StorageTek StreamLine™

SL8500 Modular Library System

Replaceable Parts Catalog

PN 96139

Revision F

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Revision F (July 2007)

This edition contains 354 pages. See the **"Summary of Changes" on page 5** for the revision history and summary of changes made to this publication.

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Summary of Changes

EC	Date	Revision	Description
111941	January 2005	A	Initial Release
111965	May 2005	B	See this edition for details.
114145	May 2006	C	See this edition for details.
114156	July 2006	D	See this edition for details.
114161	August 2006	E	See this edition for details.
114193	May 2007	F	**Part Identifier:** Corrected illustration of the Fibre Channel coupler for vendor drives (see **page 36**). **Part Description:** Noted two types of brackets for the optional operator panel. Older, pre-RoHS = 3138415xx (screws attach on sides); new, RoHS = 4196179xx (screws attach from rear). See **page 77**. **Printed Wire Assemblies:** Revised part number for HBD card (see **page 86**).

EC	Date	Revision	Description
114193	May 2007	F	**Remove and Replace:** Noted two types of brackets for the optional operator panel. Older, pre-RoHS = 3138415xx (screws attach on sides); new, RoHS = 4196179xx (screws attach from rear). See **page 240**. Revised replacement procedure for SDLT drives to note that you must use the second drive mounting hole to align with the STLK/SDLT drive tray slot (see **“Replacement—SDLT Drives” on page 298**). Added removal and replacement procedures for DLT-S4 tape drives (see **“Drives—DLT-S4 Drive” on page 300**). The procedure for IBM LTO Gen 4 drives is the same as for Gen 3 drives.

About this Catalog

The Replaceable Parts Catalog (RPC) combines part location and part number information with removal and replacement procedures in an interactive environment. With a click of your mouse, you can locate a part using part location images, then click on the name of that part to see its image, part number, description, and attaching hardware. If the part has a removal and replacement procedure, another click on a button will reveal that information as well.

Parts in the **Part Identifier** section are of two types:

- If additional information is supplied for the part (for example, attaching hardware), a click on the illustration or part name will link you to the Part Description section.
- If the illustrated part does *not* require additional hardware, the part number is supplied under the illustration; there are no removal and replacement procedures supplied for these parts. These parts are generally *not* stocked but are considered orderable.

Viewing

This catalog is designed to open in full screen for ease of viewing. If you wish to switch to a partial screen, press the “Escape” key on your computer. To enlarge a partial screen, click the ❑ symbol (“maximize”) in the upper right of the window.

Navigation Bar

To link to the various modules within this catalog, a navigation bar is supplied at the top of each page. Clicking the name of the module will link you to that section.

Other links (or buttons or icons) are also supplied on the navigation bar. They are:

- CRC—if you are connected to the internet while using this catalog, this button will open your browser to the Customer Resource Center Web page.
- Letter/envelope button—click this to forward an e-mail comment concerning this catalog.
- Printer button—click this to print pages of this catalog to your local printer. This procedure is supplied below.
- Left arrow button—click this to go to the previous *page (within the same section*).
- Circular arrow—click this to go to the previous *view* (the previous page you were viewing, which may be within another section).
- Right arrow button—click this to go to the next *page (within the same section*).
- The “X” button—click this to exit the RPC.

Print Option

This RPC is designed for viewing on a personal computer, but you do have the option to print individual pages.

To print individual pages:

1. Determine the pages you wish to print.
2. Click the printer icon at the top of the page.
3. Select a printer for your output.
4. Enter the page numbers.

Modules

A description of the modules contained within this RPC is supplied in the sections below.

Location Module

The Location module contains images and terms for the parts; it also illustrates where they are located on the product. These part terms are interactive and clicking them takes you to the part identifier page for the selected part's information.

Identifier Module

The Identifier module contains an image of each part. A click on the illustration or identifier text will link you to the Part Description Module if there are additional parts; if no additional parts are required, copy the part number to order it.

Description Module

Click the part listed in the Part Description Table of Contents and you will link to the data for that part: a photograph of the part, part number, description, and attaching hardware. From this module, you have the option of returning to the part's location image or, if it has one available, going to its removal and replacement procedure.

PWA Module

This module lists and illustrates the printed wire assemblies that are replaceable in the SL8500 library. A brief description of their function is supplied, with links to their locations and removal and replacement procedures.

Cables

This module describes and lists cables that are replaceable within the SL8500 library.

Removal and Replacement Module

The Removal and Replacement module contains step-by-step instructions showing how selected parts are removed and replaced. Not all parts on the FRU and spares lists have removal and replacement procedures.

From this module, you can go to the part location image or part information page for the selected part. Many removal and replacement procedures require that you perform checkout procedures after the part is replaced. A link is provided after completion of the part replacement that will take you to the checkout procedure for that component.

FRU/Spare Checkout Procedures Module

The FRU/Spare Checkout Procedures module contains procedures for verifying the operation of certain FRUs and spares after replacement.

Safety

This section contains common practices concerning electrical safety, ergonomics, fiber optics, and electrostatic discharge.

Safety Precautions

WARNING: *Potential injury:* On-the-job safety is important; therefore, observe the following safety precautions while you are engaging in any maintenance activity. Failing to follow these precautions could result in serious injury.

- Remove all conductive jewelry, such as watches and rings, before you service powered-on equipment.
- Avoid electrical shock. Be careful when you work near power connectors and supplies.
- Power-off the equipment that is being serviced before you remove a FRU or other component. Remember that dangerous voltages could still be present.
- Ground all test equipment and power tools.
- Lift objects properly; read the information in **“Lifting Techniques.”**
- Enforce good housekeeping practices to help prevent fire and accidents.

Note: Important things to investigate and to be aware of include the use of Halon® gas, under-the-floor smoke detectors, and cables to other equipment installed nearby.

Lifting Techniques

Lifting, regardless of how much or how little, can create serious back stress. If you follow these guidelines, you can reduce the risk of back injury:

- Do not twist your body to pick up something or to put it down. Twisting puts extreme pressure on your back, especially when you lift or carry objects. Instead of twisting, make the task two separate moves; first lift, and then use your feet to turn your body.
- Plan the lift: first examine the object and then determine how it will be lifted and where it will be placed.
- Choose the appropriate lifting technique. Examine the weight, size, location, frequency, and direction of the lift. Plan to avoid awkward postures, and determine if material-handling aids are needed.
- Place your feet shoulder-width apart, and place one foot a little behind the other. Keep your back straight because even light loads can significantly increase pressure on your spine when you lean forward.
- Whenever you can, grip the load with your whole hand, and use two hands.
- Carry objects at elbow height and close to your body. The farther away you hold an object, the more force it puts on your lower back.
- Lift with your legs instead of your back. Leg muscles are some of the strongest in the body. When you squat and lift with your legs, you can lift more weight safely.

- Alternate lifting tasks with tasks that are less stressful to the same muscles. This technique ensures that your muscles have some recovery time.

Shoulder, Elbow, Wrist, and Hand Safety

Follow these guidelines to minimize the possibility of injury to your shoulders, elbows, wrists, and hands.

- Work within your safety zone—the area between shoulder level and knuckle level of your lowered hands. You face less chance of injury when you work or lift in this area.
- Keep your elbows bent to keep loads close to your body and to decrease the amount of force necessary to do the job. If you use this posture, you will put less weight and pressure on your shoulder.
- Be sure to keep your wrists straight. Avoid bending, extending, or twisting your wrists for long periods of time.
- Do not use a pinch grip to lift large or heavy loads because the way you lift also can affect the tendons in your hand. When you grasp an object between your thumb and fingers, you put a lot of tension on hand and wrist tendons. Use both hands—use one for a while, and then use the other—to give them rest.

Fiber-optic Safety

WARNING: *Eye hazard*. Never look directly into a fiber-optic cable, a fiber-optic connector, or a laser transceiver module. Hazardous conditions might exist from laser power levels that are capable of causing injury to the eye.

Be especially careful when using optical instruments with this equipment. Such instruments might increase the likelihood of eye injury.

The laser transceivers in fiber-optic equipment can pose dangers to personal safety. Ensure that anyone who works with this Sun StorageTek equipment understands these dangers and follows safety procedures. Ensure that the optical ports of every laser transceiver module are terminated with an optical connector, a dust plug, or a cover.

Each fiber-optic interface in this Sun StorageTek Fibre Channel equipment contains a laser transceiver that is a Class 1 Laser Product. Each laser transceiver has an output of less than 70 µW. Sun StorageTek's Class 1 Laser Products comply with EN60825-1:1994+A1+A2 and with sections 21 CFR 1040.10 and 1040.11 of the Food and Drug Administration (FDA) regulations.

WARNING: Use of controls or adjustment or performance of procedures other than those specified herein might result in hazardous radiation exposure.

The following translations are for users in Finland and Sweden who wish to identify laser safety and classification:

CLASS 1 LASER
LUOKAN 1 LASERLAITE
KLASSE 1 LASER APPARAT

Laser Product Label

In accordance with safety regulations, a label on each Sun StorageTek Fibre Channel product identifies the laser class of the product and the place and date of the manufacturer. The label appears on top of a Fibre Channel tape drive and near the Fibre Channel connectors on a Fibre Channel tape library. A copy of the label is shown here:

CLASS 1 LASER PRODUCT
LASER KLASSE 1
APPAREIL A LASER DE CLASSE 1
COMPLIES WITH 21 CFR 1040.10 AND 1040.11

Fiber-optic Cable Handling

Observe these precautions when you handle fiber-optic cables:

- Do not coil the cable to less than 96 mm (3.75 in.) in diameter.
- Do not bend the cable to less than 12 mm (0.5 in.) in radius. It is most important that a cable's bend radius be *no less* than 20 times the diameter of the cable.
- Do not pull on the cables; carefully place them into position.
- Do not grasp the cables with pliers, grippers, or side cutters; do not attach pulling devices to the cables or connectors.
- Keep cables away from sharp edges or sharp protrusions that could cut or wear through the cable; make sure that cutouts in the equipment have protective edging.
- Protect the cable from extreme temperature conditions.
- Install the connector's protective cover whenever the connector is not connected.

Electrostatic Discharge Damage Prevention

Before you touch any internal components in the library, including drives, you must take precautions against electrostatic discharge (ESD).

CAUTION: *Components are sensitive to static electricity:* Even a small electrostatic discharge can damage an electrical component that is inside the library. A damaged component might not fail immediately, but over time, it will become worse and might eventually cause an “intermittent” problem. Be sure that you touch an *unpainted* metal surface of the library before you reach inside the library or touch the drives or optional interface equipment.

Before you touch any internal components:

1. With your finger, touch an *unpainted* metal surface of the library. In some libraries, you can touch the library’s frame. In other libraries, you might have to touch a bolt on the wall or on the door frame.
2. Keep your body movement to a minimum as you touch the drives or the library components.

Note: Anti-static wrist straps that have clip-on ends are commercially available.

Library Safety

It is essential that safety procedures are followed. Be sure you are familiar with the *all* precautions in this section before you attempt to enter or service a component within the library.

SL8500 Door Interlocks

Door safety interlocks (located within each door frame of both front doors of the customer interface module) are provided on the tape library. To open either door, an access key is required.

Door safety interlocks are redundant and constantly monitored by the controller card (HBC). During normal operation, if a front door is opened, the HBN card (located at the front, bottom of the machine) detects an Emergency Robotics Stop condition and immediately disables 48 VDC rail voltage. This prevents motors from operating while a library door is open. If the library operation is stopped by varying or modifying it offline, opening either front door will also disconnect DC voltages to the rails and the front power bus (at the elevator and turntable assembly).

When two libraries are connected by a pass-thru port (PTP):

- Opening an access door to either library automatically suspends pass-thru operations.
- Operations stop within the library with the open door
- Operations continue within the other library (if all doors are closed).

SL8500 Servo Power Interrupt

An additional safety feature is the HBC card-generated servo power interrupt (SPI). If a library motor is determined to be out-of-range by the HBC card, the processor card will generate an SPI to turn off drive voltage to the faulty motor. This prevents a servo runaway condition until the cause of the problem can be determined.

Smoke Detection

The smoke detector is located in the upper right section of the Drive and Electronics module, referenced from the rear of the machine.

If smoke is detected, the library performs an emergency power-off procedure, removing all (AC and DC) power from the library.

Note: Replacement of the smoke detector is an annual preventive maintenance item. Replace *only* the detector, *not* its base.

Emergency Robotics Stop Switches

If an immediate power-off of the robotics is required, there are two Emergency Robotics Stop switches: one underneath a spring-loaded cover on the front operator key panel and a second one in the left aisle, next to the tape drive modules. Pressing either switch causes an immediate power-off of DC power to the HandBots. Pressing the front key panel switch again resets the switch. To reset the interior switch, either press it again (older switches) or twist it clockwise (newer switches) until the button pops out.

Mechanical Door Releases

Both locks/handles on the front doors of the library contain mechanical releases (painted yellow) that, when pushed, release the lock and open the door. The mechanical door releases are an additional safeguard in case a person is inside the library and a front door is closed and locked.

Library Entry—Maintenance Area

WARNING: *Personal injury:* Before you enter a library, read the following safety information.

Two maintenance keys are supplied in the installation kit. *These keys are required for maintenance access into a library and are not available to operators.*

To activate the optional service safety door, you must:

- Determine if you wish to enter the left or right side:
  - If the left, have the operator vary the left elevator offline to StreamLine Library Console
  - if the right, have the operator vary the right elevator offline to StreamLine Library Console and the CAPs offline to HCS/ACSLS.
- Insert a maintenance key into the side required
- Turn the key clockwise

Inserting a maintenance key and turning it clockwise will automatically engage the optional service safety door (if installed); the door will move to the side that was requested, dividing the operational section of the library from the maintenance section in the front of the

machine. This allows you to repair a defective HandBot, CAP, or elevator without interrupting operations in the rest of the library.

CAUTION: *Shock hazard:* When repairing or replacing a component within the safety area, be aware that *rail voltage is still active.*

Service Safety Door Interlocks

The service safety door slides to the left or right, depending on which maintenance key switch is activated. The service safety door also has dual-switch interlocks. These switches are located behind the service safety door track.

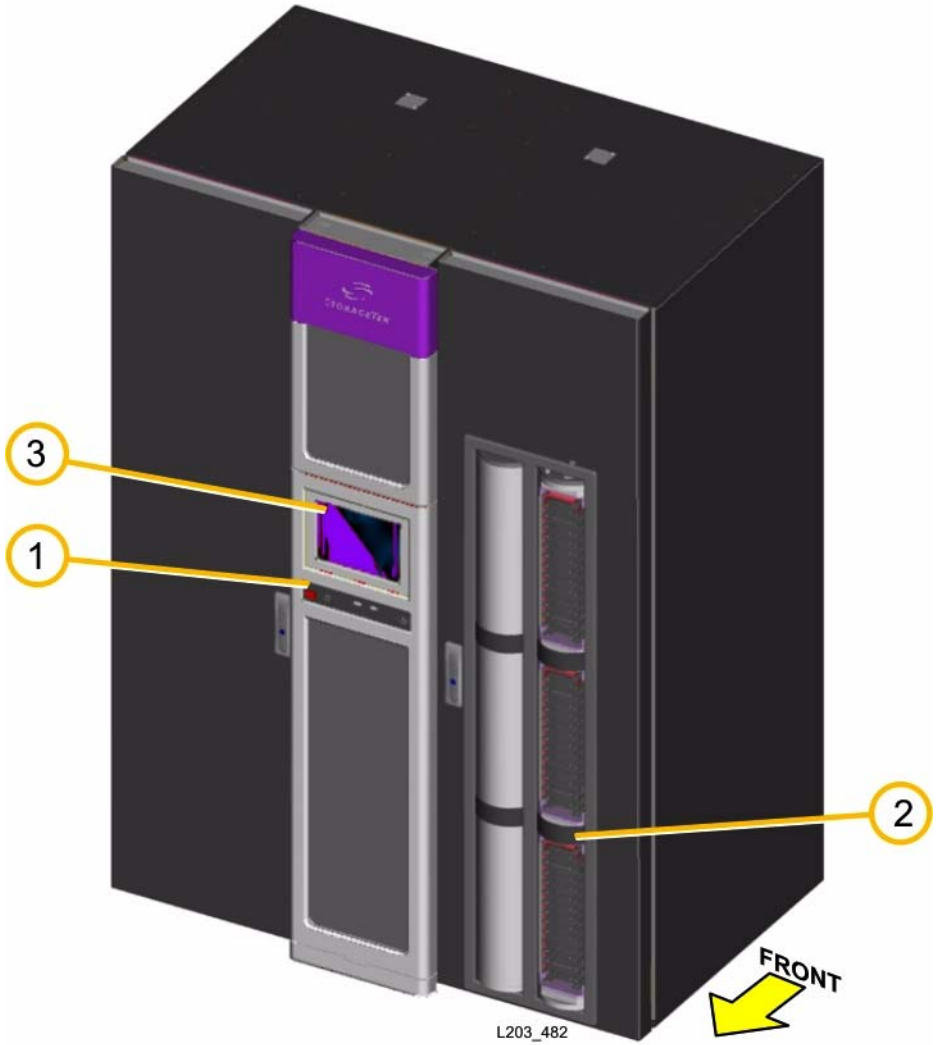
Interior Lighting

The interior of the library is always illuminated by white LEDs (located on HBLW circuit cards attached to the ceiling). After you exit the library and close and lock the front doors, yellow LEDs (located on the HBLY circuit cards attached to the ceiling in the front, maintenance area) will flash for approximately 10 seconds. This alerts anyone who may still be inside the library that library startup is about to begin.

Module Locations

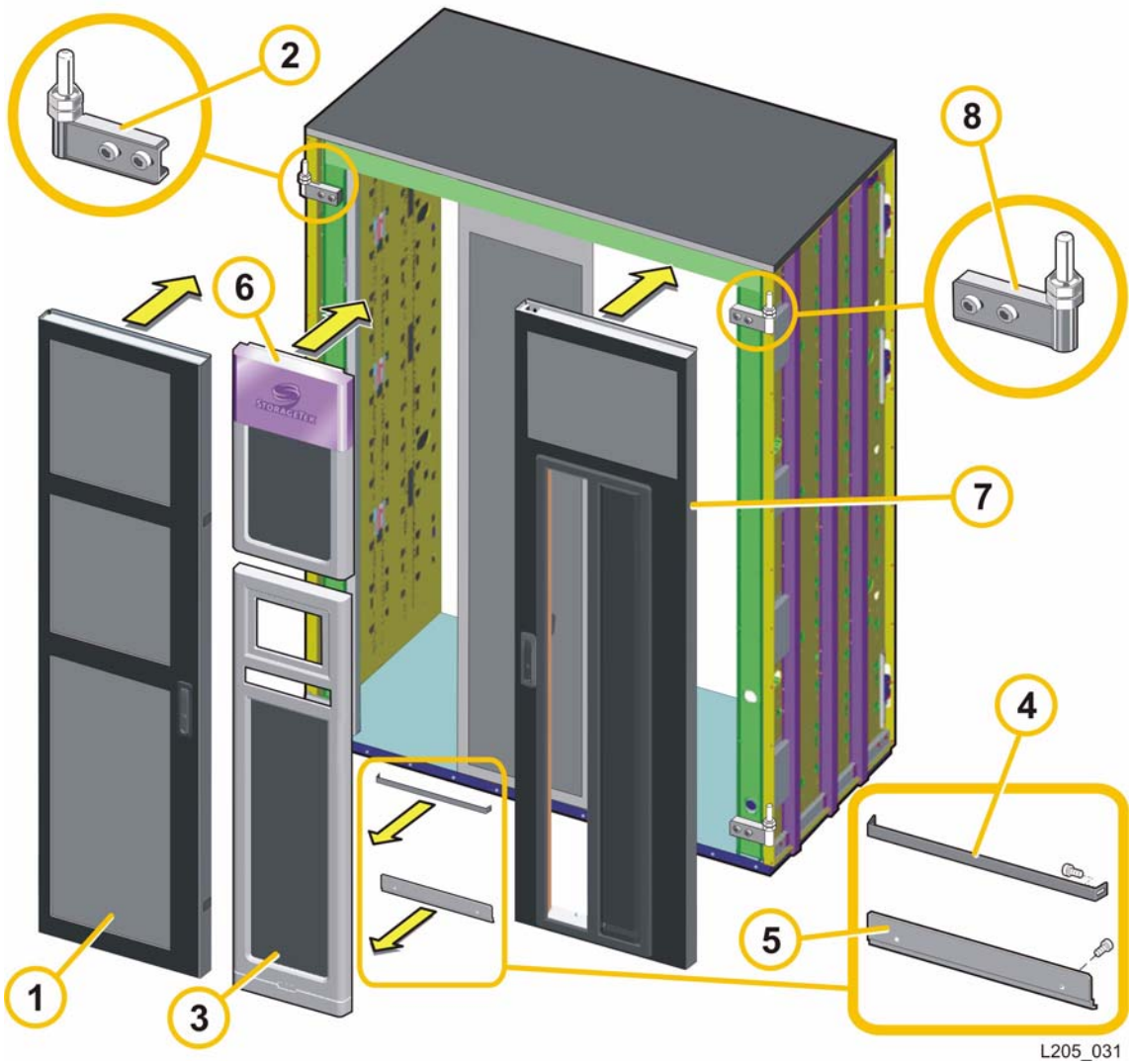
1. Storage Expansion Module
2. Drive and Electronics Module (1 of 2)
3. Robotics Interface Module
4. Customer Interface Module (1 of 5)

Customer Interface Module (1 of 5)



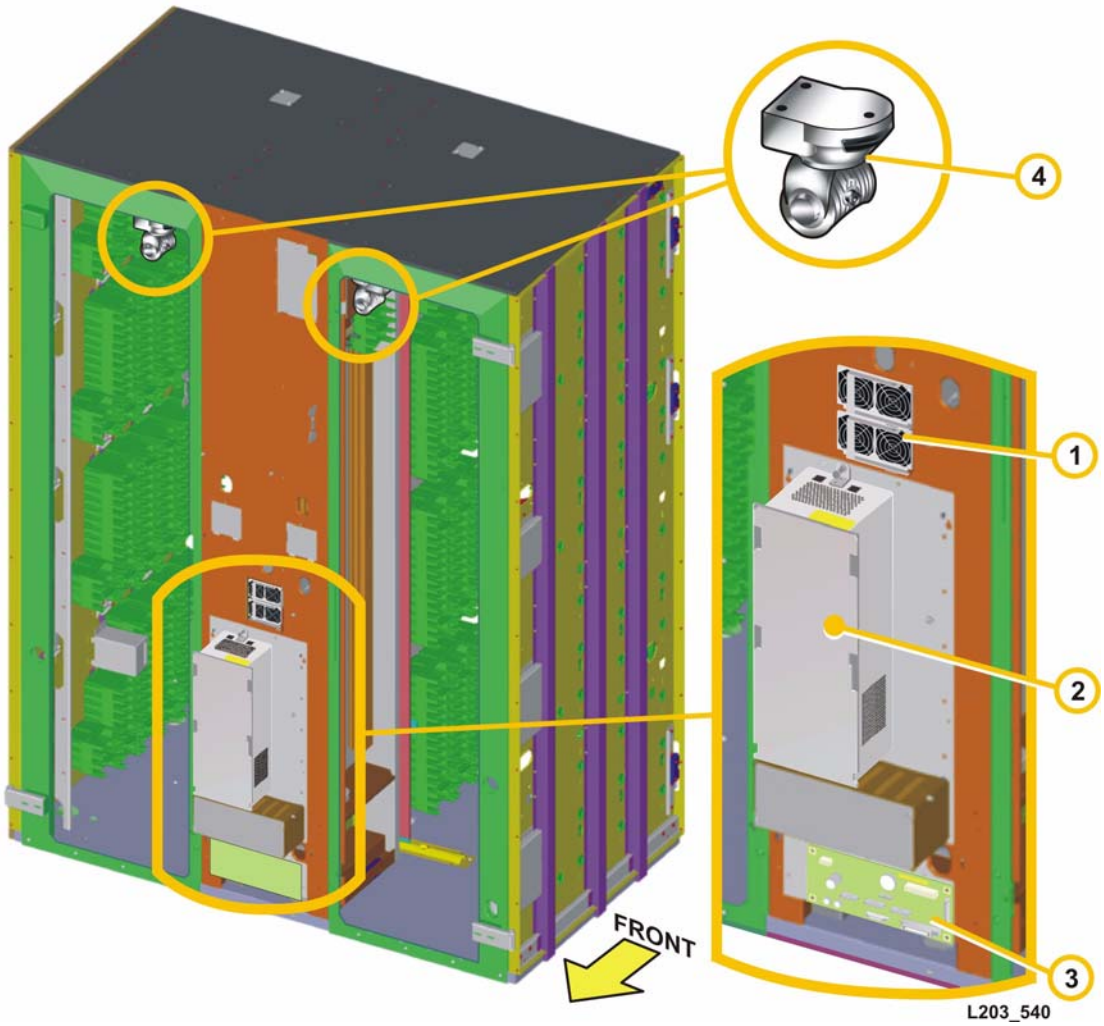
1. Keypad Assembly
2. Cartridge Access Port (CAP) Assembly
3. Operator Panel

Customer Interface Module (2 of 5)



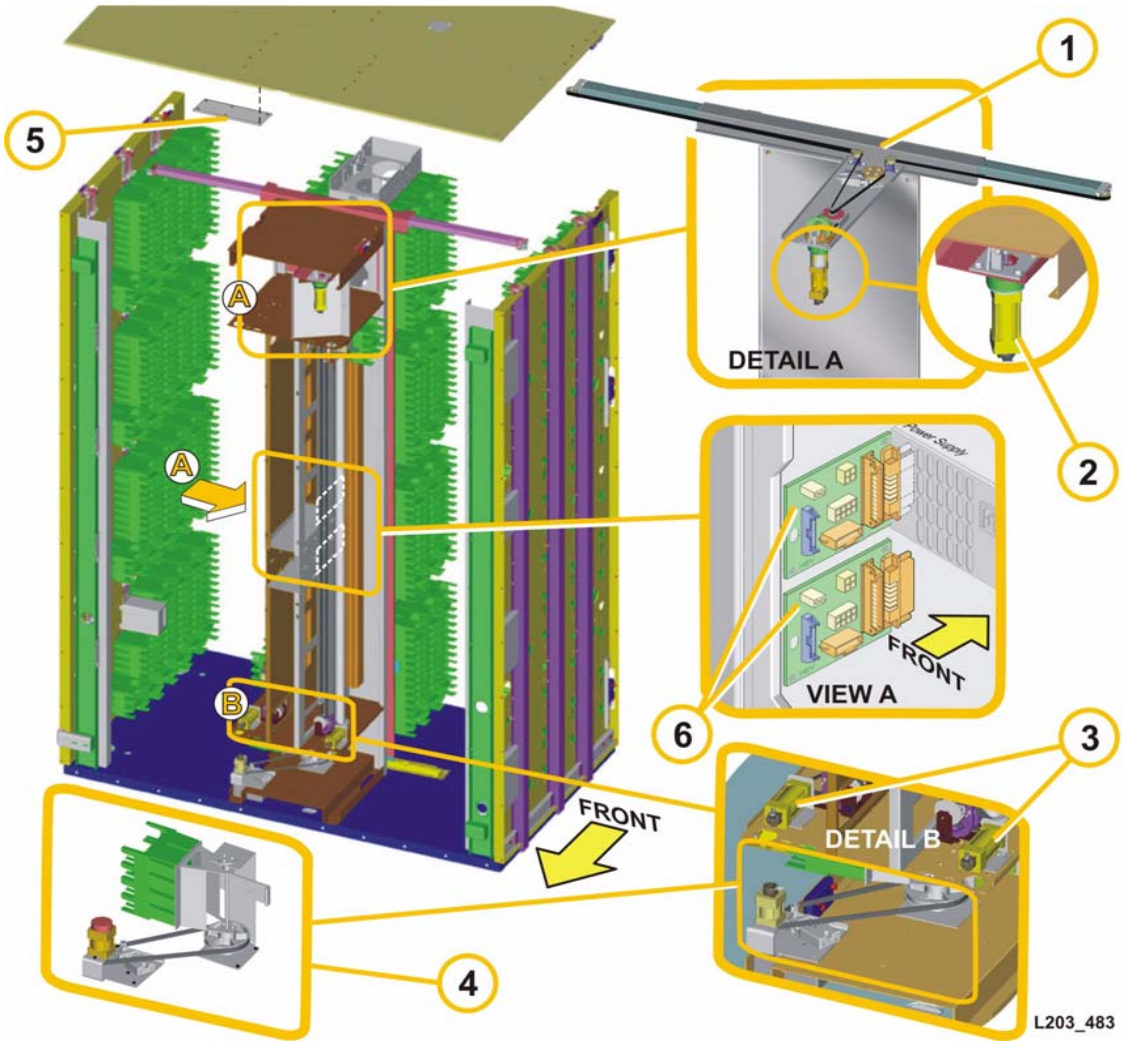
1. Door, Front, Left
2. Door Hinges, Front
3. Façade, Lower
4. Façade, Filter Clip
5. Façade, Lower Bracket
6. Façade, Upper PN 4196453xx
7. Door, Front, Right
8. Door Hinges, Front

Customer Interface Module (3 of 5)



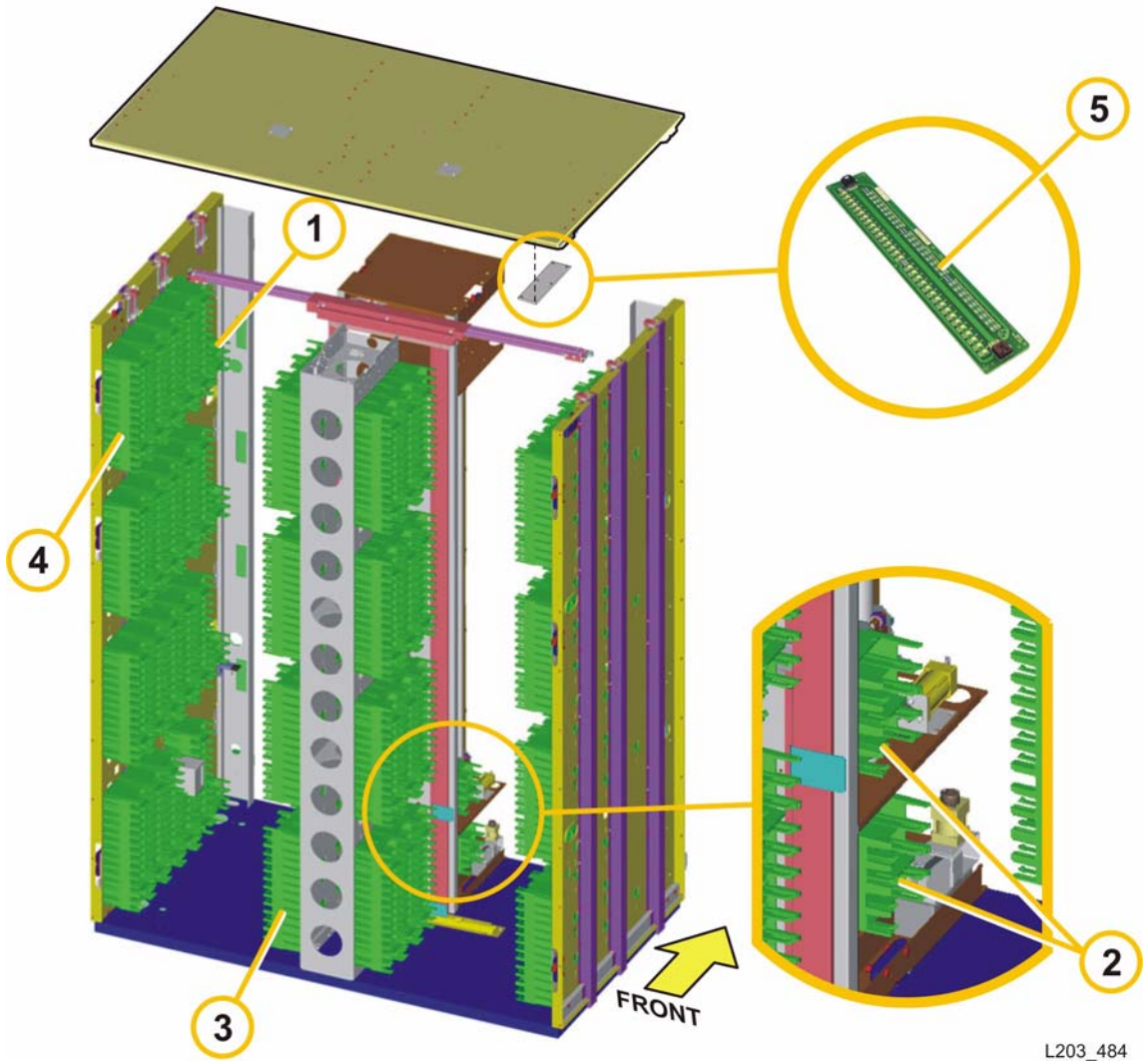
1. 48V Power Supply Module
2. Elevator/CAP Controller (HBZ) Module
3. PWA, HBN
4. Remote Camera

Customer Interface Module (4 of 5)



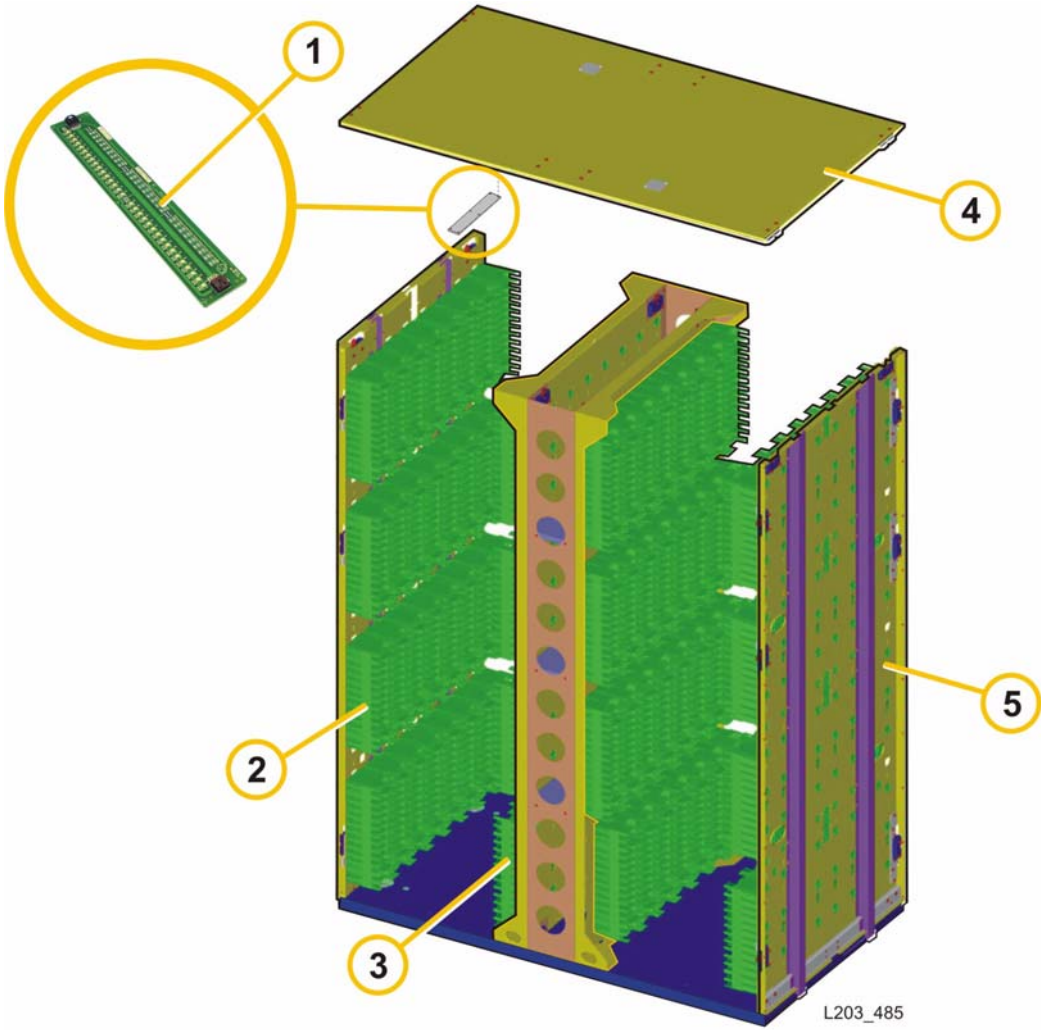
1. Service Safety Door Assembly
2. Service Safety Door Motor
3. Elevator Motor Assembly
4. Turntable Assembly
5. PWA, HBLY
6. Card Assy, HBV

Customer Interface Module (5 of 5)



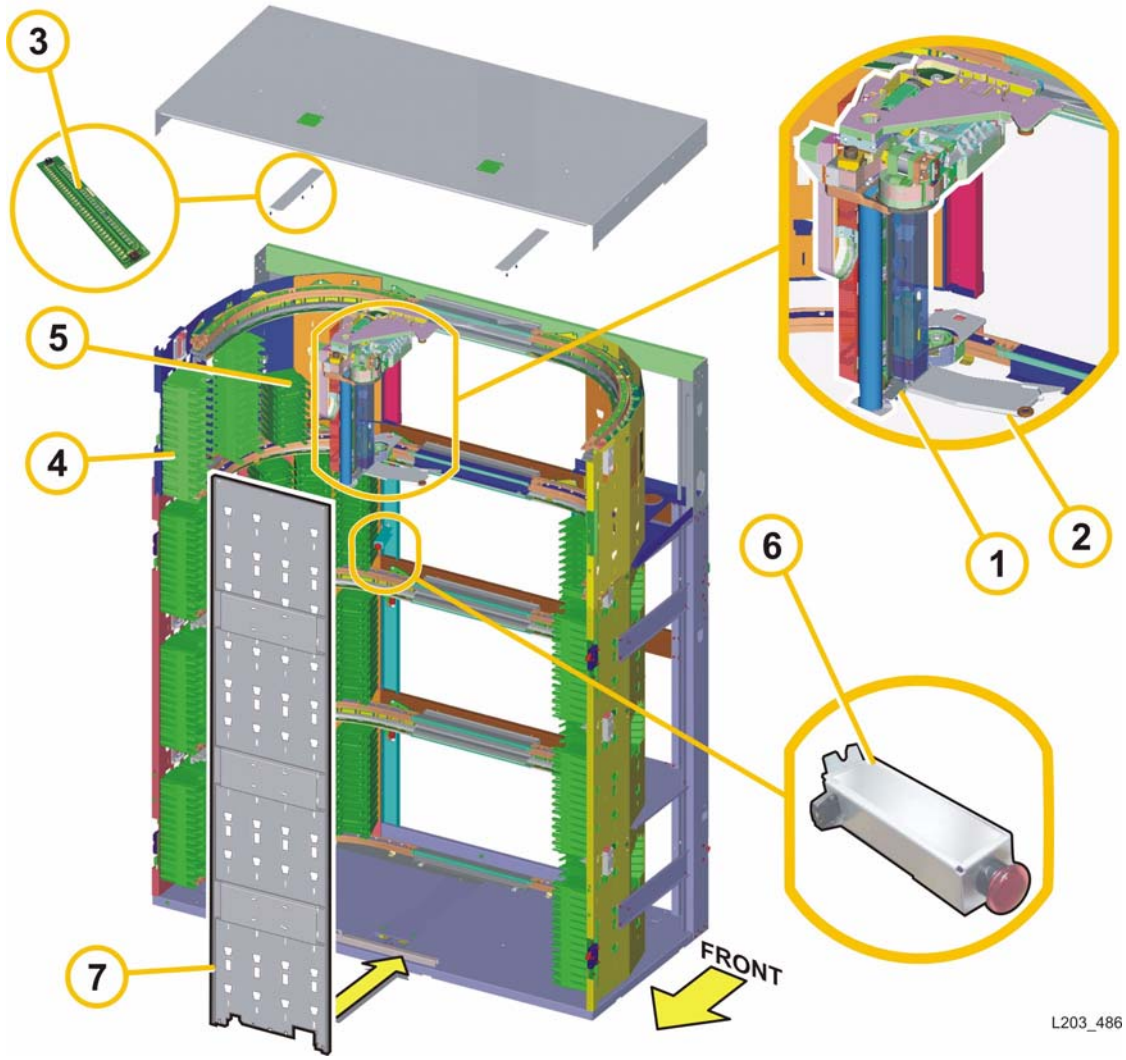
1. 3-Cell Array
2. 4-Cell Array
3. 14-Cell Array
4. 13-Cell Array
5. PWA, HBLY

Storage Expansion Module



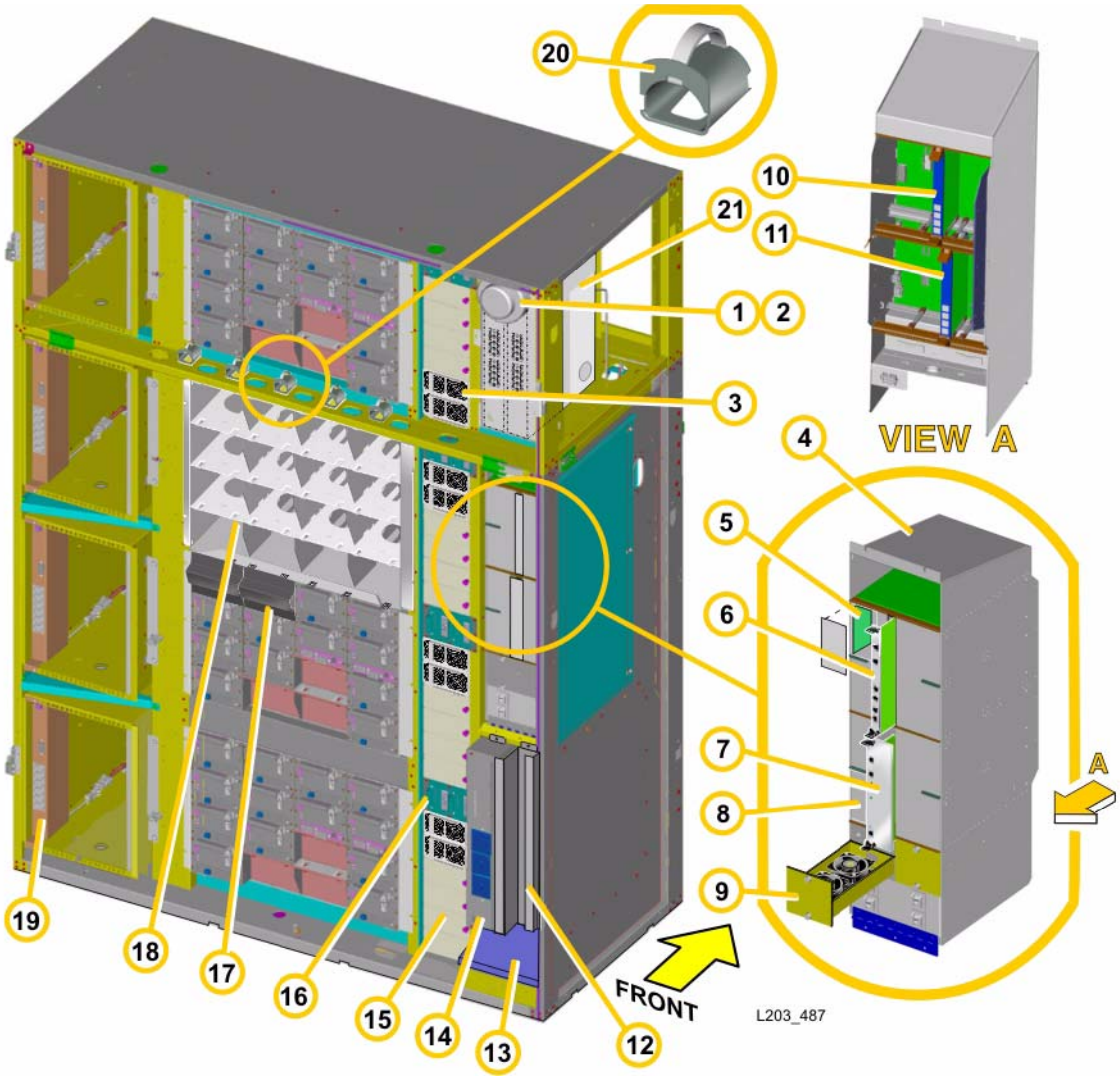
1. PWA, HBLW
2. 13-Cell Array
3. 14-Cell Array
4. Ceiling, Expansion Module PN 4196026xx
5. Weldment, Outside Wall, Expansion Module PN 4196028xx

Robotics Interface Module



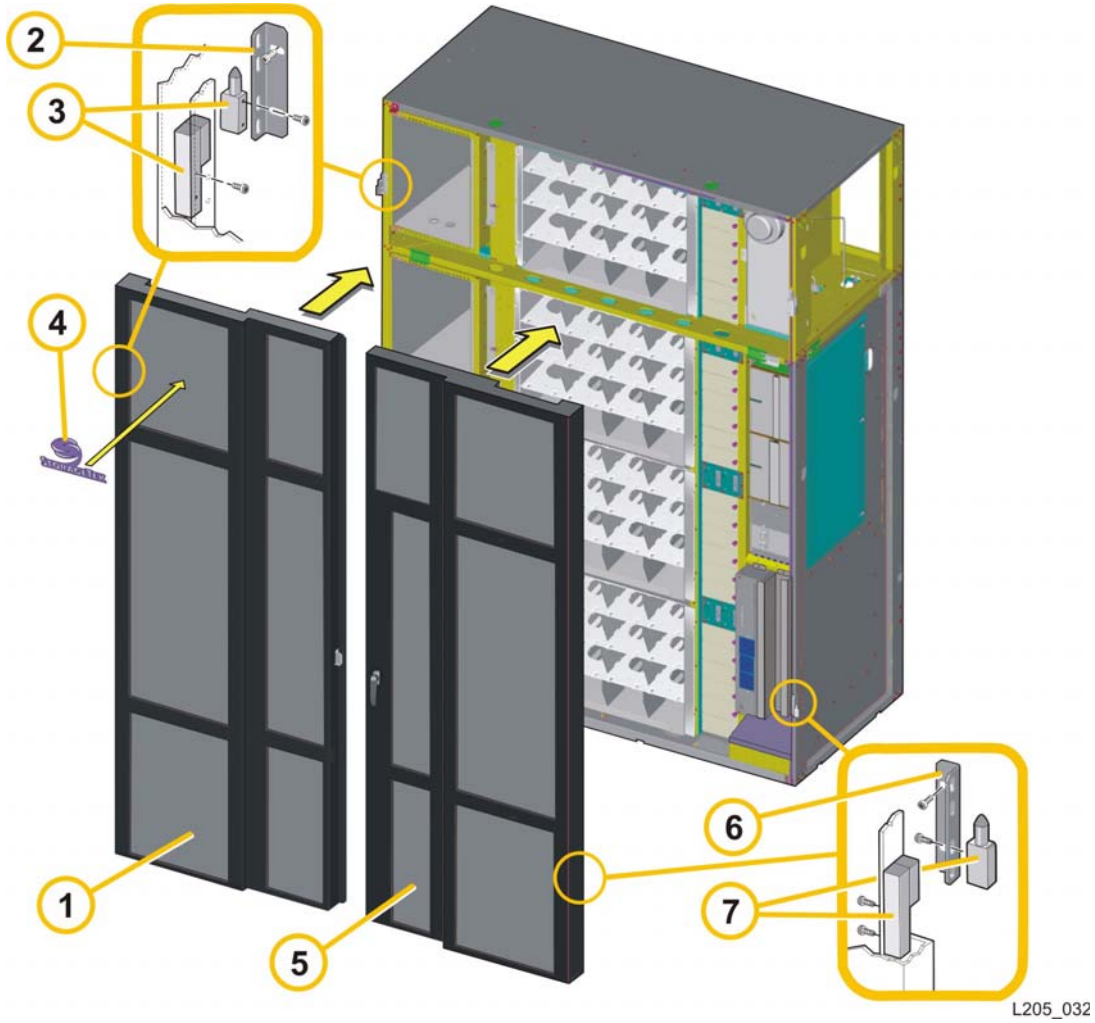
1. HandBot Assembly
2. Lower Extension Plate
3. PWA, HBLW
4. 13-Cell Array
5. 8-Cell Array
6. Interior Emergency Robotics Stop Switch
7. Center Wall

Drive and Electronics Module (1 of 2)



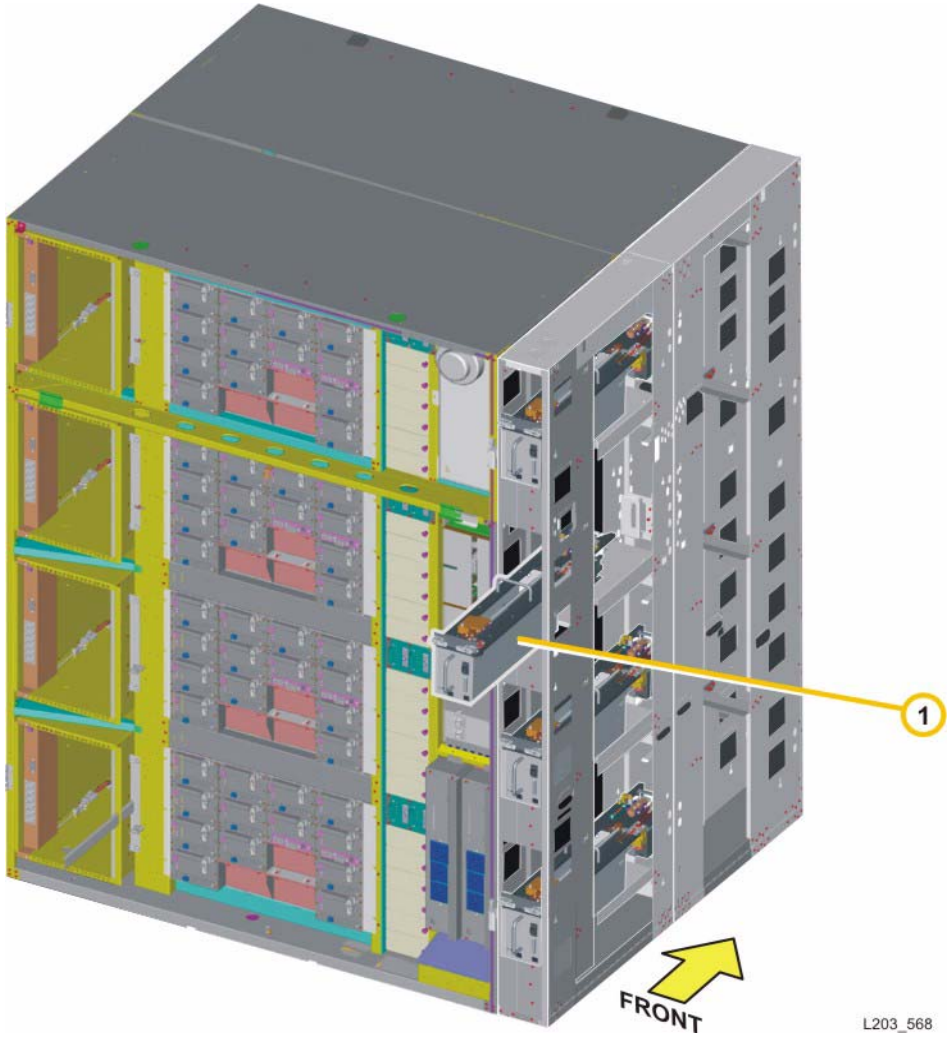
1. **Smoke Detector** *Note: This must be replaced for annual Preventive Maintenance.
2. **Base, Smoke Detector**
3. **48V Power Supply Module**
4. **Mid-Plane & Card Cage**
5. **PWA, HBK**
6. **PWA, HBC**
7. **PWA, HBT/HBT2**
8. **EM Power Supply**
9. **EM Fan Tray Assembly**
10. **PWA, HBX**
11. **PWA, HBY**
12. **N+1 Assembly**
13. **AC Inlet Cover, Rear**
14. **AC Power Distribution Unit**
15. **Power Supply Slot Cover**
16. **HBS Module**
17. **Drive Array Vacancy Plate**
18. **PWA, HBO**
19. **Accessory Rack AC Power Strip**
20. **Radius Control Assembly (PN 3139805xx)**
21. **Ethernet Switch**

Drive and Electronics Module (2 of 2)



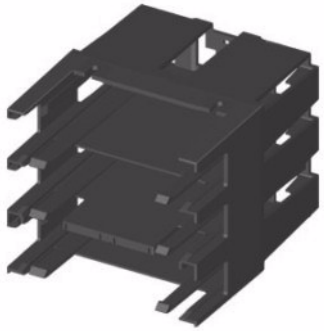
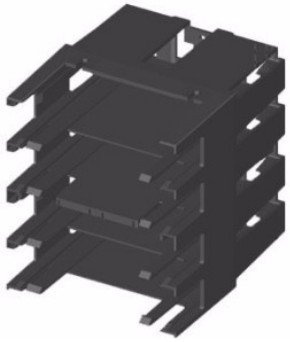
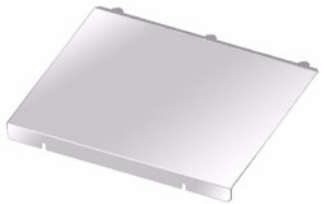
1. Door, Rear, Left
2. Bracket, door hinge
3. Door Hinge, Rear, (Offset B—Left)
4. Badge (Logo) PN 3139132xx
5. Door, Rear, Right
6. Bracket, door hinge
7. Door Hinge, Rear (Offset A—Right)

