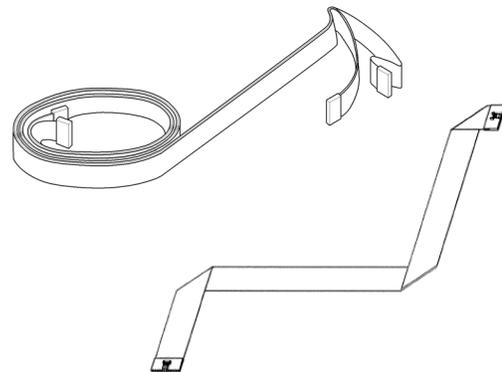# Shuttle & Track Flex Cables Replacement

This document describes how to remove and replace the flex cables for the shuttle and its track assembly inside a NEO 4000e tape library from Overland Storage.

⚠️ **WARNING:** To reduce the risk of electric shock or damage to equipment, always remove any power cords while working with the unit.

⚠️ **AVERTISSEMENT:** Pour réduire le risque de choc électrique ou endommagement de l'équipement, retirez toujours les cordons électriques en travaillant avec l'appareil.

⚠️ **CAUTION:** While working with the unit, observe standard Electrostatic Discharge (ESD) precautions to prevent damage to micro-circuitry or static-sensitive devices.
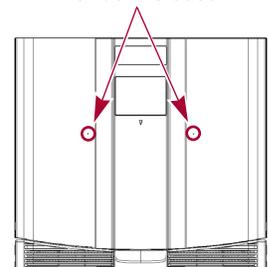
Prepare the Unit

Remove Cartridges

- If the **library** is operational:
  a. Exit the **application software** and, if necessary, stop the software services.
  b. Using the front panel or Web Management Interface, remove any **cartridges** from the drives.
  c. Use the front panel to remove **all** the magazines.
- If the library is **non-operational** (and OFF), the doors can be manually opened by pushing a stiff wire against the mechanical releases behind the front panel.
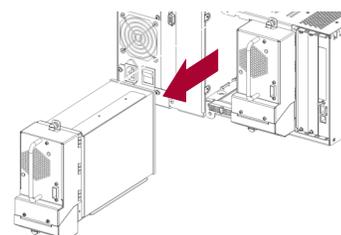
Manual Release

Power Off Library

1. At the **front panel**, press **Power > OK** (at Confirm).
2. Turn the **power supply** switch to OFF (O).
3. Remove the **power cord**.
4. Remove all **external cables**.
   For SCSI drives, leave the terminators attached.
5. If XpressChannel is installed, release it by loosening the **two captive screws** on the back side and, if working on a Master unit, unplugging the **DB-15 cable**.

Remove Drive Assemblies

1. Loosen the captive **thumbscrews** at the top and bottom of the drive assembly.
2. Fully supporting the assembly, pull the handle to remove the **drive assembly**.
3. Label each drive assembly with the **bay number** and place it on its side on an **ESD surface** to prevent the bending of its tabs.
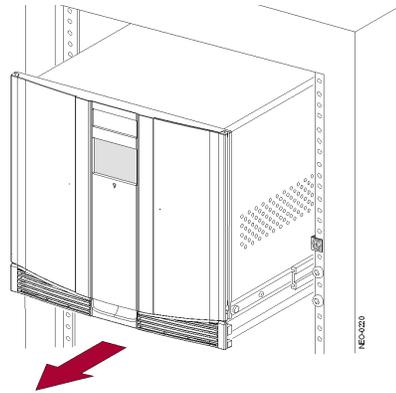
Remove Library from Rack

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

⚠️ **AVERTISSEMENT:** Afin d'éviter des blessures pendant l'installation, il est recommande d'utiliser un monte-charge (ou au moins deux personnes) pour élever ou aligner l'appareil.

