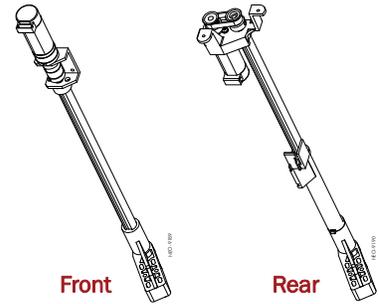


# Spare Z-Axis Assemblies

## Remove & Replace Instructions



### Overview & Notes

**IMPORTANT:** Overland Storage requires that all NEO Series parts be removed and replaced by an Overland Storage authorized service provider. Improper installation may result in damage which voids existing warranties.

This document describes how to remove and replace either the front or rear Z-Axis assembly in a NEO 4000 or NEO 4000E library from Overland Storage.

You will need wire cutters, Phillips screwdrivers, and a Torque wrench.

**WARNING:** The GUI touch screen does not completely shut off NEO Series system power. To reduce the risk of electric shock or damage, unplug both power cords.

#### Unpacking the Spare

Carefully unpack and verify that you have all the parts:

- Front or rear Z-Axis assembly
- Four (4) M3x20mm panhead Phillips screws
- Four (4) M3 cup washers
- Two (2) M3x6mm panhead Phillips screws
- One (1) miniature cable tie (rear assembly only)
- These instructions

#### Electrostatic Discharge Information

A discharge of static electricity can damage micro-circuitry or static-sensitive devices. To help prevent Electrostatic Discharge (ESD), observe standard ESD precautions.

### Preparing the Library

#### Remove Library from Rack

1. Remove all four tape **magazines**.

**IMPORTANT:** If the library is non-operational, the doors can be manually opened by pushing a stiff wire through the manual release holes (Figure 1).

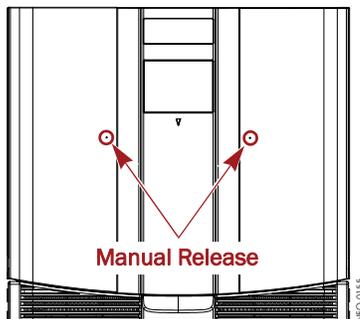


Figure 1. Manual Door Release Locations

2. If operating, use the GUI to **power down** the library.
3. Turn the **power supply** switches to OFF (O), and remove the **power cords**.
4. Remove all **external host cables**.

5. Also, to reduce weight, we recommend removing the **drive assemblies**.

**WARNING:** To prevent injury, it is recommended that a mechanical lifter (or at least two people) be used during rack installation or removal.

6. Using a mechanical lifter (or two people), remove the **unit** from the rack and place it on a secure ESD surface.

#### Remove Top Covers

1. Remove and retain the **two screws** securing the front top cover.
2. Lift and remove the **front** top cover, and set aside.
3. If replacing the **rear** Z-Axis assembly, also remove the **fan cover** assembly at the top rear:
  - a. Remove and retain the **11 screws** that secure the fan cover assembly to the library chassis.
  - b. Carefully lift the inside edge of the **fan cover assembly** and disconnect the cooling fan connector.

**CAUTION:** Lifting the cover too far can cause a strain on the cables possibly damaging them or their connectors.

- c. Lift the **fan cover** assembly off and set aside.  
Be sure the fan side is up to prevent damage to the fan assembly.

## Remove Shuttle and Track Plate

### 1. Remove the shuttle:

- a. By hand, turn the **motor/track coupler** until the track section is at a 45° or larger angle (Figure 2).

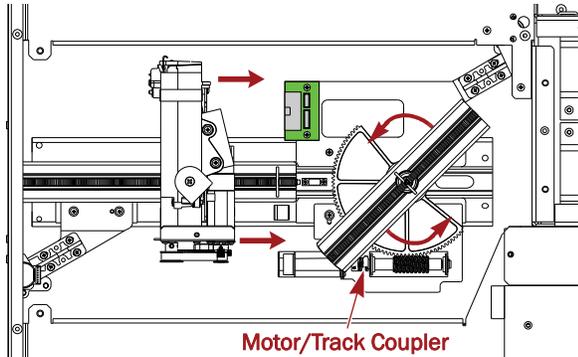


Figure 2. Rotating Track & Removing Shuttle (Top View)

- b. With one hand supporting the top of the shuttle, grasp the shuttle base and carefully **slide the shuttle** off the track.