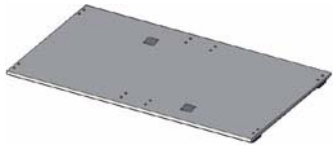
Pass-Thru Port Mechanism

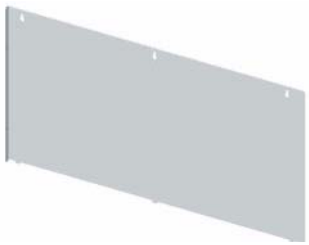


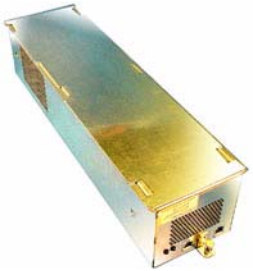
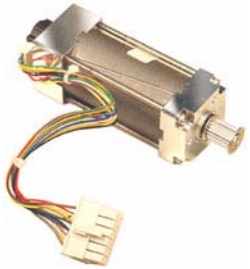
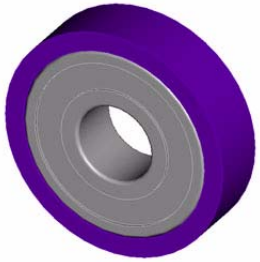
1. **“Pass-Thru Port Mechanism”**

Part Identifier

				
3-Cell Array	4-Cell Array	8-Cell Array	13-Cell Array	14-Cell Array
				
48V Power Supply Module	Accessory Rack AC Power Strip	Accessory Rack Fan Assembly	AC Inlet Cover, Rear PN 4196097xx	AC Inlet Cover, Front PN 4196093xx

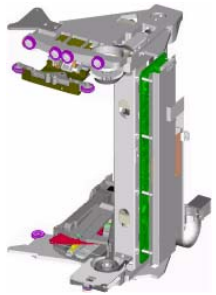
AC Inlet Cover, Rear PN 3138570xx	AC Power Distribution Unit	Badge (Logo) PN 3139132xx	Cable Clamp 1.5 Sq. PN 10075040	Cartridge Access Port (CAP) Assembly
				
Ceiling, Expansion Module PN 4196026xx	Center Wall	Clip, Retaining PN 3139170xx	Conductor (Power Strip)	Connector, Power Rail PN 3138555xx

				
Corner Spacer PN 3138778xx	Cover Side ECM PN 4196199xx	Door, Front, Left	Door, Front, Right	Door Hinges, Front
Door Hinge, Rear (Offset A—Right)	Door Hinge, Rear, (Offset B—Left)	Door, Rear, Left	Door, Rear, Right	Door Stops, Front

				
Door Stops, Rear	Door Switch Hardware, Front Door	Drive Array Vacancy Plate PN 3139987xx	Drive Tray Fan Assembly	Elevator/CAP Controller (HBZ) Module
				
Elevator Motor Assembly	Elevator Roller PN 313797602	EM Fan Tray Assembly PN 4196050xx	EM Power Supply PN 3143445xx	Ethernet Switch

Façade, Lower and Hardware

Façade, Upper
PN 4196453xx



HandBot Assembly

HBS Module

HP LTO/LTO2 Bezel
PN 3139355xx

IBM LTO2 Bezel
PN 3139287xx

Interior Emergency Robotics Stop Switch

Keypad Assembly

LC Coupler
(for vendor drives)
PN 10800160

LC Duplex
(for T9x40 drives)
PN 10800316

Load Plate
PN 3139945xx

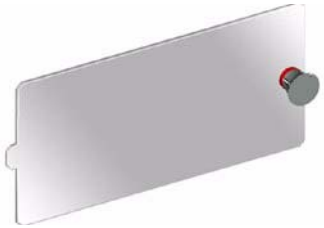
Mid-Plane & Card Cage

N+1 Assembly

Operator Panel

Pass-Thru Port Mechanism

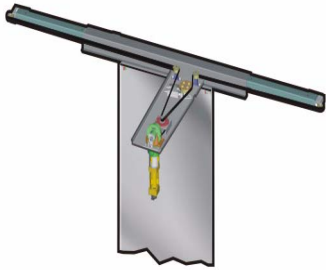
Power Cord
10187056



Power Supply Slot Cover
PN 4196096xx

Remote Camera

SDLT 600 Bezel
PN 3139609xx



Service Safety Door Assembly

Smoke Detector and Base (Detector is an annual PM item)

STK T9x40 Bezel
PN 3139224xx

Terminator, Rail
PN 3138452xx
(replace with
PN 4198025xx)

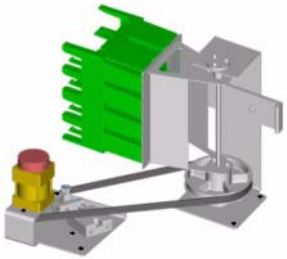
Terminator, Rail Power
PN 4198025xx

Touch-up Paint Kit
PN 3118708xx

Track

Track Clamp

Track Stop
PN 3148642xx



Turntable Assembly

Weldment, Outside Wall, Expansion Module
PN 4196028xx

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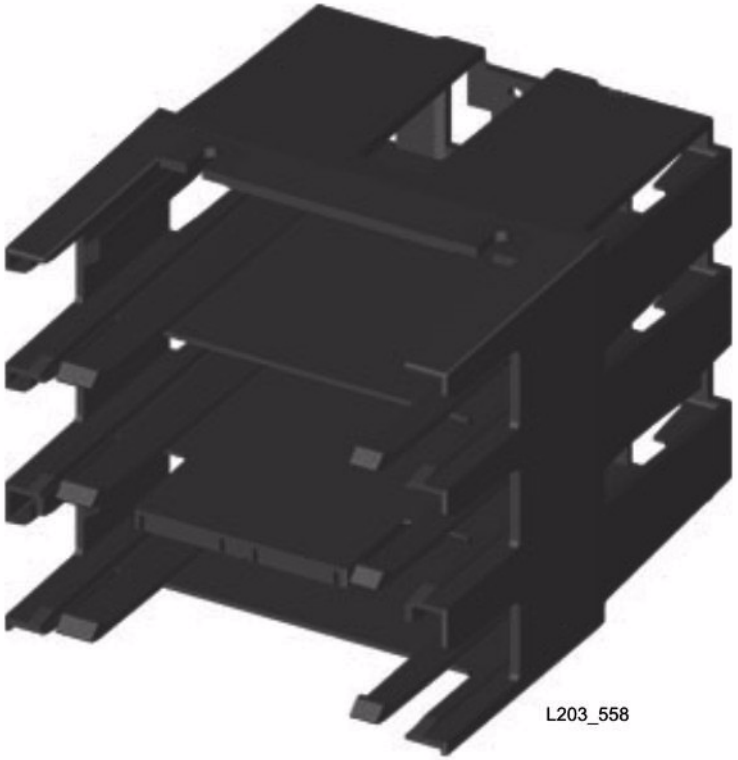
3-Cell Array



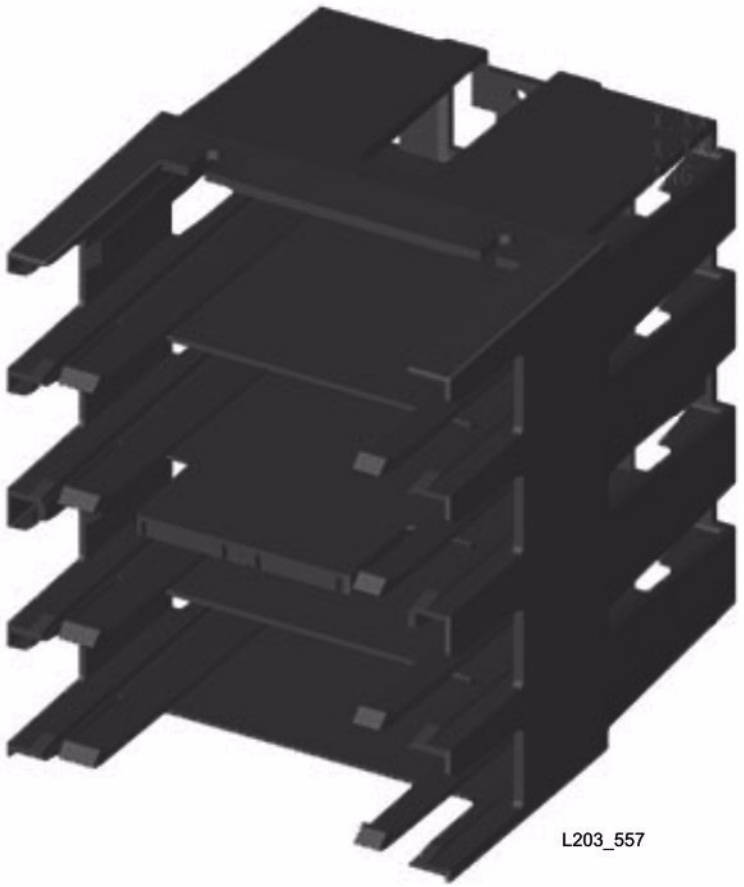
Part Number	Description	Qty
3138546xx	Cartridge Array, 3 Cell or PTP	8

Attaching Hardware

Part Number	Description	Qty
10207318	SCREW, Machine 6-32 x 0.500 TXPH	1

Location

4-Cell Array



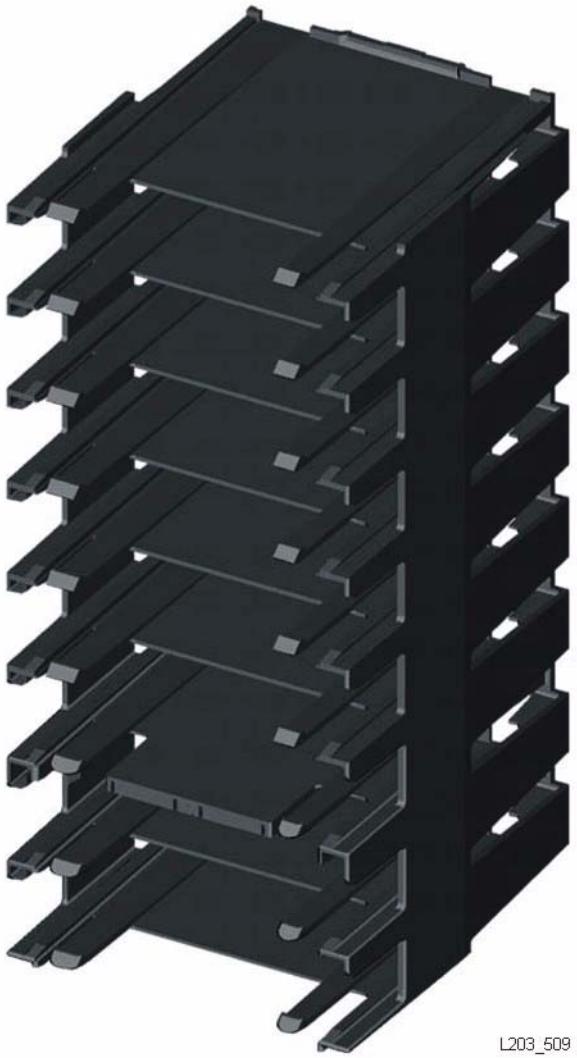
Part Number	Description	Qty
3138545xx	Cartridge Array, 4 Cells	3-4

Attaching Hardware

Part Number	Description	Qty
10206115	SCREW, Machine 6-32 x 0.375 TXFH	1

Location

8-Cell Array



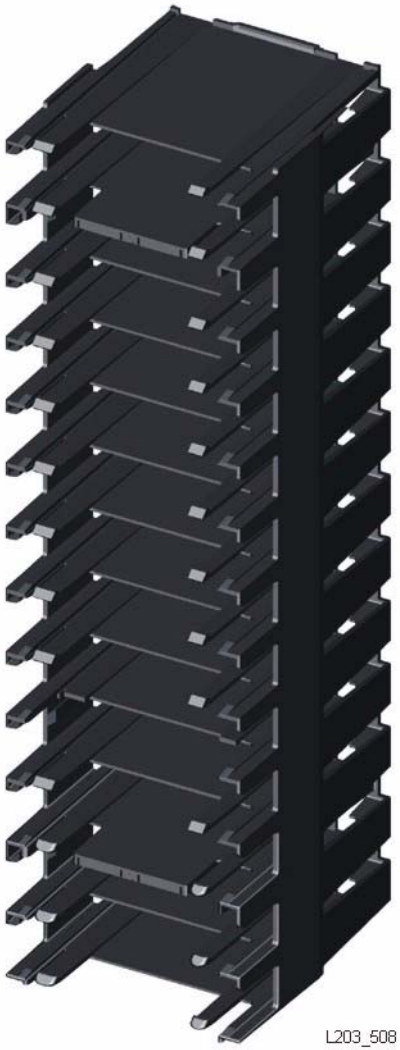
Part Number	Description	Qty
3138543xx	Cartridge Array, 8 Cells, with target	

Attaching Hardware

Part Number	Description	Qty
None		

Location

13-Cell Array



Part Number	Description	Qty
3138542xx	Cartridge Array, 13 Cell, with target	

Attaching Hardware

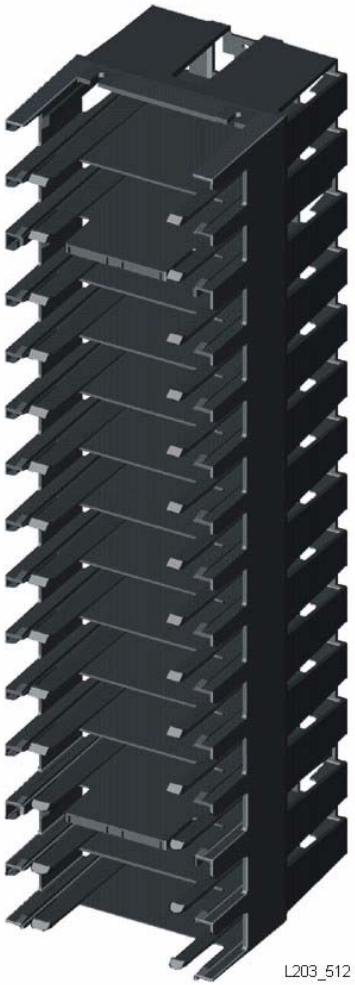
Part Number	Description	Qty
None		

Location
Customer Interface Module

Location
Storage Expansion Module

Location
Robotics Interface Module

14-Cell Array



Part Number	Description	Qty
3138547xx	Cartridge Array, 14 Cell, with target	

Attaching Hardware

Part Number	Description	Qty
None		

Location
Customer Interface Module

Location
Storage Expansion Module

48V Power Supply Module

Part Number	Description	Qty
3143444xx	PS, AC/DC, +48V, 24A, +12V, 4A, 1200W	6-26
3143362xx	PS, AC/DC, +48V, 24A, +12V, 1200W	6-26

Attaching Hardware

Part Number	Description	Qty
None		

Location
Customer Interface Module

Location
Drive and Electronics Module

Remove/Replace
Customer Interface Module

Remove/Replace
Drive and Electronics Module

Accessory Rack AC Power Strip

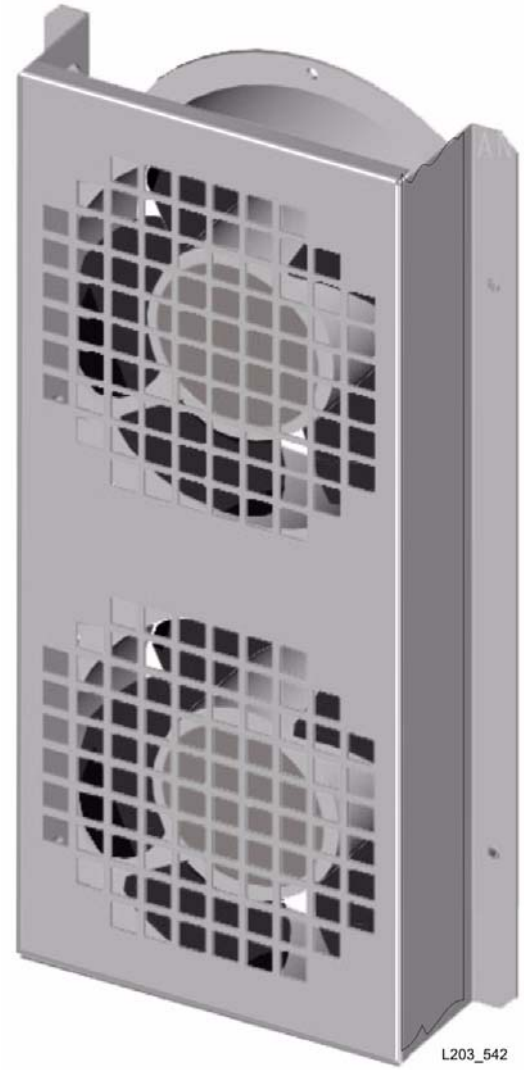
Part Number	Description	Qty
4198035xx	Power Strip, AC	1-4

Attaching Hardware

Part Number	Description	Qty
10207319	SCREW, Machine 6-32 x 0.625 TXPH	2

Location | Remove/Replace

Accessory Rack Fan Assembly



Part Number	Description	Qty
1565509xx	Fan, Co-axial, Accessory Rack	1-8

Attaching Hardware

Part Number	Description	Qty
4196251xx	Guard, Fan	1
10207319	SCREW, Machine 6-32 x 0.625 TXPH	4

Location

Within rack modules

Remove/Replace

AC Power Distribution Unit

Part Number	Description	Qty
4196419xx	PDU Assy, AC, DELTA	1-2
4196418xx	PDU Assy, AC, WYE	1-2
4196420xx	PDU Assy, AC, SUVA	1-2
4196417xx	PDU Assy, AC, 1PH	1-2

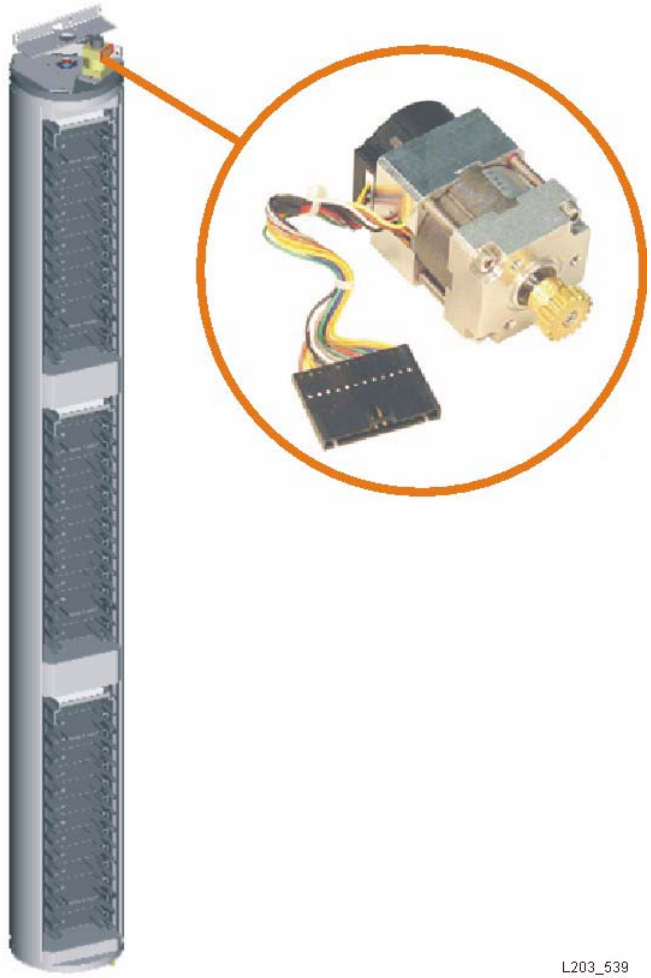
Note: The Delta PDU, typical for U.S. installations, is shown. The WYE and SUVA PDUs are visually similar, but with distinct labeling. Single phase PDUs have three visible circuit breakers.

Attaching Hardware

Part Number	Description	Qty
10207323	SCREW, Machine, 10-32 x 0.500 TXPH	2

Location | Remove/Replace

Cartridge Access Port (CAP) Assembly



Part Number	Description	Qty
4196397xx	CAP assembly	1-2
4198699xx	CAP motor and switch assembly (Dual)	1
4198700xx	CAP locking motor (Dual)	1
4196119xx	CAP motor (Single motor configuration)	1
3139975xx	Alignment pin	1
4196122xx	Bracket, Lower	1
4196123xx	Bracket, Upper	1
3139492xx	Pin, theta stop, CAP	1

Location Remove/Replace

Attaching Hardware

Part Number	Description	Qty
10207323	SCREW, MACH 10-32 x 0.500 TXPH	2

Location Remove/Replace

Center Wall

Part Number	Description	Qty
4196011xx	Center wall	1

Attaching Hardware

Part Number	Description	Qty
10207323	10-32 x 0.5 TXPH screw	6

Location

Conductor (Power Strip)

L205_015

Part Number	Description	Qty
4196485xx	Conductor, 1m (3.4 ft)—Customer Interface Module	1
4196404xx	Conductor, 2m (6.5 ft)—1 Expansion Module (EM)	1
4196405xx	Conductor, 3m (9.7 ft)—2 EM	1
4196406xx	Conductor, 3.9m (12.8 ft)—3 EM	1
4198103xx	Conductor, 4.9m (15.9 ft)—4 EM	1
4198104xx	Conductor, 5.8m (19 ft)—5 EM	1

Attaching Hardware

Part Number	Description	Qty
3139170xx	Clip, retaining	1
3138855xx	Connector	1

Location

Within extrusions

Door, Front, Left

Part Number	Description	Qty
4196054xx	Door, Front, Left	1

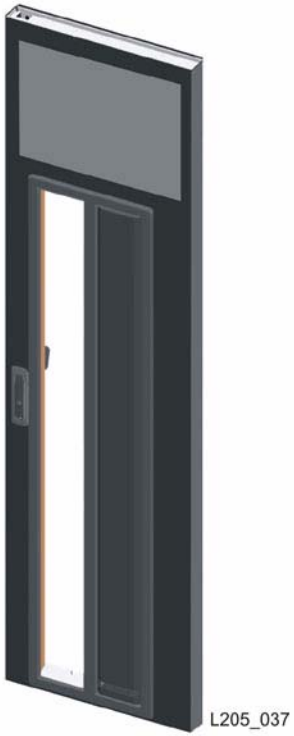
Attaching Hardware

Part Number	Description	Qty

Location

Customer Interface Module

Door, Front, Right



Part Number	Description	Qty
4196055xx	Door, Front, Right	1

Attaching Hardware

Part Number	Description	Qty

Location

Customer Interface Module

Door Hinges, Front

L205_012

Part Number	Description	Qty
4196327xx	Hinge, Front, Upper Left	1
4196332xx	Hinge, Front, Lower Left	1
4196326xx	Hinge, Front, Upper Right	1
4196333xx	Hinge, Front, Lower Right	1

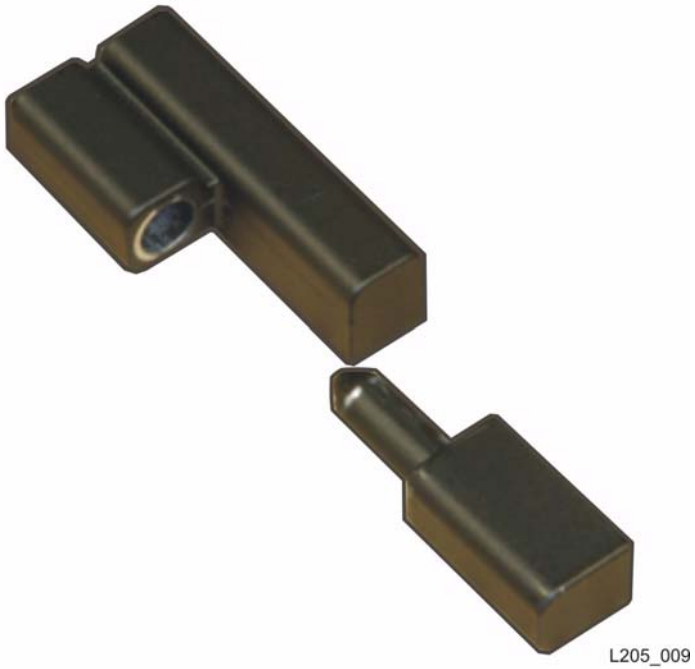
Attaching Hardware

Part Number	Description	Qty
10207102	T-30 screws	2 ea.

Location

Customer Interface Module

Door Hinge, Rear (Offset A—Right)



Part Number	Description	Qty
10421342	Hinge, Offset A, (Right)	1

Attaching Hardware

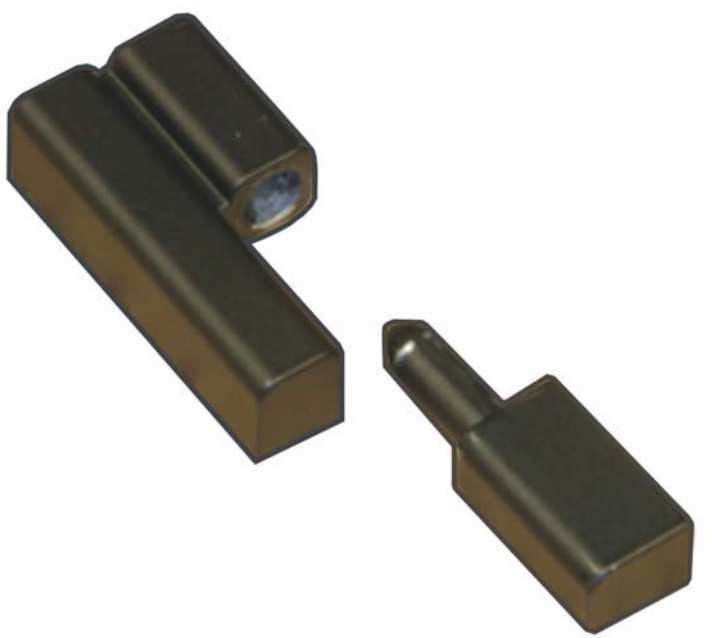
Part Number	Description	Qty
10207323	10-32 x 0.5 TXPH screw	2
4196182xx	Bracket, door hinge	1

Location

Right rear door

Door Hinge, Rear, (Offset B—Left)

Part Number	Description	Qty
10421343	Hinge, Offset B, (Left)	1



Attaching Hardware

Part Number	Description	Qty
10207323	10-32 x 0.5 TXPH screw	2
4196182xx	Bracket, door hinge	1

Location

Left, rear door

Door, Rear, Left

Part Number	Description	Qty
4196130xx	Door, rear, left	1

Attaching Hardware

Part Number	Description	Qty

Location

Drive and Electronics Module

Door, Rear, Right

Part Number	Description	Qty
4196047xx	Door, Rear, Right	1

Attaching Hardware

Part Number	Description	Qty

Location

Drive and Electronics Module

Door Stops, Front

Part Number	Description	Qty
3139808xx	Door Stop, Front, Left	1
3139809xx	Door Stop, Front, Right	1

Attaching Hardware

Part Number	Description	Qty
4196292xx	Keeper, door stop	1
10207323	10-32 x 0.5 TXPH screw	2

Location

Door stop—Attached to front door

Keeper—Attached to front door frame

Door Stops, Rear

Part Number	Description	Qty
4196337xx	Door Stop, Rear, Left	1
4196336x	Door Stop, Rear, Right	1

Attaching Hardware

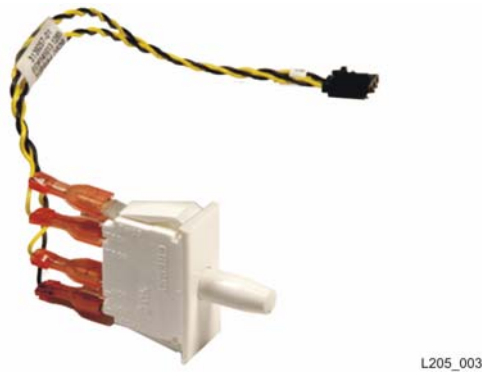
Part Number	Description	Qty
(Included with stop)	Bracket, stop	1
10207319	6-32 x 0.500 screw	1

Location

Door stop—Attached to rear door

Bracket—Attached to rear door frame

Door Switch Hardware, Front Door



Part Number	Description	Qty
Included with cable	Switch, front door	1
4196215xx	Cable, front switch	1
4196301xx	Bracket, switch	1

Attaching Hardware

Part Number	Description	Qty
10207323	10-32 x 0.5 TXPH screw	2

Location

Within front door frame

Drive Tray Fan Assembly

L203_620

Part Number	Description	Qty
1565073xx	Fan Assembly, Drive Tray	1

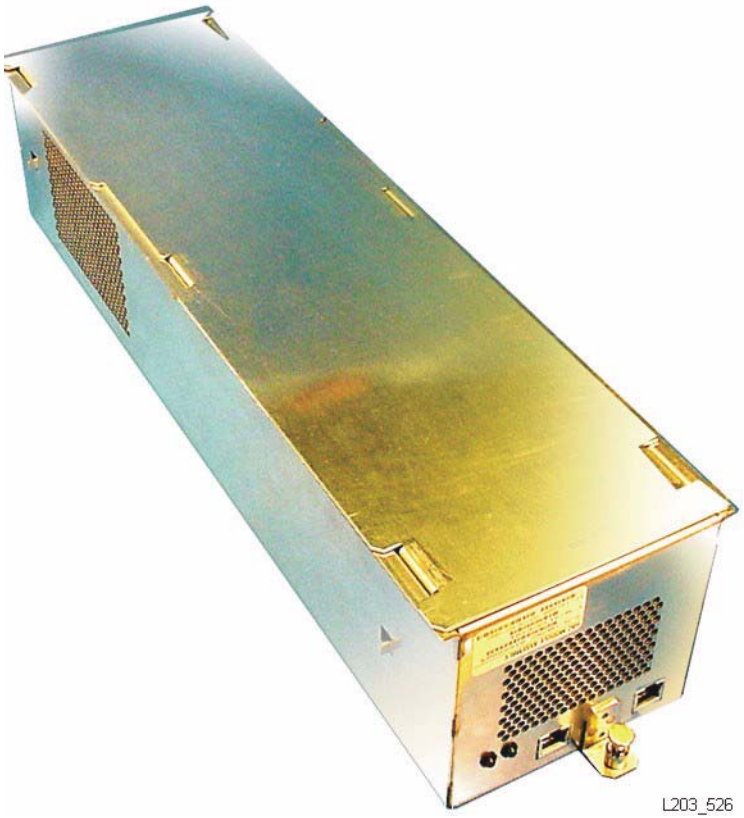
Attaching Hardware

Part Number	Description	Qty
10075232	Cable Tie/Mount	1
10310529	SCREW, Machine 4-40 x 0.375 TXPH	2

Location: Drive Tray

Remove/Replace

Elevator/CAP Controller (HBZ) Module



Part Number	Description	Qty
4198037xx	Module Assy, HBZ	1-2

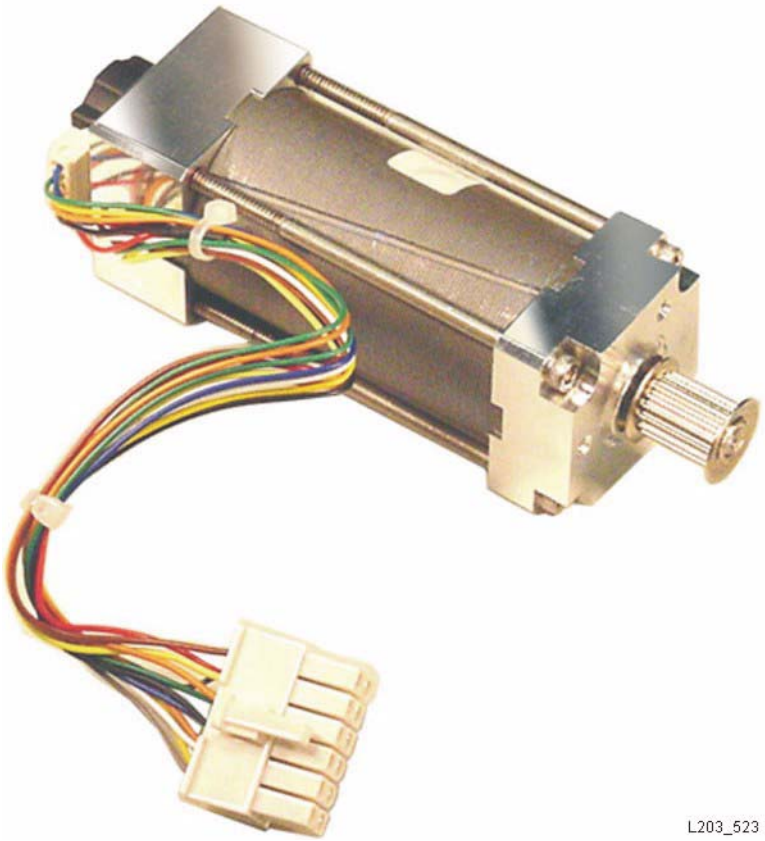
Note: Two modules are required for Dual CAP operation.

Attaching Hardware

Part Number	Description	Qty
None		

Location | Remove/Replace

Elevator Motor Assembly



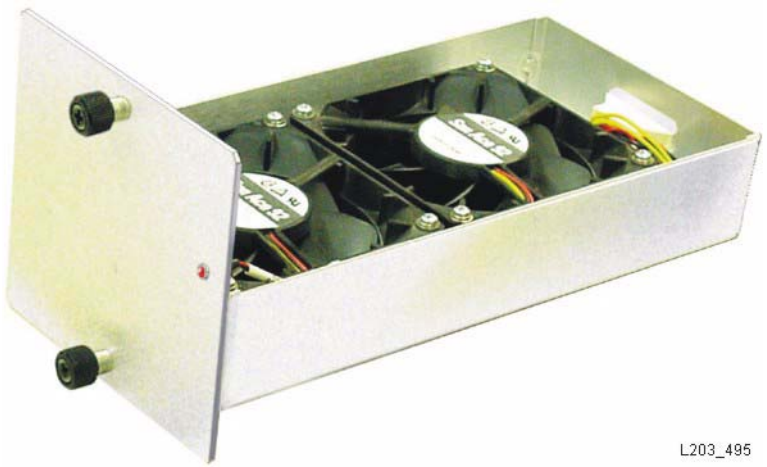
Part Number	Description	Qty
4198048xx	Motor Assembly, Elevator	2

Attaching Hardware

Part Number	Description	Qty
4196053xx	Mount, Motor, Elevator	1
10203215	SCREW, 6-32 x 0.375	5

Location | Remove/Replace

EM Fan Tray Assembly



Part Number	Description	Qty
4196050xx	Fan Tray Assy, EM	1-2

Attaching Hardware

Part Number	Description	Qty
None		

Location | Remove/Replace

EM Power Supply

L203__529

Part Number	Description	Qty
3143445xx	PS, AC/DC, +5.0V, +3.3V, +12V, -12V, 150W	1-4

Attaching Hardware

Part Number	Description	Qty
None		

Location | Remove/Replace

Ethernet Switch

Part Number	Description	Qty
260800489	Library Ethernet switch	2

Attaching Hardware

Part Number	Description	Qty
10207324	SCREW, Machine 10-32 x 0.625 TXPH	4

Location | Remove/Replace

Façade, Lower

Part Number	Description	Qty
4196439xx	Façade, lower	1

Attaching Hardware

Part Number	Description	Qty

Location

Façade, Lower Bracket

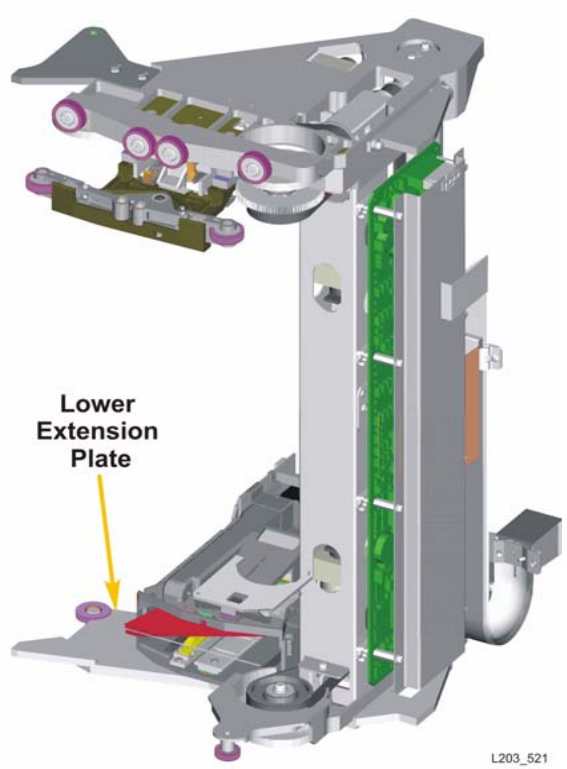
Part Number	Description	Qty
4196441xx	Façade, lower bracket	1
4196437xx	**Façade, Filter Clip**	1

Attaching Hardware

Part Number	Description	Qty
10207323	10-32 x 0.5 TXPH screw (Lower Bracket)	2
10206242	10-31 x 3/4 TXPH screw (Filter Clip)	2

Location

HandBot Assembly



Part Number	Description	Qty
4196426xx	HandBot Assembly	4/8

Attaching Hardware

Part Number	Description	Qty
None		

Part Number	Description	Qty
3139772xx	Lower Extension Plate	4-8

Attaching Hardware

Part Number	Description	Qty
10207601	Screw, M3.5-1.2x12,TF,TXPH/C	16-32

Location **Remove/Replace**

*Eight-HandBot installations require this part number or later and matching HBS modules (see **"HandBot Assembly"**).

HBS Module

Part Number	Description	Qty
4198011xx*	Tray Assembly, HBS	4/8

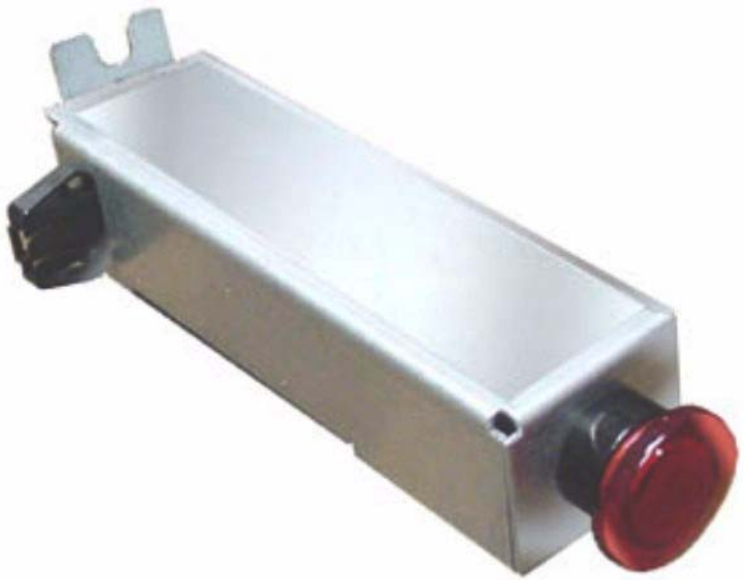
Attaching Hardware

Part Number	Description	Qty
10207319	SCREW, Machine TF, 6-32 x 0.625	2

Location | Remove/Replace

*Eight-HandBot installations require this part number or later and matching HandBot assemblies (see **"HandBot Assembly"**).

Interior Emergency Robotics Stop Switch


L203_578

Part Number	Description	Qty
3148815xx	Interior Emergency Robotics Stop Switch (Old)	1
4196029xx	Interior Emergency Robotics Stop Switch (New)	1

Attaching Hardware

Part Number	Description	Qty
10207323	SCREW, Machine 10-32 x 0.500	1
3138418xx	Cable Assembly, EPO Switch	1
		1

Location | Remove/Replace

Keypad Assembly

Part Number	Description	Qty
4198024xx	Keypad Assembly	1

Attaching Hardware

Part Number	Description	Qty
10207323	SCREW, Machine, 10-32 x 0.500 TXPH	4

Location | Remove/Replace

Mid-Plane & Card Cage

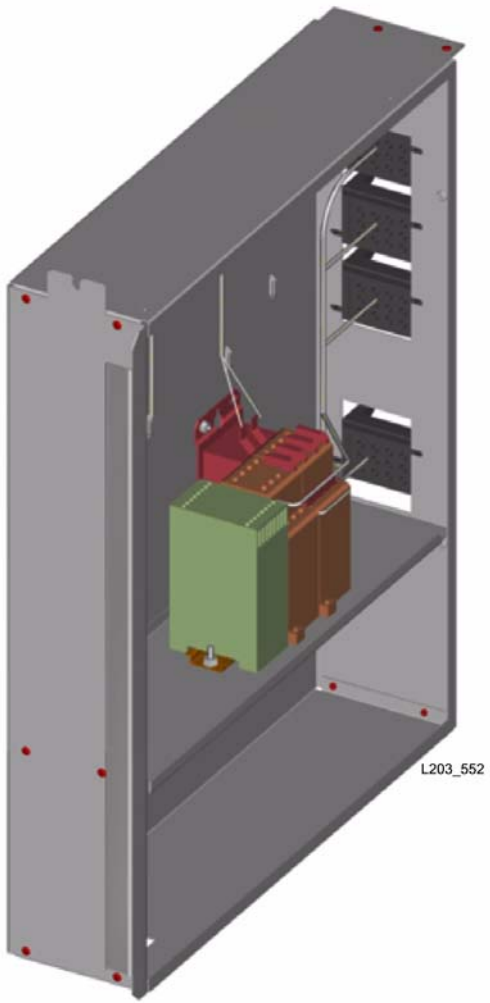
Part Number	Description	Qty
4198027xx	HBM Mid-Plane and Card Cage	1

Attaching Hardware

Part Number	Description	Qty
10207323	SCREW, Machine, 10-32 x 0.500 TXPH	5

Location | Remove/Replace

N+1 Assembly



Part Number	Description	Qty
4196422xx	N+1 Assy, AC	1
4196423xx	N+1 Assy, AC, SUVA*	1

Note: The SUVA N+1 Unit is visually similar, but with a distinct SUVA label.

Attaching Hardware

Part Number	Description	Qty
10207323	SCREW, Machine, 10-32 x 0.500 TXPH	2

Location | Remove/Replace

Operator Panel

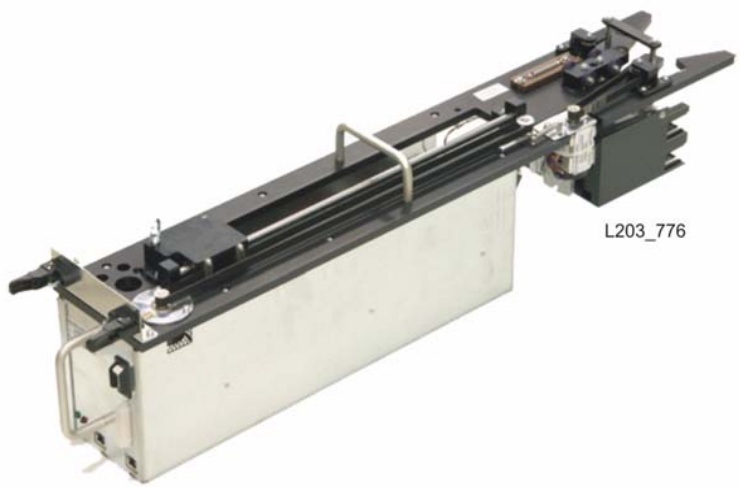
Part Number	Description	Qty
4196179xx	Panel, Operator, STK (RoHS)	0-1
3138995xx	Panel, Operator, STK (pre-RoHS)	0-1

Attaching Hardware

Part Number	Description	Qty
10207216	Screw, Machine, 12-32 x 375 TXPH (RoHS)	4
4196056xx	Bracket, Mounting, Op Panel (RoHS)	1
3138415xx	Bracket, Mounting, Op Panel (pre-RoHS)	1
10207323	Screw, Machine, 8-32 x 0.500 TXFH	4

Location | Remove/Replace

Pass-Thru Port Mechanism



Part Number	Description	Qty
4196414xx	Pass-Thru Port Mechanism	4
10190307	Pin, QK-REL,PS,3/8D,1.8GRIP,RG	4

Attaching Hardware

Part Number	Description	Qty
None		

Location | Remove/Replace

Remote Camera

L203_780

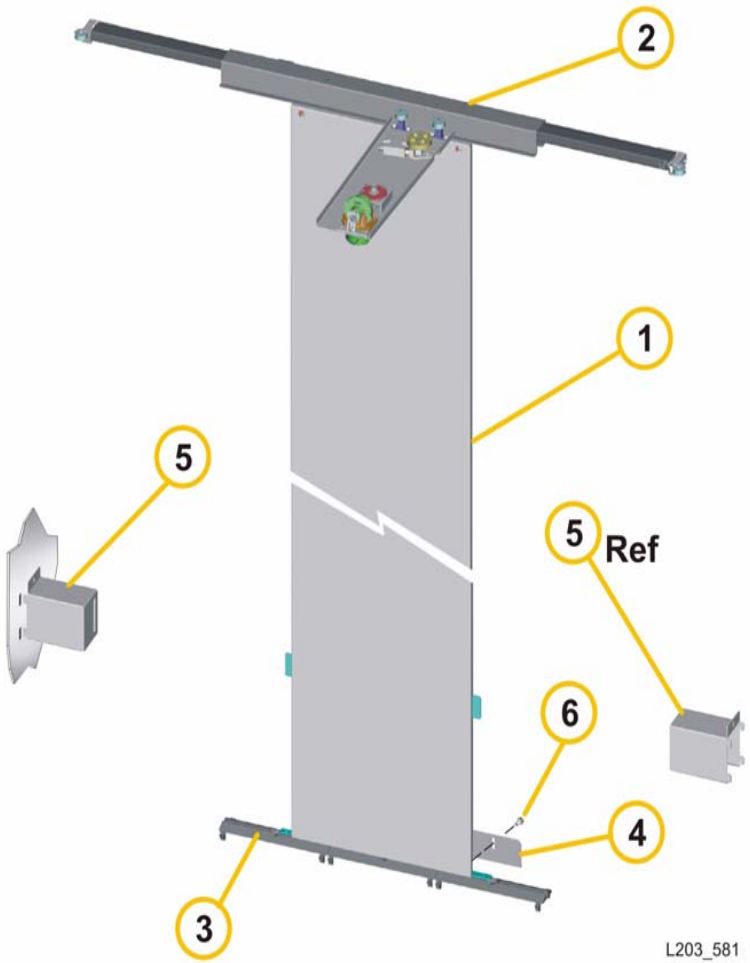
Part Number	Description	Qty
10501902	Remote Camera	2

Attaching Hardware

Part Number	Description	Qty
10207102	T30 screw	1 per camera

Location | Remove/Replace

Service Safety Door Assembly



Part Number	Description	Qty
1. 4196195xx	Safety Door	1
2. 4198007xx	Track Carriage Assembly	1
3. 3148798xx	Threshold Guide	3
4. 4196374xx	Safety Door Bracket Guide	1
5. 4196336xx	Safety Door Stop (Left)	1
4196337xx	Safety Door Stop (Right)	1
4198064xx	Safety Door Motor (not shown)	1

Attaching Hardware

Part Number	Description	Qty
10207323	SCREW, Machine, 10-32 x 0.500, TXPH	5
10207310	SCREW, Machine, 10-32 x 0.500, TXFH	6

Location | Remove/Replace

Smoke Detector and Base

Part Number	Description	Qty
4102733xx	Smoke Detector	1

Attaching Hardware

Part Number	Description	Qty
None		

Location | Remove/Replace

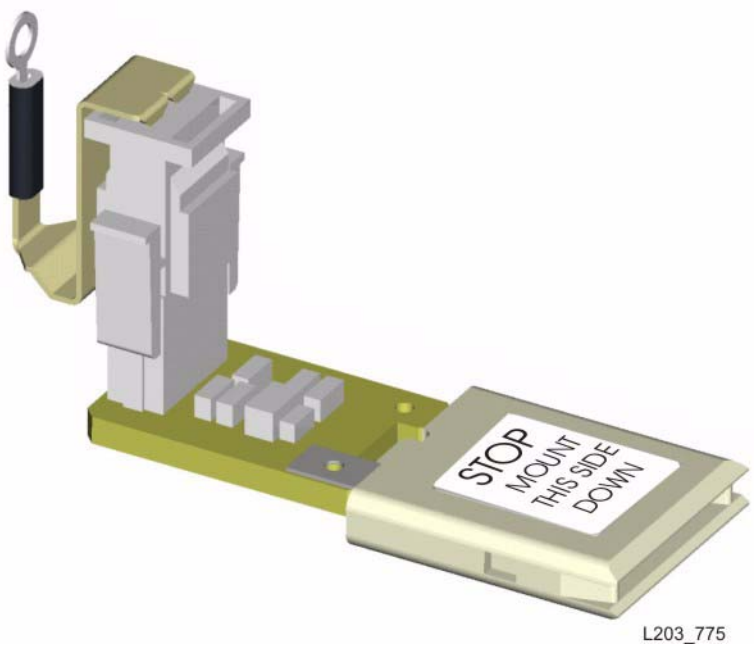
Part Number	Description	Qty
4102737xx	Base, Smoke Detector	1

Attaching Hardware

Part Number	Description	Qty
10075150	CA-CLP	1

Location | Remove/Replace

Terminator, Rail Power



L203_775

Part Number	Description	Qty
4198025xx*	Terminator, with HBQ card	1
3138452xx	Terminator (old style—replace with above part)	1

Attaching Hardware

Part Number	Description	Qty
10207323	SCREW, Machine, 10-32 x 0.500, TXPH	1

Location

At end of each rail conductor

*This part is required for 8-HandBot operation.

Track

L205_019

Part Number	Description	Qty
3138857xx	Track	1

Note: May require cutting for proper length

Attaching Hardware

Part Number	Description	Qty

Location

Within extrusion

Track Clamp

Part Number	Description	Qty
4196411xx	Track clamp	1

Individual Hardware

Part Number	Description	Qty
3139817xx	Shoulder bolt	1
3139818xx	Spring disc	1

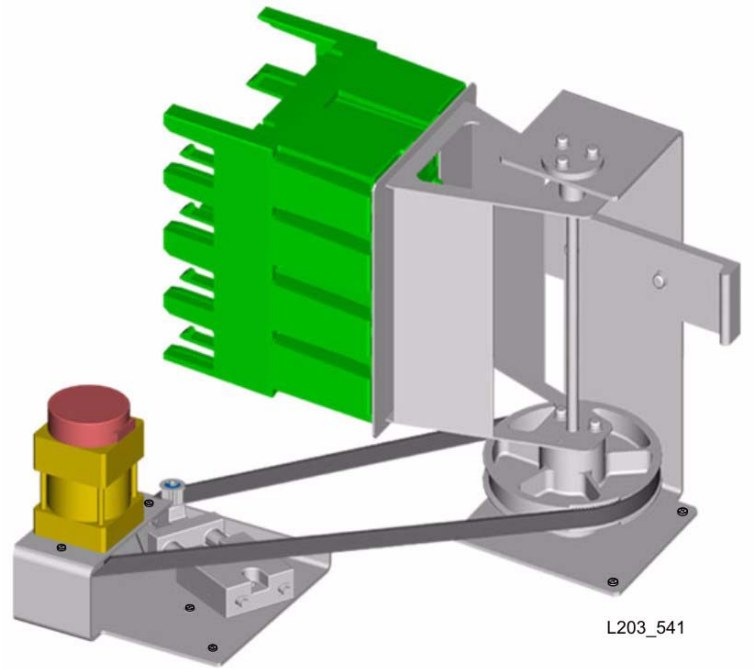
Attaching Hardware

Part Number	Description	Qty
10207323	10-32 x 0.5 TXPH screw	4

Location

Outside walls, securing extrusions

Turntable Assembly



Part Number	Description	Qty
4198049xx	Turntable Assembly	1-2

Attaching Hardware

Part Number	Description	Qty
10206215	SCREW, Machine 6-32 x 0.375	7

Location | Remove/Replace

Printed Wire Assemblies (PWAs)

PN 3138172xx

Description

PWA, HBC

Function:

Library Controller. Stores and executes library firmware; and, coordinates all library operations.

Location	Remove/ Replace

PN 3137845xx

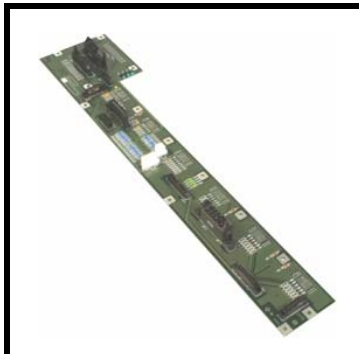
Description

PWA, HBD

Function:

Drive environmental monitor. Interfaces drive tray assembly to the library.

