



Changing The World of Storage

Spectra T950

Bulk TAP Service Guide



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A	May 2012	Initial release

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CHAPTER 1

Prepare for Service

This chapter provides detailed instructions for preparing the bulk TAP frame for service.

Estimated Time = 15 minutes

Topic	Described beginning on...
Level of Disassembly	page 4
Tools	page 5
Materials	page 6
Ensure ESD Protection	page 6
Discontinue Backups	page 6
Power Off the Library	page 7

LEVEL OF DISASSEMBLY

Replaceable components in the bulk TAP frame require one or two levels of disassembly, depending on where the component to be replaced is located. It is always necessary to remove the front panel and compartment covers, but it is not always necessary to remove the bulk TAP carousel itself.

Note: Disassembly is not required if you need to replace the magazine positioners, door hinges, or the Service Control Module (SCM). Refer to the following documents if you need to replace any of these components.

- To replace the magazine positioners or door hinges, see the *Bulk TAP Door Component Replacement Guide*.
- To replace the Service Control Module, see the *Bulk TAP SCM Replacement Guide* for instructions.

Components that can be replaced after removing the front panel and compartment covers

- Bulk TAP interface board
- Carousel motor assembly
- Upper and lower bulk TAP LED assemblies
- Bulk TAP door release button and cable

Components that can be replaced after removing bulk TAP carousel

Note: You need to remove the front panel and compartment covers before you can remove the bulk TAP carousel.

- Carousel position sensors
- Upper and lower door control arms
- Carousel coupler
- Carousel locking solenoid
- Upper and lower door release latches

See [Chapter 2 – Component Locator](#), beginning on [page 8](#) to locate the component you need to replace.

TOOLS

Use this tool...	When you remove and replace...											
	Initial Disassembly and Reassembly	Carousel Removal and Replace	Carousel Motor Assembly	Bulk TAP Interface Board	LED Assembly	Door Release Button Board	Door Release Button Cable	Carousel Locking Solenoid	Door Latch and Release Cable	Carousel Position Sensor	Door Control Arm	Motor Shaft Coupler
#1 Phillips screwdriver										✓		
#2 Phillips screwdriver	✓		✓	✓	✓	✓			✓			
5-inch or shorter #2 Phillips screwdriver					✓				✓			
Right-angle #2 Phillips screwdriver					✓							
Small flatblade screwdriver	✓						✓				✓	
Large flatblade screwdriver	✓										✓	
9/64-inch Allen wrench		✓	✓									
5/16-inch Allen wrench		✓										
Ratchet wrench and 15/16-inch socket								✓				
Ratchet wrench and 11 mm socket												✓
7/16-inch open-end wrench									✓			

MATERIALS

You must have one or more of the following replacement parts to complete this procedure:

- Carousel motor assembly
- Bulk TAP interface board
- LED assembly
- Door release button board
- Door release button cable
- Carousel locking solenoid
- Door latch and release cable
- Carousel position sensor
- Door control arm
- Motor shaft coupler

Note: Keep all packaging to return the failed part to Spectra Logic.

ENSURE ESD PROTECTION

The repair environment for the library must be free of conditions that could cause electrostatic discharge (ESD). To protect the library from ESD, follow these procedures when repairing or testing the library:

- Place a static protection mat on the work surface used while removing and installing library components. Use a 1-megaohm resistor to ground the static protection mat.
- Wear a static protection wristband or grounding footstrap whenever you handle library components that have been removed from their anti-static bags. Connect the wristband to the static protection mat or to other suitable ESD grounding.
- Keep all electronic components in anti-static bags when not in use.

DISCONTINUE BACKUPS

1. Use your backup software to stop all backup and restore operations to the library.
2. Use your backup software to move any cartridges that are currently in drives back to their storage location. If you cannot use your backup software, then move the cartridges using the BlueScale interface as described in your library *User Guide*.
3. Pause PostScan if it is running as described in your library *User Guide*. Any tapes currently being scanned are returned to their storage locations.

POWER OFF THE LIBRARY

Bulk TAP components are not hot swappable. You must power off the library while performing the replacement.

1. Power off the library from the front panel.

Note: Refer to your *User Guide* for instructions if the BlueScale Soft Power option is enabled.

- a. Press the front panel power button for approximately six seconds or until the button's LED starts flashing.
- b. Wait for the power-off sequence to complete. It takes from one minute to five minutes (depending on the library) while the library allows the BlueScale software to shut down gracefully.

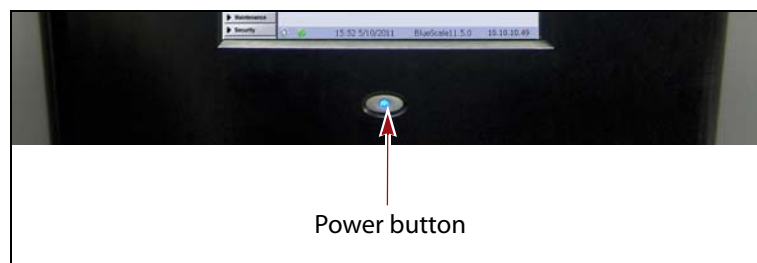


Figure 1 Press and hold the front panel power button.

2. Open the rear access doors on the main frame and each drive frame by lifting and rotating the latch a quarter turn, then pulling the doors open.

Note: You may need to unlock the latch before you can open it.

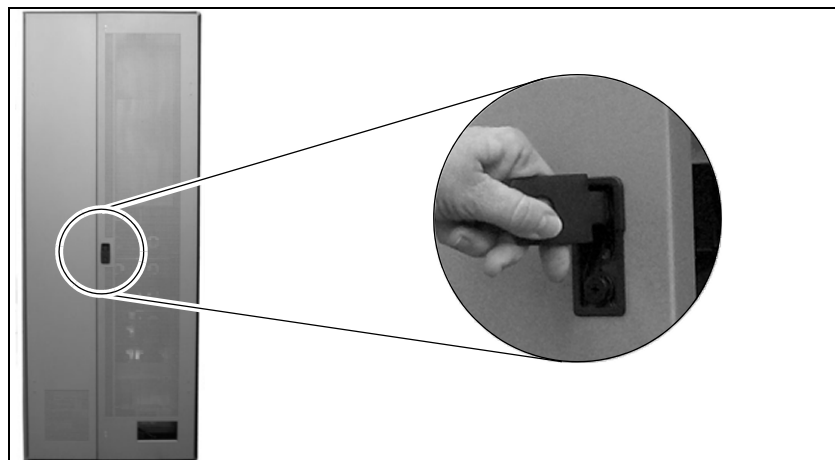


Figure 2 Open the access doors on the main frame and drive frames.

3. Set the AC breaker switches on the back of the library main frame and drive frames to the **off** (down) position. Disconnect the AC power cords from each frame.

Note: If you have redundant power supplies installed, make sure you turn off both breaker switches.

CHAPTER 2

Component Locator

The figures in the following sections show the location of each replaceable component in the bulk TAP frame. Use this chapter to identify the component to be replaced.

Topic	Described beginning on...
Frame Overview	page 9
Carousel Motor Compartment Components	page 10
Carousel Compartment Components	page 11
Sensor Cable and HAX Motor Compartment Components	page 12

FRAME OVERVIEW

Figure 3 shows the service areas in the bulk TAP frame (carousel removed).

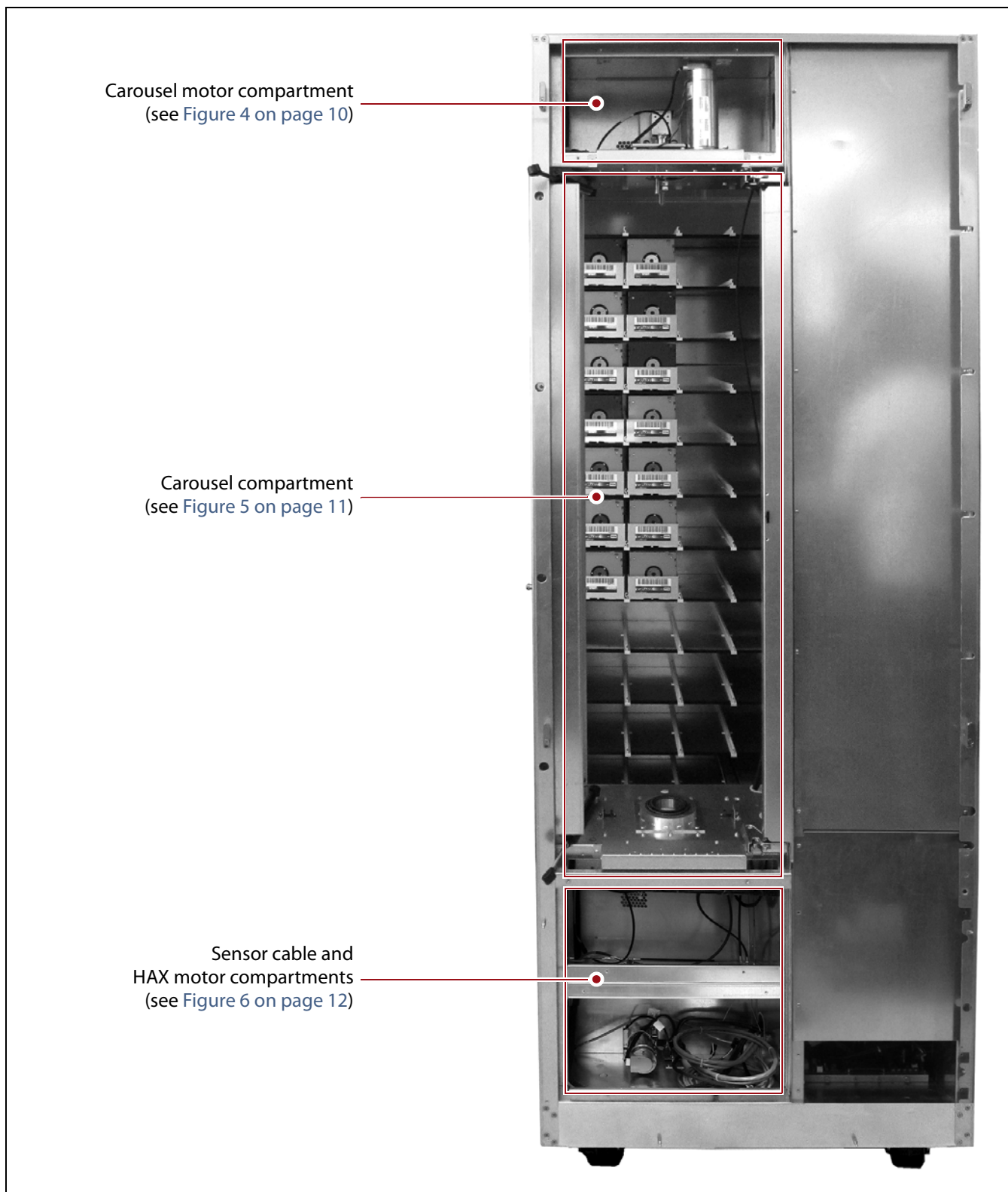


Figure 3 Bulk TAP frame compartments.

CAROUSEL MOTOR COMPARTMENT COMPONENTS

Figure 4 shows the components in the carousel motor compartment.

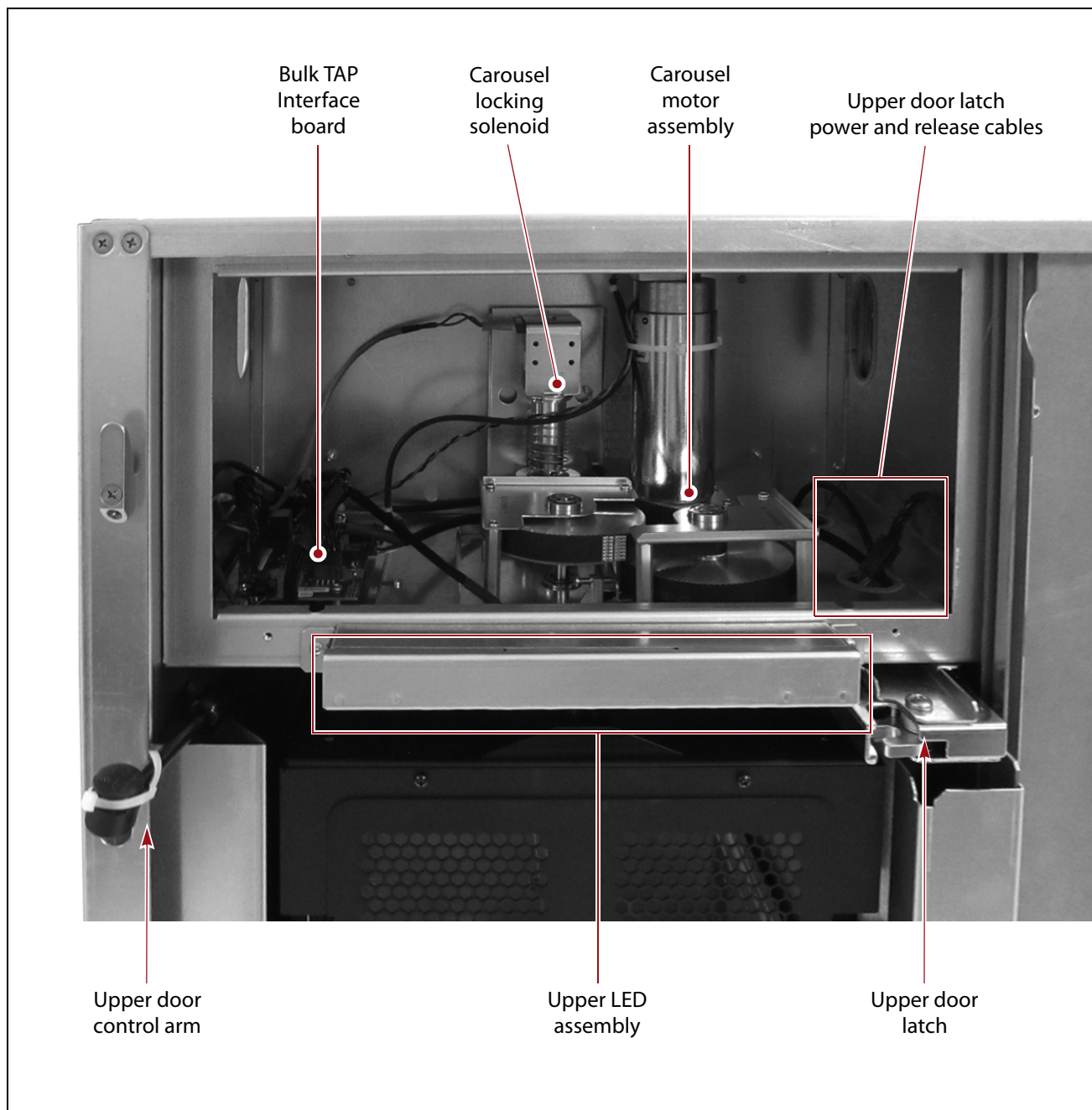


Figure 4 Carousel motor compartment components.

CAROUSEL COMPARTMENT COMPONENTS

Figure 5 shows the components in the bulk TAP frame carousel compartment.

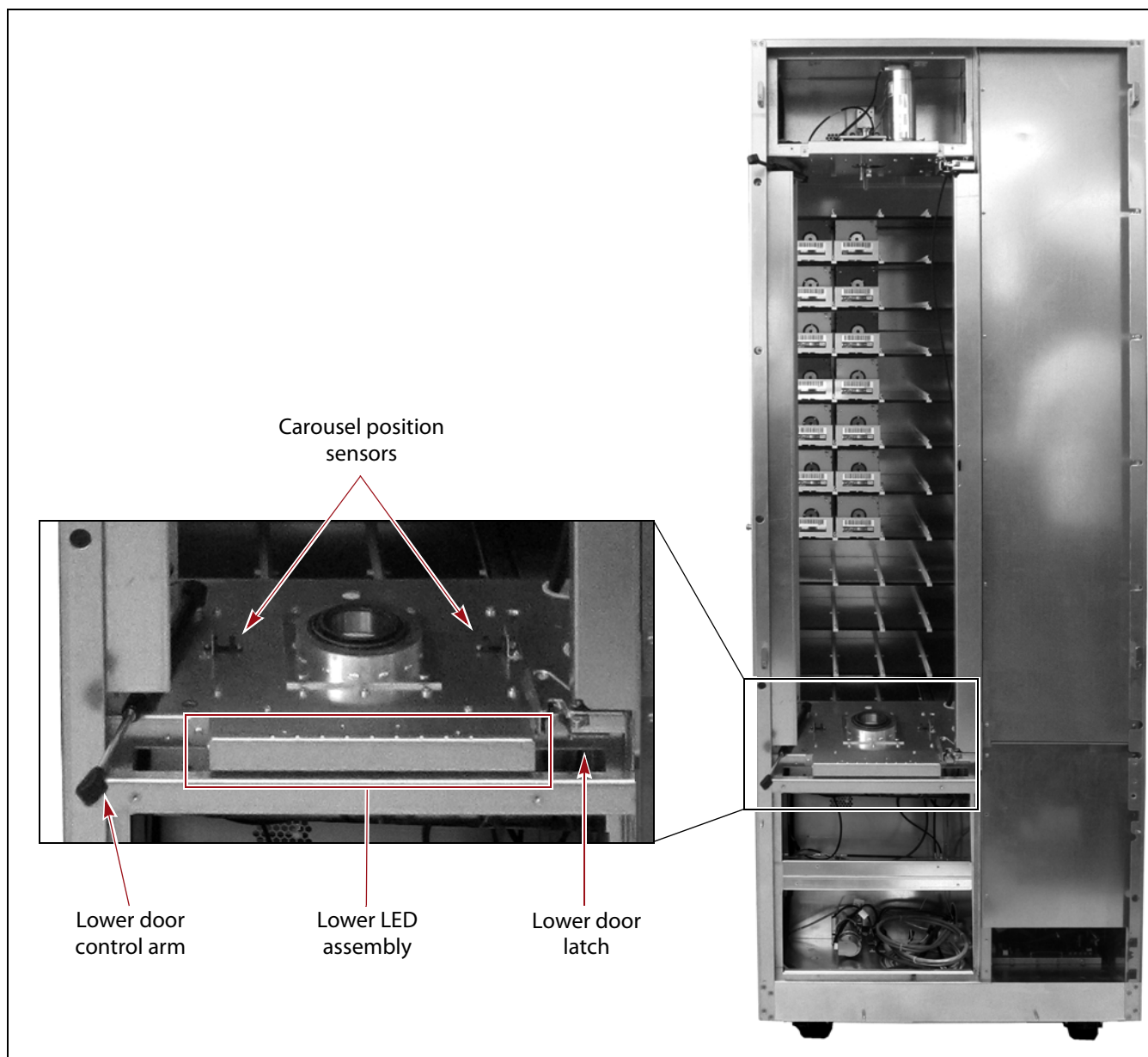


Figure 5 Carousel compartment components.

SENSOR CABLE AND HAX MOTOR COMPARTMENT COMPONENTS

Figure 6 shows the components in the sensor cable and HAX motor compartments.

Note: HAX motor replacement is not covered in this guide. To replace the HAX motor in the bulk TAP frame, see the *HAX Motor Replacement Guide* for instructions.

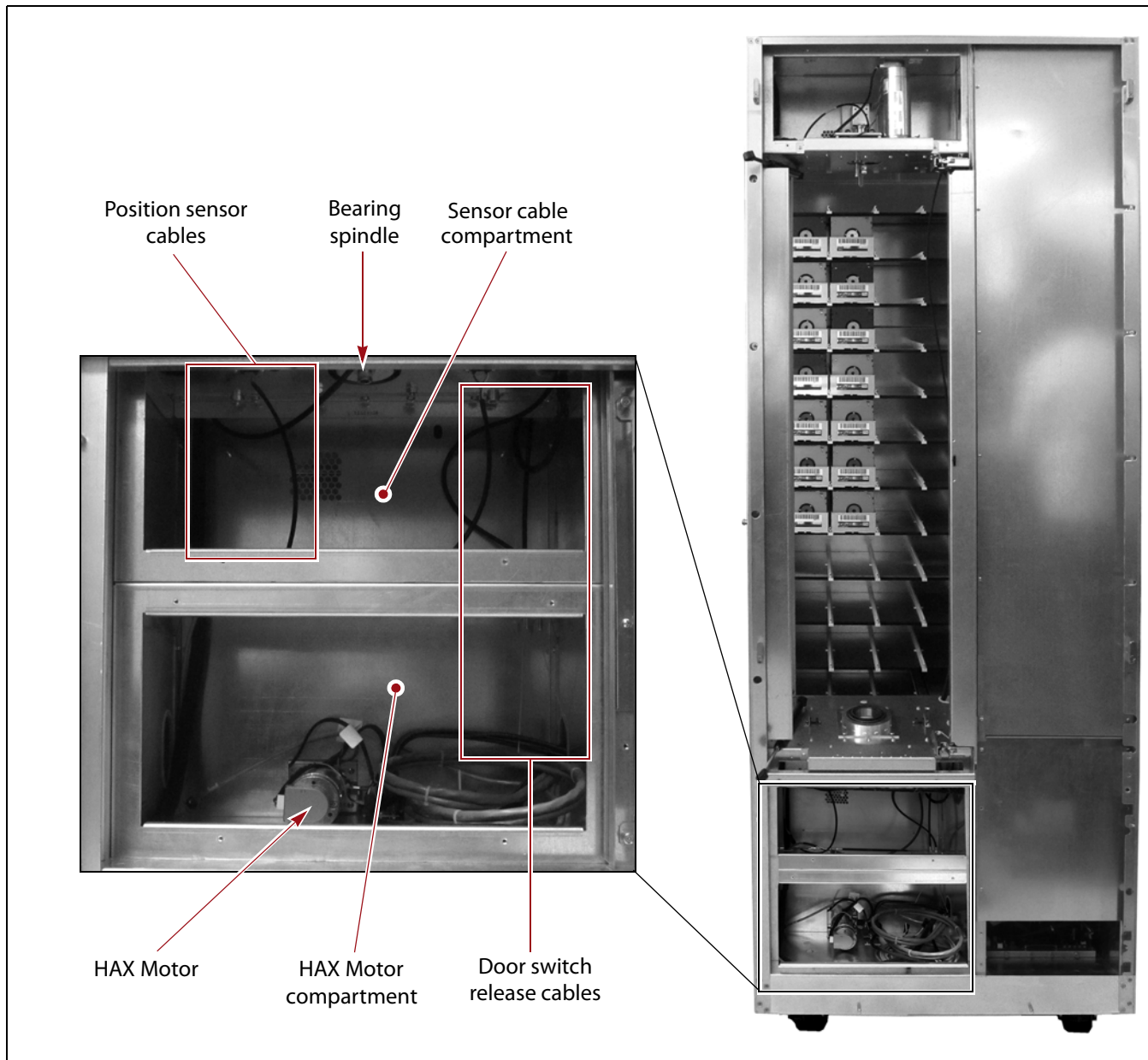


Figure 6 Sensor cable and HAX motor compartment components.