Using a mechanical lifter (or two people), remove the **unit** from the rack:

1. Release the **captive screws** inside the doors.
2. Slide **library** out until it stops.
3. Release the **rail catches** on each side and slide the library out onto the lifter.
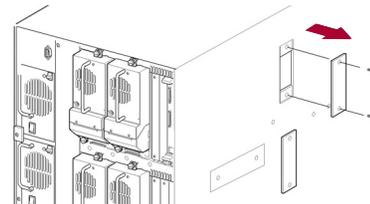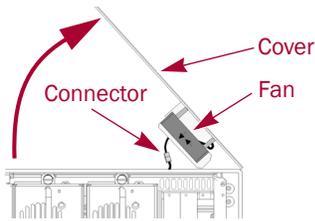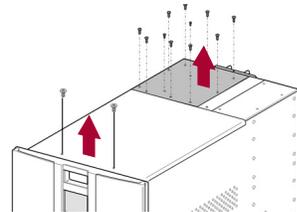4. Place the unit on a secure **ESD surface**.

Remove Covers

1. Remove the **top front cover**:
   a. Remove and retain the **two screws** securing the front cover.
   b. Lift and remove the **front cover,** and set it aside.
2. Remove the **top rear fan cover**:
   a. Remove and retain the **11 screws** that secure the rear fan cover assembly to the library chassis.
   b. Carefully lift the inside edge of the cover and disconnect the **cooling fan connector**.
   c. Lift the rear **fan cover** off and set aside.
      Be sure the fan side is up to prevent damage to it.
3. Remove the **upper card cage access panel** on the side:

   NOTE: This is done to simplify the removal and replacement of the flex cables.

   a. Remove and retain the **two screws** securing the upper card cage access panel.
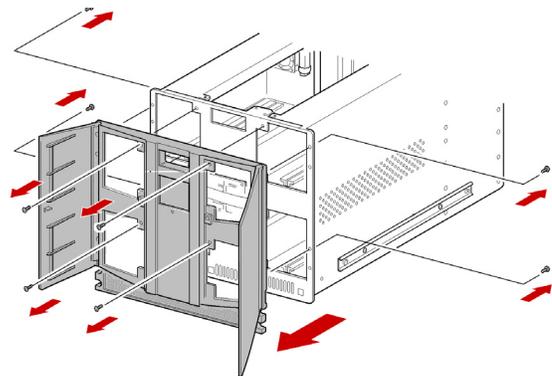   b. Take the **cover** off and set aside.
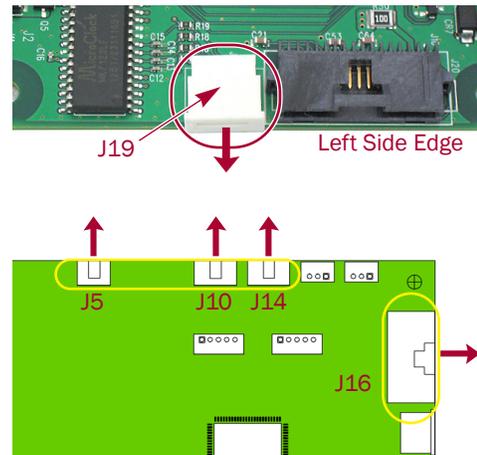
Remove Front Panel

1. Remove the **four screws** on the **back side** of the outer edge of the Front Panel.
2. Manually open the **magazine doors**.
3. Carefully remove the **Front Panel**:
   a. While holding the Front Panel against the chassis, remove the **four screws** inside the doors.

      ➡️ **IMPORTANT:** To prevent damage, continue to hold the front panel without putting strain on the cables.