*NOTE: On older models, you must release the shuttle brake latch at the bottom of the shuttle next to the track plate that secures the large black gear.*

- c. Without twisting the shuttle flex cable, set the **shuttle assembly** (with the PCB side up) on the top edge of the unit (Figure 3).

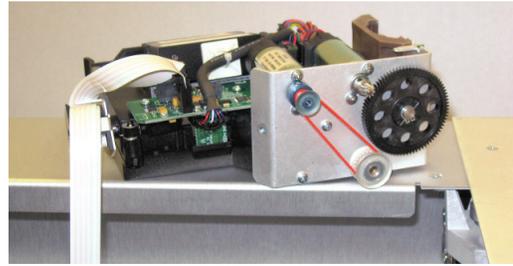


Figure 3. Set the Shuttle Aside; PCB Up

- 2. On the **defective Z-Axis**, remove the **four screws and washers** (Figure 4) securing the Screw Rail to the track plate.

*NOTE: If unscrewing the rear Z-Axis screws, retain the Screw Rail clamp from the bottom.*

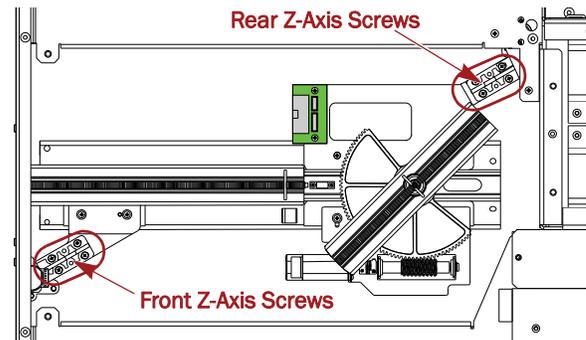


Figure 4. Remove the Z-Axis Screw Rail Screws

- 3. If the track plate is stuck in a raised position, on the **other Z-Axis**, remove the **four screws and washers** (Figure 4) securing the Screw Rail, and carefully lower the track plate to the floor.

Continue with either “Replacing the Front Assembly” or “Replacing the Rear Assembly” on page 3.

## Replacing the Front Assembly

### Remove Old Front Assembly

- 1. Remove the two **bracket screws** located immediately below the drive motor (Figure 5).

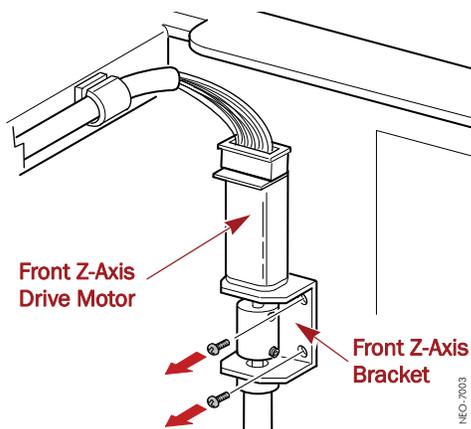


Figure 5. Remove Front Z-Axis Bracket Screws (Inside View)

- 2. Tilt the assembly inward and remove the **7-pin connector** from the Z-Axis drive motor top (Figure 6).

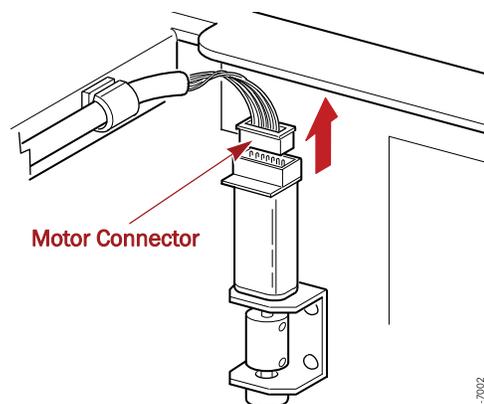


Figure 6. Remove Front Z-Axis Motor Cable (Inside View)

- 3. Lift out the old front Z-Axis assembly.