CHAPTER 3

Remove the Front Panel and Compartment Covers

This chapter provides detailed instructions for removing the front panel and compartment covers in the bulk TAP frame to provide access to interior components.

Estimated Time = 30 minutes

Topic	Described beginning on...
Remove the Light Bar	page 14
Remove the Filter Cover	page 15
Remove the Fan Assembly and HAX Compartment Cover	page 16
Remove the Bulk TAP Door	page 17
Remove the Front Panel	page 20
Remove the Filter Sensor Switch and Cross Brace	page 23
Remove the Sensor Cable Compartment Cover	page 24
Remove the Carousel Motor Compartment Cover	page 25
Next Steps	page 25

REMOVE THE LIGHT BAR

The light bar is located along the top front edge of each frame.

1. Using your fingers, lift upward on the left end of the light bar to disengage the ball stud on the back of the bar from the hole in the frame.



Caution

Do not pull up on the light bar from the top. You will separate the sandwiched assembly. The light bar is fragile. Handle it with care as you remove it.

Note: If necessary, insert a flatblade screw driver under the bottom edge of the light bar near where the ball stud is located and very gently pry the bar up.

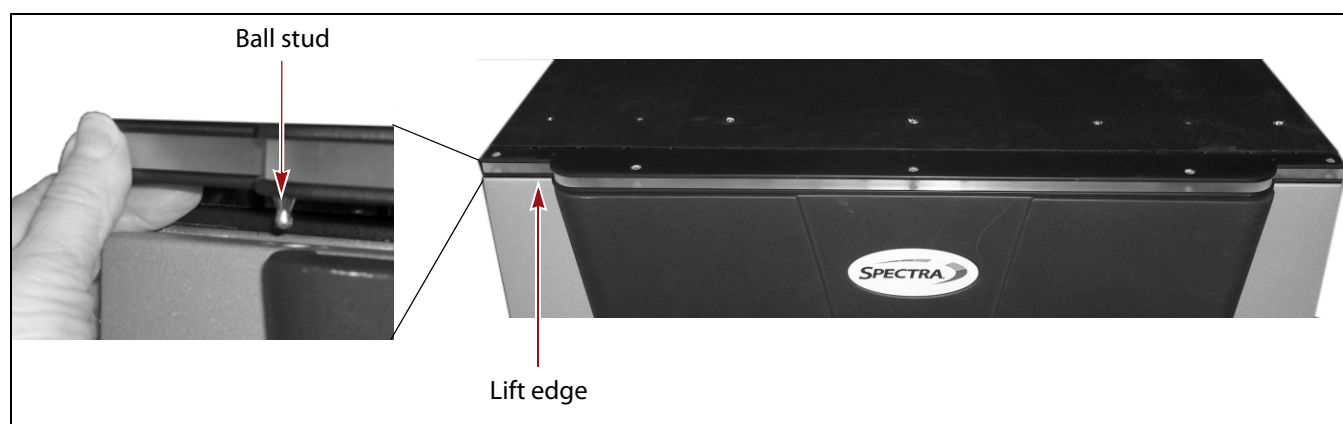


Figure 7 Remove the light bar.

2. Lift up on the other end of the light bar to disengage the ball stud on that end from the hole in the frame.
3. Remove the light bar and set it aside.

REMOVE THE FILTER COVER

1. Remove the cover from the bottom front of the bulk TAP frame by first pulling firmly outward on the bottom center of the panel (**A**), then pulling outward on the handle at the top center of the panel (**B**).

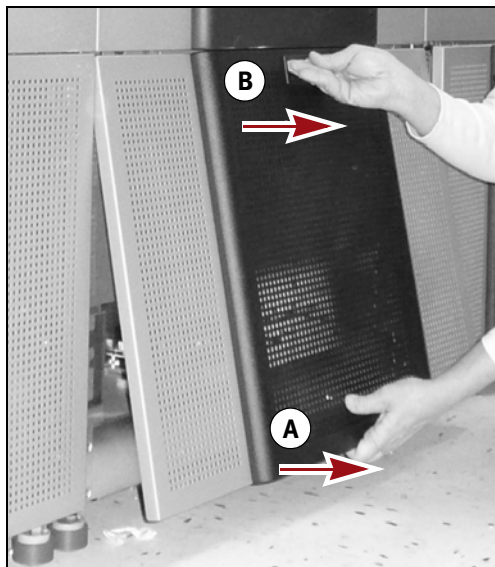


Figure 8 Remove the filter cover.

2. Set the cover aside.

REMOVE THE FAN ASSEMBLY AND HAX COMPARTMENT COVER

1. Use a #2 Phillips screwdriver to loosen the four captive screws securing the fan assembly to the front of the frame.

Note: It is not necessary to remove the filter from the fan assembly.

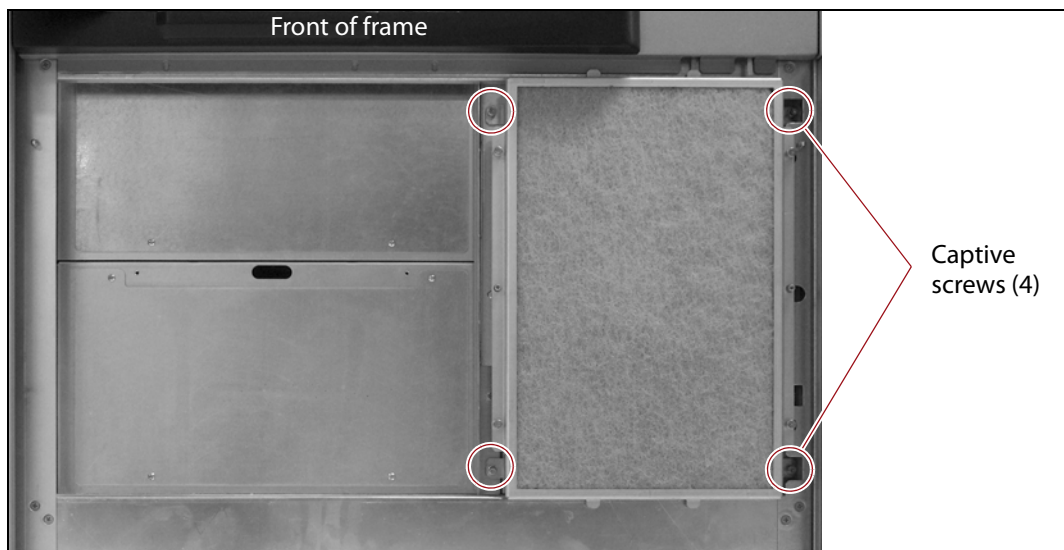


Figure 9 Loosen the captive screws securing the fan assembly to the frame.

2. Grasping the bottom of the fan assembly, carefully pull it straight out of the frame.
3. Using a #2 Phillips screwdriver, remove the four screws securing the HAX motor compartment cover to the front of the frame. Set the cover and screws aside.

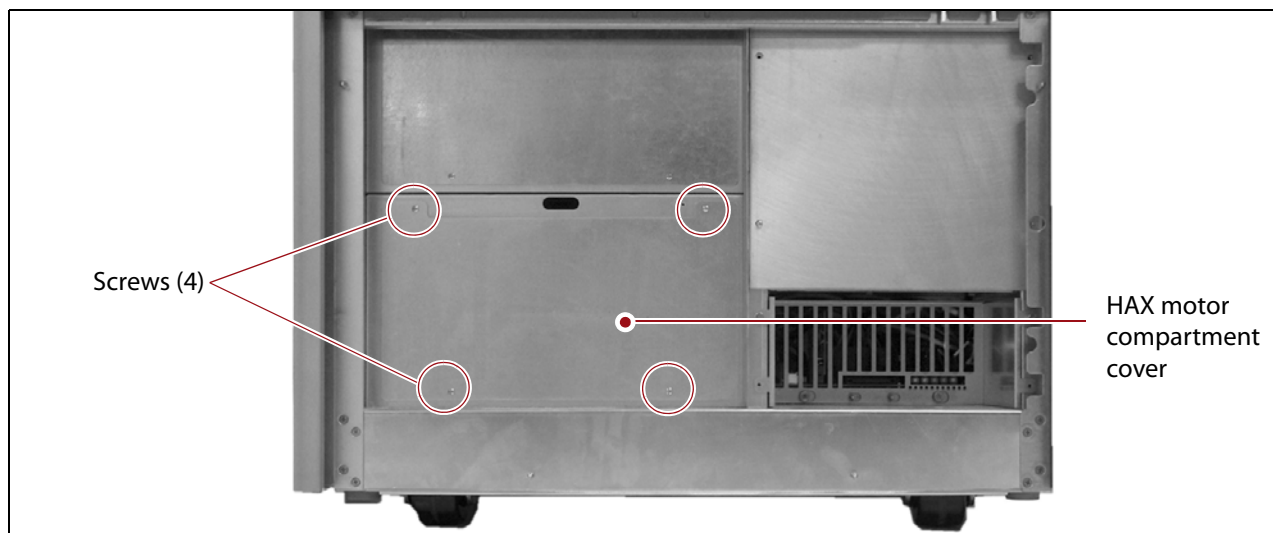


Figure 10 Remove the HAX motor compartment cover.

REMOVE THE BULK TAP DOOR

1. Reach inside the HAX motor compartment and pull down on both door release cables located in the upper right-hand corner of the compartment.

**Caution**

The bulk TAP door swings open when you pull the release cables. Watch out that the door does not hit your head when it opens.

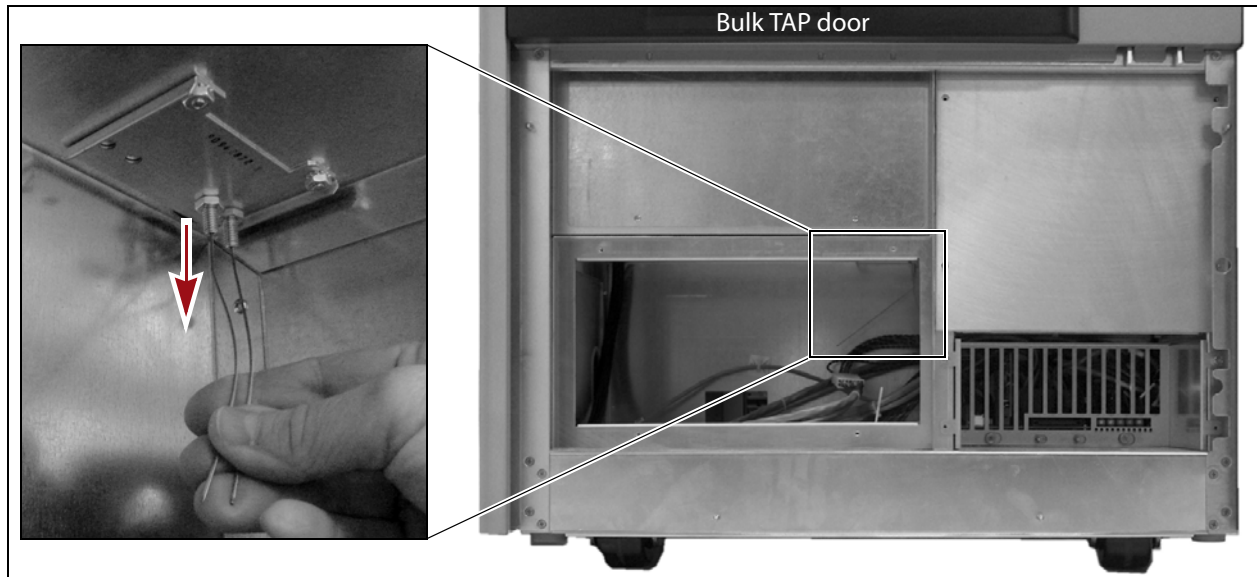


Figure 11 Pull the door release cables to open the bulk TAP door.

2. Disconnect the upper and lower control arms from the bulk TAP door.



Caution

Do not attempt to disconnect the control arm without first removing the locking cap from the socket.



Caution

Disconnecting the control arms requires using a flatblade screwdriver to pry the arm socket from the ball joint on the door. Be very careful not to damage the arm sockets.

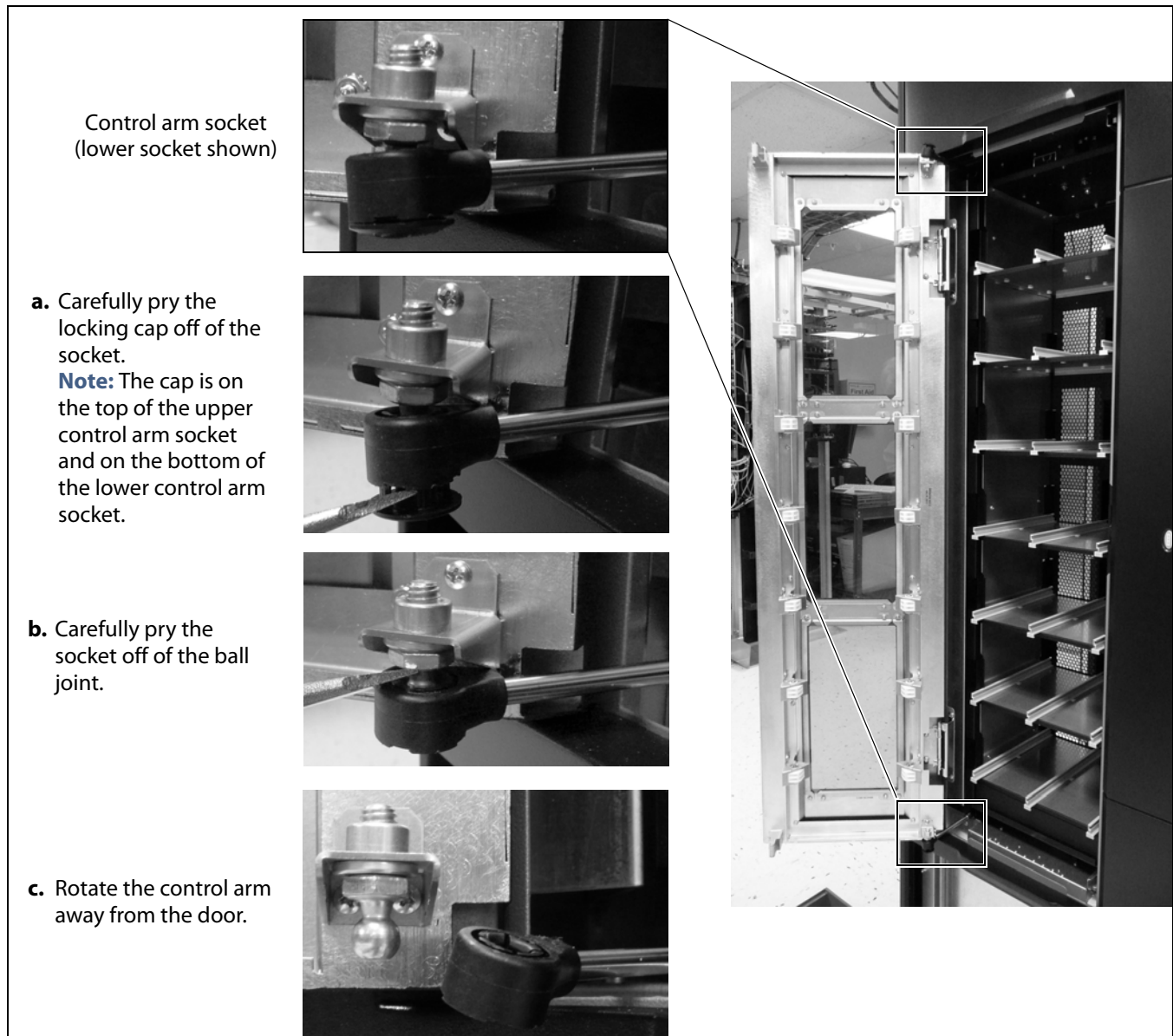


Figure 12 Disconnect the control arms from the bulk TAP door (lower control arm shown).

- a. Using a small flatblade screwdriver, carefully pry the locking cap out of the arm socket. Remove the cap and set it aside.

- Notes:**
- The cap is on the top of the upper control arm socket and on the bottom of the lower control arm socket.
 - You may need a step ladder to reach the upper control arm cap.

- b. Using a large flatblade screwdriver, carefully pry the arm socket away from the ball joint mounted on the door.
 - c. Rotate the arm away from the door.
 - d. Repeat Step a through Step c to disengage the other control arm.
3. Remove the bulk TAP door.
 - a. Firmly grasp the door with one hand to steady it while you release the latches.
 - b. Squeeze the two spring-loaded latching pins on each hinge together and rotate them to the right to retract the hinge pins and disengage the two halves of the hinge.

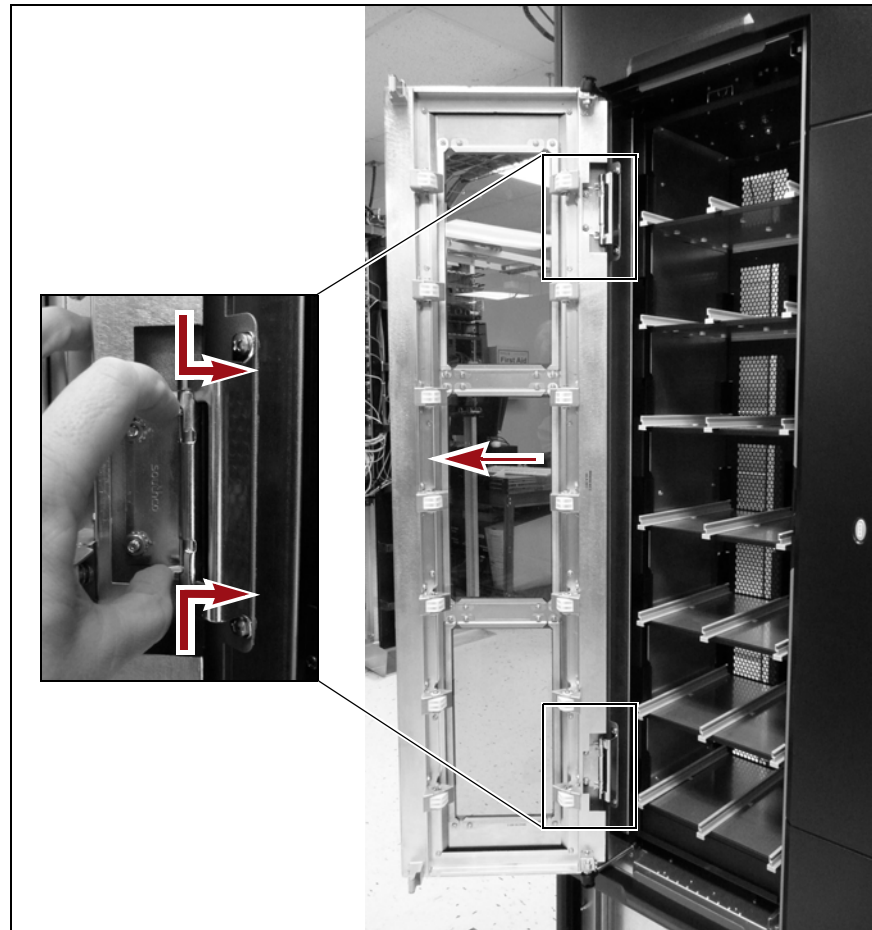


Figure 13 Remove the bulk TAP door.

- c.** Lift the door away from the frame and set it aside.

REMOVE THE FRONT PANEL

1. Remove the door release switch cover.

There may be a cover installed over the door release switch connector. This cover helps prevent the removal of the front panel before the switch is disconnected. If the switch cover is not present, skip to [Step 2 on page 21](#), otherwise perform the following steps to remove the cover.

- a. Locate the door release switch cable cover on the right-hand side of the bulk TAP front panel.
- b. Using a #2 Phillips screwdriver, remove the two screws securing the cable cover to the frame.
- c. Set the switch cover aside.

