IBM

Power Systems

5802 and 5877 removal and replacement procedures

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Note

Before using this information and the product it supports, read the information in "Notices," on page 83, "Safety notices" on page v, the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125–5823.

This edition applies to IBM Power Systems™ servers that contain the POWER6® processor and to all associated models.

Contents

Safety notices

Safety notices may be printed throughout this guide:

- **DANGER** notices call attention to a situation that is potentially lethal or extremely hazardous to people.
- **CAUTION** notices call attention to a situation that is potentially hazardous to people because of some existing condition.
- **Attention** notices call attention to the possibility of damage to a program, device, system, or data.

World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, a safety information booklet is included in the publications package shipped with the product. The booklet contains the safety information in your national language with references to the U.S. English source. Before using a U.S. English publication to install, operate, or service this product, you must first become familiar with the related safety information in the booklet. You should also refer to the booklet any time you do not clearly understand any safety information in the U.S. English publications.

German safety information

Das Produkt ist nicht für den Einsatz an Bildschirmarbeitsplätzen im Sinne § 2 der Bildschirmarbeitsverordnung geeignet.

Laser safety information

IBM® servers can use I/O cards or features that are fiber-optic based and that utilize lasers or LEDs.

Laser compliance

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:
This product might contain one or more of the following devices: CD-ROM drive, DVD-ROM drive, DVD-RAM drive, or laser module, which are Class 1 laser products. Note the following information:

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of the controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

(C026)

CAUTION:
Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. (C027)

CAUTION:
This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

CAUTION:
Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information: laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

Power and cabling information for NEBS (Network Equipment-Building System) GR-1089-CORE

The following comments apply to the IBM servers that have been designated as conforming to NEBS (Network Equipment-Building System) GR-1089-CORE:

The equipment is suitable for installation in the following:

- Network telecommunications facilities
- Locations where the NEC (National Electrical Code) applies

The intrabuilding ports of this equipment are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding ports of this equipment *must not* be metallically connected to the interfaces that connect to the OSP (outside plant) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

Note: All Ethernet cables must be shielded and grounded at both ends.

The ac-powered system does not require the use of an external surge protection device (SPD).

The dc-powered system employs an isolated DC return (DC-I) design. The DC battery return terminal *shall not* be connected to the chassis or frame ground.

Removal and replacement procedures

This topic collection contains instructions for removing and replacing parts, verifying the repair, and closing a service call.

Both HMC and non HMC removal and replacement procedures are provided.

- If the expansion unit has an HMC, see "HMC-based procedures."
- If the expansion unit does not have an HMC, see "Non-HMC-based procedures."

HMC-based procedures

Use the Service Focal Point application on the Hardware Management Console (HMC) to find information about how to remove and replace parts.

Follow these procedures to access the Service Focal Point application:

1. Log into the HMC as the service representative.
2. In the navigation area, select **Servers** from the **Systems Management** navigation.
3. Select the server that requires a parts exchange.
4. Select **Serviceability**, then **Hardware**, and then **Exchange FRU**.
5. The **Exchange FRU** window opens. Select the FRU to exchange, next click on **Launch Procedure**, and follow the instructions.

Non-HMC-based procedures

Use the removal and replacement procedures when you repair, maintain, or exchange your system parts.

The removal and replacement procedures are divided into field replaceable units (FRUs) and customer replaceable units (CRUs). CRUs can be removed and replaced by customers, but FRUs can only be removed and replaced by an IBM authorized service representative.

Use the following procedures after the server has identified a failing part. The server information details how to activate and deactivate LEDs. After the part or parts are replaced, refer to the server's documentation to verify the repair, and close the service call.

Backplane (CRU)

Use this procedure to install and remove the backplane.

Removing the backplane

If your system is managed by the IBM Systems Director Management Console (SDMC), use the SDMC to complete the steps for removing the disk drive backplane from the server. For instructions, see Removing a part using the Systems Director Management Console.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing the disk drive backplane from the server. For information about using the HMC to remove the disk drive backplane, see Removing a part using the Hardware Management Console.

If you do not have an HMC or SDMC, complete the following steps to remove the disk drive backplane:

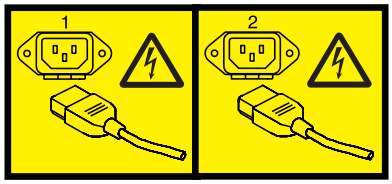
1. Perform the prerequisite tasks as described in "Before you begin" on page 51.
2. Do one of the following steps, as applicable:

a. If you are removing the disk drive backplane for a system upgrade or as part of another procedure, continue to step 3.
b. If you are removing the disk drive backplane because of a system failure, use the service action log to help identify the failing part. See Identifying a failing part.

3. Stop the system or logical partition. For instructions, see Stopping a system or logical partition.
4. Disconnect power from the 5802 expansion unit by unplugging the system.

   Note: This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

   (L003)



or

5. Open the front rack door.
6. Remove the disk drives and fillers from the backplane in the 5802 expansion unit as shown in Figure 1 on page 3. Record the location of each of the disk drives you remove. The disk drives must be reinstalled to the same location again.
   a. Squeeze the latch of the disk drive and pull the handle **(A)** toward you to release the drives.
   b. Supporting the bottom of the disk drive with your hand, slide it out of the backplane.

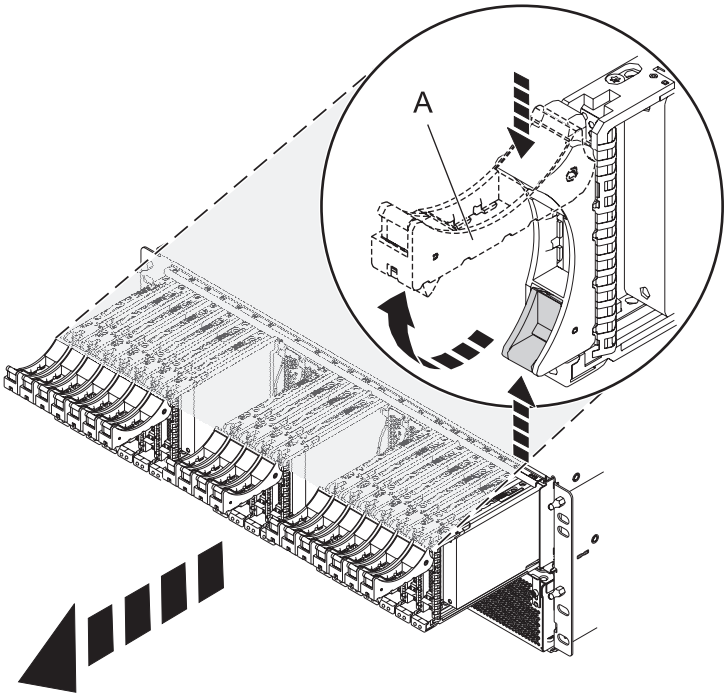


Figure 1. Removing the disk drives from the backplane

7. Remove the port cards and fillers from the backplane in the 5802 expansion unit as shown in Figure 2 on page 4.
   a. Grasp the end of the latching handle **(A)** and pull it upward to unlock the port card.
   b. Using your hand to support the bottom of the port card, slide it out of the backplane.
   c. Place the port card on an electrostatic discharge (ESD) surface.

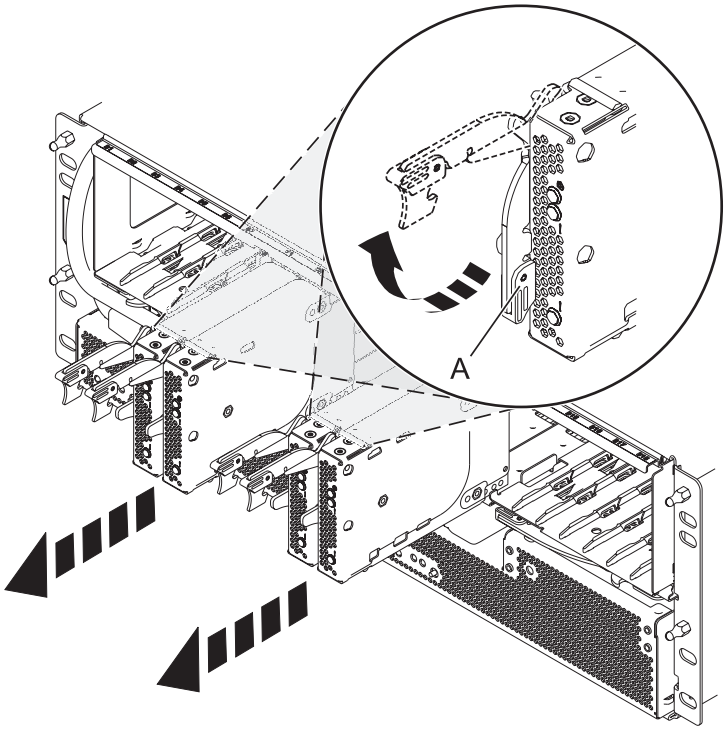


Figure 2. Removing the port card from the backplane

8. Remove the backplane from the 5802 expansion unit as shown in Figure 3 on page 5 or the backplane filler from the 5877 expansion unit as shown in Figure 4 on page 5.

   CAUTION:
   The backplane in the 5802 expansion unit might be heavy. Ensure that you can safely complete the procedure.

   a. Squeeze the blue latches **(A)** to unlock the handles.
   b. Pull the handles **(B)** outward in the direction shown to release the backplane.
   c. Slide the backplane out of the enclosure, using your hand to support the bottom of the backplane.

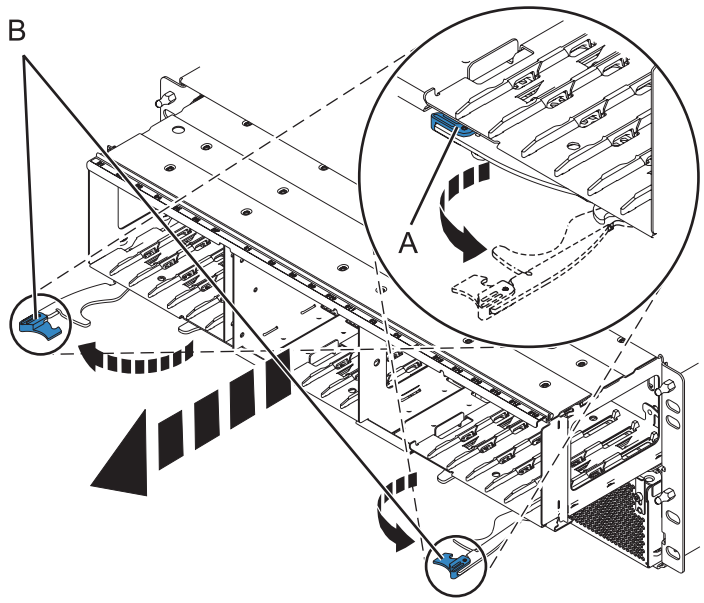


Figure 3. Removing the backplane from the enclosure

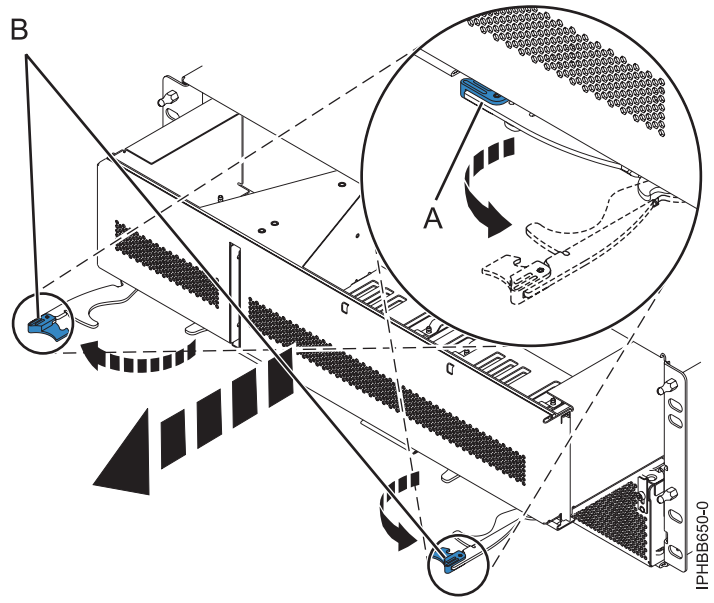


Figure 4. Removing the backplane filler from the enclosure

Replacing the backplane

If your system is managed by the IBM Systems Director Management Console (SDMC), use the SDMC to complete the steps for replacing the disk drive backplane in the server. For instructions, see Replacing a part using the Systems Director Management Console.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing the disk drive backplane in the server. For instructions, see Exchanging a part using the Hardware Management Console.

If you do not have an HMC or SDMC, complete the following steps to replace the disk drive backplane:

1. Perform the prerequisite tasks as described in "Before you begin" on page 51.
2. To replace the disk drive backplane or backplane filler, lift the backplane along the two sides and align it with the guide rails in the expansion unit.

   CAUTION:
   The backplane for the 5802 expansion unit might be heavy. Ensure that you can safely perform this task before you begin.
3. Using your hand to support the bottom of the backplane or backplane filler, slide it into the expansion unit as shown in Figure 5 or Figure 6 on page 7.
4. Secure the backplane in place by moving the locking tabs from the open position **(B)** to the locked position **(A)**.

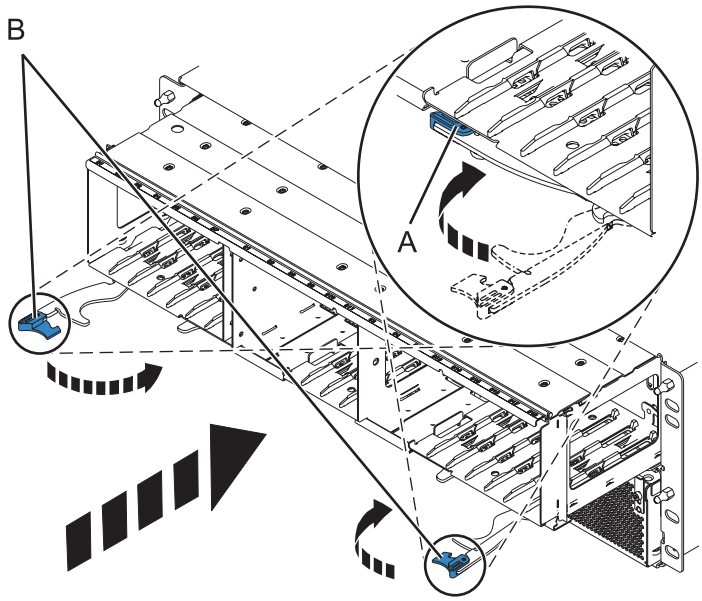


Figure 5. Installing the backplane on a rack-mounted model

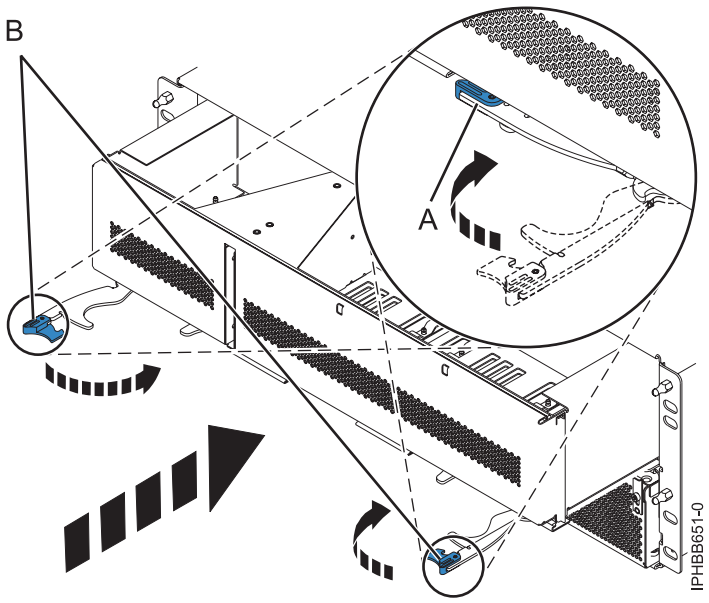
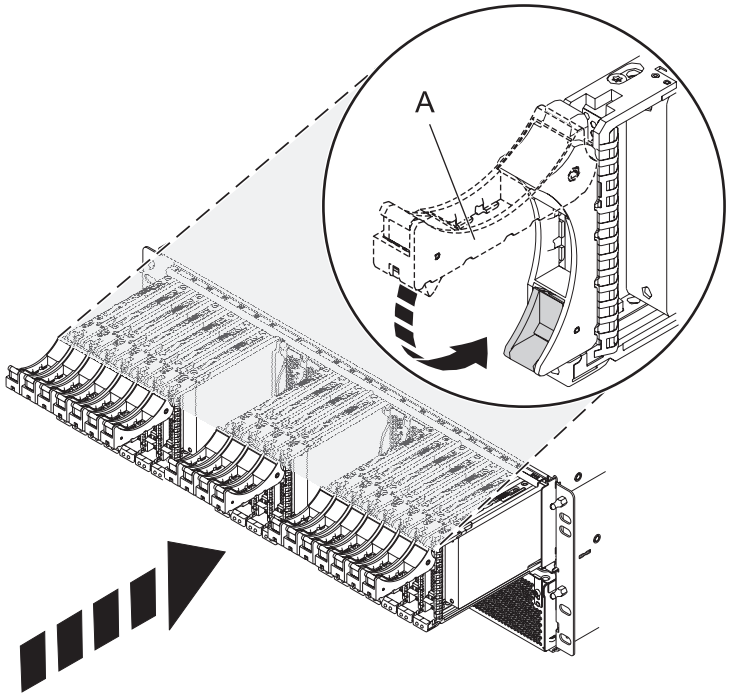


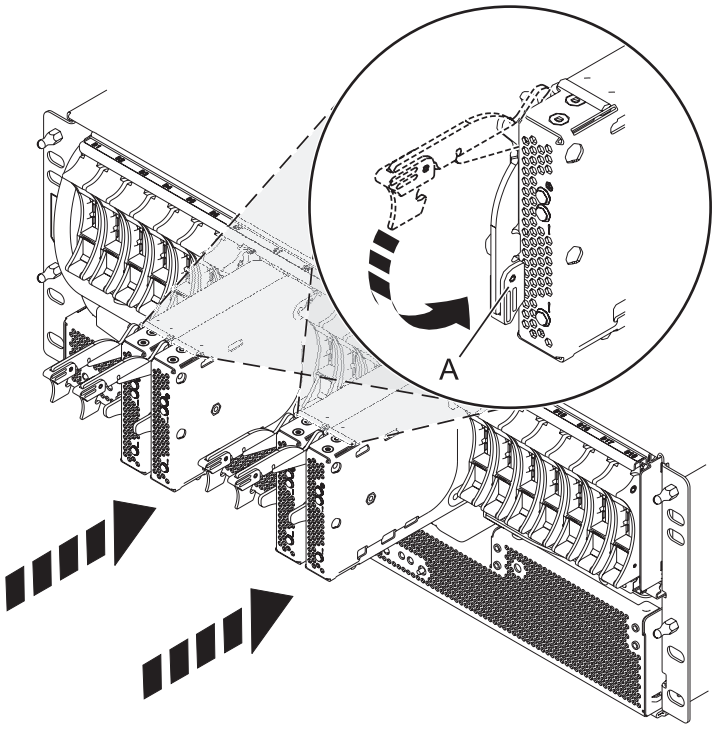
Figure 6. Installing the backplane filler on a rack-mounted model

5. Replace all disk drive units and fillers, if you removed them earlier.
   a. Support the bottom of the disk drive unit as you align it with the guide rails in the backplane.
   b. Slide the disk drive unit all the way into the backplane.
   c. Move the handle **(A)** toward the disk drive unit to lock it into place.



6. Replace all expander cards and fillers, if you removed them earlier.
   a. Supporting the bottom of the expander card with your hand, align it with the guide rails in the backplane.

b. Slide the expander card all the way into the backplane.
c. Move the handle **(A)** toward the card to lock it into place.



7. Connect the power cords to the back of the enclosure as shown in Figure 7.

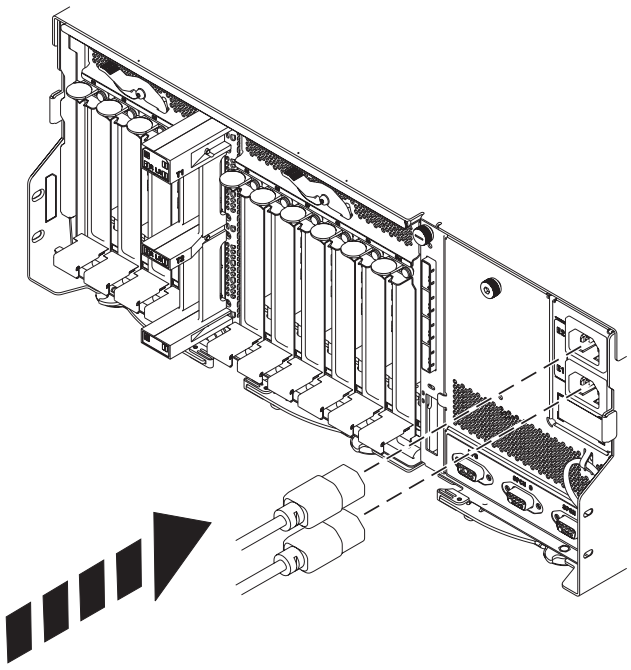


Figure 7. Connecting the power cords

8. Close the front rack door.

9. Place the system in the operating position. For instruction, see Placing the rack-mounted system or expansion unit in the operating position.
10. Start the system. See Starting the system or logical partition.
11. Verify the installed part. For instructions, see Hardware service manager Verify option.

Disk drive (CRU)

Use this procedure to install and remove disk drives.

See Disk drives for instructions on installing and removing disk drives.

Enclosure management controller (CRU)

Use this procedure to install and remove the enclosure management controller (EMC).

Removing the enclosure management controller card

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing the enclosure management controller from the server. For instructions, see Exchanging a part using the Hardware Management Console.

If you do not have an HMC, complete the following steps to remove the enclosure management controller:

1. Perform the prerequisite tasks as described in “Before you begin” on page 51.
2. Complete one of the following choices as appropriate:
   - If you are removing the enclosure management controller for a system upgrade or as part of another procedure, continue to the next step.
   - If you are removing the enclosure management controller because of a system failure, use the service action log to help identify the failing part. For instructions, see Identifying a failing part.
3. Stop the system. For instructions, see Stopping a system or logical partition.
4. Disconnect the power source from the system by unplugging the system.

   Note: This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

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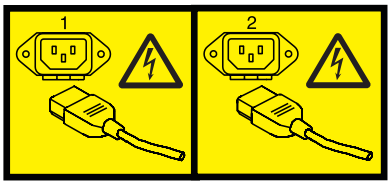


or

5. Disconnect and label the cables from the enclosure management controller.
6. Squeeze in on the latch **(B)** and pull the lever **(A)** away from the system as shown in the following figure.

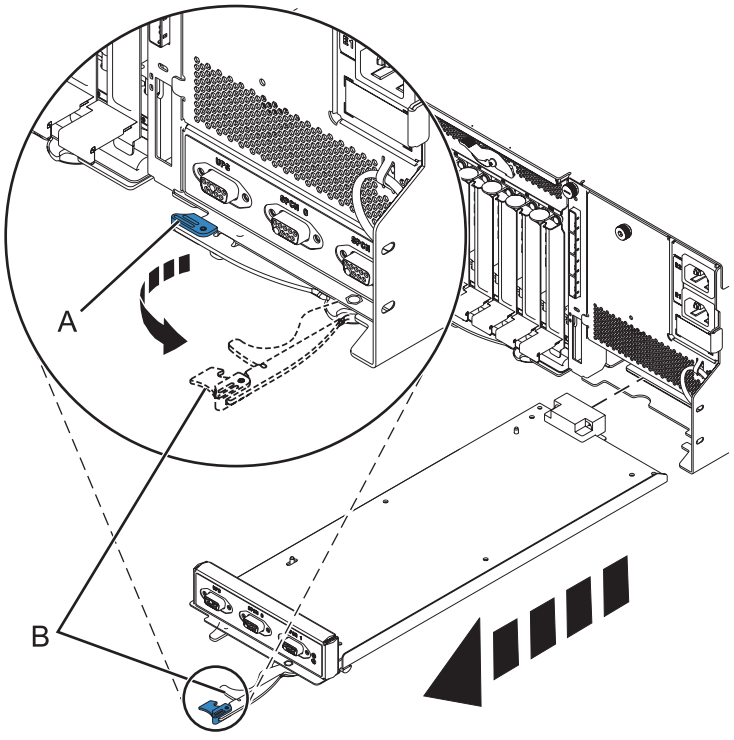


Figure 8. Removing the enclosure management controller from the system

7. Pull the enclosure management controller out of the system.

- If you removed the enclosure management controller as a part of another procedure, continue with that procedure.
- To replace the enclosure management controller or install a new controller, see Replacing the 5802 enclosure management controller .

