Power Systems

Servicing the IBM Power System S812LC (8348-21C)

IBM

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Contents

Safety notices

Safety notices may be printed throughout this guide:

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

World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, safety information documentation is included in the publications package (such as in printed documentation, on DVD, or as part of the product) shipped with the product. The documentation 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 documentation. You should also refer to the safety information documentation any time you do not clearly understand any safety information in the U.S. English publications.

Replacement or additional copies of safety information documentation can be obtained by calling the IBM Hotline at 1-800-300-8751.

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

IBM servers may be installed inside or outside of an IT equipment rack.

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:
- If IBM supplied the power cord(s), 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.
  - For AC power, disconnect all power cords from their AC power source.
  - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.

- For racks with AC power, 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.
    - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:
- 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. For AC power, remove the power cords from the outlets.
  3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
  4. Remove the signal cables from the connectors.
  5. 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. For AC power, attach the power cords to the outlets.
  5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
  6. Turn on the devices.

  Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

(R001 part 1 of 2):

DANGER: Observe the following precautions when working on or around your IT rack system:
- Heavy equipment–personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices. In addition, do not lean on rack mounted devices and do not use them to stabilize your body position (for example, when working from a ladder).

- Each rack cabinet might have more than one power cord.
  - For AC powered racks, be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
  - For racks with a DC power distribution panel (PDP), turn off the circuit breaker that controls the power to the system unit(s), or disconnect the customer's DC power source, when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

(R001 part 2 of 2):

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

- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

CAUTION:
Removing components from the upper positions in the rack cabinet improves rack stability during relocation. Follow these general guidelines whenever you relocate a populated rack cabinet within a room or building.

- **Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:**
  - **Remove all devices in the 32U position (compliance ID RACK-001 or 22U (compliance ID RR001) and above.**
  - **Ensure that the heaviest devices are installed in the bottom of the rack cabinet.**
  - **Ensure that there are little-to-no empty U-levels between devices installed in the rack cabinet below the 32U (compliance ID RACK-001 or 22U (compliance ID RR001) level, unless the received configuration specifically allowed it.**
- **If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.**
- **If the rack cabinet you are relocating was supplied with removable outriggers they must be reinstalled before the cabinet is relocated.**
- **Inspect the route that you plan to take to eliminate potential hazards.**
- **Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.**
- **Verify that all door openings are at least 760 x 230 mm (30 x 80 in.).**
- **Ensure that all devices, shelves, drawers, doors, and cables are secure.**
- **Ensure that the four leveling pads are raised to their highest position.**
- **Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.**
- **Do not use a ramp inclined at more than 10 degrees.**
- **When the rack cabinet is in the new location, complete the following steps:**
  - **Lower the four leveling pads.**
  - **Install stabilizer brackets on the rack cabinet.**
  - **If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.**
- **If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also lower the leveling pads to raise the casters off of the pallet and bolt the rack cabinet to the pallet.**

(R002)

(L001)

DANGER: Hazardous voltage, current, or energy levels are present inside any component that has this label attached. Do not open any cover or barrier that contains this label. (L001)

(L002)

DANGER: Rack-mounted devices are not to be used as shelves or work spaces. (L002)

(L003)
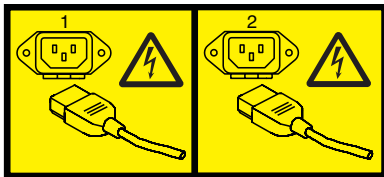
or

or

or

or

DANGER: Multiple power cords. The product might be equipped with multiple AC power cords or multiple DC power cables. To remove all hazardous voltages, disconnect all power cords and power cables. (L003)

(L007)

CAUTION: A hot surface nearby. (L007)

(L008)

CAUTION: Hazardous moving parts nearby. (L008)

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. Although shining light into one end and looking into the other end of a disconnected optical fiber to verify the continuity of optic fibers many not injure the eye, this procedure is potentially dangerous. Therefore, verifying the continuity of optical fibers by shining light into one end and looking at the other end is not recommended. To verify continuity of a fiber optic cable, use an optical light source and power meter. (C027)
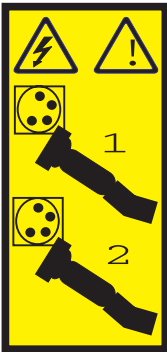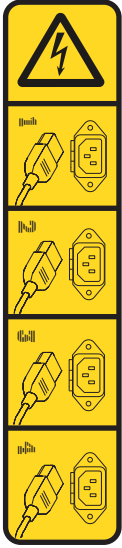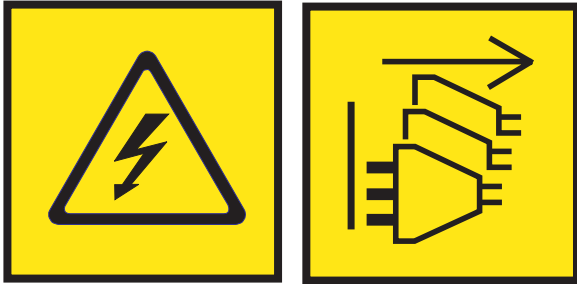
CAUTION:
This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

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)

CAUTION:
The battery contains lithium. To avoid possible explosion, do not burn or charge the battery.

Do Not:
- **___ Throw or immerse into water**
- **___ Heat to more than 100°C (212°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. (C003)

CAUTION:

Regarding IBM provided VENDOR LIFT TOOL:

- Operation of LIFT TOOL by authorized personnel only.
- LIFT TOOL intended for use to assist, lift, install, remove units (load) up into rack elevations. It is not to be used loaded transporting over major ramps nor as a replacement for such designated tools like pallet jacks, walkies, fork trucks and such related relocation practices. When this is not practicable, specially trained persons or services must be used (for instance, riggers or movers).
- Read and completely understand the contents of LIFT TOOL operator's manual before using. Failure to read, understand, obey safety rules, and follow instructions may result in property damage and/or personal injury. If there are questions, contact the vendor's service and support. Local paper manual must remain with machine in provided storage sleeve area. Latest revision manual available on vendor's web site.
- Test verify stabilizer brake function before each use. Do not over-force moving or rolling the LIFT TOOL with stabilizer brake engaged.
- Do not move LIFT TOOL while platform is raised, except for minor positioning.
- Do not exceed rated load capacity. See LOAD CAPACITY CHART regarding maximum loads at center versus edge of extended platform.
- Only raise load if properly centered on platform. Do not place more than 200 lb (91 kg) on edge of sliding platform shelf also considering the load's center of mass/gravity (CoG).
- Do not corner load the platform tilt riser accessory option. Secure platform riser tilt option to main shelf in all four (4x) locations with provided hardware only, prior to use. Load objects are designed to slide on/off smooth platforms without appreciable force, so take care not to push or lean. Keep riser tilt option flat at all times except for final minor adjustment when needed.
- Do not stand under overhanging load.
- Do not use on uneven surface, incline or decline (major ramps).
- Do not stack loads.
- Do not operate while under the influence of drugs or alcohol.
- Do not support ladder against LIFT TOOL.
- Tipping hazard. Do not push or lean against load with raised platform.
- Do not use as a personnel lifting platform or step. No riders.
- Do not stand on any part of lift. Not a step.
- Do not climb on mast.
- Do not operate a damaged or malfunctioning LIFT TOOL machine.
- Crush and pinch point hazard below platform. Only lower load in areas clear of personnel and obstructions. Keep hands and feet clear during operation.
- No Forks. Never lift or move bare LIFT TOOL MACHINE with pallet truck, jack or fork lift.
- Mast extends higher than platform. Be aware of ceiling height, cable trays, sprinklers, lights, and other overhead objects.
- Do not leave LIFT TOOL machine unattended with an elevated load.
- Watch and keep hands, fingers, and clothing clear when equipment is in motion.
- Turn Winch with hand power only. If winch handle cannot be cranked easily with one hand, it is probably over-loaded. Do not continue to turn winch past top or bottom of platform travel. Excessive unwinding will detach handle and damage cable. Always hold handle when lowering, unwinding. Always assure self that winch is holding load before releasing winch handle.
- A winch accident could cause serious injury. Not for moving humans. Make certain clicking sound is heard as the equipment is being raised. Be sure winch is locked in position before releasing handle. Read instruction page before operating this winch. Never allow winch to unwind freely. Freewheeling will cause uneven cable wrapping around winch drum, damage cable, and may cause serious injury. (C048)

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.

The dc-powered system is intended to be installed in a common bonding network (CBN) as described in GR-1089-CORE.

Removing and replacing parts in the 8348-21C

Learn how to remove and replace failing parts in the IBM Power® System S812LC (8348-21C). These parts are referred to as field replaceable units (FRUs).

About this task

Note: See the IBM Publications Center (http://www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss). The publication number: SC27-6601-00 provides a list of the key IBM system installation activities and a list of activities that might be billable.

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:
- If IBM supplied the power cord(s), 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.
  - For AC power, disconnect all power cords from their AC power source.
  - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
  - For racks with AC power, 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.
  - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:
- 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. For AC power, remove the power cords from the outlets.
  3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.

4. Remove the signal cables from the connectors.
5. 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. For AC power, attach the power cords to the outlets.
5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
6. Turn on the devices.

Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

Attention:

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

For safety and airflow purposes, if you remove parts from the system, you must ensure the following items:
- Peripheral component interconnect express (PCIe) tail-stock fillers are present.
- Graphics processing unit (GPU) or PCIe carriers are present and that either GPU or PCIe fillers are installed in the carriers.

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 you handle logic cards, single chip modules (SCM), multi-chip modules (MCM), 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, and then reinstall an electronic component, temporarily place the component on an ESD pad or blanket.

Procedure
1. If you are completing a replacement procedure that might put your data at risk, ensure, 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.
   - The color **terracotta** on the part indicates you might not need to power off the system to complete service. This determination depends on your system configuration, and you might need to complete steps to prepare the system before a service action can be completed on the system with the system power turned on.
   - The color **blue** on the part indicates that the procedure might require the system to be shut down before servicing. Check your service procedure before you attempt the repair.
4. Ensure that you have access to a medium, flat-blade screwdriver, and a Phillips screwdriver.
5. If parts are incorrect, missing, or visibly damaged, contact the provider of the part or your next level of support.

Removing and replacing a disk drive in the 8348-21C

Learn how to remove and replace a disk drive in the IBM Power System S812LC (8348-21C) system. The drive might be a hard disk drive (HDD) or a solid-state drive (SSD).

Removing and replacing a front drive in the 8348-21C

Learn how to remove and replace a front drive in the IBM Power System S812LC (8348-21C) system.

Removing a front drive in the 8348-21C

Learn how to remove a front drive in the IBM Power System S812LC (8348-21C) system. The front disks can be removed and replaced when the system is running and the system power is on.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. If the device is part of a fault tolerant logical drive, the OS will continue to access the logical drive. Continue to step 3.

   If the device falls into any of the following categories, make sure that the OS is not actively using the device before continuing to step 3.

   - A raw disk
   - A member of a simple volume
   - A member of a raid 0 logical drive

3. Identify device and prepare it for removal.

   a. Run the **arcconf** command to list the logical drives and device configurations. For additional information on the arcconf tool, refer to http://i.adaptec.com/power

      ```
      arcconf getconfig 1
      ```

   b. Note the Channel and Device numbers of the desired drive. In this example, the channel number is 0 and the device number is 11.