   b. Carefully pivot the **panel top** away from the chassis
   c. Lift the **panel bottom** out of the alignment holes.
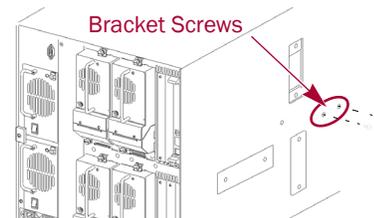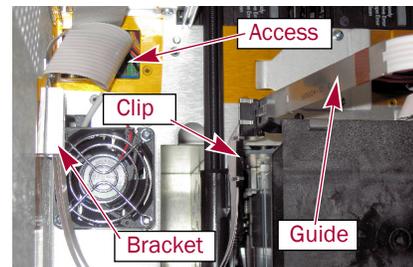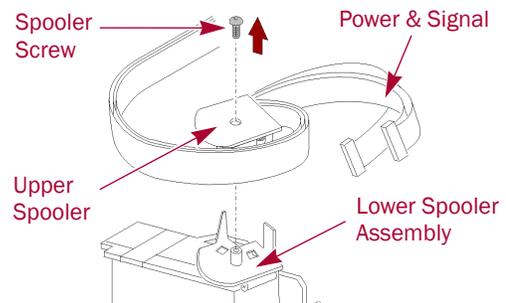   d. Set the **bottom edge** down just in front of the chassis and hold it there to remove the cables.

4. Disconnect the **Front Panel cables** from the Controller card:

   a. Disconnect the touchscreen zero insertion force **flex cable (J19)** by sliding out the connector body to release the cable, and then gently removing the flex cable from the connector.

   b. Disconnect the other **Front Panel cables**:

      • **J5**   Status/Fault LED (black)

      • **J10**   Right Door Latch (black)

      • **J14**   Left Door Latch (black)

      • **J16**   LCD Display (white)

5. Set the Front Panel aside, face down on a **padded** flat surface.

J19   Left Side Edge
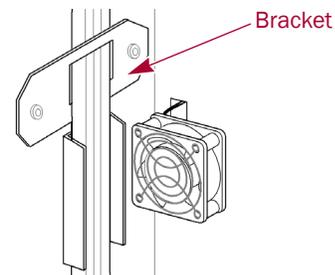
J5   J10   J14   J16

Replace the Shuttle Cable

Remove Old Shuttle Cable

1. Disconnect the **Power and Signal Controller cables** from the Shuttle PCB.

2. Disconnect the flex cable from the **shuttle spooler**:

   a. Remove and retain the screw holding the **spooler top** and remove the top making sure the bottom assembly stays on the shuttle.

   b. Slide the **flex cable** out of the spooler top.

   c. Return the **spooler top** to the shuttle and loosely secure it with the screw.

3. Remove and retain the **clip** holding the flex cable to the rear Z-axis cable bracket.

4. Lift the flex cable out of the Z-axis **cable guide**.

5. Disconnect the flex cable from the **J5** and **J6 connectors** on the Card Cage PWA.

6. Thread the **Shuttle Flex Cable** carefully down the backplane PCB, and out the **access hole** near the midpoint of the library.

7. Remove and retain the two **screws** (outside of the unit to the right of the access panels) that secure the flex cable wall bracket.

8. Remove the **old flex cable** from the wall bracket and set both aside.
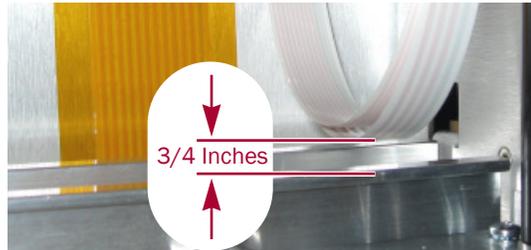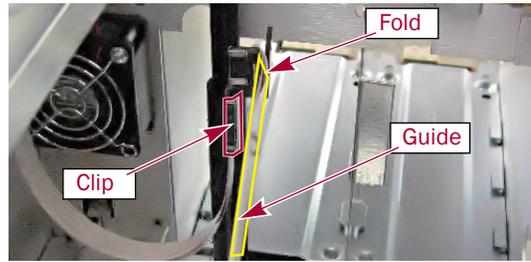

Spooler Screw   Power & Signal

Upper Spooler   Lower Spooler Assembly

Access   Clip   Guide   Bracket

Bracket Screws

Install New Shuttle Cable

1. Slide the **wall bracket** onto the flex cable.

2. Thread the end of the **new Shuttle Flex Cable** without the polycarbonate stiffener through the access hole behind the card cages.