Replacing the enclosure management controller card

To remove the enclosure management controller, see Removing the 5802 enclosure management controller.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing the enclosure management controller in the server. For instructions, see Exchanging a part using the Hardware Management Console.

If you do not have an HMC, complete the following steps to replace the enclosure management controller:

1. Perform the prerequisite tasks as described in "Before you begin" on page 51.
2. Carefully slide the enclosure management controller into the system and close the latch **(A)** as shown in the following figure.

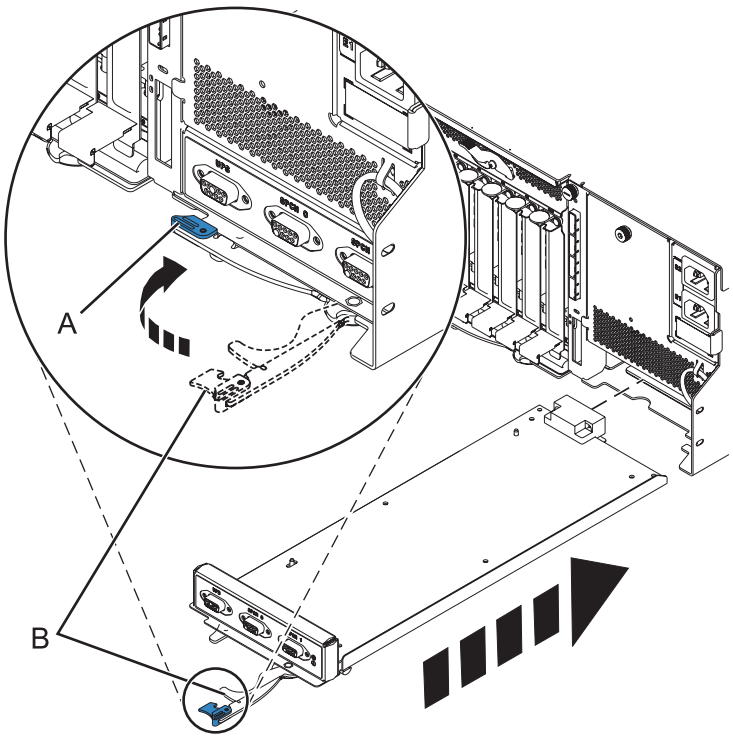


Figure 9. Replacing the enclosure management controller

3. Start the system. For instructions see, Starting the system or logical partition.
4. Verify the installed part. For instructions, see Verifying the installed part.

I/O planar (CRU)

Use this procedure to install and remove the planar.

Removing the I/O planar

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for removing the I/O planar from the server. For instructions, see Exchanging a part using the Hardware Management Console.

If you do not have an HMC, complete the following steps to remove the I/O planar:

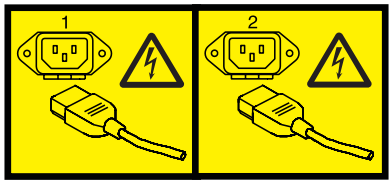
1. Perform the prerequisite tasks described in "Before you begin" on page 51.
2. Do one of the following steps as appropriate:

- If you are removing the I/O planar for a system upgrade or as part of another procedure, continue to step 3.
- If you are removing the I/O planar because of a system failure, use the service action log to help identify the failing part. See Identifying a failing part.

3. Stop the system. For instructions, see Stopping a system or logical partition.
4. Disconnect the power source from the system by unplugging the system.

   Note: This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

   (L003)



   or

5. Disconnect the cables from the back of the I/O planar.
6. If you need to replace the I/O planar because of an upgrade or system failure, remove the adapters from the I/O planar. For instructions, see Model 5802 and 5877 expansion units, PCI adapters, and cassettes.
7. Squeeze the release latches **(A)** and pull the levers **(B)** out away from the system, as shown in the following figure.

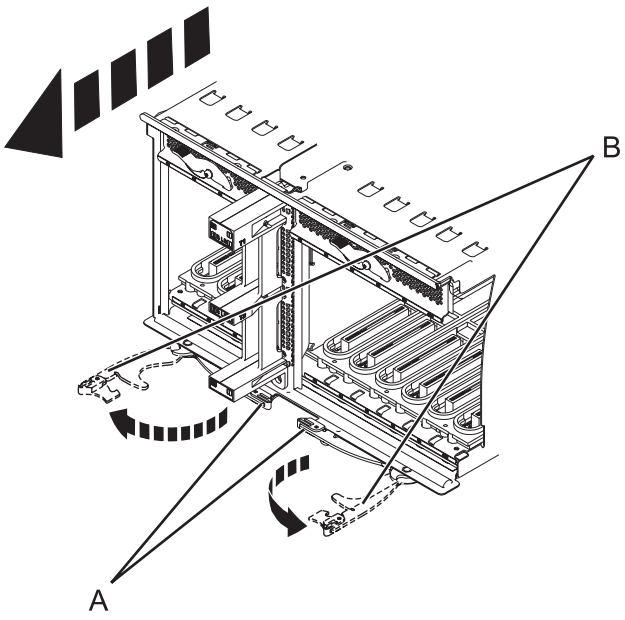


Figure 10. Removing the I/O planar

8. Slide the planar out of the system.

Replacing the I/O planar

To remove the I/O planar, see Removing the 5802 I/O planar.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for replacing the I/O planar in the server. For instructions, see Exchanging a part using the Hardware Management Console.

If you do not have an HMC, complete the following steps to replace the I/O planar:

1. Perform the prerequisite tasks as described in "Before you begin" on page 51.
2. Carefully lift and align the I/O planar with the slot at the back of the expansion unit.
3. Insert the I/O planar firmly into the server, as shown in the following figure.
4. Secure the I/O planar with the locking tabs **(A)** as shown in the following figure.

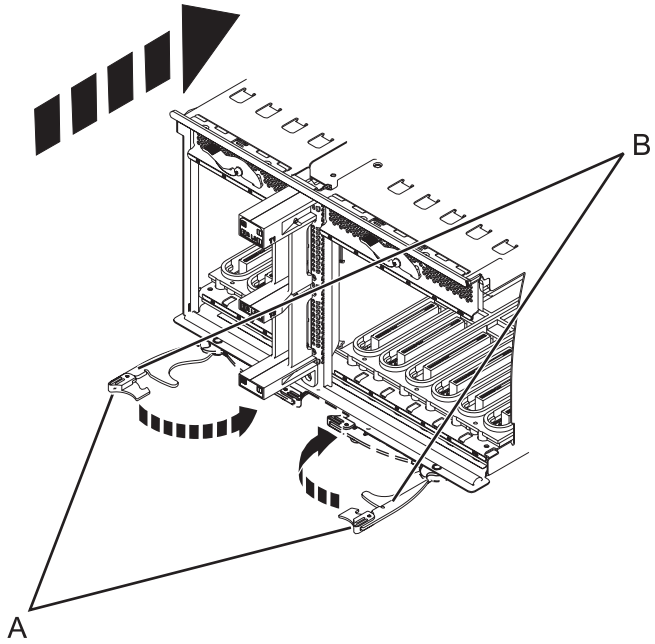


Figure 11. Install the I/O planar on a rack mounted model

If you are replacing the I/O planar as a part of another procedure, return to that procedure now.

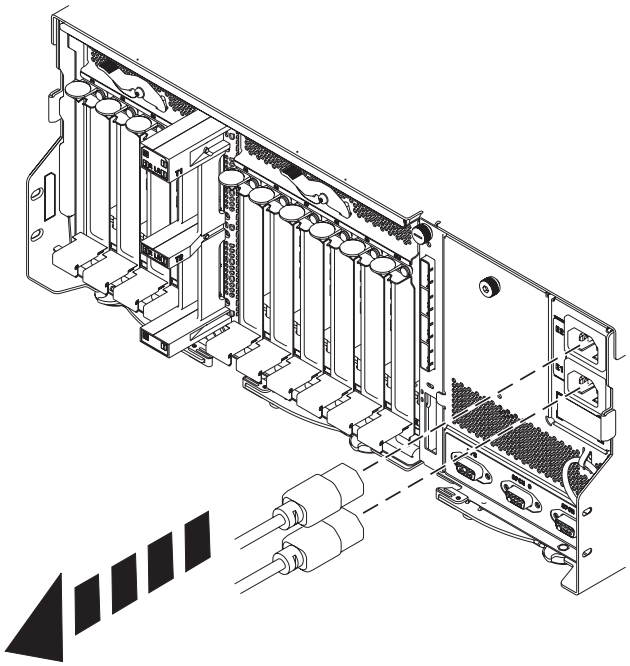
If you are replacing the I/O planar to repair a failed unit, you can now reinstall the adapters and resume operation. For instructions, see Model 5802 and 5877 expansion units, PCI adapters, and cassettes.

Midplane (FRU)

Use this procedure to service the midplane.

This unit is serviced nonconcurrently.

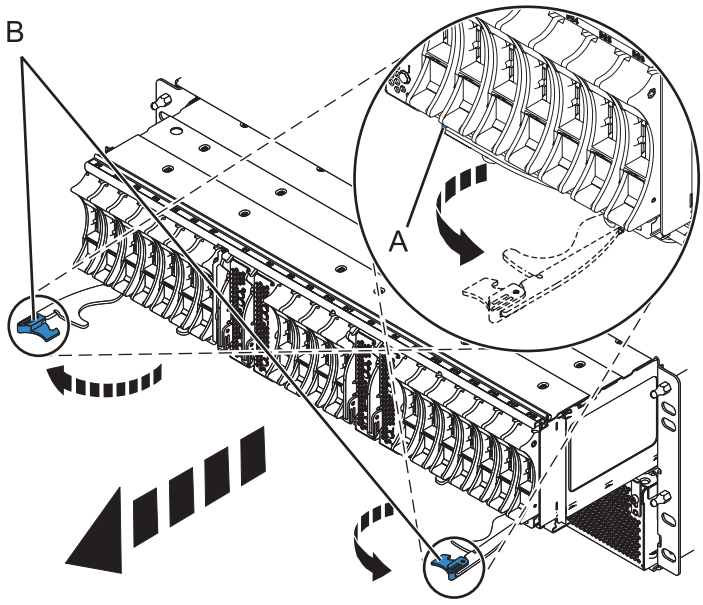
1. Disconnect the enclosure power cord
   - Disconnect both power cords from the back of the enclosure.



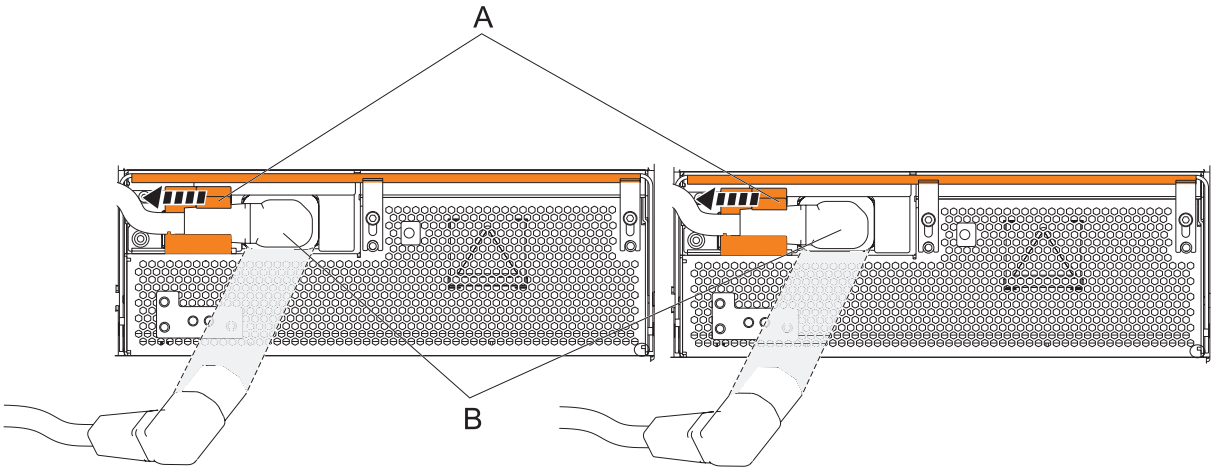
2. Remove the DASD backplane

   Note: This part or unit is heavy. Use care when lifting, removing, or installing this part or unit.

   a. Pinch the latches **(A)** to unlock the handles.
   b. Pull the handles **(B)** outward in the direction shown to unseat the DASD backplane.
   c. While supporting the bottom of the DASD backplane, slide the DASD backplane out of the enclosure.

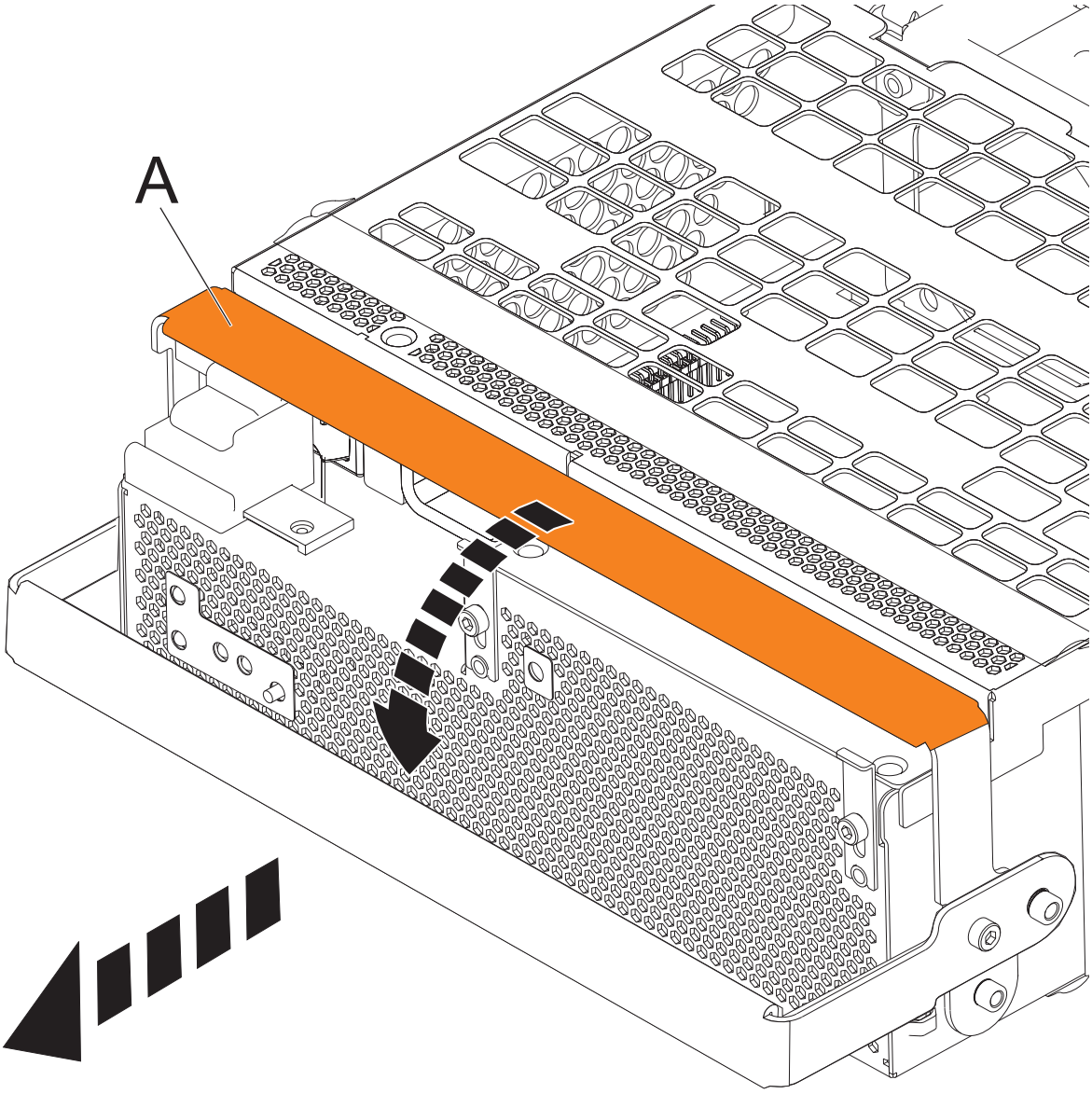


3. Disconnect both Offline Converter Assembly (OCA) power cords
   a. On the front of both OCAs, slide the power cord holders **(A)** to the left.
   b. Label and disconnect both OCA power cords **(B)** from each OCA.

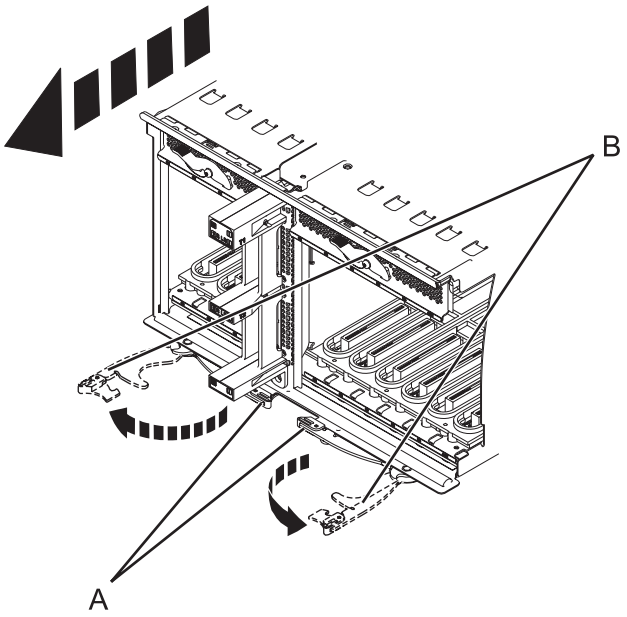


4. Remove both Offline Converter Assemblies (OCAs)
   a. Pull the OCA handle **(A)** all the way down in the direction shown to unseat the OCA.
   b. Grasp both sides of the OCA and pull it out of the enclosure.

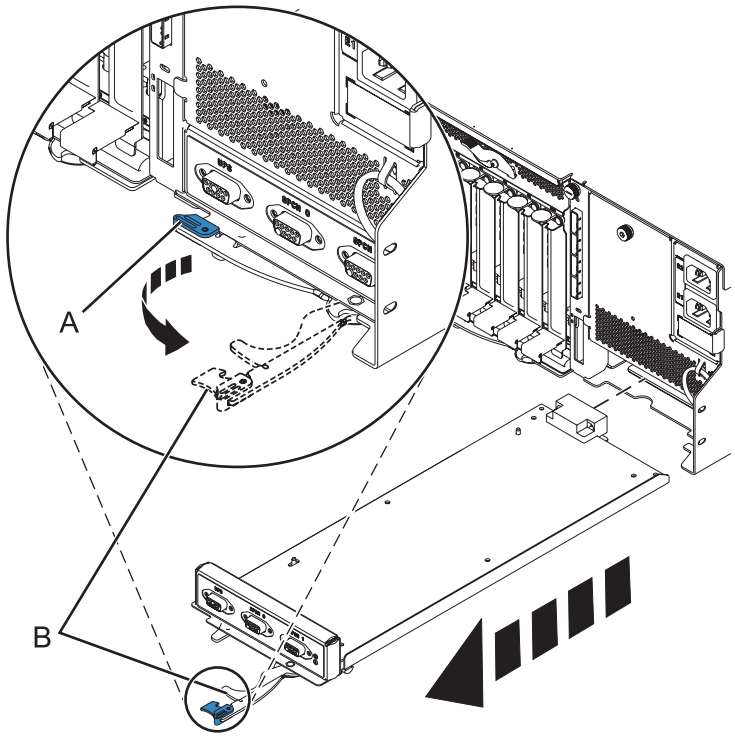
      Note: Use 2 hands to support the OCA as it is pulled out of the enclosure.
   c. Repeat these steps to remove both OCAs.
   d.



5. Remove the IO planar
   a. Pinch the latches **(A)** to unlock the handles.
   b. Pull the handles **(B)** outward in the direction shown to unseat the IO planar.
   c. Supporting the bottom of the IO planar, slide the IO planar out of the enclosure.

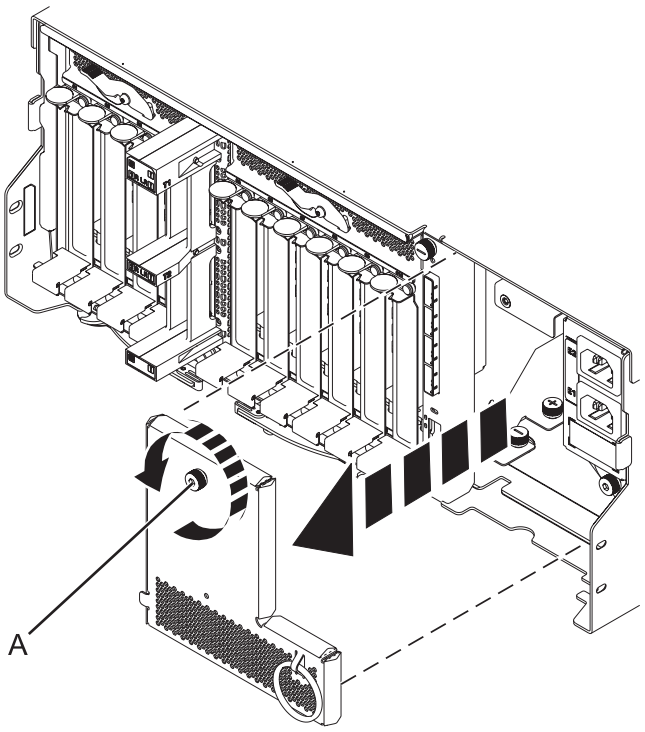


6. Remove the EMC card
   a. Label and disconnect any cables connected to the EMC card.
   b. Pinch the latch **(A)** to unlock the handle **(B)**.
   c. Pull the handle outward in the direction shown to unseat the EMC card.
   d. Slide the EMC card straight out of the enclosure.

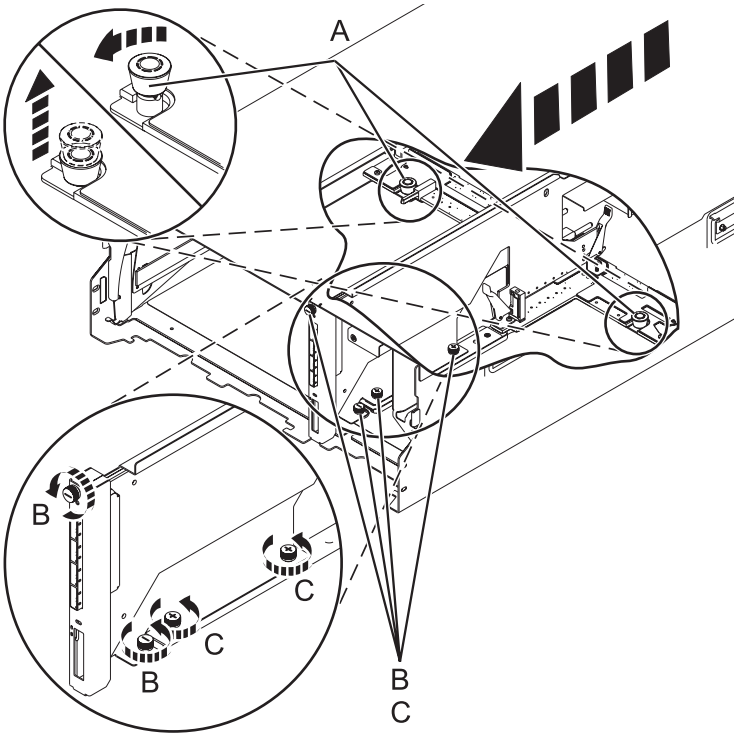


7. Remove the power cord plate

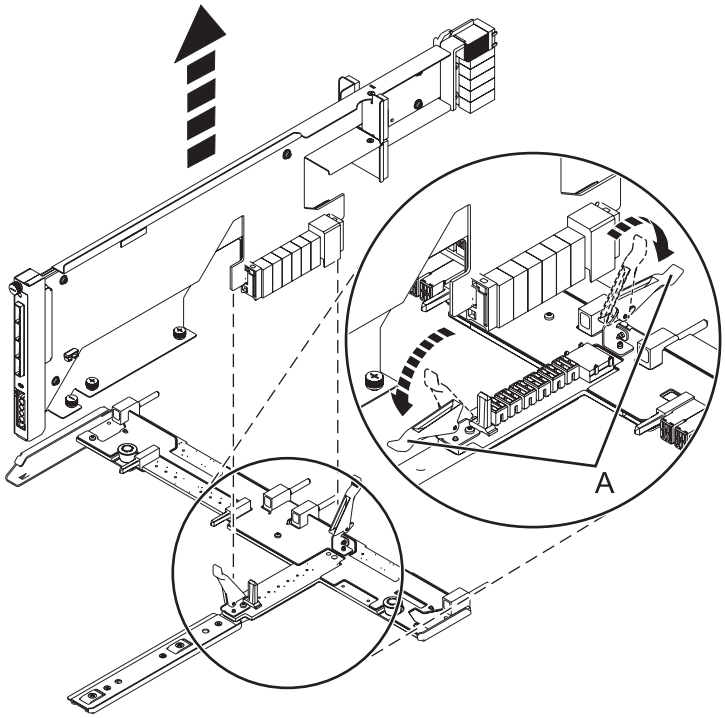
a. Remove the power cord plate at the back of the enclosure by turning thumbscrew **(A)** in the direction shown.
b. Pull the plate away from the enclosure.
c.