      ```
      Reported Channel,Device(T:L)      : 0,11(11:0)
      ```

   c. Take the drive off line. Run the following **arcconf setstate** command, using the Channel and Device numbers from the **arcconf getconfig** command: This will also activate the Fault LED on the drive.

      ```
      arcconf setstate 1 device 0 11 ddd
      ```

   d. You can now physically remove the drive from the system.

4. Unlock the drive tray handle by pushing the handle release **(A)** in the direction shown. The handle **(B)** snaps out towards you. If the handle does not snap out all the way, the drive tray does not slide out of the system, as shown in Figure 1 on page 4.
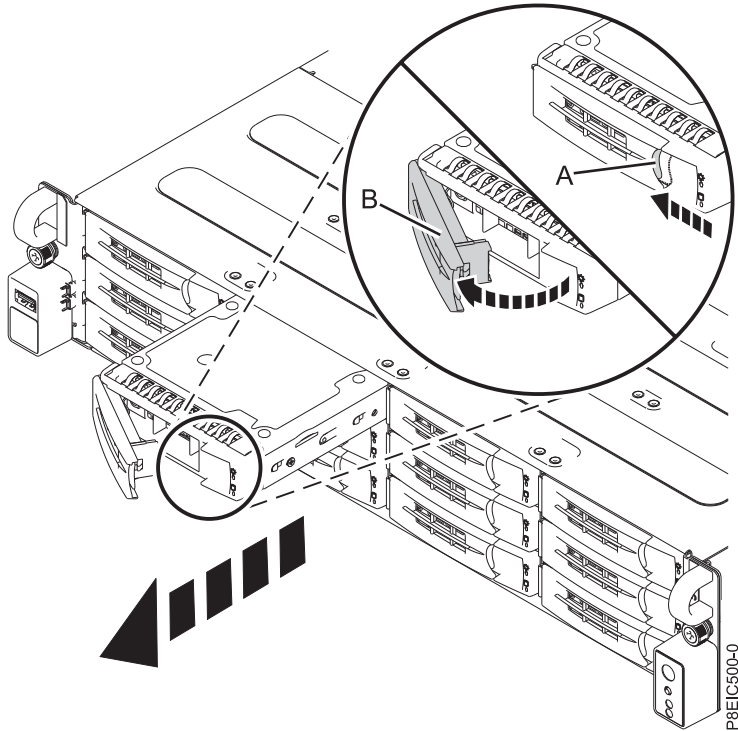
Figure 1. Removing a front drive tray

5. Support the bottom of the drive tray as you slide it out of the system. Do not hold the drive tray by the handle.
6. If you are removing more than one drive, repeat the steps 3 on page 3 to 5 in this procedure until all drives are removed.
7. Remove a drive from the tray.
   • For a 3.5 inch drive, unfasten the drive from the sides of the tray by removing four screws (2 on each side), as shown in Figure 2 on page 5.
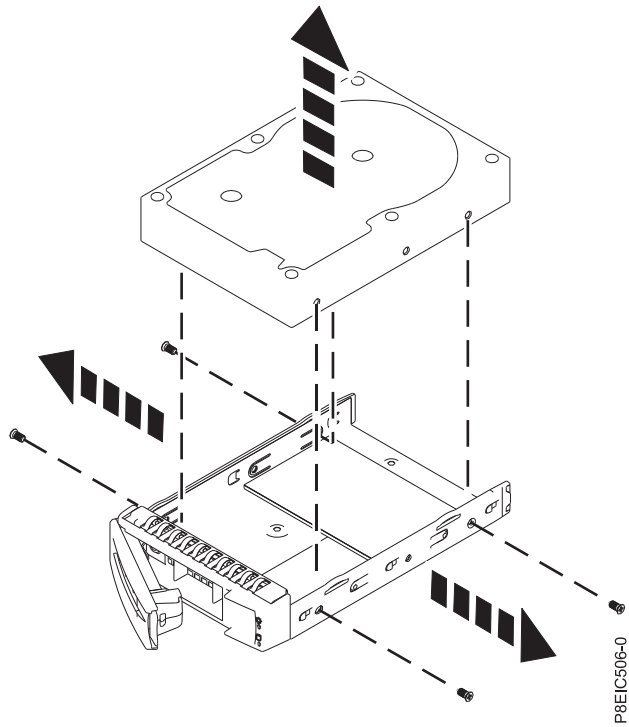
Figure 2. Removing the 3.5 inch drive from the tray

- For a 2.5 inch drive, turn the tray over. Unfasten the drive from the bottom of the tray by removing four screws, as shown in Figure 3.

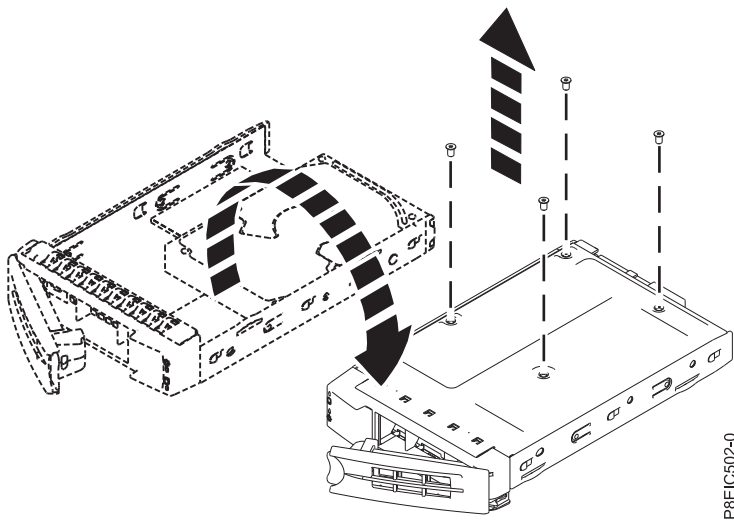*Figure 3. Removing the 2.5 inch drive from the tray*

Replacing a front drive in the 8348-21C

Learn how to remove a front drive in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Install a drive into the tray. Orient the drive such that the connectors are pointing to the rear of the drive.

- A 3.5 inch drive fills the tray, as shown in Figure 4. Fasten the drive to the sides of the tray with four screws (2 on each side).
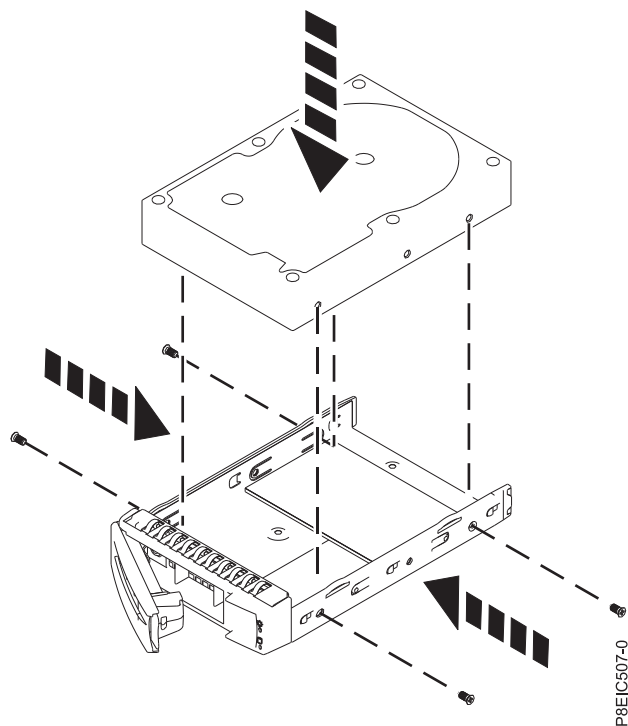

Figure 4. Mounting the 3.5 inch drive in the tray

- A 2.5 inch drive must be positioned at the rear of the tray. While you hold both the drive and the tray, turn the tray over. Fasten the drive to the bottom of the tray with four screws, as shown in Figure 5.
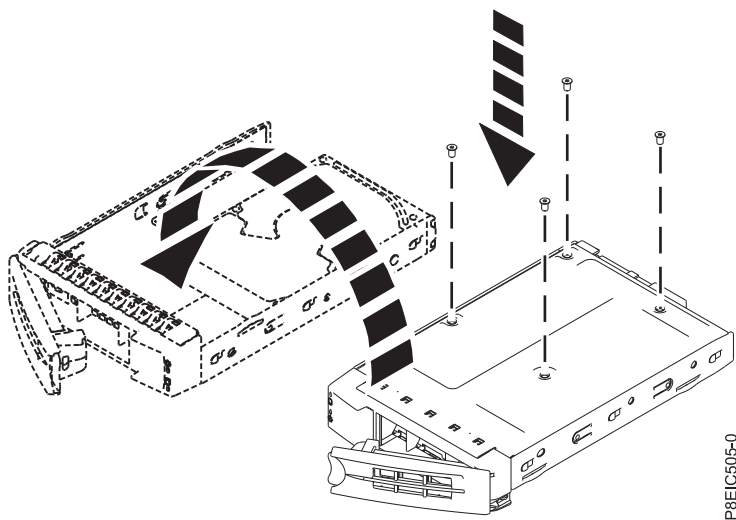

Figure 5. Mounting the 2.5 inch drive in the tray

3. Hold the drive tray by the bottom as you position the drive tray. Slide the drive try all the way into the system. Push the drive tray in until the drive tray handle **(A)** starts to close, then push the handle
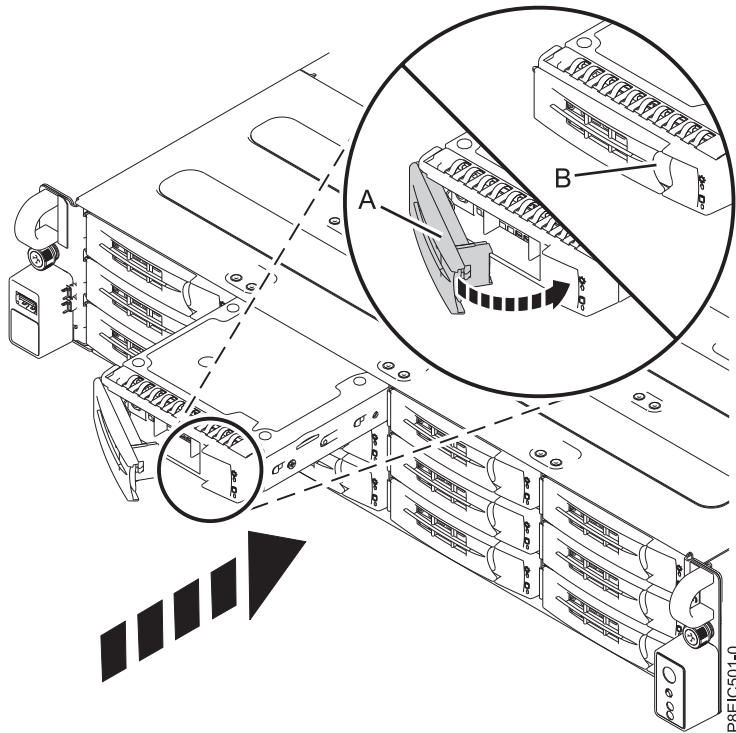
in until it locks, as shown in Figure 6.

