ESCALA

ESCALA PL160T/R, PL260T/R and PL460T/R Removal and Replacement Procedures

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Hardware

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Contents

Safety notices v

Chapter 1. Removing and replacing FRUs 1
External cables. 3
Battery 3
Cache battery pack 16
Control panel. 25
Disk drive 28
Replacing the disk drive using AIX 29
Replacing the disk drive using Linux 32
Preparing to remove the disk drive 32
Removing the disk drive 35
Replacing the disk drive 36
Replacing the disk drive nonconcurrently 38
Rebuilding data on a replacement disk drive using Linux 40
Replacing the disk drive using IBM i 46
Disk unit backplane 47
Ethernet card 58
Fan 64
GX adapter 70
Media device 76
Memory DIMM 85
PCI adapter 92
Power supply 98
RAID enablement card 104
Auxiliary cache card 109
Slimline media 115
System backplane 119
Thermal power management device (TPMD) card 151
Voltage regulator module (pair) 156
Voltage regulator module (single). 164
Vital product data (VPD) card 171

Chapter 2. Verifying a repair 181
Verifying the repair in AIX 182
Verifying the repair in Linux 185
Verifying a repair using an IBM i system or logical partition 185

Chapter 3. Closing a service call 189
Closing a service call using Integrated Virtualization Manager 193
Closing a service call using AIX or Linux 197
Activating and deactivating LEDs 202
Deactivating a system attention LED or partition LED using the HMC 202
Activating or deactivating an identify LED using the HMC 202
Deactivating a system attention LED or logical partition LED using the Advanced System Management Interface 203
Activating or deactivating an identify LED using the Advanced System Management Interface 203

Appendix. Notices 205
Trademarks 206
Electronic emission notices 206
Class A Notices. 206
Terms and conditions. 209

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.

Chapter 1. Removing and replacing FRUs

Use these procedures to remove and replace failing parts.

Before you begin a replacement, perform these tasks:

1. If you are performing a replacement procedure that might put your data at risk, ensure, if possible, that you have a current backup of your system or logical partition (including operating systems, licensed programs, and data).
2. Review the installation or replacement procedure for the feature or part.
3. 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.
4. Ensure that you have access to a medium, flat-blade screwdriver.
5. If parts are incorrect, missing, or visibly damaged, contact your service provider or next level of support.

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)

Attention:

Failure to follow the step-by-step sequence for FRU removal or installation may result in FRU or system damage.

Use the following precautions whenever you handle electronic components or cables.

- The electrostatic discharge (ESD) kit and the ESD wrist strap must be used when handling logic cards, SCMs, MCMs, electronic boards, and disk drives.
- Keep all electronic components in the shipping container or envelope until you are ready to install them.
- If you remove, then reinstall an electronic component, temporarily place the component on an ESD pad or blanket.

  External cables

  Control panel

  Disk drive

  Disk unit enclosure

Fans
I/O Backplane
Media device enclosure
Memory DIMM
RIO/HSL adapter and 12X host channel adapter
PCI adapter
C6 PCI adapter
Power supply
Removable media
Service processor assembly and time-of-day battery
Service processor cable
SMP cable
System backplane
System processor assembly
Voltage regulator assembly
VPD Card
VPD passthru card

External cables

Use this procedure to service the external cables.

1. **Remove the external cable**

Trace the cable and record the system location at the other end, and then remove the cable.

2. **Install the external cable**

Attention: To prevent damaging the FRU or the system, use the following precautions before plugging cables into a connector or adapter:

- Make sure that you have the right type of cable for the connector or adapter.
- Make sure that the cable plug is correctly aligned with the connector or adapter.
- Make sure that the tongue on the HSL/RIO cable plug matches the white location keys on the connector.

Install the cable, then route and install the other end of the cable to the system location that was previously recorded.

3.

Go to Chapter 2, “Verifying a repair,” on page 181.

Battery

Use this procedure to service the battery.

Note: This part cannot be serviced concurrently. Every partition must be shut down and the managed system must be powered off to continue the repair.

1. Access the ASMI

The Advanced System Management Interface (ASMI) is the interface to the service processor that is required to perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, and controlling the system power. The ASMI may also be referred to as the service processor menus.

To access the ASMI, refer to Accessing the Advanced System Management Interface.

When you have accessed the ASMI, continue with the next step.

2. Check and record the server settings

Prior to replacing this FRU, check and record all server settings as you may need to update the system after you update this FRU. This can be done through the **Advanced System Management Interface (ASMI)** .

1. Check and record the **server firmware level** indicated on the right edge of the status frame, the area where the **Log out** button is located. You may need to update the system to the latest server firmware code level after you update this FRU.
2. Check and record the service processor settings you previously set using ASMI. You will need to reset these service processor settings after you update this FRU or the default settings will be used. Settings to record include the following:
   - **Power/Restart Control** settings.
   - **System Service Aids** settings.
   - **System Configuration** settings, **System Name** setting.
   - **Network Services** settings.
   - **Performance Setup** settings.
   - **Login Profile** settings.
3. Record any service processor settings you may have set using operating system commands.

3. Shut down the partitions and power off the system

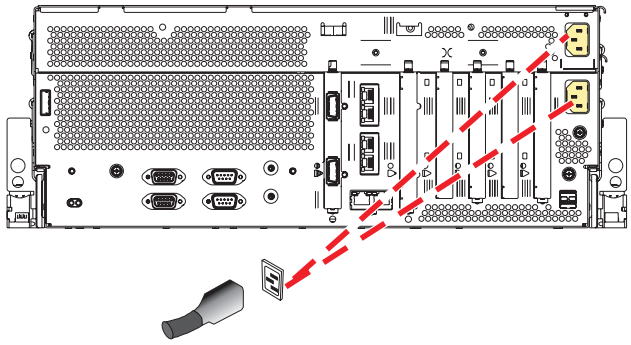
This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

4. Disconnect the power cords

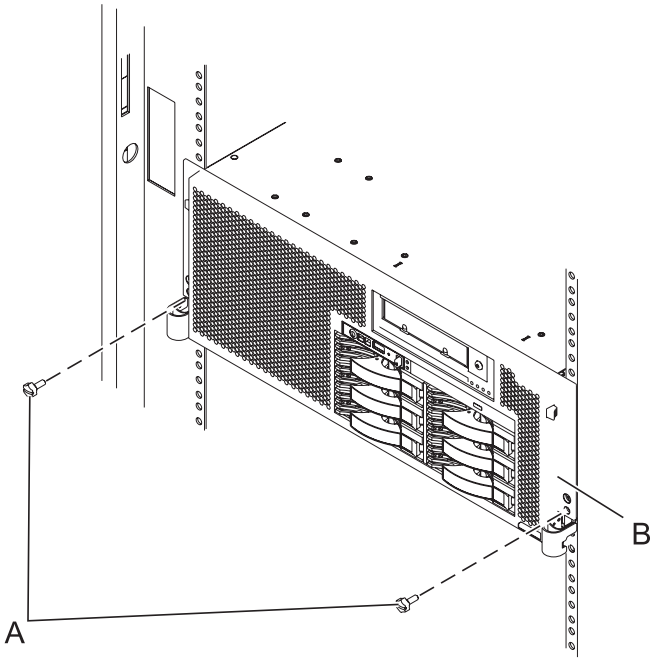
1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.



5. Place into service position

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Expansion unit users can still use this procedure. However, users of expansion units should ignore specific references to rack-only features, such as rack doors, rack thumbscrews, and rack-specific FRU orientation.

1. Open the front rack door.
2. Identify the system unit you are servicing in the rack.
3. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.

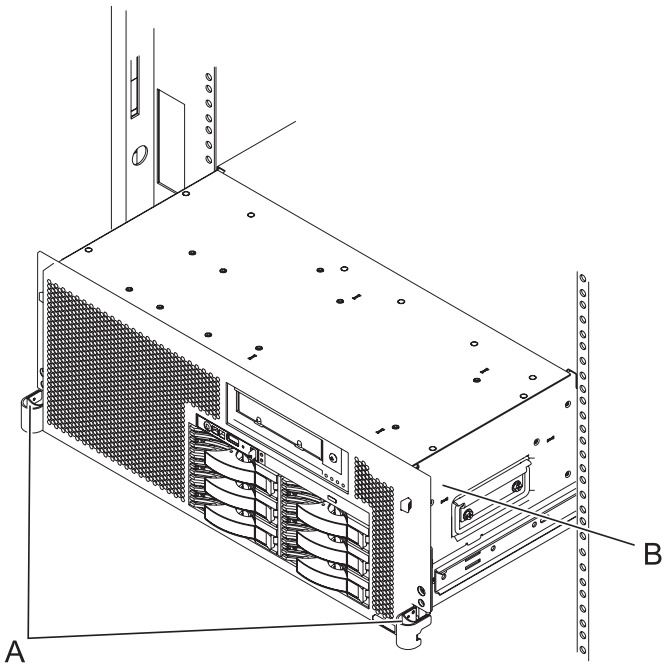


6. Place into service position (continued)

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

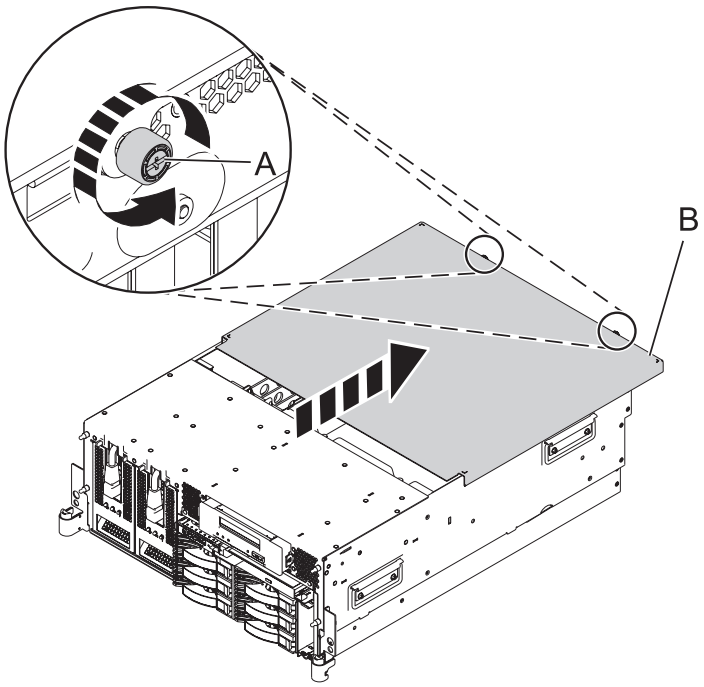
While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



7. Remove the service access cover

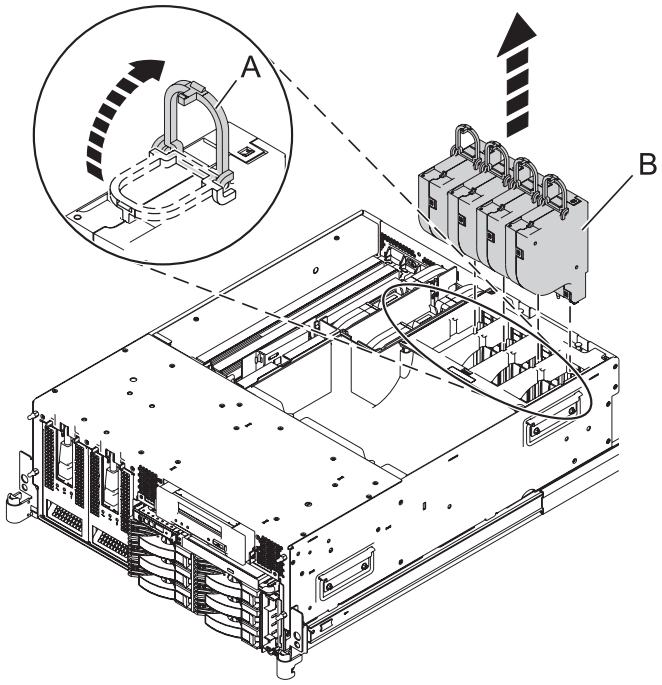
1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



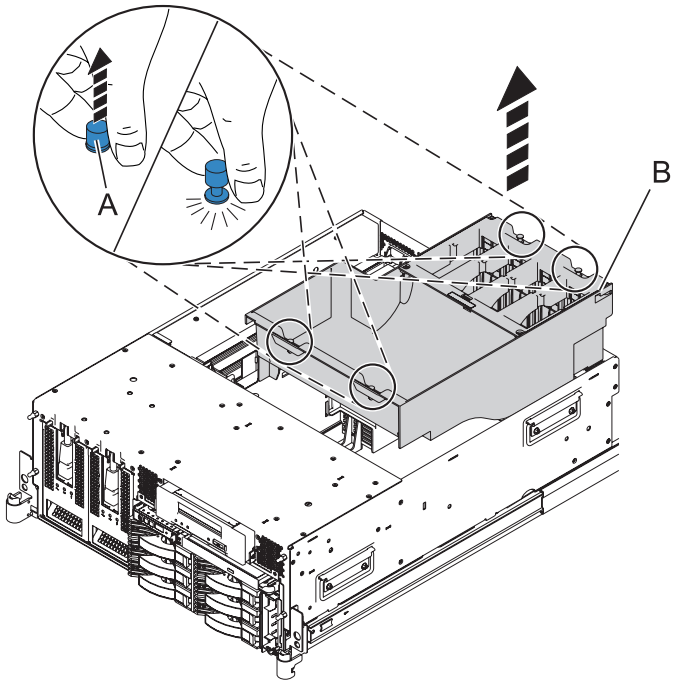
8. Remove the fans

1. Push the latch **(A)** upward to disengage the fan from the fan cage.
2. Pull the fan **(B)** out of the fan cage.
3. Repeat these steps until all fans are removed from the fan cage.



9. Remove the fan cage

1. Pull the four retaining tabs **(A)** that secure the fan cage to its enclosure.
2. Lift the fan cage **(B)** straight up and out of the enclosure.



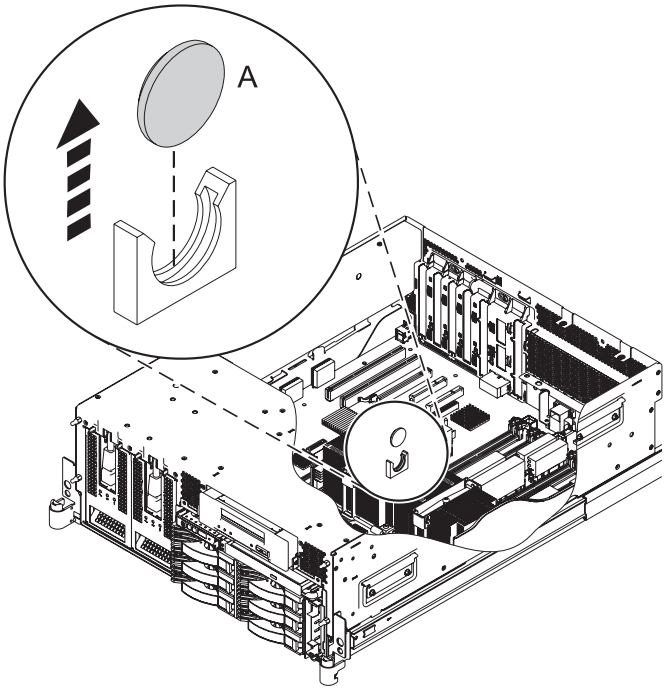
10. Remove the time-of-day battery

Attention: When removing the battery, do not use metallic tool to disengage it from its slot.

Remove the time-of-day battery **(A)** from the system backplane, being careful to observe the polarity (+/-) of the battery.

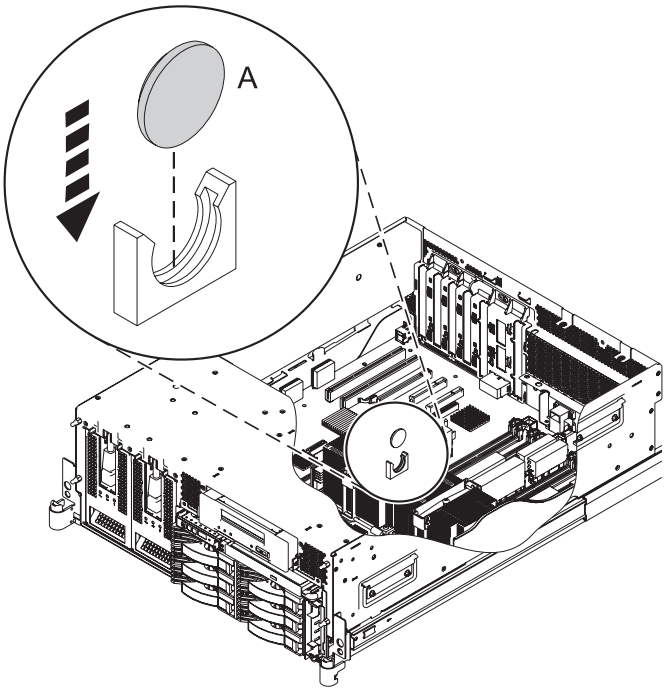
- **Do not:**
- Burn or charge the battery (this to avoid possible explosion, battery contains lithium).
- Throw or immerse into water.
- Heat to more than 100 degrees C (212 degrees F).
- Repair or disassemble.

Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call.



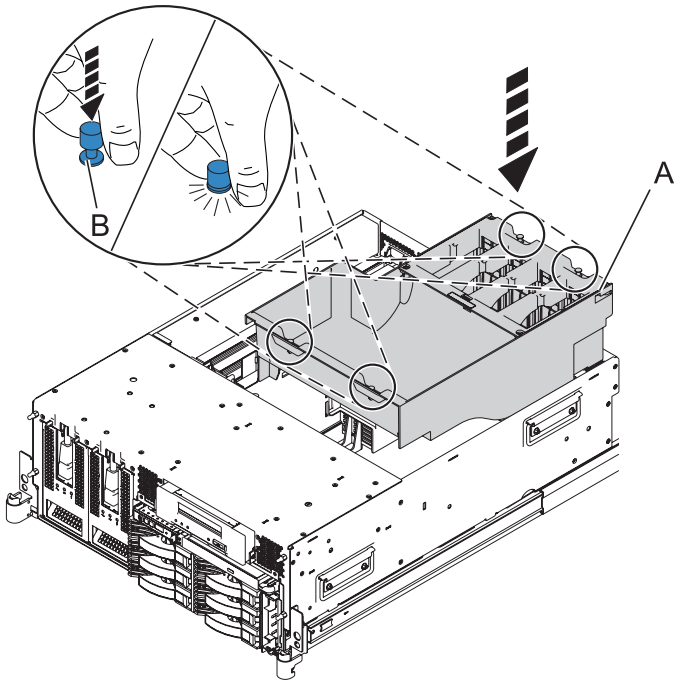
11. Insert the time-of-day battery

Insert the time-of-day battery **(A)** in the slot on the system backplane, being sure to insert the battery with the polarity (+/-) the same as the battery that was removed.



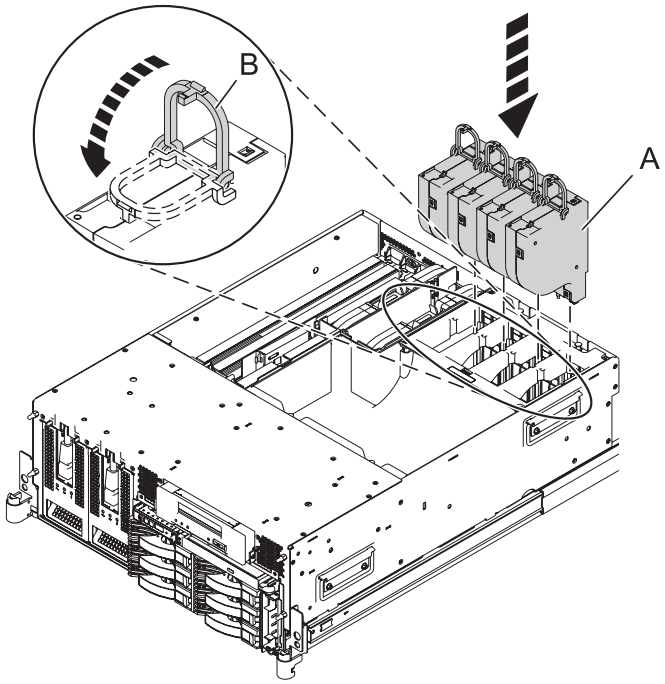
12. Install the fan cage

1. Check that the four retaining tabs are in open position.
2. Lower the fan cage **(A)** into its location on the enclosure, aligning the blue tabs with the holes.
3. Push firmly on the fan cage so that you are sure it fits into its position.
4. Tighten the four retaining tabs **(B)** securing the fan cage to its enclosure.



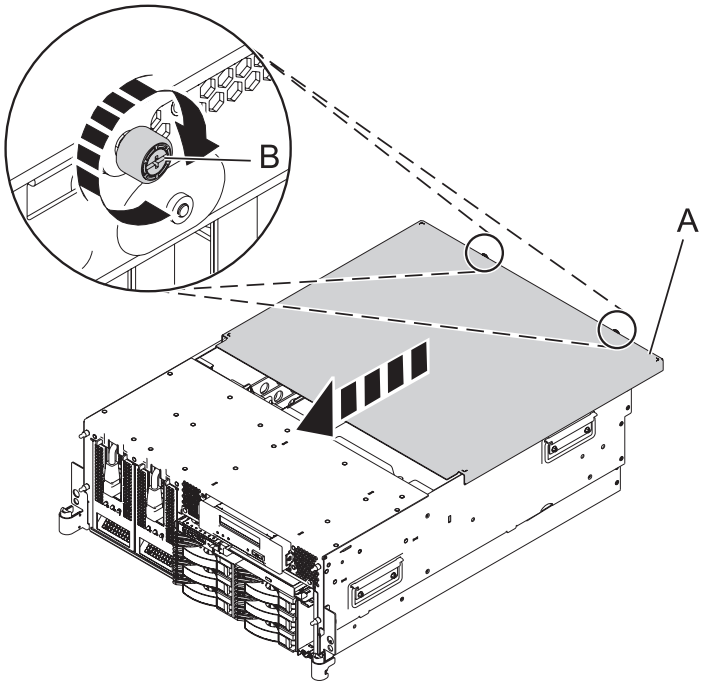
13. Install the fans

1. Lower the fan **(A)** into its location in the fan cage.
2. Push down on the fan until it locks into place.
3. Secure the fan by closing the latch **(B)**.
4. Repeat these steps until all fans are installed.



14. Install the service access cover

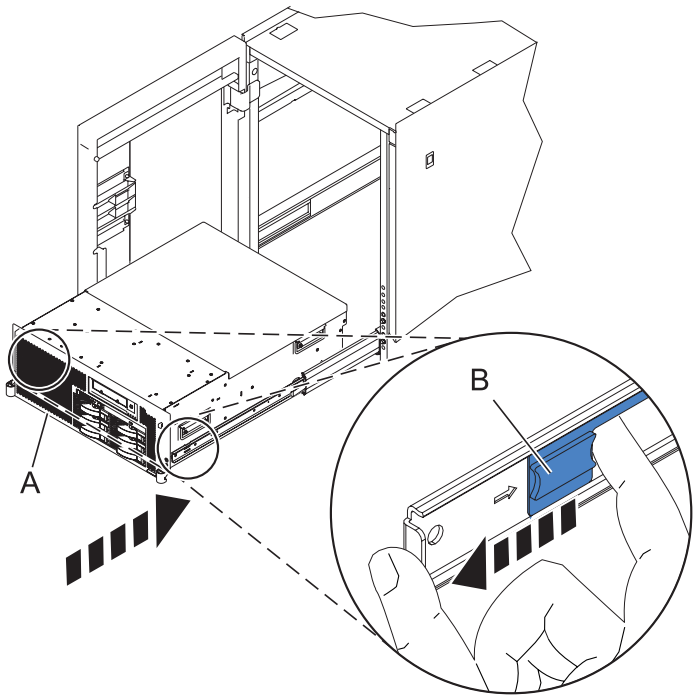
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



15. Place into operating position

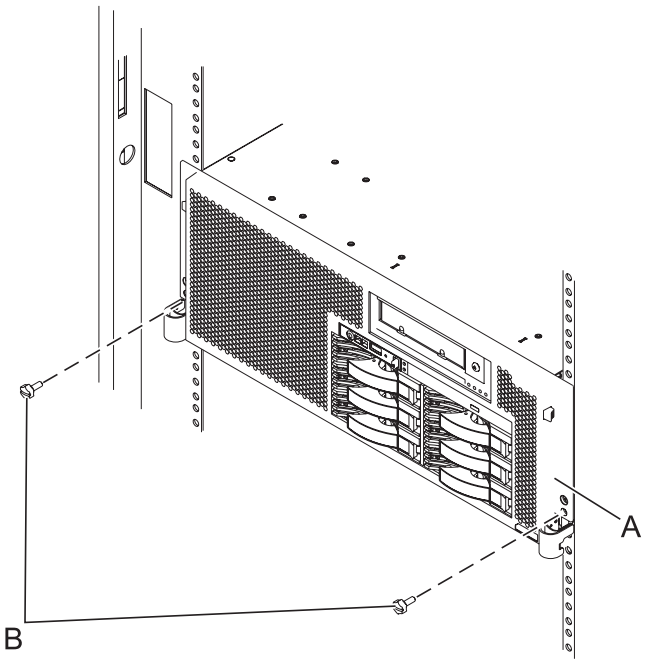
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



16. Place into operating position (continued)

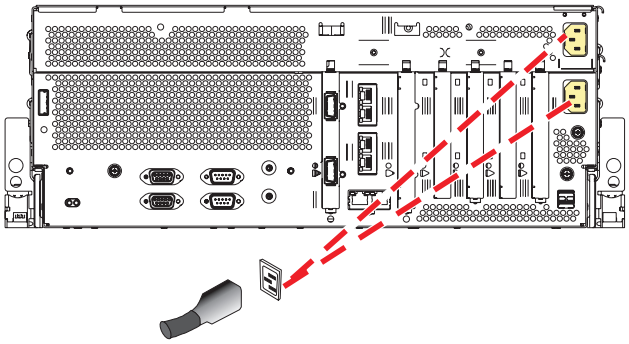
1. Replace and tighten the two screws **(B)** that secure the system unit **(A)** to the rack.
2. Close the front rack door of the unit you are servicing.



17. Install the power cords

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



18. Restore network connectivity

The service processor must connect to the network to be accessible from the HMC.

How will the IP Address of the Service Processor be managed?

Obtain an IP Address automatically from a DHCP server	Configure a static IP Address
↓	Go to step20.

19. Restore service processor settings

Enable network access to the service processor by proceeding as follows:

If the network connection uses the Dynamic Host Configuration Protocol (DHCP) to establish an IP address, and uses the Hardware Management Console (HMC) as the DHCP server, no additional configuration is necessary to enable network access to the service processor. Perform the following steps:

1. Ensure that the service processor is connected to the existing service network by verifying that the HMC cable is connected to the HMC port on the system backplane.
2. If not already connected, connect all system power cables by plugging them into power outlets. **Note:** Do not start the system at this time.

Do you have network access to the service processor?

Yes	No
Go to step 22 on page 13.	Go to step 24 on page 13

20. Restore service processor settings through the ASMI

The Advanced System Management Interface (ASMI) is the interface to the service processor that is required to perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, controlling the system power, and setting service processor network ports.

The ASMI may also be referred to as the service processor menus.

The ASMI can be accessed through https.

As the network connection uses static IP address assignments, perform the following:

1. To know your service processor network ports, if necessary, you can use the control panel in manual mode. Refer to service functions to get control panel documentation in that case.
2. Connect a client with a Web browser directly to the service processor network ports you previously noted. It could be something like the following URLs:
   - https://169.254.2.147
   - https://169.254.3.147
3. If not already connected, connect all system power cables by plugging them into power outlets.**Note:** Do not start the system at this time.
4. Log on to the ASMI with the ″admin″ **User ID** and ″admin″ default **Password**.
5. Change the ″admin″ User ID's **Password** and the ″general″ User ID's **Password** when prompted.
6. To configure network access perform the following:
   a. Click on **Network Configuration** under the **Network Services** node.
   b. On the right pane, configure **eth0** and **eth1** network interfaces, choose for **Type of IP Address** '**Static**', set a **Host name**, an **IP address**, a **Subnet mask**.

21. Restore service processor settings

With the network connection now configured to use static IP address assignments, try to access the service processor network ports.

Do you have network access to the service processor?

Yes	No
↓	Go to step 25 on page 14

---

22. Access the ASMI

If you are already connected to the ASMI, click **Next** to continue.

Otherwise to access the ASMI through the Hardware Management Console (HMC), complete the following steps:

1. Ensure that the server you are working with is selected.
2. Click **Tasks**.
3. Click **Operations**, then click **Advanced System Management (ASM)**.

   Note: If there is more than one service processor, you must select the primary service processor.

23.

Go to step 27 on page 14.

---

24. Restore service processor settings

If the network connection uses DHCP to establish an IP address, but does not use an HMC as the DHCP server, perform the following:

1. Complete any network configuration necessary to allow the DHCP server to recognize and assign an IP address to the service processor.
2. Ensure that the service processor is connected to the existing service network by verifying that the network cable is connected to the network port.
3. If not already connected, connect all system power cables by plugging them into power outlets. **Note:** Do not start the system at this time.

Do you have network access to the service processor?

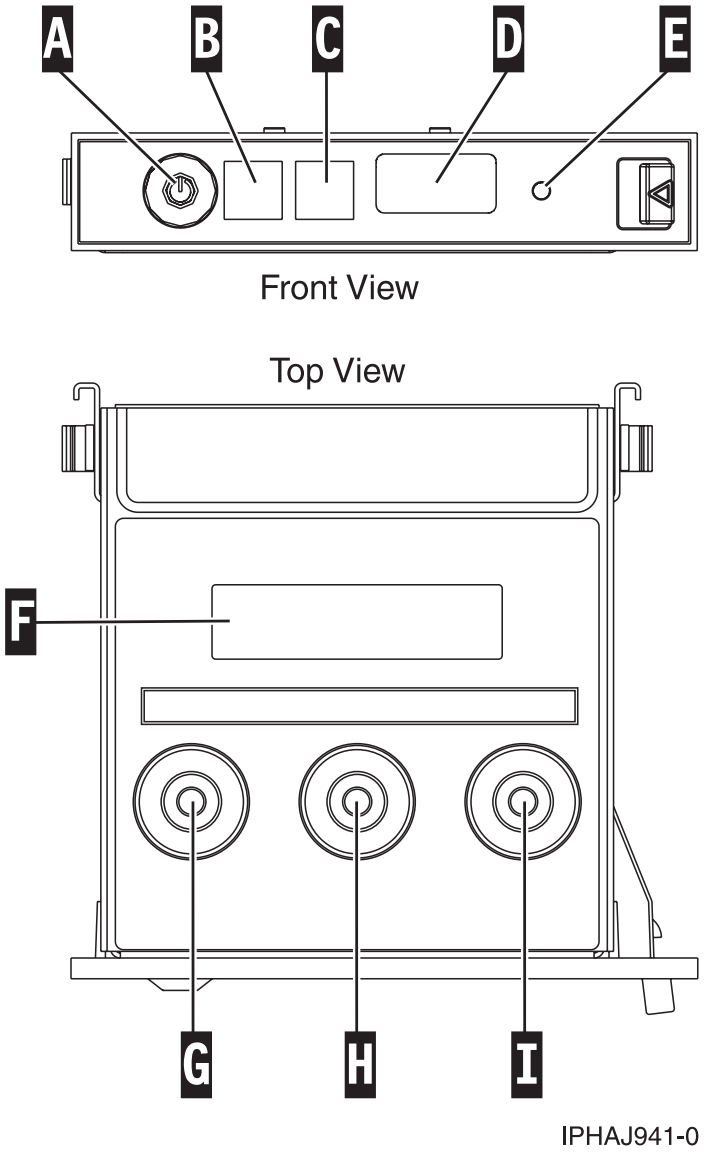
No	Yes
↓	Go to step 22

---

25. **Restore service processor settings**

You have indicated that you are still not able to access the service network.

You will need to reset the service processor by pressing the pin-hole switch **(E)** on the operator panel.



26.

Go to step 18 on page 11.

27. **Restore service processor settings**

Change the password of the admin user ID when prompted by performing the following steps:

1. In the navigation area of the ASMI, expand **Login Profile**.
2. Select **Change Password** under **Login Profile**.
3. Specify the required information, and click **Continue**.

As a security measure, you are required to enter your current user password in the **Current password for current user ID** field.

Note: Passwords can be any combination of up to 64 alphanumeric characters. The default password for the admin **User ID** is admin. After your initial login to the ASMI, the admin password must be changed.

28. Restore service processor settings

Set the system name.

The system name can be changed to any valid ASCII string. It does not have to follow the initialized *machine type_model_serial number* format.

To change the system name, perform the following:

1. In the navigation area of the ASMI, expand **System Configuration**.
2. Select **System Name** under **System Configuration**.
3. Enter the desired system name.
4. Click **Save settings** to update the system name to the new value.

The new system name is displayed in the status frame, the area where the **Log out** button is located. If another method, such as the HMC, is used to change the system name, the status frame does not reflect the change.

---

29. Restore service processor settings

Set the time-of-day.

1. In the navigation area of the ASMI, expand **System Configuration**.
2. Select **Time of Day** under **System Configuration**.
3. If the system is powered off, the right pane displays a form that shows the current date (month, day, and year) and time (hours, minutes, seconds).
4. Change either the date or the time or both, and click **Save settings**.

---

30. Restore service processor settings

Reenter any of the following settings that were previously changed through the ASMI, unless you want to use the default settings. Settings to be set include the following:

1. **Power/Restart Control** settings.
2. **System Service Aids** settings.
3. **System Configuration** settings, if not already done.
4. **Network Services** settings.
5. **Performance Setup** settings.
6. **Login Profile** settings.

---

31. Restore service processor settings

1. Reset any service processor settings that you may have set using operating system commands. You recorded these settings at the beginning of this procedure.
2. If you choose to reset the **HMC Access password**, perform the following:
3.
   a. From the HMC GUI (preferred method):
   b.
      1) Expand the **Systems Management** folder in the navigation tree pane.
      2) Double click the **Servers** folder.
      3) Use the checkbox to select a server, in the central panel.
      4) Under the **Operations** folder, select **Change Password**.
      5) Provide the desired information.
   c.
   d. Or, from the HMC command line, type:
   e.
      /usr/hmcrbin/chsyspwd -m managedsystem -t access --passwd --newpasswd newpassword where:
      - The value for managedsystem is the new service processor's managed system name.
      - No value for --passwd is entered thereby allowing authentication.
      - The value for newpasswd is the newpassword value.

---

32. Restore partition data on the service processor, if you had a partition in your system

Profile data stored in the managed server has been cleared or corrupted.

To recover profile data using the HMC, proceed as follows:
1. Expand the **Systems Management** folder in the navigation tree pane.
2. Double click the **Servers** folder.
3. Use the checkbox to select a server, in the central panel.
4. In the **Configuration** folder if you have the **Manage Partition Data** folder, select **Restore**.

33.

Go to Chapter 2, "Verifying a repair," on page 181.

Cache battery pack

Use this procedure to service the cache battery pack.

1. Cache battery pack replacement procedure information

Attention: To prevent possible data loss, ensure that the cache battery pack is in an error state before replacing it. This will ensure all cache data is written to disk and that it is safe to replace the cache battery pack.

By following this procedure, you are going to:

1. Force the cache battery pack into an error state.
2. Perform the cache battery pack replacement.

You will be allowed to resume this procedure later if you cannot ensure that the cache battery pack is in an error state.

Forcing the cache battery pack into an error state will result in the following:

- The system logs an error.
- Data caching becomes disabled on the selected controller.
- System performance could become significantly degraded until the cache battery pack is replaced on the selected controller.
- The **battery pack can be safely replaced** field on the controller rechargeable battery information screen will show **Yes**.
- The cache data present LED will stop flashing.
- The cache battery pack requires replacement.

Ensure that you have the correct type of cache battery pack to perform the replacement.

2.

Is the system powered off?

No	**Yes**
↓	Go to step 9 on page 19

3.

Select the operating system:

AIX®	Linux®	IBM i
↓	Go to step 8 on page 19.	Go to step 6 on page 18.

---

4. Force the cache battery pack into an error state on AIX

To force the cache battery pack into an error state in order to prevent possible data loss, proceed as follows on the system or partition containing the adapter:

1. Navigate to the IBM SAS Disk Array Manager as described below:
   a. At the command prompt, type **smit**, and press **Enter**.
   b. Select **Devices**.
   c. Select **Disk Array**.
   d. Select **IBM SAS Disk Array**.
   e. Select **IBM SAS Disk Array Manager** from the menu with options for configuring and managing the IBM SAS RAID Controller.
2. Select **Diagnostics and Recovery Options**.
3. Select **Controller Rechargeable Battery Maintenance**.
4. Select **Force Controller Rechargeable Battery Error**.
5. Select the **IBM SAS RAID Controller** whose battery you want to replace, using this option places the battery into the error state, which requires it to be replaced.
6. Press **Enter**.
7. Determine that it is safe to replace the cache battery pack. Refer to **How to display rechargeable battery information** below. It is safe to replace the cache battery pack when **Yes** is displayed next to **Battery pack can be safely replaced**. You may need to reselect the option to **Display Controller Rechargeable Battery Information** multiple times as it may take several minutes before it is safe to replace the cache battery pack.

How to display rechargeable battery information

1. Navigate to the **IBM SAS Disk Array Manager** as described above.
2. Select **Diagnostics and Recovery Options**.
3. Select **Controller Rechargeable Battery Maintenance**.
4. Select **Display Controller Rechargeable Battery Information**.
5. Select the **IBM SAS RAID Controller**.

5.

Go to step 9 on page 19.

---

6. To prevent data loss, ensure that the cache battery pack is in an error state

To force the cache battery pack into an error state in order to prevent possible data loss, proceed as follows on the system or partition containing the adapter:

1. Be sure that you are signed on to the system with at least service level authority.
2. Type **strsst** on the command line and press Enter.
3. Type your service tools userid and service tools password on the **System Service Tools (SST) Sign On** display. Press Enter.
4. Select **Start a Service Tool** from the **System Service Tools (SST)** display. Press Enter.
5. Select **Hardware Service Manager** from the **Start a Service Tool** display. Press Enter.
6. Select **Work with resources containing cache battery packs** from the **Hardware Service Manager** display. Press Enter.
7. Select **Force battery pack into error state** for the I/O card you are working with from the **Work with Resources containing cache battery packs** display. Press Enter.
8. On the **Force Battery Packs Into Error State** display, verify that the correct I/O adapter has been selected and press the function key that confirms your choice.
9. Return to the Work with Resources containing cache battery packs display and select **Display battery information**. Ensure that the field **Safe to replace cache battery = YES**. **Note: This may take several minutes and you may need to press the refresh key to see the field update**.

7.

Go to step 9.

8. Force the cache battery pack into an error state on Linux

To force the cache battery pack into an error state in order to prevent possible data loss, proceed as follows on the system or partition containing the adapter:

1. Run the **iprconfig** utility by typing **iprconfig**.
2. Select **Work with disk unit recovery**.
3. Select **Work with resources containing cache battery packs**.
4. Select your adapter and type **2**. Then press **Enter** to force the battery error. **Note:** Using this option places the battery into the error state, which requires it to be replaced.
5. If you are sure you want to force a battery error, type **c** to confirm. If you do not want to force a battery error, type **q** to cancel.
6. Determine that it is safe to replace the cache battery pack. Refer to **How to display rechargeable battery information** below. It is safe to replace the cache battery pack when **Yes** is displayed next to **Battery pack can be safely replaced**. You may need to reselect the option to **Display Controller Rechargeable Battery Information** multiple times as it may take several minutes before it is safe to replace the cache battery pack.

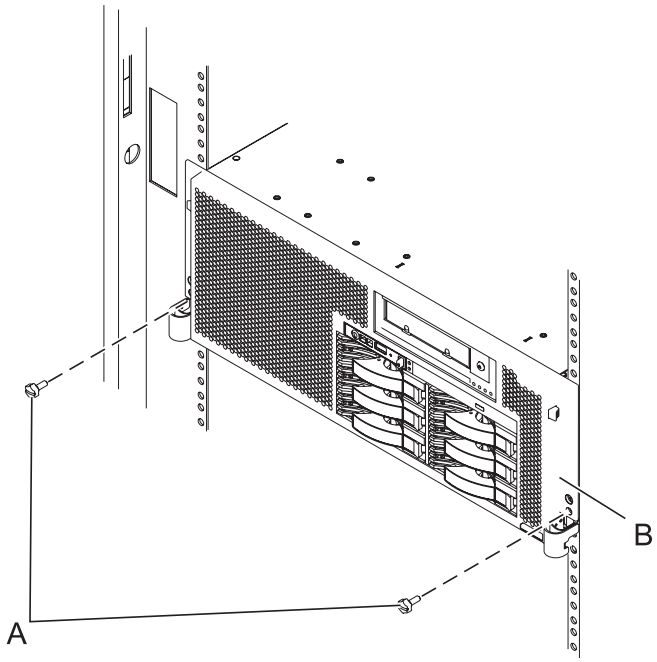
How to display rechargeable battery information

1. Run the **iprconfig** utility by typing iprconfig.
2. Select **Work with disk unit recovery**.
3. Select **Work with resources containing cache battery packs**.
4. Select your adapter and type **1**.
5. Then press **Enter** to display battery information.

9. Place into service position

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Expansion unit users can still use this procedure. However, users of expansion units should ignore specific references to rack-only features, such as rack doors, rack thumbscrews, and rack-specific FRU orientation.

1. Open the front rack door.
2. Identify the system unit you are servicing in the rack.
3. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.

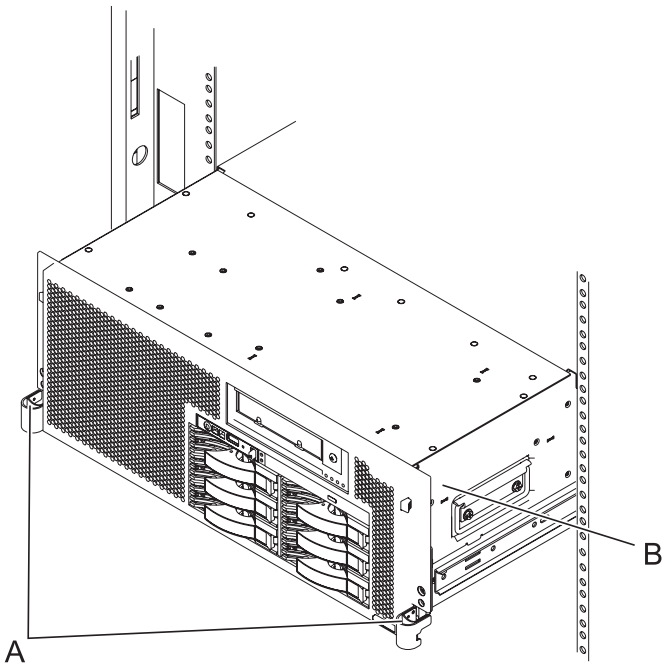


10. Place into service position (continued)

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

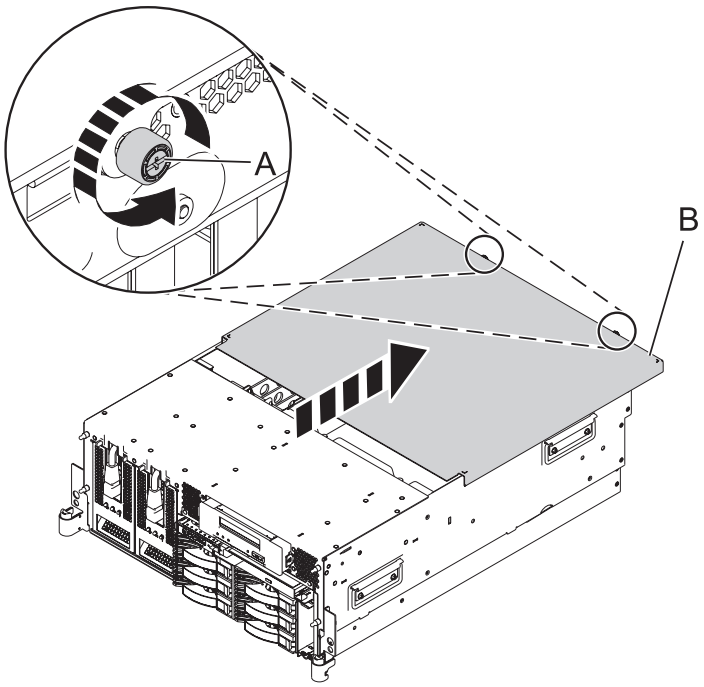
While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



11. Remove the service access cover

1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



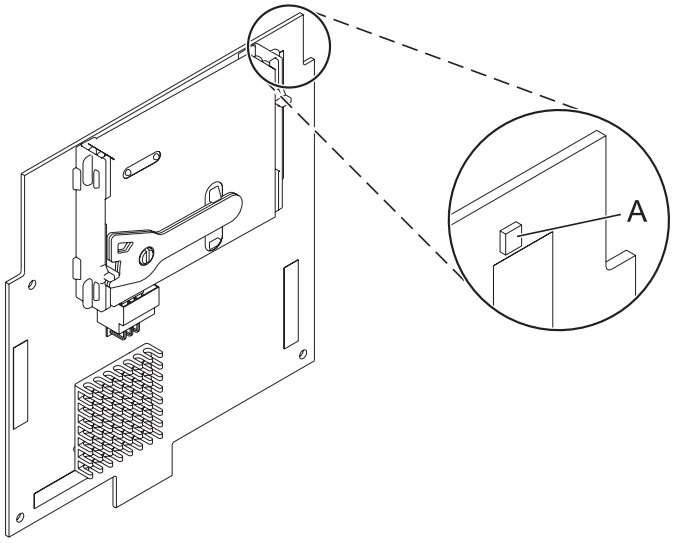
12. Check cache data present LED

Examine the LED **(A)** near the cache battery pack on the RAID enablement card.

This LED is called the **cache data present LED.**

If the LED is flashing, there is cache data that has not been written to disk.

If the LED is not flashing, all cache data has been written to disk.



Is the cache battery LED flashing?

Yes, the LED is flashing	No, the LED is not flashing
↓	Go to step 14 on page 22

---

13. Stop removing the cache battery pack

Attention:

- The flashing LED indicates that there is cache data that has not been written to disk.
- This data will be lost if the battery is removed at this time.
- **Do not replace the cache battery pack at this time.**

Complete this service procedure without replacing the cache battery pack.

If the system is powered on:

1. Retry the procedure from the beginning to ensure that all cache data is written to disk before the battery is replaced.

If the system is powered off:

1. Power on the system and activate the partitions.
2. Retry the procedure from the beginning but this time with power on to ensure that all cache data is written to disk before the battery is replaced.

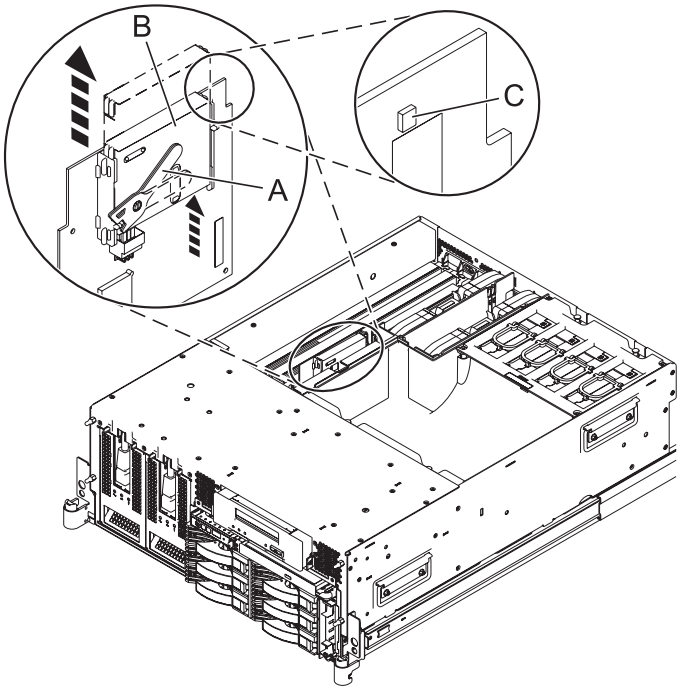
Go to step 21 on page 23.

---

14. Remove the cache battery pack

Attention: Do not remove battery if LED **(C)** is flashing; cache data exists.

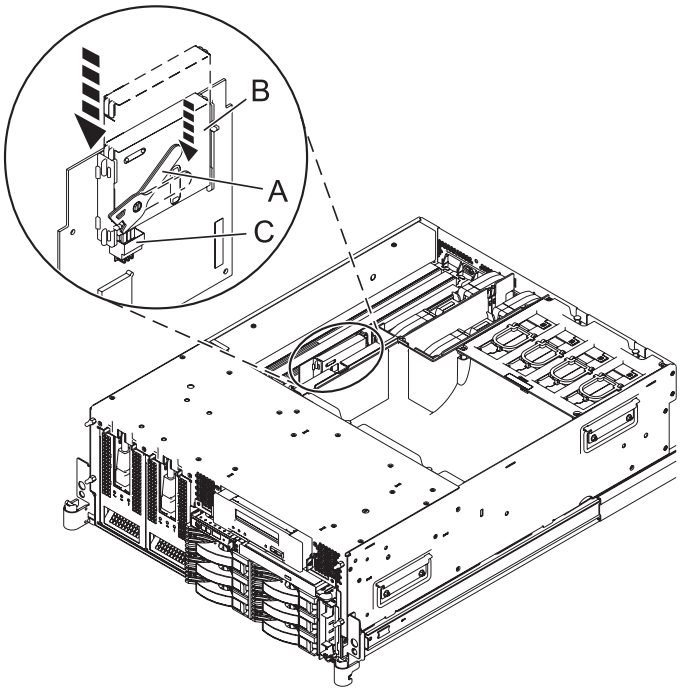
1. Move the cache battery lever **(A)** away from the connector to disengage the battery from the connector.
2. Slide the cache battery pack **(B)** out of the mounting guides and remove it from the controller.



15. Install the cache battery pack

Attention: When installing the cache battery pack, ensure that the cache battery pack is disconnected for at least 60 seconds before connecting the new battery. This is the minimum amount of time needed for the card to recognize that the battery has been replaced.

1. Slide the cache battery pack **(B)** into the mounting guides on the controller until it is seated in the battery connector **(C)**.
2. Move the lever **(A)** to the latched position to fully seat the battery into the connector.



16.

Is the system powered off?

No	**Yes**
↓	Go to step 21 on page 23.

17. Re-enable the cache

Select the operating system:

AIX	Linux	IBM i
↓	The write cache is automatically enabled. Go to step 21.	Go to step 20.

18. Re-enabling caching on AIX

Restart the adapter's write cache by doing the following:

1. Navigate to the **IBM SAS Disk Array Manager** by using the steps in **Using the IBM SAS Disk Array Manager**.
2. Select **Diagnostics and Recovery Options**.
3. Select **Controller Rechargeable Battery Maintenance**.
4. Select **Start Adapter Cache**.
5. Select your IBM SAS RAID Controller whose battery you just replaced.
6. Press **Enter**.

19.

Go to step 21.

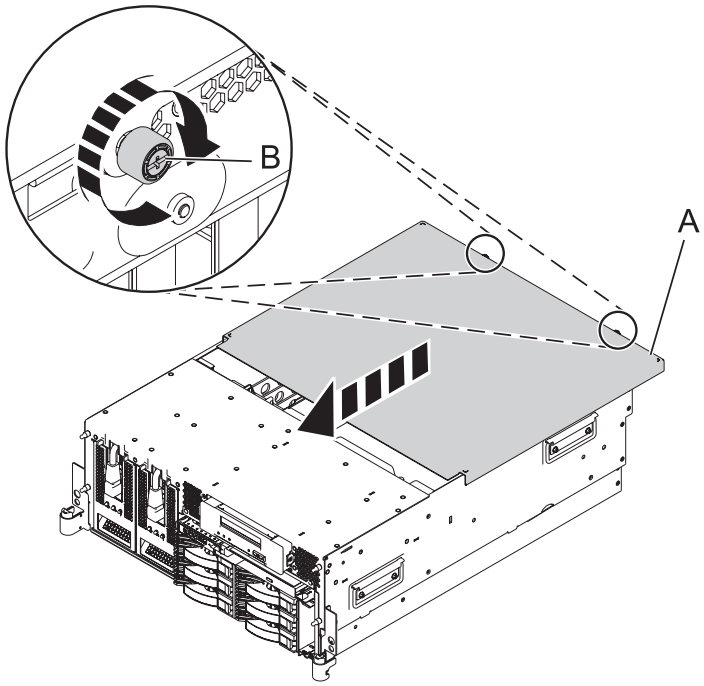
20. Re-enabling caching on IBM i

Restart the adapter's write cache by doing the following:

1. Return to the **Work with Resources containing Cache Battery Packs** display and select **Start IOA cache**. Press **Enter**.
2. Verify that a message stating that the Cache was started has been received.

21. Install the service access cover

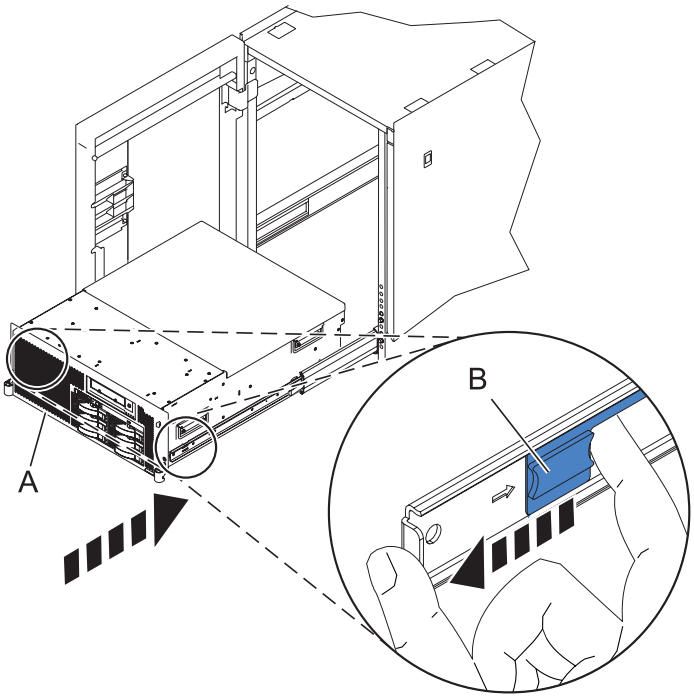
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



22. Place into operating position

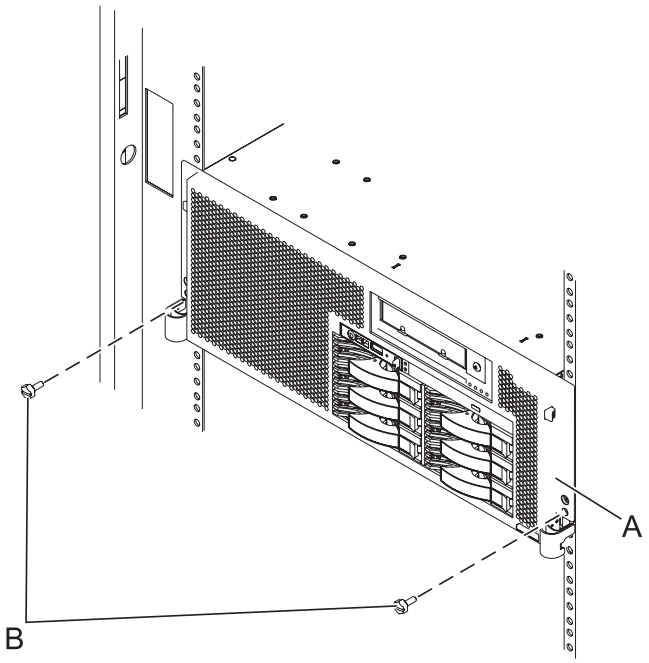
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



23. Place into operating position (continued)

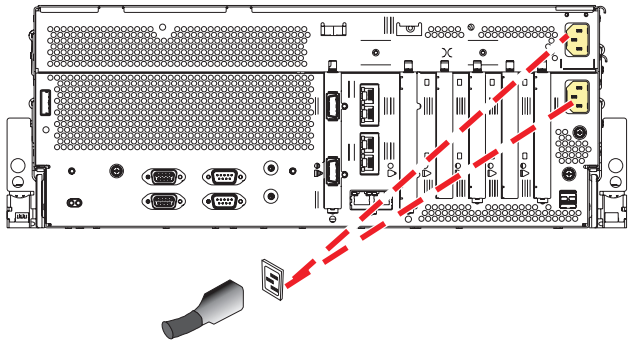
1. Replace and tighten the two screws **(B)** that secure the system unit **(A)** to the rack.
2. Close the front rack door of the unit you are servicing.



24. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



25.

Go to Chapter 2, “Verifying a repair,” on page 181.

Control panel

Use this procedure to service the control panel.

1. **Shut down the partitions and power off the system**

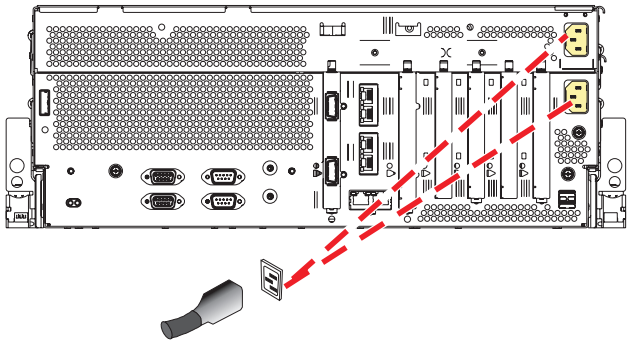
This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

2. Disconnect the power cords

1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.

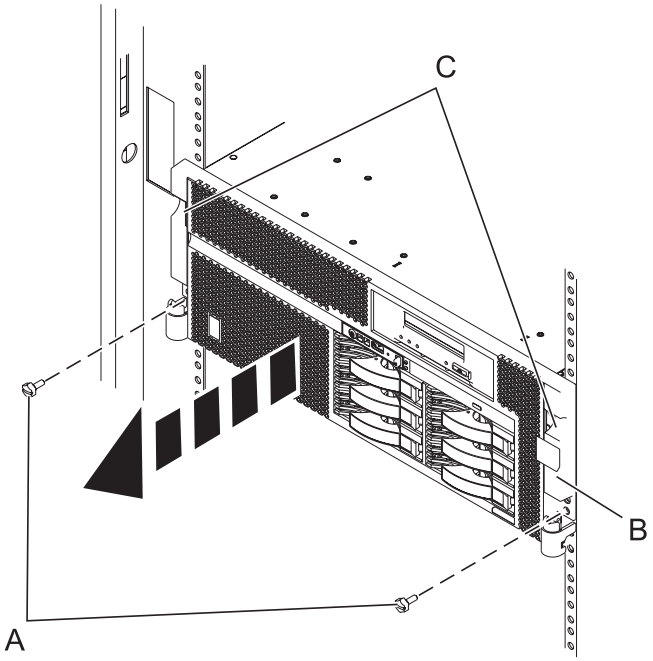


---

3. Remove the front cover

Note to Tower Users: The instructions in this procedure are written based on the Rack model. Tower users may still use this procedure. However, Tower users should ignore specific references to rack-only features such as rack doors, rack thumbscrews, and rack-specific FRU orientation, etc.

1. Open the front rack door.
2. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.
3. Grab the cover at points **(C)** and pull it out and away from the system unit.



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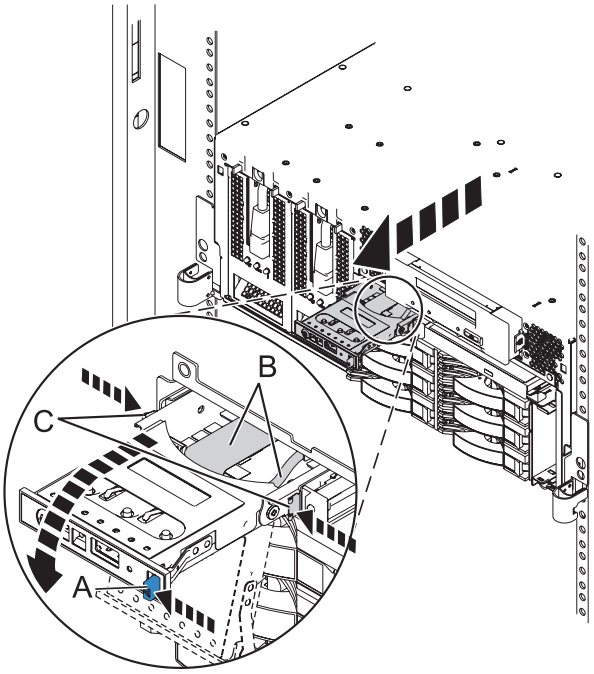
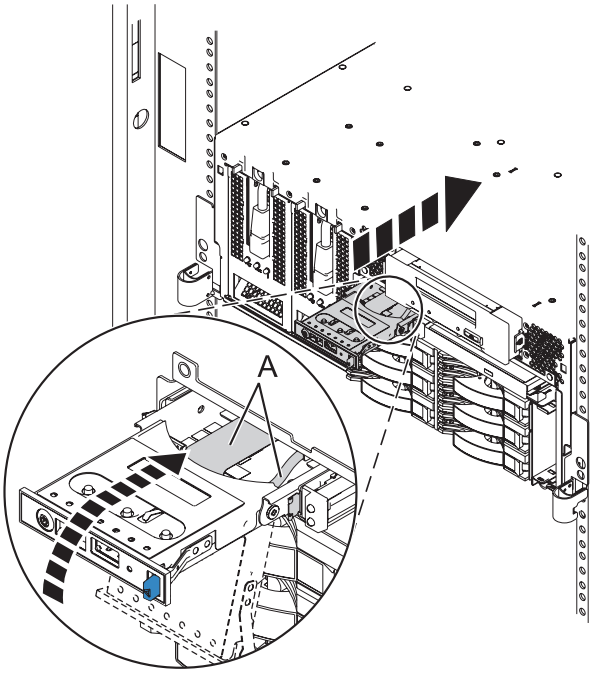
4. Remove the operator panel

1. Release the operator panel by pushing the release tab **(A)** to the left.
2. Grasp the edges of the operator panel and pull it partially out of the bay.
3. Press the locking pins **(C)** inward and gently pull the operator panel completely out of the bay, **taking care not to pull on the cables (B)**.
4. Rotate the operator panel downward if needed, and disconnect the operator panel cables **(B)** from the operator panel.
5. Record the operator panel cables orientation, for reconnecting them the same way.



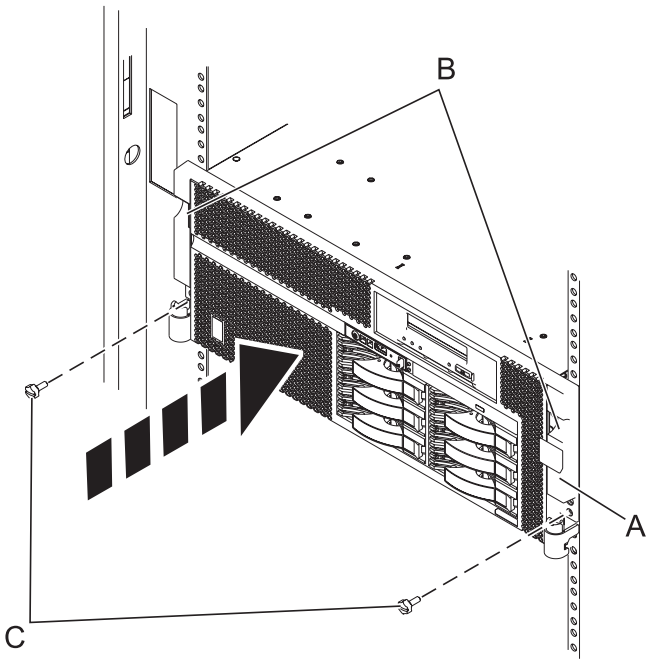
5. Install the operator panel

1. Carefully guide both operator panel cables **(A)** through the cables conduit in the extension of the operator panel while gently sliding the operator panel into the operator panel bay.
2. Connect the operator panel cables **(A)** to the operator panel.
3. Rotate the front of the operator panel upward and continue sliding it into the bay until the operator panel engages and locks into place.



