the brake fluid reservoir. Torque to **1.5 N-m (1.1 ft-lbf)**.

Draining Brake Lines

Drain the brake line before replacing a master cylinder, brake line, or caliper.

Tools Required: Gloves
Shop Towels
¼ in. tubing
Empty container
Phillips screwdriver
¼ in. wrench

Procedure

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the wheels are chocked.
2. Access the Caliper
Front: remove the Front Fender ([page 26](#))
Rear: remove a Rear Wheel ([page 32](#))
3. Using a Phillips screwdriver, remove the cover of the Master Cylinder.
4. Fit one end of the tubing over the bleed valve on the Caliper. Place the other end in an empty container. See [Figure 75](#).
5. Using a ¼ in. wrench, open the bleed valve. Brake fluid will flow out of the bleed valve. See [Figure 76](#).
6. Pump the brake lever to drain the Master Cylinder.
7. After all the fluid has drained, use the ¼ in. wrench to close the bleed valve.

NOTICE

Some fluid will remain in the brake line and Master Cylinder. When disconnecting components of the brake system, use shop towels to absorb any brake fluid that leaks out.

8. Dispose of used brake fluid in accordance with your local environmental regulations.

⚠ WARNING!

Do not operate the SE-3 Patroller with the brake line drained. You may not be able to come to a stop.

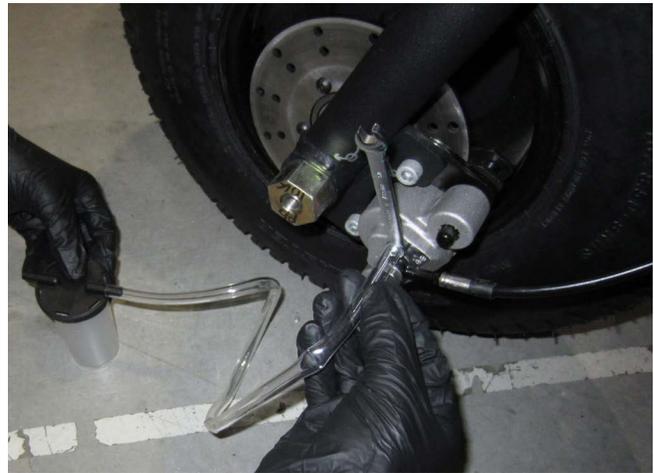


Figure 75: Draining the Front Brake Line



Figure 76: Draining the Rear Brake Line

Bleeding Brake Lines

Bleed the brake line after replacing a master cylinder, brake line, or caliper. Also bleed the brake line if air is in the brake line or if there is insufficient pressure in the brake lever.

⚠ WARNING!

- Use only DOT 4 brake fluid from a sealed container.
- Use a clean funnel when filling the brake fluid reservoir.
- Do not use brake fluid taken from old or already opened containers.
- Do not mix different fluids.
- Failure to follow these warnings could result in damage to the brake system, which could cause serious bodily injury or death if the brake system fails to engage.

Tools Required: Gloves
 ¼ in. tubing
 Empty container
 Phillips screwdriver
 ¼ in. wrench
 5 mm hex wrench
 Torque wrench
 Digital level

Procedure

NOTICE

Assistance is required to perform this procedure.

1. Make sure the SE-3 Patroller is powered off, unplugged, and the wheels are chocked.

⚠ CAUTION!

You can't bleed the rear brake line with the parking brake on. Chock the wheels and ensure the SE-3 doesn't move.

2. Access the Caliper
 Front: remove the Front Fender ([page 26](#))
 Rear: remove a Rear Wheel ([page 32](#))
3. Using a 5 mm hex wrench, loosen the fasteners holding the Master Cylinder to the handlebar.
4. Rotate the Master Cylinder until it is level, then tighten the fasteners again.
5. Using a Phillips screwdriver, remove the cover of the Master Cylinder.
6. Pour brake fluid (DOT 4 only) into the Master Cylinder until it reaches the FILL line.

NOTICE

Be careful not to drip brake fluid on the SE-3 Patroller.

7. Fit one end of the tubing over the bleeder valve on the Caliper. Place the other end in an empty container. See [Figure 77](#).



Figure 77: Bleeding the Front Brake Line



Figure 78: Bleeding the Rear Brake Line

8. Squeeze the brake lever.
9. While the brake lever is being squeezed, open the bleeder valve. See **Figure 78**. As brake fluid drains out of the bleeder valve, the brake lever will move toward the handlebar.
10. Before the brake lever touches the handlebar, close the bleeder valve.
11. Release the brake lever.
12. Repeat steps 8–11 until the brake lever is firm.

⚠ CAUTION!

Do not let the Master Cylinder run dry. This could introduce air into the brake line. Keep adding brake fluid to the Master Cylinder to keep the fluid level at the FILL line.

13. Using a ¼ in. wrench, tighten the bleeder valve.
Torque to **4.5 N-m (3.3 ft-lbf)**.
14. Place the cap on the Master Cylinder. Using a Phillips screwdriver, install the two fasteners.
Torque to **1.5 N-m (1.1 ft-lbf)**.
15. Using a 5 mm hex wrench, loosen the fasteners holding the Master Cylinder to the handlebar.
16. Rotate the Master Cylinder so that it is **11.5°** from horizontal, then tighten the fasteners again.
See **Figure 79**. Torque to **10 N-m (7.4 ft-lbf)**.
17. Install the following components:
Front: install the Front Fender (**page 26**)
Rear: install a Rear Wheel (**page 32**)
18. Perform post-service tests (**page 129**).



Figure 79: Aligning the Master Cylinder

Front Caliper

Tools Required: 4-inch bar clamp
6 mm hex wrench
14 mm socket wrench
Torque wrench
Vehicle jack

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Place a vehicle jack under the center front of the skid plate. Raise the SE-3 Patroller until the front wheel is off the ground (**Figure 80**).

⚠ WARNING!

Make sure the SE-3 Patroller is stable or use a jack stand to stabilize it while the wheel is off the ground. Failure to stabilize the SE-3 Patroller could result in death or serious injury from the vehicle falling over.

3. Remove the Front Fender (**page 26**).
4. Using a bar clamp and socket, compress the caliper as shown in **Figure 81**, then remove the bar clamp.

NOTICE

If you don't have a bar clamp, you will need to remove the rotor fasteners. See **page 60**.

5. Using a 6 mm hex wrench, remove the two fasteners holding the caliper in place. See **Figure 82**. Slide the caliper off the rotor.

NOTICE

Secure the caliper so that it doesn't fall or otherwise stress the brake line.

6. Disconnect the brake line:
 - a. Drain the brake line (**page 55**).
 - b. Using a 14 mm socket wrench, remove the Banjo Bolt.

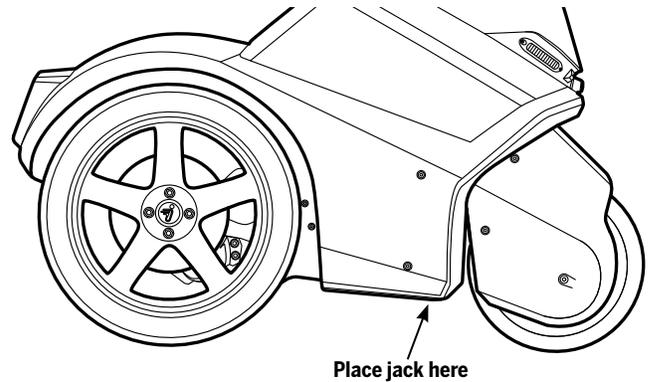


Figure 80: Front Lifting Point



Figure 81: Compress the Caliper

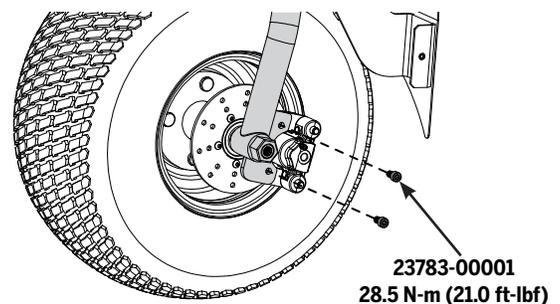


Figure 82: Front Caliper Bolts

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Using a 14 mm socket wrench, attach the Banjo Bolt (on the end of the brake line) to the Caliper. Torque to **28.5 N-m (21.0 ft-lbf)**. See **Figure 83**.

⚠ CAUTION!

Always use new crush washers when attaching a Banjo Bolt to any component. Used crush washers may leak, causing a reduction in braking force.

3. Carefully slide the Caliper onto the Rotor so the Rotor rests between the two brake pads.
4. Using a 6 mm hex wrench, install the two fasteners holding the Caliper in place. See **Figure 82**. Torque to **28.5 N-m (21 ft-lbf)**.
5. Bleed the Brake Line (**page 56**).
6. Install the Front Fender (**page 26**).
7. Perform post-service tests (**page 129**).

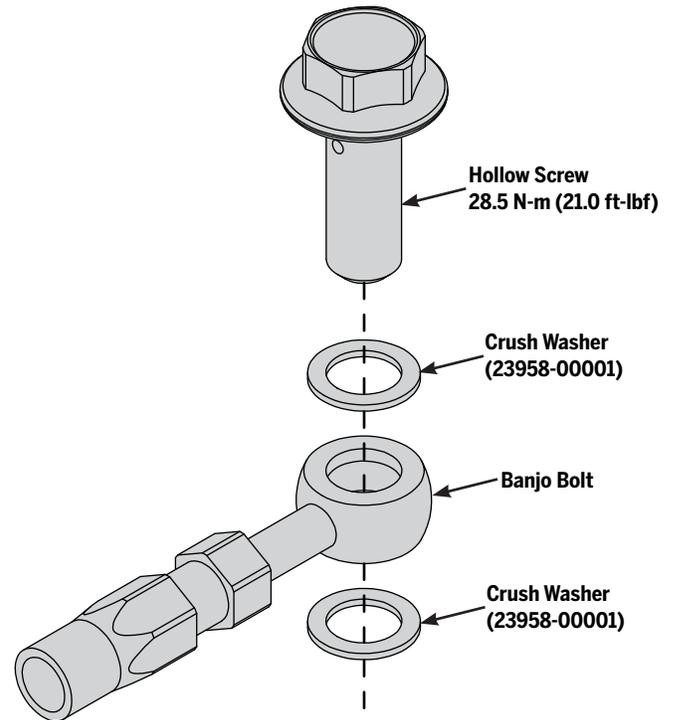


Figure 83: Brake Line Fasteners

Front Rotor

Tools Required: 5 mm hex wrench
30 mm socket wrench (2)
Torque wrench
Vehicle jack

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Place a vehicle jack under the center front of the skid plate. Raise the SE-3 Patroller until the front wheel is off the ground (**Figure 80**).
3. Remove the following components:
 - a. Front Fender (**page 26**)
 - b. Front Caliper (**page 58**)

NOTICE

Do not disconnect the caliper from the brake line.

4. Using a 30 mm socket wrench, remove the axle and slide it out. See **Figure 84**.
5. Slide the wheel assembly out of the front fork.
6. Using a 5 mm hex wrench, remove the five fasteners holding the rotor in place. See **Figure 85**.
7. Remove the Rotor.

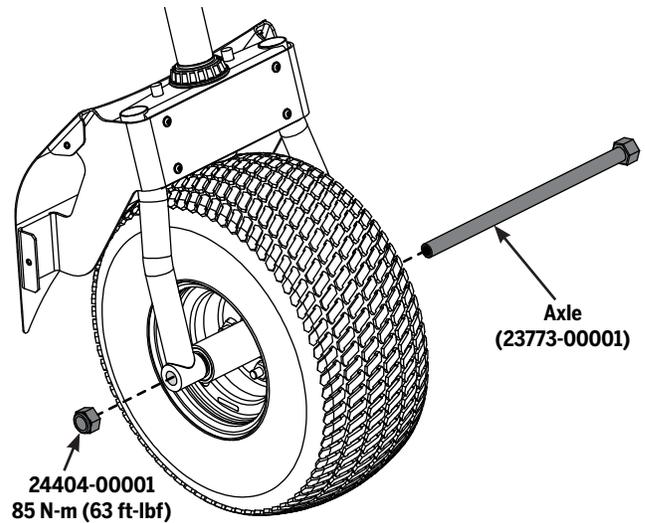


Figure 84: Front Axle Removal

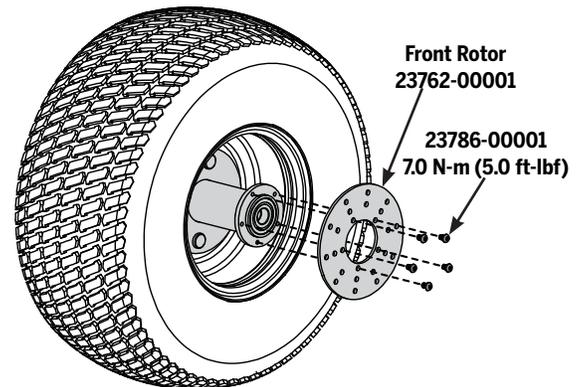


Figure 85: Front Rotor Explode

Installation

8. Align the Rotor with the flange on the spindle.
9. Using a 5 mm hex wrench, install the five fasteners holding the Rotor in place. See **Figure 85**. Torque to **7 N-m (5 ft-lbf)**.
10. Slide the wheel assembly onto the front fork. Orient the wheel assembly so the rotor flange is toward the left side of the SE-3.
11. Slide the axle through the forks and wheel assembly. See **Figure 84**.
12. Using a pair of 30 mm socket wrenches, fasten the nut onto the axle. Torque to **85 N-m (63 ft-lbf)**.
13. Install the following components:
 - a. Front Caliper (**page 58**)
 - b. Front Fender (**page 26**)
14. Perform post-service tests (**page 129**).

Master Cylinder

These instructions apply to both the Front (left) and Rear (right) Master Cylinders.

- Tools Required:**
- 5 mm hex wrench
 - 14 mm socket wrench
 - Digital level
 - Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Drain the brake fluid out of the brake line. See **page 55**.
3. Using a 14 mm socket wrench, remove the Banjo Bolt on the Master Cylinder. See **Figure 86**.
4. Using a 5 mm hex wrench, remove the two fasteners on the Master Cylinder. See **Figure 87**.
5. Pull the Master Cylinder off of the handlebar.

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Orient the Master Cylinder on the handlebar.
3. Using a 5 mm hex wrench, install the clamp holding the Master Cylinder to the handlebar.
4. Using a digital level, orient the Master Cylinder so that it is **11.5°** off of horizontal, with the handlebar tipped downward. See **Figure 88**. Torque to **10 N-m (7.4 ft-lbf)**.
5. Using a 14 mm socket wrench, install the Banjo Bolt onto the Master Cylinder. See **Figure 83**. Torque to **28.5 N-m (21.0 ft-lbf)**.

CAUTION!

Always use new crush washers when attaching a Banjo Bolt to any component. Used crush washers may leak, causing a reduction in braking force.

6. Install brake fluid and bleed the brake line (see **page 56**).
7. Perform post-service tests (**page 129**).



Figure 86: Master Cylinder

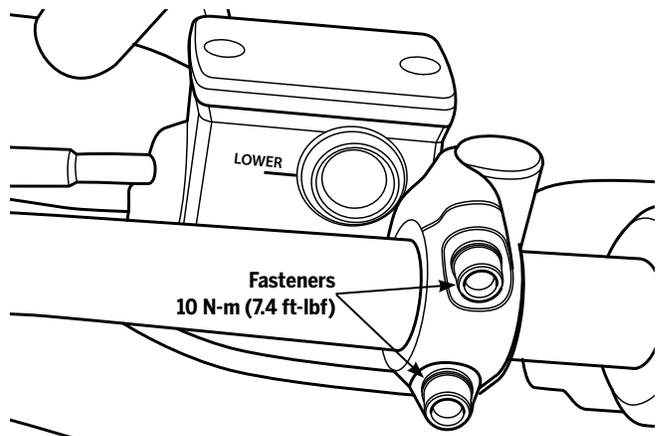


Figure 87: Master Cylinder Fasteners



Figure 88: Aligning the Master Cylinder

Brake Lever

Tools Required: Flathead screwdriver
10 mm socket wrench
Phillips head screwdriver
Torque wrench
UltraLube marine & trailer bearing grease

Removal

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the wheels are chocked.
 -  **CAUTION!**
You can't remove the right-hand brake lever with the parking brake on. Chock the wheels and ensure the SE-3 Patroller doesn't move.
2. **If removing the left-hand brake lever**, proceed to step 3 below.
If removing the right-hand brake lever, first remove the parking brake cap:
 - a. Using a flathead screwdriver, remove the retaining ring (**Figure 89**).

NOTICE
Be careful not to lose the retaining ring. Since it is under spring tension, it can travel a long distance through the air. Use your hand to catch or deflect it so it doesn't get lost.

 - b. Slide the pin out and remove the parking brake cap.
 - c. Using a phillips head screwdriver, remove the two screws. Keep track of the spring and lock washers.
3. Using a 10 mm socket wrench, remove the nut underneath the brake lever (**Figure 90**).
4. Using a 10 mm socket wrench, unscrew and remove the shoulder bolt (**Figure 91**).
5. Remove the brake lever and the parking brake bracket, if applicable.

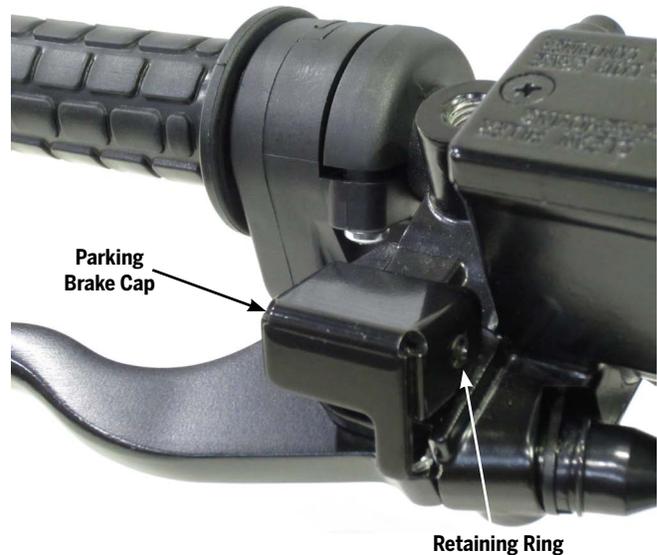


Figure 89: Retaining Ring

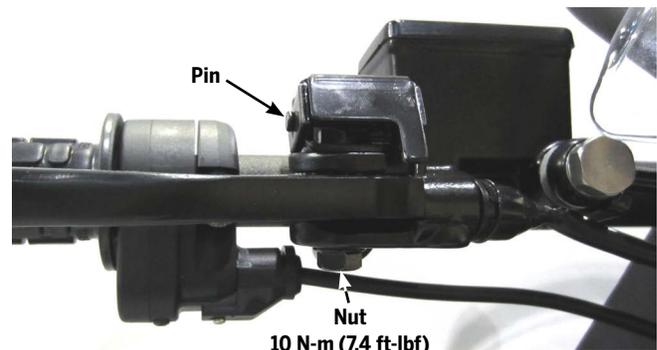


Figure 90: Nut Location

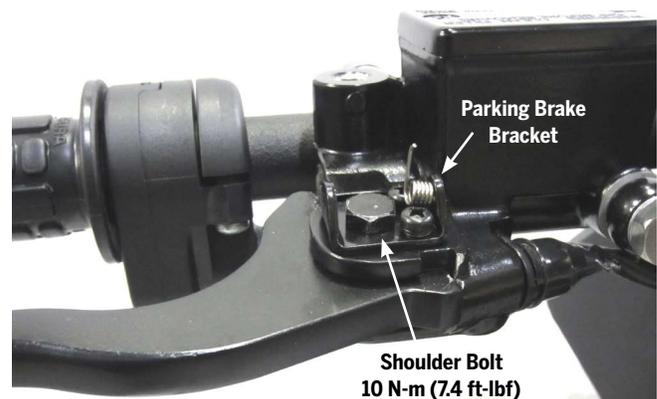


Figure 91: Parking Brake Cap Removed

Installation

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the wheels are chocked.
 -  **CAUTION!**
You can't service the right-hand brake lever with the parking brake on. Chock the wheels and ensure the SE-3 Patroller doesn't move.
2. Put a thin film of lubrication on the shoulder of the shoulder bolt (**Figure 94**) and on the end of the piston (**Figure 92**). Use UltraLube marine and trailer grade bearing grease (P/N 24431-00001).
3. Orient the brake lever with the end ball facing toward the front of the SE-3 Patroller (see **Figure 93**).
4. Slide the brake lever in place, making sure the spring is seated correctly. One end of the spring fits into a hole in the brake housing and the other end fits into a hole in the brake lever.
5. **If installing the right-hand brake lever**, position the parking brake bracket on top of the brake housing.
6. Using a 10 mm socket wrench, install the shoulder bolt (**Figure 94**). Torque to **10 N-m (7.4 ft-lbf)**.
7. Using a 10 mm socket wrench, install the nut underneath the brake lever (**Figure 90**). Torque to **10 N-m (7.4 ft-lbf)**.
8. **If installing the right-hand brake lever**, install the parking brake as follows:
 - a. Using a phillips head screwdriver, install the spring and front screw, as shown in **Figure 95**.
 - b. Using a phillips head screwdriver, install the second screw.
 - c. Torque both screws to **1.5 N-m (1.1 ft-lbf)**.
 - d. Place the parking brake cap over the spring and slide the pin through the holes.
 - e. Install a retaining ring on the end of the pin.
9. Perform post-service tests (**page 129**) to verify the brakes are functioning properly.

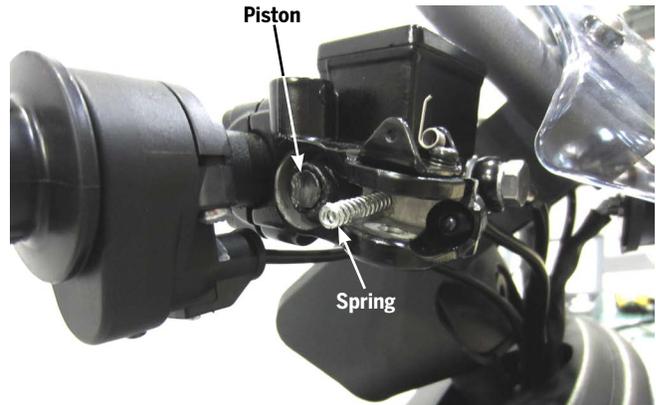


Figure 92: Spring Location



Figure 93: Brake Lever

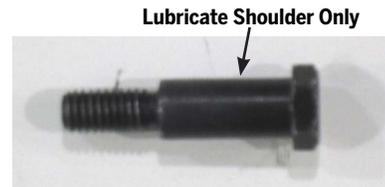


Figure 94: Shoulder Bolt

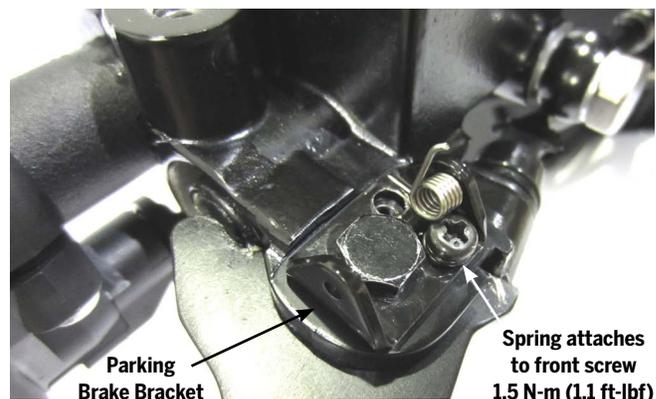


Figure 95: Parking Brake Spring

Rear Caliper & Rotor

Tools Required: 6 mm hex wrench
14 mm socket wrench
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Fender ([page 24](#))
 - e. Rear Tire/Wheel ([page 32](#))

NOTICE

Leave the SE-3 jacked up.