## Install New Front Assembly

1. Insert the new front Z-Axis assembly into the round **Z-Axis bracket** on the chassis floor.
2. Align the **Z-Axis bracket** over the screw holes on the front bulkhead and secure it using **two new M3x6mm screws** (Figure 7).

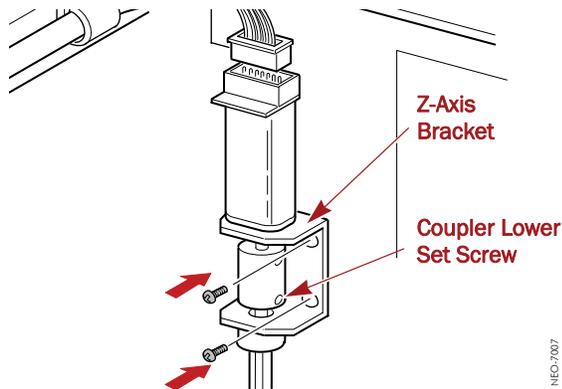


Figure 7. Install the New Bracket Screws

3. Attach the **7-pin connector** to the drive motor.
4. Attach the Screw Rail bracket to the **track plate** assembly (Figure 8) on the chassis floor as follows:

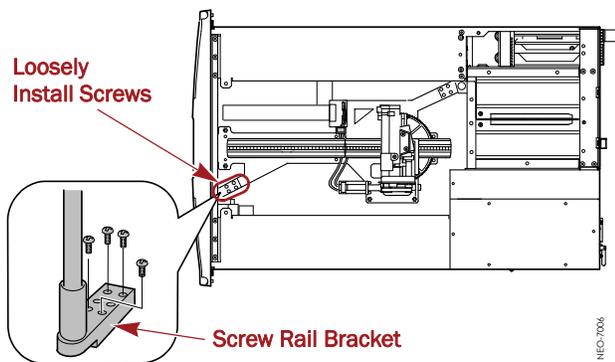


Figure 8. Loosely Install Screw Rail Bracket Screws

- a. Align the Screw Rail bracket holes over the track plate **holes**.
- b. Manually lower the **Screw Rail bracket** down onto the track plate by turning the motor coupler (Figure 9) counterclockwise until resistance is felt.

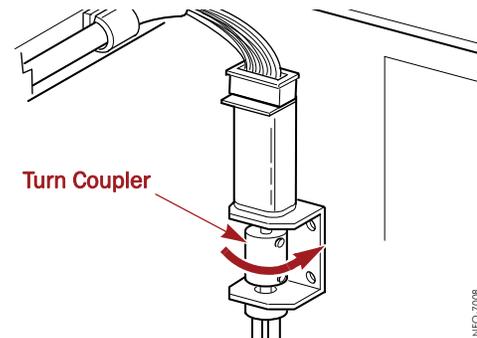


Figure 9. Turn Front Z-Axis Motor Coupler (Inside View)

- c. Install the four **new M3x20mm screws** and **M3 washers** until snug, then loosen them **one turn**.

**NOTE:** The screws are tightened during the final unit test.

Be sure the cup washer is positioned correctly with the cup side up against the screwhead (Figure 10).

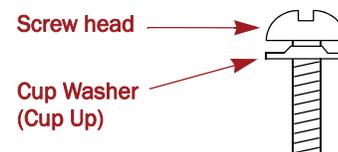


Figure 10. Screw and Cup Washer Assembly

**IMPORTANT:** Continue with "Power On and Test the Library" on page 5.

## Replacing the Rear Assembly

### Remove Old Rear Assembly

1. Remove the shuttle flex cable from the Z-Axis bracket:
  - a. Remove and retain the **clip** (Figure 11) holding the flex cable to the Z-Axis cable bracket.