Figure 6. Locking the drive tray handle

4. Lock the drive tray handle **(A)** by pushing the handle in until it clicks into place.
5. Configure the installed or replaced drive for your environment.
   a. After you insert a new drive, you must rescan for the device.
      - **Ubuntu Linux operating system**: To run the **rescan-scsi-bus** command in the Ubuntu Linux operating system, log in to the system as the root user, and run the following command:

        ```
        rescan-scsi-bus
        ```

        The **rescan-scsi-bus** tool is available in the *scsitools* package; install the package by using the following command:

        ```
        sudo apt-get install scsitools
        ```

      - **Red Hat Enterprise Linux (RHEL) version 7.2**: To run the rescan command in the REHL version 7.2 operating system, log in to the system as the root user, and run the command:

        ```
        rescan-scsi-bus.sh -a
        ```

        The **rescan-scsi-bus** tool is available in the *sg3_utils* package; install the package by using the following command:

        ```
        yum install sg3_utils
        ```

        You may also want to refer to: Adding a Storage Device or Path (https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/7/html/Storage_Administration_Guide/adding_storage-device-or-path.html)
   b. Load or restore data from your backup media. If a drive failed, refer to Recovering from a Disk Drive Failure (www.adaptec.com/en-us/support/infocenter/release-2015-1/index.jsp?topic=/RAID_IUG.xml/Topics/Recovering_from_a_Disk_Drive_Failure.html).

Removing and replacing a rear drive in the 8348-21C

Learn how to remove and replace a rear drive in the IBM Power System S812LC (8348-21C) system.

Removing a rear drive in the 8348-21C

Learn how to remove one or both rear drives in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Shut down the system for this procedure. For instructions, see "Stopping the 8348-21C system" on page 110.
2. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

3. Unlock the rear drive tray handle by pushing in the handle release **(A)**. The handle then snaps out towards you. Pull the handle out all the way; if the handle is not fully open, the drive tray does not slide out of the system, as shown in Figure 7.
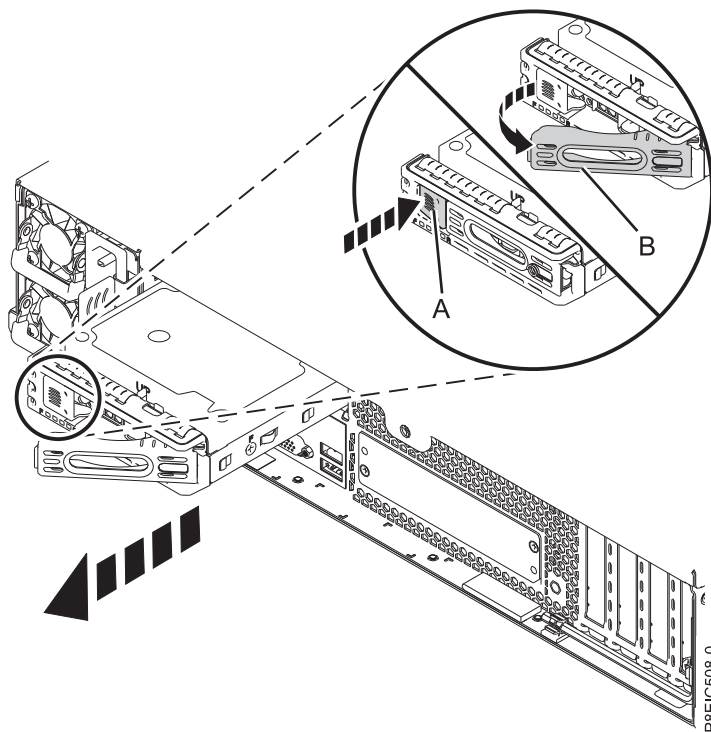

Figure 7. Removing a rear drive

4. Support the bottom of the drive tray as you slide it out of the system. Do not hold the drive tray by the handle.
5. Check the serial number of the drive to ensure that the drive called out in the diagnostic steps is the actual drive to be removed and replaced. For the diagnostic steps, see Beginning troubleshootingem analysis analysis (www.ibm.com/support/knowledgecenter/POWER8/p8ei3/p8ei3_kickoff.htm).
6. Remove the drive from the tray.

- For a 3.5 inch drive:
  a. Unfasten the drive from the sides of the tray by removing four screws (2 on each side), as shown in Figure 8.
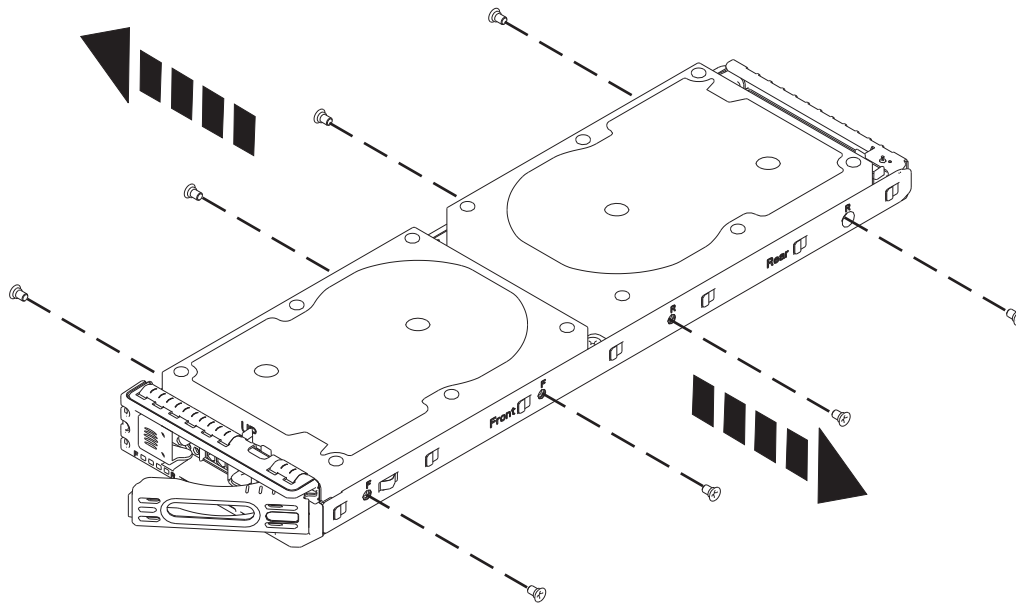
Figure 8. Removing the screws from the 3.5 inch drive

  b. Slide the drive out of the socket and lift the drive out of the tray.
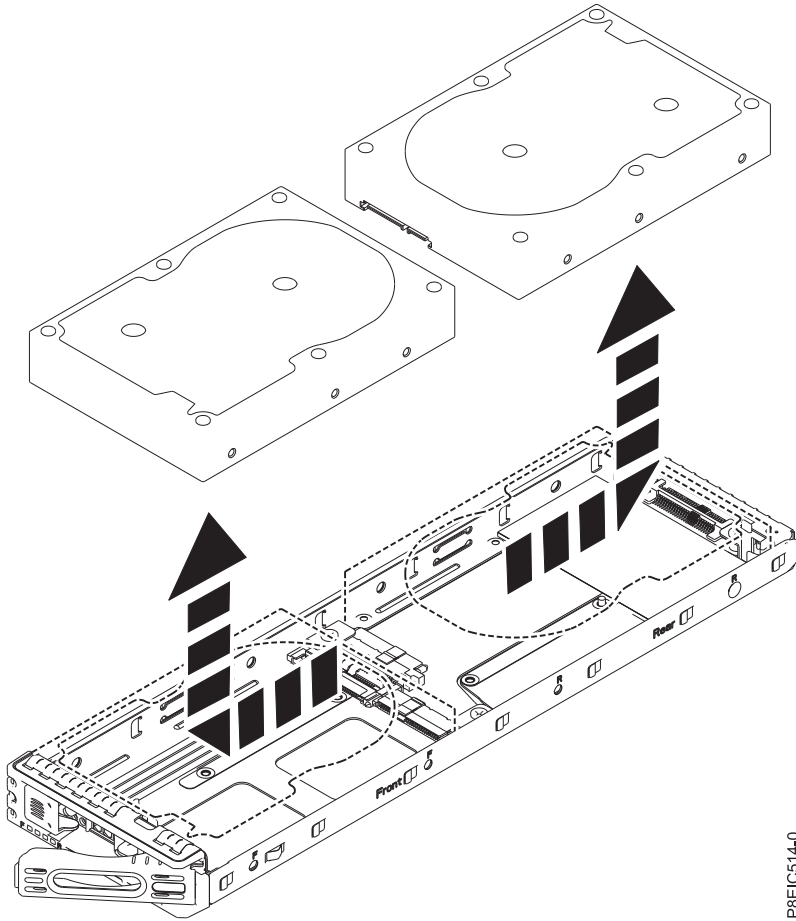
Figure 9. Removing the 3.5 inch drive

- For a 2.5 inch drive:
  a. Turn the tray over such that the drive is facing down.
  b. Unfasten the drive from the bottom of the tray by removing the four screws for the drive you want to remove, as shown in Figure 10 on page 11.
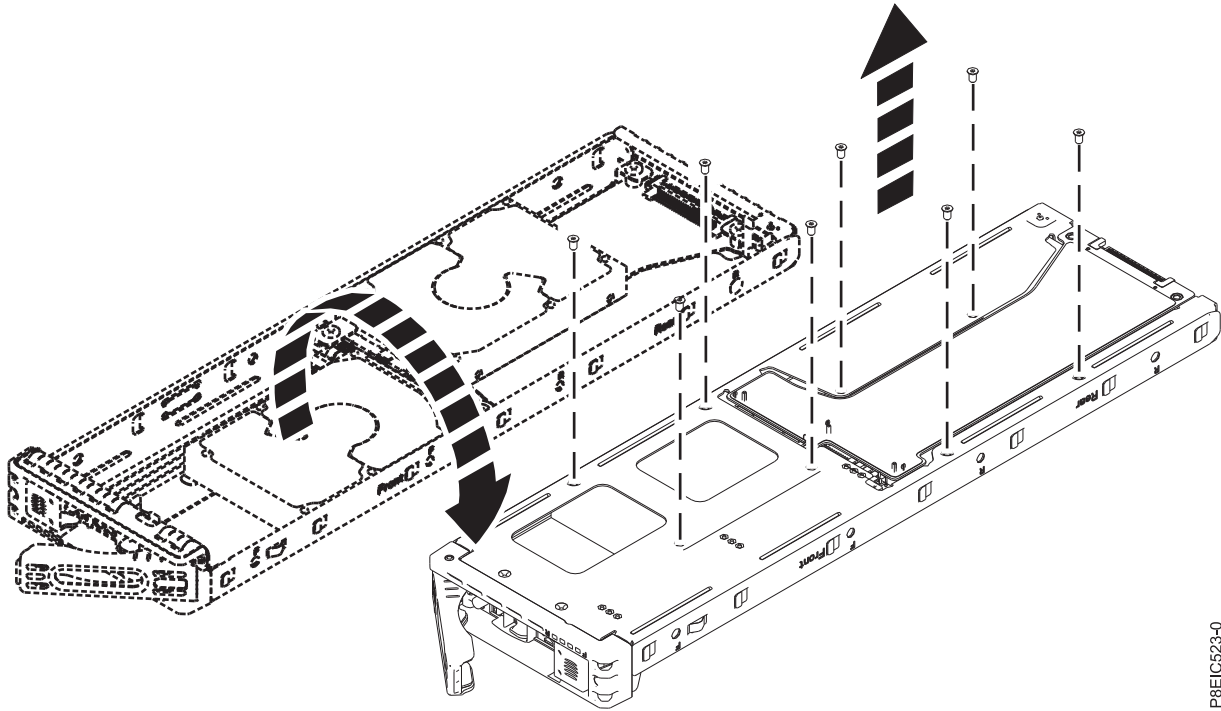
Figure 10. Removing the 2.5 inch drive screws

     c. While you hold both the drive and the tray, turn the tray over such that the drive is facing up.