3. Chock the wheels.
4. Release the rear brake.
5. Using a 6 mm hex wrench, remove the two caliper fasteners. See [Figure 96](#).
6. Remove the Caliper and secure it so it doesn't strain the brake line.
7. Remove the Rotor and Spacer. See [Figure 97](#). Place the rotor on a clean surface.

NOTICE

Scratching the Rotor or introducing debris could shorten the life of the Rotor.

8. To remove the Caliper:
 - a. Drain the brake line ([page 55](#)).
 - b. Using a 14 mm socket wrench, disconnect the Banjo Bolt.

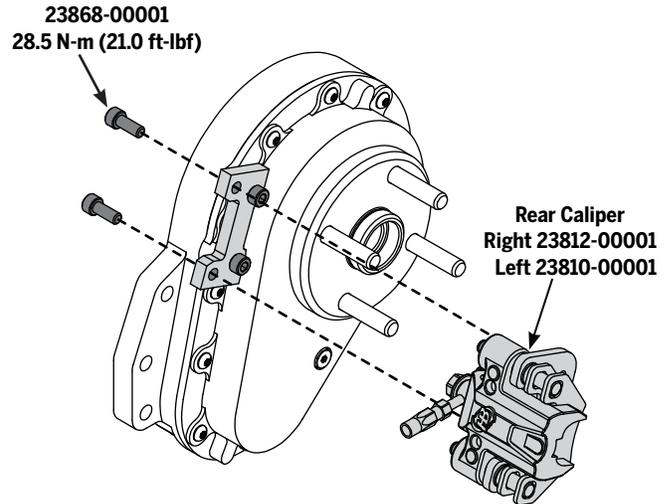


Figure 96: Rear Caliper

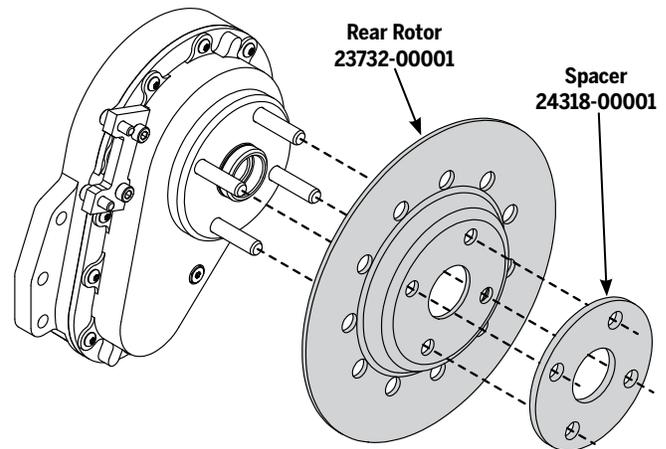


Figure 97: Rear Rotor

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Ensure the Rotor, Spacer, and all mounting surfaces are clean and free of debris.
3. Install the Rotor and Spacer. See **Figure 97**.
4. Using a 14 mm socket wrench, attach the Banjo Bolt (on the end of the brake line) to the Caliper. See **Figure 99**. Torque to **28.5 N-m (21.0 ft-lbf)**.

CAUTION!

Always use new crush washers when attaching a Banjo Bolt to any component. Used crush washers may leak, causing a reduction in braking force.

5. Carefully slide the Caliper onto the Rotor so the Rotor is between the two brake pads.
6. Using a 6 mm hex wrench, install the two caliper fasteners. See **Figure 96**. Torque to **28.5 N-m (21.0 ft-lbf)**.
7. Install the following components:
 - a. Rear Tire/Wheel (**page 32**)
 - b. Fender (**page 24**)
 - c. Bib Panel (**page 16**)
 - d. Storage Trays (**page 15**)
 - e. Battery Module (**page 8**)
8. Perform post-service tests (**page 129**).

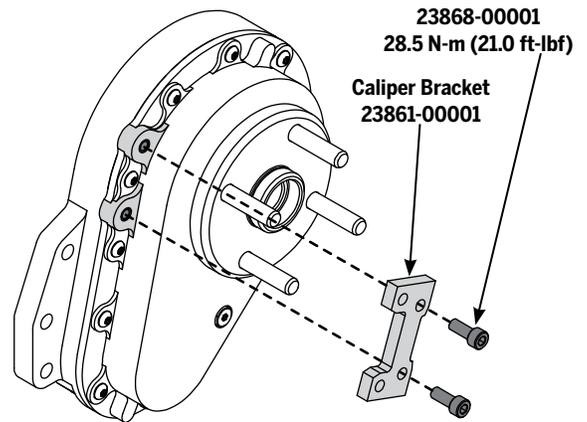


Figure 98: Rear Caliper Bracket

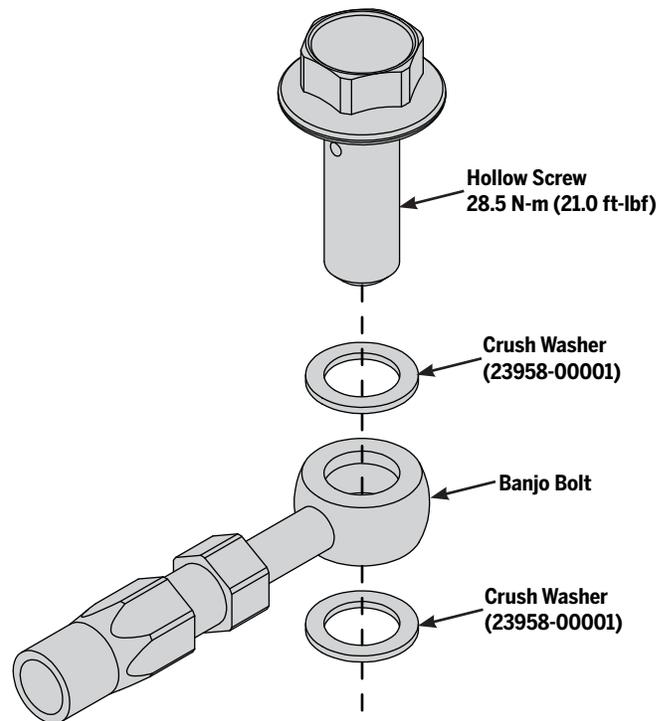


Figure 99: Brake Line Fasteners

Front Brake Line

Replacing the Front Brake Line can be a messy job. Be careful not to let any brake fluid get on the harnesses, electronics, or rotor. Immediately wipe up any spilled brake fluid with a shop towel.

Tools Required: 2.5 mm hex wrench
14 mm socket wrench
Wire cutters
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
 2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))
 - f. Light Cluster ([page 20](#))
 - g. Front Fender ([page 26](#))
 3. Drain the brake fluid out of the front brake line (see [page 55](#)).
 4. Using a 14 mm socket wrench, disconnect the Banjo Bolt from the Caliper. See [Figure 101](#).
- NOTICE**
Place the Banjo Bolt in a container to catch any brake fluid that drains out.
5. Using a 2.5 mm hex wrench, remove the three P-Clips. See [Figure 100](#).
 6. Using wire cutters, remove the cable tie on the steering column. See [Figure 100](#).
 7. Using a 14 mm socket wrench, disconnect the Banjo Bolt from the Master Cylinder. See [Figure 86](#).
 8. Remove the brake line.

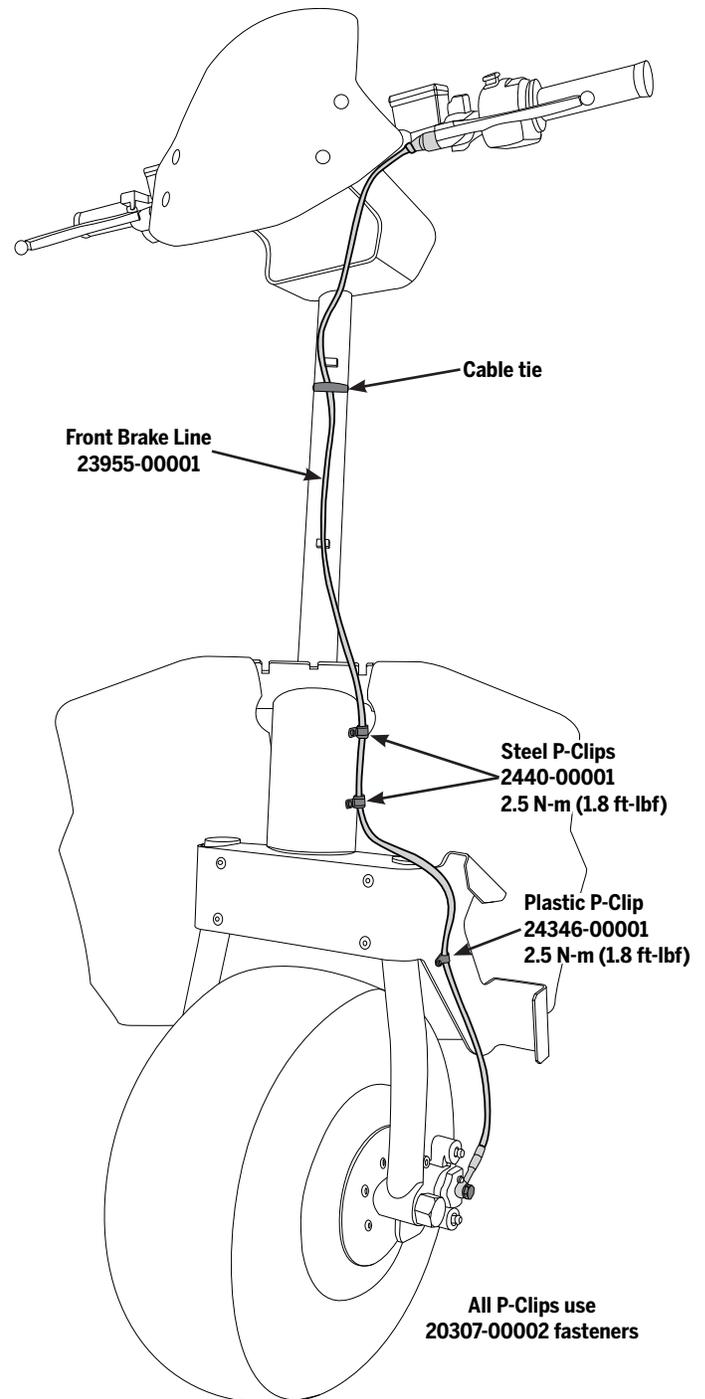


Figure 100: Front Brake Line

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Using a 14 mm socket wrench, connect a Banjo Bolt to the Master Cylinder. See **Figure 86**. Torque to **28.5 N-m (21.0 ft-lbf)**.
3. Thread the Brake Line between the Main Splash Guard and the frame.
4. Run the Brake Line down the steering column and through both cable clamps.
5. Install a cable tie around both brake lines on the steering column.

NOTICE

Make sure there is enough slack in the brake lines to turn the handlebar full left and right.

6. Using a 14 mm socket wrench, connect the Banjo Bolt to the Caliper. See **Figure 102**.

CAUTION!

Always use new crush washers when attaching a Banjo Bolt to any component. Used crush washers may leak, causing a reduction in braking force.

7. Using a 2.5 mm hex wrench, install three P-Clips: two on the frame and one on the Front Fender Bracket. See **Figure 100**. Torque to **2.5 N-m (1.8 ft-lbf)**.

NOTICE

Make sure there is enough slack in the brake line to turn the wheel full left and right.

8. Install brake fluid and bleed the brake line (see **page 56**).
9. Install the following components:
 - a. Front Fender (**page 26**)
 - b. Light Cluster (**page 20**)
 - c. Front Cowl (**page 19**)
 - d. Glove Box (**page 18**)
 - e. Bib Panel (**page 16**)
 - f. Storage Trays (**page 15**)
 - g. Battery Module (**page 8**)
10. Perform post-service tests (**page 129**).



Figure 101: Front Caliper Banjo Bolt

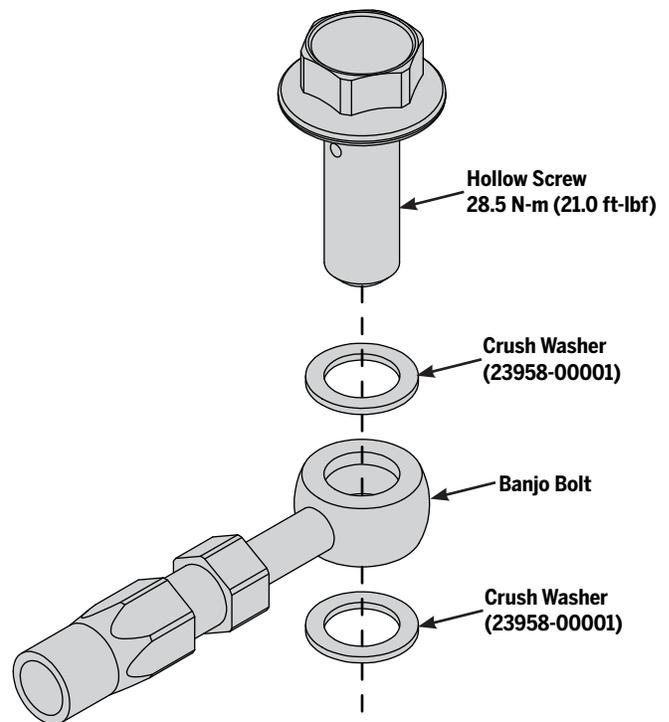


Figure 102: Brake Line Fasteners

Rear Brake Line

Tools Required: 2.5 mm hex wrench
8 mm socket wrench
14 mm socket wrench
Wire cutters
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))
 - f. Light Cluster ([page 20](#))
 - g. Side Panels ([page 22](#))
 - h. Fenders ([page 24](#))
 - i. Main Splash Guard ([page 28](#))
3. Drain the brake fluid out of the rear brake line (see [page 55](#)).
4. Using a 14 mm socket wrench, disconnect one of the Banjo Bolts from its Caliper.

NOTICE

Place the Banjo Bolt in a container to catch any brake fluid that drains out.

5. Repeat step 4 for the Banjo Bolt on the other side.
6. Using a 2.5 mm hex wrench, remove the P-Clips on the sides of the frame (one each side). See [Figure 104](#).
7. Using an 8 mm socket wrench, remove the lock nuts holding the three P-Clips to the front of the frame. Then slide the P-Clips off the threaded studs. See [Figure 105](#).
8. Using wire cutters, remove the cable tie holding the brake lines to the steering column.
9. Using a 14 mm socket wrench, disconnect the Banjo Bolt from the Master Cylinder.
10. Remove the Brake Line.

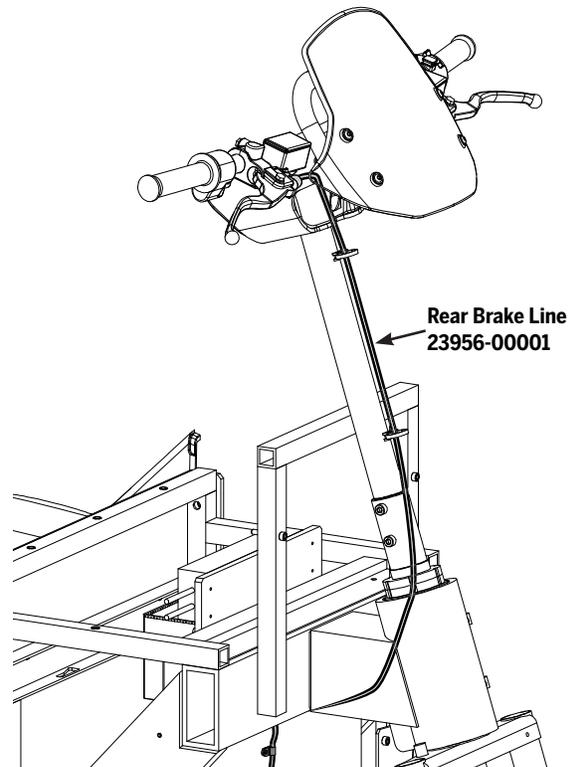


Figure 103: Rear Brake Line

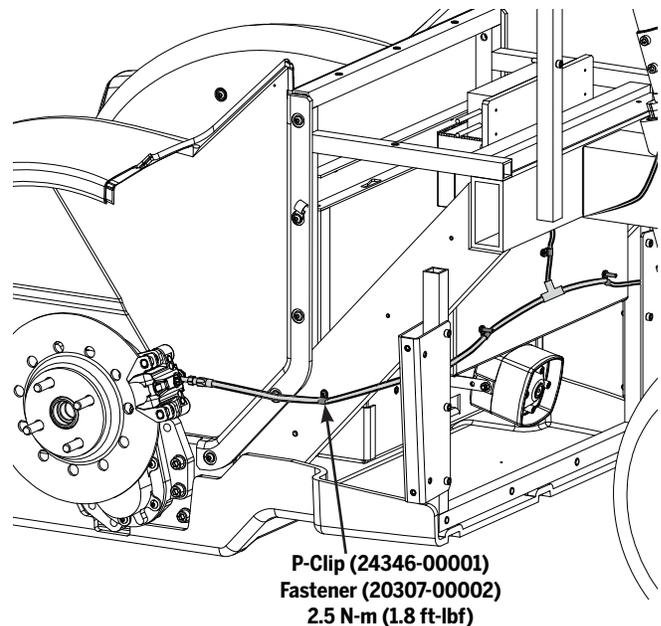


Figure 104: Rear Brake Line

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Using a 14 mm socket wrench, connect the upper Banjo Bolt to the Master Cylinder. See **Figure 106**. Torque to **28.5 N-m (21.0 ft-lbf)**.
3. Route the brake line down the steering column and around the right side of the front fork. See **Figure 103**.
4. Install a cable tie around both brake lines on the steering column.

NOTICE

Make sure there is enough slack to turn the handbar full left and right.

5. Install three P-Clips onto the brake line, then slide the P-Clips onto the threaded studs on the frame. See **Figure 105**.
6. Using an 8 mm socket wrench, install a lock nut over the P-Clip on each threaded stud. Torque to **1.4 N-m (1.0 ft-lbf)**.
7. Route one end of the brake line along the right side of the frame. Thread the brake line between the harnesses and the frame. See **Figure 104**.
8. Using a 14 mm socket wrench, attach the Banjo Bolt to the Caliper. See **Figure 106**. Torque to **28.5 N-m (21.0 ft-lbf)**.
9. Using a 2.5 mm hex wrench, install a P-Clip holding the brake line to the side of the frame.

NOTICE

Make sure the brake line has plenty of slack around corners to avoid pinching or rubbing.

10. Repeat steps 7–9 on the left side of the frame.
11. Install brake fluid and bleed the brake line (**page 56**).
12. Install the following components:
 - a. Main Splash Guard (**page 28**)
 - b. Fenders (**page 24**)
 - c. Side Panels (**page 22**)
 - d. Light Cluster (**page 20**)
 - e. Front Cowl (**page 19**)
 - f. Glove Box (**page 18**)
 - g. Bib Panel (**page 16**)
 - h. Storage Trays (**page 15**)
 - i. Battery Module (**page 8**)
13. Perform post-service tests (**page 129**).



Figure 105: Brake Line P-Clips

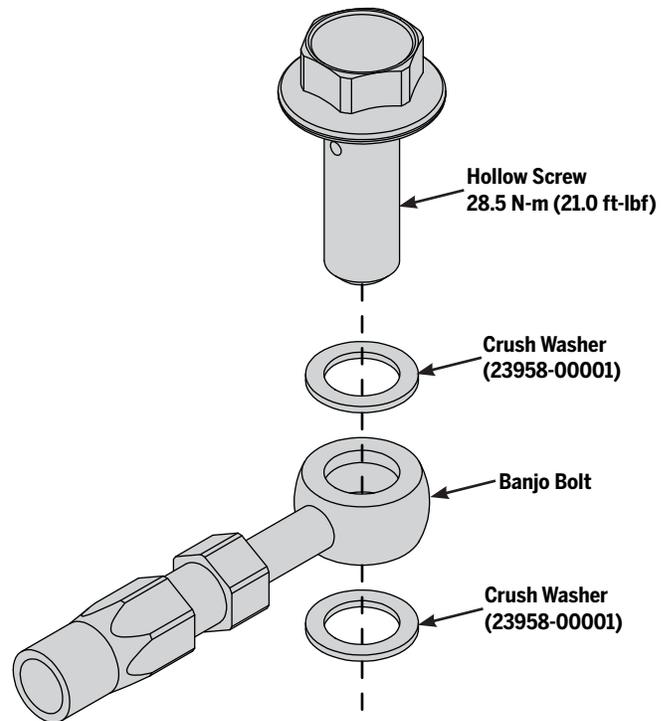


Figure 106: Brake Line Fasteners

Controls

Overview

This chapter covers the UI, Control Cluster, Throttle, and Handlebar Grip.

When to Replace

Replace the Control Cluster or Throttle when troubleshooting determines that it is malfunctioning.

Replace the Handlebar Grip when it is cracked, loose, or otherwise broken.

NOTICE

To service Brake Levers, see the Brakes chapter ([page 53](#)).

Contents

- UI Module
- UI Housing
- Control Cluster
- Throttle
- Handlebar Grip

UI Module

The UI Module is how the user interacts with the SE-3 Patroller.

NOTICE

The fault history is stored in the UI Module. Replacing the UI Module will essentially “reset” the fault history.

Tools Required: 4 mm hex wrench
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the Battery Module ([page 8](#)).
3. Using a 4 mm hex wrench, remove the four fasteners as shown in [Figure 107](#).
4. Disconnect the harness as shown in [Figure 108](#).
5. Remove the UI Module.

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Connect the harness as shown in [Figure 108](#).
3. Using a 4 mm hex wrench, install the four fasteners as shown in [Figure 107](#). Torque to **1.8 N-m (1.3 ft-lbf)**.
4. Install the Battery Module ([page 8](#)).
5. Perform post-service tests ([page 129](#)).

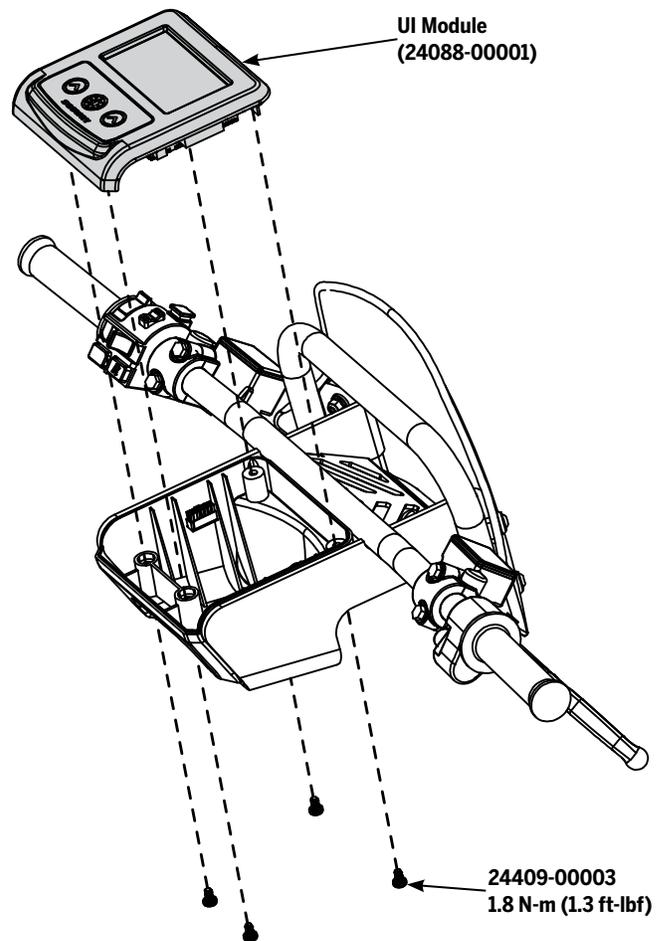


Figure 107: UI Module



Figure 108: UI Harness

UI Housing

Tools Required: 4 mm hex wrench
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. UI Module ([page 72](#))
3. Using a 4 mm hex wrench, remove the four fasteners as shown in **Figure 109**.
4. Carefully push the rubber grommet out of the hole in the back of the UI Housing. See **Figure 110**.