8. Remove the SAS conduit card and midplane
   a. Pull the spring plungers **(A)** up and turn them one quarter to the left.
   b. Turn the captive screws **(B)** and **(C)** counterclockwise until they are completely loosened.
   c. Pull the SAS conduit and midplane component out of the enclosure.



9. Remove the midplane
   a. Push the handles **(A)** down to disengage the SAS conduit card.
   b. Pull the SAS conduit card out of the connectors and remove it from the midplane.



10. Install the midplane
    - Install the new midplane by reversing the procedures described above. This completes the procedure.

PCI adapters

Learn about installing, removing, and replacing Peripheral Component Interconnect (PCI) adapters in 5802 and 5877 expansion units.

Related reference:

Managing PCI adapters
Find specifications, instructions, and part numbers for specific adapters.

PCI adapter placement for machine types 82xx and 91xx
Find PCI adapter placement information for machine types 82xx and 91xx.

PCI adapter placement for machine type 94xx
Find PCI adapter placement information for machine type 94xx.

Preparing to install, remove, or replace a PCI adapter cassette

Learn about steps you must do before you install, remove, or replace a PCI adapter cassette in a 5802 or 5877 expansion unit.

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a PCI adapter.

To install, remove or replace an adapter, do the following steps:

1. Perform prerequisite tasks as described in "Before you begin" on page 51.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Avoiding electric shock" on page 53 and "Handling static-sensitive devices" on page 54.
3. If you are installing a new adapter, determine in which slot to place the new adapter. See the PCI adapter placement for machine types 82xx and 91xx or the PCI adapter placement for machine type 94xx.
4. If you are removing a failing PCI adapter, see Identifying a failing part.
5. If you are installing a PCI adapter in a rack-mounted system or expansion unit, open the rear rack door.
6. Determine the location of PCI adapter cassette in the system.

Related information:

Installing a feature using the Hardware Management Console

Logical partitioning

Installing a PCI adapter contained in a cassette

You can install a PCI adapter cassette in a 5802 or 5877 expansion unit.

Installing a PCI adapter cassette with the power off:

You can install a PCI adapter cassette in a 5802 or 5877 expansion unit with the power off.

Before you begin: Prepare to install a PCI adapter cassette. See "Preparing to install, remove, or replace a PCI adapter cassette."

To install an adapter with the system power off, do the following steps:

1. Stop the system or logical partition. See Stop the system or logical partition.
2. Disconnect the power source from the system by unplugging the system.

   Note: This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.

3. Remove the PCI adapter cassette from the system. Refer to “Removing a PCI adapter cassette from the expansion unit” on page 27.
4. Install the adapter into the PCI adapter cassette. Refer to “PCI adapter single-width and double-width cassettes” on page 34.
5. Install the PCI adapter cassette in the system. Refer to “Installing a PCI adapter cassette.”
6. Start the system or logical partition. Refer to Start the system or logical partition.
7. Verify that the new resource is functional. See Verify the installed part.

Installing a PCI adapter cassette:

You can install a PCI adapter cassette in a 5802 or 5877 expansion unit.

1. Ensure that the lower cassette handle **(C)** is pressed up toward the retainer clip. This places the adapter in the correct position to be docked in the system. See the following figure.
2. Slide the cassette into the cassette slot.
3. When the cassette is fully inserted into the system, firmly press downward on the lower cassette handle **(C)** to lock the adapter in its connector.

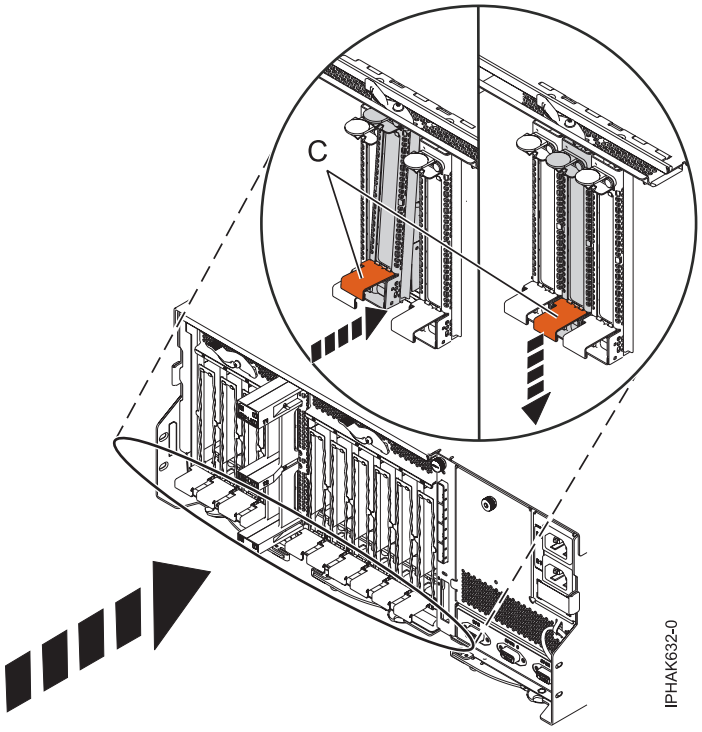


Figure 12. Installing the PCI adapter cassette

4. Lower the access door **(B)** into the closed position. Latch **(A)** automatically latches to hold the access door closed.

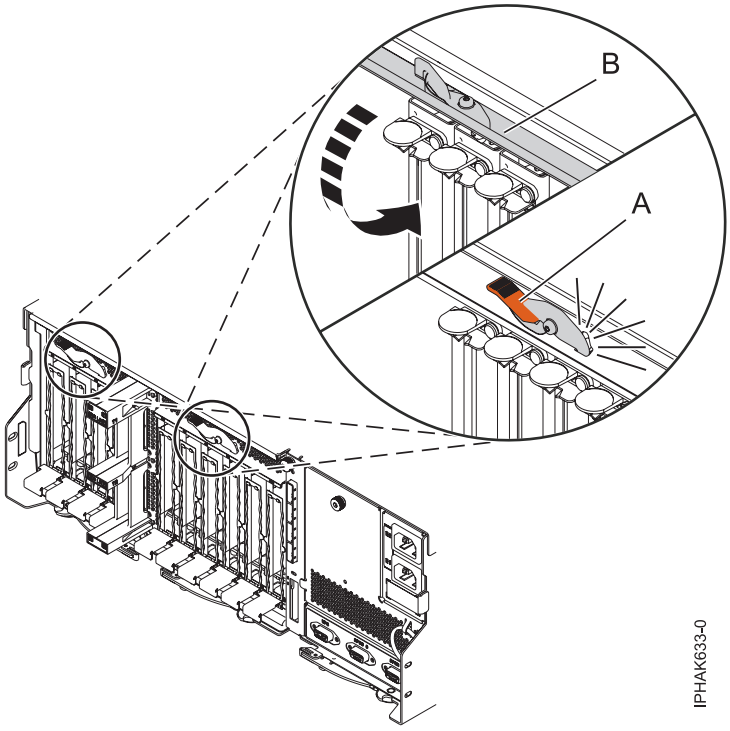


Figure 13. Closing the access door

5. Return to the procedure that sent you here.

Installing a PCI adapter contained in a cassette with the power on in AIX:

You can install a PCI adapter cassette in a 5802 or 5877 expansion unit that is running the AIX operating system with the system power on.

Before you begin: Prepare to install a PCI adapter cassette. See "Preparing to install, remove, or replace a PCI adapter cassette" on page 22.

To install an adapter with the system power on in AIX®, do the following steps:

1. Refer to "PCI hot-plug manager access for AIX" on page 55, and follow the steps in the access procedure to select **PCI Hot Plug Manager**. Then return here to continue.
2. From the PCI Hot-Plug Manager menu, select **Add a PCI Hot-Plug Adapter** and press Enter. The Add a Hot-Plug Adapter window displays.
3. Select the appropriate PCI slot from the ones listed on the screen, and press Enter.
4. Locate the PCI adapter slot and cassette you want to use.
5. If the cassette you want to use does not contain a PCI adapter, continue to the next step. If the cassette you want to use does contain an active PCI adapter, see "Removing a PCI adapter contained in a cassette from the expansion unit with the power on in AIX" on page 28.
6. Remove the PCI adapter cassette from the system. Refer to "Removing a PCI adapter cassette from the expansion unit" on page 27.
7. Install the adapter into the PCI adapter cassette. Refer to "PCI adapter single-width and double-width cassettes" on page 34.
8. Follow the instructions on the screen to install the adapter until the LED for the specified PCI slot is set to the Action state. See "Component LEDs" on page 58.
9. Install the PCI adapter cassette in the system. Refer to "Installing a PCI adapter cassette" on page 23.

10. Run the **cfgmgr** command to configure the adapter.
11. Verify that the new resource is functional. See Verify the installed part.

Installing a PCI adapter contained in a cassette with the power on in IBM i:

You can install a PCI adapter cassette in a 5802 or 5877 expansion unit that is running the IBM i operating system with the system power on.

Before you begin: Prepare to install a PCI adapter cassette. See "Preparing to install, remove, or replace a PCI adapter cassette" on page 22.

To install an adapter with the system power on in the i operating system, do the following steps:

1. Type **strsst** on the command line of the Main Menu and then press Enter.
2. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.
3. Select **Start a service tool** from the System Service Tools (SST) display and press Enter.
4. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
5. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display. Press Enter.
6. Type **9** (Hardware contained within package) in the **System Unit** or **Expansion Unit** field of the unit where you are replacing the card. Press Enter.
7. Select the option to **Include empty positions**.
8. Select **Concurrent Maintenance** on the card position where you want to replace the card, and then press Enter.
9. Select the option **Toggle LED blink off/on**. A light-emitting diode (LED) blinks identifying the position you chose. Physically verify that this is the slot where you want to install the adapter.
10. Select the option **Toggle LED blink off/on** to stop the blinking LED.
11. Select the option **Power off domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
12. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:
    ```
    Power off complete
    ```
13. Locate the PCI adapter slot and cassette you want to use.
14. If the cassette you want to use does not contain a PCI adapter, continue to the next step. If the cassette you want to use does contain an active PCI adapter, see "Removing a PCI adapter contained in a cassette from the expansion unit with the power on in IBM i" on page 29.
15. Remove the PCI adapter cassette from the system. Refer to "Removing a PCI adapter cassette from the expansion unit" on page 27.
16. Install the adapter into the PCI adapter cassette. Refer to "PCI adapter single-width and double-width cassettes" on page 34.
17. Install the PCI adapter cassette in the system. Refer to "Installing a PCI adapter cassette" on page 23.
18. Select **Power on domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
19. Select **Assign to** on the resource that has an asterisk (*) on the Work with Controlling Resource display. Press Enter.
20. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:
    ```
    Power on complete
    ```
21. Verify that the new resource is functional. See Verify the installed part.

Installing a PCI adapter contained in a cassette with the power on in Linux:

You can install a PCI adapter cassette in a 5802 or 5877 expansion unit that is running the Linux operating system with the system power on.

Before you begin: Prepare to install a PCI adapter cassette. See "Preparing to install, remove, or replace a PCI adapter cassette" on page 22.

To install an adapter with the system power on in Linux, do the following steps:

1. Log in to the system console as the root user.
2. Use the lsslot tool to list the hot-plug PCI slots that are available in the server or logical partition:

   ```
   lsslot -c pci -a
   ```

   The following is an example of the information displayed by this command:

   ```
   Slot                  Description                       Devices
   U7879.001.DQD014E-P1-C1 PCI-X capable, 64 bit, 133MHz slot Empty
   U7879.001.DQD014E-P1-C4 PCI-X capable, 64 bit, 133MHz slot Empty
   U7879.001.DQD014E-P1-C5 PCI-X capable, 64 bit, 133MHz slot Empty
   ```

   Select the appropriate empty PCI slot from the ones listed by the command.
3. Remove the PCI adapter cassette from the system. Refer to "Removing a PCI adapter cassette from the expansion unit" on page 27.
4. Install the adapter into the PCI adapter cassette. Refer to "PCI adapter single-width and double-width cassettes" on page 34.
5. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be locked in the system.
6. Run the **drslot_chrp_pci** command to enable an adapter to be installed.

   For example, to install an adapter in slot U7879.001.DQD014E-P1-C3, run:

   ```
   drslot_chrp_pci -a -s U7879.001.DQD014E-P1-C3
   ```

   The following displays:

   ```
   The visual indicator for the specified PCI slot has been set to the
   identify state. Press Enter to continue or enter x to exit.
   ```
7. Press Enter.

   The following displays:

   ```
   The visual indicator for the specified PCI slot has been set to the
   action state. Insert the PCI card into the identified slot, connect any
   devices to be configured and press Enter to continue. Enter x to exit.
   ```
8. Install the PCI adapter cassette in the system. Refer to "Installing a PCI adapter cassette" on page 23.
9. Use the **lsslot** command to verify that U7879.001.DQD014E-P1-C3 is occupied.

   Enter `lsslot -c pci -s U7879.001.DQD014E-P1-C3`

   The following is an example of the information displayed by this command:

   ```
   Slot                  Description                       Devices
   U7879.001.DQD014E-P1-C3 PCI-X capable, 64 bit, 133MHz slot 0001:40:01.0
   ```

Removing a PCI adapter contained in a cassette from the expansion unit

You can remove a PCI adapter cassette from the 5802 or 5877 expansion unit.

Removing a PCI adapter contained in a cassette from the expansion unit with the system power off:

You can remove a PCI adapter cassette from the 5802 or 5877 expansion unit with the system power off.

Before you begin: Prepare to remove a PCI adapter cassette. See "Preparing to install, remove, or replace a PCI adapter cassette" on page 22.

To remove an adapter, do the following steps:

1. Stop the system or logical partition. See Stop the system or logical partition.
2. Disconnect the power source from the system by unplugging the system.

   Note: This system might be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.
3. Determine the location of PCI adapter in the system.
4. Remove the PCI adapter cassette from the system. Refer to "Removing a PCI adapter cassette from the expansion unit."
5. Place the cassette with the cover facing up on an approved ESD surface.
6. To remove the adapter from the cassette, refer to "PCI adapter single-width and double-width cassettes" on page 34.

Removing a PCI adapter cassette from the expansion unit:

You can remove a PCI adapter cassette from the 5802 or 5877 expansion unit.

To remove a PCI adapter cassette, do the following steps:

1. Press down on latch **(A)** to release the access door. The access door is spring loaded, which causes it to rotate up into the open position **(B)**.

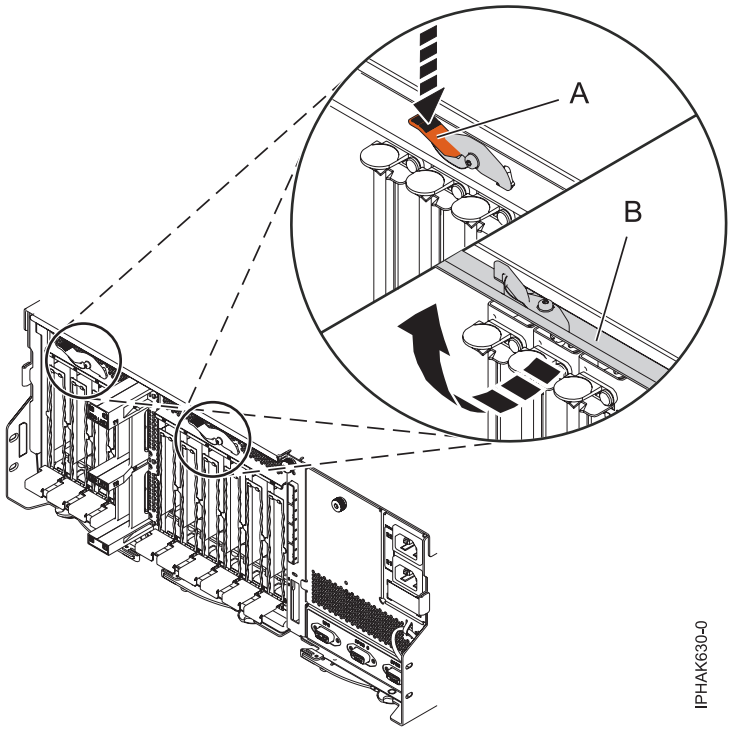


Figure 14. Opening the access door

2. Lift up the lower cassette handle **(C)** and pull the cassette out of the unit.

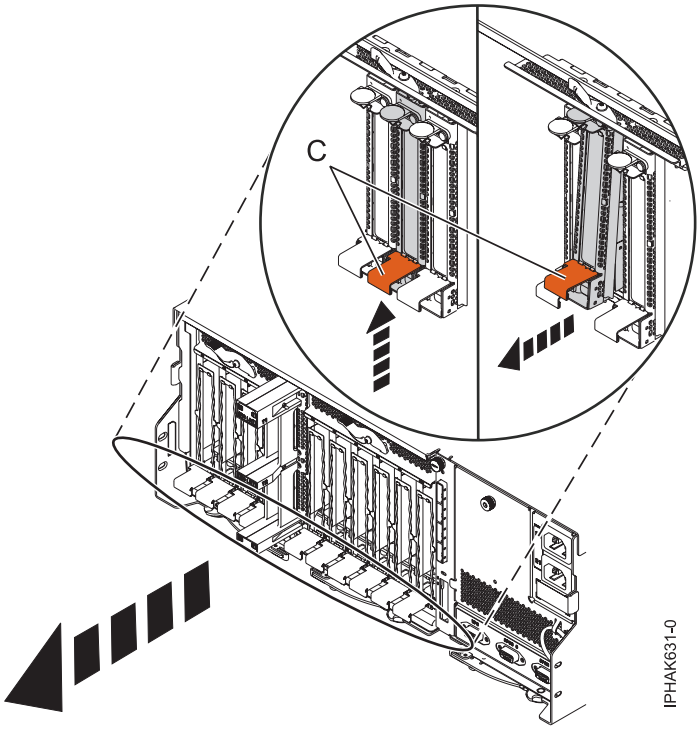


Figure 15. Removing a PCI adapter cassette

Attention: A cassette that contains either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling.

3. Return to the procedure that sent you here.

Removing a PCI adapter contained in a cassette from the expansion unit with the power on in AIX:

You can remove or replace a PCI adapter cassette from the 5802 or 5877 expansion unit that is running the AIX operating system with the system power on.

Before you begin: Prepare to remove a PCI adapter cassette. See "Preparing to install, remove, or replace a PCI adapter cassette" on page 22.

Notes:

1. Use this procedure to remove a PCI adapter and leave the slot in the system unit empty.
2. If the adapter that is removed will be placed into a different slot or system, complete this removal procedure, and then install the adapter as described in "Installing a PCI adapter contained in a cassette with the power on in AIX" on page 24.
3. Procedures performed on a PCI adapter with the system power on in AIX, also known as hot-plug procedures, require the system administrator to take the PCI adapter offline prior to performing the operation. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

To remove an adapter, do the following steps:

1. If you are removing a failing PCI adapter, see Identifying a failing part. If you are removing the PCI adapter for other reasons, continue to the next step.
2. Determine the location of PCI adapter in the system.
3. Record the slot number and location of each adapter being removed.

Note: Adapter slots are numbered on the rear of the system unit.

4. Ensure that any processes or applications that might use the adapter are stopped.
5. Enter the system diagnostics by logging in as root user or as the celogin user, and type **diag** at the AIX command line.
6. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
7. At the FUNCTION SELECTION menu, select **Task Selection**, and then press Enter.
8. At the Task Selection list, select **PCI Hot Plug Manager**.
9. Select **Unconfigure a Device**, and then press Enter.
10. Press F4 (or press Esc+4) to display the **Device Names** menu.
11. Select the adapter you are removing in the **Device Names** menu.
12. Use the Tab key to answer NO to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, and then press Enter. The **ARE YOU SURE** screen displays.
13. Press Enter to verify the information. Successful unconfiguration is indicated by the OK message displayed next to the **Command** field at the top of the screen.
14. Press F4 (or press Esc+4) twice to return to the **Hot Plug Manager** menu.
15. Select **Replace/remove PCI Hot Plug adapter**.
16. Select the slot that has the device to be removed from the system.
17. Select **Remove**. A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.
18. Label all cables that are attached to the adapter that you plan to remove.
19. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.
20. Disconnect all cables attached to the adapter that you plan to remove.
21. Remove the PCI adapter cassette from the system. Refer to “Removing a PCI adapter cassette from the expansion unit” on page 27.
22. Place the cassette with the cover facing up on an approved ESD surface.
23. Continue to follow the screen instructions until you receive a message that the adapter removal is successful. Successful removal is indicated by the message OK, which is displayed next to the **Command** field at the top of the screen.
24. If you have other adapters to remove, press the F3 key to return to the PCI Hot-Plug Manager menu, and then return to step 20.

    If you do not have other adapters to remove, continue with the next step.
25. Press F10 to exit the Hot-Plug Manager.
26. Run the **diag -a** command. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.
27. To remove the adapter from the cassette, see “PCI adapter single-width and double-width cassettes” on page 34.
28. Place an empty cassette into the unused PCI slot for proper air flow.

Removing a PCI adapter contained in a cassette from the expansion unit with the power on in IBM i:

You can remove a PCI adapter cassette from the 5802 or 5877 expansion unit that is running the IBM i operating system with the system power on.

Before you begin: Prepare to remove a PCI adapter cassette. See “Preparing to install, remove, or replace a PCI adapter cassette” on page 22.

To remove an adapter, do the following steps:

1. Determine the location of PCI adapter in the system.

2. Type `strsst` on the command line of the Main Menu and then press Enter.
3. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display and press Enter.
4. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
5. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display. Press Enter.
6. Type **9** (Hardware contained within package) in the **System Unit** or **Expansion Unit** field of the unit where you are removing the card. Press Enter.
7. Select the option **Include empty positions**.
8. Select **Concurrent Maintenance** on the card position where you want to remove the card, and then press Enter.
9. Select the option **Toggle LED blink off/on**. A light-emitting diode (LED) blinks identifying the position you chose. Physically verify that this is the slot where you want to install the adapter.
10. Select the option **Toggle LED blink off/on** to stop the blinking LED.
11. Select the option **Power off domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
12. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:

    ```
    Power off complete
    ```
13. Remove the PCI adapter cassette from the system. Refer to “Removing a PCI adapter cassette from the expansion unit” on page 27.
14. Place the cassette with the cover facing up on an approved ESD surface.
15. To remove the adapter from the cassette, see “PCI adapter single-width and double-width cassettes” on page 34.

Removing a PCI adapter contained in a cassette from the expansion unit with the power on in Linux:

You can remove a PCI adapter cassette from the 5802 or 5877 expansion unit that is running the Linux operating system with the system power on.

Do the following actions before beginning the procedure:

- Follow the steps in “Preparing to install, remove, or replace a PCI adapter cassette” on page 22.
- Ensure that the system meets the “Prerequisites for hot-plugging PCI adapters in Linux” on page 57.
- Verify that the Linux, hot-plug PCI tools are installed. See “Verify that the Linux, hot-plug PCI tools are installed” on page 57

To remove an adapter, do the following steps:

1. Determine the location of the PCI adapter in the system.
2. Label and then disconnect all cables attached to the adapter you plan to remove.
3. Run the **drslot_chrp_pci** command to enable an adapter to be removed:

   For example, to remove the PCI adapter in slot U7879.001.DQD014E-P1-C3 run this command:

   ```
   drslot_chrp_pci -r -s U7879.001.DQD014E-P1-C3
   ```

   Follow the instructions on the display to complete the task.
4. Remove the PCI adapter cassette from the system. Refer to “Removing a PCI adapter cassette from the expansion unit” on page 27.
5. Place the cassette with the cover facing up on an approved ESD surface.
6. To remove an adapter from the cassette, refer to “PCI adapter single-width and double-width cassettes” on page 34.

Replacing a PCI adapter contained in a cassette from the expansion unit with the power off:

You can replace a PCI adapter cassette from the 5802 or 5877 expansion unit with the system power off.

You must have already completed the procedure “Removing a PCI adapter contained in a cassette from the expansion unit with the system power off” on page 26 to have the slot powered off.

To replace an adapter with the system power off, do the following steps:

1. If the adapter needs to be placed in a PCI adapter cassette, see “PCI adapter single-width and double-width cassettes” on page 34.
2. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
3. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be docked in the system.
4. Install the PCI adapter cassette in the system. Refer to “Installing a PCI adapter cassette” on page 23.
5. Reconnect the system to the power source.
6. Start the system or logical partition. Refer to Start the system or logical partition.
7. Verify that the new resource is functional. See Verify the installed part.

Replacing a PCI adapter contained in a cassette from the expansion unit with the power on in AIX:

You can remove or replace a PCI adapter cassette from the 5802 or 5877 expansion unit that is running the AIX operating system with the system power on.