6. **Install the front cover**

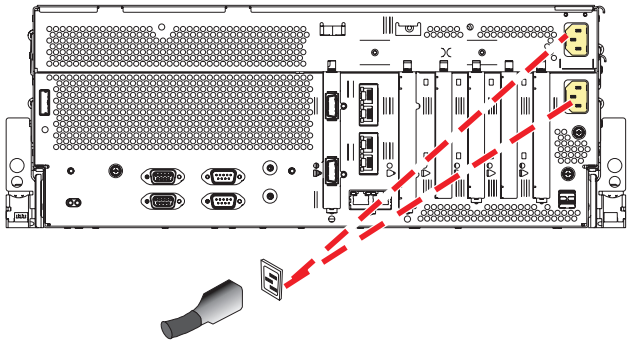
1. Position the cover on the front of the system unit so that the two screws **(C)** align with the screw holes on the front of the system unit **(A)**.
2. Push the cover at points **(B)** to attach it to the front of the system unit as shown in the following figure.
3. Tighten the two screws that secure the system unit to the rack.
4. Close the front rack door.



7. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



8.

Go to Chapter 2, “Verifying a repair,” on page 181.

Disk drive

Use this procedure to replace the disk drive.

Your system can be powered off or powered on when you replace the disk drive. Do one of the following:

- If the operating system is not running, or if the disk drive to be replaced is in the AIX or Linux root volume group (rootvg) and it is not protected with either a Redundant Array of Independent Disks (RAID) or mirroring, use the procedure for replacing the disk drive with the power off. The power-off procedures are also known as *nonconcurrent* in the following information.
- If the operating system is running, and if the disk drive to be replaced is in not the AIX or Linux root volume group (rootvg) and it is protected with either a Redundant Array of Independent Disks (RAID) or mirroring, you can replace a disk drive with the power on. The power-on procedures are also known as *concurrent* in the following information.

1.

Do you want to replace the disk drive concurrently with system operations and the unit powered on?

Yes	**No**
↓	Go to "Replacing the disk drive nonconcurrently" on page 38.

2.

Choose the procedure that is appropriate for the operating system running in the partition that the disk drive resource is assigned to.

For AIX, go to "Replacing the disk drive using AIX."

For Linux, go to "Replacing the disk drive using Linux" on page 32.

For IBM i, go to "Replacing the disk drive using IBM i" on page 40.

Replacing the disk drive using AIX

Use this procedure to remove and replace a disk drive concurrently using AIX.

1.

Remove the disk drive as a resource:

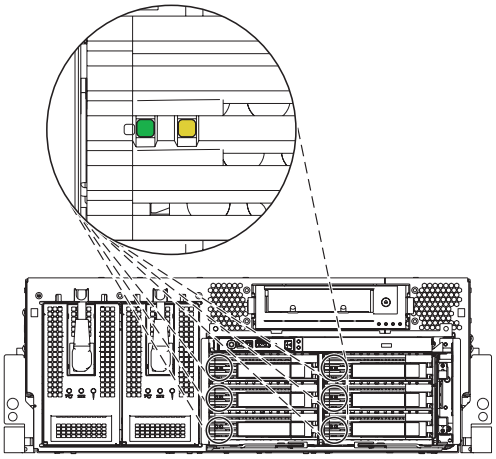
1. Log in as root user or use CE Login.
2. At the command line, type **diag** and press Enter.
3. Press Enter to continue.
4. On the Function Selection display, select **Task Selection**.
5. Select **Hot Plug Task**.
6. Select **RAID Hot Plug Manager**.
7. Select **Identify a Device Attached to SCSI Hot Swap Enclosure Device**.
8. Select the disk drive you want to remove and press Enter.

   The disk drive slot enters the identify state. The concurrent maintenance light for the slot begins flashing. The following figure shows the locations of the concurrent maintenance lights. Verify that the flashing light corresponds to the location for the disk drive you want to remove, and press Enter.

   The disk drive slot exits the identify state.
9. On the Identify and Remove Resources display, select **Identify a Device Attached to SCSI Hot Swap Enclosure Device**.

   A list of the disk drives that you can remove is shown. If the disk drive you want to remove does not appear on the list, ask your system administrator to put the disk drive in the failed state before continuing with this procedure. For information, see **AIX System Management Guide: Operating System and Devices**.
10. Select the disk drive you want to remove and press Enter.

    The disk drive slot enters the remove state and power is removed from the slot. The concurrent maintenance light for the slot begins flashing rapidly.

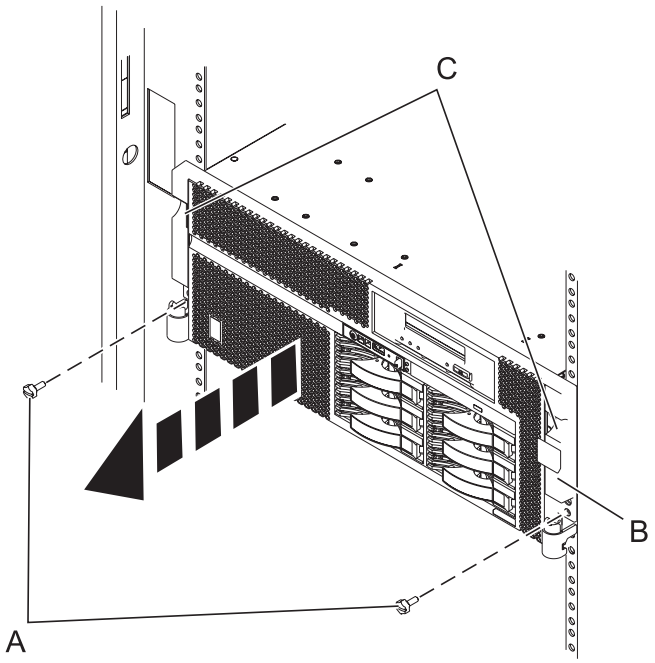


Note: If the disk drive slot is not in the Remove state, contact your next level of support.

2. **Remove the front cover**

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Tower users may still use this procedure. However, expansion unit users should ignore specific references to rack-only features such as rack doors, rack thumbscrews, rack-specific FRU orientation, and so on.

1. Open the front rack door.
2. Remove the two thumbscrews **(A)** that secure the system unit **(B)** to the rack.
3. Push the cover release latches **(C)** in the direction of the arrows to release the cover from the system unit.
4. Pull the cover out and away from the system unit.

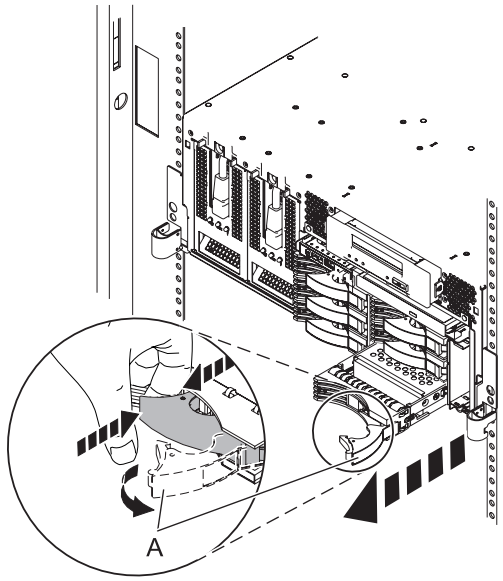


3.

Remove the disk drive:

1. Unlock the disk drive handle **(A)** and pull the disk drive out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system unit. Do not hold the disk drive by the handle.

   The concurrent maintenance light for the slot turns off when you remove the disk drive.

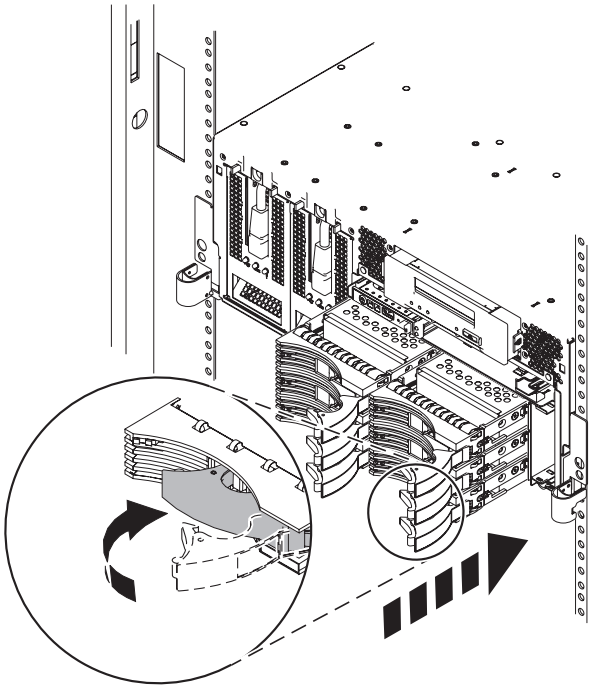


4.

Install the disk drive:

1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
2. Slide the disk drive into the system until it stops.
3. Push the disk drive handle in until it locks.

   Note: When you install a disk drive, ensure that the drive is fully seated and all the way into the system.



5.

Add the new disk drive as a resource:

1. Press Enter.

   The disk drive slot exits the remove state and enters the normal state.
2. Exit to the RAID Hot-Plug Devices menu. Press the F3 or ESC 3 key to return.
3. Exit to the Task selection display.
4. Select **Log Repair Action**.
5. Select the disk drive that you replaced and then press Enter.
6. Select **Commit** after you have made your selection and then press Enter.
7. Exit to the command line.

6.

To rebuild data on the replacement disk drive, refer to the information in the **AIX System Management Guide: Operating System and Devices**.

---

7. Go to Chapter 2, "Verifying a repair," on page 181. **This completes this procedure.**

Replacing the disk drive using Linux

Use this procedure to replace a disk drive in a location that is controlled by a system or logical partition that is running Linux.

Preparing to remove the disk drive

1. Log in as root user.
2. Type `iprconfig` on the command line of the Linux session and press Enter.

   The IBM Power RAID Configuration Utility display is shown.

3. Select **Analyze log**. Press Enter. The Kernel Messages Log display is shown.

```
                                  Kernel Messages Log


Select one of the following:

    1. View most recent ipr error messages
    2. View ipr error messages
    3. View all kernel error messages
    4. View iprconfig error messages
    5. Set root kernel message log directory
    6. Set default editor
    7. Restore defaults
    8. View ipr boot time messages


Selection:

e=Exit
```

Figure 1. Kernel Messages Log

4. Select **View most recent ipr error messages** from the Kernel Messages Log display. Press Enter.
5. Find the entry in the log for the disk drive you want to replace.
6. Record the location information for the disk drive.

   Note: The location information has the form of 2:0:8:0. In this example, 2 is the SCSI host number, 0 is the SCSI bus, 8 is the SCSI target ID, and 0 is the LUN (logical unit).
7. Return to the command line.
8. Type the following:

   `ls -ld /sys/class/scsi_host/host#/device`

   where # is the SCSI host number. Press Enter.
9. Record the PCI location information.

   Note: The PCI location information has the form of 61:01:0:2.
10. Type `iprconfig` on the command line and press Enter.
    The IBM Power RAID Configuration Utility display is shown.
11. Select **Display hardware status** from the IBM Power RAID Configuration Utility display. Press Enter.
    The Display Hardware Status display is shown.

```
                          Display Hardware Status

Type option, press Enter.
  1=Display hardware resource information details

OPT Name   PCI/SCSI Location          Description               Status
--- ------ ------------------------- ------------------------- ----------------
           0000:01:01.0.0/           PCI-X SCSI Adapter        Operational
           0000:41:01.0.1/           PCI-X SCSI Adapter        Operational
    sda    0000:41:01.0.1/0:3:0      Physical Disk             Active
    sdb    0000:41:01.0.1/0:4:0      Physical Disk             Active
    sdc    0000:41:01.0.1/0:8:0      Physical Disk             Active
    sdd    0000:41:01.0.1/1:3:0      Physical Disk             Active
    sde    0000:41:01.0.1/1:4:0      Physical Disk             Active
    sdf    0000:41:01.0.1/1:5:0      Physical Disk             Active
           0001:61:01.0.2/           PCI-X SCSI RAID Adapter   Operational
    sdg    0001:61:01.0.2/0:3:0      Physical Disk             Active
           0001:61:01.0.2/0:6:0      Advanced Function Disk    Active
    sdi    0001:61:01.0.2/0:9:0      Physical Disk             Active
    sdh    0001:61:01.0.2/255:0:0    RAID 10 Disk Array        Failed
           0001:61:01.0.2/0:4:0      RAID 10 Array Member      Failed
           0001:61:01.0.2/0:5:0      RAID 10 Array Member      Failed

e=Exit   q=Cancel   r=Refresh   t=Toggle
```

Figure 2. Example Display Hardware Status

12. Look for the disk drive at the PCI location you recorded. The disk drive might have a Failed status.
13. If the disk drive you want to replace is unprotected or in use, move the data from the disk drive before continuing with this procedure.

    For information, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.
14. Type option **1** (Display hardware resource information details) next to the disk drive you want to replace. Press Enter.

    A Disk Hardware Resource Information Details display similar to the following is shown.

```
                Disk Unit Hardware Resource Information Details


Manufacturer . . . . . . . . . . . . . . : IBM
Product ID . . . . . . . . . . . . . . . : ST336607LC
Firmware Version . . . . . . . . . . . . : 43353048 (C50H)
Serial Number. . . . . . . . . . . . . . : 00006719
Capacity . . . . . . . . . . . . . . . . : 36.40 GB
Resource Name. . . . . . . . . . . . . . : /dev/sdd

Physical location
PCI Address. . . . . . . . . . . . . . . : 0001:50:01.0
SCSI Host Number . . . . . . . . . . . . : 2
SCSI Channel . . . . . . . . . . . . . . : 0
SCSI Id. . . . . . . . . . . . . . . . . : 4
SCSI Lun . . . . . . . . . . . . . . . . : 0

Extended Details
FRU Number . . . . . . . . . . . . . . . : 00P2676
                                                                        More...
Press Enter to Continue

e=Exit   q=Cancel   f=PageDn   b=PageUp
```

Figure 3. Example Disk Hardware Resource Information Details display

15. Record the physical location information.
16. Return to the IBM Power RAID Configuration Utility display.

Removing the disk drive

1. From the IBM Power RAID Configuration Utility display, select **Work with disk unit recovery**. Press Enter.
2. From the Work with Disk Unit Recovery display, select **Concurrent remove device**. Press Enter. A Concurrent Device Remove display is shown, similar to the following display.

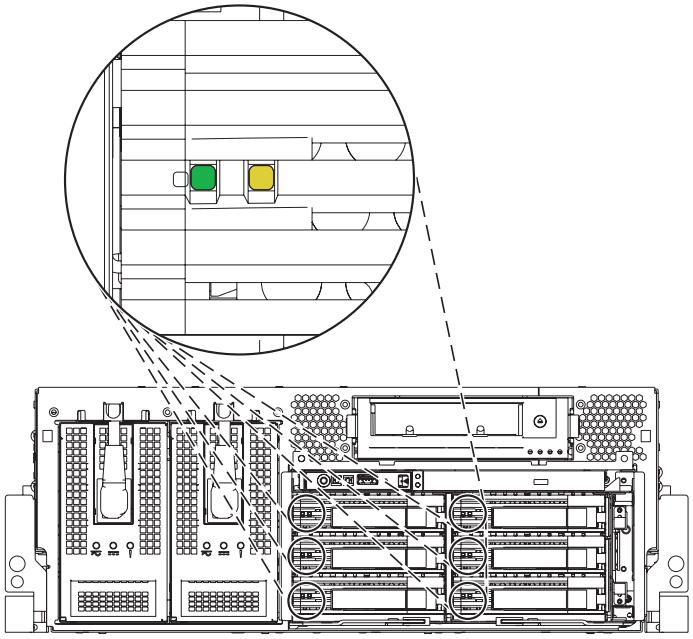
```
                                Concurrent Device Remove

Choose a single location for remove operations
  1=Select

OPT Name   PCI/SCSI Location          Description               Status
--- ------ -------------------------- ------------------------- -----------------
    sdc    0000:41:01.0.1/0:8:0       Physical Disk             Active
           0000:41:01.0.1/0:5:                                  Empty
    sdb    0000:41:01.0.1/0:4:0       Physical Disk             Active
    sda    0000:41:01.0.1/0:3:0       Physical Disk             Active
           0000:41:01.0.1/1:8:                                  Empty
    sdf    0000:41:01.0.1/1:5:0       Physical Disk             Active
    sde    0000:41:01.0.1/1:4:0       Physical Disk             Active
    sdd    0000:41:01.0.1/1:3:0       Physical Disk             Active
           0001:61:01.0.2/0:8:                                  Empty
    sdh    0001:61:01.0.2/0:9:0       Physical Disk             Active
    sdg    0001:61:01.0.2/0:3:0       Physical Disk             Active
```

Figure 4. Example Concurrent Device Remove display

3. Type option 1 (Select) next to the location for the disk drive you want to replace. Press Enter.
4. The Verify Device Concurrent Remove display is shown. The concurrent maintenance light turns on for that disk drive slot.



5. On the Verify Device Concurrent Remove display, verify that the selected disk drive is the disk drive you want to replace, then press Enter. The identify light turns on for the disk drive.

   Attention: To prevent loss of data, ensure that the disk drive is not in use.
6. The Complete Device Concurrent Remove display is shown.

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.

7. Squeeze and pull the handle of the disk drive out toward you before you remove the disk drive as shown in Figure 5. If the handle is not all the way out, the disk drive will not slide out of the system or expansion unit.

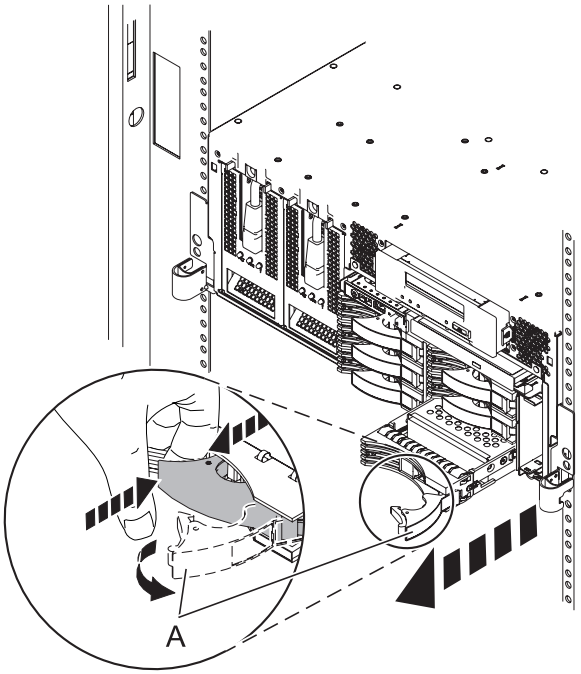


Figure 5. Disk Drive Removal

8. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.
9. Press Enter on the IBM Power RAID Configuration Utility to indicate that you have removed the disk drive.

Replacing the disk drive

1. Find the package that contains the new disk drive.

   Attention: Disk drives are fragile. Handle them with care.
2. Remove the disk drive from its protective package.
3. Unlock the disk drive handle and pull the disk drive out toward you before you install the disk drive. If the handle is not all the way out, the disk drive will not slide into the system or expansion unit.
4. From the IBM Power RAID Configuration Utility display, select **Work with disk unit recovery**. Press Enter.
5. From the Work with Disk Unit Recovery display, select **Concurrent add device**. Press Enter.

A Concurrent Device Add display similar to the following is shown.

```
                                  Concurrent Device Add

Choose a single location for add operations
  1=Select

OPT Name   PCI/SCSI Location          Description               Status
--- ------ ------------------------- ------------------------- -----------------
           0000:41:01.0.1/0:5:                                 Empty
           0000:41:01.0.1/1:8:                                 Empty
           0001:61:01.0.2/0:8:                                 Empty
```

Figure 6. Example Concurrent Device Add display

6. Type option1 (Select) next to the location from which you removed the disk drive.
   The Verify Device Concurrent Add display is shown.
7. Press Enter on the Verify Device Concurrent Add display. The Complete Device Concurrent Add display is shown.
8. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
9. Slide the disk drive all the way into the system or expansion unit and then lock it in place by pushing in the disk drive handle, as shown in Figure 7.

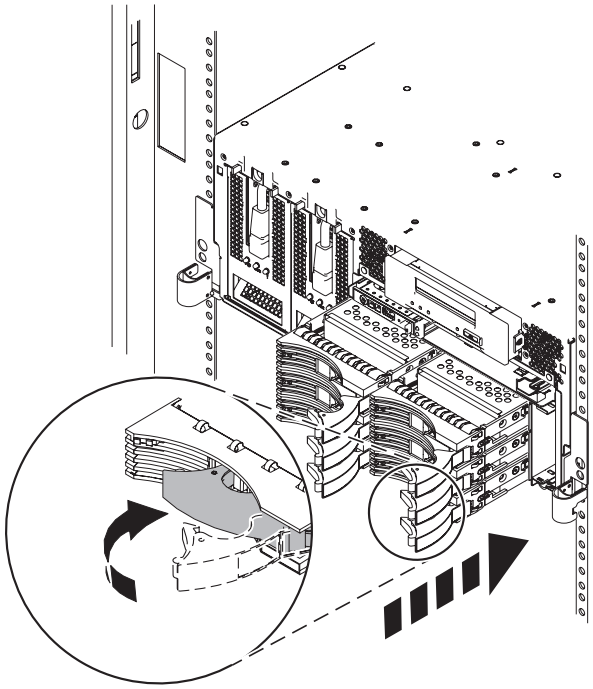


Figure 7. Disk drive installation

10. Press Enter on the Complete Device Concurrent Add display to indicate that the disk drive is installed.
11. Rebuild the data on the replacement disk drive. For instructions, go to “Rebuilding data on a replacement disk drive using Linux” on page 40.
12. Go to Chapter 2, “Verifying a repair,” on page 181. **This completes this procedure.**

Replacing the disk drive nonconcurrently

Use this procedure to remove and replace a disk drive nonconcurrently.

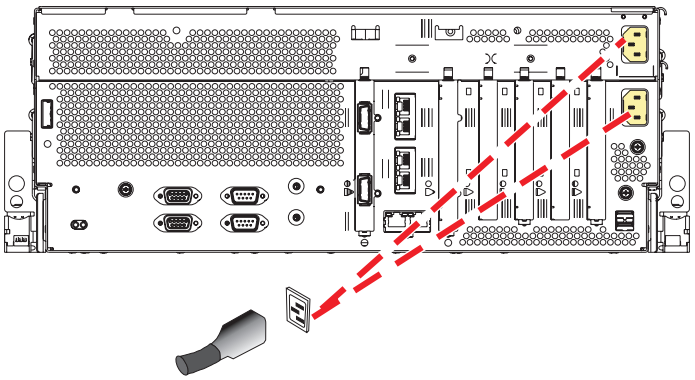
1. Power off the system and remove the power cords

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

If possible, shut down any running applications and the operating system before powering off the system.

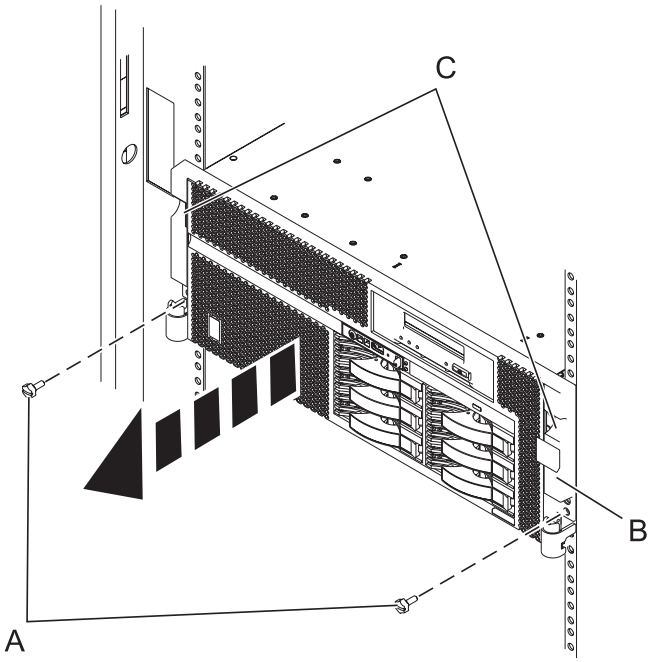
Once the system is powered off, remove all power cords from all of the power supplies.



2. Remove the front cover

Note to Tower Users: The instructions in this procedure are written based on the Rack model. Tower users may still use this procedure. However, Tower users should ignore specific references to rack-only features such as rack doors, rack thumbscrews, and rack-specific FRU orientation, etc.

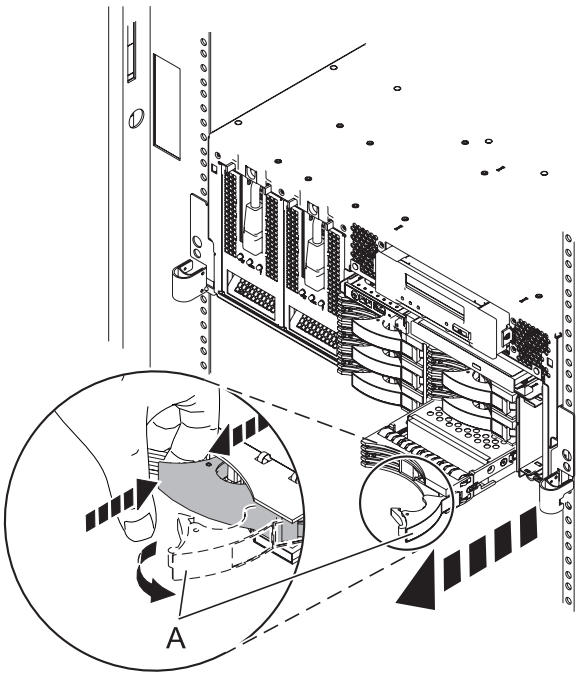
1. Open the front rack door.
2. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.
3. Grab the cover at points **(C)** and pull it out and away from the system unit.



3.

Remove the disk drive:

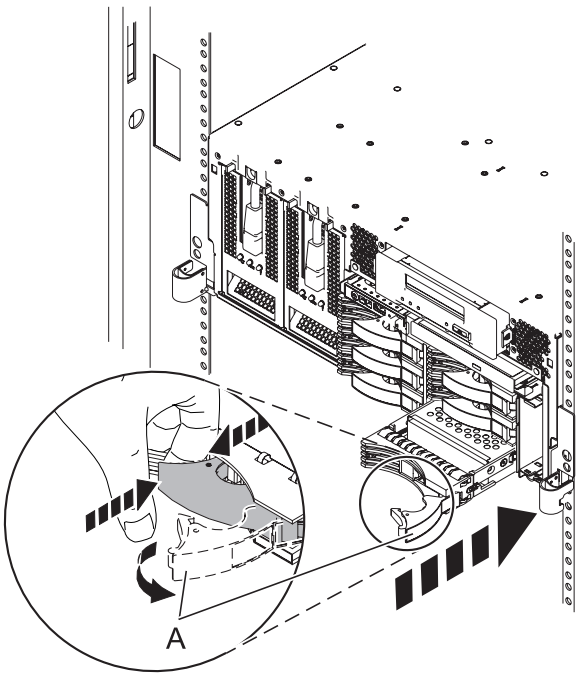
1. Unlock the disk drive handle **(A)** and pull the disk drive out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.



4.

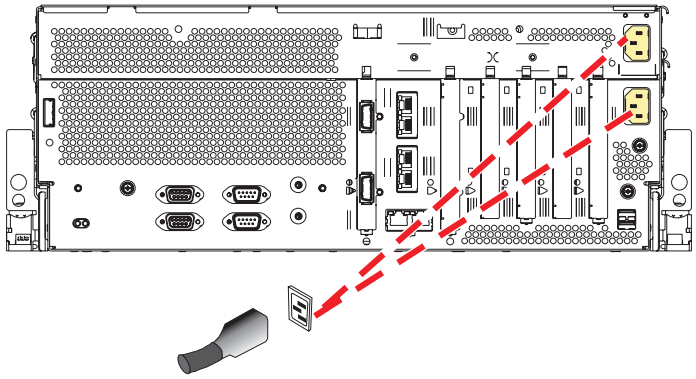
Install the disk drive:

1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
2. Slide the disk drive into the system until it stops.
3. Push the disk drive handle in until it locks.
   Note: When you install a disk drive, ensure that the drive is fully seated and all the way into the system.



5.

If you removed the power cords, reinstall the power cords for all of the power supplies.



6.

Go to Chapter 2, “Verifying a repair,” on page 181. **This completes this procedure.**

Rebuilding data on a replacement disk drive using Linux

Use this procedure to rebuild data on a replacement disk drive.

To rebuild data on the replacement disk drive, complete the steps listed here.

For an unprotected disk drive

If the disk drive you are replacing is in a RAID Level 0 disk array or in a failed RAID Level 5 or RAID Level 10 disk array, perform these tasks:

1. Re-create the disk array.
2. Re-create the file systems on the disk array.
3. Copy the data back to the restored disk array from your backup media.

For information on these tasks, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*, SA23-1327.

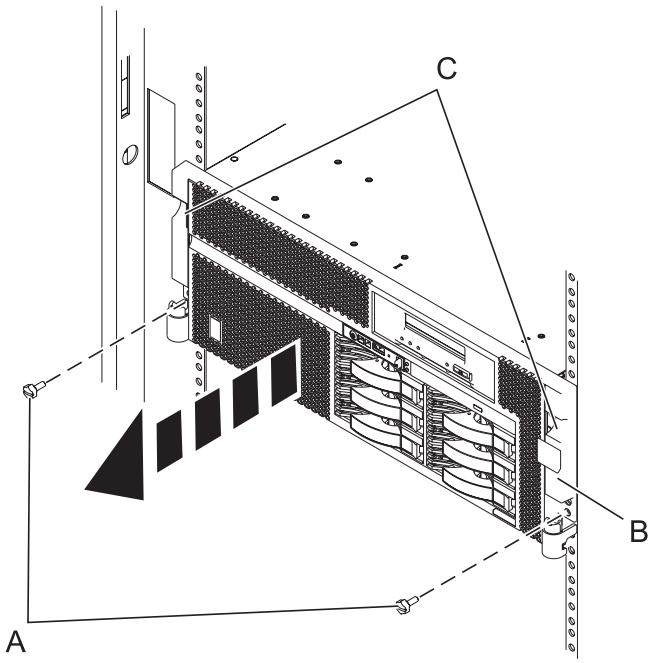
Replacing the disk drive using IBM i

Use this procedure to remove and replace a disk drive concurrently with IBM i.

1.

Access the unit:

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.



2.

To recover any data that might be lost when a disk drive is replaced you must know if the disk drive has data protection.

Do you know the protection status of the disk drive to be removed?

No: Continue with the next step.

Yes: If the disk drive is mirrored, record the status of both disk drives in the mirrored pair and go to step 5 on page 42. If the disk drive is parity protected, go to step 8 on page 43.

3.

Determine the protection status of the disk drive to be removed:

1. Sign on the operator console with at least service level authority.
2. Type strsst on the command line of the IBM i session and press Enter.
3. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display. Press Enter.
4. Select **Work with disk units** from the System Service Tools (SST) display. Press Enter.
5. Select **Display Disk Configuration** from the Work with Disk Units display. Press Enter.
6. Select **Display Disk Configuration Status** from the Display Disk Configuration display. Press Enter.

   A list of each auxiliary storage pool (ASP) displays, showing the disk drives that are members of the ASPs..
7. Is the status of the failing disk drive **Mirrored**?

   No: Continue with the next step.

   Yes: Record the status of both disk drives in the mirrored pair and continue at step 5 on page 42.

4.

Determine if the failing disk drive is parity protected:

Check the status of the failing disk drive for one of the following:

DPY/Active

DPY/Failed

DPY/HDW Failure

DPY/Degraded

DPY/Power Loss

DPY/Not Ready

DPY/Unknown

If the status of the failing disk drive and all other disk drives in the array have a status listed above, the failing disk drive is parity protected.

Is the failing disk drive parity protected?

Yes: Go to step 8 on page 43.

No: The disk drive cannot be replaced concurrently. Go to "Replacing the disk drive nonconcurrently" on page 38.

Note: An ASP with a status of Unprotected might contain disk drives that are device parity protected.

5.

Does the disk drive you are replacing have a status of Suspended?

Yes: Go to step 8 on page 43.

No: Check the status of the disk drive that is mirrored to the disk drive you are replacing. If it is Suspended, go to step 7 on page 43. If it is Active, continue with the next step.

6.

Suspend the disk drive that you are replacing by performing the following:

1. Press **F3** from the Display Disk Configuration display to return to the Work with Disk Units display.
2. Select Work with Disk Unit Recovery from the Work with Disk Units display and press **Enter**.
3. Select Suspend mirrored protection from the Work with Disk Unit Recovery display and press **Enter**.
4. Select the option to suspend the disk drive that you are replacing from the Suspend Mirrored Protection display and press **Enter**.
5. Go to step 8 on page 43

7.

The suspended mirrored pair of the failing drive has also failed and must be replaced.

Perform a backup of the data in the failing ASP.

Go to step 8 to replace the failing mirrored disk.

Return to the beginning of this procedure to replace the disk that you originally intended to replace.

Note: Performing a backup is a customer task. Refer to the system's Operations Guide for instructions.

8.

Select Device Concurrent Maintenance from the Hardware Service Manager display by:

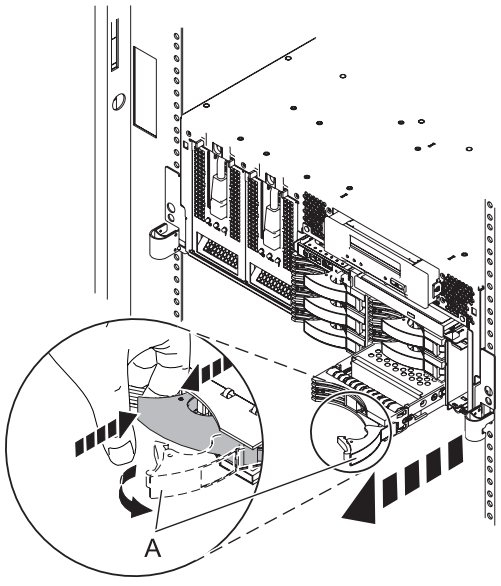
1. Press **F3** until the main SST menus is displayed.
2. Select option 1 (Start a service tool). Press **Enter**.
3. Select option 7 (Hardware Service Manager). Press **Enter**.
4. Select option 8 (Device Concurrent Maintenance). Press **Enter**.
5. Enter the location code of the disk drive being replaced in the form of: U787A.001.AAAXXXX-P3-D4.
6. Select option 1 (Remove device) for the **Action to be performed**.
7. Set the time delay for one minute: 01. **Important:** Do not press Enter at this time.
8. Locate the concurrent maintenance light that corresponds to the position of the disk drive that you are replacing.
9. **Important**: When you press Enter, after a one minute delay, this light comes on and begins to blink rapidly. You then have nine seconds to remove the disk drive.
10. Press **Enter** on the console.
11. When the light blinks rapidly, perform the next step to remove the disk drive within 9 seconds.

9.

Remove the disk drive by:

1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

   The concurrent maintenance light for the slot turns off when you remove the disk drive.



10.

Loosen and pull out on the thumbscrew B to release the disk-drive bezel C from the disk drive, as shown in the graphic.

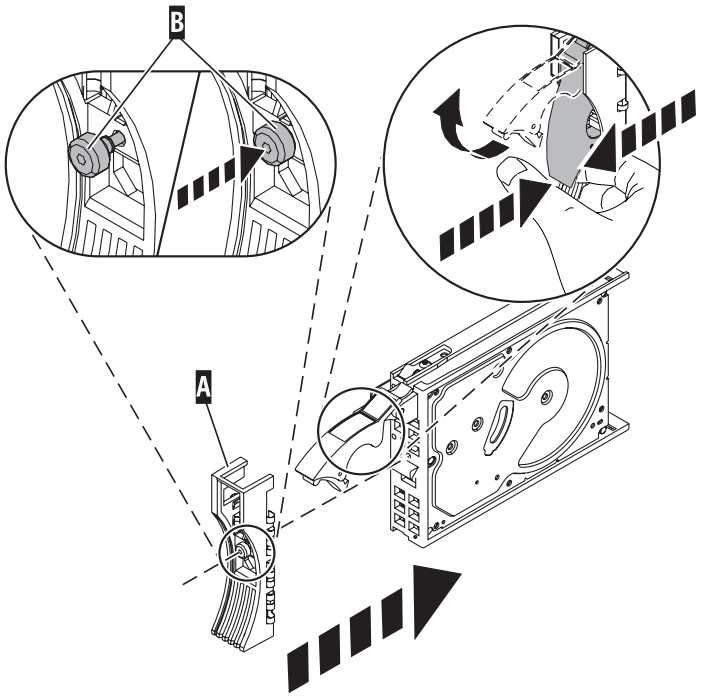
Continue with the next step.

11.

Install the bezel on the new disk drive:

1. Find the package that contains the new disk drive.

   Attention: Disk drives are fragile. Handle with care.
2. Remove the disk drive from its static protective package.
3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
4. Attach the disk drive bezel **A** to the replacement disk drive as shown.
5. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



12.

1. Return to the console and wait until the Concurrent Maintenance Results display is shown. Press F12.
2. The physical locations you entered in step 6 of this procedure might still appear on the display. If not, retype the physical location where you will be installing the new disk drive.
3. Select option **2** (Install device) for the **Action to be performed**.
4. Set the time delay for one minute: 01. **Important:** Do not press Enter at this time.
5. Locate the concurrent maintenance light that corresponds to the position of the disk drive that you are replacing
6. **Important**: When you press Enter, after a one minute delay, this light comes on and begins to blink rapidly. You then have nine seconds to install the disk drive.
7. Continue with the next step.

13.

Install the disk drive:

1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
2. Slide the disk drive into the system until it stops.
3. Press **Enter** on the console.
4. When the light blinks rapidly, perform the next step to install the disk drive within 9 seconds.
5. Push the disk drive handle in until it locks.
   Note: Ensure that when you install a disk drive that the drive is fully seated and all the way into the system.
6. Continue with the next step.

14.

1. If you removed a front cover, install the front cover
2. Install or close the system, expansion unit or rack front door.
3. Return to the console and wait until the Concurrent Maintenance Results display is shown. Press **Enter**.
4. If you return to the Service Action Log display, exit the service action log.
5. When the Hardware Service Manager display is shown, press **F3**.
6. Continue with the next step.

15.

Rebuild the data on the replacement disk drive by:

1. If necessary, start System Service Tools (SST) by typing strsst on the command line of the IBM i session and pressing Enter.
2. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display. Press Enter. **Note:** The service tools password is case sensitive.
3. Select **Work with disk units** from the Start System Service Tools (SST) display. Press Enter.

Was the failing disk drive mirrored?

Yes: Go to step 19 on page 47.

No: Continue with the next step.

16.

Did the array have a hot spare installed before the failure occurred?

No: Go to step 18 on page 46.

Yes: Continue with the next step.

17.

Perform the following:

1. Select **Non-configured disk units** from the Work with Disk Units display. Press Enter.
2. Is the new disk unit displayed with a status of non-configured?
   Note: It may take several minutes for the new disk drive to be displayed.

   No: Contact your next level of support.

   Yes: Continue with the next step.
3. Press **F3** to return to the Work with Disk Units display.
4. Select **Work with disk unit recovery** from the Work with Disk Units display. Press Enter.
5. Select **Disk unit problem recovery procedure**. Press Enter.
6. Select **Initialize and format disk unit**. Press Enter.
7. Select the new disk and press Enter.
   Note: This will take several minutes to complete.
8. When the disk drive is initialized and formatted, press **F3** to return to the Work with Disk Units display.
9. Select **Start hot spare**. Press Enter.
10. Select the IOA with the new disk. Press Enter and press Enter again.
    Note: This will take several minutes to complete.
11. Press F3 (Exit) to return to the System service tools display.
12. Press F3 (Exit) to return to the Exit SST display and press Enter. **This completes this procedure.**

18.

Perform the following:

1. Press **F3** to return to the Work with Disk Units display.
2. Select **Work with disk unit recovery** from the Work with Disk Units display. Press Enter.
3. Select **Rebuild disk unit data** on the Work with Disk unit recovery display. Press Enter.
4. Select 1 to rebuild the disk drive displayed (the disk drive displayed is the disk drive that you removed) on the Rebuild Disk Unit Data display. Press Enter.
5. Press Enter on the Confirm Rebuild Disk Unit Data display. The rebuild process might take several minutes to complete.
6. Press F5 to refresh the display until the **Percent complete** shows 5%.
7. When the display shows at least 5% complete, you can either continue to monitor this display to completion, or press F3 (Exit) to return to the Work with disk units display.
8. Press F3 (Exit) to return to the System service tools display.
9. Press F3 (Exit) to return to the Exit SST display and press Enter.

19.

1. Select **Work with disk unit recovery** from the Work with Disk Units display. Press Enter.
2. Select **Replace configured unit** on the Work with Disk unit recovery display. Press Enter.
3. Select the configured disk drive that you are exchanging (suspended drive) on the Select Configured Unit to Replace display. Press Enter.
4. Select the disk drive that you just installed on the Select Replacement Unit display. This drive has a non-configured status.

   Note: In some cases, it might take several minutes for a new disk drive to display. Repeat these steps until the new drive is shown.

   Press Enter.
5. Press Enter on the Confirm Replace of Configured Unit display to confirm your choice for replacement.

   The replacement process might take several minutes to complete.

   When the process is complete, the Work with Disk unit recovery display is shown.
6. Press **F3** (Exit) to return to the Work with disk units display.
7. Select **Display disk configuration** on the Work with disk units display.
8. Select **Display disk configuration status** on the Display Disk Configuration display.

   Mirrored status shows Resuming. When complete, the mirrored status shows Active. This process might take several minutes to complete. You can either monitor this display to completion, or press **F3** (Exit) three times, and then press Enter to return to the main menu.

20.

Go to Chapter 2, “Verifying a repair,” on page 181. **This completes this procedure.**

Disk unit backplane

Use this procedure to service the disk unit backplane.

Note: If your system supports internal DASD sharing, see Internal DASD sharing on model 8204–E8A, 8203–E4A, 9407–M15, 9408–M25, or 9409–M50.

1. **Shut down the partitions and power off the system**

This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

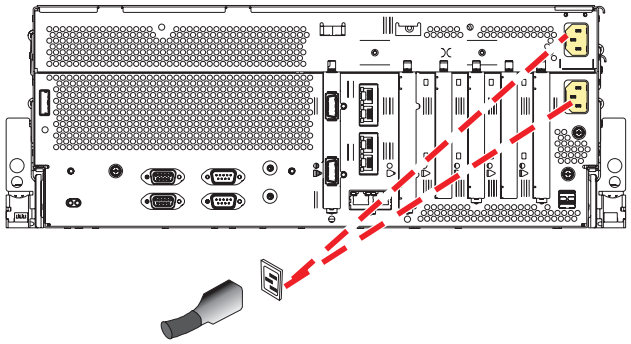
Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

---

2. Disconnect the power cords

1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.

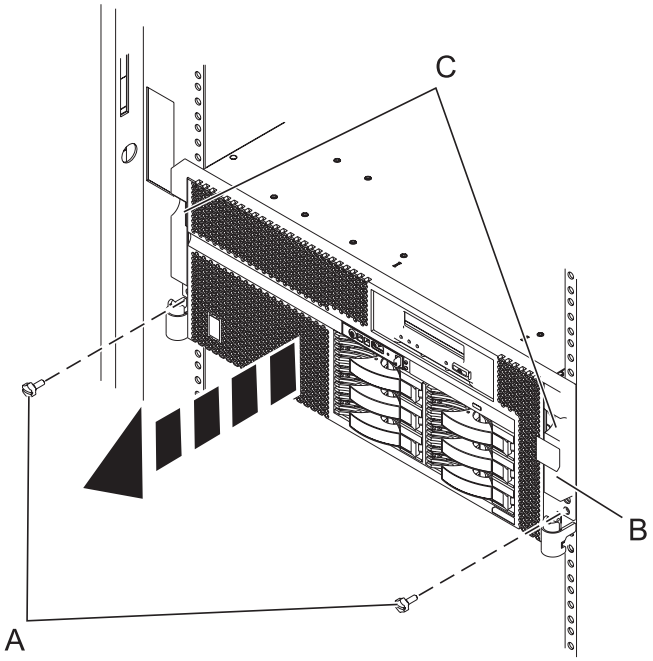


---

3. Remove the front cover

Note to Tower Users: The instructions in this procedure are written based on the Rack model. Tower users may still use this procedure. However, Tower users should ignore specific references to rack-only features such as rack doors, rack thumbscrews, and rack-specific FRU orientation, etc.

1. Open the front rack door.
2. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.
3. Grab the cover at points **(C)** and pull it out and away from the system unit.



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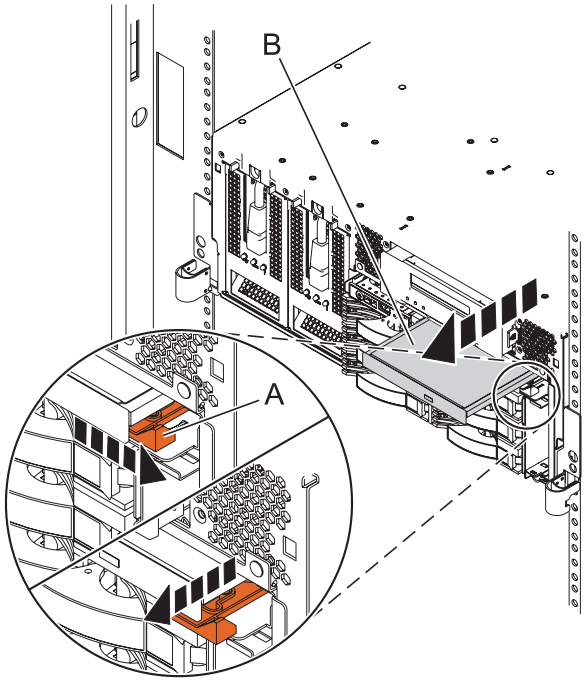
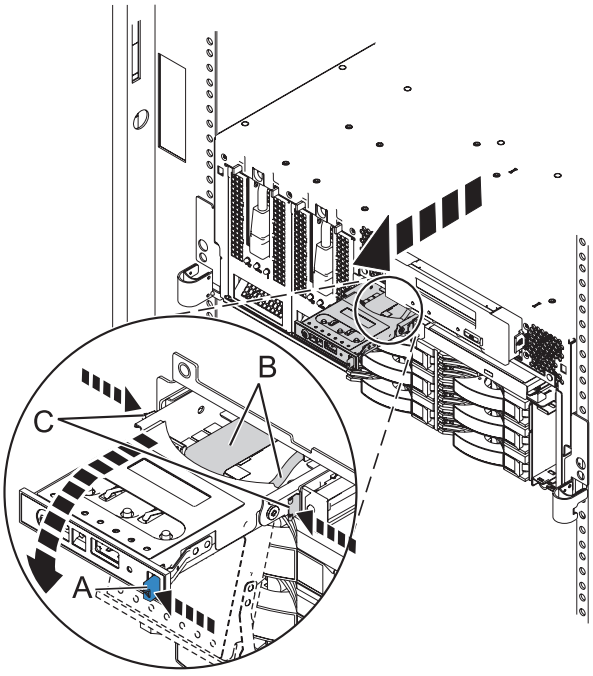
4. Remove the slimline media or filler panel device

1. If there is a slimline media or filler panel device in the system, push the terra cotta plastic retaining tab **(A)** approximately 5mm to the right away from the device.
2. While depressing the terra cotta plastic retaining tab, grasp the device **(B)** and pull it out of the system.



5. Remove the operator panel

1. Release the operator panel by pushing the release tab **(A)** to the left.
2. Grasp the edges of the operator panel and pull it partially out of the bay.
3. Press the locking pins **(C)** inward and gently pull the operator panel completely out of the bay, **taking care not to pull on the cables (B)**.
4. Rotate the operator panel downward if needed, and disconnect the operator panel cables **(B)** from the operator panel.
5. Record the operator panel cables orientation, for reconnecting them the same way.

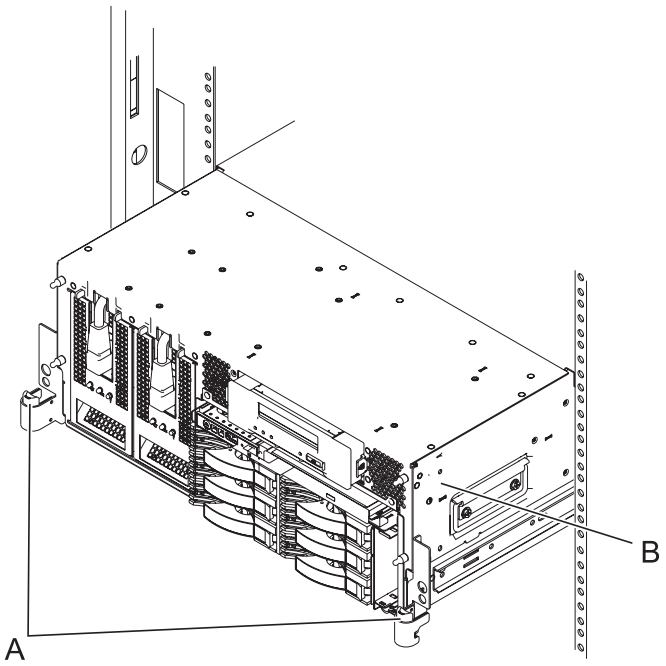


6. Place into service position

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

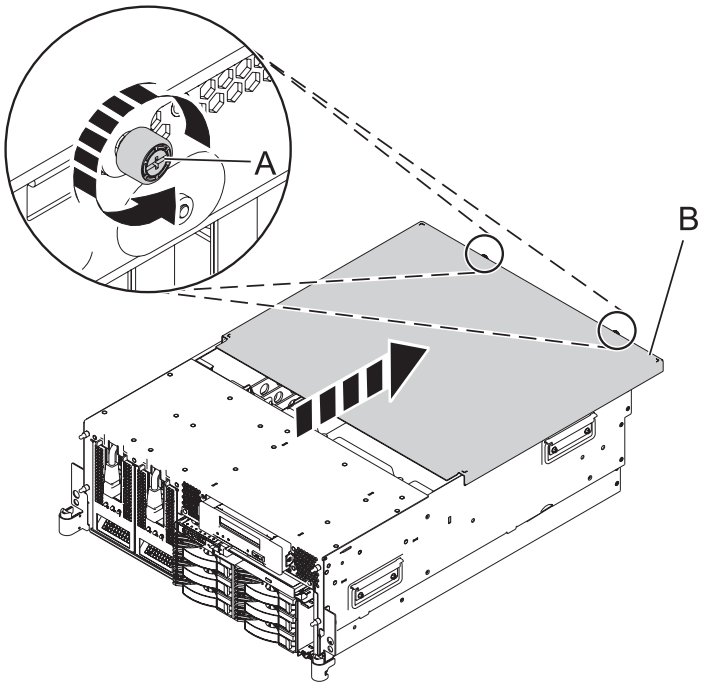
While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



7. Remove the service access cover

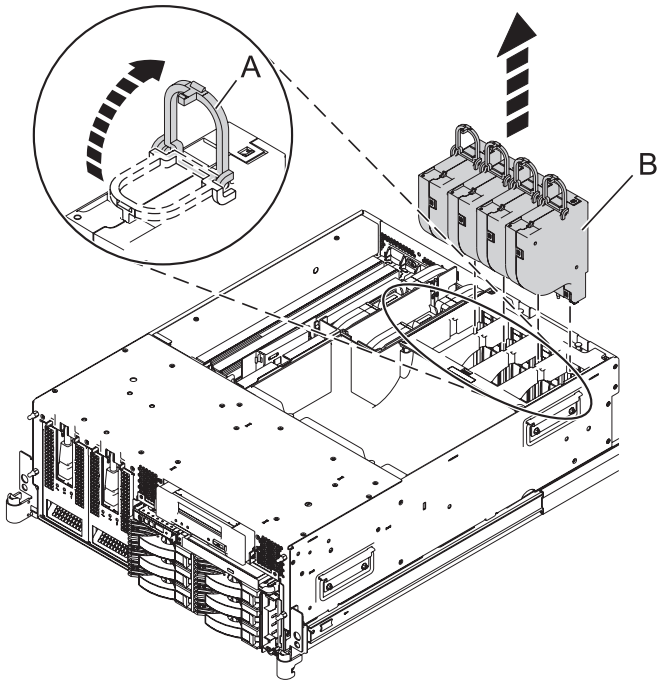
1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



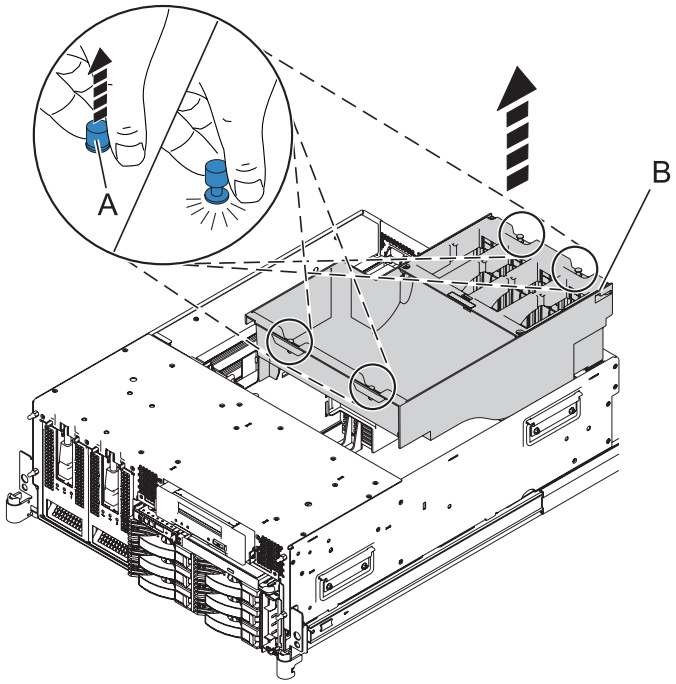
8. Remove the fans

1. Push the latch **(A)** upward to disengage the fan from the fan cage.
2. Pull the fan **(B)** out of the fan cage.
3. Repeat these steps until all fans are removed from the fan cage.



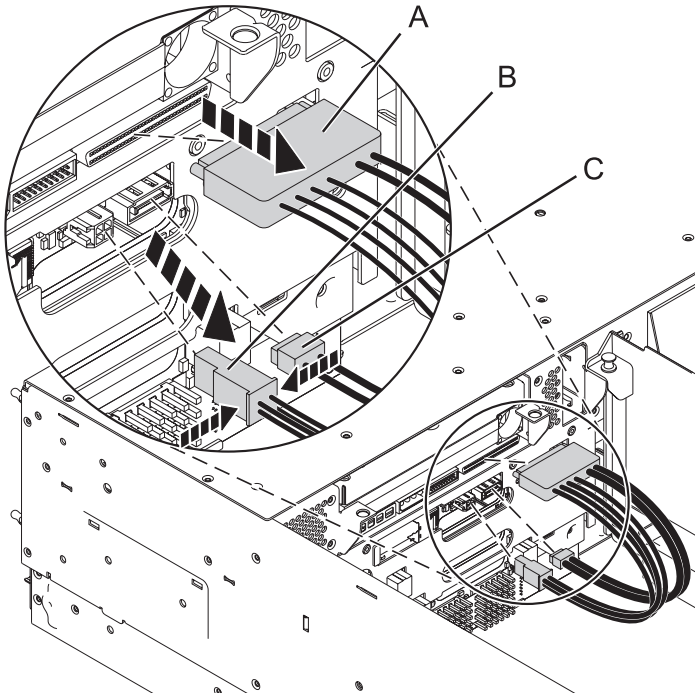
9. Remove the fan cage

1. Pull the four retaining tabs **(A)** that secure the fan cage to its enclosure.
2. Lift the fan cage **(B)** straight up and out of the enclosure.



10. Disconnect the cables, if any, from the back of the disk drive backplane

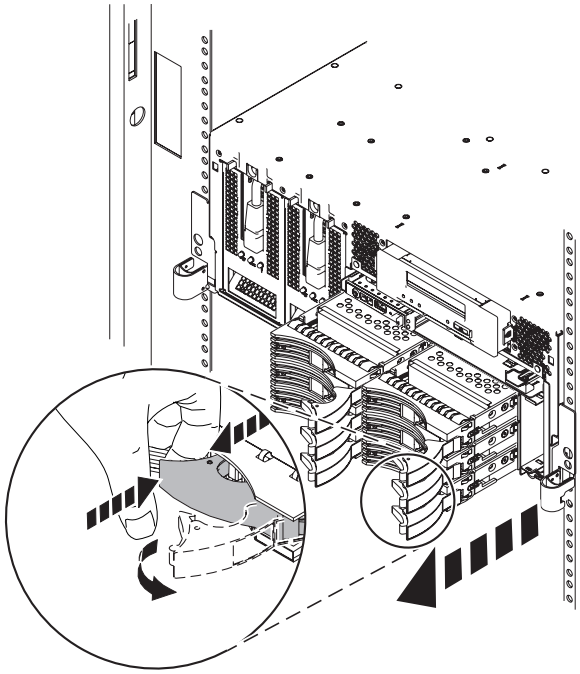
1. Media device cable connector **(A)** can remain connected.
2. Squeeze the media device cable connectors **(B)** and **(C)**as shown and disconnect them from their connector sockets on the disk unit backplane.
   Note: Some systems might have additional cables attached to the disk unit backplane; not all cabling options appear in the illustration.
3. If there are other cables connected to the disk unit backplane, disconnect them from their connector sockets on the disk unit backplane, noting their attachment points.



11. Remove the disk units and fillers

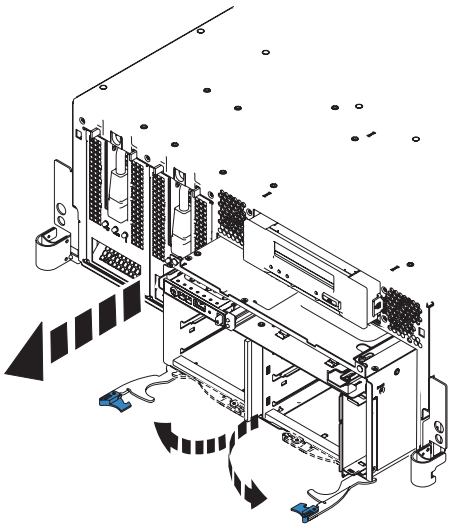
Note: Support the bottom of the disk unit while you slide it out. Do not hold the disk unit by the handle.

1. Open the disk units handles by pinching the two surfaces of the handles together.
2. Pull all of the disk units out of the disk unit cage and backplane.
3. Repeat these steps for any disk unit fillers that are present.



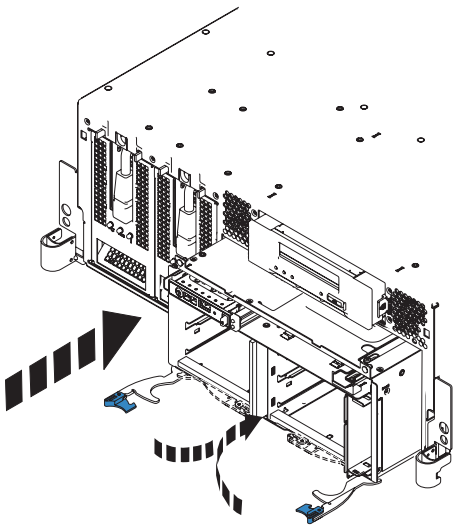
12. Remove the disk unit cage and backplane

1. Rotate the handles outward in the direction shown to release the disk unit cage and backplane.
2. Slide the disk unit cage and backplane out of the system unit.



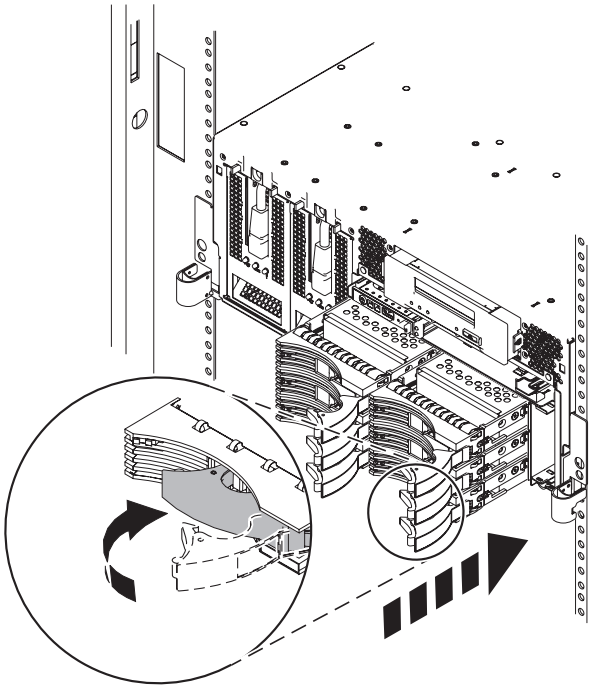
13. Install the disk unit cage and backplane

1. Slide the replacement disk unit cage and backplane into the system until you feel it engages and locks into place.
2. Rotate the handles in the direction shown to secure the disk unit cage and backplane.



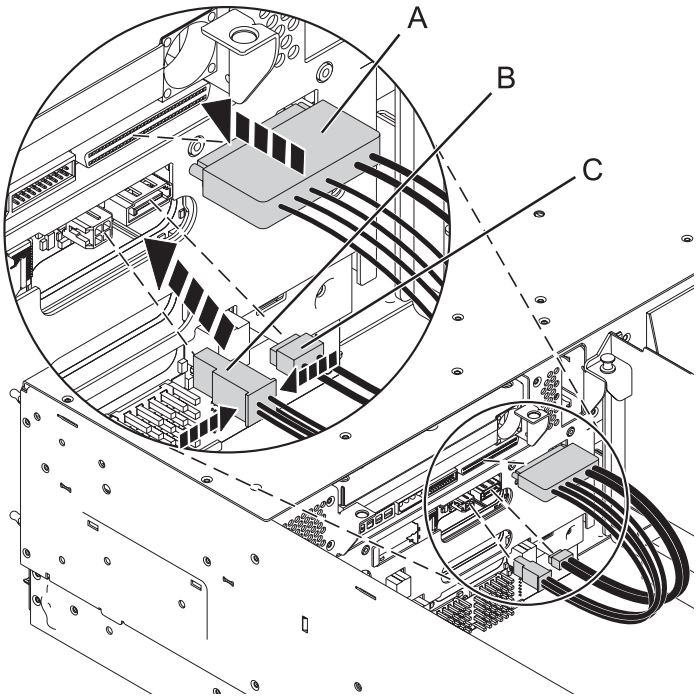
14. Install the disk units and fillers

1. Slide the disk units back into the disk unit cage and backplane.
2. Push in the handles of each disk unit to lock them into place.
3. Repeat these steps for any disk unit fillers that are present.



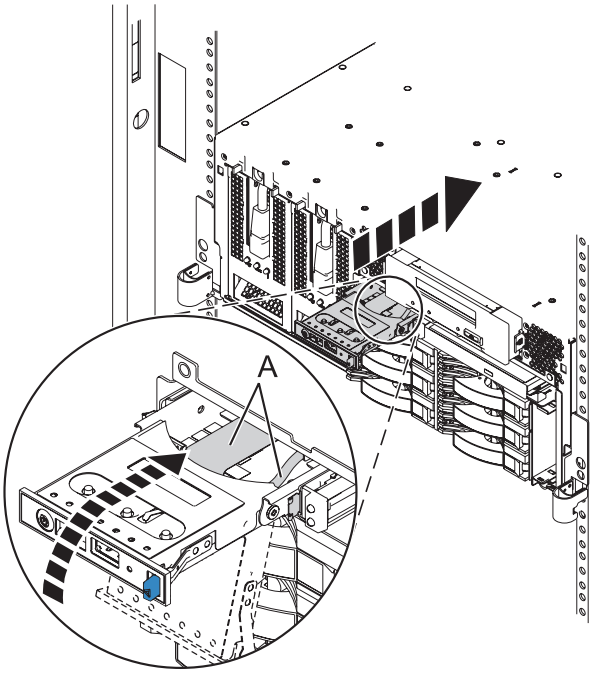
15. Connect the cables, if any, to the back of the disk unit backplane

1. Media device cable **(A)** does not need to be touched.
2. Connect the media device cables **(B)** and **(C)** to their connectors on the disk unit backplane.
3. Reconnect any other cables that were detached previously. The illustration does not contain all cabling options.