NOTICE

Do not use any sharp or pointed tools. You could puncture the grommet, thereby allowing water to enter the UI Housing.

5. Remove the UI Housing.

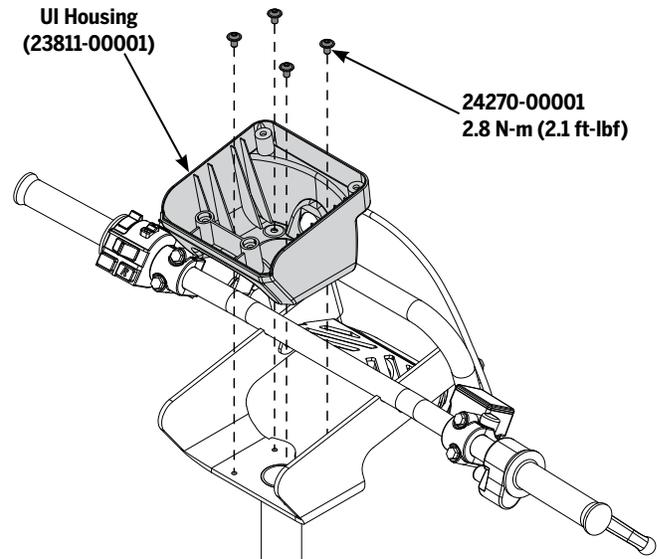


Figure 109: UI Housing

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Orient the UI Housing on the frame.
3. Insert the UI Harness into the UI Housing and carefully press the grommet into place. See **Figure 110**.

NOTICE

Do not use any sharp or pointed tools. You could puncture the grommet, thereby allowing water to enter the UI Housing.

4. Using a 4 mm hex wrench, install the four fasteners as shown in **Figure 109**. Torque to **2.8 N-m (2.1 ft-lbf)**.
5. Install the following components:
 - a. UI Module ([page 72](#))
 - b. Battery Module ([page 8](#))
6. Perform post-service tests ([page 129](#)).



Figure 110: UI Harness Grommet

Control Cluster

Tools Required: T15 Torx wrench
Wire cutters
Torque wrench
Digital level

Removal

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))
3. Disconnect the wire harness. See **Figure 111**.
4. Using a pair of wire cutters, remove the two cable ties on the steering column.
5. Using a T15 Torx wrench, loosen the three fasteners on the under side of the Control Cluster. See **Figure 112**.
6. Pull the two halves apart, and lift the Control Cluster off the Handlebar.

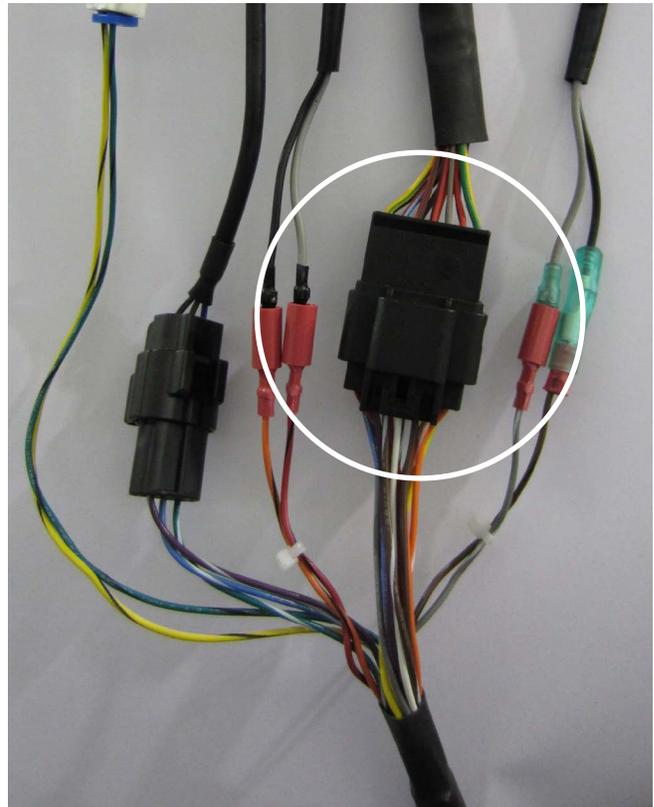


Figure 111: Control Cluster Harness

Installation

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Slide the Control Cluster onto the handlebar.
3. Leave a small gap (**5 mm**) between the Control Cluster and the Handlebar Grip.
4. Orient the Control Cluster so the bottom is parallel to the ground (**0°**).
5. Using a T15 Torx wrench, install the three fasteners. Torque to **2.8 N-m (2.0 ft-lbf)**.

NOTICE

Tighten the fasteners carefully to make sure the two halves align correctly with each other.

6. Connect the wire harness. See **Figure 111**.
7. Install two cable ties around the harnesses on the steering column.
8. Install the following components:
 - a. Front Cowl (**page 19**)
 - b. Glove Box (**page 18**)
 - c. Bib Panel (**page 16**)
 - d. Storage Trays (**page 15**)
 - e. Battery Module (**page 8**)
9. Perform post-service tests (**page 129**).

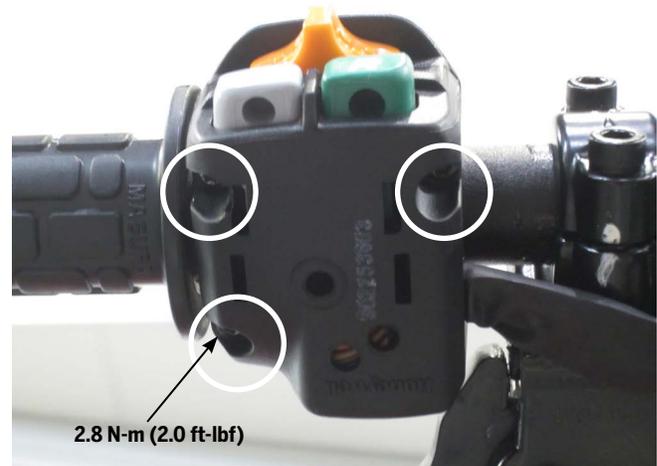


Figure 112: Control Cluster Fasteners

Throttle

The throttle needs to be calibrated for the particular SE-3 Patroller it is installed on. For instructions on calibrating the throttle contact Segway Technical Support.

Tools Required: Phillips screwdriver
Wire cutters
Torque wrench
LPS heavy duty silicone lubricant
Digital level

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))
3. Disconnect the wire harness. See [Figure 114](#).
4. Using a pair of wire cutters, remove the two cable ties on the steering column.
5. Using a Phillips screwdriver, loosen the two fasteners on the underside of the Throttle. See [Figure 113](#).
6. Slide the Throttle off the handlebar.



Figure 113: Throttle

Installation

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Spray some LPS Heavy Duty Silicone Lubricant (P/N 24430-00001) on the first 100 mm of the handlebar. This will help the Throttle to rotate smoothly and evenly.

NOTICE

Do not apply lubricant where the Throttle clamps to the Handlebar. This could reduce the holding power of the Throttle clamp, allowing it to rotate.

3. Slide the Throttle onto the handlebar. Slide it until it bottoms out, then pull it back 3–5 mm.
4. Using a digital level, align the Throttle so that the rear face (rider side) is at **82°**.
5. Using a Phillips screwdriver, tighten the two fasteners on the underside of the Throttle.
Torque to **4.0 N-m (3.0 ft-lbf)**.

NOTICE

Tighten the fasteners carefully to make sure there is an even and consistent gap between the two halves.

6. Connect the wire harness. See **Figure 114**.
 - grey & red/black
 - black & orange/black
7. Install two cable ties around the harnesses on the steering column.
8. Install the following components:
 - a. Front Cowl (**page 19**)
 - b. Glove Box (**page 18**)
 - c. Bib Panel (**page 16**)
 - d. Storage Trays (**page 15**)
 - e. Battery Module (**page 8**)
9. Perform post-service tests (**page 129**).

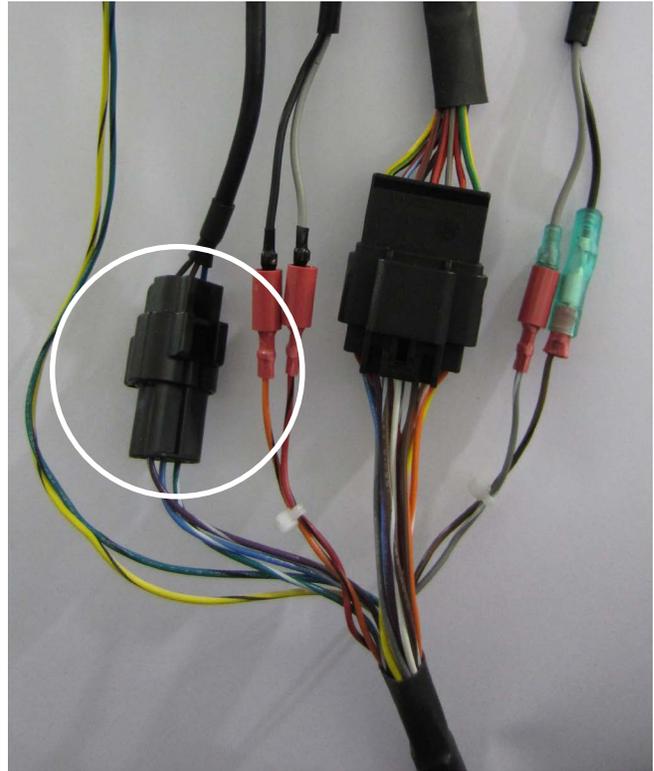


Figure 114: Throttle Harness

Handlebar Grip

The Handlebar Grip does not slide off easily. To remove it, you will have to cut it off the handlebar.

Tools Required: Cutting tool (box cutter or utility knife)

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Score the Handlebar Grip with a cutting tool.
 - ⚠ **CAUTION!**
Be careful not to cut yourself with the sharp blade.
3. Grab the Handlebar Grip near the flange and tear it at the score line you created.
4. Tear the Handlebar Grip and pull it off the handlebar.

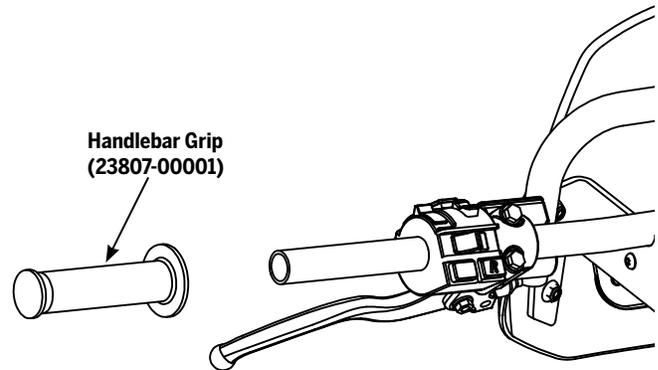


Figure 115: Handlebar Grip

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Slide the end of the Handlebar Grip onto the left handlebar. See **Figure 115**.
3. Press the palm of your hand onto the end of the Handlebar Grip. Push the Handlebar Grip onto the handlebar until it is fully seated.

NOTICE

Do not twist the Handlebar Grip when installing it.

Siren

Siren

The Siren produces both the horn and siren sounds.

When to Replace

Replace when troubleshooting determines that the Siren is malfunctioning.

Contents

- Siren

Siren

Tools Required: 4 mm hex wrench
10 mm socket wrench
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Main Splash Guard ([page 28](#))
3. Locate the Siren on the front of the frame. See **Figure 116**.
4. Reach behind the Right Side Panel and disconnect the siren harness. See **Figure 117**.
5. Using a 10 mm socket wrench, loosen the nut on each side of the Siren. See **Figure 119**.
6. Pull the Siren off the bracket.
7. Using a 4 mm hex wrench, remove the two fasteners holding the bracket to the frame. See **Figure 118**.
8. Remove the bracket.



Figure 116: Siren



Figure 117: Siren Harness Connector

Installation

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Orient the bracket on the frame.
3. Using a 4 mm hex wrench, install the two bracket fasteners. See **Figure 118**. Torque to **7.5 N-m (5.5 ft-lbf)**.
4. Verify that the bolts are loosely installed on the bracket.
5. Slide the Siren onto the bracket so the bolt heads go through the slots on the sides of the siren.
6. Using a 10 mm socket wrench, tighten the nuts on the bracket. See **Figure 119**. Torque to **2.5 N-m (1.8 ft-lbf)**.
7. Thread the siren lead behind the Right Side Panel and connect it to the Siren Harness. See **Figure 116**.
8. Install the following components:
 - a. Main Splash Guard (**page 28**)
 - b. Glove Box (**page 18**)
 - c. Bib Panel (**page 16**)
 - d. Storage Trays (**page 15**)
 - e. Battery Module (**page 8**)
9. Perform post-service tests (**page 129**).



Figure 118: Siren Bracket

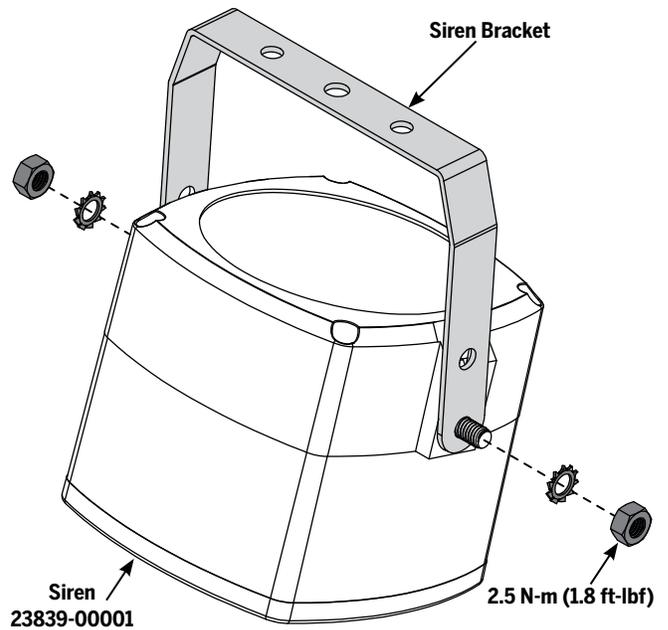


Figure 119: Siren Fasteners

Rider Detect Mat

Overview

The Rider Detect Mat acts as an operator presence control device by only allowing the SE-3 Patroller to drive while the rider is standing on the Rider Detect Mat.

When to Replace

Replace the Rider Detect Mat when it is excessively worn or when troubleshooting determines that it is malfunctioning.

Contents

- Rider Detect Mat

Rider Detect Mat

Tools Required: 3 mm hex wrench
Torque wrench

⚠ CAUTION!

Do not bend the Rider Detect Mat harness where it connects to the Rider Detect Mat. The cable can become damaged, rendering the Rider Detect Mat unusable.

Service Access

To access the Motor Cavity beneath the Rider Detect Mat, you do not need to remove the Rider Detect Mat entirely. Simply lean it out of the way, as described below.

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the Battery Module ([page 8](#)).
3. Using a 3 mm hex wrench, remove the four fasteners as shown in **Figure 120**.
4. Lift the Rider Detect Mat until you can see the harness, as shown in **Figure 122**.

⚠ CAUTION!

Be careful not to bend, kink, or otherwise damage the Rider Detect Mat harness. If this harness becomes damaged, the Rider Detect Mat will need to be replaced.

5. Carefully pull the Rider Detect Mat back a couple inches and lean it against the Bib Panel.

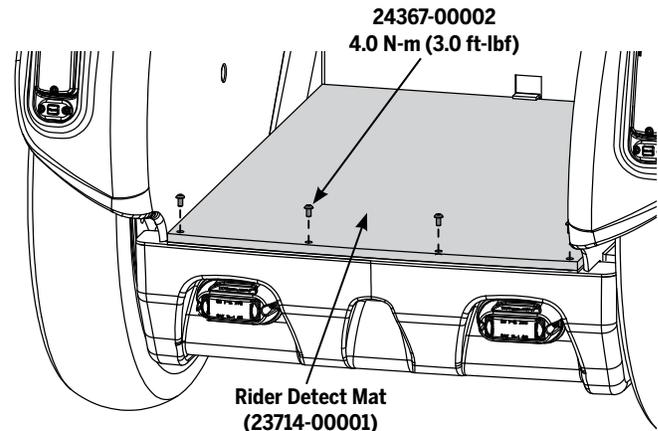


Figure 120: Rider Detect Mat

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#)).
 - b. Storage Trays ([page 15](#)).
 - c. Bib Panel ([page 16](#)).
 - d. Glove Box ([page 18](#)).
 - e. Front Cowl ([page 19](#)).
 - f. Light Cluster ([page 20](#)).
 - g. Left Side Panel ([page 22](#)).
3. Using a 3 mm hex wrench, remove the four fasteners as shown in **Figure 120**.
4. Disconnect the harness from the PI Board. See **Figure 121**.
5. Lift the Rider Detect Mat and slide it off of the SE-3 Patroller.

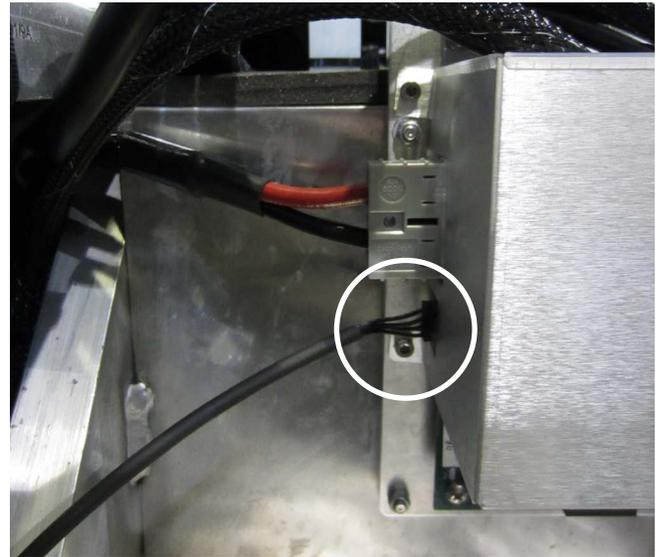


Figure 121: Rider Detect Harness

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Orient the Rider Detect Mat on the SE-3 Patroller with the wire harness toward the front.
3. Feed the wire harness through the hole in the frame.
4. Connect the wire harness to the left side of the PI Board. See **Figure 121**.
5. Slide the Rider Detect Mat in place. The front should rest under the tab and the rear should line up with the threaded studs.
6. Using a 3 mm hex wrench, install the four fasteners as shown in **Figure 120**. Torque to **4.0 N-m (3.0 ft-lbf)**.
7. Install the following components:
 - a. Left Side Panel ([page 22](#)).
 - b. Light Cluster ([page 20](#)).
 - c. Front Cowl ([page 19](#)).
 - d. Glove Box ([page 18](#)).
 - e. Bib Panel ([page 16](#)).
 - f. Storage Trays ([page 15](#)).
 - g. Battery Module ([page 8](#)).
8. Perform post-service tests ([page 129](#)).



Figure 122: Rider Detect Mat Harness

Drive Train

Overview

The Drive Train consists of the Gearbox, Motor, Motor Controller, and the couplings that join them together.

When to Replace

Replace when troubleshooting determines that a component is malfunctioning.

Contents

- Gearbox
- Elastomer Bushing & Drive Hub
- Accessing the Motor Cavity
- Motor
- Motor Controller

Gearbox

Tools Required: 8 mm hex wrench
6 mm hex wrench
4 mm hex wrench
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Fender ([page 24](#))
 - e. Rear Tire/Wheel ([page 32](#))
 - f. Rear Caliper & Rotor ([page 64](#))

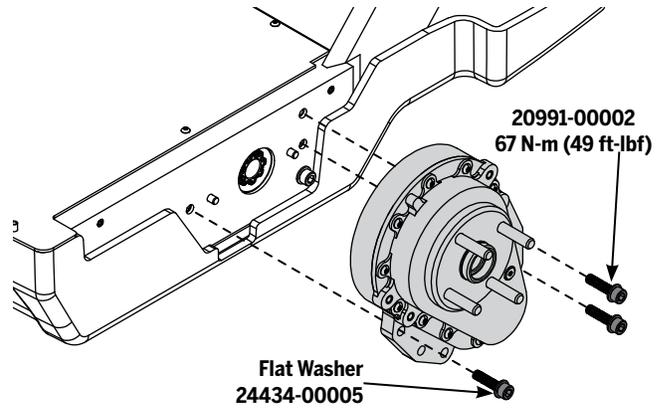


Figure 123: Gearbox

NOTICE

Leave the SE-3 Patroller jacked up and chock the wheels.

⚠ WARNING!

Make sure the SE-3 Patroller is stable or use a jack stand to stabilize it while the wheel is off the ground. Failure to stabilize the SE-3 Patroller could result in death or serious injury from the vehicle falling over.

3. Using a 8 mm hex wrench, remove the three fasteners as shown in **Figure 123**.
4. Pull the Gearbox off of the chassis.
5. Make note of the O-ring and keep track of it. See **Figure 124**.
6. If replacing the gearbox, remove the following components as well:
 - a. Using a 6 mm hex wrench, remove the two fasteners on the Caliper Bracket. Set the Caliper Bracket aside. See **Figure 125**.
 - b. Using a 4 mm hex wrench, remove the three fasteners on the Fender Bracket. Set the Fender Bracket aside. See **Figure 126**.

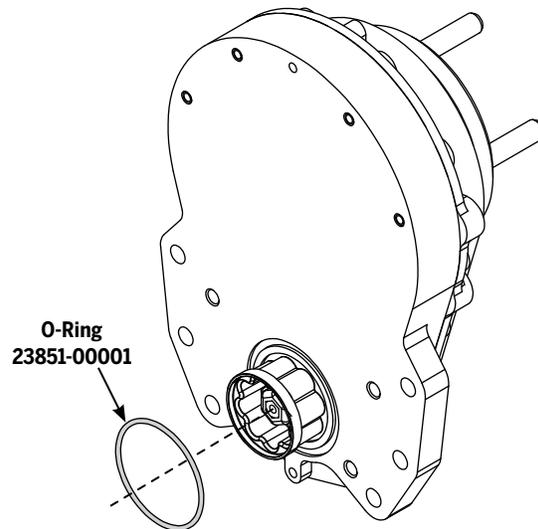


Figure 124: Gearbox O-Ring

Installation

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Install the O-ring on the input side of the Gearbox. See **Figure 124**.
3. Orient the Gearbox on the Frame so that the Gearbox is tipped toward the rear of the SE-3 Patroller.
4. Slide the Gearbox into place, making sure the plastic coupling fits over the Elastomer Bushing.
5. Using an 8 mm hex wrench, install the three Gearbox fasteners. See **Figure 123**. Torque to **67 N-m (49 ft-lbf)**.
6. Using a 6 mm hex wrench, install the Caliper Bracket. See **Figure 125**. Torque to **28.5 N-m (21.0 ft-lbf)**.
7. Using a 4 mm hex wrench, install the Fender Bracket. See **Figure 126**. Torque to **4.0 N-m (3.0 ft-lbf)**.

NOTICE

Orient the Fender Bracket with the indent away toward the rider platform.