     d. Slide the drive out of the socket and lift the drive out of the tray, as shown in Figure 11 on page 12.
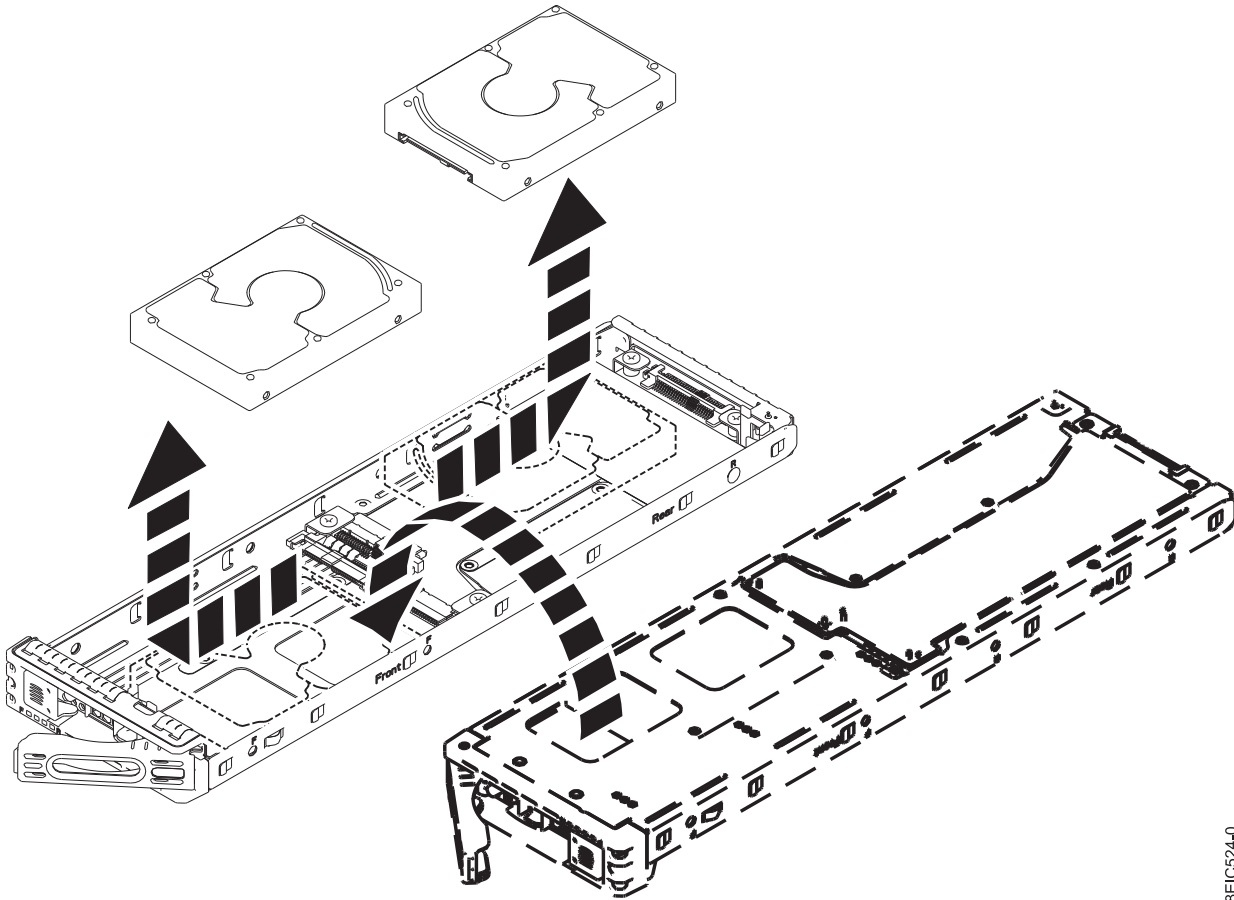
Figure 11. Removing the 2.5 inch drive

Replacing a rear drive in the 8348-21C

Learn how to replace one or both rear drives in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Shut down the system for this procedure. For instructions, see "Stopping the 8348-21C system" on page 110.
2. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
3. Install a drive into the tray.
   - For a 3.5 inch drive:
     a. Place the drive in the tray, then slide the drive into the socket, as shown in Figure 12 on page 13.

Figure 12. Installing the 3.5 inch drive into the tray

    b. Fasten the drive to the sides of the tray by using four screws (2 on each side), as shown in Figure 13 on page 14.
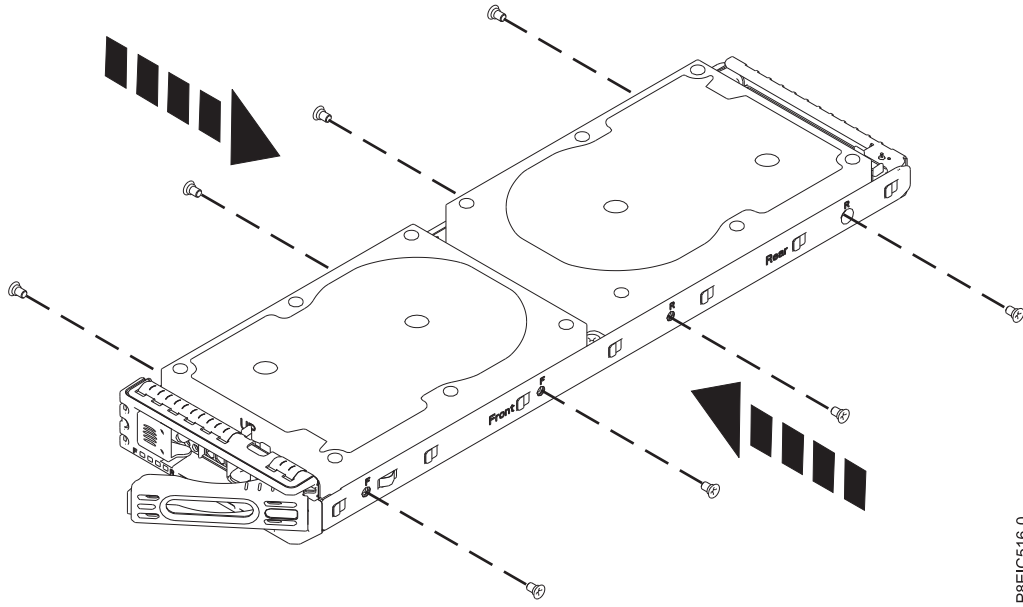
Figure 13. Fastening the 3.5 inch drive to the tray

- For a 2.5 inch drive:

    a. Place the drive in the tray, then slide the drive into the socket, as shown in Figure 14.

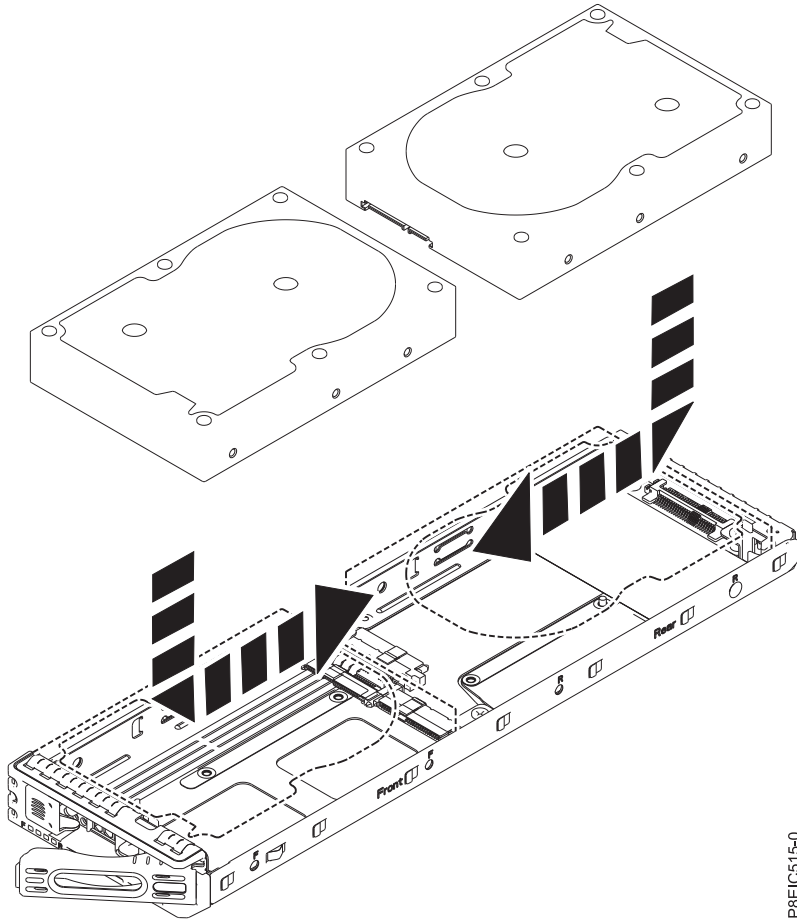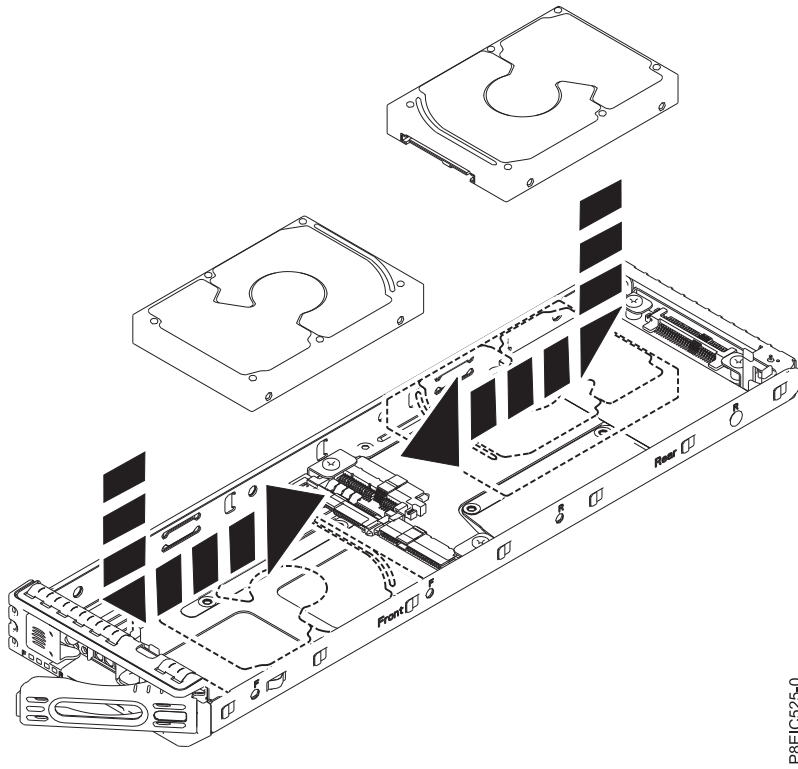*Figure 14. Installing the 2.5 inch drive into the tray*

    b. While you hold both the drive and the tray, turn the tray over such that the drive is facing down.