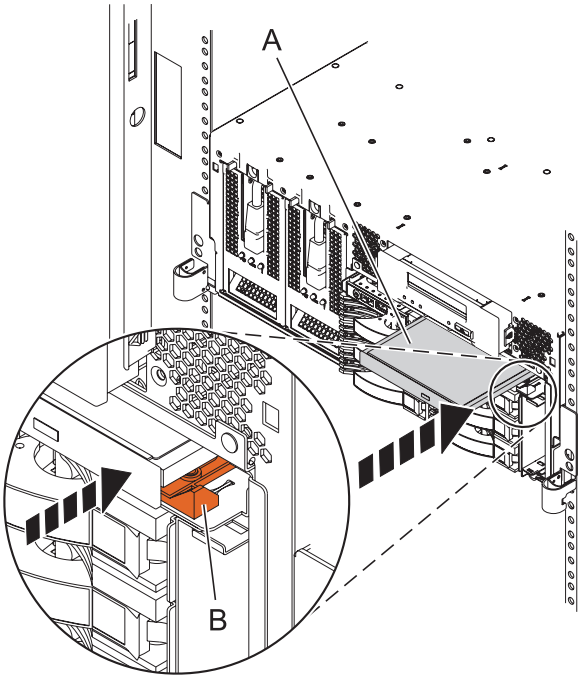
16. Install the operator panel

1. Carefully guide both operator panel cables **(A)** through the cables conduit in the extension of the operator panel while gently sliding the operator panel into the operator panel bay.
2. Connect the operator panel cables **(A)** to the operator panel.
3. Rotate the front of the operator panel upward and continue sliding it into the bay until the operator panel engages and locks into place.



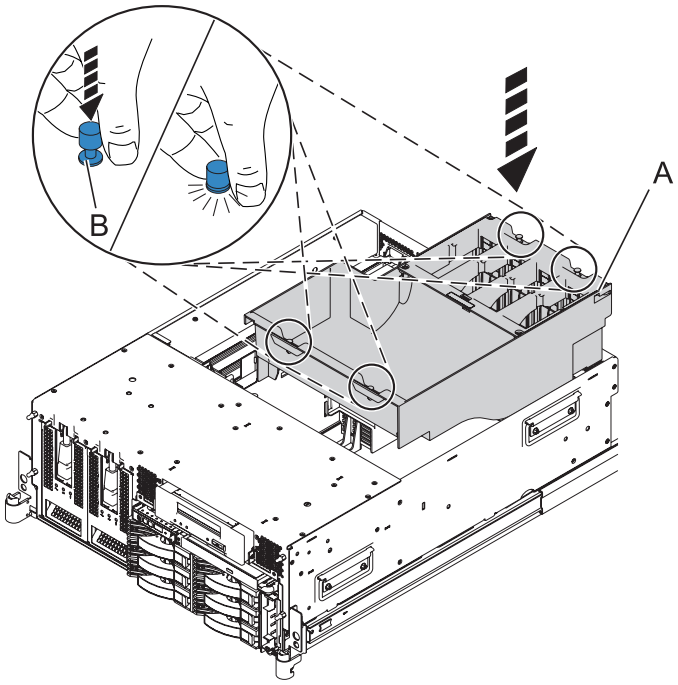
17. Install the slimline media or filler panel device

1. If there was a slimline media or filler panel device present in the system, align the device **(A)** with the slimline media bay.
2. Push it into the system until the retaining tab **(B)** locks the device into place.



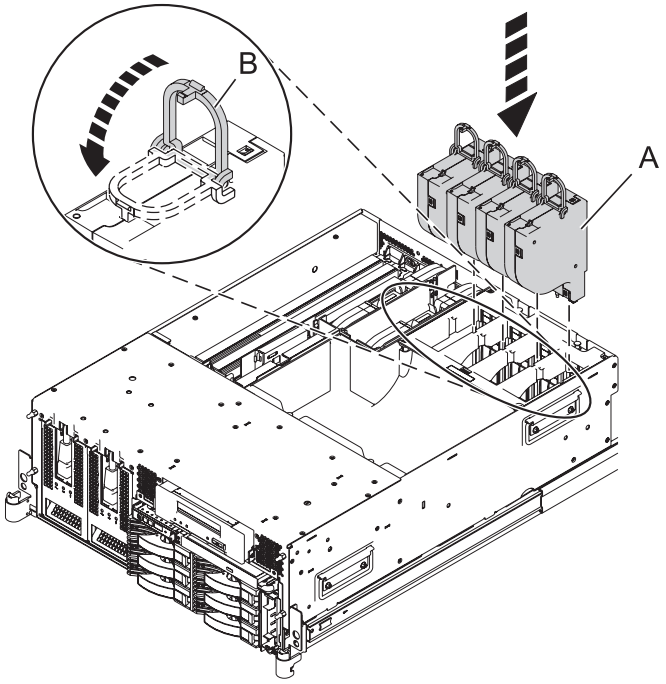
18. Install the fan cage

1. Check that the four retaining tabs are in open position.
2. Lower the fan cage **(A)** into its location on the enclosure, aligning the blue tabs with the holes.
3. Push firmly on the fan cage so that you are sure it fits into its position.
4. Tighten the four retaining tabs **(B)** securing the fan cage to its enclosure.



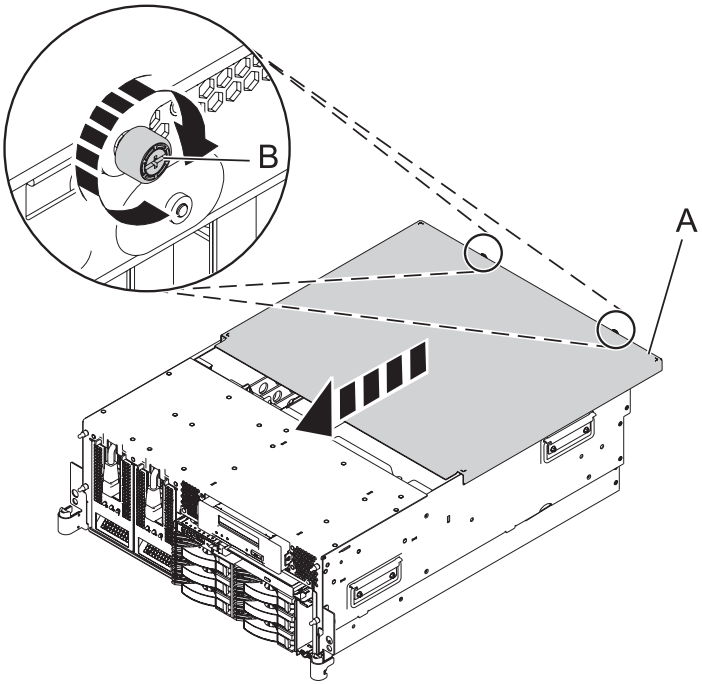
19. Install the fans

1. Lower the fan **(A)** into its location in the fan cage.
2. Push down on the fan until it locks into place.
3. Secure the fan by closing the latch **(B)**.
4. Repeat these steps until all fans are installed.



20. Install the service access cover

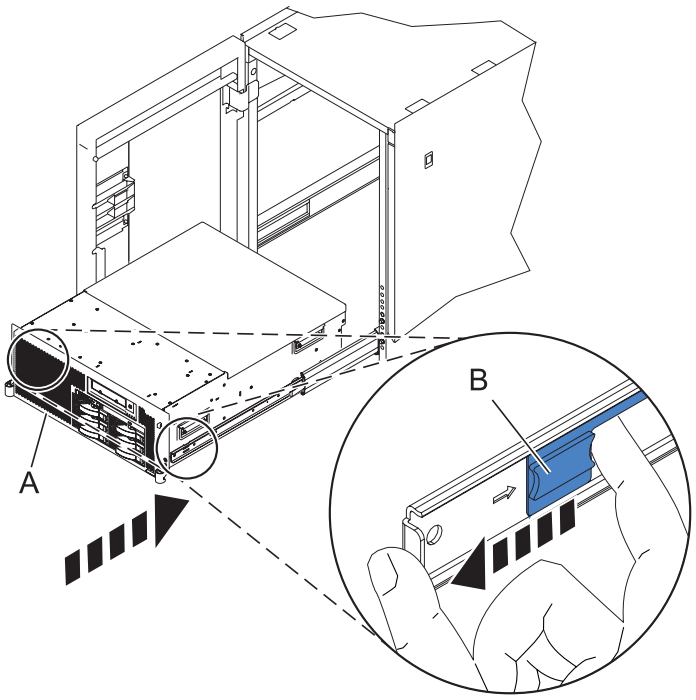
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



21. Place into operating position

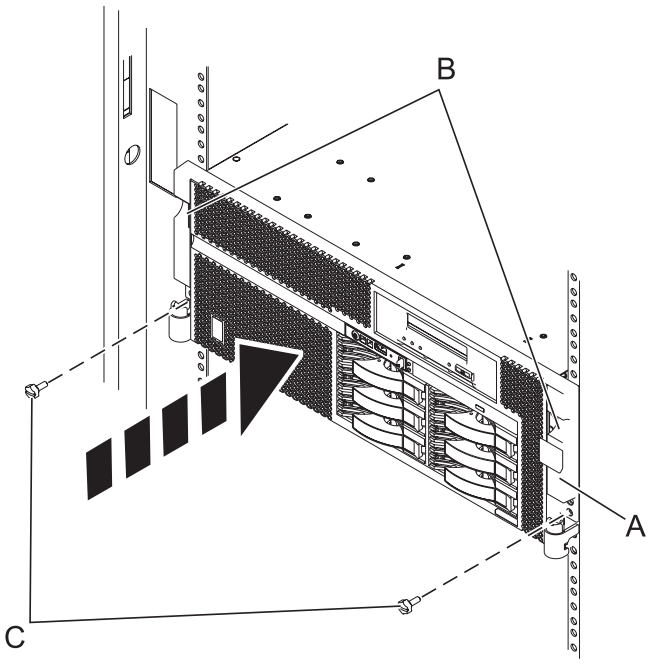
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



22. Install the front cover

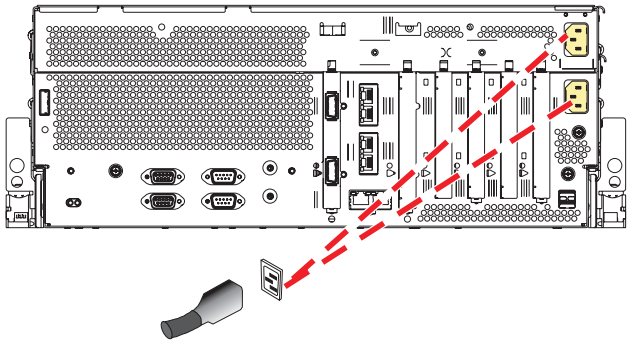
1. Position the cover on the front of the system unit so that the two screws **(C)** align with the screw holes on the front of the system unit **(A)**.
2. Push the cover at points **(B)** to attach it to the front of the system unit as shown in the following figure.
3. Tighten the two screws that secure the system unit to the rack.
4. Close the front rack door.



23. Install the power cords

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



24.

Go to Chapter 2, “Verifying a repair,” on page 181.

Ethernet card

Use this procedure to service the Ethernet card.

1. Shut down the partitions and power off the system

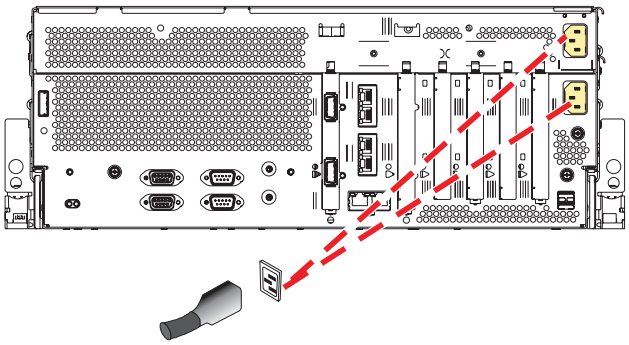
This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

2. Disconnect the power cords

1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.



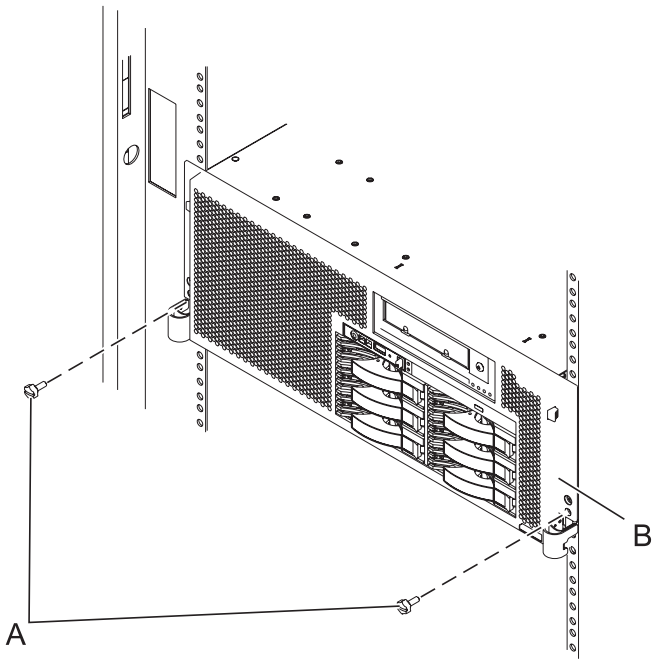
3. Disconnect the external cables

1. Carefully label the external cables connected to the FRU you are servicing so that they can be reconnected in exactly the same place after the repair.
2. Disconnect the external cables.

4. Place into service position

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Expansion unit users can still use this procedure. However, users of expansion units should ignore specific references to rack-only features, such as rack doors, rack thumbscrews, and rack-specific FRU orientation.

1. Open the front rack door.
2. Identify the system unit you are servicing in the rack.
3. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.

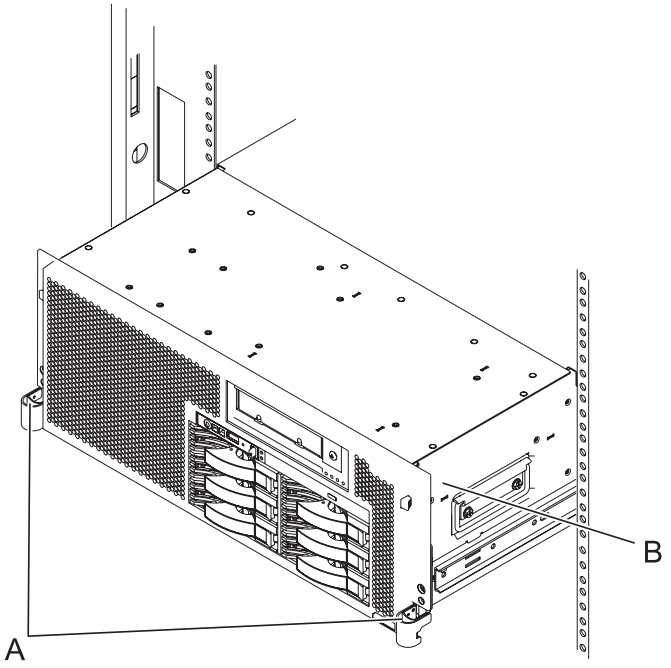


5. Place into service position (continued)

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

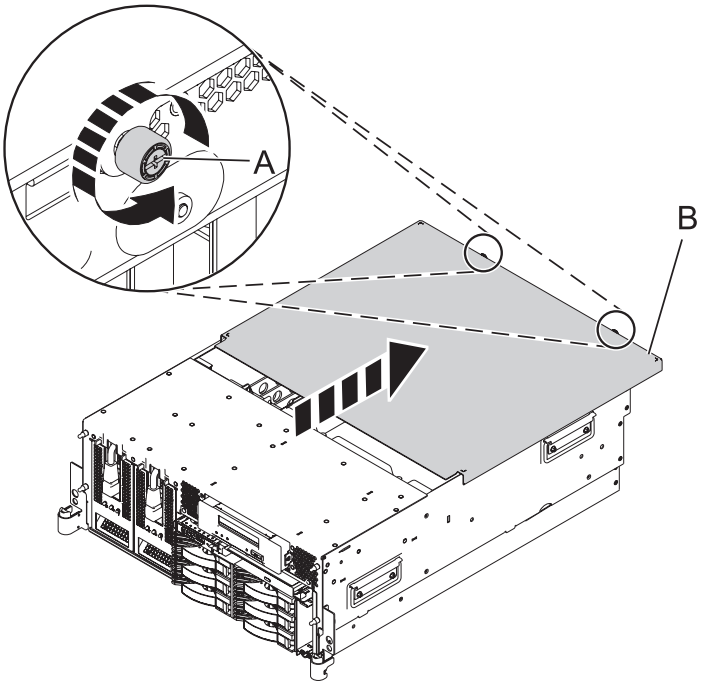
While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



6. Remove the service access cover

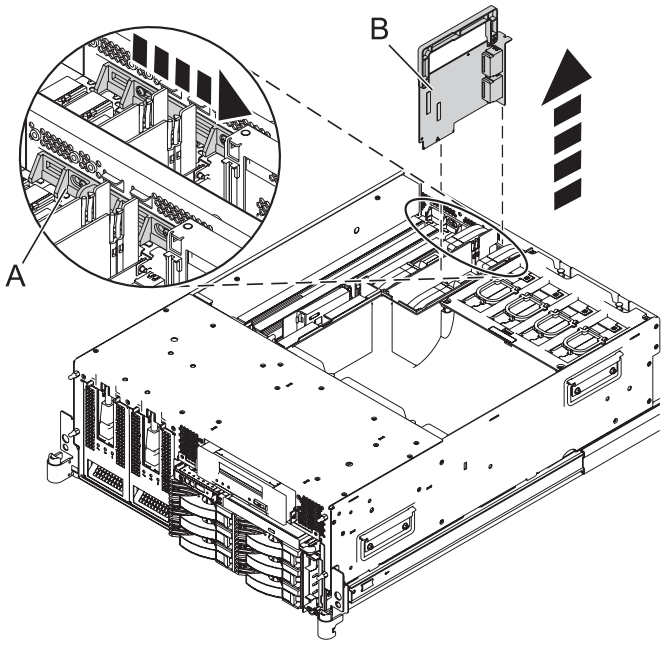
1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



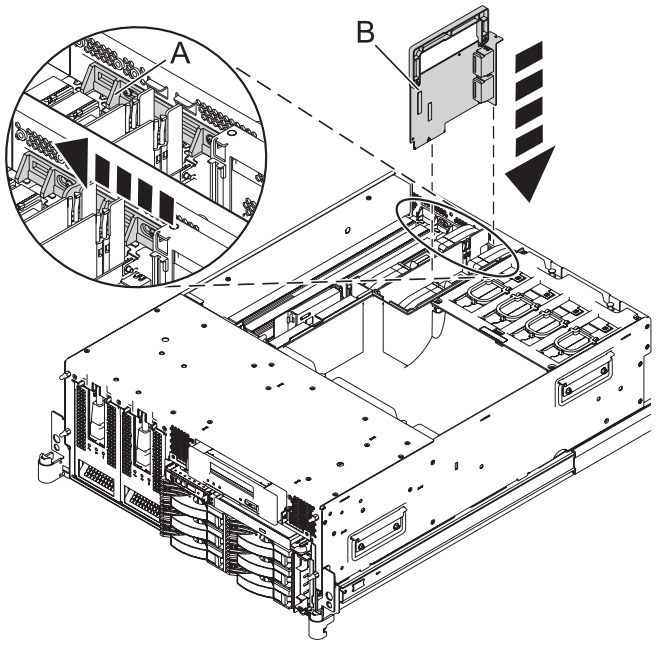
7. Remove the Ethernet adapter

1. Slide the latch **(A)** in the direction shown to release the Ethernet adapter **(B)**.
2. Carefully grasp the Ethernet adapter by its blue handle, and pull it straight out of its connector on the system backplane.



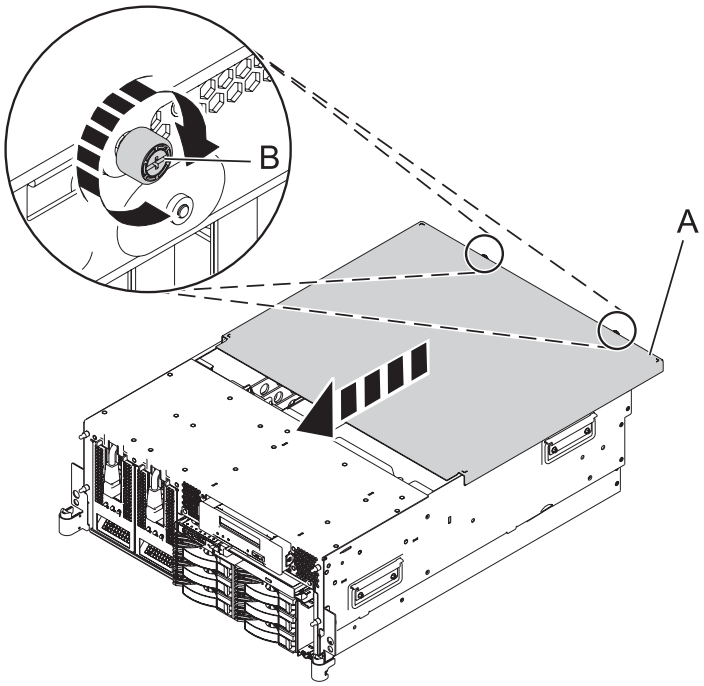
8. Install the Ethernet adapter

1. Check the latch **(A)** is in the open position to let the Ethernet adapter slot accessible.
2. Carefully grasp the Ethernet adapter **(B)** by its blue handle, and align the card with its connector on the system backplane.
3. Press the Ethernet adapter firmly into its connector.
4. Slide the latch **(A)** back in the direction of the arrow to secure the Ethernet adapter.



9. Install the service access cover

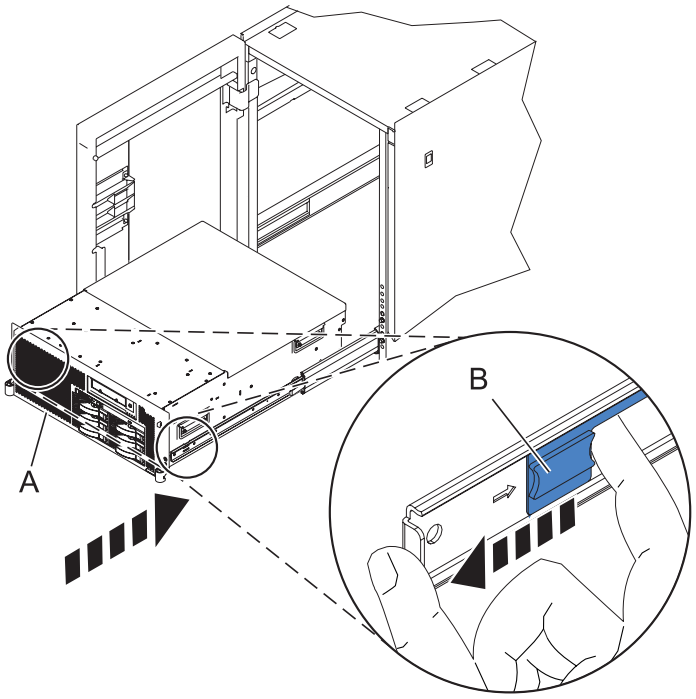
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



10. Place into operating position

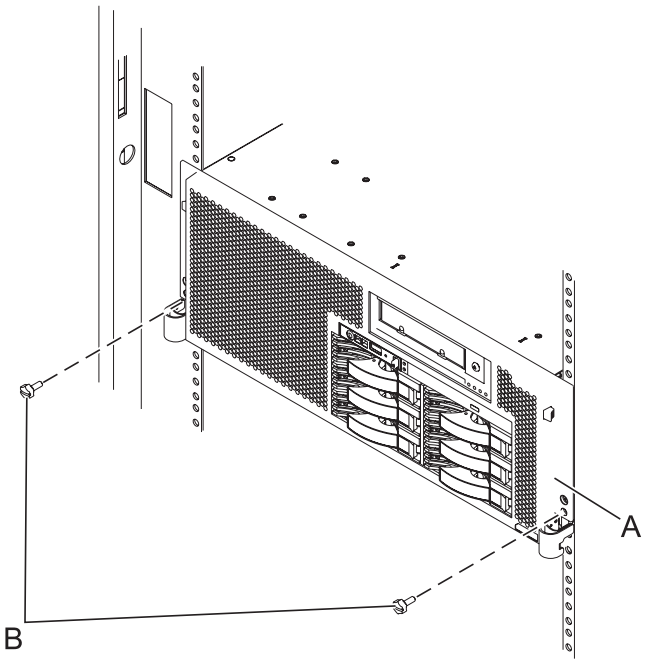
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



11. Place into operating position (continued)

1. Replace and tighten the two screws **(B)** that secure the system unit **(A)** to the rack.
2. Close the front rack door of the unit you are servicing.



12. Reconnect the external cables

Attention: To prevent damaging the FRU or the system, use the following precautions before plugging cables into a connector or adapter:

- Make sure that you have the right type of cable for the connector or adapter.
- Make sure that the cable plug is correctly aligned with the connector or adapter.
- Make sure that the tongue on the HSL/RIO cable plug matches the white location keys on the connector.

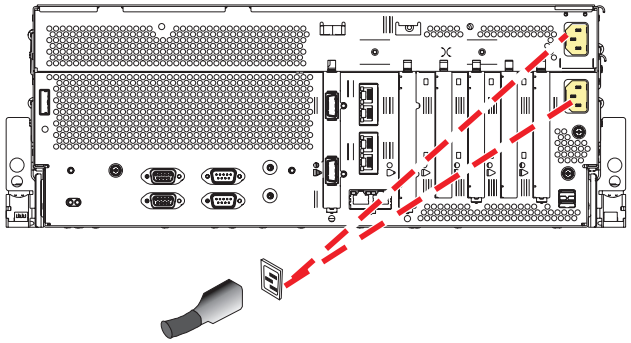
External cables were labeled before disconnection so that they can be reconnected in exactly the same place after the repair.

Reconnect the external cables you previously removed to the FRU you are servicing.

13. Install the power cords

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



14.

Go to Chapter 2, “Verifying a repair,” on page 181.

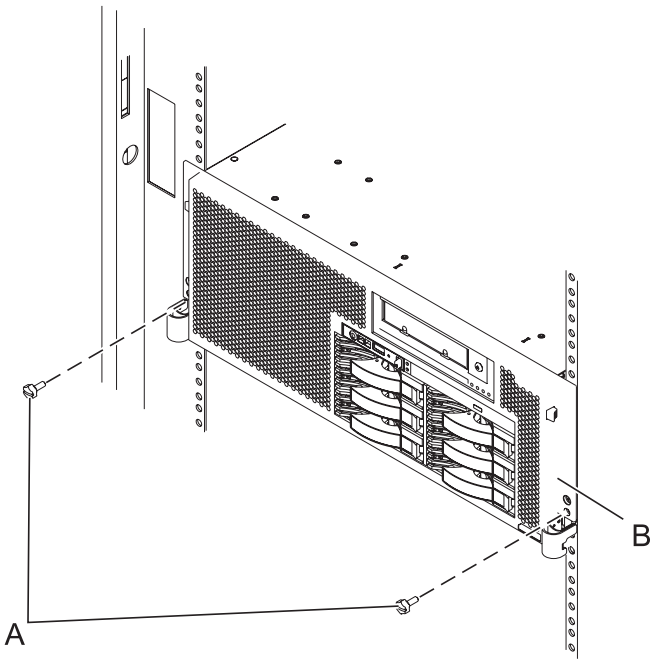
Fan

Use this procedure to service the fan.

1. Place into service position

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Expansion unit users can still use this procedure. However, users of expansion units should ignore specific references to rack-only features, such as rack doors, rack thumbscrews, and rack-specific FRU orientation.

1. Open the front rack door.
2. Identify the system unit you are servicing in the rack.
3. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.

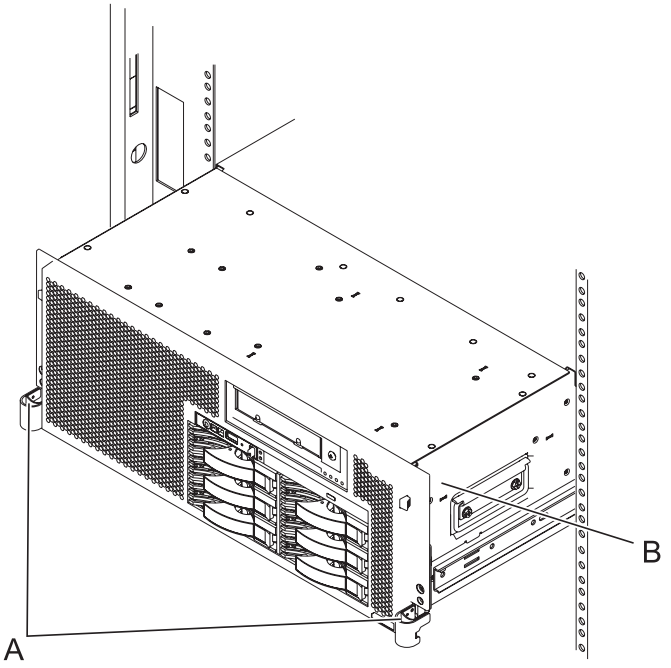


2. Place into service position (continued)

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

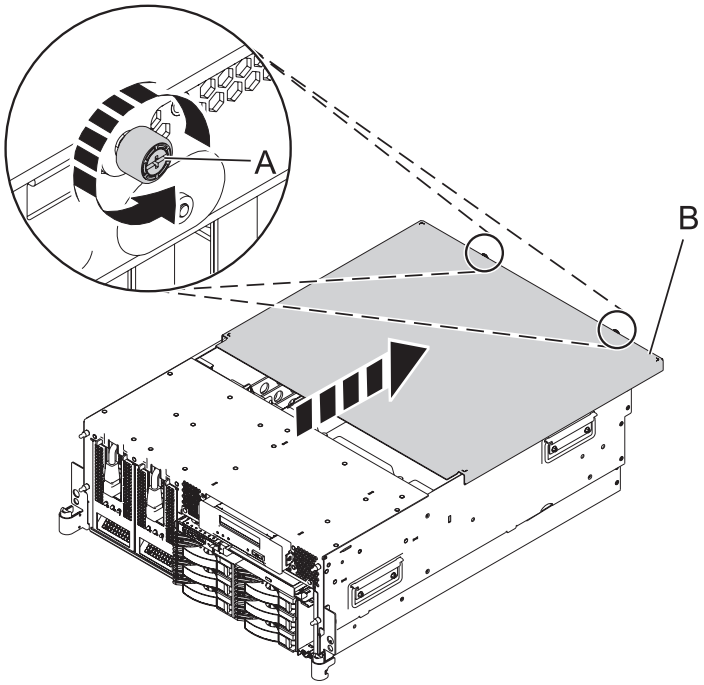
While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



3. Remove the service access cover

1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



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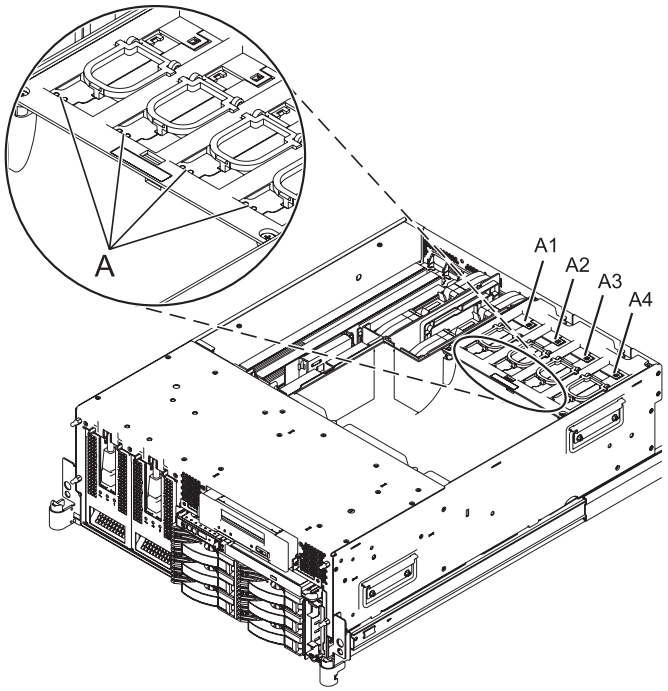
4. Can repair be concurrent?

You must determine if the repair can continue concurrently (that is, with power on). To continue the repair concurrently, the following conditions must be true:

- Fans must already be installed at the other three fan locations.
- Each of these fans has a green LED and an amber LED. The LEDs **(A)** must be set as follows:
  - Green - on
  - Amber - off

If any of the conditions are not true, the repair can continue only after powering off the unit containing the FRU that is being repaired. If the unit is already powered off, you may proceed with a non-concurrent repair.



5.

Select an action		
Nonconcurrent repair. Power off the unit and continue the repair.	Concurrent repair. Continue the repair with unit power on.	Delay the repair.
↓	Go to step 9.	**This ends the procedure.**

6. Shut down the partitions and power off the system

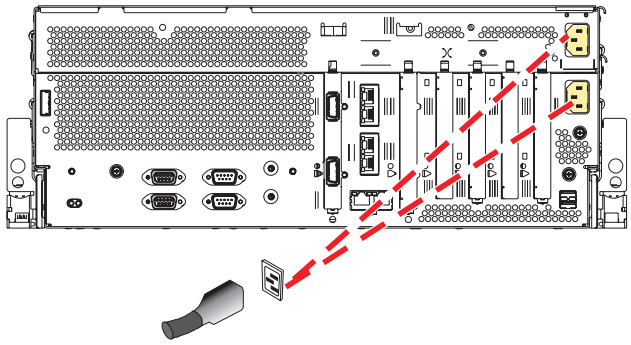
This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

7. Disconnect the power cords

1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.



8.

Go to step 10 on page 68.

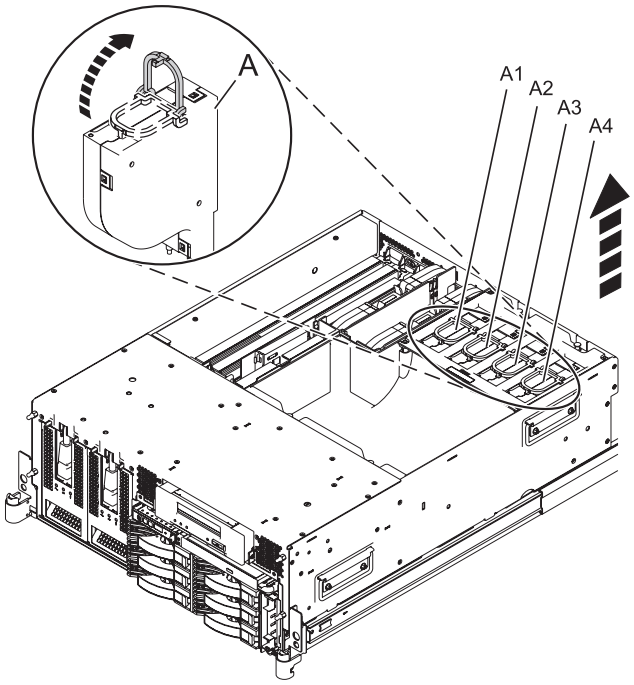
9. Locate the hot-swap cooling fan

Locate the fan you are servicing.

Note: Each fan unit has two LEDs. The green LED indicates the fan is operating properly. The amber LED indicates a fan failure.

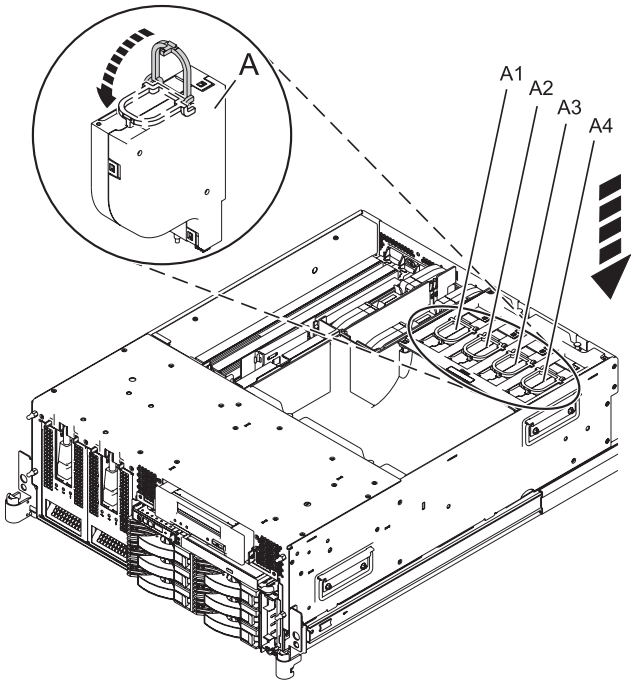
10. Remove the fan

1. Locate the failing fan to be removed.
2. Push the latch **(A)** upward to disengage the fan from the fan cage.
3. Pull the fan out of the fan cage.



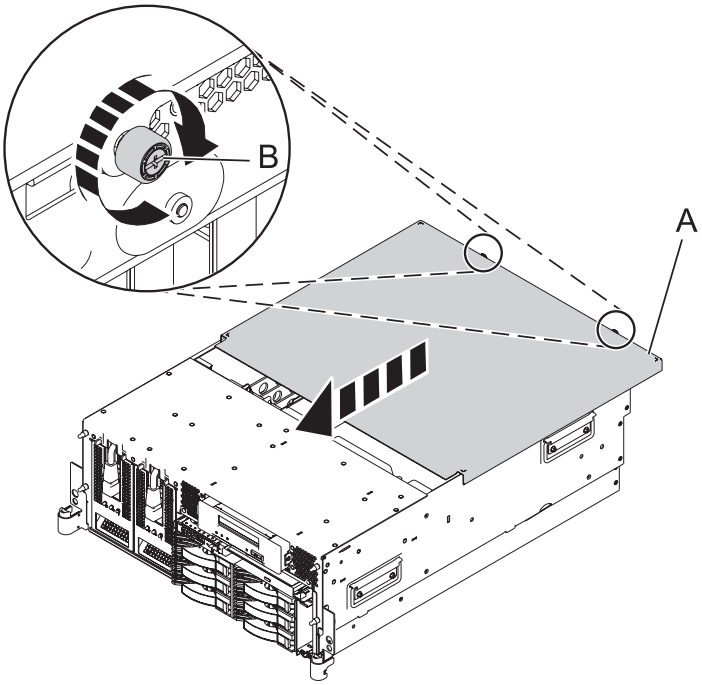
11. Install the fan

1. Lower the fan into its location in the fan cage.
2. Push down on the fan until it locks into place.
3. Secure the fan **(A)** by closing the latch.



12. Install the service access cover

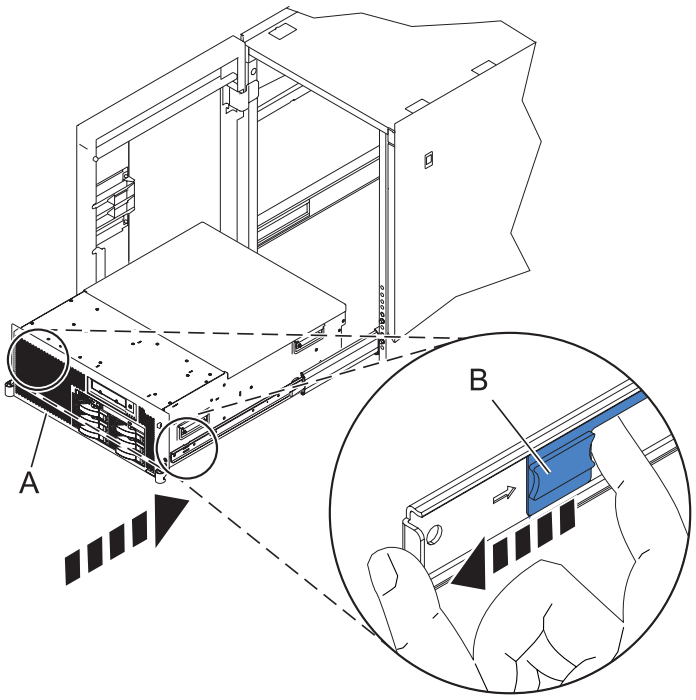
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



13. Place into operating position

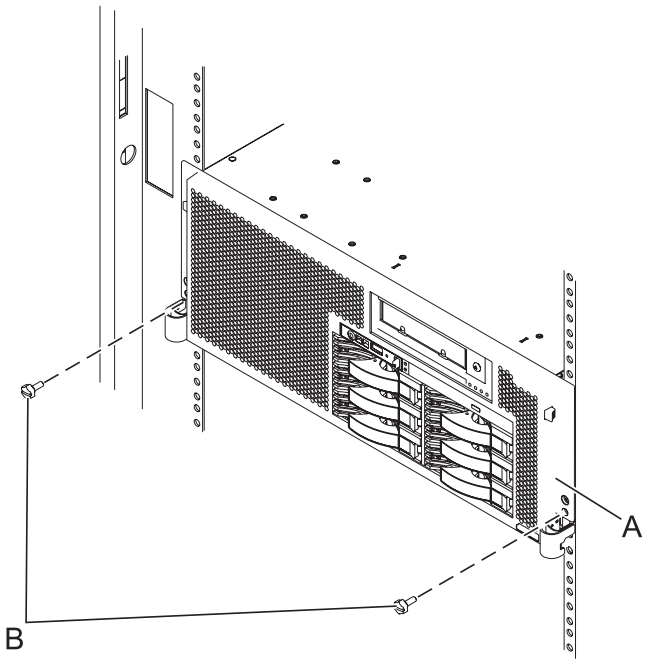
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



14. **Place into operating position (continued)**

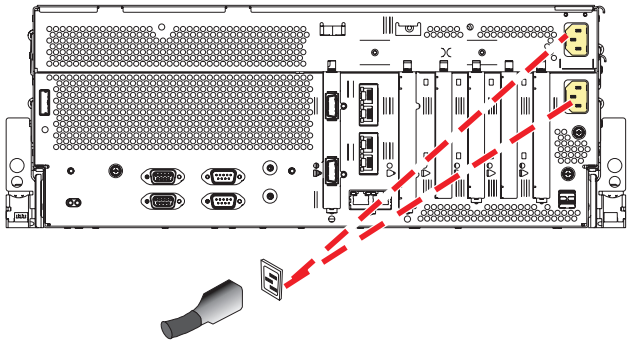
1. Replace and tighten the two screws **(B)** that secure the system unit **(A)** to the rack.
2. Close the front rack door of the unit you are servicing.



15. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



16.

Go to Chapter 2, “Verifying a repair,” on page 181.

GX adapter

Use this procedure to service the GX adapter.

1. **Shut down the partitions and power off the system**

This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

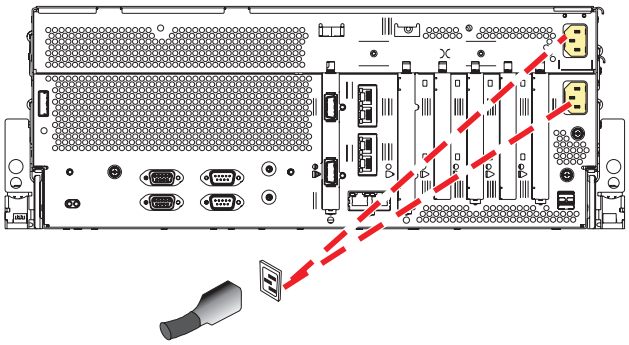
Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

---

2. **Disconnect the power cords**

1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.

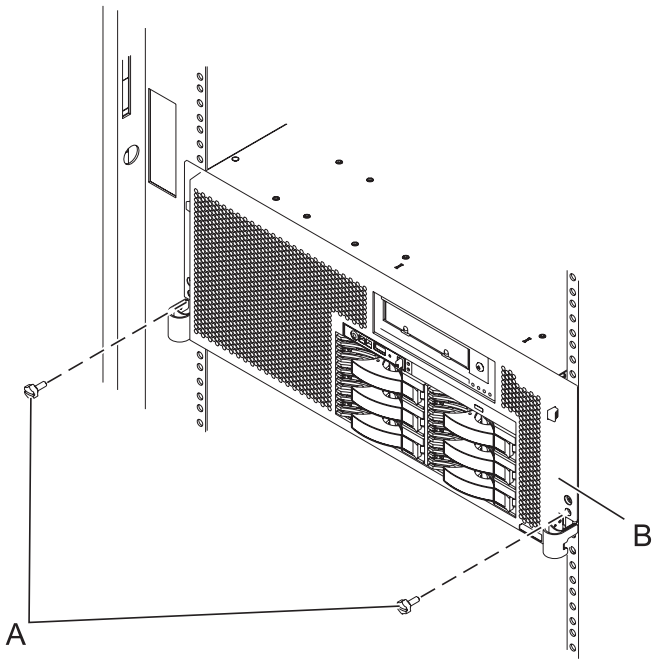


---

3. Place into service position

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Expansion unit users can still use this procedure. However, users of expansion units should ignore specific references to rack-only features, such as rack doors, rack thumbscrews, and rack-specific FRU orientation.

1. Open the front rack door.
2. Identify the system unit you are servicing in the rack.
3. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.

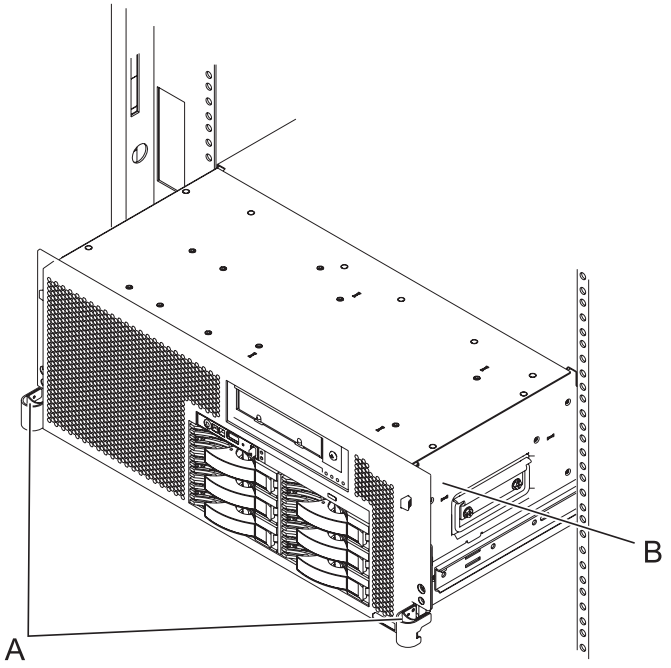


4. Place into service position (continued)

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

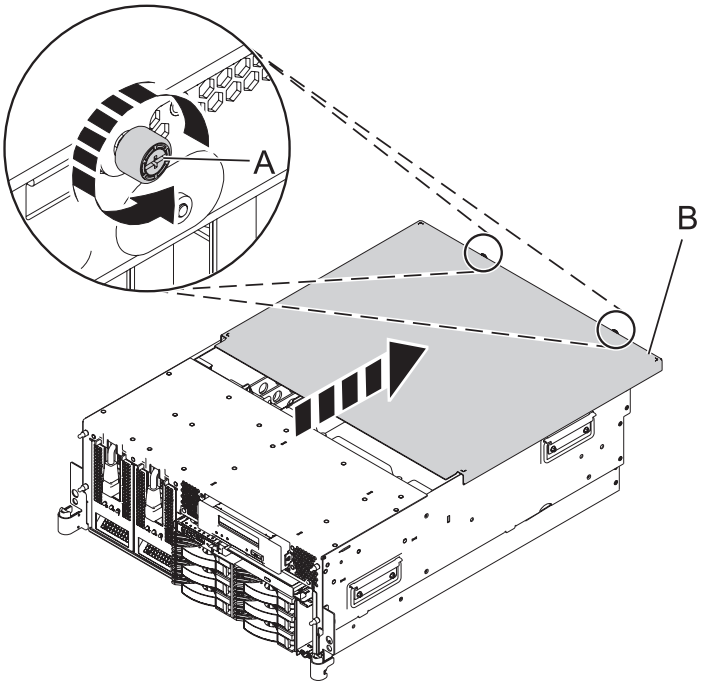
While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



5. Remove the service access cover

1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.

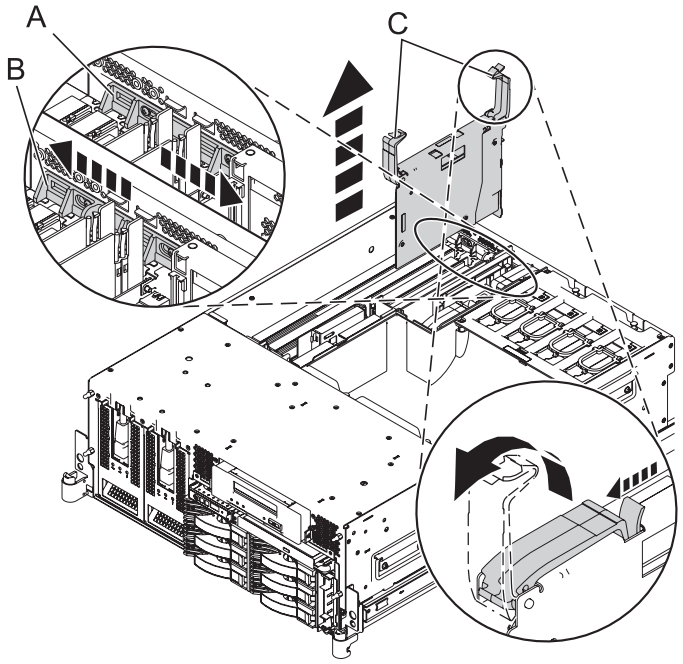


6. Disconnect the external cables

1. Carefully label the external cables connected to the FRU you are servicing so that they can be reconnected in exactly the same place after the repair.
2. Disconnect the external cables.

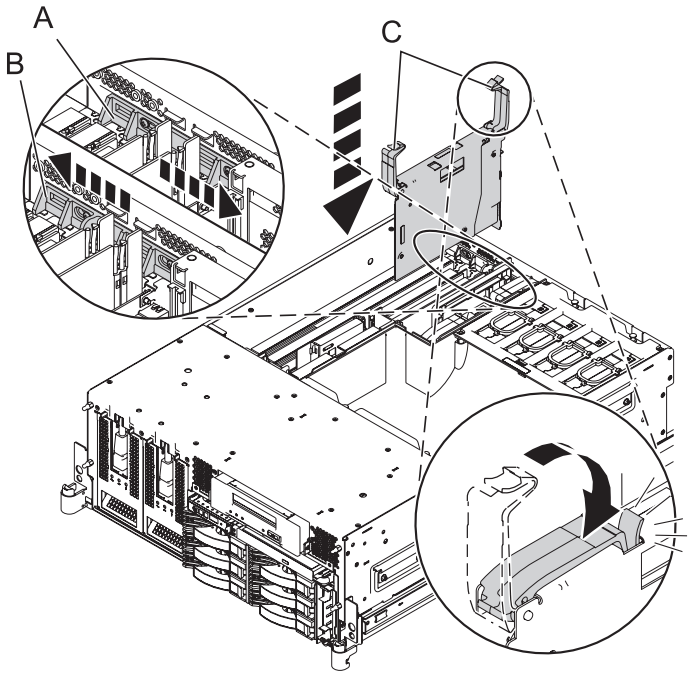
7. Remove the GX adapter

1. Slide the latch in the direction of the arrow **(A)** to release the GX adapter.
2. Pinch the GX adapter latches **(C)** and rotate them in the direction shown to release the GX adapter from the slot.
3. Gently pull the GX adapter straight up and out of the system.



8. Install the GX adapter

1. Align the GX adapter with its connector on the system backplane.
2. Gently push the GX adapter straight into the system.
3. Rotate the latches **(C)** in the direction shown until they latch.
4. Slide the latch back in the direction of the arrow **(B)** to secure all adapters.



9. Reconnect the external cables

Attention: To prevent damaging the FRU or the system, use the following precautions before plugging cables into a connector or adapter:

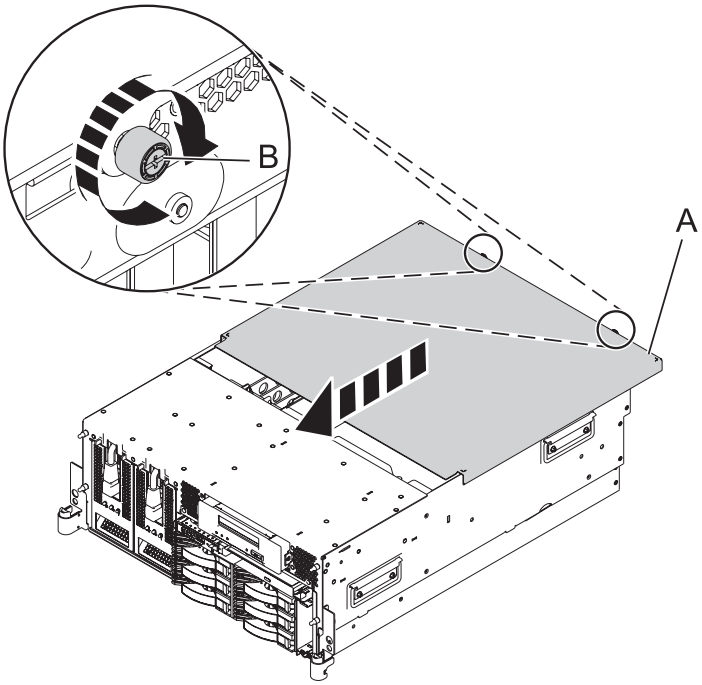
- Make sure that you have the right type of cable for the connector or adapter.
- Make sure that the cable plug is correctly aligned with the connector or adapter.
- Make sure that the tongue on the HSL/RIO cable plug matches the white location keys on the connector.

External cables were labeled before disconnection so that they can be reconnected in exactly the same place after the repair.

Reconnect the external cables you previously removed to the FRU you are servicing.

10. Install the service access cover

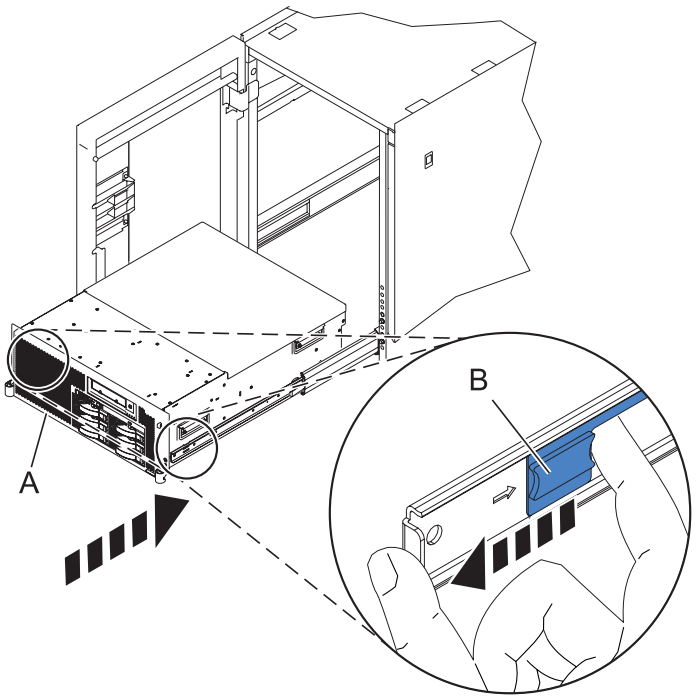
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



11. Place into operating position

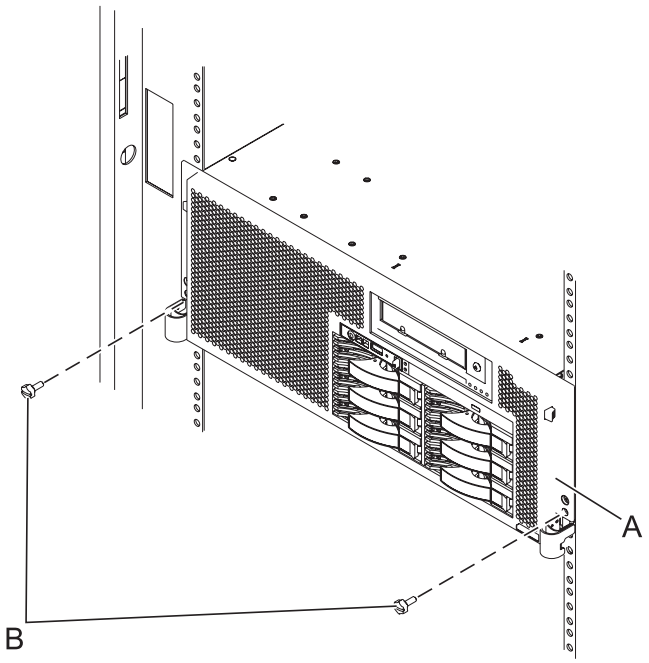
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



12. **Place into operating position (continued)**

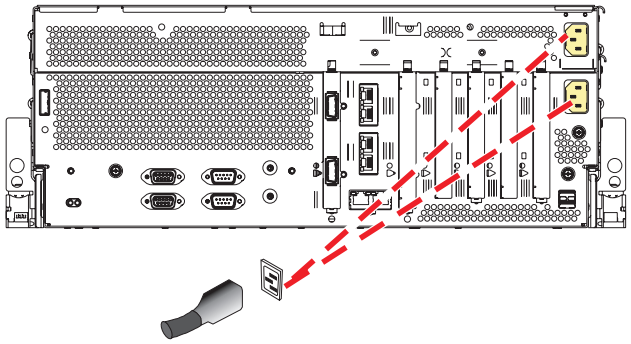
1. Replace and tighten the two screws **(B)** that secure the system unit **(A)** to the rack.
2. Close the front rack door of the unit you are servicing.



13. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



14.

Go to Chapter 2, “Verifying a repair,” on page 181.

Media device

Use this procedure to service the media device.

1. Shut down the partitions and power off the system

This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

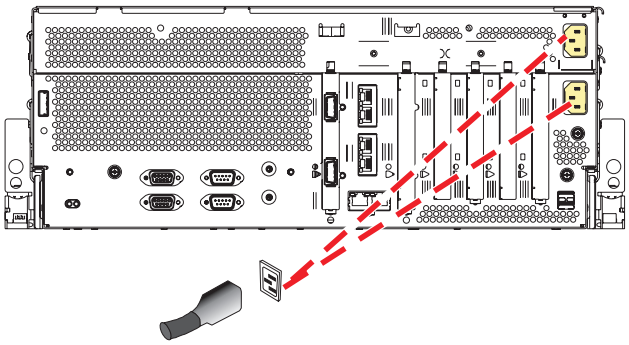
Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

---

2. Disconnect the power cords

1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.



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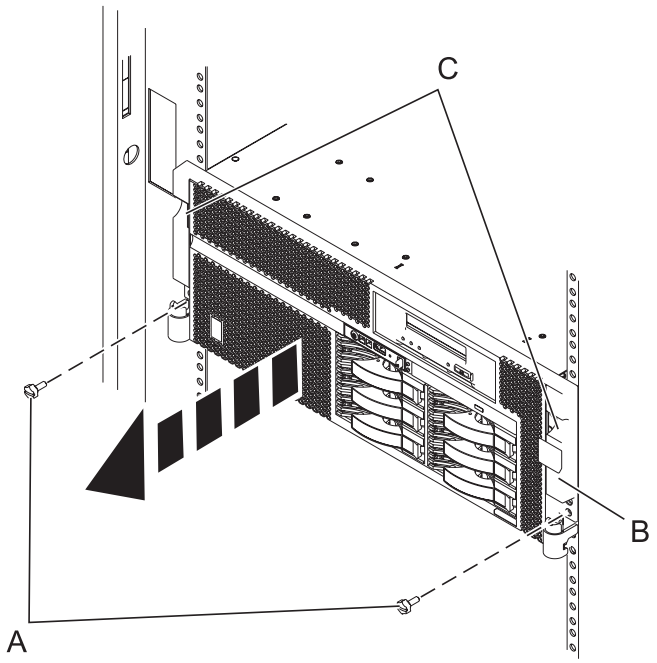
3. Remove the front cover

Note to Tower Users: The instructions in this procedure are written based on the Rack model. Tower users may still use this procedure. However, Tower users should ignore specific references to rack-only features such as rack doors, rack thumbscrews, and rack-specific FRU orientation, etc.

1. Open the front rack door.
2. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.
3. Grab the cover at points **(C)** and pull it out and away from the system unit.

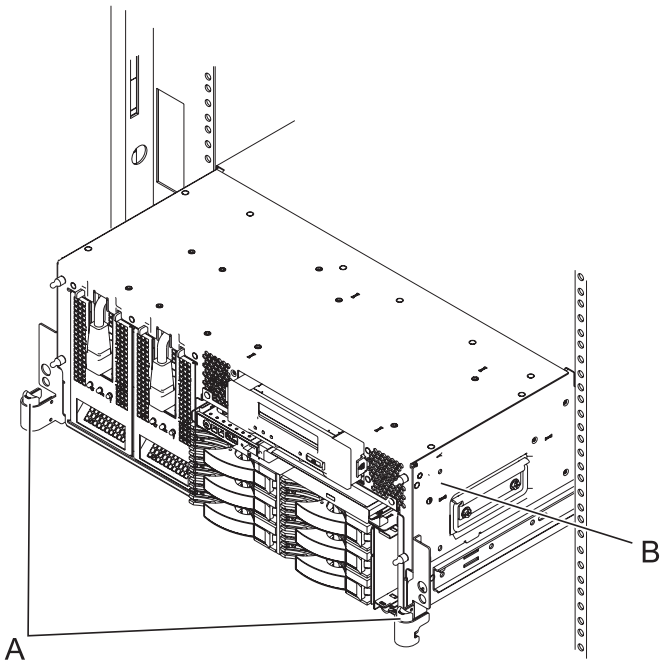


4. Place into service position

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

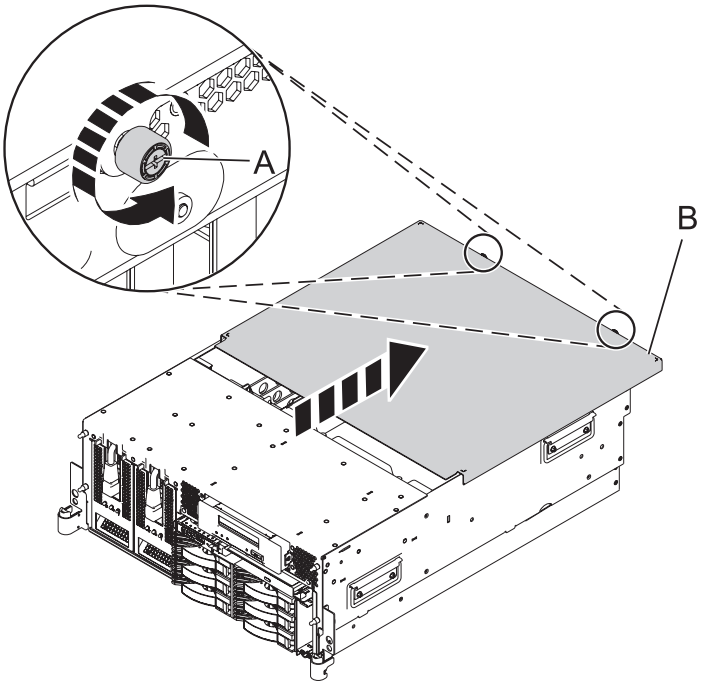
While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



5. Remove the service access cover

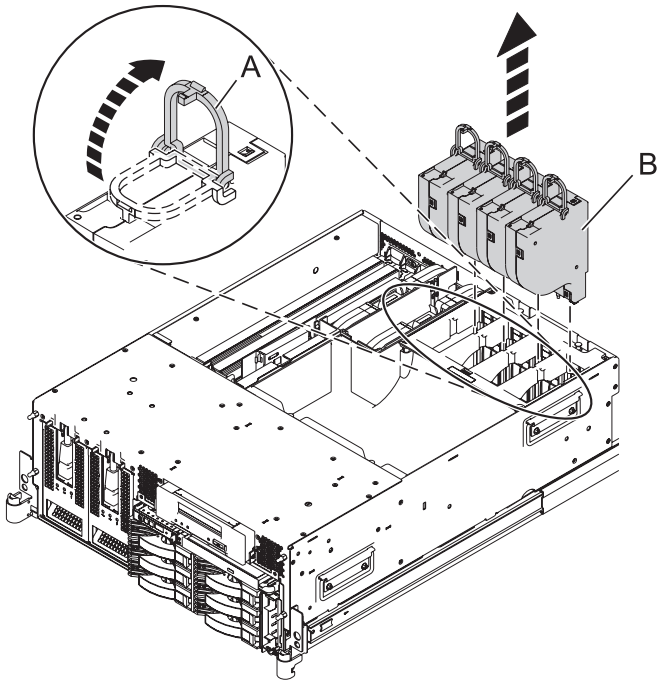
1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



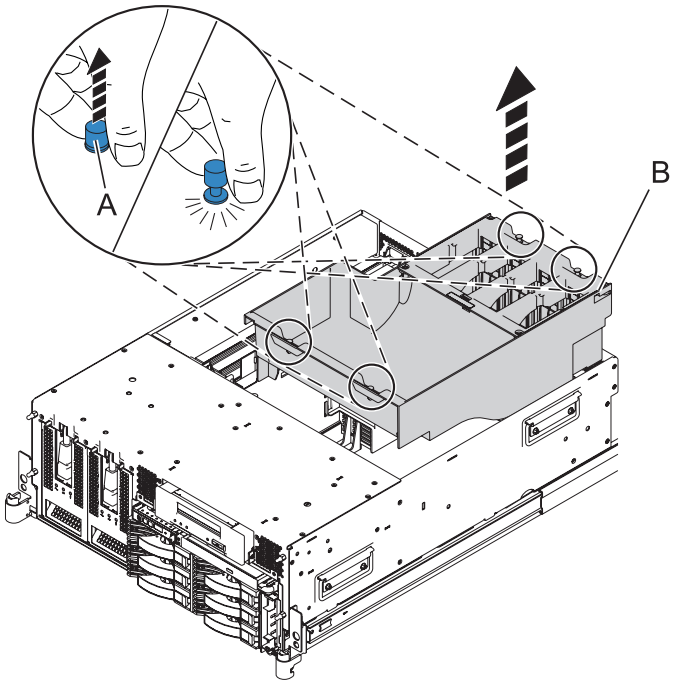
6. Remove the fans

1. Push the latch **(A)** upward to disengage the fan from the fan cage.
2. Pull the fan **(B)** out of the fan cage.
3. Repeat these steps until all fans are removed from the fan cage.