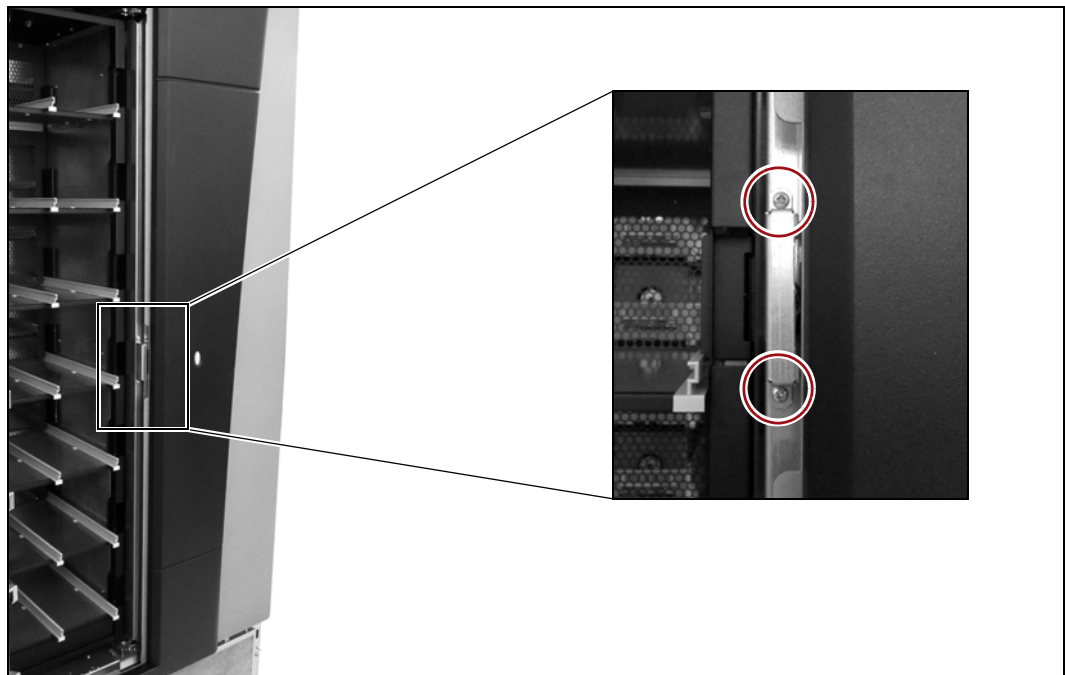


Figure 14 Remove the door release switch connector cover.

2. Carefully disconnect the door release switch from the right-hand side of the bulk TAP door frame by pressing the locking tab on the connector and pulling straight out.

**Caution**

Make sure that you disconnect the door release switch cable before removing the front panel. Failure to do so will damage the switch connector.

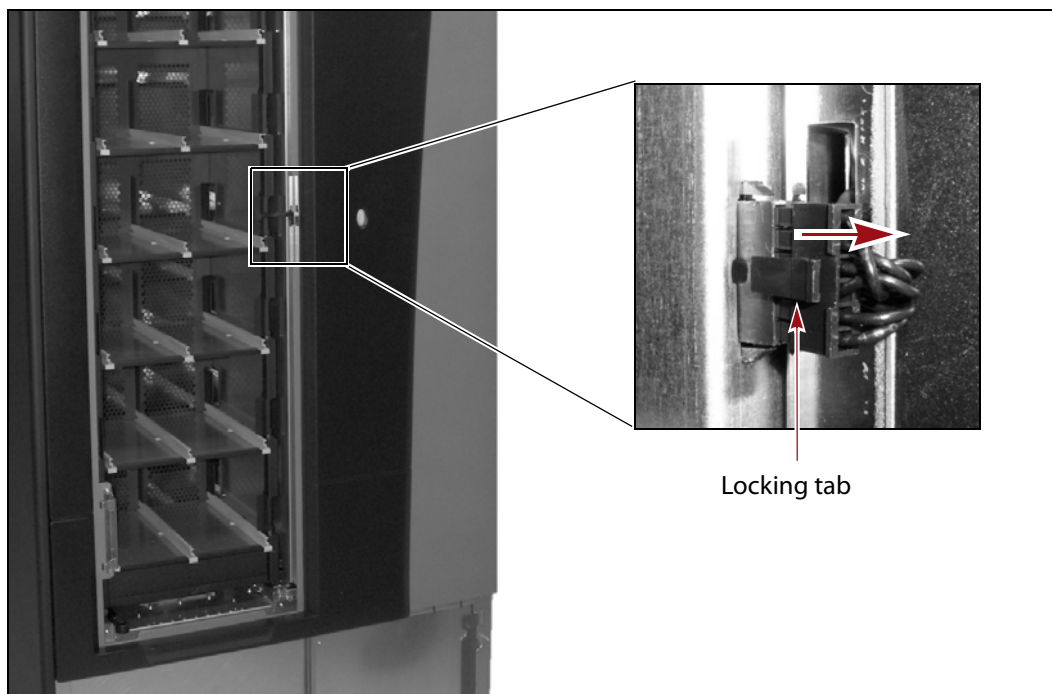


Figure 15 Disconnect the door release switch from the bulk TAP door frame.

3. Using a #2 Phillips screwdriver, remove the three screws that secure the bottom of the front panel to the frame (see [Figure 16 on page 22](#)).
4. Position the door control arms away from the door opening in the frame before you remove the front panel from the library.

5. Grasp the sides of the front panel and slide it upward and off of the two hangers on each side of the frame. Set the panel aside.

**Caution**

The front panel is heavy and awkward to handle. Make sure that you do not snag or otherwise damage the two door control arms that extend through the opening in the panel as you lift the panel off the frame.

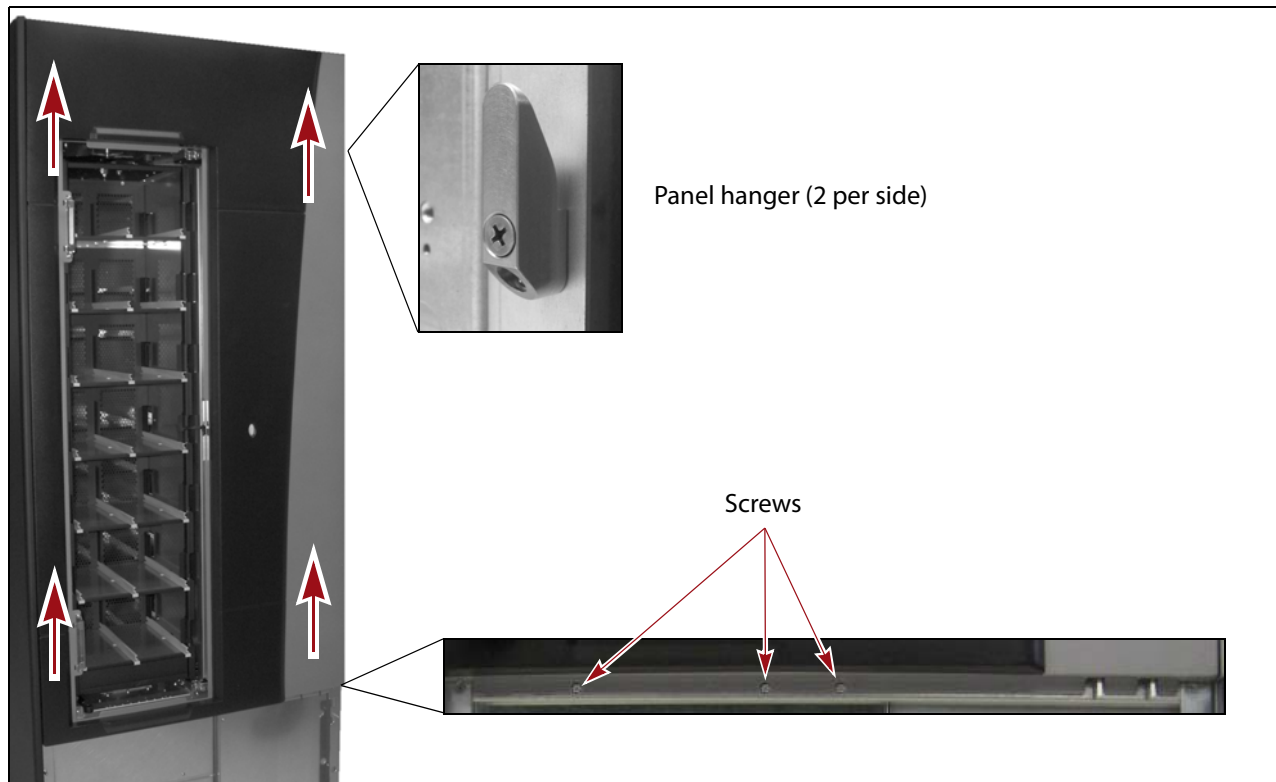


Figure 16 Remove the screws and slide the front panel up and off the hangers.

REMOVE THE FILTER SENSOR SWITCH AND CROSS BRACE

1. Using a #2 Phillips screwdriver, remove the two screws securing the filter sensor switch assembly to the frame and move the switch assembly out of the way.

Note: Do not disconnect the cables from the sensor switch.

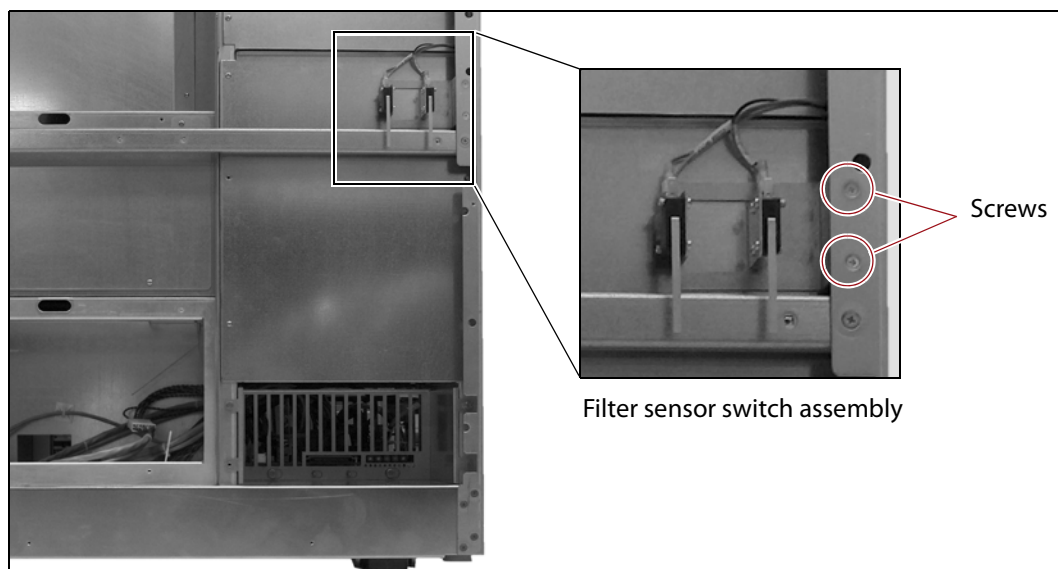


Figure 17 Remove the screws securing the filter sensor switch assembly to the frame.

2. Using a #2 Phillips screwdriver, remove the two screws securing the cross brace to the frame and set it aside.

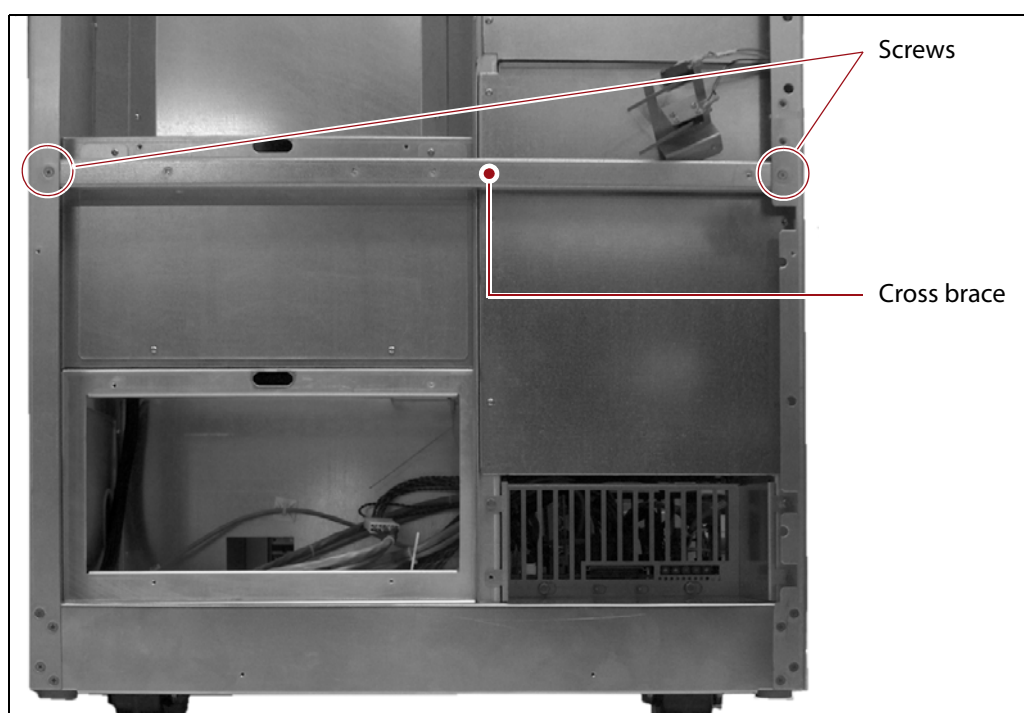


Figure 18 Remove the frame cross brace.

REMOVE THE SENSOR CABLE COMPARTMENT COVER

1. Using a #2 Phillips screwdriver, remove the four screws securing the cover over the sensor cable compartment just below the carousel in the bulk TAP frame.

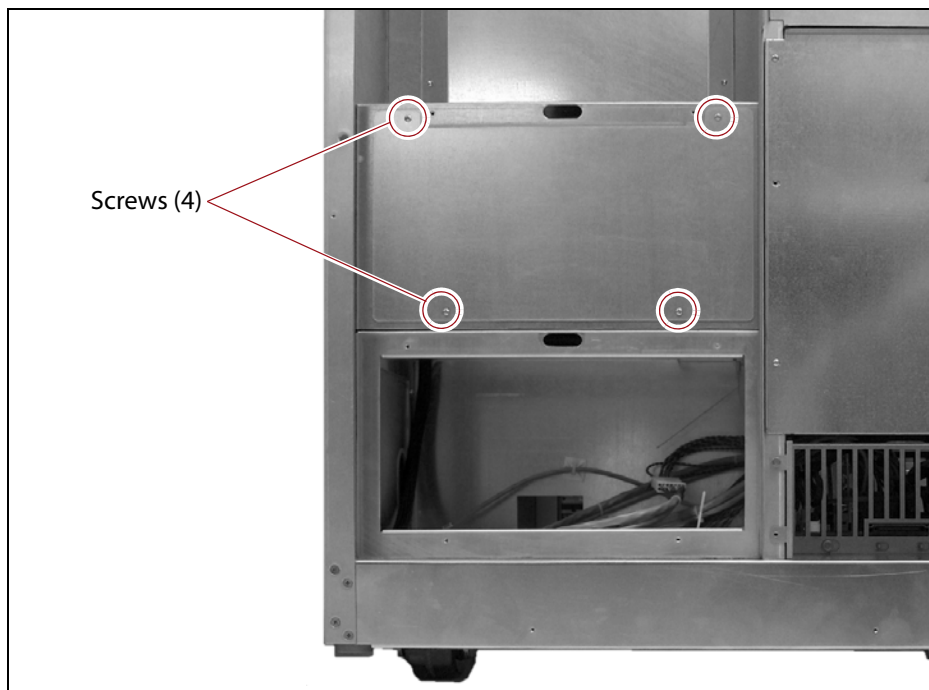


Figure 19 Remove the sensor cable compartment cover.

2. Remove the cover and set it aside.

REMOVE THE CAROUSEL MOTOR COMPARTMENT COVER

1. Using a #2 Phillips screwdriver, remove the four screws securing the cover over the carousel motor compartment at the top of the bulk TAP frame.



Figure 20 Remove the carousel motor compartment cover.

2. Remove the cover and set it aside.

NEXT STEPS

After completing the steps in this chapter, the next steps depend on the component you are replacing.

- If you have completed the level of disassembly required to replace the failed component, continue to [Chapter 4 – Replace Front Panel and Compartment Components](#), beginning on page 26.
- If you need to remove the bulk TAP carousel, skip to [Chapter 5 – Remove the Bulk TAP Carousel](#), beginning on page 34.

CHAPTER 4

Replace Front Panel and Compartment Components

This chapter provides detailed instructions for replacing components in the bulk TAP front panel and in the carousel motor compartments. You must complete the disassembly steps in [Chapter 3 – Remove the Front Panel and Compartment Covers](#), beginning on [page 13](#) before replacing a part described in this chapter.

Topic	Described beginning on...
Replace the Bulk TAP Interface Board	page 27
Replace an LED Assembly	page 29
Replace the Door Release Cable or Button	page 31

REPLACE THE BULK TAP INTERFACE BOARD

Use the following steps to replace the bulk TAP interface board.

1. Locate the bulk TAP interface board mounted on the floor of the carousel motor compartment (see [Figure 4 on page 10](#)).
2. Label the solenoid sensor and carousel position sensor cables so that you can correctly connect them to the replacement interface board.

Note: Each of the other cables connected to the bulk TAP interface board uses a different style connector, making them easy to identify.

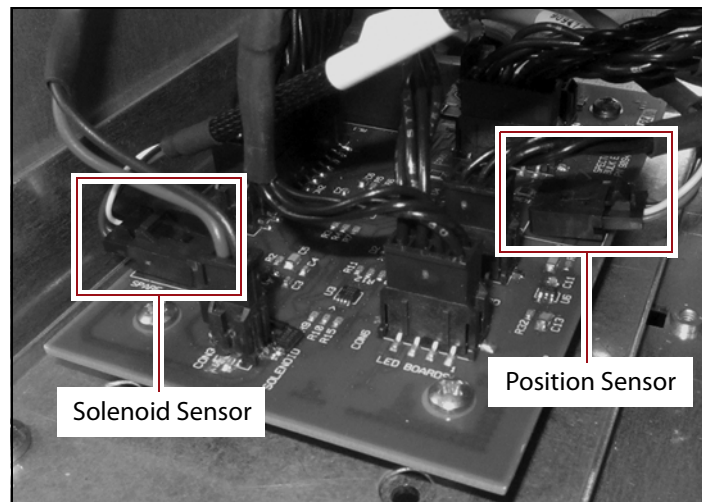


Figure 21 Label the solenoid sensor and position sensor cables.

3. Disconnect all cables on the interface board.

4. Using a short #2 Phillips screwdriver, remove the four screws securing the interface board to the floor of the motor compartment.

Note: One screw is not visible in [Figure 22](#); its position is indicated by the arrow.

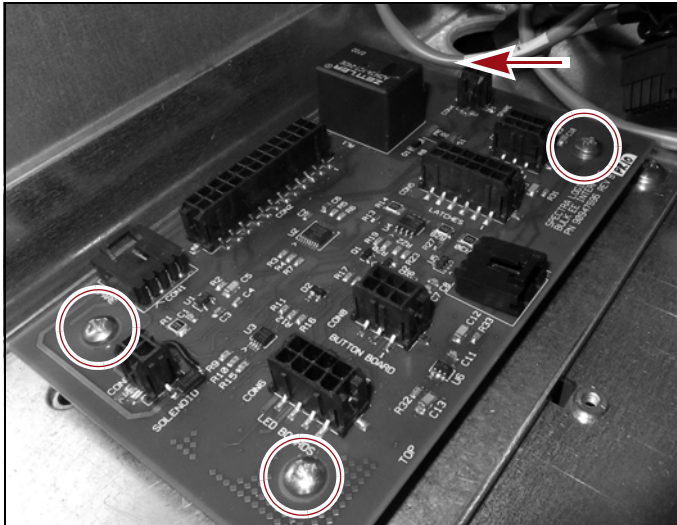


Figure 22 Remove the bulk TAP interface board.

5. Install the new bulk TAP interface board.
 - a. Orient the replacement board as it appears in [Figure 22](#) over the screw standoffs.
 - b. Use a short #2 Phillips screwdriver to install the four screws that secure the board to the frame.
6. Reconnect all of the cables to the interface board, ensuring that the solenoid sensor and position sensor cables are connected to the correct connector. The cable connectors are keyed to only fit one way, do not force them.



Caution

Make sure that you reconnect each cable to the correct connector. Connecting the cables in the wrong positions will result in the bulk TAP functioning incorrectly.

7. Skip to [Chapter 8 – Install the Front Panel and Compartment Covers](#), beginning on [page 58](#).

REPLACE AN LED ASSEMBLY

Use the following steps to replace an LED assembly.

- Notes:**
- It may be easier to replace an LED assembly after removing the carousel. See [Chapter 5 – Remove the Bulk TAP Carousel](#), beginning on [page 34](#) for instructions on how to remove the bulk TAP carousel.
 - You must have a right-angle #2 Phillips screwdriver to remove an LED assembly without removing the bulk TAP carousel.
 - Images for this procedure show the carousel removed.
1. Locate the LED assembly you need to replace (see [Figure 4 on page 10](#) and [Figure 5 on page 11](#)).
 2. Using a right angle #2 Phillips screwdriver, remove the four screws that secure the LED assembly to the frame. Set the screws aside; you will use them to install the replacement LED assembly.
 - If you are removing the lower LED assembly, the screws are located on the sides and top of the assembly (see [Figure 23](#)).
 - If you are removing the upper LED assembly, the screws are located on the sides and underside of the assembly (see [Figure 24](#)).

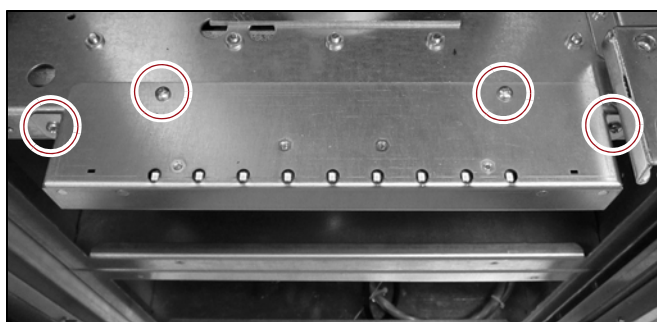


Figure 23 Remove the lower LED screws.