8. Install the following components:
 - a. Rear Caliper & Rotor (**page 64**)
 - b. Rear Tire/Wheel (**page 32**)
 - c. Fender (**page 24**)
 - d. Bib Panel (**page 16**)
 - e. Storage Trays (**page 15**)
 - f. Battery Module (**page 8**)
9. Perform post-service tests (**page 129**).

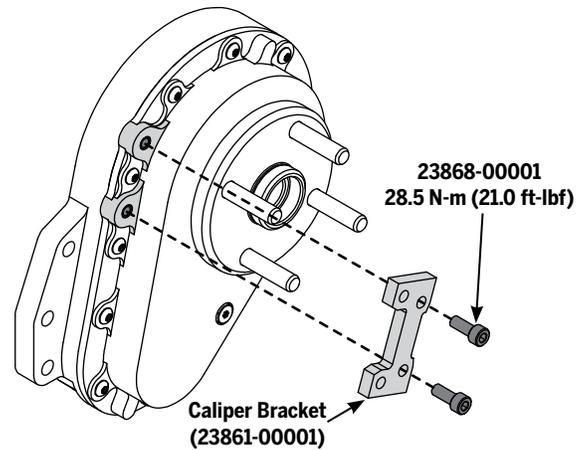


Figure 125: Caliper Bracket

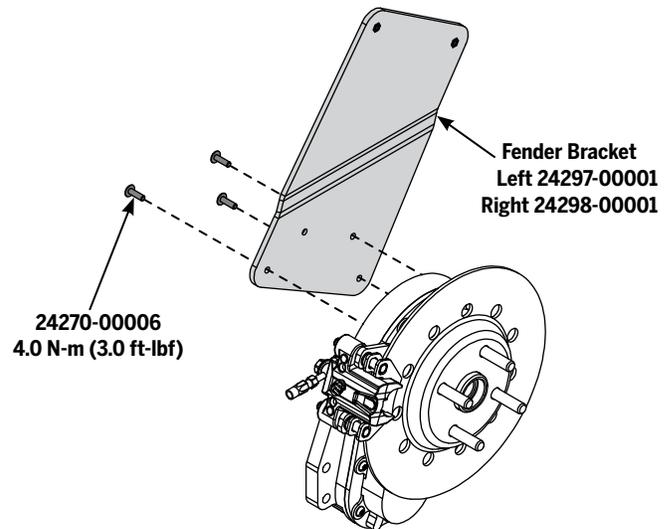


Figure 126: Fender Bracket

Elastomer Bushing & Drive Hub

Check to see if the Elastomer Bushing is worn or damaged. Presence of excessive particles of elastomer material indicates that replacement is necessary.

Tools Required: Cotton swab
Molykote G-n paste

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Fender ([page 24](#))
 - e. Rear Tire/Wheel ([page 32](#))
 - f. Rear Caliper & Rotor ([page 64](#))
 - g. Gearbox ([page 88](#))
3. Pull the Drive Hub off the Motor.
4. Pull the Elastomer Bushing off of the Drive Hub ([Figure 127](#)).

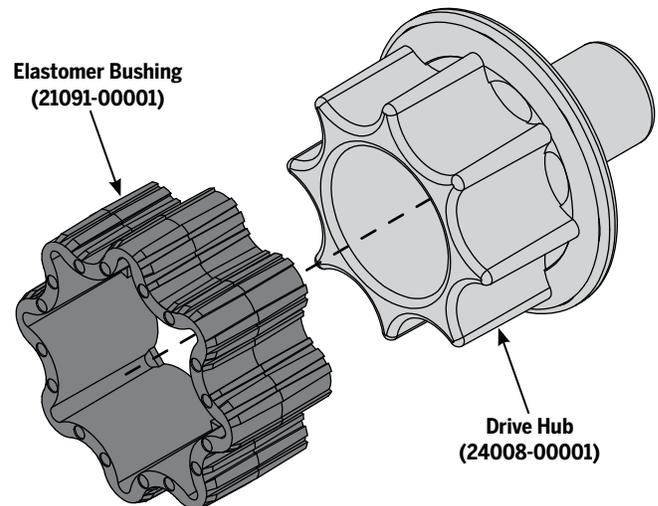


Figure 127: Elastomer Bushing

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Orient the Elastomer Bushing with the tabs toward the Drive Hub.
3. Slide the Elastomer Bushing onto the Drive Hub.
4. Use a cotton swab to spread some Molykote G-n paste (P/N 24505-00001) on the splines inside the Drive Hub. This paste helps reduce wear between the Drive Hub and the Motor.
5. Slide the Drive Hub onto the Motor.
6. Install the following components:
 - a. Gearbox ([page 88](#))
 - b. Rear Caliper & Rotor ([page 64](#))
 - c. Rear Tire/Wheel ([page 32](#))
 - d. Fender ([page 24](#))
 - e. Bib Panel ([page 16](#))
 - f. Storage Trays ([page 15](#))
 - g. Battery Module ([page 8](#))
7. Perform post-service tests ([page 129](#)).

Accessing the Motor Cavity

Tools Required: 3 mm hex wrench
Torque wrench

Accessing

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the Battery Module (**page 8**).
3. Lean the Rider Detect Mat against the Bib Panel (Service Access, **page 84**)
4. Lean the Rider Detect Spacer against the Rider Detect Mat.
5. Using a 3 mm hex wrench, remove the eight fasteners as shown in **Figure 128**.
6. Remove the Motor Cavity Lid.

Securing

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Align the Motor Cavity Lid on the chassis/frame.
3. Using a 3 mm hex wrench, install the eight fasteners as shown in **Figure 128**.
Torque to **4.0 N-m (3.0 ft-lbf)**.
4. Place the Rider Detect Spacer on top of the Motor Cavity Lid.
5. Install the following components:
 - a. Rider Detect Mat (**page 84**)
 - b. Battery Module (**page 8**)
6. Perform post-service tests (**page 129**).

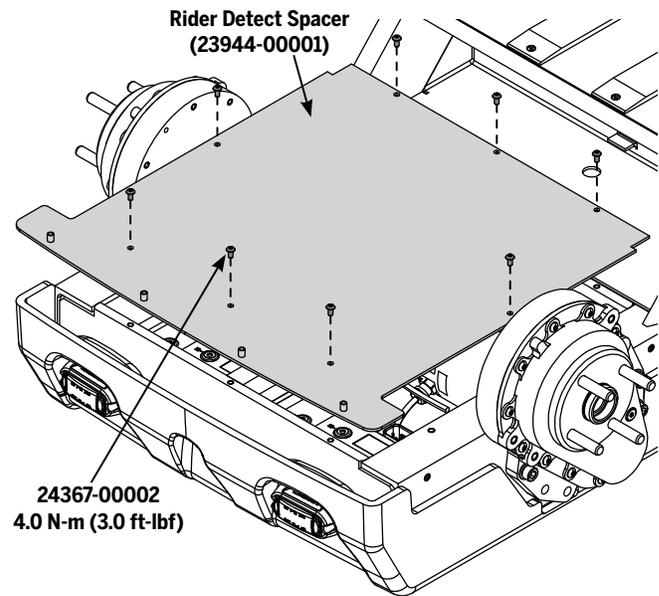


Figure 128: Motor Cavity Lid

Motor

- Tools Required:** 5 mm hex wrench
 10 mm socket wrench
 Torque wrench
 Cotton swab
 Molykote G-n paste

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Access the motor cavity (**page 91**).
3. Disconnect the Hall Sensor Feedback harness.
4. Using a 10 mm socket wrench, disconnect the motor phase leads. See **Figure 129**.
5. Using a 5 mm hex wrench, remove the four fasteners as shown in **Figure 130**. Lift the Motor Assembly out of the motor cavity.
6. Make note of the O-ring and keep track of it.
7. Using a 5 mm hex wrench, remove the four fasteners as shown in **Figure 131**.
8. Remove the motor mount plate and keep track of the O-ring.
9. Remove the Drive Hub.

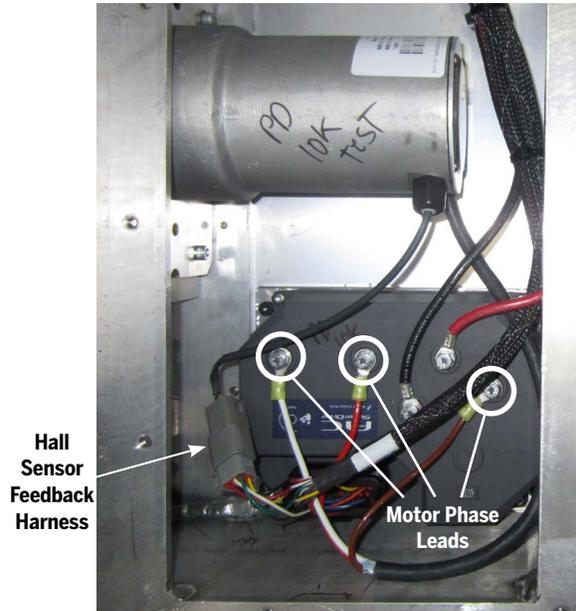


Figure 129: Motor Harnesses

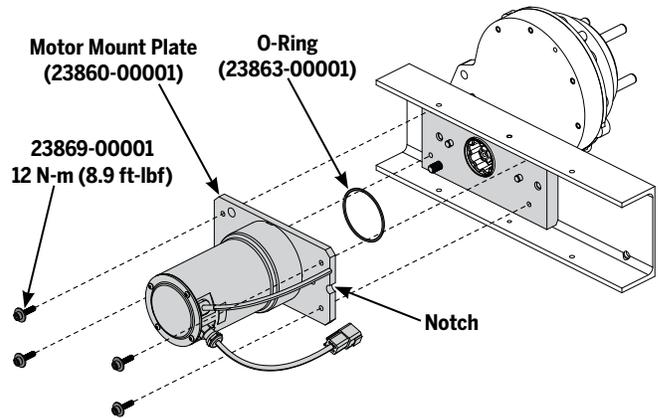


Figure 130: Motor Assembly

Installation

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Use a cotton swab to spread some Molykote G-n paste (P/N 24505-00001) on the splines inside the Drive Hub. This paste helps reduce wear between the Drive Hub and the Motor.
3. Slide the Drive Hub onto the Motor.
4. Place an O-ring on the motor.
5. Orient the Motor Mount Plate on the Motor so the notch on the mount plate is centered between the harnesses on the motor. See **Figure 131**.
6. Using a 5 mm hex wrench, install the four fasteners as shown in **Figure 131**.
Torque to **12 N-m (8.9 ft-lbf)**.
7. Place an O-ring on the motor mount plate.
8. Orient the Motor Assembly so the notch on the motor mount plate is toward the rear of the SE-3 Patroller. Slide the Motor Assembly into place (**Figure 130**).
9. Using a 5 mm hex wrench, install the four fasteners as shown in **Figure 130**.
Torque to **12 N-m (8.9 ft-lbf)**.
10. Using a 10 mm socket wrench, connect the motor phase leads.
 - W White
 - V Red
 - U Brown
 Arrange the hardware stack as shown in **Figure 134**.
Torque to **7.5 N-m (5.5 ft-lbf)**.
11. Connect the Hall Sensor Feedback harness. See **Figure 129**.
12. Secure the motor cavity (**page 91**).
13. Perform post-service tests (**page 129**).

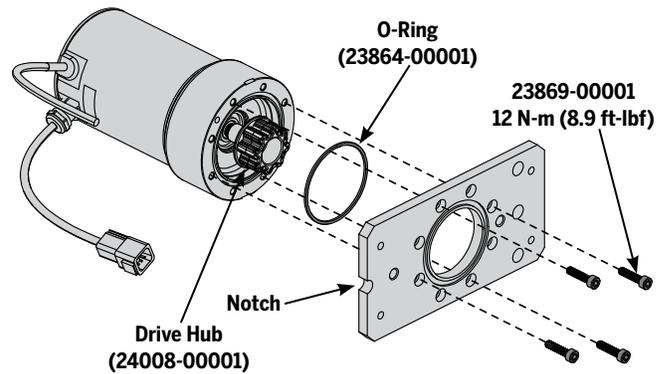


Figure 131: Motor Mount Plate

Motor Controller

When replacing the left motor controller, the throttle needs to be recalibrated. For instructions on calibrating the throttle contact Segway Technical Support.

- Tools Required:** 5 mm hex wrench
 10 mm socket wrench
 Flathead screwdriver
 Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Access the motor cavity ([page 91](#)).
3. Using a 10 mm socket wrench, disconnect the power and motor current harnesses.
4. Using a flathead screwdriver, lift the tab on the Drive Harness while pulling the connector off. See [Figure 133](#).
5. Using a 5 mm hex wrench, remove the four fasteners holding the motor plate onto the bottom of the motor cavity. See [Figure 132](#).

NOTICE

Do not remove the four star drive fasteners holding the Motor Controller cover.

6. Remove the Motor Controller.

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Place the Motor Controller in the Motor Cavity. Orient it so the large connector is toward the rear.
3. Using a 5 mm hex wrench, install the four fasteners. Torque to **7.5 N-m (5.5 ft-lbf)**.
4. Connect the Drive Harness.

Using a 10 mm socket wrench, install the remaining harnesses:

Power	
B+	Red
B-	Black
Motor	
W	White
V	Red
U	Brown

Arrange the hardware stack as shown in [Figure 134](#). Torque to **7.5 N-m (5.5 ft-lbf)**.

5. Secure the motor cavity ([page 91](#)).
6. Perform post-service tests ([page 129](#)).

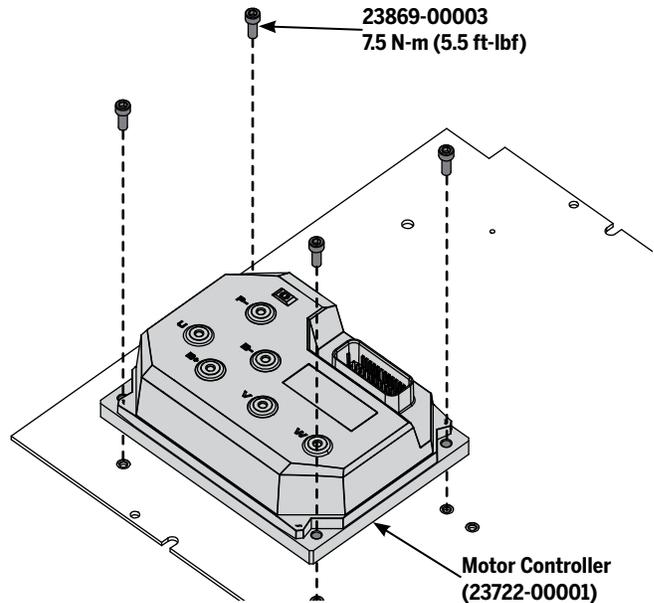


Figure 132: Motor Controller



Figure 133: Removing the Harness

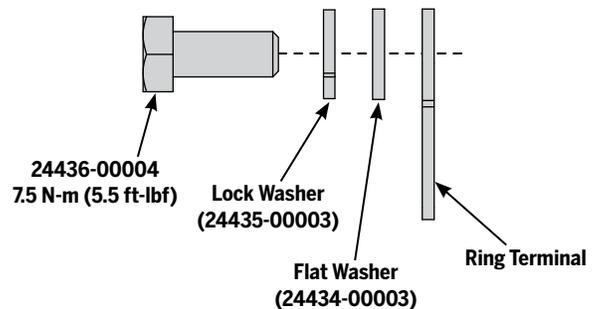


Figure 134: Hardware Stack

Steering Column

Overview

The Steering Column is made up of two components: the Handlebar and the Front Fork. The Handlebar is the upper portion of the Steering Column, with the Windshield, Throttle, and other controls. The Front Fork is the lower portion of the Steering Column; it includes the front wheel.

When to Replace

Replace the Handlebar or Front Fork when it is cracked, bent, or otherwise broken.

Contents

- Handlebar
- Front Fork
- Front Fender Bracket

Handlebar

Tools Required: 5 mm hex wrench
 6 mm hex wrench
 13 mm socket wrench
 Wire cutters
 Torque wrench
 UltraLube corrosion inhibitor
 Digital level
 Cutting tool (box cutter or utility knife)
 Heat gun

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))
 - f. Light Cluster ([page 20](#))
3. Using wire cutters, remove all the cable ties on the handlebar.
4. Disconnect the Handlebar Controls Harness along the handlebar ([page 114](#)).
5. Using a 5 mm hex wrench, remove both Brake Levers. See [Figure 137](#).

NOTICE

Secure the Brake Levers so that they don't fall or otherwise stress the brake line.

6. Score the heat-shrink tubing with a cutting tool, then remove the heat-shrink tubing.

CAUTION!

Be careful not to cut yourself with the sharp blade.

7. Using a 6 mm hex wrench and a 13 mm socket wrench, remove the two fasteners as shown in [Figure 135](#).
8. Slide the Handlebar up and out.

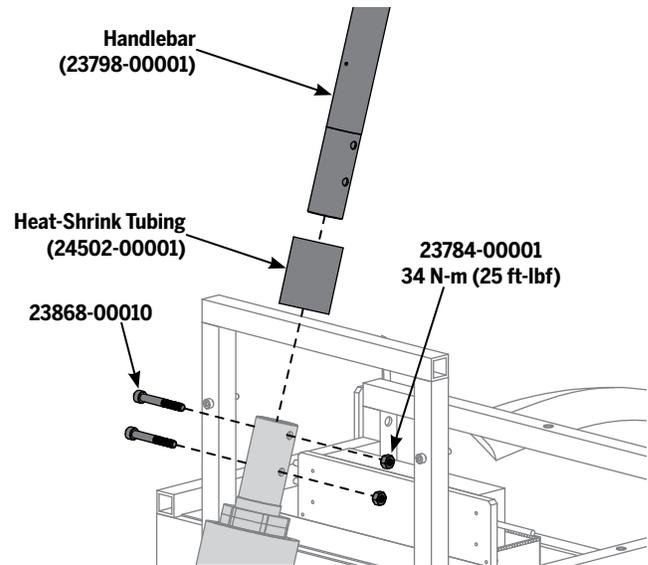


Figure 135: Handlebar

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Spray some UltraLube Industrial Grade Corrosion Inhibitor (P/N 24429-00001) on the bottom of the Handlebar where it slides into the Front Fork. This will make it easier to remove the Handlebar in the future.
3. Slip a piece of heat-shrink tubing onto the Handlebar.
4. Slide the Handlebar into the top of the Front Fork.
5. Using a 6 mm hex wrench and a 13 mm socket wrench, install the fasteners as shown in **Figure 135**. Torque to **34 N-m (25 ft-lbf)**.
6. Slide the heat-shrink tubing over the fasteners. Then, use a heat gun to shrink the tubing around the fasteners.

NOTICE

The purpose of the heat shrink tubing is to keep wire harnesses from catching on the fasteners when turning the Handlebar.

7. Using a 5 mm hex wrench, install the Brake Levers. See **Figure 137**. Do not fully tighten.
8. Rotate the Brake Lever so that it is **11.5°** from horizontal (**Figure 136**). Then tighten the fasteners. Torque to **10 N-m (7.4 ft-lbf)**.
9. Install a cable tie in the upper bracket on the steering column. Secure both brake lines.

NOTICE

Make sure there is enough slack in the brake lines to turn the handlebar full left and right.

10. Connect the Handlebar Controls Harness to the handlebar components (**page 114**).
11. Install two cable ties around the handlebar harnesses.
12. Install the following components:
 - a. Light Cluster (**page 20**)
 - b. Front Cowl (**page 19**)
 - c. Glove Box (**page 18**)
 - d. Bib Panel (**page 16**)
 - e. Storage Trays (**page 15**)
 - f. Battery Module (**page 8**)
13. Perform post-service tests (**page 129**).



Figure 136: Aligning the Brake Levers

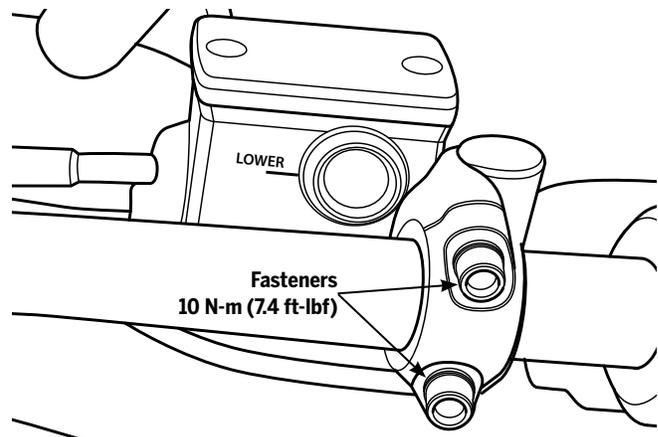


Figure 137: Master Cylinder Fasteners

Front Fork

Some text goes here.

Tools Required: SKF HN 8-9 spanner wrench
Torque wrench
UltraLube marine & trailer bearing grease
Permatex anti-seize lubricant
Vehicle jack

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
 2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))
 - f. Light Cluster ([page 20](#))
 - g. Front Fender ([page 26](#))
 - h. Front Splash Guard ([page 27](#))
 - i. Front Fender Bracket ([page 100](#))
 - j. Front Caliper ([page 58](#))
 - k. Handlebar ([page 96](#))
 3. Jack up the front of the SE-3 Patroller ([Figure 138](#)).
- ⚠ **WARNING!**
Make sure the SE-3 Patroller is stable or use a jack stand to stabilize it while the wheel is off the ground. Failure to stabilize the SE-3 Patroller could result in death or serious injury from the vehicle falling over.
4. Using an SKF HN 8-9 spanner wrench, remove the two collar rings as shown in [Figure 139](#).
 5. Remove the Front Fork as shown in [Figure 140](#).

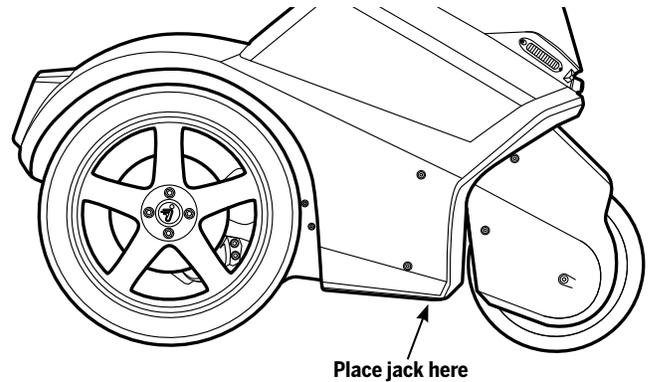


Figure 138: Front Lifting Point

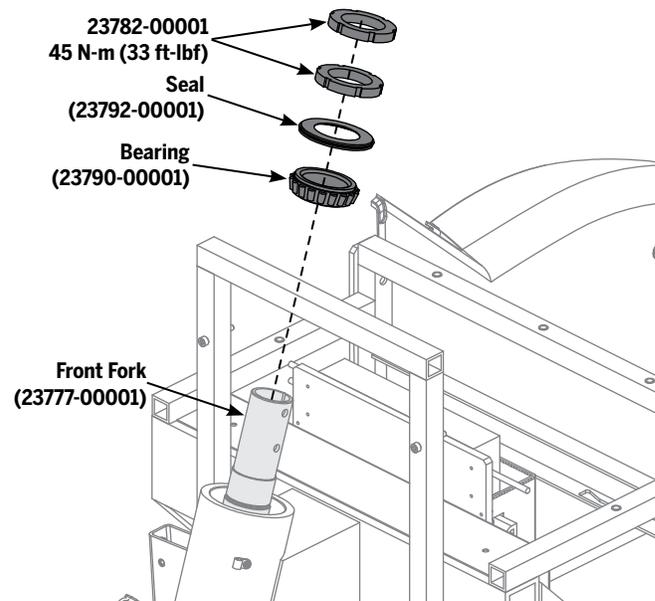


Figure 139: Front Fork Collars

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Jack up the front of the SE-3 Patroller (**Figure 138**).