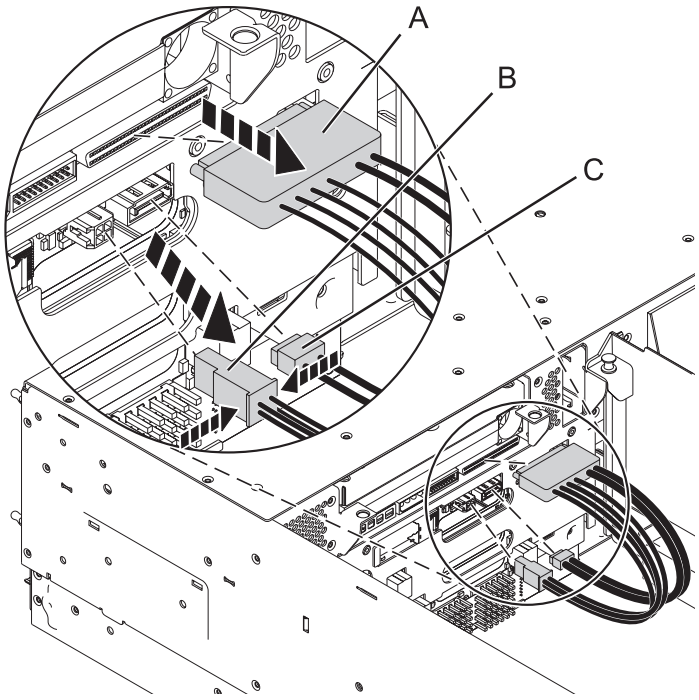
7. Remove the fan cage

1. Pull the four retaining tabs **(A)** that secure the fan cage to its enclosure.
2. Lift the fan cage **(B)** straight up and out of the enclosure.



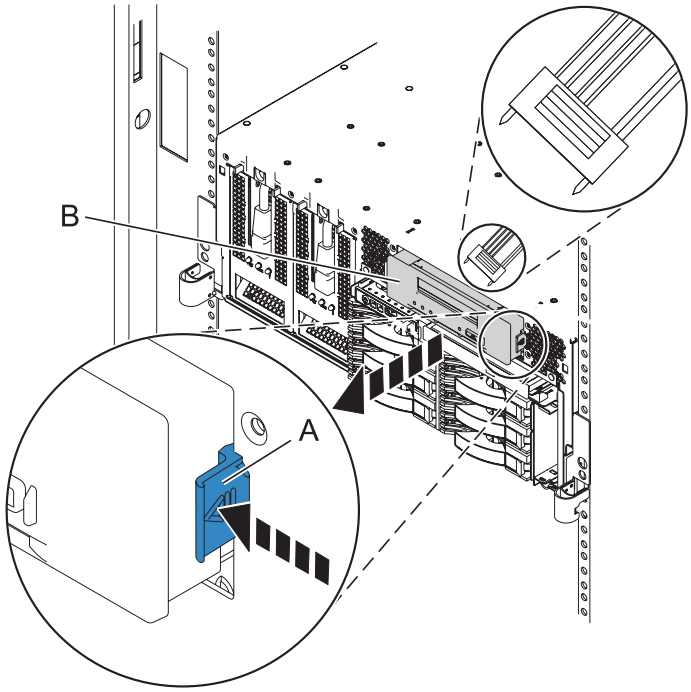
8. Disconnect the media device cables

1. Disconnect the media device cable **(A)** from its connector at the rear of the media device.
2. Media device cables **(B)** and **(C)** do not need to be touched.



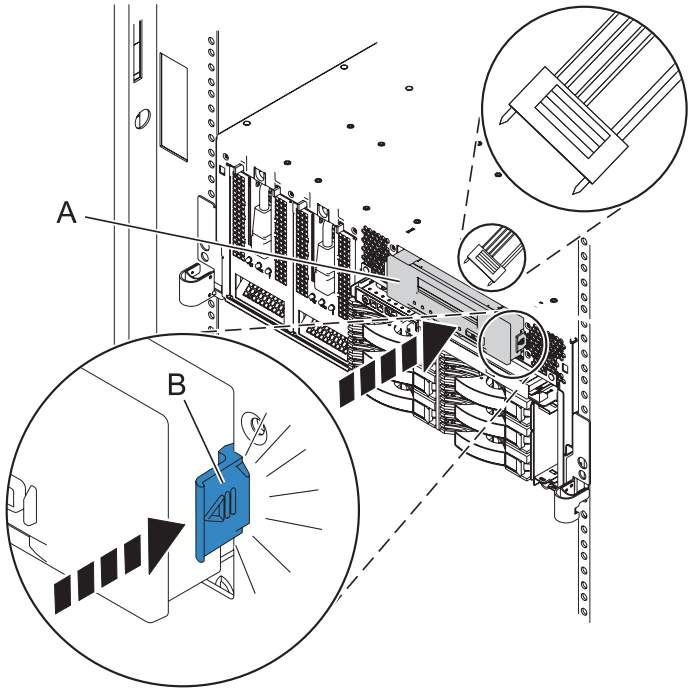
9. Remove the media device

1. While pushing the media device release latches **(A)** on both the left and right sides, grasp the device **(B)** and begin to pull it out of the system unit.
2. Disconnect the cable attached to the back of the media device.
3. Finish pulling the media device out of the system unit.



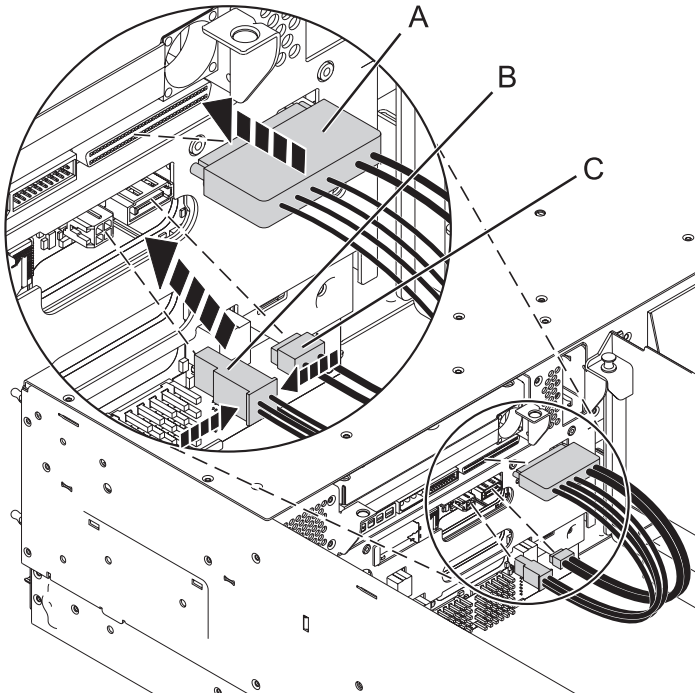
10. Install the media device

1. Connect the cable to the back of the media device **(A)**.
2. Push the media device **(A)** into the system unit until you feel the latches **(B)** lock.



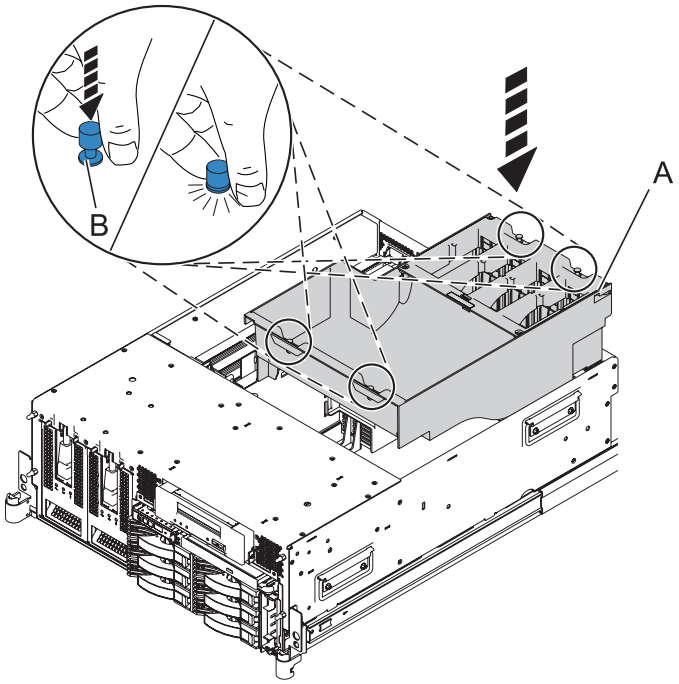
11. Connect the media device cables

1. Connect the media device cable **(A)** to its connector at the rear of the media device.
2. Media device cables **(B)** and **(C)** do not need to be touched here.



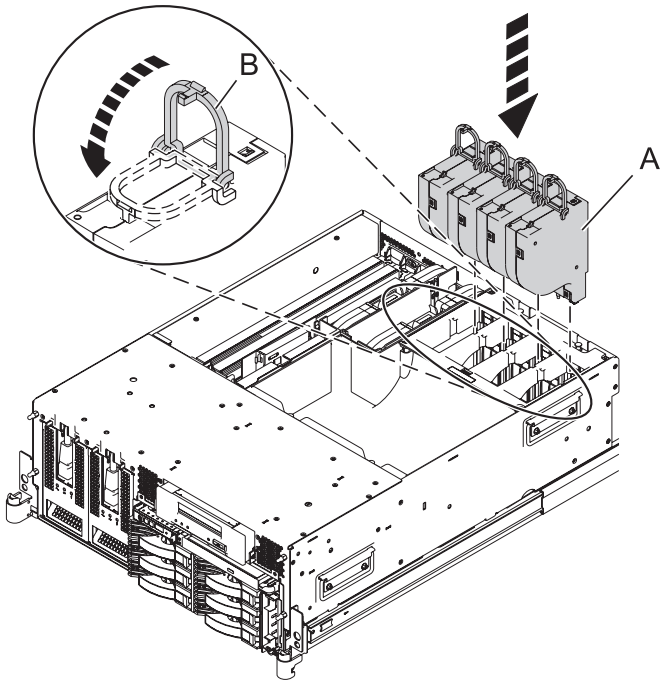
12. Install the fan cage

1. Check that the four retaining tabs are in open position.
2. Lower the fan cage **(A)** into its location on the enclosure, aligning the blue tabs with the holes.
3. Push firmly on the fan cage so that you are sure it fits into its position.
4. Tighten the four retaining tabs **(B)** securing the fan cage to its enclosure.



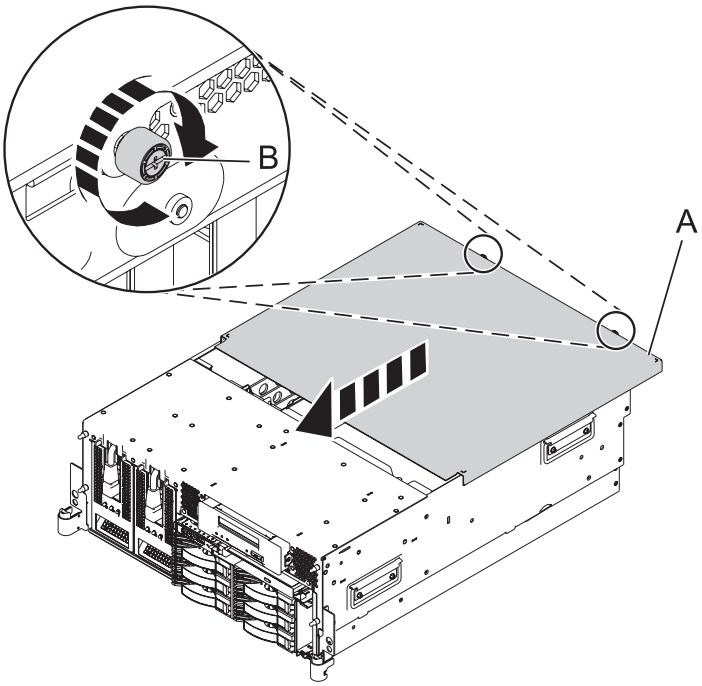
13. Install the fans

1. Lower the fan **(A)** into its location in the fan cage.
2. Push down on the fan until it locks into place.
3. Secure the fan by closing the latch **(B)**.
4. Repeat these steps until all fans are installed.



14. Install the service access cover

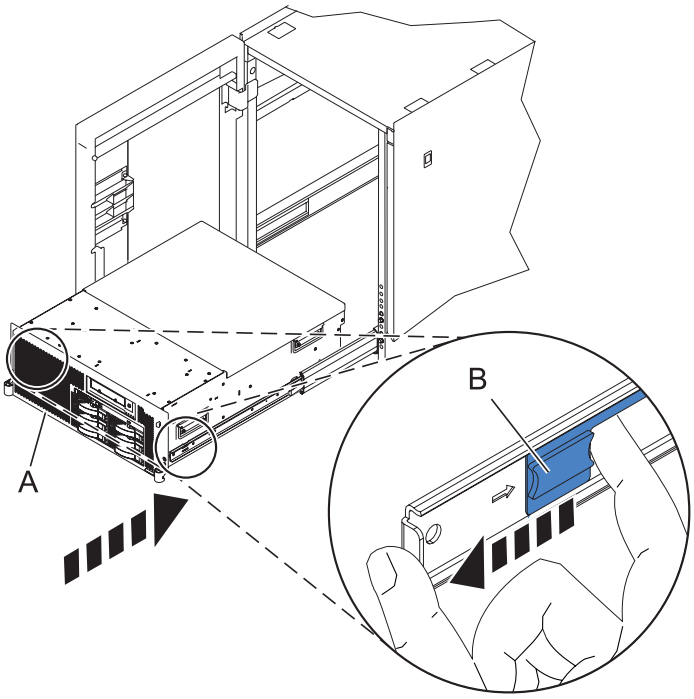
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



15. Place into operating position

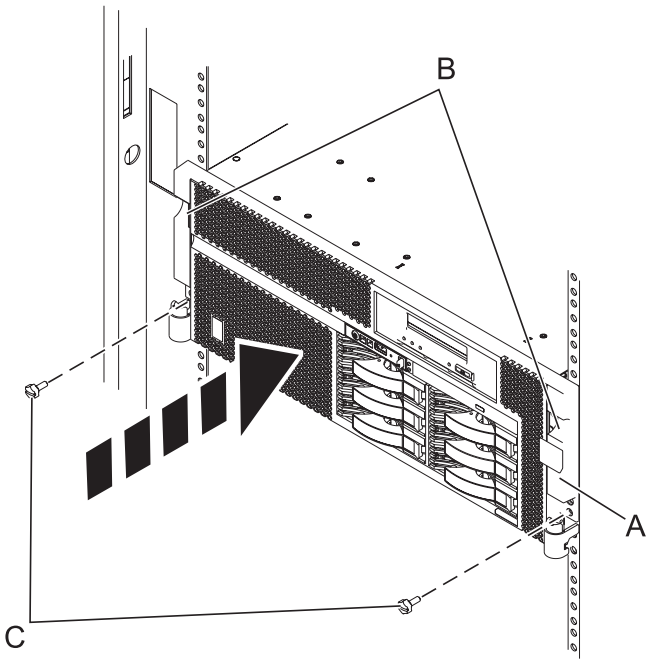
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



16. Install the front cover

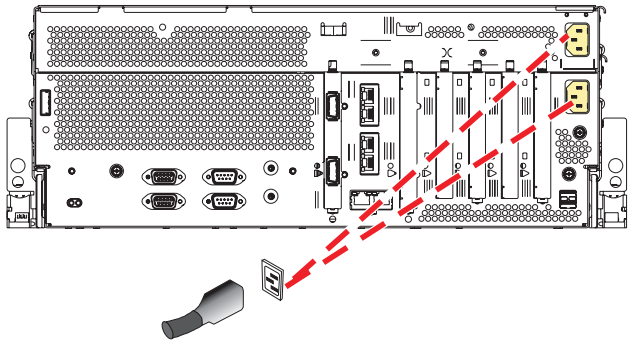
1. Position the cover on the front of the system unit so that the two screws **(C)** align with the screw holes on the front of the system unit **(A)**.
2. Push the cover at points **(B)** to attach it to the front of the system unit as shown in the following figure.
3. Tighten the two screws that secure the system unit to the rack.
4. Close the front rack door.



17. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



18.

Go to Chapter 2, “Verifying a repair,” on page 181.

Memory DIMM

Use this procedure to service a memory DIMM.

1. **Shut down the partitions and power off the system**

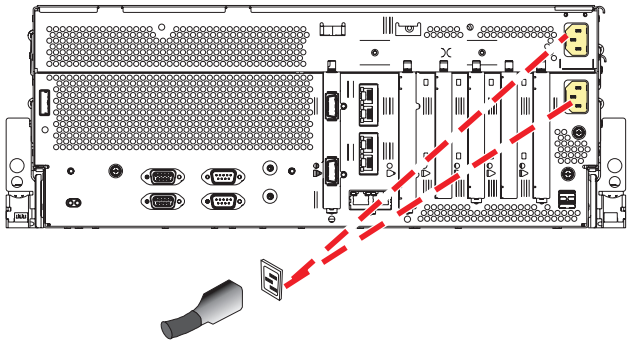
This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

2. Disconnect the power cords

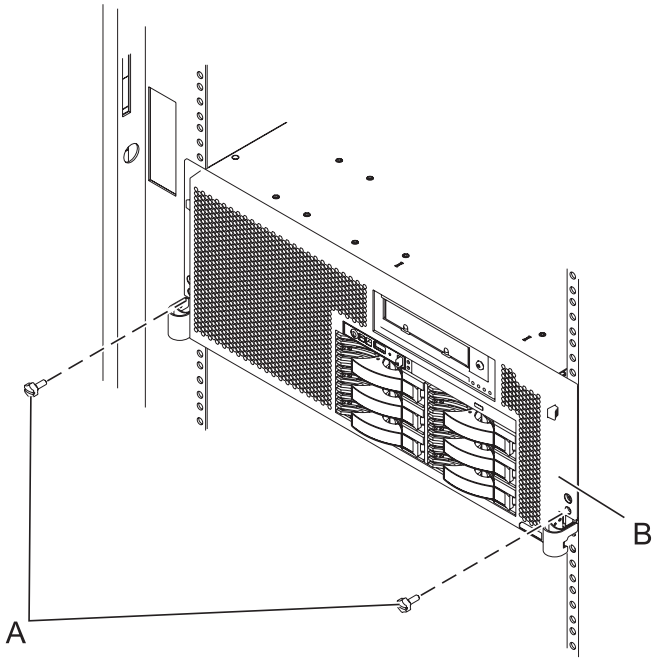
1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.



3. Place into service position

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Expansion unit users can still use this procedure. However, users of expansion units should ignore specific references to rack-only features, such as rack doors, rack thumbscrews, and rack-specific FRU orientation.

1. Open the front rack door.
2. Identify the system unit you are servicing in the rack.
3. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.

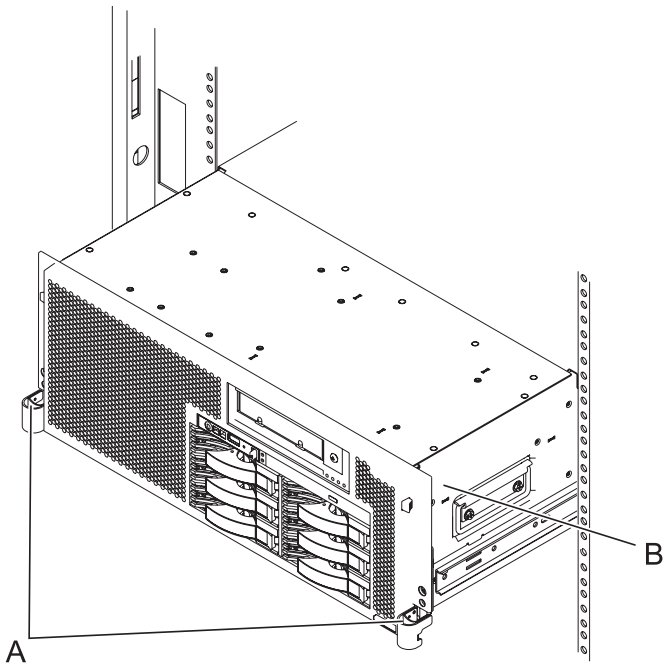


4. **Place into service position (continued)**

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.

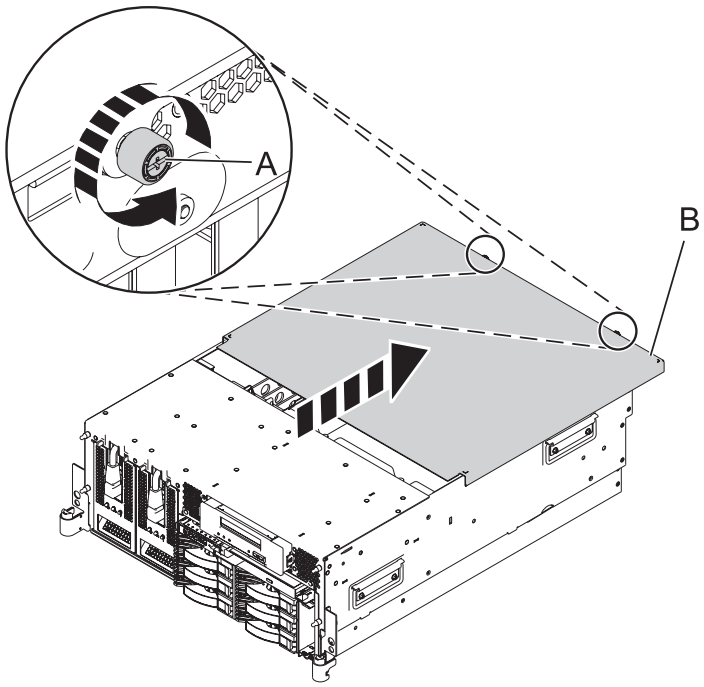


---

5. **Remove the service access cover**

1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

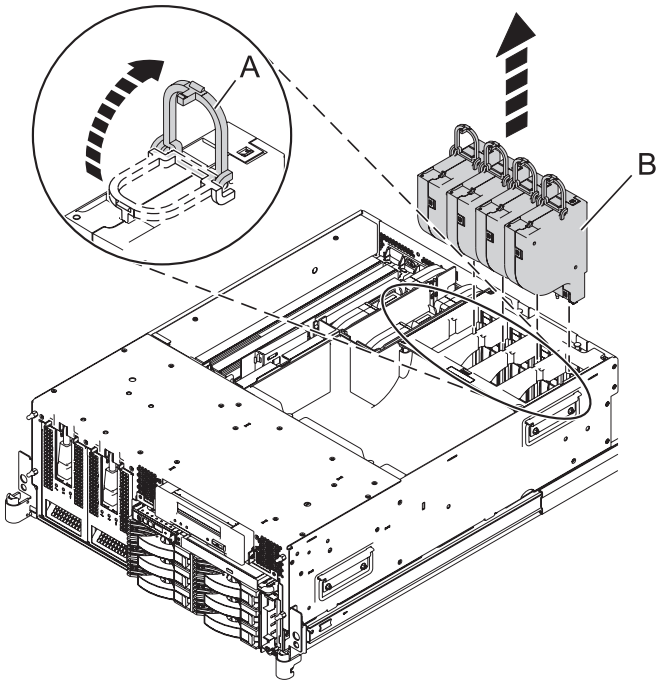
Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



---

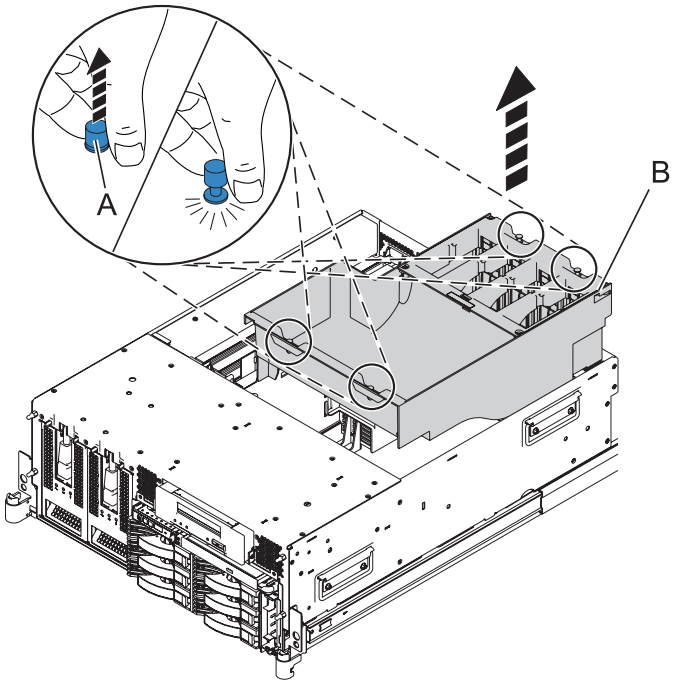
6. Remove the fans

1. Push the latch **(A)** upward to disengage the fan from the fan cage.
2. Pull the fan **(B)** out of the fan cage.
3. Repeat these steps until all fans are removed from the fan cage.



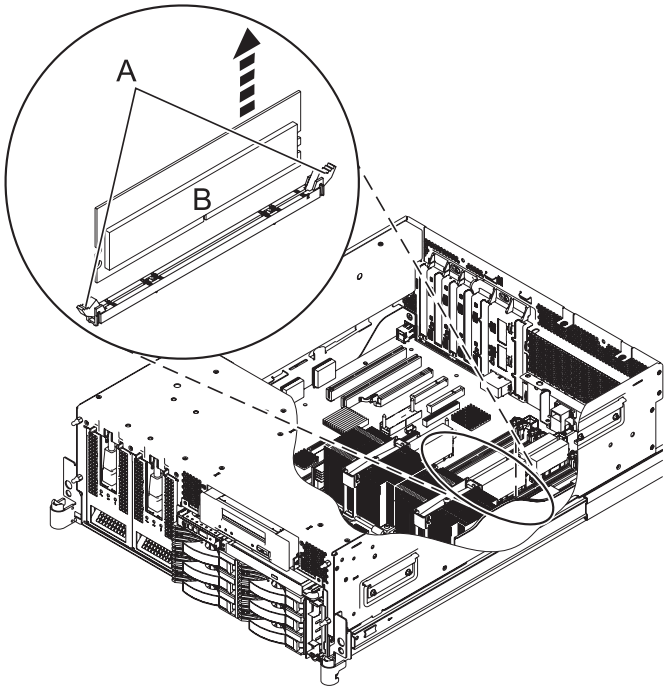
7. Remove the fan cage

1. Pull the four retaining tabs **(A)** that secure the fan cage to its enclosure.
2. Lift the fan cage **(B)** straight up and out of the enclosure.



8. Remove the memory DIMM

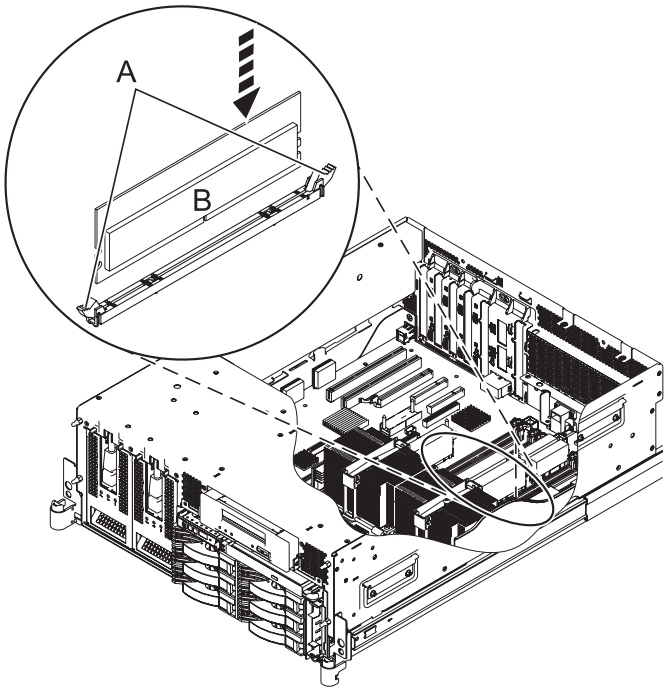
1. Locate the memory DIMM you want to remove.
2. Remove the memory DIMM by pushing the tabs **(A)** out and then down. The tabs' lever action forces the memory DIMM out of the connector.
3. Pull the memory DIMM **(B)** out of the connector.



9. Install the memory DIMM

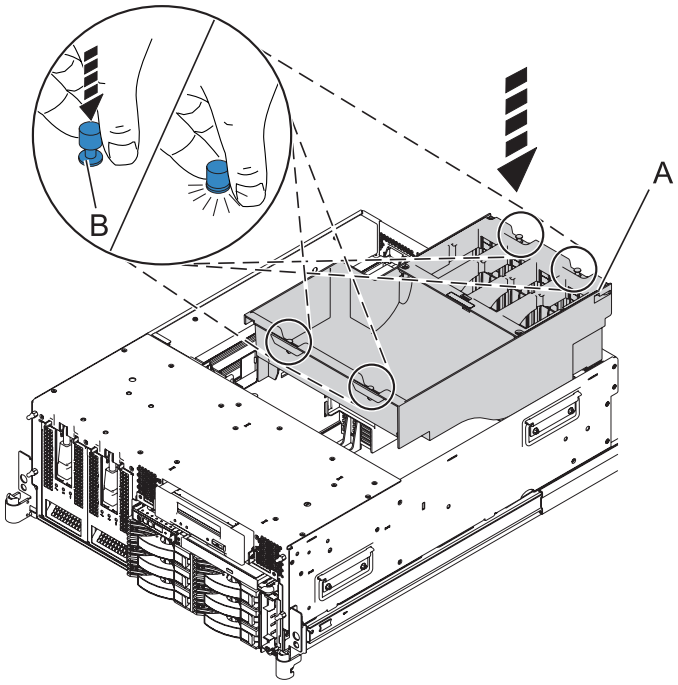
Note: Memory DIMMs are keyed to prevent a DIMM from being installed incorrectly. Note the locations of the key tabs within the DIMM connector before attempting to install the DIMM.

1. Ensure that the connector locking tabs **(A)** are pushed out in the unlocked position before installing a new memory DIMM.
2. Carefully grasp the memory DIMM **(B)** along two edges and align the connector.
3. Insert the memory DIMM firmly into the connector.
4. Secure the memory DIMM by pushing in the locking tabs **(A)**.



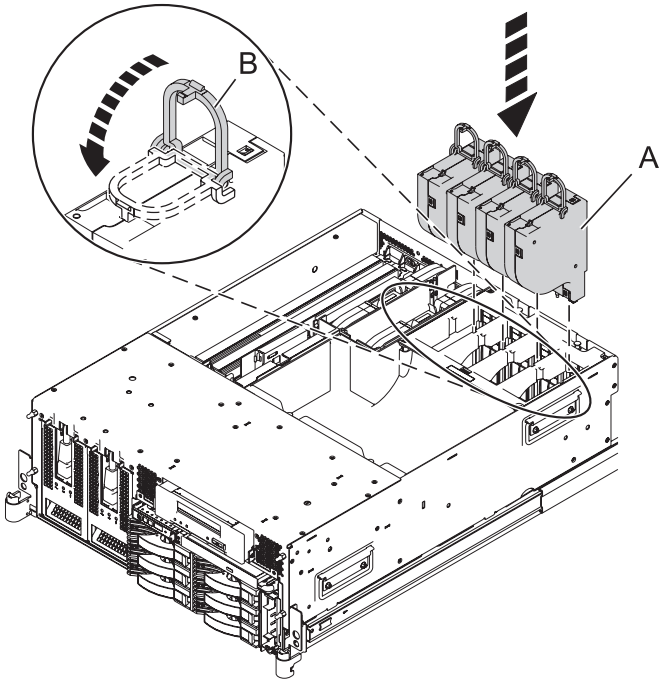
10. Install the fan cage

1. Check that the four retaining tabs are in open position.
2. Lower the fan cage **(A)** into its location on the enclosure, aligning the blue tabs with the holes.
3. Push firmly on the fan cage so that you are sure it fits into its position.
4. Tighten the four retaining tabs **(B)** securing the fan cage to its enclosure.



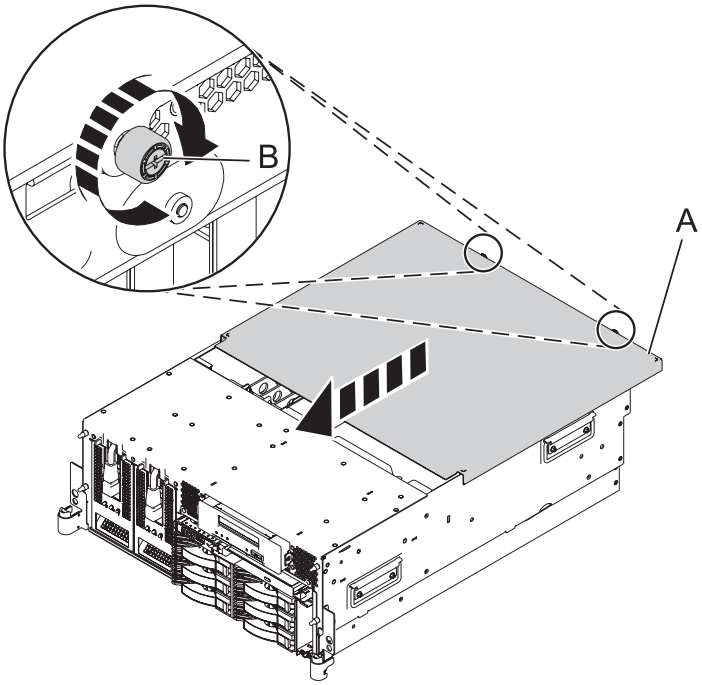
11. Install the fans

1. Lower the fan **(A)** into its location in the fan cage.
2. Push down on the fan until it locks into place.
3. Secure the fan by closing the latch **(B)**.
4. Repeat these steps until all fans are installed.



12. Install the service access cover

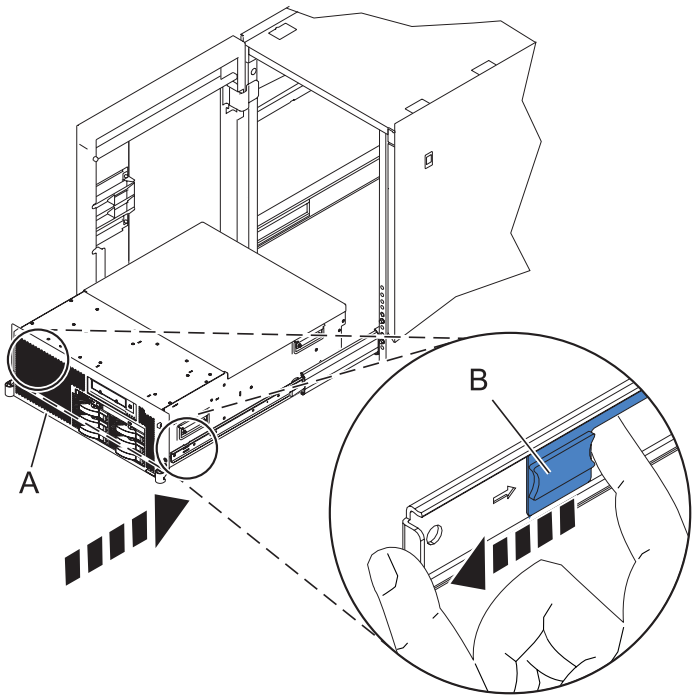
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



13. Place into operating position

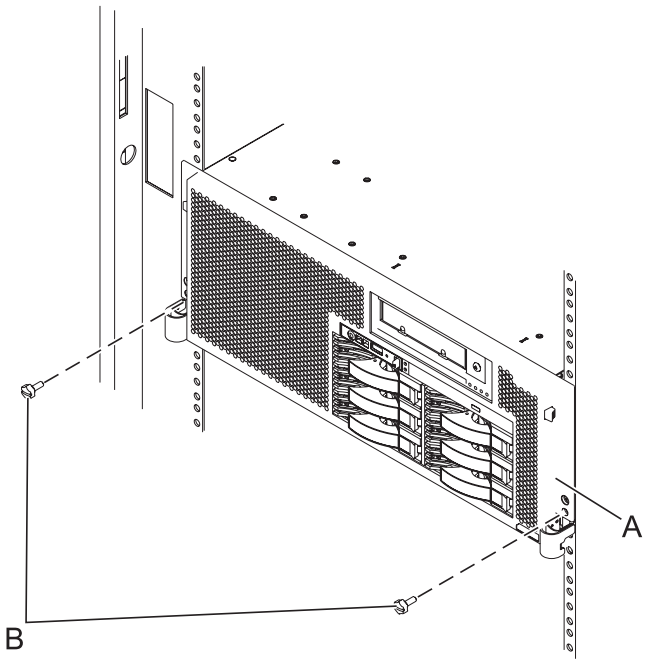
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



14. **Place into operating position (continued)**

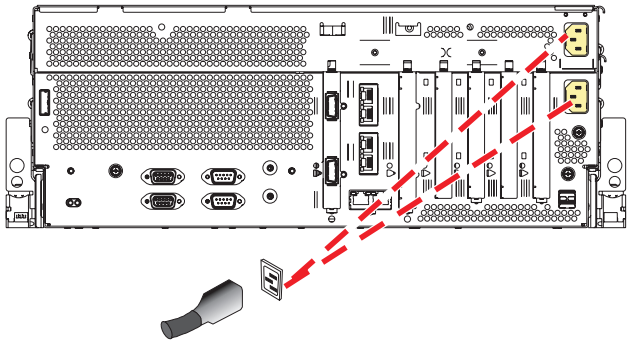
1. Replace and tighten the two screws **(B)** that secure the system unit **(A)** to the rack.
2. Close the front rack door of the unit you are servicing.



15. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



16.

Go to Chapter 2, “Verifying a repair,” on page 181.

PCI adapter

Use this procedure to service the PCI adapter.

1. **Are you doing a concurrent repair?**

You may service the PCI adapter concurrently or nonconcurrently. For more information, see PCI Adapters.

If you are servicing the PCI adapter concurrently, continue with step 4. Otherwise, continue with the next step.

2. **Shut down the partitions and power off the system**

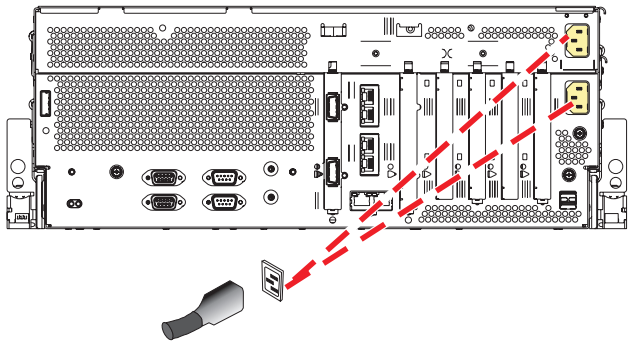
This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

3. **Disconnect the power cords**

1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.



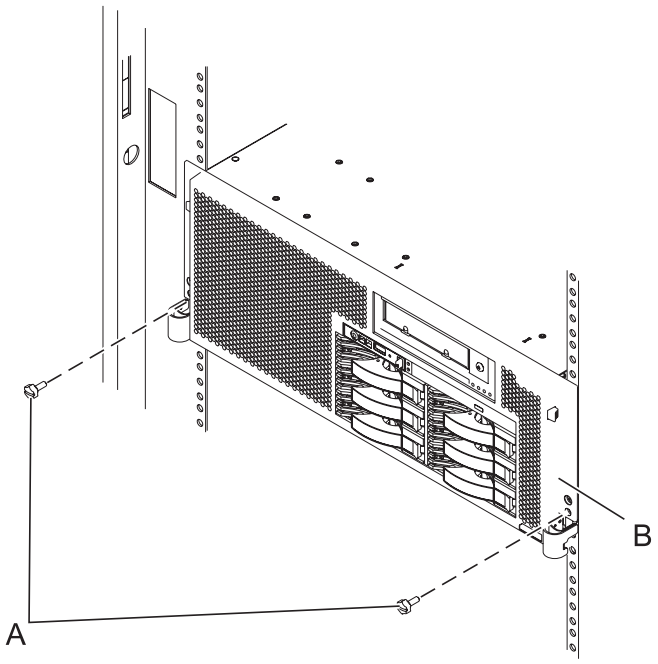
4. **Disconnect the external cables**

1. Carefully label the external cables connected to the FRU you are servicing so that they can be reconnected in exactly the same place after the repair.
2. Disconnect the external cables.

5. Place into service position

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Expansion unit users can still use this procedure. However, users of expansion units should ignore specific references to rack-only features, such as rack doors, rack thumbscrews, and rack-specific FRU orientation.

1. Open the front rack door.
2. Identify the system unit you are servicing in the rack.
3. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.

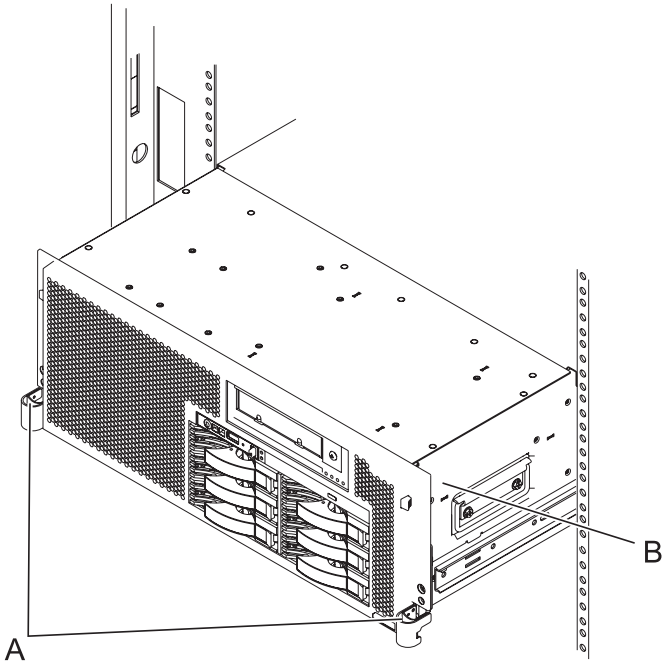


6. Place into service position (continued)

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

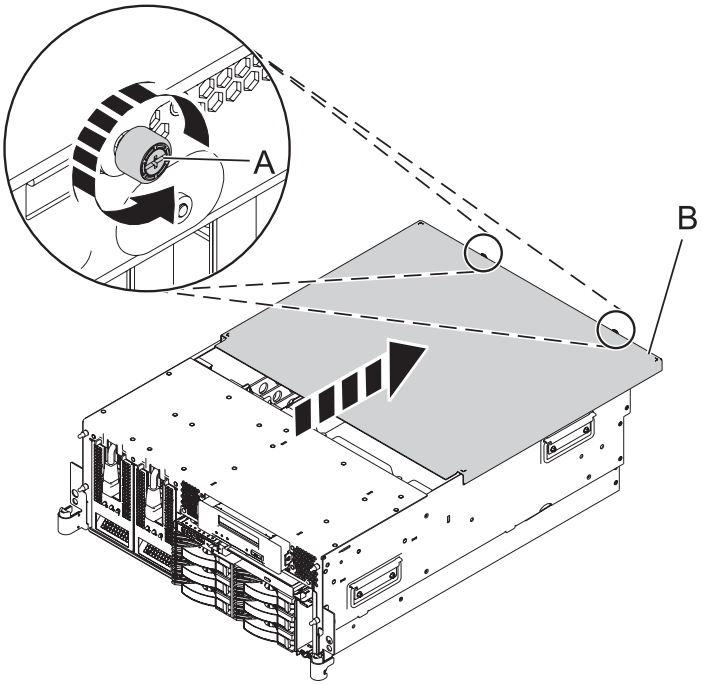
While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



7. Remove the service access cover

1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

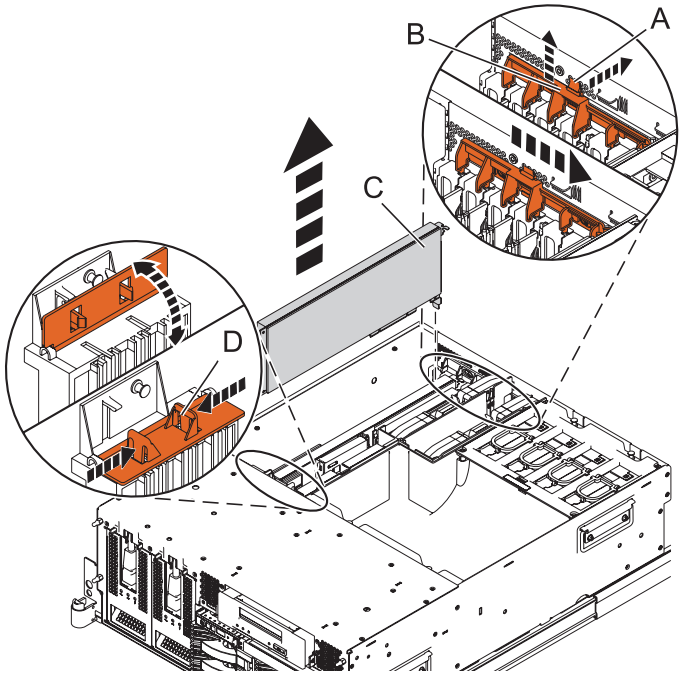
Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



8. Remove the PCI adapter

1. For a long PCI adapter, squeeze the terra cotta latch **(D)** on top of the front support, and swing it up in the open position.
2. Push the release tab **(A)** and lift the latch **(B)**, sliding it to release the PCI adapters.

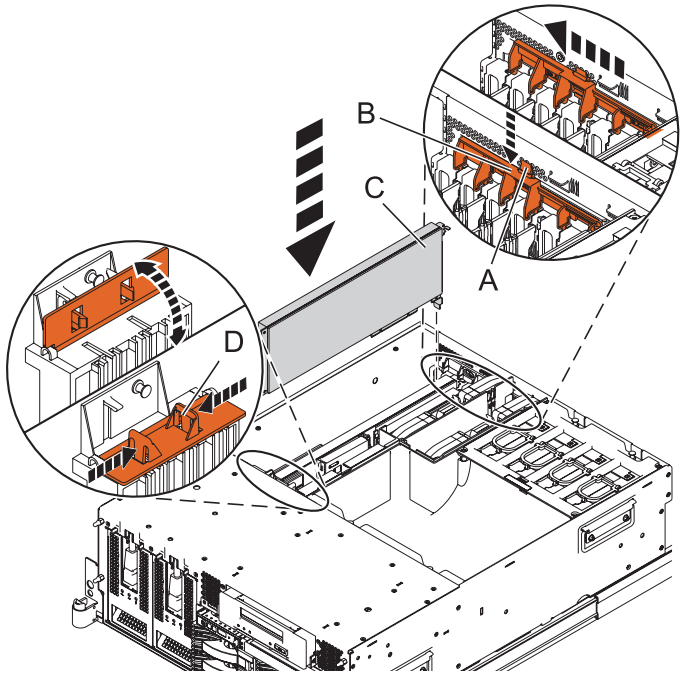
   Attention: Some models do not contain a release tab or require that the latch be lifted; on these models, slide the latch carefully.
3. Locate the PCI adapter you want to remove.
4. Carefully grasp the PCI adapter **(C)** by its top edge or upper corners, and pull the PCI adapter up and out of its connector on the system backplane.
5. If you opened the terra cotta latch on top of the front support, close it now.



9. Install the PCI adapter

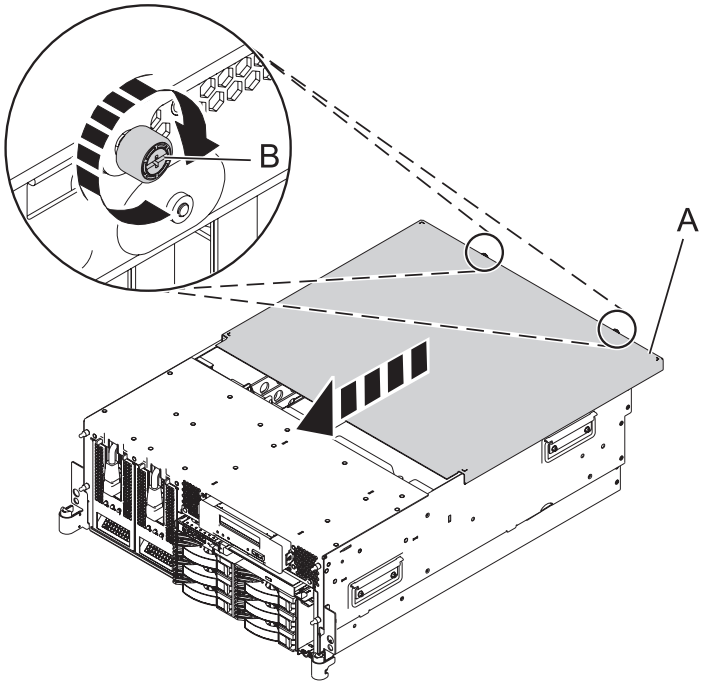
1. Place the PCI adapter, component-side up, on a flat, static-protective surface.
2. Set any jumpers or switches on the PCI adapter as instructed by the adapter's manufacturer.
3. For a long PCI adapter, squeeze the terra cotta latch **(D)** on top of the front support, and swing it up in the open position.
4. With latch **(B)** in the open position, carefully grasp the PCI adapter **(C)** by its top edge, and align the PCI adapter with its connector on the system backplane.
5. Press the PCI adapter firmly into its connector.
6. Slide the latch **(B)** over to secure the adapters and press down until the lock **(A)** is engaged.

   Attention: Some models do not contain a locking tab and might have a slightly different latch; on these models, slide the latch carefully.
7. If you opened the terra cotta latch on top of the front support, close it now.



10. Install the service access cover

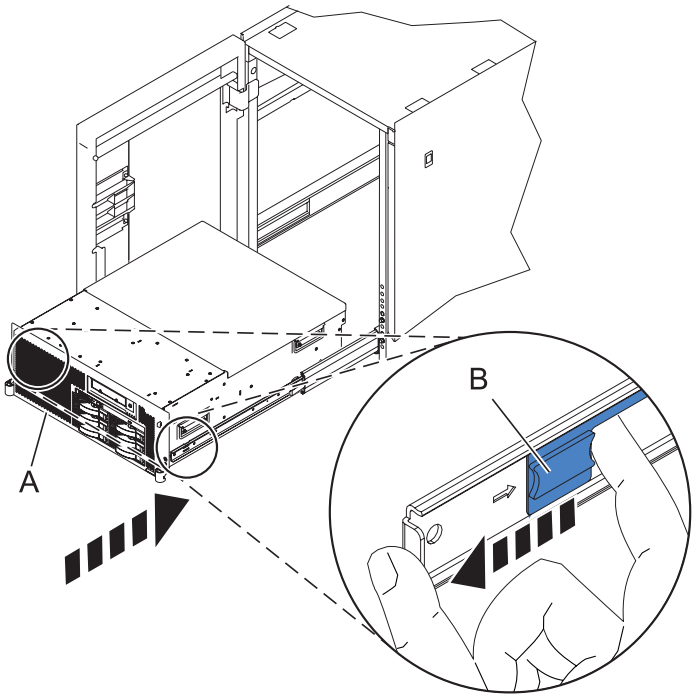
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



11. Place into operating position

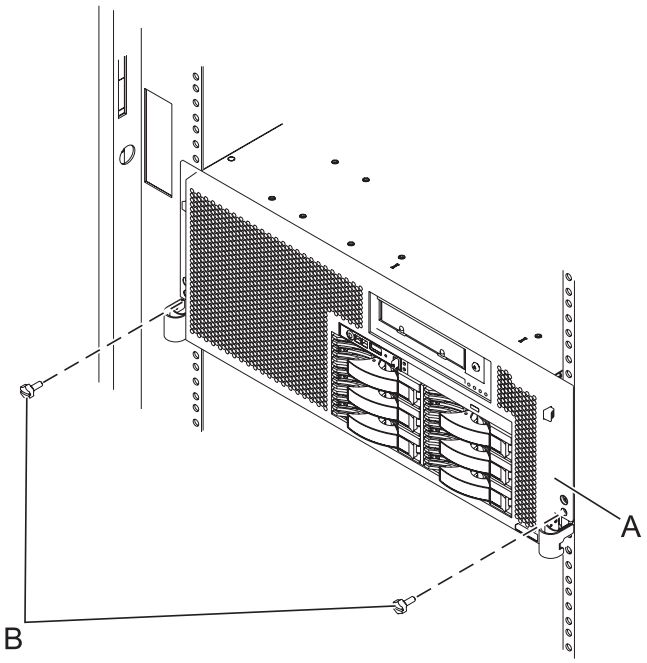
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



12. Place into operating position (continued)

1. Replace and tighten the two screws **(B)** that secure the system unit **(A)** to the rack.
2. Close the front rack door of the unit you are servicing.



13. **Reconnect the external cables**

Attention: To prevent damaging the FRU or the system, use the following precautions before plugging cables into a connector or adapter:

- Make sure that you have the right type of cable for the connector or adapter.
- Make sure that the cable plug is correctly aligned with the connector or adapter.
- Make sure that the tongue on the HSL/RIO cable plug matches the white location keys on the connector.

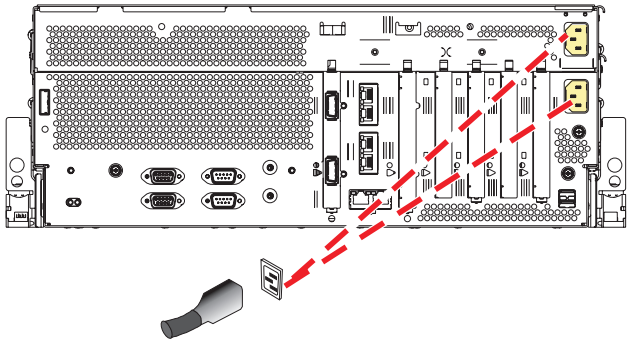
External cables were labeled before disconnection so that they can be reconnected in exactly the same place after the repair.

Reconnect the external cables you previously removed to the FRU you are servicing.

14. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



15.

Go to Chapter 2, “Verifying a repair,” on page 181.

Power supply

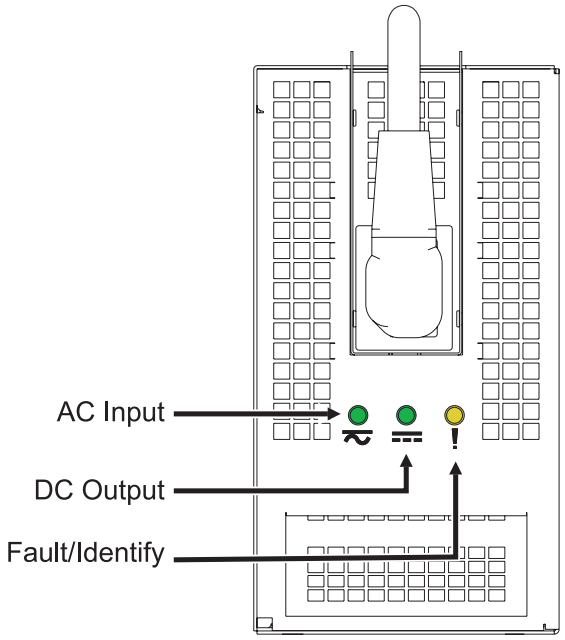
Use this procedure to service the power supply.

1. **Can repair be concurrent?**

You must determine if the repair can continue concurrently. To continue the repair concurrently, the following conditions must be true:

- Another power supply must already be installed.
- Its three LEDs must be set as follows:
  - AC Input - on, not blinking
  - DC Output - on, not blinking
  - Fault/Identify - off

If any of the conditions are not true, the repair can continue only after powering off the unit containing the FRU that is being repaired. If the unit is already powered off, you may proceed with a non-concurrent repair.



2.

Select an action:

Nonconcurrent repair. Power off the unit and continue the repair.	Concurrent repair. Continue the repair with unit power on.	Delay the repair.
↓	Go to step 8 on page 101.	**This ends the procedure.**

3. **Shut down the partitions and power off the system**

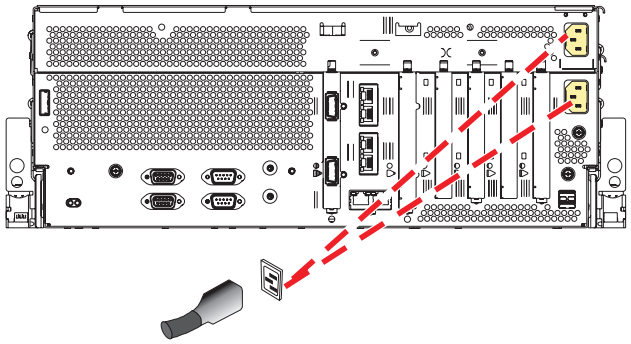
This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

4. Disconnect the power cords

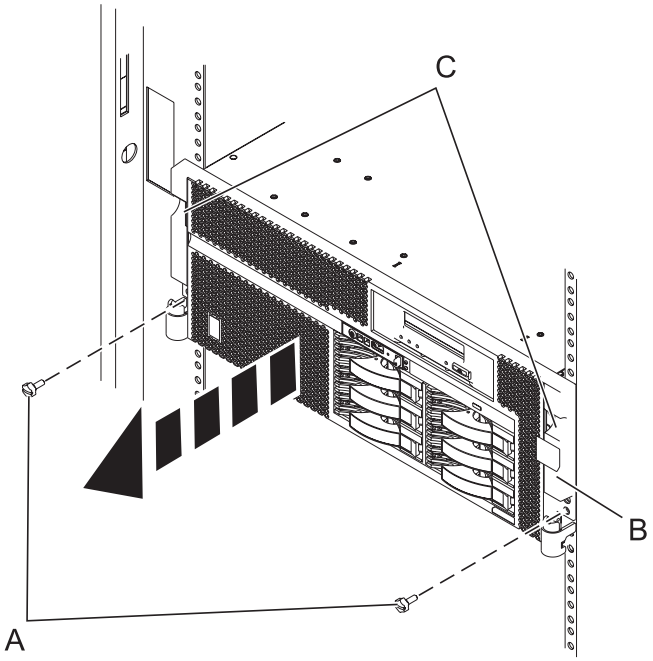
1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.



5. Remove the front cover

Note to Tower Users: The instructions in this procedure are written based on the Rack model. Tower users may still use this procedure. However, Tower users should ignore specific references to rack-only features such as rack doors, rack thumbscrews, and rack-specific FRU orientation, etc.

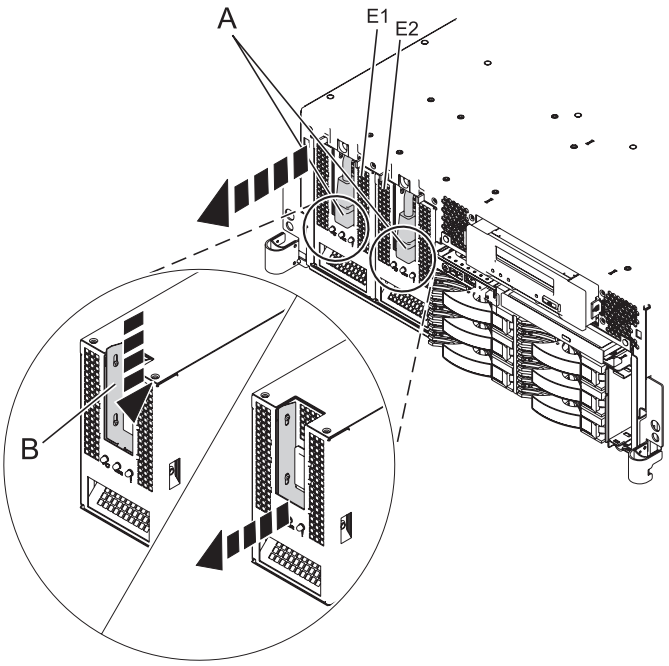
1. Open the front rack door.
2. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.
3. Grab the cover at points **(C)** and pull it out and away from the system unit.



6. Remove the power supply

Attention: Do not attempt to open the covers of the power supply. Power supplies are not serviceable and are to be replaced as a unit.

1. Disconnect the power cable **(A)** from the power supply you are removing.
2. While pushing the lever **(B)** down, pull the power supply straight out of the system.



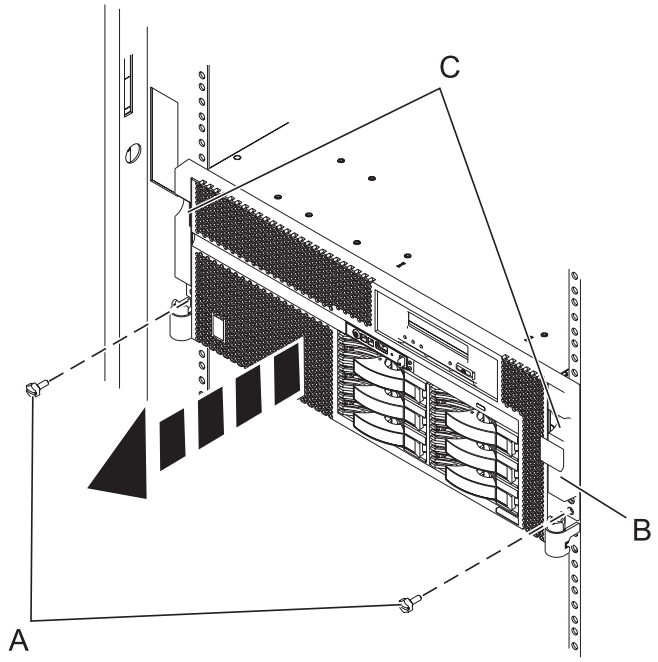
7.

Go to step 10 on page 102.

8. Remove the front cover

Note to Tower Users: The instructions in this procedure are written based on the Rack model. Tower users may still use this procedure. However, Tower users should ignore specific references to rack-only features such as rack doors, rack thumbscrews, and rack-specific FRU orientation, etc.

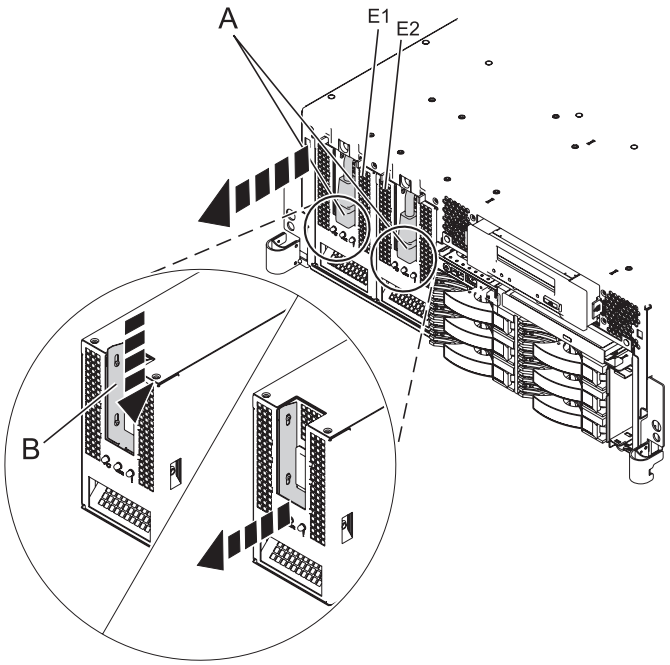
1. Open the front rack door.
2. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.
3. Grab the cover at points **(C)** and pull it out and away from the system unit.



9. Remove the power supply

Attention: Do not attempt to open the covers of the power supply. Power supplies are not serviceable and are to be replaced as a unit.

1. The power supply you are servicing should have its Fault/Identify LED (amber LED) blinking.
2. Disconnect the power cable **(A)** from the power supply you are removing.
3. While pushing the lever **(B)** down, pull the power supply straight out of the system.