Before you begin: Prepare to replace a PCI adapter cassette. See “Preparing to install, remove, or replace a PCI adapter cassette” on page 22.

Important:

- Use this procedure if you intend to remove a failing PCI adapter and replace it with the same type of adapter. If you plan to remove a failing adapter and leave the slot empty, see “Removing a PCI adapter contained in a cassette from the expansion unit with the power on in AIX” on page 28.
- Do not use this procedure to remove an existing adapter and install a different type of adapter. To install a different adapter, remove the existing adapter as described in “Removing a PCI adapter contained in a cassette from the expansion unit with the power on in AIX” on page 28, and then install the new adapter as described in “Installing a PCI adapter contained in a cassette with the power on in AIX” on page 24.
- Procedures performed on a PCI adapter with the system power on in AIX, also known as hot-plug procedures, require the system administrator to take the PCI adapter offline prior to performing the operation. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

To replace an adapter, do the following steps:

1. Determine the location of the PCI adapter in the system.
2. Record the slot number and location of each adapter being removed.

   Note: Adapter slots are numbered on the rear of the system unit.
3. Ensure that any processes or applications that might use the adapter are stopped.
4. Enter the system diagnostics by logging in as root user or as the celogin user, and type **diag** at the AIX command line.
5. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
6. At the FUNCTION SELECTION menu, select **Task Selection**, and then press Enter.
7. At the Task Selection list, select **PCI Hot Plug Manager**.

8. Select **Unconfigure a Device**, and then press Enter.
9. Press F4 (or Esc+4) to display the **Device Names** menu.
10. Select the adapter that you are removing in the **Device Names** menu.
11. Use the Tab key to answer YES to **Keep Definition**. Use the Tab key again to answer YES to **Unconfigure Child Devices**, and then press Enter. The **ARE YOU SURE** screen displays.
12. Press Enter to verify the information. Successful unconfiguration is indicated by the message OK, which is displayed next to the **Command** field at the top of the screen.
13. Press F3 (or Esc+3) twice to return to the **Hot Plug Manager** menu.
14. Select **Replace/remove PCI Hot Plug adapter**.
15. Select the slot that has the device to be removed from the system.
16. Select **Replace**.

    Note: A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.
17. Press Enter. This places the adapter in the action state, meaning it is ready to be removed from the system.
18. Label and then disconnect all cables attached to the adapter that you plan to remove.
19. Remove the PCI adapter cassette from the system. Refer to "Removing a PCI adapter cassette from the expansion unit" on page 27.
20. Place the cassette with the cover facing up on an approved ESD surface.
21. Install the adapter into the PCI adapter cassette. Refer to "PCI adapter single-width and double-width cassettes" on page 34.
22. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
23. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be docked in the system.
24. Install the PCI adapter cassette in the system. Refer to "Installing a PCI adapter cassette" on page 23.
25. Press Enter and continue to follow the screen instructions until you receive a message that the replacement is successful. Successful replacement is indicated by the message OK, which is displayed next to the **Command** field at the top of the screen.
26. Press the F3 (or Esc+3) key to return to the **PCI Hot-Plug Manager** menu.
27. Press the F3 (or Esc+3) key to return to the **TASK** selection list.
28. Select **Log Repair Action**.
29. Select the resource just replaced, press Enter, press Commit (F7 or ESC 7), and then press Enter.
30. Press F3 (or Esc+3) to return to **TASK Selection List**.
31. Select **Hot Plug Task**, press Enter.
32. Select **PCI Hot Plug Manager**, and then select **Configure a defined device**, then press Enter.
33. Select the device just replaced from the list, and then press Enter. The device is now configured.
34. Press the F10 key to exit the diagnostic program.

    Note: If you are running the stand-alone diagnostics, do not exit the program completely.
35. Verify the PCI adapter by using the following instructions:
    a. Did you replace the adapter with the system power on?
       - Yes: Go to the next step.
       - No: Load the diagnostic program by doing the following steps:
         - If AIX is available, boot AIX, log in as root or CELOGIN, and then enter the **diag** command.
         - If AIX is not available, boot the stand-alone diagnostics

    b. Type the **diag** command if you are not already displaying the diagnostic menus.

c. Select **Advance Diagnostic Routines**, and then select **Problem Determination**.
d. Select the name of the resource just replaced from the menu. If the resource just replaced is not shown, choose the resource associated with it. Press Enter, and then press **Commit** (F7 or Esc+7).
e. Did the Problem Determination identify any problems?
   - No: Continue to the next step.
   - Yes: A problem is identified
     – If you are a customer, record the error information, and then contact your service provider.
     – If you are an authorized service provider, return to map 210-5.

36. Press the F10 key to exit the diagnostic program.

Replacing a PCI adapter contained in a cassette from the expansion unit with the power on in IBM i:

You can replace a PCI adapter cassette from the 5802 or 5877 expansion unit that is running the IBM i operating system with the system power on.

You must have already completed the procedure "Removing a PCI adapter contained in a cassette from the expansion unit with the power on in IBM i" on page 29 to have the slot powered off.

To replace an adapter, do the following steps:

1. If the adapter needs to be placed in the PCI adapter cassette, see "PCI adapter single-width and double-width cassettes" on page 34.
2. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
3. Install the PCI adapter cassette in the system. Refer to "Installing a PCI adapter cassette" on page 23.
4. Select **Power on domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
5. Select **Assign to** on the resource that has an asterisk (*) on the Work with Controlling Resource display. Press Enter.
6. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message:
   ```
   Power on complete
   ```
7. Verify that the new resource is functional. See Verify the installed part.

Replacing a PCI adapter contained in a cassette from the expansion unit with the power on in Linux:

You can replace a PCI adapter cassette from the 5802 or 5877 expansion unit that is running the Linux operating system with the system power on.

You must have already completed the procedure "Removing a PCI adapter contained in a cassette from the expansion unit with the power on in Linux" on page 30 to have the slot powered off.

Note: Use this procedure only when you are replacing an adapter with an identical adapter. If you are replacing an adapter with an adapter that is not identical to the adapter removed, follow the steps in "Installing a PCI adapter contained in a cassette with the power on in Linux" on page 26.

To replace an adapter with the power on in Linux, do the following steps:

1. If the adapter needs to be placed in the PCI adapter cassette, see "PCI adapter single-width and double-width cassettes" on page 34.
2. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
3. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be docked in the system.
4. Run the **drslot_chrp_pci** command to enable an adapter to be replaced:
   For example, to replace the PCI adapter in slot U7879.001.DQD014E-P1-C3 run this command:
   ```
   drslot_chrp_pci -R -s U7879.001.DQD014E-P1-C3
   ```

5. Follow the instructions on the display to complete the task. When you are instructed to insert the adapter in the adapter slot, see “Installing a PCI adapter cassette” on page 23.
6. Run the **lsslot** command to verify that the slot is occupied.

   For example, Enter `lsslot -c pci -s U7879.001.DQD014E-P1-C3`

   The following is an example of the information displayed by this command:

```
Slot                  Description                       Devices
U7879.001.DQD014E-P1-C3 PCI-X capable, 64 bit, 133MHz slot 0001:40:01.0
```

PCI adapter single-width and double-width cassettes

You can remove, replace, or install PCI adapters in a cassette.

Removing an adapter from the PCI adapter single-width cassette:

You can remove a PCI adapter from a single-width cassette. .

To remove an adapter from the single-width cassette, do the following steps:

1. Perform the prerequisite tasks described in “Before you begin” on page 51.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 53 and “Handling static-sensitive devices” on page 54.
3. Remove the cassette from the system.
4. Remove the cassette cover by doing the following steps:
   a. Slide the cover latch **(A)** to disengage it from the pivot pin **(C)** as shown in the following figure.
   b. Lift the cover **(B)** off the pivot pin.
   c. Slide the cover off the cassette.

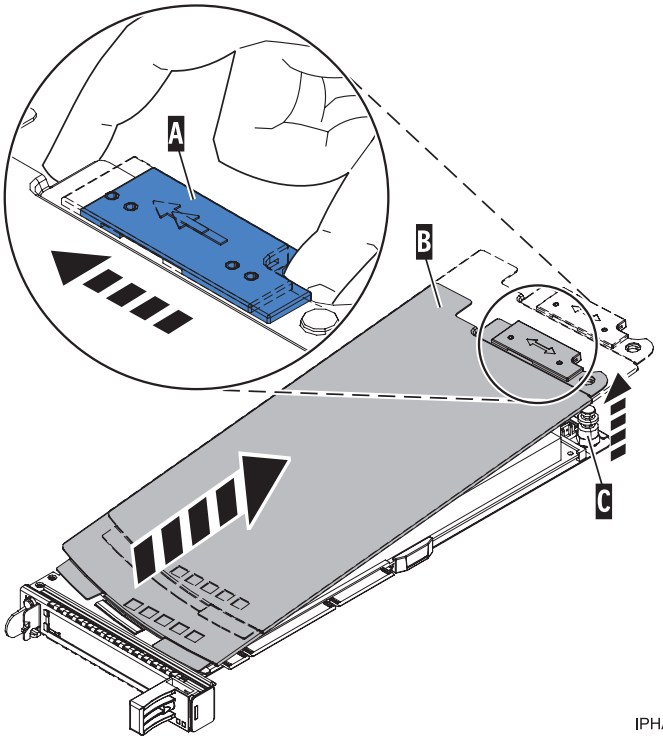


Figure 16. PCI adapter cassette cover removed

5. Remove the adapter from the cassette by doing the following steps:

a. Unlock the adapter retainers by rotating the retainer clip **(A)** into the horizontal position. See Figure 17.

   Notes:

   1) The edge of the adapter located at the end of the cassette that contains the cassette handles is called the adapter **tailstock**.
   2) Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock.
   3) When the retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide away from the card.
   4) If the corner support retainer is used, unlock it, and then slide the corner support retainer away from the card.

b. Push the adapter retainers **(B)** away from the adapter.
c. Unlock the adapter tailstock clamp **(C)**.
d. Rotate the adapter out of the cassette by grasping the edge of the adapter opposite the tailstock, and then firmly rotate the adapter toward the bottom of the cassette.
e. Lift the adapter out of the tailstock retaining channel.

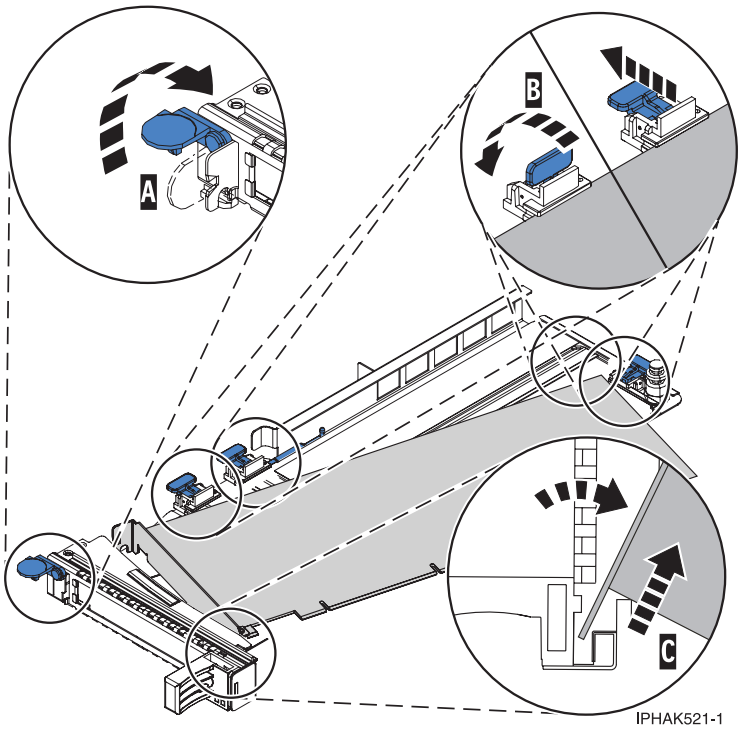


Figure 17. Adapter removed from the PCI adapter cassette

f. Put the adapter in a safe place.

   Attention: A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling.

g. Place a PCI adapter or filler panel in the cassette. See "Placing a PCI adapter in a single-width cassette" on page 36.
h. Replace the cassette cover by doing the following steps:
   1) Slide the cover **(B)** into position on the cassette.
   2) While holding the cover latch **(A)** in the open position, place the cover over the pivot pin **(C)**.

3) Release the cover latch to lock the cover into place.

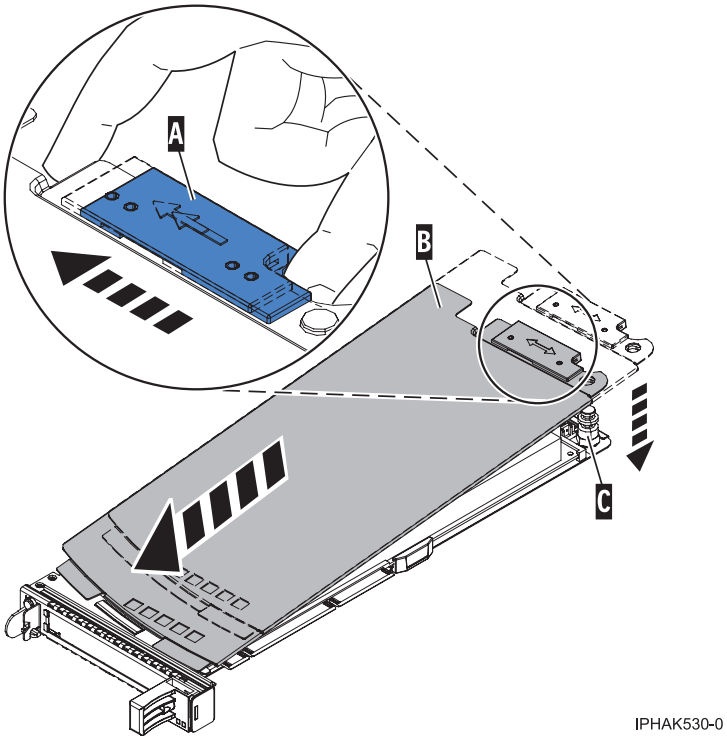


Figure 18. PCI adapter cassette cover replaced

Placing a PCI adapter in a single-width cassette:

You can place a PCI adapter in a single-width cassette. .

To place a PCI adapter in a cassette, do the following steps:

1. Perform the prerequisite tasks described in “Before you begin” on page 51.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see “Avoiding electric shock” on page 53 and “Handling static-sensitive devices” on page 54.
3. Remove any shipping handles or brackets attached to the adapter.
4. Remove the cassette cover by doing the following steps:
   a. Slide the cover latch **(A)** to disengage it from the pivot pin **(C)** as shown in the following figure.
   b. Lift the cover **(B)** off of the pivot pin.
   c. Slide the cover off of the cassette.

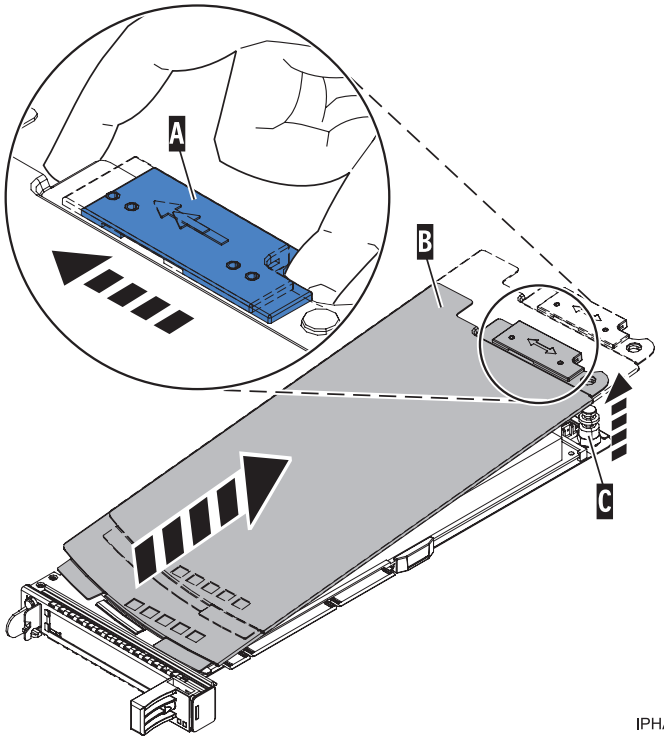


Figure 19. PCI adapter single-width cassette cover removed

5. Ensure the cassette is prepared to receive an adapter by doing the following steps:
   a. Ensure the cassette is empty by doing one of the following steps:
      - "Removing an adapter from the PCI adapter single-width cassette" on page 34.
      - Remove the adapter filler panel from the cassette.
   b. Ensure that all of the adapter retainers **(A)** have been pushed out to the edges of the cassette to allow the placement of the adapter. See Figure 20 on page 38.

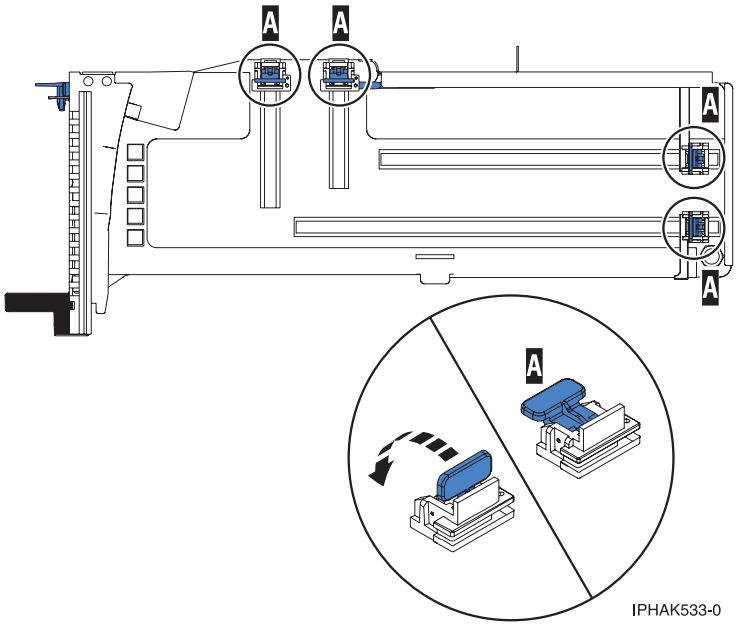


Figure 20. Adapter retainers

c. Rotate the tailstock clamp into the open position.

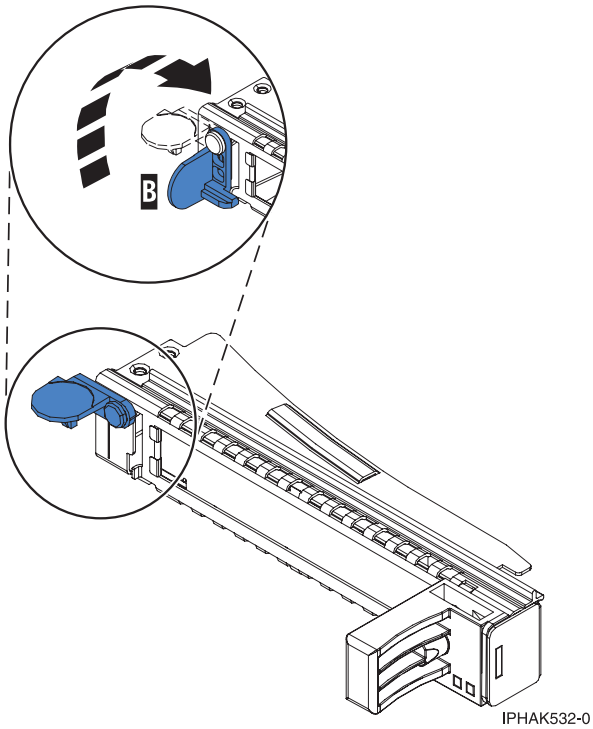


Figure 21. Tailstock clamp in the open position

6. Place the adapter in the cassette by doing the following steps:
   a. With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel **(A)**. See Figure 22 on page 39.
   b. Rotate the adapter toward the top of the cassette and into place.

c. Close the tailstock clamp **(B)**. See Figure 22.

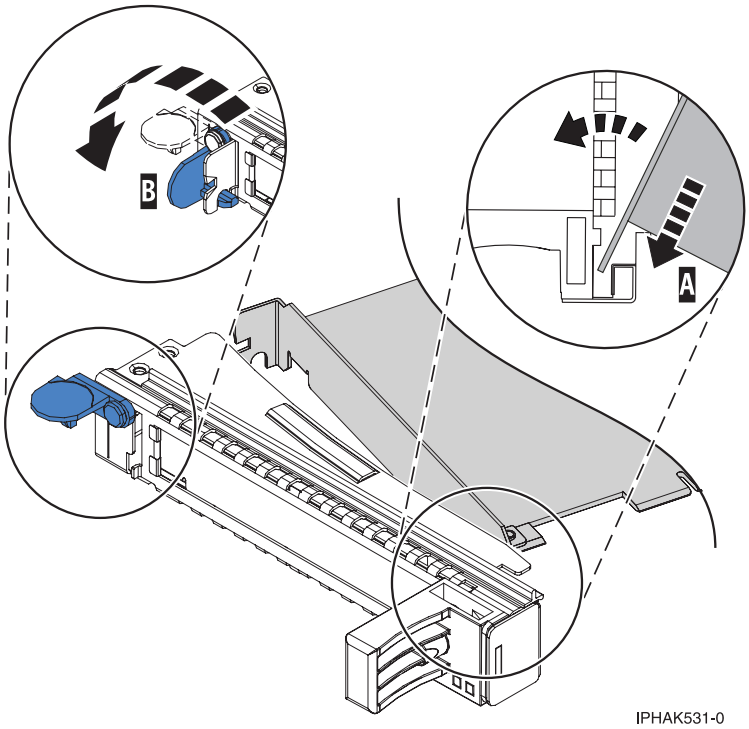


Figure 22. Adapter removed from the PCI adapter single-width cassette

d. Position the adapter retainers to support the adapter, and then rotate the retainer clip into the closed position.

Notes:

1) Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock.
2) When the adapter retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide toward the adapter.
3) Place the retainers on the adapter according to the length of the adapter being used. Select the appropriate instructions:

   Adapter-cassette retainer placement for large adapters

   a) Place and lock the retainers **(B)**. See Figure 23 on page 40.