⚠ WARNING!

Make sure the SE-3 Patroller is stable or use a jack stand to stabilize it while the wheel is off the ground. Failure to stabilize the SE-3 Patroller could result in death or serious injury from the vehicle falling over.

3. Check both bearings. If necessary, pack some UltraLube Marine & Trailer Bearing Grease (P/N 24431-00001) into the bearings.
4. Slide the Front Fork up into the frame (**Figure 140**).
5. Install the bearing and seal as shown in **Figure 139**.
6. Spread some Permatex Anti-Seize Lubricant (P/N 24433-00001) on the collar nut threads. This lubricant will make it easier to remove the collar nuts in the future.
7. Using a SKF HN 8-9 spanner wrench, install the two collar nuts. Torque to **45 N-m (33 ft-lbf)**.
8. Install the following components:
 - a. Handlebar (**page 96**)
 - b. Front Caliper (**page 58**)
 - c. Front Fender Bracket (**page 100**)
 - d. Front Splash Guard (**page 27**)
 - e. Front Fender (**page 26**)
 - f. Light Cluster (**page 20**)
 - g. Front Cowl (**page 19**)
 - h. Glove Box (**page 18**)
 - i. Bib Panel (**page 16**)
 - j. Storage Trays (**page 15**)
 - k. Battery Module (**page 8**)
9. Perform post-service tests (**page 129**).

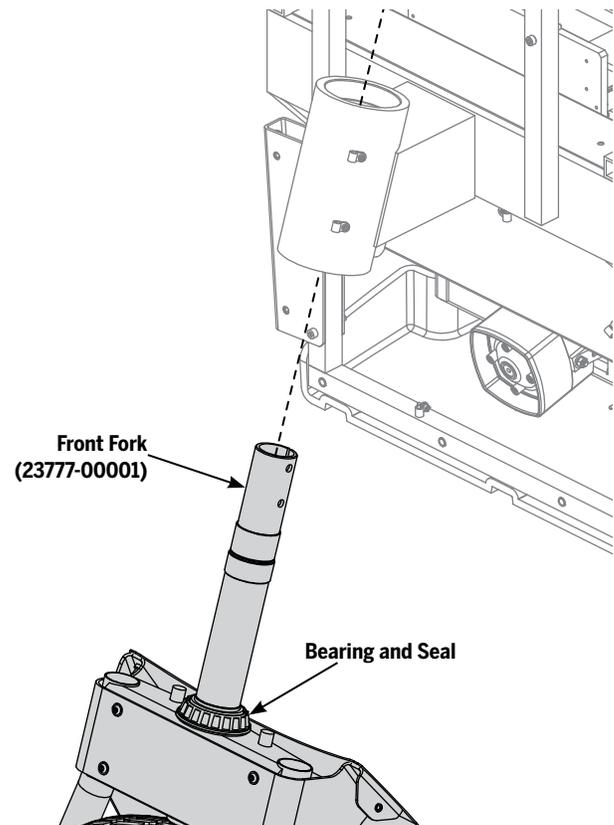


Figure 140: Front Fork Removal/Installation

Front Fender Bracket

This bracket holds the Front Fender and the Front Splashguard. It also provides a mounting point for routing the brake line.

Tools Required: 3 mm hex wrench
4 mm hex wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Front Fender (**page 26**)
 - b. Front Splash Guard (**page 27**)
3. Using a 3 mm hex wrench, remove the P-clip that holds the brake line to the Bracket.
4. Using a 4 mm hex wrench, remove the four fasteners as shown in **Figure 141**.
5. Remove the Bracket.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Slide the Bracket onto the Front Fork.
3. Using a 4 mm hex wrench, install the four fasteners as shown in **Figure 141**.
Torque to **7.5 N-m (5.5 ft-lbf)**.
4. Using a 3 mm hex wrench, install the P-clip to affix the brake line to the Bracket.
5. Install the following components:
 - a. Front Splash Guard (**page 27**)
 - b. Front Fender (**page 26**)

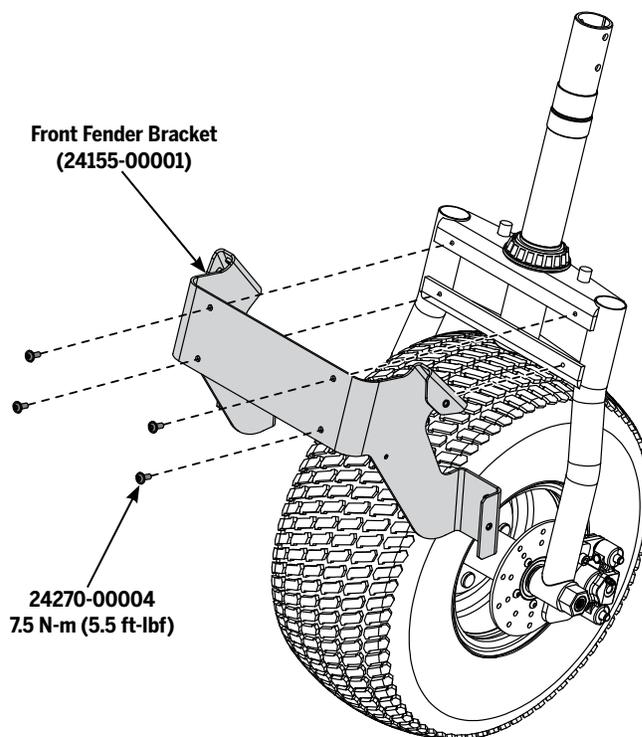


Figure 141: Front Fender Bracket

Power Interface

Overview

The Power Interface is composed of the Power Interface Board (PI Board), the Charger, and the Electronics Shield. These components are mounted on an aluminum block for thermal dissipation.

All of the electronic components of the SE-3 Patroller connect to the PI Board via cable harnesses. The Battery Module connects directly to the PI Board.

When to Replace

Replace the Power Interface Board or Charger when troubleshooting indicates that it is malfunctioning.

Replace fuses when they blow.

NOTICE

If any fuse blows — other than FH9, 12V Accessory Supply — a deeper issue may exist. Contact Segway Technical Support (see **page iv**).

Safety

WARNING!

Wait two minutes after removing the Battery Module before removing the Electronics Shield. This is how long it takes for the capacitors on the PI Board to self-discharge. Touching the PI Board before the capacitors have fully discharged could result in electric shock.

CAUTION!

Use ESD best practices to avoid damaging the PI Board and other electronics.

Contents

- Electronics Shield
- Charger
- PI Board
- Fuses
- Maximum Speed

Electronics Shield

The Electronics Shield protects the PI Board and harnesses.

⚠ WARNING!

Wait two minutes after removing the Battery Module before removing the Electronics Shield. This is how long it takes for the capacitors on the PI Board to self-discharge. Touching the PI Board before the capacitors have fully discharged could result in electric shock.

Tools Required: 3 mm hex wrench
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
3. Using a 3 mm hex wrench, remove the four fasteners as shown in **Figure 142** and **Figure 143**.
4. Remove the Electronics Shield.

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Orient the Electronics Shield with the opening toward the top.
3. Using a 3 mm hex wrench, install the four fasteners as shown in **Figure 142** and **Figure 143**. Torque to **2.5 N-m (1.8 ft-lbf)**.
4. Install the following components:
 - a. Glove Box ([page 18](#))
 - b. Bib Panel ([page 16](#))
 - c. Storage Trays ([page 15](#))
 - d. Battery Module ([page 8](#))
5. Perform post-service tests ([page 129](#)).

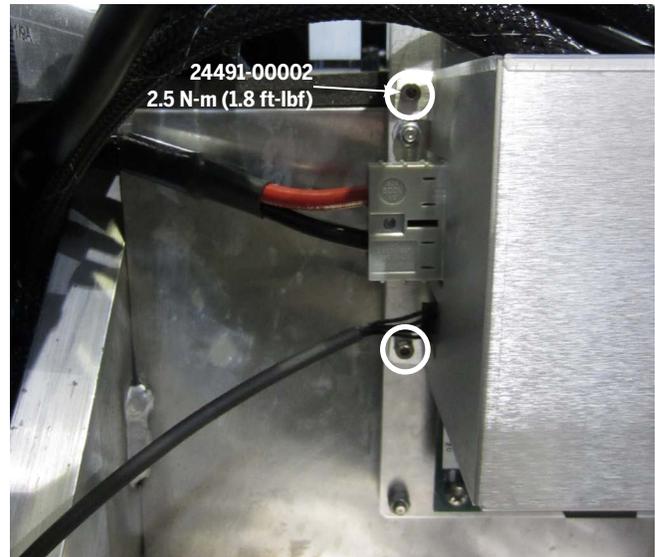


Figure 142: Left Side Fasteners

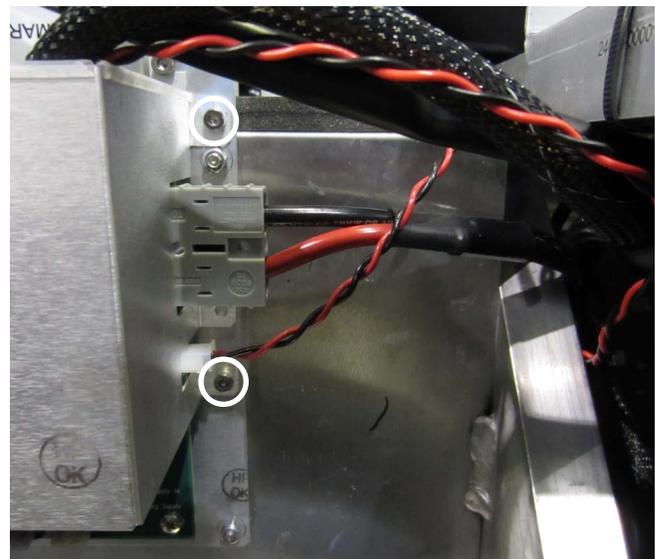


Figure 143: Right Side Fasteners

Charger

The Charger is mounted onto the same aluminum plate as the PI Board. It can be serviced in place, or the PI Board assembly can be removed and the Charger can be serviced on a bench.

Tools Required: 3 mm hex wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module (page 8)
 - b. Storage Trays (page 15)
 - c. Bib Panel (page 16)
 - d. Glove Box (page 18)
 - e. Electronics Shield (page 102)
3. Disconnect the harnesses connecting the Charger to the PI Board.
4. Using a 3 mm hex wrench, remove the four fasteners as shown in **Figure 144** and **Figure 145**.
5. Remove the Charger.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Orient the Charger as shown in **Figure 146**.
3. Using a 3 mm hex wrench, install the four fasteners as shown in **Figure 144** and **Figure 145**. Torque to **2.5 N-m (1.8 ft-lbf)**.
4. Connect the charger harness to the PI Board.
5. Install the following components:
 - a. Electronics Shield (page 102)
 - b. Glove Box (page 18)
 - c. Bib Panel (page 16)
 - d. Storage Trays (page 15)
 - e. Battery Module (page 8)
6. Perform post-service tests (page 129).



Figure 144: Charger Left Side



Figure 145: Charger Right Side

PI Board

The Power Interface Board (PI Board) is the heart of the SE-3 Patroller. It controls the motors, controls, and lights; it communicates with the User Interface Board (UI Board); and it controls the charging circuitry.

Tools Required: 8 mm socket wrench
Torque wrench

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Electronics Shield ([page 102](#))
 - f. Charger ([page 103](#))
3. Disconnect all harnesses connected to the PI Board.
4. Using an 8 mm socket wrench, remove the four nylock nuts as shown in **Figure 146**.
5. Remove the PI Board and aluminum plate.

⚠ CAUTION!

Use ESD best practices to avoid damaging the PI Board electronics.



Figure 146: PI Board and Charger

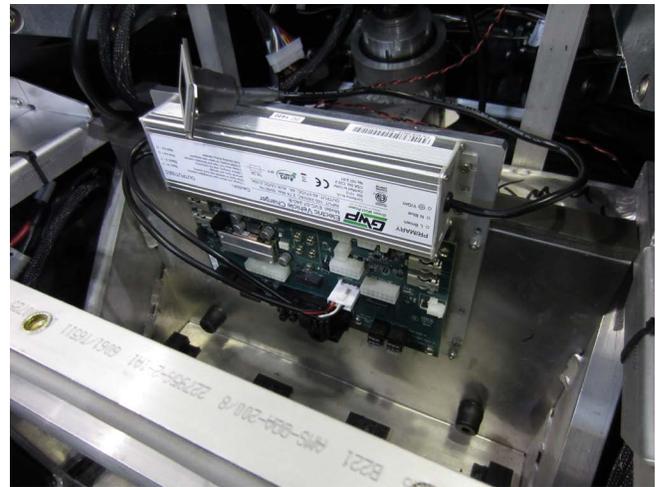


Figure 147: PI Board on the Frame

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Orient the PI Board and aluminum plate on the frame. See **Figure 147**.
3. Using an 8 mm socket wrench, install the four nylock nuts as shown in **Figure 146**. Torque to **6.0 N-m (4.4 ft-lbf)**.
4. Connect all the harnesses. See **Figure 148**.
5. Install the following components:
 - a. Charger (**page 103**)
 - b. Electronics Shield (**page 102**)
 - c. Glove Box (**page 18**)
 - d. Bib Panel (**page 16**)
 - e. Storage Trays (**page 15**)
 - f. Battery Module (**page 8**)
6. Perform post-service tests (**page 129**).

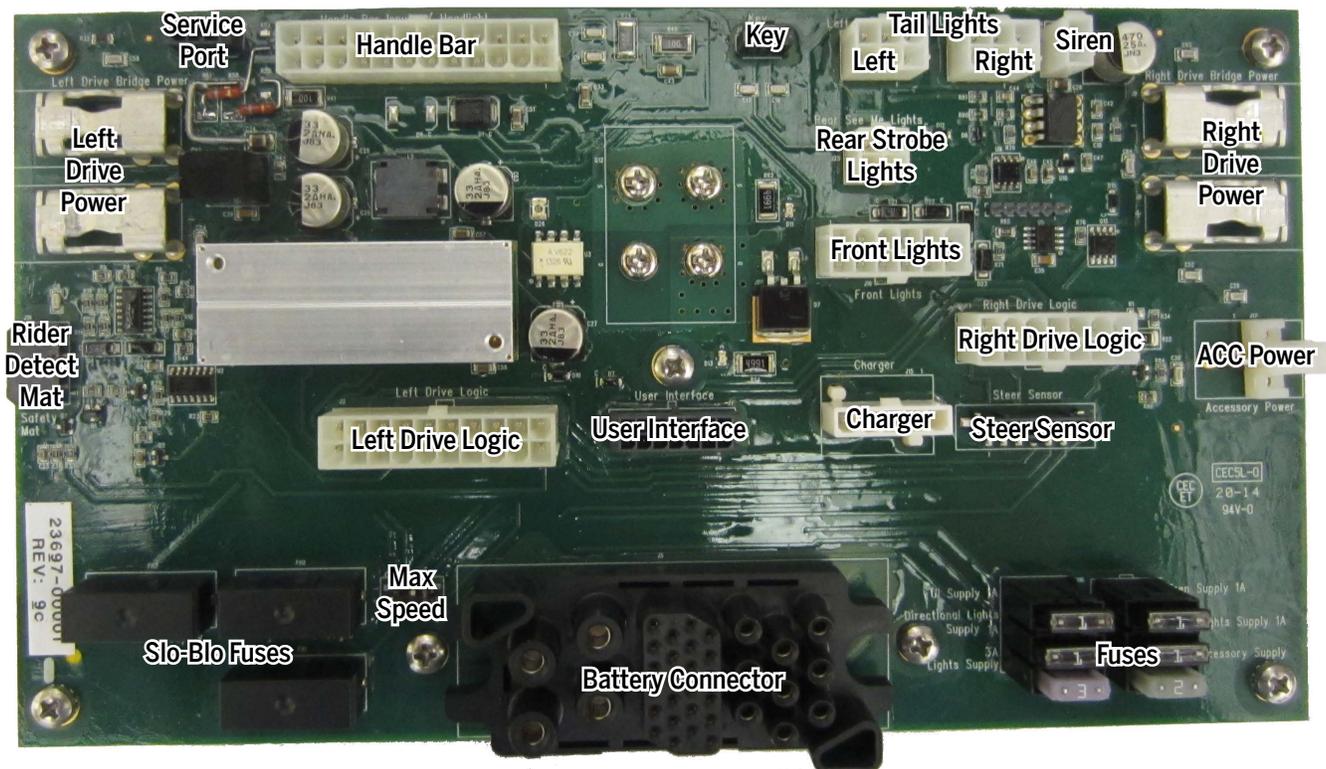


Figure 148: PI Board Components and Connectors

Fuses

Tools Required: None

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the Battery Module (**page 8**).

⚠ WARNING!

Wait 2 minutes after removing the Battery Module before touching the PI Board. This is how long it takes for the capacitors on the PI Board to self-discharge. Touching the PI Board before the capacitors have fully discharged could result in electric shock.

3. Remove the Fuse
 - Mini Blade
 - a. Pull on the fuse to remove.
 - Ceramic Cartridge
 - a. Remove the plastic cover.
 - b. Pull on the fuse to remove.

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Install the Fuse
 - Mini Blade
 - a. Press the fuse into the socket.
 - Ceramic Cartridge
 - a. Press the fuse into the socket.
 - b. Install the plastic cover.
3. Install the Battery Module (**page 8**).
4. Perform post-service tests (**page 129**).



Figure 149: Mini Blade Fuses



Figure 150: Ceramic Cartridge Fuses

Table 3: Fuse Information

#	Location	Type	Rating	Part Number
FH1	Left Drive Logic	Ceramic Cartridge	5 A	Littelfuse 0216005
FH2	Right Drive Logic	Ceramic Cartridge	5 A	Littelfuse 0216005
FH3	Accessory Supply	Ceramic Cartridge	5 A	Littelfuse 0216005
FH4	Brake Lights Supply	Mini Blade	1 A	Littelfuse 168.6785.410
FH6	Directional Lights Supply	Mini Blade	1 A	Littelfuse 168.6785.410
FH7	Siren Supply	Mini Blade	1 A	Littelfuse 168.6785.410
FH8	Lights Supply	Mini Blade	7.5 A	Littelfuse 029707.5
FH9	12V Accessory Supply	Mini Blade	2 A	Littelfuse 0297002
FH10	UI Supply	Mini Blade	1 A	Littelfuse 168.6785.410

Maximum Speed

You can set the maximum speed of the SE-3 Patroller by using a DIP switch located on the PI Board.

Tools Required: None

Procedure

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the Battery Module (**page 8**).

⚠ WARNING!

Wait 2 minutes after removing the Battery Module before touching the PI Board. This is how long it takes for the capacitors on the PI Board to self-discharge. Touching the PI Board before the capacitors have fully discharged could result in electric shock.

3. Adjust the DIP switch. See **Table 4**.
4. Install the Battery Module (**page 8**).

Validation

1. Bring the SE-3 Patroller to a large open space, such as an empty parking lot.
2. Drive the SE-3 Patroller until it reaches maximum speed.
3. Look at the speedometer. Verify that the displayed speed is the desired maximum speed.

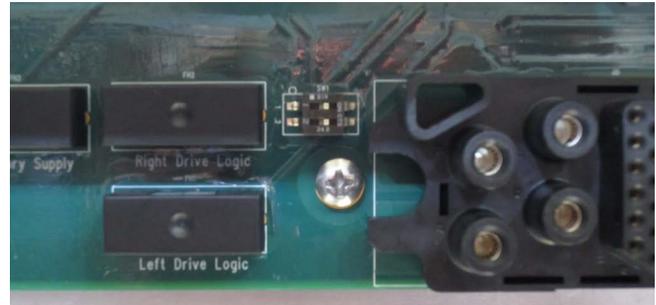


Figure 151: DIP Switch

Table 4: DIP Switch Settings

Switch 1	Left	Left	Right	Right
Switch 2	Left	Right	Left	Right
Max. Speed	8 mph	10 mph	12.5 mph	15 mph

Harnesses

Overview

Harnesses connect the various electrical components together.

When to Replace

Replace a Harness when it is severed, frayed, or when diagnostic testing determines that it is malfunctioning.

Contents

- Left/Right Motor Power Harness
- Left/Right Drive Harness
- Handlebar Controls Harness
- User Interface Harness
- Light Cluster Harness
- Tail Light Harness
- Rear Strobe Light Harness
- Accessory Power Harness
- KeyLock Harness
- Sirenn Harness
- Service Interface Harness

Left/Right Motor Power Harness

This harness provides power to the motor. There are separate harnesses for the left motor and the right motor.

Tools Required: Wire cutters
10 mm socket wrench
Torque wrench

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))
 - f. Light Cluster ([page 20](#))
 - g. Side Panel ([page 22](#))

NOTICE

Remove the left Side Panel to access the Left Motor Power Harness. Remove the right Side Panel to access the Right Motor Power Harness.

- h. Rider Detect Mat ([page 84](#))
- i. Motor Cavity Lid ([page 91](#))
3. Disconnect the wire harness from the PI Board. See [Figure 152](#).

NOTICE

You do not need to remove the Electronics Shield to access the Motor Power Harnesses.

4. Using a pair of wire cutters, remove the two cable ties on the side of the frame.
5. Using a pair of wire cutters, remove the two cable ties inside the motor cavity.
6. Using a 10 mm socket wrench, disconnect the power leads from the Motor Controller. See [Figure 154](#).
7. Remove the Motor Power Harness.

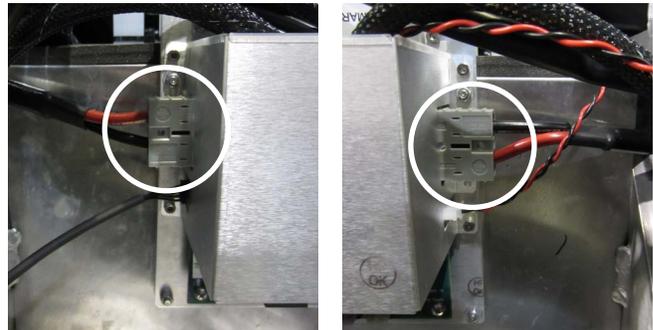


Figure 152: Motor Power Harnesses to PI Board

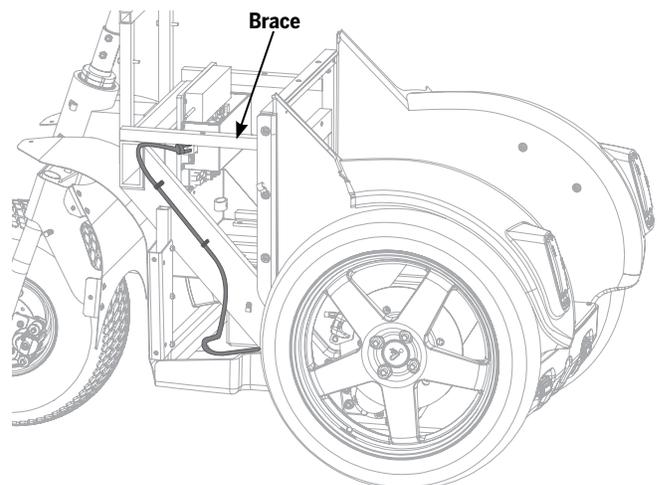


Figure 153: Motor Power Harnesses Routing

Installation

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Using a 10 mm socket wrench, connect the leads to the Motor Controller.