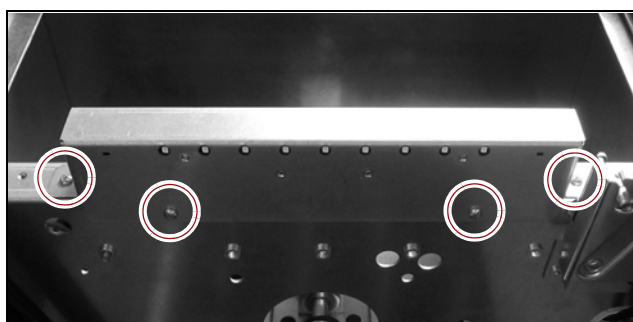


Figure 24 Remove the upper LED screws.

3. Carefully rotate the assembly toward you, out of the frame until the power cable is exposed.

4. Locate the power cable extending through the frame and disconnect it from the LED assembly.

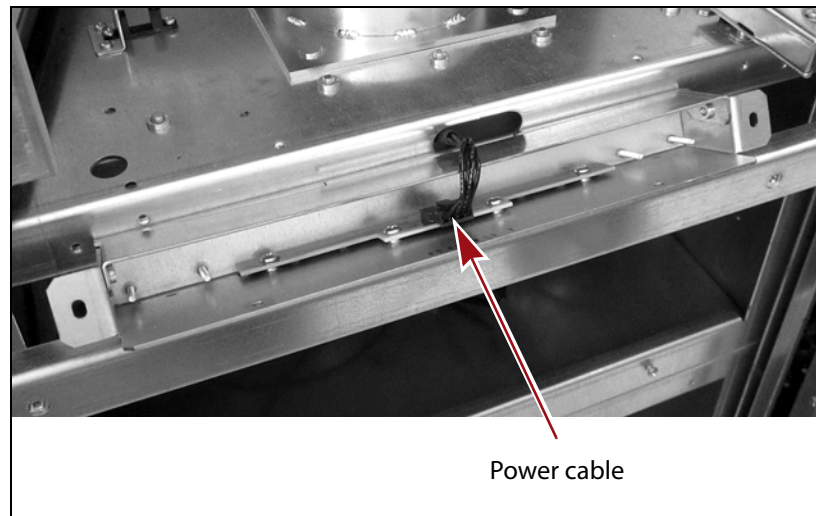


Figure 25 Disconnect the power cable from the LED assembly (lower LED assembly shown).

5. Plug the power cable into the replacement LED assembly.
Note: The connector is keyed to only fit one way. Do not force it.
6. Position the new LED assembly over the screw holes in the frame.
7. Using a right angle #2 Phillips screwdriver and the four screws you removed in [Step 2 on page 29](#), attach the LED assembly to the frame. Tighten the screws securely.
8. Skip to [Chapter 8 – Install the Front Panel and Compartment Covers](#), beginning on [page 58](#).

REPLACE THE DOOR RELEASE CABLE OR BUTTON

Use the instructions in the following sections to replace the door release cable or button mounted on the bulk TAP front panel.

Note: If you are replacing the door release button circuit board, you must first disconnect the button cable as described in [Replace the Door Release Button Cable](#).

Replace the Door Release Button Cable

1. Place the front panel on a sturdy work surface with the underside of the panel facing upward.
2. Locate the door release cable and button mounting bracket assembly on the back of the panel.



Figure 26 Locate the button mounting bracket on the back side of the panel.

3. Disconnect the door release button cable.
 - a. Route the free end of the cable through the holes in the side of the skin (see [Figure 27](#)).
 - b. Using a small flatblade screwdriver, reach through the button mounting bracket and press the release tab on the door release cable connector to disengage the connector from the button circuit board (see [Figure 28](#)).
 - c. Carefully pull the connector out through the opening in the mounting plate.

**Important**

If you are not replacing the cable, make sure that you do not damage the connector as you remove it.

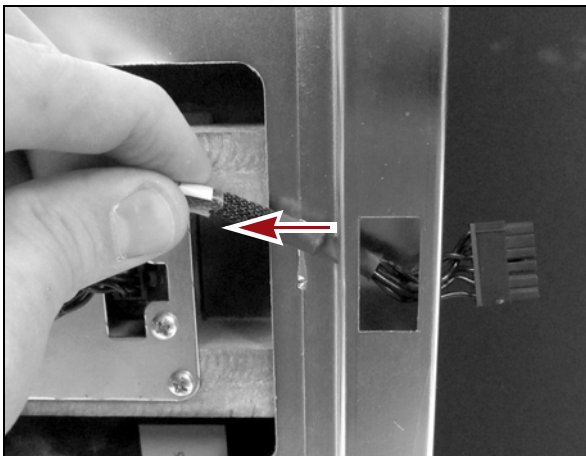


Figure 27 Route the free end of the cable through the front panel skin.

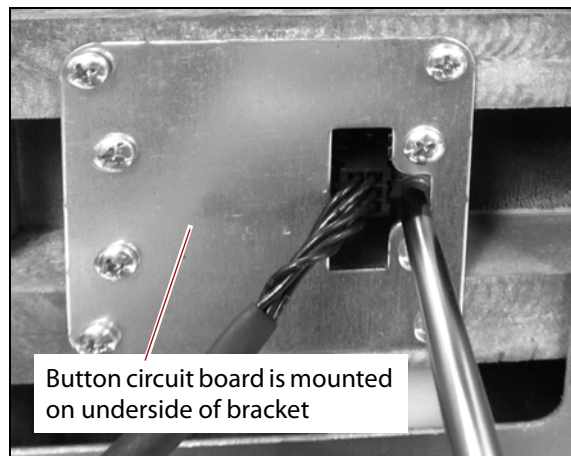


Figure 28 Depress the cable connector latch.

4. If you are only replacing the cable, continue to [Step 5](#). If you need to replace the door release button board, skip to [Replace the Door Release Button Board on page 33](#). Otherwise, use the following steps to install the new cable.
5. Install the new door release button cable.
 - a. Route the wide 6-pin connector on the replacement cable through the opening between the front panel skin and the back of the panel.
 - b. Insert the square 6-pin connector through the opening in the button mounting bracket and connect it to the button circuit board.
 - c. Tug gently on the cable to make sure that it is fully seated in the button circuit board connector.
6. If you need to replace the door release button board, continue to [Replace the Door Release Button Board on page 33](#). Otherwise, skip to [Chapter 8 – Install the Front Panel and Compartment Covers, beginning on page 58](#).

Replace the Door Release Button Board

1. Disconnect the door release cable from the button circuit board as described in [Replace the Door Release Button Cable on page 31](#).
2. Using a #2 Phillips screwdriver, remove the four outer screws securing the button mounting bracket to the back of the front panel.

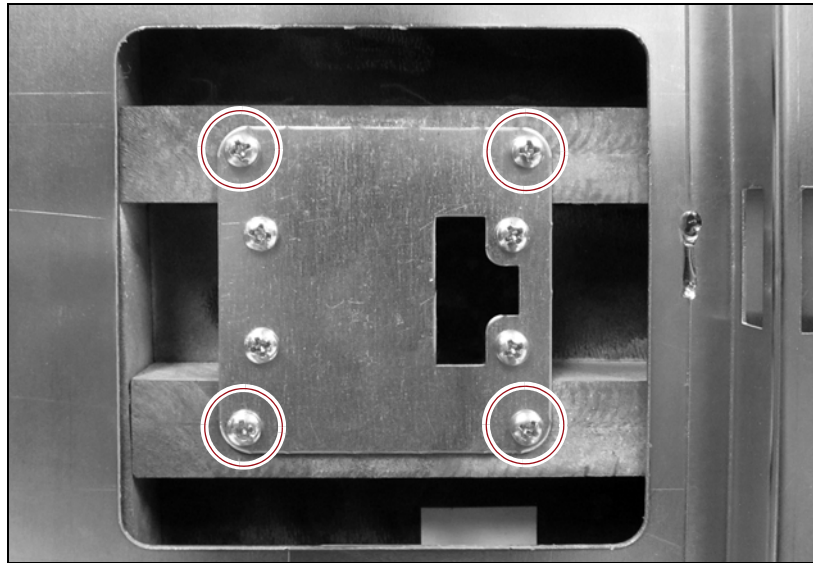


Figure 29 Remove the door release button mounting bracket.

3. Using a #2 Phillips screwdriver, remove the four screws securing the button circuit board to the mounting bracket.
4. Attach the new button release circuit board to the mounting bracket.
5. Orient the mounting bracket with the cutout for the door release cable toward the right and reattach the bracket to the back of the front panel.
6. Install the door release button cable as described in [Step 5 on page 32](#).
7. Skip to [Chapter 8 – Install the Front Panel and Compartment Covers](#), beginning on [page 58](#).

CHAPTER 5

Remove the Bulk TAP Carousel

This chapter provides detailed instructions for removing the bulk TAP carousel in preparation for service.

Before removing the bulk TAP carousel, make sure you have completed all the steps in [Chapter 3 – Remove the Front Panel and Compartment Covers](#), beginning on [page 13](#).

Estimated Time = 30 minutes

Topic	Described beginning on...
Remove the Carousel Motor	page 35
Remove the Carousel	page 37

REMOVE THE CAROUSEL MOTOR

1. If necessary, rotate the carousel until the hex screws in the coupler at the top of the carousel are facing towards the front of the library.

Note: To rotate the carousel, pull up on the solenoid bearing (see Figure 35 on page 37) and turn the carousel by hand.

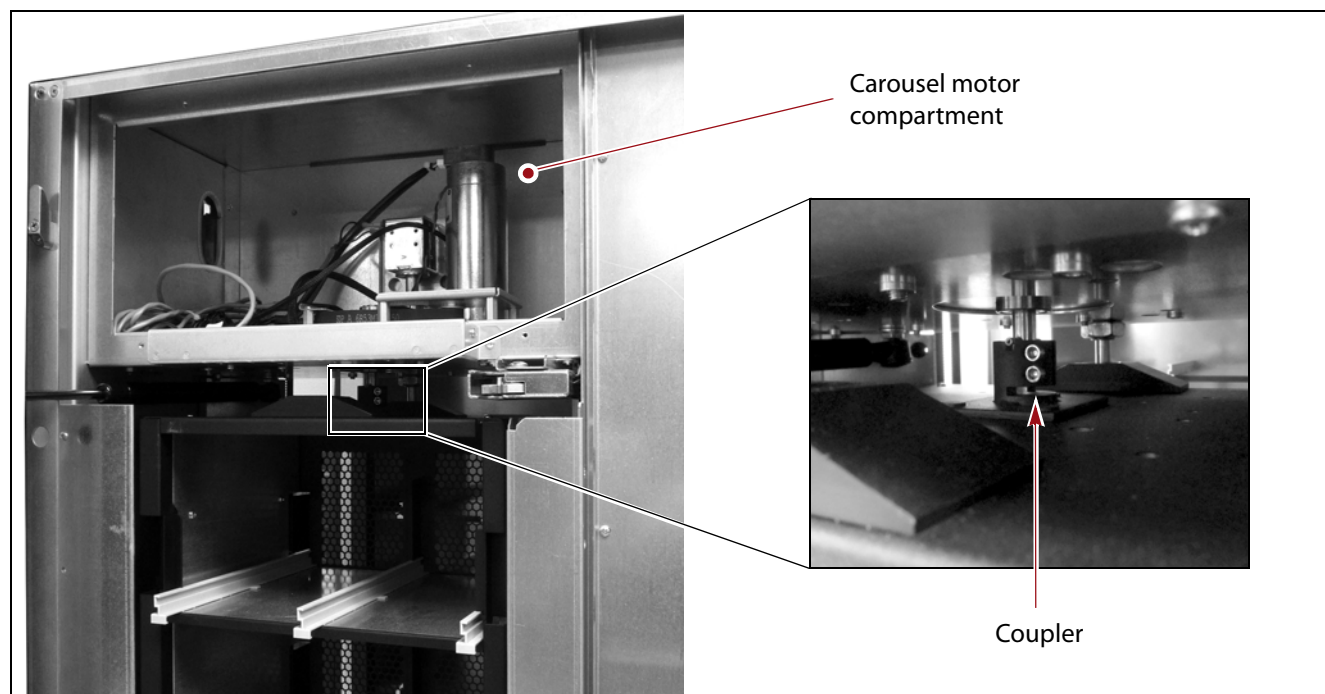


Figure 30 Bulk TAP carousel coupler hex screws facing front of library.

2. Using a 9/64-inch Allen wrench, loosen, but do not remove, the coupler hex screws.

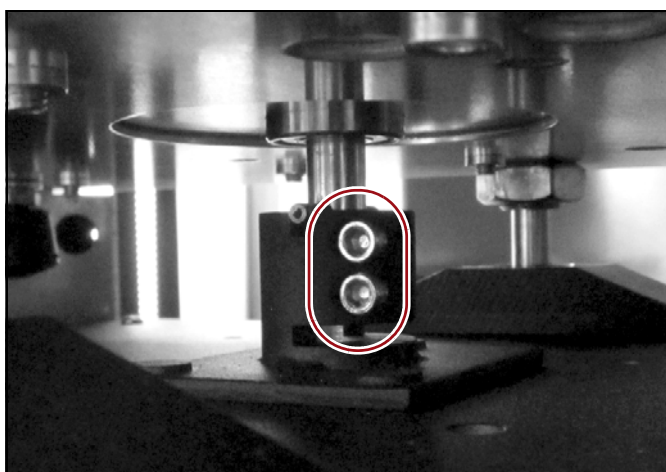


Figure 31 Loosen the coupler hex screws.

3. Reach through the front of the carousel motor compartment and disconnect the motor cable from the bulk TAP interface board. Press and hold the tab that secures the cable connector to the interface board and disconnect the cable.

Note: The bulk TAP interface board is located on the floor of the carousel motor compartment.

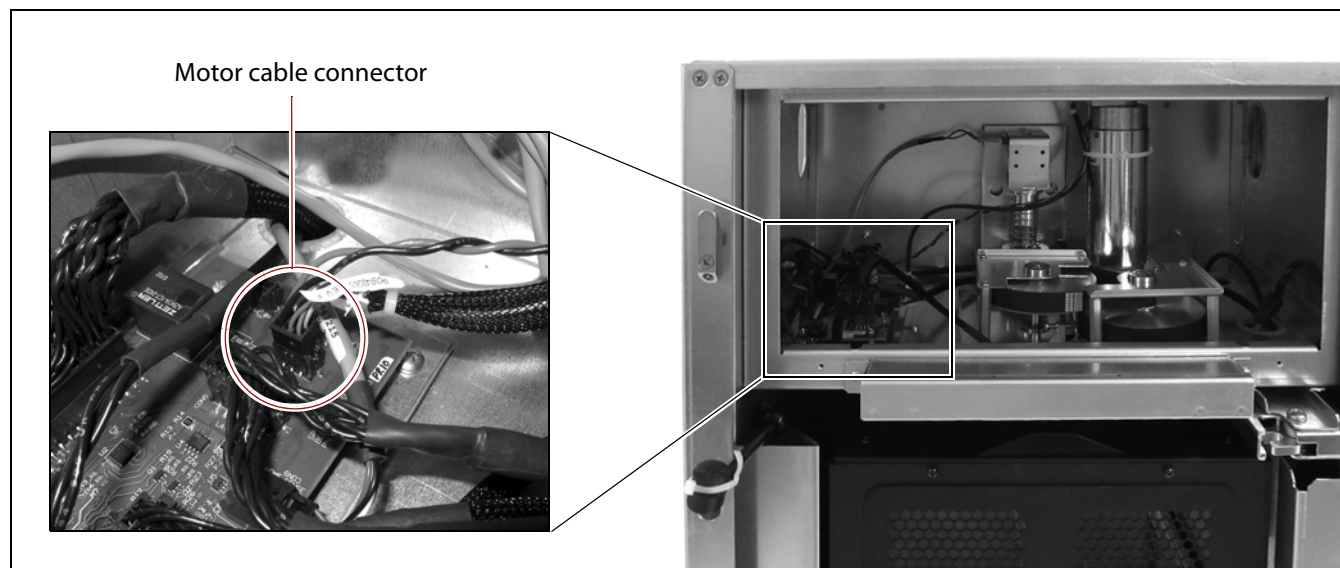


Figure 32 Disconnect the carousel motor cable from the bulk TAP interface board.

4. Using a #2 Phillips screwdriver, remove the six screws that secure the carousel motor assembly to the floor of the carousel motor compartment.

Note: Three screws are located behind the motor assembly and are not visible in [Figure 33](#). Arrows indicate the approximate positions of the rear screws.

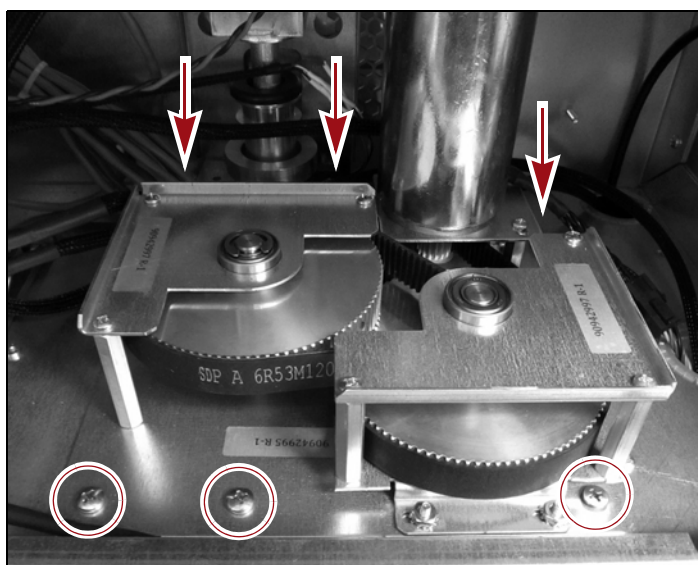


Figure 33 Remove the six screws securing the carousel motor in place.

5. Lift the motor assembly up to disengage it from the coupler you loosened in [Step 2 on page 35](#) and lift it out of the compartment.

Note: If you are replacing the carousel motor assembly, skip to [Install the Carousel Motor Assembly on page 55](#), otherwise, continue to [Remove the Carousel](#).

REMOVE THE CAROUSEL

1. In the compartment directly below the bulk TAP carousel, use a 5/16-inch Allen wrench to remove the bearing spindle that secures the lower end of the carousel to the frame. Turn the spindle counter-clockwise to unscrew it.



Figure 34 Remove the bearing spindle.

2. Reach into the carousel motor compartment and lift up on the solenoid bearing.

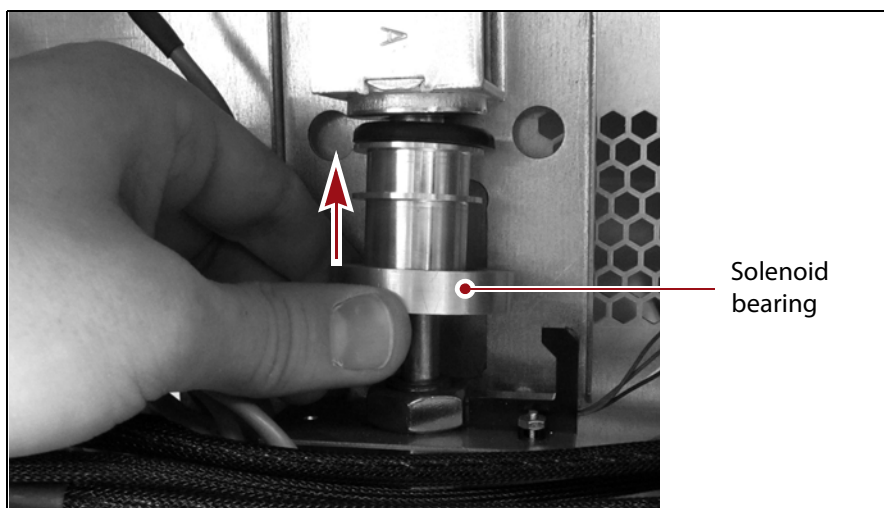


Figure 35 Lift up on solenoid bearing.

3. Remove the carousel from the library.
 - a. Tilt the top of the carousel inward toward the interior of the frame.
 - b. With one hand lifting the carousel from the bottom and the other hand steadying the top, lift the carousel, bottom first, out of the library.

**Caution**

The carousel weighs approximately 40 lb (19 kg). Make sure you are grasping the carousel firmly as you lift it.

**Caution**

Be careful not to bump the gears and pins on the bottom of the carousel or the position sensors mounted on the floor of the carousel compartment as you lift the carousel out of the frame.

- c. Place the carousel on its side on a sturdy work surface.



Figure 36 Tilt the top of the carousel toward the interior of the frame.



Figure 37 Lift the carousel out of the frame.

CHAPTER 6

Replace Bulk TAP Carousel Components

This chapter provides detailed instructions for replacing components in the carousel compartment. You must complete the disassembly steps in [Chapter 5 – Remove the Bulk TAP Carousel](#), beginning on [page 34](#) before replacing a part described in this chapter.

Topic	Described beginning on...
Replace the Carousel Locking Solenoid	page 40
Replace a Door Latch and Release Cable	page 42
Replace a Carousel Position Sensor	page 46
Replace a Door Control Arm	page 49
Replace the Motor Shaft Coupler	page 51

REPLACE THE CAROUSEL LOCKING SOLENOID

1. Locate the carousel locking solenoid and bulk TAP interface board in the carousel motor compartment (see [Figure 4 on page 10](#)).
2. Disconnect the solenoid cable from the interface board.