Location (Drive Tray)	Remove/ Replace



PN 3139582xx

Description

PWA, HBF

Function:

PS/HBS Module Socket. Provides mounting for rail/ drive power supply modules, rail communication modules.

Location	Remove/ Replace

PN 3138252xx

Description

PWA, HBK

Function:

Security Key. Provides library access security, and maintains password control.

Location	Remove/ Replace

PN 3138275xx
PN 3138276xx*

Description

PWA, HBN

Function:

Library Interlock Controller. Monitors all library door interlock switches, and other sensors.

Location	Remove/ Replace

*Contains LEDs

PN 3138133xx (HBT)
PN 4198432xx (HBT2)*

Description

PWA, HBT/HBT2

Function:

Drive Controller. Translates drive related library firmware commands into unique drive commands.

Location	Remove/ Replace

Note: *HBT2 card requires FRS_3.02 or later code.*

PN 3138302xx

Description

PWA, HBO

Function:

Drive interface, one for each horizontal drive row within a drive array.

Location (Drive Array)	Remove/ Replace

PN 3138164xx

Description

Card Assy, HBV

Function:

PS Module Socket. Provides mounting for CAP, elevator, turntable, and safety door motor power supply module.

Location	Remove/ Replace

PN 3138383xx

Description

PWA, HBLW

Function:

White interior lighting.

Location (CIM)	Remove/ Replace
Location (Expansion)	
Location (Robotics)	

PN 3138393xx

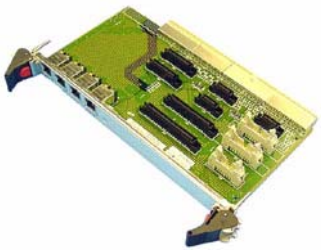
Description

PWA, HBLY

Function:

Yellow interior lighting. Flashes to indicate pending HandBot initialization.

Location	Remove/ Replace



PN 3138183xx

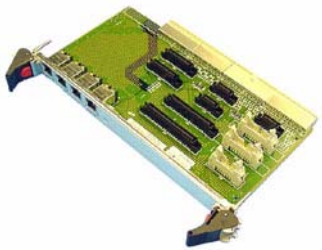
Description

PWA, HBX

Function:

Library Interface. Provides interface between the library controller and other library components.

Location	Remove/ Replace



PN 3138193xx

Description

PWA, HBY

Function:

Drive Interface. Provides interface between the drive controller and all drive arrays.

Location	Remove/ Replace

PN 3143446xx

Description

PWA, Power Supply
Function:

Drive power supply. Provides operating power to the drive.

Location: (Drive Tray)	Remove/ Replace

Cable List

Part Number	Description
4196155xx	Cable Assembly, AC Jumper, Accessory Rack
3138434xx	Cable Assembly, AC, Operator Panel Power
4196030xx	Cable Assembly, AC Power-Drive, Lower
3138417xx	Cable Assembly, AC Power-Drive/HandBot, Upper
3138072xx	Cable Assembly, AC Power-ECM/FF
3138070xx	Cable Assembly, AC Power-HandBot/Rack, Lower
4196254xx	Cable Assembly, AC System HUB, Upper
3138863xx	Cable Assembly, AC, Term BLK-PNL
3137653xx	Cable Assembly, Drive DC BUS-HBF/HBO, Lower
3137654xx	Cable Assembly, Drive DC BUS-HBF/HBO, Upper
3138062xx	Cable Assembly, Drive TTI, HP LTO2
4196005xx	Cable Assembly, Drive TTI, IBM LTO2
3138040xx	Cable Assembly, Drive TTI, SDLT
315428001	Cable Assembly, Drive TTI, T9X40B/C
3138476xx	Cable Assembly, ECM-HBF, Drive Power Supply 1-4
3138477xx	Cable Assembly, ECM-HBF, Drive Power Supply 7-10

(Sheet 1 of 4)

Part Number	Description
3138478xx	Cable Assembly, ECM-HBF, Drive Power Supply 13-16
3138479xx	Cable Assembly, ECM-HBF, Drive Power Supply 19-22, Lower
3138440xx	Cable Assembly, ECM-HBF, Rail 1-2
3138514xx	Cable Assembly, ECM-HBF, Rail 3-4
3138504xx	Cable Assembly, ECM-HBF, Rail Power Supply, Lower
4196066xx	Cable Assembly, ECM-HBN
4196069xx	Cable Assembly, ECM-HBO, Drive 1-8
4196070xx	Cable Assembly, ECM-HBO, Drive 9-16
4196071xx	Cable Assembly, ECM-HBO, Drive 17-24
4196072xx	Cable Assembly, ECM-HBO, Drive 25-32
4196073xx	Cable Assembly, ECM-HBO, Drive 33-40
4196074xx	Cable Assembly, ECM-HBO, Drive 41-48
4196075xx	Cable Assembly, ECM-HBO, Drive 49-56
4196076xx	Cable Assembly, ECM-HBO, Drive 57-64
4196208xx	Cable Assembly, ECM-PDU/Panel
4196287xx	Cable Assembly, Ethernet, HUB-ECM
4196215xx	Cable Assembly, Front Door Switch
3152485xx	Cable Assembly, Ground Strap, HBD, Drive Tray

Part Number	Description
3138540xx	Cable Assembly, HBD-Power, SW, LED
3138447xx	Cable Assembly, HBF-Fans, Rack
4196264xx	Cable Assembly, HBF-HBF Jumper
3138437xx	Cable Assembly, HBF-Panel, Lights
3138432xx	Cable Assembly, HBF-Pass Thru, 48V
3138049xx	Cable Assembly, HBF, Rail Power/Signal Panel
3138917xx	Cable Assembly, HBN-HBV, DRV
4196164xx	Cable Assembly, HBN-HBX, Jumper
3138448xx	Cable Assembly, HBV-Ground
3148089xx	Cable Assembly, HBV
4196343xx	Cable Assembly, HBZ-CAP
3139282xx	Cable Assembly, HBZ, Panel-to-Panel
3138903xx	Cable Assembly, Jumper, AC Power-Frt, EF
3138931xx	Cable Assembly, Jumper, DC Power-HBN, EF
4196165xx	Cable Assembly, Jumper, HBN-EPO/Kill, EF
4196168xx	Cable Assembly, Jumper, HBN-HBX, EF
4196163xx	Cable Assembly, Jumper, Light-Light
10800316	LC—LC Coupler (for vendor drives)

Part Number	Description
10800316	LC—LC Duplex (for T9x40 drives)
10800307	LC—LC Duplex, 1.09 m (for vendor drives)
3154279xx	Cable Assembly, LED-Drive
3138865xx	Cable Assembly, N+1, Frame, AC
4196206xx	Cable Assembly, Pass Thru, HBX-Master
4196207xx	Cable Assembly, Pass Thru, HBX-Slave
3138071xx	Cable Assembly, PDU Signal
3144770xx	Cable Assembly, Power Supply/Drive
3127861xx	Cable Assembly, Power Supply/Drive
3144769xx	Cable Assembly, Power Supply/Drive
4196443xx	Cable Assembly, Power To Drive
4196198xx	Cable Assembly, Rack Module, Fans
3137655xx	Cable Assembly, Rail DC BUS-HBF/HBW, Lower
3137656xx	Cable Assembly, Rail DC BUS-HBF/HBW, Upper
3138452xx	Cable Assembly, Rail Terminator
3138965xx	Cable Assembly, Smoke Detector, Upper
3154284xx	Cable Assembly, SW, Drive Tray

Remove/Replace Table of Contents

This module contains removal/replacement procedures for library and vendor drive tray components.

Note: Refer to Sun StorageTek tape drive manuals for servicing Sun StorageTek tape drives.

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Preparation Procedures

This section contains step-by-step procedures necessary to prepare the library for FRU/ spare replacement. These procedures include:

- Opening/closing the library rear doors
- Opening/closing the library front doors

Library Doors

Open/Close Rear Doors

Note: The SL8500 rears doors are not interlocked with the library control firmware. Therefore, you can open/close the rear doors at any time.

Open

1. Insert the door key, and rotate 180 degrees counterclockwise to unlock the handle.
2. Rotate the door handle 90 degrees counterclockwise.
3. Pull on the handle to open the right door.
4. Pull on the left door to open.
   Note: There are magnetic strips at the top and bottom of the left door.

Close

1. Push the left door until the magnetic strips attach to the library frame.
   Note: Make sure the handle is horizontal before you close the right door.
2. Close the right door, then rotate the handle 90 degrees clockwise to secure doors.
3. Rotate the key 180 degrees clockwise to lock the handle.
4. Remove the door key.

Continued on next page

Open/Close Front Doors

Open

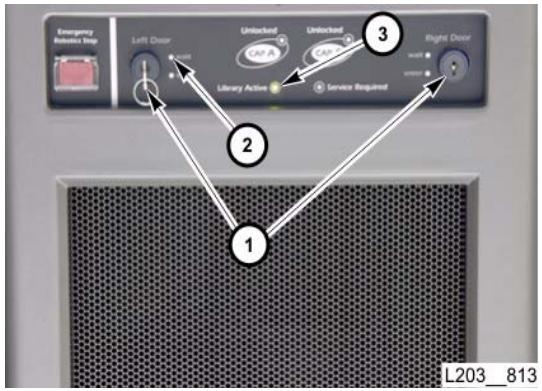
Notes: If the safety door is present, you *must* use the keypad to move the safety door to the correct side before opening the corresponding front door.

- *If the safety door is present* and in position (left or right), opening the *opposite* front door stops HandBot operation and causes the library to perform an audit when the door is closed. **Before opening the *opposite* front door, ask the operator to place the library offline to the Host/ACSLS.**
- *If the optional safety door is not present*, opening *either* front door stops HandBot operations and causes the library to perform an audit when the doors are closed. **Before opening *either* front door, ask the operator to place the library offline to the Host/ACSLS.**

1. If the safety door is not present or if you require access to an area outside of a service bay, ask the operator to place the library offline to the Host/ACSLS, then go to **Step 5**.

Continued on next page

Open/Close Front Doors



2. Insert the maintenance key into the keypad switch (1) of the desired door.
3. Turn the key to the horizontal position. The red “wait” indicator (2) lights, and the door begins moving into position.
4. When the door is in position, the green “enter” indicator (3) lights and the “wait” indicator goes off.

5. Insert the access door key into the appropriate door lock and rotate either direction to unlock the handle.
6. Remove the access door key.
7. Pull up on the handle to unlatch, then outward to open the access door. The yellow ceiling lights begin to flash slowly.

   Note: If the optional safety door is present, library HandBot operations continue outside the service area of the opened door.

   If the optional safety door is present, opening *both* front doors halts library operation.

   If the optional safety door is *not* present, opening either door halts library operation.

Continued on next page

Open/Close Front Doors

Close

1. Raise the handle fully, then push the access door completely closed.
2. While holding the door closed, push down on the handle to latch the door.

   Note: The latch remains flush when the door latches; otherwise, repeat steps 1 and 2.
3. Remove the access door key, if still in the door handle.

   Note: The yellow ceiling lights flash at a faster rate for approximately ten seconds to indicate pending HandBot start-up.
4. Turn the maintenance key back to the vertical position and remove the key. The green “enter” light goes off and the red “wait” light comes on until the safety door has moved to the center position.

   Note: Do not leave any maintenance keys with the operator.
5. If the library is offline, ask the operator to place it back online to the Host/ ACSLS.

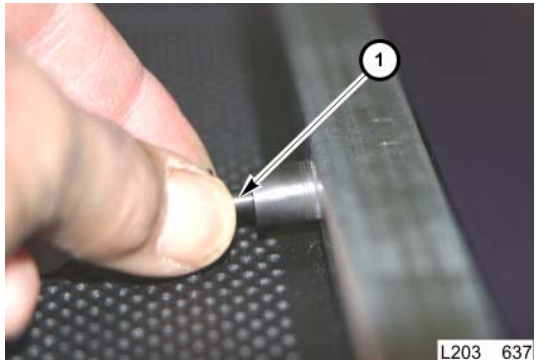
Go to top of procedure

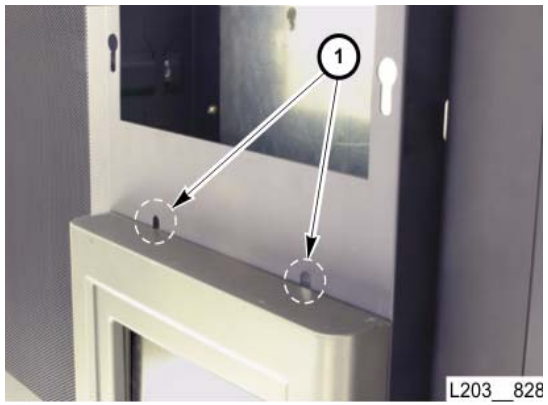
Go to R&R TOC

Next procedure: ***Center Section Access***

Center Section Access

Façade Removal



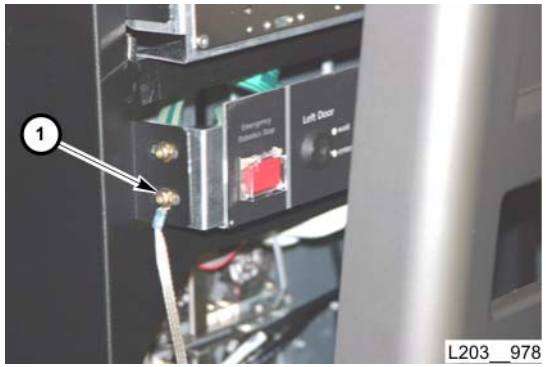


Note: Perform all six steps to remove both façades.
Perform steps 1 through 3, alone, for the upper façade only.

1. Pull out on the retaining pin (1) on the façade's top rear edge.
2. While holding the retaining pin out, lift up the upper façade, then pull the panel straight out.
   Note: The retaining pin may be locked in the retracted position by pulling out on the pin and rotating CCW until it locks.
3. Place the upper façade outside of the working area.
4. Reach behind the frame above the lower façade and twist upper retaining lugs (1) to align with slots on frame.
   Note: The ground strap attached to the keypad limits movement away from the library. Support the lower façade until step 6 is completed.
5. Lift up the lower façade, then pull it straight out.

Continued on next page

Façade Removal



6. Loosen screw securing lower façade grounding strap terminal lug (1).
7. Place the lower façade outside the working area.

Façade Installation

Note: The lower façade must be installed before installing the upper façade.
Perform all six steps to install both façades.
Perform steps 5 and 6, alone, for the upper façade only.

1. Position the lower façade close to the library center section.
2. Secure lower façade grounding strap terminal lug (1) to the screw loosened during removal.
   Position the lower façade bottom tab into the library frame bottom lip.

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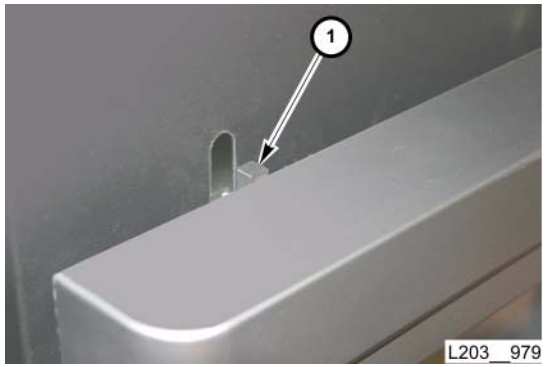
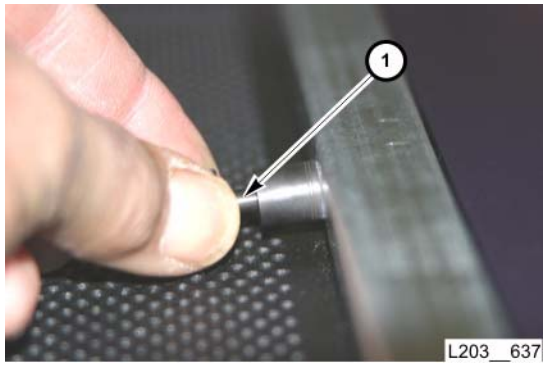
Façade Installation



3. Align the lugs (1) at the top of the lower facade with the slots in the frame above the optional local operator panel. If necessary, twist lugs to align with slots.
4. Lift slightly to position the lugs in the slots, then pull the façade straight down.
5. Reach behind the front frame and twist the lugs 90 degrees to secure the bottom façade.



6. Position the upper façade studs into the mounting slots, then pull it straight down.
7. Pull the retaining pin (1) out and allow the upper façade to drop into place, then release the locking pin.

   Note: If the retaining pin was locked in the retracted position, turn it CW until it releases.

Go to top of procedure
Go to R&R TOC
Next procedure: ***Library Components***

Library Components

This section contains step-by-step procedures to remove/replace selected Library FRUs and spares. Use the cross-reference link to access a supporting procedure; then, use the navigation tool to return to the original procedure.

Note: Access to library FRUs/spares might require opening library doors, and/or library center section access.

48V Power Supply Module (Customer Interface)

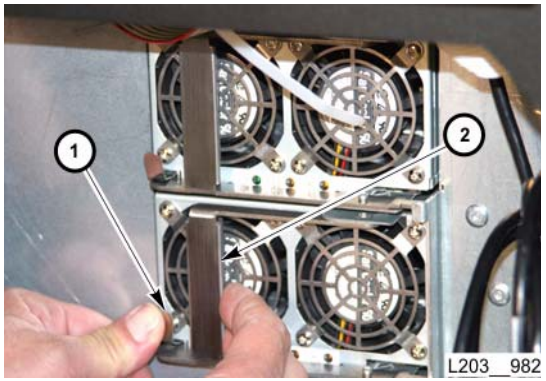
Part Location | Part Data

Removal

1. Remove both library center section façades (see **“Façade Removal”**).

Note: You can hot-swap a 48V Power Supply Module, located in the Customer Interface Assembly, if redundant power supply is present. Otherwise, the library must be in the offline.

2. If a redundant power supply is not present, request the operator to place library offline to Host/ACSLS.

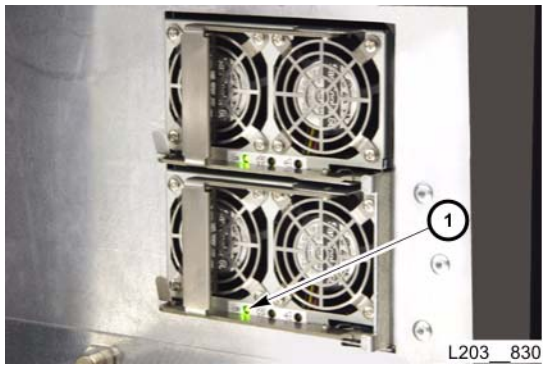


3. Press and hold the handle retention tab (1) in the lower left, then pull the handle (2) to unseat the connectors.
4. Pull the power supply, by the handle, completely out of the slot.

Continued on next page

Replacement

1. Push the replacement power supply, with the handle (1) extended, fully into the slot until the connectors are seated.
   Note: Make sure the power supply handle is in the extended position. Otherwise, a closed handle will prevent connector seating.



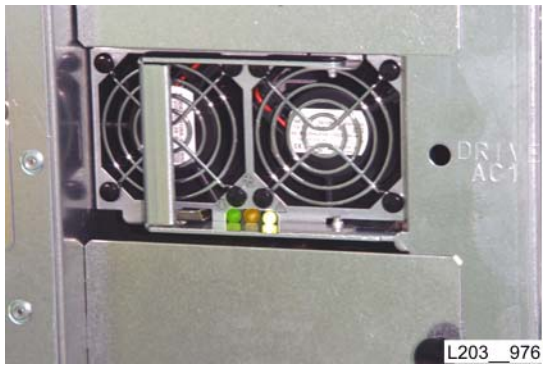
2. Close the handle to secure the assembly.
3. Verify that the green LED (1) lights.
4. If necessary, request the operator to place the library online to the Host/ ACSLS.
5. Re-install both library center section façades. (see **“Façade Installation”**).

Go to top of procedure

Next procedure: ***48V PS Module, Drive/Electronics Module***

48V Power Supply Module, Drive/Electronics Module

Part Location | Part Data



Removal

1. Open the library rear doors (see **"Open/Close Rear Doors"**).
2. Note the ratio of functional power supply modules to the number of installed, operating tape drives; or, to the number of rail communication modules.

   Note: You can hot-swap a 48V Power Supply Module if there is adequate redundancy.

   There must be a minimum of one functional power supply module per eight installed, operating tape drives after removing a power supply module.

   There must be a minimum of one functional power supply module per two installed, operating rail communication modules after removing a power supply module.

   Power supply modules are numbered from the bottom, up:

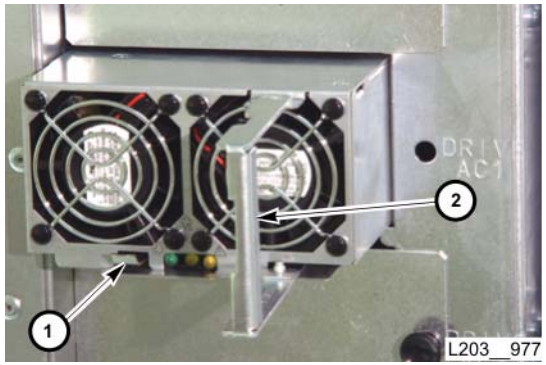
   PS1 - 4, 7 - 10, 13 - 16, 19 -22 power the drive bus.

   PS5 - 6, 11 - 12, 17 - 18, 23 -24 power the rail bus.

   The appearance of the LEDs and handle retention tab may differ from the one shown.
3. Power-off selected tape drives or rail communication modules until an adequate ratio can be maintained.

Continued on next page

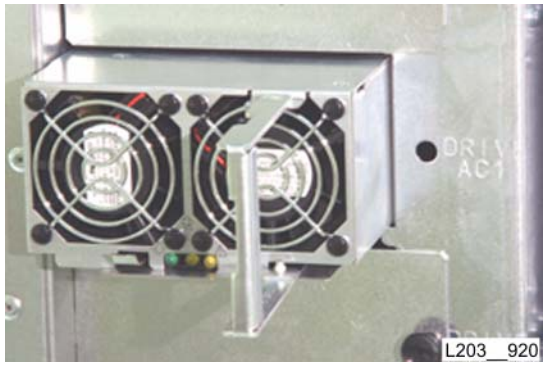
Removal



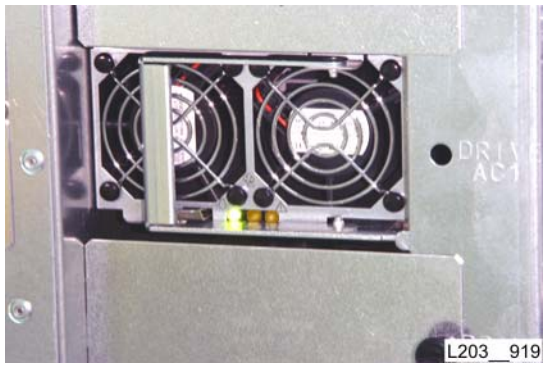
4. Press and hold the handle retention tab (1) in the lower left, then pull the handle (2) to unseat the connectors.
5. Pull the power supply, by the handle, completely out of the slot.

Continued on next page

Replacement



1. Push the replacement power supply, with the handle extended, fully into the slot until the connectors are seated.
   Note: Make sure the power supply handle is in the extended position. Otherwise, a closed handle will prevent connector seating.



2. Close the handle to secure the assembly.
3. Verify that the green LED is ON.
4. Perform **"48V Power Supply Module (Drive Electronics) Verification."**
5. Power-up all tape drives that were powered-off during removal steps.
6. Close the library rear doors (see **"Open/Close Rear Doors"**).

Go to top of procedure

Next procedure: ***48V Power Supply/HBS Module Socket (HBF) Card***

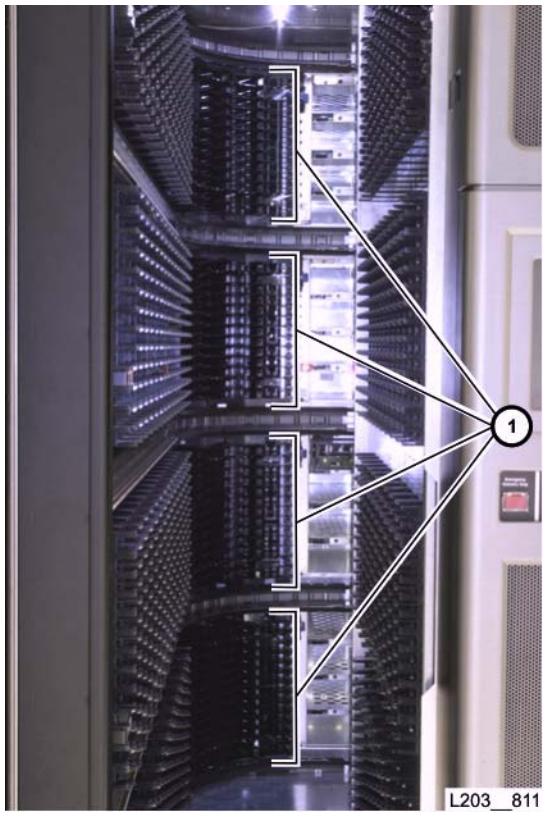
48V Power Supply/HBS Module Socket (HBF) Card

Location

Behind arrays at Column -5

Part Data

Removal



Note: Access to the HBF cards is through a panel, located at the -3, through -6 cartridge array columns (1), for each rail inside the Base Assembly. The library operation must be halted, and all power shut down before replacing an HBF card.

1. Ask the operator to place the library offline to the Host/ACSLS.
2. Open the library rear doors and left front door (see **“Open/Close Rear Doors”** and **“Open/Close Front Doors”**).

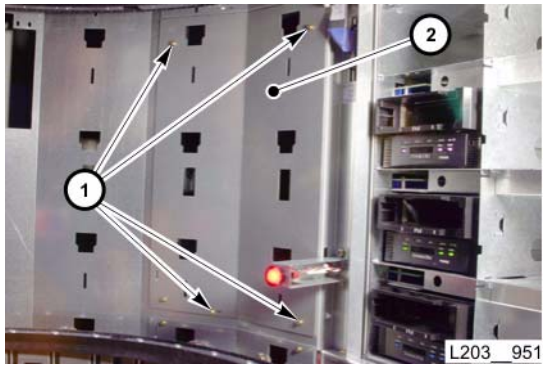
Removal

WARNING: *Electrical Shock Hazard:* Potentially hazardous AC and DC voltage could be encountered at the HBF locations. MAKE SURE library is powered-off, and main AC input circuit breakers are off.

3. Set PDU circuit breaker(s) (1) to OFF (down).
4. Park all HandBots in the library right side rails.
5. Remove all related power supplies, noting their position number (see **"Drive and Electronics Module (1 of 2)"**).
6. Remove all related HBS trays, noting their position number (see **"Drive and Electronics Module (1 of 2)"**), as needed.

Continued on next page

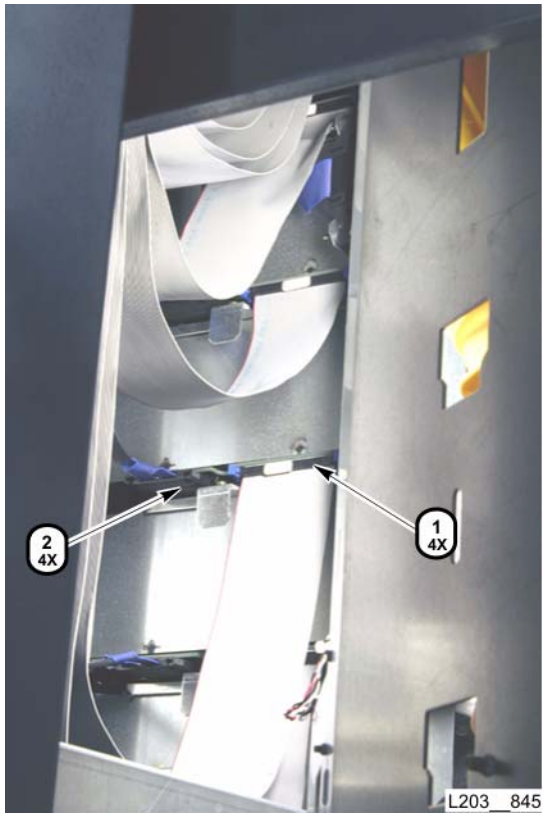
Removal



7. Remove cartridges and cartridge arrays at columns -3 through -6, of the related rail and place them out of the work area.
8. Remove four T15 screws (1) securing the exposed access panel (2).
9. Remove the access panel and place it out of the work area.

Continued on next page

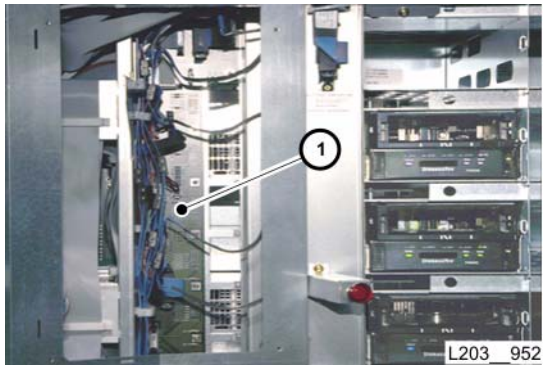
Removal



10. Disconnect ribbon (1) and power (2) cables from the HBO cards adjacent to the related HBF card.

    Note: Unsnap the HBO card ribbon cable retainer and move the cables out of the way, if necessary.

Continued on next page



Removal

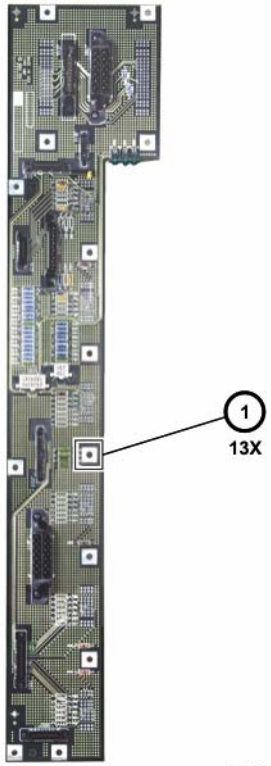
Note: All cables should be labeled.
Cables are individually shaped/keyed.
Some card receptacles are not used.

11. Disconnect all connections at the HBF card (1).
    a. Inspect each cable for a label that matches the card jack.
    b. Label all cables that are not already clearly labeled.

Continued on next page

Removal

12. Remove 13 T10 screws (1) securing the HBF card.
13. Remove the HBF card through the open access panel.



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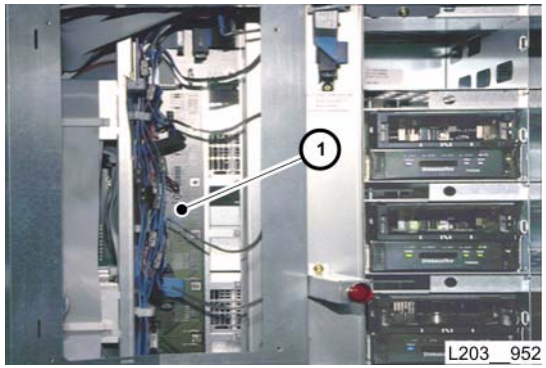
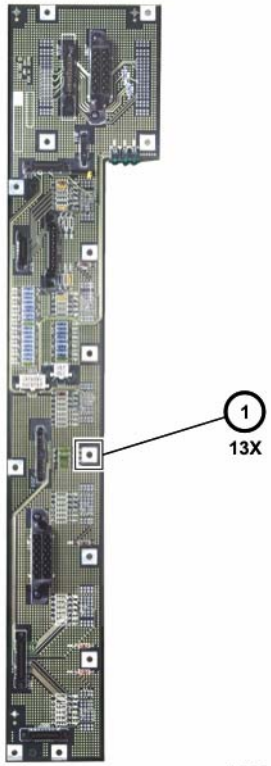
Replacement



1. Insert and position the HBF (1) card through the open access panel.

Continued on next page

Replacement



2. Insert and loosely tighten 13 T10 screws (1).
   Note: Do not fully tighten screws until all 13 are threaded.
3. Tighten all 13 screws to secure the card.

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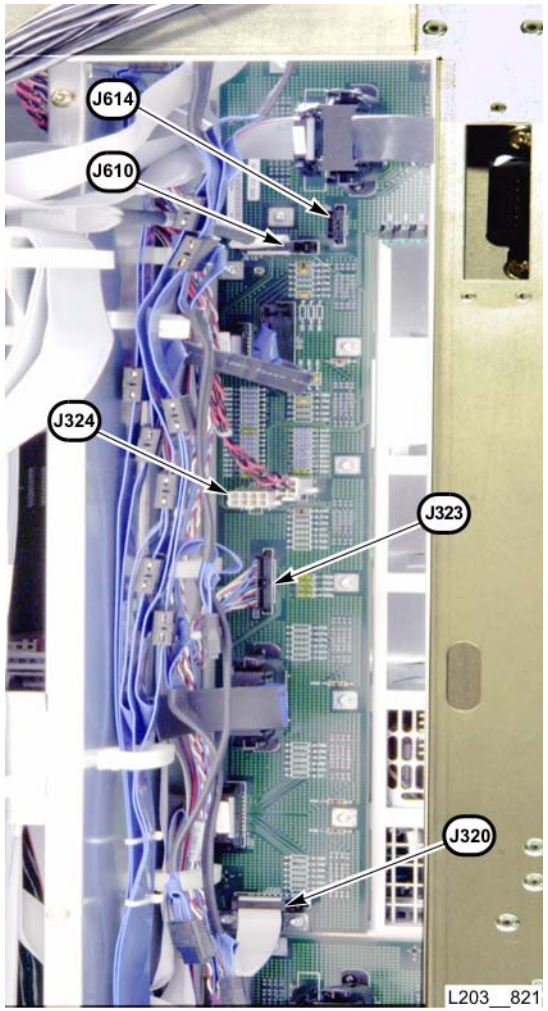
Replacement



Note: All cables should be labeled.
Cables are individually shaped/keyed.
The following card jacks are not used:

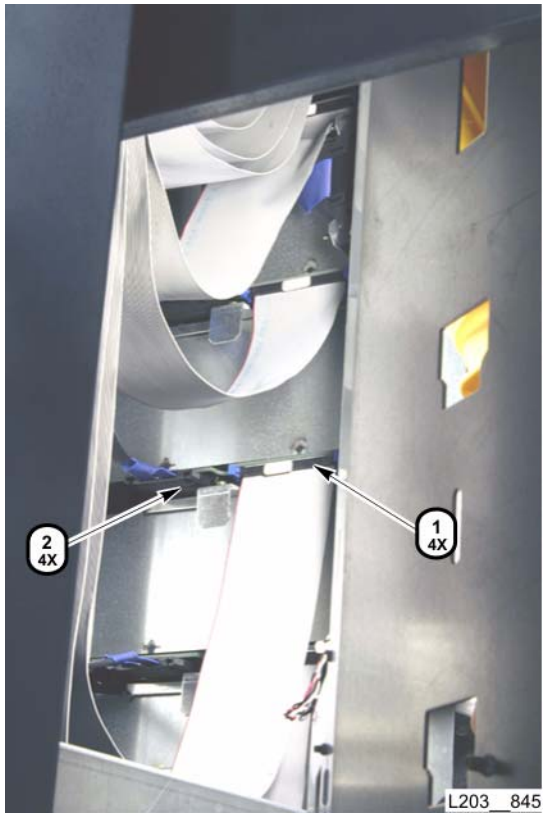
4. Connect the cables to the HBF card jacks.

Note: The following card jacks are not used (HBF #3 shown):

HBF #4 (top) - J610, J323, J614
HBF #3 - J324, J614
HBF #2 - J614
HBF #1 (bottom) - J320, J323

Continued on next page

Replacement



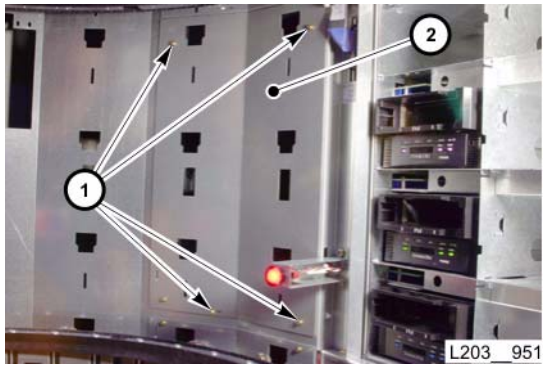
5. Connect all ribbon (1) and power (2) cables to the HBO cards according to their labeling.

   Note: Ribbon cables are labeled P235-n (n=1 through 16, starting from the lowest HBO row).

6. If necessary, reposition HBO ribbon cables in their cable retainer and snap the retainer closed.

Continued on next page

Replacement



7. Replace access panel (1) and thread four T15 screws (2).
   Note: Make sure access panel is completely flush before tightening the screws. Otherwise, a bowed access panel could cause cartridge insertion/extraction problems.
8. Tighten the four threaded screws.
9. Replace cartridge arrays and cartridges removed to expose access panel.
10. Close and latch the library left door.
11. Reinstall all related power supplies to their original positions (see **"Drive and Electronics Module (1 of 2)"**).
12. Reinstall all related HBS trays to their original positions (see **"Drive and Electronics Module (1 of 2)"**).

Continued on next page

Replacement

13. Set PDU circuit breaker(s) (1) to ON (up).
14. If the top HBF card was replaced, verify that the interior lights are lit.
15. If this card also powers a PTP, verify that it initializes.
16. Perform **“Drive Array and HBO Verification.”**

Go to top of procedure

Next procedure: ***48V Power Supply Module Socket (HBV) Card***

48V Power Supply Module Socket (HBV) Card

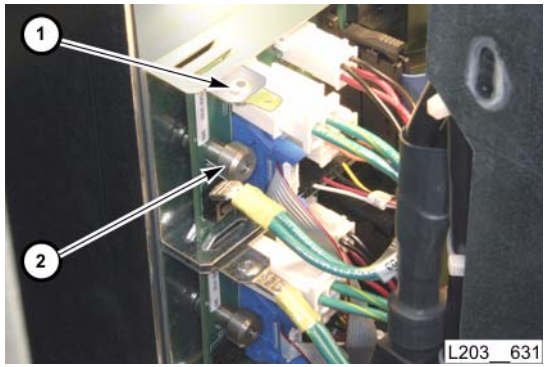
Part Location | Part Data

Removal

1. Request operator to place the library offline to the Host/ACSLS.
2. Open library rear doors (see **“Open/Close Rear Doors”**).
3. Set PDU circuit breaker(s) (1) to OFF (down).
4. Remove both library center section façades (see **“Façade Removal”**).
5. Remove the related 48V Power Supply (see **“48V Power Supply Module”**).
6. Open both library front doors (see **“Open/Close Front Doors”**).
7. Position the optional safety door (if present) into the right-side service bay.

Continued on next page

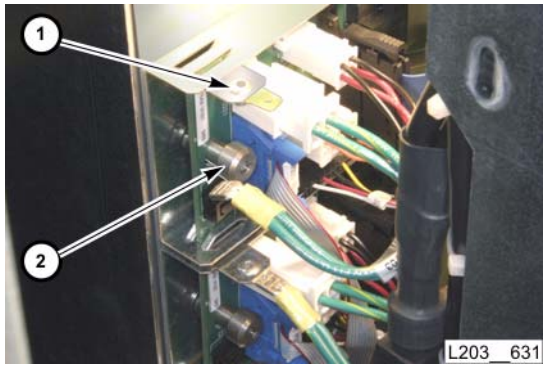
Removal



8. Disconnect the HBV card grounding terminal lug (1) from the frame tab.
9. Fully loosen the captive thumbscrew (2) retaining the HBV card.
10. Disconnect all cables, one at a time:
    a. Inspect each cable for a label that matches the card receptacle.
    b. Label cables, if required.
11. Pull the card completely out of the mounting slot.

Continued on next page

Replacement



1. Position the replacement HBV card near the mounting slot.
2. Connect all cables to the appropriate receptacles.
3. Insert the card into the slot, then align and tighten the thumbscrew (2) to secure the card.

   Note: Make sure the card edges are inside the slot guides.
4. Connect the HBV card grounding terminal lug (1) to the frame tab.
5. Install the 48V Power Supply (see **“48V Power Supply Module (Customer Interface)”**).

Continued on next page

Replacement

6. At the rear of the library, set PDU circuit breaker(s) (1) to ON (up).
7. Close both library doors (see **“Open/Close Front Doors”** and **“Open/Close Rear Doors”**).
8. Perform **“Elevator/CAP Controller (HBZ) Module Verification.”**
9. Re-install both library center section façades (see **“Façade Installation”**).
10. Request the operator to place the library online to the Host/ACSLS.

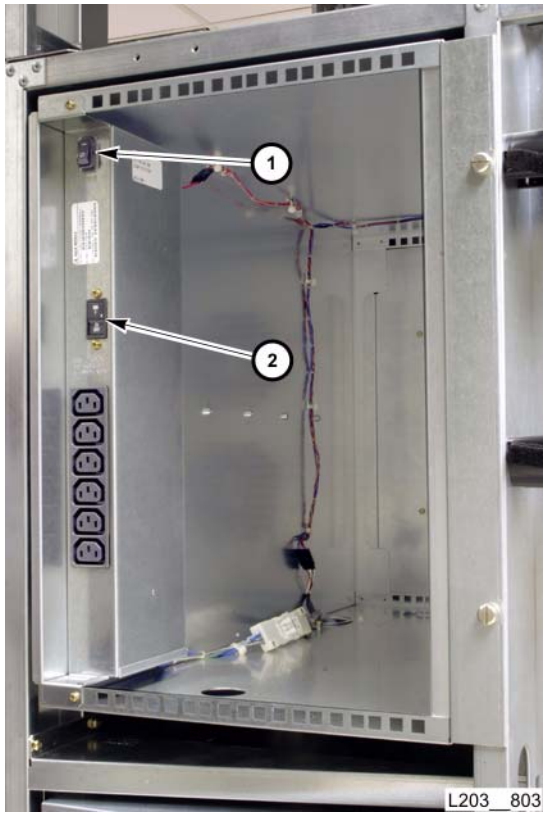
Go to top of procedure

Next procedure: ***Accessory Rack AC Power Strip***

Accessory Rack AC Power Strip

Part Location | Part Data

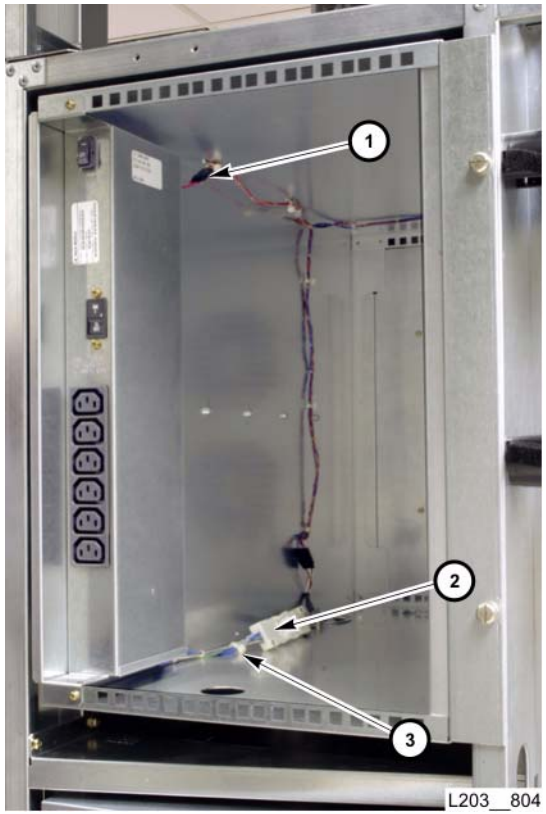
Removal



1. Open the library rear doors (see **“Open/Close Rear Doors”**).
2. Set the fan power switch (1) to off (O).
3. Set the power strip AC circuit breaker (2) to off (O).
4. Disconnect all accessory rack component AC power cords from the power strip.

Continued on next page

Removal



5. Disconnect the fan control cable (J761/P761) (1).
   Note: You can open access panels on the module side wall, when the module is fully extended on its rails, for additional accessibility.
6. Clip and discard the cable tie/mount (3) securing the AC power in connector (J31x) (2).
7. Disconnect the AC power input (J31x/P31x).

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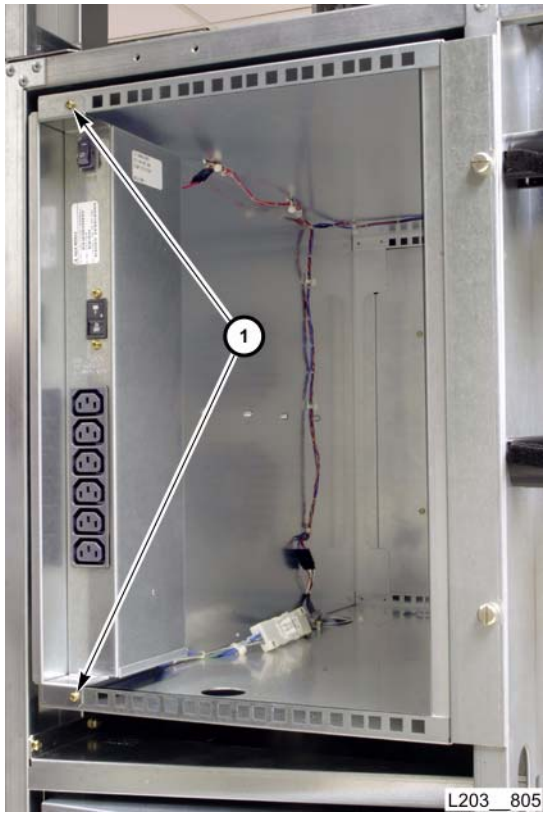
Removal



8. Remove two T15 screws (1) securing the power strip to the mounting rails.
9. Remove the power strip.

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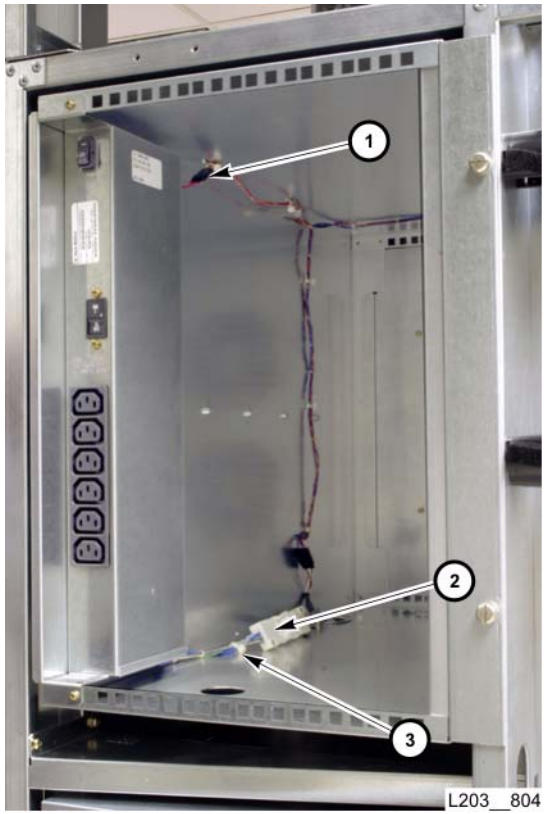
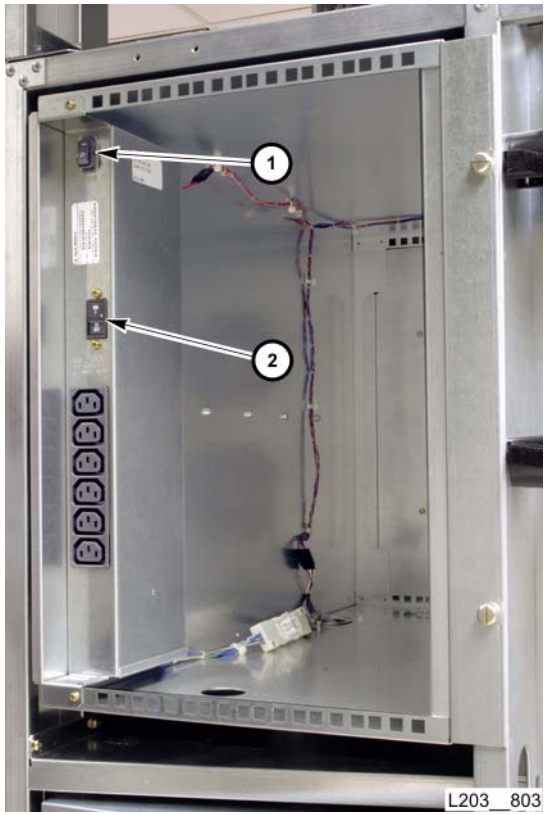
Replacement



1. Set the power strip AC circuit breaker and fan power switch to off (O).
2. Position the replacement power strip fully into the mounting slot.
3. Secure the power strip with two T15 screws (1).

Continued on next page

Replacement



4. Connect the fan control cable (J761/P761) (1).
   Note: You can open access panels on the module side wall, when the module is fully extended on its rails, for additional accessibility.
5. Connect the power strip's AC power input (J31x/P31x) (2).
6. Install a new cable tie/mount (3) to secure the AC power in connector (J31x).
7. Connect all accessory rack component AC power cords.

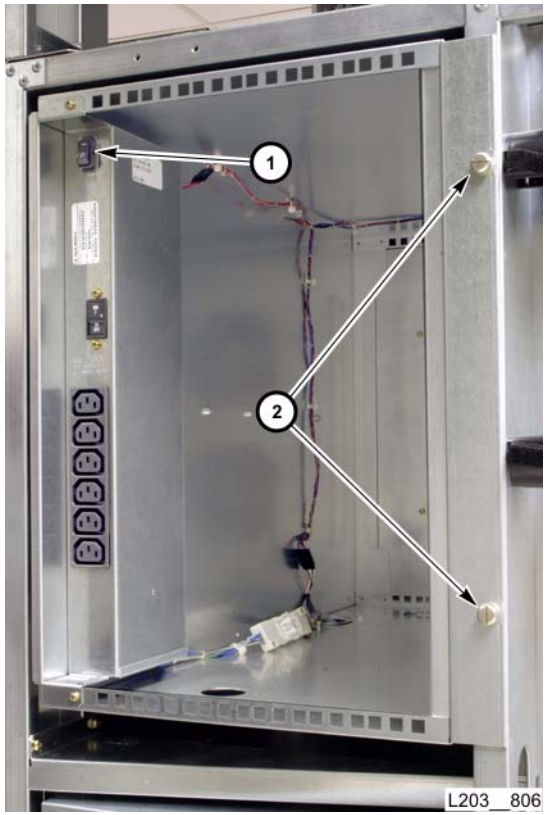
Go to top of procedure

Next procedure: ***Accessory Rack Fan Assembly***

Accessory Rack Fan Assembly

Part Location | Part Data

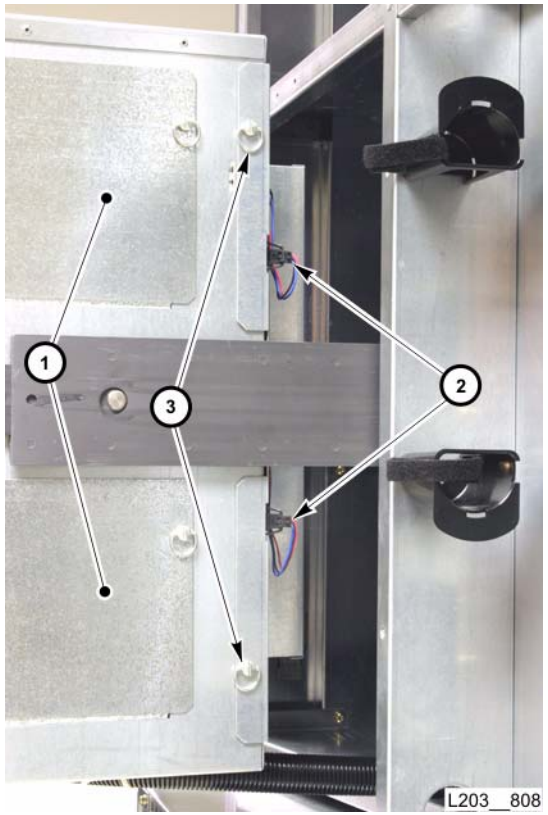
Removal



1. Open the library rear doors (see **“Open/Close Rear Doors”**).
2. Set the fan power switch (1) to off (O).
3. Fully loosen both captive thumbscrews (2) retaining the accessory rack module to the library.

Continued on next page

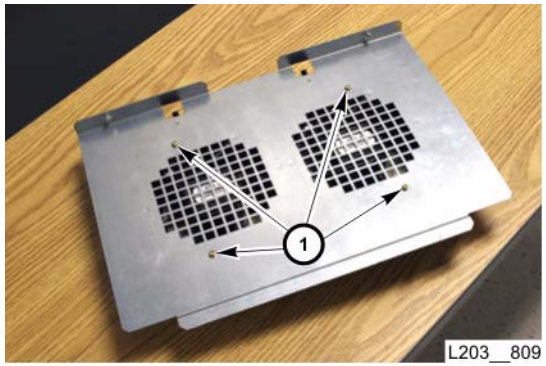
Removal



4. Pull the accessory rack module out until rails are fully extended and latched.
5. If necessary to improve access, unlatch and remove both right side wall access panels (1).
6. Disconnect both fan power cords (2) from the module rear wall connector.
7. Unlatch both latches (3) securing the fan assembly to the right wall.
8. Remove the fan assembly through the open rear wall and out a right side wall access opening, and place it on a work surface.