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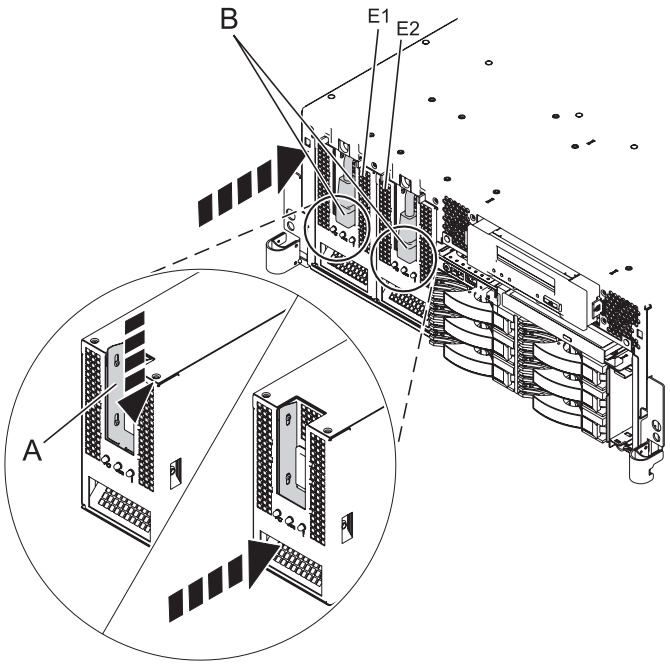
10. Install the power supply

1. While pushing the lever **(A)** down, carefully slide the power supply into its location in the system.
2. Connect the power cable **(B)** to the power supply.



11.

Are you doing a concurrent repair?
Yes **No**

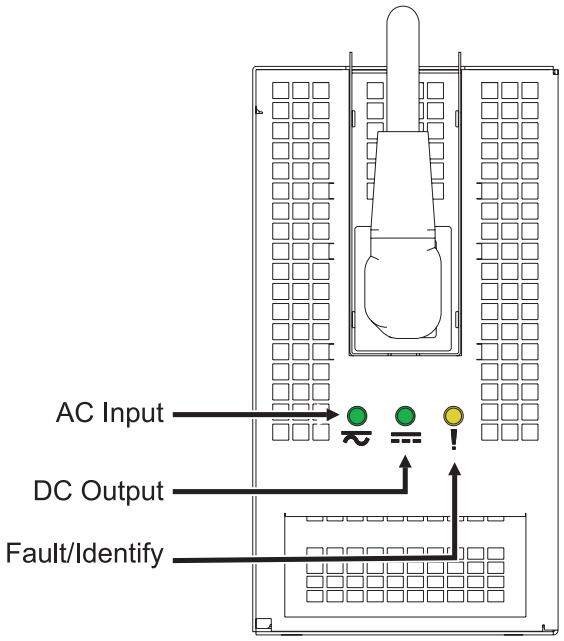
Are you doing a concurrent repair?
↓ Go to step 13.

12. Is power supply operational?

You must determine if the new power supply is operational. The new power supply is operational if its LEDs are set as follows:

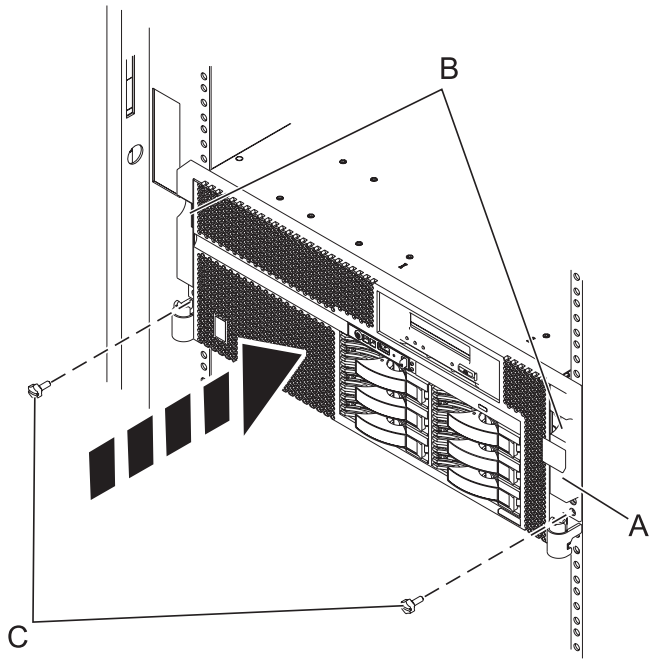
- AC Input - on, not blinking
- DC Output - on, not blinking
- Fault/Identify - blinking or off

If the LEDs are set differently, you must determine why. Make sure the power supply is plugged into a working AC power source, try installing a different power supply, or call your next level of support.



13. Install the front cover

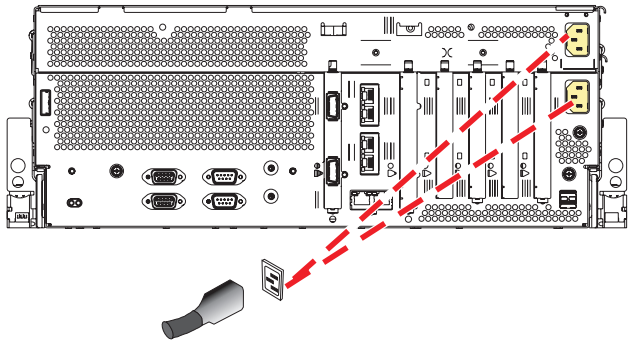
1. Position the cover on the front of the system unit so that the two screws **(C)** align with the screw holes on the front of the system unit **(A)**.
2. Push the cover at points **(B)** to attach it to the front of the system unit as shown in the following figure.
3. Tighten the two screws that secure the system unit to the rack.
4. Close the front rack door.



14. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



15.

Go to Chapter 2, “Verifying a repair,” on page 181.

RAID enablement card

Use this procedure to service the RAID enablement card.

1. **Shut down the partitions and power off the system**

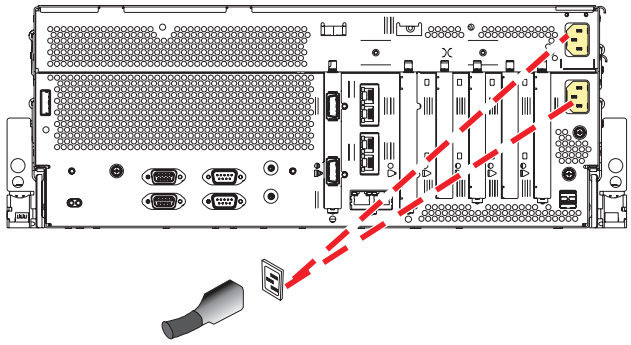
This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

2. Disconnect the power cords

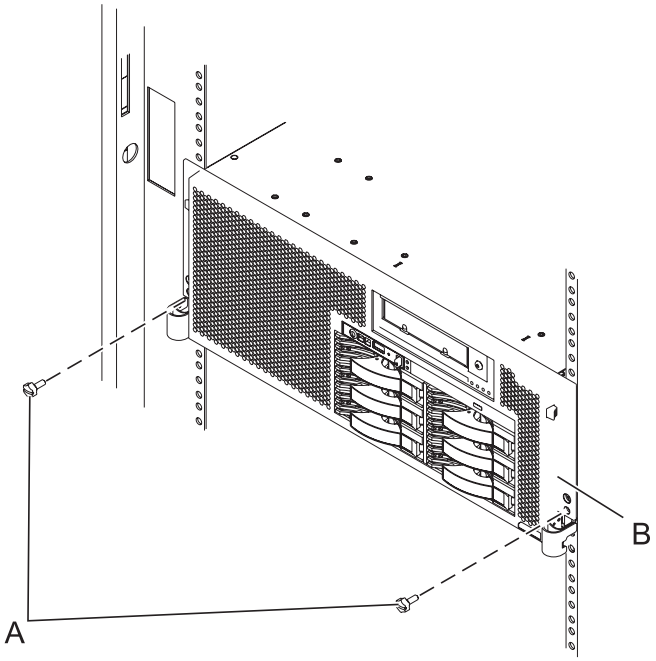
1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.



3. Place into service position

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Expansion unit users can still use this procedure. However, users of expansion units should ignore specific references to rack-only features, such as rack doors, rack thumbscrews, and rack-specific FRU orientation.

1. Open the front rack door.
2. Identify the system unit you are servicing in the rack.
3. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.

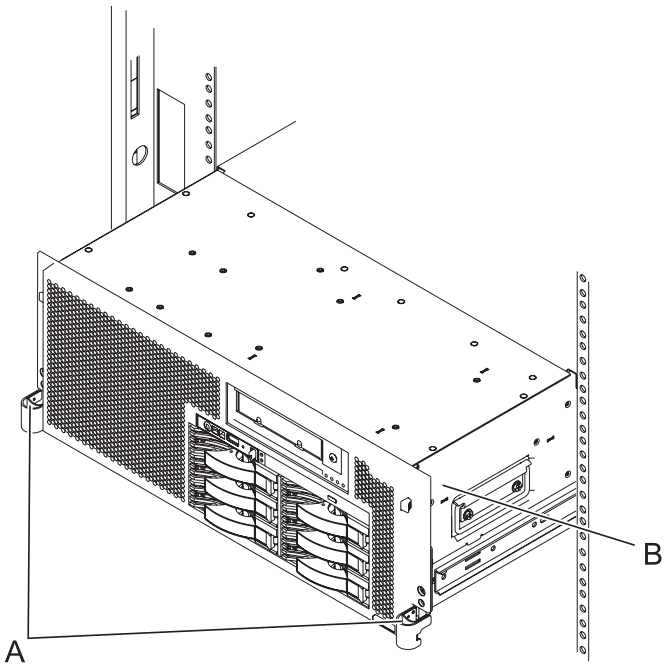


4. **Place into service position (continued)**

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

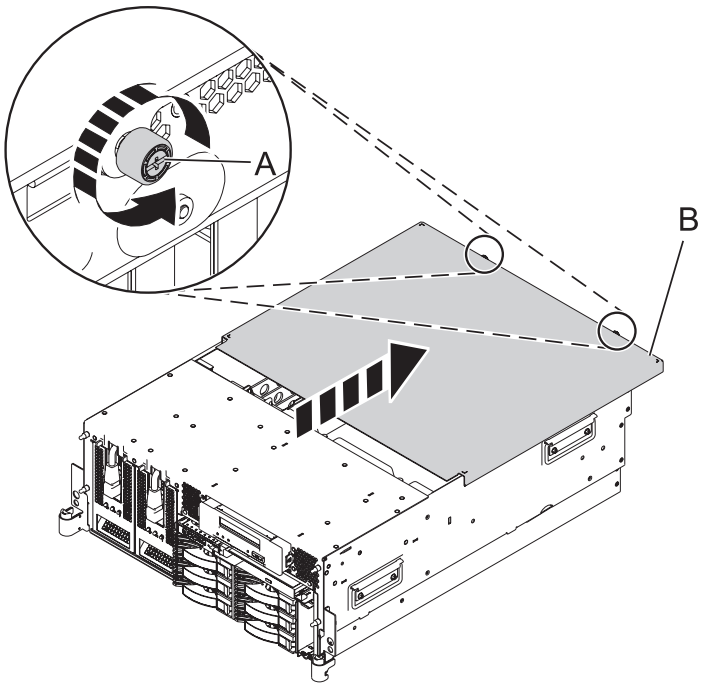
While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



5. **Remove the service access cover**

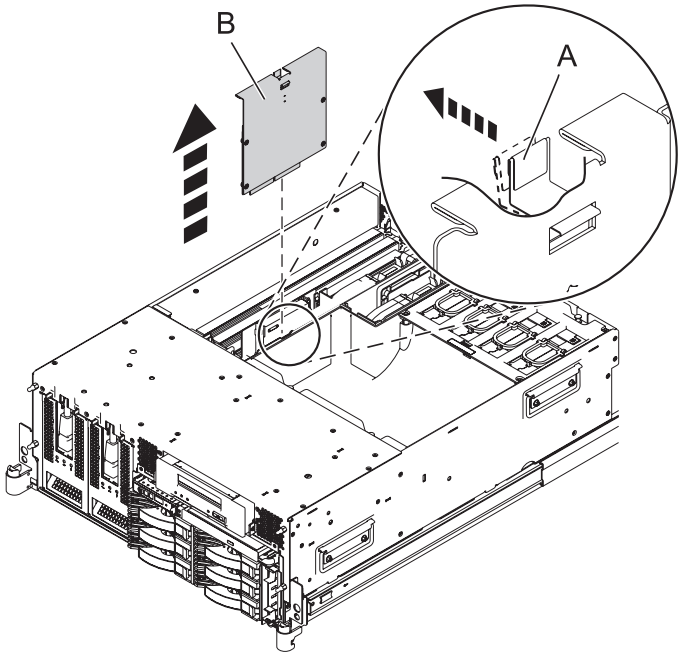
1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



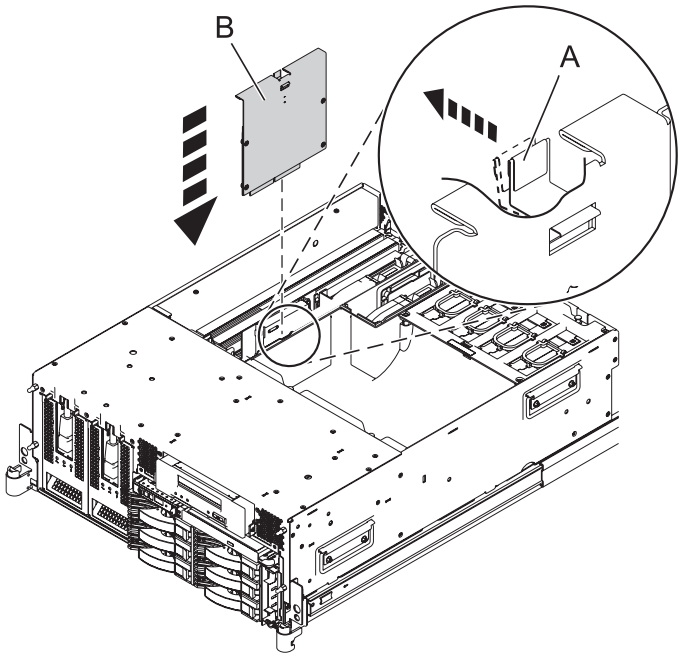
6. Remove the RAID enablement card

1. Push the tab **(A)** in the direction shown to release the card.
2. Gently pull the card **(B)** straight up and out of the enclosure.



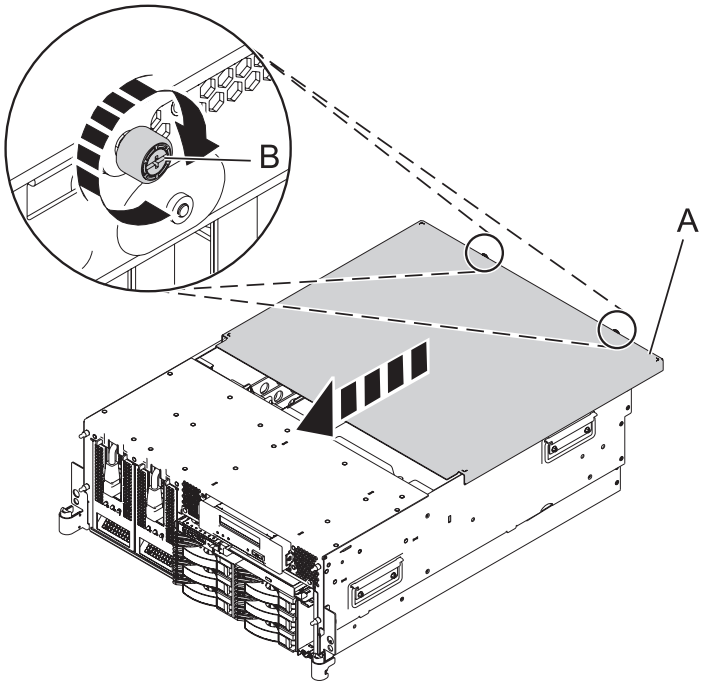
7. Install the RAID enablement card

1. Push the card **(B)** down in the direction shown, along the sliders of the middle divider.
2. Align the card with its connector on the system backplane.
3. Push the tab **(A)** in the direction shown and gently push the card down until it engages into its slot.
4. Release the tab **(A)** to lock the card into its slot.



8. Install the service access cover

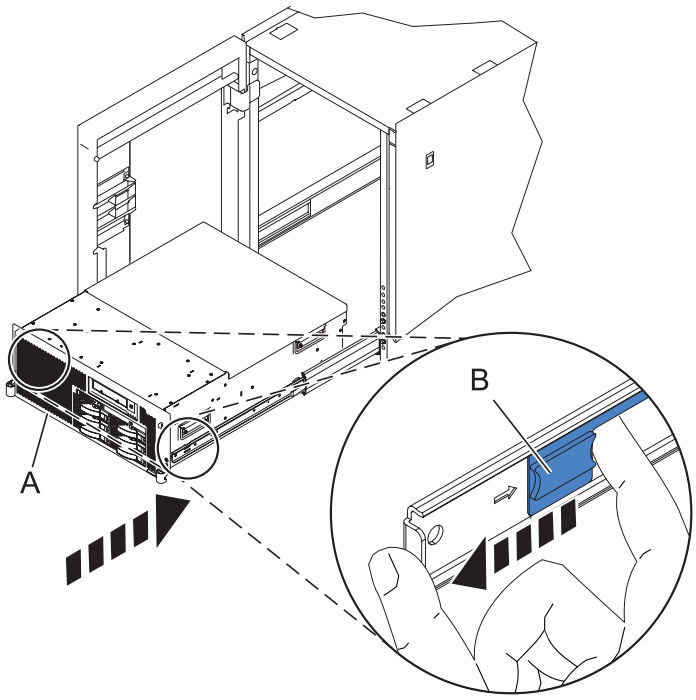
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



9. Place into operating position

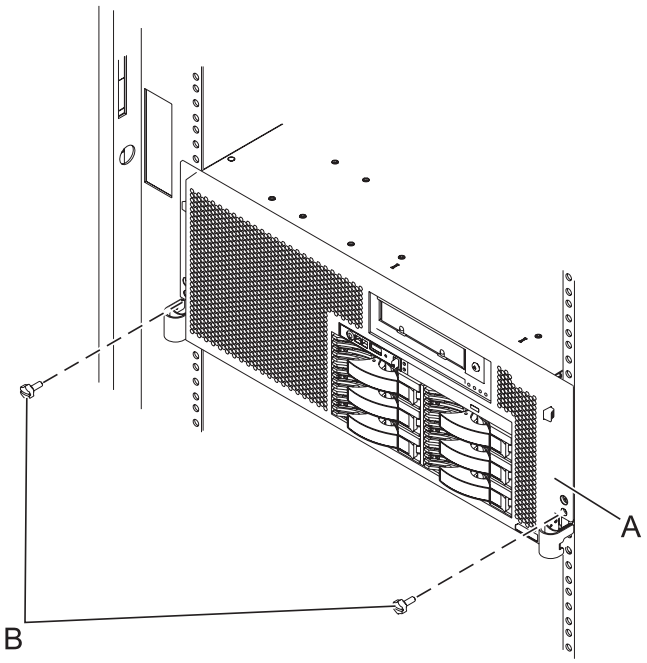
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



10. **Place into operating position (continued)**

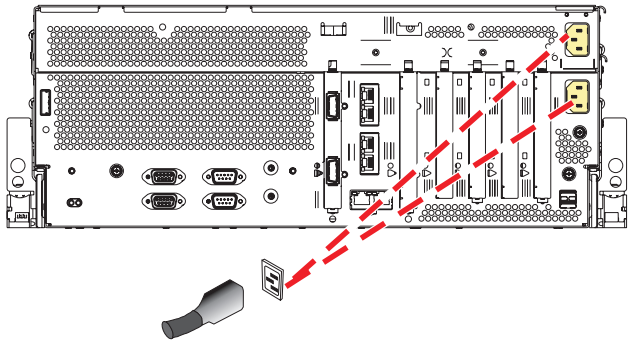
1. Replace and tighten the two screws **(B)** that secure the system unit **(A)** to the rack.
2. Close the front rack door of the unit you are servicing.



11. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



12.

Go to Chapter 2, “Verifying a repair,” on page 181.

Auxiliary cache card

Use this procedure to service the auxiliary cache card.

1. Shut down the partitions and power off the system

This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

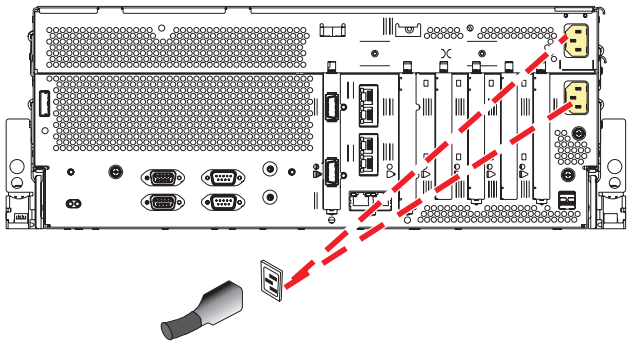
Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

---

2. Disconnect the power cords

1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.

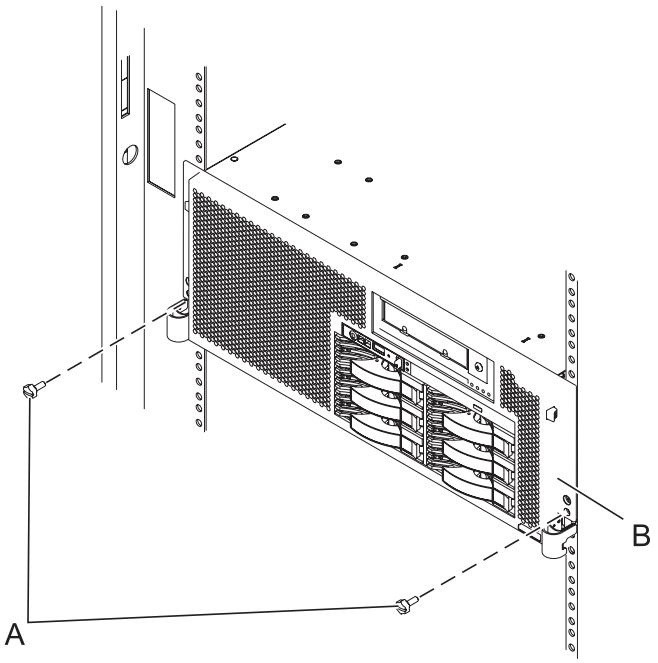


---

3. Place into service position

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Expansion unit users can still use this procedure. However, users of expansion units should ignore specific references to rack-only features, such as rack doors, rack thumbscrews, and rack-specific FRU orientation.

1. Open the front rack door.
2. Identify the system unit you are servicing in the rack.
3. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.

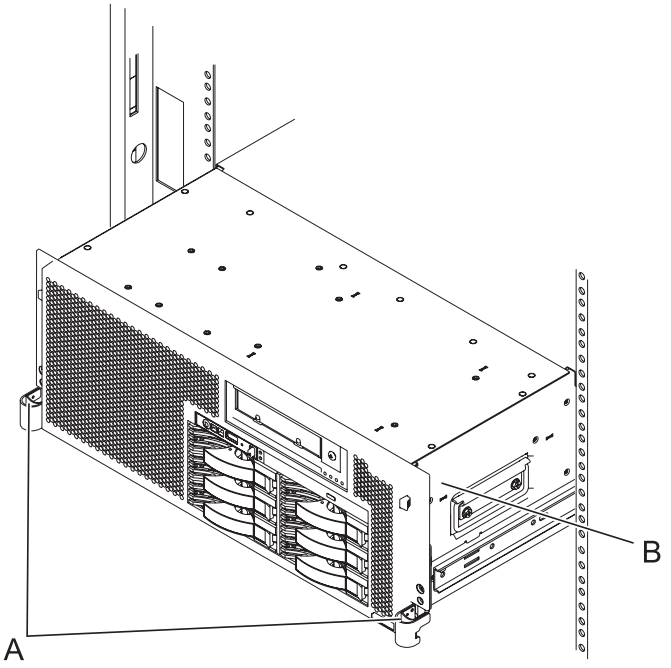


4. Place into service position (continued)

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

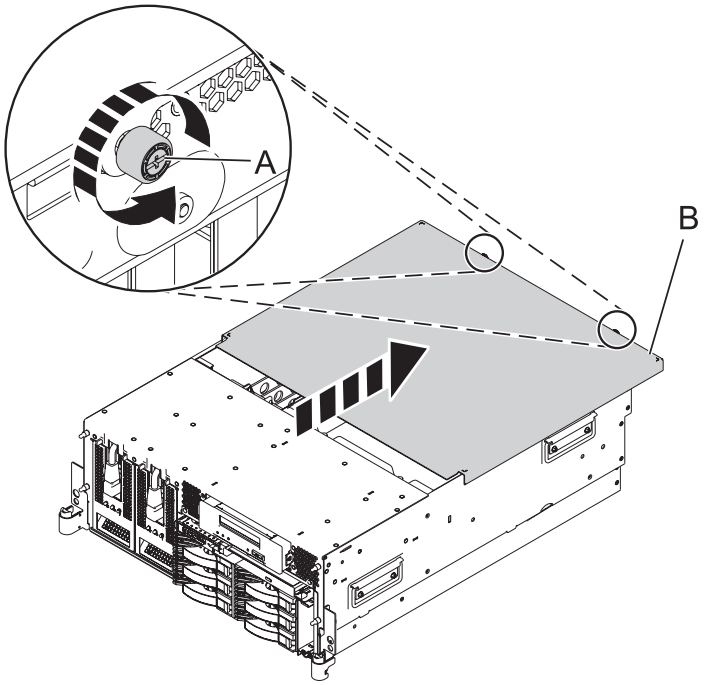
While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



5. Remove the service access cover

1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

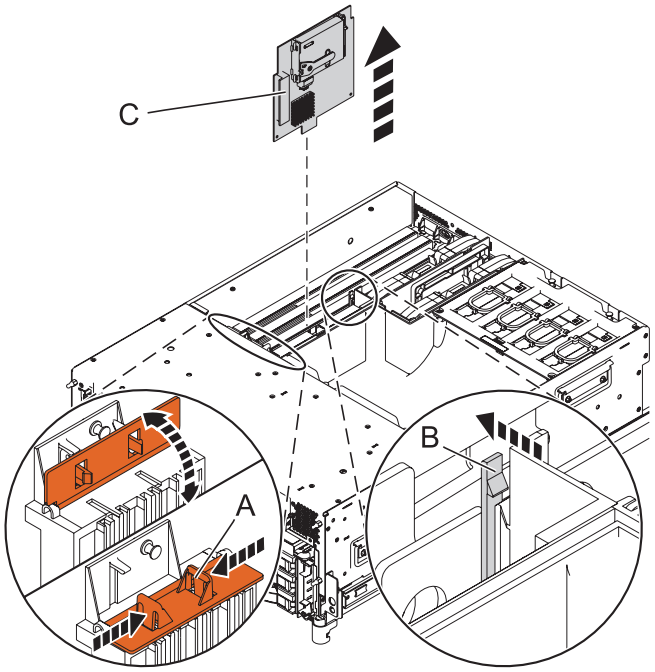
Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



6. Remove the auxiliary cache card

Note: When removing the auxiliary cache card, handle it by its edges, and not by the attached battery.

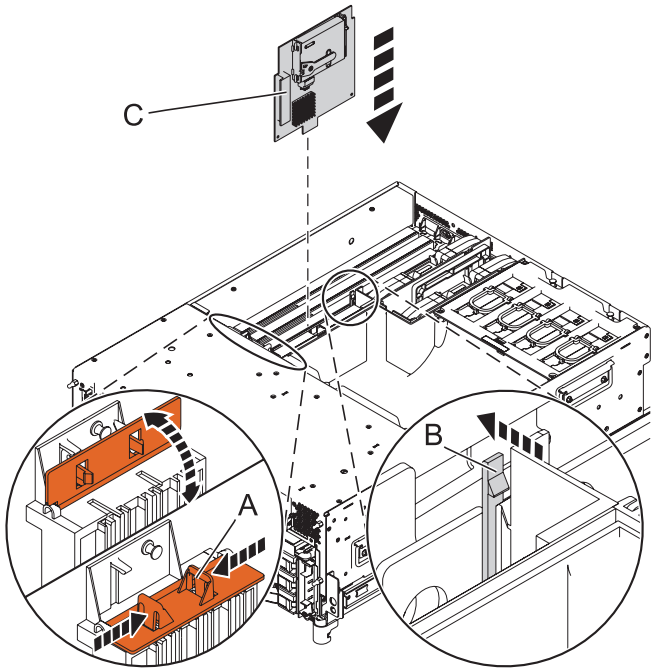
1. Squeeze the terra cotta latch **(A)** on top of the front support, and swing it up in the open position.
2. Push the latch **(B)** in the direction shown to release the card.
3. Gently pull the card **(C)** straight up and out of the enclosure.



7. Install the auxiliary cache card

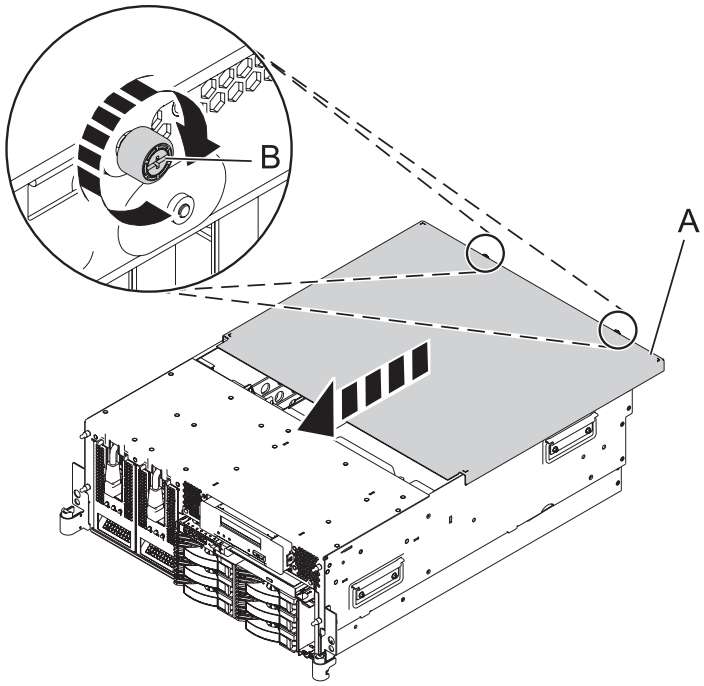
Note: When installing the auxiliary cache card, handle it by its edges, and not by the attached battery.

1. Align the card **(C)** with its connector on the system backplane.
2. Push the latch **(B)** in the direction shown, and gently push the card **(C)** down until it engages into its slot.
3. Release the latch **(B)** to lock the card into its slot.
4. Close the terra cotta latch on top of the front support **(A)**.



8. Install the service access cover

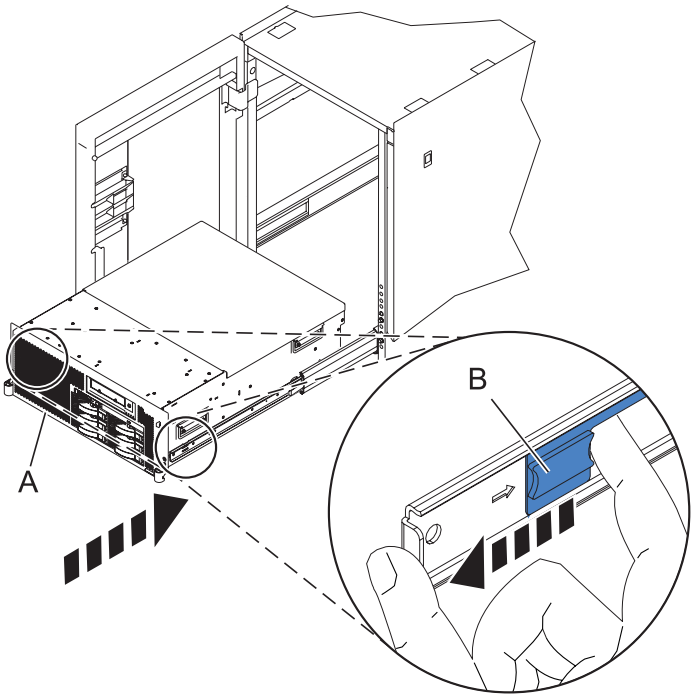
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



9. Place into operating position

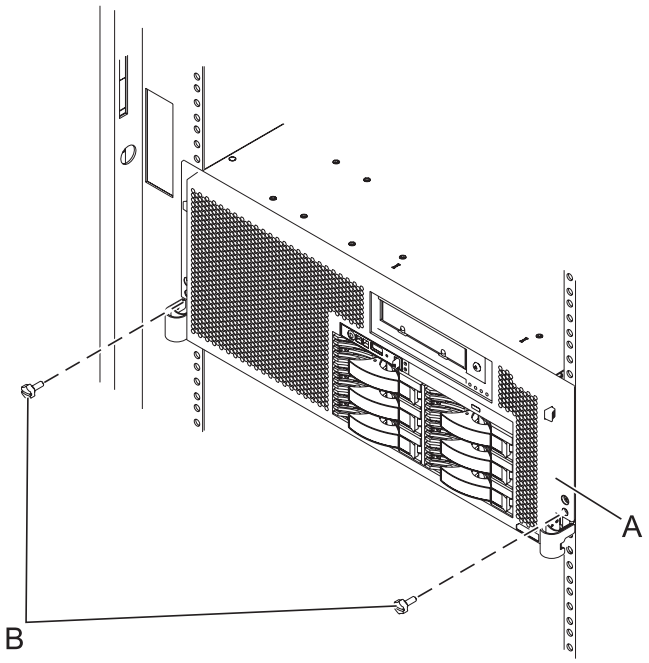
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



10. Place into operating position (continued)

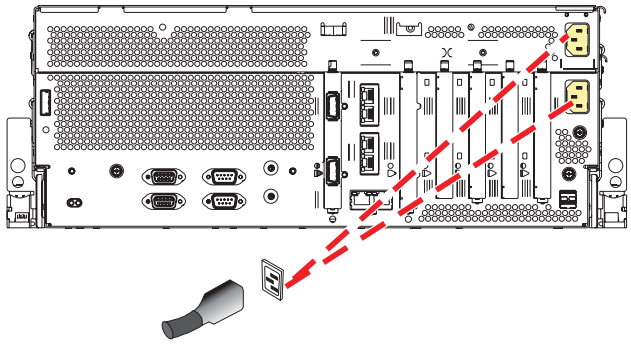
1. Replace and tighten the two screws **(B)** that secure the system unit **(A)** to the rack.
2. Close the front rack door of the unit you are servicing.



11. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



12.

Go to Chapter 2, “Verifying a repair,” on page 181.

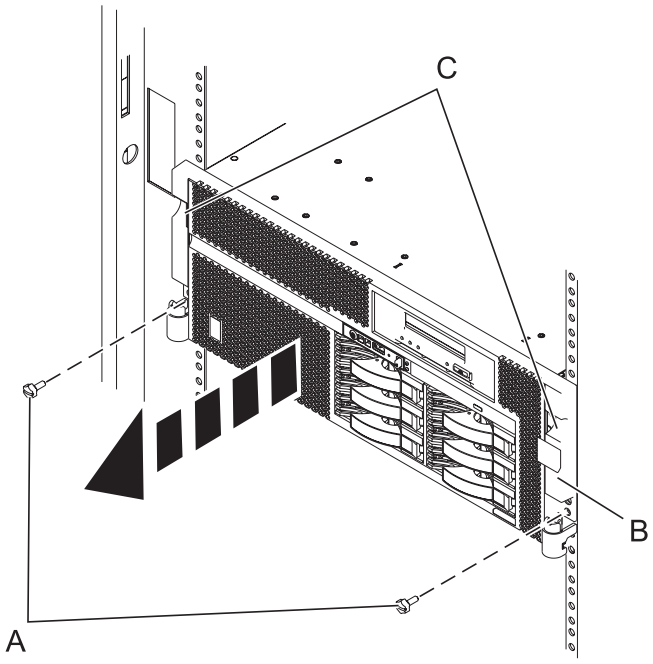
Slimline media

Use this procedure to service the Slimline media.

1. **Remove the front cover**

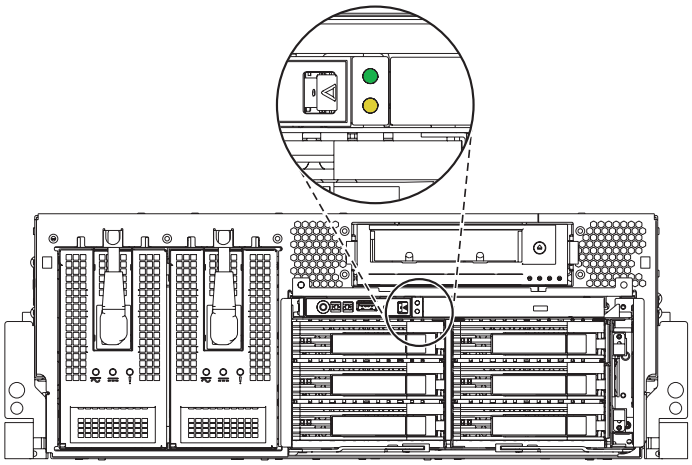
Note to Tower Users: The instructions in this procedure are written based on the Rack model. Tower users may still use this procedure. However, Tower users should ignore specific references to rack-only features such as rack doors, rack thumbscrews, and rack-specific FRU orientation, etc.

1. Open the front rack door.
2. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.
3. Grab the cover at points **(C)** and pull it out and away from the system unit.



2. **Can repair be concurrent?**

You must determine if the repair can continue concurrently (i.e. with power on). If the top LED is green as shown in the figure on the right, you may proceed with a concurrent repair. Otherwise, the repair can continue only after powering off the unit. If the unit is already powered off, you may proceed with a non-concurrent repair.



3.

Select an action:

Nonconcurrent repair. Power off the unit and continue the repair.	Concurrent repair. Continue the repair with unit power on.	Delay the repair.
↓	Go to step 6 on page 117.	**This ends the procedure.**

4. **Shut down the partitions and power off the system**

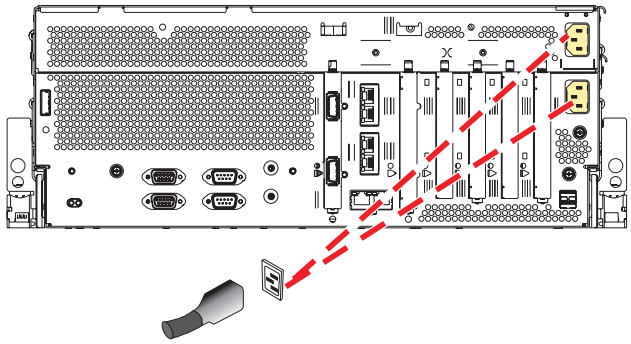
This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

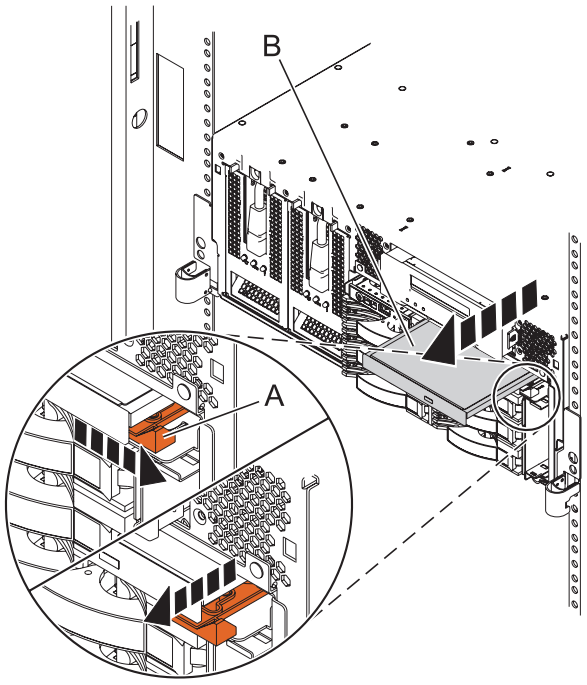
5. Disconnect the power cords

1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.



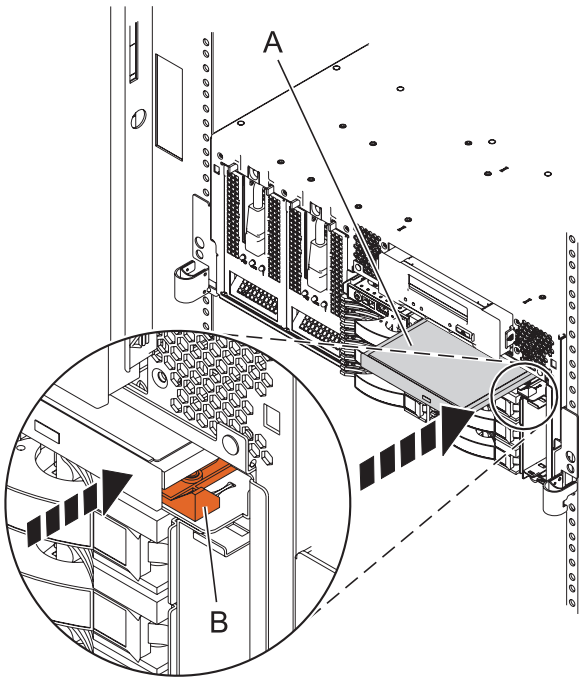
6. Remove the slimline media device

1. Push the terra cotta plastic retaining tab **(A)** approximately 5mm to the right away from the slimline media device.
2. While depressing the terra cotta plastic retaining tab, grasp the device **(B)** and pull it out of the system.



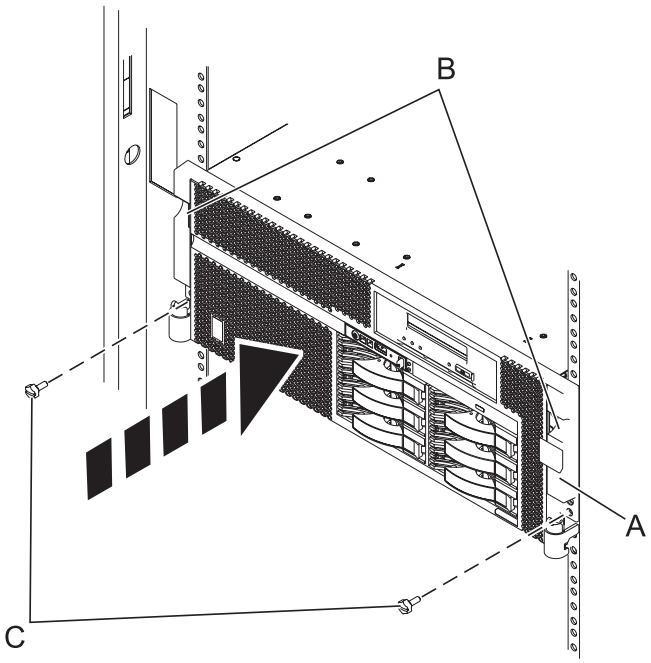
7. Install the slimline media device

1. Align the replacement device **(A)** with the slimline media bay.
2. Push it into the system until the retaining tab **(B)** locks the device into place.



8. Install the front cover

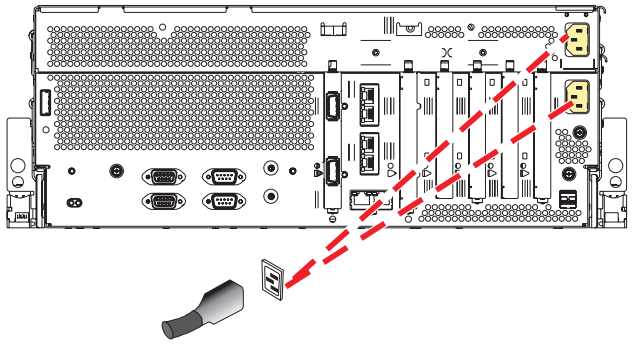
1. Position the cover on the front of the system unit so that the two screws **(C)** align with the screw holes on the front of the system unit **(A)**.
2. Push the cover at points **(B)** to attach it to the front of the system unit as shown in the following figure.
3. Tighten the two screws that secure the system unit to the rack.
4. Close the front rack door.



9. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



10.

Go to Chapter 2, “Verifying a repair,” on page 181.

System backplane

Use this procedure to replace the system backplane.

1. **Access the ASMI**

The Advanced System Management Interface (ASMI) is the interface to the service processor that is required to perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, and controlling the system power. The ASMI may also be referred to as the service processor menus.

To access the ASMI, refer to Accessing the Advanced System Management Interface.

When you have accessed the ASMI, continue with the next step.

2. Check and record the server settings

Prior to replacing this FRU, check and record all server settings as you may need to update the system after you update this FRU. This can be done through the **Advanced System Management Interface (ASMI)** .

1. Check and record the **server firmware level** indicated on the right edge of the status frame, the area where the **Log out** button is located. You may need to update the system to the latest server firmware code level after you update this FRU.
2. Check and record the service processor settings you previously set using ASMI. You will need to reset these service processor settings after you update this FRU or the default settings will be used. Settings to record include the following:
   - **Power/Restart Control** settings.
   - **System Service Aids** settings.
   - **System Configuration** settings, **System Name** setting.
   - **Network Services** settings.
   - **Performance Setup** settings.
   - **Login Profile** settings.
3. Record any service processor settings you may have set using operating system commands.

---

3. Shut down the partitions and power off the system

This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

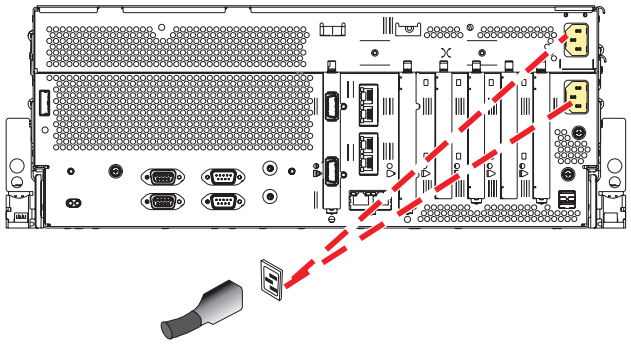
Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

---

4. Disconnect the power cords

1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.

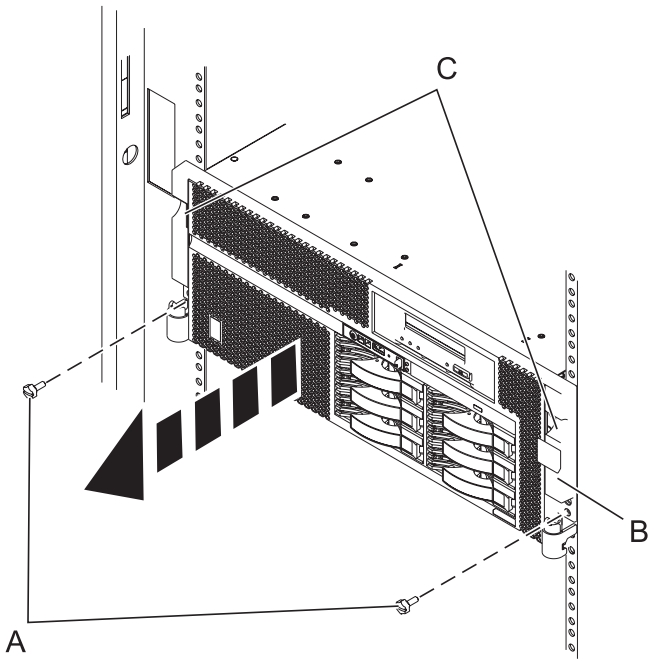


---

5. Remove the front cover

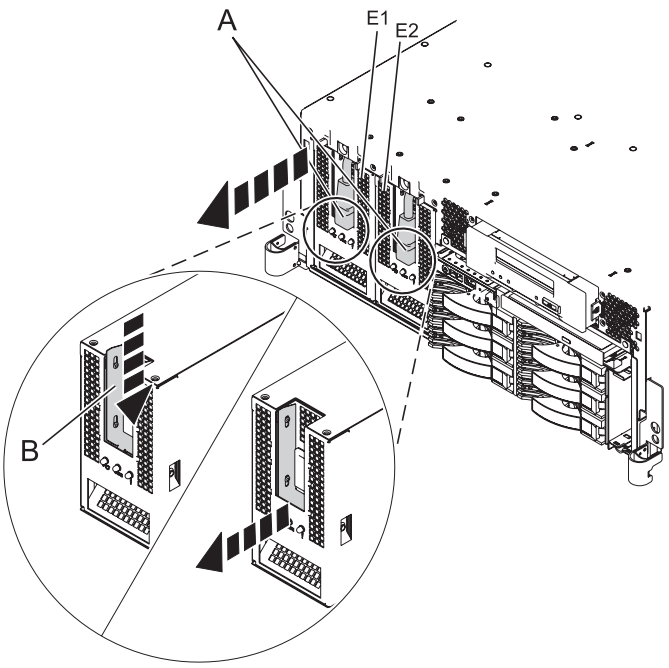
Note to Tower Users: The instructions in this procedure are written based on the Rack model. Tower users may still use this procedure. However, Tower users should ignore specific references to rack-only features such as rack doors, rack thumbscrews, and rack-specific FRU orientation, etc.

1. Open the front rack door.
2. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.
3. Grab the cover at points **(C)** and pull it out and away from the system unit.



6. Remove the power supply or both power supplies

1. Disconnect the power cable **(A)** from the first power supply you are removing, either **E1** or **E2**.
2. While pushing the lever **(B)** down, pull the power supply straight out of the system.
3. Repeat these steps to remove the other power supply, if present.



7. Disconnect all the external cables

1. Carefully label the external cables connected to the FRU you are servicing so that they can be reconnected in exactly the same place after the repair.
2. This can include cables on the following ports:
   a. Serial
   b. SPCN
   c. GX
   d. Ethernet
   e. PCI
   f. USB
3.
4. Then disconnect the external cables.

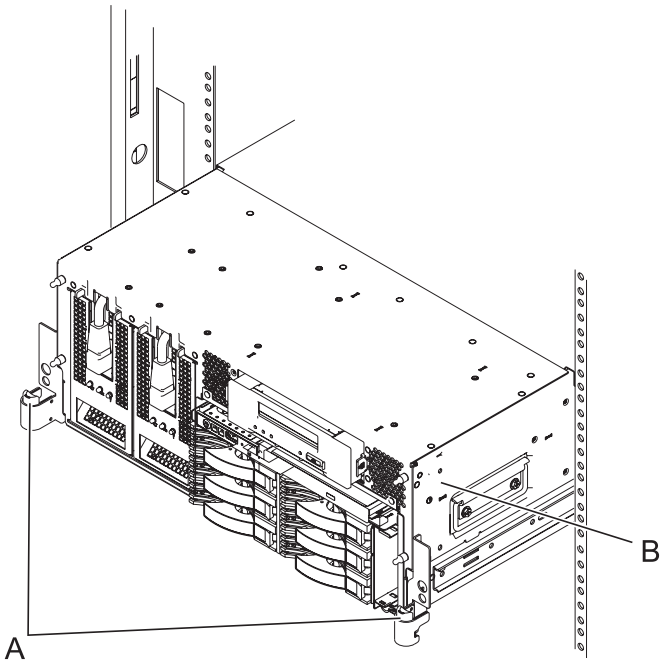
---

8. Place into service position

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



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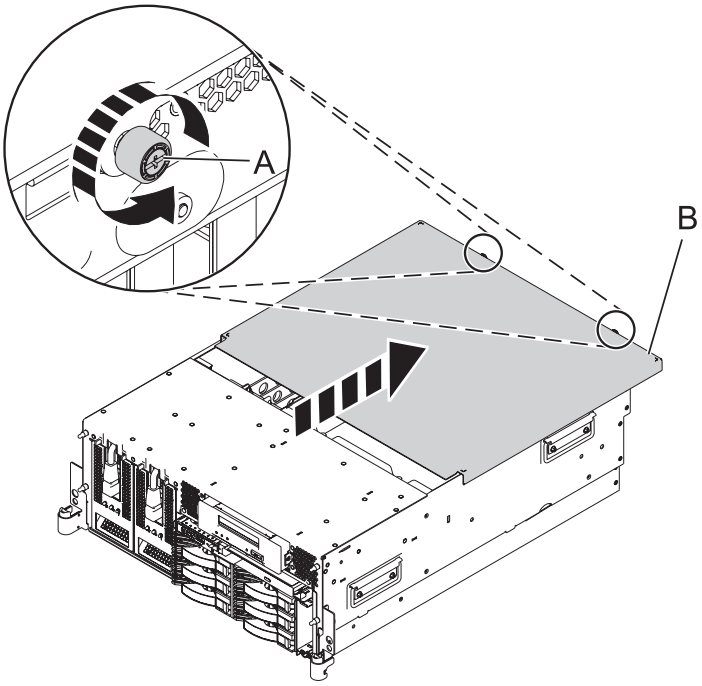
9. Remove the service access cover

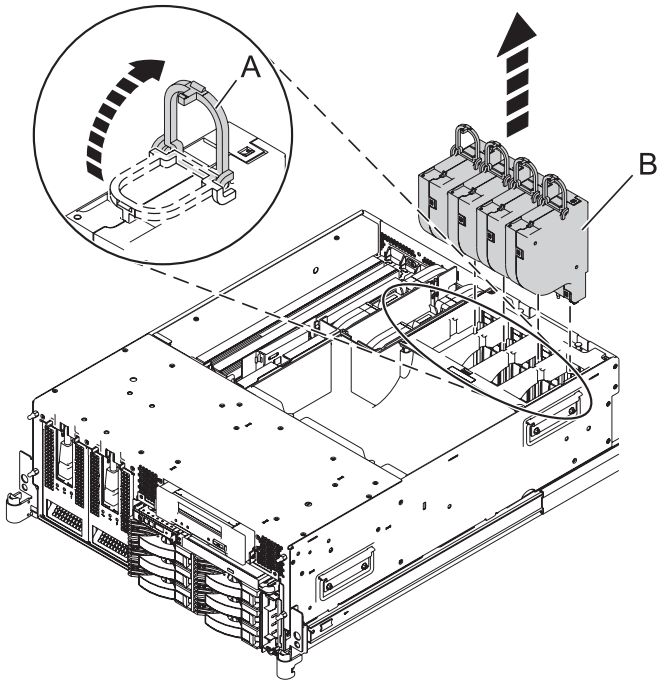
1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



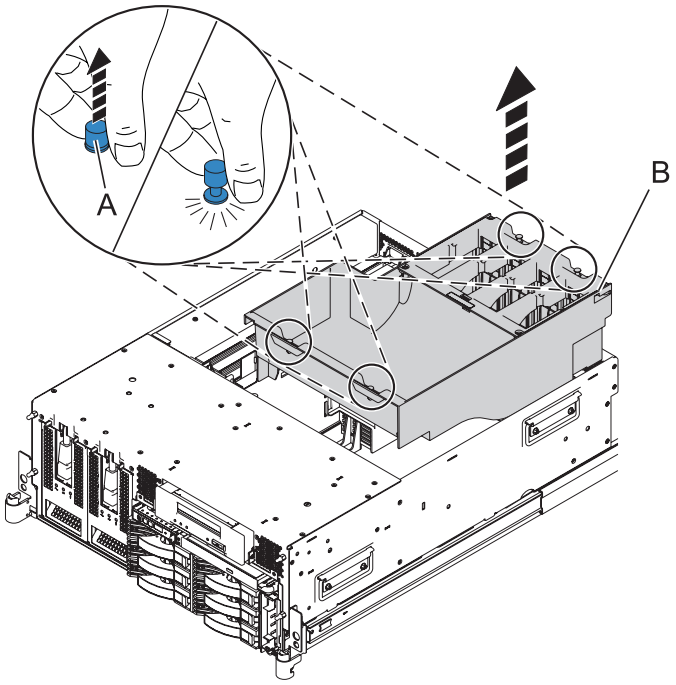
10. Remove the fans

1. Push the latch **(A)** upward to disengage the fan from the fan cage.
2. Pull the fan **(B)** out of the fan cage.
3. Repeat these steps until all fans are removed from the fan cage.



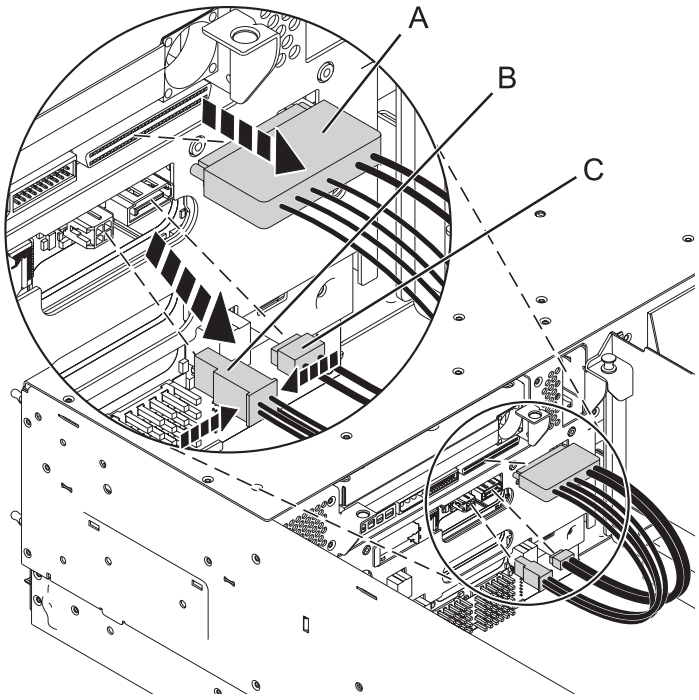
11. Remove the fan cage

1. Pull the four retaining tabs **(A)** that secure the fan cage to its enclosure.
2. Lift the fan cage **(B)** straight up and out of the enclosure.



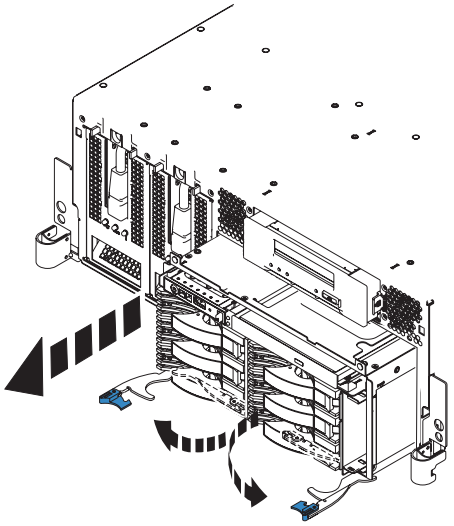
12. Disconnect the media device cables

1. Disconnect the media device cable **(A)** from its connector at the rear of the media device.
2. Media device cables **(B)** and **(C)** do not need to be touched.



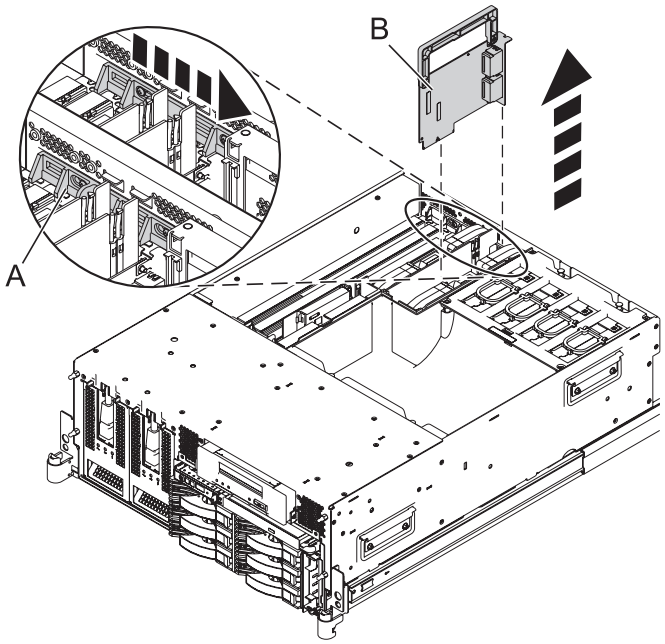
13. Remove the disk unit cage and backplane

1. Rotate the handles outward in the direction shown to release the disk unit cage and backplane.
2. Slide the disk unit cage and backplane out of the system unit.



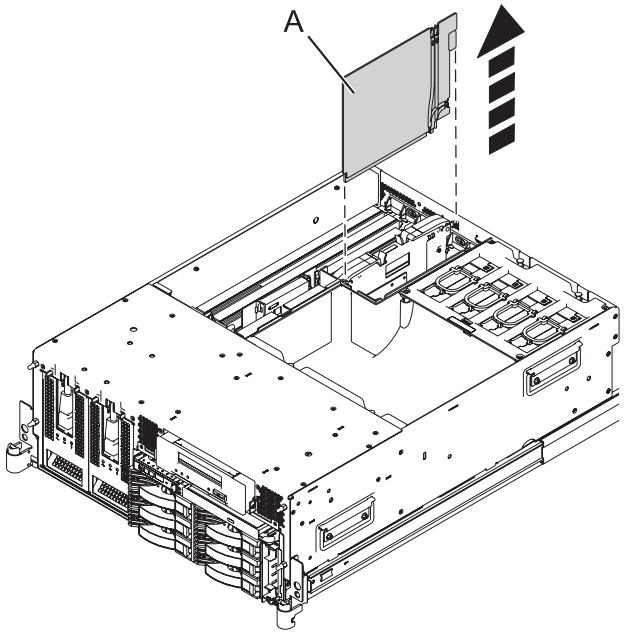
14. Remove the Ethernet adapter

1. Slide the latch **(A)** in the direction shown to release the Ethernet adapter **(B)**.
2. Carefully grasp the Ethernet adapter by its blue handle, and pull it straight out of its connector on the system backplane.



15. Remove the GX adapter divider

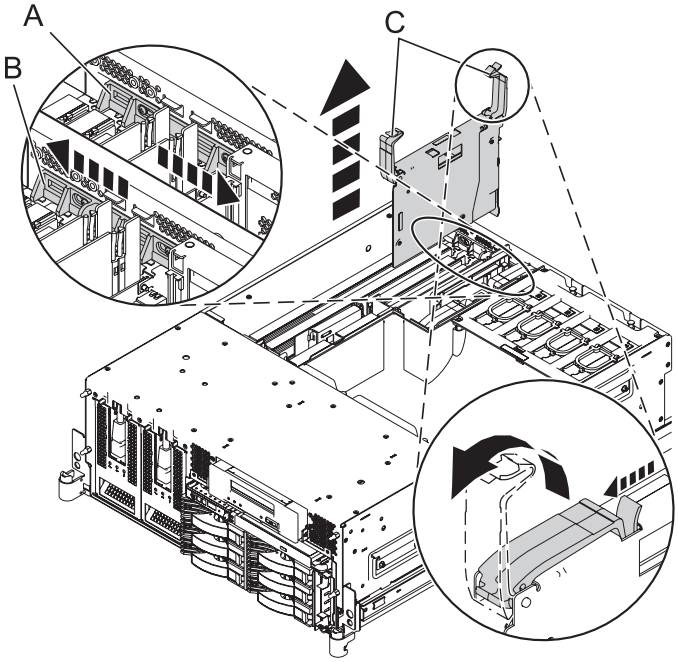
Grasp the GX adapter divider by its top edge, and slide it up and out of the system.



16. Remove all GX adapters, if present

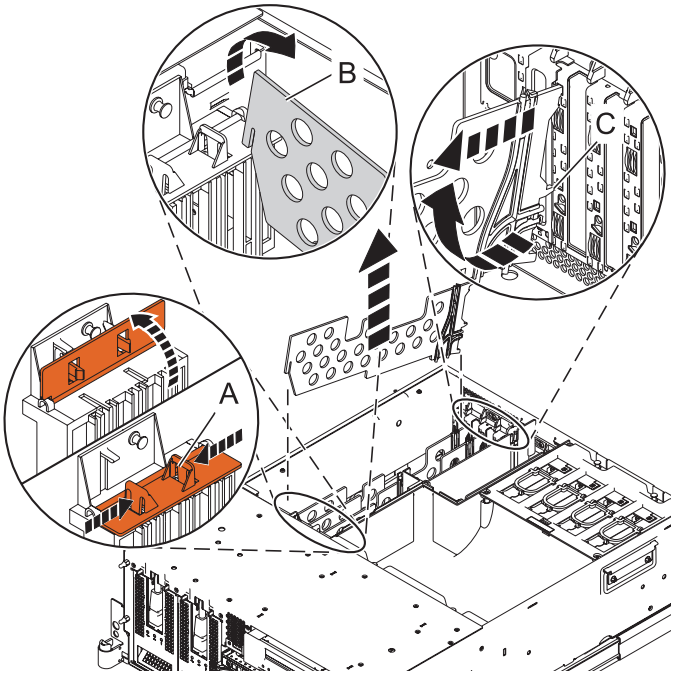
Note: Record the slot location of all adapters that are going to be removed, so that they can be reinstalled in exactly the same place after the repair.