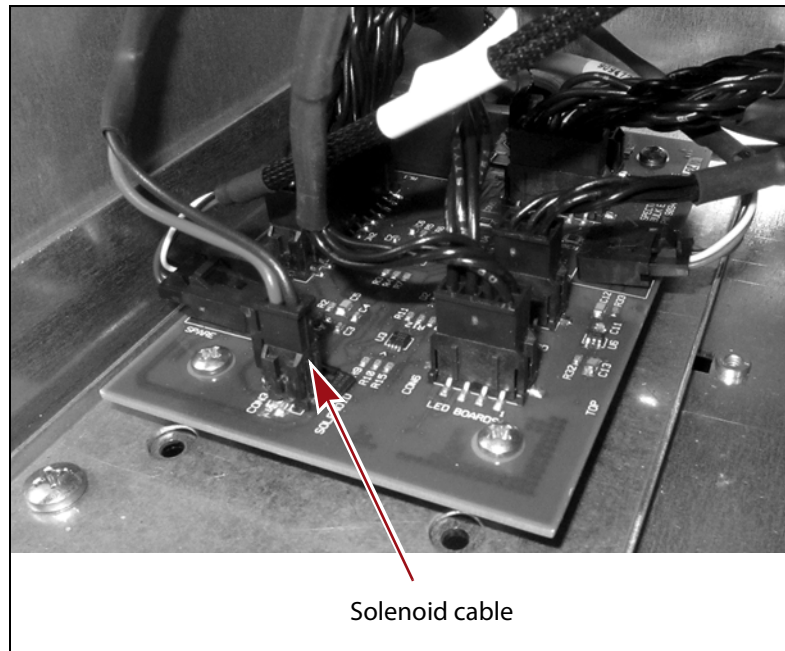


Figure 38 Disconnect the solenoid cable.

3. From inside the carousel compartment, use a 15/16th-inch ratchet socket wrench to remove the solenoid nut that fits over the solenoid piston extending through the floor of the motor compartment into the carousel compartment. Set the nut aside, you will use it to install the new solenoid

Note: The piston is toward the back of the compartment.

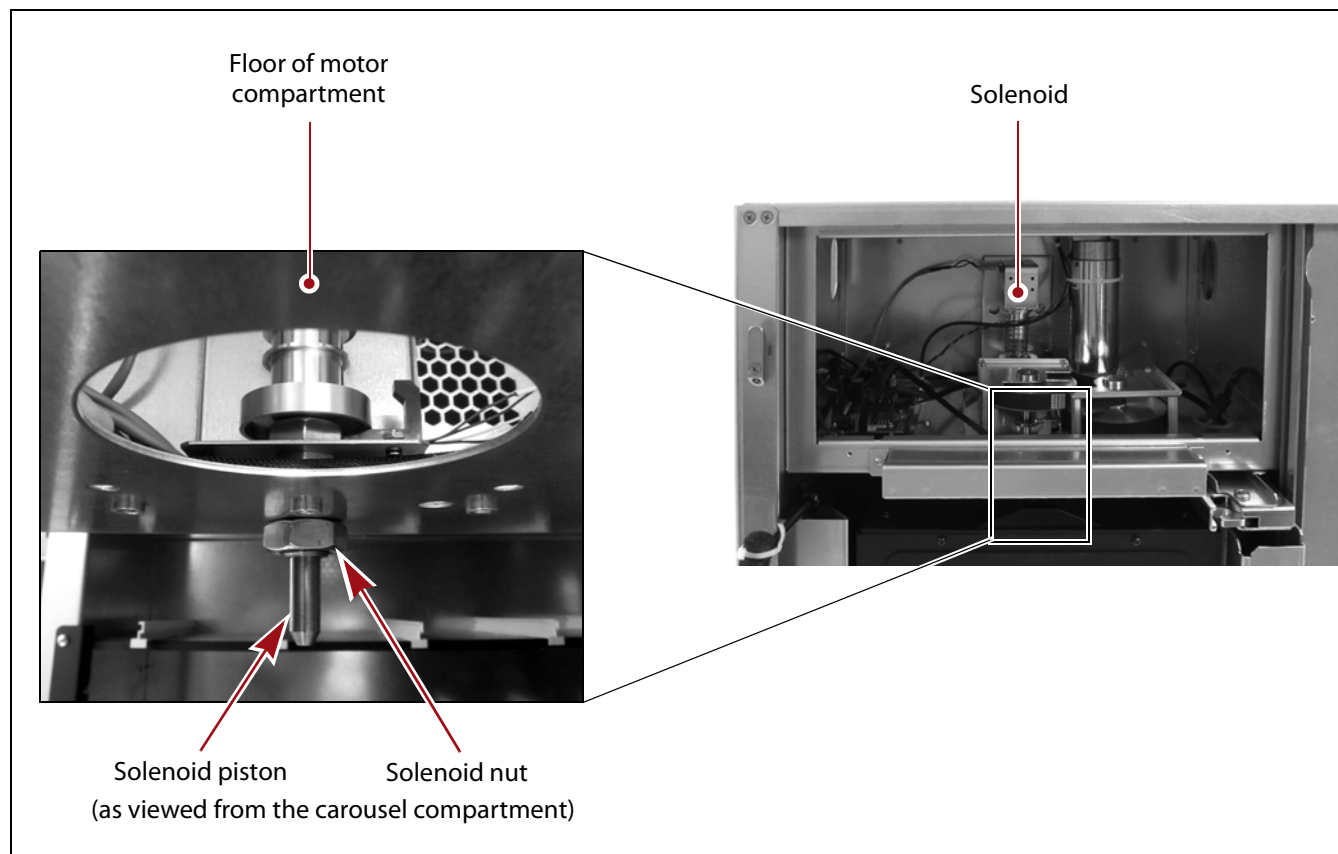


Figure 39 Disconnect the solenoid nut.

4. Pull the solenoid up and out of the motor compartment.
 5. From inside the carousel motor compartment, position the new carousel locking solenoid with the piston extending through the hole in the compartment floor.
 6. From inside the carousel compartment, install the nut you removed in [Step 3](#) over the solenoid piston. Tighten the nut securely.
 7. Plug the solenoid cable into the bulk TAP interface board (see [Figure 38](#) on page 40).
- Note:** The connector is keyed to only fit one way. Do not force it.
8. Skip to [Chapter 7 – Install the Bulk TAP Carousel](#), beginning on page 53.

REPLACE A DOOR LATCH AND RELEASE CABLE

The upper and lower door latches lock and release the bulk TAP door during normal operation. The door latches are located near the top and bottom of the carousel compartment. The release cables are used to manually open the door latches. The release cables are located in the HAX motor compartment at the bottom of the bulk TAP frame (see [Figure 6 on page 12](#)).

Note: A door latch and its connected release cable are replaced together.

1. Locate the door latch release cables in the upper right rear corner of the HAX motor compartment.
2. Identify the door latch you need to remove. The left-most cable releases the upper door latch; the right-most cable releases the lower door latch.

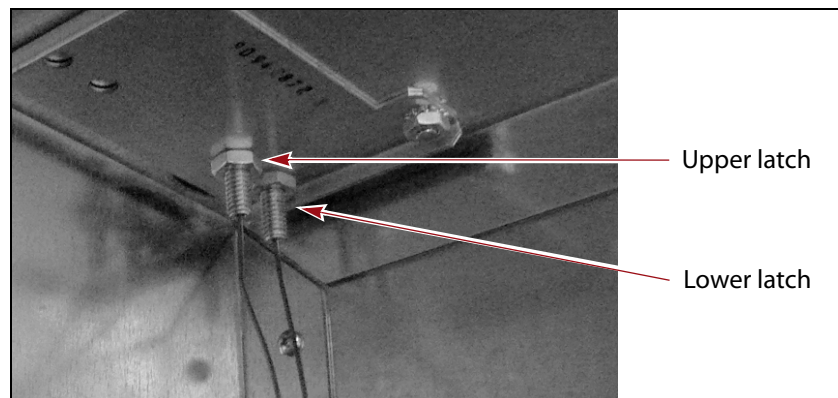
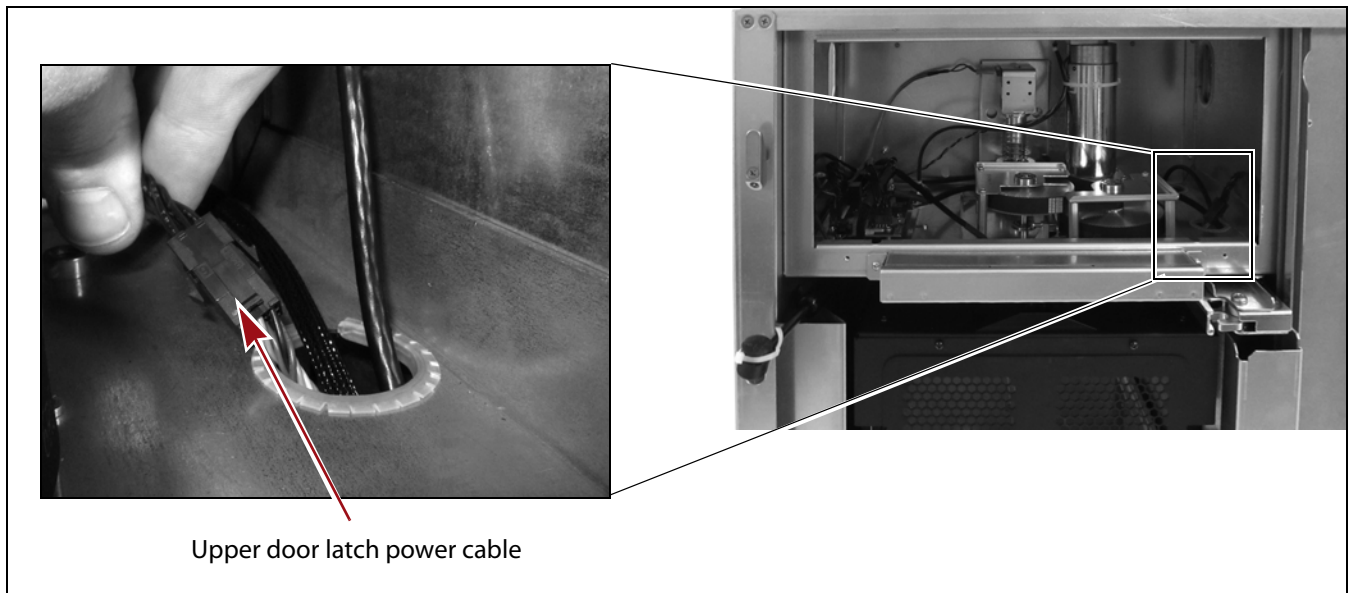


Figure 40 The bulk TAP door latch cables.

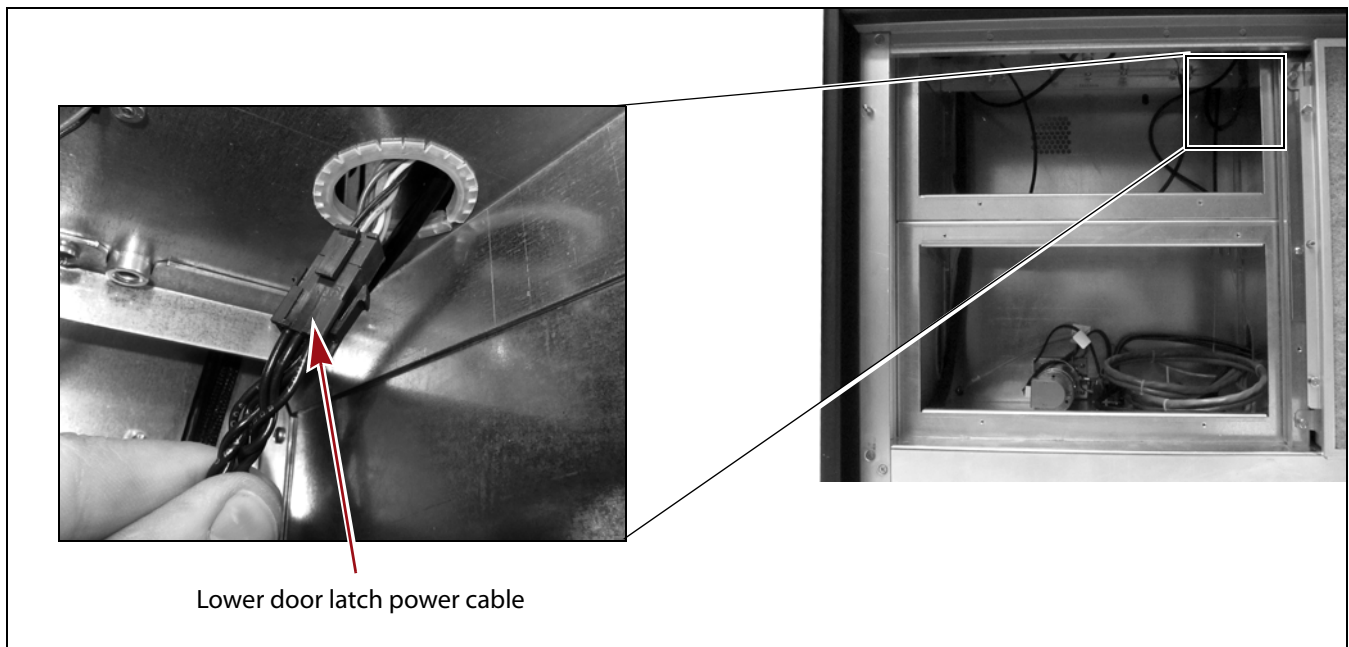
3. Use a 7/16-inch open-end wrench to remove the nut from the threaded cable guide for the failed latch release cable. Slide the nut down the cable and remove it.

4. Disconnect the door latch power cable.

- If you are replacing the upper door latch, the power cable connector is located in the lower right front corner of the motor compartment.

**Figure 41** Upper door latch power cable.

- If you are replacing the lower latch, the power cable is located in the upper right rear corner of the sensor cable compartment.

**Figure 42** Lower door latch power cable.

5. Locate the screws that secure the door latch to the bulk TAP frame.
 - If you are replacing the upper door latch, the screws are in the carousel motor compartment (see [Figure 43](#)).
 - If you are replacing the lower latch, the screws are in the sensor cable compartment (see [Figure 44](#)).

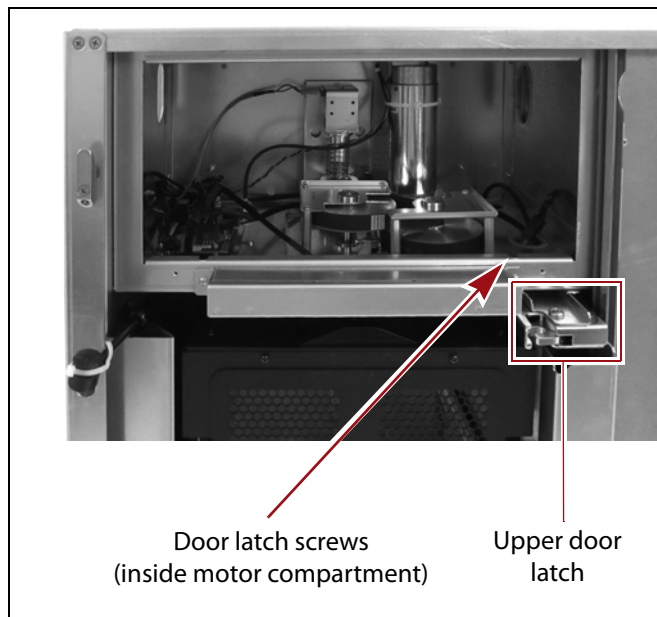


Figure 43 Locate the upper latch screws.

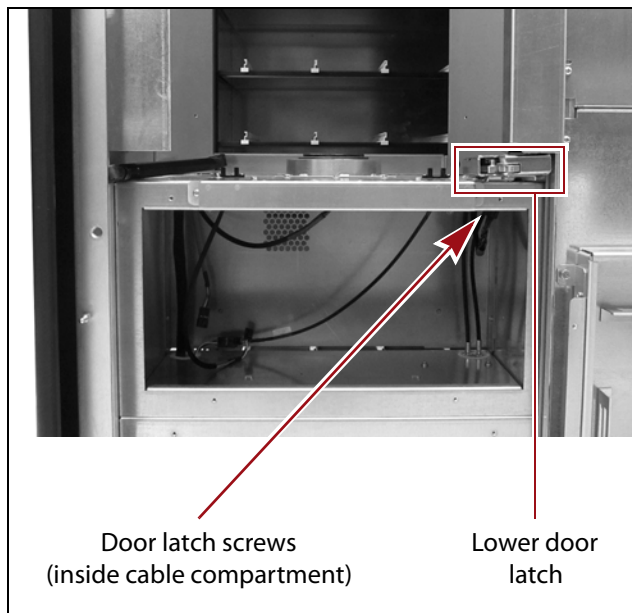


Figure 44 Locate the lower latch screws.

6. Using a short #2 Phillips screwdriver, remove the four screws that secure the latch to the frame. Do not remove the larger #3 Phillips screw.

Note: The outermost screws are hidden from view in [Figure 45](#).

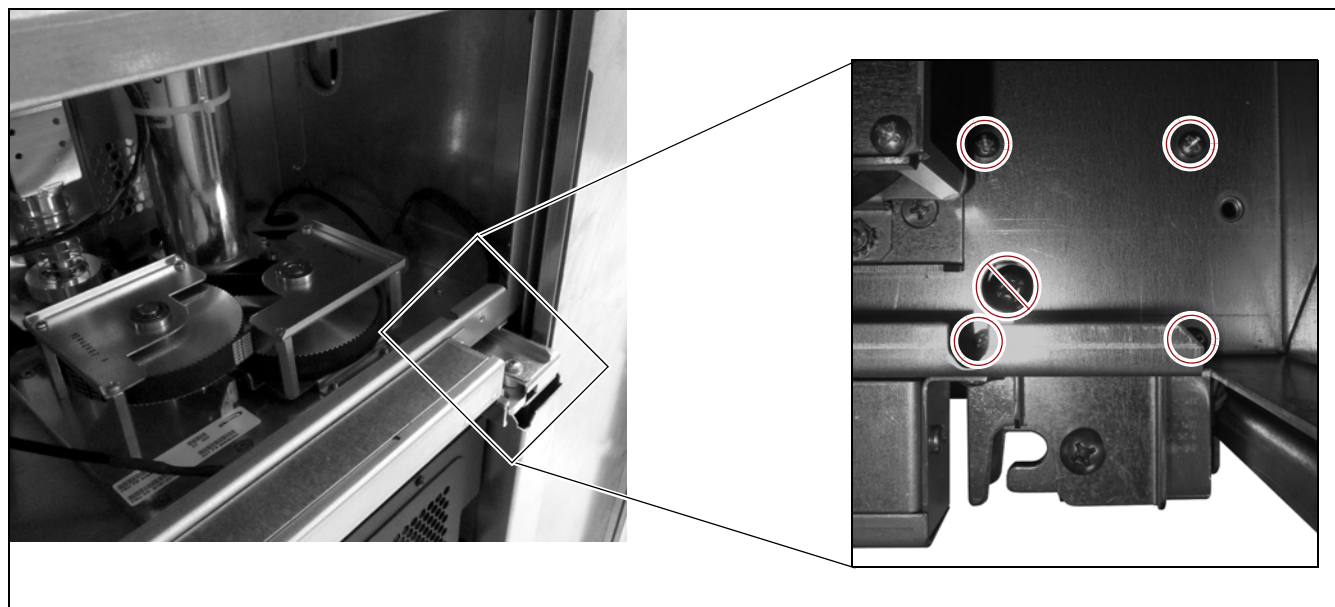


Figure 45 Remove door latch screws (upper door latch shown).

7. Pull the door latch and attached release cable out of the library. If you are removing the top latch, pull the release cable slowly upward to slide it out of the cable channel in the lower right rear corner of the motor compartment.

Note: Pull the cable slowly so that it does not snag on the other cables in the channel.

8. Route the release cable for the replacement door latch through the frame.

If you are replacing the upper door latch

- a. While holding the door latch assembly in the carousel compartment, route the release cable up through the floor of the motor compartment (A) and then down through the cable channel (B), through the carousel compartment and into the sensor cable compartment.

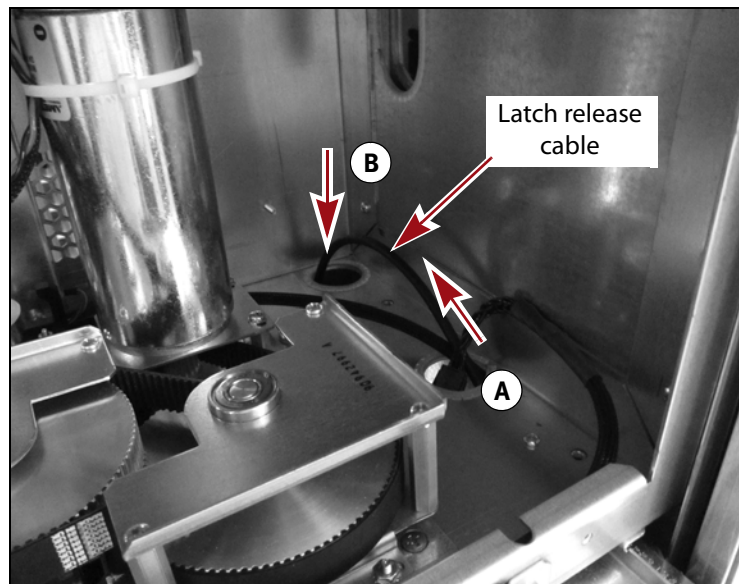


Figure 46 Route the upper door latch release cable.

- b. From inside the sensor cable compartment, guide the release cable down through the compartment and into the HAX motor compartment.

If you are replacing the lower door latch

- a. While holding the door latch assembly in the carousel compartment, route the release cable down through the hole in the right rear corner of the carousel compartment, into the sensor cable compartment.
- b. From inside the sensor cable compartment, guide the release cable down through the compartment and into the HAX motor compartment.

9. Using a short #2 Phillips screwdriver, secure the latch to the frame using the four screws you removed in [Step 6 on page 44](#).
10. Connect the power cable for the replacement door latch (see [Step 4 on page 43](#)).
11. In the HAX motor compartment, thread the nut you removed in [Step 3 on page 42](#) over the door latch release cable and use a 7/16th-inch open-end wrench to attach the nut to the frame.
12. Skip to [Chapter 7 – Install the Bulk TAP Carousel](#), beginning on [page 53](#).