Continued on next page

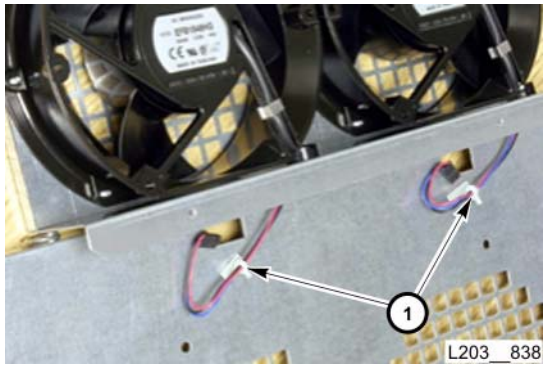
Removal



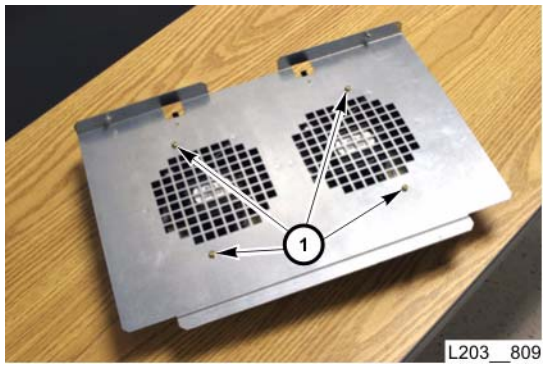
9. Clip and discard the cable tie/mount securing the fan power cable.
10. Remove four T10 screws (1) securing the fan guard to the mounting plate, and remove the fan from the mounting studs.
11. The fans are retained by the fan guard and mounting plate mating.

Continued on next page

Replacement



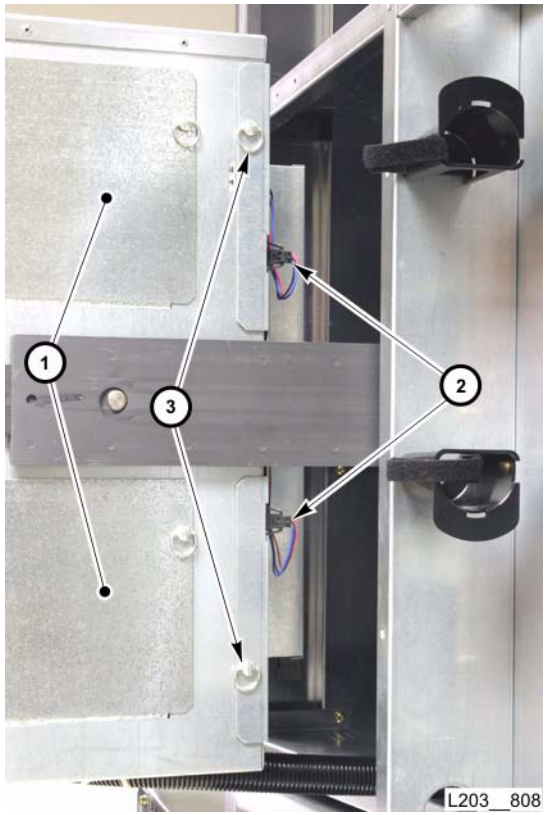
1. Position the replacement fan on the mounting plate studs.
2. Secure the fan power cord with a new cable tie/mount (1).
3. Position the fan guard, mating mounting plate studs to fans.



4. Thread and tighten four T10 screws (1) to secure the fan assembly.
5. Maneuver the fan assembly through a right side access panel and the open rear wall, positioning the fan assembly tab into the rack's left rear corner wall slot.

Continued on next page

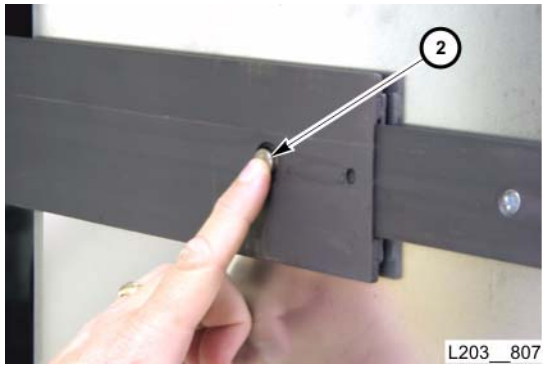
Replacement



6. Secure the fan assembly to the rack's right wall with two latches (3).
7. Connect both fan power cords (2) to the rack connectors.
8. Replace and latch both right side wall access panels (1), if removed.

Continued on next page

Replacement



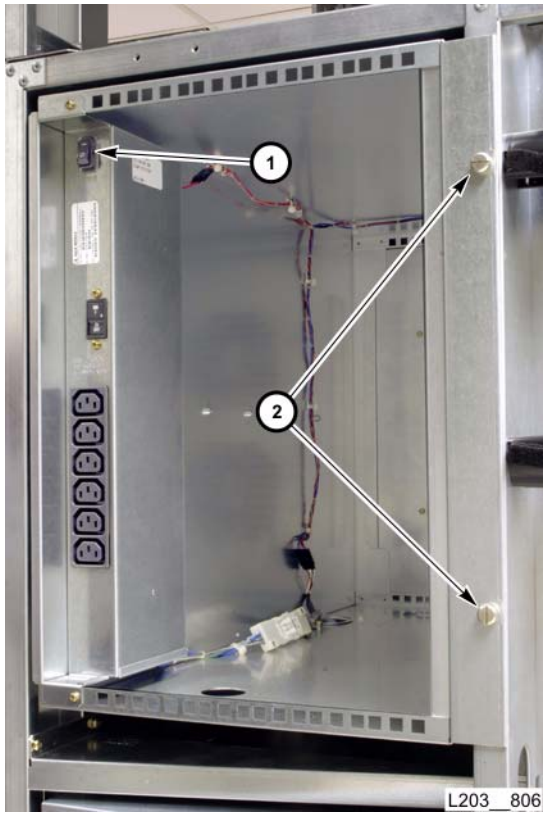
WARNING: *Pinch Hazard:* Push slowly on the module while pressing the rail latches to prevent injury.

9. Press in on module rail latches (1), and SLOWLY push the module fully into the library.

   Note: There is one rail latch on each side.

Continued on next page

Replacement



10. Tighten both thumbscrews (2) to retain the rack module.
11. Set the fan power switch (1) to (|).
12. Verify fan operation.
13. Close the library rear doors (see **“Open/Close Rear Doors”**).

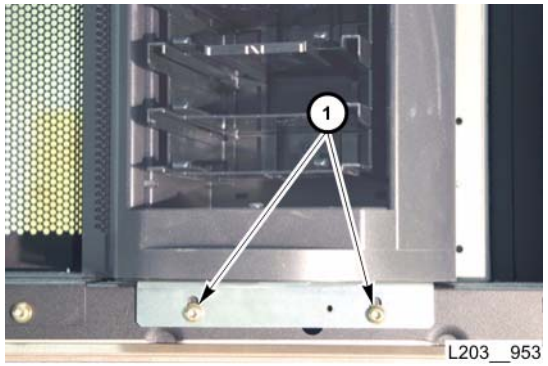
Go to top of procedure

Next procedure: ***CAP Assembly***

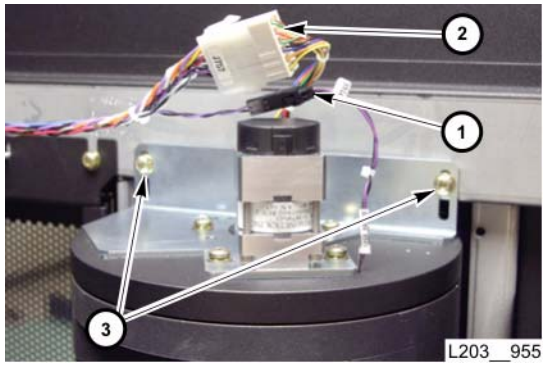
CAP Assembly

Part Location | Part Data

Removal

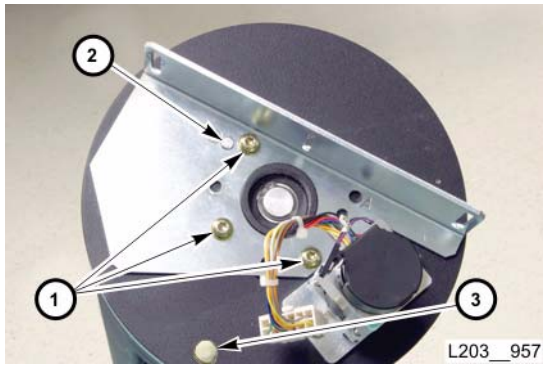


1. Open the library right front door (see **"Open/Close Front Doors"**).
2. Remove the two T25 screws (1) at the bottom of the CAP assembly.

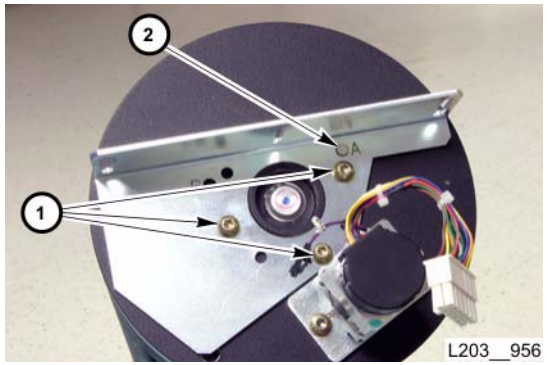


3. Disconnect the in-line connectors.
   CAP A: J748/P74x (1) and J792/P75x (2).
   CAP B: J747/P74x (1) and J756/P75x (2).
4. Remove the two T25 screws (3) securing the top of CAP assembly.
5. Lift the CAP assembly up and off the door bottom ledge, removing it from the library door.

Continued on next page



CAP B Position



CAP A Position

Replacement

1. Make sure replacement CAP upper mounting bracket location matches CAP position.

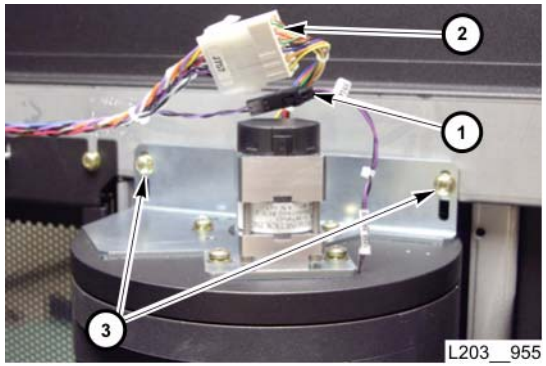
   Note: The CAP assembly FRU ships with the upper mounting bracket in the CAP B position (locator pin [2] occupies CAP hole “B”).

2. Relocate the upper mounting bracket for CAP A, if required:
   a. Remove three T25 screws (1) that secure the bracket and remove the bracket.
   b. Remove the knurled limit pin (3).
   c. Lift the bracket and reposition it so that the locator pin (2) occupies CAP hole “A”.
   d. Insert and tighten three T25 screws (1) to secure the bracket.

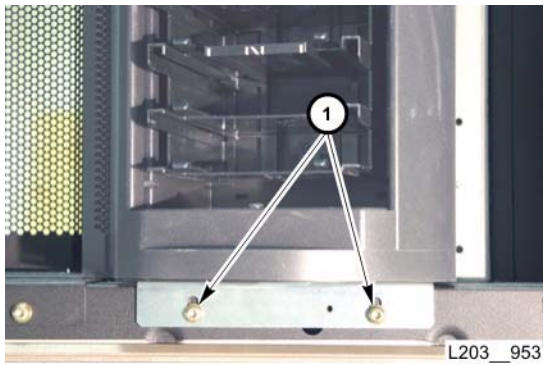
   Note: When the upper bracket is configured for CAP A, it partially obscures the vacated CAP B limit pin hole.

Continued on next page

Replacement



3. Position the replacement CAP assembly onto the door bottom ledge.
4. Position two T25 screws (3) in the upper mounting bracket.
5. Thread, but DO NOT tighten two screws to the top of the CAP.
6. Connect in-line connectors (1).
   CAP A: J748/P74x (1) and J792/P75x (2).
   CAP B: J747/P74x (1) and J756/P75x (2).



7. Position two T25 screws (1) in the bottom bracket.
8. Thread, but DO NOT tighten the two screws.
9. Tighten all four screws *evenly* to secure the CAP assembly.
10. Close the library door (see **“Open/Close Front Doors”**).

Continued on next page

Replacement

11. Perform **“CAP Assembly Verification.”**

    Note: If the CAP operates properly, continue with the next step.
    If the CAP does not turn, or does not turn to its fully open and locked position, repeat steps 3 through 10, placing one 0.508 mm (0.020 in) shim (part 3148106xx) from the CAP installation kit behind the top and bottom brackets. A maximum of 5 shims may be installed under the top and bottom brackets. If the CAP still does not operate properly after installing the fifth shim, you must order a new CAP.

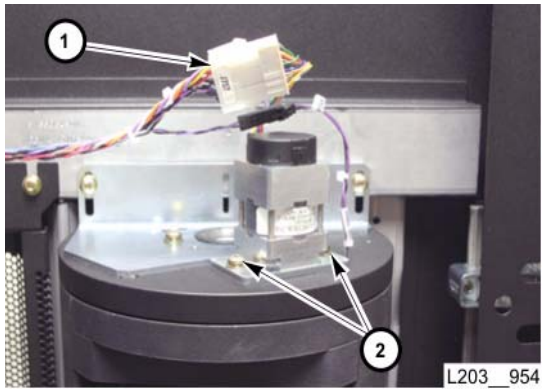
12. Transfer all cartridge arrays from the removed CAP to the replacement CAP.

Go to top of procedure

Next procedure: ***CAP Motor Assembly***

CAP Motor Assembly

Part Location | Part Data



Removal

1. Open the library right front door (see **"Open/Close Front Doors"**).
2. Disconnect the in-line connector (1) closest to the CAP motor assembly.
3. Remove two T15 screws (2) securing the CAP motor assembly.
4. Lift the CAP Motor Assembly up and off the CAP.

Replacement

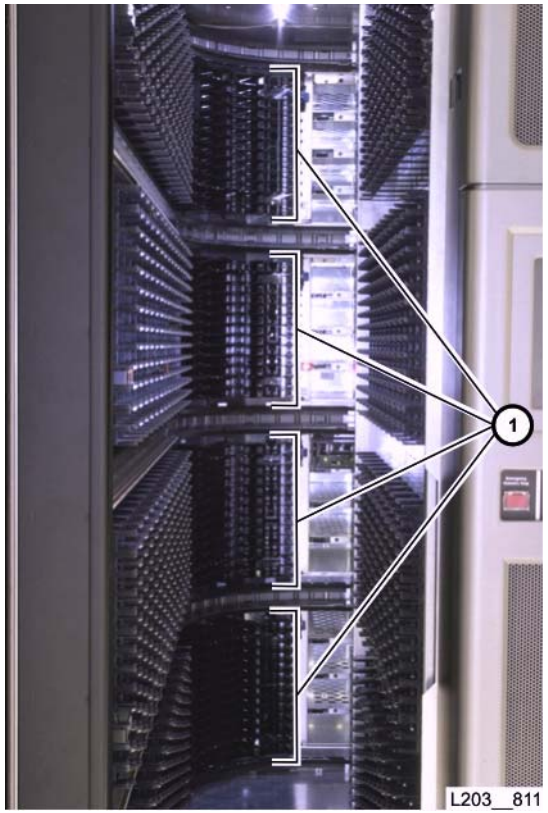
1. Position the replacement CAP motor assembly onto the CAP, with the mounting plate locator pins engaged.
2. Insert and tighten two T15 screws (2) to secure the CAP motor assembly to the CAP.
3. Connect the CAP motor assembly in-line connector (1) to the cable assembly.
4. Close the library door (see **"Open/Close Front Doors"**).
5. Perform **"CAP Assembly Verification."**

Next procedure: ***Drive Array***

Drive Array and HBO Card

Part Location | Part Data

Removal



1. Ask the operator to place the library offline to the Host/ACSLS.
2. Open the library rear doors and left front door (see **“Open/Close Rear Doors”** and **“Open/Close Front Doors”**).
3. Park all HandBots out of the way on the right side of the library.
4. Remove cartridges and cartridge arrays at columns -3 through -6 (1) of the related rail and place them out of the work area.

Continued on next page

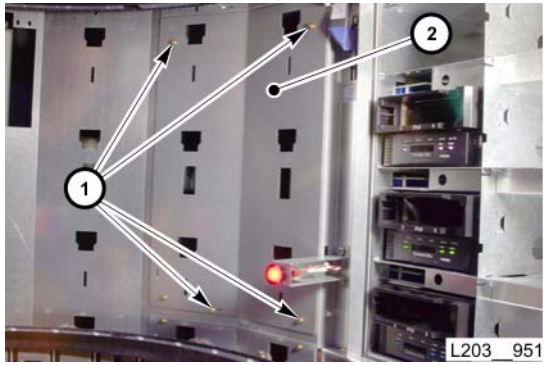
Removal

WARNING: *Electrical Shock Hazard:* Potentially hazardous AC and DC voltage could be encountered at the HBO card locations. MAKE SURE the library is powered-off, and the main AC input circuit breakers are off.

5. Set PDU circuit breaker(s) (1) to OFF (down).

Continued on next page

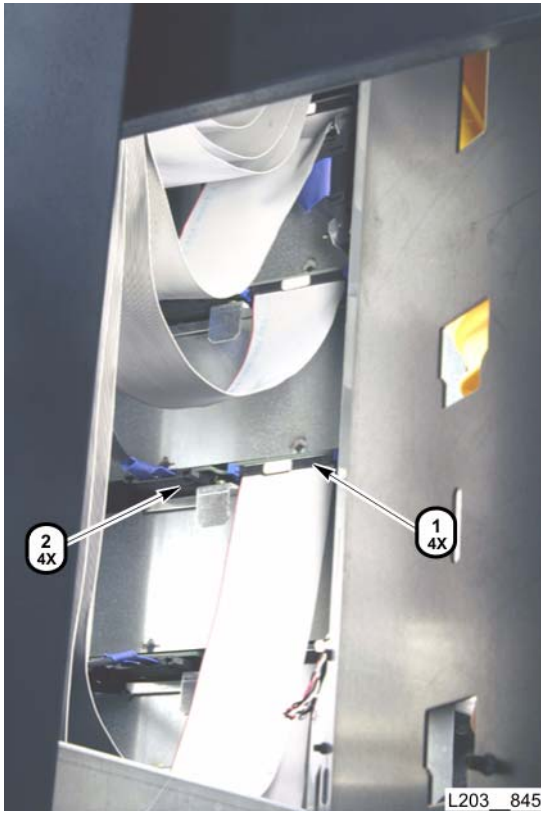
Removal



6. Remove four T15 screws (1) securing access panel (2).
7. Remove the access panel and place it out of the work area.

Continued on next page

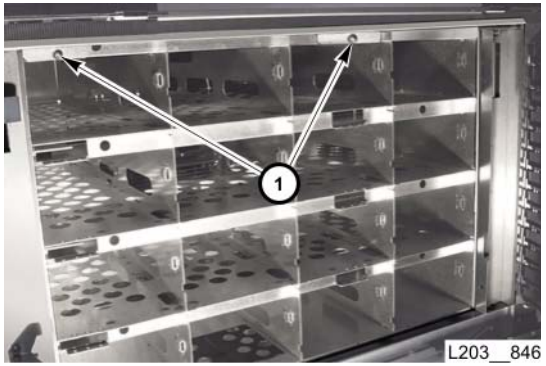
Removal



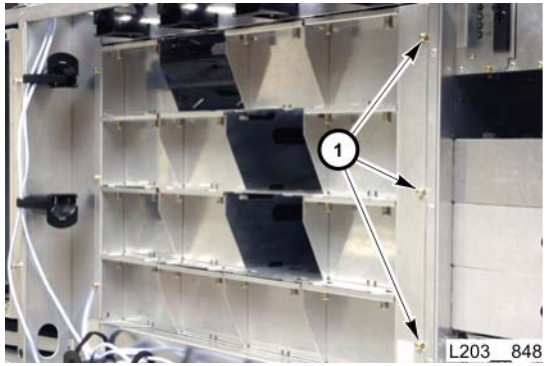
8. Disconnect the ribbon (1) and power (2) cables from each HBO card.
   Note: Check connectors for proper labeling, label any connector not labeled. Ribbon cables are labeled P235-n (n=1 through 16, starting from the lowest HBO row).

Continued on next page

Removal



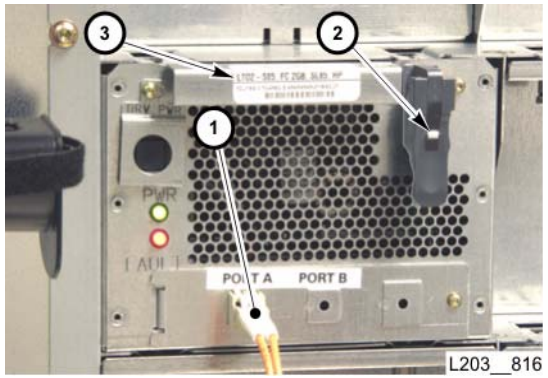
9. Inside the library, remove two T25 screws (1) at the top of the drive array.



10. At the rear of the library, remove three T25 screws (1) on each side of the drive array.

Continued on next page

Removal



11. Remove all drive trays from the drive array:
    a. Disconnect the host interface cable (1) from the tray rear panel.
    b. On T9x40 drive trays, disconnect the Service Delivery Platform Ethernet cable, if present.
    c. Press the tray latch lever release tab (2), then rotate the lever upward into the detent position (unlatched).
    d. Pull the tray, by the handle (3), straight out of the library drive bay, and place it out of the work area.

       Note: Make sure you support the tray before it clears the library drive bay.
    e. Disconnect or move other cables as necessary to allow removal of the drive array.

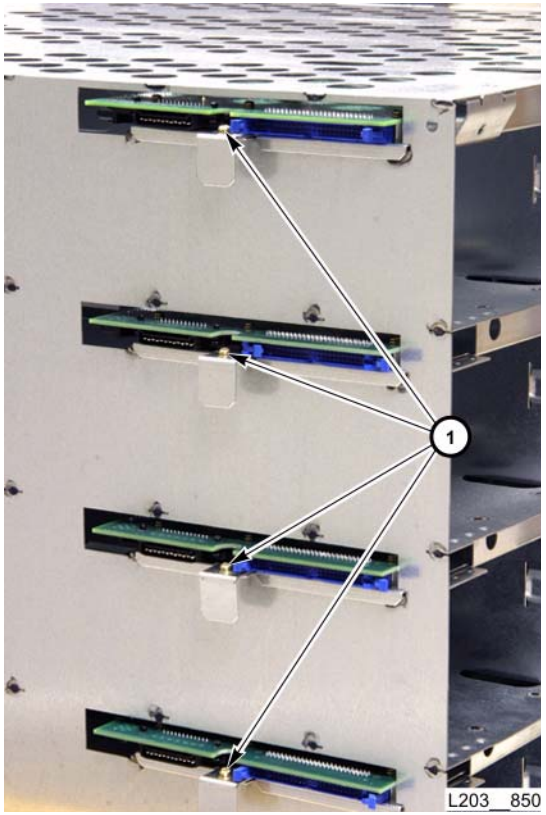
WARNING: *Lifting hazard:* The upper drive array weights approximately 34kg (75 lb). Follow the directions in **"Lifting Techniques."**

Potential personal injury. Be careful of sharp sheet metal edges when handling the drive array.

12. Slide the drive array out of the library and place it on a work surface.

Continued on next page

Removal

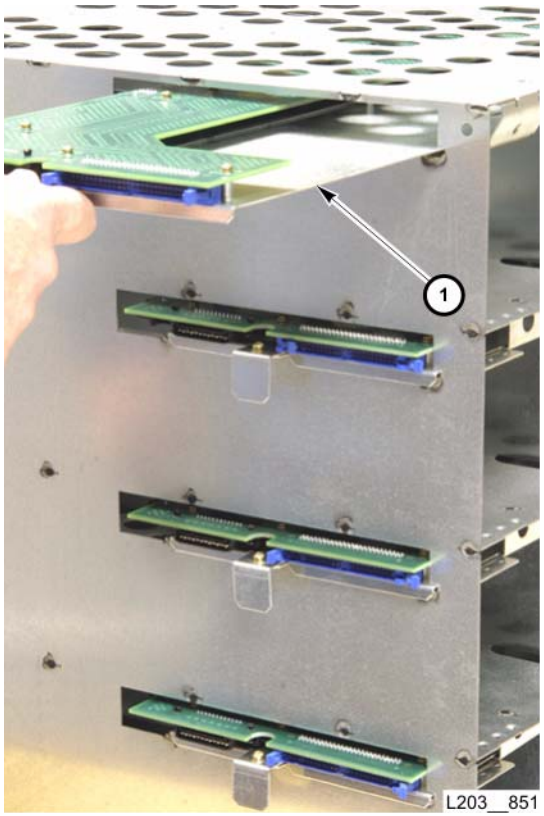


13. Remove one T15 screw (1) securing each HBO card plate to the drive array.

Note: If you are removing only one defective HBO card, remove the card from the plate and replace it. When you are done, proceed to the Replacement procedure on page **150**.

Continued on next page

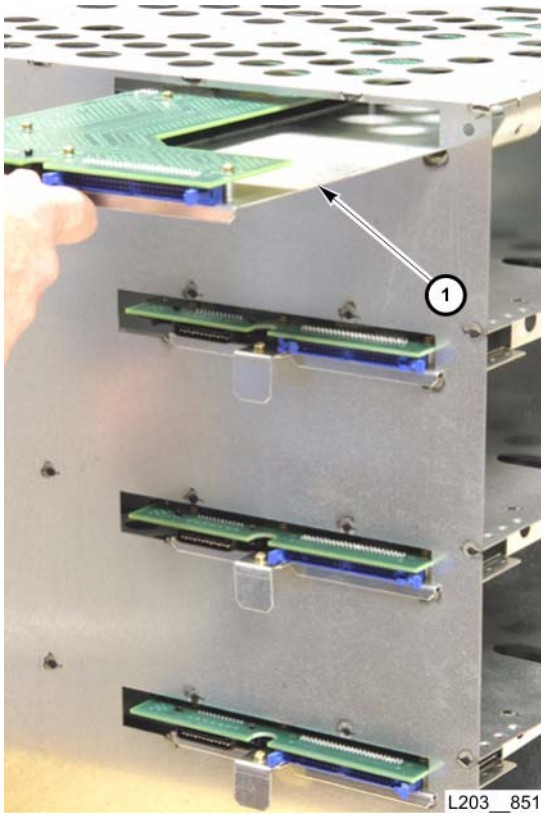
Removal



14. Remove four HBO card plates (1) from the library by sliding straight out.

Continued on next page

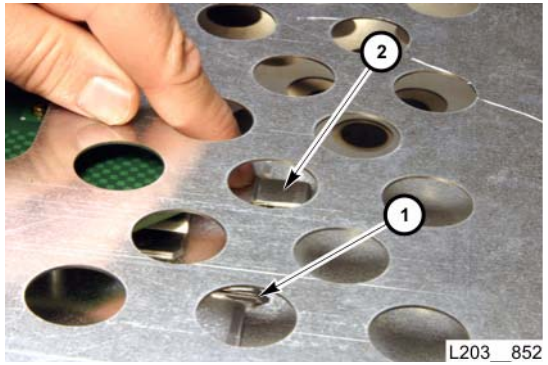
Replacement



1. Slide four HBO card plates (with HBO card attached) about halfway into the drive array, card-side up.

Continued on next page

Replacement

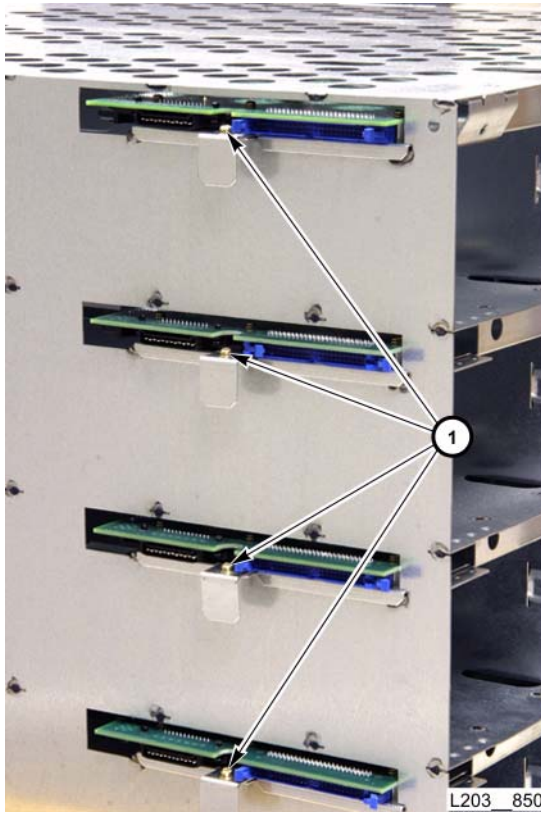


CAUTION: *Possible equipment damage:* The alignment slot in card plate must be aligned with the raised metal key (1) inside the drive array. If necessary, push down on card plate to place it under the metal tab (2).

2. Slide each HBO card plate fully into drive array, one at a time:
   a. Make sure slot in card plate is aligned with raised metal key (1).
   b. Push down on end of card plate to engage metal tab (2).

Continued on next page

Replacement



3. Secure each card plate to drive array with one T15 screw (1).

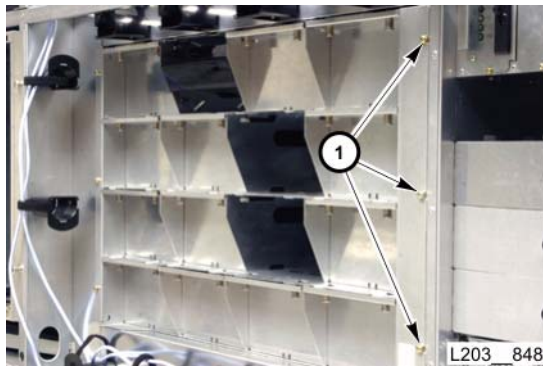
Continued on next page

Replacement

WARNING: *Lifting hazard:* The upper drive array weights approximately 34kg (75 lb). Follow the directions in **"Lifting Techniques."**

Potential personal injury: Be careful of sharp sheet metal edges when handling the drive array.

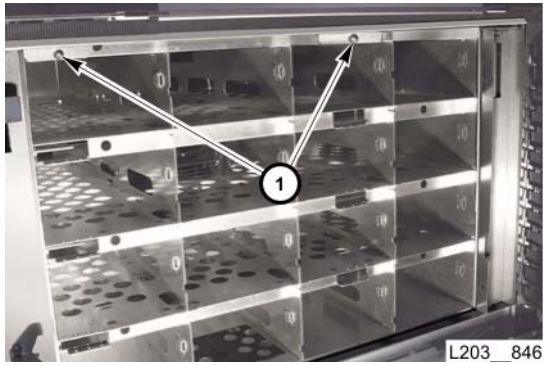
4. Lift the drive array and slide into the library.



5. At rear of library, secure drive array with three T25 screws (1) on each side.

Continued on next page

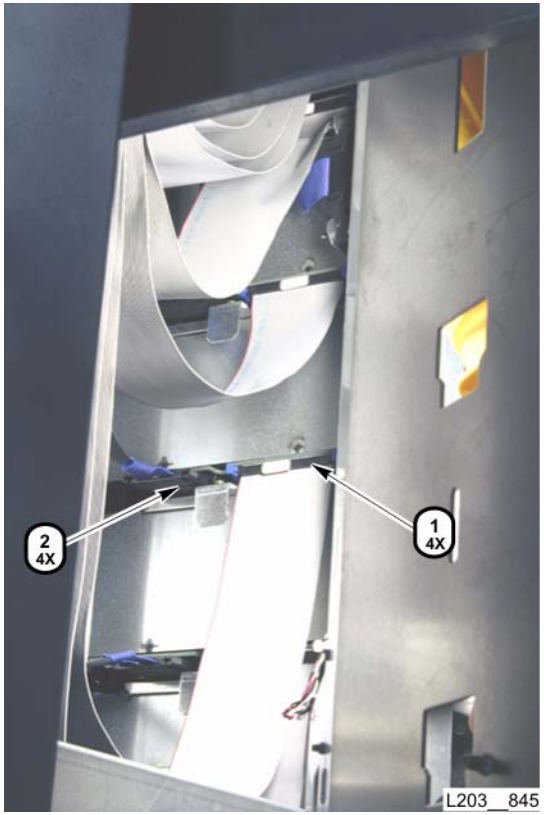
Replacement



6. Inside library, secure drive array with two T25 screws (1) at the top center of the array.

Continued on next page

Replacement

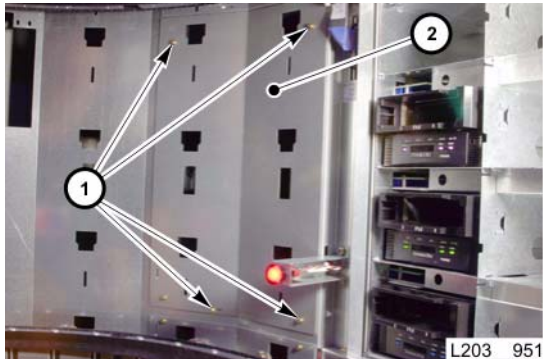


Note: Ribbon cables are labeled P235-n (n=1 through 16, starting from the lowest HBO row).

7. Connect HBO card ribbon (1) and power cables (2) according to their labels.

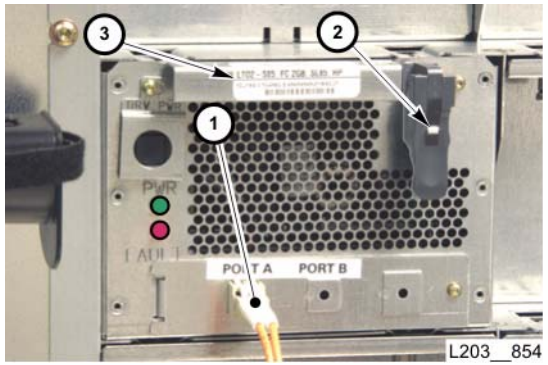
Continued on next page

Replacement



Note: Make sure access panel is flush in its mounting area before tightening screws.

8. Position the access panel and secure with four T15 screws.
9. Install cartridge arrays and cartridges at columns -3 through -6, of the related rail.



10. Reinstall drive trays:
    a. Make sure the tray latch lever is in the upward detent position.
    b. Using the handle (3) slide the drive tray fully into the drive bay to seat the tray connector.
    c. Reconnect the host cable (1).
    d. On T9x40 drives, connect the Service Delivery Platform Ethernet cable, if present.
    e. Rotate tray latch lever downward until it locks (2).
11. Connect/secure all other cabling disconnected or moved to facilitate drive array removal.

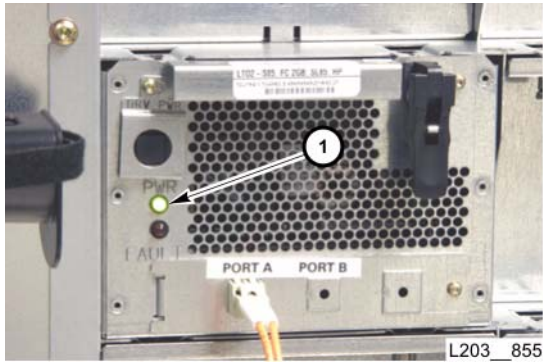
Continued on next page

Replacement

12. Set PDU circuit breaker(s) (1) to ON (up).

Continued on next page

Replacement



Note: The green PWR LED (1) on the drive trays begins blinking, which indicates presence of 48VDC to the drive tray power supply card. Once the library detects the drive, the green PWR LED changes from blinking to steady, the drive powers up, and begins the IPL sequence.

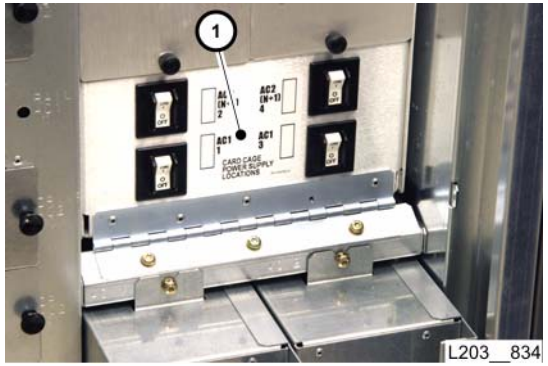
13. Use the library console to verify the properties for the drive trays in the replaced drive array.
14. Load a diagnostic cartridge into each drive in the replaced drive array.
15. Close the library front and rear doors (see **“Open/Close Rear Doors”** and **“Open/Close Front Doors”**).
16. Ask the operator to place the library online to the Host/ACSLS.
17. Go to **“Drive Array and HBO Verification” on page 319**.

Go to top of procedure
Go to R&R TOC
Next procedure: ***Drive Controller (HBT) Card***

Drive Controller (HBT) Card

Part Location | Part Data

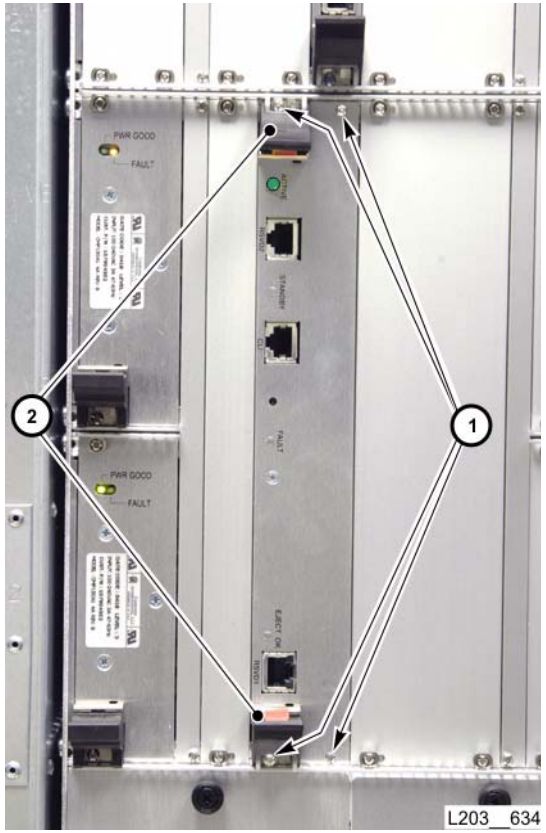
Removal



1. Request the operator to place the library offline to the Host/ACSLS.
2. Open the library rear doors (see **“Open/Close Rear Doors”**).
3. Set related EM card cage circuit breaker(s) (1) to OFF (down).

Continued on next page

Removal



4. Fully loosen four captive screws (1) securing the card.
5. Unlatch both card levers by pressing the red tab (2) on each lever.
6. Press both card levers outward, simultaneously, to unseat the connector.
7. Pull the card completely out of the card slot.

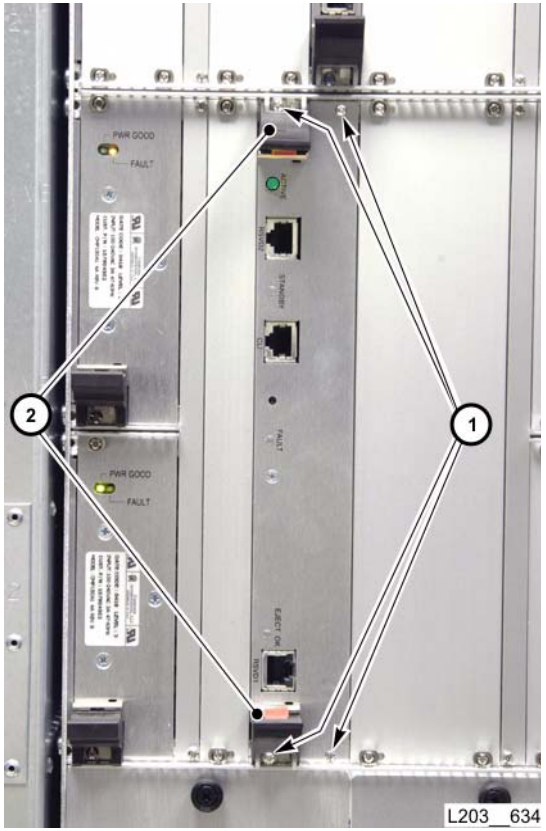
Continued on next page

Replacement

1. Align the card edges with the slot guides (1) at the top and bottom, and push the replacement card into the slot until it contacts the slot connector.

Continued on next page

Replacement



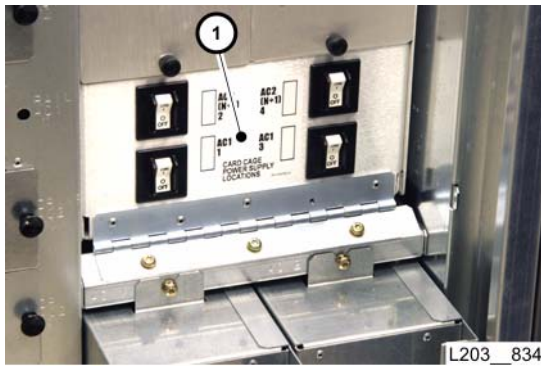
2. Press both card levers (2) inward, simultaneously, to seat the connector.
   Note: The levers auto-latch when the connector is fully seated.

CAUTION: *Possible Screwhead Damage:* DO NOT overtighten card captive screws.

3. Tighten all four captive screws (1) to secure the card.

Continued on next page

Replacement



4. Set EM card cage circuit breaker(s) (1) to ON (up).

CAUTION: *Possible Equipment Damage:* If keypad Wait LEDs are flashing, DO NOT open library front doors.

5. Observe Wait LEDs on the front keypad after EM card cage circuit breakers are set to ON.
6. If the front keypad Wait LEDs are flashing, code is being downloaded to the replaced HBT card.

   Note: If the front keypad Wait LEDs are flashing, code is being downloaded to the replaced HBT card.

   When Wait LEDs stop flashing, or if Wait LEDs do not flash, proceed with the next step.
7. Perform **"Drive Controller (HBT) Card Verification."**
8. Close the library rear doors (see **"Open/Close Rear Doors"**).
9. Request the operator to place the library online to the Host/ACSLS.

Go to top of procedure

Next procedure: ***Drive Interface (HBY) Card***

Drive Interface (HBY) Card

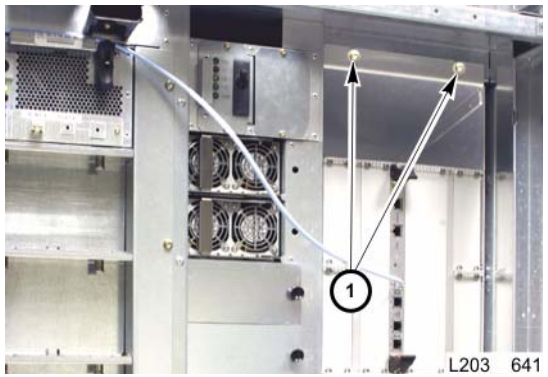
Part Location | Part Data

Removal

1. Ask the operator to place the library offline to the Host/ACSLS.
2. Open the library rear doors (see **“Open/Close Rear Doors”**).
3. Set PDU circuit breaker(s) (1) to OFF (down).

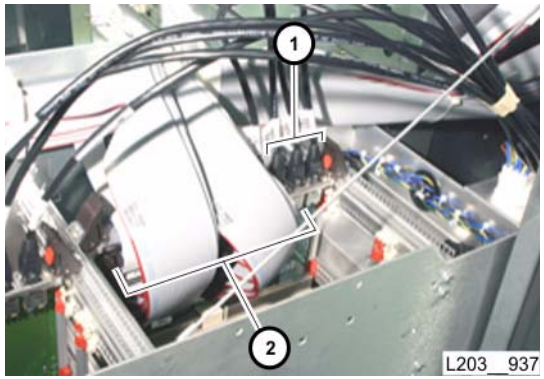
Continued on next page

Removal



Note: The EM front panel is hinged on the bottom.
You can access the HBY card when the EM is rotated fully open.

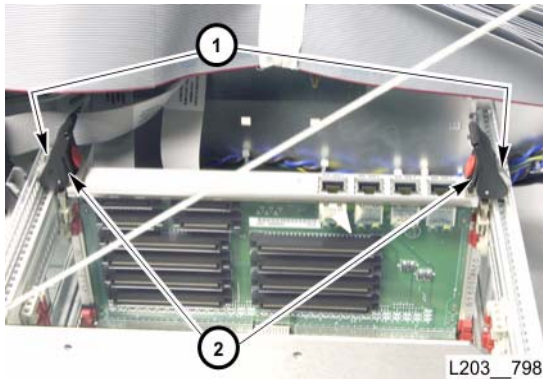
4. Remove two T25 screws (1) securing the EM front panel.
5. Rotate the EM front panel out of the library until retained by the lanyard.
   Note: The HBY Card is closest to the EM front panel hinge.



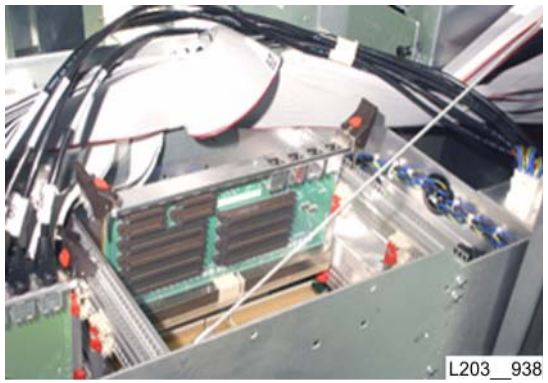
6. Disconnect all Ethernet cables (1), one at a time:
   a. Inspect each Ethernet cable for a label that matches the card port.
   b. Label all cables that are not already clearly labeled.
7. Disconnect all ribbon cables (2), one at a time:
   a. Inspect each cable for a label that matches the card jack.
   b. Label all cables that are not already clearly labeled.

Continued on next page

Removal



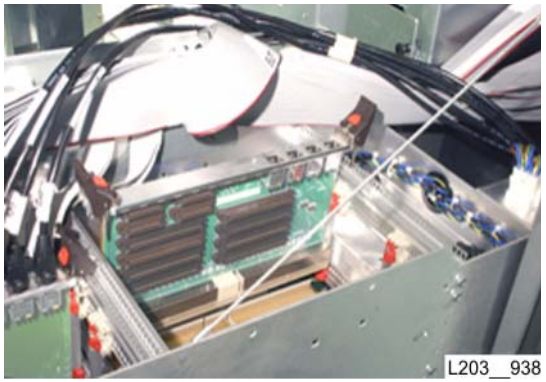
8. Fully loosen two captive screws (1) securing the card.
9. Unlatch card levers (2) by pressing the red tab on each lever.
10. Press both card levers outward, simultaneously, to unseat the connector.



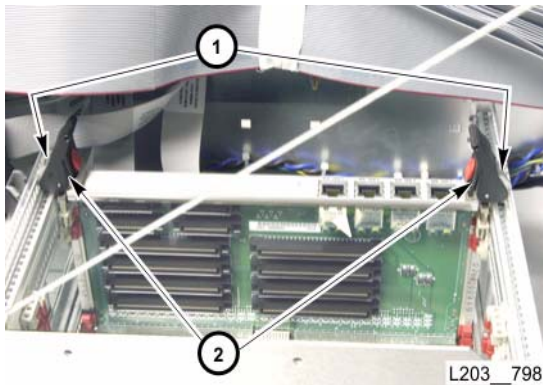
11. Pull the card completely out of the card slot.

Continued on next page

Replacement



1. Align the card edges with the slot guides (1), and push the replacement card into the slot until it contacts the slot connector.



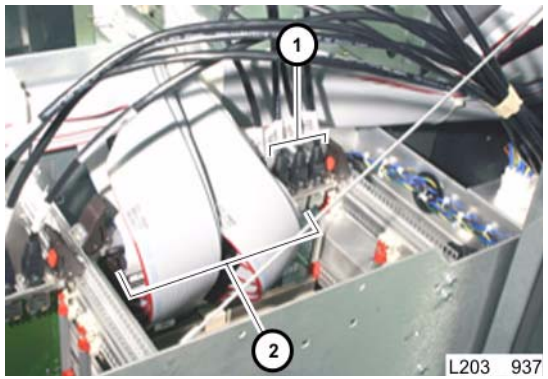
2. Press both card levers (2) inward, simultaneously, to seat the connector.
   Note: The card levers auto-latch when the card connector is fully seated.

CAUTION: *Possible Screwhead Damage:* DO NOT overtighten card captive screws.

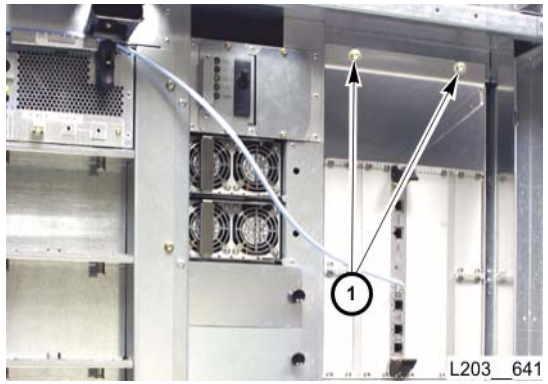
3. Tighten two captive screws (1) to secure the card.

Continued on next page

Replacement



4. Connect all ribbon cables (2) to the appropriate jacks.
5. Connect all Ethernet cables (1) to the appropriate ports.
6. Rotate the EM front panel into the library until the front panel is closed.



7. Insert and tighten two T25 screws (1) to secure the EM panel.

Continued on next page

Replacement

8. Set PDU circuit breaker(s) (1) to ON (up).
9. Perform **“Drive Interface (HBY) Card Verification.”**
10. Close the library rear doors (see **“Open/Close Rear Doors”**).
11. Ask the operator to place the library online to the Host/ACSLS.

Go to top of procedure

Next procedure: ***Elevator/CAP Controller (HBZ) Module***

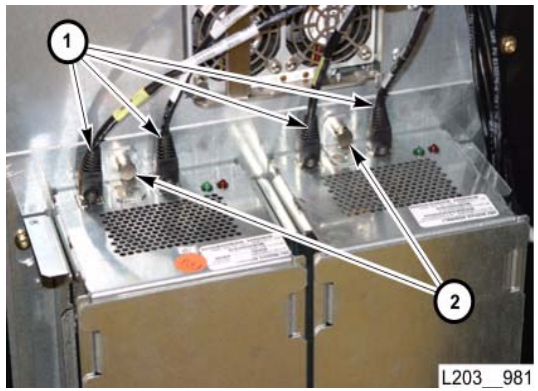
Elevator/Cap Controller (HBZ) Module

Part Location | Part Data

Removal

Note: If there is only one HBZ module present, the library must be placed offline.

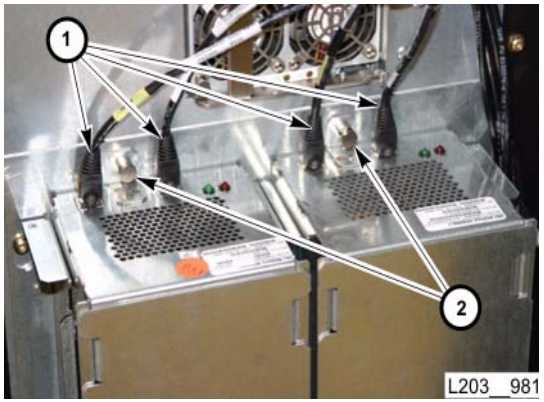
1. If necessary, ask the operator to place the library offline to the Host/ACSLS.
2. Remove both library center section façades (see **"Façade Removal"**).



3. Disconnect both Ethernet cables (1) from the module.
   Note: Label Ethernet cable connectors before disconnecting.
4. Pull out on the module retaining pin (2), then rotate it 90 degrees to lock it in the recessed position.
5. Lift the module straight up, then out to remove it from the mounting.

Continued on next page

Replacement



1. Make sure the replacement HBZ module retaining pin (2) is in the recessed position. Otherwise, pull it out, then rotate it 90 degrees to lock.
2. Position the replacement module into the mounting guides, then push it straight down to seat the module connectors.
3. Rotate the retaining pin 90 degrees to release it into the extended position.
4. Pull up on the module to make sure it is secured.
5. Connect Ethernet cables (1) to the appropriate jacks.

CAUTION: *Possible Equipment Damage:* If keypad Wait LEDs are flashing, DO NOT open library front doors.

6. Observe Wait LEDs on the keypad after Ethernet cables are connected. If Wait LEDs are flashing, code is being downloaded to the replaced HBZ module.