      Attention: Use of the lower corner support retainer might interfere with the docking of the PCI card when positioned within the system. Ensure the retainer does not interfere with the adapter connectors on the system backplane.

   b) Ensure the adapter edge is seated in each retainer groove **(A)**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

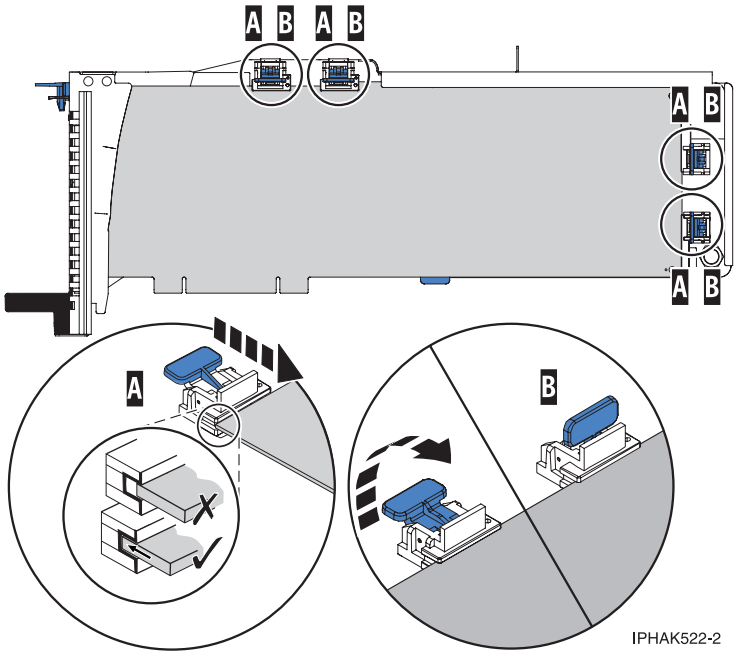


Figure 23. Large adapter in the PCI adapter cassette with the supports and stabilizer in place

Adapter-cassette retainer placement for medium-length adapters

a) Remove the adapter stabilizer **(C)**. See Figure 24 on page 41.

b) Place and lock the retainers **(B)**.

c) Ensure the adapter edge is seated in each retainer groove **(A)**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

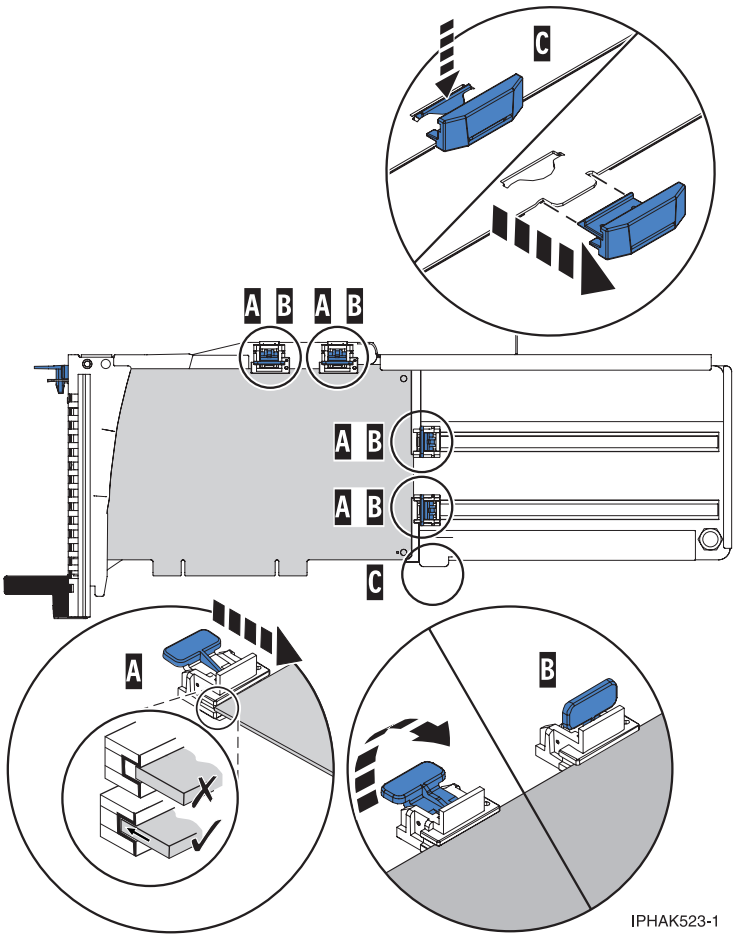


Figure 24. Medium-length adapter in the PCI adapter cassette with the supports in place

Adapter-cassette retainer placement for small adapters

a) Remove the adapter stabilizer **(C)**. See Figure 25 on page 42.

b) Place the hookarm **(D)** into the hole in the corner of the adapter. This supports the card when it is undocked from the connector on the system backplane.

c) Place and lock the retainers **(B)**.

d) Ensure the adapter edge is seated in each retainer groove **(A)**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

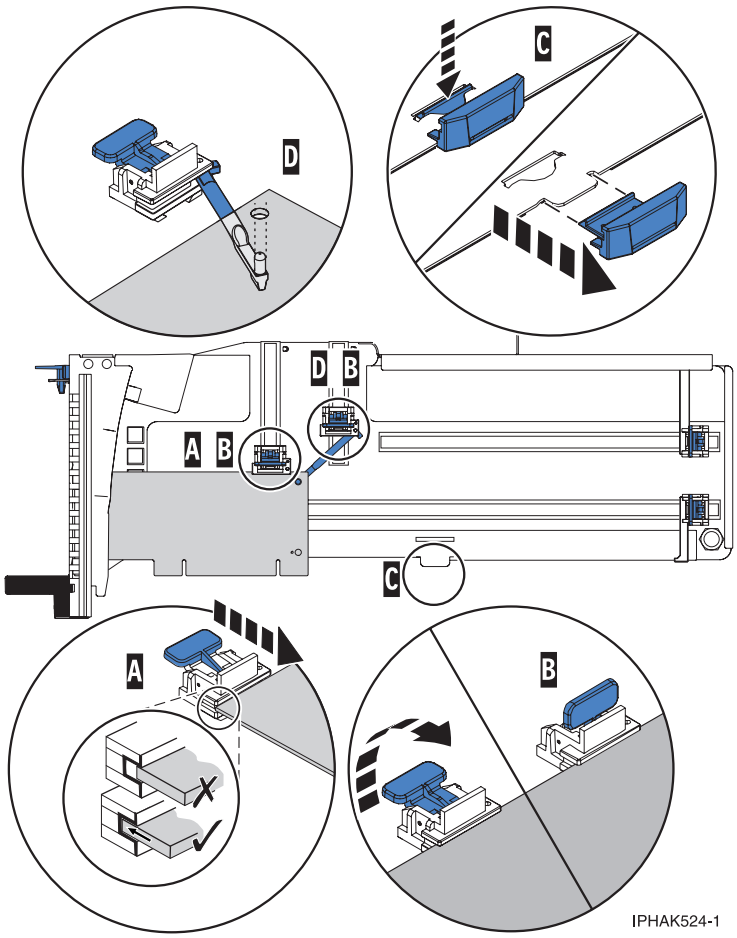


Figure 25. Small adapter in the PCI adapter cassette with the supports and the hookarm in place

7. Replace the cassette cover by doing the following steps:
   a. Slide the cover **(B)** into position on the cassette as shown in the following figure.
   b. While holding the cover latch **(A)** in the open position, place the cover over the pivot pin **(C)**.
   c. Release the cover latch to lock the cover into place.

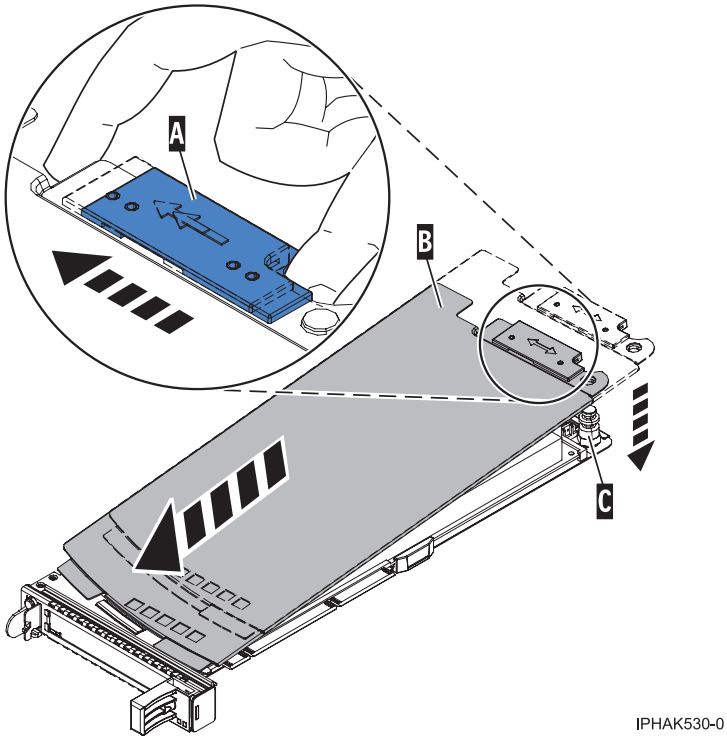


Figure 26. PCI adapter cassette cover replaced

Removing an adapter from the PCI adapter double-wide cassette:

You can remove a PCI adapter from a double-wide cassette. .

To remove an adapter from the cassette, do the following steps:

1. Perform the prerequisite tasks described in "Before you begin" on page 51.
2. Take appropriate precautions for avoiding electric shock and handling static-sensitive devices. For information, see "Avoiding electric shock" on page 53 and "Handling static-sensitive devices" on page 54.
3. Remove the PCI adapter contained in a cassette from the system.
4. Remove any shipping handles or brackets attached to the adapter.
5. Remove the cassette cover by doing the following steps:
   a. Slide the cover latch **(A)** to disengage it from the pivot pin **(C)** as shown in the following figure.
   b. Lift the cover **(B)** off of the pivot pin.
   c. Slide the cover off of the cassette.

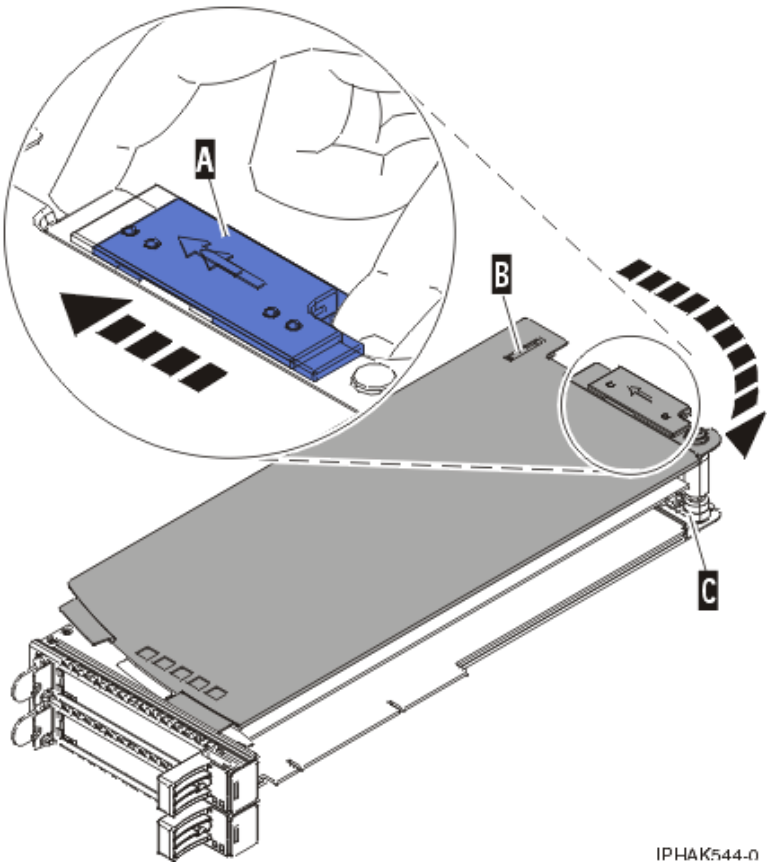


Figure 27. PCI adapter cassette cover removed

d. Unscrew pivot pin **(C)** and put it in a safe place

6. Remove the adapter from the cassette by doing the following steps:
   a. Unlock the adapter retainers by rotating the retainer clip **(A)** into the horizontal position. See Figure 28 on page 45.

      Notes:

      1) The edge of the adapter located at the end of the cassette that contains the cassette handles is called the adapter **tailstock**.
      2) Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock.
      3) When the retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide away from the card.
      4) If the corner support retainer is used, unlock it, and then slide the corner support retainer away from the card.

   b. Push the adapter retainers **(B)** away from the adapter.
   c. Unlock the adapter tailstock clamp **(C)**.
   d. Rotate the adapter out of the cassette by grasping the edge of the adapter opposite the tailstock, and then firmly rotate the adapter toward the bottom of the cassette.
   e. Lift the adapter out of the tailstock retaining channel.

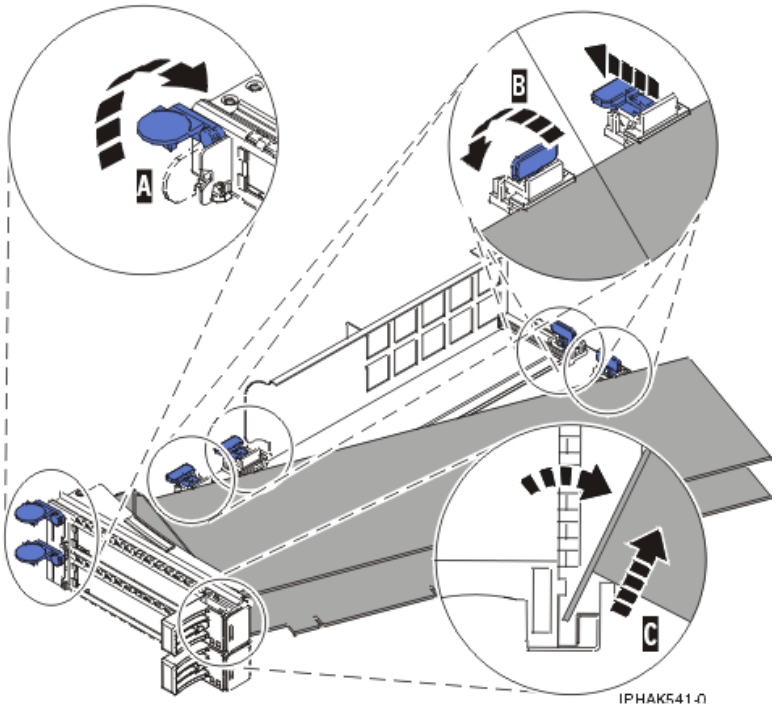


Figure 28. Adapter removed from the PCI adapter cassette

f. Put the adapter in a safe place.

   Attention: A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling.

g. Place the adapter in the PCI adapter double-wide cassette. For information, see "Placing an adapter in the PCI adapter double-wide cassette" on page 46.

   Note: If the cassette is not going to contain a PCI adapter, use this same procedure to place an adapter filler panel in the cassette.

h. Replace the cassette cover by doing the following steps:
   1) Screw pivot pin **(C)** into place.
   2) Slide the cover **(B)** into position on the cassette.
   3) While holding the cover latch **(A)** in the open position, place the cover over the pivot pin **(C)**.
   4) Release the cover latch to lock the cover into place.

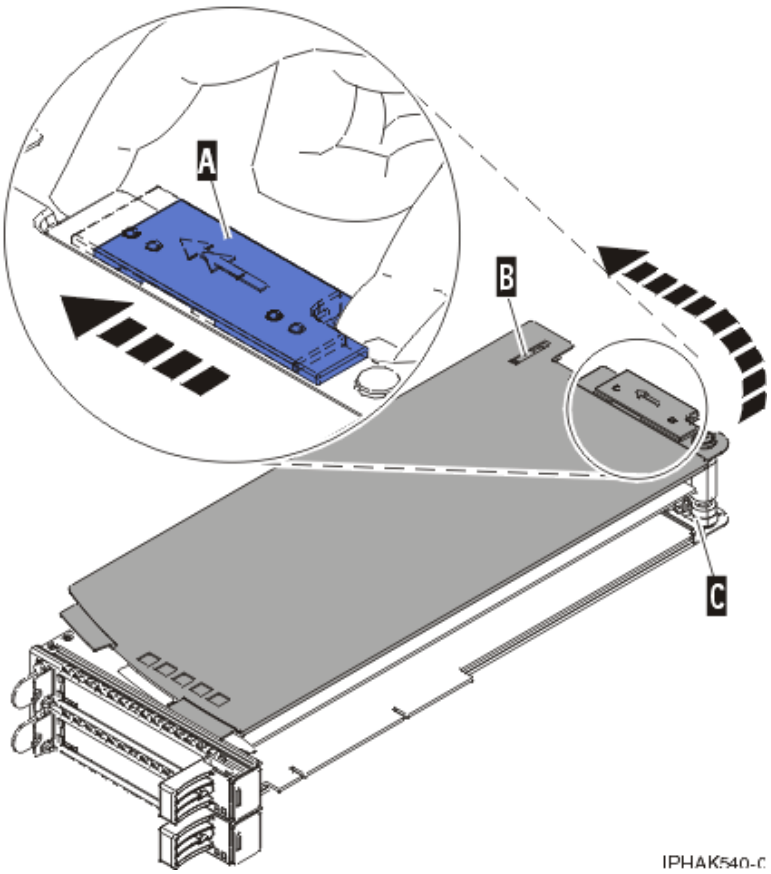


Figure 29. PCI adapter cassette cover replaced

Placing an adapter in the PCI adapter double-wide cassette:

You can place a PCI adapter in a double-wide cassette. .

To place an adapter in a cassette, do the following steps:

1. Perform the prerequisite tasks described in "Before you begin" on page 51.
2. Remove the PCI adapter contained in a cassette from the system.
3. Remove the cassette cover by doing the following steps:
   a. Slide the cover latch **(A)** to disengage it from the pivot pin **(C)** as shown in the following figure.
   b. Lift the cover **(B)** off of the pivot pin.
   c. Slide the cover off of the cassette.

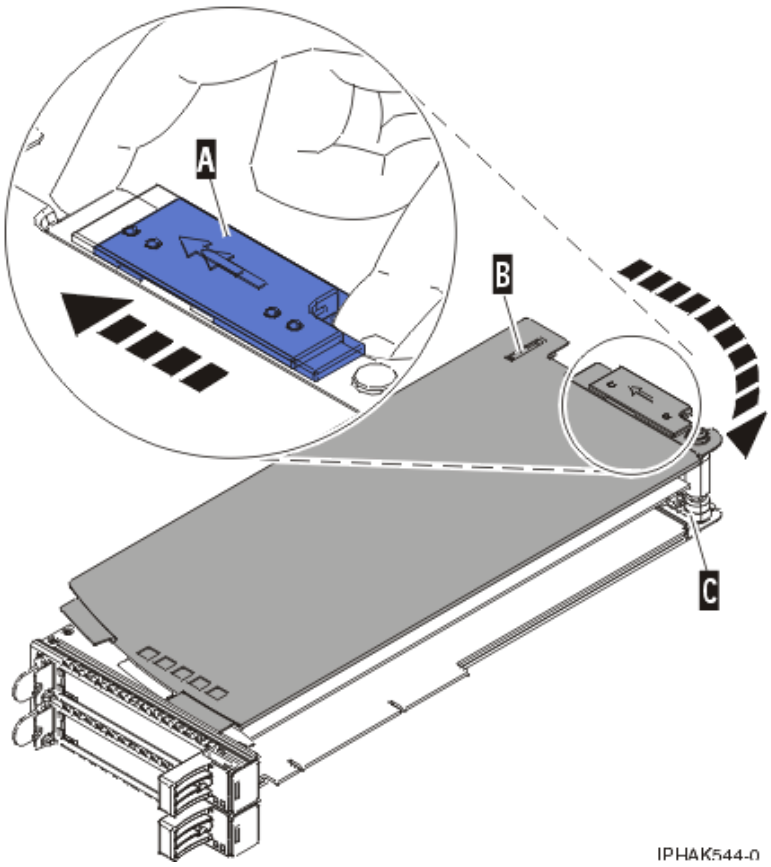


Figure 30. PCI adapter cassette cover removed

d. Unscrew pivot pin **(C)** and put it in a safe place.

4. Ensure the cassette is prepared to receive an adapter by doing the following steps:
   a. Ensure the cassette is empty by doing one of the following steps:
      - Remove the adapter from the PCI adapter double-wide cassette. For information, see "Removing an adapter from the PCI adapter double-wide cassette" on page 43.
      - Remove the adapter filler panel from the cassette.
   b. Ensure that all of the adapter retainers have been pushed out to the edges of the cassette to allow the placement of the adapter.
   c. Place the tailstock clamp in the open position by pressing the cassette handle towards the retainer clip.
5. Place the adapter in the cassette by doing the following steps:
   a. With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel **(A)**. See Figure 31 on page 48.
   b. Rotate the adapter toward the top of the cassette and into place.
   c. Close the tailstock clamp.

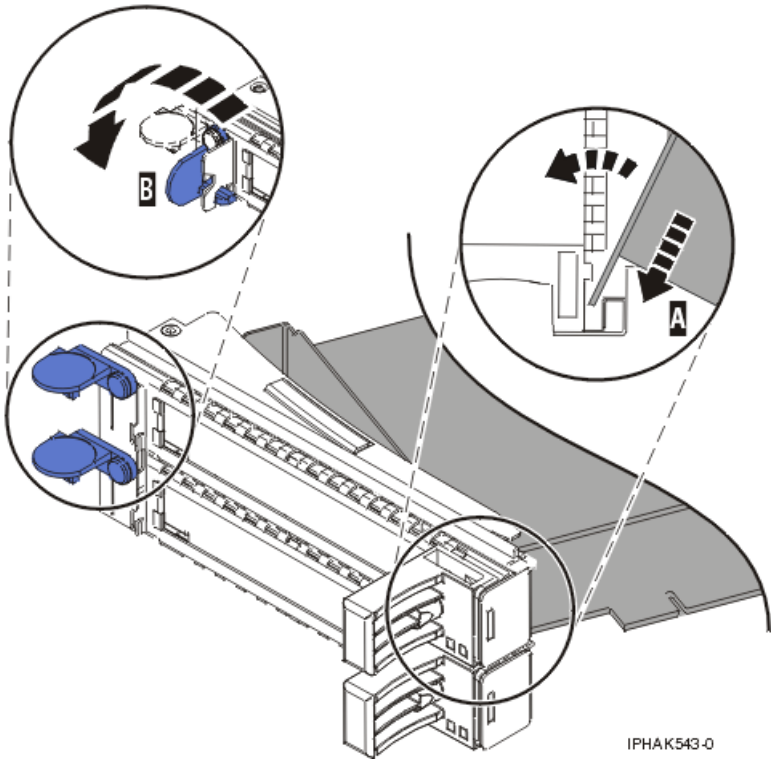


Figure 31. Adapter replaced in the PCI adapter cassette

d. Position the adapter retainers to support the adapter, and then rotate the retainer clip **(B)** into the closed position. See Figure 31.

Notes:

1) Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock.
2) When the adapter retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide toward the adapter.
3) Place and lock the retainers **(B)**. See Figure 32 on page 49.

   Attention: Use of the lower corner support retainer might interfere with the docking of the PCI card when positioned within the system. Ensure the retainer does not interfere with the adapter connectors on the system backplane.
4) Ensure the adapter edge is seated in each retainer groove **(A)**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

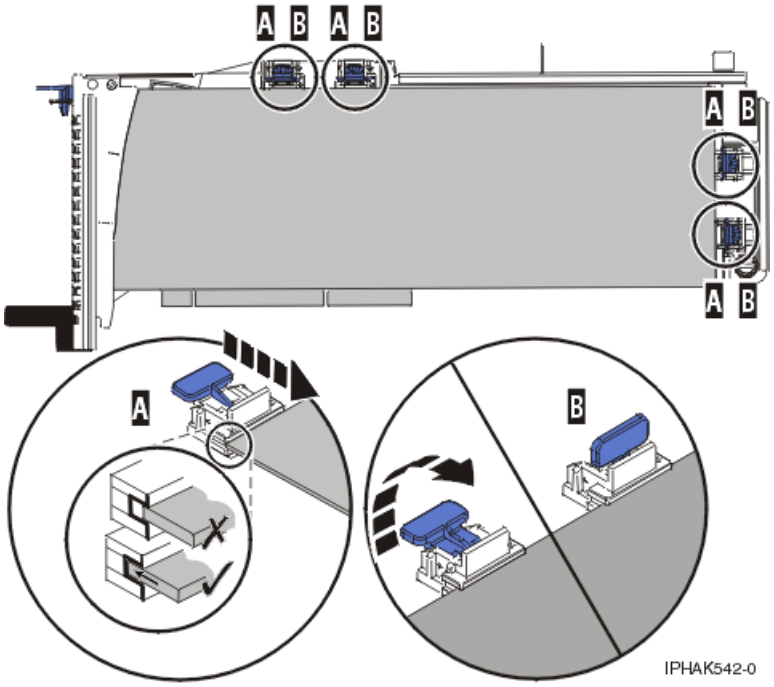


Figure 32. Long adapter in the PCI adapter cassette with the supports and stabilizer in place

6. After the retainers are placed, replace the cassette cover by doing the following steps:
   a. Screw pivot pin **(C)** into place.
   b. Slide the cover **(B)** into position on the cassette as shown in the following figure.
   c. While holding the cover latch **(A)** in the open position, place the cover over the pivot pin **(C)**.
   d. Release the cover latch to lock the cover into place.

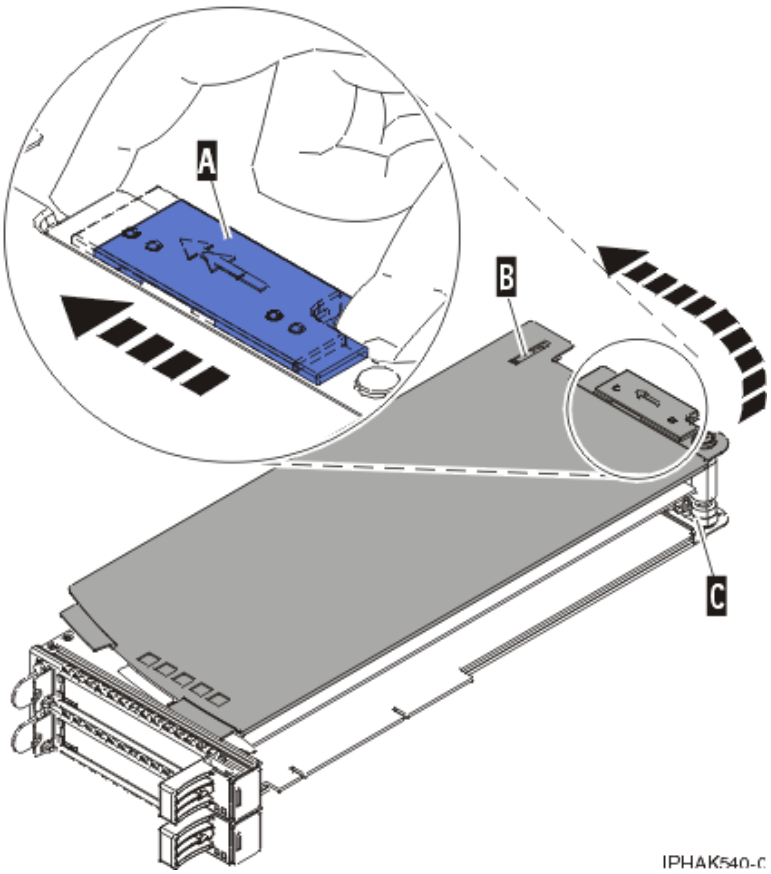


Figure 33. PCI adapter cassette cover replaced

7. Replace the PCI adapter contained in a cassette in the system.

   Attention: A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling.