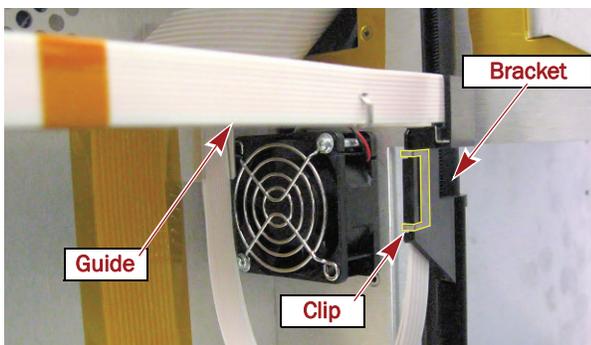


Figure 11. Remove Clip Holding Flex Cable

- b. Pressing the release, lift the **guide** up and off the Z-Axis guide bracket.

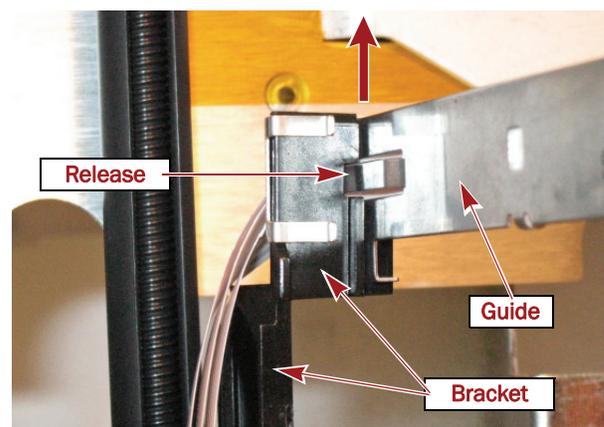


Figure 12. Press Release to Remove Cable Guide

c. Carefully stow the **flex cable and guide assembly** off to the left in the magazine bay.

**2. Release the Z-Axis upper connections:**

a. Remove the **two mounting screws** (Figure 13).

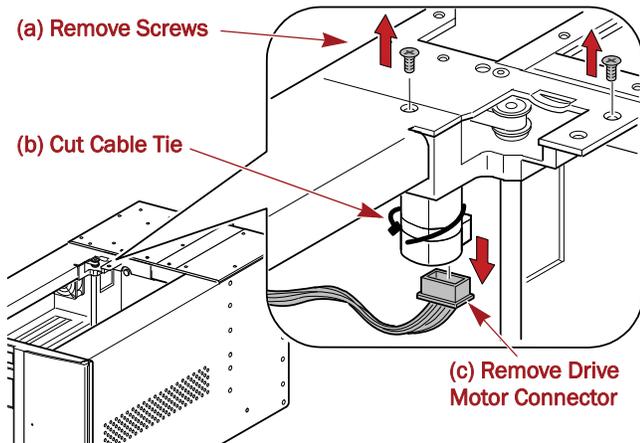


Figure 13. Remove the Upper Z-Axis Items

b. Cut the  **cable tie** from the drive motor.  
 c. Remove the **7-pin connector** from the drive motor.

3. Verify that the Screw Rail bracket clears the track plate **alignment pins** (Figure 14).

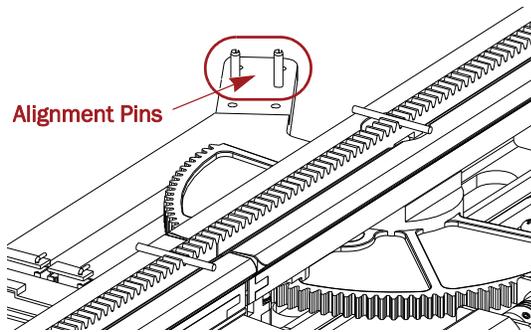


Figure 14. Rear Z-Axis Alignment Pins on Track Plate

If it does not clear the pins, manually rotate the **Z-Axis motor gear** clockwise (Figure 15) to raise the bracket until it clears the pins.