c. Fasten the drive to the bottom of the tray by using four screws, as shown in Figure 15.
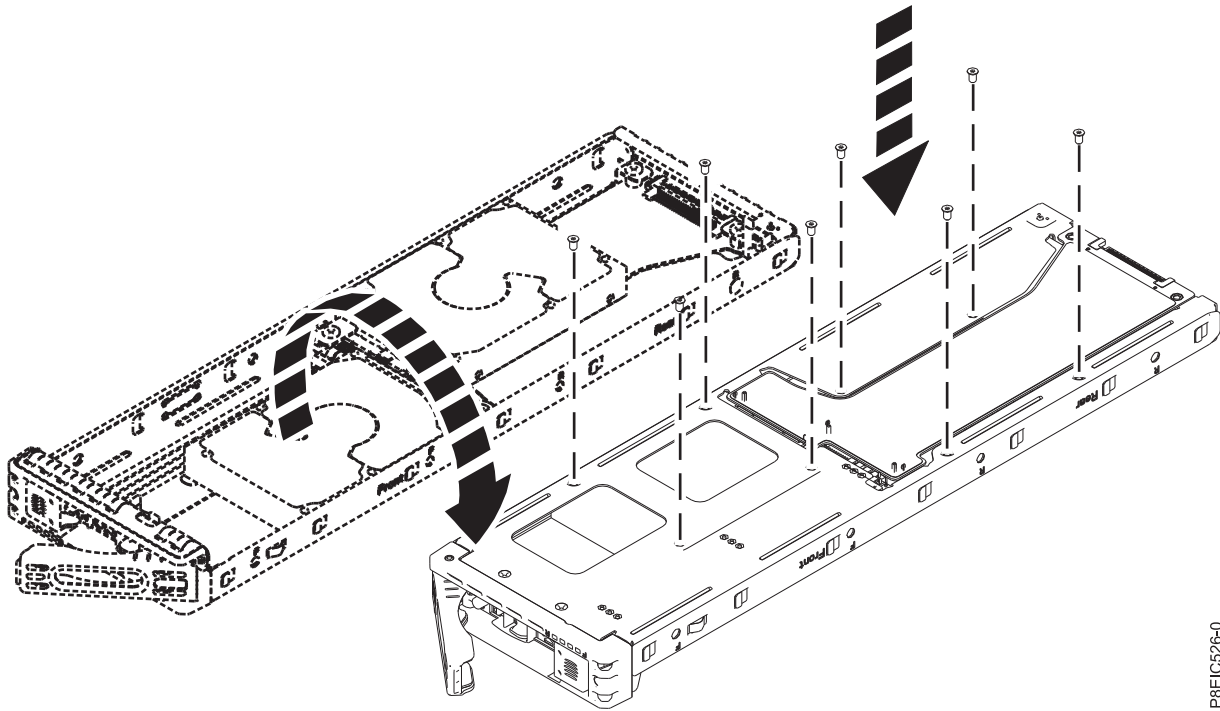
Figure 15. Screw locations for the 2.5 inch drive

d. Turn the tray over so that the drive is facing up.

4. Hold the drive tray by the bottom as you position the drive. Slide the drive tray all the way into the system. Push the drive tray in until the handle starts to close, then push the handle in until it locks. as shown in Figure 16 on page 16.

Figure 16. Locking the rear drive tray handle

5. Start the system. For instructions, see "Starting the 8348-21C system" on page 109.
6. Configure the installed or replaced drive for your environment.
   a. After you insert a new drive, you must rescan for the device.
      - **Ubuntu Linux operating system**: To run the **rescan-scsi-bus** command in the Ubuntu Linux operating system, log in to the system as the root user, and run the following command:

        ```
        rescan-scsi-bus
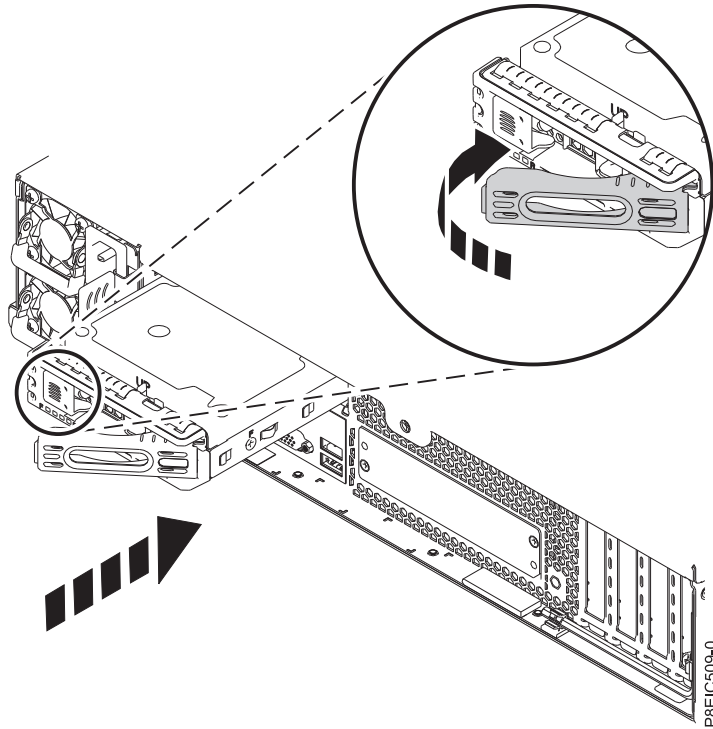        ```

        The **rescan-scsi-bus** tool is available in the *scsitools* package; install the package by using the following command:

        ```
        sudo apt-get install scsitools
        ```

      - **Red Hat Enterprise Linux (RHEL) version 7.2**: To run the rescan command in the REHL version 7.2 operating system, log in to the system as the root user, and run the command:

        ```
        rescan-scsi-bus.sh -a
        ```

        The **rescan-scsi-bus** tool is available in the *sg3_utils* package; install the package by using the following command:

        ```
        yum install sg3_utils
        ```

        You may also want to refer to: Adding a Storage Device or Path (https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/7/html/Storage_Administration_Guide/adding_storage-device-or-path.html)
   b. Load or restore data from your backup media. If a drive failed, refer to Recovering from a Disk Drive Failure (www.adaptec.com/en-us/support/infocenter/release-2015-1/index.jsp?topic=/RAID_IUG.xml/Topics/Recovering_from_a_Disk_Drive_Failure.html).

Removing and replacing the rear drive tray assembly in the 8348-21C

Learn how to remove and replace the rear drive tray assembly in the IBM Power System S812LC (8348-21C) system.

Removing the rear drive tray assembly in the 8348-21C

Learn how to remove the rear drive tray assembly in the IBM Power System S812LC (8348-21C) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the system to remove and replace internal parts in the 8348-21C" on page 105.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. Remove the processor air baffle. For instructions, see "Removing the processor baffle from an 8348-21C system" on page 118.

3. Remove the power cable and the drive signal cable from the cable clip **(A)** on the side of the rear drive tray assembly, as shown in Figure 17.
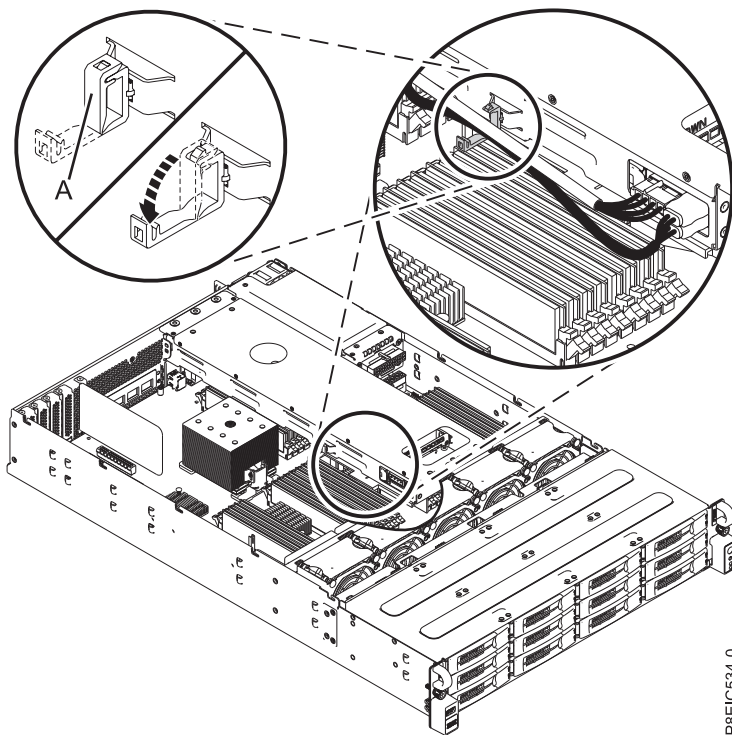
Figure 17. Removing cables from the cable clip

4. Disconnect the power cable **(A)** and the two signal connectors **(1)** and **(2)** from the rear drive tray assembly, as shown in Figure 18 on page 18.
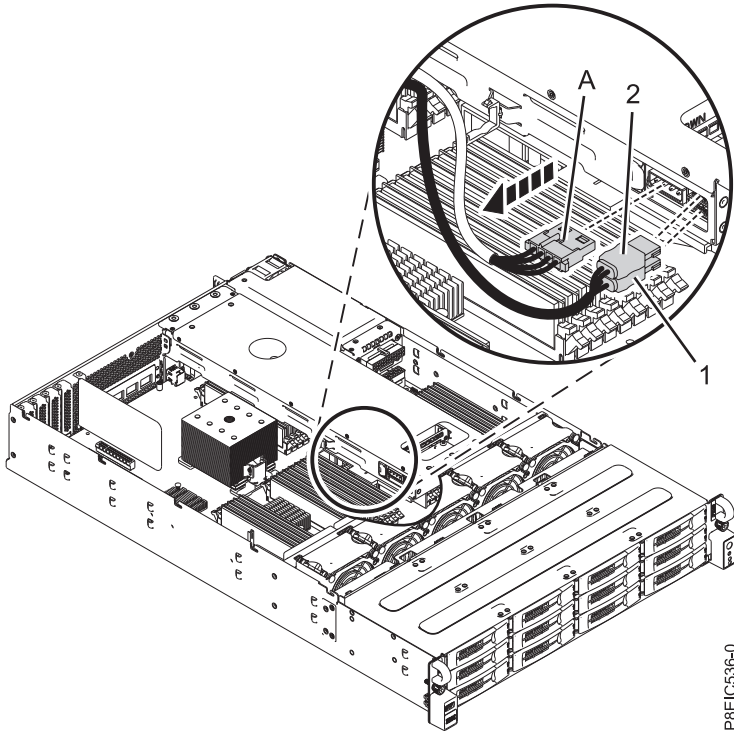
Figure 18. Removing power cable and signal cables