3. Carefully work the cable up the backplane (using the side access panel) and connect it to the **J5 and J6 connectors** on the upper backplane PCB.

Bracket

4. Install the Shuttle Cable in the **wall bracket**:
   a. With the flex cable positioned correctly, loosely reinstall the **two retained screws** that hold the wall bracket. Do not tighten yet.
   b. Verify that the **new cable** moves freely in the bracket so that the loop size can be adjusted.
5. Insert the cable in the **Z-axis cable guide**:
   a. Position the fold at the top of the **bracket** where the guide attaches.
   b. Insert the flex cable beyond the fold into the **guide**.
   c. Attach the retained **clip** just below the bracket to secure the flex cable.
6. Configure the proper flex cable **loop size**:
   a. From the top of the track, slide the flex cable in the wall bracket until it hangs 3/4 inches above the track.
   b. Tighten the **wall bracket screws**.
7. Install the flex cable in the **shuttle spooler top**:

   ➡ IMPORTANT: To provide the correct amount of strain relief on the flex cable, the end of the polycarbonate stiffener must be EVEN with the edge of the spooler top rear slot.

   a. Remove and retain the spooler **screw**.
   b. Remove the **spooler top** and mount the flex cable in it.
   This is done by simultaneously sliding the side with the polycarbonate stiffener into the rear spool slot and the side with the two connections in the front spool slot.
   c. Fully extend the long end of the **cable and spooler** assembly, verifying that the cable is not twisted.
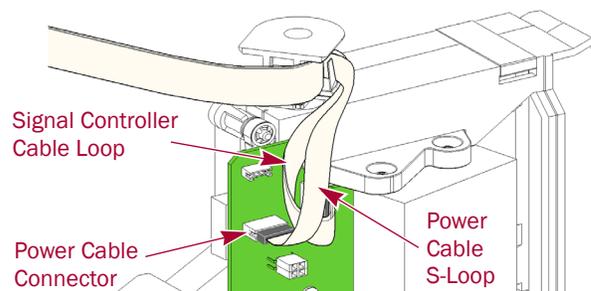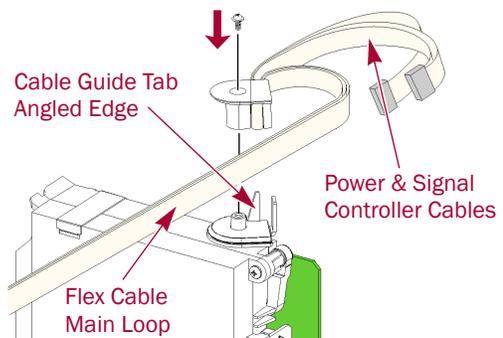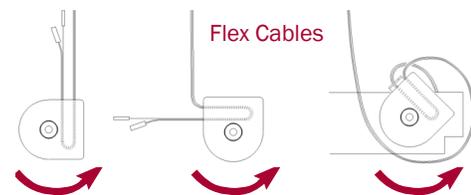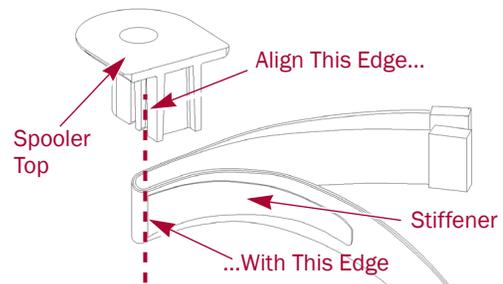   d. Rotate the spooler and cable **counter-clockwise** one full turn.

   ⚠ CAUTION: If the flex cable is not looped properly as shown, the shuttle will jam when operated.

   e. Align the wrapped lower spooler assembly over and slide it onto the shuttle **mounting post**.
   f. Verify that both the Signal Controller and the Power cables are threaded **outside** of the angled edge of the cable guide tab.
8. Using the **retained screw**, secure the spooler top to the shuttle.

   NOTE: To align the screw to the plastic mounting post threads, make a half turn counter-clockwise before tightening the screw.