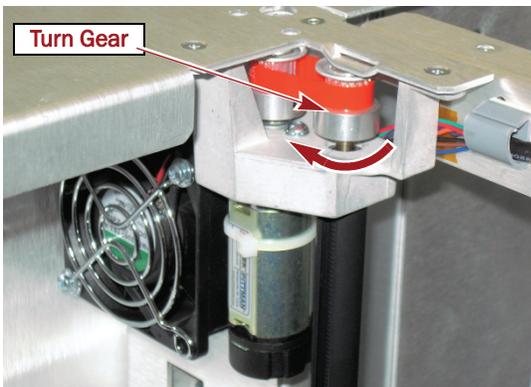


Figure 15. Turn Rear Z-Axis Pulley Gear

4. Swing the Screw Rail bracket toward the rear, then tilt and remove the rear **Z-Axis assembly**.

**Installing New Rear Assembly**

1. Insert the new rear Z-Axis assembly into the round **Z-Axis bracket** on the chassis floor.
2. Insert the 7-pin **connector** to the bottom of the Z-Axis drive motor.
3. Using **two new M3x6mm screws**, secure the Z-Axis assembly to the two top mounting holes.
4. Install **new cable tie** to secure the cables to the motor (Figure 16) observing these points:
  - Cables in rear must be clear of the **pulleys**.
  - Locate the **Tie ratchet** away from the Screw Rail.
  - Trim the excess **tie leader** that extends beyond the tie ratchet.

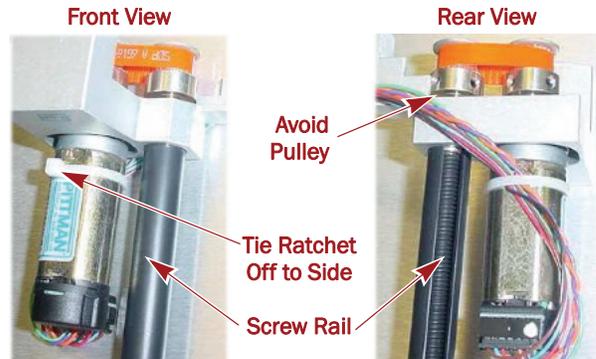


Figure 16. Cable Tie and Cable Positions on Drive Motor

5. Attach the Screw Rail bracket to the **track plate assembly** (Figure 17) on the chassis floor as follows:

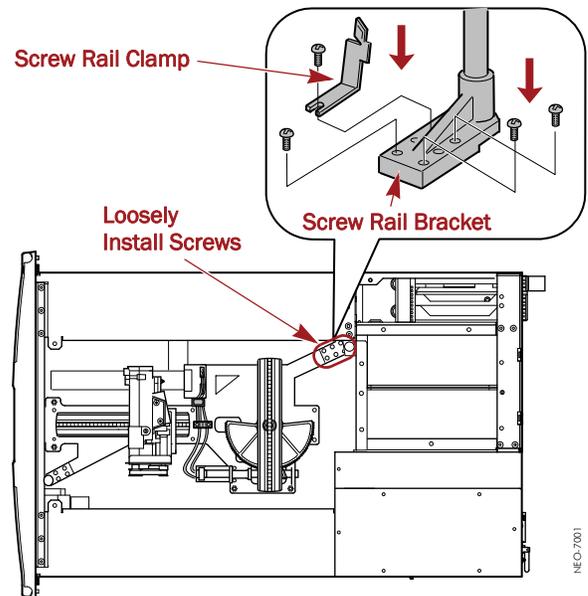
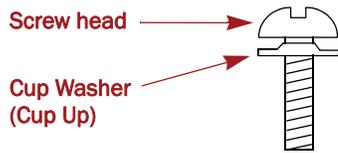


Figure 17. Loosely Install Screw Rail Bracket Screws

- a. Align the Screw Rail bracket holes over the **Track Plate holes and alignment pins**.
- b. Manually lower the **Screw Rail bracket** down onto the track plate by turning the motor gear counterclockwise until resistance is felt.
- c. Reinstall the **Screw Rail clamp** over the rear-left screw hole on the Screw Rail bracket.

- d. Using a new **M3x20mm screw and M3 washer**, secure the clamp to the Screw Rail, tightening the screw until snug and then loosening it **one** turn.  
Be sure the cup washer is positioned correctly with the cup side up against the screwhead (**Figure 18**).