5. Lift the rear drive tray assembly from the system, as shown in Figure 19.
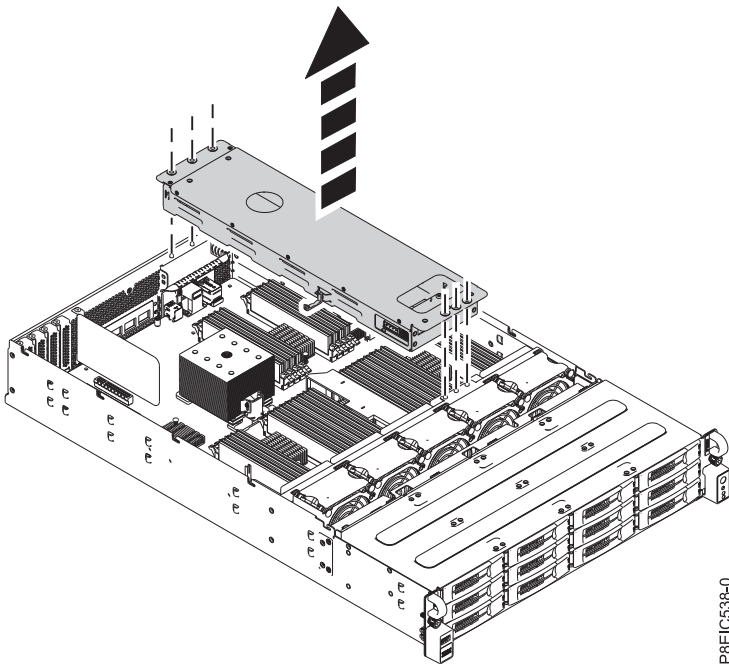
Figure 19. Removing rear drive tray assembly

6. If you want to move the drives from the old rear drive tray assembly to a new rear drive tray assembly, see "Removing and replacing a rear drive in the 8348-21C" on page 7.

Replacing the rear drive tray assembly in the 8348-21C

Learn how to replace the rear drive tray assembly in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.

2. Place the rear drive tray assembly into the system, by using the alignment pins. Three pins are located in the chassis for the front of the assembly, three pins are at the back, and two pins are on the side next to the power supplies, as shown in Figure 20.
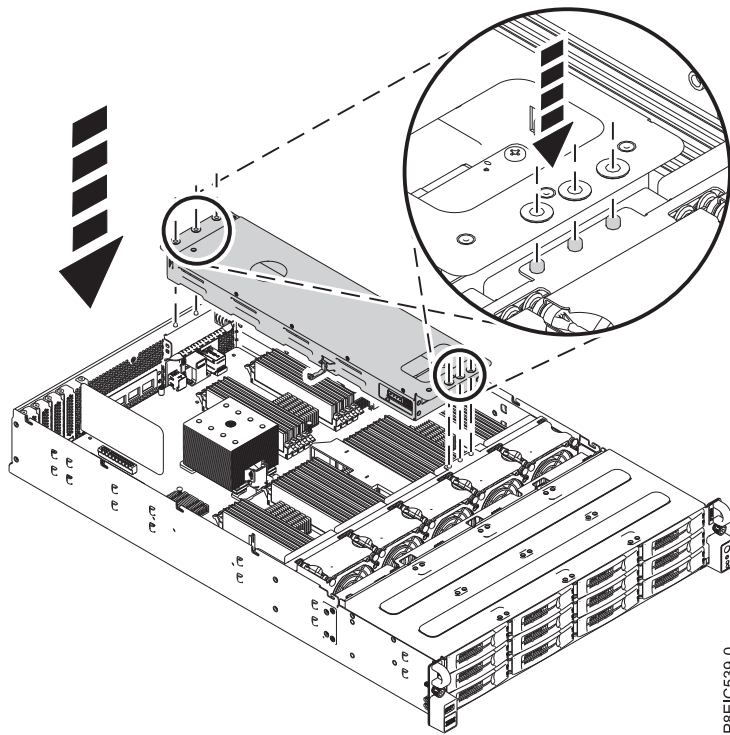
Figure 20. Installing rear drive tray assembly

3. Connect the drive signal cable (connectors **(1)** and **(2)**) to the rear drive tray assembly. Cable **(1)** plugs into the bottom socket and cable **(2)** plugs into the top socket, as shown in Figure 21 on page 20.

   Connect the power cord **(A)**.
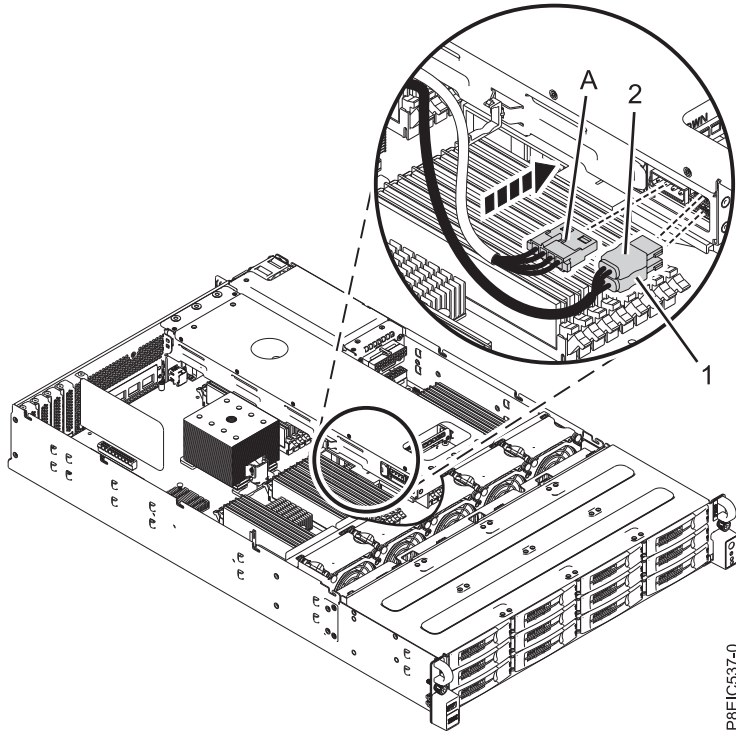
Figure 21. Connecting the drive signal and power cables

4. Fasten the cables to the side of the rear drive tray assembly by using the cable clip **(A)**. See Figure 22.
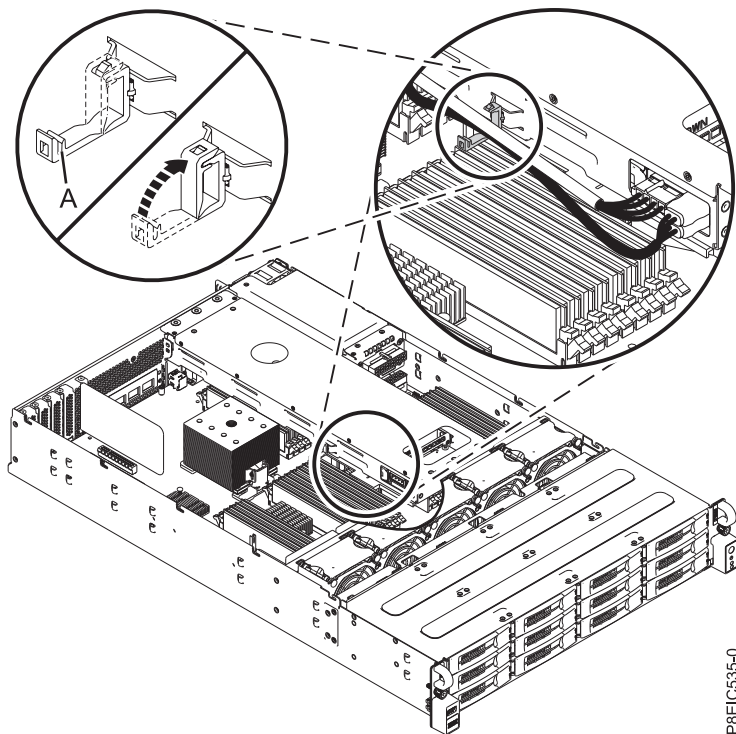
Figure 22. Fastening cables to the cable clip

5. Replace the processor air baffle. For instructions, see "Replacing the processor baffle in an 8348-21C system" on page 119.

What to do next

Prepare the system for operation. For instructions, see "Preparing the system for operation after removing and replacing internal parts for the 8348-21C" on page 108.

Removing and replacing the disk drive backplane in the 8348-21C

Learn how to remove and replace the disk drive backplane in the IBM Power System S812LC (8348-21C) system.

About this task

You can use a commercially available magnetic tip screwdriver to remove and replace the screws.

Removing the disk drive backplane from the 8348-21C

Learn how to remove the disk drive backplane in the IBM Power System S812LC (8348-21C) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the system to remove and replace internal parts in the 8348-21C" on page 105.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. Remove the fans. For instructions, see "Removing the fan in the 8348-21C" on page 30.

3. Label and remove the three front drive signal cables from the drives PCIe adapter. Using your thumb, press the release latch on the connector to remove the cable. See Figure 23 on page 22.
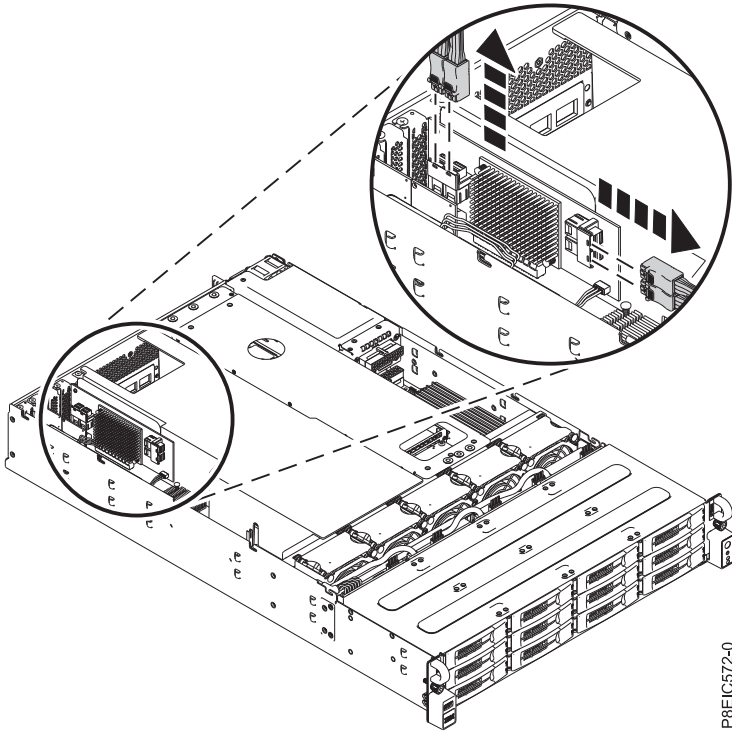
Figure 23. Disconnecting the drive signal cables