Related procedures for installing and removing PCI adapters

These procedures are related to installing and removing PCI adapters.

Before you begin:

Understand prerequisites for installing, removing, or replacing features and parts.

DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- **Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.**
- **Do not open or service any power supply assembly.**
- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.**
- **Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.**
- **Connect any equipment that will be attached to this product to properly wired outlets.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.**

  To Disconnect:

  1. **Turn off everything (unless instructed otherwise).**
  2. **Remove the power cords from the outlets.**
  3. **Remove the signal cables from the connectors.**
  4. **Remove all cables from the devices**

  To Connect:

  1. **Turn off everything (unless instructed otherwise).**
  2. **Attach all cables to the devices.**
  3. **Attach the signal cables to the connectors.**
  4. **Attach the power cords to the outlets.**
  5. **Turn on the devices.**

  (D005)

DANGER

Observe the following precautions when working on or around your IT rack system:

- **Heavy equipment–personal injury or equipment damage might result if mishandled.**
- **Always lower the leveling pads on the rack cabinet.**
- **Always install stabilizer brackets on the rack cabinet.**
- **To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.**
- **Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.**

- **Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.**
- **Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.**
- **An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.**

CAUTION

- **Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.**
- **Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.**
- **Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.**
- *(For sliding drawers.)* **Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.**
- *(For fixed drawers.)* **This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.**

(R001)

Before you begin a replacement or installation procedure, perform these tasks:

1. If you are installing a new feature, ensure that you have the software required to support the new feature.

   To do this, go to the following Web site: http://www-912.ibm.com/e_dir/eServerPrereq.nsf
2. If you are performing an installation or replacement procedure that might put your data at risk, ensure, wherever possible, that you have a current backup of your system or logical partition (including operating systems, licensed programs, and data).
3. Review the installation or replacement procedure for the feature or part.
4. Note the significance of color on your system.

Blue or terra-cotta on a part of the hardware indicates a touch point where you can grip the hardware to remove it from or install it in the system, open or close a latch, and so on. Terra-cotta might also indicate that the part can be removed and replaced with the system or logical partition power on.

5. Ensure that you have access to a medium, flat-blade screwdriver, a Phillips screwdriver, and a pair of scissors.
6. If parts are incorrect, missing, or visibly damaged, do the following:
   - If you are replacing a part, contact the provider of your parts or next level of support.
   - If you are installing a feature, contact one of the following service organizations:
     - The provider of your parts or next level of support.
     - In the United States, the IBM Rochester Manufacturing Automated Information Line (R–MAIL) at 1–800–300–8751.

   In countries and regions outside of the United States, use the following Web site to locate your service and support telephone numbers:

   `http://www.ibm.com/planetwide`
7. If you encounter difficulties during the installation, contact your service provider, your IBM reseller, or your next level of support.
8. If you are installing new hardware in a logical partition, you need to understand and plan for the implications of partitioning your system. For information, see Logical Partitioning.

Avoiding electric shock:

Learn about precautions you should take to avoid electric shock when working on our around a computer system.

DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- **Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.**
- **Do not open or service any power supply assembly.**
- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.**
- **Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.**
- **Connect any equipment that will be attached to this product to properly wired outlets.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.**

  To Disconnect:

  1. **Turn off everything (unless instructed otherwise).**
  2. **Remove the power cords from the outlets.**
  3. **Remove the signal cables from the connectors.**
  4. **Remove all cables from the devices**

  To Connect:

  1. **Turn off everything (unless instructed otherwise).**
  2. **Attach all cables to the devices.**
  3. **Attach the signal cables to the connectors.**
  4. **Attach the power cords to the outlets.**
  5. **Turn on the devices.**

  (D005)

Handling static-sensitive devices:

Learn about precautions you should take to prevent damage to electronic components from static electricity discharge.

Electronic boards, adapters, media drives, and disk drives are sensitive to static electricity discharge. These devices are wrapped in antistatic bags to prevent this damage. Take the following precautions to prevent damage to these devices from static electricity discharge.

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
- When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
- If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
- Do not remove the device from the antistatic bag until you are ready to install the device in the system.

- With the device still in its antistatic bag, touch it to the metal frame of the system.
- Grasp cards and boards by the edges. Avoid touching the components and gold connectors on the adapter.
- If you need to lay the device down while it is out of the antistatic bag, lay it on the antistatic bag. Before picking it up again, touch the antistatic bag and the metal frame of the system at the same time.
- Handle the devices carefully to prevent permanent damage.

PCI hot-plug manager access for AIX:

You might need to service PCI adapters with the system power on in AIX. Use the procedures in this section to perform this task.

The instructions for servicing PCI adapters with the system power on in AIX refer you to these procedures when it is appropriate to perform them.

Note: For an adapter to be serviced with the system power on, both the adapter and the system unit must support hot-plug procedures. To identify adapters that are hot-pluggable in the system you are servicing, refer to the following placement information: PCI adapter placement for machine types 82xx and 91xx or the PCI adapter placement for machine type 94xx.

Accessing hot-plug management functions:

You can use PCI Hot Plug Manager to service PCI adapters with the system power on in AIX. Use the procedures in this section to perform this task.

Note: Procedures performed on a PCI adapter with the system power on in AIX, also known as hot-plug procedures, require the system administrator to take the PCI adapter offline prior to performing the operation. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

To access the hot-plug menus, do the following:

1. Log in as root user.
2. At the command line, type `smitty`.
3. Select **Devices**.
4. Select **PCI Hot Plug Manager** and press Enter.
5. The PCI Hot-Plug Manager menu displays. Return to the procedure that directed you here. The following section describes the menu options.

PCI hot-plug manager menu:

You can use PCI Hot Plug Manager to service PCI adapters with the system power on in AIX. The following options are available from the PCI Hot Plug Manager menu.

Note: For information about the PCI slot LED states, see “Component LEDs” on page 58.

List PCI hot-plug slots

Provides a descriptive list of all slots that support PCI hot-plug capability. If the listing for a slot indicates it holds an “Unknown” device, select the **Install/configure Devices added after IPL** to configure the adapter in that slot.

Add a PCI hot-plug adapter

Allows the user to add a new PCI hot-plug-capable adapter to the slot with the system turned on. You will be asked to identify the PCI slot that you have selected prior to the actual operation. The selected PCI slot will go into the Action state and finally into the On state.

Note: The system will indicate the slot holds an "Unknown" device until you perform the **Install/configure devices added after IPL** option to configure the adapter.

Replace/remove a PCI hot-plug adapter

Allows the user to remove an existing adapter, or replace an existing adapter with an identical one. For this option to work, the adapter must be in the Defined state (see the "Unconfigure a Device" option).

You will be asked to identify the PCI slot prior to the actual operation. The selected PCI slot will go into the Action state.

Identify a PCI hot-plug slot

Allows the user to identify a PCI slot. The selected PCI slot will go into the Identify state. See "Component LEDs" on page 58.

Unconfigure a device

Allows the user to put an existing PCI adapter into the Defined state if the device is no longer in use.

This step must be completed successfully before starting any removal or replacement operation. If this step fails, the customer must take action to release the device.

Configure a defined device

Allows a new PCI adapter to be configured into the system if software support is already available for the adapter. The selected PCI slot will go into the On state.

Install/configure devices added after IPL

The system attempts to configure any new devices and tries to find and install any required software from a user-selected source.

The add, remove, and replace functions return information to the user indicating whether the operation was successful. If additional instructions are provided on the screen, complete the recommended actions. If the instructions do not resolve the problem, do the following:

- If the adapter is listed as Unknown, perform the **Install/configure devices Added After IPL** option to configure the adapter.
- If you receive a warning indicating that needed device packages are not installed, the system administrator must install the specified packages before you can configure or diagnose the adapter.
- If you receive a failure message indicating a hardware error, the problem might be either the adapter or the PCI slot. Isolate the problem by retrying the operation in a different PCI slot, or trying a different adapter in the slot. If you determine that you have failing hardware, call your service representative.
- *Do not* use **Install/configure devices added after IPL** if your system is set up to run HACMP™ clustering. Consult with your system administrator or software support to determine the correct method to configure the replacement device.

Prerequisites for hot-plugging PCI adapters in Linux:

In the course of installing, removing, or replacing a PCI adapter with the system power on in Linux you might need complete some prerequisite tasks. Use the information in this section to identify those prerequisites.

The Linux, system administrator needs to take the PCI adapter offline prior to removing, replacing, or installing a PCI adapter with the system power on (hot-plugging). Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

Before hot-plugging adapters for storage devices, ensure file systems on those devices are unmounted. After hot-plugging adapters for storage devices, ensure the file systems on those devices are remounted.

Before hot-plugging an adapter, ensure that the server or partition is at the correct level of the Linux operating system (Linux 2.6 or later).

Install the POWER® Linux Service Aids. These service aids enable system serviceability, as well to improve system management.

If you are using a Linux on POWER distribution with Linux kernel version 2.6 or later, you can install the Service Aids that gives you access to more capabilities, which can help you diagnose problems on your system.

This software is available at the Service and productivity tools for Linux on POWER Web site (http://techsupport.services.ibm.com/server/lopdiags).

Verify that the Linux, hot-plug PCI tools are installed:

In the course of installing, removing, or replacing a PCI adapter with the system power on in Linux you might need use the hot-plug PCI tools. Use the procedure in this section to verify that you have the hot-plug PCI tools installed.

1. Enter the following command to verify that the hot-plug PCI tools are installed:

   ```
   rpm -aq | grep rpa-pci-hotplug
   ```

   If the command does not list any rpa-pci-hotplug packages, the PCI Hot Plug tools are not installed.
2. Enter the following command to ensure that the rpaphp driver is loaded:

   ```
   ls -l /sys/bus/pci/slots/
   ```

   The directory should contain data. If the directory is empty, the driver is not loaded or the system does not contain hot-plug PCI slots. The following is an example of the information displayed by this command:

   ```
   drwxr-xr-x 15 root root 0 Feb 16 23:31 .
   drwxr-xr-x  5 root root 0 Feb 16 23:31 ..
   drwxr-xr-x  2 root root 0 Feb 16 23:31 0000:00:02.0
   drwxr-xr-x  2 root root 0 Feb 16 23:31 0000:00:02.2
   drwxr-xr-x  2 root root 0 Feb 16 23:31 0000:00:02.4
   drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.0
   drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.2
   drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.4
   drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.6
   drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.0
   drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.2
   drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.4
   drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.6
   ```

   If the directory does not exist, run the following command to mount the filesystem:

   ```
   mount -t sysfs sysfs /sys
   ```

3. Ensure the following tools are available in the /usr/sbin directory.
   - lsslot
   - drslot_chrp_pci
4. Return to the procedure that sent you here.

Component LEDs:

Individual LEDs are located on or near the failing components. Use the information in this section to interpret the LEDs.

The LEDs are located either on the component itself or on the carrier of the component (for example, memory card, fan, memory module, or processor). LEDs are either green or amber.

Green LEDs indicate either of the following:

- Electrical power is present.
- Activity is occurring on a link. (The system could be sending or receiving information.)

Amber LEDs indicate a fault or identify condition. If your system or one of the components on your system has an amber LED turned on or blinking, identify the problem and take the appropriate action to restore the system to normal.

Power supply and fan (CRU)

Use this procedure to install and remove the power supply and fan.

Removing a power supply or fan with power on

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for removing a power supply. For instructions, see Removing a part using the Hardware Management Console.

Attention: Two power supplies must be present in the expansion unit. If one power supply fails, the expansion unit continues to operate.

To remove a power supply or fan from an expansion unit in a system that is not managed by the HMC while the system power is on, complete the following steps:

1. Complete the prerequisite tasks described in “Before you begin” on page 51.
2. Open the front rack door.
3. Identify the power supply that needs to be replaced, as described in Identifying a failing part.
4. At the front of the expansion unit, identify the power supply that must be replaced. To identify the power supply, observe the state of the amber field-replaceable unit (FRU) fault and identify light-emitting diode (LED) **(A)** as shown in Figure 34 on page 59. A lit (flashing or on solid) LED indicates the failing power supply.

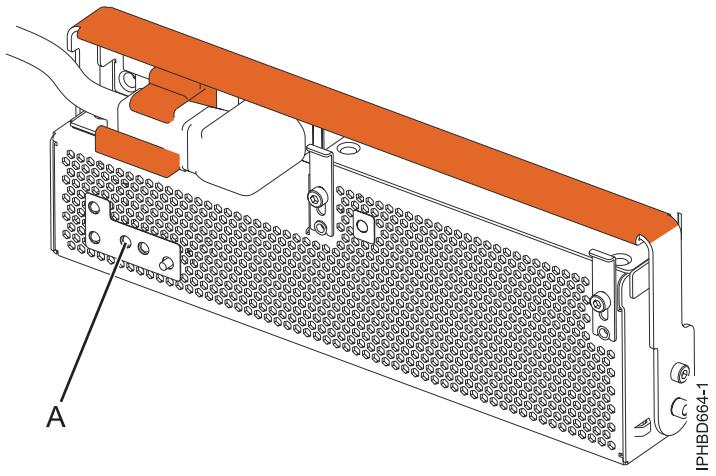


Figure 34. FRU fault and identify LED

5. Remove the plastic baffle cover from the front of the IO drawer, by first removing the two screws and use the touch points to take off the cover.
6. For the power supply that you want to remove, slide the cable retention bracket to the open position **(A)**, and then disconnect the power cable **(B)** as shown in Figure 35. By moving the bracket to the open position, you turn the power supply off.

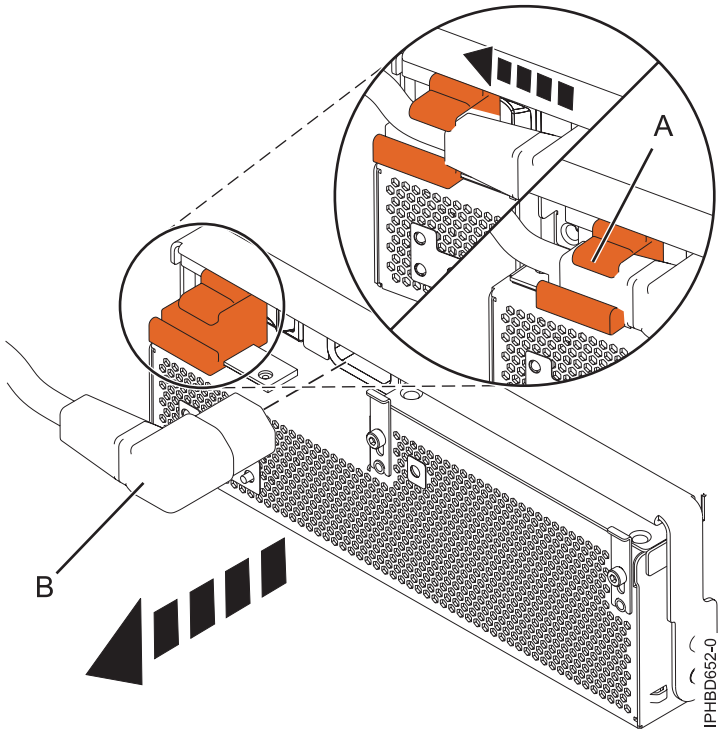


Figure 35. Disconnecting the power cable from the front of an expansion unit

7. Attach the wrist strap.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) from damaging your hardware.
- When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
- If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

8. Rotate the power-supply locking handle **(A)** to the open position as shown in Figure 36, and then pull the power supply out of the expansion unit.

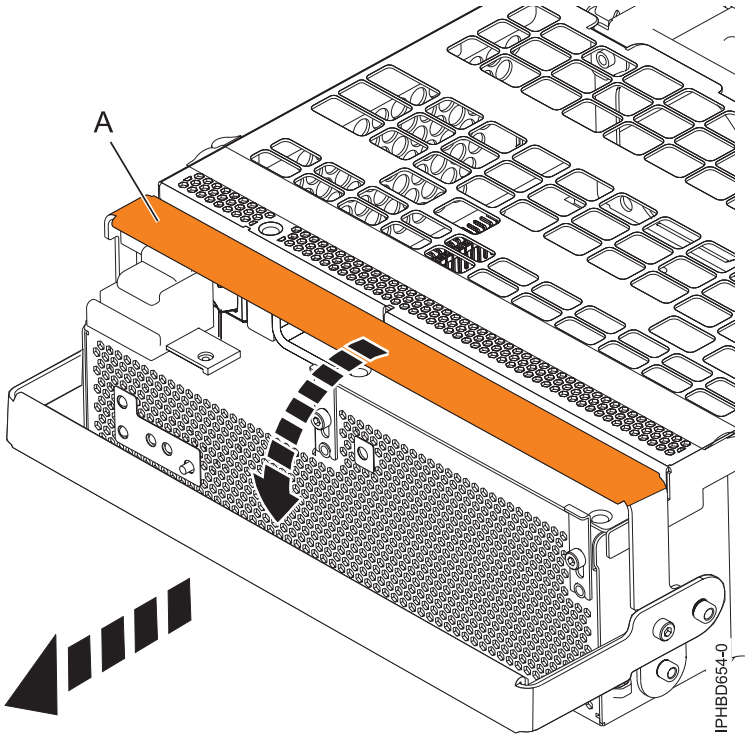


Figure 36. Removing a power supply

9. Optional: If you must remove a failing power-supply fan, complete the following steps:

   Note: If a fan fails, the amber fan fault LED **(B)** on the front of the Offline Converter Assembly (OCA), as shown in Figure 37 on page 61, is on solid.

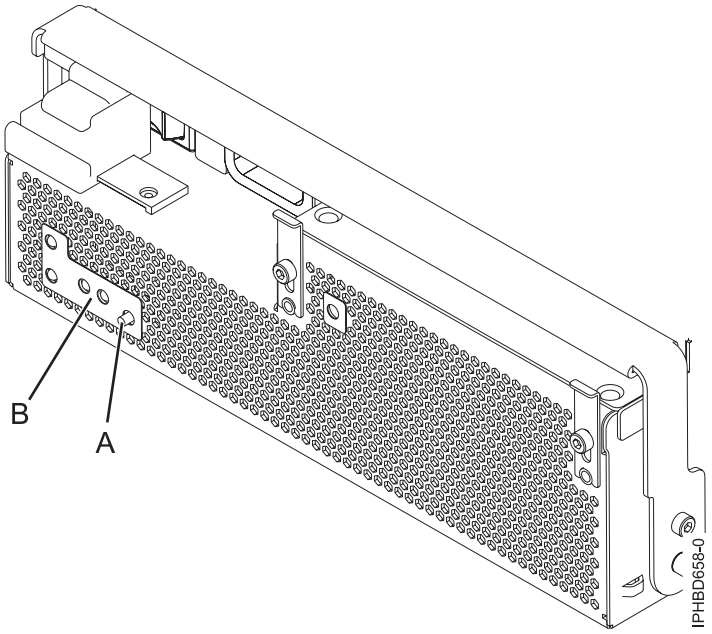


Figure 37. Fan fault LED and fan identify button

a. Identify the failing fan by pressing the fan identify button **(A)** shown in Figure 37. An amber left or right fan-fault LED **(C)** on solid, as shown in Figure 38, indicates the faulty fan.

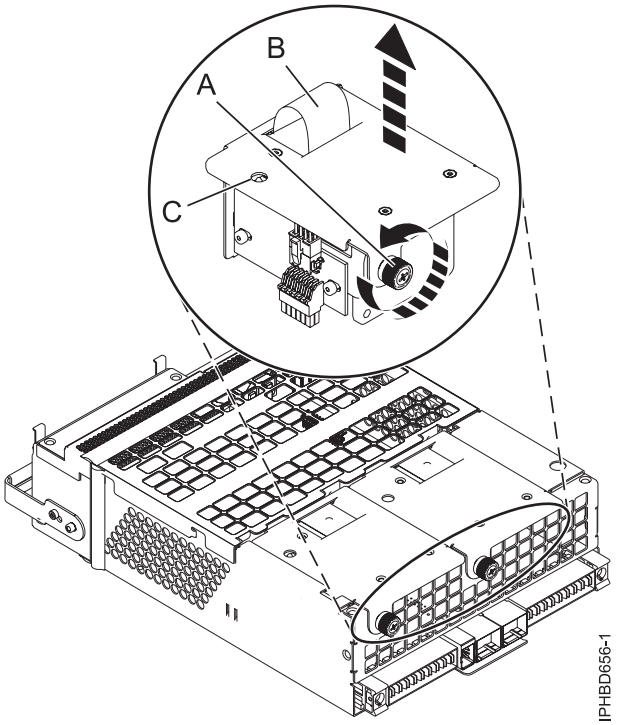


Figure 38. Removing a fan

b. Loosen the thumbscrew **(A)** that holds the fan in the power-supply assembly, as shown in Figure 38.

c. Use the recessed fan handle **(B)** to pull the fan out of the power-supply assembly, as shown in Figure 38 on page 61.

If you removed the power supply or fan as part of another service action, or if you must replace the power supply or fan that you removed from an expansion unit, see Replacing a power supply or fan in a 5802 or 5877 expansion unit with power on.

Replacing a power supply or fan with power on

If your system is managed by the Hardware Management Console (HMC), you can use the HMC to complete the steps for replacing a power supply. For instructions, see Exchanging a part using the Hardware Management Console.

Attention: Two power supplies must be present in the expansion unit. If one power supply fails, the expansion unit continues to operate.

To replace the power supply in an expansion unit for a system that is not managed by the HMC while the system power is on, complete the following steps:

1. If you are replacing a power supply or power-supply fan because of a failure, remove the failing part as described in Removing a power supply or fan from a 5802 or 5877 expansion unit with power on.
2. Complete the prerequisite tasks described in "Before you begin" on page 51.
3. Open the front rack door if it is not already open.
4. Attach the wrist strap.

   Attention:

   - Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) from damaging your hardware.
   - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
   - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
5. Optional: If you need to replace a failing power-supply fan, complete the following steps:
   a. Align the new fan with the opening in the power-supply assembly.
   b. Press the fan **(A)** into its connector in the assembly as shown in Figure 39 on page 63.
   c. Tighten the thumbscrew **(D)** as shown in Figure 39 on page 63.

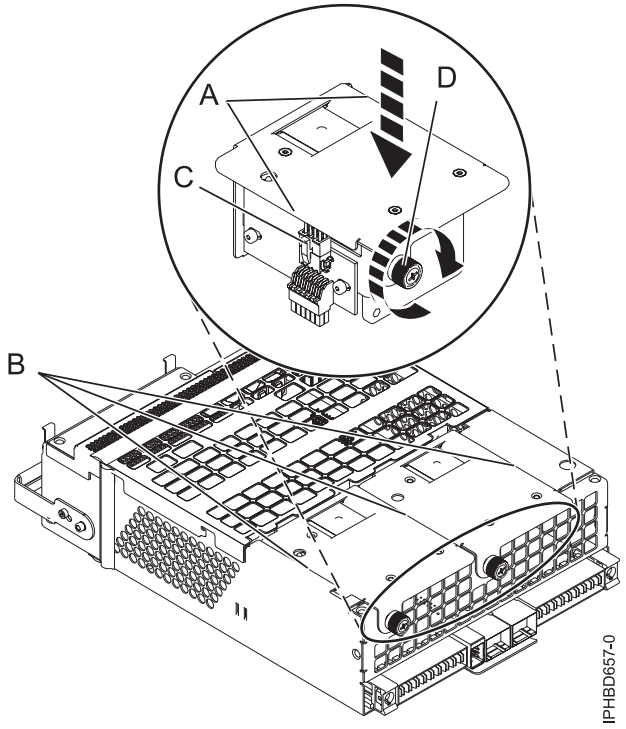


Figure 39. Replacing a fan

6. To replace the power supply, with the locking handle **(A)** in the open position, push the power supply into the expansion unit as shown in Figure 40.