9. Attach the flex cable to the **shuttle PCB**:
   a. Without bending the cable, carefully loop and insert the **Power cable** into the Power cable connector.
   b. Without bending the cable, carefully loop and insert the **Signal Controller cable** into the Signal Controller cable connector.
   c. Position the Signal Controller cable **underneath the Power cable** to prevent damage.

   ⚠ CAUTION: Failure to secure the Shuttle Controller cable can result in damage to the cable.

Fold
Guide
Clip

3/4 Inches

Spooler Top
Align This Edge...
Stiffener
...With This Edge

Flex Cables

Cable Guide Tab Angled Edge
Power & Signal Controller Cables
Flex Cable Main Loop

Signal Controller Cable Loop
Power Cable Connector
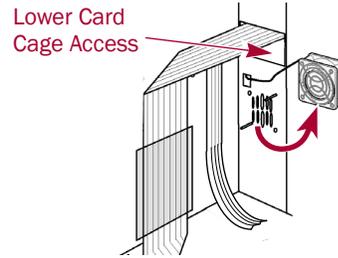Power Cable S-Loop

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Replace the Track Cable

Move Lower Card Cage Fan

NOTE: Removal of the lower card cage cooling fan from its mounting is necessary to access to the rear mounting screws of the lower left magazine track. The fan does not need to be removed from the library or disconnected from the card cage backplane.

1. Remove and retain the **two screws** that secure the finger guard and fan to the standoffs.

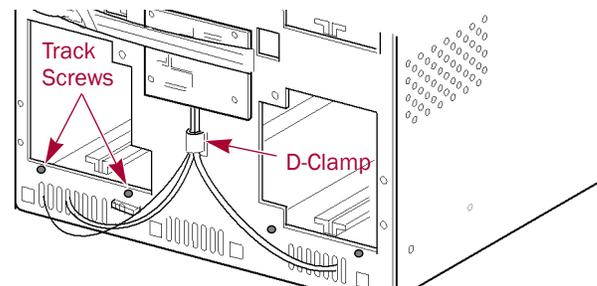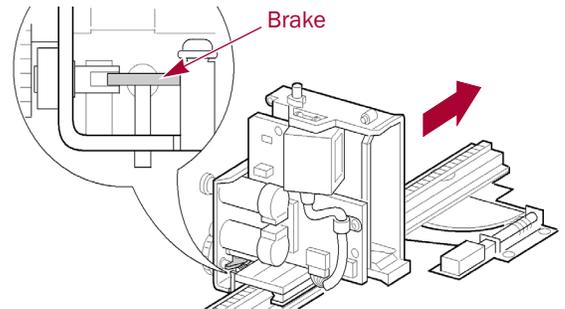2. Slide the **fan** off the mounting standoffs and move it off to the side.

Move Lower Left Magazine Track

Moving the lower left track allows the replacement flex cable to be attached to the inner wall of the library chassis:

1. With one hand supporting the top of the shuttle, grasp the shuttle base and carefully **slide the shuttle** to the rear of the track to provide more room.
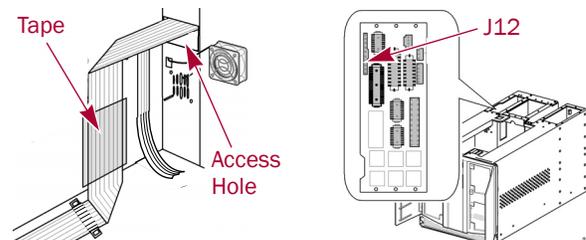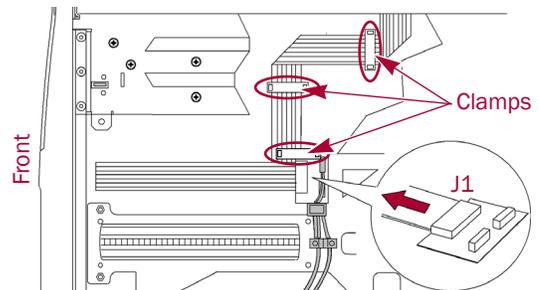
   On older models, you need to release the brake.