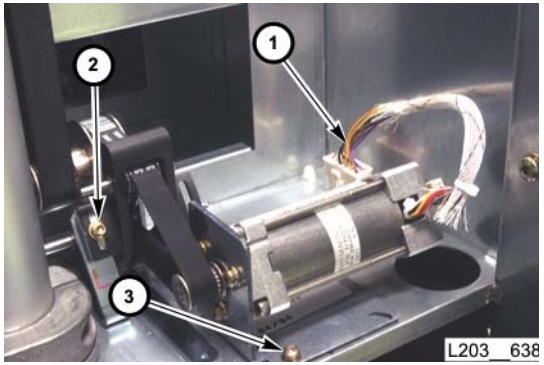
   Note: When Wait LEDs stop flashing, or if Wait LEDs do not flash, proceed with the next step.
7. Perform **"Elevator/CAP Controller (HBZ) Module Verification."**
8. Re-install both library center section façades (see **"Façade Installation"**).
9. If the library is offline, ask the operator to place it back online to the Host/ACSLS.

Go to top of procedure

Next procedure: ***Elevator Motor Assembly***

Elevator Motor Assembly

Part Location | Part Data



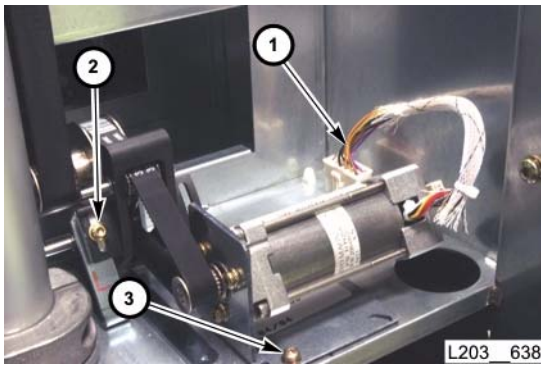
Removal

Note: If the optional safety door is *not* present, the library must be placed offline before removing/replacing the elevator motor assembly.

1. If the service safety door is *not* present, ask the operator to place the library offline to the Host/ACSLS.
   - If the service safety door *is* present, and you wish to replace the *left* elevator motor, ask the operator to place the *left* elevator offline to StreamLine Library Console (see **"Service Safety Door Verification"** if you are unfamiliar with activation of the service safety door).
   - If the service safety door *is* present, and you wish to replace the *right* elevator motor, ask the operator to place the right elevator offline to StreamLine Library Console and place the CAPs offline to the Host/ ACSLS.
2. Open the appropriate library front door (see **"Open/Close Front Doors"**).
3. Disconnect the motor assembly power cable (1) at the bulkhead connector.
4. Loosen the T15 tension assembly screw (2), press on the tensioner to relieve tension, then re-tighten the screw.
5. Remove two T15 screws (3), on opposite corners of the mounting plate.
6. Rotate motor assembly toward tensioner to disengage drive belt.
7. Lift the motor assembly away from the mounting area.

Continued on next page

Replacement



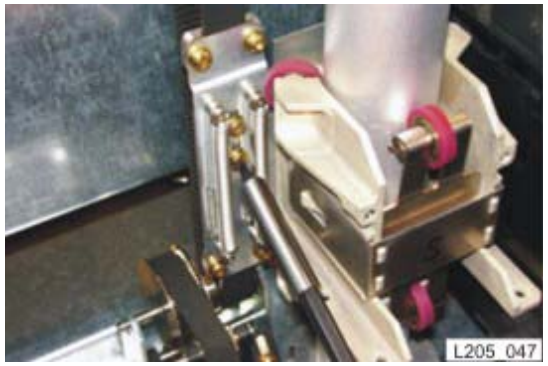
1. Position the replacement motor assembly with motor pulley behind drive belt.
2. Rotate motor assembly away from tensioner to engage drive belt and position mounting plate on locator pins in the mounting area.
3. Insert and tighten the two T15 mounting plate screws (3).
4. Loosen the T15 tension assembly screw (2) a couple of turns to apply tension to the drive belt, then retighten the tension assembly screw.
5. Connect the motor assembly cable (1) to the bulkhead connector.
6. Close the library door (see **“Open/Close Front Doors”**).
7. Perform **“Elevator Motor Verification.”**
8. If the entire library is offline, ask the operator to place it back online to the Host/ACSLS.
   - If the *left* elevator is offline to StreamLine Library Console, ask the operator to vary it online.
   - If the *right* elevator is offline to StreamLine Library Console, ask the operator to vary it online. Then ask the operator to modify/vary the CAPs online to HSC/ACSLS.

Go to top of procedure

Next procedure: ***Elevator Rollers***

Elevator Rollers

Part Location | Part Data



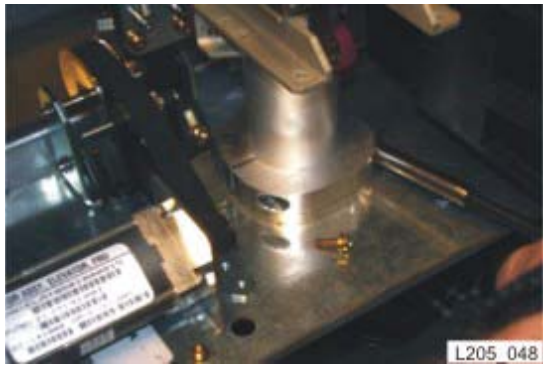
Removal

1. If the service safety door is *not* present, ask the operator to place the library offline to the Host/ACSLS.
   - If the service safety door *is* present, and you wish to replace the *left* elevator rollers, ask the operator to place the *left* elevator offline to StreamLine Library Console (see **"Service Safety Door Verification"** if you are unfamiliar with activation of the service safety door).
   - If the service safety door *is* present, and you wish to replace the *right* elevator rollers, ask the operator to place the right elevator offline to StreamLine Library Console and place the CAPs offline to the Host/ ACSLS.
2. Open the appropriate library front door (see **"Open/Close Front Doors"**).
3. Manually move the elevator carriage to the bottom of its travel.
4. Loosen (but do ***not*** remove) the two T15 screws that lock the belt tension plate.

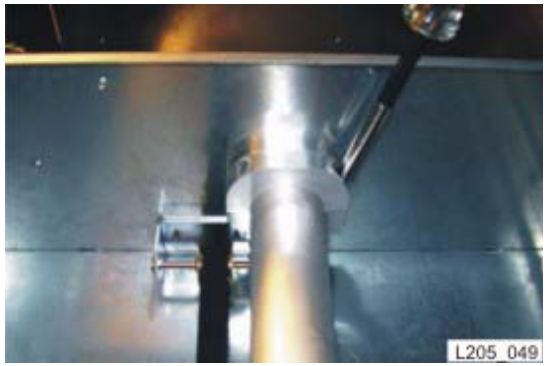
Continued on next page

Removal

5. Remove the two T15 screws that hold the lower tube clamp in place.



6. Remove the two T15 screws that hold the upper tube clamp in place.
7. Lift the elevator carriage approximately 0.3 m (1 ft).
8. Loosen the tube assembly from the tube clamp base.



Continued on next page

Removal

9. Shift the tube assembly toward the front of the library.
10. Remove the anti-rotation wheel from the channel.
11. Rotate the tube assembly toward the front of the library and remove the two T15 screws from the back of the sheet metal plate.

CAUTION: *Drop hazard:* In the next step, once the screws are removed, the tube assembly is free and ***must be held***.

12. Place the tube assembly on a flat surface.

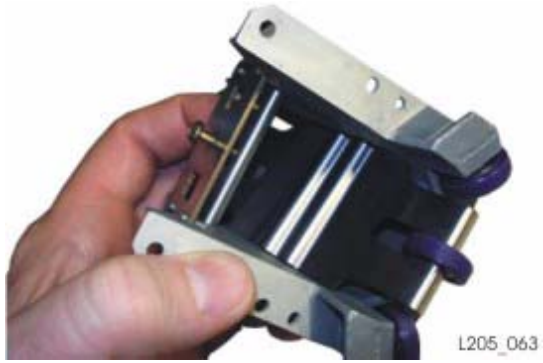
Continued on next page

Removal

L205_064

CAUTION: In steps 13, 14, and 15, do ***not*** adjust the spring roller assembly adjustment screw; it is factory-set and cannot be adjusted in the Field. Also, do ***not*** remove the Z-carriage assembly from the elevator pull. This will misadjust the tension setting. Keep the spring (which rests on the shaft) from tilting during re-assembly.

13. While holding the Z-carriage, pull the tube through the Z-carriage until it is free. Once the tube is free, the Z-spring will fall loose into the Z-carriage.
14. The four rollers on the Z-carriage and Z-spring assembly can now be replaced.



L205_063

15. Re-install the Z-carriage on the tube. Be sure the pin in the Z-carriage rests in the groove in the Z-spring assembly.

Continued on next page

Replacement

16. Re-assemble in reverse order.

Note: Be sure the two T15 screw lengths are used in their correct locations. Be sure the Z-carriage is correctly oriented.

17. Torque all screws to 1.4 Nm (12 in-lbs).
18. Move the elevator up and down manually to check for smooth operation
19. Perform **“Elevator Motor Verification.”**

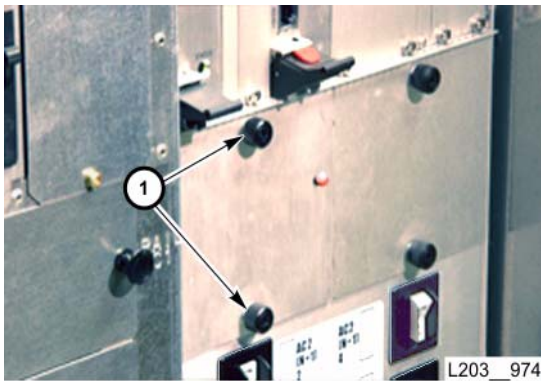
Go to top of procedure

Next procedure: ***EM Fan Tray Assembly***

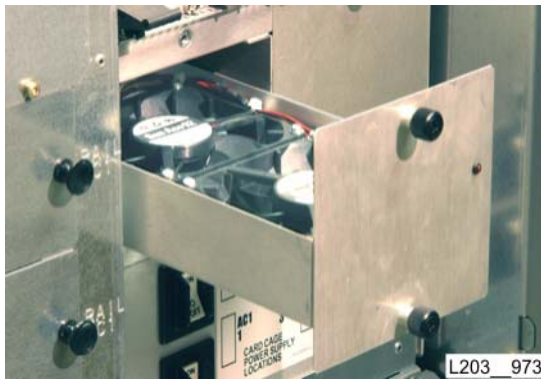
EM Fan Tray Assembly

Part Location | Part Data

Removal



1. Open the library rear doors (see **“Open/Close Rear Doors”**).
2. Fully loosen both thumb-screws (1) securing the fan tray.



3. Pull the fan tray completely out of the slot.

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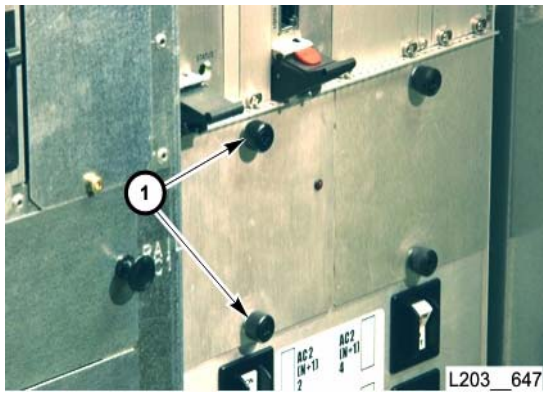
Replacement



1. Push the replacement fan tray completely into the slot.
2. Tighten both thumb-screws (1) to secure the fan tray.
3. Verify that air is exhausting above the EM and the red LED is off.

   Note: If there are redundant EM modules, two fan trays are also present. Air exhaust increases when you seat the second fan tray.
4. Close the library rear doors (see **"Open/Close Rear Doors"**).

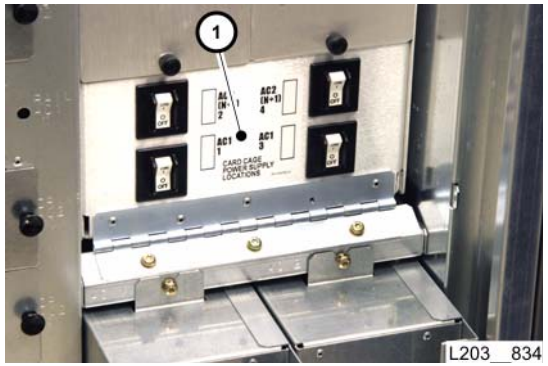
Go to top of procedure

Next procedure: ***EM Power Supply***

EM Power Supply

Part Location | Part Data

Removal



1. Open the library rear doors (see **“Open/Close Rear Doors”**).
2. Set the related circuit breaker (1) to OFF.

Continued on next page

Removal

Note: Power supply appearance may differ slightly from the one shown,

3. Fully loosen both captive screws (1) securing the power supply.
4. Unlatch the card lever (2) by pressing downward to first detent.
5. Press the card lever fully downward to unseat the card connector.
6. Pull the power supply completely out of the card slot.

Continued on next page

Replacement

1. Align the card edges with the slot guides, and push the replacement power supply into the slot until it contacts the slot connector.

Continued on next page

Replacement

2. Press card lever (2) fully upward, to seat the connector.
   Note: The lever latches when the connector is fully seated.

CAUTION: *Possible Screwhead Damage:* DO NOT overtighten captive screws.

3. Tighten both captive screws (1) to secure the power supply.
4. Set the related circuit breaker to ON.
5. Verify the green LED (PWR GOOD) (3) on power supply lights.
6. Library PDU must be powered.
7. Close the library rear doors (see **"Open/Close Rear Doors"**).

Go to top of procedure

Next procedure: ***Ethernet Switch***

Ethernet Switch

Part Location | Part Data

Removal

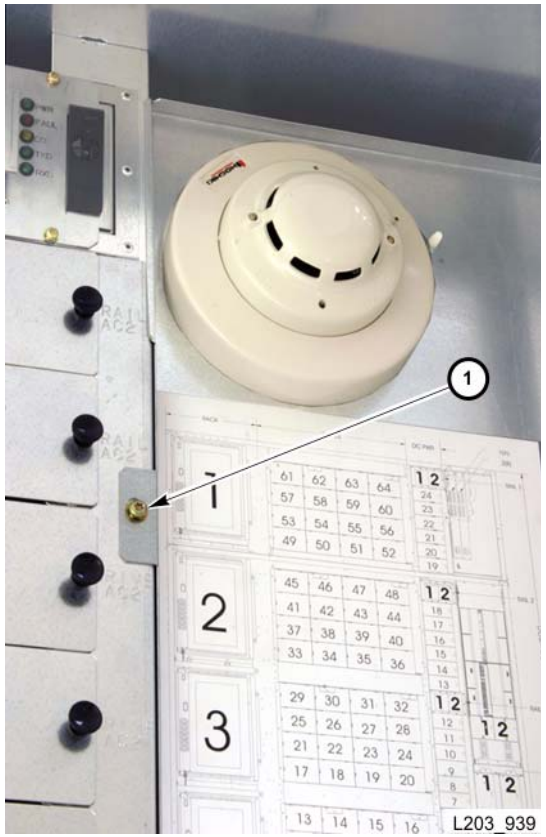
1. Open the library rear doors (see **“Open/Close Rear Doors”**).
2. Request the operator to place the library offline to the Host/ACSLS.

   Note: Until there is full redundancy with regard to the Ethernet switches, the library must be powered down.

3. Set PDU circuit breaker(s) (1) to OFF (down).

Continued on next page

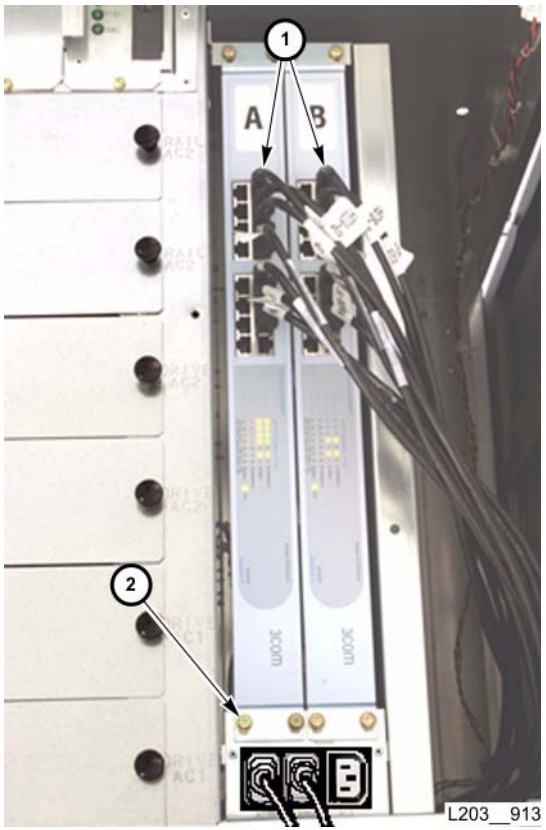
Removal



4. Remove one T25 screw (1) and open the access panel (with the smoke detector) to expose the library Ethernet switches.

Continued on next page

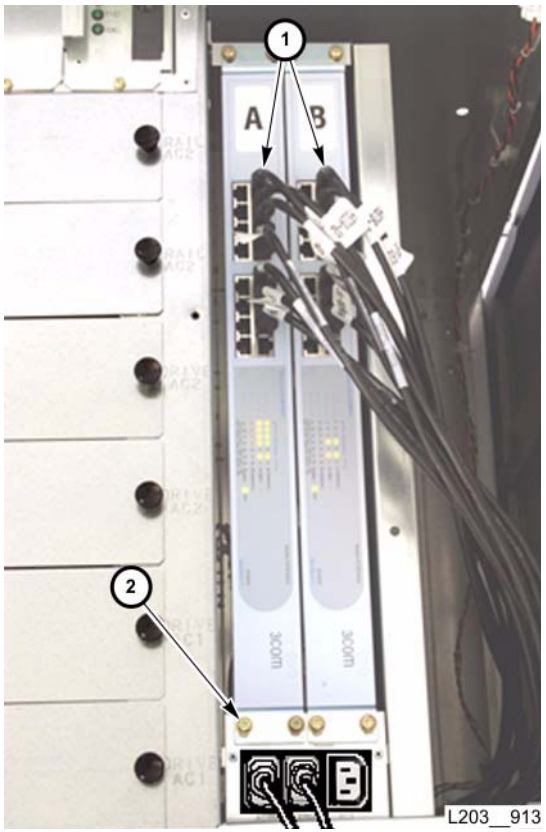
Removal



5. Remove AC power from the specific switch.
   Note: Use a power switch, if present, or disconnect the AC power cord.
6. Disconnect all Ethernet cables (1).
   a. Inspect all Ethernet cables at the switch for labels that identify the switch connection.
   b. Label cables that are not already clearly labeled.
7. Disconnect power cable from back of switch.
8. Remove four T25 screws (2) securing the switch to the 19-inch mounting rails.
9. Remove the switch.
10. Remove the mounting brackets for use with the replacement switch.

Continued on next page

Replacement



1. Attach the mounting brackets to the replacement switch.
2. Position the replacement switch fully into the mounting slot.
3. Insert and tighten four T25 screws (2) to secure the switch to the rails.
4. Connect all Ethernet cables (1) as labeled during the removal action.
5. Connect the AC power cord to the back of the switch.
6. Set the Ethernet switch AC power switch, if present, to ON.

Continued on next page

Replacement

7. Set PDU circuit breaker(s) (1) to ON (up).
8. Perform **“Ethernet Switch Verification.”**
9. Close and secure the mounting plate/access panel with one T25 screw.
10. Close the library rear doors (see **“Open/Close Rear Doors”**).
11. Request the operator to place the library online to the Host/ACSLS.

Go to top of procedure

Next procedure: ***HandBot Assembly***

HandBot Assembly

Part Location | Part Data

Removal

CAUTION:

Initialization Error: For all 8-HandBot libraries, HandBot replacement should *not* be done without using the Service Safety Door.

1. If a defective HandBot does *not* position itself in the service area after a failure:
   a. Check the library event log and determine if the HandBot encountered a “reach unsafe” error. Firmware will *not* move the HandBot in this case.
   b. If the error is not associated with a “reach unsafe” fault, attempt a soft boot through the StreamLine Library Console diagnostic menu.
   c. If there is a “reach unsafe” error or if the soft reboot does not move the HandBot into the service area, it is necessary to vary the libraries offline, open the access door, and physically move the HandBot into the service area.
   d. Close the access door and replace the HandBot using the Service Safety Door.

Continued on next page

Removal

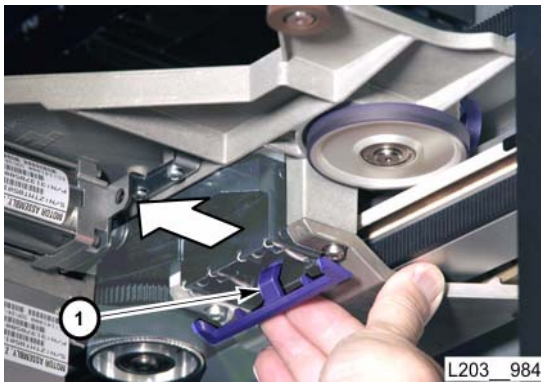
1. Determine where the defective HandBot is located.

   Notes: If the library is unable to move the HandBot into a service area or the optional safety door is not present, the operator must halt HandBot operations. Start with step 2.

   If the HandBot is inside a service area and the optional service door *is* present, start with step 3.
2. Ask the operator to place the library offline to ACSLS/HSC.
3. If a service safety door is present and the HandBot is in the:
   a. *Left* service area, have the operator vary the left elevator offline *to StreamLine Library Console.*
   b. *Right* service area, have the operator vary/modify the CAPs offline to ACSLS/HSC and then vary the right elevator offline *to StreamLine Library Console*
4. Open the appropriate library front door (see **“Open/Close Front Doors”**).

Continued on next page

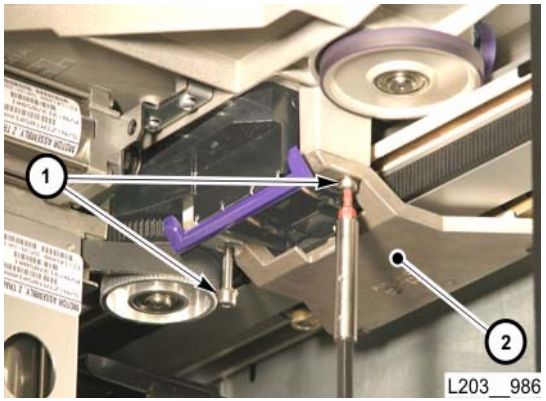
Removal



WARNING: *Electrical Shock Hazard:* There is 48 VDC present on the electrical bar of *powered* rail assemblies (in the case of a service safety door activation). DO NOT TOUCH the electrical bar during the remaining steps.

5. Open the rail brushes by moving the locking lever (1) *away from* the outer wall.

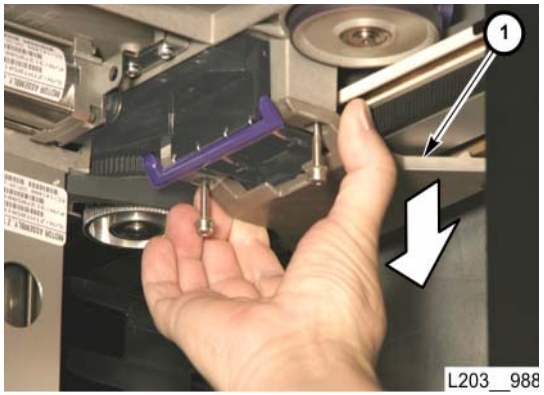
   Note: The color of the locking lever may vary.



6. Fully loosen both T15 captive screws (1) on the preload assembly (2).

Continued on next page

Removal



7. Pull down on the upper preload assembly (1) to free the rollers from behind the upper rail.

Continued on next page

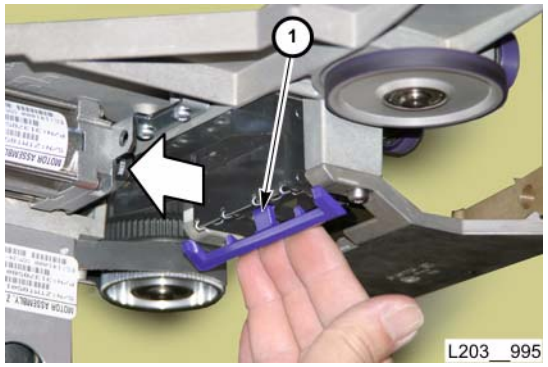
Removal

CAUTION: *Possible Equipment Damage*: Do not grasp or bump the lower plate or any plastic parts on the HandBot during removal. Lift the HandBot Z-column and frame only.

8. Tilt the HandBot assembly away from the upper rail.
9. Remove the HandBot from the library and place it safely away from your work area.

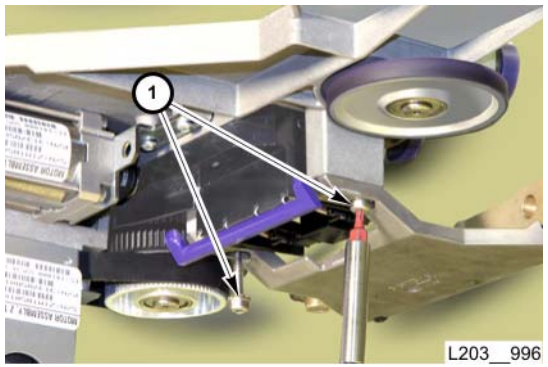
Continued on next page

Removal



Note: The color of the locking lever may vary.
HandBots for an eight-HandBot library require special firmware and matching HBS modules for proper operation. Verify that the replacement HandBot part number is appropriate for the library (see **“HandBot Assembly”**).

1. Verify the rail brushes are open. If necessary, move the locking lever (1) *toward* the Z-assembly.
   Note: A new/replacement HandBot FRU ships with the locking lever taped in the open position. Leave the tape in place until the HandBot is mounted.



2. Fully loosen both T15 captive screws (1) on the upper preload assembly.

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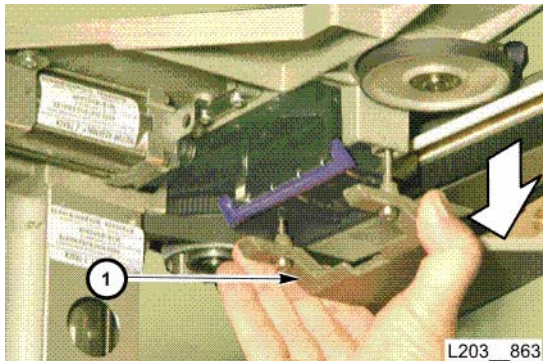
Removal



3. Pull straight down on the preload assembly (1) so that it rests on the screw heads.

Continued on next page

Replacement

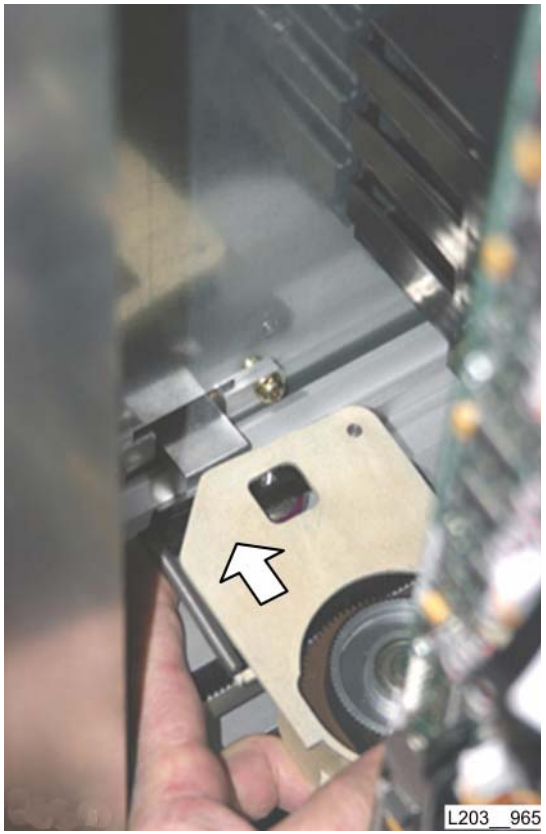
WARNING: *Electrical Shock Hazard:* There is 48 VDC present on the electrical bar of powered rail assemblies (in the case of a service safety door activation). DO NOT TOUCH the electrical bar during the remaining steps.

CAUTION: *Possible Equipment Damage*: Do not grasp or bump the lower plate or any plastic parts on the HandBot during removal. Lift the HandBot using the Z-column and frame only.

4. Position the HandBot next to the rail assembly with the *top* of the HandBot tilted *away* from the upper rail.

Continued on next page

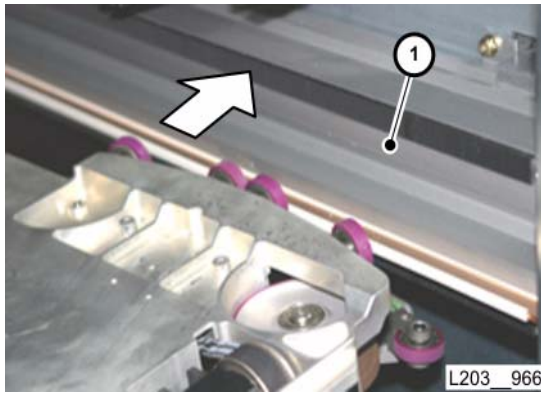
Replacement



5. Insert the *lower* preload assembly roller into the lower rail.
   Note: It may be necessary to press on the roller tensioner to relieve some preload tension (as shown by arrow).

Continued on next page

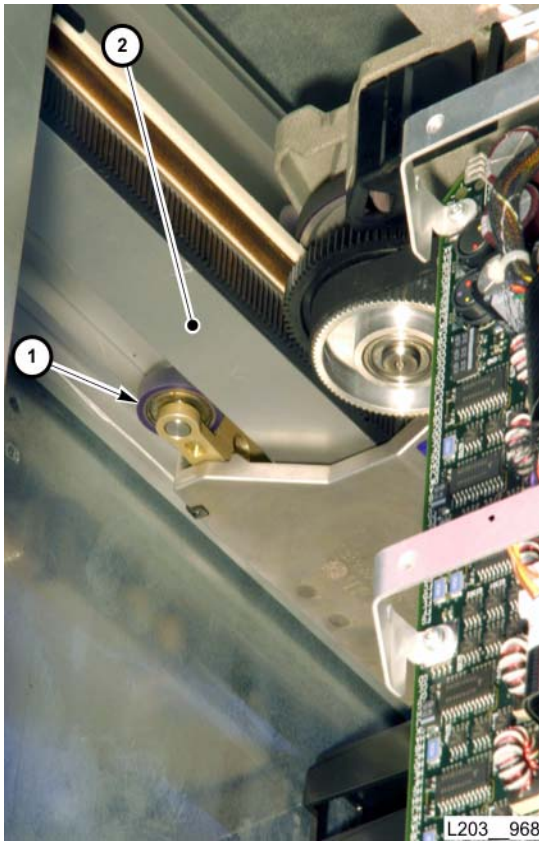
Replacement



6. Move the *top* of the HandBot assembly *toward* the upper rail, resting the top rollers on the upper rail (1).

Continued on next page

Replacement



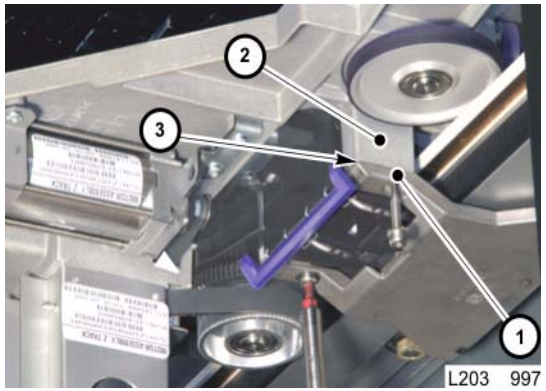
View from behind

7. Push *up* on the upper preload assembly, placing preload assembly rollers (1) behind the upper rail (2).

   Note: You may have to press each roller against spring tension to position the rollers behind the upper rail.

Continued on next page

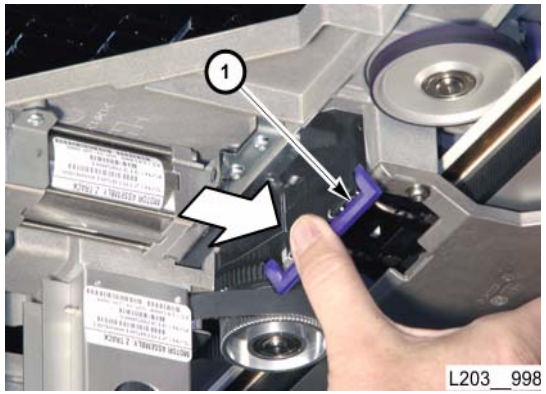
Replacement



CAUTION: *Possible Equipment Damage:* The upper preload assembly will break if it is improperly aligned before tightening the screws.

8. Carefully align the upper preload assembly (1) with the upper frame (2) so there is no gap (3) between the two parts (tapered locating pins fit into their respective holes).
9. Tighten both T15 screws evenly.
10. Move the HandBot back and forth slightly to verify that it glides easily. Any binding could damage the brushes.

    Note: If the HandBot does not move easily, re-check your work. Remove and re-install the HandBot, if necessary.



11. Remove the rail brush locking lever shipping tape, if present.
12. Move the rail brush locking lever *toward* the outer wall to engage the brushes.
13. Move the HandBot slightly back and forth to verify that it glides easily.

    Note: With the rail brushes engaged, there will be a small, additional amount of drag, but the HandBot must still move easily.

Continued on next page

Replacement

14. Close the library doors (see **"Open/Close Front Doors"**).
15. If the service safety door was activated, turn the maintenance key to its vertical position.

CAUTION: *Possible Equipment Damage*: If keypad Wait LEDs are flashing, DO NOT open library front doors.

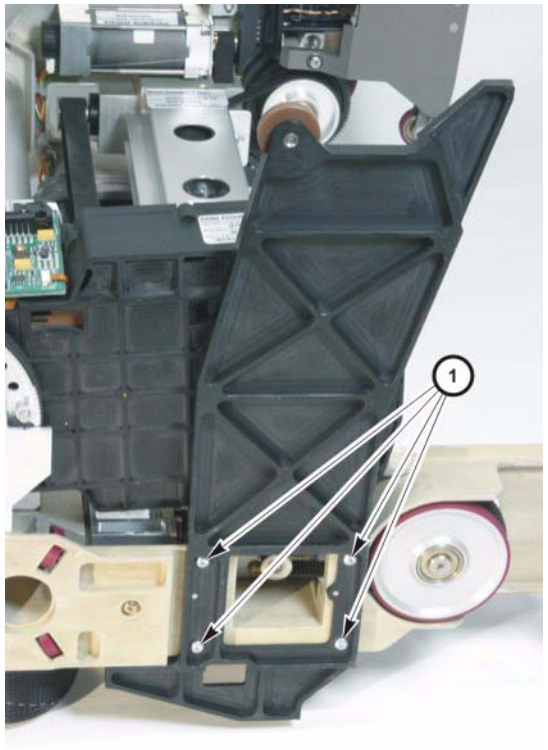
16. Observe Wait LEDs on the keypad after both front doors are closed. If Wait LEDs are flashing, code is being downloaded to the replaced HandBot.
    Note: When Wait LEDs stop flashing, or if Wait LEDs do not flash, proceed with the next step.
17. Perform **"HandBot Verification."**
18. If the entire library is offline, ask the operator to place it back online to ACSLS/HSC.
19. If the service safety door was activated:
    a. For the *left* side, have the operator vary the left elevator online to StreamLine Library Console.
    b. For the *right* side, have the operator vary/modify the CAPs online to ACSLS/HSC, then vary the right elevator online to *StreamLine Library Console.*

Go to top of procedure

Next procedure: ***HandBot Lower Extension Plate***

HandBot Lower Extension Plate

Part Location **Part Data**



L203__765

Removal

1. Determine where the defective HandBot is located.

   Notes: If the library is unable to move the HandBot into a service bay or the optional safety door is not present, the operator must halt HandBot operations. Start with step 1.

   If the HandBot is inside a service bay and the optional service door *is* present, start with step 2.

1. If necessary, ask the operator to place the library offline to the Host/ACSLS.
2. If a service safety door is present and the HandBot is in the:
   a. *Left* service area, have the operator vary the left elevator offline *to StreamLine Library Console.*
   b. *Right* service area, have the operator vary/modify the CAPs offline to ACSLS/HSC and then vary the right elevator offline *to StreamLine Library Console.*
3. Open the appropriate library front door (see **"Open/Close Front Doors"**).
4. If necessary for access, remove the HandBot with the broken lower extension plate from the library (see **"HandBot Assembly"**), and place it on a work surface.

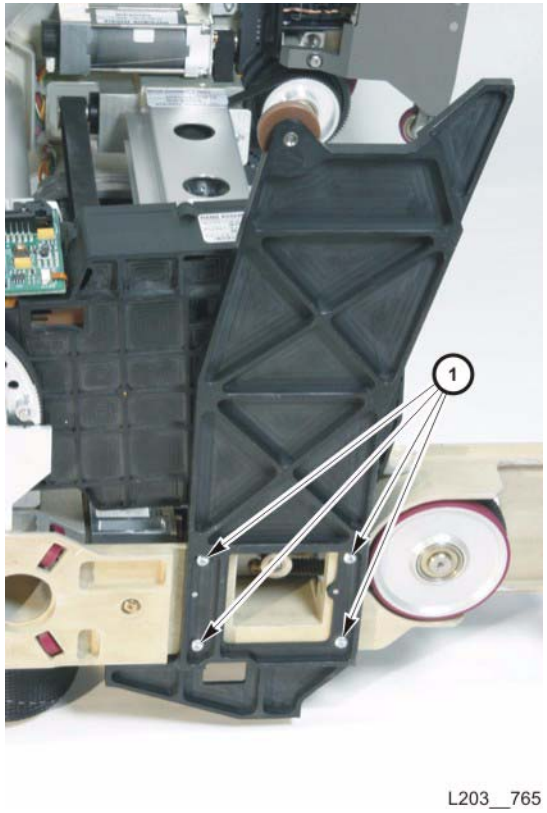
Continued on next page

Removal

5. Remove four T15 screws (1) securing the lower extension plate to the HandBot, then remove the plate.

Continued on next page

Replacement



L203__765

1. Position the replacement lower extension plate on the HandBot frame.
2. Install but do not tighten four T15 (2) screws.

CAUTION: *Component damage:* Overtightening screws will crack the lower extension plate.

3. Evenly tighten four T15 screws.
4. Install the HandBot, if removed for access (see **"HandBot Assembly"**).
5. Close the library front door (see **"Open/Close Front Doors"**).
6. If the library is offline, ask the operator to place it back online to the Host/ ACSLS.
7. If a service safety door is present and the HandBot is in the:
   a. *Left* service area, have the operator vary the left elevator onLine *to StreamLine Library Console.*
   b. *Right* service area, have the operator vary/modify the CAPs online to ACSLS/HSC and then vary the right elevator online *to StreamLine Library Console.*

Go to top of procedure

Next procedure: ***Interlock Controller (HBN) Card***

Interlock Controller (HBN) Card

Part Location | Part Data

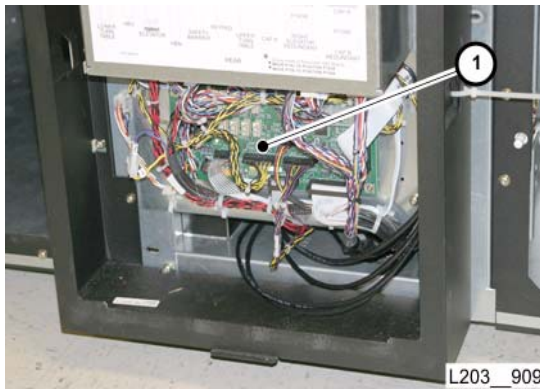
Removal

Note: Host operations must be halted before removing the HBN card.

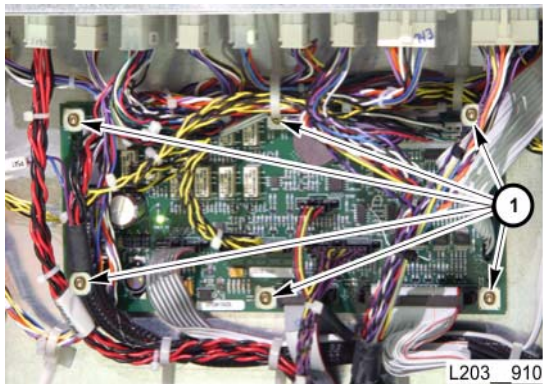
1. Request the operator to place the library offline to the Host/ACSLS.
2. Open the library rear doors (see **"Open/Close Rear Doors"**).
3. Set PDU circuit breaker(s) (1) to OFF (down).

Continued on next page

Removal



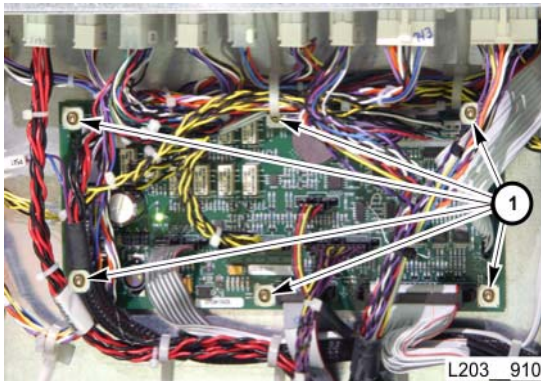
4. Remove both library center section façades to access the HBN card (1) (see **"Façade Removal"**).



Note: There are nine jacks on the HBN card: J500 through J508. J505 is connected only when the library contains the optional safety door.

5. Disconnect all cables, one at a time:
   a. Inspect each cable for a label that matches the card jack.
   b. Label any cables that are not already clearly labeled.
6. Remove six T10 screws (1) securing the card.
7. Remove the card.

Continued on next page



Replacement

1. Position the replacement HBN Card into the mounting location.
2. Thread, but do not fully tighten, six T10 screws.
   Note: Do not tighten screws until all six are threaded. Otherwise, one or more screws may not start.
3. Tighten all six T10 screws to secure the card.
4. Connect all cables to appropriate receptacles (J500 through J508).
   Note: All connectors are either different or keyed differently. J505 is connected only when the library contains the optional safety door.

Continued on next page

Replacement

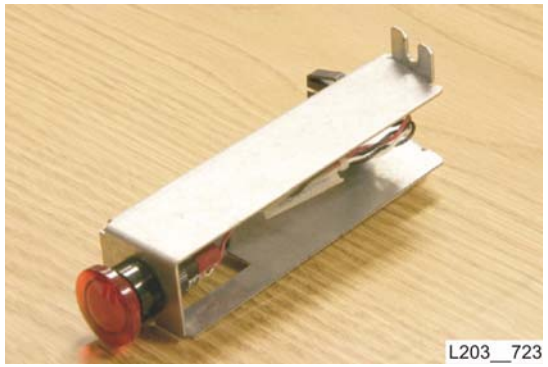
5. Set PDU circuit breaker(s) (1) to ON (up) and allow library to initialize.
6. Perform **“Remote Camera Verification.”**
7. Re-install both library center section façades (see **“Façade Installation”**).
8. Request the operator to place the library online to the Host/ACSLS.

Go to top of procedure

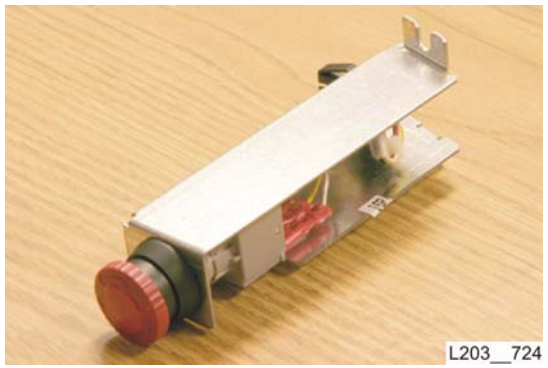
Next procedure: ***Interior Emergency Robotics Stop Switch***

Interior Emergency Robotics Stop Switch

Part Location **Part Data**



PN 3138418xx



PN 3137951xx

Removal

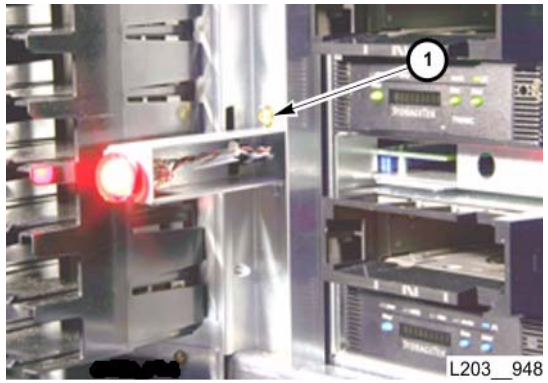
Note: There are two types of interior emergency robotics stop switches available.

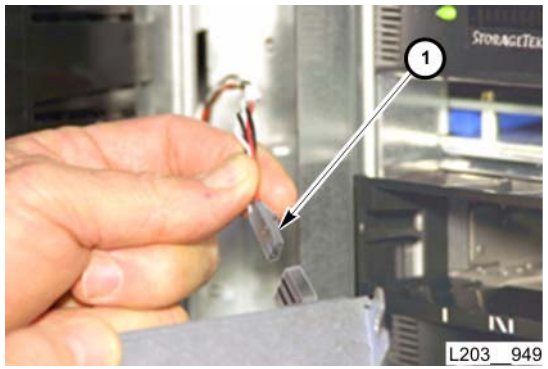
- One is translucent (PN 3138418xx) and is always lit—once pushed in (ON/activated), it is reset by pressing the button again.
- The other (PN 3137951xx) is lit only when OFF (not activated)—once activated, the LED is turned OFF. It is reset by twisting the button clockwise. Once reset, the LED will turn ON.

The switches are interchangeable.

Continued on next page

Removal





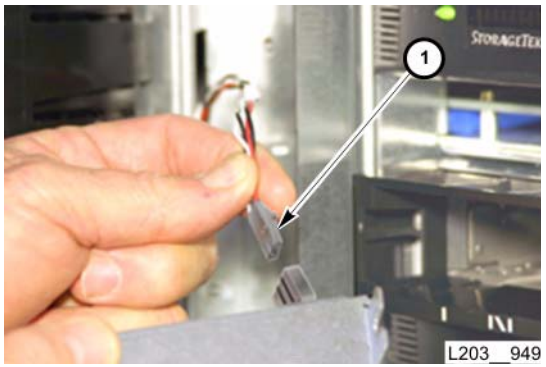
1. Ask the operator to place the library offline to the Host/ACSLS.
2. Open both library front doors (see **“Open/Close Front Doors”**).
3. If necessary, manually move HandBots to gain access to the emergency power-off switch.
4. Remove one T25 screw (1) securing the switch assembly.
5. Lift the switch assembly out of the mounting slot.

Note: You might need to partially remove (slide backward approximately six inches) drive 36, if present, out of its slot to gain adequate access to the switch connector. *If this is required, be sure to have the operator vary drive 36 offline to the Host/ACSLS before moving the drive.*

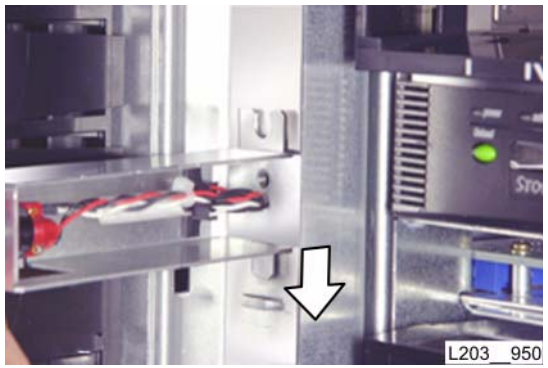
6. Disconnect the switch assembly connector (1) and remove the assembly.

Continued on next page

Replacement



1. Connect the replacement switch to the library connector (1).



2. Insert the switch assembly tab into the mounting slot.

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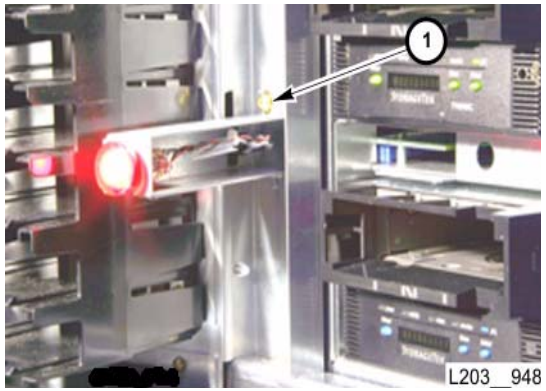
Replacement



3. Insert and tighten one T25 screw (1) to secure switch assembly.
4. Re-seat and latch drive 36, if it was partially removed for access.
5. Close the library doors (see **“Open/Close Front Doors”**).
6. Verify that library HandBots begin power-on self test (indicated by their movement).
7. Request the operator to place the library online to the Host/ACSLS.
8. If drive 36 was varied offline, request the operator to place it online to the Host/ACSLS.

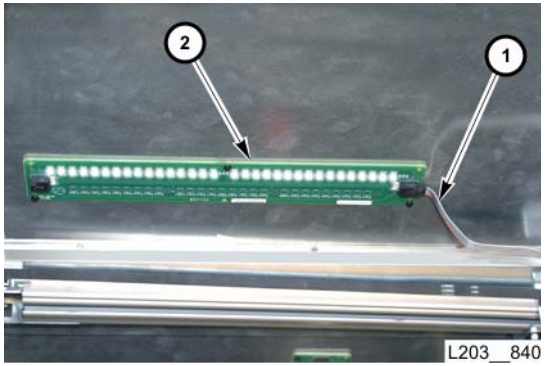
Go to top of procedure

Next procedure: ***Interior Light Card***

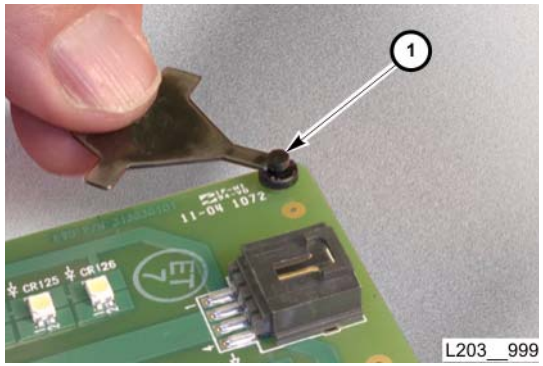
Interior Light Card

Part Location | Part Data

Removal



1. Ask the operator to place the library offline to the Host/ACSLS.
2. Open library appropriate library front door (see **"Open/Close Front Doors"**).
3. Disconnect the ribbon cable(s) (1) from the light card (2).

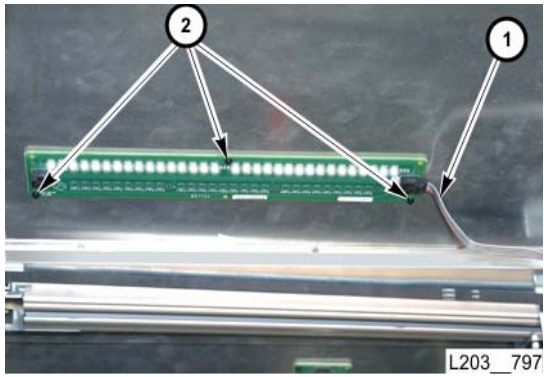


4. Remove three card retainer pins (1) securing the card to the ceiling.

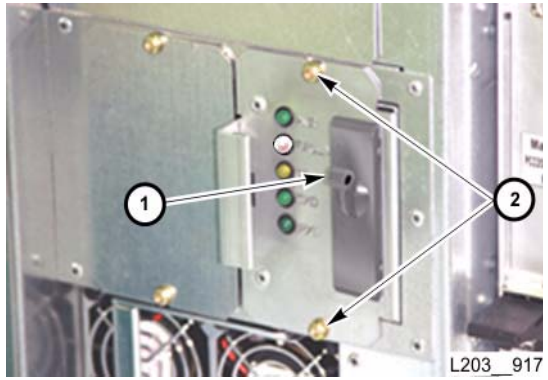
   Note: Use a knife blade or thin screwdriver to pry the center pin out of the card retainer and release the card from the ceiling.
5. Remove the card.

Continued on next page

Removal



1. Position the replacement light card in the mounting place.
2. Insert three retainer pins (2) to secure the card.
3. Connect the ribbon cable(s) (1).
4. Verify all lights are on.



5. Set all rail communication module circuit breakers (1) to ON.
6. Close the library doors (see **"Open/Close Front Doors"** and **"Open/Close Rear Doors"**).
7. Verify all HandBots begin operation (indicated by their movement).
8. Ask the operator to place the library online to the Host/ACSLS.