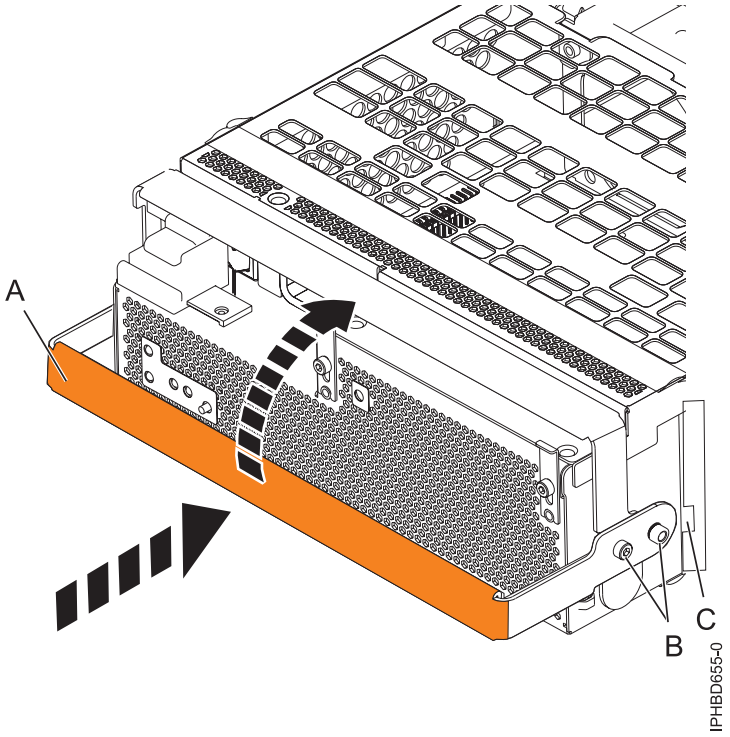


Figure 40. Replacing a power supply

7. Close the locking handle **(A)** until the power supply locks into position.

8. Reconnect the power cable **(A)** to the front of the power supply, and then slide the cable retention bracket **(B)** to the closed position to secure the cable as shown in Figure 41. When the bracket is moved to the closed position, the power supply is turned on.

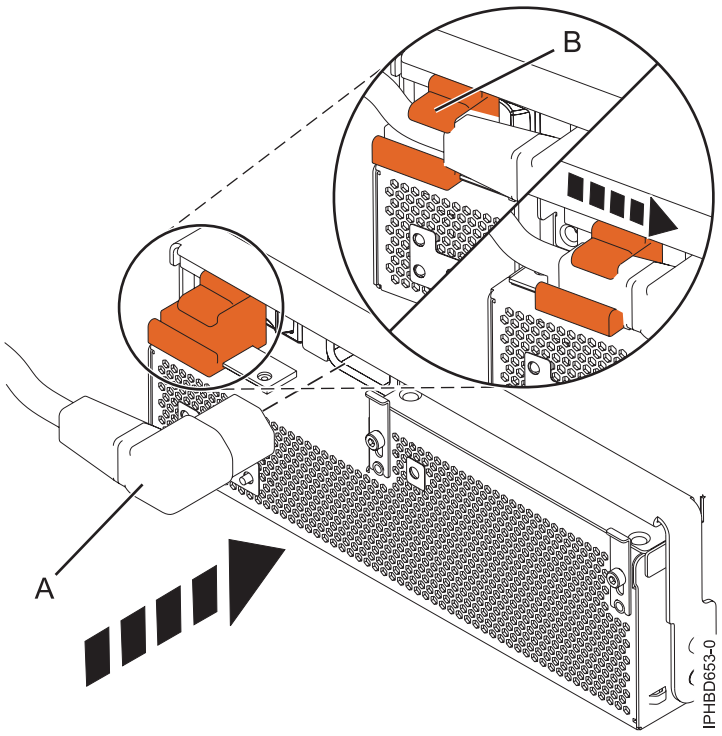


Figure 41. Connecting the power cable to the front of an expansion unit

9. Note the state of the green ac power in **(A)** and Offline Converter Assembly (OCA) power light-emitting diodes (LEDs) **(B)** shown in Figure 42 on page 65, and do one of the following actions, as applicable:
   - If the LEDs indicate that the power supply is operating normally, that is, that the ac power in LED **(A)** is on solid and the OCA power **(B)** LED is on solid or blinking, continue to the next step.
   - If not, remove the power supply from the expansion unit and repeat the procedure starting with step 6 on page 63. If, after repeating the procedure, the power supply is not operating normally, contact your service provider.

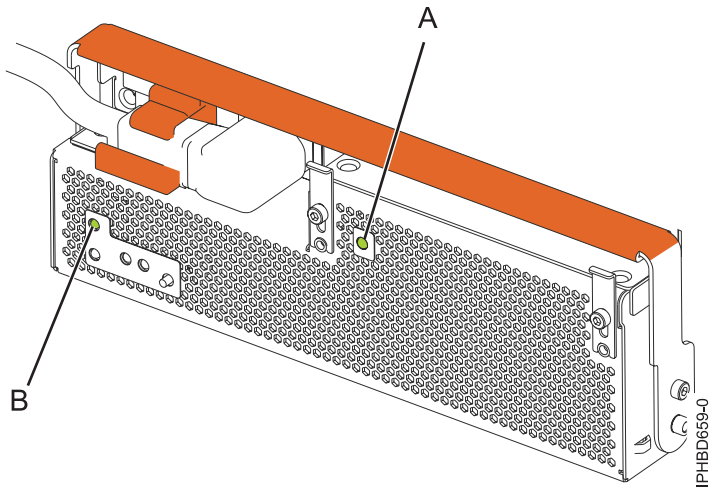


Figure 42. Expansion unit ac power and OCA power LEDs

Note: If you replaced a power-supply fan as part of this procedure, note the state of the fan fault LED **(B)** shown in Figure 43. If the LED is off, indicating that both fans are operating normally, continue to the next step. If not, remove the power-supply assembly from the expansion unit and repeat the procedure starting with step 5 on page 62. If, after repeating the procedure, the power-supply fan is not operating normally, contact your service provider.

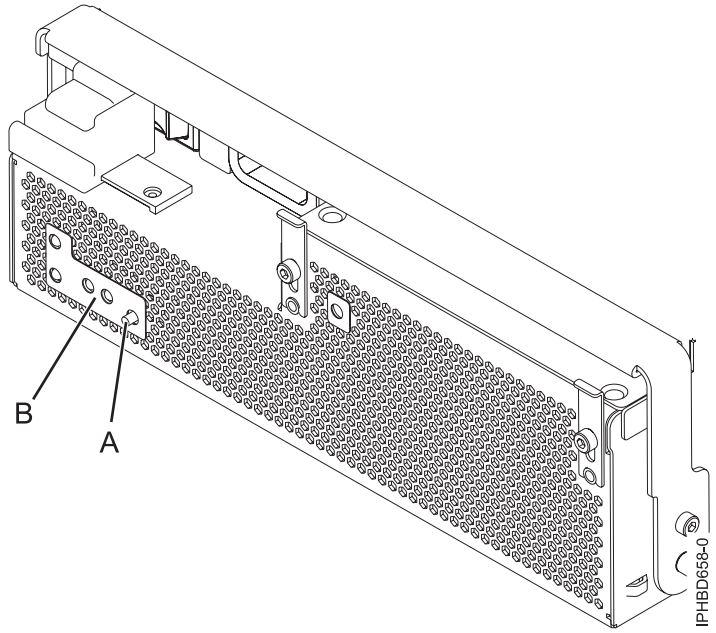


Figure 43. Fan fault LED

10. Verify the installed part, as described in Hardware service manager Verify option.
11. Close the front rack door.

Continue with any other service actions you need to perform.

SAS conduit card (CRU)

Use this procedure to install and remove the SAS conduit card.

Removing the SAS conduit card

If your system is managed by the Hardware Management Console (HMC) use the HMC to remove the SAS conduit card. For instructions see, Removing a part using the Hardware Management Console.

1. Perform the prerequisite tasks as described in "Before you begin" on page 51.
2. Identify the card you are going to remove. For instructions see, Identifying a failing part.
3. Stop the system. For instructions see, Stopping a system or logical partition.
4. Remove the disk drives and fillers as shown in the following figure.
   a. Squeeze the latch of the disk drive and pull the handle **(A)** toward you to release the drives.
   b. Supporting the bottom of the disk drive with your hand, slide it out of the backplane.

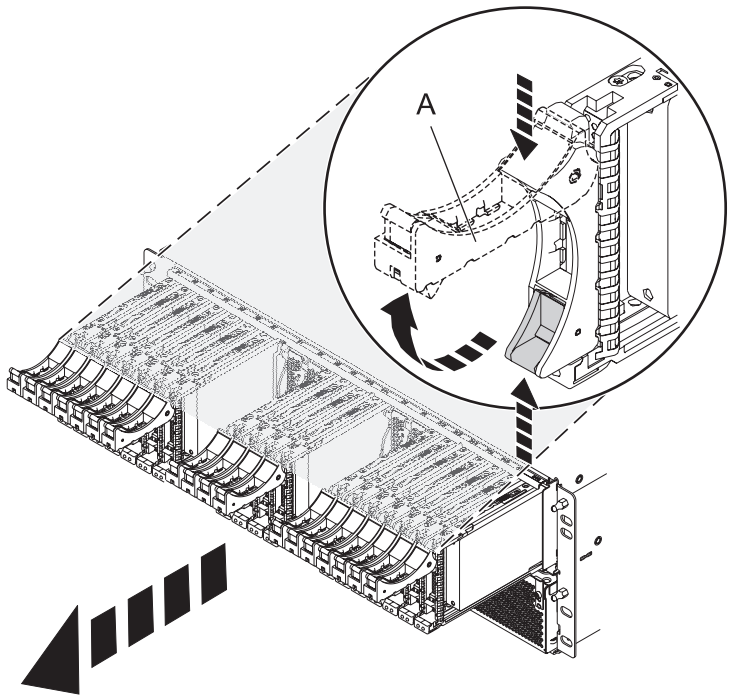


Figure 44. Removing the disk drives from the backplane

5. Remove the port cards and fillers as shown in the following figure.
   a. Grasp the end of the latching handle **(A)** and pull it upward to unlock the port card.
   b. Using your hand to support the bottom of the port card, slide it out of the backplane.
   c. Place the port card on an electrostatic discharge (ESD) surface.

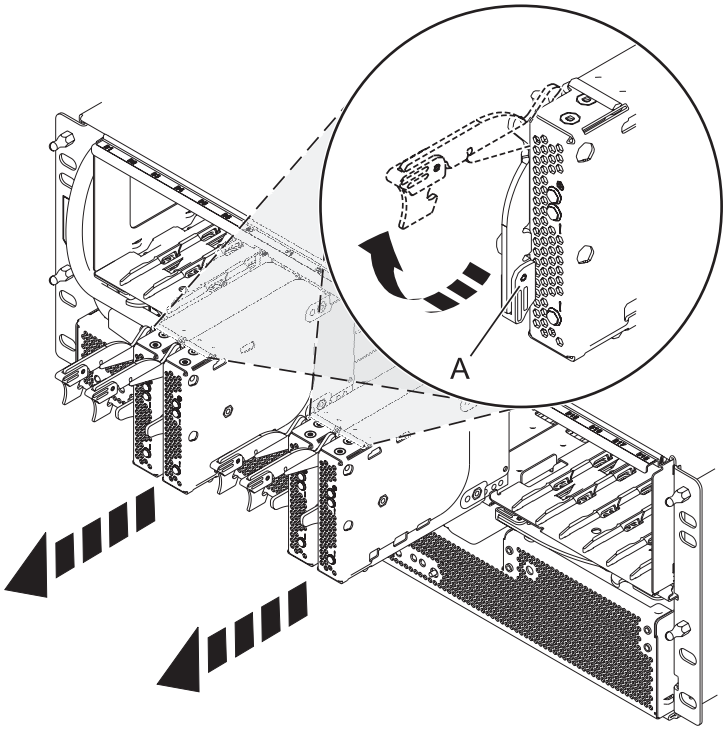


Figure 45. Removing the port card from the backplane

6. Remove the backplane as shown in the following figure.

   CAUTION:
   The backplane might be heavy. Ensure that you can safely complete the procedure.

   a. Squeeze the blue latches **(A)** to unlock the handles.
   b. Pull the handles **(B)** outward in the direction shown to release the backplane.
   c. Slide the backplane out of the enclosure, using your hand to support the bottom of the backplane.

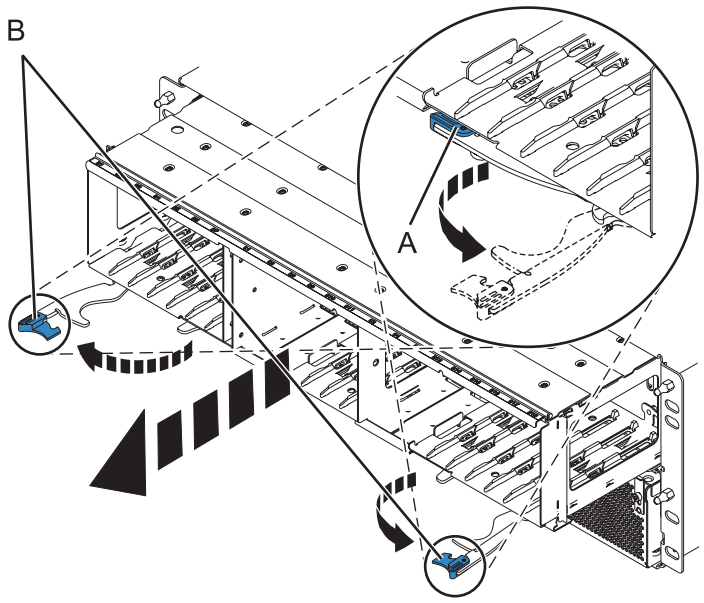


Figure 46. Removing the backplane from the enclosure

7. Disconnect both offline converter assembly (OCA) power cords by doing the following:
   a. On the front of both OCAs, slide the power cord holders **(A)** to the left.
   b. Label and disconnect both OCA power cords **(B)** from each OCA.

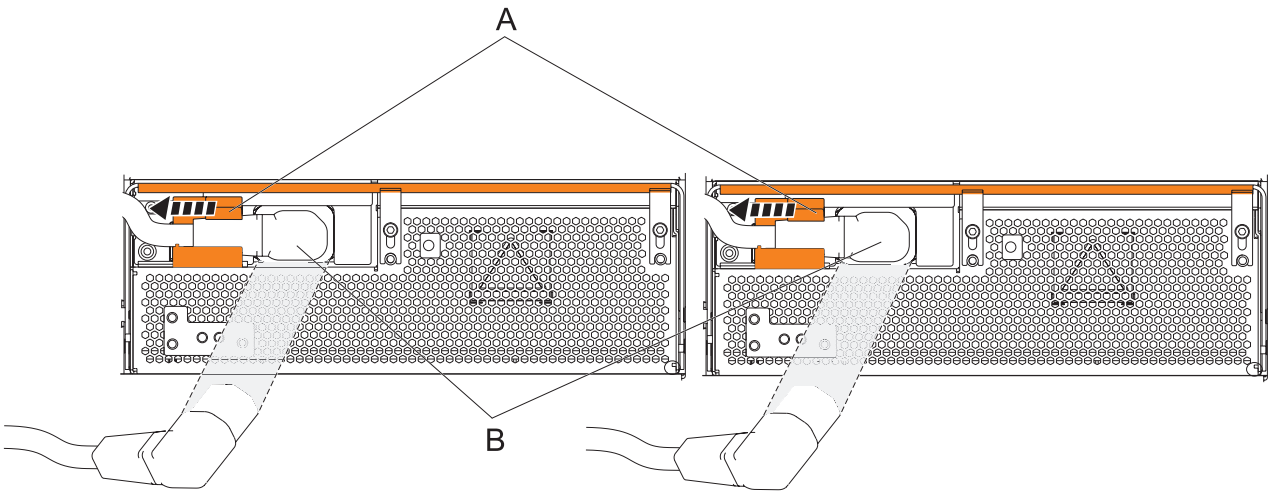


Figure 47. Disconnecting the OCA power cords

8. Remove the offline converter assemblies by doing the following steps:
   a. Pull the OCA handle **(A)** all the way down in the direction shown to unseat the OCA.
   b. Grasp both sides of the OCA and pull it out of the enclosure.

      Note: Use 2 hands to support the OCA as it is pulled out of the enclosure.
   c. Repeat these steps to remove both OCAs.

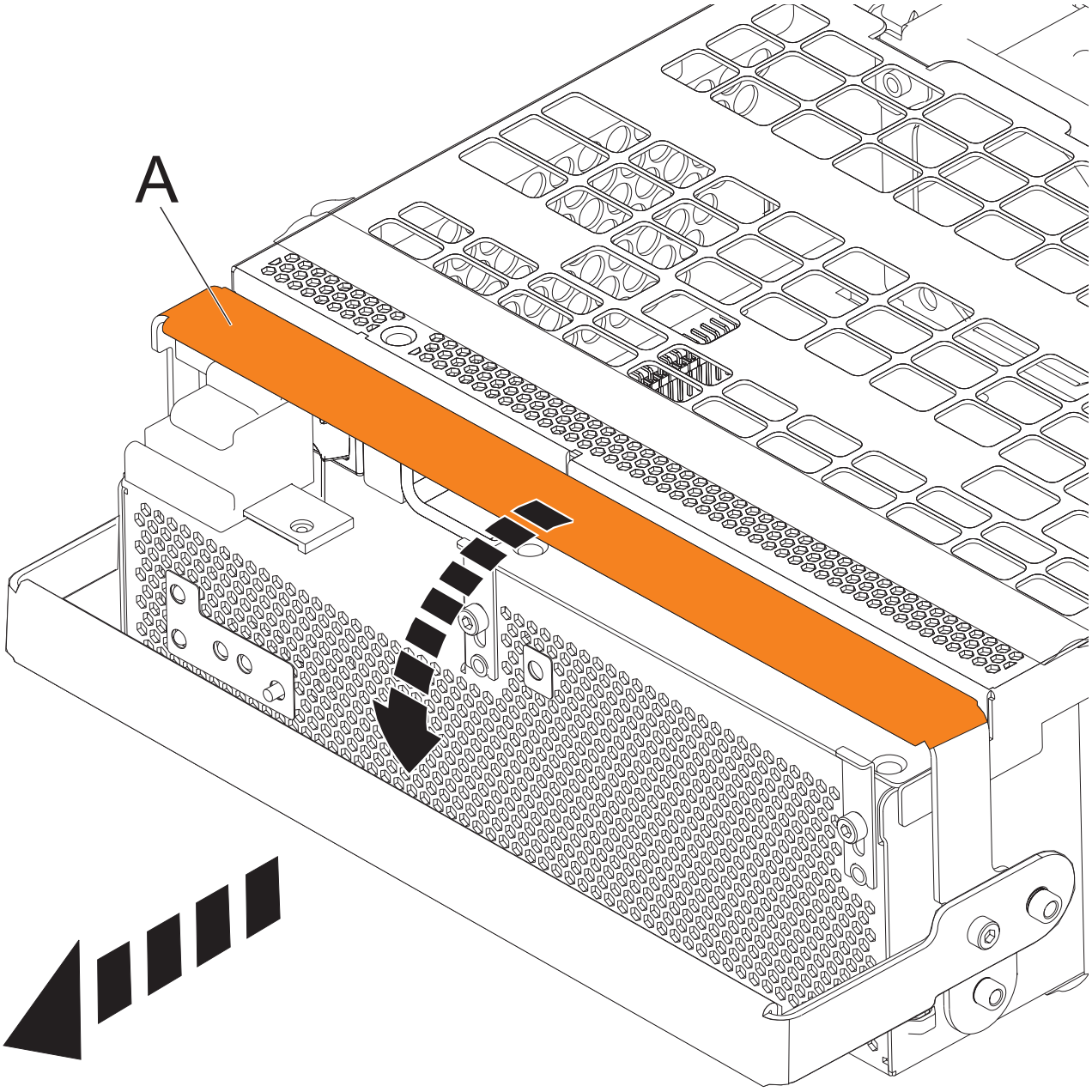


Figure 48. Remove the offline converter assemblies

9. Remove the enclosure management controller by doing the following steps:
   a. Label and disconnect any cables connected to the enclosure management controller card.
   b. Pinch the latch **(A)** to unlock the handle **(B)**.
   c. Pull the handle outward in the direction shown to unseat the EMC card.
   d. Slide the enclosure management controller card straight out of the enclosure.

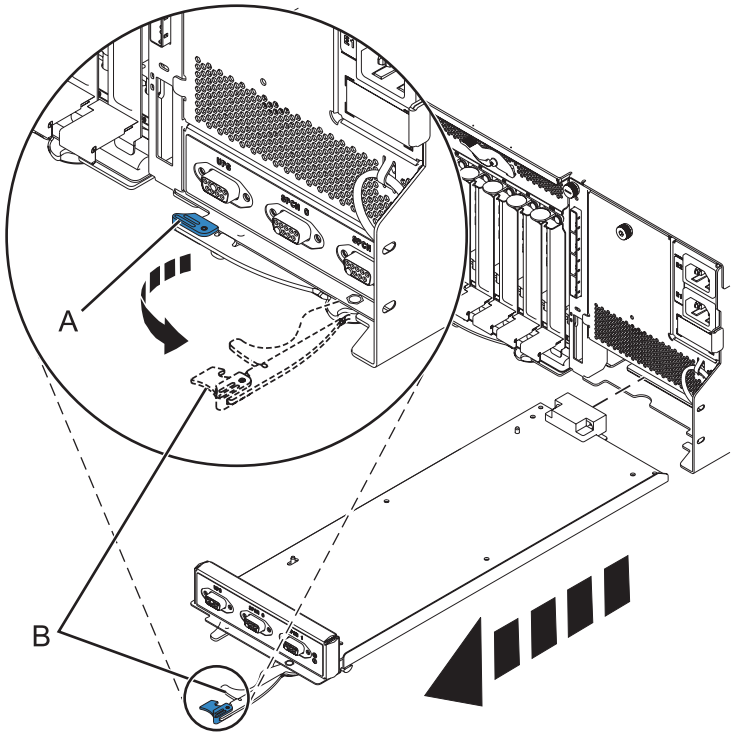


Figure 49. Remove the enclosure management controller

10. Remove the power cord plate by turning the thumbscrew **(A)** and pulling the plate away from the system.

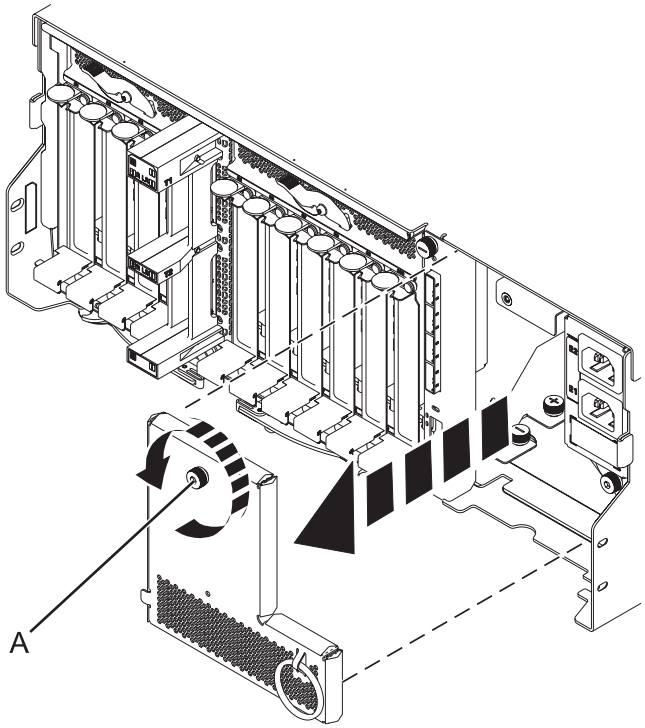


Figure 50. Removing the power cord plate

11. Disconnect the cables from the back of the I/O planar.

12. Remove the adapters from the I/O planar. For instructions, see Model 5802 and 5877 expansion units, PCI adapters, and cassettes.
13. Squeeze the release latches **(A)** and pull the levers **(B)** out away from the system, as shown in the following figure.

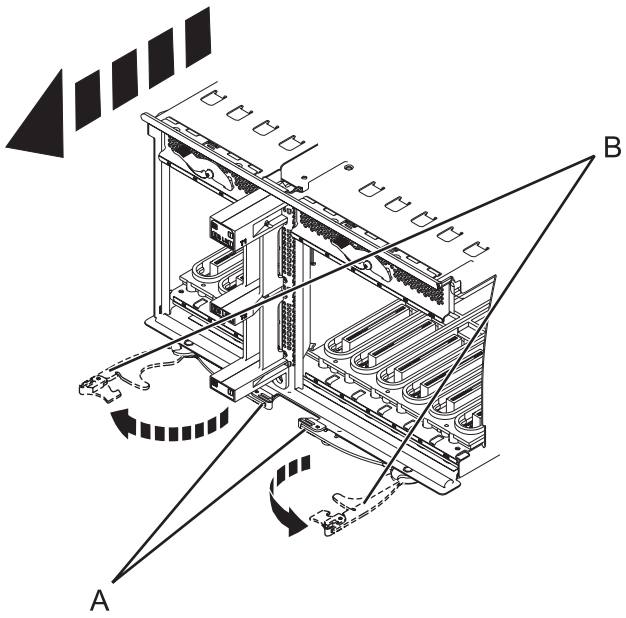


Figure 51. Removing the I/O planar

14. Slide the planar out of the system.
15. Remove the SAS conduit card and midplane from the enclosure by doing the following steps:
    a. Pull the spring plungers **(A)** up and turn them one quarter to the left.
    b. Turn the captive screws **(B)** and **(C)** counterclockwise until they are completely loosened.
    c. Pull the SAS conduit and midplane component out of the enclosure.