2. Remove the **four screws and washer sets** that secure the lower left Magazine Track to the chassis.

   Two are located outside on the front of the chassis and two are at the top rear of the track below the fan.

3. Release the left track cables from the **center D-clamp** and reposition them to provide slack.

4. Carefully lift the **track rear** up and over to the right.

   Position it so it is clear of the Track Flex Cable and no stress is on any of its cables.
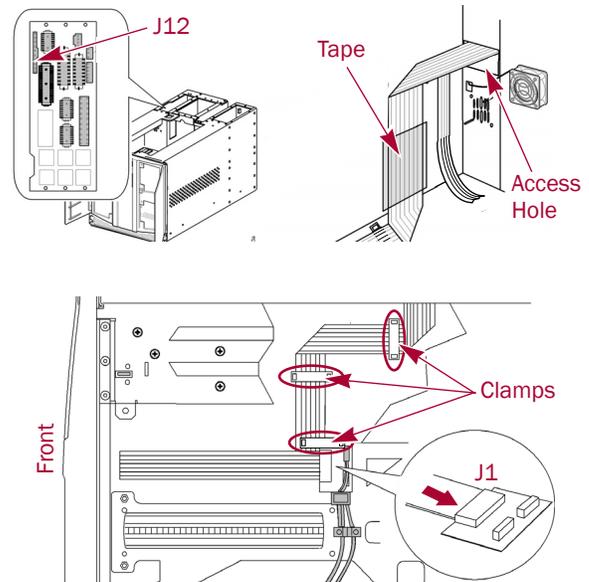
Remove the Old Cable

1. Release the teflon **cable clamp tops** that secure the Track Flex Cable to the floor.

2. Disconnect the flex cable from **J1 connector** at the Track Plate base.

3. Remove the **Kapton tape** holding the flex cable to the wall.

4. Disconnect the flex cable from the **J12 connector** on Upper Card Cage Backplane PCB.

5. Thread the **Track Flex Cable** carefully down the backplane PCB, through the opening near the midpoint of the library chassis, and remove it from the library.
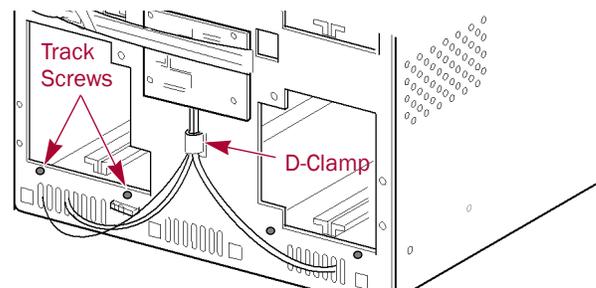
Install the New Cable

1. Remove the **shipping tape** from the folded areas of the replacement flex cable.

2. Thread the **flex cable end** with the fold closest to the plug through the access hole behind the card cages.

3. Carefully work the flex cable up the backplane (using the side access panel) and connect it to the **J12 connector** on the upper backplane PCB.

4. Secure the flex cable to the **chassis wall**:

   a. **Clean** both the chassis wall and the area of the flex cable to be attached to the side of the chassis.

   b. Attach the **double-sided tape** to the back side of the flex cable.

   c. Align the **top edge** of the flex cable fold with the top of the access hole, and affix the cable to the chassis wall.

   d. Place the supplied 2-inch **Kapton tape** over the center of the flex cable attached to the wall.

   Be sure to smooth the tape to ensure against air bubbles and lifted edges.

5. Reinstall the **teflon cable holders** that secure the flex cable to the library floor.

6. Reconnect the flex cable at the **J1 connector** on the shuttle base.
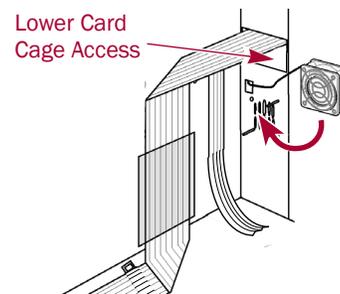
Reinstall the Magazine Track

1. Loosely install the **four screw**s (two front and two rear) that secure the lower left Magazine Track to the chassis.