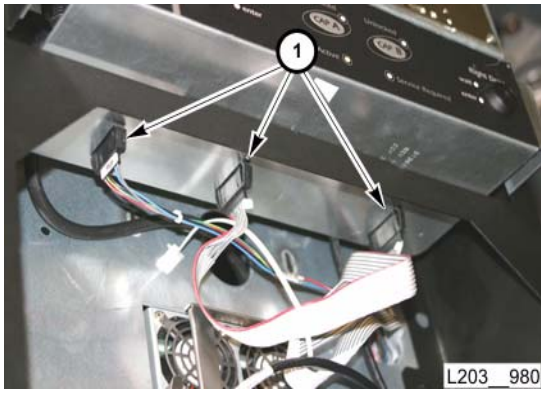
Go to top of procedure

Next procedure: ***Keypad Assembly***

Keypad Assembly

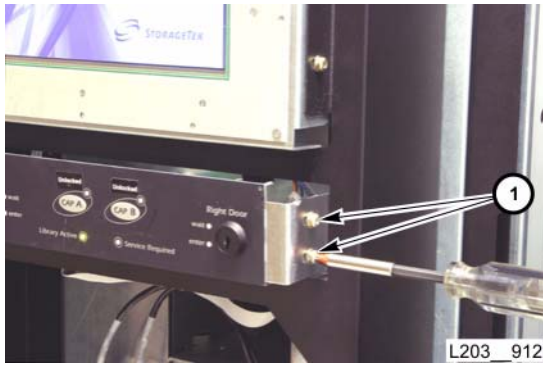
Part Location | Part Data

Removal



Note: The library must be in the maintenance mode before you remove the keypad assembly.

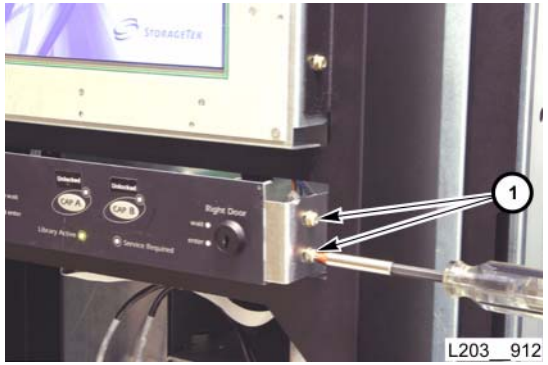
1. Make sure the library is in the maintenance mode.
2. Remove both library center section façades. (see **“Façade Removal”**).
3. Disconnect three cables (1) from keypad.



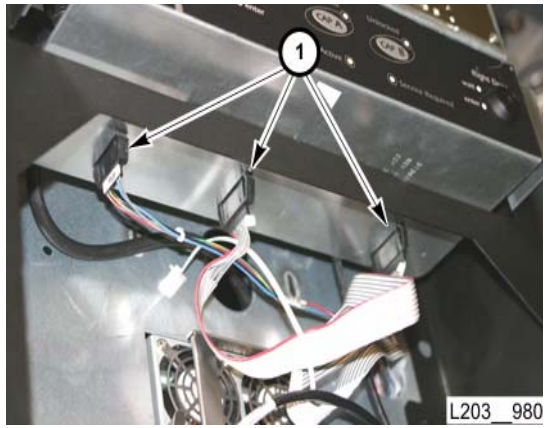
4. Remove two T25 screws (1) on each side of keypad assembly.
5. Remove the keypad assembly.

Continued on next page

Replacement



1. Position the replacement keypad into the mounting location.
2. Thread, but do not fully tighten two T25 screws (1) on each side of keypad assembly.
3. Position the keypad assembly at the forward end of the mounting slots.



4. Connect all cables (1).
   Note: Cable connectors are individually keyed, and cannot be cross-connected.
5. Perform **“Keypad Assembly Verification.”**
6. Install the library center section lower façade temporarily to reposition the loosely mounted keypad into proper relationship with the lower façade.
   Note: The keypad front surface should be flush with the inside surface of the lower façade without restricting removal/installation of the façade.
7. Remove the lower façade.

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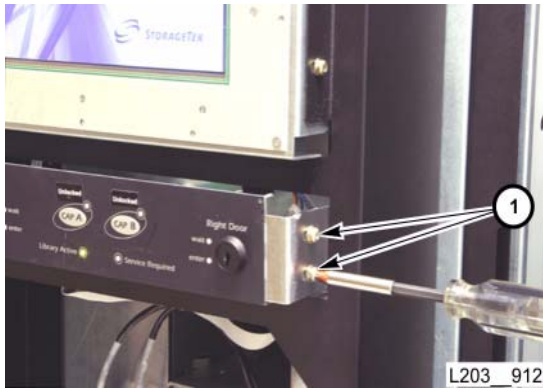
Replacement



8. Remove the lower façade and tighten the two T25 keypad mounting screws (1) on each side of the keypad assembly to secure it in the repositioned location.
9. Re-install both library center section façades. (see **“Façade Installation”**).

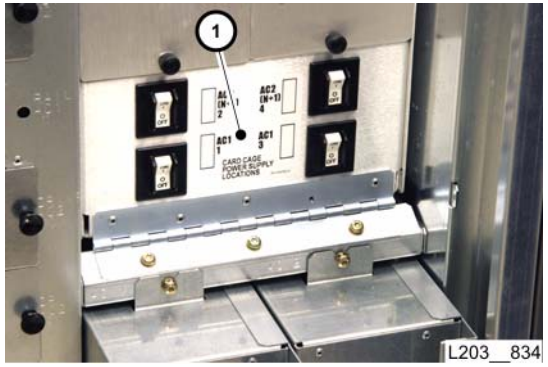
Go to top of procedure

Next procedure: ***Library Controller (HBC) Card***

Library Controller (HBC) Card

Part Location | Part Data

Removal



CAUTION: Before replacing the HBC card, you must be sure to have a copy of the current library microcode resident on your personal computer and available for downloading to the HBC card. The microcode is minimally installed to prevent an auto-code update that would activate code that may *not* be the version you require for your library.

1. Ask the operator to place the library offline to the Host/ACSLS.
2. Open the library rear doors (see **"Open/Close Rear Doors"**).

3. Set EM card cage circuit breakers (1) to OFF (down) for the related HBC card.

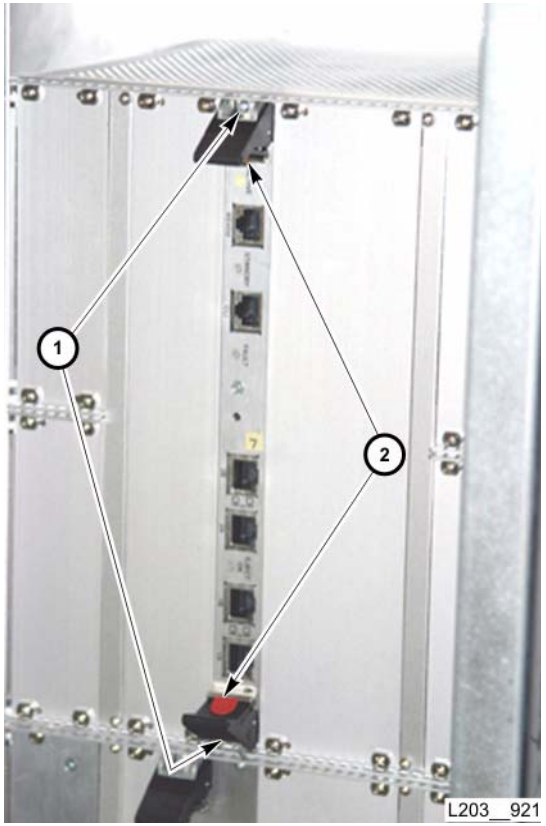
Continued on next page

Removal

4. Disconnect the Ethernet cable (1).

Continued on next page

Removal



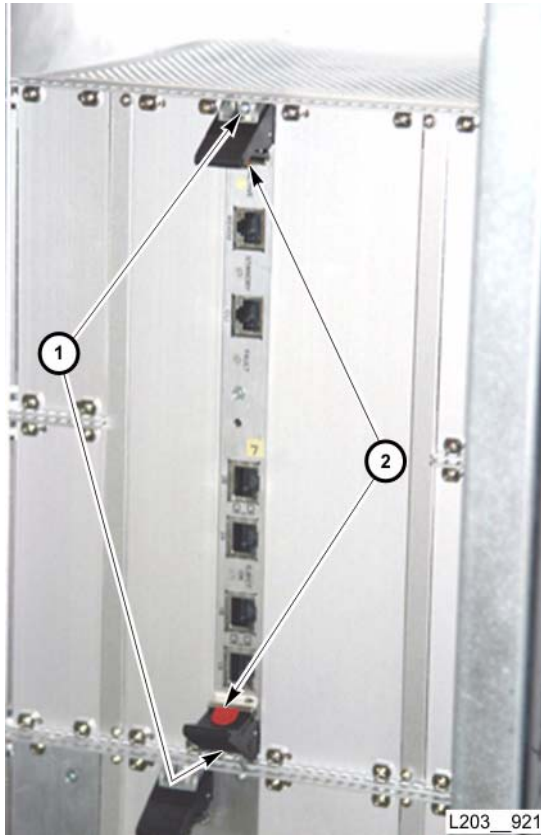
5. Fully loosen two captive screws (1) securing the card.
6. Unlatch both card levers by pressing the red tab (2) on each lever.
7. Press both card levers outward, simultaneously, to unseat the connector.
8. Pull the card completely out of the card slot.

Continued on next page

Replacement

1. Align the card edges with the slot guides (1) at the top and bottom, and push the replacement card into the slot until it contacts the slot connector.

Continued on next page



Replacement

2. Press both card levers (2) inward, simultaneously, to seat the connector.

   Note: The levers auto-latch when the connector is fully seated.

CAUTION: *Possible Screwhead Damage:* DO NOT overtighten card captive screws.

3. Tighten both captive screws (1) to secure the card.

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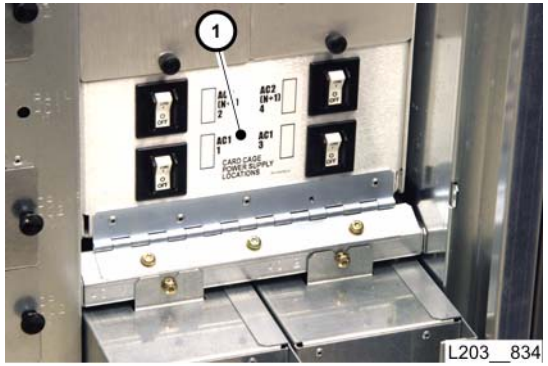


Replacement

4. Set related EM card cage circuit breaker(s) (1) to ON (up).
5. If you have access to the customer's network, you can re-connect the Ethernet cable to Port B at this time. If not, go to the next step.

Note: You must wait until the routing tables have been re-established (up to 20 minutes). To check for completion, ping the library.

6. If you do *not* have access to the customer's network, connect an Ethernet crossover cable from your laptop to the HBC card's Port 2B
7. Using your laptop, download and activate the microcode version that is required for your library.

Allow time for the activation to complete.

CAUTION: *HBC card damage:* To prevent code corruption on library logic cards, **NEVER** open a library access door during a code activation; you will permanently damage the HBC card.

8. Reboot the library.
9. Check the library's configuration (this should not have changed since it is contained on the HBK card).

Note: Check for the correct number of columns and drives in either the StreamLine Library Console screen or the CLI configuration print (the CAP address reflects the library's length).

Continued on next page

Replacement

10. After activation is completed, login to the StreamLine Library Console and initiate an audit (Diagnostics ⇒ Audit. Next, select entire library ⇒ physical audit ⇒ audit).

Note: Audits can last from 20 minutes to one hour and 20 minutes, depending upon the library's capacity and number of HandBots.

11. If you did *not* have access to the customer's network (step 6), re-connect their Ethernet cable (1) to Port 2B at this time.

Note: If you have just re-connected the customer's Ethernet cable, allow time for the network to re-map to the IP address (up to 20 minutes) before completing the next step. Alternately, ping the library's address to verify this.

12. Perform **"Library Controller (HBC) Card Verification."**
13. Be sure the host can ping the library address.
14. Close the rear library doors (see **"Open/Close Rear Doors"**).

15. Request the operator to place the library online to the Host/ACSLS.

Go to top of procedure

Next procedure: ***Library Interface (HBX) Card***

Library Interface (HBX) Card

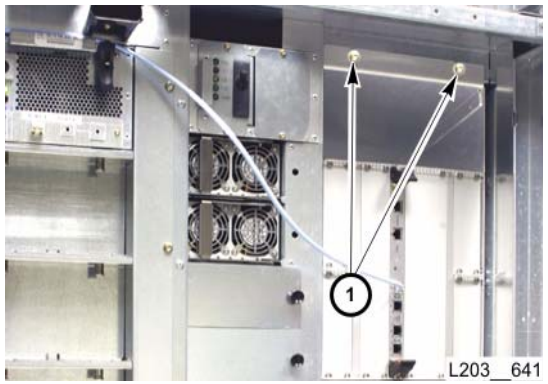
Part Location | Part Data

Removal

1. Request the operator to place the library offline to the Host/ACSLS.
2. Open the library rear doors (see **“Open/Close Rear Doors”**).
3. Set PDU circuit breaker(s) (1) to OFF (down).

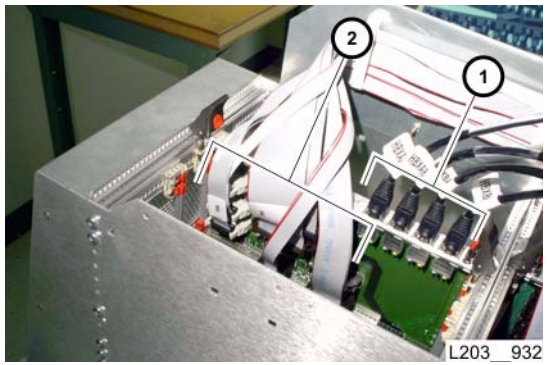
Continued on next page

Removal



Note: The EM front panel is hinged on the bottom.
You can access the HBX card when the EM is rotated fully open.

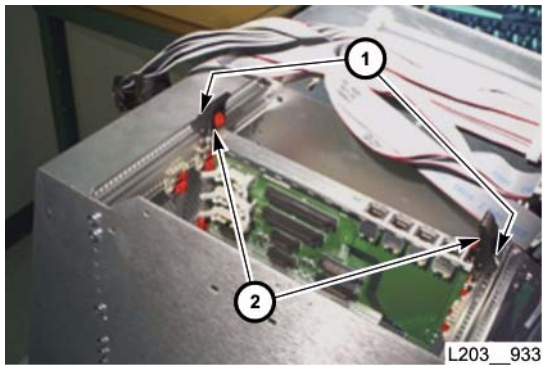
4. Remove two T25 screws (1) securing the EM front panel.
5. Rotate the EM front panel out of the library until retained by the lanyard.
   Note: The HBX card is closest to the EM front panel open end.



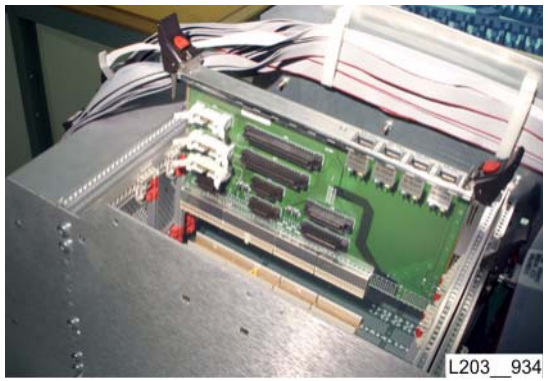
6. Disconnect all Ethernet cables (1), one at a time:
   a. Inspect each Ethernet cable for a label that matches the card port.
   b. Label all cables that are not already clearly labeled.
7. Disconnect all ribbon cables (2), one at a time:
   a. Inspect each cable for a label that matches the card jack.
   b. Label all cables that are not already clearly labeled.

Continued on next page

Removal



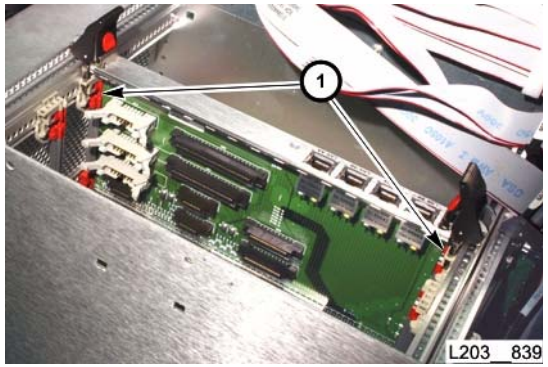
8. Fully loosen two captive screws (1) securing the card.
9. Unlatch both card levers (2) by pressing the red tab on each lever.
10. Press both card levers outward, simultaneously, to unseat the connector.



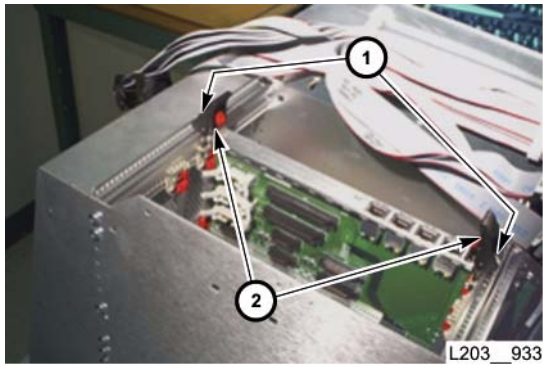
11. Pull the card completely out of the card slot.

Continued on next page

Replacement



1. Align the card edges with the slot guides (1), and push the replacement card into the slot until it contacts the slot connector.



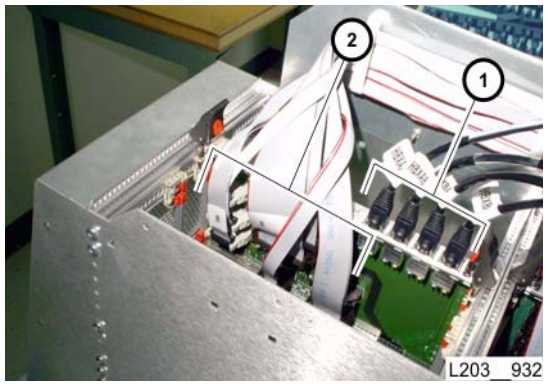
2. Press both card levers (2) inward, simultaneously, to seat the connector.
   Note: The card levers auto-latch when the card connector is fully seated.

CAUTION: *Possible Screwhead Damage:* DO NOT overtighten card captive screws.

3. Tighten two captive screws (1) to secure the card.

Continued on next page

Replacement



4. Connect all ribbon cables (1) into the appropriate jacks.
5. Connect all Ethernet cables (2) into the appropriate ports.
6. Rotate the EM front panel into the library until the front panel is closed.v

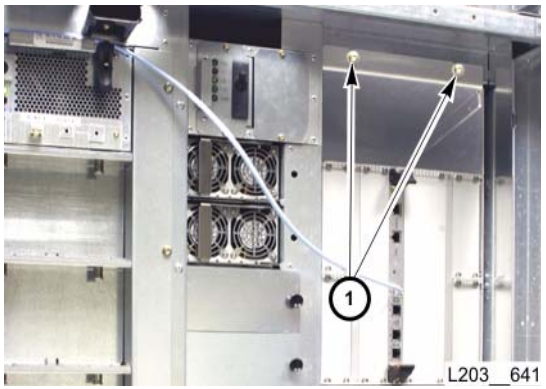
Continued on next page

Replacement

7. Set PDU circuit breakers (1) to ON (up).
8. Perform **“Library Interface (HBX) Card Verification.”**

Continued on next page

Replacement



9. Insert and tighten two T25 screws (1) to secure the panel.
10. Close the library rear doors (see **“Open/Close Rear Doors”**).
11. Request the library online to the Host/ACSLS.

Go to top of procedure

Next procedure: ***Mid-Plane and Card Cage***

Mid-Plane and Card Cage

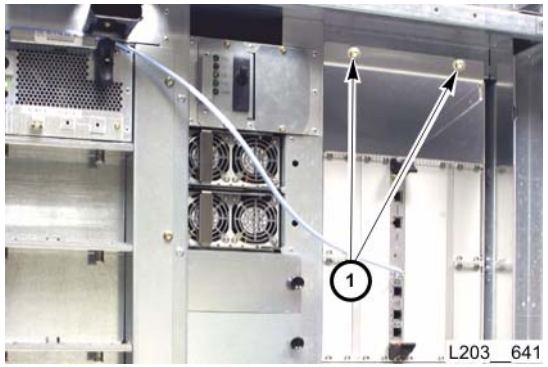
Part Location | Part Data

Removal

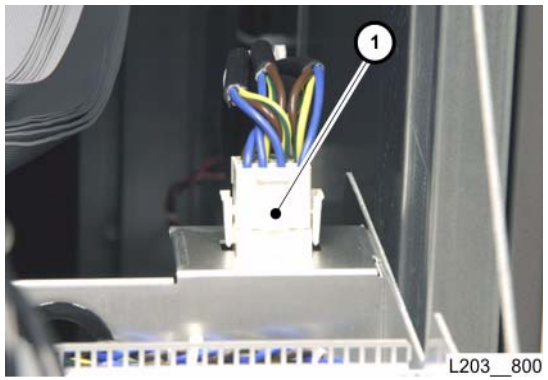
1. Ask the operator to place the library offline to the Host/ACSLS.
2. Open the library rear doors (see **"Open/Close Rear Doors"**).
3. Set PDU circuit breaker(s) (1) to OFF (down).
4. Remove all front-mounted PWAs/Modules (see applicable procedures):
   a. Library Controller, HBC (**page 219**).
   b. Drive Controller, HBT (**page 159**).
   c. Security Key, HBK (**page 261**).
   d. EM Power Supply (**page 181**).
   e. EM Fan Tray (**page 179**).

Continued on next page

Removal



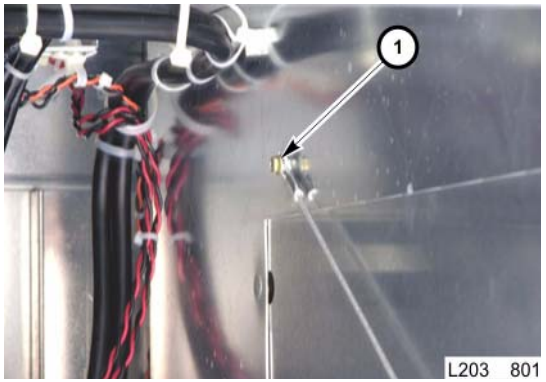
5. Remove two T25 screws (1) at top of EM.
6. Remove both rear-mounted PWAs (see applicable procedures):
   a. Library Interface, HBX (**page 226**).
   b. Drive Interface, HBY (**page 164**).



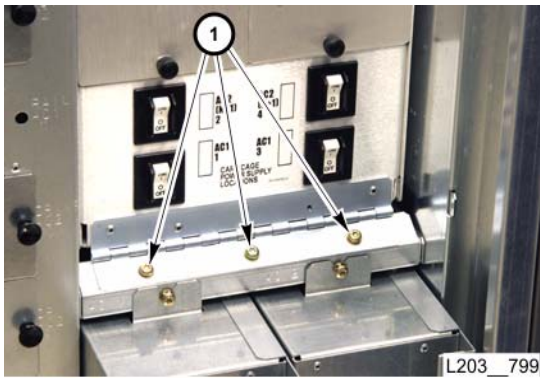
7. Disconnect EM power connector (1).

Continued on next page

Removal



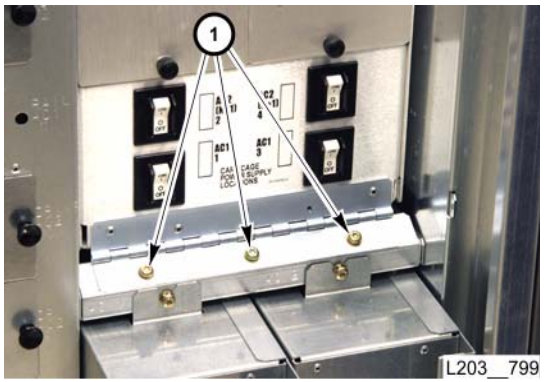
8. Support the open card cage, then remove the T15 screw (1) securing the lanyard at the library end.
9. Rotate the card cage to the closed position.



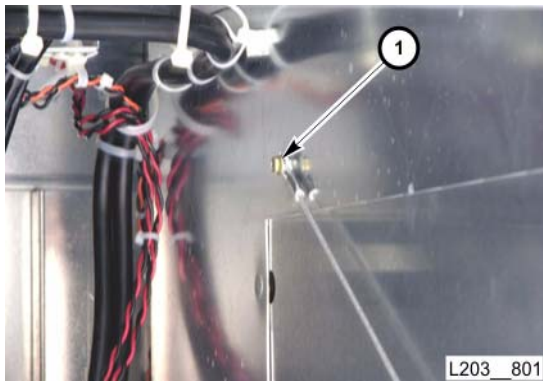
10. Remove three T25 screws (1) securing the card cage bottom hinge to the library.
11. Remove the card cage from the library.

Continued on next page

Replacement



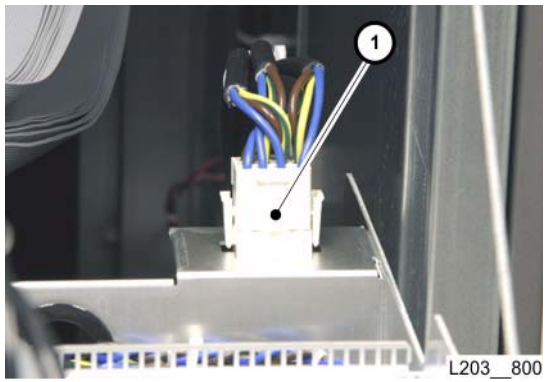
1. Position the replacement card cage into the library.
2. Secure the bottom hinge to the library with three T25 screws (1).



3. Rotate the card cage to the open position, and support until the lanyard is attached.
4. Secure the lanyard to the library with one T15 screw (1).

Continued on next page

Replacement



5. Connect EM power connector (1).
6. Install both rear-mounted PWAs (see applicable procedures):
   a. Library Interface, HBX (**page 226**).
   b. Drive Interface, HBY (**page 164**).
7. Install all front-mounted PWAs/Modules (see applicable procedures):
   a. Library Controller, HBC (**page 219**).
   b. Drive Controller, HBT (**page 159**).
   c. Security Key, HBK (**page 261**).
   d. EM Power Supply (**page 181**).
   e. EM Fan Tray (**page 179**).

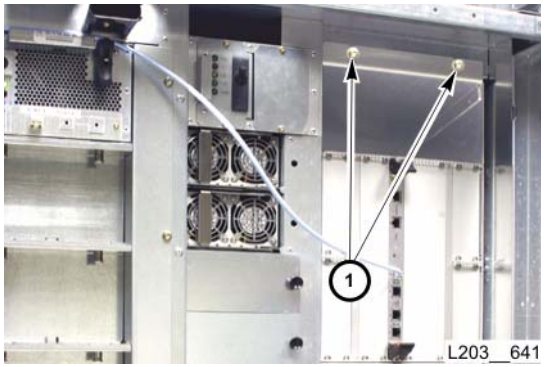
Continued on next page

Replacement

8. Set PDU circuit breaker(s) (1) to ON (up).
9. Perform **“Mid-plane and Card Cage Verification.”**

Continued on next page

Replacement



10. Secure the card cage with two T25 screws (1) at the top.
11. Close and secure library rear doors (see **“Open/Close Rear Doors”**).
12. Ask the operator to place the library online to the Host/ACSLS.

Go to top of procedure

Next procedure: ***Operator Panel***

Operator Panel

Part Location | Part Data

Removal

1. Remove both library center section façades (see **"Façade Removal"**).

   Note: There are two different types of mounting brackets: older brackets (pre-RoHS) attach the bracket to the operator panel with screws on the *side*; newer brackets (RoHS) attach with screws at the *rear* of the panel.

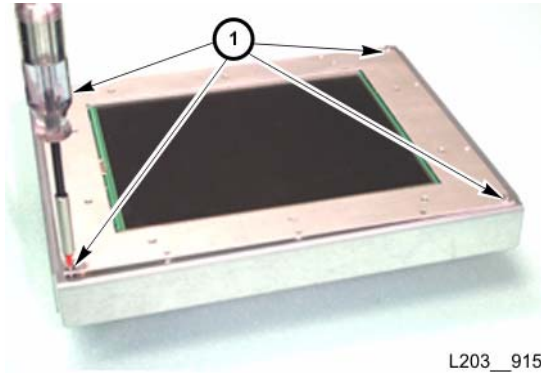
2. Remove two T25 screws (1) securing each side of the local operator panel mounting brackets.

Note: There are two screws on each side of the panel.
Firmly support the panel firmly before you remove the last mounting screw.

3. Lift and move the panel enough to access the connections.
   a. Set the power switch to off (O).
   b. Disconnect the AC power cord.
   c. Disconnect the Ethernet cable.

Continued on next page

Removal—Older style Bracket



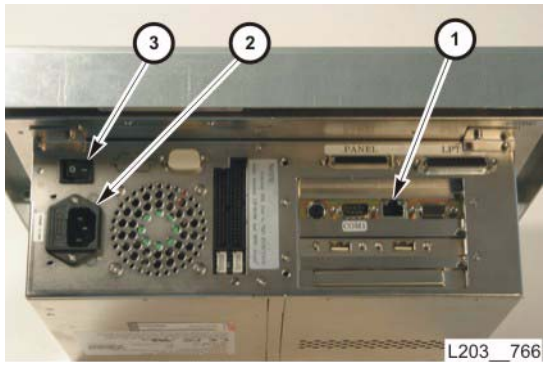
L203__915

4. Place the panel on a suitable work surface, with the screen up.
5. Remove four T15 screws (1) securing the panel to the mounting bracket, and lower the mounting bracket to the work surface.
6. Set the panel aside on the work surface.

Replacement—Older style Bracket

1. Join the retained mounting bracket to the replacement panel with four T15 screws (1).

   Note: The mounting bracket must be attached to the panel with the larger lip surface toward the bottom of the screen.



L203__766

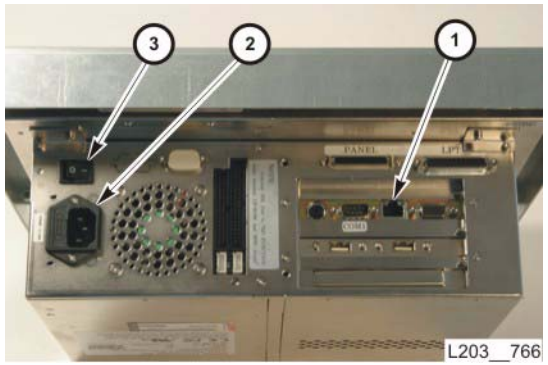
2. Position and support the panel near the mounting area.
3. Connect the following cables where shown
   a. Ethernet cable (1).
   b. AC power cord (2).
4. Set the power switch (3) to on (|).

Continued on next page

Removal—New style Bracket

1. Place the panel on a suitable work surface, with the screen facing to one side.
2. Remove four T15 screws on the rear of the panel, securing the panel to the mounting bracket.
3. Set the panel aside on the work surface.

Replacement—New style Bracket



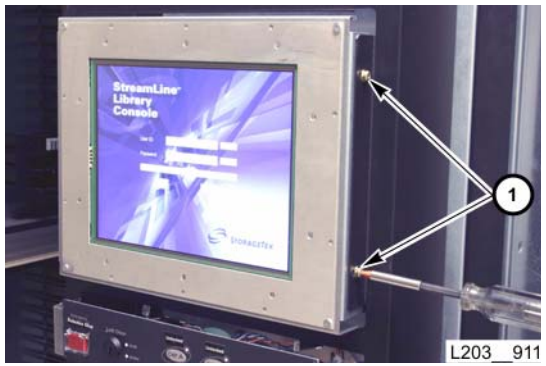
1. Join the mounting bracket to the replacement panel with four T15 screws.

Note: The mounting bracket must be attached to the panel with the larger lip surface toward the bottom of the screen.

2. Position and support the panel near the mounting area.
3. Connect the following cables where shown
   a. Ethernet cable (1).
   b. AC power cord (2).
4. Set the power switch (3) to on (|).

Continued on next page

Replacement—Operator Panel



1. Support the panel in the mount and align with the mounting slots.
2. Thread, but do not fully tighten four T25 screws (1) to position the console at the forward end of the mounting slots.
   Note: There are two screws on each side of the panel.
3. Perform **"Operator Panel Verification."**
4. Install the library center section lower façade temporarily to reposition the operator panel into proper relationship with the lower façade.
   Note: The panel front surface should be flush with the inside surface of the lower façade.
5. Remove the lower façade.
6. Tighten the four T25 screws (1) to secure the operator panel.
   Note: There are two screws on each side.
7. Re-install both library façades
   (see **"Façade Installation"**).

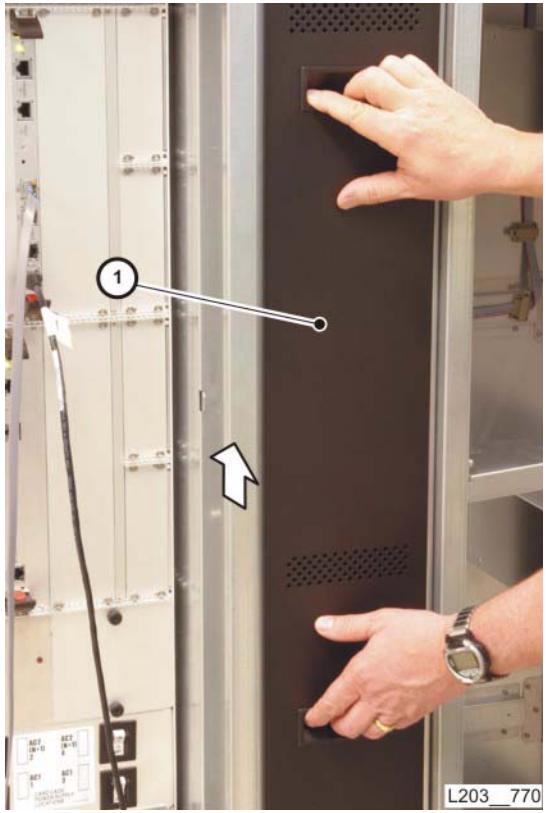
Go to top of procedure

Next procedure: ***Pass-thru Port Mechanism***

Pass-Thru Port Mechanism

Part Location | Part Data

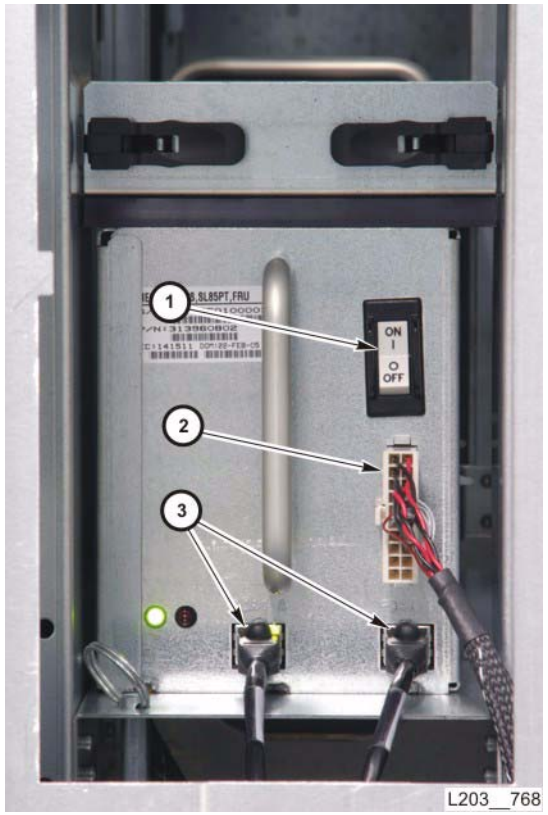
Removal



CAUTION: *System problems:* Make sure there are no PTP actions pending or in progress for the PTP mechanism being replaced.

1. Lift the access panel (1) from Pass-thru Port (PTP) frame and place it out of the work area.

Continued on next page



2. Set the PTP mechanism power switch (1) to OFF.
3. Disconnect the power cable (2) and two Ethernet cables (3), one at a time:
   a. Inspect each cable for a label that matches the jack.
   b. Label any cable that is not clearly labeled.

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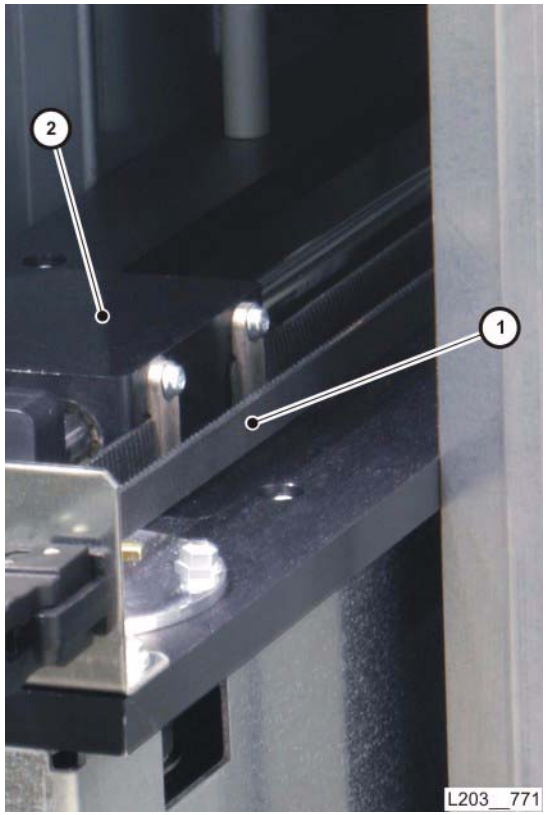


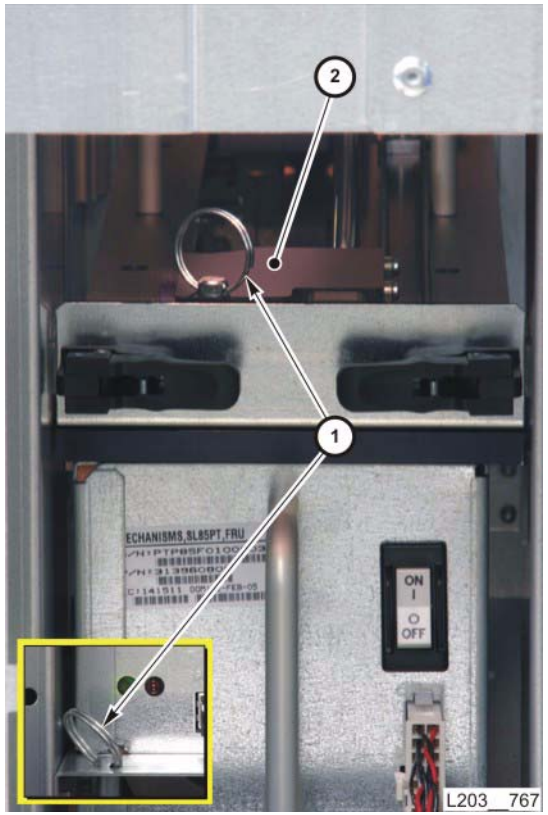
PTP mechanism removed for clarity. Shown with actuator (2) in fully retracted position.

CAUTION: *Component damage:* To prevent damage, the PTP actuator must be in the retracted position before removing the mechanism.

Note: Verify the PTP actuator is retracted before removing the mechanism from the library.

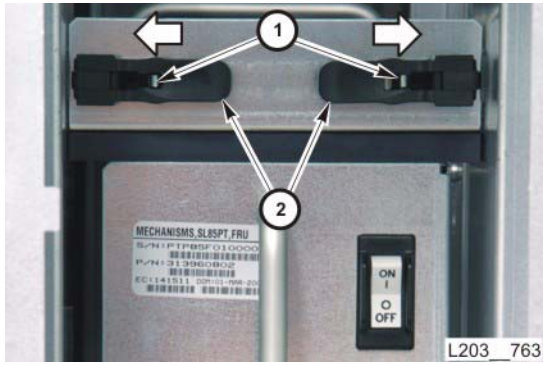
4. If the PTP actuator is not retracted, grasp the outer portion of the drive belt (1) and push it inward until the actuator (2) is fully retracted.

Continued on next page



5. Remove the shipping pin (1) from the PTP frame in front of the mechanism (inset) and install it in the PTP actuator (2).

Continued on next page



6. Press the latch lever release buttons (1), then rotate the locking levers (2) outward to the unlatched position.

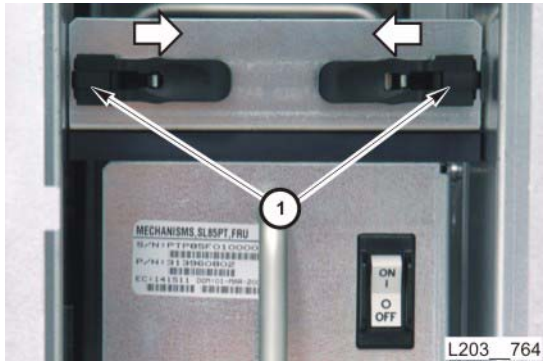
7. Slide the PTP mechanism from the library and place it out of the work area.

Continued on next page

Replacement

1. On the replacement PTP mechanism, make sure the locking levers (1) are rotated outward (unlatched).
2. Slide the replacement PTP mechanism fully into the frame.

Continued on next page



3. Press the locking levers (1) inward until the locking tabs engage. Pull slightly on the PTP mechanism to verify it is locked in position.

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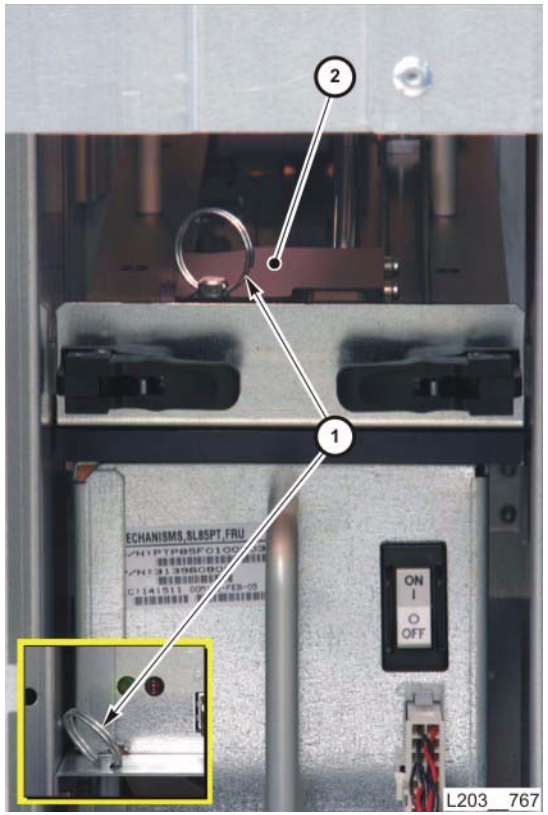
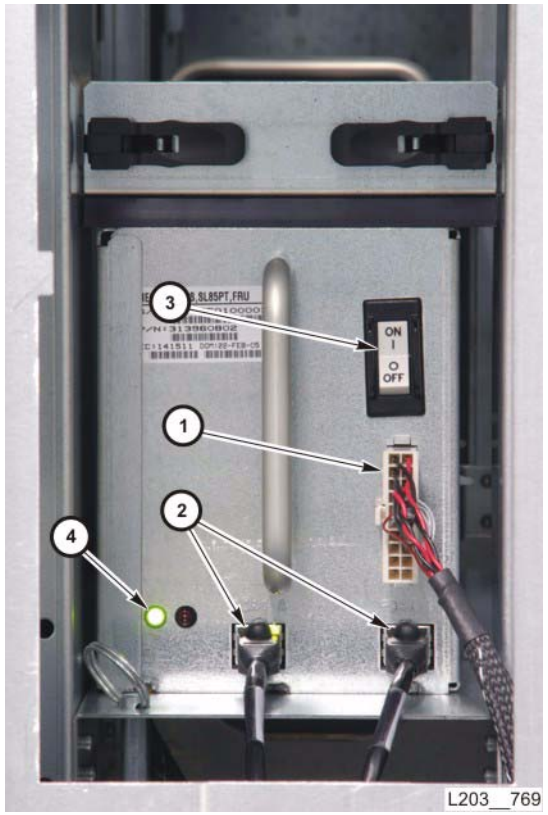


4. Remove the shipping pin (1) from the PTP actuator (2) and place it in the storage hole in front of the PTP mechanism (inset).

Continued on next page



5. Connect the power (1) and Ethernet (2) cables to the PTP mechanism.

Ethernet Cable Connector	PTP Mechanism Jack
PTPxA	Port A
PTPxB	Port B

where x is the rail number

6. Set the PTP mechanism power switch (3) to ON and verify that the green LED (4) comes on after about 45 seconds.

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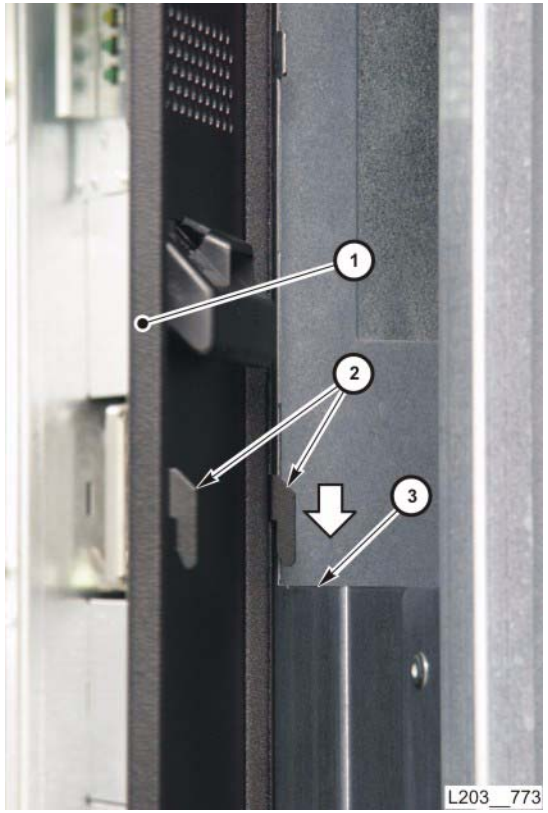


7. Position the PTP access cover (1) so the metal hooks (2) engage with the frame (3), then let it drop into position.

Go to top of procedure
Go to R&R TOC

Next procedure: ***Power Distribution Units***

Power Distribution Units

Part Location | Part Data

Removal

Slot	Rail	Drive	AC1	AC2	N+1
24	●			●	
23	●			●	
22		●		●	
21		●		●	
20		●	●		
19		●	●		
18	●			●	●
17	●			●	●
16		●		●	
15		●		●	
14		●	●		
13		●	●		
12	●		●		
11	●		●		
10		●		●	
9		●		●	
8		●	●		
7		●	●		
6	●		●		
5	●		●		
4		●		●	●
3		●		●	●
2		●	●		
1		●	●		

L203_860

1. Open the library rear doors (see **"Open/Close Rear Doors"**).

   Note: When two power distribution units (PDUs) are present, you can hot-swap either PDU, but power will be lost to redundant 48V power supplies, rail communication modules, and related accessory racks (AC1 powers accessory racks 2 and 4, AC2 powers accessory racks 1 and 3). You can also hot-swap an N+1 unit if installed in the second PDU slot, but power will be lost to redundant 48V power supplies, rail communication modules, and accessory racks 1 and 3. Refer to the table at left to see the PDU-to-Drive and Rail Power supply slot relationship.

   When only one PDU is present, you must temporarily shut down the library (if not already shut down by PDU failure) to remove and replace the PDU.

2. If only one PDU is present, ask the operator to place the library offline to the Host/ACSLS.

Continued on next page

Removal

3. Set PDU circuit breaker (3) to OFF (down).
   Note: The N+1 PDU Assembly does not have circuit breakers.
4. Remove two T25 screws (4) securing the PDU.
   Note: There is one screw at the top and bottom.
5. Pull the PDU, by the hand hold, straight out to unseat the connectors, and remove the PDU assembly completely out of the slot.

Continued on next page

Replacement

1. Set the replacement PDU circuit breaker (1) to OFF (down).
   Note: The N+1 PDU Assembly (2) does not have circuit breakers.
2. Position the replacement PDU in the slot, then push it fully into the slot to seat the connectors.
3. Insert and tighten two T25 screws (3) to secure the PDU.
   Note: There is one screw at the top and one screw at the bottom.
4. Set the replacement PDU circuit breaker (1) to ON (up).
5. Verify PDU LEDs are ON (4).
   Note: N+1 PDU does not have LEDs.
6. Close the library rear doors (see **"Open/Close Rear Doors"**).
7. If necessary, ask the operator to place the library online to the Host/ACSLS.

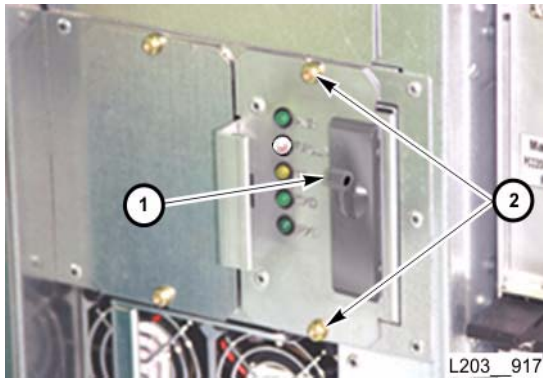
Go to top of procedure

Next procedure: ***Rail Communication (HBS) Module***

Rail Communication (HBS) Module

Part Location | Part Data

Removal

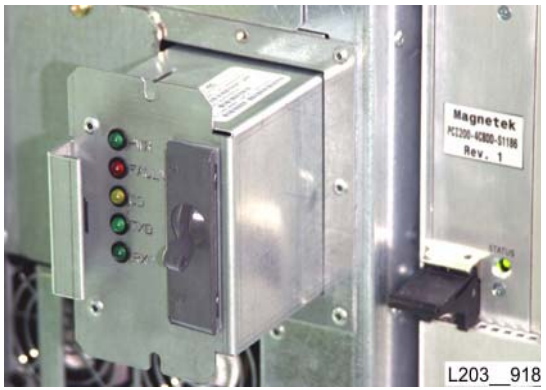


Note: An HBS module can be hot-swapped if there is a redundant HBS module present.
HBS modules for an eight-HandBot library require special firmware and matching HandBots for proper operation. Verify that the replacement HBS module part number is appropriate for the library (see **“Badge (Logo) PN 3139132xx”**). Also, HBS modules usable on eight-HandBot libraries have an “X” stamped in the upper left corner of the faceplate.

1. Open the library rear doors (see **“Open/Close Rear Doors”**).
2. Set the circuit breaker (1) to OFF on the module.
3. Remove two T15 screws (2) retaining the module.
4. Pull the module by the handle to unseat the connector, and slide the module completely out of the slot.

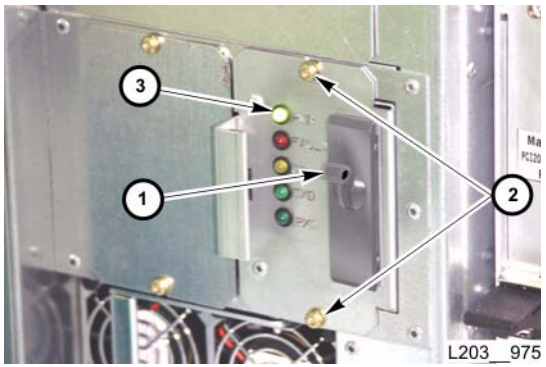
Continued on next page

Replacement



Note: HBS modules for an eight-HandBot library require special firmware and matching HandBots for proper operation. Verify that the replacement HBS module part number is appropriate for the library (see **"Badge (Logo) PN 3139132xx"**). Also, HBS modules usable on eight-HandBot libraries have an "X" stamped in the upper left corner of the faceplate.

1. Push the replacement module fully into the slot until the connector is seated.



2. Insert and tighten two T15 screws (2) to retain the module.
3. Set the circuit breaker (1) to ON.
4. Verify that the green LED (PWR) (3) is ON and the red LED (FAULT) is OFF.
   Note: The remaining LEDs may flicker as the HandBots send and receive commands.
5. Perform **"Rail Communication (HBS) Module Verification."**
6. Close the library rear doors (see **"Open/Close Rear Doors"**).