4. Remove the front drives power cable from the system backplane, as shown in Figure 24. Using your thumb, press the release latch on the connector to remove the cable.
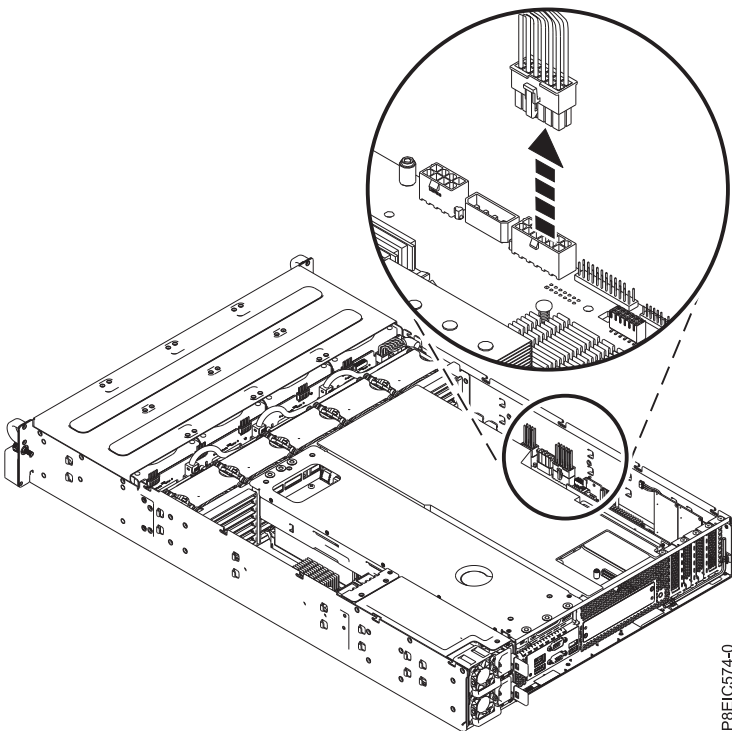
Figure 24. Disconnecting the front drives power cable

5. Remove the front fan signal cable from the system backplane, as shown in Figure 25.
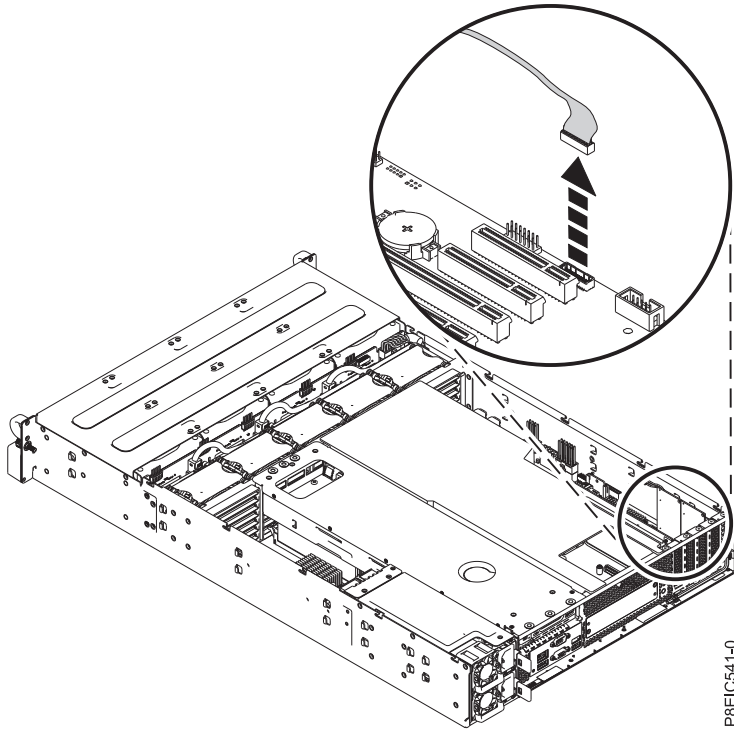
Figure 25. Removing front fan signal cable

6. Partially remove the front drive trays. They do not need to be fully removed; pull them out about 2 cm (1 in). For instructions, see "Removing a front drive in the 8348-21C" on page 3.
7. Remove two screws from the bottom of the disk drive backplane as shown in Figure 26 on page 24.
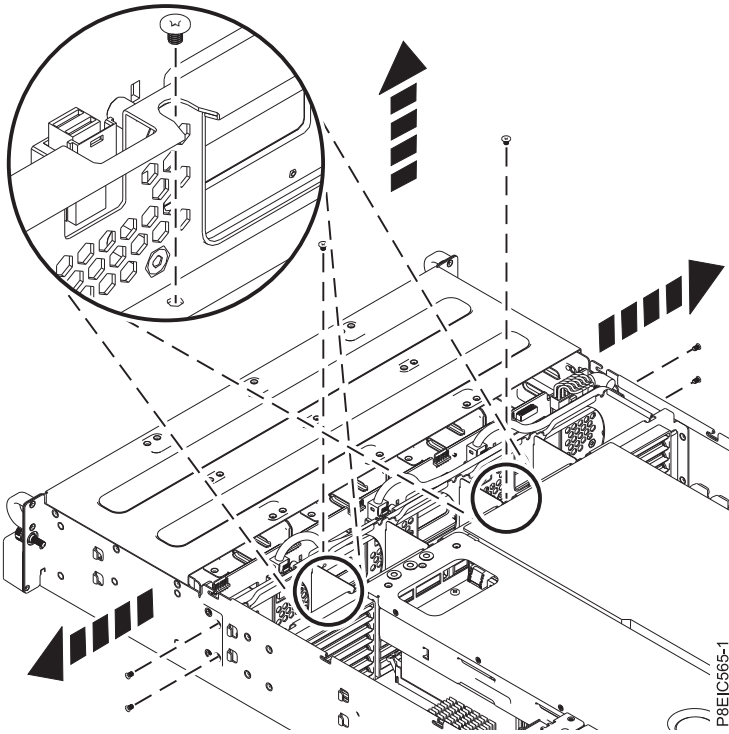
Figure 26. Removing the disk drive backplane screws

8. Remove two or four screws that secure the disk drive backplane, as shown in Figure 26. The one or two screws that must be removed are located closer together on the each side of the chassis; ensure that you remove the indicated screws.

9. Lift the disk drive backplane straight out from the chassis, as shown in Figure 27 on page 25.
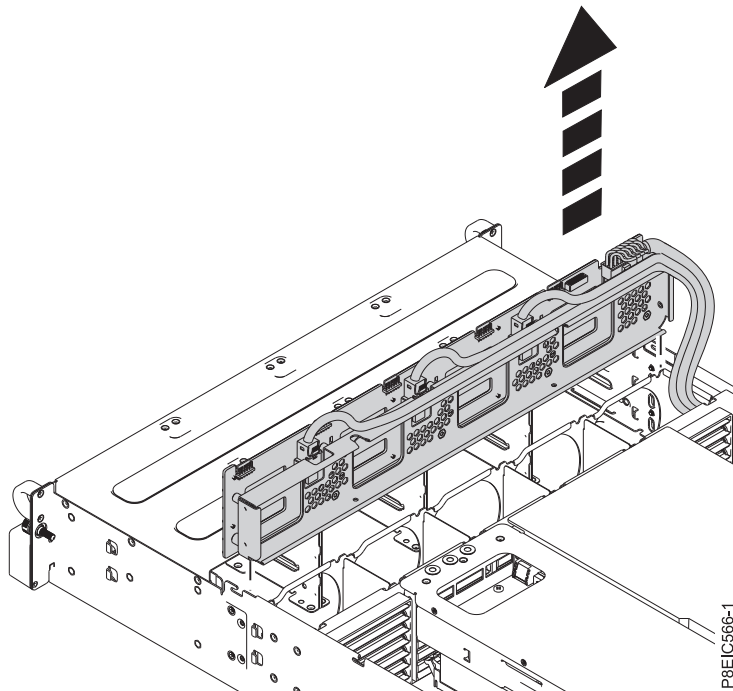
Figure 27. Removing the disk drive backplane

10. Carefully pass the drive signal cables, drive power cable, and fan control cable through the chassis to remove them, as shown in Figure 28.
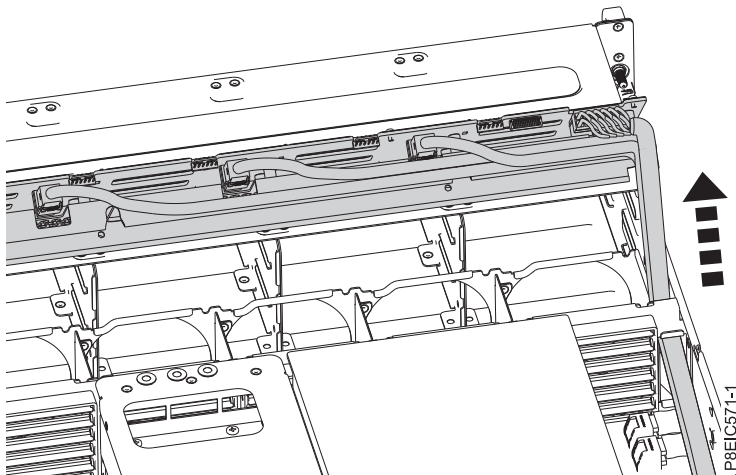
Figure 28. Removing the cables

11. Place the disk drive backplane and cables on the table.

Replacing the disk drive backplane in the 8348-21C

Learn how to replace the disk drive backplane in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Remove the replacement disk drive backplane and cables from the protective plastic envelope.
3. Carefully pass the fan signal cable, drive power cable, and drive signal cables through the chassis to install them, as shown in Figure 29.
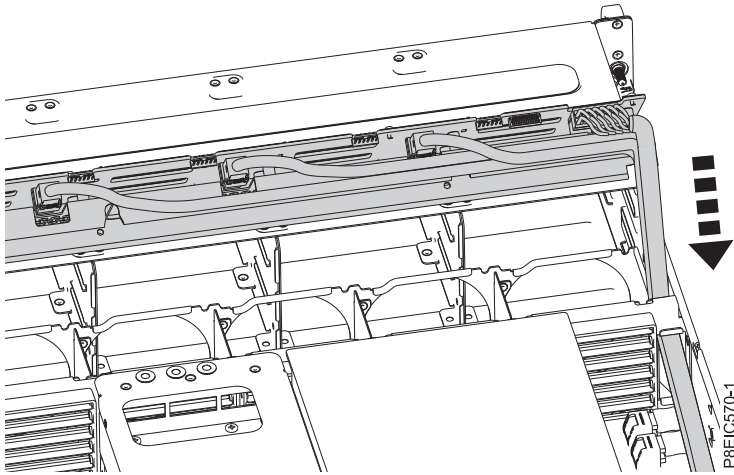
Figure 29. Installing the drive cables