2. Tighten the **front track screws** first.

3. Then tighten the **two rear screws**.

4. Reposition the **cables** from the left track back in the D-clamp on the chassis front.

Reinstall Lower Card Cage Fan

Inside the chassis, reattach the **Lower Card Cage Cooling Fan** to its mounting above the lower left track:
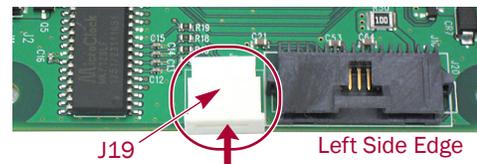
1. Slide the **fan** back onto the mounting standoffs.

2. Using the **two retained screws**, secure the finger guard and fan to the standoffs.

Reinstall Front Panel

1. Position the **bottom edge** of the Front Panel next to the bottom edge of the chassis.
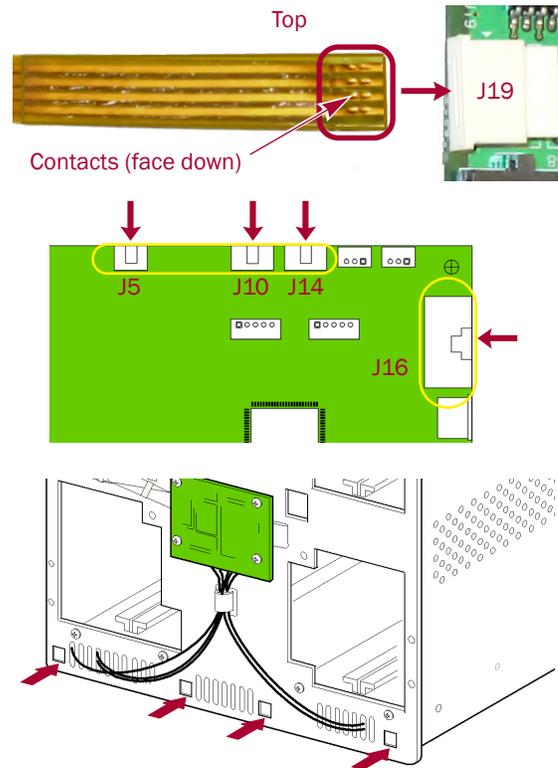
   IMPORTANT: To prevent damage, continue to hold the front panel in place without putting strain on the cables as you connect them to the Controller card.

2. Reconnect the zero insertion force **flex cable** at **J19** by sliding out the connector body, inserting the flex cable, and sliding the connector body back in to relock it.

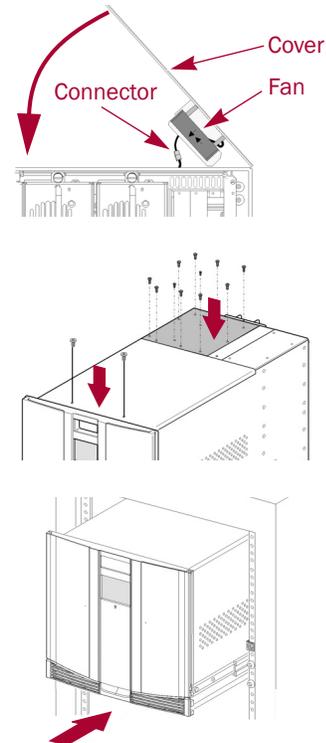⚠ CAUTION: The contacts on the flex cable must face down toward the card.