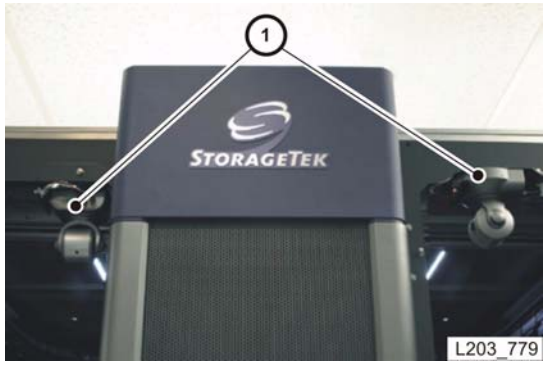
Go to top of procedure

Next procedure: ***Remote Camera***

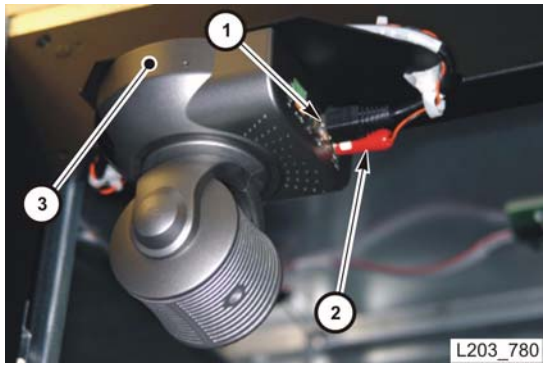
Remote Camera

Part Location | Part Data

Removal



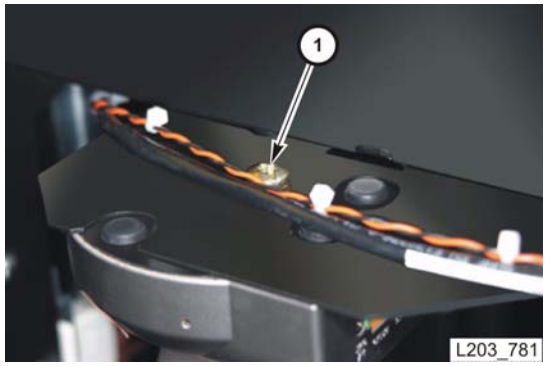
1. Open the appropriate library front door (see **“Open/Close Front Doors”**) for access to failed camera (1).



2. Disconnect the Ethernet (1) and power (2) cables at the camera (3).

Continued on next page

Removal

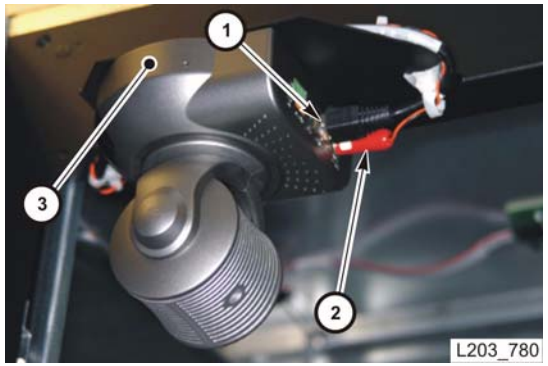


3. While supporting the camera, remove one T30 screw (1) from the top, securing camera to camera bracket and remove camera.

Replacement

1. Secure camera to camera bracket from the top with one T30 screw (1).

   Note: Make sure the rubber feet on the camera base fit into the cutouts in the bracket.



2. Connect the Ethernet (1) and power cables (2) to the camera (3).
3. Perform **"Remote Camera Verification."**
4. Close the library front door (see **"Open/Close Front Doors"**).

Go to top of procedure

Next procedure: ***Security Key (HBK) Card***

Security Key (HBK) Card

Part Location | Part Data

Removal

1. Open the library rear doors (see **"Open/Close Rear Doors"**).
2. Fully loosen four captive screws (1) securing the upper-left cover plate.

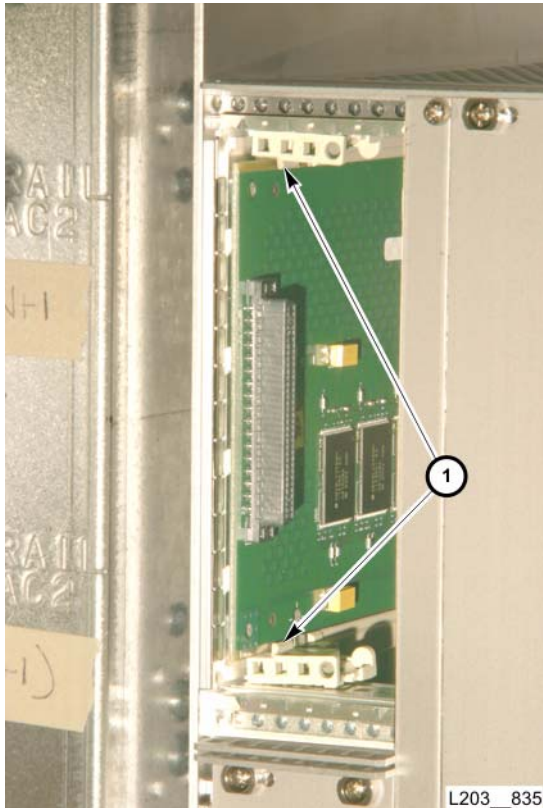
Continued on next page

Removal

3. Pull the HBK card completely out of the card slot.

Continued on next page

Replacement



CAUTION: Configuration and account information contained in the HBK card is unique to each library. Before installing a new HBK card, verify that it has been configured with the unique information required for your library.

1. Align the card edges with the slot guides (1), and push the replacement HBK card into the slot until it contacts the slot connector.
2. Press card firmly, to seat the connector.

Continued on next page

Replacement

Note: Perform the following step only if you are installing a **new** HBK card. If you are installing an HBK card that was previously installed in your library, go to step 4.

3. Configure user accounts and passwords of a *new* HBK card as if you are logging onto the library for the first time. Refer to “Activating User Accounts” in the *SL8500 Installation Manual*, PN 96138.

   Note: Advise the customer that they must reset their passwords.
4. Reinitialize the library and verify successful completion of power-on self test and audit.
5. Position the cover plate.

CAUTION: *Possible Screwhead Damage.*
DO NOT overtighten captive screws.

6. Tighten four captive screws (1) to secure the cover plate.
7. Close the library rear doors (see **“Open/Close Rear Doors”**).
8. Inform operator that all passwords will have to be reset.

Go to top of procedure

Next procedure: ***Service Safety Door Assembly***

Service Safety Door Assembly

Part Location | Part Data

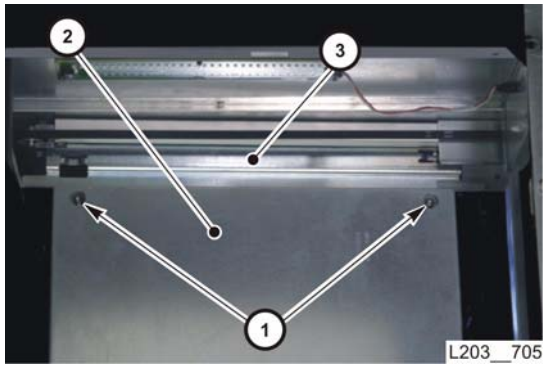
Removal

Right side shown

1. Ask the operator to place the library offline to the Host/ACSLS.
2. Open the library front doors (see **“Open/Close Front Doors”**).
3. At the front of the library, remove the first two 13-cell arrays (1) at Rail 1 on each side of the library.
4. Remove the safety door motor assembly (see **“Service Safety Door Motor Assembly”**).

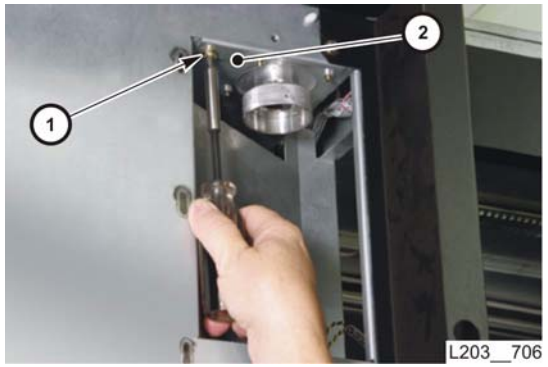
Continued on next page

Removal



Safety Door Panel

5. Remove two T25 screws (1) securing the top of the safety door panel (2) to the carriage track assembly (3).
6. Remove the safety door panel from library and place it out of the work area.

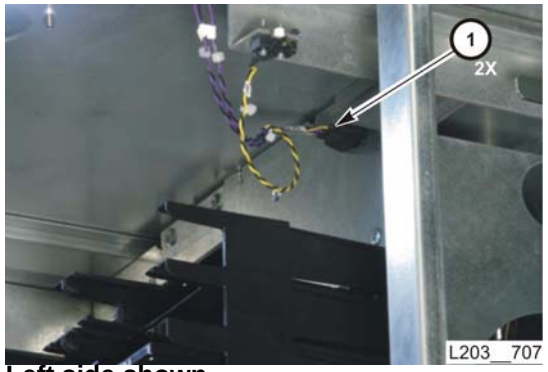


Carriage Track Assembly

7. Inside the safety door motor access port, remove one T25 screw (1) securing the safety door motor mounting plate to frame.

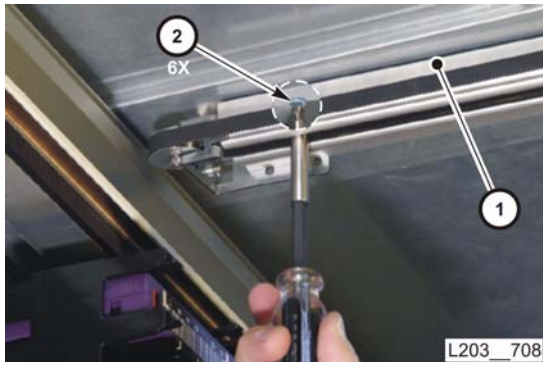
Continued on next page

Removal



Left side shown

8. Disconnect two safety door assembly switch connectors (1) at the library bulkhead (one on each side).



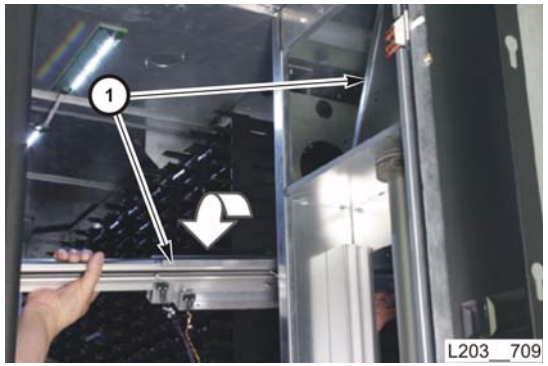
CAUTION: *Possible equipment damage:* Unless supported, the carriage track assembly will drop when the last screw is removed.

9. While supporting the safety door carriage track (1) in the center, remove six T20 screws (2, three on each side) securing the safety door carriage track to the ceiling of the library.

   Note: The screws are located inside the carriage track channel, above the belt.

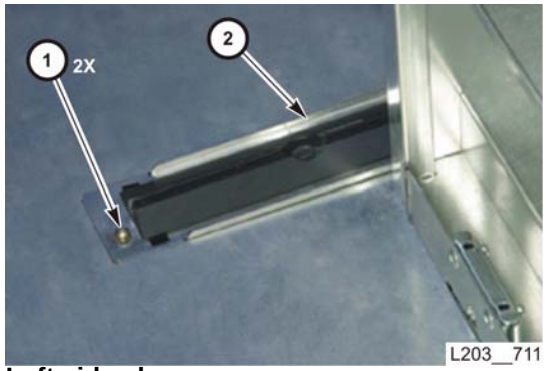
Continued on next page

Removal



CAUTION: *Possible equipment damage:* Be careful not to damage switches, wiring, and cell arrays when removing the carriage track.

10. Tilt the carriage track assembly (1) down at the back and carefully remove it from the library. Place the carriage track assembly out of the work area.



Left side shown

Threshold Guide

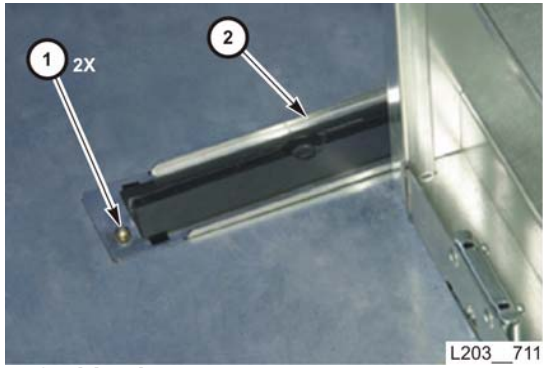
Note: The following step may be omitted if threshold guide removal is not required.

11. Remove two T25 screws (1) securing the threshold guide (2) to the floor, and remove the guide from the library.

Continued on next page

Replacement

Threshold Guide

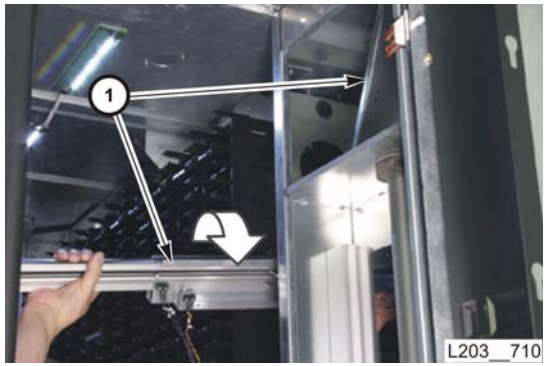


Left side shown

Note: Go to step 4 if the threshold guide was not removed.

1. Position threshold guide in the floor.
2. Thread two T25 screws (1) in threshold guide (2).
3. Tighten both screws evenly.

Carriage Track Assembly



Left side shown

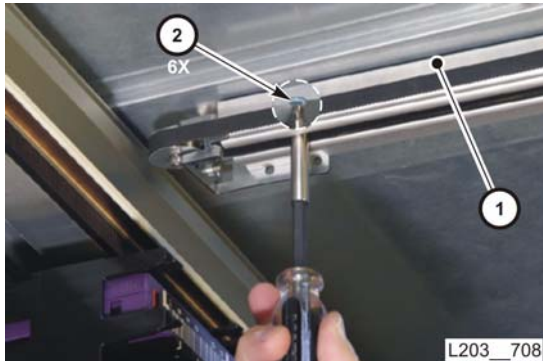
CAUTION: *Possible equipment damage:* Be careful not to damage switches, wiring, and cell arrays when positioning the carriage track.

4. Tilt the carriage track assembly (1) up and rotate into position.

Continued on next page

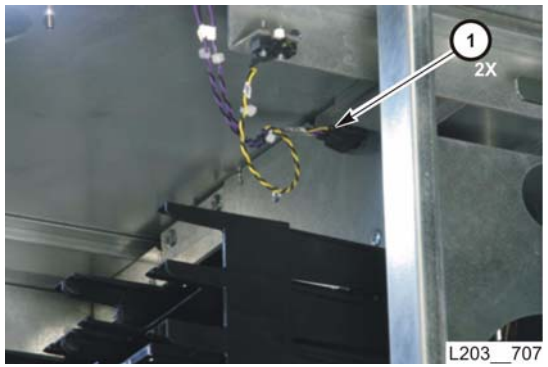
Replacement

Note: When threading screws, thread the two innermost screws first.



5. While supporting the safety door carriage track assembly (1) against the library ceiling, thread six T20 *flathead* screws (2) through the track and into the ceiling. Do *not* tighten screws.

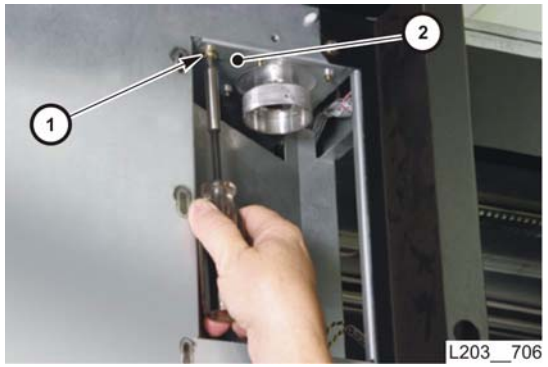
   Note: The use of pan head screws will prevent safety door operation.



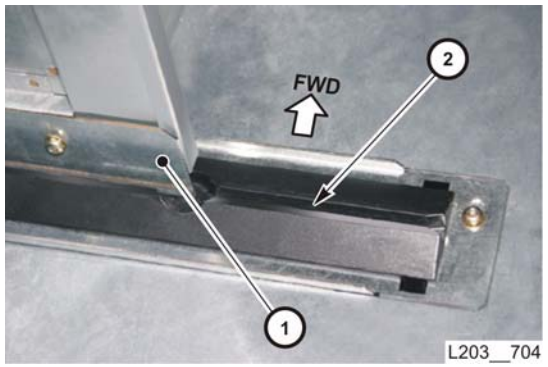
6. Connect two switch connectors (1) (one on each side of the carriage track) at the library bulkhead.

Continued on next page

Replacement



7. Inside the safety door motor access port, thread one T25 screw (1) into the safety door motor mounting plate (2).
8. Tighten carriage track and mounting plate screws evenly.



Service Safety Door Panel

9. Position the guide bracket (1) on the bottom of the safety door panel in the threshold guide channel (2).

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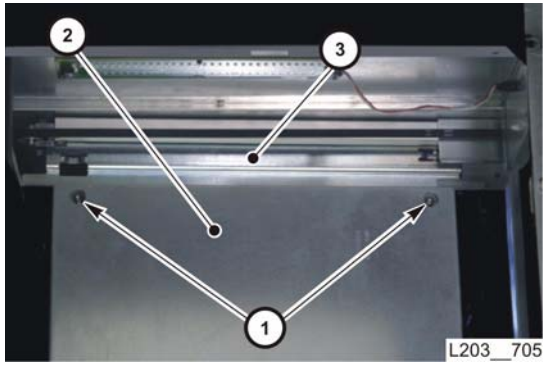


10. While supporting the safety door panel (2) against the carriage track bracket (3) at the top, thread two T25 screws (1) through the top of the safety door panel and into the carriage track bracket.
11. Tighten screws evenly.

Continued on next page

Replacement

Left side shown

12. At the front of the library, install the first two 13-cell arrays (1) at Rail 1 on each side of the library.
13. Close the library front doors (see **"Open/Close Front Doors"**).
14. Install the safety door motor assembly (see **"Service Safety Door Motor Assembly"**).
15. Go to **"Service Safety Door Verification"** to verify correct operation.
16. After verifying correct operation, ask the operator to place the library online to the Host/ACSLS.

Go to top of procedure

Next procedure: ***Service Safety Door Motor Assembly***

Service Safety Door Motor Assembly

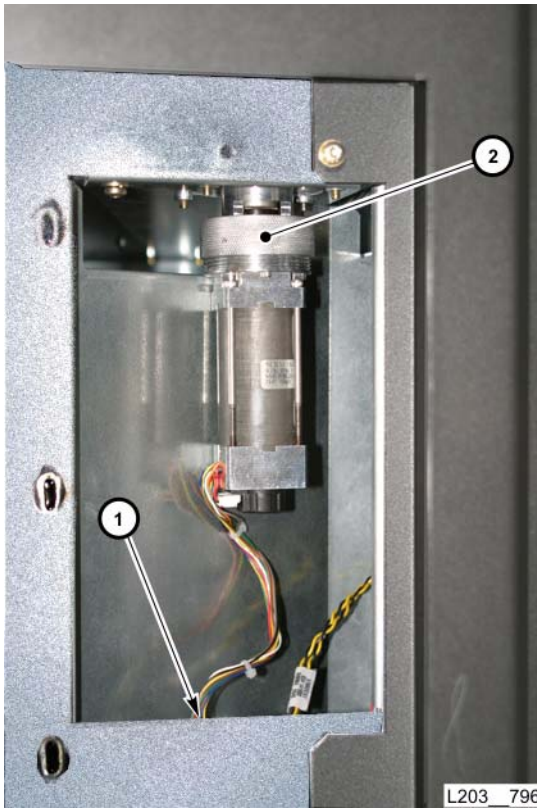
Part Location **Part Data**

Removal

1. Remove the library upper façade (see **“Façade Removal”**).
2. Remove one T25 screw (1) securing the safety door motor access panel and remove the panel.

Continued on next page

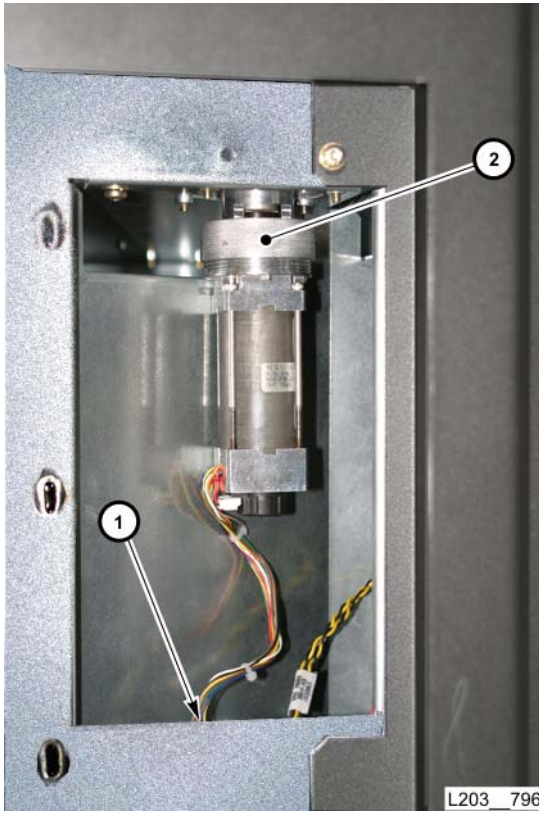
Removal



3. Disconnect the motor assembly power cable (1) from the bulkhead connector.
4. Unscrew the coupler collar (2) securing the motor assembly.
5. Lower the motor assembly away from the coupler.

Continued on next page

Replacement



1. Position the replacement motor assembly into the mounting area, making sure the motor shaft coupler tab is aligned with the linkage coupler slot.
   Note: You might need to rotate motor shaft to align the coupler.
2. Raise the motor assembly vertically to engage the coupler.
3. Continue raising the motor assembly vertically to engage the collar locating pins.
   Note: The collar locating pins engage only when the motor coupler is properly engaged.
4. Thread and tighten the coupler collar (2) to secure the motor assembly.
5. Connect the motor power cable (1) to the bulkhead connector.

Continued on next page

Replacement

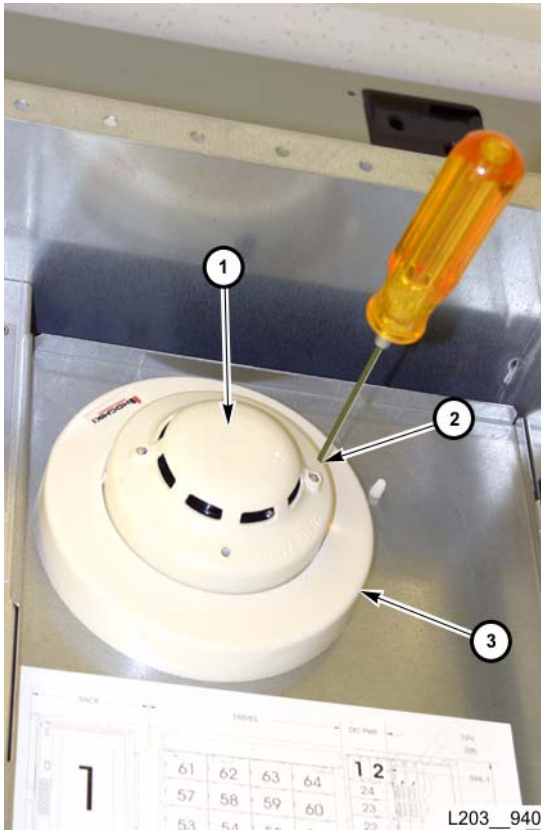
6. Re-install safety door motor access panel and secure with one T25 screw (1).
7. Re-install the library's upper façade. (see **"Façade Installation"**).
8. Perform **"Service Safety Door Verification."**

Go to top of procedure

Next procedure: ***Smoke Detector and Base***

Smoke Detector and Base

Part Location **Part Data**



Detector Removal

Note: Replacement of the smoke detector is an annual preventive maintenance (PM) item. It is non-disruptive. Do *not* replace the base as a PM procedure—it will remove power from the entire library.

1. Open the library rear doors (see **"Open/Close Rear Doors"**).
2. Loosen the smoke detector (1) set screw (#21 allen, 2) six to eight turns.
   Note: It is not necessary to remove the set screw.
3. Rotate the detector counterclockwise approximately 1/8 turn, then pull it straight out.
   Note: If the smoke detector base (3) requires replacement, go to **"Base Removal."**

Detector Replacement

1. Loosen the replacement smoke detector (1) set screw (#21 allen, 2) six to eight turns.
2. Position the replacement smoke detector into the detector base (3), with the "TEST" label at approximately 12 o'clock, then rotate clockwise 1/8 turn.
3. Tighten the set screw until flush to secure the smoke detector.
4. Close the library rear doors (see **"Open/Close Rear Doors"**).

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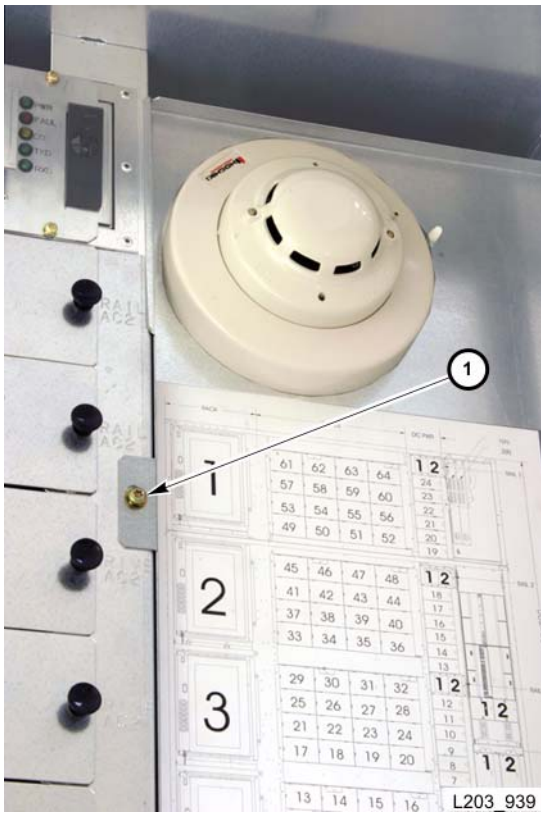
Base Removal

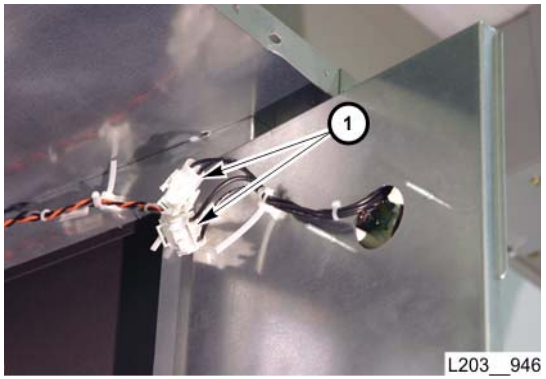


CAUTION: *System problems:* Be sure the library and drives are offline before removing the smoke detector base. Removal of the base also removes power from the entire library.

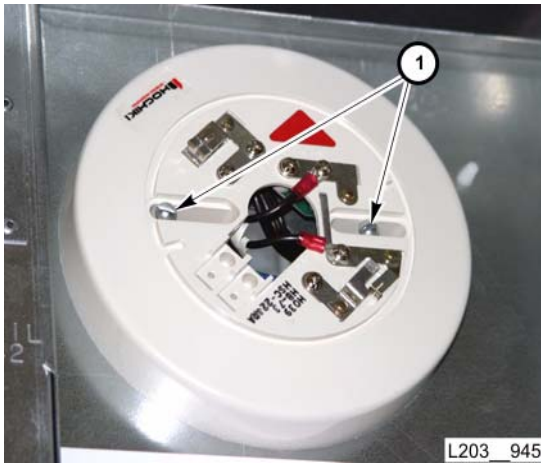
1. Have the operator vary/modify the library and drives offline to ACSLS/HSC.
2. Power-off the library at the main circuit breaker.
3. Remove the smoke detector unit (see **"Detector Removal"**).
4. Remove one T25 screw (1) securing the mounting plate/access panel.

Continued on next page

Base Removal



5. Disconnect two in-line connectors (J/P856 and J/P857) (1).
6. Cut/remove the cable mounting/tie.
7. Place the mounting plate on a suitable work surface.



8. Remove two slotted screws (1) securing the base assembly.
9. Remove the smoke detector base assembly.

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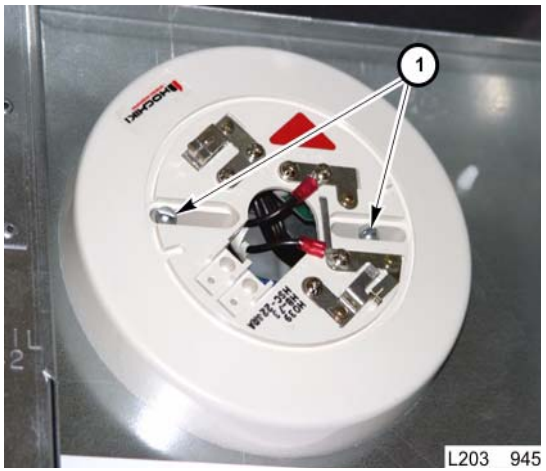
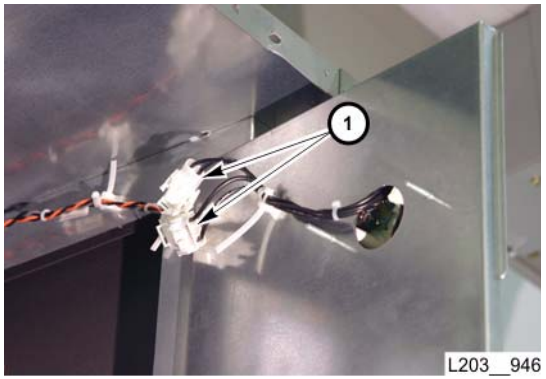
Base Replacement



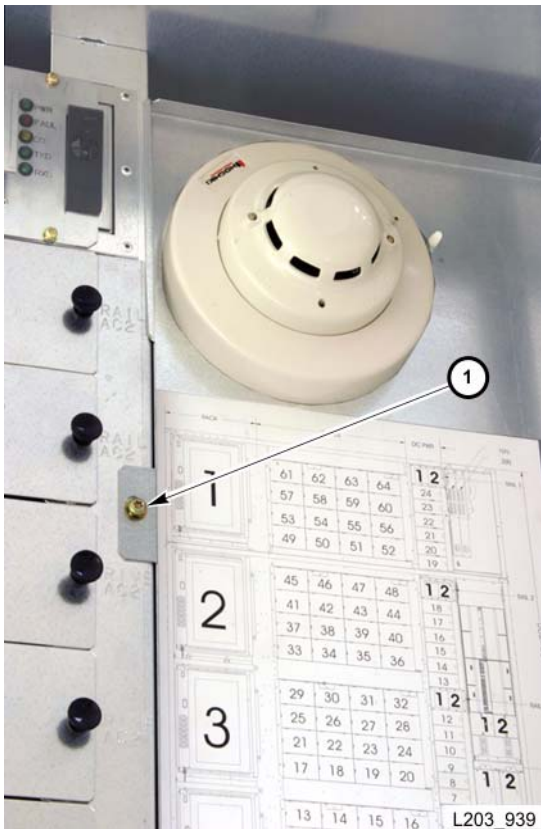
1. Position the replacement base assembly on the mounting plate and secure with two screws (1).



2. Connect the two in-line connectors (1) and secure the cables to the mounting plate with a cable mounting/tie.

Continued on next page

Base Replacement



3. Close and secure the mounting plate/access panel with one T25 screw (1).
4. Reinstall the smoke detector unit (see **“Detector Replacement”**).

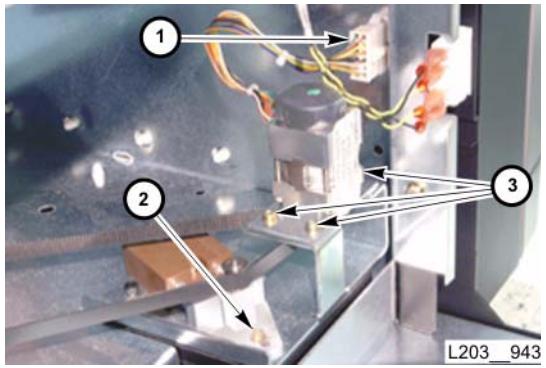
Go to top of procedure

Next procedure: ***Turntable Assembly***

Turntable Assembly

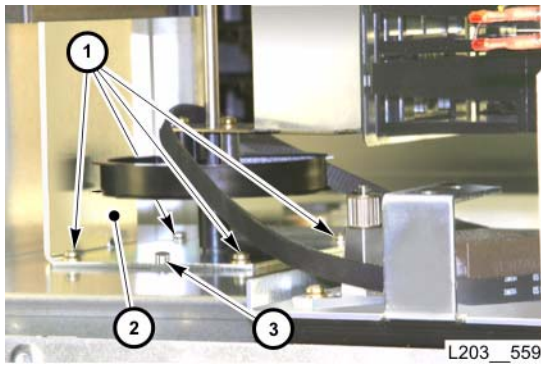
Part Location | Part Data

Removal



1. Open the left library front door (see **"Open/Close Front Doors"**).
2. Disconnect the motor assembly cable at the bulkhead connector (1).
3. Loosen the T15 tensioner slide screw (2) a couple of turns, press the tensioner to relieve belt tension, then tighten the tensioner slide screw.
4. Remove the drive belt from motor shaft pulley.
5. Remove three T15 screws (3) securing the motor assembly to the motor and tension mounting plate.

   Note: There is limited vertical clearance with lower turntable motor assembly.



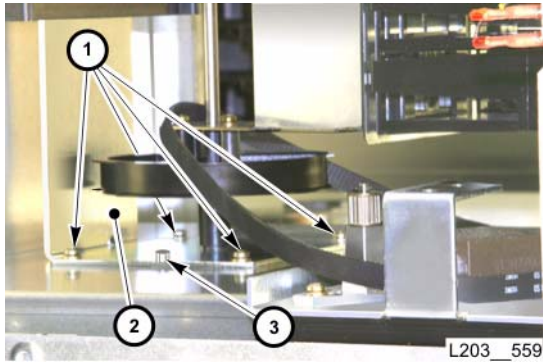
6. Lift the motor assembly away from the mounting area.

   CAUTION: *Component damage:* Be careful not to break the plastic cell array when removing the turntable array assembly.

7. Remove four T15 screws (1) securing turntable array assembly (2) to the library floor and remove the assembly from the library.

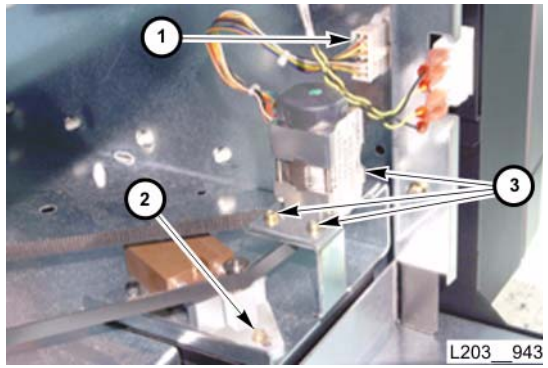
Continued on next page

Replacement



CAUTION: *Component damage:* Be careful not to break the plastic cell array when installing the turntable array assembly.

1. Position turntable array assembly (2) on the mounting posts (3), then insert and thread four T15 screws (1).
   Note: Do not tighten the screws until all four have been threaded.
2. Tighten the four screws to secure the turntable assembly.



3. Position the motor assembly onto the mounting area.
4. Insert and tighten three T15 screws (3) to secure the motor.
5. Position the drive belt onto the motor pulley and turntable pulley.
6. Loosen the T15 tensioner slide screw (2), reapply tension to the drive belt, then retighten the screw.
7. Connect the motor assembly cable (1) to the bulkhead connector.
8. Close the library door (see **"Open/Close Front Doors"**).
9. Perform **"Turntable Motor Verification."**

Go to top of procedure

Next Section: Drive Tray Components

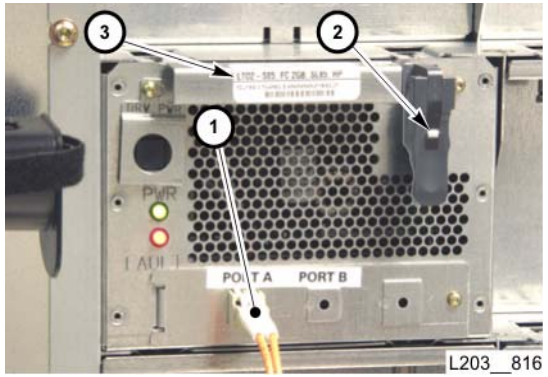
Drive Tray Components

This section contains step-by-step procedures to remove/replace drive tray FRUs/spares for drive trays containing IBM, HP, SDLT and DLT-S4 drives.

CAUTION: *Mount failures*: **SDLT and DLT-S4** drive mounting holes are labeled “STK/SDLT;”
HP and **IBM** drive mounting holes are labeled “LTO.” Be sure you closely follow the directions for each drive type’s removal and replacement procedure.

For removal and replacement procedures for Sun StorageTek drives, refer to Sun StorageTek Tape Drive documentation.

Drive Tray Removal/FRU Access



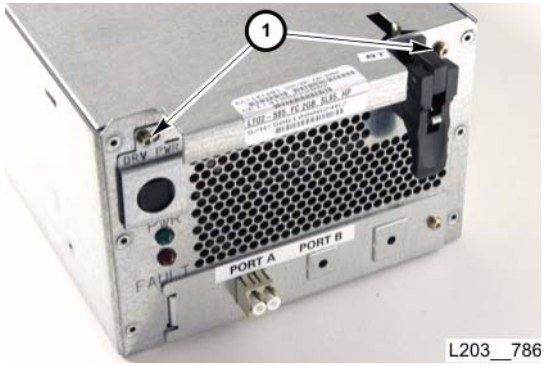
1. Make sure there is not active input/output (I/O) at the subject drive to/from host(s), and the drive is out of service.
2. Open the library rear doors (see **"Open/Close Rear Doors"**).
3. Disconnect the host interface cable (1) from the tray rear panel.

CAUTION: *HBD card damage:* Be sure to follow the next step before removing a drive tray.

4. Depress the power switch. The green LED will flash while the unit is powering down. *WAIT until the LED is solid red (approximately one minute) before pulling out the drive tray*.
5. Press the tray latch lever release tab (2), then rotate the lever upward into the detent position (unlatched).
6. Pull the tray, by the handle (3), straight out of the library drive bay, and place it on a suitable work surface.

   Note: Make sure you support the tray before it clears the library drive bay.

Continued on next page



CAUTION: *ESD Damage Potential*. An open drive tray exposes ESD-sensitive components. Improper handling could result in permanent damage to components. MAKE SURE YOU FOLLOW ESD PRECAUTIONS AND PROCEDURES detailed in **"Electrostatic Discharge Damage Prevention."**

Note: The tray top cover does not have to be removed if you are only replacing the drive.

7. Remove two T10 screws (1) securing the tray top cover and switch guard (2) to the rear panel.

   Note: Place the screw and switch guard out of the work area.
8. Slide the top cover forward and lift it up from the drive tray.

Go to top of procedure

Next procedure: ***Cable Assemblies***

Cable Assemblies

Removal/Replacement

Note: The drive tray assembly must be out of the library and on a suitable work surface (see **"Drive Tray Removal/FRU Access"**).

1. Disconnect the cable assembly.

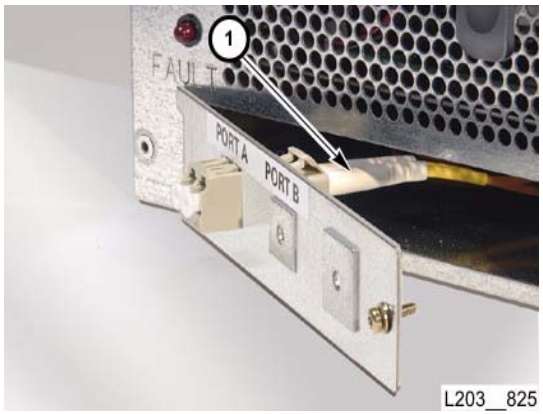
   Note: If necessary, remove components to gain adequate access to connectors (see appropriate removal paragraphs).

2. Clip and discard all cable tie/mounts securing the cable assembly to the tray assembly.

3. If replacing the fibre-optic cable:
   a. Remove the T10 mounting screw (1) from the drive interface plate.

Continued on next page

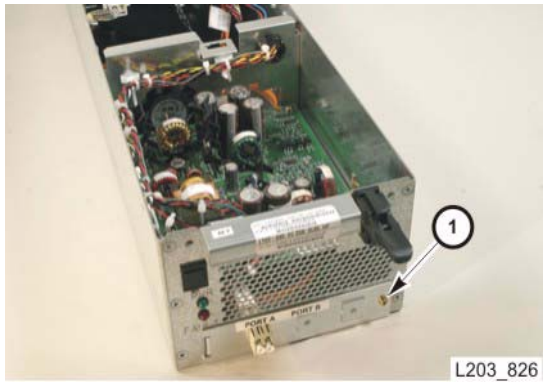
Removal/Replacement



b. Pull plate away from the drive tray rear panel to access and disconnect the rear fibre-optic cable connector (1).

4. Connect replacement cable assembly.
5. Secure cable assembly to tray assembly with new cable/tie mounts.

   Note: If necessary, install any removed component (see appropriate replacement paragraphs).



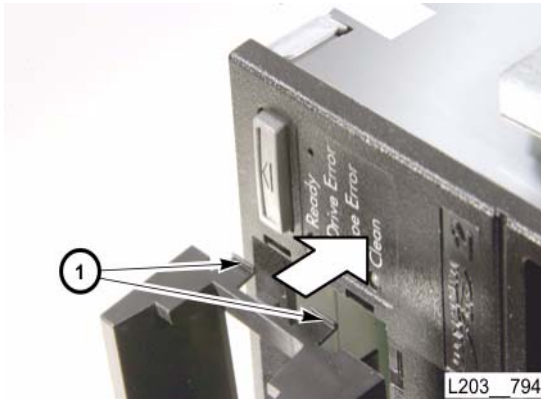
6. If necessary, reattach drive interface plate to drive tray rear panel with one T10 screw (1).
7. Go to **“Drive Tray Reassembly/Reinstallation.”**

Go to top of procedure

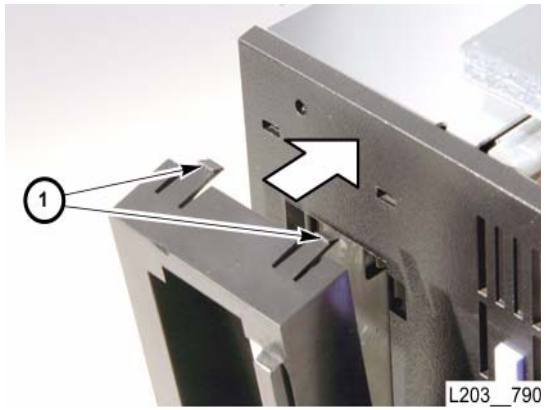
Next procedure: ***Drive Removal/Replacement***

Drives—HP and IBM

Removal—HP and IBM Drives



HP Drive Bezel



IBM Drive Bezel

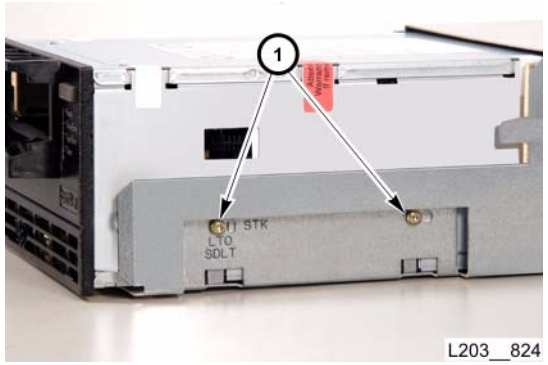
Note: The HP and IBM drives are shown on the left side of this page.

1. Remove the drive tray from the library (see **"Drive Tray Removal/FRU Access"**) and place it on a suitable work surface.
   Note: Four locking tabs (1), two on each side, secure the bezel.

2. Remove and retain the bezel for re-use with the replacement drive:
   a. Press down on the two locking tabs on one side.
   b. Pivot the bezel out from the other side.

Continued on next page

Removal—HP and IBM Drives

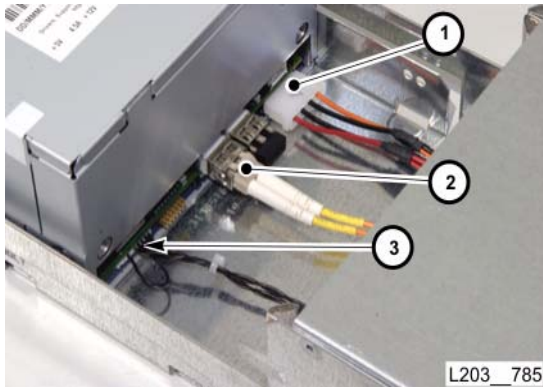


3. Remove four T10 mounting screws (1) securing the drive.

Note: There are two short screws on each side of the tray assembly, near the front of the drive.

Continued on next page

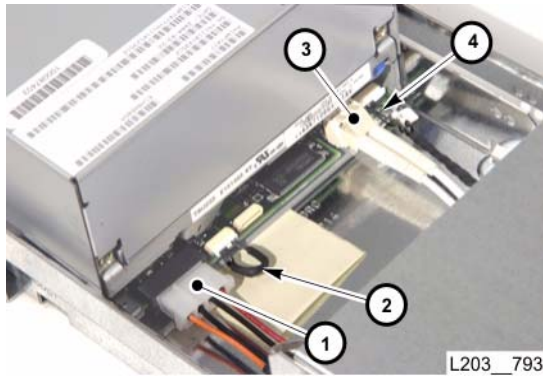
Removal—HP and IBM Drives



4. Disconnect the following cable connectors from the drive (pull out the drive enough to gain access):

   HP

   a. Drive power cable (1)
   b. Fibre-optic cable (2)
   c. TTI cable (3)



   IBM

   a. Drive power cable (1)
   b. Jumper cable (2)
   c. Fibre-optic cable (3)
   d. TTI cable (4)

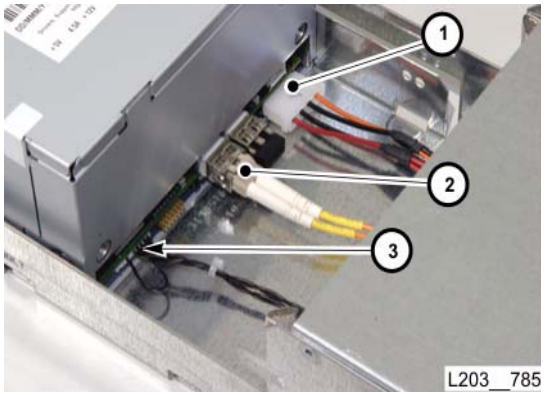
5. Slide the drive completely out of the tray assembly, and set it aside.

Note: For IBM drives, check the settings for the microswitches on the bottom of the drive. Switches 1 and 2 should be ON and all others are OFF. Make sure this is the same for the replacement drive.

Continued on next page

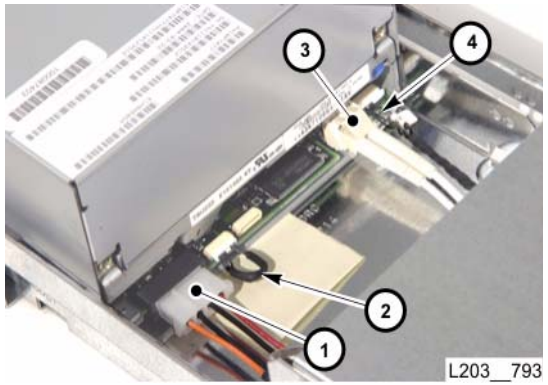
Replacement—HP and IBM Drives

1. Slide the replacement drive into the drive tray assembly just enough to allow access to drive rear panel connections.
2. Connect the following cable connectors to the rear of the drive:



HP

a. Drive power cable (1)
b. Fibre-optic cable (2)
c. TTI cable (3)

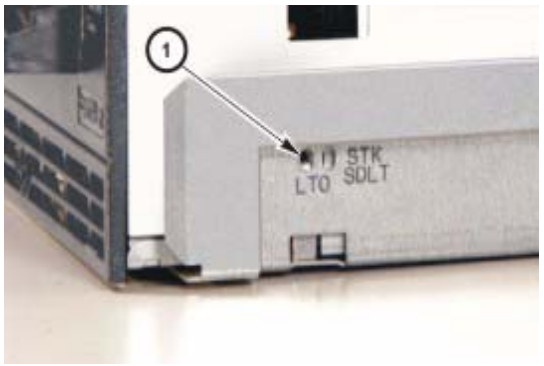


IBM

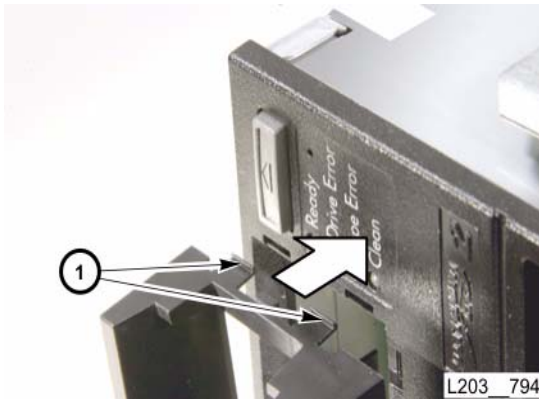
a. Drive power cable (1)
b. Jumper cable (2)
c. Fibre-optic cable (3)
d. TTI cable (4)

Continued on next page

Replacement—HP and IBM Drives



3. Align the replacement drive with the tray assembly to match the **LTO** mounting holes (1).
   Note: **LTO** mounting screw holes are the ones forward of each pair. Make sure you use the **LTO** mount holes; otherwise, cartridges will not load properly.
4. Insert and thread, but do not fully tighten, four T10 drive mounting screws.
   Note: Make sure you use short drive mounting screws.
5. Tighten all four drive screws to secure drive to the drive tray assembly.

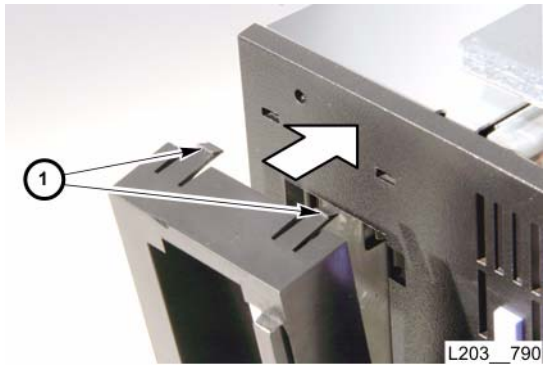


HP Drive Bezel

6. Install the drive bezel:
   a. Press down on the two locking tabs on one side.
   b. Pivot the bezel in from the other side.

Continued on next page

Replacement—HP and IBM Drives



IBM Drive Bezel

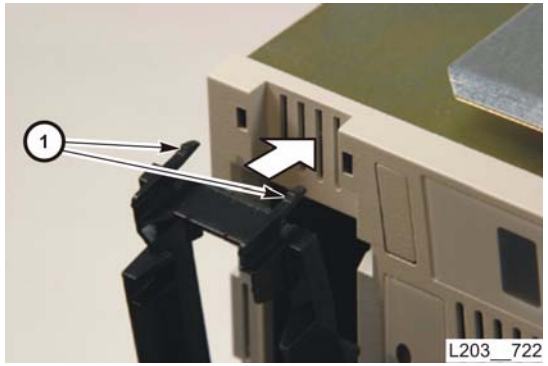
To complete the removal and replacement of HP and IBM drives, go to **Drive Tray Reassembly/Reinstallation**

Go to top of procedure

Next Procedure: ***Drives—SDLT Drive***

Drives—SDLT Drive

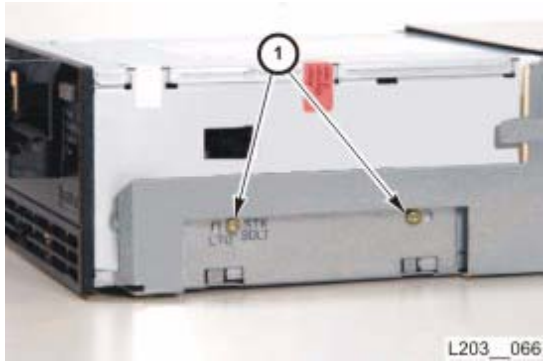
Removal—SDLT Drives



SDLT Drive Bezel

Note: The SDLT drive is shown on the left side of this page.

1. Remove the drive tray from the library (see **“Drive Tray Removal/FRU Access”**) and place it on a suitable work surface.
2. Four locking tabs (1), two on each side, secure the bezel.
3. Remove and retain the bezel for re-use with the replacement drive:
   a. Press down on the two locking tabs on one side.
   b. Pivot the bezel out from the other side.



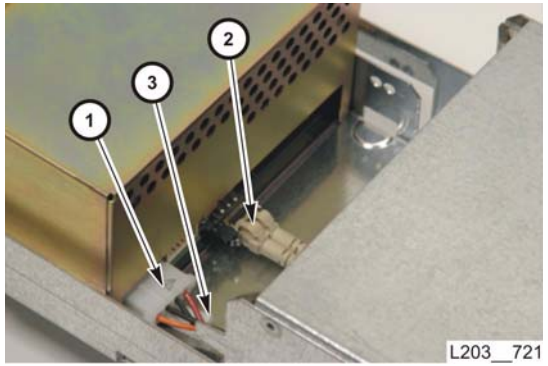
SDLT Drive

4. Remove four T10 mounting screws (1) securing the drive.

Note: There are two short screws on each side of the tray assembly, near the front of the drive.