1. If the latch is in position **(B)**, slide it in the direction of the arrow **(A)** to release the GX adapters.
2. Pinch the GX Adapter latches **(C)** and rotate them in the direction shown to release the GX adapter from the slot.
3. Gently pull the GX adapter straight up and out of the system.
4. Repeat these steps to remove a second GX adapter, if present.



17. Remove the PCI adapter dividers

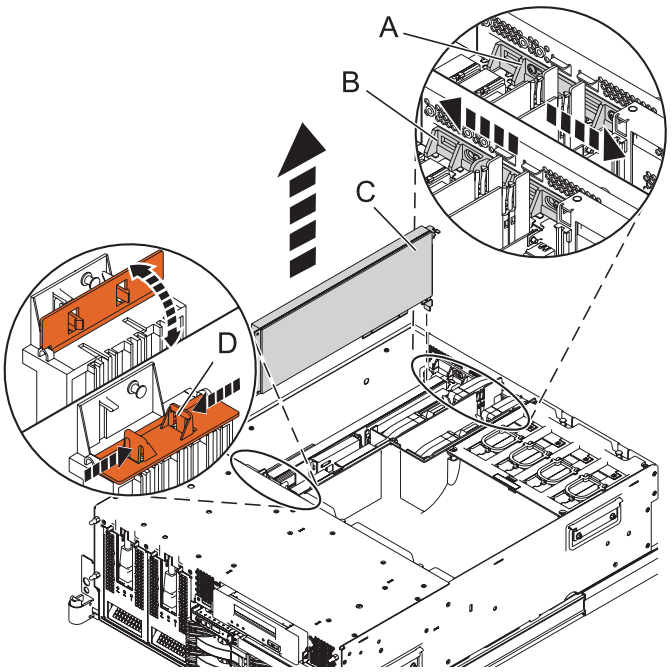
1. Squeeze the terra cotta latch **(A)** on top of the front support, and swing it up in the open position.
2. Flex the front edge **(B)** of the PCI adapter divider out of the bracket and toward the rest of the divider.
3. Pull the back edge of the divider away from the retention notches **(C)** in the system chassis.
4. Repeat these steps for the other PCI adapter dividers that need to be removed.



18. Remove all PCI adapters

Note: Record the slot location of all adapters that are going to be removed, so that they can be reinstalled in exactly the same place after the repair.

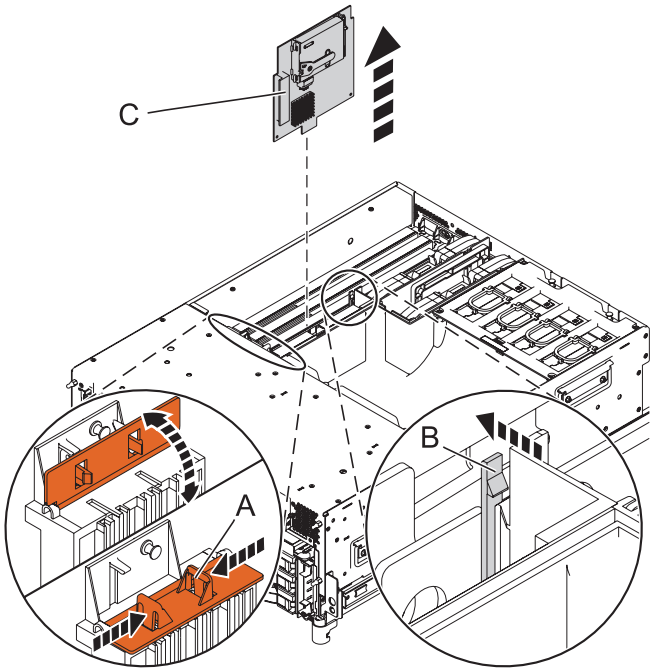
1. If there is a long PCI adapter, squeeze the terra cotta latch **(D)** on top of the front support, and swing it up in the open position.
2. If the latch is in position **(B)**, slide it in the direction of the arrow **(A)** to release the PCI adapters.
3. Carefully grasp the PCI adapter **(C)** by its top edge or upper corners, and pull the PCI adapter up and out of its connector on the system backplane.
4. Store the PCI adapter in a safe place.
5. Repeat these steps until **all** PCI adapters are removed.



19. Remove the auxiliary cache card, if present

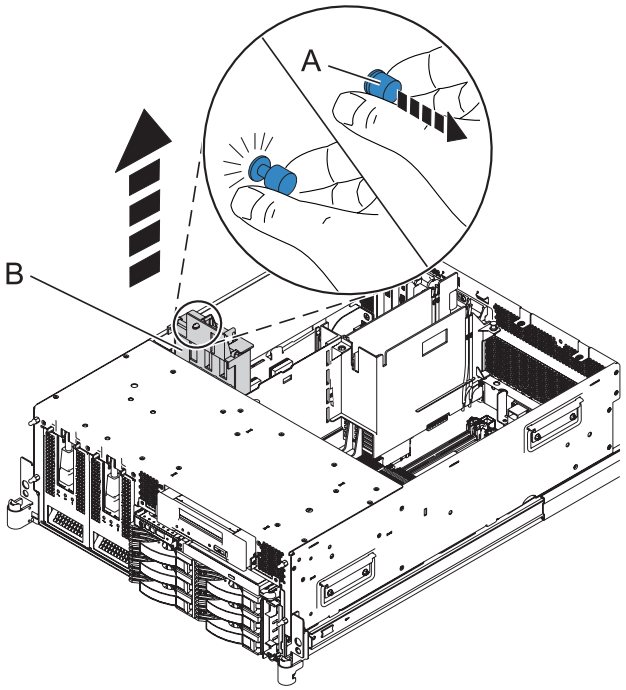
Note: When removing the auxiliary cache card, handle it by its edges, and not by the attached battery.

1. If needed, squeeze the terra cotta latch **(A)** on top of the front support, and swing it up in the open position.
2. Push the latch **(B)** in the direction shown to release the card.
3. Gently pull the card **(C)** straight up and out of the enclosure.



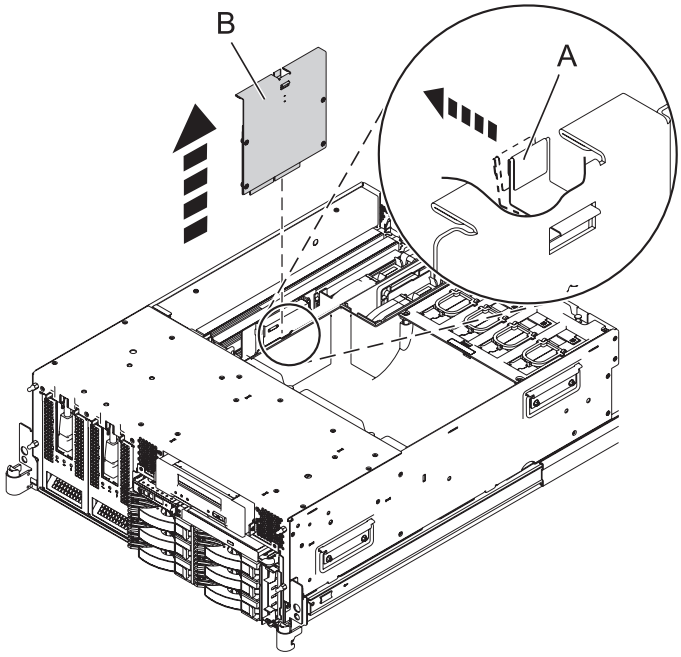
20. Remove the PCI front support

1. Loosen the blue retaining tab **(A)** that secures the PCI front support to its enclosure.
2. Lift the PCI front support **(B)** up and out of the enclosure.



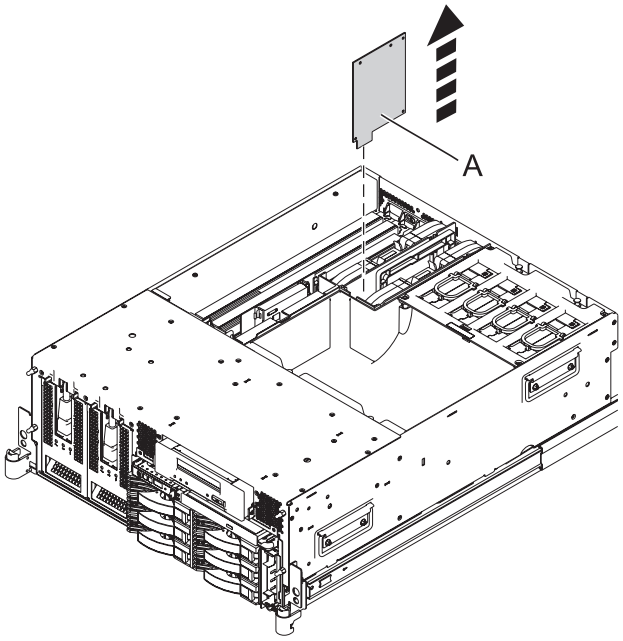
21. Remove the RAID enablement card, if present

1. Push the tab **(A)** in the direction shown to release the card.
2. Gently pull the card **(B)** straight up and out of the enclosure.



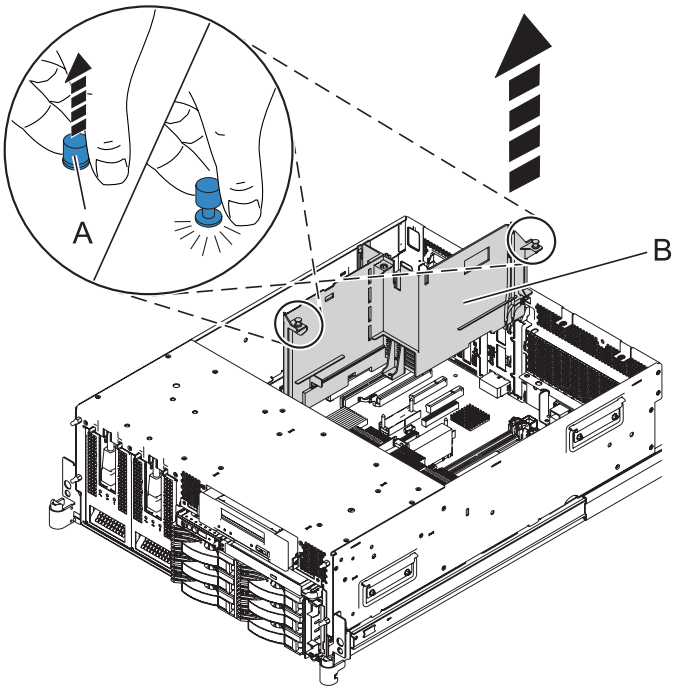
22. Remove the TPMD card, if present

Gently pull the TPMD card **(A)** straight up and out of its slot on the system backplane.



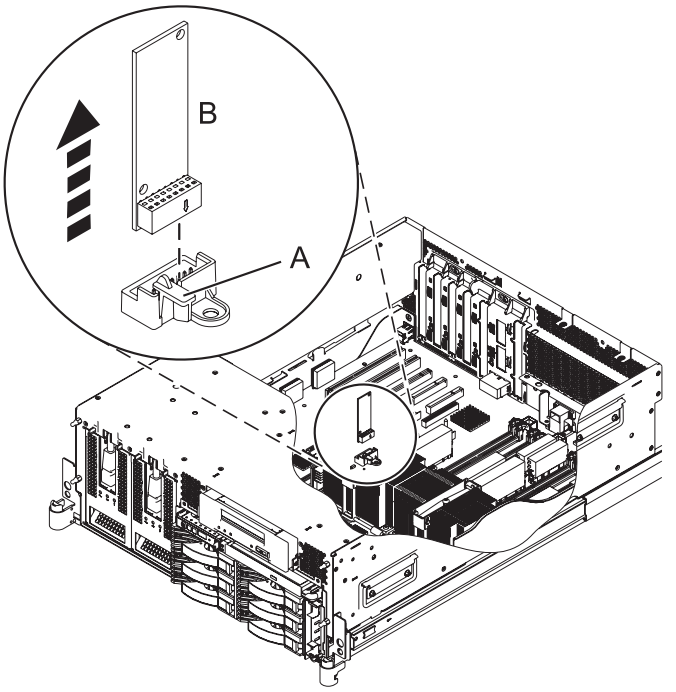
23. Remove the middle system divider

1. Loosen the two blue retaining tabs **(A)** that secure the middle system divider from the system chassis.
2. Grasp the middle system divider **(B)** and lift it out of the system.



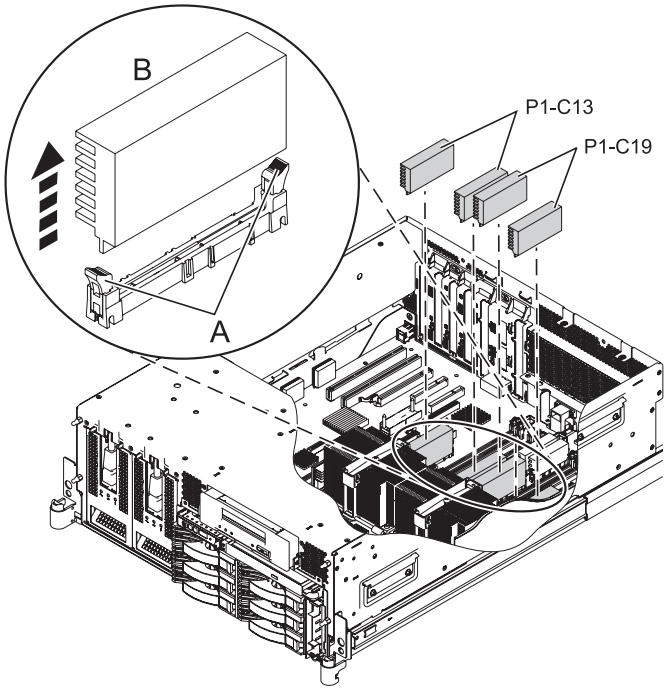
24. Remove the VPD card

1. Press gently on the handle **(A)** to unlock the VPD card **(B)** from its slot on the system backplane.
2. Pull the VPD card out of its slot.



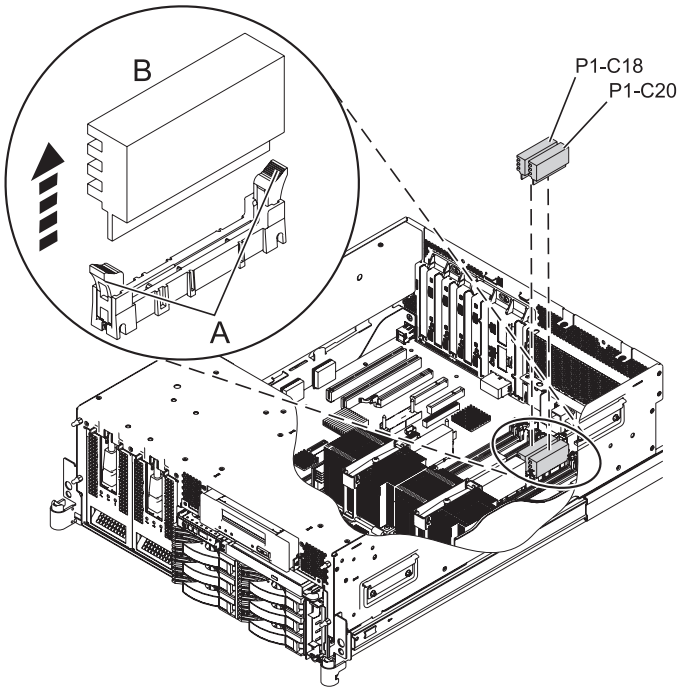
25. Remove the voltage regulator module pairs

1. Locate the first voltage regulator module pair.
2. Push the connector tabs **(A)** out and then down to unlock one module.
3. Pull the module **(B)** out of the connector.
4. Repeat these steps to remove the other module in the pair.
5. Keep the two modules of the pair together.
6. Repeat these steps to remove the other module pair.



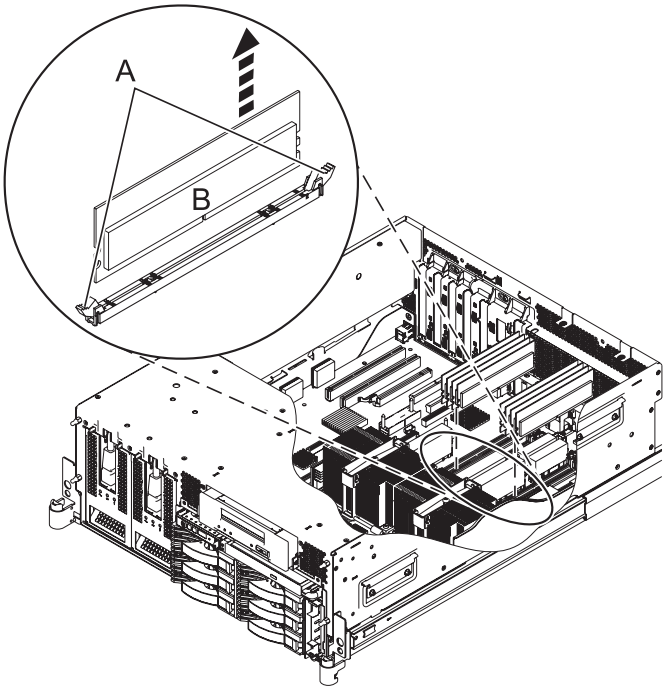
26. Remove the single voltage regulator modules

1. Locate the first single voltage regulator module.
2. Push the connector tabs **(A)** out and then down to unlock one module.
3. Pull the module **(B)** out of the connector.
4. Repeat these steps to remove the other voltage regulator module.



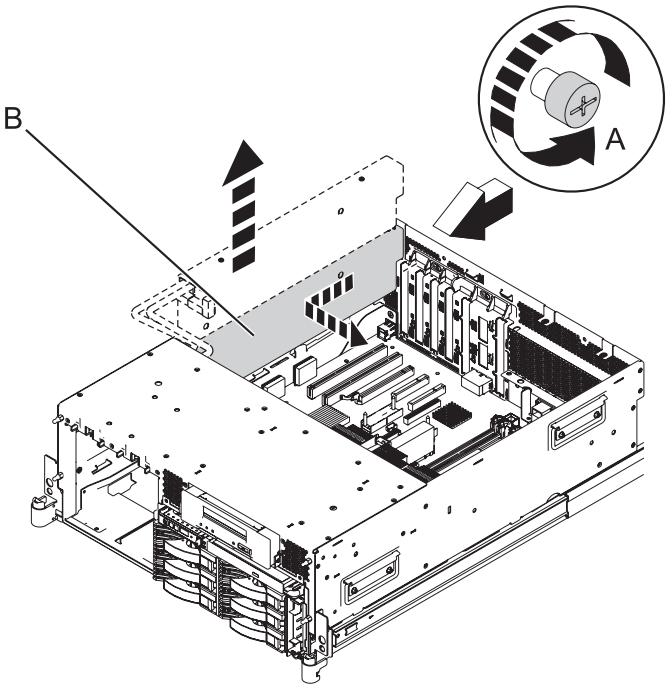
27. Remove all memory DIMMs

1. Remove the memory DIMM by pushing the tabs **(A)** out and then down. The tabs' lever action forces the memory DIMM out of the connector.
2. Pull the memory DIMM **(B)** out of the connector.
3. Repeat these steps until **all** memory DIMMs have been removed from the system backplane being replaced.



28. Remove the line cord assembly

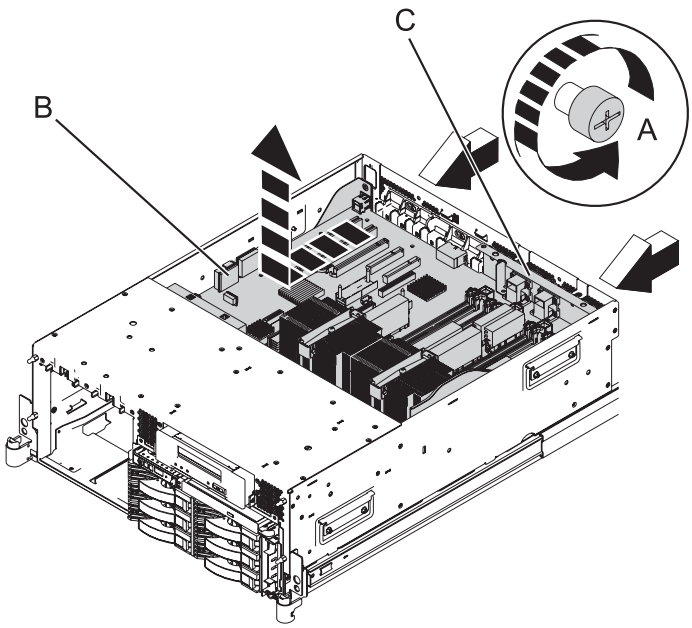
1. Loosen the upper right thumbscrew **(A)** located on the back of the system chassis.
2. Slide the line cord assembly **(B)** toward the front of the system to unlock it.
3. Without removing the line cords, grasp the line cord assembly, disengage it, pull it upward, and place it next to the system chassis.



29. Remove the system backplane

Note: Take care when removing the system backplane. Do not lift the system backplane by any of the attached modules.

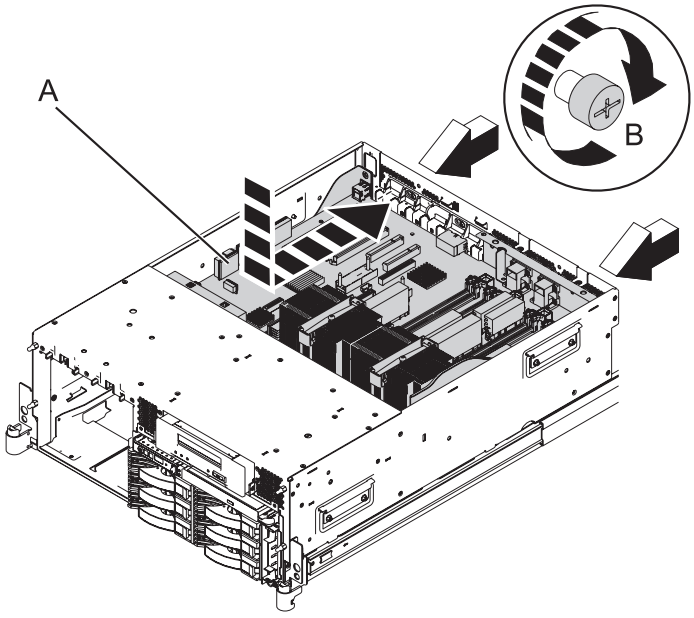
1. Loosen the two thumbscrews **(A)** located on the back of the system chassis, as shown in the figure.
2. Push the system backplane **(B)** toward the front of the system - about 10 mm (half inch) - to unlock it from the system chassis.
3. Grasp the system backplane by the metal frame **(C)** located at the back of the backplane.
4. Carefully lift the system backplane out of the chassis.



30. Install the system backplane

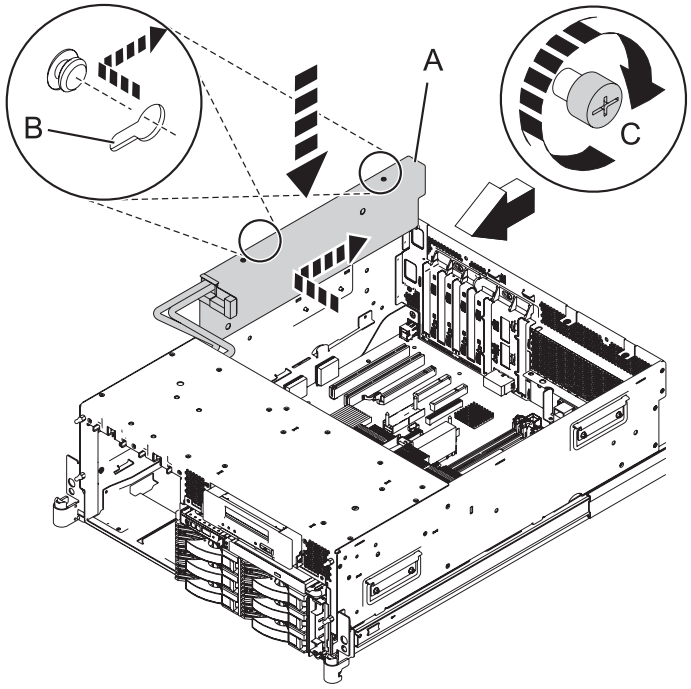
Note: Take care when installing the system backplane. Do not lift the system backplane by any of the attached modules.

1. Carefully grasp the replacement system backplane **(A)** along two edges.
2. Lower the system backplane at an angle, with the front of the backplane connecting with the system chassis first.
3. When the system backplane lays at the bottom of the system chassis, slide it toward the back of the system chassis - about 10 mm (half inch) - until it locks.
4. Tighten the two thumbscrews **(B)** located on the back of the system chassis, as shown in the figure, to secure the backplane to the chassis.



31. Install the line cord assembly

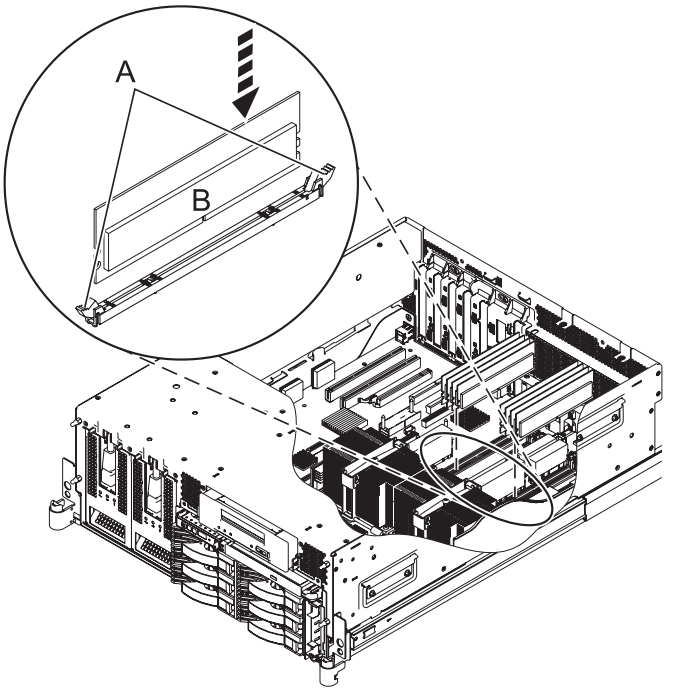
1. Place the line cord assembly **(A)** into position, ensuring the slots **(B)** on the line cord assembly align with the pins on the system chassis.
2. Slide the line cord assembly toward the back of the system to lock it into place.
3. Insert and tighten the upper right thumbscrew **(C)** located on the back of the system chassis, to secure the line cord assembly.



32. Install all memory DIMMs

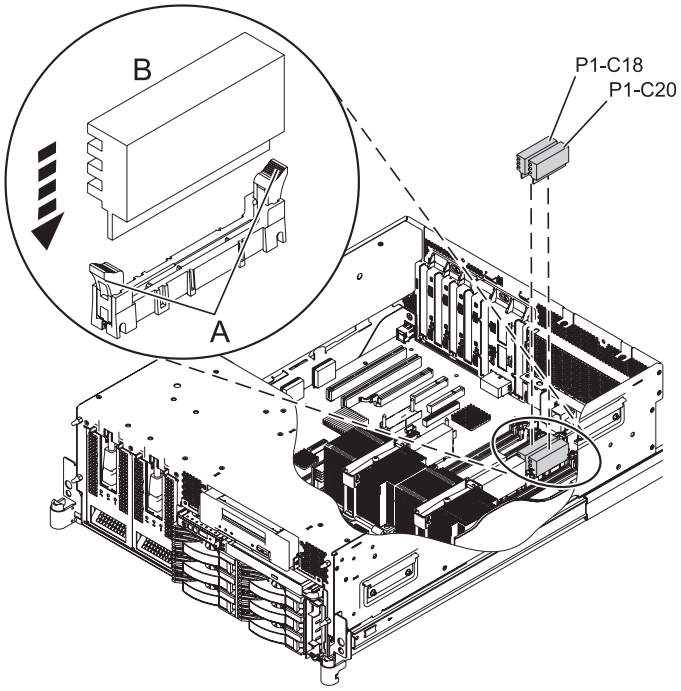
Attention: Memory DIMMs are keyed to prevent a DIMM from being installed improperly. Note the locations of the key tabs within the DIMM connector before attempting to install the DIMM.

1. Ensure that the connector locking tabs **(A)** are pushed out in the unlocked position before installing a memory DIMM.
2. Carefully grasp the memory DIMM **(B)** along two edges and align the connector.
3. Insert the memory DIMM firmly into the connector.
4. Secure the memory DIMM by pushing in the locking tabs **(A)**.
5. Repeat these steps until **all** memory DIMMs have been installed.



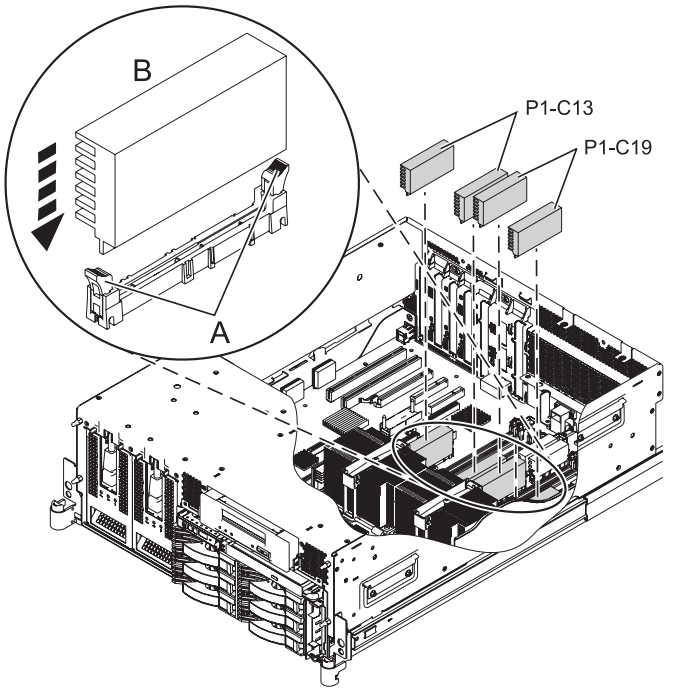
33. Install the two single voltage regulator modules

1. Ensure that the connector tabs **(A)** are pushed out in the unlocked position before installing a new voltage regulator module.
2. Carefully grasp the module **(B)** along two edges and align it with the connector.
3. Insert the module into the connector.
4. Push the connector tabs into the locked position.
5. Repeat these steps to install the other single voltage regulator module.



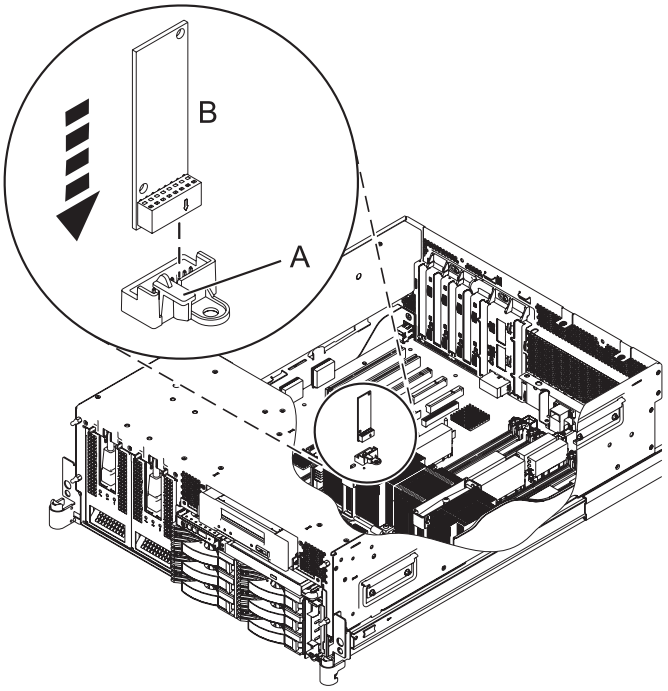
34. Install the two voltage regulator module pairs

1. Install the voltage regulator modules, pair by pair.
2.
   a. Ensure that the connector tabs **(A)** are pushed out in the unlocked position before installing the module **(B)**.
   b. Carefully grasp the module along two edges and align it with the connector.
   c. Insert the module into the connector.
   d. Push the connector tabs into the locked position.
   e. Repeat these steps to install the other module in the pair.
3. Repeat these steps to install the other pair of modules.



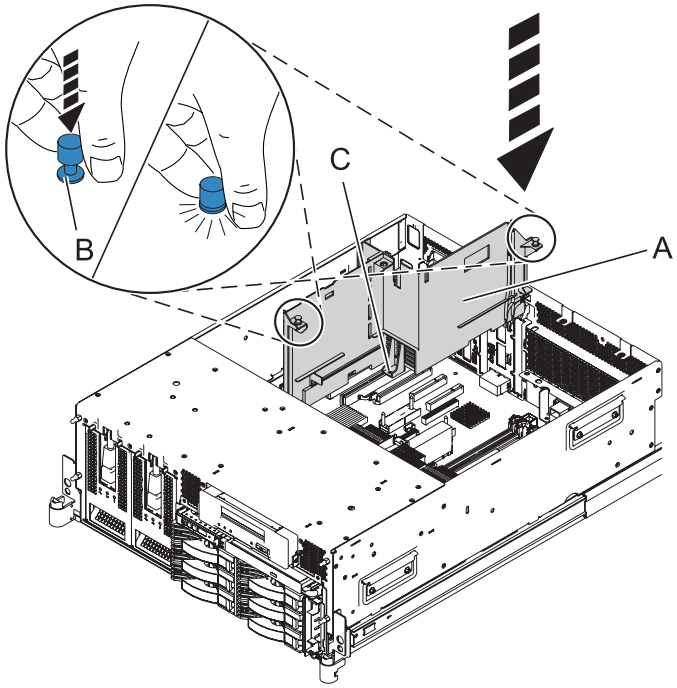
35. Install the VPD card

1. Press gently on the handle **(A)** to insert the VPD card **(B)** into its slot on the system backplane.
2. Push the VPD card into place until it is fully seated.



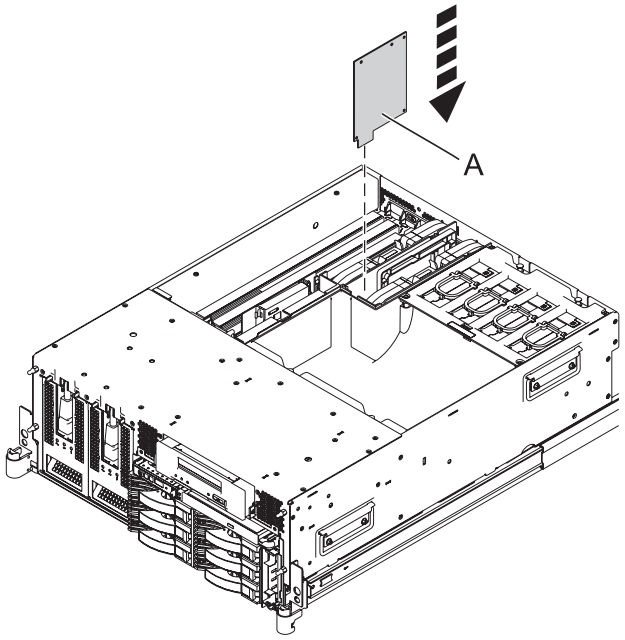
36. Install the middle system divider

1. Align the two blue tabs **(B)** that secure the middle system divider **(A)** with the two holes.
2. Slide the middle system divider down and into its position, and align it with the pin **(C)** in the middle on the system backplane.
3. Tighten the two blue tabs **(B)** that secure the middle system divider with the system chassis.



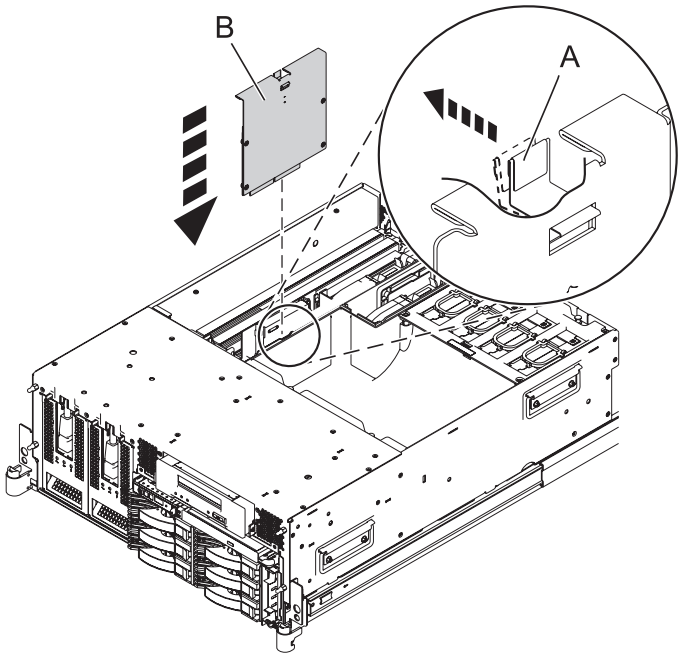
37. Install the TPMD card, if previously removed

Gently push the TPMD card **(A)** straight into its slot on the system backplane.



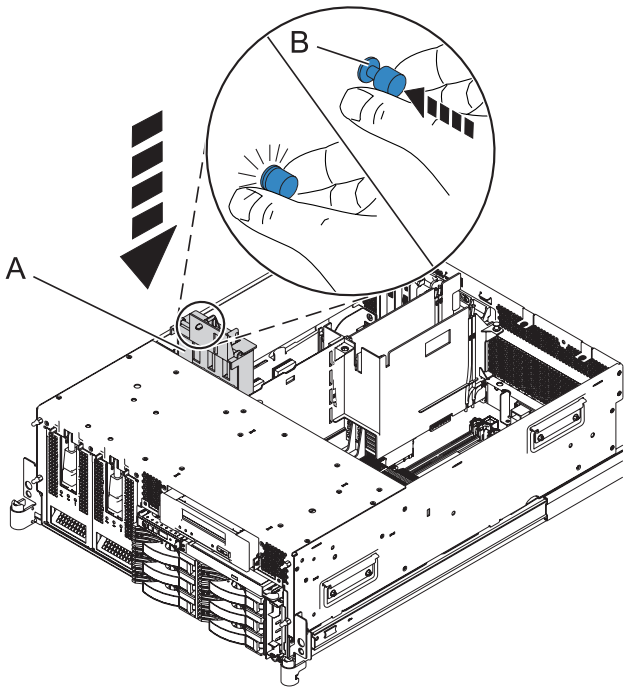
38. Install the RAID enablement card, if previously removed

1. Push the card **(B)** down in the direction shown, along the sliders of the middle divider.
2. Align the card with its connector on the system backplane.
3. Push the tab **(A)** in the direction shown and gently push the card down until it engages into its slot.
4. Release the tab **(A)** to lock the card into its slot.



39. Install the PCI front support

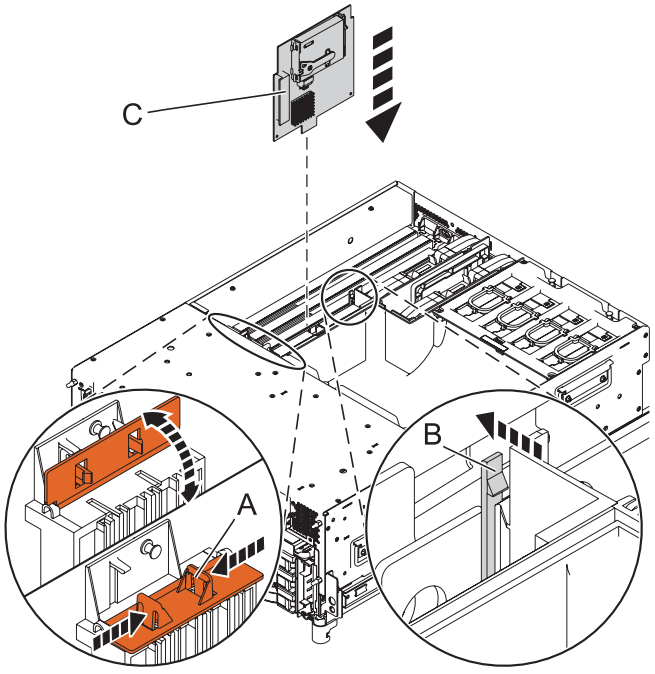
1. Lower the PCI front support **(A)** into its location on the enclosure, aligning the tab with the hole on the back of the front chassis.
2. Tighten the blue tab **(B)** that secures the PCI front support.



40. Install the auxiliary cache card, if previously removed

Note: When installing the auxiliary cache card, handle it by its edges, and not by the attached battery.

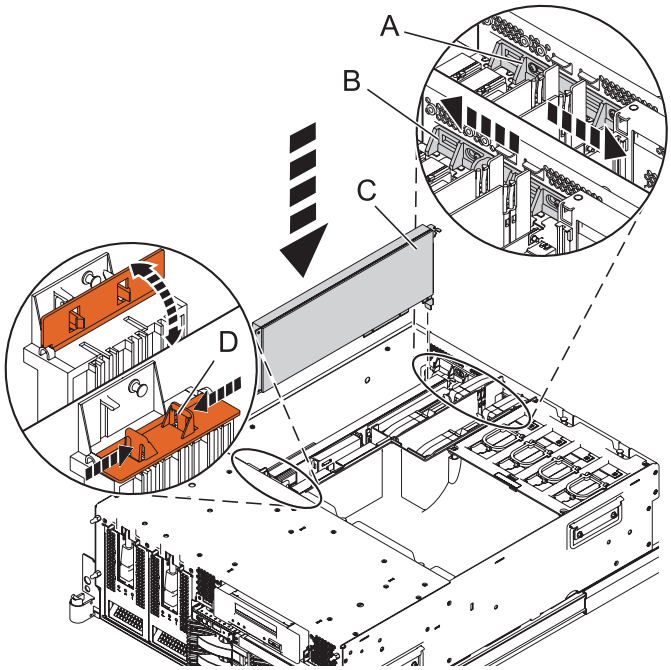
1. Squeeze the terra cotta latch **(A)** on top of the front support, and swing it up in the open position.
2. Align the card **(C)** with its connector on the system backplane.
3. Push the latch **(B)** in the direction shown, and gently push the card **(C)** down until it engages into its slot.
4. Release the latch **(B)** to lock the card into its slot.



41. Install all PCI adapters, if previously removed

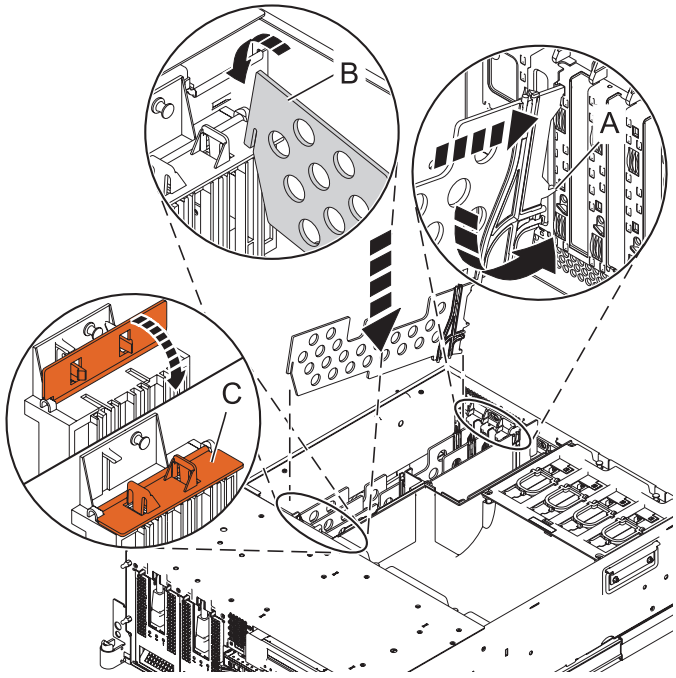
Note: Reinstall the cards in the same slot locations as before the repair.

1. If there is a long PCI adapter and if needed, squeeze the terra cotta latch **(D)** on top of the front support, and swing it up in the open position.
2. If needed, slide the latch in the direction of the arrow **(A)** to let the PCI adapter slot accessible.
3. Carefully grasp the PCI adapter **(C)** by its top edge, and align the PCI adapter with its connector on the system backplane.
4. Press the PCI adapter firmly into its connector.
5. Repeat these steps until **all** PCI adapters are installed.



42. Install the PCI adapter dividers

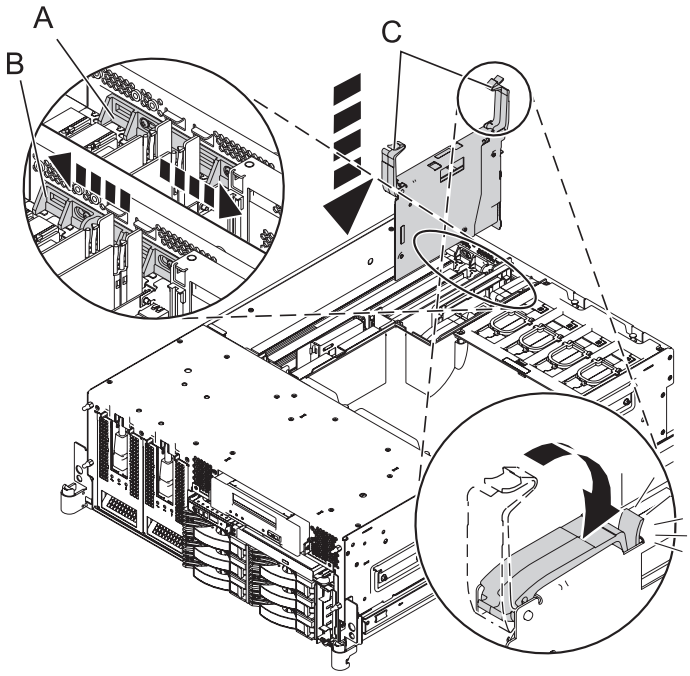
1. If needed, squeeze the terra cotta latch **(C)** on top of the front support, and swing it up in the open position.
2. Grasp the PCI adapter divider by its top edge and align the back edge of the divider with the retention notches **(A)** in the system chassis.
3. Slide the front edge of the divider **(B)** into its slot.
4. Repeat these steps for the other PCI adapter dividers that need to be installed.
5. Close the terra cotta latch **(C)** on top of the front support.



43. Install all GX adapters, if previously removed

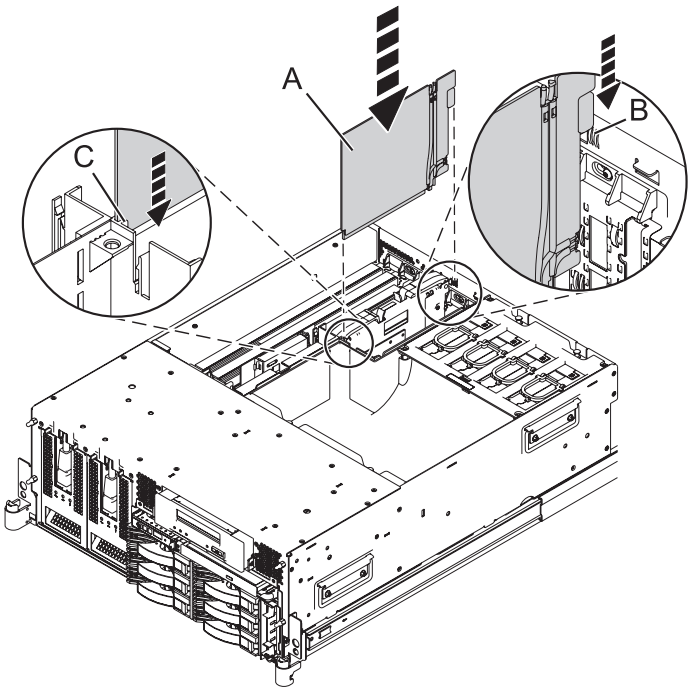
Note: Reinstall the cards in the same slot locations as before the repair.

1. If needed, slide the latch in the direction of the arrow **(A)** to let the GX adapter slot accessible.
2. Align the GX adapter with its connector on the system backplane.
3. Gently push the GX adapter straight into the system.
4. Rotate the latches **(C)** in the direction shown until they latch.
5. Repeat these steps to install a second GX adapter, if previously removed.



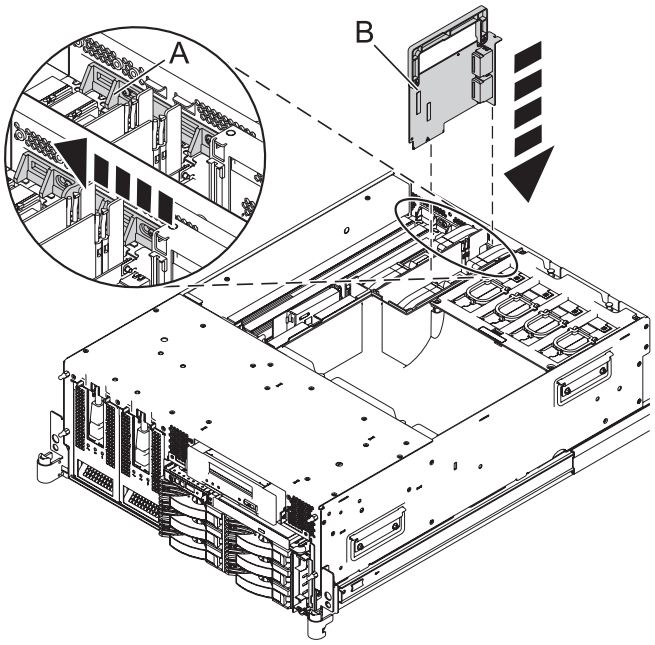
44. Install the GX adapter divider

1. Align the GX adapter divider **(A)** with its sliders **(B)** and **(C)**.
2. Slide the GX adapter divider down and into the system.



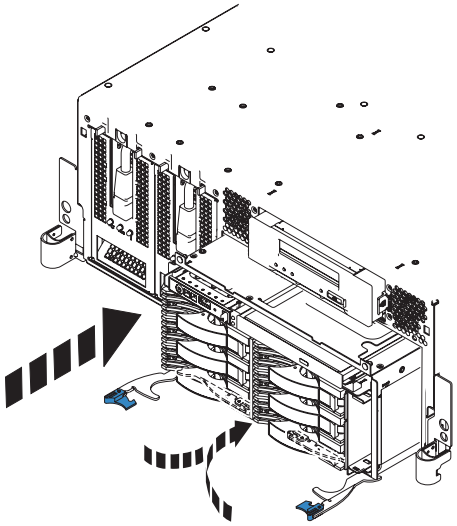
45. Install the Ethernet adapter

1. Check the latch **(A)** is in the open position to let the Ethernet adapter slot accessible.
2. Carefully grasp the Ethernet adapter **(B)** by its blue handle, and align the card with its connector on the system backplane.
3. Press the Ethernet adapter firmly into its connector.
4. Slide the latch **(A)** back in the direction of the arrow to secure the Ethernet adapter.



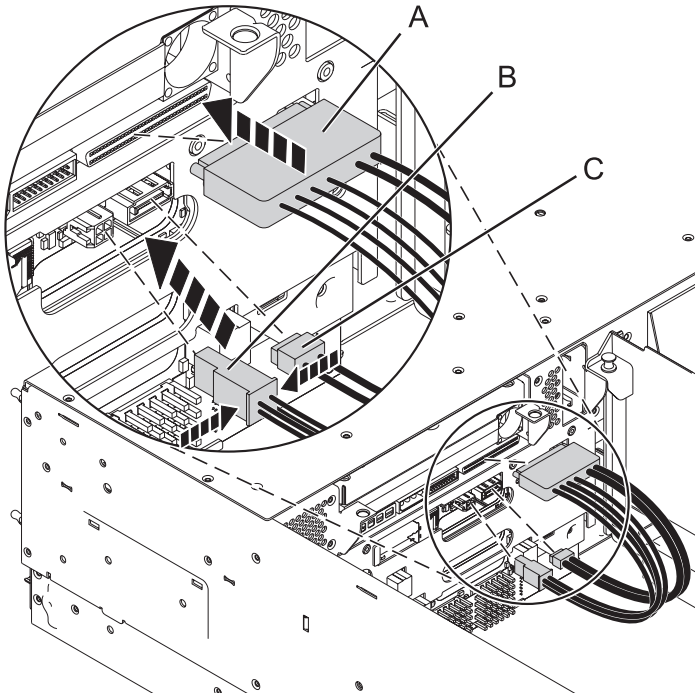
46. Install the disk unit cage and backplane

1. Slide the replacement disk unit cage and backplane into the system until you feel it engages and locks into place.
2. Rotate the handles in the direction shown to secure the disk unit cage and backplane.



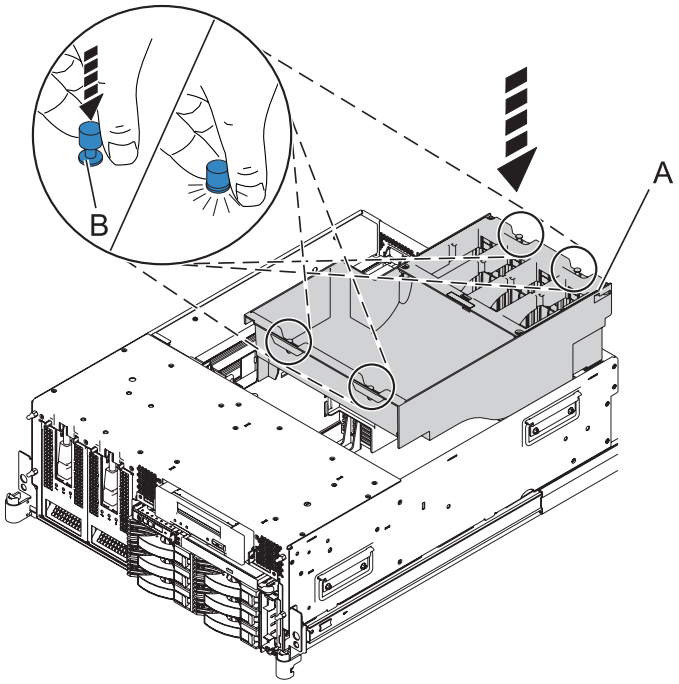
47. Connect the media device cables

1. Connect the media device cable **(A)** to its connector at the rear of the media device.
2. Media device cables **(B)** and **(C)** do not need to be touched here.



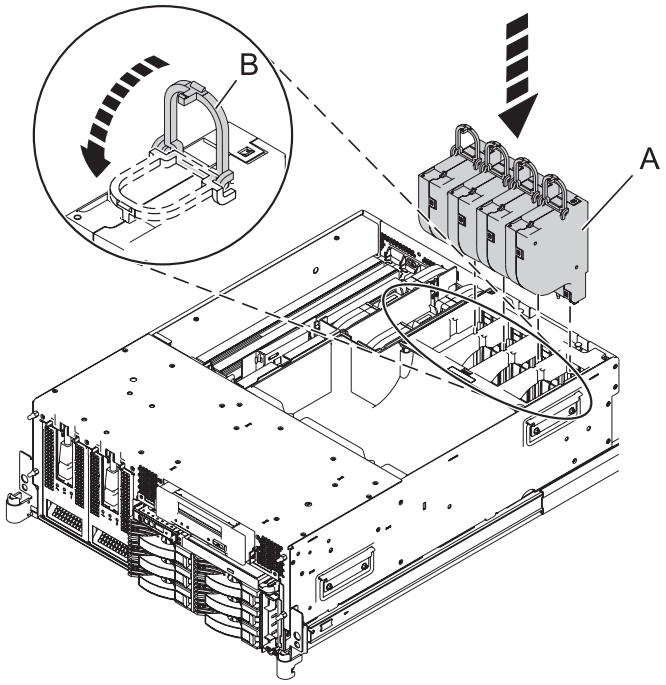
48. Install the fan cage

1. Check that the four retaining tabs are in open position.
2. Lower the fan cage **(A)** into its location on the enclosure, aligning the blue tabs with the holes.
3. Push firmly on the fan cage so that you are sure it fits into its position.
4. Tighten the four retaining tabs **(B)** securing the fan cage to its enclosure.



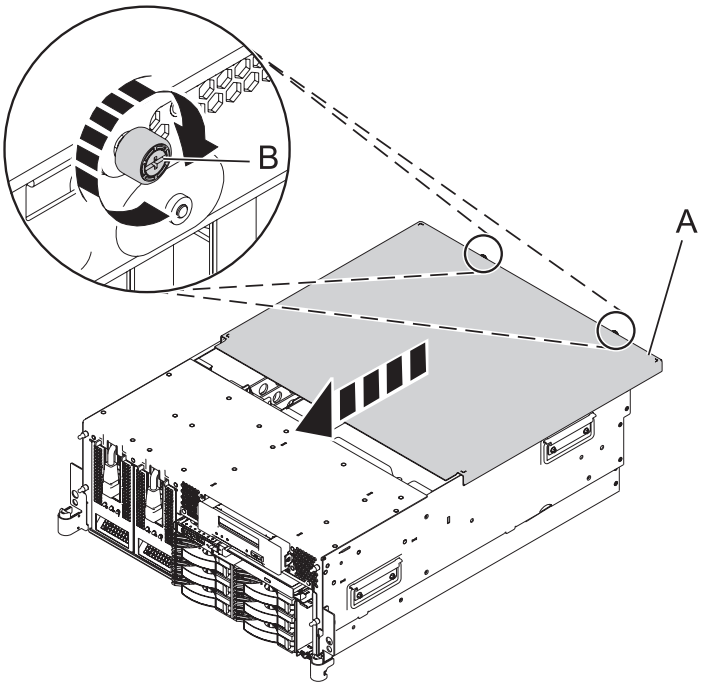
49. Install the fans

1. Lower the fan **(A)** into its location in the fan cage.
2. Push down on the fan until it locks into place.
3. Secure the fan by closing the latch **(B)**.
4. Repeat these steps until all fans are installed.



50. Install the service access cover

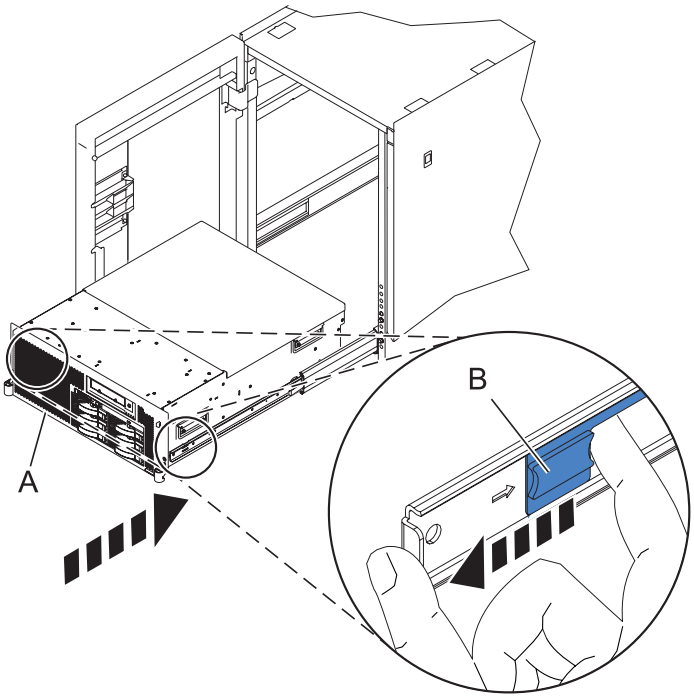
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



51. Place into operating position

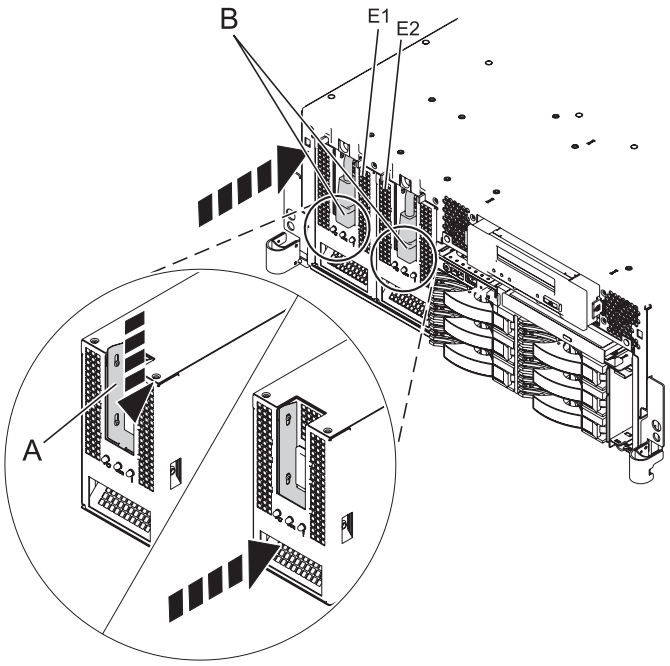
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



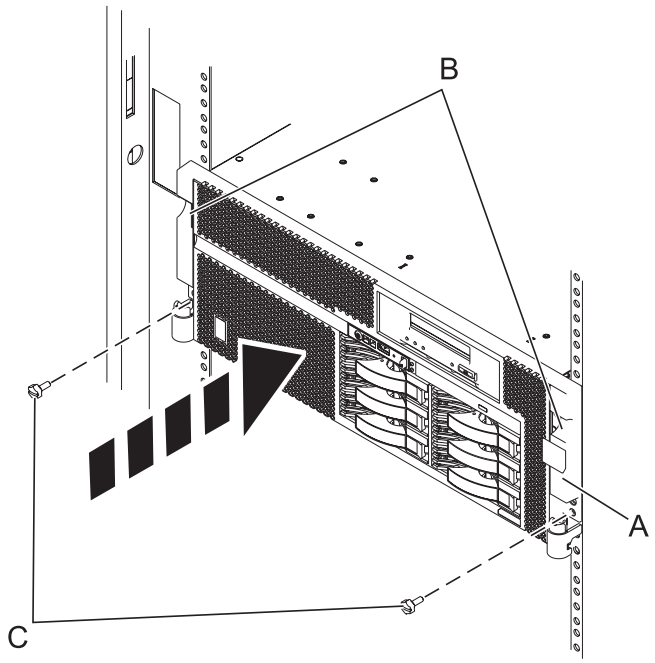
52. Install the power supply or both power supplies

1. While pushing the lever **(A)** down, carefully slide the power supply into its location either **E1** or **E2** in the system.
2. Connect the power cable **(B)** to the power supply.
3. Repeat these steps to install the other power supply, if present.



53. Install the front cover

1. Position the cover on the front of the system unit so that the two screws **(C)** align with the screw holes on the front of the system unit **(A)**.
2. Push the cover at points **(B)** to attach it to the front of the system unit as shown in the following figure.
3. Tighten the two screws that secure the system unit to the rack.
4. Close the front rack door.



54. Reconnect all the external cables

Attention: To prevent damaging the FRU or the system, use the following precautions before plugging cables into a connector or adapter:

- Make sure that you have the right type of cable for the connector or adapter.
- Make sure that the cable plug is correctly aligned with the connector or adapter.
- Make sure that the tongue on the HSL/RIO cable plug matches the white location keys on the connector.

External cables were labeled before disconnection so that they can be reconnected in exactly the same place after the repair.

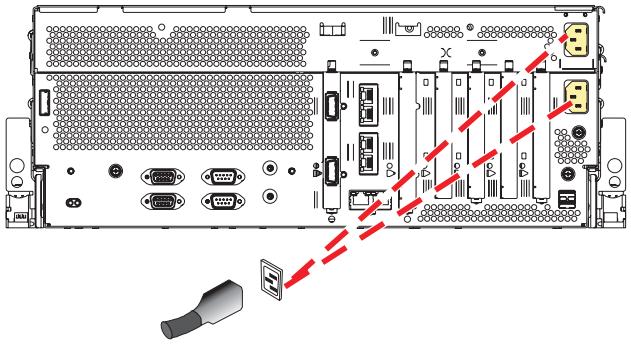
Reconnect all external cables to the rear of the machine you are servicing. This can include cables on the following ports:

1. Serial
2. SPCN
3. GX
4. Ethernet
5. PCI
6. USB

55. Install the power cords

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



56. Restore network connectivity

The service processor must connect to the network to be accessible from the HMC.

How will the IP Address of the Service Processor be managed?

Obtain an IP Address automatically from a DHCP server	Configure a static IP Address
↓	Go to step58 on page 147.

57. Restore service processor settings

Enable network access to the service processor by proceeding as follows:

If the network connection uses the Dynamic Host Configuration Protocol (DHCP) to establish an IP address, and uses the Hardware Management Console (HMC) as the DHCP server, no additional configuration is necessary to enable network access to the service processor. Perform the following steps:

1. Ensure that the service processor is connected to the existing service network by verifying that the HMC cable is connected to the HMC port on the system backplane.
2. If not already connected, connect all system power cables by plugging them into power outlets. **Note:** Do not start the system at this time.