3. Reconnect the other **Front Panel cables**:
   - **J5**   Status/Fault LED (black)
   - **J10**   Right Door Latch (black)
   - **J14**   Left Door Latch (black)
   - **J16**   LCD Display (white)

4. Secure the **Front Panel**:
   a. Carefully lift and insert the Front Panel bottom **four alignment tabs** into the chassis bottom.
   b. Carefully pivot the **top** of the Front Panel up to the chassis.
   c. While holding the Front Panel against the chassis, use the manual door releases to open the doors and install the **four new M4x10mm screws** inside to secure the panel.
   d. Install the **four new M3x8mm screws** to the **back side** of the outer edge of the Front Panel.
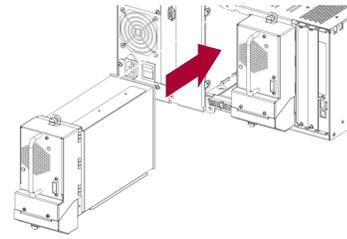
Reactivate the Library

Reinstall Covers and Replace Library in Rack

1. Using the retained two screws, secure the **upper card cage access panel** back on the side of the library.

2. Reinstall the **top rear fan cover**:
   a. Carefully align the cover against the **outside edge** with the fan next to that edge.
   b. Reconnect the **fan connector** back together.
   c. Using the retained **11 screws**, secure the rear fan cover assembly to the library chassis.

3. Reinstall the **top front cover**:
   a. Slide the **front cover tabs** into their slots and gently set the cover into place.
   b. Using the retained **two screws**, secure the front cover.

4. Using a mechanical lifter (or two people), insert the **library** into the rack:
   a. Extend the **rack rails**.
   b. Align the **inner rails** on the library with the rack rails and insert the library into those rails.
   c. Slide the **library** into the rack until it stops.
   d. Release the **rail catches** and slide the library all the way into the rack.
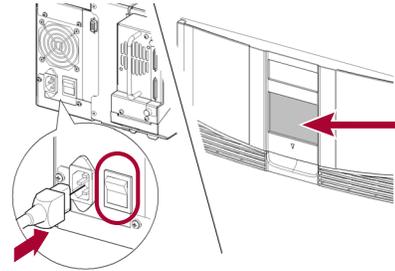
Reinstall Magazines and Drives

1. Reinstall the **magazines** into the same positions.
2. Using the attached labels, reinstall the **drive assemblies** in the same bay positions.
3. If used, reconnect the **XpressChannel**.
4. Reconnect the **external cables**.
5. For SCSI systems, verify the **terminators** are still in place.
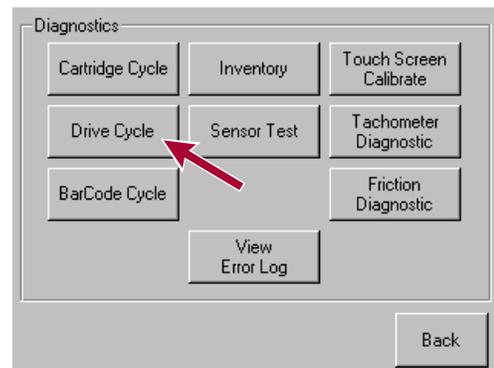
Power On the Library

1. Plug in all the **power cords**.
2. Turn all the power supply **switches** to ON (|).
3. Press the **touchscreen** on the front of the library module to power the unit ON.
4. Observe the POST process to verify the **shuttle cable** installation:
   - Watch the **shuttle assembly and track** movement.
   - Make sure that nothing interferes with the cable assembly through its **full range of motion**.

Run a Drive Cycle Diagnostic

Run the library Drive Cycle diagnostics to test the library's operational mechanisms. The diagnostic randomly fetches cartridges from slots and inserts them into the drives.

1. Verify that there is **at least one more cartridge** than the total number of drives (# drives+1) in the library.
2. From the touch-screen GUI, press **Menu** > **Diagnostics**.
3. From the Diagnostics screen, press **Drive Cycle**.
4. Press **Start** and let it run at least five minutes.
5. When the diagnostic is done, check the **error status**.

   If there are **no errors**, the library is ready to use.

> IMPORTANT: If errors occur, note them and contact Overland Storage Technical Support.

Return Old Parts to Overland

1. Place the **old parts** in the anti-static bags and put them in the replacement part's box.
2. Use an RMA to return the part to **Overland Storage**.

   For return shipping details and RMA number, go to:
   http://docs.overlandstorage.com/return-instructions