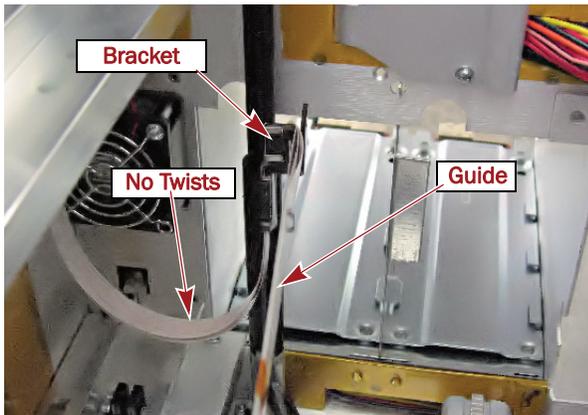


**Figure 18. Screw and Cup Washer Assembly**

- e. Install the remaining **three new M3x20mm screws and M3 washers**, tightening the screws until snug and then loosening them **one** turn.

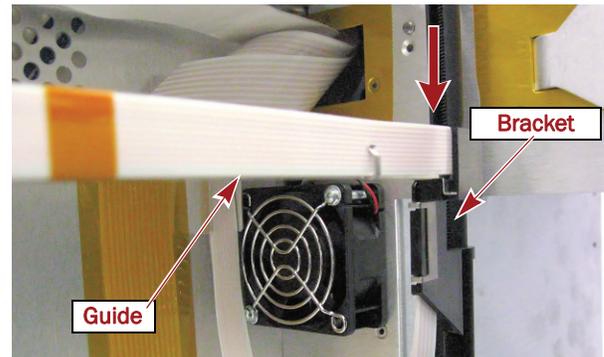
**NOTE:** The screws are tighten during the final unit test.

6. Insert the cable guide onto the new **Z-Axis bracket**:
  - a. Positioning the **flex cable and guide assembly** over the Z-Axis bracket, verify that there are **NO** twists in the **flex cable** between the chassis wall and the bracket (**Figure 19**).



**Figure 19. Flex Cable Position Around Shuttle Spooler**

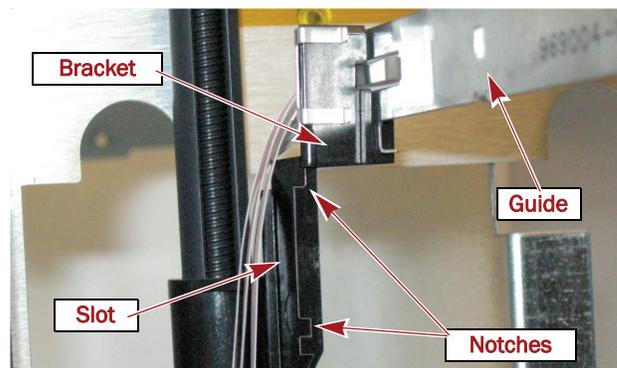
- b. Slide the clip end of the **cable guide** onto the Z-Axis bracket (**Figure 20**).



**Figure 20. Insert Cable Guide onto Z-Axis Bracket**

- c. Attach the retained **clip** onto the bracket to secure the flex cable (**Figure 21**).

Verify that the flex cable is in the appropriate slot and that the clip is positioned in the notches.



**Figure 21. Retaining Clip Notches & Flex Cable Slot**

7. Reinstall the **Fan Cover**:
  - a. Carefully reposition the **Fan Cover** assembly over the opening and move it slightly toward the front to permit the deflector to enter the cavity.
  - b. Reconnect the fan cable to the **backplane cable**.
  - c. Align the **cover** in place.

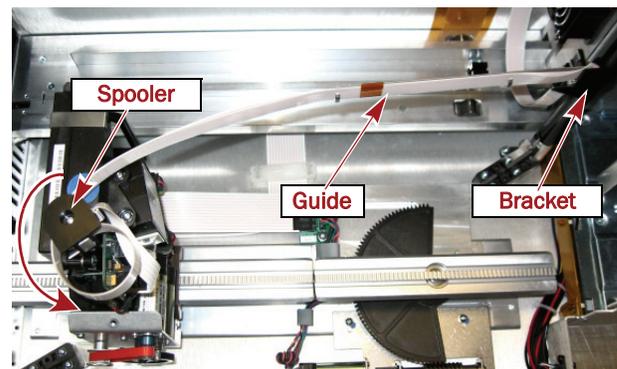
**NOTE:** Verify that all the cables are clear before closing.