Do you have network access to the service processor?

Yes	No
Go to step 60 on page 147.	Go to step 62 on page 148

58. Restore service processor settings through the ASMI

The Advanced System Management Interface (ASMI) is the interface to the service processor that is required to perform general and administrator-level service tasks, such as reading service processor error logs, reading vital product data, setting up the service processor, controlling the system power, and setting service processor network ports.

The ASMI may also be referred to as the service processor menus.

The ASMI can be accessed through https.

As the network connection uses static IP address assignments, perform the following:

1. To know your service processor network ports, if necessary, you can use the control panel in manual mode. Refer to service functions to get control panel documentation in that case.
2. Connect a client with a Web browser directly to the service processor network ports you previously noted. It could be something like the following URLs:
   - https://169.254.2.147
   - https://169.254.3.147
3. If not already connected, connect all system power cables by plugging them into power outlets.**Note:** Do not start the system at this time.
4. Log on to the ASMI with the ″admin″ **User ID** and ″admin″ default **Password**.
5. Change the ″admin″ User ID's **Password** and the ″general″ User ID's **Password** when prompted.
6. To configure network access perform the following:
   a. Click on **Network Configuration** under the **Network Services** node.
   b. On the right pane, configure **eth0** and **eth1** network interfaces, choose for **Type of IP Address** '**Static**', set a **Host name**, an **IP address**, a **Subnet mask**.

---

59. Restore service processor settings

With the network connection now configured to use static IP address assignments, try to access the service processor network ports.

Do you have network access to the service processor?

Yes	No
↓	Go to step 63 on page 148

---

60. Access the ASMI

If you are already connected to the ASMI, click **Next** to continue.

Otherwise to access the ASMI through the Hardware Management Console (HMC), complete the following steps:

1. Ensure that the server you are working with is selected.
2. Click **Tasks**.
3. Click **Operations**, then click **Advanced System Management (ASM)**.
   Note: If there is more than one service processor, you must select the primary service processor.

61.

Go to step 65 on page 149.

---

62. Restore service processor settings

If the network connection uses DHCP to establish an IP address, but does not use an HMC as the DHCP server, perform the following:

1. Complete any network configuration necessary to allow the DHCP server to recognize and assign an IP address to the service processor.
2. Ensure that the service processor is connected to the existing service network by verifying that the network cable is connected to the network port.
3. If not already connected, connect all system power cables by plugging them into power outlets. **Note:** Do not start the system at this time.

Do you have network access to the service processor?

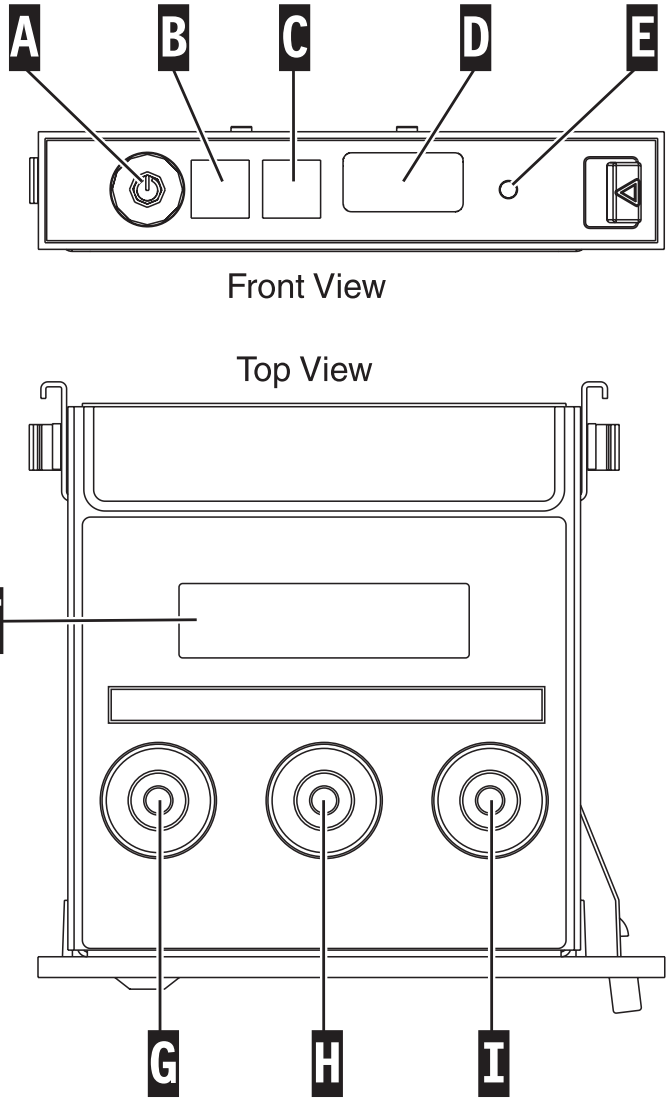
No	Yes
↓	Go to step 60 on page 147

---

63. Restore service processor settings

You have indicated that you are still not able to access the service network.

You will need to reset the service processor by pressing the pin-hole switch **(E)** on the operator panel.



64.

Go to step 56 on page 146.

---

65. **Restore service processor settings**

Change the password of the admin user ID when prompted by performing the following steps:

1. In the navigation area of the ASMI, expand **Login Profile**.
2. Select **Change Password** under **Login Profile**.
3. Specify the required information, and click **Continue**.

As a security measure, you are required to enter your current user password in the **Current password for current user ID** field.

Note: Passwords can be any combination of up to 64 alphanumeric characters. The default password for the admin **User ID** is admin. After your initial login to the ASMI, the admin password must be changed.

---

66. **Restore service processor settings**

Set the system name.

The system name can be changed to any valid ASCII string. It does not have to follow the initialized *machine type_model_serial number* format.

To change the system name, perform the following:

1. In the navigation area of the ASMI, expand **System Configuration**.
2. Select **System Name** under **System Configuration**.
3. Enter the desired system name.
4. Click **Save settings** to update the system name to the new value.

The new system name is displayed in the status frame, the area where the **Log out** button is located. If another method, such as the HMC, is used to change the system name, the status frame does not reflect the change.

---

67. **Restore service processor settings**

Set the time-of-day.

1. In the navigation area of the ASMI, expand **System Configuration**.
2. Select **Time of Day** under **System Configuration**.
3. If the system is powered off, the right pane displays a form that shows the current date (month, day, and year) and time (hours, minutes, seconds).
4. Change either the date or the time or both, and click **Save settings**.

---

68. **Restore service processor settings**

Reenter any of the following settings that were previously changed through the ASMI, unless you want to use the default settings. Settings to be set include the following:

1. **Power/Restart Control** settings.
2. **System Service Aids** settings.
3. **System Configuration** settings, if not already done.
4. **Network Services** settings.
5. **Performance Setup** settings.
6. **Login Profile** settings.

---

69. Restore service processor settings

1. Reset any service processor settings that you may have set using operating system commands. You recorded these settings at the beginning of this procedure.
2. If you choose to reset the **HMC Access password**, perform the following:
3.
   a. From the HMC GUI (preferred method):
   b.
      1) Expand the **Systems Management** folder in the navigation tree pane.
      2) Double click the **Servers** folder.
      3) Use the checkbox to select a server, in the central panel.
      4) Under the **Operations** folder, select **Change Password**.
      5) Provide the desired information.
   c.
   d. Or, from the HMC command line, type:
   e.

      /usr/hmcrbin/chsyspwd -m managedsystem -t access --passwd --newpasswd newpassword where:
      - The value for managedsystem is the new service processor's managed system name.
      - No value for --passwd is entered thereby allowing authentication.
      - The value for newpasswd is the newpassword value.

---

70. Restore partition data on the service processor, if you had a partition in your system

Profile data stored in the managed server has been cleared or corrupted.

To recover profile data using the HMC, proceed as follows:

1. Expand the **Systems Management** folder in the navigation tree pane.
2. Double click the **Servers** folder.
3. Use the checkbox to select a server, in the central panel.
4. In the **Configuration** folder if you have the **Manage Partition Data** folder, select **Restore**.

---

71. Update vital product data

If your system is running IBM i and is not managed by the HMC, you must update the load source after replacing the system backplane.

Note:

To update the load source without using the HMC, do the following:

1. Load the I_BASE_01 Licensed Internal Code optical media into the device that is defined for the system and access it to perform an initial program load (IPL).
   Note: This IPL can take several minutes.
2. When the Select a Language Group screen appears, press Enter to select the default language feature 2924 (English).
   Note: To change the language feature, type the language feature that appears on the media that contains the operating system; then, press Enter.

   Confirm the language feature by pressing Enter.
3. The Install Licensed Internal Code display appears; select **option 2** (Work with Dedicated Service Tools (DST)) and press Enter.

   Use the Dedicated Service Tools to make sure the disk units, including the Load Source, are reporting correctly and that there are no errors that might prevent the IPL from disk. When all errors have been resolved and the Load Source disk is reporting in correctly, continue with the next step.
4. From the Work with Dedicated Service Tools (DST) screen, select **option 2** (Work with disk units) and press Enter.
5. Select **option 8** (Update system vital product data) to identify the location of the load source disk unit. Press Enter.
6. The Update System Vital Product Data display appears. Press Enter to confirm that you want the vital product data to be written.
7. Press **F12** twice.
8. Press **1** and Enter to exit DST. Use the system control panel to perform a delayed power-off. Change the IPL mode to B; then, power on the system to perform an IPL from disk.

72.

Go to Chapter 2, “Verifying a repair,” on page 181.

Thermal power management device (TPMD) card

Use this procedure to service the thermal power management device (TPMD) card.

1. Shut down the partitions and power off the system

This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

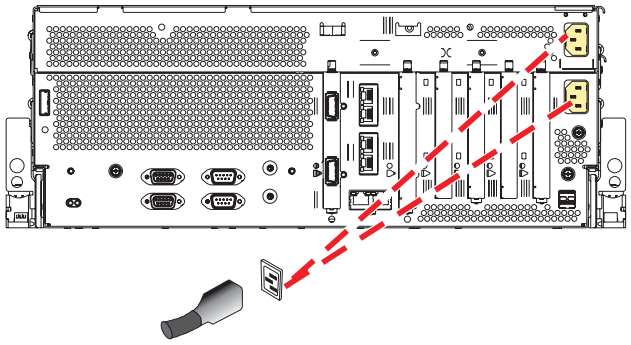
Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

---

2. Disconnect the power cords

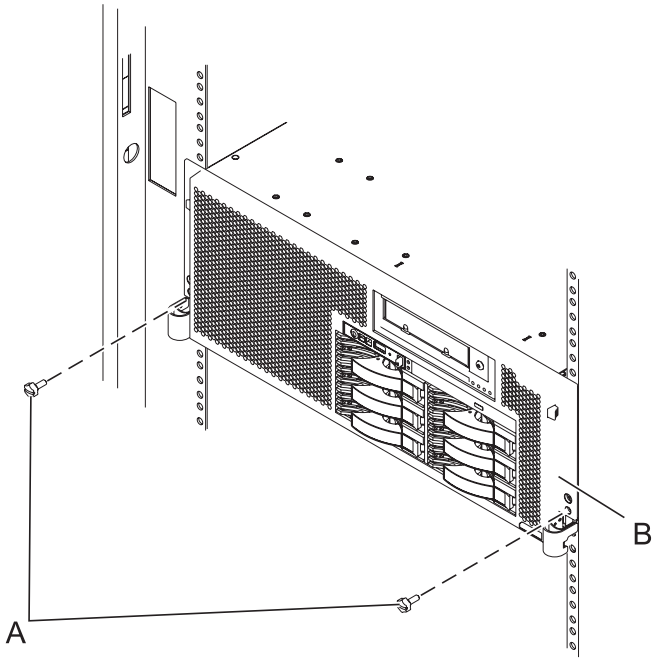
1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.



3. Place into service position

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Expansion unit users can still use this procedure. However, users of expansion units should ignore specific references to rack-only features, such as rack doors, rack thumbscrews, and rack-specific FRU orientation.

1. Open the front rack door.
2. Identify the system unit you are servicing in the rack.
3. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.

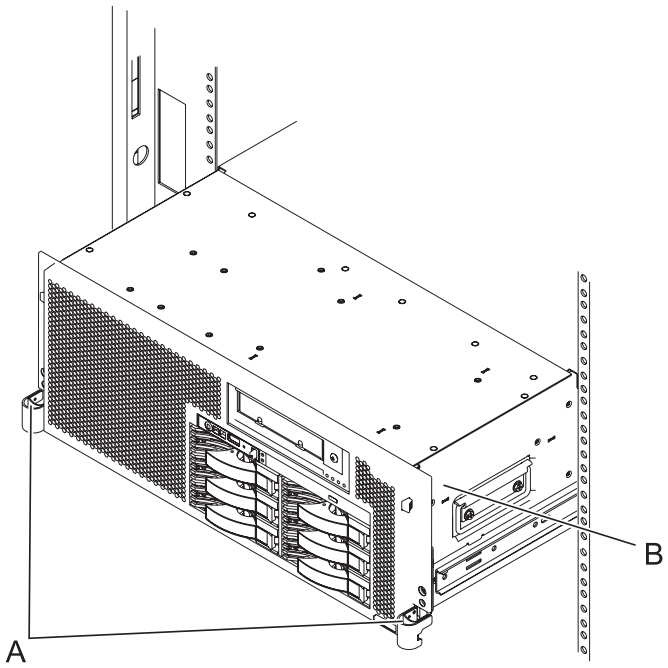


4. **Place into service position (continued)**

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.

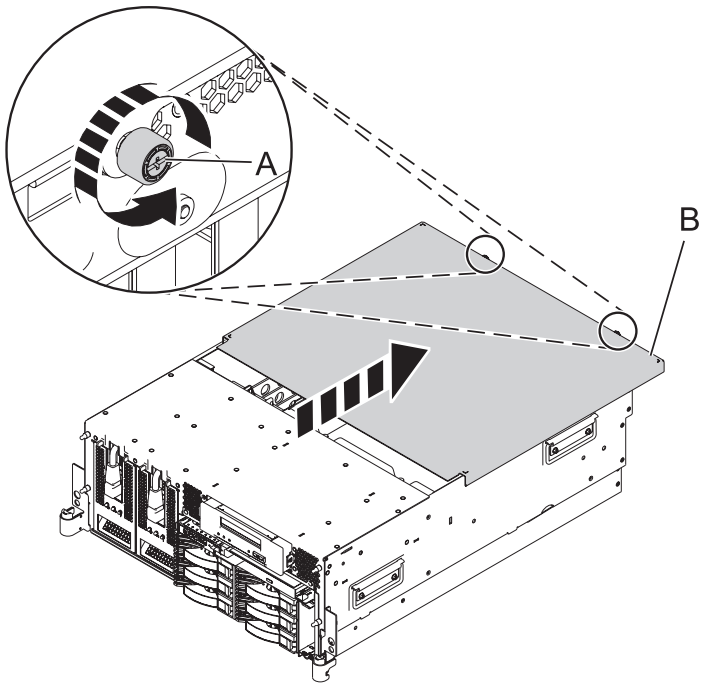


---

5. **Remove the service access cover**

1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



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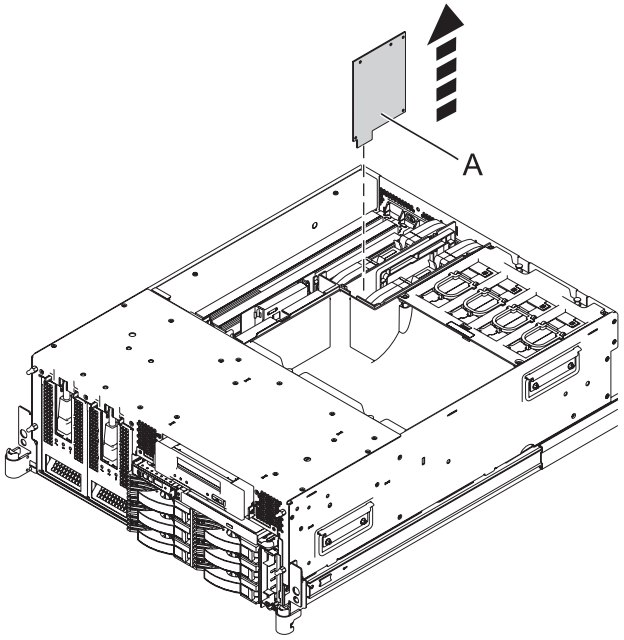
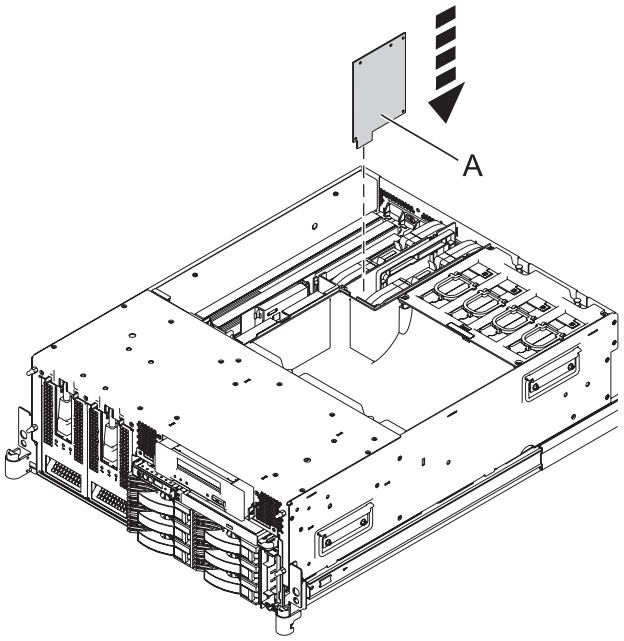
6. **Remove the TPMD card**

Gently pull the TPMD card **(A)** straight up and out of its slot on the system backplane.



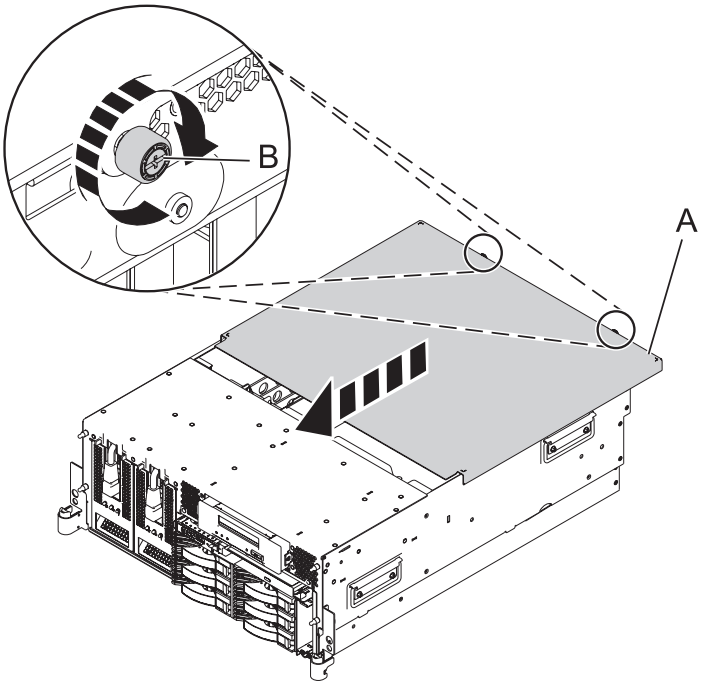
7. **Install the TPMD card**

Gently push the TPMD card **(A)** straight into its slot on the system backplane.



8. Install the service access cover

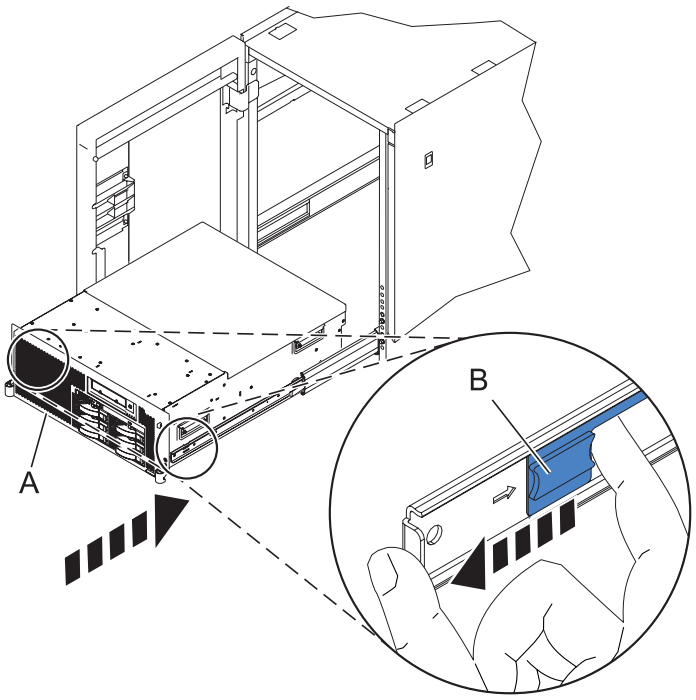
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



9. Place into operating position

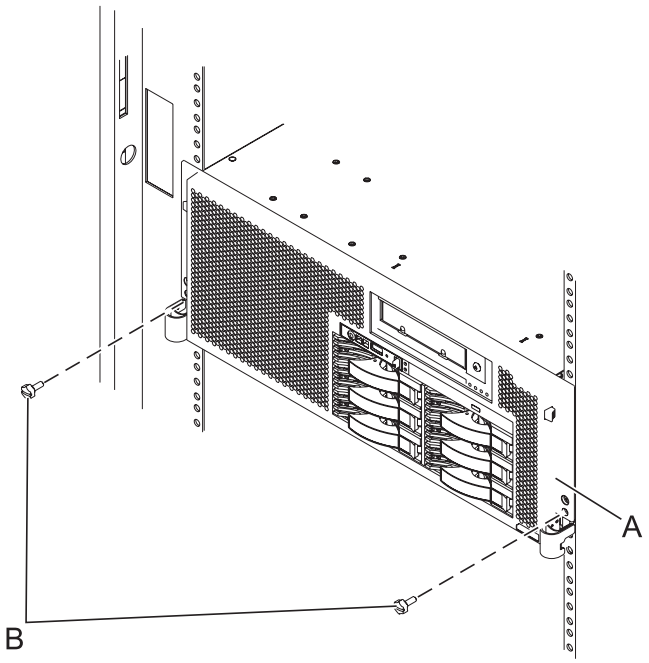
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



10. **Place into operating position (continued)**

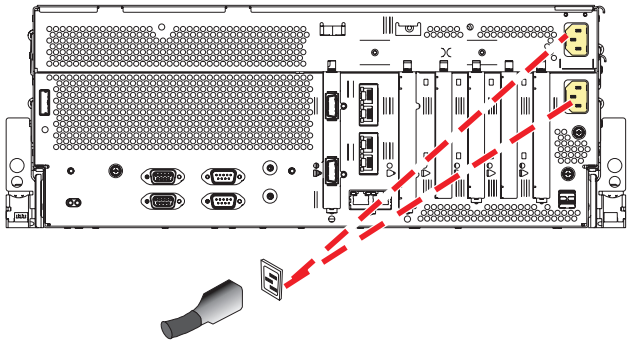
1. Replace and tighten the two screws **(B)** that secure the system unit **(A)** to the rack.
2. Close the front rack door of the unit you are servicing.



11. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



12.

Go to Chapter 2, “Verifying a repair,” on page 181.

Voltage regulator module (pair)

Use this procedure to service a pair of voltage regulator modules.

1. Shut down the partitions and power off the system

This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

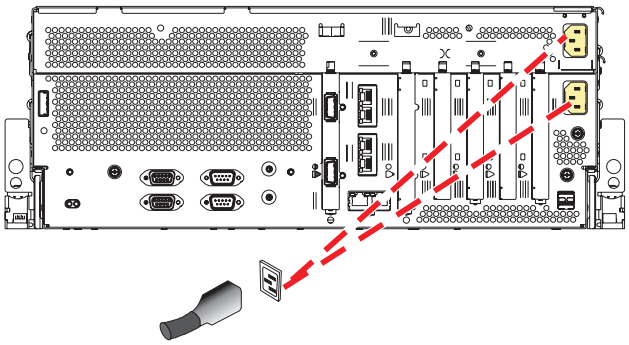
Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

---

2. Disconnect the power cords

1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.

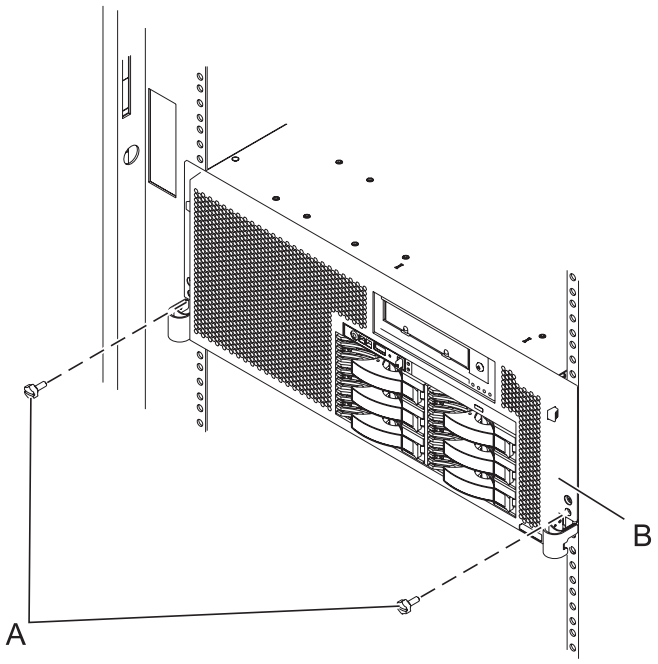


---

3. **Place into service position**

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Expansion unit users can still use this procedure. However, users of expansion units should ignore specific references to rack-only features, such as rack doors, rack thumbscrews, and rack-specific FRU orientation.

1. Open the front rack door.
2. Identify the system unit you are servicing in the rack.
3. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.

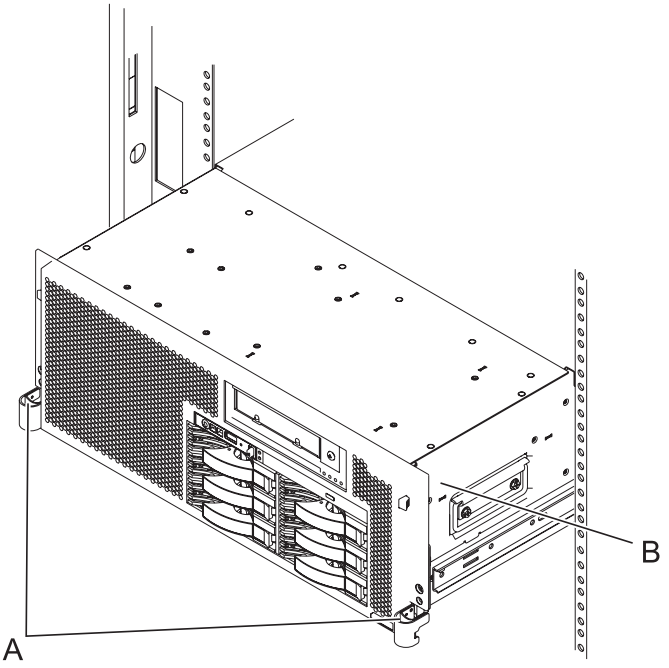


4. **Place into service position (continued)**

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

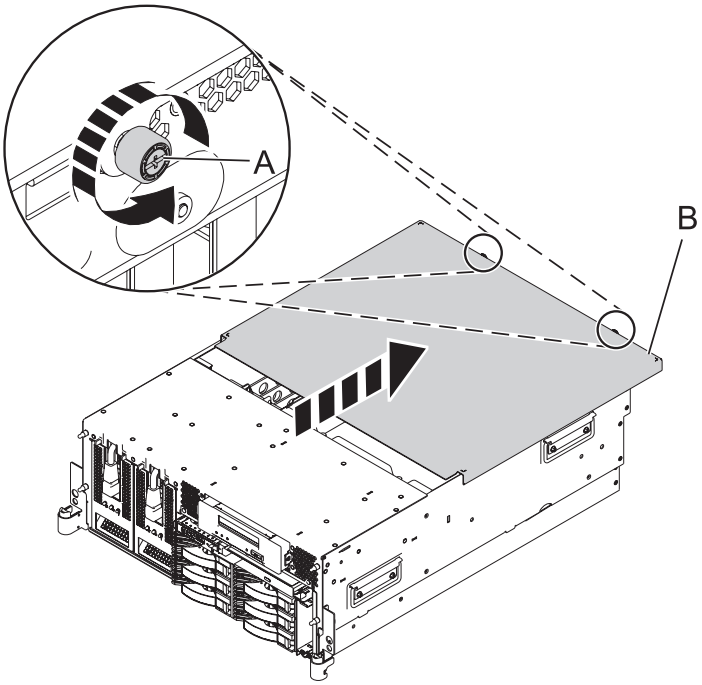
While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



5. Remove the service access cover

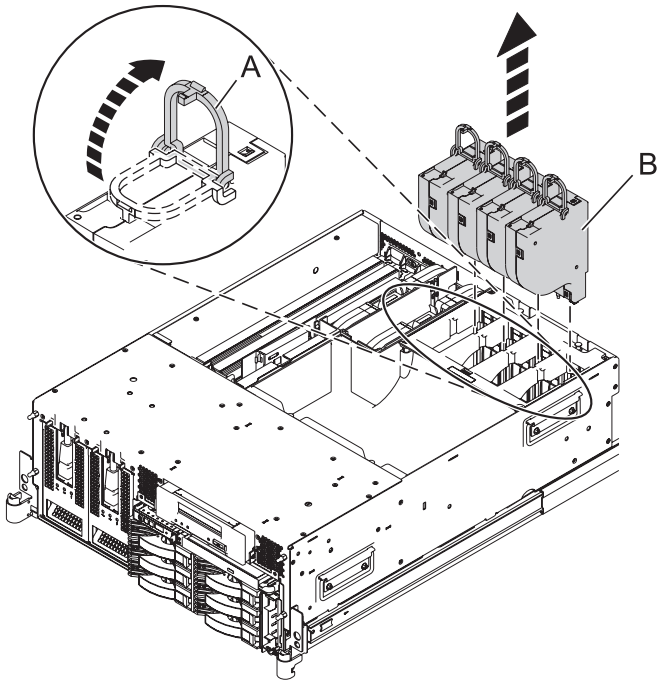
1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



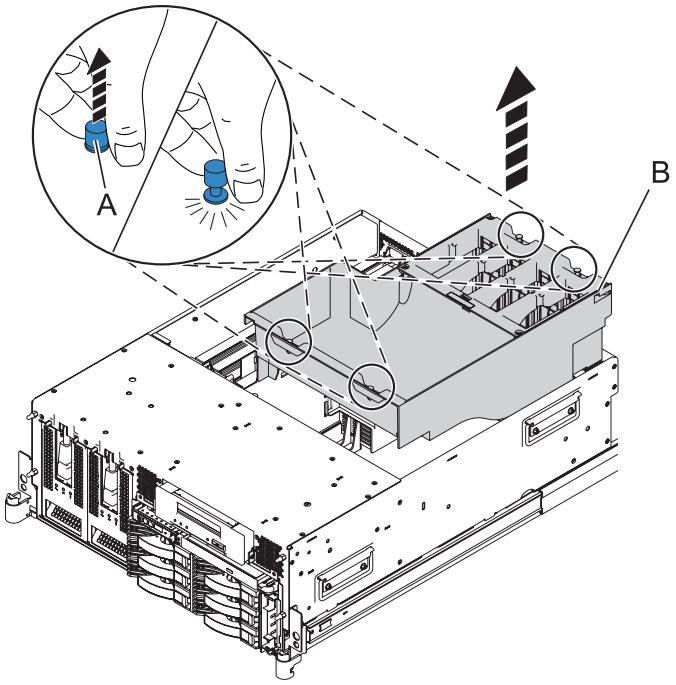
6. Remove the fans

1. Push the latch **(A)** upward to disengage the fan from the fan cage.
2. Pull the fan **(B)** out of the fan cage.
3. Repeat these steps until all fans are removed from the fan cage.



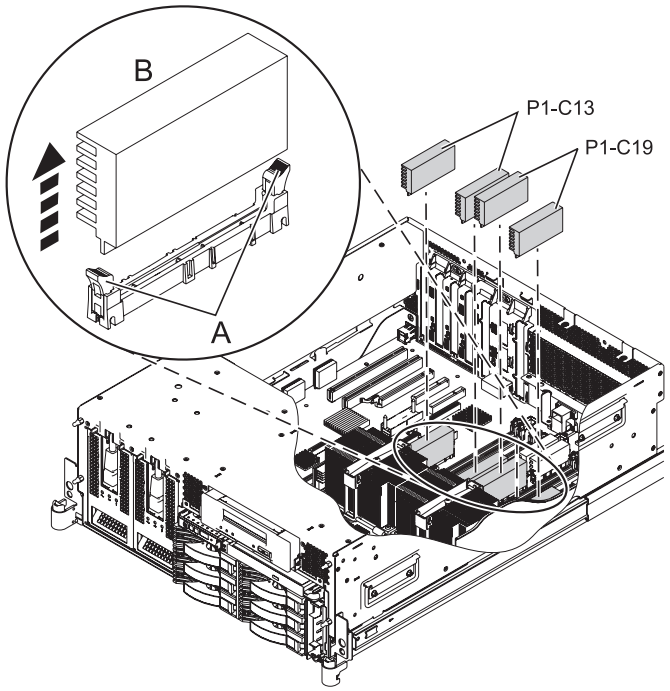
7. Remove the fan cage

1. Pull the four retaining tabs **(A)** that secure the fan cage to its enclosure.
2. Lift the fan cage **(B)** straight up and out of the enclosure.



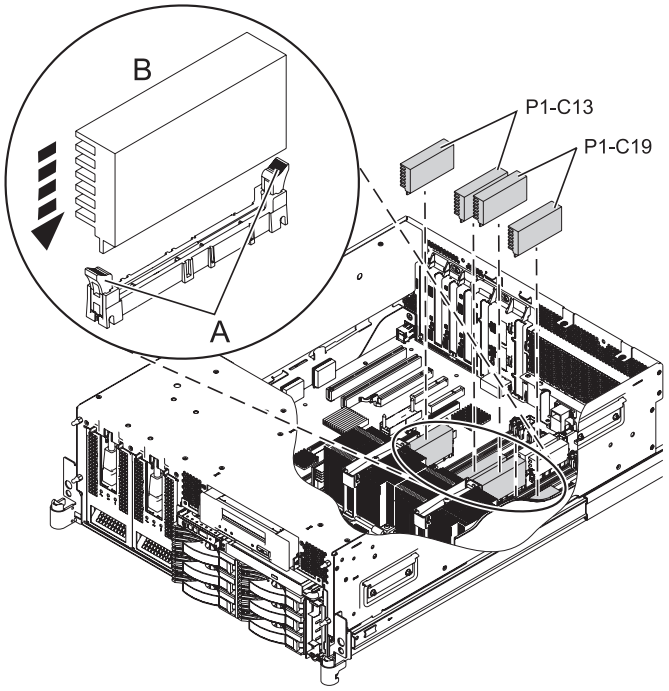
8. Remove the voltage regulator module pair

1. Locate the voltage regulator module pair. You will need to remove both voltage regulator modules of the pair.
2. Push the connector tabs **(A)** out and then down to unlock the module.
3. Pull the module **(B)** out of the connector.
4. Repeat these steps to remove the other module of the pair.



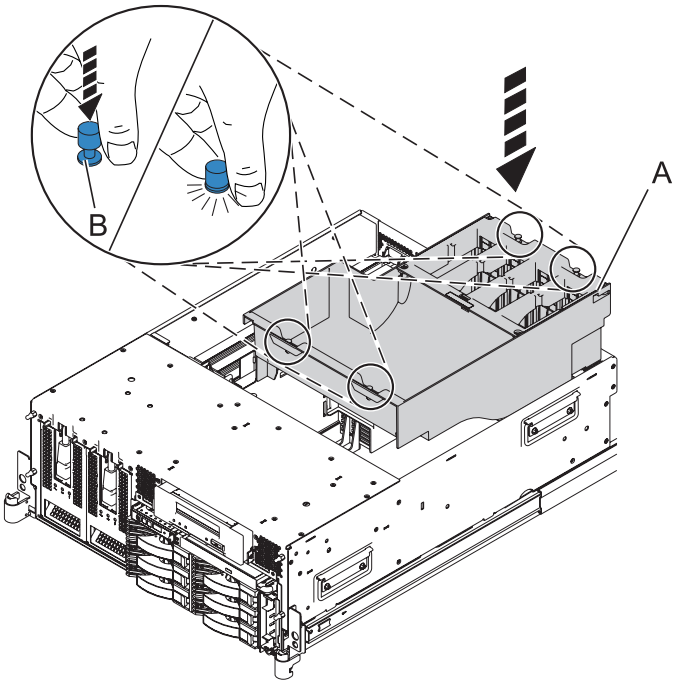
9. Install a voltage regulator module pair

1. Ensure that the connector tabs **(A)** are pushed out in the unlocked position before installing a new module.
2. Carefully grasp the module **(B)** along two edges and align it with the connector.
3. Insert the module into the connector.
4. Push the connector tabs into the locked position.
5. Repeat these steps to install the other voltage regulator module in the pair.



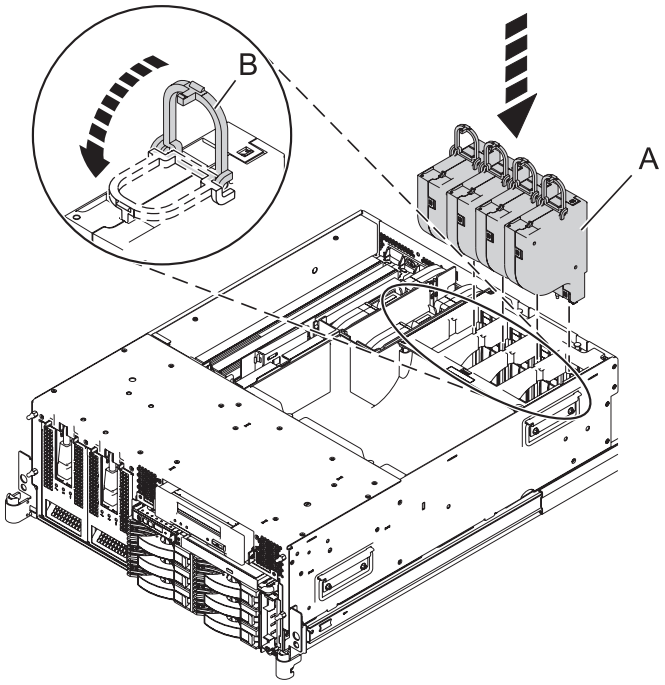
10. Install the fan cage

1. Check that the four retaining tabs are in open position.
2. Lower the fan cage **(A)** into its location on the enclosure, aligning the blue tabs with the holes.
3. Push firmly on the fan cage so that you are sure it fits into its position.
4. Tighten the four retaining tabs **(B)** securing the fan cage to its enclosure.



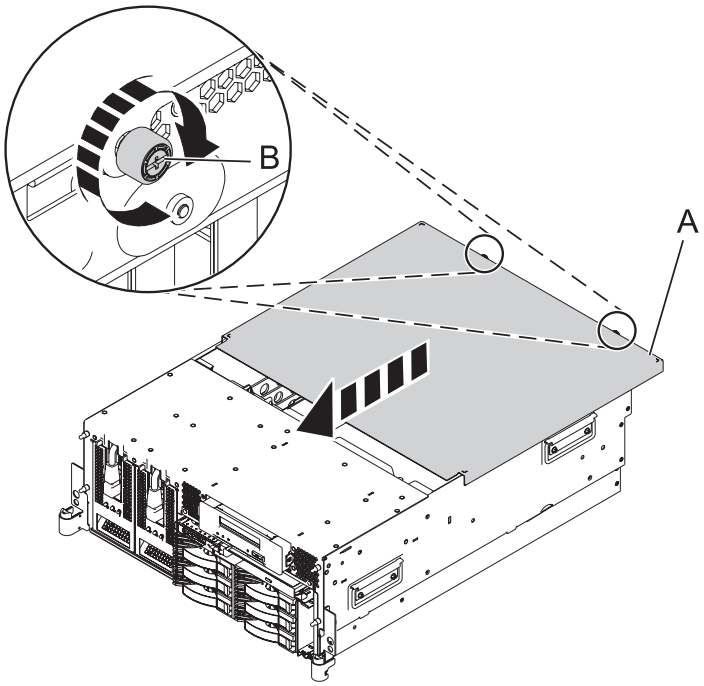
11. Install the fans

1. Lower the fan **(A)** into its location in the fan cage.
2. Push down on the fan until it locks into place.
3. Secure the fan by closing the latch **(B)**.
4. Repeat these steps until all fans are installed.



12. Install the service access cover

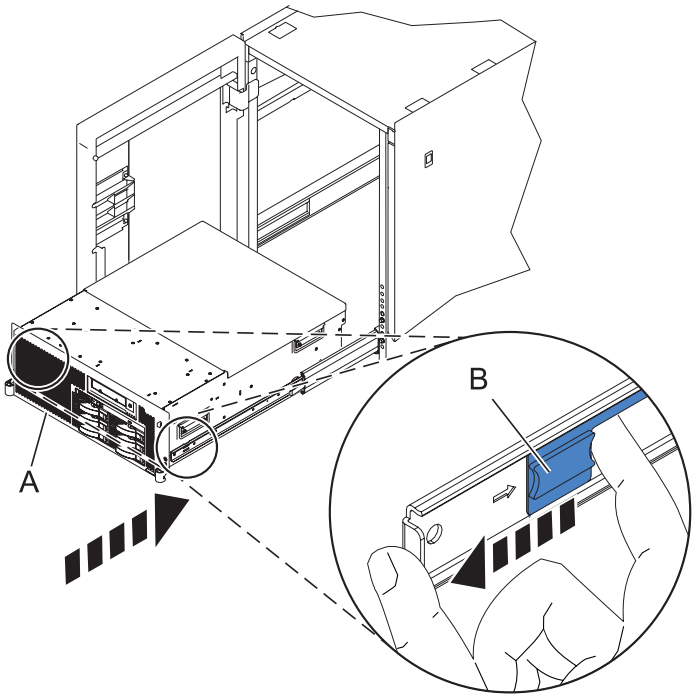
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



13. Place into operating position

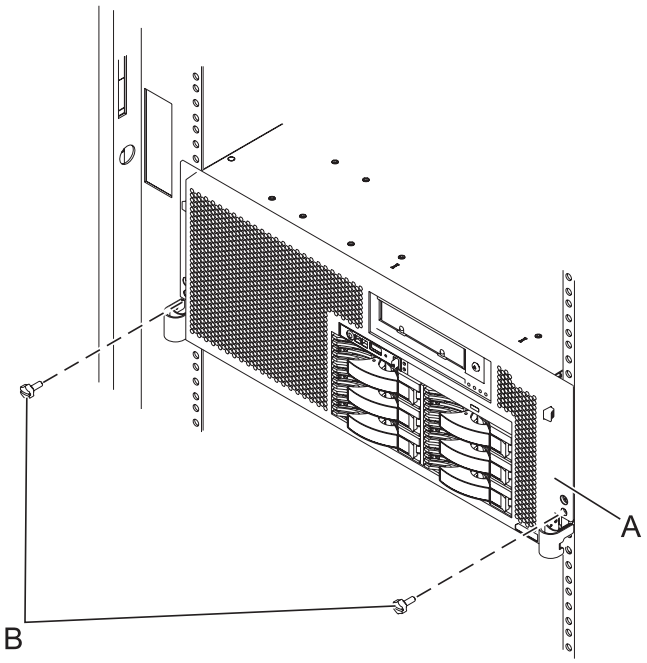
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



14. Place into operating position (continued)

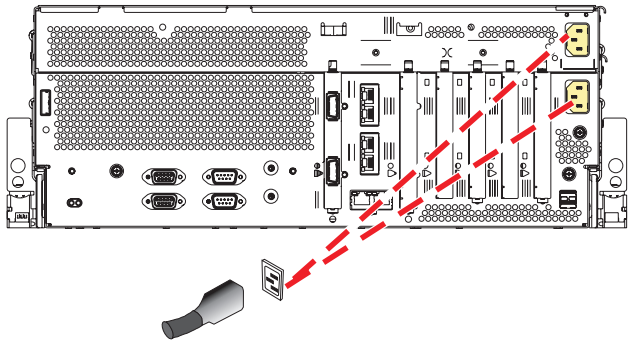
1. Replace and tighten the two screws **(B)** that secure the system unit **(A)** to the rack.
2. Close the front rack door of the unit you are servicing.



15. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



16.

Go to Chapter 2, “Verifying a repair,” on page 181.

Voltage regulator module (single)

Use this procedure to service a single voltage regulator module.

1. **Shut down the partitions and power off the system**

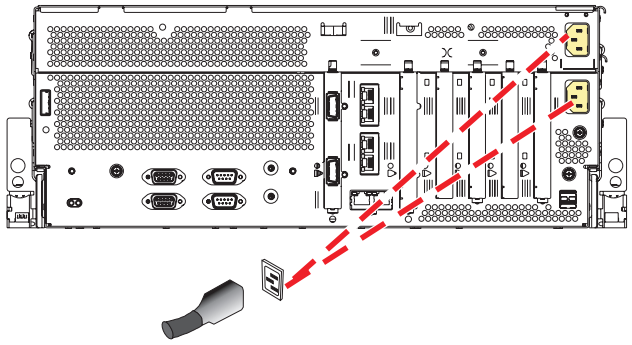
This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

2. Disconnect the power cords

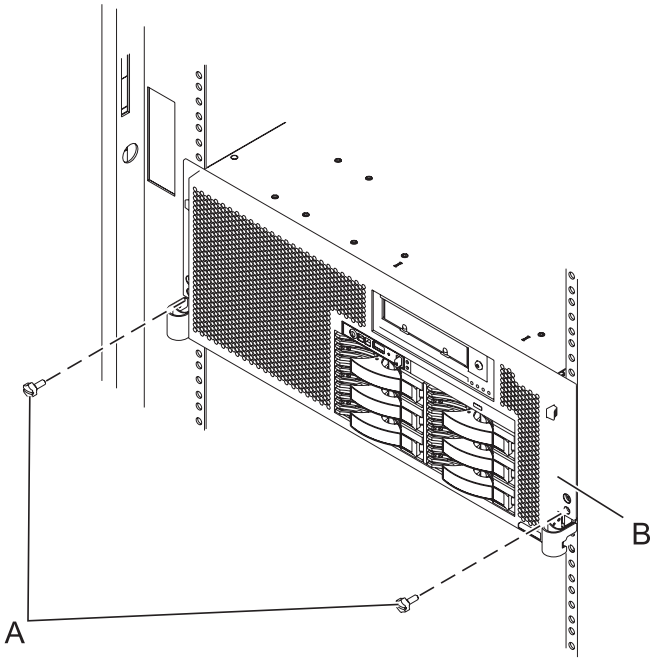
1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.



3. Place into service position

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Expansion unit users can still use this procedure. However, users of expansion units should ignore specific references to rack-only features, such as rack doors, rack thumbscrews, and rack-specific FRU orientation.

1. Open the front rack door.
2. Identify the system unit you are servicing in the rack.
3. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.

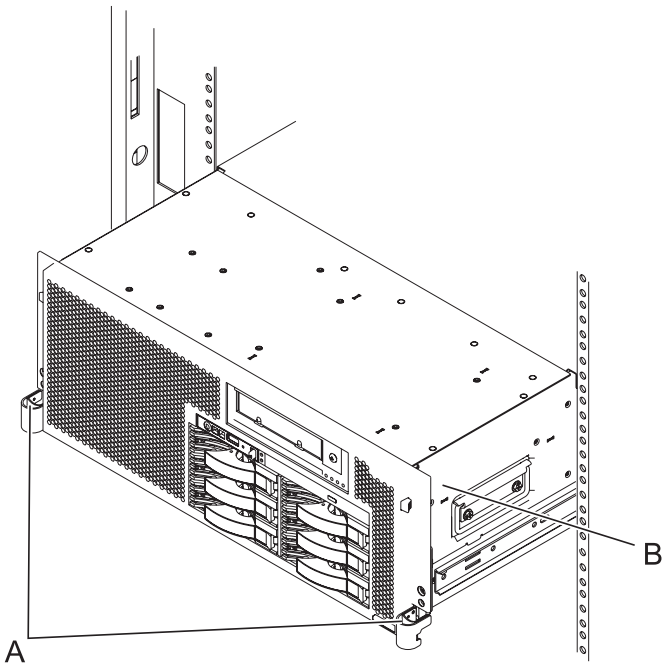


4. **Place into service position (continued)**

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

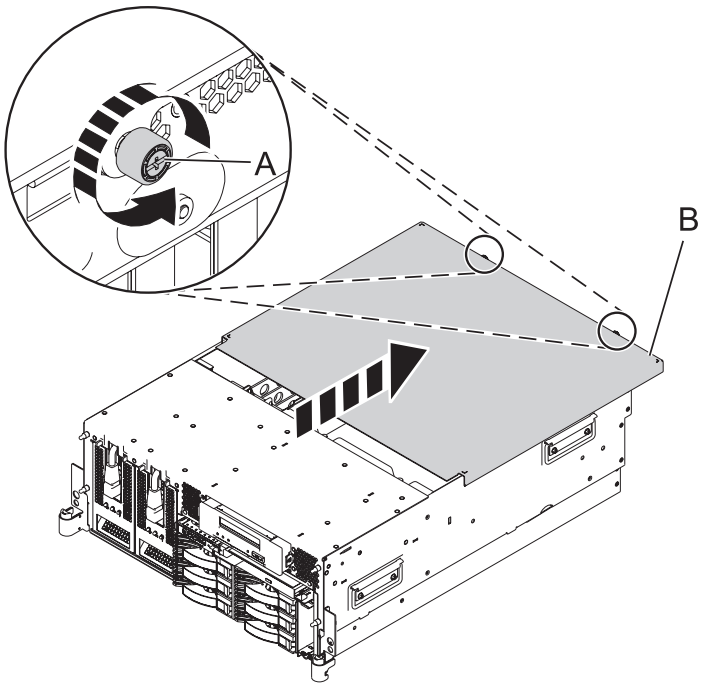
While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



5. **Remove the service access cover**

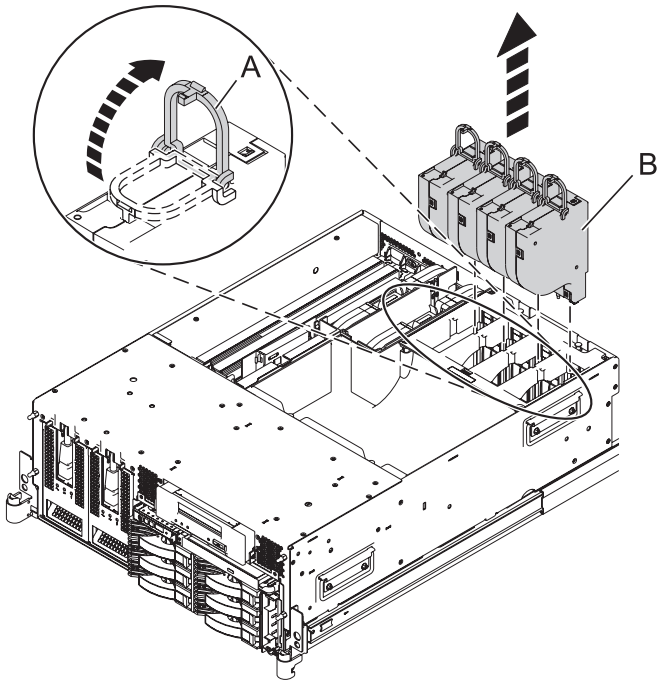
1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



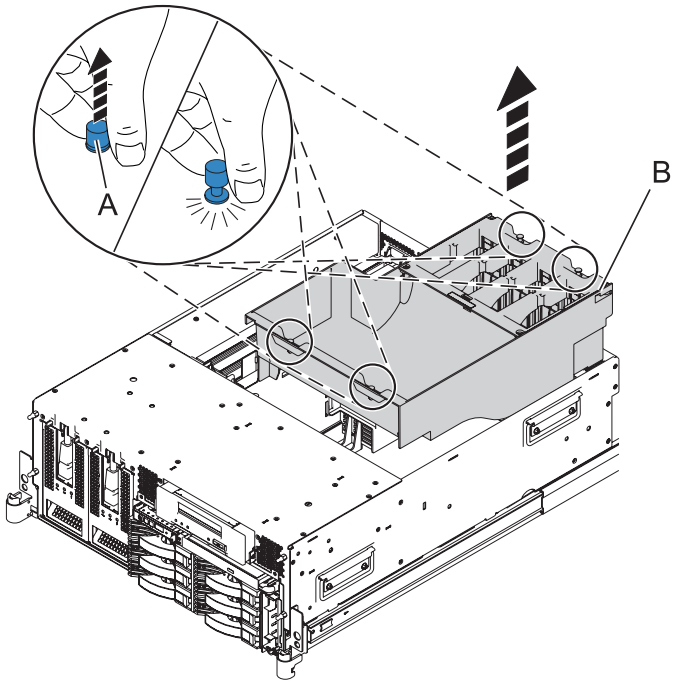
6. Remove the fans

1. Push the latch **(A)** upward to disengage the fan from the fan cage.
2. Pull the fan **(B)** out of the fan cage.
3. Repeat these steps until all fans are removed from the fan cage.



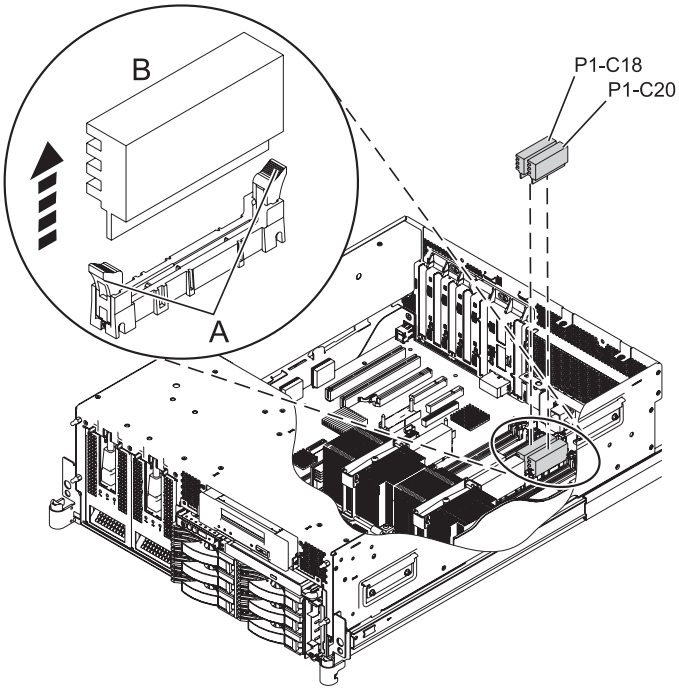
7. Remove the fan cage

1. Pull the four retaining tabs **(A)** that secure the fan cage to its enclosure.
2. Lift the fan cage **(B)** straight up and out of the enclosure.



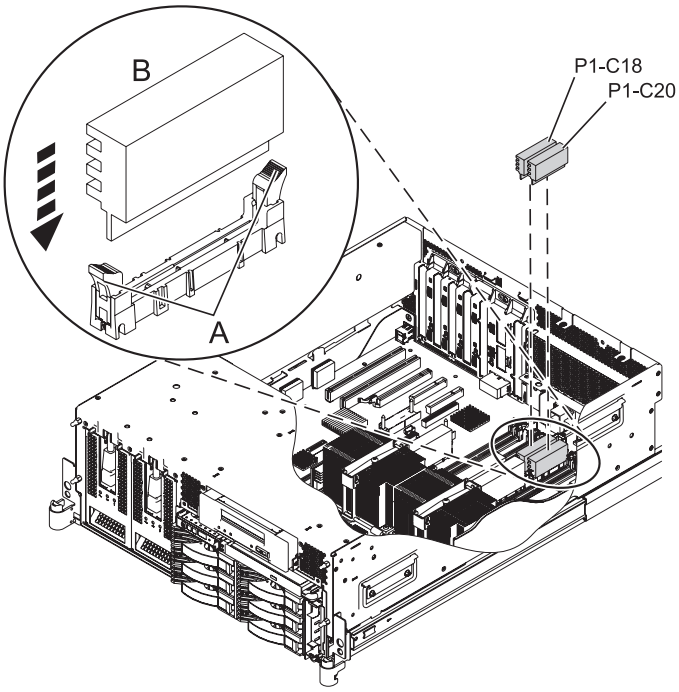
8. Remove a single voltage regulator module

1. Locate the voltage regulator module.
2. Push the connector tabs **(A)** out and then down to unlock the module.
3. Pull the module **(B)** out of the connector.



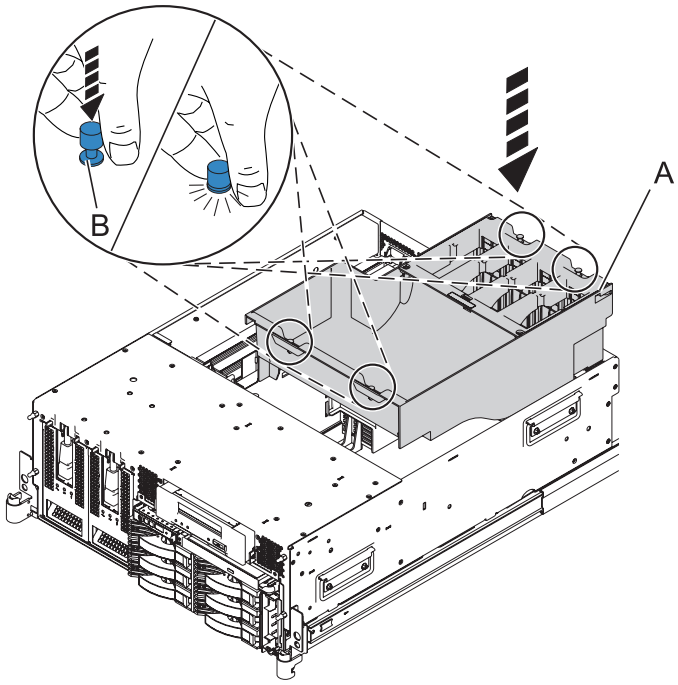
9. Install a single voltage regulator module

1. Ensure that the connector tabs **(A)** are pushed out in the unlocked position before installing a new voltage regulator module.
2. Carefully grasp the module **(B)** along two edges and align it with the connector.
3. Insert the module into the connector.
4. Push the connector tabs into the locked position.



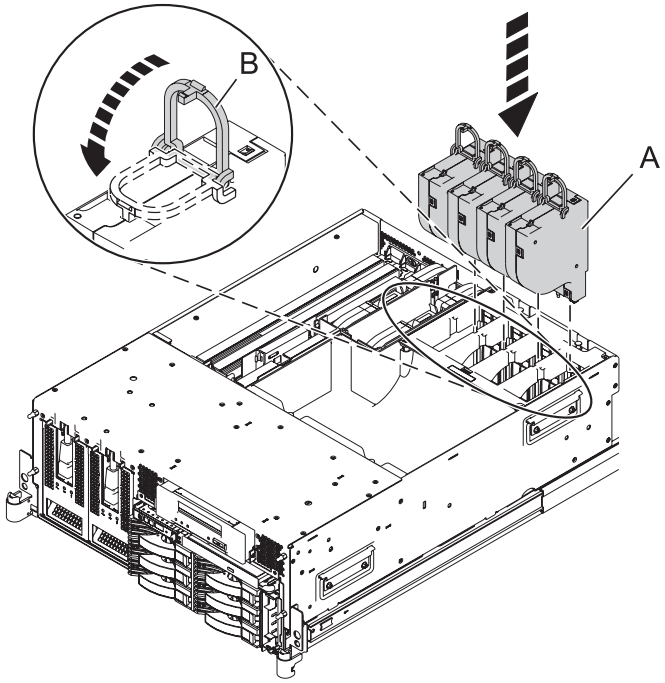
10. Install the fan cage

1. Check that the four retaining tabs are in open position.
2. Lower the fan cage **(A)** into its location on the enclosure, aligning the blue tabs with the holes.
3. Push firmly on the fan cage so that you are sure it fits into its position.
4. Tighten the four retaining tabs **(B)** securing the fan cage to its enclosure.



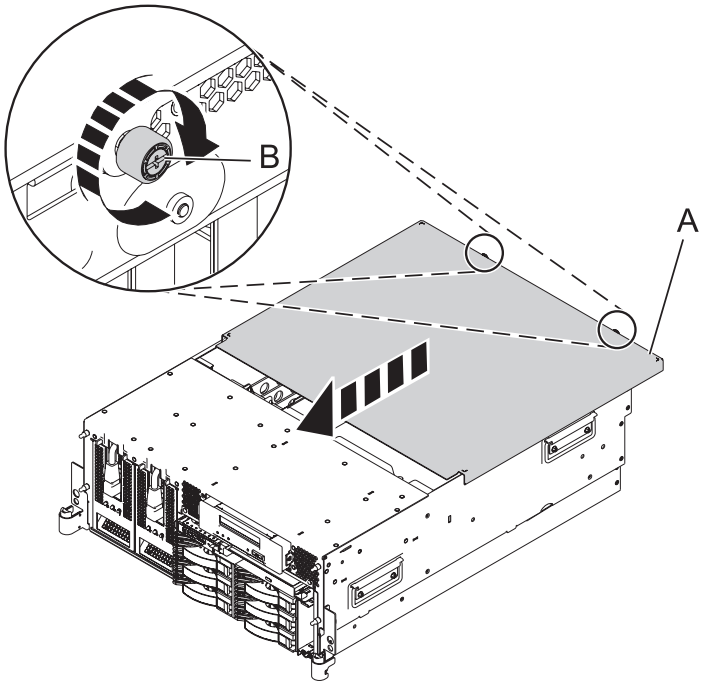
11. Install the fans

1. Lower the fan **(A)** into its location in the fan cage.
2. Push down on the fan until it locks into place.
3. Secure the fan by closing the latch **(B)**.
4. Repeat these steps until all fans are installed.



12. Install the service access cover

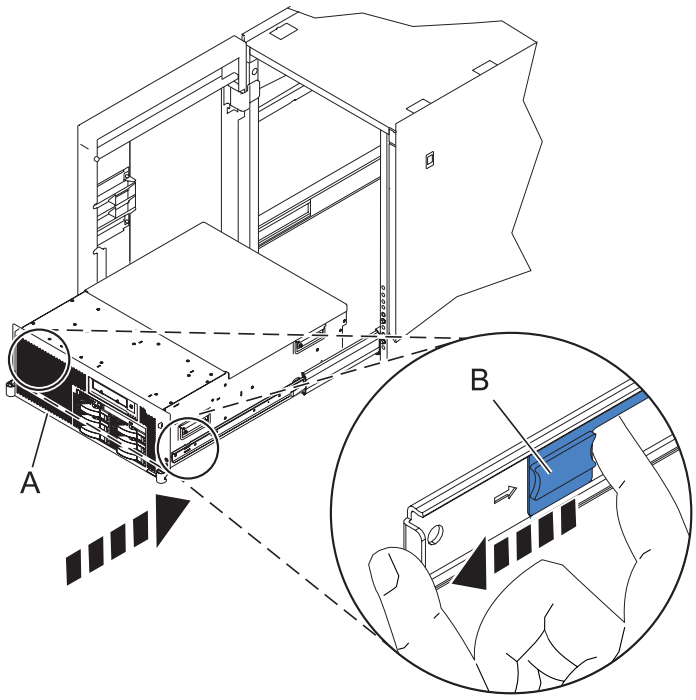
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



13. Place into operating position

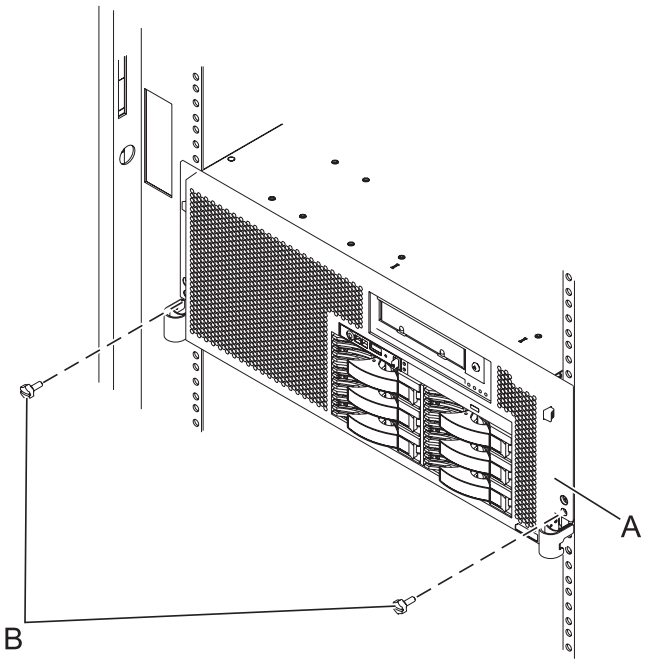
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



14. **Place into operating position (continued)**

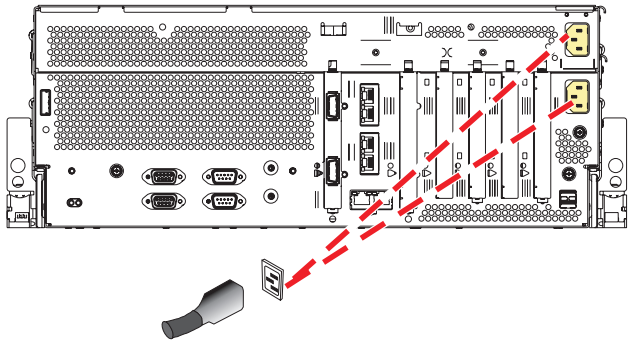
1. Replace and tighten the two screws **(B)** that secure the system unit **(A)** to the rack.
2. Close the front rack door of the unit you are servicing.