REPLACE A CAROUSEL POSITION SENSOR

The two carousel position sensors allow the library to determine the rotational position of the carousel. The left hand sensor is the robot sensor and the right hand sensor is the user sensor. The sensor names indicate whether the carousel is facing inward toward the robot or outward facing the user, respectively.

1. Locate the cable for the failed carousel position sensor in the sensor cable compartment.

Note: The two cables to the far right hand side of the compartment are the door latch release cables and are not used in this procedure.

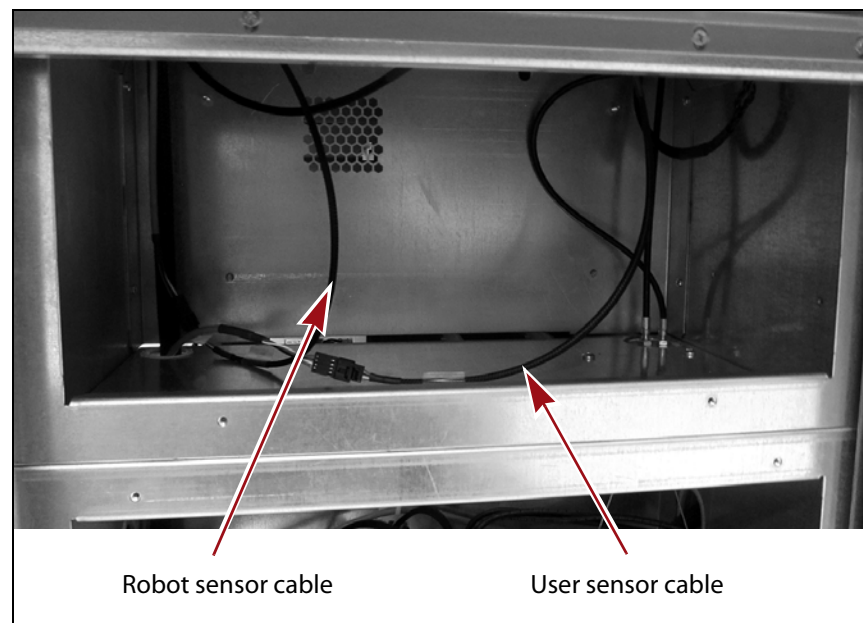


Figure 47 Locate the sensor cable for the failed position sensor.

2. Disconnect the sensor cable.**Important**

There are two position sensors. Make sure you disconnect the cable for the failed sensor.

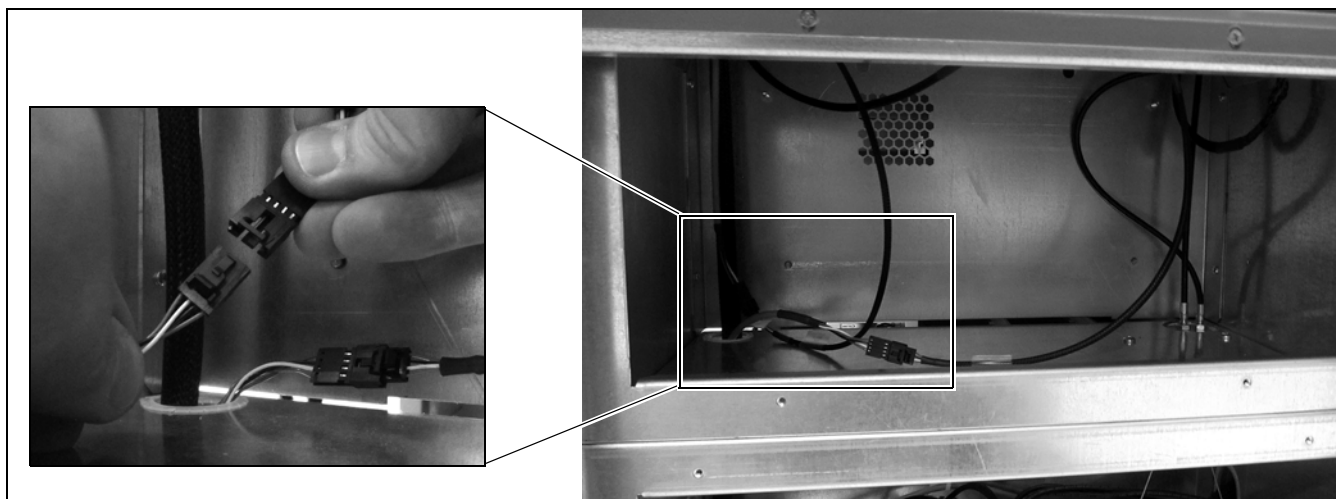


Figure 48 Disconnect the position sensor cable, located inside the sensor cable compartment.

- 3.** Locate the carousel position sensor mounted on the carousel compartment floor (see [Figure 5 on page 11](#)).
- 4.** Using a #1 Phillips screwdriver, remove the four screws that secure the position sensor and its protective bracket to the floor of the carousel compartment.

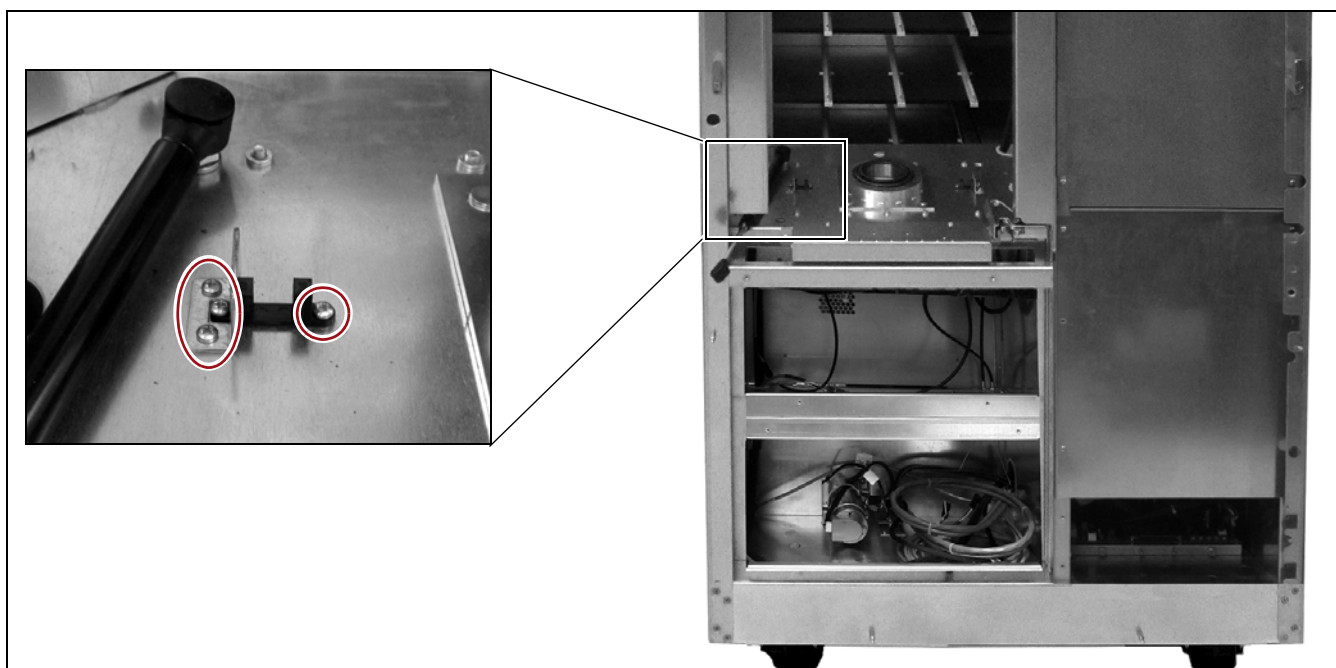


Figure 49 Remove position sensor screws.

- 5.** Guide the cable attached to the sensor up through the hole in the floor of the compartment and lift the sensor out of the frame.

6. Guide the cable for the replacement sensor through the hole in the floor of the carousel compartment.
7. Align the holes in the base of the sensor with the screw holes in the floor of the compartment. The orientation of the sensor does not matter.
8. Install two screws to secure the position sensor to the frame. Tighten the screws only enough to hold the sensor in place.

**Caution**

Do not over tighten the screws that hold the position sensor in place. Overtightening the screws will crack the plastic sensor mount.

9. Orient the protective sensor bracket on the side of the sensor closest to the wall of the carousel compartment.
10. Install two screws to secure the protective bracket in place.
11. Skip to [Chapter 7 – Install the Bulk TAP Carousel](#), beginning on [page 53](#).

REPLACE A DOOR CONTROL ARM

The bulk TAP door uses two control arms, one at the top and one at the bottom of the carousel compartment, to prevent the door from opening too far and to control the rate at which the door can be closed.

1. Locate the failed door control arm in the bulk TAP carousel compartment (see [Figure 5 on page 11](#) and [Figure 6 on page 12](#)).
2. Using a small flatblade screwdriver, pry the locking cap out of the control arm socket.

**Caution**

Do not attempt to disconnect the control arm without first removing the locking cap from the socket. Be careful not to damage the socket as you pry off the locking cap.



Figure 50 Remove the locking cap (bottom control arm shown).

3. Insert a large flatblade screwdriver under the control arm near the socket, and pry the arm off the ball joint.

**Caution**

Disconnecting the control arm requires using a flatblade screwdriver to pry the arm socket from the ball joint on the door. Be careful not to damage the ball joint.

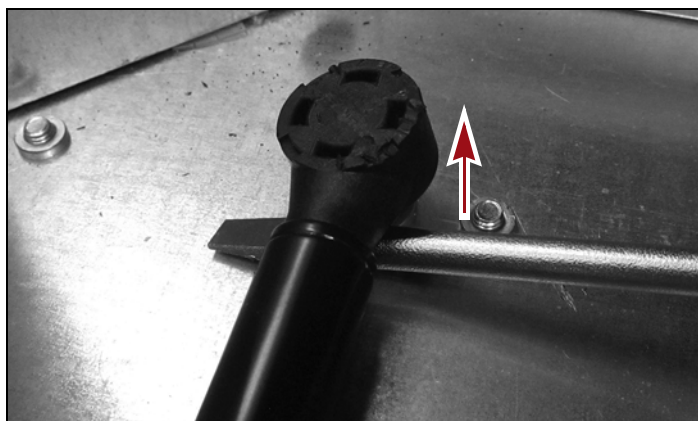


Figure 51 Remove the control arm (bottom control arm shown).

4. Install the new control arm.
 - a. Position the socket on the new control arm over the ball joint.
 - b. Using your thumb, firmly press the socket over the ball joint until it snaps into place.

**Caution**

The top and bottom control arms function differently. Do not use a bottom arm in the top position and vice versa.

**Caution**

When installing the bottom control arm, be careful not to bump the position sensor mounted near it.

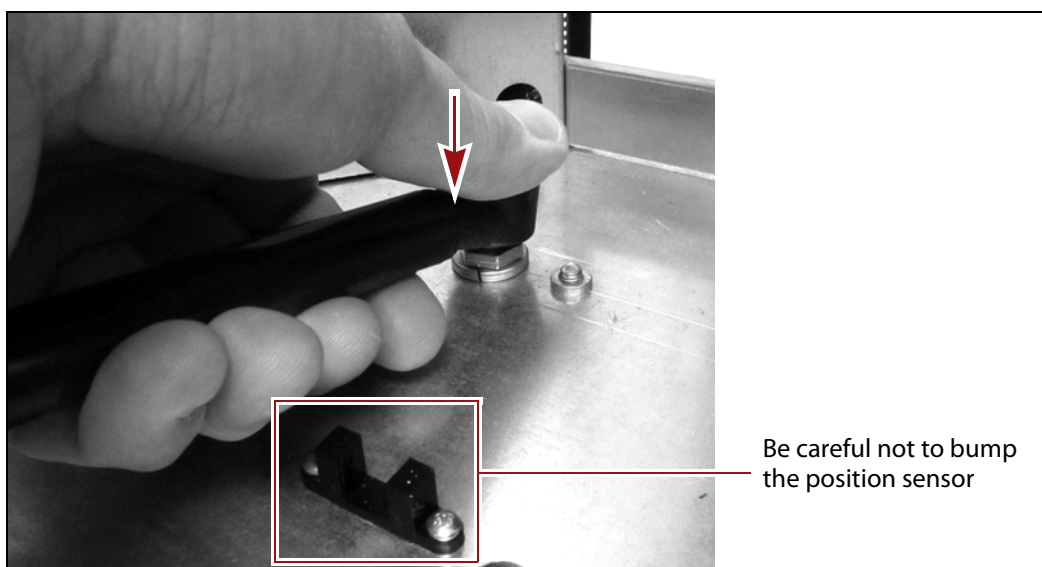


Figure 52 Install the control arm (bottom control arm shown).

5. Install the locking cap.
 - a. Position the locking cap so that the legs fit into openings in the socket.
 - b. Using your thumb, press the cap into place to secure the control arm to the ball joint.
6. Skip to [Chapter 7 – Install the Bulk TAP Carousel](#), beginning on [page 53](#).

REPLACE THE MOTOR SHAFT COUPLER

1. Place the carousel on a sturdy, flat work surface so that the top of the carousel is accessible.
2. Locate the motor shaft coupler assembly attached to the top of the carousel.

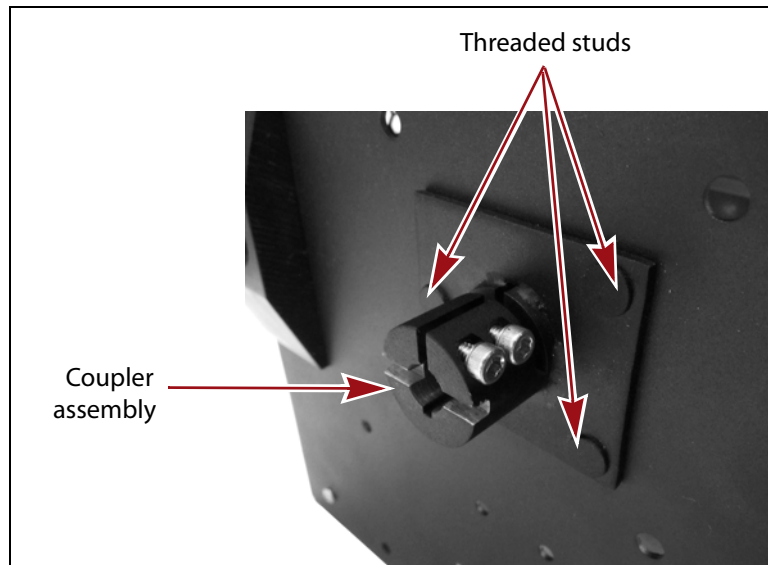


Figure 53 Carousel coupler assembly

3. From inside the carousel, use an 11 mm ratchet socket wrench to remove the three nuts from the threaded studs that secure the motor shaft coupler to the top of the carousel.

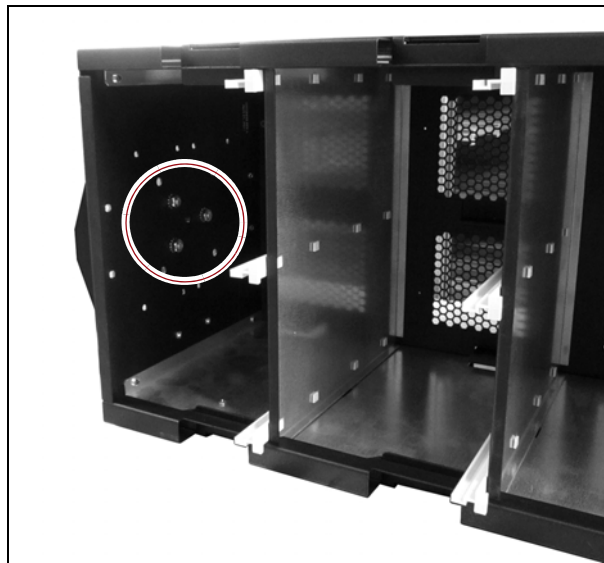


Figure 54 Remove the coupler.

4. From outside the carousel, lift the coupler assembly straight out and away from the top of the carousel.
Note: The threaded studs remain attached to the coupler assembly.
5. From the top of the carousel, position the new motor shaft coupler assembly so that the three threaded studs fit through the holes in the top of the carousel.
6. From inside the carousel, use an 11 mm ratchet socket wrench to install the three nuts that secure the coupler assembly to the carousel. Tighten the nuts securely.
7. Skip to [Chapter 7 – Install the Bulk TAP Carousel](#), beginning on page 53.

CHAPTER 7

Install the Bulk TAP Carousel

This chapter provides detailed instructions for installing the bulk TAP carousel and motor assembly after completing the replacement procedure.

Estimated Time = 30 minutes

Topic	Described beginning on...
Install the Carousel	page 54
Install the Carousel Motor Assembly	page 55

INSTALL THE CAROUSEL

1. Install the carousel.

- a. With one hand lifting the carousel and the other steadying the top, angle the bottom of the carousel into the carousel compartment.
- b. Set the carousel into the compartment, making sure the gears on the bottom of the carousel align with the opening in the bearing ring on the floor of the compartment where the bearing spindle fits.

**Caution**

The carousel weighs approximately 40 lb (19 kg). Make sure you are grasping the carousel firmly as you lift it.

**Caution**

Be careful not to bump the gears and pins on the bottom of the carousel or the position sensors mounted on the floor of the carousel compartment as you lift the carousel into the frame.

Note: It may be helpful to have another person guide the carousel gears into the opening in the floor of the compartment while you hold the weight of the carousel.

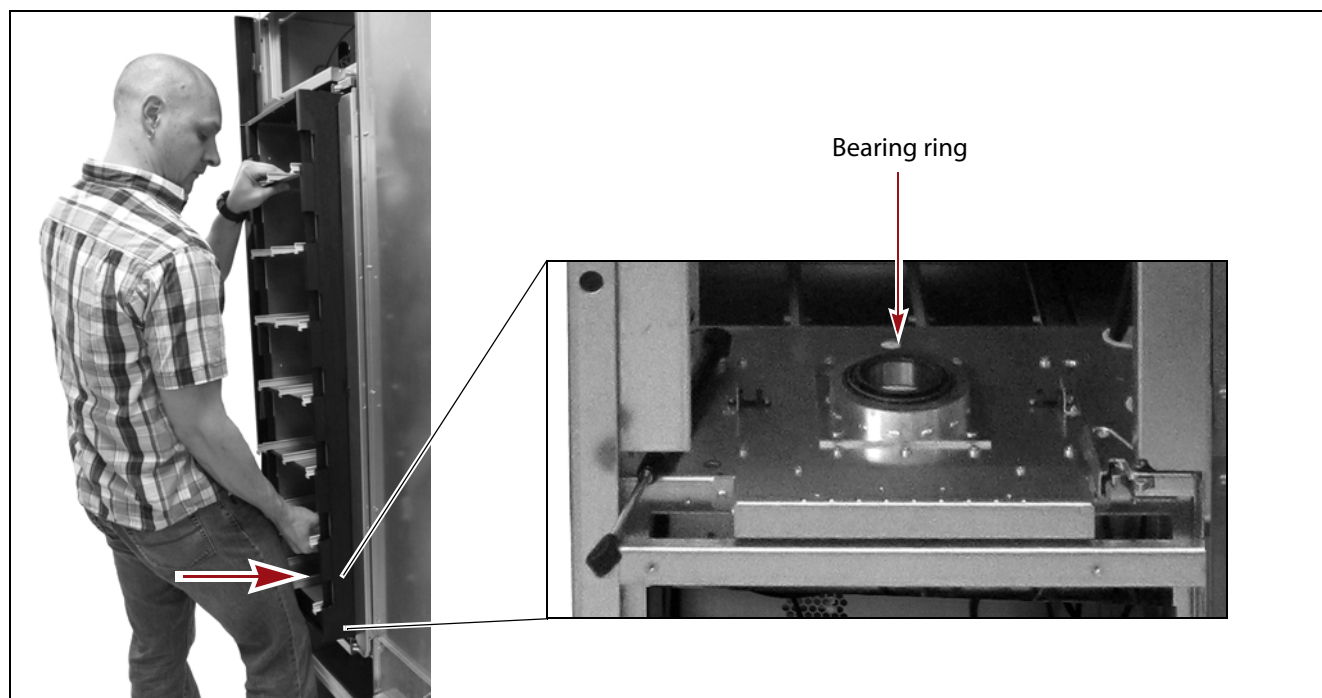


Figure 55 Lift the carousel into the library.

- c. Tilt the top of the carousel inward toward the interior of the frame.

INSTALL THE CAROUSEL MOTOR ASSEMBLY

1. Position the carousel motor assembly in the compartment above the carousel so that the motor drive shaft engages the coupler mounted on the top of the carousel.