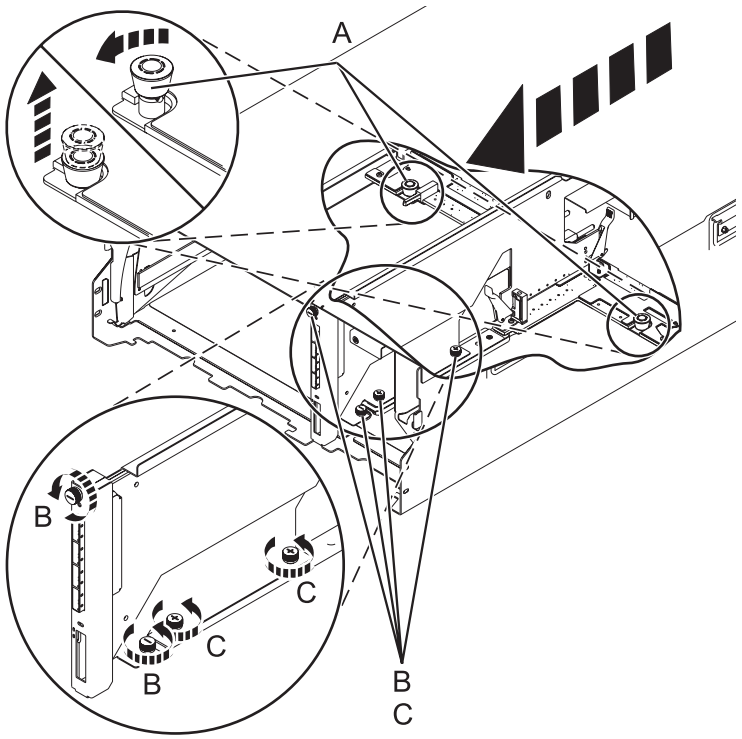


Figure 52. Removing the SAS conduit card and midplane

16. Push the handles **(A)** on the conduit card down to disengage the card from the midplane, and remove the card.

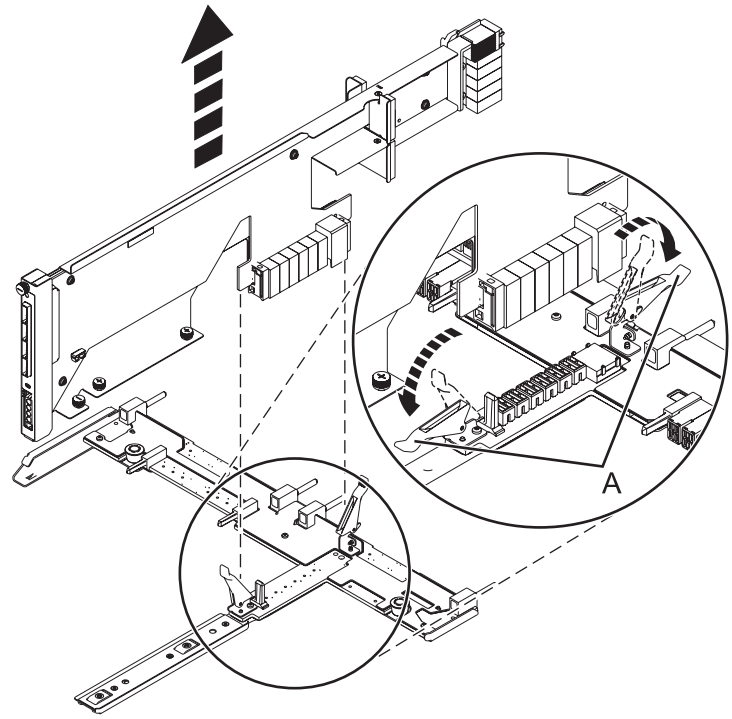


Figure 53. Removing the SAS conduit card from the midplane

Continue with replacing the SAS expander card or return to the procedure that sent you here.

Replacing the SAS conduit card

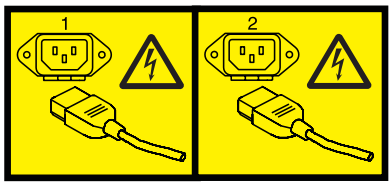
Review the requirements in “Before you begin” on page 51.

If your system is managed by the Hardware Management Console (HMC) use the HMC to replace the card. For instructions see,

1. Stop the system if it is running. For instructions see, Stopping a system or logical partition.
2. Disconnect the power source from the system by unplugging the system.

   Attention: You must disconnect the power source from the system by disconnecting all power cords to prevent system damage during this procedure.

   (L003)



   or

3. Place the card connector **(C)** onto the on the midplane connection **(D)** using the guide track **(B)** to ensure a good connection. Then lift the handle **(A)** to seat and secure the SAS conduit card to the midplane as shown in the following figure.

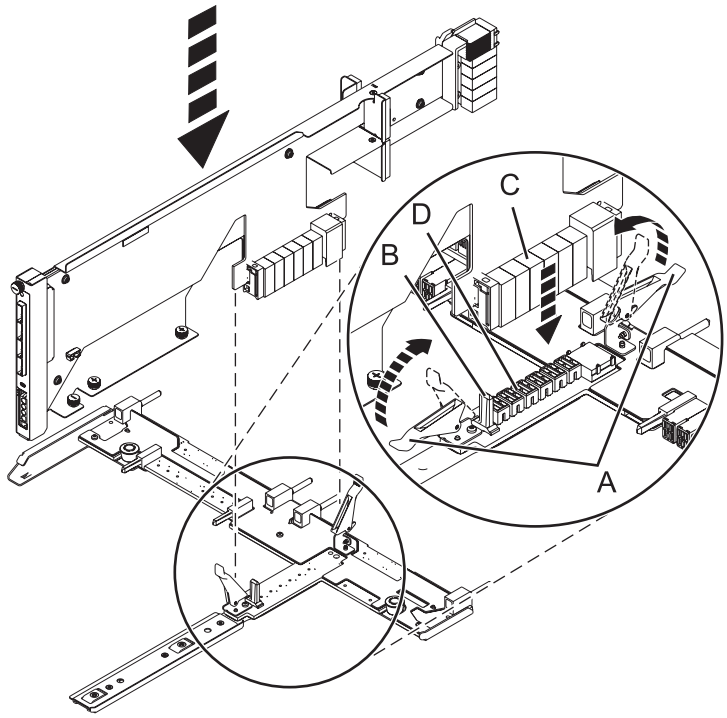


Figure 54. Installing the SAS conduit card into the midplane

4. Place the midplane and SAS conduit card back into the system by doing the following steps:
   a. Align the midplane with the track and ensure the slot **(A)** on the midplane attaches to the post **(B)** in the system.
   b. Secure the thumbscrews **(C)** and **(D)** on the SAS conduit card.
   c. Secure the thumbscrews **(E)** on the sides of the midplane.
5. Attach the power cord cover and secure the thumbscrew **(A)** to the system.

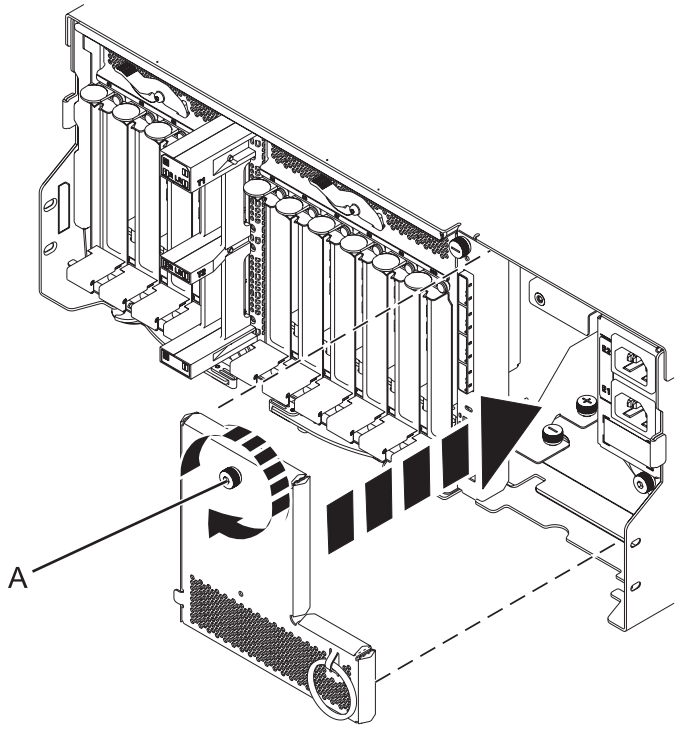


Figure 55. Installing the power cord plate

6. Carefully slide the enclosure management controller into the system and close the latch **(A)** as shown in the following figure.

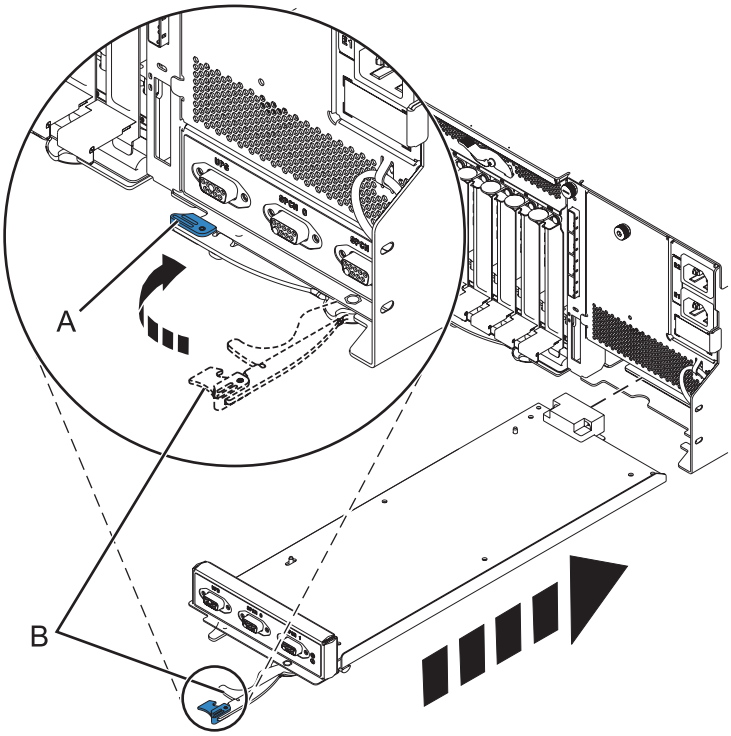


Figure 56. Replacing the enclosure management controller

7. Carefully lift and align the I/O planar with the slot at the back of the expansion unit.

8. Insert the I/O planar firmly into the server, as shown in the following figure.
9. Secure the I/O planar with the locking tabs **(A)** as shown in the following figure.

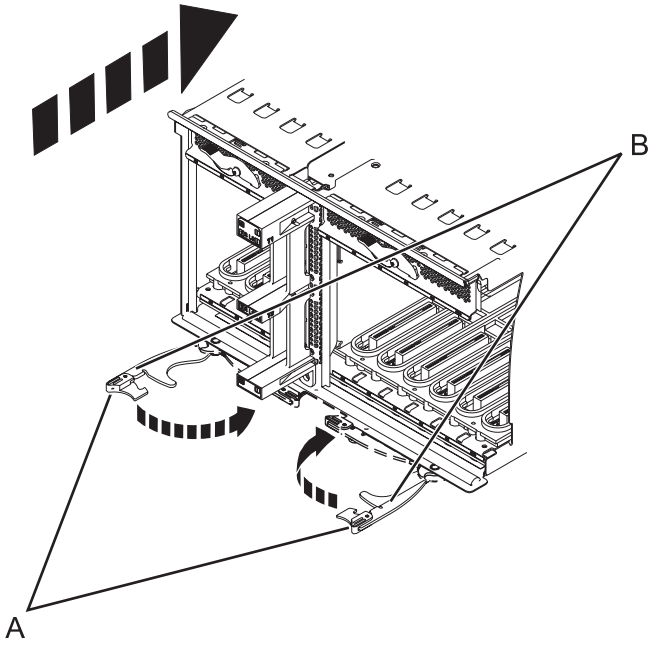


Figure 57. Install the I/O planar on a rack mounted model

10. To replace the power supply, with the locking handle **(A)** in the open position, push the power supply into the expansion unit as shown in the following figure.
11. Close the locking handle **(A)** until the power supply locks into position.

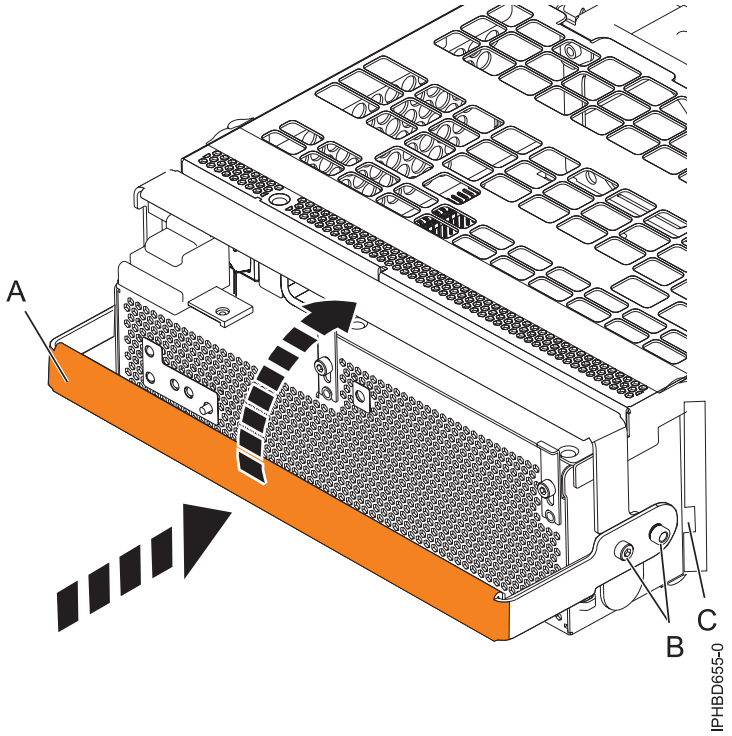


Figure 58. Replacing a power supply

12. To replace the disk drive backplane, lift the backplane along the two sides and align with the guide rails in the expansion unit.

    CAUTION:
    The backplane may be heavy. Ensure that you can safely perform this task before you begin.
13. Using your hand to support the bottom of the backplane, slide it into the expansion unit as shown in the following figure.
14. Secure the backplane in place by moving the locking tabs from the open position **(B)** to the locked position **(A)**.

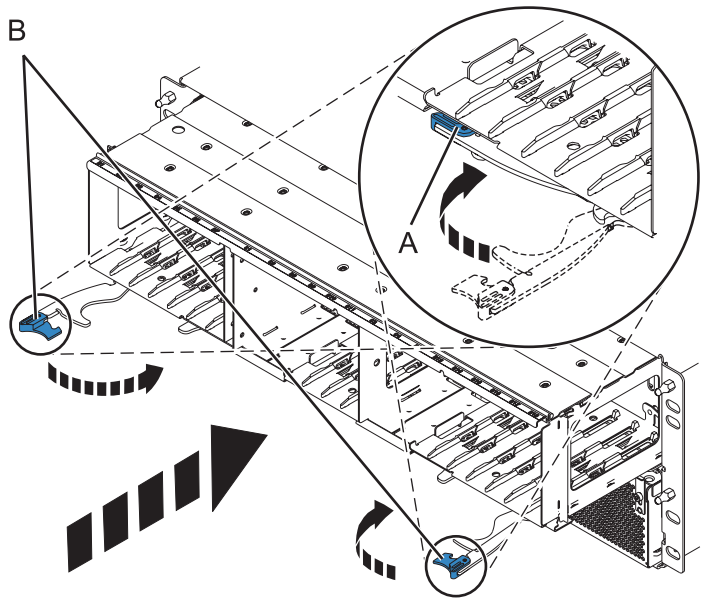
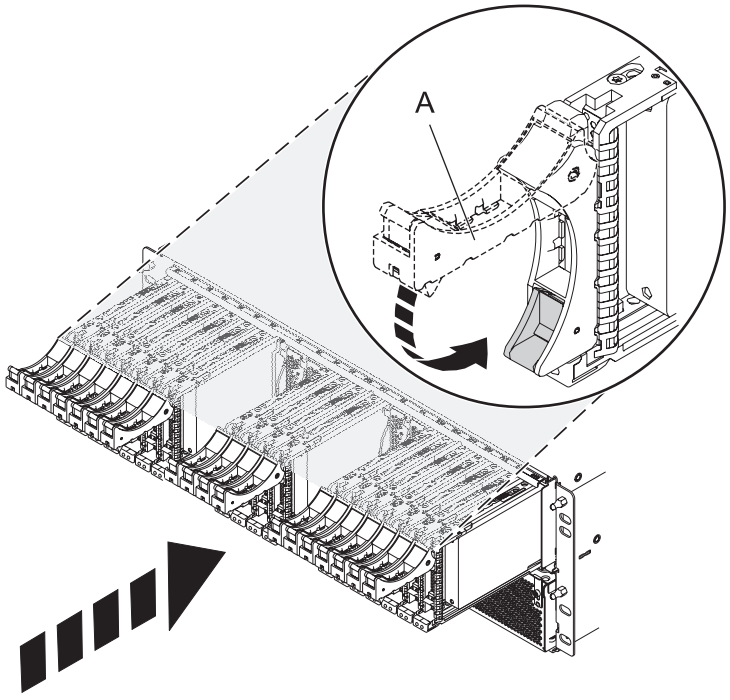
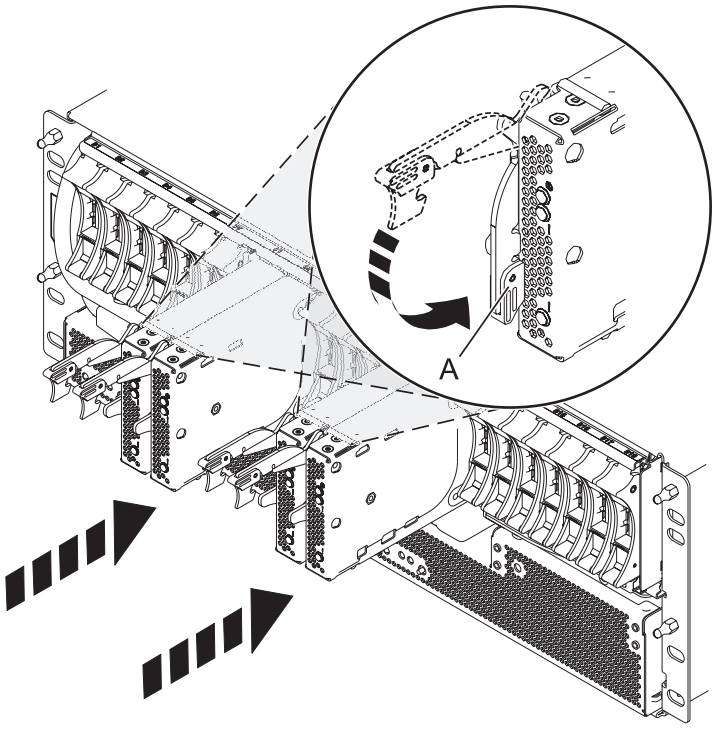


Figure 59. Installing the backplane on a rack-mounted model

15. Replace all disk drive units and fillers, if you removed them earlier.
    a. Support the bottom of the disk drive unit as you align it with the guide rails in the backplane.
    b. Slide the disk drive unit all the way into the backplane.
    c. Push the handle **(A)** toward the disk drive unit to lock it into place.



16. Replace all expander cards and fillers, if you removed them earlier.
    a. Supporting the bottom of the expander card with your hand, align it with the guide rails in the backplane.
    b. Slide the expander card all the way into the backplane.
    c. Push the handle **(A)** toward the card to lock it into place.



17. Start the system. For instructions see, Starting the system or logical partition.

Continue with any other service actions you need to perform.

- For information on connecting the system see Connecting your expansion units
- For information an installing the PCI adapters into the planar, see Model 5802 and 5877 expansion units, PCI adapters, and cassettes.

SAS expander card (CRU)

Use this procedure to install and remove the serial attached SCSI (SAS) expander card

Removing a SAS expander card with power off

If your system is managed by the Hardware Management Console (HMC) use the HMC to remove the SAS expander card. For instructions see, Removing a part using the Hardware Management Console.

1. Perform the prerequisite tasks as described in “Before you begin” on page 51.
2. Stop the system. For instructions see, Stopping a system or logical partition.
3. Identify the card you are going to remove. For instructions see, Identifying a failing part.
4. Lift the handle **(A)** and pull the card out of the system, as shown in the following figure.

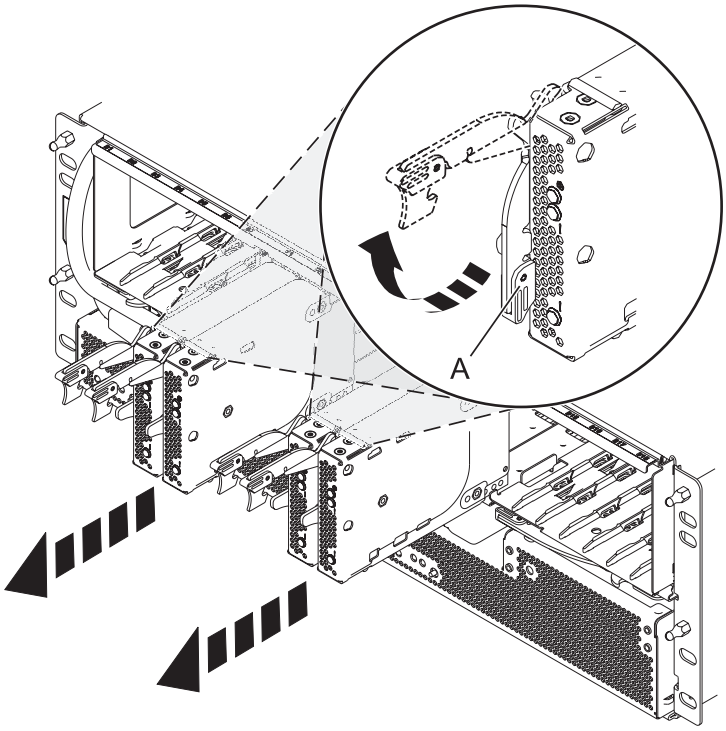


Figure 60. Removing the SAS expander card.

Continue with replacing the SAS expander card or return to the procedure that sent you here.

Replacing a SAS expander card with power off

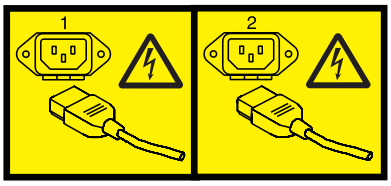
Review the requirements in "Before you begin" on page 51.

If your system is managed by the Hardware Management Console (HMC) use the HMC to replace the card. For instructions see,

1. Stop the system if it is running. For instructions see, Stopping a system or logical partition.
2. Disconnect the power source from the system by unplugging the system.

   Attention: You must disconnect the power source from the system by disconnecting all power cords to prevent system damage during this procedure.

   (L003)



   or

3. Slide the card completely into the slot and push the lever **(A)** down to secure the card as shown in the following figure.

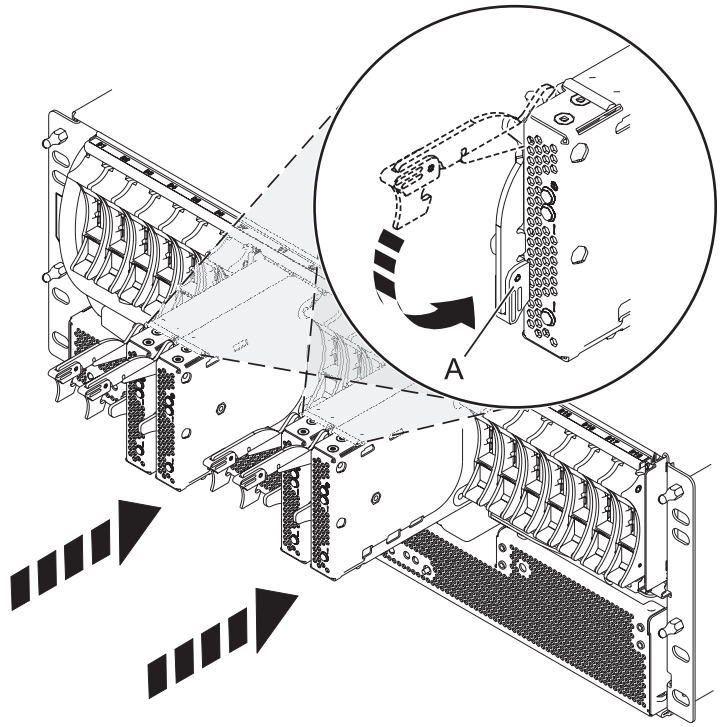


Figure 61. Installing the SAS expander card

4. Start the system. For instructions see, Starting the system or logical partition.
5. Verify the presence of the newly installed card. For instructions see, Hardware service manager Verify option.

Continue with any other service actions you need to perform.

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Avis de conformité à la réglementation d'Industrie Canada

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