B+	Red
B-	Black

Arrange the hardware stack as shown in **Figure 155**. Torque to **7.5 N-m (5.5 ft-lbf)**.
3. Feed the harness through the hole in the front of the motor cavity. Send the left Motor Power Harness out the left side of the frame. Send the right Motor Power Harness out the right side of the frame.
4. Feed the harness under the horizontal brace on the frame and connect it to the PI Board. See **Figure 152**.
5. Install two cable ties around the harnesses in the motor cavity.
6. Install two cable ties around the harnesses on the side of the frame. See **Figure 153**.
7. Install the following components:
 - a. Motor Cavity Lid (**page 91**)
 - b. Rider Detect Mat (**page 84**)
 - c. Side Panel (**page 22**)
 - d. Light Cluster (**page 20**)
 - e. Front Cowl (**page 19**)
 - f. Glove Box (**page 18**)
 - g. Bib Panel (**page 16**)
 - h. Storage Trays (**page 15**)
 - i. Battery Module (**page 8**)
8. Perform post-service tests (**page 129**).

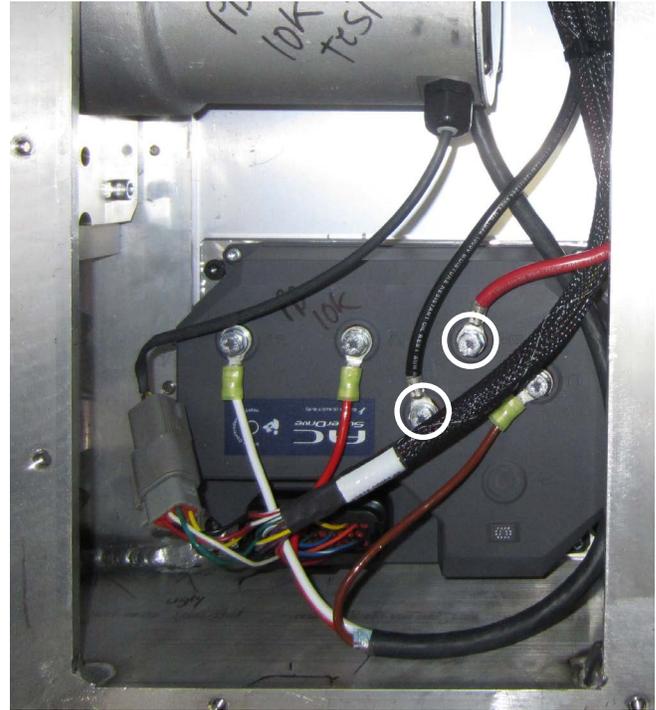


Figure 154: Motor Power Harness to Motor Controller

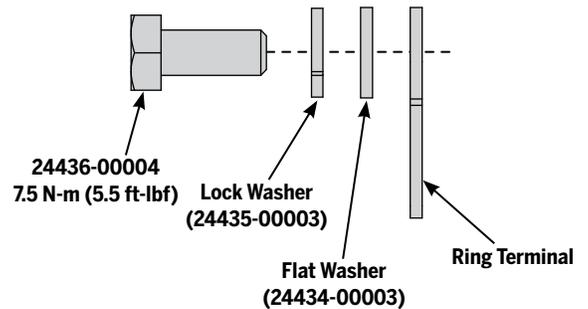


Figure 155: Hardware Stack

Left/Right Drive Harness

This delivers control commands to the motor controllers and provides feedback information to the PI Board. There are separate harnesses for the left motor controller and the right motor controller.

Tools Required: Flathead screwdriver
Torque wrench

Removal

1. ⚠ Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module (**page 8**)
 - b. Storage Trays (**page 15**)
 - c. Bib Panel (**page 16**)
 - d. Glove Box (**page 18**)
 - e. Front Cowl (**page 19**)
 - f. Light Cluster (**page 20**)
 - g. Side Panel (**page 22**)

NOTICE

Remove the left Side Panel to access the left Drive Harness. Remove the right Side Panel to access the right Drive Harness.

- h. Electronics Shield (**page 102**)
- i. Rider Detect Mat (**page 84**)
- j. Motor Cavity Lid (**page 91**)
3. Disconnect the wire harness from the PI Board. See **Figure 156**.
4. Using a pair of wire cutters, remove the two cable ties on the side of the frame.
5. Using a pair of wire cutters, remove the two cable ties inside the motor cavity.
6. Using a flathead screwdriver, lift the tab on the Drive Harness while pulling the connector off. See **Figure 157**.
7. Disconnect the Drive Harness from the Motor.
8. Remove the Drive Harness.

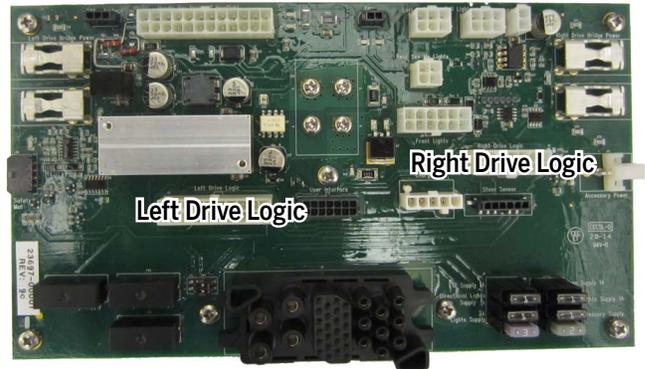


Figure 156: Drive Harness to PI Board



Figure 157: Drive Harness to Motor Controller

Installation

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Connect the Drive Harness to the Motor Controller.
3. Connect the Drive Harness to the Motor.
4. Feed the harness through the hole in the front of the motor cavity. Send the Left Drive Harness out the left side of the frame. Send the Right Drive Harness out the right side of the frame.
5. Feed the harness under the horizontal brace on the frame (see **Figure 158**) and connect it to the PI Board.
6. Install two cable ties around the harnesses in the motor cavity.
7. Install two cable ties around the harnesses on the side of the frame.
8. Install the following components:
 - a. Motor Cavity Lid (**page 91**)
 - b. Rider Detect Mat (**page 84**)
 - c. Electronics Shield (**page 102**)
 - d. Side Panel (**page 22**)
 - e. Light Cluster (**page 20**)
 - f. Front Cowl (**page 19**)
 - g. Glove Box (**page 18**)
 - h. Bib Panel (**page 16**)
 - i. Storage Trays (**page 15**)
 - j. Battery Module (**page 8**)
9. Perform post-service tests (**page 129**).

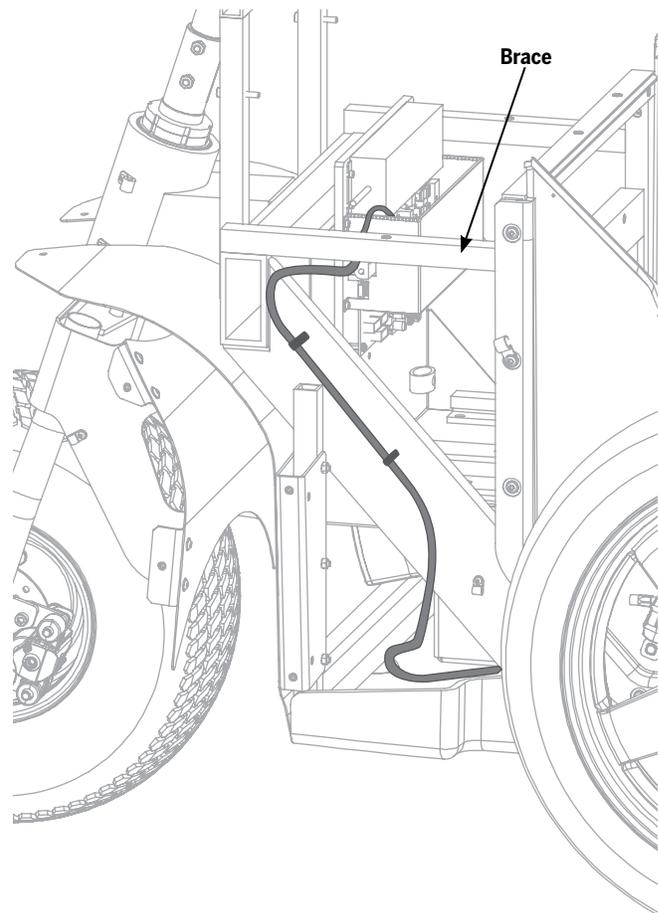


Figure 158: Drive Harness Routing

Handlebar Controls Harness

This harness connects the PI Board to the Control Cluster, Headlight, Throttle, and both Brake Levers.

Tools Required: Wire cutters

Removal

1. ⚠ Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))
 - f. Electronics Shield ([page 102](#))
3. Disconnect the wire harness from the PI Board. See [Figure 159](#).
4. Disconnect the wire harness from the Control Cluster, Headlight, Throttle, and both Brake Levers. See [Figure 160](#).
5. Using a pair of wire cutters, remove three cable ties:
 - a. This harness to the frame.
 - b. This harness to the User Interface Harness.
 - c. Harnesses on the steering column.
6. Remove the Handlebar Controls Harness.



Figure 159: Handlebar Controls Harness to PI Board

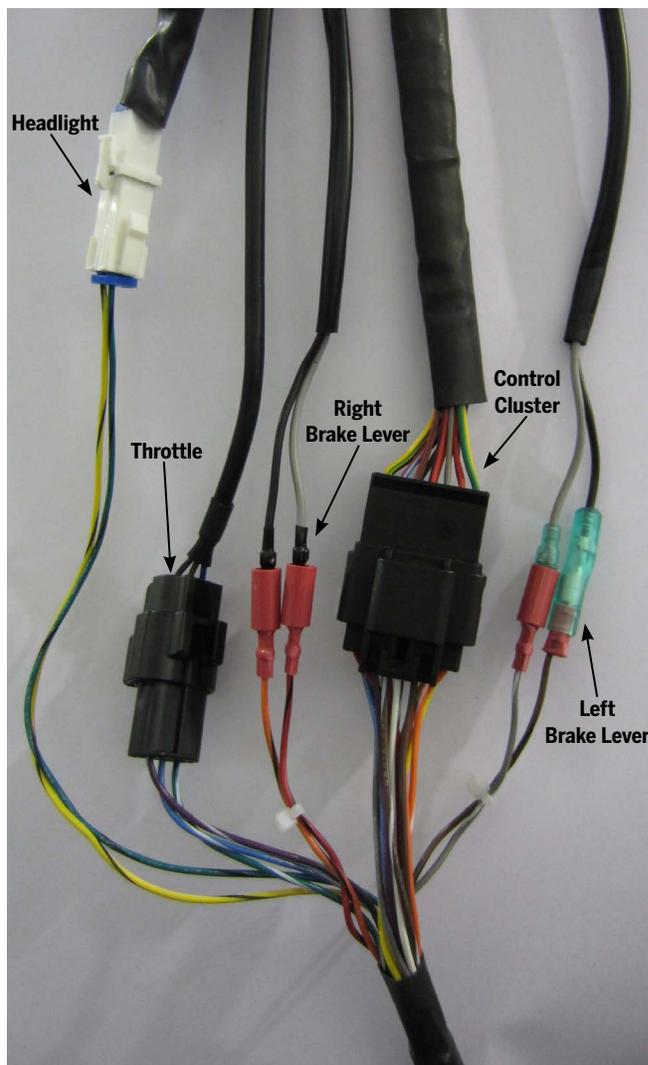


Figure 160: Connectors on Steering Column

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Connect the wire harness to the Control Cluser, Headlight, Throttle, and both Brake Levers.
 - Right Brake Lever
 - Grey Red/Black
 - Black Orange/Black
 - Left Brake Lever
 - Grey Grey/White
 - Black Brown/Black
3. Route the harness around the left side of the frame.
4. Connect the wire harness to the PI Board.
See **Figure 159**.
5. Install three cable ties:
 - a. Harnesses on the steering column.
 - b. This harness to the User Interface Harness.
 - c. This harness to the frame.
6. Install the following components:
 - a. Electronics Shield (**page 102**)
 - b. Front Cowl (**page 19**)
 - c. Glove Box (**page 18**)
 - d. Bib Panel (**page 16**)
 - e. Storage Trays (**page 15**)
 - f. Battery Module (**page 8**)
7. Perform post-service tests (**page 129**).

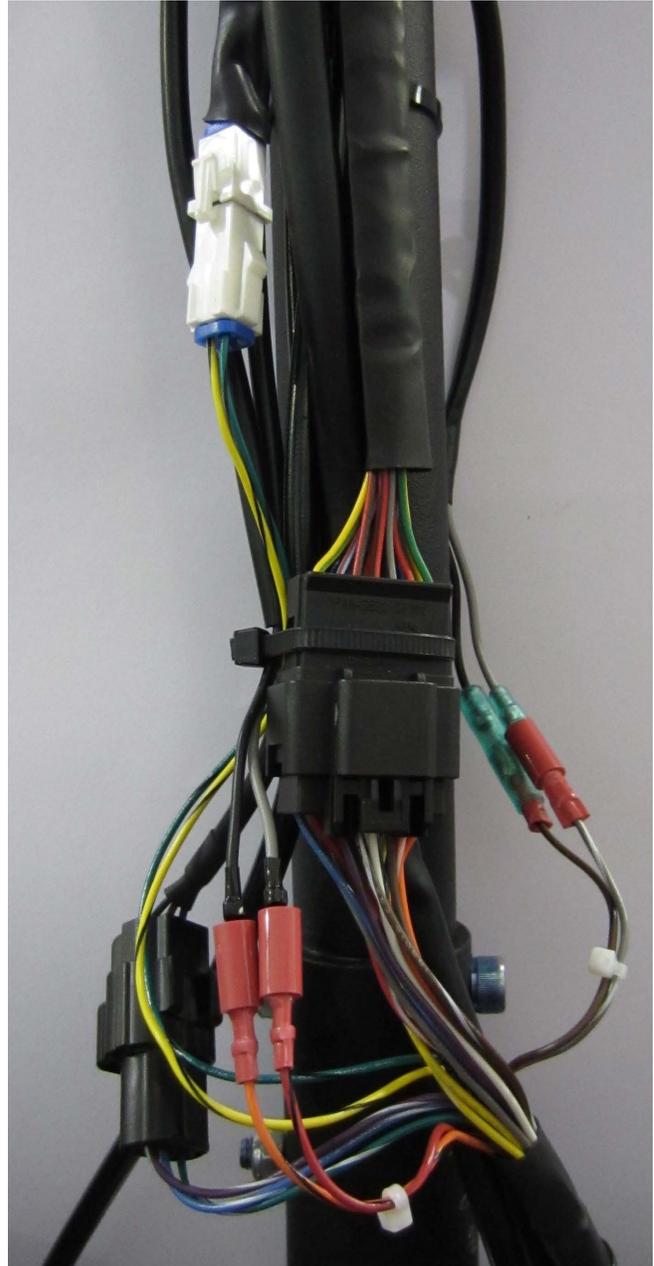


Figure 161: Handlebar Controls Harness on the Steering Column

User Interface Harness

This harness connects the PI Board and the UI Module.

Tools Required: Wire cutters

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))
 - f. Electronics Shield ([page 102](#))
 - g. UI Module ([page 72](#))
3. Disconnect the wire harness from the PI Board. See [Figure 162](#).
4. Disconnect the wire harness from the UI Board. See [Figure 163](#).
5. Using wire cutters, remove four cable ties:
 - a. Two holding the harness to the steering column.
 - b. One connecting this harness to the Handbar Controls Harness.
 - c. One connecting the harness to the frame.
6. Carefully push the rubber grommet out of the hole in the back of the UI Housing. See [Figure 164](#).

NOTICE

Do not use any sharp or pointed tools. You could puncture the grommet, thereby allowing water to enter the UI Housing.

7. Remove the User Interface Harness.

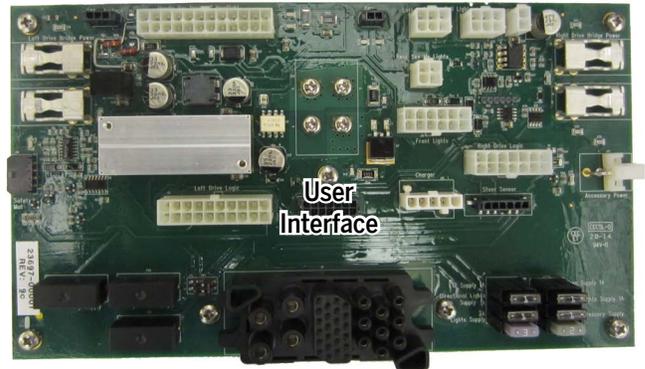


Figure 162: UI Harness to PI Board



Figure 163: Harness to UI Board

Installation

1. ⚠ Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Insert the harness into the UI Housing and carefully press the grommet into place. See **Figure 164**.

NOTICE

Do not use any sharp or pointed tools. You could puncture the grommet, thereby allowing water to enter the UI Housing.

3. Route the harness down the steering column and around the left side of the frame. See **Figure 165**.
4. Connect the harness to the PI Board. See **Figure 162**.
5. Install four cable ties:
 - a. Two around the harnesses on the steering column.
 - b. One connecting this harness to the Handlebar Controls Harness near the steering column.
 - c. One connecting this harness to the frame.
6. Install the following components:
 - a. UI Module (**page 72**)
 - b. Electronics Shield (**page 102**)
 - c. Front Cowl (**page 19**)
 - d. Glove Box (**page 18**)
 - e. Bib Panel (**page 16**)
 - f. Storage Trays (**page 15**)
 - g. Battery Module (**page 8**)
7. Perform post-service tests (**page 129**).



Figure 164: UI Harness Grommet

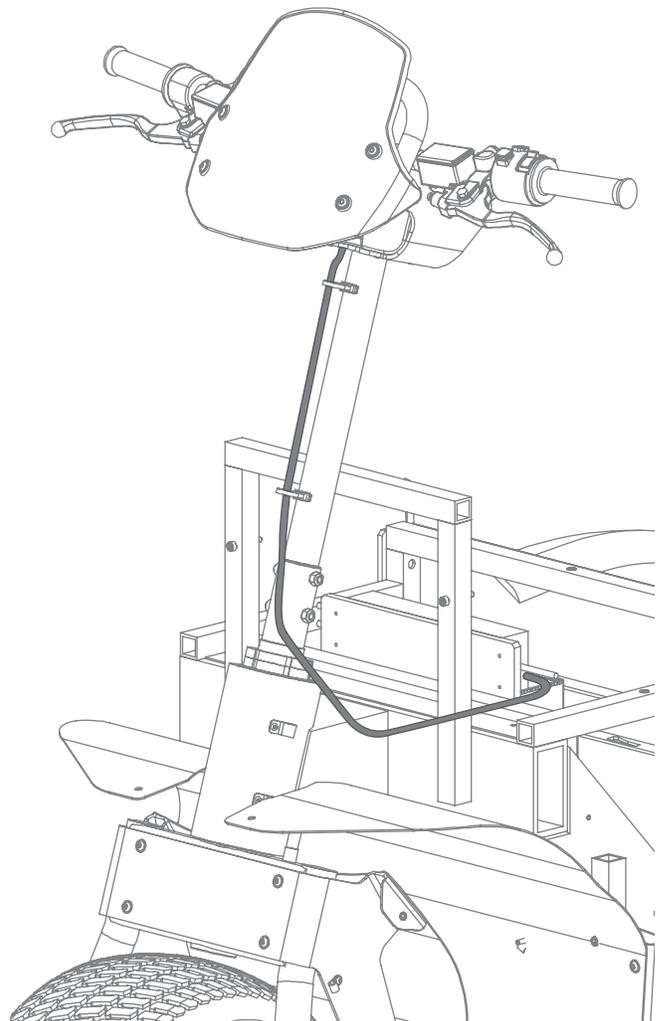


Figure 165: UI Harness Routing

Light Cluster Harness

This harness connects the PI Board to the directional lights and the strobe lights in the Light Cluster.

Tools Required: Wire cutters

Removal

1.  Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module (**page 8**)
 - b. Storage Trays (**page 15**)
 - c. Bib Panel (**page 16**)
 - d. Glove Box (**page 18**)
 - e. Front Cowl (**page 19**)
 - f. Electronics Shield (**page 102**)
3. Disconnect the wire harness from the PI Board. See **Figure 166**.
4. Using a pair of wire cutters, remove the cable tie connecting the harness to the frame.
5. Using a pair of wire cutters, remove the cable ties around the harness inside the Light Cluster.
6. Disconnect the wire harness from the lights. See **Figure 167**.
7. Remove the Light Cluster Harness.



Figure 166: Light Cluster Harness to PI Board

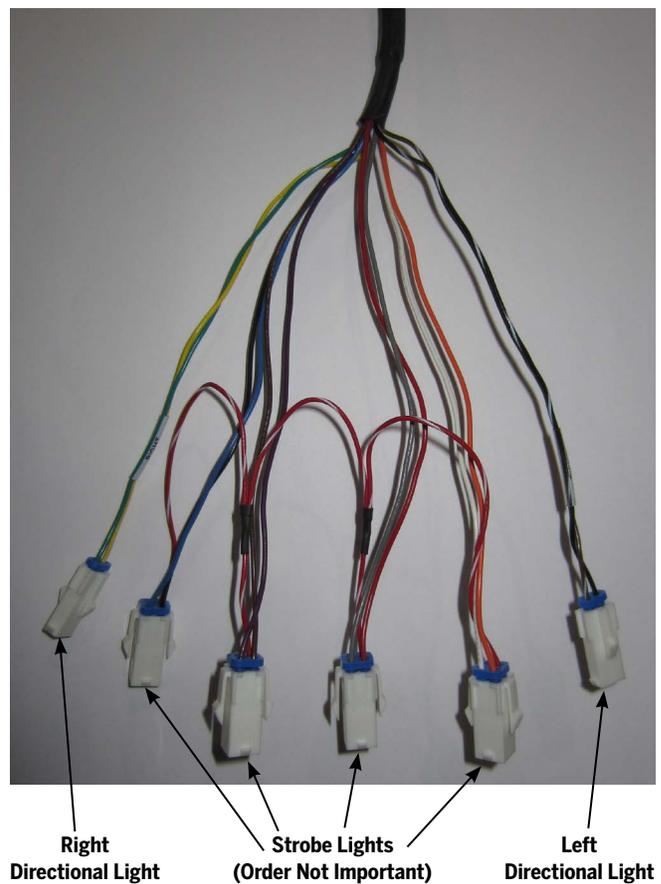


Figure 167: Light Cluster Harness Connectors

Installation

1. ⚠ Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Connect the wire harness to the lights.
See **Figure 167** & **Figure 168**.
3. Route harness around the left side of the frame.
4. Connect the wire harness to the PI Board.
See **Figure 166**.
5. Install two cable ties to hold the harness neatly and tightly behind the Light Cluster.
6. Install a cable tie connecting this harness to the frame.
7. Install the following components:
 - a. Electronics Shield (**page 102**)
 - b. Front Cowl (**page 19**)
 - c. Glove Box (**page 18**)
 - d. Bib Panel (**page 16**)
 - e. Storage Trays (**page 15**)
 - f. Battery Module (**page 8**)
8. Perform post-service tests (**page 129**).