15. **Install the power cords**

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



16.

Go to Chapter 2, “Verifying a repair,” on page 181.

Vital product data (VPD) card

Use this procedure to service the vital product data (VPD) card.

1. Save the system identifiers

1. On the ASMI Welcome pane, if you have not already logged in, specify your userid and password, and click **Log in**.

   Note: To perform this operation, your authority level must be Administrator or Authorized service provider.
2. In the navigation area, expand **System Configuration** and then **Program Vital Product Data**.
3. In the navigation area, select **System Brand** under **Program Vital Product Data**.
4. Manually record the value for the System Brand, which appears in the right pane.
5. In the navigation area, select **System Keywords** under **Program Vital Product Data**.
6. Manually record the values for the **Machine type-model**, **System serial number** and **System unique ID**, which appear in the right pane.

---

2. Shut down the partitions and power off the system

This FRU cannot be serviced concurrently. Every partition must be shut down and the system powered off to continue the repair.

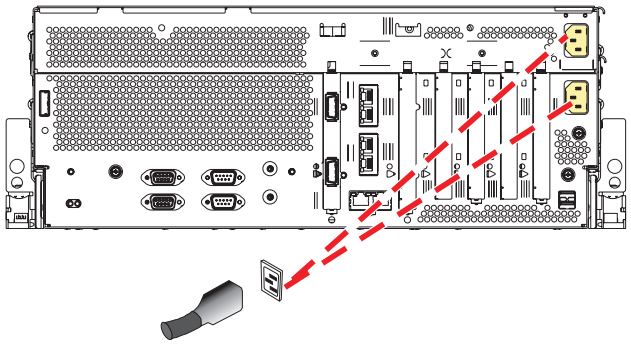
Authorization **must come from the customer** to shut down all running partitions and power off the system.

If the customer will not allow the partitions to be shut down or the system to be powered off, delay the service procedure. If the customer is using a secondary HMC to manage the system, make sure they are not powering on the system at this time.

---

3. Disconnect the power cords

1. Open the back rack door on the unit you are servicing.
2. Identify the system unit you are servicing in the rack.
3. Disconnect all power cords from the unit you are servicing.



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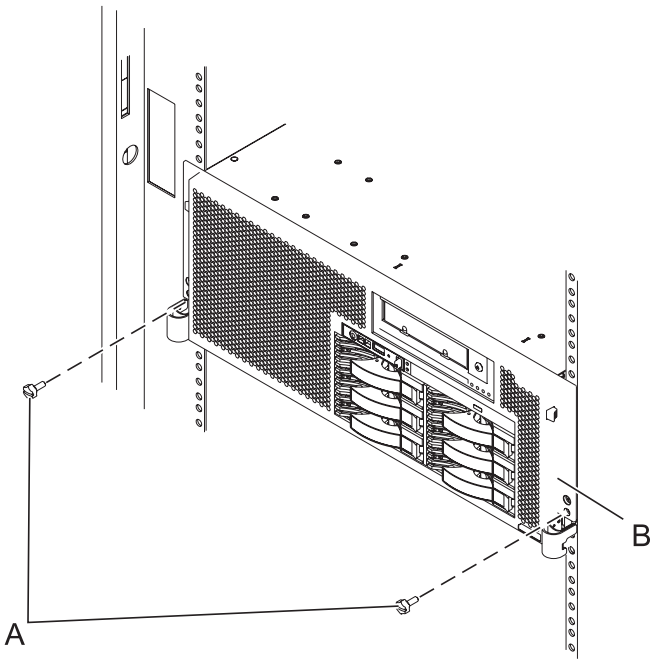
4. Place into service position

Note to expansion unit users: The instructions in this procedure are written based on the rack model. Expansion unit users can still use this procedure. However, users of expansion units should ignore specific references to rack-only features, such as rack doors, rack thumbscrews, and rack-specific FRU orientation.

1. Open the front rack door.
2. Identify the system unit you are servicing in the rack.
3. Remove the two screws **(A)** (if present) that secure the system unit **(B)** to the rack.

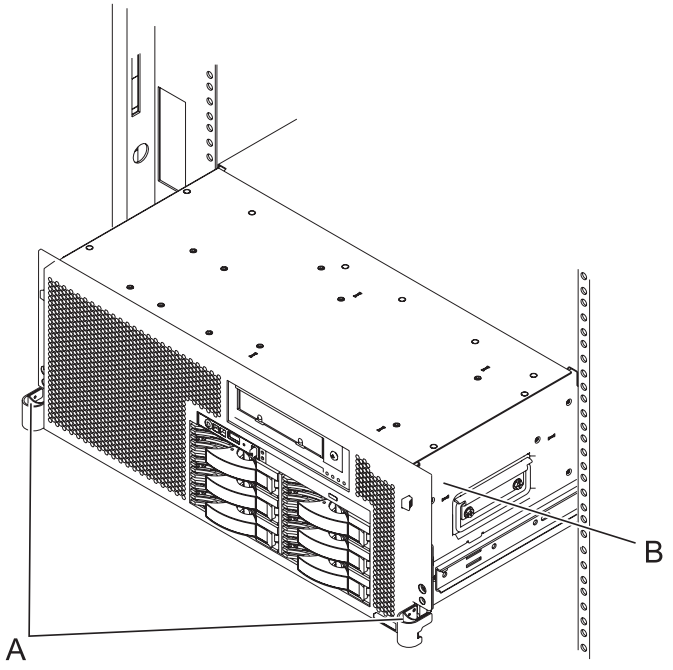


5. Place into service position (continued)

Notes:

1. When placing the system into the service position, it is essential that all stability plates are firmly in position to prevent the rack from toppling. Ensure that only one system unit is in the service position at a time.
2. Ensure that the cables at the back of the system unit do not catch or bind as you pull the unit forward in the rack.
3. When the system unit rails are fully extended, the rail safety latches lock into place. This action prevents the system from being pulled out too far.

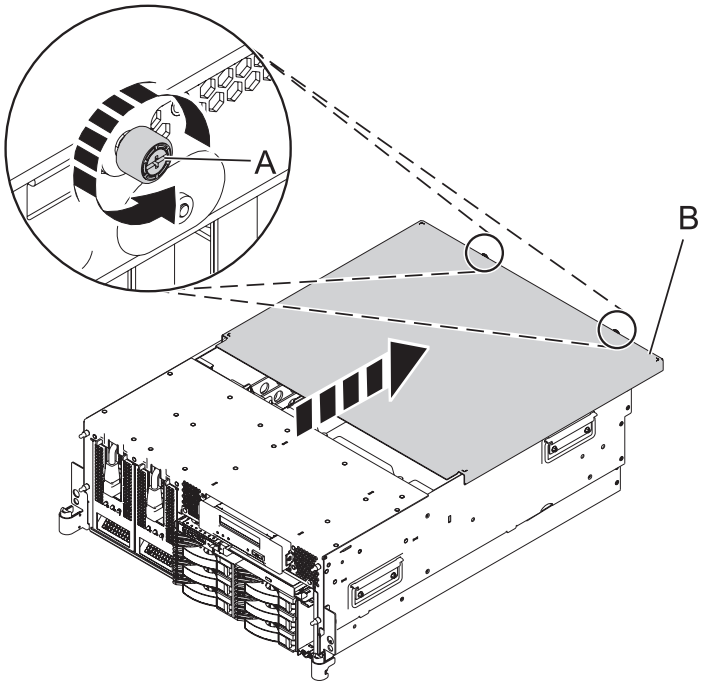
While holding the system unit release latches **(A)** down on both the left and right sides, pull the system unit **(B)** out from the rack until the rails are fully extended and locked.



6. Remove the service access cover

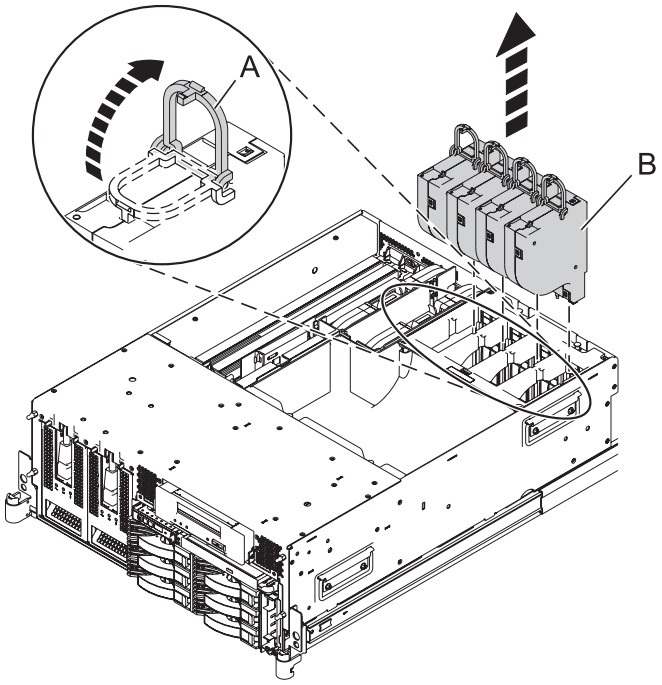
1. Loosen the two thumbscrews **(A)** located at the back of the cover.
2. Slide the cover **(B)** toward the back of the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.

Attention: For proper cooling and air flow, re-install the cover before turning on the system. Operating the system without the cover for more than 30 minutes could damage the system components.



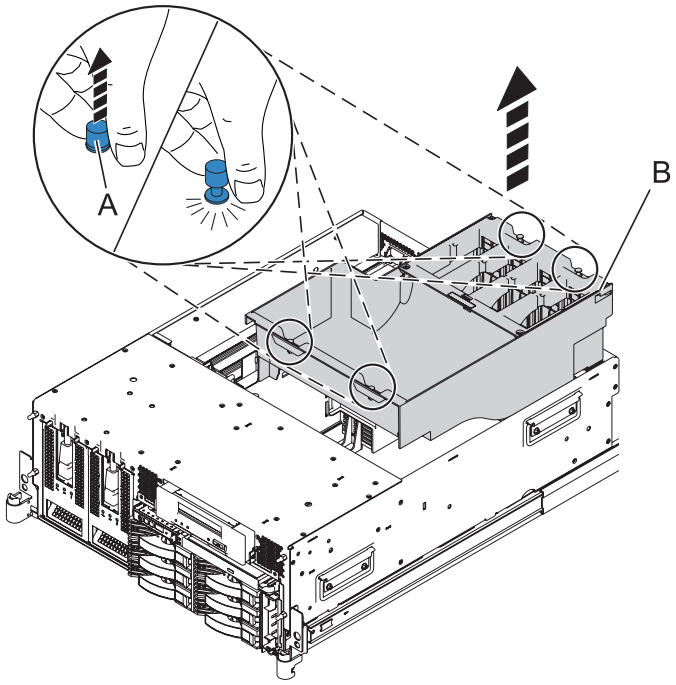
7. Remove the fans

1. Push the latch **(A)** upward to disengage the fan from the fan cage.
2. Pull the fan **(B)** out of the fan cage.
3. Repeat these steps until all fans are removed from the fan cage.



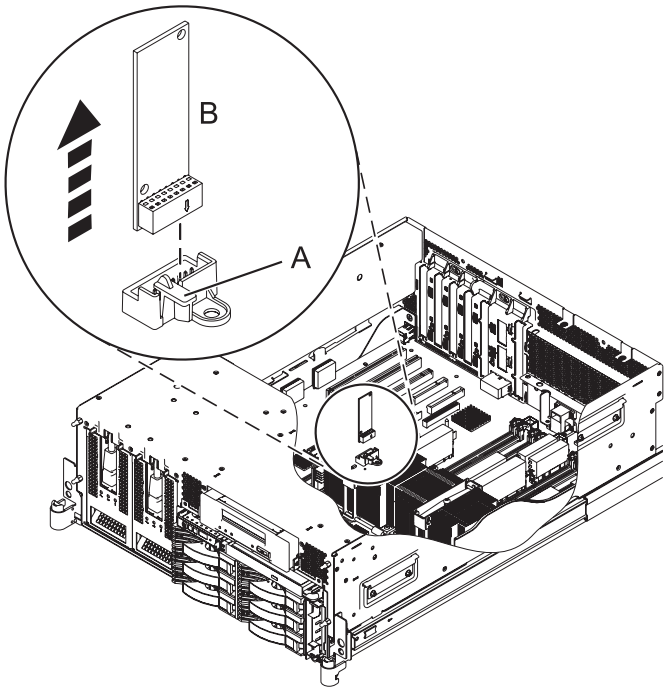
8. Remove the fan cage

1. Pull the four retaining tabs **(A)** that secure the fan cage to its enclosure.
2. Lift the fan cage **(B)** straight up and out of the enclosure.



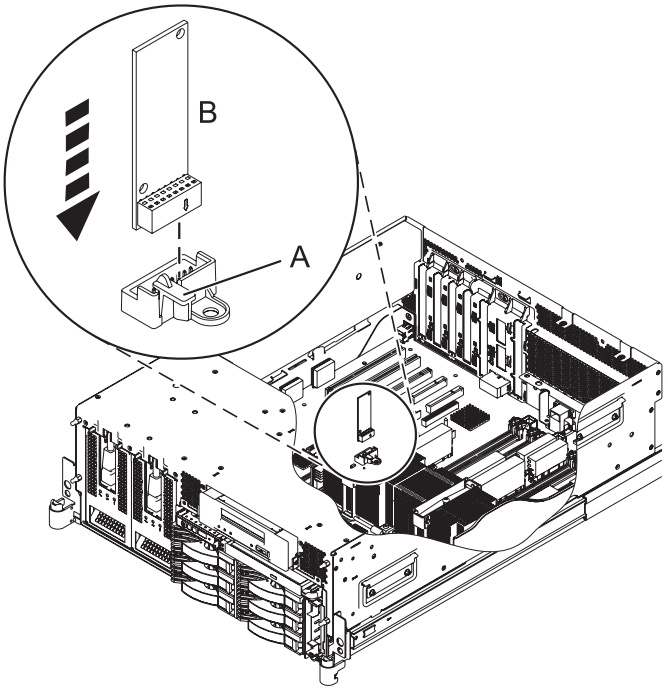
9. Remove the VPD card

1. Press gently on the handle **(A)** to unlock the VPD card **(B)** from its slot on the system backplane.
2. Pull the VPD card out of its slot.



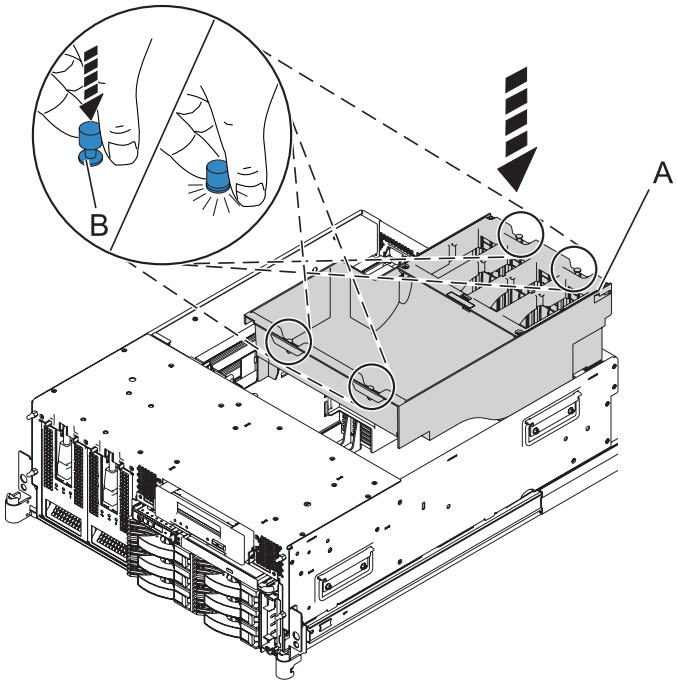
10. Install the VPD card

1. Press gently on the handle **(A)** to insert the VPD card **(B)** into its slot on the system backplane.
2. Push the VPD card into place until it is fully seated.



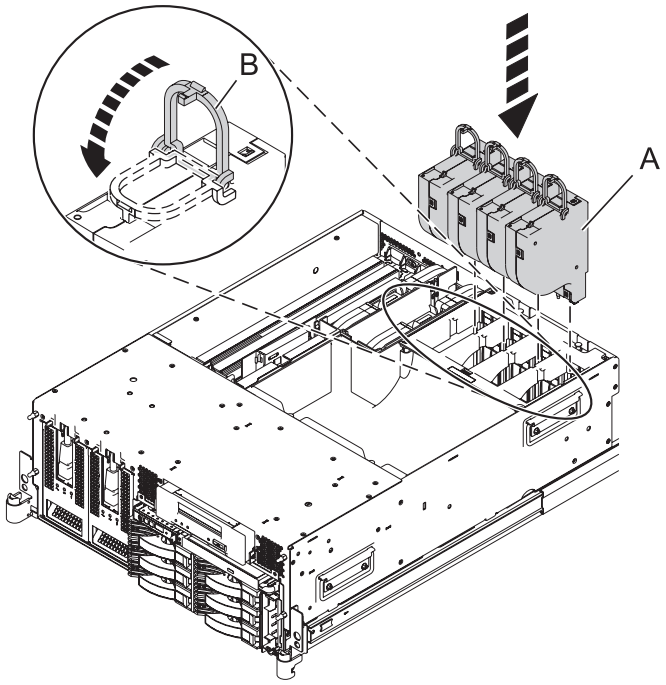
11. Install the fan cage

1. Check that the four retaining tabs are in open position.
2. Lower the fan cage **(A)** into its location on the enclosure, aligning the blue tabs with the holes.
3. Push firmly on the fan cage so that you are sure it fits into its position.
4. Tighten the four retaining tabs **(B)** securing the fan cage to its enclosure.



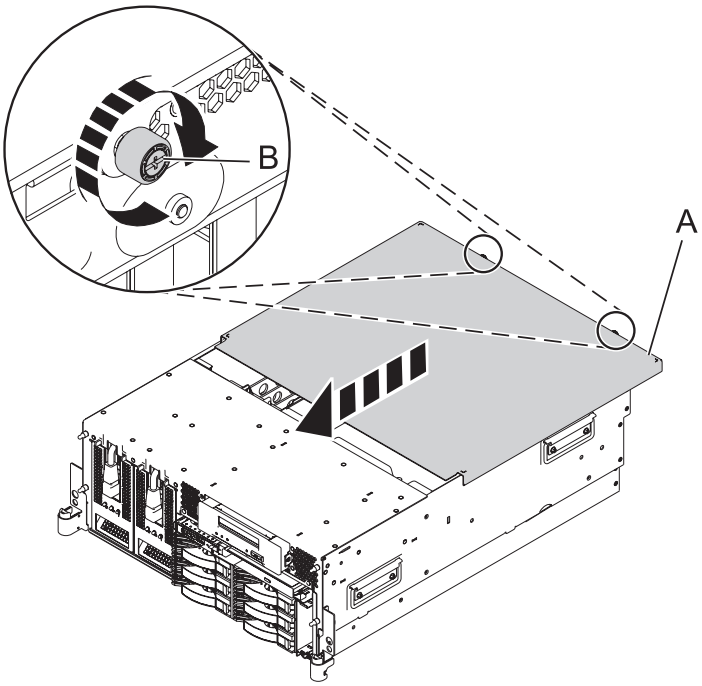
12. Install the fans

1. Lower the fan **(A)** into its location in the fan cage.
2. Push down on the fan until it locks into place.
3. Secure the fan by closing the latch **(B)**.
4. Repeat these steps until all fans are installed.



13. Install the service access cover

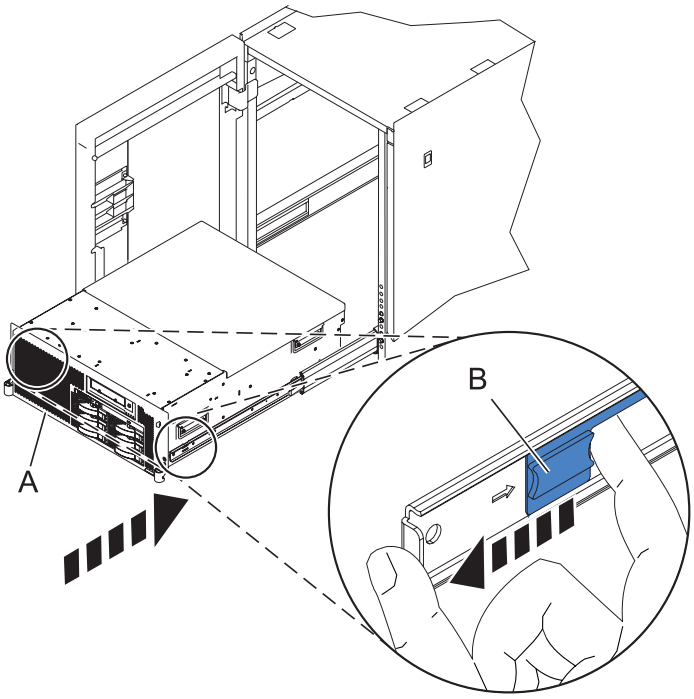
1. Place the service access cover **(A)** on top of the system, about 25 mm (1 in.) from the upper chassis ledge.
2. Hold the service access cover against the system unit and slide it toward the front of the system. The tabs of the service access cover slide beneath the upper chassis ledge.
3. Align the two thumbscrews **(B)** located on the back of the service access cover with the two holes on the back of the system chassis.
4. Tighten the thumbscrews to secure the service access cover.



14. Place into operating position

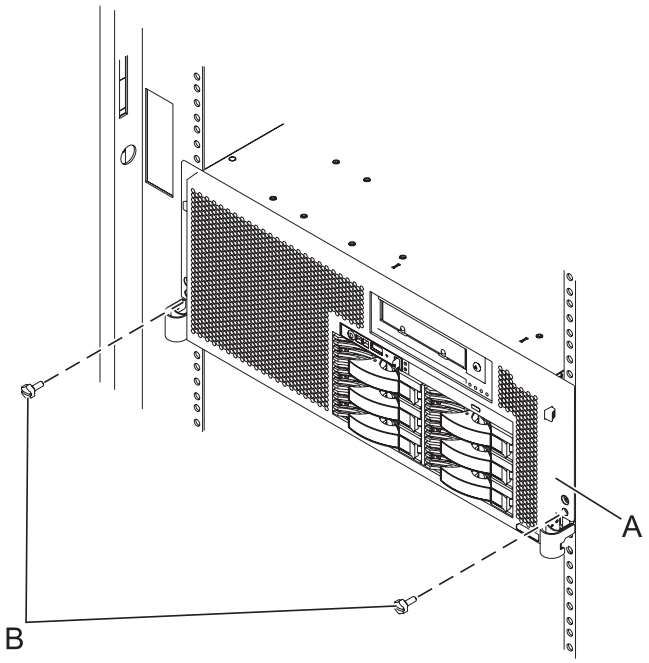
Note: When placing the system into operating position, ensure that the cables at the back of the system do not catch or bind as you push the system unit back into the rack.

1. Unlock the rail safety latches **(B)** by sliding them toward the front of the system.
2. Push the system unit **(A)** back into the rack until both system-unit release latches have locked into position.



15. Place into operating position (continued)

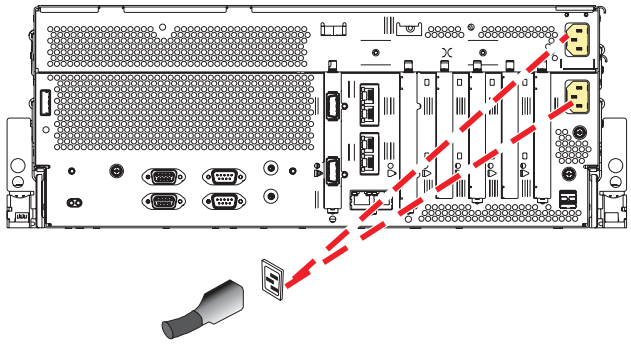
1. Replace and tighten the two screws **(B)** that secure the system unit **(A)** to the rack.
2. Close the front rack door of the unit you are servicing.



16. Install the power cords

If you removed the power cords, perform the following steps.

1. Identify the system unit you are servicing in the rack.
2. Connect all power cords to the unit you are servicing.
3. Close the back rack door.



17. Power on the system.

Power on the system.

18. Access the ASMI

If you are already connected to the ASMI, click **Next** to continue.

Otherwise to access the ASMI through the Hardware Management Console (HMC), complete the following steps:

1. Ensure that the server you are working with is selected.
2. Click **Tasks**.
3. Click **Operations**, then click **Advanced System Management (ASM)**.

   Note: If there is more than one service processor, you must select the primary service processor.

19. Set the system identifiers

1. On the ASMI Welcome pane, if you have not already logged in, specify your userid and password, and click **Log In**.

   Note: To perform this operation, your authority level must be Administrator or Authorized service provider.
2. In the navigation area, expand **System Configuration** and **Program Vital Product Data**.
3. Select **System Brand**.
4. If the system brand is not set, and only in that case, enter the correct system brand and click **Continue**.

   Note: If you do not know the correct system brand, contact your next level of support.
5. Select **System Keywords** under **Program Vital Product Data**.
6. If the backed up system keywords are correct, click **Save settings**. Otherwise, enter the values for the **Machine type-model**, **System serial number**, and **System unique ID**. Set the Reserved field to blank spaces unless directed otherwise by Level 4 technical support.

   Note: If you do not know the system unique ID, contact your next level of support. You cannot boot the system until valid values are entered for all fields. You can change these entries only once.
7. Click **Save settings** to update the system keywords and save them to the VPD.

20.

Go to Chapter 2, “Verifying a repair,” on page 181.

Chapter 2. Verifying a repair

Use these procedures to verify hardware operation after making repairs to the system.

Choose from the following options:

- To verify the repair of a system that is currently powered off, go to step 1.
- To verify the repair of a system that is currently powered on with no operating system loaded, go to step 3.
- To verify the repair of a system that is currently powered on and that has an operating system loaded, go to step 5.

1. Power on the server and all attached I/O enclosures.

Did all the enclosures power on?
Yes: Go to step 3.↓ Go to step 3.
No: Continue with the next step.

---

2. Choose from the following options:

- If the original problem was that an enclosure would not power on and you have another FRU to replace, locate and replace the next field-replaceable unit (FRU).
- If the next FRU in the FRU list is an isolation procedure, perform the isolation procedure.
- If the original problem was that an enclosure would not power on and you have an isolation procedure to complete, perform the isolation procedure.
- If the original problem was that an enclosure would not power on and there are no more FRUs or isolation procedures in the FRU list, contact your next level of support.
- If you have a new problem, perform problem analysis and repair the new problem.

---

3. Load the operating system.

Did the operating system load successfully?
Yes: Go to step 5.
No: Continue with the next step.

---

4. Choose from the following options:

- If the original problem was a failing disk drive that contained the operating system software, go to step 5.
- If the original problem was that the operating system would not load and you have another FRU to replace, go to your FRU locations section to locate the next FRU.
- If the next FRU in the FRU list is an isolation procedure, perform the isolation procedure.
- If the original problem was that the operating system would not load and you have an isolation procedure to complete, perform the isolation procedure.
- If the original problem was that the operating system would not load and there are no more FRUs or isolation procedures in the FRU list, contact your next level of support.
- If you have a new problem, perform problem analysis and repair the new problem.

---

5. Choose from the following options:
   - "Verifying the repair in AIX" on page 182
   - "Verifying the repair in Linux" on page 185
   - "Verifying a repair using an IBM i system or logical partition" on page 185

Verifying the repair in AIX

You can use this procedure to verify that a repair is complete using the AIX operating system.

Use this maintenance analysis procedure (MAP) to check out the server after a repair is completed.

1. Did you replace a disk drive in the root volume group?

NO Go to step 3.

YES Continue with the next step.

2. Run stand-alone diagnostics either from a CD or from a Network Installation Management (NIM) server.

Did you encounter any problems?

NO Reinstall the operating system and continue with step 5.

YES If the original problem still exists, replace the field-replaceable unit (FRU) or perform the isolation procedure that is next in the FRU list. If you have reached the end of the FRU list, contact your next level of support.

If a new problem has occurred, go to Beginning problem analysis.

3. Did you replace a FRU with the power turned on and concurrently with system operations?

NO Go to step 5.

YES Continue with the next step.

4. Did you use an AIX diagnostics service aid hot-swap operation to change the FRU?

YES Go to step 6.

NO Go to step 7 on page 183.

Note: The AIX diagnostic service aid was used if a resource was removed using the **Hot Plug** task.

5.

Note: If any FRUs have been removed that should be reinstalled, reinstall them now.

Perform the following steps:

1. If the system is not powered on, power it on now.
2. Perform a slow boot.
3. Wait until the AIX operating system login prompt displays or until system activity on the operator panel or display apparently has stopped.
4. Did you encounter any problems?

NO Continue at step 6.

YES If the original problem still exists, replace the FRU or perform the isolation procedure that is next in the FRU list. If you have reached the end of the FRU list, contact your next level of support.

If a new problem has occurred, go to Beginning problem analysis.

6. If the Resource Repair Action menu is already displayed, go to step 9 on page 183; otherwise, perform the following steps:

1. Log into the operating system either with root authority (if needed, ask the customer to enter the password) or use the CE login.
2. Enter the `diag -a` command and check for missing resources. Follow any instructions that display. If an SRN displays, suspect a loose card or connection. If no instructions display, no resources were detected as missing. Continue with the next step.

---

7. Perform the following steps:

1. Enter `diag` at the command prompt.
2. Press Enter.
3. Select the **Diagnostics Routines** option.
4. When the Diagnostic Mode Selection menu displays, select **System verification**.
5. When the Diagnostic Selection menu displays, select the **All Resources** option or test the FRUs you exchanged, and any devices that are attached to the FRU(s) you exchanged, by selecting the diagnostics for the individual FRU.

Did the Resource Repair Action menu (801015) display?

NO Continue with the next step.

YES Go to step 9.

---

8. Did the Testing Complete, no trouble was found menu (801010) display?

YES Use the **Log Repair Action** option, if not previously logged, in the TASK SELECTION menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with that repair action.

If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.
Note: If the system attention indicator is on, this action will set it back to the normal state.

Go to step 11 on page 184.

NO If the original problem still exists, replace the FRU or perform the isolation procedure that is next in the FRU list. If you have reached the end of the FRU list, contact your next level of support.

If a new problem has occurred, go to Beginning problem analysis.

---

9. When a test is run on a resource in system verification mode that resource has an entry in the AIX error log and the test on that resource was successful, the Resource Repair Action menu displays.

   After replacing a FRU, you must select the resource for that FRU from the Resource Repair Action menu. This updates the AIX error log to indicate that a system-detectable FRU has been replaced.

   Note: If the system attention indicator is on, this action will set it back to the normal state.

Perform the following steps:

1. Select the resource that has been replaced from the Resource Repair Action menu. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.
2. Press **Commit** after you make your selections.

Did another Resource Repair Action (801015) display?

NO If the No Trouble Found menu displays, go to step 11.

YES Continue with the next step.

---

10. The parent or child of the resource you just replaced might also require that you run the Resource Repair Action service aid on it.

    When a test is run on a resource in system verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the Resource Repair Action menu displays.

    After replacing that FRU, you must select the resource for that FRU from the Resource Repair Action menu. This updates the AIX error log to indicate that a system-detectable FRU has been replaced.

    Note: If the system attention indicator is on, this action will set it back to the normal state.

    Perform the following steps:

1. From the RESOURCE REPAIR ACTION menu, select the parent or child of the resource that has been replaced. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.
2. Press COMMIT after you make your selections.
3. If the No Trouble Found menu displays, continue with the next step.

---

11. If you changed the service processor or network settings, as instructed in previous MAPs, restore the settings to the value they had prior to servicing the system. If you ran stand-alone diagnostics from CD-ROM, remove the stand-alone diagnostics CD-ROM from the system.

    Did you perform service on a RAID subsystem involving changing of the PCI RAID adapter cache card or changing the configuration?

    Note: This information does not apply to the PCI-X RAID adapter or cache.

NO Go to the close of call procedure.

YES Continue with the next step.

---

12. Use the **Recover Options** selection to resolve the RAID configuration. To do this, perform the following steps:

1. On the PCI SCSI Disk Array Manager display, select **Recovery options**.
2. If a previous configuration exists on the replacement adapter, this must be cleared. Select **Clear PCI SCSI Adapter Configuration** and press F3.
3. On the Recovery Options screen, select **Resolve PCI SCSI RAID Adapter Configuration**.
4. On the Resolve PCI SCSI RAID Adapter Configuration screen, select **Accept Configuration on Drives**.
5. On the PCI SCSI RAID Adapter selections menu, select the adapter that you changed.
6. On the next screen, press Enter.
7. When you see the Are You Sure selection menu, press Enter to continue.
8. If you see a `Failed` status message, verify that you selected the correct adapter, and then repeat this procedure. When the recovery is complete, exit the operating system.
9. Go to the close of call procedure.

Verifying the repair in Linux

You can use this procedure to verify that a repair is complete using the Linux operating system.

1. Run stand-alone diagnostics from either a CD or from a Network Installation Management (NIM) server. See Running the stand-alone diagnostics from CD-ROM.

Did you encounter any problems?

NO Reboot the operating system and continue with the close of call procedure.

YES If the original problem still exists, replace the field-replaceable unit (FRU) or perform the isolation procedure that is next in the FRU list. If you have reached the end of the FRU list, contact your next level of support.

If a new problem has occurred, go to Beginning problem analysis and repair the new problem.

Verifying a repair using an IBM i system or logical partition

Use this procedure to verify a repair using the IBM i operating system.

1. Was the system powered off during the repair?

   Yes: Continue with the next step.

   No: Continue with step 3.
2. Perform the following tasks:
   a. Verify that the power cable is plugged into the power outlet.
   b. Verify that power is available at the customer's power outlet.
3. Was the partition powered off during the repair?

   Yes: Continue with the next step.

   No: Continue with step 6.
4. Select the IPL type and mode for the system or logical partition that the customer uses (see IPL type mode and speed options in the Service functions).
5. Start an IPL by powering on the system or partition (see Powering on and powering off). Did the system complete the IPL?

   Yes: Continue with the next step.

   No: This might be a new problem. Go to the Start of call procedure. **This ends the procedure.**

6. Did the system or partition remain running throughout the repair, and was the I/O processor, I/O adapter, or storage device replaced?

   Yes: Continue with step 10.

   No: Continue with the next step.

7. Use the service action log or serviceable event view (if the system is managed by an HMC) to look for any reference codes that are related to this IPL (see Using the Service Action Log). Are there any reference codes that are related to this IPL?

   Yes: Continue with the next step.

   No: If the problem was related to removable media or communications, perform the verification procedures in the Service functions to verify that the problem is corrected. Then return the system to the customer and have the customer verify the system date and time. **This ends the procedure.**

8. Is the new reference code the same as the original reference code?

   Yes: Continue with the next step.

   No: A new symptom might have occurred. Go to the Start of call procedure. **This ends the procedure.**

9. Are there any other failing items that remain to be replaced?

   Yes: Replace the next failing item listed for this reference code. **This ends the procedure.**

   No: Contact your next level of support for assistance. **This ends the procedure.**

10. Was concurrent maintenance performed on an optical storage unit?

    Yes: The product activity log and service action log, in most cases, contain a reference code for the optical storage unit when concurrent maintenance is performed. You can ignore this reference code. Perform the following:

    - Perform the verification procedures in the Service functions topic to verify that the problem is corrected.

    - Return the system to the customer and have the customer verify the system date and time. **This ends the procedure.**

    No: Continue with the next step.

11. Use the service action log to look for any new reference codes (see Using the Service Action Log). Are there any new reference codes?

    Yes: Continue with the next step.

    No: Go to step 14.

12. Is the new reference code the same as the original reference code?

    Yes: Continue with the next step.

    No: A new symptom might have occurred. Go to the Start of call procedure to determine the cause of the problem. **This ends the procedure.**

13. Are there any other failing items that need to be replaced?

    Yes: Replace the next failing item listed for the reference code. **This ends the procedure.**.

    No: Contact your next level of support for assistance. **This ends the procedure.**

14. Are you working with a tape device?

    Yes: Perform the verification procedures in the Service functions to verify that the problem is corrected. After the verification test is complete, the tape device description will be set to the failed state because a resource change was detected. Perform the following tasks:

    - Vary the tape device description off and then on.

    - Return the system to the customer and have the customer verify the system date and time. Then go to Verifying the repair from the HMC. **This ends the procedure.**

    No: Continue with the next step.

15. Are you working with an IOP or an IOA?

Yes: Use the display hardware configuration service function to check for any missing or failed hardware:

- On the command line, enter the STRSST (Start System Service Tools command). If you cannot get to SST, select DST. Do not IPL the system or partition to get to DST.

- On the Start Service Tools Sign On display, enter the user ID with the service authority and password.

- Select **Start a service tool → Hardware service manager → Logical hardware resources → System bus resources**.

- Select the function key for **Include nonreporting resources**.

- If the IOP and IOA that you just replaced is a failed or non-reporting resource, the problem has not been fixed. Continue to the next failing item in the failing item list. **This ends the procedure.**

No: Perform the verification procedures in the Service functions topics to verify that the problem is corrected. Resources that usually vary on automatically during an IPL, or that were previously varied on manually, might need to be varied on again after the verification procedures are complete. Return the system to the customer and have the customer verify the system date and time. **This ends the procedure.**

Chapter 3. Closing a service call

Perform these procedures to close problem numbers, clear hardware messages, and prepare the server to return to the customer.

Follow this checklist before performing the procedures:

- Return the server to the state that the customer normally uses such as IPL type, IPL mode, and the way the system is configured or partitioned.

  Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.
- While you were performing the problem analysis on the original serviceable event, other serviceable events might have been opened. Close all serviceable events that were opened as a result of your service activity.
- Ensure that server verification has been performed and no problems require additional service actions.
- If the repair was done using the Hardware Management Console (HMC) online repair procedures, ensure that the original serviceable event is now closed.

1. Record the system reference code (SRC) or symptom and the location code of the field-replaceable unit (FRU) you replaced, for future reference. Is the server managed by an HMC?

- **Yes:** Continue with the next step.
- **No:** Do one of the following steps:
  - If the server is managed by Integrated Virtualization Manager (IVM), go to "Closing a service call using Integrated Virtualization Manager" on page 193.
  - If the server is not partitioned and is running the AIX or Linux operating system, go to "Closing a service call using AIX or Linux" on page 197.

---

2. On the HMC, open **Manage Serviceable Events** and examine the service action event log for any open service action events.

---

3. Are there any service action events that are open?

- **Yes:** Continue with the next step.
- **No:** If the system attention LED is still on, turn off the LED as described in "Activating and deactivating LEDs" on page 202. Return the system to the customer. **This completes the repair.**

---

4. Record the list of open service action events.

---

5. From the list of serviceable events recorded in step 4, perform the following step 6 through step 32 on page 192 for each open service action event.

---

6. Determine the error class of the serviceable event. Record for future use.

---

7. Examine the details of the open service action event.

Is the error code that is associated with this service action event the same as recorded in Step 1 on page 189?

- **Yes:** Go to step 11.
- **No:** Continue with the next step.

---

8. Examine the FRU list of the service action event. Are any FRUs listed for the service action event?

- **Yes:** Continue with the next step.
- **No:** Go to step 11.

---

9. Is the FRU list identical (same FRUs, same number of FRUs, and same order of FRUs) to the FRU list of the error code recorded in step 1 on page 189?

- **Yes:** Go to step 11.
- **No:** Continue with the next step.

---

10. The FRU list is different. Is the FRU you replaced and recorded in step 1 on page 189 in the list of FRUs for this service action event?

- **Yes:** Continue with the next step.
- **No:** Go to step 32 on page 192.
  Note: There are service action events that will remain open when you leave this MAP. Further service actions might be required to complete the repair.

---

11. Examine the details of this service action event, and record the partitions involved in this service action event for use in a later step.

---

12. Is the error code associated with this service action event of the form A11-xxx or A01-xxx?

- **Yes:** Continue with the next step.
- **No:** Go to step 17 on page 191.

---

13. Have you begun a list of A*xx* partitions from prior service action events that you processed in this maintenance analysis procedure (MAP)?

- **Yes:** Go to step 15.
- **No:** Continue with the next step.

---

14. Begin a new list of A*xx* partitions by copying the list of partitions obtained in step 11. Go to step 16.

---

15. Add the partition list obtained in step 11 to the existing list of A*xx* partitions obtained from processing previous service action events in this MAP.

---

16. Remove all entries in the list of all partitions you recorded in step 11. If you are referred to the list of partitions obtained in step 11 in future steps, the list is empty. Go to step 17 on page 191.

17. Select and highlight the service action event from the Error Associated With This Serviceable Event window.

18. Click **Close Event**.

19. Add comments for the serviceable event. Include any unique additional information. Click **OK**. The following steps will add or update FRU information.

20. Did you replace, add, or modify a FRU of the open service action event?

- **Yes:** Continue with the next step.
- **No:** Go to step 22.

21. From the FRU list, select a FRU that you need to update. Double-click the FRU, and update the FRU information. Go to step 23.

22. Select the **No FRU Replaced for this Serviceable Event** option.

23. Click **OK** to close the service action event.

24. Is the list of all partitions you recorded in step 11 on page 190 empty?

- **Yes:** Go to step 32 on page 192.
- **No:** Continue with the next step.

25. Does the list of all partitions you recorded in step 11 on page 190 contain more than one entry?

- **Yes:** Continue with the next step.
- **No:** Go to step 32 on page 192.

26. Is the error class recorded in step 25 AIX?

- **Yes:** Continue with the next step.
- **No:** Go to step 32 on page 192.

27. Perform the following steps for each entry in the list of all partitions you recorded in step 11 on page 190, except the partition you were using to debug the original problem.

28. From the HMC virtual terminal window of a partition in the list of all partitions, type `diag` at the AIX command prompt.

---

29. When the diagnostic operating instructions are displayed, do the following steps:

    1. Press Enter.
    2. Select the **Task Selection** option.
    3. Select the **Log Repair** option.
    4. Select the resource associated with the repair action. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your repair action is not displayed on the Resource List, select **sysplanar0**.
    5. Click **Commit** after you have made your selection.

    Note: If the terminal type is not defined, you are prompted to define it before you can proceed.

---

30. Exit from diagnostics in this partition and return to the AIX prompt.

---

31. Have all the partitions in the list of all the partitions you recorded in step 11 on page 190 been processed?

- **Yes:** Continue with the next step.
- **No:** Go to step 24 on page 191 to process the next partition in the list you recorded in step 11 on page 190.

---

32. Have all the serviceable events recorded in step 4 on page 189 been processed?

- **Yes:** Continue with the next step.
- **No:** Go to step 5 on page 189 and process the next service action event in the list of serviceable events recorded in step 4 on page 189.

---

33. While processing all service action events, were you directed to step 14 on page 190?

- **Yes:** Continue with the next step.
- **No:** If the system attention LED is still on, turn off the LED as described in "Activating and deactivating LEDs" on page 202. Return the system to the customer. **This completes the repair.**
  Note: If during the processing of the list of open service action events, some service action events remained open, further service actions might be required to complete the repair.

---

34. Perform the following steps for each entry in the list of A*xx* partitions you began recording in step 14 on page 190, except the partition you were using to debug the original problem.

---

35. From the HMC virtual terminal window of a partition in the list of A*xx* partitions, type `diag` at the AIX command prompt.

---

36. When the diagnostic operating instructions are displayed, do the following steps:

1. Press Enter.
2. Select the **Task Selection** option.
   Note: If the terminal type is not defined, you are prompted to define it before you can proceed.
3. Select the **Log Repair** option.
4. Select the resource associated with the repair action. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your repair action is not displayed on the Resource List, select **sysplanar0**.
5. Click **Commit** after you have made your selection.

37. Exit from diagnostics in this partition and return to the AIX prompt.

38. Have all the partitions in the list of A*xx* partitions you began recording in step 14 on page 190 been processed?

- **Yes:** Continue with the next step.
- **No:** Go to step 34 on page 192 to process the next partition in the list you recorded in step 14 on page 190.

39. If the system attention LED is still on, turn off the LED as described in "Activating and deactivating LEDs" on page 202. This completes the repair. Return the system to the customer.

    Note: If during the processing of the list of open service action events, some service action events remained open, further service actions might be required to complete the repair.

Closing a service call using Integrated Virtualization Manager

Perform these procedures to close problem numbers, clear hardware messages, and prepare the server to return to the customer.

Follow this checklist before performing the procedures:

- Return the server to the state that the customer normally uses, such as IPL type, IPL mode, and the way the system is configured or partitioned.

  Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.
- While you were performing the problem analysis on the original serviceable event, other serviceable-event numbers might have been opened. Close all serviceable events that were opened as a result of your service activity.
- Ensure that server verification has been performed and there are no problems that require additional service actions.
- If the repair was done using the Integrated Virtualization Manager (IVM) online repair procedures, ensure that the original serviceable event is now closed.

1. Record the system reference code (SRC) or symptom and the location code of the field-replaceable unit (FRU) you replaced, for future reference.

2. On the IVM, open **Manage Serviceable Events** and look at existing serviceable events.

---

3. Are there any service action events that are open?

- **Yes:** Continue with the next step.
- **No:** If the system attention LED is still on, turn off the LED as described in "Activating and deactivating LEDs" on page 202. Return the system to the customer. **This completes the repair.**

---

4. Record the list of open service action events.

---

5. From the list of serviceable events recorded in step 4, perform step 6 through step 30 on page 196 for each open service action event.

---

6. Determine the error class of the serviceable event. Record for future use.

---

7. Examine the details of the open service action event.

Is the error code associated with this service action event the same as recorded in step 1 on page 193?

- **Yes:** Go to step 11.
- **No:** Continue with the next step.

---

8. Examine the FRU list of the service action event. Are any FRUs listed for the service action event?

- **Yes:** Continue with the next step.
- **No:** Go to step 11.

---

9. Is the FRU list identical (same FRUs, same number of FRUs, and same order of FRUs) to the FRU list of the error code recorded in step 1 on page 193?

- **Yes:** Go to step 11.
- **No:** Continue with the next step.

---

10. Is the FRU you replaced and recorded in step 1 on page 193 in the list of FRUs for this service action event?

- **Yes:** Continue with the next step.
- **No:** Go to step 30 on page 196.
  Note: There are service action events that will remain open when you leave this MAP. Further service actions might be required to complete the repair.

---

11. Examine the details of this service action event, and record the partitions involved in this service action event for use in a later step.

---

12. Is the error code associated with this service action event of the form A11-xxx or A01-xxx?

- **Yes:** Continue with the next step.
- **No:** Go to step 17.

---

13. Have you begun a list of A*xx* partitions from prior service action events that you processed in this maintenance analysis procedure (MAP)?

- **Yes:** Go to step 15.
- **No:** Continue with the next step.

---

14. Begin a new list of A*xx* partitions by copying the list of partitions obtained in step 11 on page 194. Go to step 16.

---

15. Add the partition list obtained in step 11 on page 194 to the existing list of A*xx* partitions obtained from processing previous service action events in this MAP.

---

16. Remove all entries in the list of all partitions you recorded in step 11 on page 194. If you are referred to the list of partitions obtained in step 11 on page 194 in future steps, the list is empty. Go to step 17.

---

17. Select and highlight the service action event from the Manage Serviceable Events window.

---

18. Click **Close Event**.

---

19. Add comments for the serviceable event. Include any unique additional information. Click **OK**.

---

20. Add or update FRU information:

Did you replace, add, or modify a FRU of the open service action event?

- **Yes:** Continue with the next step.
- **No:** Go to step 22.

---

21. Click **OK** to close the service action event.

---

22. Is the list of all partitions you recorded in step 11 on page 194 empty?

- **Yes:** Go to step 30 on page 196.
- **No:** Continue with the next step.

---

23. Does the list of all partitions you recorded in step 11 on page 194 contain more than one entry?

- **Yes:** Continue with the next step.
- **No:** Go to step 30.

---

24. Is the error class recorded in step 23?

- **Yes:** Continue with the next step.
- **No:** Go to step 30.

---

25. Perform the following steps for each entry in the list of all partitions you recorded in step 11 on page 194, except the partition you were using to debug the original problem.

---

26. From the IVM virtual terminal window of a partition in the list of all partitions, type `diag` at the AIX command prompt.

---

27. When the diagnostic operating instructions are displayed, do the following steps:

1. Press Enter.
2. Select the **Task Selection** option.
3. Select the **Log Repair** option.
4. Select the resource associated with the repair action. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your repair action is not displayed on the Resource List, select **sysplanar0**.
5. Click **Commit** after you have made your selection.

Note: If the terminal type is not defined, you are prompted to define it before you can proceed.

---

28. Exit from diagnostics in this partition and return to the AIX prompt.

---

29. Have all the partitions in the list of all partitions you recorded in step 11 on page 194 been processed?

- **Yes:** Continue with the next step.
- **No:** Go to step 25 to process the next partition in the list you recorded in step 11 on page 194.

---

30. Have all the serviceable events recorded in step 4 on page 194 been processed?

- **Yes:** Continue with the next step.
- **No:** Go to step 5 on page 194 and process the next service action event in the list of serviceable events recorded in step 4 on page 194.

---

31. While processing all service action events, were you directed to step 14 on page 195?

- **Yes:** Continue with the next step.
- **No:** If the system attention LED is still on, turn off the LED as described in "Activating and deactivating LEDs" on page 202. Return the system to the customer. **This completes the repair.**
  Note: If during the processing of the list of open service action events, some service action events remained open, further service actions might be required to complete the repair.

---

32. Perform the following steps for each entry in the list of A*xx* partitions you began recording in step 14 on page 195, except the partition you were using to debug the original problem.

---

33. From the IVM virtual terminal window of a partition in the list of A*xx* partitions, type `diag` at the AIX command prompt.

---

34. When the diagnostic operating instructions are displayed, do the following steps:

1. Press Enter.
2. Select the **Task Selection** option.
   Note: If the terminal type is not defined, you are prompted to define it before you can proceed.
3. Select the **Log Repair** option.
4. Select the resource associated with the repair action. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your repair action is not displayed on the Resource List, select **sysplanar0**.
5. Click **Commit** after you have made your selection.

---

35. Exit from diagnostics in this partition and return to the AIX prompt.

---

36. Have all the partitions in the list of A*xx* partitions you began recording in step 14 on page 195 been processed?

- **Yes:** Continue with the next step.
- **No:** Go to step 32 to process the next partition in the list you recorded in step 14 on page 195.

---

37. If the system attention LED is still on, turn off the LED as described in "Activating and deactivating LEDs" on page 202. This completes the repair. Return the system to the customer.

Note: If, during the processing of the list of open service action events, some service action events remained open, further service actions might be required to complete the repair.

Closing a service call using AIX or Linux

If the server is not connected to an Hardware Management Console (HMC) and not using Integrated Virtualization Manager (IVM), perform these procedures to close problem numbers, clear hardware messages, and prepare the server to return to the customer.

Follow this checklist before performing the procedures:

- Return the server to the state that the customer normally uses, such as IPL type, IPL mode, and the way the system is configured or partitioned.

  Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.
- While you were performing the problem analysis on the original serviceable event, other serviceable-event numbers might have been opened. Close all serviceable events that were opened as a result of your service activity.
- Ensure that server verification has been performed and that no problems require additional service actions.
- If the repair was done using the IVM online repair procedures, ensure that the original serviceable event is now closed.

1. Did you use an AIX diagnostics service aid hot-swap operation to change the FRU?

- **Yes:** Go to step 4
- **No:** Continue with the next step.

---

2. Do you have any field-replaceable units (FRUs) (for example cards, adapters, cables, or devices) that were removed during problem analysis that you want to put back into the system?

   Note: If the system planar or battery has been replaced and you are loading diagnostics from a server over a network, it might be necessary for the customer to set the network boot information for this system before diagnostics can be loaded. The system time and date information should also be set when the repair is completed.

- **Yes:** Reinstall all of the FRUs that were removed during problem analysis. Go to step 3
- **No:** Continue with the next step.

---

3. Is the system or logical partition that you are performing a repair action on running the AIX operating system?

- **Yes:** Continue with the next step.
- **No:** Go to step 5.

---

4. Does the system or logical partition you are performing a repair action on have AIX installed?

   Note: Answer no to this question if you have just replaced a hard disk in the root volume group.

- **Yes:** Go to step 7 on page 199.
- **No:** Continue with the next step.

---

5. Run stand-alone diagnostics in problem determination mode from either a CD-ROM or from a Network Installation Management (NIM) server.

   Note: For instructions on running stand-alone diagnostics from a CD and not using an HMC, go to Running the stand-alone diagnostics from CD on a server without an HMC attached.

   For instructions on running stand-alone diagnostics from a NIM server, go to Running the stand-alone diagnostics from a Network Installation Management server.

   Did you encounter any problems?

- **Yes:** Go to problem analysis.
- **No:** Continue with the next step.

---

6. The system hardware is functioning correctly.

If the system attention LED is still on, turn off the LED as described in “Activating and deactivating LEDs” on page 202.

This completes the repair.
Note: If, during the processing of the list of open service action events, some service action events remained open, further service actions might be required to complete the repair.

Return the server to the state that the customer normally uses, such as IPL type, IPL mode, and the way the system is configured or partitioned. This might require you to reboot the operating system.

Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.

---

7. Complete the following steps:

1. If the system supports slow boot (see Performing a slow boot), do a slow boot on the system. If the system does not support slow boot, do a normal boot.
2. Power on the system.
3. Wait until the AIX operating system login prompt displays or until system activity on the operator panel or display apparently has stopped.

Did the AIX Login Prompt display?

- **Yes:** Continue with the next step.
- **No:** Go to problem analysis.

---

8. If the Resource Repair Action menu is already displayed, go to 12 on page 200; otherwise, do the following steps:

1. Log into the operating system, either with root authority (if needed, ask the customer to enter the password) or use the CE login.
2. Enter the `diag -a` command and check for missing resources. Follow any instructions that display. If an system request number (SRN) displays, suspect a loose card or connection. If no instructions display, no resources were detected as missing. Continue with 9 on page 200.

---

9. Complete the following steps:

1. Enter `diag` at the command prompt.
2. Press Enter.
3. Select the **Diagnostics Routines** option.
4. When the Diagnostic Mode Selection menu displays, select **Problem determination**.
5. When the Advanced Diagnostic Selection menu displays, select the **All Resources** option, or test the FRUs you exchanged, and any devices that are attached to the FRUs you exchanged, by selecting the diagnostics for the individual FRU.

Did the Resource Repair Action menu (801015) display?

- **Yes:** Go to step 13.
- **No:** Continue with the next step.

---

10. Did the TESTING COMPLETE, no trouble was found menu (801010) display?

- **Yes:** Continue with the next step.
- **No:** There is still a problem. Go to problem analysis.

---

11. Use the **Log Repair Action** option, if not previously logged, in the TASK SELECTION menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with that repair action.

If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.
Note: If the system attention indicator is on, this will set it back to the normal state. Go to step 14 on page 201.

---

12. When a test is run on a resource in system verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the Resource Repair Action menu displays.

After replacing a FRU, you must select the resource for that FRU from the Resource Repair Action menu. This updates the AIX error log to indicate that a system-detectable FRU has been replaced.
Note: If the system attention indicator is on, this action will set it back to the normal state.

Do the following steps:

1. Select the resource that has been replaced from the Resource Repair Action menu. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.
2. Press **Commit** after you make your selections.

Did another Resource Repair Action (801015) display?

- **Yes:** Continue with the next step.
- **No:** If the No Trouble Found menu displays, go to step 14 on page 201.

---

13. The parent or child of the resource you just replaced might also require that you run the Resource Repair Action service aid on it.

When a test is run on a resource in system verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the Resource Repair Action menu displays.

After replacing that FRU, you must select the resource for that FRU from the Resource Repair Action menu. This updates the AIX error log to indicate that a system-detectable FRU has been replaced.
Note: If the system attention indicator is on, this action will set it back to the normal state.

Do the following steps:

1. From the Resource Repair Action menu, select the parent or child of the resource that has been replaced. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.
2. Press COMMIT after you make your selections.

Did the No Trouble Found menu display?

- **Yes:** Continue with the next step.
- **No:** Go to problem analysis.

---

14. If you changed the service processor or network settings, as instructed in previous MAPs, restore the settings to the value they had prior to servicing the system. If you ran stand-alone diagnostics from CD-ROM, remove the stand-alone diagnostics CD-ROM from the system.

Did you perform service on a RAID subsystem involving changing of the PCI RAID adapter cache card or changing the configuration?
Note: This does not refer to the PCI-X RAID adapter or cache.

- **Yes:** Continue with the next step.
- **No:** Go to step 16.

---

15. Use the **Recover Options** selection to resolve the RAID configuration. To do this, do the following steps:

1. On the PCI SCSI Disk Array Manager dialog, select **Recovery options**.
2. If a previous configuration exists on the replacement adapter, this must be cleared. Select **Clear PCI SCSI Adapter Configuration** and press F3.
3. On the Recovery Options dialog, select **Resolve PCI SCSI RAID Adapter Configuration**.
4. On the Resolve PCI SCSI RAID Adapter Configuration dialog, select **Accept Configuration on Drives**.
5. On the PCI SCSI RAID Adapter selections menu, select the adapter that you changed.
6. On the next dialog, press Enter.
7. When you see the Are You Sure selection menu, press Enter to continue.
8. You should see an `OK` status message when the recover is complete. If you get a `Failed` status message, verify that you selected the correct adapter, and then repeat this procedure. When recover is complete, exit the operating system.
9. Go to 16.

---

16. The system hardware is functioning correctly. Return the server to the state that the customer normally uses, such as IPL type, IPL mode, and the way the system is configured or partitioned.

Attention: Before returning the system to the customer, remove the system from service mode. If the system is left in service mode, it automatically places a call for service every two hours.

Activating and deactivating LEDs

You can use these procedures to activate or deactivate LEDs using the Hardware Management Console (HMC) or the Advanced System Management Interface (ASMI).

Choose from the following tasks:

- "Deactivating a system attention LED or partition LED using the HMC"
- "Activating or deactivating an identify LED using the HMC"
- "Deactivating a system attention LED or logical partition LED using the Advanced System Management Interface" on page 203
- "Activating or deactivating an identify LED using the Advanced System Management Interface" on page 203

Deactivating a system attention LED or partition LED using the HMC

You can deactivate a system attention LED or a logical partition LED if you decide that a problem is not a high priority and you decide to repair the problem at a later time.

If you want to be alerted if another problem occurs, you must deactivate the system attention LED so that it can be activated again if another problem occurs.

To deactivate a system attention LED using the HMC, complete the following steps:

1. In the navigation area, open **Systems management**.
2. Select the server you are working on by checking the box next to its name.
3. Open **Operations**.
4. Open **LED Status**.
5. Select **View System Attention**. The system attention LED window opens. The selected system and its LED state are displayed in the upper part of the window. The logical partition and its LED state are displayed in the lower part of the window. From the system attention LED window, you can deactivate both the system attention LED and the logical partition LED.
6. Select **Deactivate System Attention LED** from the Action menu. A confirmation window is displayed that provides the following information:
   - A verification that the system attention LED was deactivated.
   - An indication that there still might be open problems within the system.
   - An indication that you cannot activate the system attention LED.
7. Select one of the logical partitions in the lower table, and select **Deactivate partition LED** from the Partition Operations menu. A confirmation window is displayed that provides the following information:
   - A verification that the logical partition LED was deactivated.
   - An indication that there still might be open problems within the logical partition.
   - An indication that you cannot activate the logical partition LED.

Activating or deactivating an identify LED using the HMC

You can activate or deactivate an identify LED for components attached to the system.

The system provides several LEDs that help identify various components, such as enclosures or field-replaceable units (FRUs), in the system. For this reason, they are called *identify LEDs*.

You can activate or deactivate the following types of identify LEDs:

- **Identify LED for an enclosure** If you want to add an adapter to a specific drawer (enclosure), you need to know the machine type, model, and serial number (MTMS) of the drawer. To determine whether you have the correct MTMS for the drawer that needs the new adapter, you can activate the LED for a drawer and verify that the MTMS corresponds to the drawer that requires the new adapter.
- **Identify LED for a FRU associated with a specified enclosure** If you want to hook up a cable to a specific I/O adapter, you can activate the LED for the adapter, which is a field replaceable unit (FRU), and then physically check to see where you should hook up the cable. This is especially useful when you have several adapters with open ports.

To activate or deactivate an identify LED for an enclosure or FRU, follow these steps:

1. In the navigation area, open **Systems management**.
2. Select the server you are working on.
3. Click **Operations** → **LED Status** → **Identify LED**. The Identify LED, Select Enclosure window opens.
4. To activate or deactivate an identify LED for an enclosure, select an enclosure from the table, and click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.
5. To activate or deactivate an identify LED for a FRU, select an enclosure from the table, and then select **Selected** → **List FRUs**.
6. Select one or more FRUs from the table, and click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.

Deactivating a system attention LED or logical partition LED using the Advanced System Management Interface

You can deactivate a system attention LED or a logical partition LED using the Advanced System Management Interface (ASMI).

The system attention indicator provides a visual signal that the system as a whole requires attention or service. Each system has a single system attention indicator. When an event occurs that either needs your intervention or that of service and support, the system attention indicator lights continuously. The system attention indicator is turned on when an entry is made in the service processor error log. The error entry is transmitted to the system error log and the operating system error log.

To perform this operation, your authority level must be one of the following levels:

- Administrator
- Authorized service provider

To turn off the system attention indicator, do the following steps:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration** → **Service Indicators** → **System Attention Indicator**.
3. In the right pane, click **Turn off system attention indicator**. If the attempt is unsuccessful, an error message is displayed.

Activating or deactivating an identify LED using the Advanced System Management Interface

You can activate or deactivate an identify LED using the Advanced System Management Interface (ASMI).

You can specify the location code of any indicator to view or modify its current state. If you provide the wrong location code, the advanced system manager attempts to go to the next higher level of the location code.

The next level is the base-level location code for that field replaceable unit (FRU). For example, a user types the location code for the FRU located on the second I/O slot of the third enclosure in the system. If the location code for the second I/O slot is incorrect (the FRU does not exist at this location), an attempt to set the indicator for the third enclosure is initiated. This process continues until a FRU is located or no other level is available.

To perform this operation, your authority level must be one of the following levels:

- Administrator
- Authorized service provider

To change the current state of an indicator, do the following steps:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration** → **Service Indicators** → **Indicators by Location code**.
3. In the right pane, enter the location code of the FRU and click **Continue**.
4. Select the preferred state from the list.
5. Click **Save settings**.

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Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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Industry Canada Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A respecte est conforme à la norme NMB-003 du Canada.

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This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

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Warning: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

VCCI Statement - Japan

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

The following is a summary of the VCCI Japanese statement in the box above.

This product is a Class A Information Technology Equipment and conforms to the standards set by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Electromagnetic Interference (EMI) Statement - People's Republic of China

声　明

此为A级产品，在生活环境中，
该产品可能会造成无线电干扰。
在这种情况下，可能需要用户对其
干扰采取切实可行的措施。

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者：
這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user will be required to take adequate measures.

IBM Taiwan Contact Information:

台灣IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

Electromagnetic Interference (EMI) Statement - Korea

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자
또는 사용자는 이점을 주의하시기 바라며, 만약 잘못 판매 또는
구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Please note that this equipment has obtained EMC registration for commercial use. In the event that it has been mistakenly sold or purchased, please exchange it for equipment certified for home use.

Germany Compliance Statement

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der IBM gesteckt/eingebaut werden.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:
"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A.

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Konformitätserklärung nach des EMVG ist die IBM Deutschland GmbH, 70548 Stuttgart.

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse A.

Electromagnetic Interference (EMI) Statement - Russia

ВНИМАНИЕ! Настоящее изделие относится к классу А.
В жилых помещениях оно может создавать
радиопомехи, для снижения которых необходимы
дополнительные меры

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