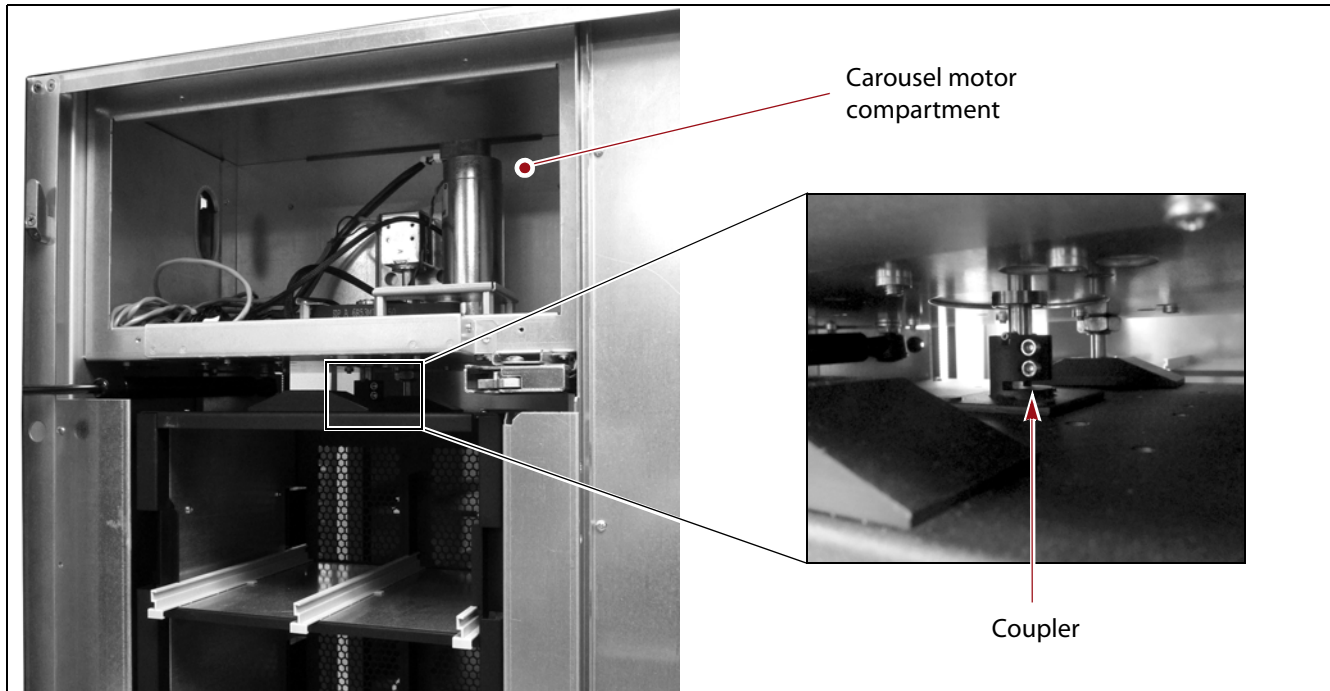


Figure 56 Position the motor assembly so the drive shaft engages the coupler.

2. Using a #2 Phillips screwdriver, install the six screws that secure the motor assembly to the floor of the carousel motor compartment.

Note: Three screws are located behind the motor assembly and are not visible in [Figure 57](#). Arrows indicate the approximate position of the rear screws.

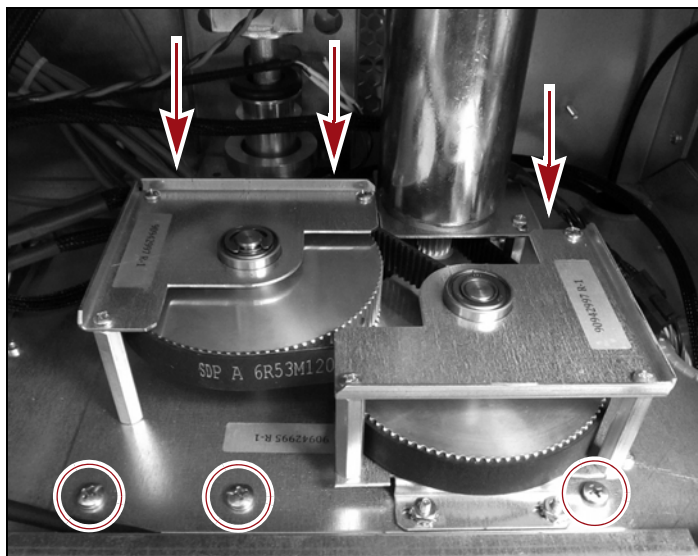


Figure 57 Install the six screws to secure the motor.

3. Using a 9/64-inch Allen wrench, fully tighten the hex screws to secure the coupler to the motor shaft.

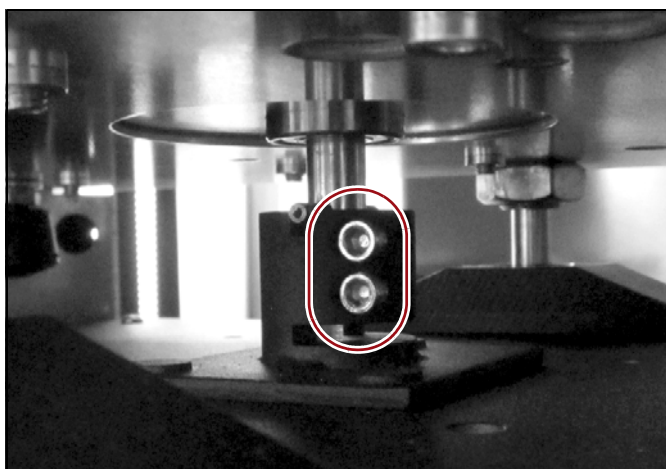


Figure 58 Tighten the coupler hex screws.

4. In the carousel motor compartment, connect the motor cable to the bulk TAP interface board. After connecting the cable, gently pull on the cable connector to ensure that it is fully seated.

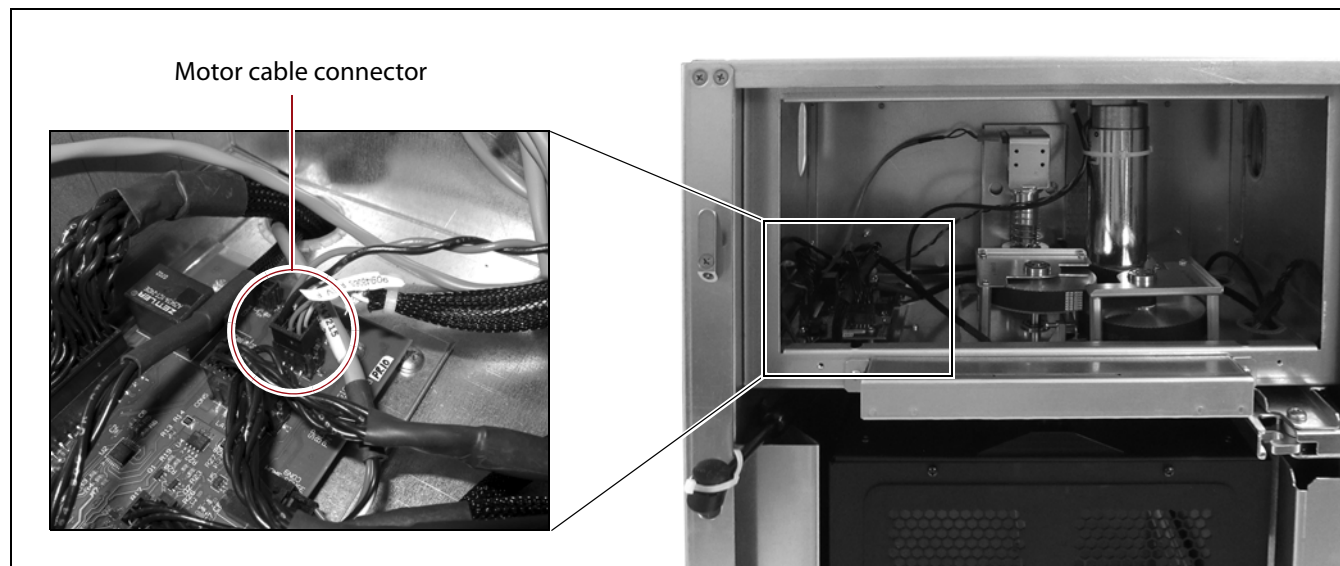


Figure 59 Disconnect the carousel motor cable from the bulk TAP interface board.

5. In the sensor cable compartment, use a 5/16-inch Allen wrench to install the bearing spindle that secures the bottom of the carousel to the library. Turn the spindle clockwise to install it.



Figure 60 Install the bearing spindle.

6. Continue to [Chapter 8 – Install the Front Panel and Compartment Covers](#), beginning on page 58.

CHAPTER 8

Install the Front Panel and Compartment Covers

This chapter provides detailed instructions for installing the bulk TAP compartment covers and front panel after completing the replacement procedure.

Estimated Time = 30 minutes

Topic	Described beginning on...
Install the Carousel Motor Compartment Cover	page 59
Install the Sensor Cable Compartment Cover	page 59
Install the Frame Cross Brace and Fan Sensor Switch	page 60
Install the HAX Motor Compartment Cover	page 61
Install the Front Panel	page 62
Install the Bulk TAP Door	page 64
Install the Fan Assembly	page 66
Install the Filter Cover	page 67
Install the Light Bar	page 67

INSTALL THE CAROUSEL MOTOR COMPARTMENT COVER

1. Position the carousel motor cover over the motor compartment.
2. Using a #2 Phillips screwdriver and the four screws you previously removed, install the cover over the carousel motor compartment.



Figure 61 Install the carousel motor compartment cover.

INSTALL THE SENSOR CABLE COMPARTMENT COVER

1. Position the cover over the sensor cable compartment.
2. Using a #2 Phillips screwdriver, install the four screws to secure the cover to the frame.

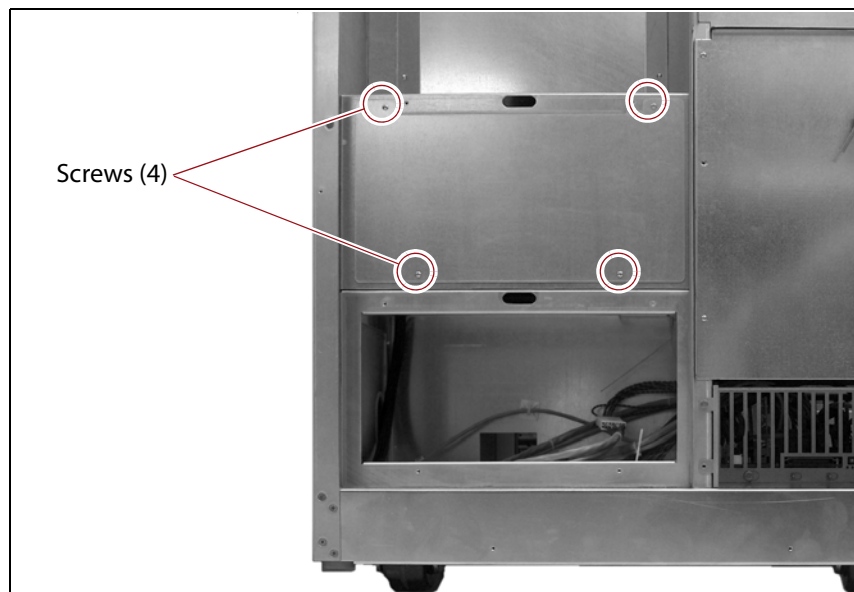


Figure 62 Install the sensor cable compartment cover.

INSTALL THE FRAME CROSS BRACE AND FAN SENSOR SWITCH

1. Orient the frame cross-brace with the end that has the two threaded holes close together to the right and position it as shown in [Figure 63](#).

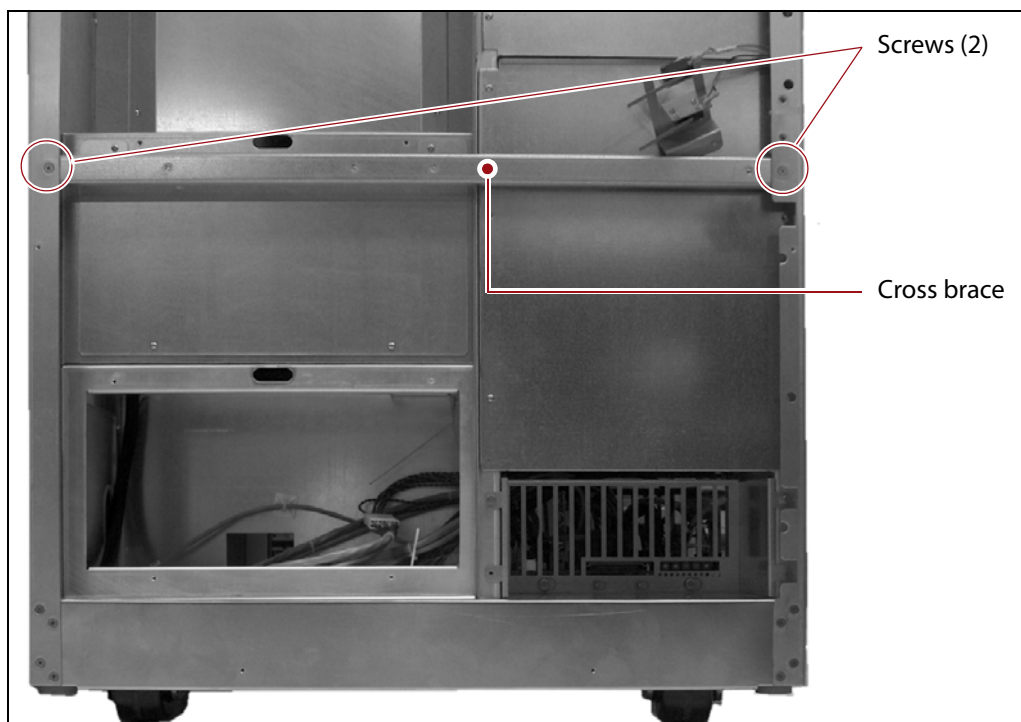


Figure 63 Install the frame cross brace.

2. Using a #2 Phillips screwdriver, install the two screws securing the frame cross brace to the frame.
3. Position the filter sensor switch mounting bracket under the right-hand edge of the frame, aligning the threaded screw holes with the holes in the frame.
4. Using a #2 Phillips screwdriver, install the two screws to secure the filter sensor switch assembly to the frame (see [Figure 64](#)).

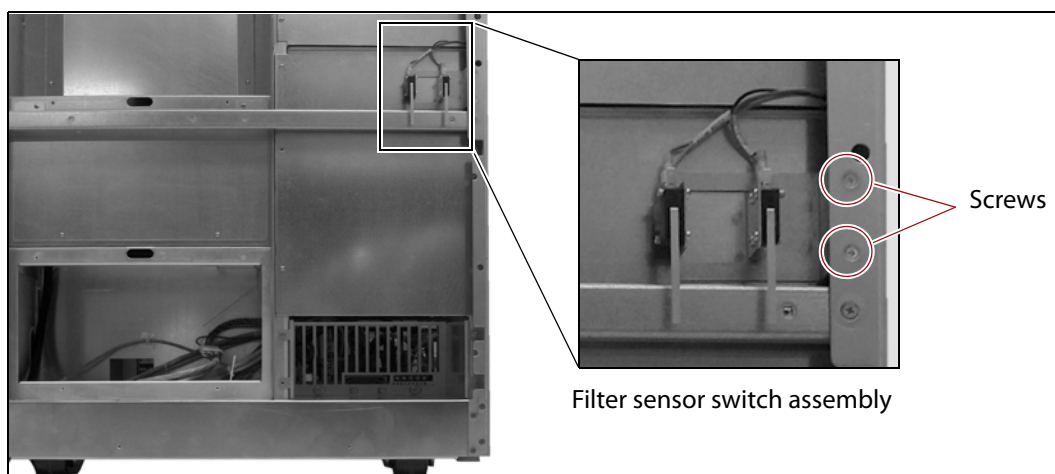


Figure 64 Attach the fan sensor switch assembly to the frame.

INSTALL THE HAX MOTOR COMPARTMENT COVER

1. Position the cover over the HAX motor compartment.
2. Using a #2 Phillips screwdriver, install the four screws to secure the cover to the frame.

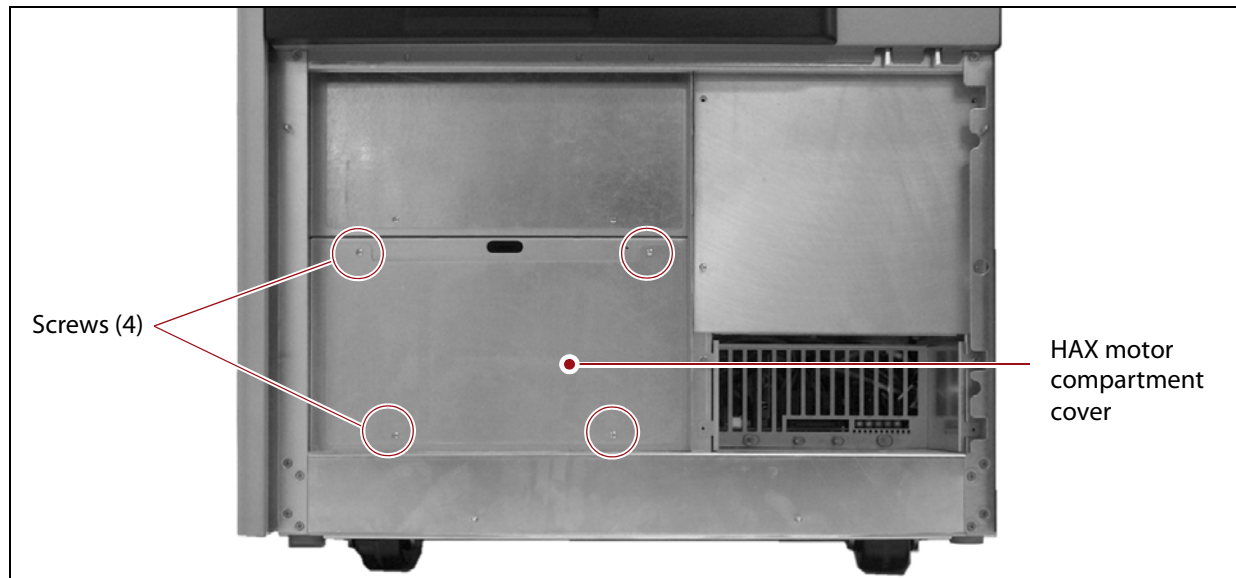


Figure 65 Install the HAX motor compartment cover.

INSTALL THE FRONT PANEL

1. Rotate the door control arms to the right, toward the opening for the door, so that they will not be in the way as you install the front panel.

**Caution**

When moving the lower control arm, be careful not to bump the position sensor mounted near it.

2. Grasp the sides of the panel and lift it onto the two hangers at the top of each side of the frame. Slide the panel straight down to engage all four hangers.

**Caution**

Be careful not to damage the door control arms as you slide the front panel into place.

**Important**

Be careful not to trap the bulk TAP door release switch cable under the panel as you install it.

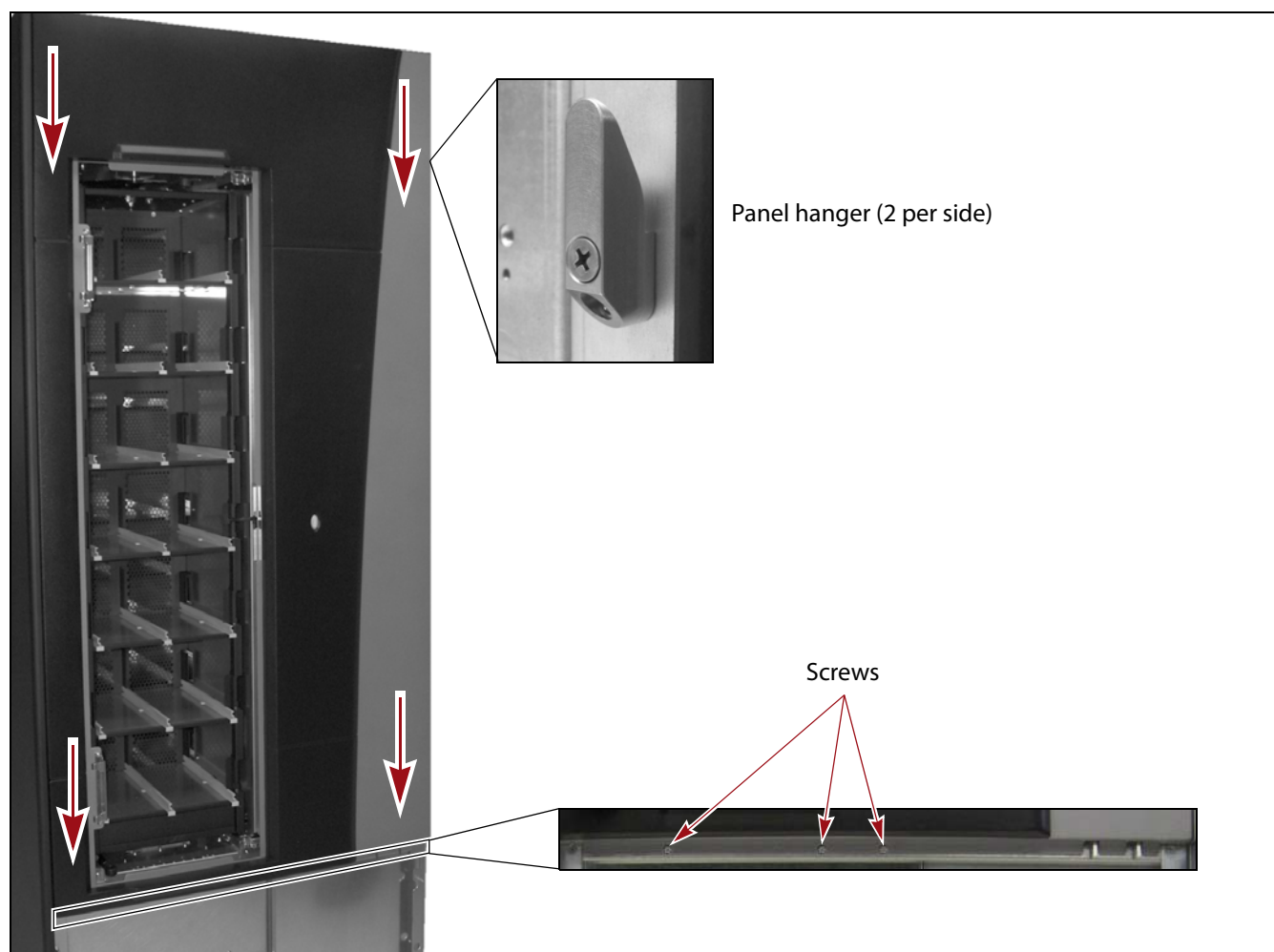


Figure 66 Slide the front panel down to engage the hangers and then install the screws at the bottom.