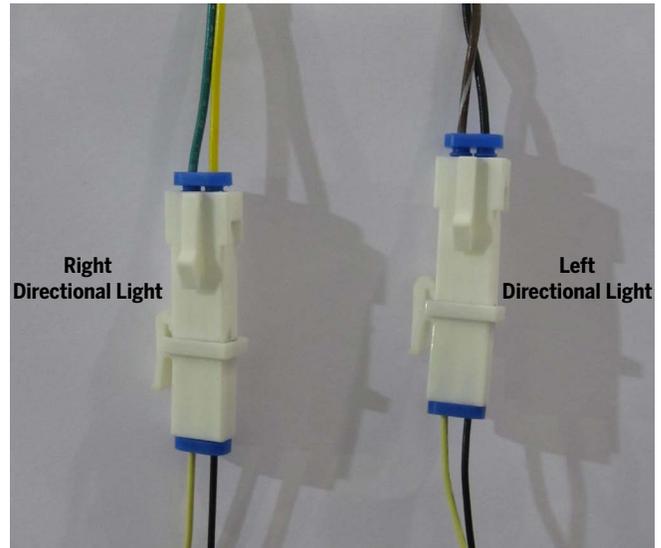


Figure 168: Directional Light Connectors

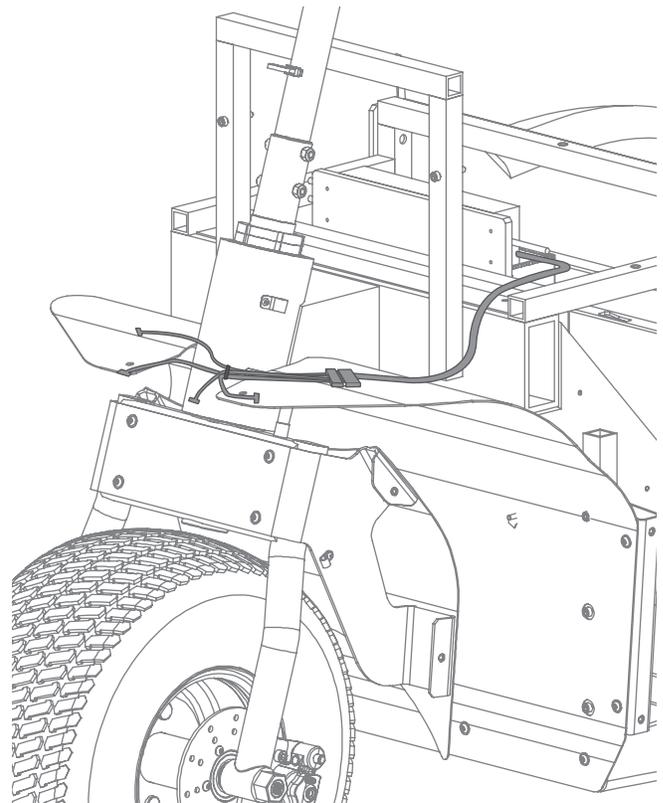


Figure 169: Light Cluster Harness Routing

Tail Light Harness

This harness connects the PI Board to the rear directional lights and the brake lights. There are two separate harnesses, one for each fender.

Tools Required: Wire cutters
 4 mm hex wrench
 10 mm socket wrench
 Torque wrench

Removal

1. ⚠ Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module (**page 8**)
 - b. Storage Trays (**page 15**)
 - c. Bib Panel (**page 16**)
 - d. Glove Box (**page 18**)
 - e. Front Cowl (**page 19**)
 - f. Light Cluster (**page 20**)
 - g. Side Panel (**page 22**)

NOTICE

Remove the left Side Panel to access the left Tail Light Harness. Remove the right Side Panel to access the right Tail Light Harness.

- h. Electronics Shield (**page 102**)
3. Disconnect the wire harness from the PI Board. See **Figure 170**.
4. Using a pair of wire cutters, remove the two cable ties on the side of the frame.
5. Using a 4 mm hex wrench, remove the fastener and P-clip shown in **Figure 171**.
6. Using a 10 mm socket wrench, remove the lock nut and P-clip shown in **Figure 172**.
7. Disconnect the wire harness from the tail lights. See **Figure 172**.
8. Remove the Tail Light Harness.



Figure 170: Tail Light Harness to PI Board

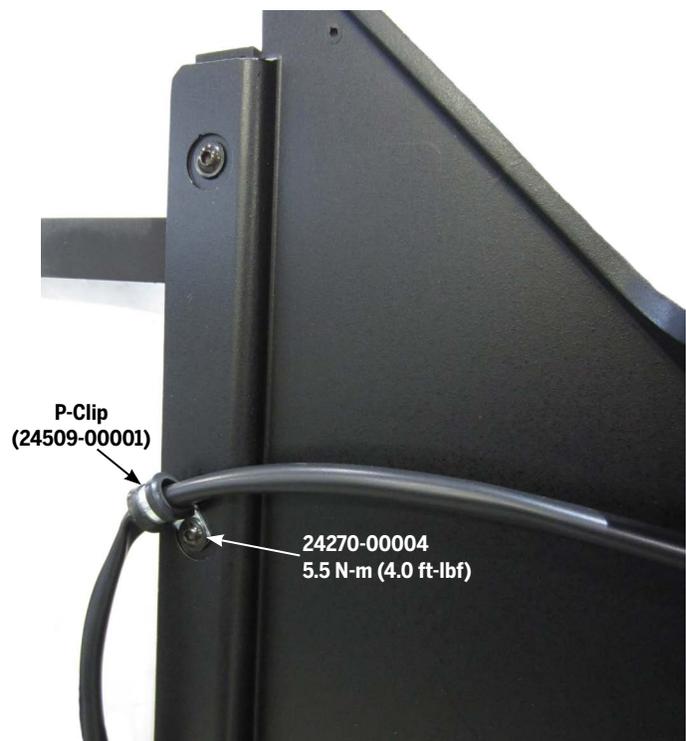


Figure 171: Tail Light Harness P-Clip

Installation

1. ⚠ Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Connect the Tail Light Harness to the tail lights. See **Figure 172**.
3. Install a P-clip around the Tail Light Harness and slide it onto the back of the upper Fender Bracket fastener, as shown in **Figure 172**.
4. Using a 10 mm socket wrench, install a lock nut to hold the P-clip in place. Torque to **5.5 N-m (4.0 ft-lbf)**.
5. Install a P-clip around the Tail Light Harness and orient it as shown in **Figure 171**.
6. Using a 4 mm hex wrench, install a fastener to hold the P-clip in place. Torque to **5.5 N-m (4.0 ft-lbf)**.
7. Route the harness under the horizontal brace on the frame. See **Figure 173**.
8. Connect the wire harness to the PI Board. See **Figure 170**.
9. Install two cable ties connecting the harness to the frame.
10. Install the following components:
 - a. Side Panel (**page 22**)

NOTICE
Ensure the harness goes over the wheel well and under the storage tray.

 - b. Light Cluster (**page 20**)
 - c. Front Cowl (**page 19**)
 - d. Electronics Shield (**page 102**)
 - e. Glove Box (**page 18**)
 - f. Bib Panel (**page 16**)
 - g. Storage Trays (**page 15**)
 - h. Battery Module (**page 8**)
11. Perform post-service tests (**page 129**).

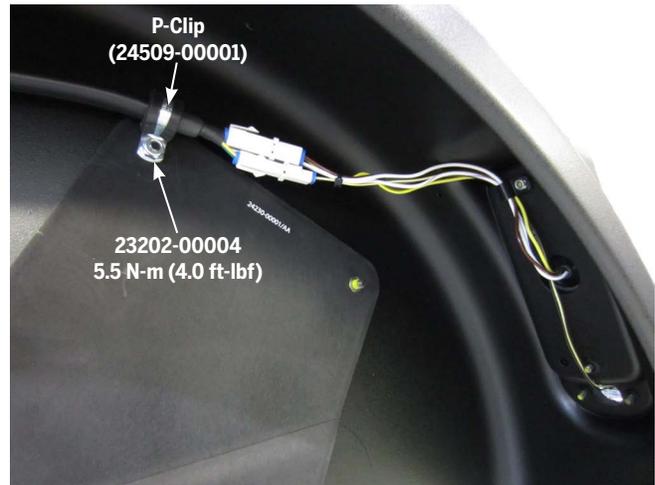


Figure 172: Tail Light Harness to Lights

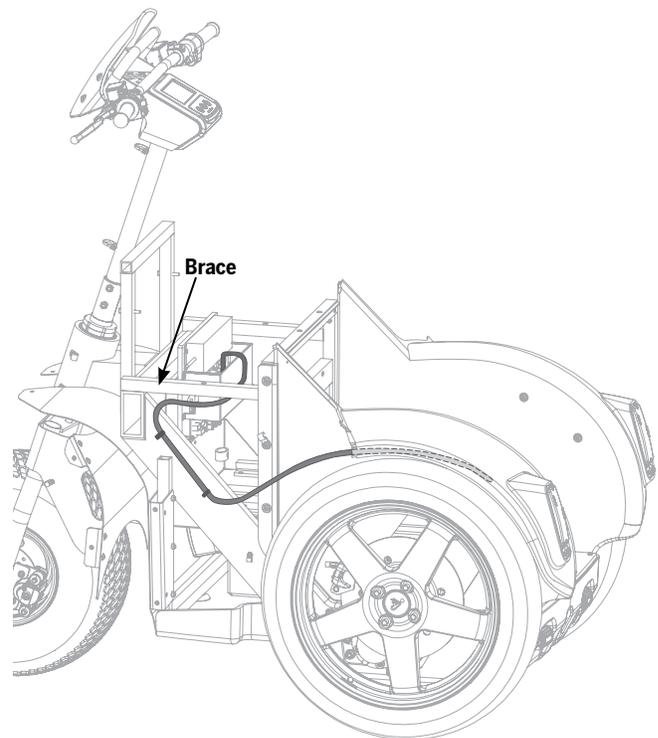


Figure 173: Tail Light Harness Routing

Rear Strobe Light Harness

This harness connects the PI Board to the rear strobe lights.

Tools Required: Wire cutters

Removal

1. ⚠ Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))
 - f. Light Cluster ([page 20](#))
 - g. Right Side Panel ([page 22](#))
 - h. Electronics Shield ([page 102](#))
 - i. Rider Detect Mat ([page 84](#))
 - j. Motor Cavity Lid ([page 91](#))
3. Disconnect the wire harness from the PI Board. See **Figure 174**.
4. Remove the two cable ties on the side of the frame.
5. Using a pair of wire cutters, remove the two cable ties at the rear of the Motor Cavity.
6. Remove the Rear Strobe Light Harness.



Figure 174: Rear Strobe Light Harness to PI Board

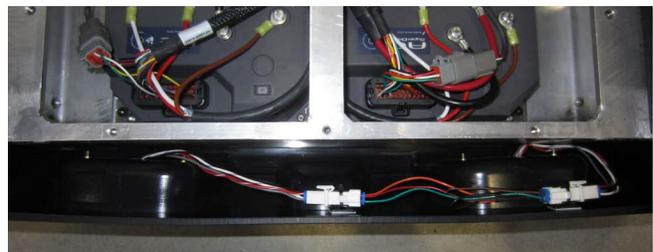


Figure 175: Rear Strobe Light Harness to Lights

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Route the harness down the right side of the skid plate. See **Figure 176**.
3. Connect the harness to the Rear Strobe Lights. See **Figure 175**.
4. Install two cable ties connecting the harness to the rear of the Motor Cavity.
5. Route the harness up the right side of the frame and under the horizontal brace on the frame.
6. Connect the wire harness to the PI Board. See **Figure 174**.
7. Install two cable ties around the harnesses on the side of the frame.
8. Install the following components:
 - a. Motor Cavity Lid (**page 91**)
 - b. Rider Detect Mat (**page 84**)
 - c. Side Panel (**page 22**)
 - d. Light Cluster (**page 20**)
 - e. Front Cowl (**page 19**)
 - f. Electronics Shield (**page 102**)
 - g. Glove Box (**page 18**)
 - h. Bib Panel (**page 16**)
 - i. Storage Trays (**page 15**)
 - j. Battery Module (**page 8**)
9. Perform post-service tests (**page 129**).

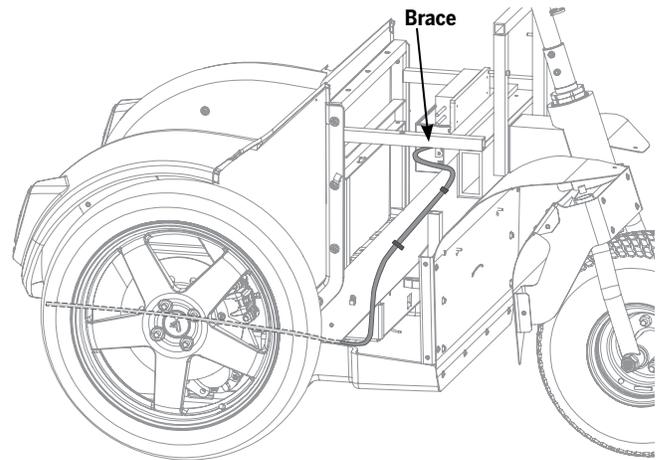


Figure 176: Rear Strobe Light Harness Routing

Accessory Power Harness

This harness connects to the Accessory Power Outlet on the Bib Panel. It provides 12 V power.

Tools Required: Wire cutters

Removal

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
3. Disconnect the wire harness from the PI Board. See [Figure 177](#).

NOTICE

You do not need to remove the Electronics Shield to access the Accessory Power Harnesses.

4. Using a pair of wire cutters, remove the two cable ties around the frame.
5. Using a pair of wire cutters, remove the cable tie holding the harness to the top of the frame.
6. Remove the Accessory Power Harness.

Installation

1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Connect the wire harness to the PI Board. See [Figure 177](#).
3. Route the harness around the right side of the frame, and up to the top left of the frame. See [Figure 178](#).
4. Install three cable ties:
 - a. One at the top of the frame.
 - b. Two holding the harness to the frame.
5. Install the following components:
 - a. Glove Box ([page 18](#))
 - b. Bib Panel ([page 16](#))
 - c. Storage Trays ([page 15](#))
 - d. Battery Module ([page 8](#))
6. Perform post-service tests ([page 129](#)).

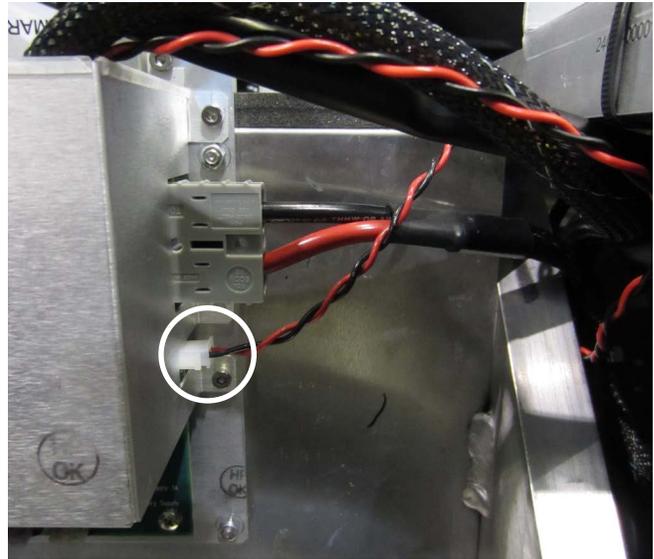


Figure 177: Accessory Power Harness to PI Board

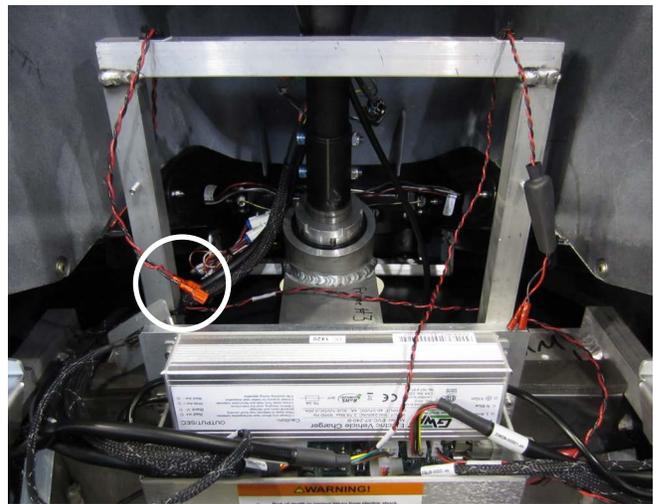


Figure 178: Accessory Power Harness Routing

KeyLock Harness

This harness connects the PI Board to the KeyLock on the Bib Panel.

Tools Required: Wire cutters

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Electronics Shield ([page 102](#))
3. Disconnect the wire harness from the PI Board. See [Figure 179](#).
4. Using a pair of wire cutters, remove the cable tie holding the harness to the top of the frame.
5. Remove the KeyLock Harness.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Connect the wire harness to the PI Board. See [Figure 179](#).
3. Route the harness through the frame and up to the top right of the frame. See [Figure 180](#).
4. Install a cable tie at the top of the frame.
5. Install the following components:
 - a. Electronics Shield ([page 102](#))
 - b. Glove Box ([page 18](#))
 - c. Bib Panel ([page 16](#))
 - d. Storage Trays ([page 15](#))
 - e. Battery Module ([page 8](#))
6. Perform post-service tests ([page 129](#)).

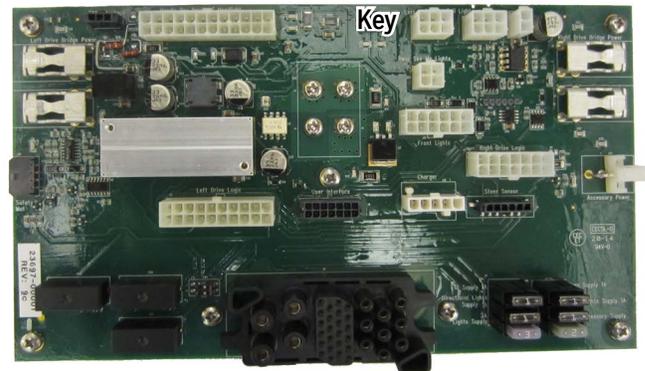


Figure 179: KeyLock Harness to PI Board

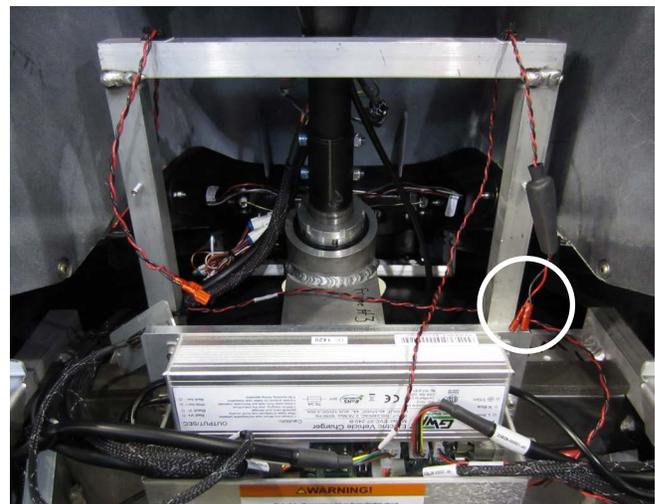


Figure 180: KeyLock Harness Routing

Siren Harness

This harness connects the PI Board to the Siren.

Tools Required: Wire cutters

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Front Cowl ([page 19](#))
 - f. Light Cluster ([page 20](#))
 - g. Right Side Panel ([page 22](#))
 - h. Electronics Shield ([page 102](#))
3. Disconnect the wire harness from the PI Board. See **Figure 181**.
4. Using a pair of wire cutters, remove the two cable ties on the side of the frame.
5. Disconnect the Siren Harness from the siren lead.
6. Remove the Siren Harness.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Connect the Siren Harness to the siren lead.
3. Route the harness under the horizontal brace on the frame. See **Figure 182**.
4. Connect the wire harness to the PI Board. See **Figure 181**.
5. Install two cable ties around the harnesses on the side of the frame.
6. Install the following components:
 - a. Electronics Shield ([page 102](#))
 - b. Side Panel ([page 22](#))
 - c. Light Cluster ([page 20](#))
 - d. Front Cowl ([page 19](#))
 - e. Glove Box ([page 18](#))
 - f. Bib Panel ([page 16](#))
 - g. Storage Trays ([page 15](#))
 - h. Battery Module ([page 8](#))
7. Perform post-service tests ([page 129](#)).

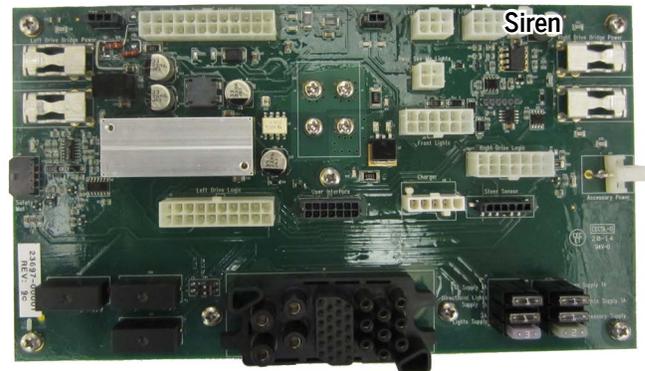


Figure 181: Siren Harness to PI Board

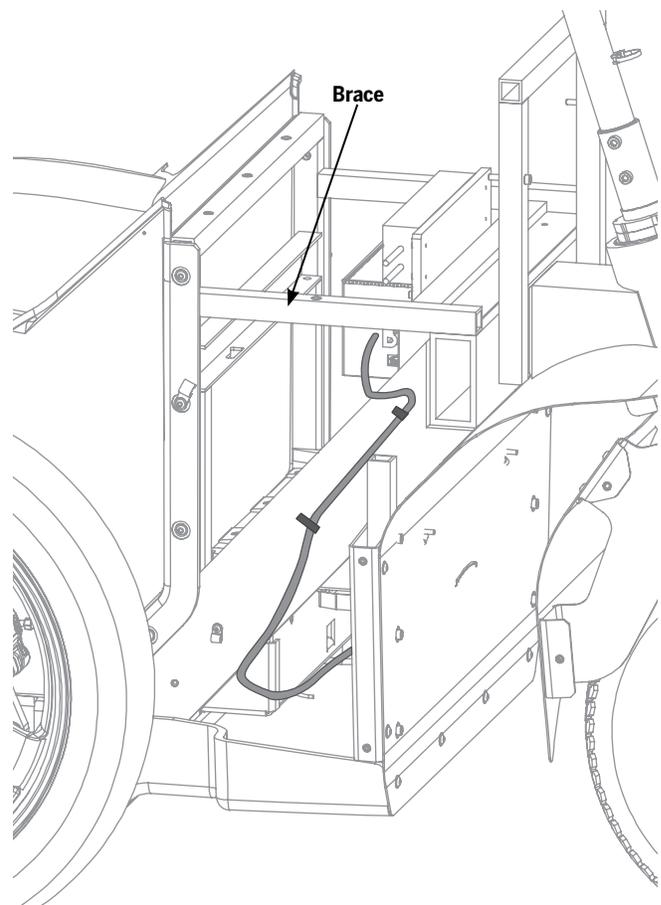


Figure 182: Siren Harness Routing

Service Interface Harness

This harness is used by service technicians when diagnosing problems with the SE-3 Patroller.

Tools Required: Wire cutters

Removal

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Remove the following components:
 - a. Battery Module ([page 8](#))
 - b. Storage Trays ([page 15](#))
 - c. Bib Panel ([page 16](#))
 - d. Glove Box ([page 18](#))
 - e. Electronics Shield ([page 102](#))
3. Disconnect the wire harness from the PI Board. See [Figure 183](#).
4. Remove the Service Interface Harness.

Installation

- ⚠ 1. Make sure the SE-3 Patroller is powered off, unplugged, and the parking brake is engaged.
2. Connect the wire harness to the PI Board. See [Figure 183](#).
3. Install the following components:
 - a. Electronics Shield ([page 102](#))
 - b. Glove Box ([page 18](#))
 - c. Bib Panel ([page 16](#))
 - d. Storage Trays ([page 15](#))
 - e. Battery Module ([page 8](#))
4. Perform post-service tests ([page 129](#)).



Figure 183: Service Interface Harness to PI Board

Post-Service Tests

This chapter describes standard tests to perform after servicing a Segway SE-3 Patroller. If the SE-3 Patroller fails any of these tests, resolve the issue before returning the SE-3 Patroller to the owner or user.