Continued on next page

Removal—SDLT Drives



SDLT Drive

5. Disconnect the following cable connectors from the drive (pull out the drive enough to gain access):

   SDLT

   a. TTI cable (# 3—under power connector)
   b. Drive power cable (# 1)
   c. Fibre-optic cable (# 2)

6. Slide the drive completely out of the tray assembly, and set it aside.

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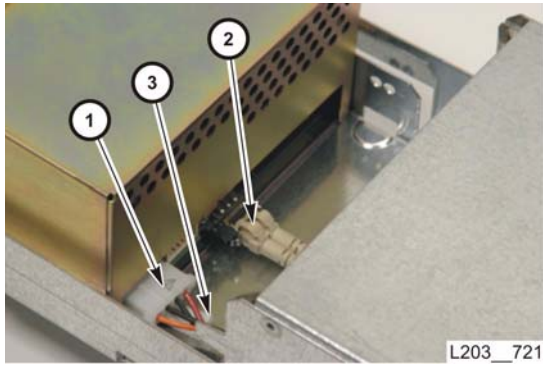
Replacement—SDLT Drives

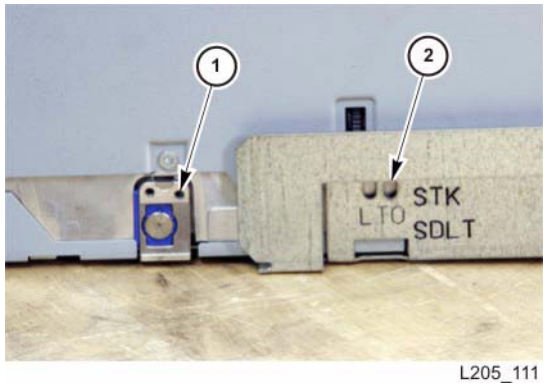


SDLT Drive

1. Slide the replacement drive into the drive tray assembly just enough to allow access to drive rear panel connections.
2. Connect the following cable connectors to the rear of the drive:

   SDLT

   a. TTI cable (# 3—under power connector)
   b. Drive power cable (# 1)
   c. Fibre-optic cable (# 2)



SDLT Drive

3. Align the *second drive mounting hole* (1) within the tray assembly to match the **STK/DLT** mounting holes (2).

   Note: Make sure you use second drive mounting hole and the **STK/DLT** tray mount holes; otherwise, cartridges will not load properly.
4. Insert and thread, but do not fully tighten, four T10 drive mounting screws.

   Note: Make sure you use short drive mounting screws.
5. Tighten all four drive screws to secure drive to the drive tray assembly.

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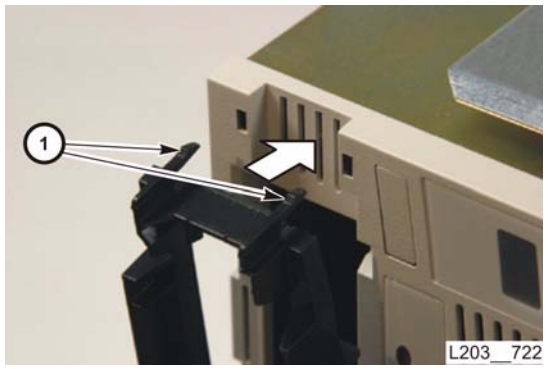
Replacement—SDLT Drives



SDLT Drive

6. Install the drive bezel:
   a. Press down on the two locking tabs on one side.
   b. Pivot the bezel in from the other side.

7. To complete the removal and replacement of SDLT drives, go to **Drive Tray Reassembly/Reinstallation**

Go to top of procedure

Next Procedure: Drive Tray Reassembly/Reinstallation

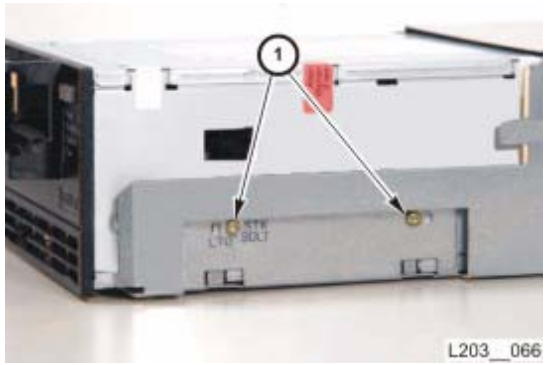
Drives—DLT-S4 Drive

Removal—DLT-S4 Drives

1. Remove the drive tray from the library (see **“Drive Tray Removal/FRU Access”**) and place it on a suitable work surface.
2. Follow the directions enclosed with the replacement drive to remove the bezel from the old drive and then install it on the new drive.

3. Remove four T10 mounting screws (1) securing the drive.

Note: There are two short screws on each side of the tray assembly, near the front of the drive.



DLT-S4 Drive

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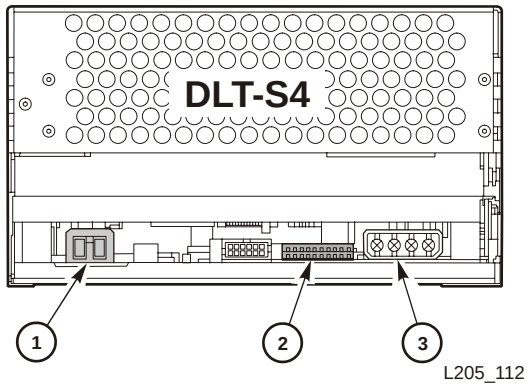


DLT-S4 Drive

Removal—DLT-S4 Drives

4. Disconnect the following cable connectors from the drive (pull out the drive enough to gain access):

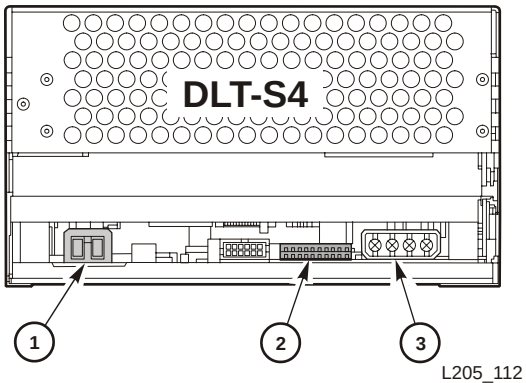
   DLT-S4

   a. Fibre-optic cable (# 1)
   b. TTI cable (# 2)
   c. Drive power cable (# 3)

5. Slide the drive completely out of the tray assembly, and set it aside.

Continued on next page

Replacement—DLT-S4 Drives

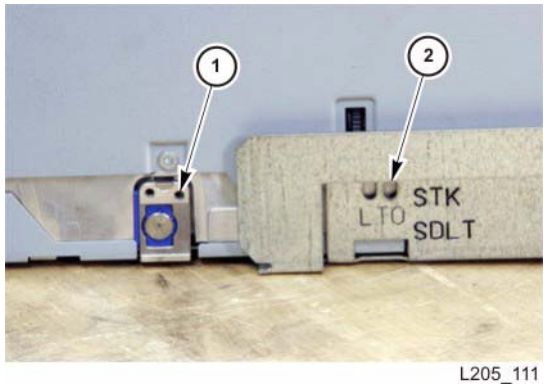


DLT-S4 Drive

1. Slide the replacement drive into the drive tray assembly just enough to allow access to drive rear panel connections.
2. Connect the following cable connectors to the rear of the drive:

   DLT-S4

   a. Fibre-optic cable (# 1)
   b. TTI cable (# 2)
   c. Drive power cable (# 3)



DLT-S4 Drive

3. Align the *second drive mounting hole* (1) within the tray assembly to match the **STK/DLT** mounting holes (2).

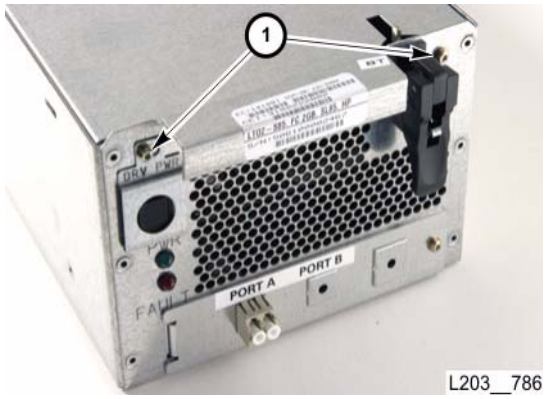
   Note: Make sure you use second drive mounting hole and the **STK/DLT** tray mount holes; otherwise, cartridges will not load properly
4. Insert and thread, but do not fully tighten, four T10 drive mounting screws.

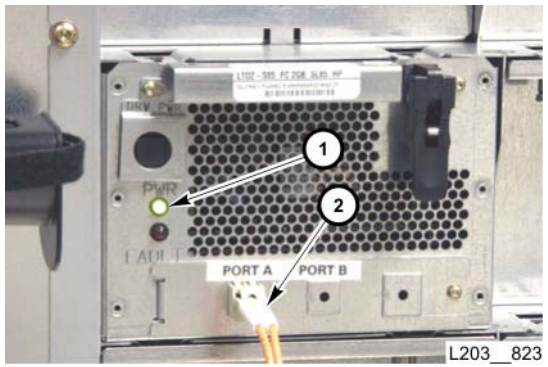
   Note: Make sure you use short drive mounting screws.
5. Tighten all four drive screws to secure drive to the drive tray assembly.
6. To complete the removal and replacement of SDLT drives, go to **Drive Tray Reassembly/Reinstallation**

Go to top of procedure

Next Procedure: Drive Tray Reassembly/Reinstallation

Drive Tray Reassembly/Reinstallation





Note: The drive tray assembly must be reinstalled into the library after replacing drive tray FRUs/spares. You must wait at least one minute between the removal and replacement of a drive tray or the library will not recognize the drive.

1. Position the tray top cover and slide toward the rear panel to engage latches.
2. Position switch guard (2), then insert and tighten two T10 screws (1) into the rear panel to secure the cover.
3. Make sure the tray latch lever is in the upward detent position.
4. Slide the drive tray fully into the library drive bay to seat the tray connector.

Note: The green PWR LED (1) begins blinking, indicating presence of 48VDC to the drive tray power supply card. Once the library detects the drive, the green PWR LED changes from blinking to steady, the drive powers up, and begins the IPL sequence.

5. Rotate the tray latch lever downward until it locks.
6. Connect host interface cable (2) to the tray interface port.
7. Use the library console to verify the properties for the drive trays in the replaced drive array.
8. Use the library console to load a diagnostic cartridge to the drive tray is in the replaced drive array.
9. Inform the library operator that the replaced drive tray is available.
10. Close the library rear doors (see **“Open/Close Rear Doors”**).

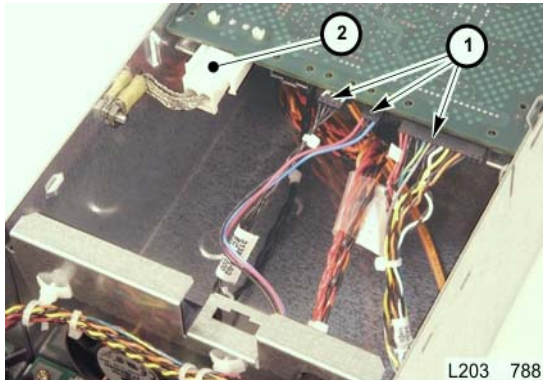
Go to R&R TOC

Next procedure: ***Environmental Monitor PWA (HBD Card)***

Environmental Monitor PWA (HBD/HBDK Card)

Removal

Note: The drive tray assembly must be out of the library and on a suitable work surface (see **"Drive Tray Removal/FRU Access"**).
HBD cards are for LTO drives. SRK drives use HBDK cards.



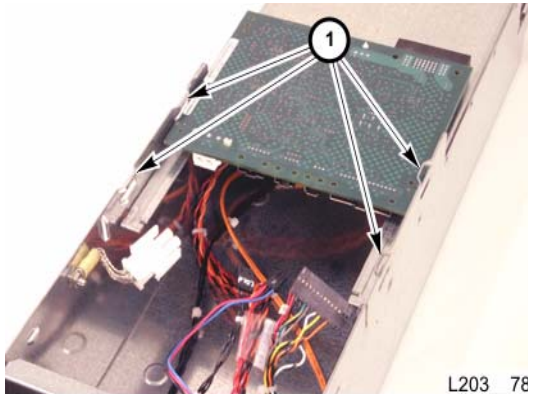
CAUTION: *ESD Damage Potential:* The HBD card contains ESD-sensitive components. Improper handling could result in permanent damage to components. MAKE SURE YOU FOLLOW ESD PRECAUTIONS AND PROCEDURES detailed in **"Electrostatic Discharge Damage Prevention."**

1. Disconnect all cables (1) from the HBD card.
   Note: The release lever is on the bottom side of the cable plugs.
2. Disconnect the ground cable (2).
3. Pull the card out of the card guides.
4. Place the removed HBD card into an ESD-protective package, or onto an ESD-qualified surface.

Continued on next page

Replacement

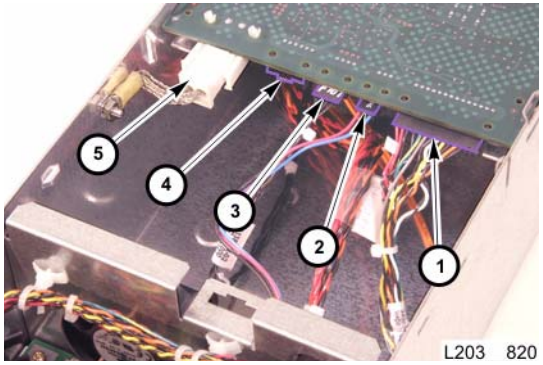
CAUTION: *ESD Damage Potential:* The HBD card contains ESD-sensitive components. Improper handling could result in permanent damage to components. MAKE SURE YOU FOLLOW ESD PRECAUTIONS AND PROCEDURES detailed in **"Electrostatic Discharge Damage Prevention."**



1. Align the replacement HBD card, component-side down, with the card guides (1), then slide it to the stops.

Continued on next page

Replacement



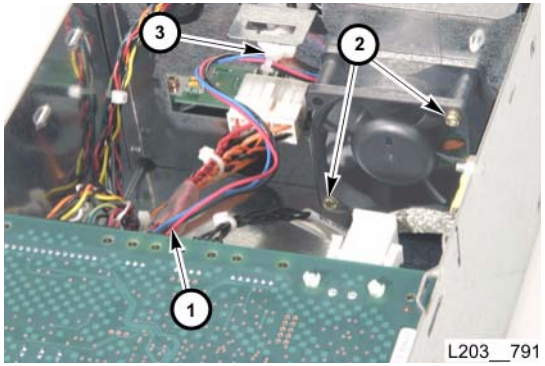
2. Connect the appropriate cables to the HBD card:
   Note: The cables will only mate with appropriate card jacks. Card jacks are labeled on the component-side of the card.
   a. J702 - Power Supply Cable (P702) (1).
   b. J4 - Fan Power Cable (2).
   c. J707 - TTI Cable (3).
   d. J705 - Not connected (4).
   e. J704 - Ground Cable (P704) (5).
3. Go to **"Drive Tray Reassembly/Reinstallation."**

Go to top of procedure

Next procedure: ***Fan Assembly***

Fan Assembly

Removal

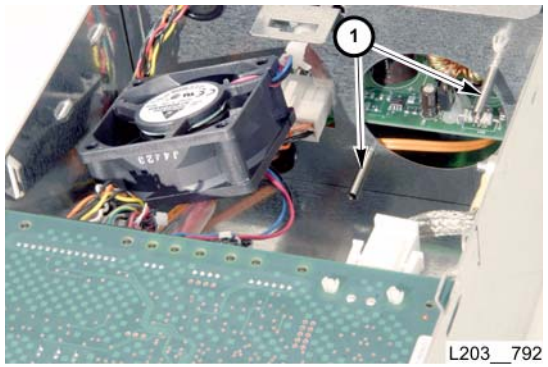


Note: The drive tray assembly must be out of the library and on a suitable work surface (see **"Drive Tray Removal/FRU Access"**).

1. Disconnect the fan power cable (1) from the HBD card.
   Note: Access to the fan mounting screws is very restrictive. If necessary, disconnect and/or move components to gain adequate access.
2. Remove two screws (2) securing the fan assembly to the tray.
3. Clip and discard the cable tie/mount (2) securing the fan power cable.
4. Pull the fan assembly forward to clear mounting posts, then lift fan out of the drive tray assembly.
5. Set the removed fan assembly FRU aside.

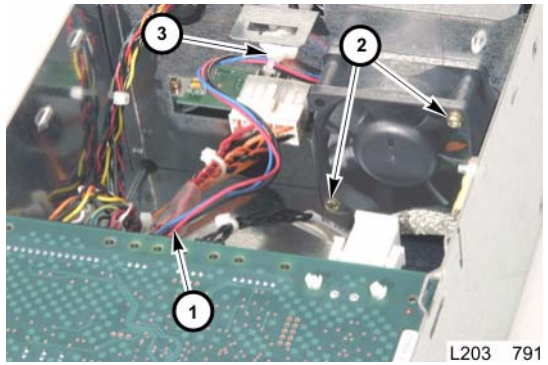
Continued on next page

Replacement



1. Position replacement fan assembly onto mounting posts (1), and slide fan toward tray bulkhead.

   Note: Make sure you position the fan with the vendor label toward the tray bulkhead and the fan power cable to the top-left.



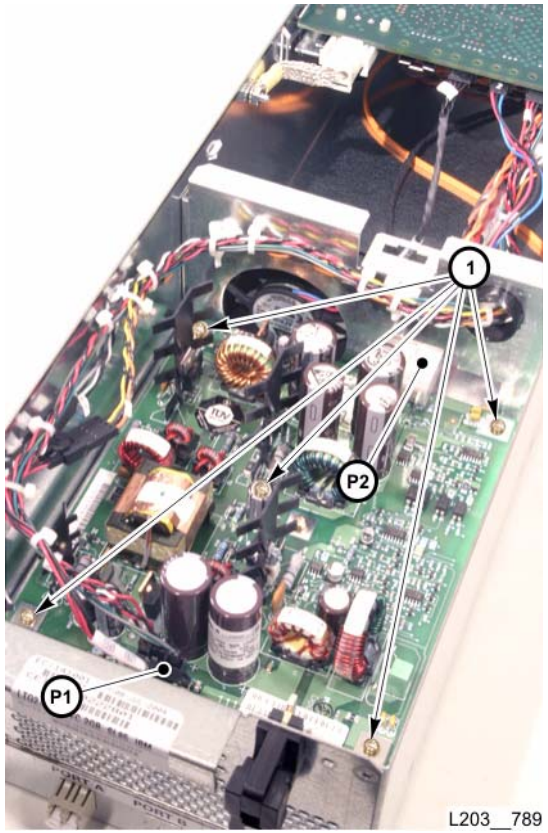
2. Insert and tighten two screws (2) to secure the fan assembly.
3. Connect the fan power cable (1) to the HBD card.
4. Secure the fan power cable with a new cable tie/mount (3).
5. Clip off excess cable tie after securing the cable.
6. Reconnect and/or reinstall all connectors/components moved to accommodate fan replacement.
7. Go to **“Drive Tray Reassembly/Reinstallation.”**

Go to top of procedure

Next procedure: ***Power Supply PWA***

Power Supply PWA

Removal



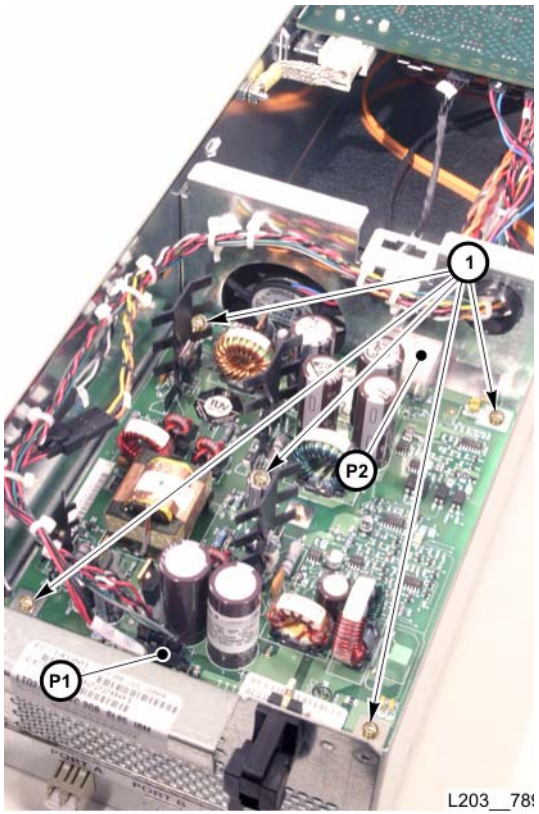
Note: The drive tray assembly must be out of the library and on a suitable work surface (see **"Drive Tray Removal/FRU Access"**).

CAUTION: *ESD Damage Potential:* The Power Supply Card contains ESD-sensitive components. Improper handling could result in permanent damage to components. MAKE SURE YOU FOLLOW ESD PRECAUTIONS AND PROCEDURES detailed **"Electrostatic Discharge Damage Prevention."**

1. Disconnect the drive power cable (P2) from the power supply card.
2. Disconnect the power-in cable (P1) from the power supply card.
3. Remove five T10 screws (1) securing the card to the tray assembly.
4. Lift the power supply card out of the drive tray assembly.
5. Place the removed power supply card into an ESD-protective package, or onto an ESD-qualified surface.

Continued on next page

Replacement



CAUTION: *ESD Damage Potential:* The Power Supply Card contains ESD-sensitive components. Improper handling could result in permanent damage to components. MAKE SURE YOU FOLLOW ESD PRECAUTIONS AND PROCEDURES detailed in **"Electrostatic Discharge Damage Prevention."**

1. Position the replacement power supply card onto the standoffs with the center mounting hole aligned.
2. Beginning with the center screw, insert and thread, five mounting screws (1).

   Note: Do not fully tighten screws until all five are threaded.
3. Tighten all five screws to secure the card.
4. Connect the power-in cable (P1) to the power supply J1.
5. Connect the drive power cable (P2) to the power supply J2.
6. Go to **"Drive Tray Reassembly/Reinstallation."**

Go to top of procedure

FRU Checkout Table of Contents

This module contains extended checkout procedures for selected FRUs.

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48V Power Supply Module, Customer Interface Module Verification

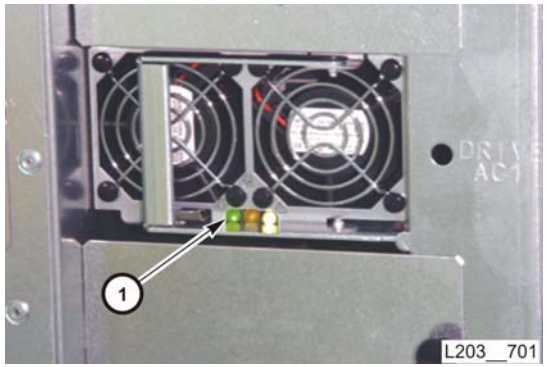
1. Perform the following test:
   a. **“Elevator Motor Verification”**
   b. **“Service Safety Door Verification”**
   c. **“CAP Assembly Verification”**

Return to **“48V Power Supply Module (Customer Interface).”**

Next procedure: ***48V Power Supply Module (Drive Electronics) Verification***

Go to Checkout TOC

48V Power Supply Module (Drive Electronics) Verification



1. On the replaced module, verify the green LED (1) is on.
   Note: The module may look slightly different, depending on manufacturer.
2. Logon to the library using the Streamline Library Console.
3. Click on the `Library` icon for the desired library.
4. In the menu, click `Tools`, then click `Utilities`.
5. On the left side of the screen, select the `Self Test` tab.
6. In the `Mode` drop-down menu, select `Partial`.
7. When the Partial test completes, check for the following test entry in the `Diagnostic Console` window:
   - `Power supply test Success OK:`

Go to Checkout TOC

Return to **"48V Power Supply Module, Drive/Electronics Module."**
Next procedure: ***48V Power Supply Module/HBS Module (HBF) Card Verification***

48V Power Supply Module/HBS Module (HBF) Card Verification

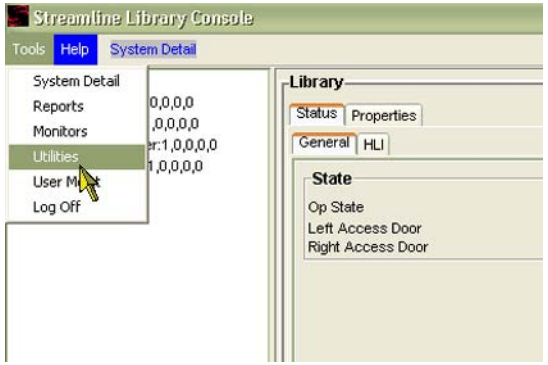
1. Verify that affected drives have power available.
2. If a PTP is installed, verify that power is available and that the PTP has successfully initialized.
3. If the top HBF card was replaced, verify that the interior ceiling lights are lit.
4. Perform **“Drive Array and HBO Verification.”**

Return to **“48V Power Supply/HBS Module Socket (HBF) Card.”**

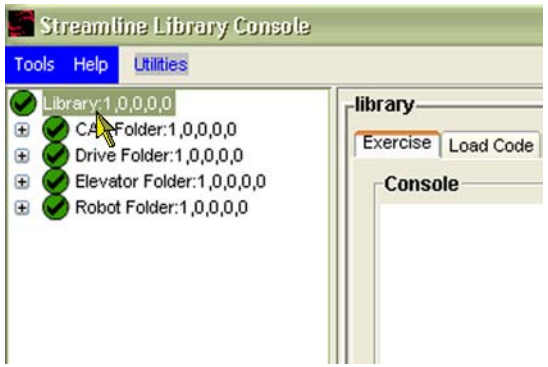
Go to Checkout TOC

Next procedure: ***CAP Assembly Verification***

CAP Assembly Verification



1. Logon to the library using the Streamline Library Console.
2. In the menu, click `Tools`, then `Utilities`.



3. On the left side of the screen, click the desired `Library` entry.

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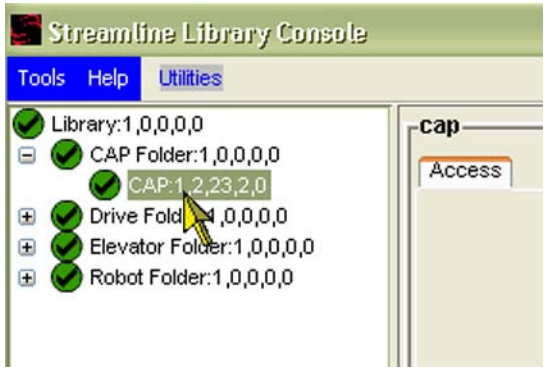
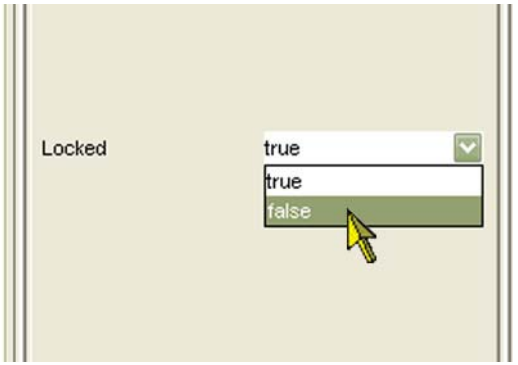


4. Click the + to expand the `CAP Folder`, then click the `CAP` entry.



5. On the right side of the screen, select `false` from the `Locked` drop-down menu.

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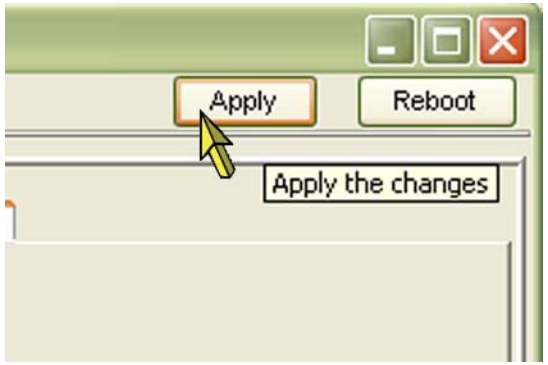

6. Click `Apply`. This unlocks the CAP.

7. On the keypad, the yellow CAP A LED (1) is on.
8. Press the CAP A button. CAP A opens.

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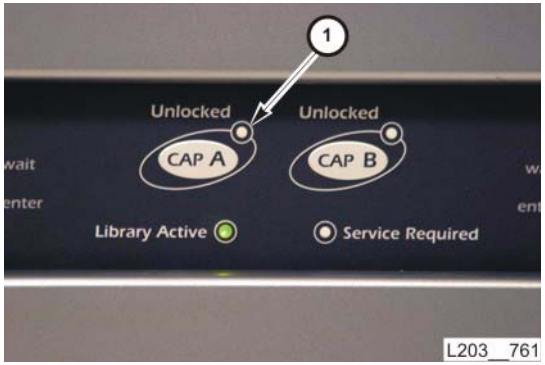


9. Press the CAP A button again. CAP A closes and the yellow LED (1) goes off.
10. On the left side of the console, click `CAP Folder`, then click the `CAP` entry to refresh the screen. The status for CAP A is `true` (CAP locked).
11. Repeat **Step 4** through **Step 10** for CAP B, if installed.

Return to **"CAP Assembly."**

Go to Checkout TOC

Next procedure: ***Drive Array Verification***

Drive Array and HBO Verification

1. Verify that all drives within the array or HBO section power-on successfully.
2. Have the operator logon to the library with Streamline Library Console.
3. In the “Systems Detail” screen, click the “Drive Folder” and verify that all drives within the array or HBO section are *online*.
4. Verify that the operator can vary any offline drives online to the host system.

Return to **“Drive Array and HBO Card.”**

Go to Checkout TOC

Next procedure: ***Drive Controller (HBT) Card Verification***

Drive Controller (HBT) Card Verification

1. At the back of the library, check the HBT card LEDs:
   - Green Active LED (1): on
   - Red Fault LED (2): off
   - Eject OK LED (3): off

Continued on next page

2. Logon to the library using the Streamline Library Console.
3. In the menu, click `Tools`, then click `Utilities`.

4. Click on the `Library` icon for the desired library.

Continued on next page

5. On the left side of the screen, select the `Self Test` tab.

6. In the `Mode` drop-down menu, select `Partial`.

Continued on next page

7. When the Partial test completes, check for the following test entry in the `Diagnostic Console` window:
   - `Network connectivity testSuccess  OK: x,x,x,x,x driveController`

     Note: Information indicated by `x` is variable.

Return to **"Drive Controller (HBT) Card."**

Go to Checkout TOC

Next procedure: ***Drive Interface (HBY) Card Verification***

Drive Interface (HBY) Card Verification

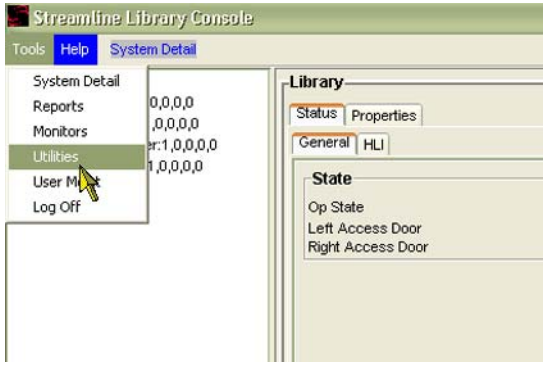
1. At the back of the library, check the HBT card LEDs:
   - Green Active LED: on
   - Red Fault LED: off
   - Eject OK LED: off
2. Have the operator logon to the library with Streamline Library Console.
3. In the “Systems Detail” screen, click the “Drive Folder” and verify that all drives are *online*.
4. Verify that the operator can vary any offline drives online to the host system.

Return to **“Drive Interface (HBY) Card.”**

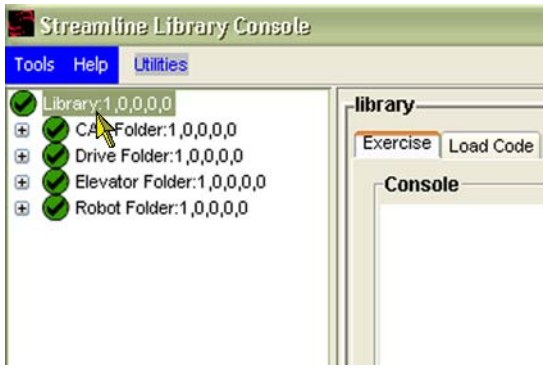
Go to Checkout TOC

Next procedure: ***Elevator/CAP Controller (HBZ) Module Verification***

Elevator/CAP Controller (HBZ) Module Verification



1. On the top of the HBZ module, verify the green LED is on.
2. Logon to the library using the Streamline Library Console.
3. In the menu, click `Tools`, then click `Utilities`.



4. Click on the `Library` icon for the desired library.

Continued on next page

5. On the right side of the screen, select the `Self Test` tab.
   Note: The Partial test may be run without interfering with normal library operations.

6. In the `Mode` drop-down menu, select `Partial`, then click `Start`.

Continued on next page

7. When the partial test completes, check for the following entries in the `Diagnostic Console` window:
   - `Network connectivity testSuccess OK: x,x,x,x,x cap`
   - `Network connectivity testSuccess OK: x,x,-x,x,x elevator`
   - `Network connectivity testSuccess OK: x,x,x,x,x elevator`
   - `Network connectivity testSuccess OK: x,x,x,x,x driveController`

   Information indicated by `x` is variable.
8. If you replaced the left *HBZ* module *and* your library also contains the service safety door, perform the **"Service Safety Door Verification."**

Return to **"Elevator/Cap Controller (HBZ) Module."**

Go to Checkout TOC

Next procedure: ***Elevator Motor Verification***

Elevator Motor Verification

1. After the library initializes, ask the operator to verify that both elevators are online and operational:
   a. Using the StreamLine Library Console, have them navigate to the "Systems Detail" screen.
   b. Have them open the elevators folder.
   c. Click both the left elevator (containing a minus number in its designation) and the right elevator.
   d. The "Op State" status for both elevators must be *online*.

Return to **"Elevator Motor Assembly."**
Go to Checkout TOC
Next procedure: ***EM Power Supply Verification***

EM Power Supply Verification

1. Verify that the green (“OK” or “Power Good”) LED on the supply is lit.
2. Perform the following:
   a. **“Library Controller (HBC) Card Verification”**
   b. **“Drive Controller (HBT) Card Verification”**

Return to **“EM Power Supply.”**

Go to Checkout TOC

Next procedure: ***Ethernet Switch Verification***

Ethernet Switch Verification

1. Logon to the library using the Streamline Library Console.
2. In the menu, click `Tools`, then click `Utilities`.
   Note:

3. Click on the `Library` icon for the desired library.

Continued on next page

4. On the left side of the screen, select the `Self Test` tab.
   Note: The Partial test may be run without interfering with normal library operations.

5. In the `Mode` drop-down menu, select `Partial`.

Continued on next page

6. When the Partial test completes, check for the following test entries:
   - `Network connectivity testSuccess  OK: x,x,x,x,x cap`
   - `Network connectivity testSuccess  OK: x,x,-x,x,x elevator`
   - `Network connectivity testSuccess  OK: x,x,x,x,x elevator`
   - `Network connectivity testSuccess  OK: x,x,x,x,x driveController`

   Note: Information indicated by `x` is variable.

Return to **"Ethernet Switch."**

Go to Checkout TOC

Next procedure: ***HandBot Verification***

HandBot Verification

1. Verify that the library has successfully finished initialization.
2. Logon to the library using the Streamline Library Console.
3. In the menu, click `Tools`, then click `Utilities`.

4. Click on the `Library` icon for the desired library.

Continued on next page

5. On the right side of the screen, select the `Self Test` tab.

Note: If replaced HandBot is behind the safety door, you can run the Partial test without interfering with normal library operations.
If the safety door is not present and the library was taken offline, run the Full test.

6. In the `Mode` drop-down menu, select `Partial` or `Full`, as required.

Continued on next page

7. When the test completes, check the `Diagnostic Console` window for the following entry for the replaced HandBot:
   - `Robot motion test  Success  OK: x,x,x,x,x robot`

     Note: Since the Partial test runs without interfering with library operations, tests for some components (other than the replaced HandBot) may indicate a failure since those components are unavailable for testing.

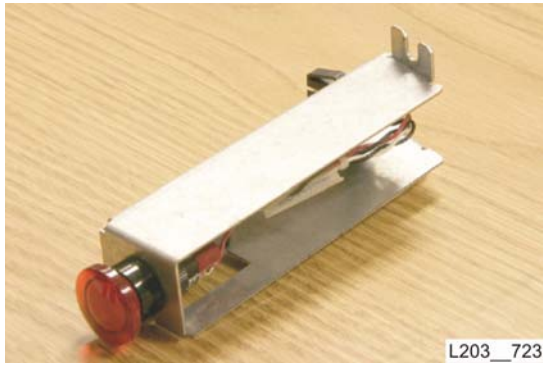
     Information indicated by `x` is variable and depends on the replaced HandBot.

Return to **"HandBot Assembly."**

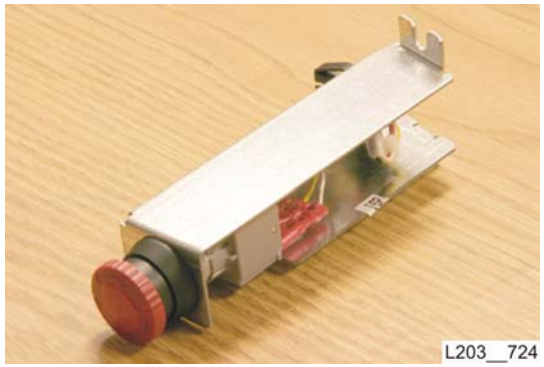
Go to Checkout TOC

Next procedure: ***Interior Emergency Robotics Stop Switch Verification***

Interior Emergency Robotics Stop Switch Verification



Translucent switch



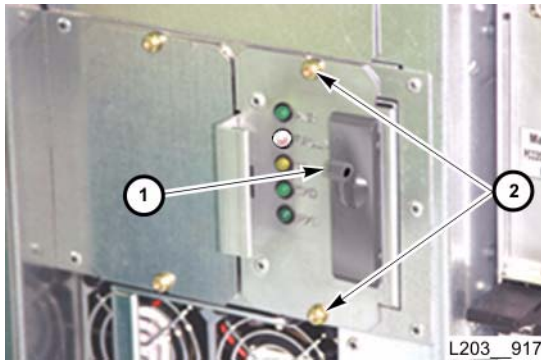
New style switch

1. Verify that the library is offline to the host/ACSLS.
2. Enter the library.
3. Press the switch:

   a. The translucent switch type will stay in and the LED will stay ON.
   b. The newer style switch type will also stay in, but the LED will go OFF.

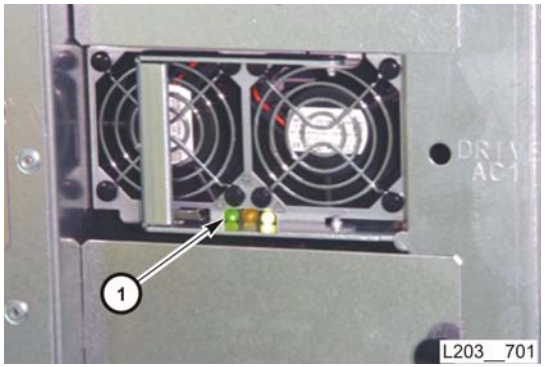
4. Exit the library and close the front doors.

Continued on next page



HBS Assembly

5. Verify that 48 VDC rail voltage has been removed by looking:
   a. Through the grating in the lower facade—the green LED on the HBZ module should be off.
   b. At the HBS assemblies at the rear of the library—the green LEDs should be off.
6. Re-enter the library.
7. To reset the switch:
   a. For the translucent switch type, press the switch again. The switch will come out to the OFF position. The LED will stay ON.
   b. For the newer style switch, twist the button clockwise and it will come out to the OFF position. The LED will turn ON.



HBZ Assembly

8. Verify that 48 VDC rail voltage is present by looking:
   a. Through the grating in the lower facade—the green LED on the HBZ module should be on.
   b. At the HBS assemblies at the rear of the library—the green LEDs should be on.

Return to **"Interior Emergency Robotics Stop Switch."**

Go to Checkout TOC

Next procedure: ***Interlock Controller (HBN) Card Verification***

Interlock Controller (HBN) Card Verification

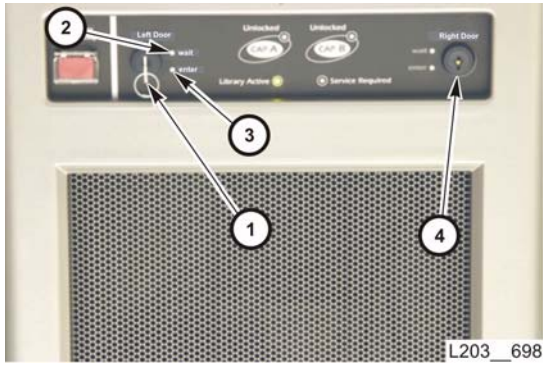
1. Verify that the green LED (seen through the grating in the middle of the Customer Interface Module) is lit.
2. Perform the following tests:
   a. **“Interior Emergency Robotics Stop Switch Verification”**
   b. **“Maintenance Lock Verification”**
   c. **“Service Safety Door Verification”** (if applicable)
   d. **“Interior Emergency Robotics Stop Switch Verification”**

Return to **“Interlock Controller (HBN) Card.”**

Go to Checkout TOC

Next procedure: Keypad Assembly Verification

Keypad Assembly Verification



Maintenance Lock Verification

1. Insert the maintenance key (1) in the left maintenance lock.
2. Turn the maintenance key 90 degrees clockwise and verify the following:
   a. The red “wait” indicator (2) begins flashing.
   b. If the optional service door is installed:
      - The service door moves to the right side.
      - The green “enter” indicator (3) turns on.
      - The flashing “wait” indicator turns off.
3. Turn the maintenance key 90 degrees counterclockwise and verify the following:
   a. If the optional service door is NOT installed, the flashing red “wait” indicator turns off.
   b. If the optional service door is installed:
      - The green “enter” indicator turns off.
      - The service door moves to the center position.
4. Repeat **Step 2** and **Step 3** for the right maintenance lock (4).

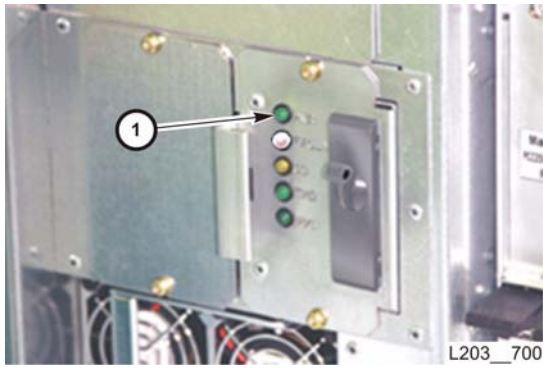
CAP Button Verification

1. Perform **“CAP Assembly Verification.”**

Continued on next page

Emergency Robotics Stop Switch Verification

1. On the keypad, press the Emergency Robotics Stop switch (1). All robotic movement stops and the hands on all HandBots drop to the bottom of their Z columns.



2. At the back of the library, verify the green PWR LED (1) is off on all Rail Communication (HBS) Modules.
3. Press the Emergency Robotics Stop switch again. All HandBots begin power-on self test (indicated by their movement).
4. On the back of the library, the green PWR LED on all Rail Communication (HBS) modules is on.

Return to **"Keypad Assembly."**

Go to Checkout TOC

Next procedure: ***Library Controller (HBC) Card Verification***

Library Controller (HBC) Card Verification

1. At the back of the library, check the HBC card LEDs:
   - Green Active LED: on
   - Red Fault LED: off
   - Eject OK LED: off
2. Verify that the operator can logon to the library with Streamline Library Console.
3. In the “Systems Detail” screen, click the “Status” tab and verify that the library is *online*.
4. Verify that the firmware version resident on the card is current; if not you must follow the procedures to load current firmware.
5. Verify that the operator can modify/vary the library online to HSC/ACSLS.

Return to **“Library Controller (HBC) Card.”**

Go to Checkout TOC

Next procedure: ***Library Interface (HBX) Card Verification***

Library Interface (HBX) Card Verification

1. At the back of the library, check the HBC card LEDs:
   - Green Active LED: on
   - Red Fault LED: off
   - Eject OK LED: off
2. Verify that the operator can logon to the library with Streamline Library Console.
3. In the “Systems Detail” screen, click the “Status” tab and verify that all library components are *online*.
4. Verify that the operator can modify/vary the library online to HSC/ACSLS.

Return to **“Library Interface (HBX) Card.”**

Go to Checkout TOC

Next procedure: ***Mid-plane and Card Cage Verification***

Mid-plane and Card Cage Verification

1. Perform **“Drive Interface (HBY) Card Verification.”“**
2. Perform **“Library Controller (HBC) Card Verification.”**
3. Perform **“Drive Controller (HBT) Card Verification.”**
4. Perform **“Security Key (HBK) Card Verification.”**
5. Perform **“EM Power Supply Verification.”**
6. Perform “EM Fan Tray Verification.”

Return to **“Mid-Plane and Card Cage.”**

Go to Checkout TOC

Next procedure: ***Operator Panel Verification***

Operator Panel Verification

1. Attempt to login to the library using the Streamline Library Console. Successful login verifies panel operation.

   Note: If the “Incompatible Versions” dialog box appears, you must download and activate new code. New code and instructions can be obtained from the Customer Resource Center.

   CAUTION: If downloading new Streamline Library Console code to the operator panel, any test parameters you may have saved will be lost.

   After downloading and activating the new code, perform **Step 1**.

2. Using the touchscreen, verify that you can navigate through the various fields available.

If you must reboot the operator panel, you can either a) physically power-off/on the operator panel or b) re-activate the StreamLine Library Console firmware to reboot it.

Both procedures are supplied on the next page.

Continued on next page

Rebooting—Physical Method

CAUTION: If your library does *not* contain a Service Safety Door, the physical procedure requires you to have the operator take the library offline (since you must open the access door).

1. Activate the Service Safety Door to the left.
2. Open the left access door.
3. Remove the access panel behind the lower left corner of the operator panel to access the power switch (located on the other side of the power cord).
4. Power-off, then -on the operator panel.

Rebooting—Firmware method

CAUTION: Using this method reloads StreamLine Library Console firmware to the operator panel; you will lose any information or tests you have saved.

Re-activate StreamLine Library Console using the StreamLine Library Console on your laptop:

1. In the **Tools** menu, click **Diagnostics**.
2. Select the **Activate Code** tab.
3. In the target field, select **SLConsole**.

Continued on next page

4. Select the active version of StreamLine Library Console (denoted by the asterisk on the left.
5. Click **Activate**
6. Click **OK** when the informational message appears.
   A warning message will appear on your laptop screen before the reboot occurs.

   StreamLine Library Console will display BIOS information and will then reboot Windows 2000.

   StreamLine Library Console will start and the login screen will appear on the optional local operator panel.

Note: If the screen requires calibration, two methods are presented below. Use the stylus for both methods

Calibration—Hardware Method

If the operator panel requires calibration:

1. Power-off the operator panel
2. Power-on the operator panel
3. Carefully watch the screen. When the Windows desktop first appears, touch the screen; then, as soon as possible, close the black DOS screen (touch the “X” in the upper right hand corner).

Note: If you do *not* close the DOS screen, the StreamLine Library Console application will activate *within five seconds.*

Continued on next page

4. Look to the bottom right for a **PM icon**—touch this icon.
   A menu will appear
5. Select **Control Panel**.
6. Select the **Calibrate** tab.
7. When the window appears, select **Calibrate** again.
   At the top of the blank screen, you will see the words **Point here** (next to a small circle).
8. Carefully touch the *exact middle* of the circle with the stylus.
9. Continue touching the *exact middle* of the circle as it moves to each location on the screen.
10. After all four screen/circle locations have been calibrated, click **OK**.
11. To initialize the StreamLine Library Console:
    a. Click **Start** in the lower left corner.
    b. Select **Startup** from the menu.
    c. Click **SLConsole**.

Calibration—Firmware Method

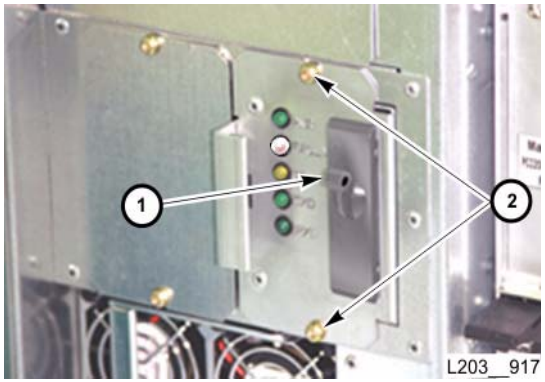
1. At the screen, touch **Start → Programs → Penmount Utilities 2000 → Penmount Control Panel**
2. Select **Calibrate**
3. Perform steps 7 through 11 (above).

Return to **"Operator Panel."**

Go to Checkout TOC

Next procedure: ***Rail Communication (HBS) Module Verification***

Rail Communication (HBS) Module Verification



1. On the replaced module, verify the green PWR LED is on.
2. Logon to the library using the Streamline Library Console.
3. Click on the `Library` icon for the desired library.
4. In the menu, click `Tools`, then click `Utilities`.
5. On the left side of the screen, select the `Self Test` tab.
6. In the `Mode` drop-down menu, select `Partial`.
7. When the Partial test completes, check for the following test entry in the `Diagnostic Console` window:
   - `Network connectivity testSuccess OK: x,x,x,x,x robot`

   Note: Information indicated by `x` is variable and identifies the replaced Rail Communication Module.

Go to Checkout TOC

Return to **"Rail Communication (HBS) Module."**
Next procedure: ***Remote Camera Verification***

Remote Camera Verification

1. At a workstation with access to the network, open a browser window, type the camera's IP address in the Address line, and press Enter.

   Note: A window may appear asking to install a Verisign certificate. If so, click Yes.

2. On the camera's home page, click the camera controls to zoom (1) and pan/tilt (2) the camera. Verify the image is clear and sharp and all areas within the camera's field of view can be seen.

3. If the image is dark or washed out, adjust the camera's settings. The camera's manual is available at (www.dlink.com).

Return to **"Remote Camera."**

Go to Checkout TOC

Next procedure: Security Key (HBK) Card Verification

Security Key (HBK) Card Verification

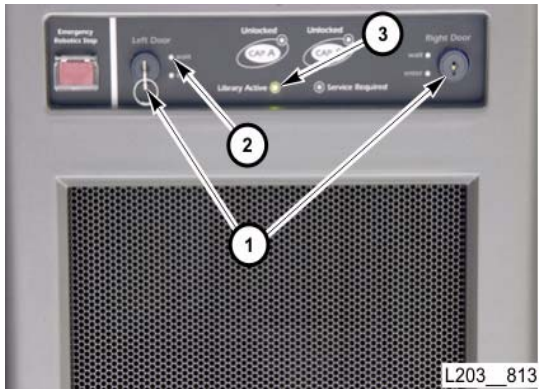
1. Be sure that all configuration information is correct.
2. Have the operator logon to StreamLine Library Console.
3. In the “Systems Detail” screen, verify that all library information is correct.
4. Enter the new “admin” activation password for the operator.
5. Have the operator enter the local password for the site.
6. Have the operator vary/modify the library online.

Return to **“Security Key (HBK) Card.”**

Go to Checkout TOC

Next procedure: ***Service Safety Door Verification***

Service Safety Door Verification



1. Insert the maintenance key into the left maintenance lock.
2. Turn the maintenance key to the horizontal position and verify the following:
   a. On the keypad, the red “wait” indicator flashes.
   b. The safety door moves to the left.
   c. On the keypad, the red “wait” indicator goes off and the green “enter” indicator lights.
3. Turn the maintenance key back to the vertical position and verify the following:
   a. On the keypad, the green “enter” indicator goes off and the red “wait” indicator flashes while the safety door moves to the center position.
   b. When the door is in position, the red “wait” indicator goes off.
4. Repeat **Step 2** and **Step 3** for the right maintenance lock.
5. Remove the maintenance key.

   Note: Do *not* leave a maintenance key with the operator.

Return to **“Service Safety Door Motor Assembly.”**

Go to Checkout TOC

Next procedure: ***Turntable Motor Verification***

Turntable Motor Verification

1. Logon to the library using the Streamline Library Console.
2. In the menu, click `Tools`, then click `Utilities`.

3. On the left side of the screen, click on the `Library` icon for the desired library.

Continued on next page

4. On the left side of the screen, select the `Self Test` tab.
   Note: The Partial test may be run without interfering with normal library operations.

5. In the `Mode` drop-down menu, select `Partial`.

Continued on next page

6. When the Partial test completes, check for the following entry in the `Diagnostic Console` window:
   - `Turntable motion test Success OK:`

Go to Checkout TOC

Return to “Turntable Assembly.”