3. Using a #2 Phillips screwdriver, install the three screws that secure the bottom of the cover to the frame (see [Figure 66](#)).
4. Connect the door release switch cable to the connector on the right-hand side of the bulk TAP door frame. The connector is keyed and only fits one way.

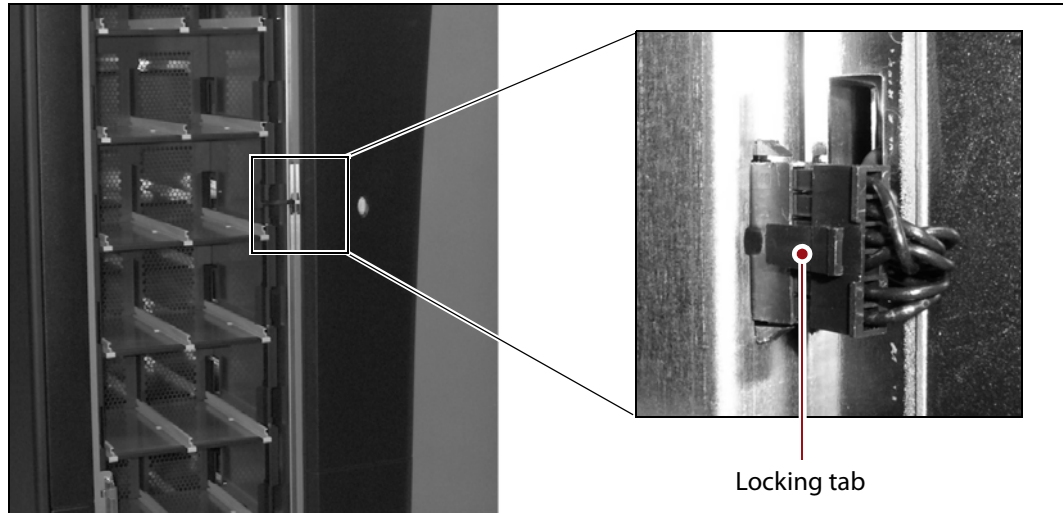


Figure 67 Connect the door release switch cable to the connector on the bulk TAP door frame.

5. If a cover was installed over the door release switch connector, slide it into place and use a #2 Phillips screwdriver to install the two screws securing the cover in place.

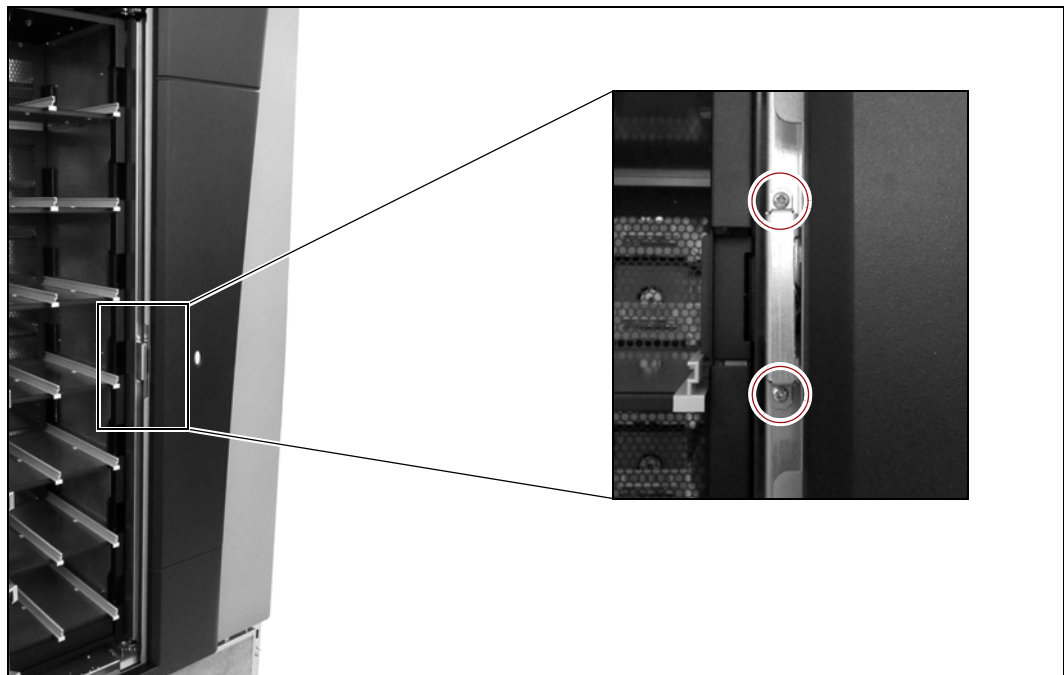


Figure 68 Install the door release switch connector cover.

INSTALL THE BULK TAP DOOR

1. Rotate the door control arms so that they are inside the bulk TAP opening.
2. Make sure that the hinge pins on both of the door-side hinge sections are in the retracted position.
3. Position the door in the opening of the bulk TAP so that the hinges on the left side are aligned.
4. Slide the half of each hinge that is mounted on the door into the corresponding half on the front of the frame.
5. Position the latching pins so that they align with the corresponding openings on the door half of the hinge.
6. Rotate the latching pins to the left until the inner pins slide into and engages the outer half of the hinge.

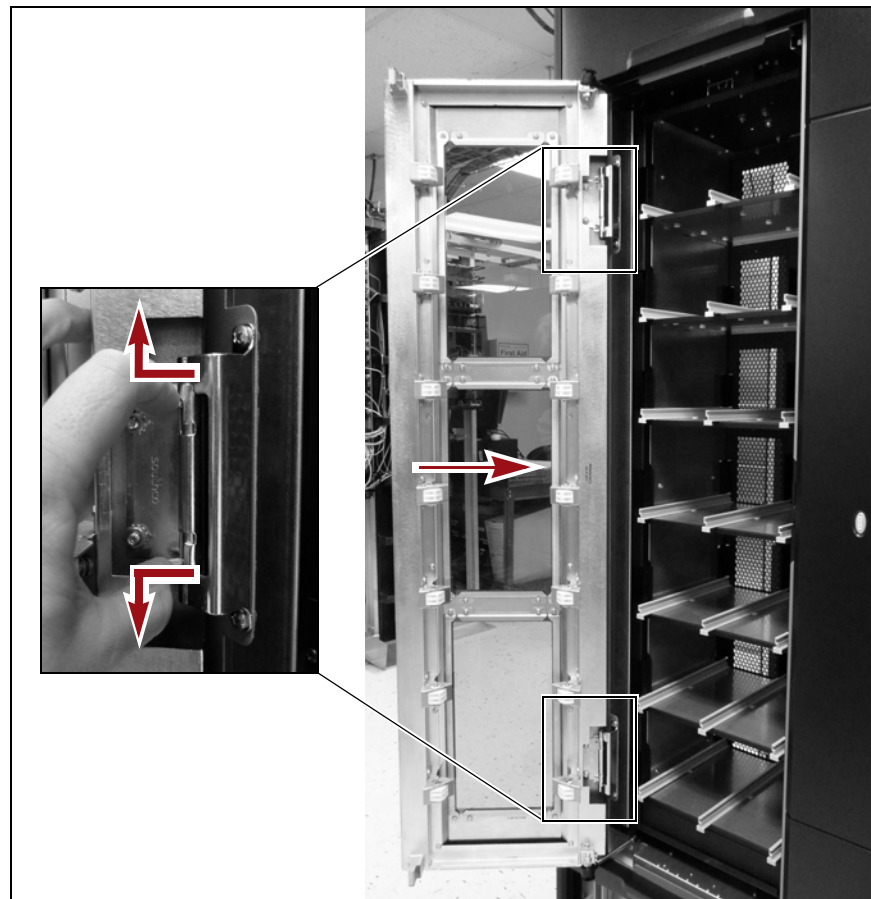


Figure 69 Install the bulk TAP door.

7. Connect the upper and lower control arms to the bulk TAP door.

Note: The relative positions of the ball joint and the socket on the control arm depend on whether you are working at the top or the bottom end of the bulk TAP door.

The upper control arm socket is positioned above the ball joint and its cap is on the top; the lower control arm socket is positioned below the ball joint and its cap is on the bottom.

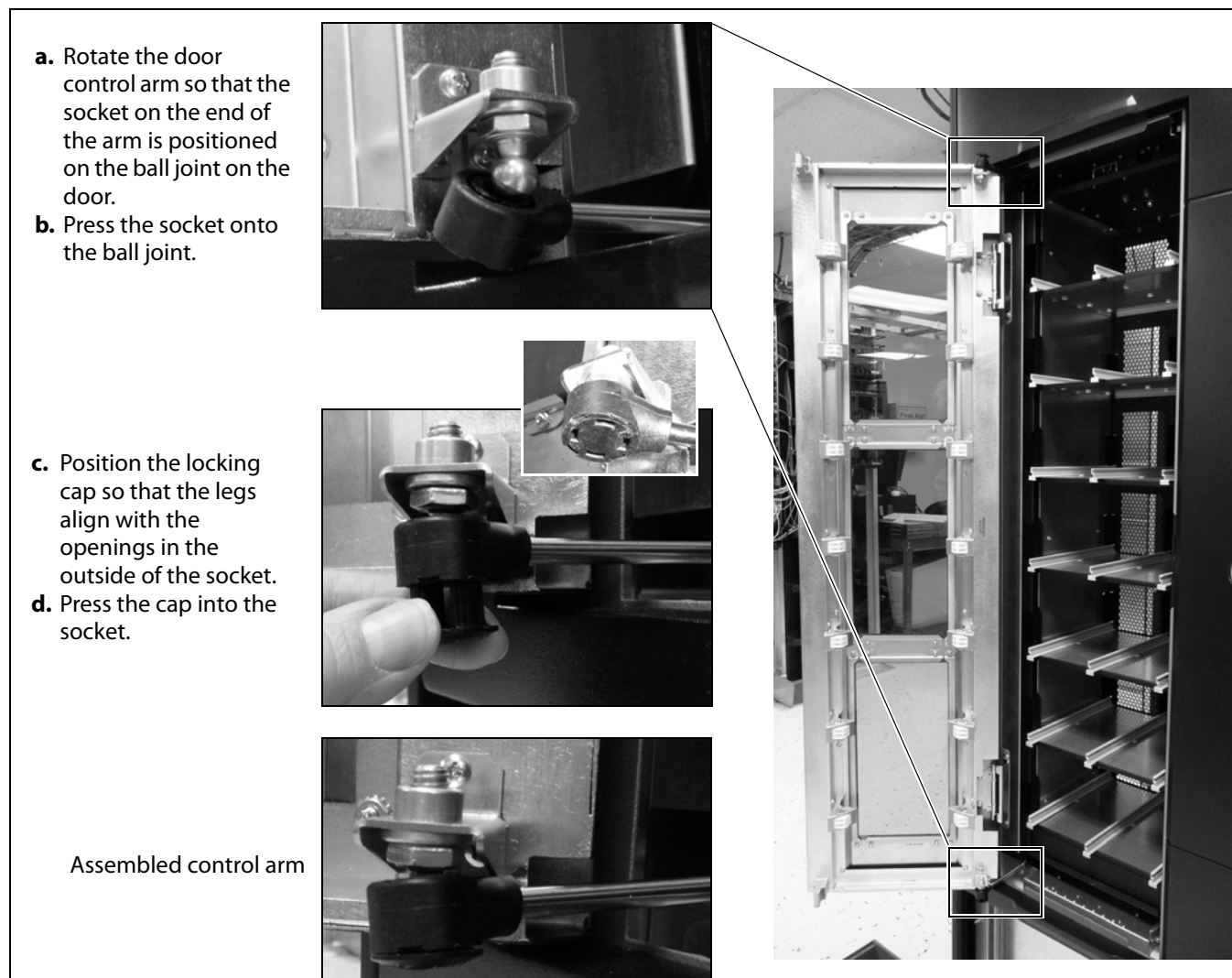


Figure 70 Connect the control arms to the bulk TAP door (lower ball joint and control arm shown).

- Rotate the door control arm so that the socket on the end of the arm is positioned on the ball joint on the door.
- Press the socket onto the ball joint.
- Position the locking cap so that the legs fit into the openings in the socket.

Notes:

- The cap is on the top of the upper control arm socket and on the bottom of the lower control arm socket.
- You may need a step ladder to reach the upper control arm cap.

- d. Press the locking cap into the socket. The cap secures the ball in the socket so that it cannot come loose.
 - e. Repeat [Step a](#) through [Step d](#) to install the other control arm.
8. Close the bulk TAP door.

INSTALL THE FAN ASSEMBLY

1. Carefully slide the fan assembly straight into the opening in the bottom front of the frame.
Note: Make sure that the tab on the filter is pressing in on the filter sensor switch.
2. Push inward on the bottom center of the fan assembly to seat the connector mounted on the back of the assembly.
3. Use a #2 Phillips screwdriver to tighten the four captive screws to secure the fan assembly to the frame.

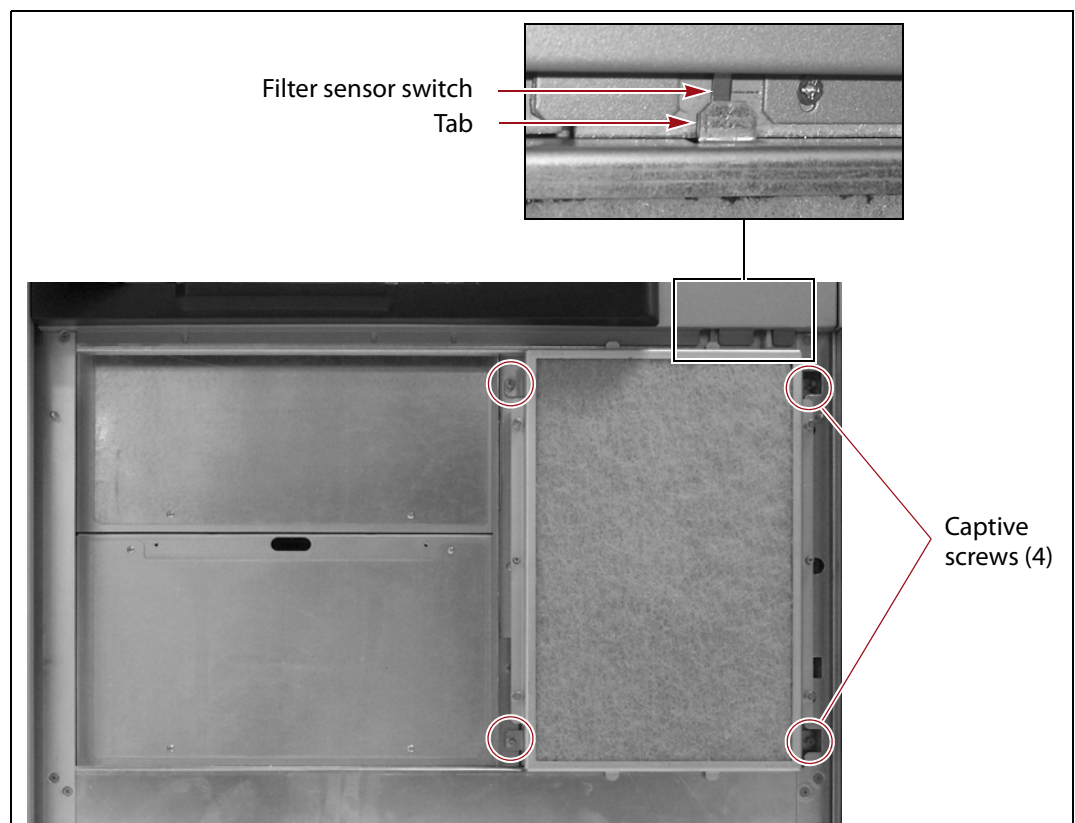


Figure 71 Tighten the captive screws to secure the fan assembly to the frame.

INSTALL THE FILTER COVER

1. Position the filter cover over the bottom of the frame with the handle toward the top (see [Figure 8 on page 15](#)).
2. Firmly push inward on the sides of the cover to snap it onto the ball studs extending from each side of the frame.

INSTALL THE LIGHT BAR

1. Orient the light bar with the curved edge toward the front of the library.



Caution The light bar is fragile. Handle it with care as you install it.

2. Position the light bar so that the ball studs on the bottom of the bar align with the holes in the top edge of the chassis.

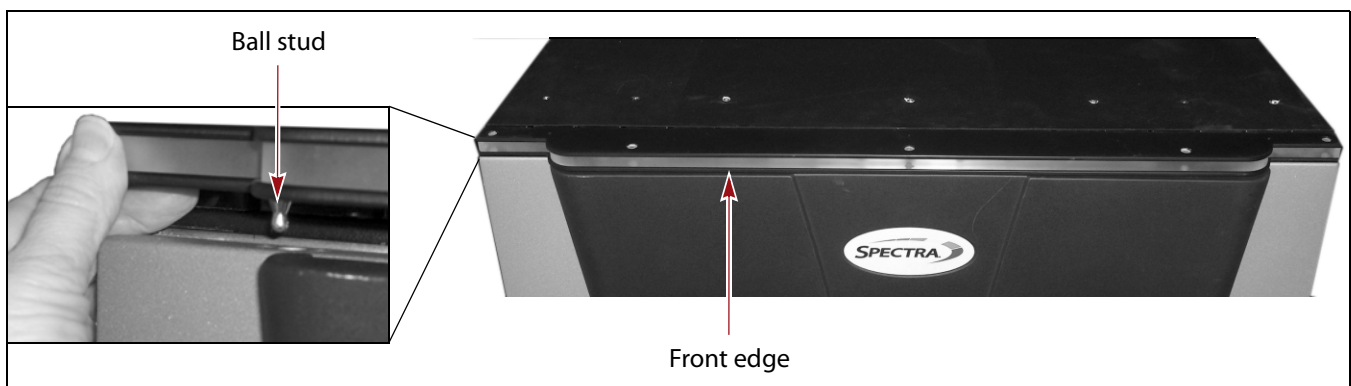


Figure 72 Install the light bar.

3. Press the light bar down to engage the ball studs with the snap-in connectors in the top of the chassis.

CHAPTER 9

Complete the Replacement

This chapter provides detailed instructions for testing the bulk TAP after completing the replacement procedure.

Estimated Time = 30 minutes

Topic	Described beginning on...
Test the Replacement	page 68
Power on the Library	page 68
Run Bulk TAP Test Diagnostic	page 69
Return the Component	page 70
Return Guidelines	page 70

TEST THE REPLACEMENT

After you install the replacement component, use the following steps to confirm that the bulk TAP is operating properly.

Power on the Library

1. If your library does not have an AC breaker locking plate installed, continue to [Step 2](#), otherwise use the following instructions to remove the locking plate.
 - a. Open the padlock and remove it from the locking plate.
 - b. Slide the locking plate to the left and out of the locking base plate.
2. Connect the power cords to the main frame and each drive frame.
3. Set the main AC breaker switches on the back of the main frame and each drive frame to the **on** (up) position.
4. Press and hold the front panel power button until the LCD turns on. Wait for the library to complete its initialization process.

Run Bulk TAP Test Diagnostic

1. From the front panel, log into the library.
2. Select **Maintenance** → **Diagnostics**. The Diagnostic screen displays.
Note: The **Bulk TAP Test** diagnostic is not available through the remote library connection.
3. Click **Bulk TAP Test**. The screen refreshes to show the details of the diagnostic.

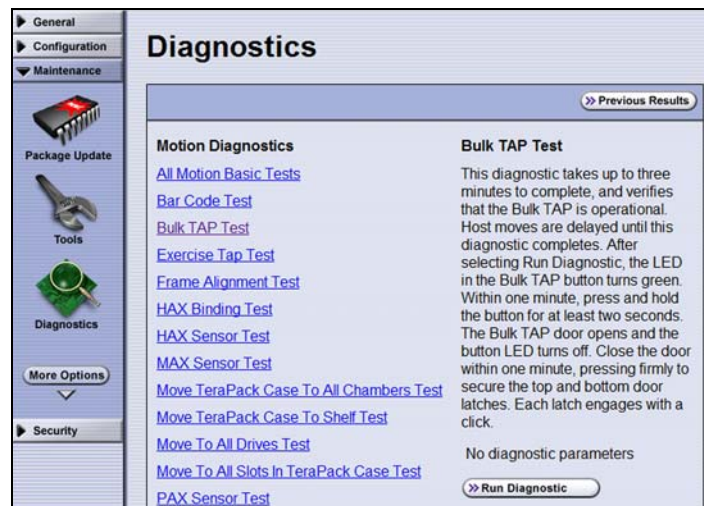


Figure 73 Run the Bulk TAP Test diagnostic.

4. Click **Run Diagnostic**. The library performs a series of tests to verify that the bulk TAP is functioning normally. If any of the diagnostic tests fail, contact Spectra Logic Technical Support for assistance (see [Contacting Spectra Logic](#) on page 2).

RETURN THE COMPONENT

Return Guidelines

Unless Spectra Logic Technical Support informs you otherwise, return the defective component to Spectra Logic following the guidelines in this section. If Spectra Logic Technical Support informs you that the component does not need to be returned, dispose of it in a manner in conformance with your company guidelines.

Return Procedures

After you complete the replacement procedure, return the defective component using ALL of the packaging material shipped with the replacement component (including any anti-static bags or foam inserts).



Caution

Severe damage can occur if the component is not packaged correctly, and you may be invoiced if it is received with damage due to improper or insufficient packaging.

Use the return label and instructions that were included with the replacement component when preparing to ship the replacement part. If you cannot locate these, contact Spectra Logic for another copy (see [Contacting Spectra Logic on page 2](#)). The return label and RMA printed on it are used to associate the returned part with your account. To avoid being invoiced for failure to return the part, do not ship the part back without the RMA return label.