Drive Disable and Rider Detect Mat

1. Use the key to turn on the SE-3 Patroller.
2. Set the Drive/Standby switch to Standby.
Verify that the screen displays "NO RIDER" and "DRIVE DISABLED."
3. Step onto the SE-3 Patroller.
Verify that the screen displays "RIDER PRESENT" and "DRIVE DISABLED."
4. Set the Drive/Standby switch to Drive.
Verify that the screen displays "RIDER PRESENT" and "0 MPH."

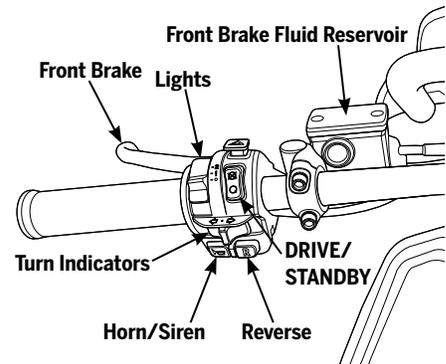


Figure 184: Left Handlebar Controls

Lights, Horn, and Siren

Perform the following tests and verify that the desired result occurs. If the SE-3 Patroller fails any of these tests, resolve the issue before returning the SE-3 Patroller to the owner or user.

Table 5: Lights, Horn, and Siren Tests

Test	Desired Result
1 Rear brake (left brake lever)	Both brake lights illuminate
2 Front brake (right brake lever)	Both brake lights illuminate
3 Headlight	Headlight and rear running lights illuminate
4 Left turn indicator	Left directional lights blink
5 Right turn indicator	Right directional lights blink
6 Strobe lights	Front and rear strobe lights illuminate
7 Horn/Siren momentary press	Horn sounds
8 Horn/Siren press and hold	Siren sounds

Brake Check

1. Look at the brake fluid reservoir sight glass for both front and rear brakes.
Verify that the fluid level is at or above the fill line.
See "Checking the Fluid Level," p. 54.
2. Squeeze the brake levers one at a time.
Verify the brake lever does not touch the handlebar when fully engaged.
Otherwise, add more brake fluid. See "Adding Brake Fluid," p. 54.
3. Check for brake fluid leakage around the master cylinders.
Wipe up any fluid and verify component torques.

Ride Test

Verify that the SE-3 Patroller drives as expected. Make sure that driving and turning are smooth and easy, and there is no binding of the handlebar, cabling, or wiring.

1. Drive forward.
2. Drive backward.
3. Turn the handlebar full left and drive in a circle.
4. Turn the handlebar full right and drive in a circle.

Charge Test

1. Use an IEC cable to connect the SE-3 Patroller to a powered outlet.
2. Verify that the screen displays the charging icon.

Fasteners

Overview

Fasteners are listed by part number. For each fastener a variety of information is provided, including:

- Type of fastener
- Location used
- Quantity used per part
- Drive used when installing/removing
- Torque required at this location
- Image, actual size

Safety

WARNING!

- Use only Segway-approved fasteners. Other fasteners may not perform as expected and may come loose.
- Do not tighten or reuse any lock nut. Instead, when any lock nut is loose or removed, replace the lock nut with a new Segway-approved lock nut.
- Before using a fastener, make certain the fastener is the correct size and type with any necessary washer and thread lock in place.
- Do not attempt to repair any stripped or damaged screw hole. Instead, replace the part. If a replacement part is not available, do not reassemble.
- Insert fasteners slowly and carefully. Do not cross-thread or over-tighten fasteners. Tighten only to the prescribed torque.
- Failure to adhere to these warnings could lead to serious injury or death or damage to property.

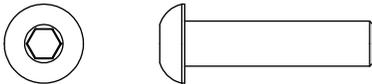
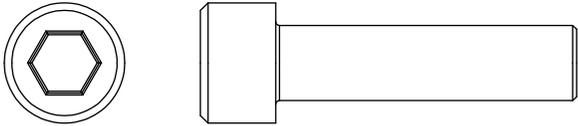
Reusing Fasteners

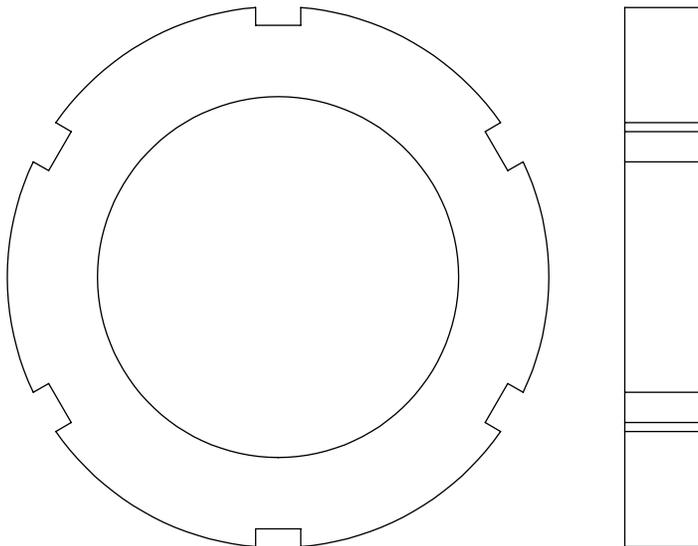
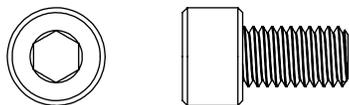
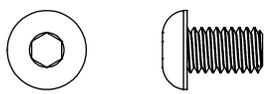
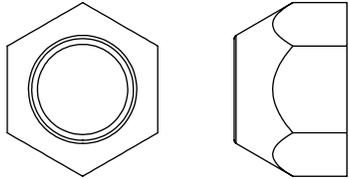
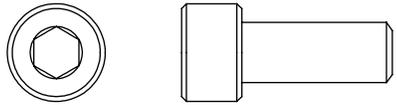
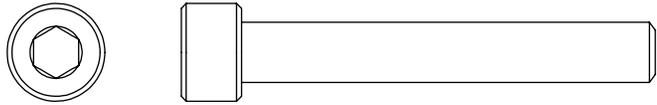
Before reusing any fastener, check if it has any threadlock residue on it. If so, you must remove the old threadlock and apply new threadlock before reusing the fastener.

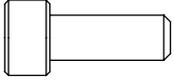
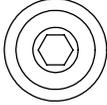
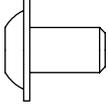
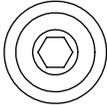
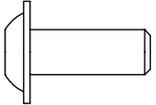
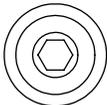
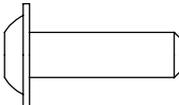
Tools Required: 1/4 inch tube brush
Wire brush
Loctite 242

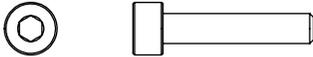
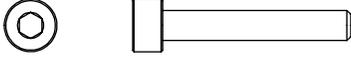
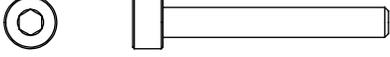
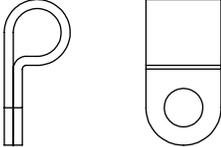
1. Use a tube brush (in a drill, or by hand) to clean any existing threadlock off the threads of the nut or threaded insert.
2. Use a wire brush to clean any existing threadlock off the threads of the fastener.
3. Before reinstalling the fastener, place a drop of Loctite 242 on the threads.

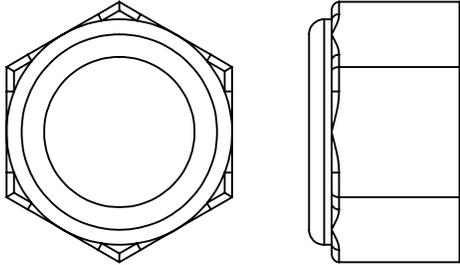
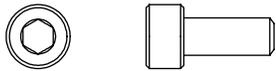
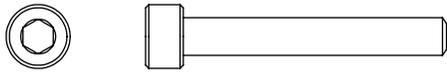
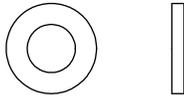
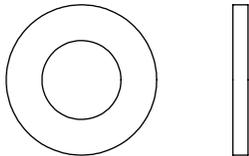
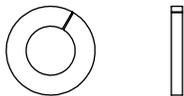
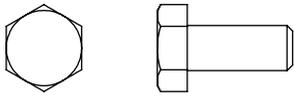
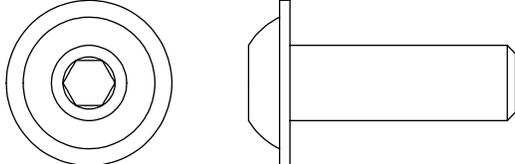
Table 6: Fasteners

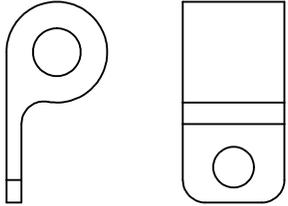
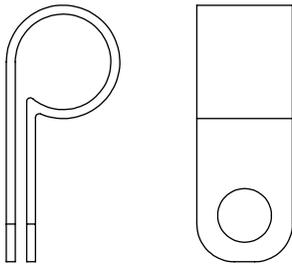
Part Number	Fastener Type	Application	Quantity	Drive	Torque
20307-00002	M4 x 8 BHCS	Front Brake Line	3	2.5 mm	2.5 N-m (1.8 ft-lbf)
		Rear Brake Line	2	2.5 mm	2.5 N-m (1.8 ft-lbf)
					
20307-00005	M4 x 16 BHCS	Glove Box Door	4	2.5 mm	1.6 N-m (1.2 ft-lbf)
		Charger (to Bib Panel)	2	2.5 mm	1.6 N-m (1.2 ft-lbf)
					
20450-00001	M4 Flat Washer	Glove Box Door	4	N/A	N/A
					
20553-00001	M6 x 25 BHCS	Glove Box	3	4 mm	1.6 N-m (1.2 ft-lbf)
					
20709-00001	M4 x 10 FHCS	Battery Slides	14	2.5 mm	1.0 N-m (0.74 ft-lbf)
					
20991-00002	M10 x 40 SHCS	Gearbox	6	8 mm	67 N-m (49 ft-lbf)
					
23202-00001	M4 Lock Nut	Brake Light P-Clip	2	7 mm	1.6 N-M (1.2 ft-lbf)
		Front Directional Light	4	7 mm	1.6 N-m (1.2 ft-lbf)
		Front Strobe Light	4	7 mm	1.6 N-m (1.2 ft-lbf)
		Glove Box Door	4	7 mm	1.6 N-m (1.2 ft-lbf)
		Side Strobe Light	4	7 mm	1.6 N-m (1.2 ft-lbf)
					
23202-00003	M5 Lock Nut	Rear Brake Line P-Clips	3	8 mm	1.4 N-m (1.0 ft-lbf)
		PI Board	4	8 mm	6.0 N-m (4.4 ft-lbf)
					
23202-00004	M6 Lock Nut	Fender P-Clip	2	10 mm	5.5 N-m (4.0 ft-lbf)
		Headlight Bracket	2	10 mm	6.0 N-m (4.4 ft-lbf)
		Windshield	4	10 mm	1.5 N-m (1.1 ft-lbf)
					

Part Number	Fastener Type	Application	Quantity	Drive	Torque
23782-00001	Collar Nut	Front Fork	2	Spanner	45 N-m (33 ft-lbf)
					
23783-00001	M8 x 14 SHCS	Front Caliper (to Front Fork)	2	6 mm	28.5 N-m (21.0 ft-lbf)
					
23784-00001	M8 Lock Nut	Handlebar (to Front Fork)	2	13 mm	34 N-m (25 ft-lbf)
					
23786-00001	M6 x 10 BHCS	Front Rotor	5	5 mm	7.0 N-m (5.0 ft-lbf)
					
23789-00001	Lug Nut	Tire/Wheel Assembly	12	Spline	67 N-m (49 ft-lbf)
					
23868-00001	M8 x 20 SHCS	Rear Caliper (to Bracket)	4	6 mm	28.5 N-m (21.0 ft-lbf)
		Rear Caliper Bracket (to Gearbox)	4	6 mm	28.5 N-m (21.0 ft-lbf)
					
23868-000010	M8 x 55 SHCS	Handlebar (to Front Fork)	2	6 mm	34 N-m (25 ft-lbf)
					

Part Number	Fastener Type	Application	Quantity	Drive	Torque
23869-00001	M6 x 25 SHCS	Motor (to Gearbox Plate on Frame)	8	5 mm	12 N-m (8.9 ft-lbf)
		Motor (to Motor Mount Plate)	8	5 mm	12 N-m (8.9 ft-lbf)
					
23869-00003	M6 x 16 SHCS	Motor Controller (to Frame)	8	5 mm	7.5 N-m (5.5 ft-lbf)
					
24270-00001	M6 x 10 BHCS FL	Siren Bracket (to Frame)	2	4 mm	7.5 N-m (5.5 ft-lbf)
		UI Housing	4	4 mm	2.8 N-m (2.1 ft-lbf)
					
24270-00004	M6 x 16 BHCS FL	Fender (to Bracket)	4	4 mm	5.5 N-m (4.0 ft-lbf)
		Fender (to Frame)	12	4 mm	5.5 N-m (4.0 ft-lbf)
		Front Cowl	6	4 mm	4.0 N-m (3.0 ft-lbf)
		Front Fender Bracket	4	4 mm	7.5 N-m (5.5 ft-lbf)
		Front Splash Guard	8	4 mm	5.5 N-m (4.0 ft-lbf)
		Headlight Bracket	2	4 mm	6.0 N-m (4.4 ft-lbf)
		Main Splash Guard	8	4 mm	5.5 N-m (4.0 ft-lbf)
		Side Panel Bracket (to Frame)	2	4 mm	5.5 N-m (4.0 ft-lbf)
		Side Panel Bracket (to Side Panel)	8	4 mm	4.0 N-m (3.0 ft-lbf)
		Side Panel (to Floating Bracket)	4	4 mm	4.0 N-m (3.0 ft-lbf)
		Side Panel (to Frame)	6	4 mm	5.5 N-m (4.0 ft-lbf)
					
24270-00006	M6 x 20 BHCS FL	Bib Panel (into Frame)	6	4 mm	5.5 N-m (4.0 ft-lbf)
		Bib Panel (into Front Cowl)	2	4 mm	4.0 N-m (3.0 ft-lbf)
		Fender (to Bracket)	2	4 mm	5.5 N-m (4.0 ft-lbf)
		Fender Bracket (to Gearbox)	6	4 mm	4.0 N-m (3.0 ft-lbf)
		Front Fender (Boot)	4	4 mm	5.5 N-m (4.0 ft-lbf)
		Light Cluster	2	4 mm	4.0 N-m (3.0 ft-lbf)
		Storage Tray	2	4 mm	1.0 N-m (0.74 ft-lbf)
		Windshield	4	4mm	1.5 N-m (1.1 ft-lbf)
					

Part Number	Fastener Type	Application	Quantity	Drive	Torque
24315-00001	M4 x 10 SHCS	Service Port	2	3 mm	1.6 N-m (1.2 ft-lbf)
					
24315-00002	M4 x 12 SHCS	Front Directional Light	4	3 mm	1.6 N-m (1.2 ft-lbf)
					
24315-00004	M4 x 16 SHCS	Rear Directional Light	4	3 mm	1.0 N-m (0.74 ft-lbf)
					
24315-00006	M4 x 20 SHCS	Front Strobe Light	4	3 mm	1.6 N-m (1.2 ft-lbf)
		Headlight	2	3 mm	1.6 N-m (1.2 ft-lbf)
		Rear Strobe Light	4	3 mm	1.6 N-m (1.2 ft-lbf)
					
24315-00007	M4 x 25 SHCS	Side Strobe Light	4	3 mm	1.6 N-m (1.2 ft-lbf)
					
24315-00008	M4 x 30 SHCS	Brake Light	4	3 mm	1.0 N-m (0.74 ft-lbf)
					
24346-00001	1/4 in. P-Clip (Plastic)	Brake Light	2	N/A	N/A
		Front Brake Line	1	N/A	N/A
		Rear Brake Line	5	N/A	N/A
					
24367-00002	M5 x 10 BHCS	Rider Detect Mat	4	3 mm	4.0 N-m (3.0 ft-lbf)
		Rider Detect Spacer	8	3 mm	4.0 N-m (3.0 ft-lbf)
					
24400-00001	4-40 x 1/4 in. SHCS	Service Port	2	3 mm	1.6 N-m (1.2 ft-lbf)
					

Part Number	Fastener Type	Application	Quantity	Drive	Torque
24404-00001	M20 Lock Nut	Front Axle	1	30 mm	85 N-m (63 ft-lbf)
					
24409-00003	M5 x 12 SHCS	UI Module	4	4 mm	1.8 N-m (1.3 ft-lbf)
					
24409-00008	M5 x 35 SHCS	Battery Bumpers	3	4 mm	2.0 N-m (1.5 ft-lbf)
					
24434-00003	M6 Flat Washer	Ring Terminal (to Motor Controller)	10	N/A	N/A
					
24434-00005	M10 Flat Washer	Gearbox	6	N/A	N/A
					
24435-00003	M6 Split Lock Washer	Ring Terminal (to Motor Controller)	10	N/A	N/A
					
24436-00004	M6 x 14 HXBT	Ring Terminal (to Motor Controller)	10	10 mm	7.5 N-m (5.5 ft-lbf)
					
24437-00003	M10 x 30 BHCS	Front Fender (Boot)	2	6 mm	5.5 N-m (4.0 ft-lbf)
					

Part Number	Fastener Type	Application	Quantity	Drive	Torque
24440-00001	1/4 in. P-Clip (Steel)	Front Brake Line	2	N/A	N/A
					
24491-00002	M4 x 8 SHCS	Electronics Shield	4	3 mm	2.5 N-m (1.8 ft-lbf)
					
24491-00003	M4 x 10 SHCS	Charger	4	3 mm	2.5 N-m (1.8 ft-lbf)
					
24509-00001	1/2 in. P-Clip (Steel)	Fender (Tail Light Harness)	4	N/A	N/A
					

Tools and Equipment

This appendix lists the tools and equipment recommended for servicing and diagnosing a Segway SE-3 Patroller.

Table 7: Tools and Equipment

Tool	Description
Air compressor (if complete service area compressed air system not installed)	2 gallon capacity minimum; 1 per service technician. The following or similar is recommended: Powermate 2 Gallon Side Stack Mini Air Compressor (VSP0000201).
Bar Clamp	4 inch long, low profile.
Brake fluid	DOT 4 brake fluid
Brake bleeding kit	1/4 inch tubing, 1/4 inch wrench, and an empty container; or a commercial kit.
Cable Ties	4 inch (18 lbs) and 8 inch (75 lbs) cable ties.
Cleaning supplies	Cotton swabs; shop towels, gloves (rubber or latex).
Digital level	Accurate to 0.1°
Drill	Power drill with 1/2 inch chuck
Drill Bits	23/64 inch or 9.12 mm
Epoxy	5-minute epoxy (P/N 24750-00001)
ESD equipment	Field electrostatic discharge (ESD) kit including anti-static mat, wrist strap, line with gator clip, and ground lead. Correct grounding of mat and wrist strap is essential.
Fuses	Mini blade fuses: 1 A, 2 A, 3 A. Ceramic cartridge fuses: 5 A. See Table 3, p. 106 , for part numbers.
Heat gun	Hand-held heat gun that can reach 105° C (220° F).
Hex adapter	1/4 inch square to 1/4 inch hex
Hex bits	2.5 mm, 3 mm, 4 mm, 5 mm, 6 mm, 8 mm
Hex wrenches	2.5 mm, 3 mm, 4 mm, 5 mm, 6 mm, 8 mm
KeyLock nut tool	P/N 24630-00001
Knife	Utility knife with replaceable blades.
Locking Pliers	
Low pressure inflation gauge	For checking tire pressure.
Lubricants	LPS Heavy duty silicone lubricant (P/N 24430-00001) Molykote G-n anti-corrosion paste (P/N 24505-00001) Permatex anti-seize lubricant (P/N 24433-00001) UltraLube industrial strength corrosion inhibitor (P/N 24429-00001) UltraLube marine and trailer grade bearing grease (P/N 24431-00001)
Mallet	Plastic or rubber, 24 oz.
Multi-meter	Capable of measuring both voltage and resistance as called out in the <i>Segway Gen2 PT General Information and Diagnostics Guide</i> .
Flashlight	

Tool	Description
Ratchet	1/4 inch drive 3/8 inch drive 1/2 inch drive
Safety glasses	
Screwdrivers	Flathead, Phillips
Shop vacuum (wet/dry vac)	The following or similar is recommended: Ridgid 12 Gallon (WD1250)
Six-lobe bits	T-15
Sockets	6-point preferred: 7 mm, 10 mm, 13 mm, 14 mm, 19 mm, 21 mm, 30 mm
Socket extension	3 inch long, 3/8 inch drive
Spanner wrench	SKF HN 8-9 spanner wrench
Thread Lock	Loctite 242 Threadlocker (P/N 23212-00001) Loctite 425 Adhesive Threadlocker (P/N 24620-00001)
Tire pump	Air pump with Schrader valve attachment
Torque wrenches	1/4 inch drive torque limiting screwdriver (1 – 6 N-m range) 1/4 inch drive torque limiting ratchet (5 – 15 N-m range) 3/8 inch drive torque limiting ratchet (25 – 80 N-m range)
Wheel nut key	Spline drive to 3/4 in. and 13/16 in. hex (P/N 24361-00001)
Wire brushes	1/4 inch tube brush with abrasive nylon bristles (P/N 24744-00001) Wire brush with brass bristles
Wire cutters	
Vehicle jack	1.5 Ton (or greater) floor jack

Glossary

Blade Type Fuse

This type of fuse has a plastic body and metal prongs. It is most commonly used in automobiles.

Body Panel

An exterior component of the SE-3; primary purpose is to provide shape and style.

Button Head Cap Screw (BHCS)

A type of screw with a rounded head and an indentation (hex or 6-lobe) used for tightening.

Cable Tie

A single-use plastic band that is wrapped around cables and components to hold them in place.

Chassis

The chassis is the aluminum frame that all the other components of the SE-3 Patroller are mounted to.

DIP Switch

A set of slides or rockers installed onto a printed circuit board. These are commonly used to customize the behavior of a device.

Electrostatic Discharge (ESD)

The rapid discharge of accumulated electrical charge. To prevent damage to the Segway SE-3 Patroller, a Certified Service Technician should always stand on a static mat, wear a grounding heel, or wear a grounding wrist strap while working on electrical elements of the SE-3 Patroller.

Enable Time

The total elapsed time during which the motor drives have been powered on.

Finger Tight

Tighten the fastener by hand. Using only your fingers, tighten it as much as you can without straining.

Glass Tube Type Fuse

This type of fuse has a cylindrical glass body with metal caps on each end.

Harness

A group of cables bound together to form one assembly, typically with connectors that plug or snap into place.

Kit

A component and all the required fasteners for installing it.

Lithium-ion (Li-ion) Battery

A type of rechargeable battery in which lithium ions move between electrodes when charging and discharging.

Odometer

This keeps track of how far the vehicle has traveled.

Operational Time

The total elapsed time during which the vehicle has been powered on.

Pan Head Cap Screw (PHCS)

A type of screw with a wide flat head and an indentation (hex or 6-lobe) used for tightening.

PI Board

Power Interface Board. This is a printed circuit board that connects to the battery and harnesses.

Pigtail

A short harness connected to a component at one end.

Rotor

Also known as a Brake Disk. A metal component that rotates with the wheel and is squeezed by the caliper when brakes are applied.

SEMS

A screw and washer assembly.

Socket Head Cap Screw (SHCS)

A type of screw with a cylindrical head and an indentation (hex or 6-lobe) used for tightening.

UI Board

User Interface Board. This is a printed circuit board that connects to a screen and buttons and powers the user interface of the SE-3 Patroller.



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