  - d. Using the retained **screws**, reattach the cover.

## Power On and Test the Library

### Reinstall the Shuttle

1. Carefully lift the **shuttle** and position it at the open end of the track, checking that there are **NO** twists in the flex cable (**Figure 22**).
- NOTE:** The open side of the shuttle should be on the left.
2. Slide the shuttle onto the **track** making sure the shuttle flex cable wraps around the spooler correctly.
  3. Turn the **motor/track coupler** until the track sections are realigned.



**Figure 22. Flex Cable Position Around Shuttle Spooler**

## Power On Library

Before returning the unit to the rack, verify that it works.

1. For SCSI systems, verify the **terminators** are still in place.
2. Plug in the **power cords**.
3. Turn the power supply **switch** to ON (I).
4. Tap the **GUI** to power on the library.
5. Observe the POST process to verify the installation of the **Z-Axis assemblies**:
  - Watch the **shuttle assembly and track** movement.
  - Make sure that nothing interferes with the track plate assembly through its **full range of motion**.

**NOTE:** If problems occur, contact Overland Storage Technical Support.

## Run Friction Test (Loose Screws)

Test the Z-Axis assemblies to make sure that they operate properly.

1. From the touch-screen GUI, press **Menu > Diagnostics > Vertical Calibration**.
2. Press **Initial Calibration**.  
The library runs 10 cycles and displays the results.
3. Verify that all the demand results are **less than 100**.

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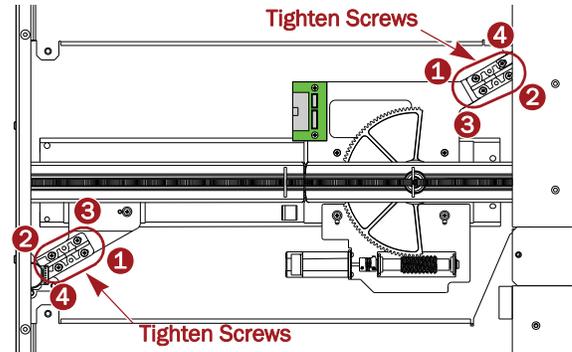
 **IMPORTANT:** If any results are over 100, repeat **Steps 2–3**. If acceptable results are still not attained, contact Overland Technical Support.

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4. Press **Back** three times.
5. Power off the library, turn off the power supplies, and remove the **power cords**.

## Run Friction Test (Tightened Screws)

1. In the order shown in **Figure 23**, tighten the **screws** until just snug.



**Figure 23. Tighten the Z-Axis Screws in This Order**

2. Next, in the same order, tighten the screws to around **6 lbs torque**.
3. Reconnect the **power cords**, turn on the power supplies, and tap the GUI to power on the library.
4. Press **Menu > Diagnostics > Vertical Calibration > Initial Calibration**.
5. Verify that all the demand results are **less than 100**.
6. Press **Final Calibration**.
7. Verify that all the demand results are **less than 100**.

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 **IMPORTANT:** If any results are over 100, power off the unit, loosen the screws, and repeat **Steps 1–7**. If acceptable results are still not attained after several attempts, contact Overland Technical Support.

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8. Press **Back** three times.
9. Power off the library, turn off the power supplies, and remove the **power cords**.

## Reinstall the Library

1. Reinstall the front top cover by inserting the **tabs** into their slots and gently setting the cover into place.
2. Reinstall the **two retained top cover screws**.
3. Using a mechanical lifter (or two people), reinstall the **library** into the rack.
4. Manually open the doors and reinstall the **magazines**.
5. Reinstall any removed **drive assemblies**.
6. Reattach all **external host cables**.
7. Reconnect the **power cords**, turn on the power supplies, and tap the GUI to power on the library.
8. Place the **removed parts** in the **replacement part box** for returning to Overland Storage.

### Additional Help

You can get additional technical support on the Internet at <http://support.overlandstorage.com>, or call 1-877-654-3429 (toll-free U.S. & Canada), +44 (0) 118-9898050 (Europe), or +1 (858) 571-5555 Option 5 (International).