4. Using the alignment channel, lower the disk drive backplane straight into the chassis, as shown in Figure 30.
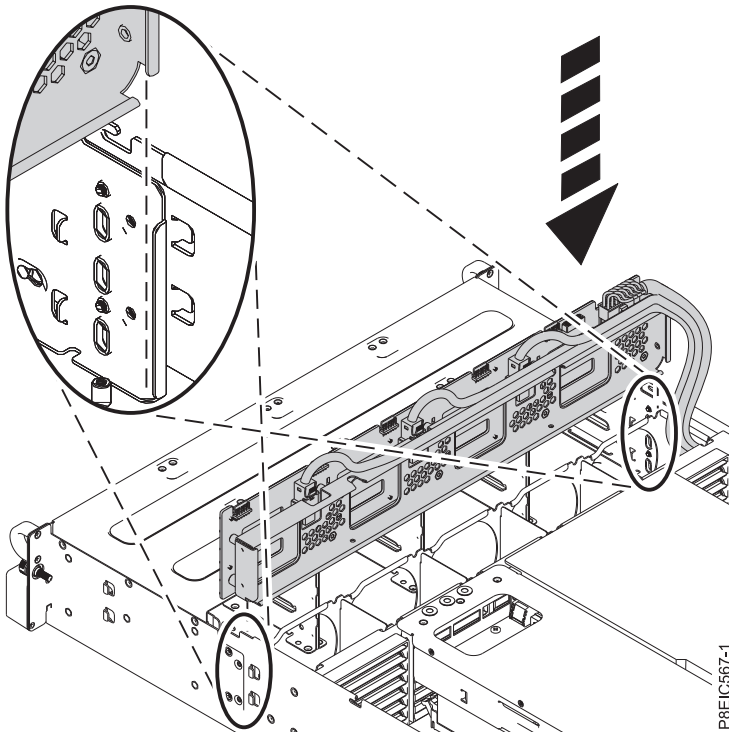
Figure 30. Installing the disk drive backplane

5. Replace two screws into the bottom of the disk drive backplane, as shown in Figure 31 on page 27.
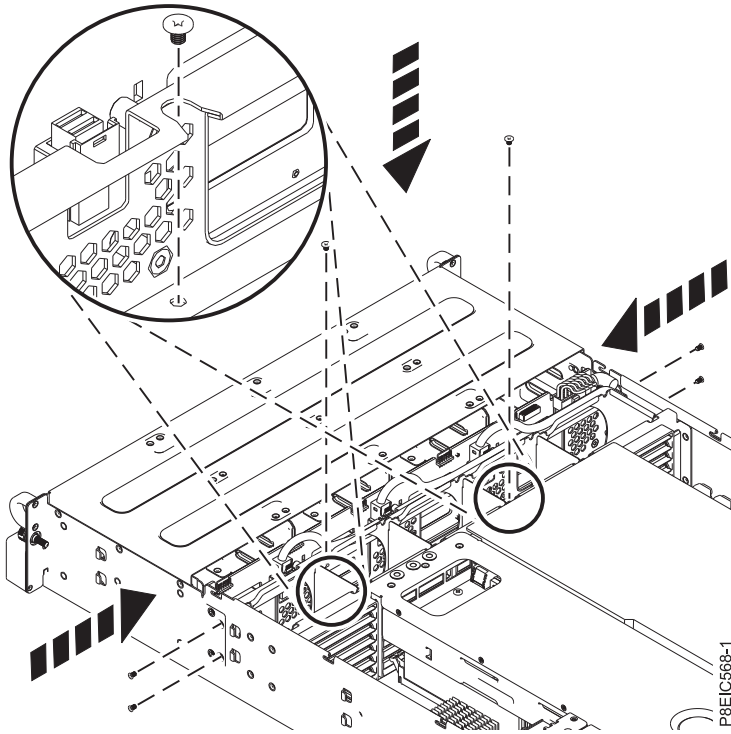
Figure 31. Replacing the disk drive backplane screws

6. Replace 2 or 4 screws into the sides of the chassis to secure the disk drive backplane, as shown in Figure 31.
7. Fully insert the front drive trays. For instructions, see "Replacing a front drive in the 8348-21C" on page 5.
8. Replace the front fan signal cable in the system backplane, as shown in Figure 32 on page 28.
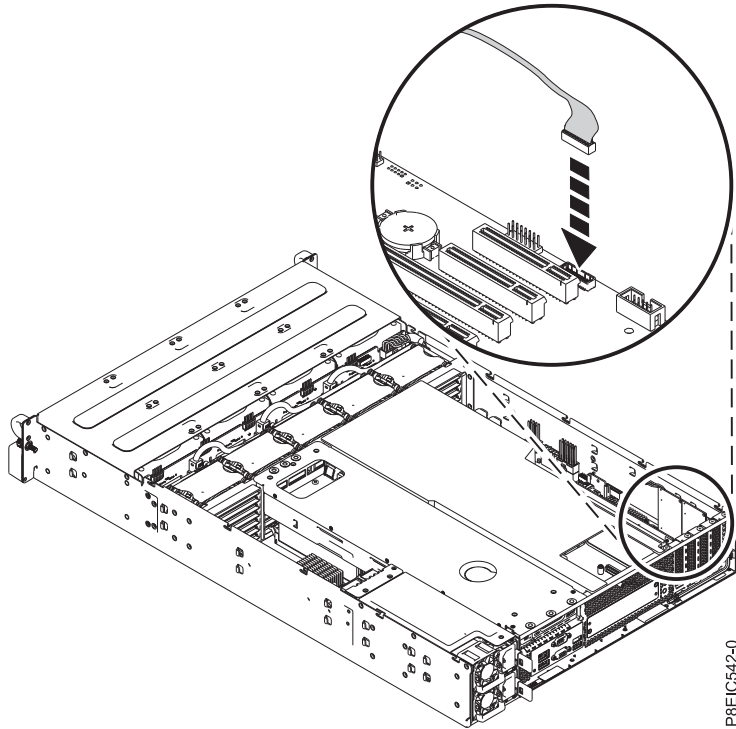
Figure 32. Replacing front fan signal cable

9. Replace the front drive power cable in the system backplane, as shown in Figure 33. Ensure that the cable latch clip snaps into place on the connector.
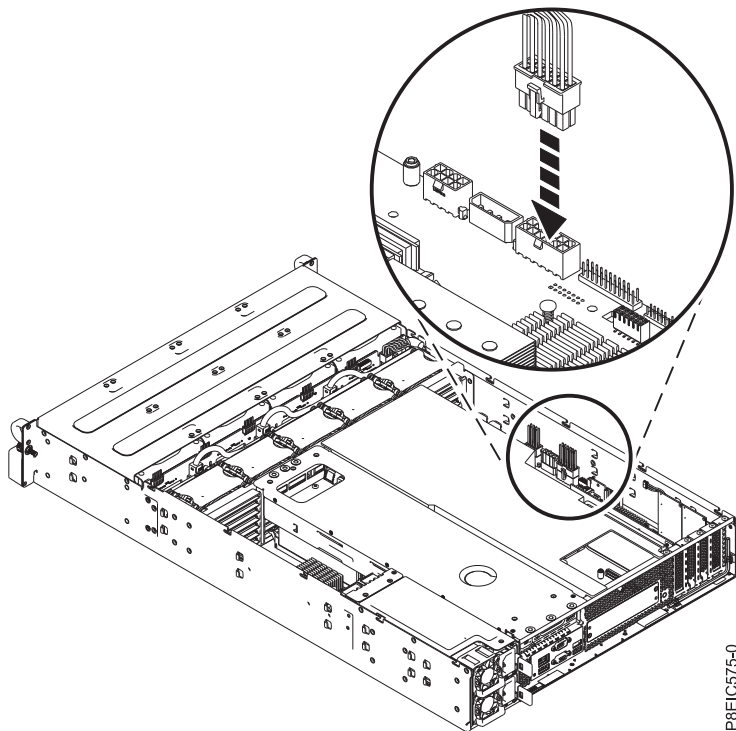
Figure 33. Connecting the front drive power cable

10. Using the labels, connect the three drive signal cables to their corresponding connectors on the drive PCIe adapter, as shown in Figure 34, Figure 35, and Figure 36 on page 30. Ensure that the cable latch clip snaps into place on the connector.
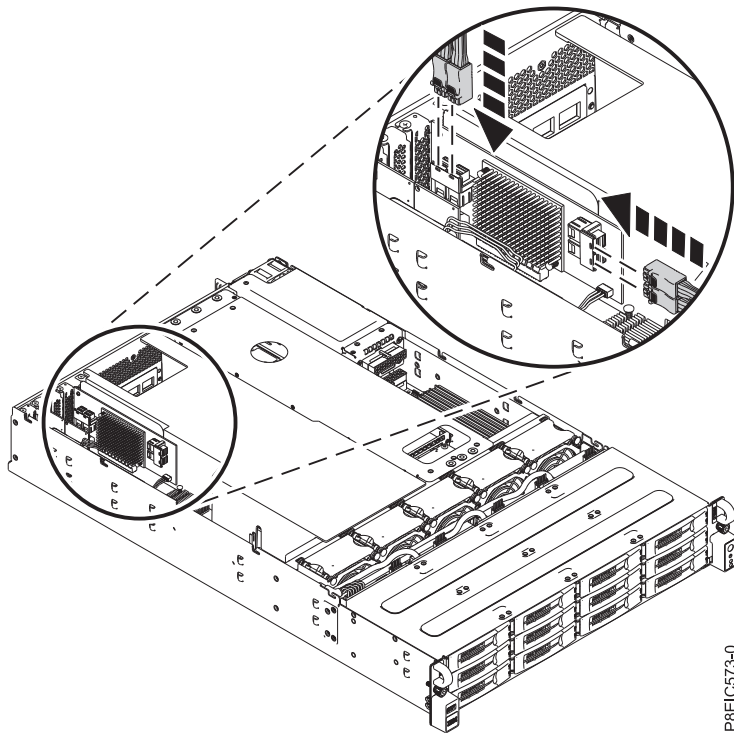
Figure 34. Connecting the drive signal cables
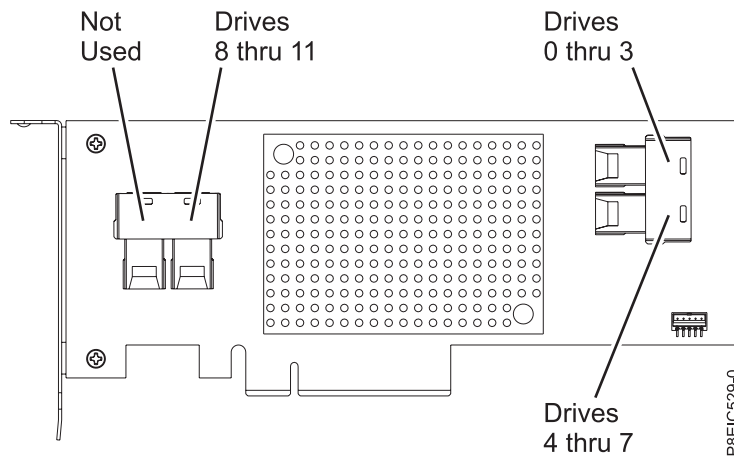
Figure 35. Feature EC3S drive cable connector details
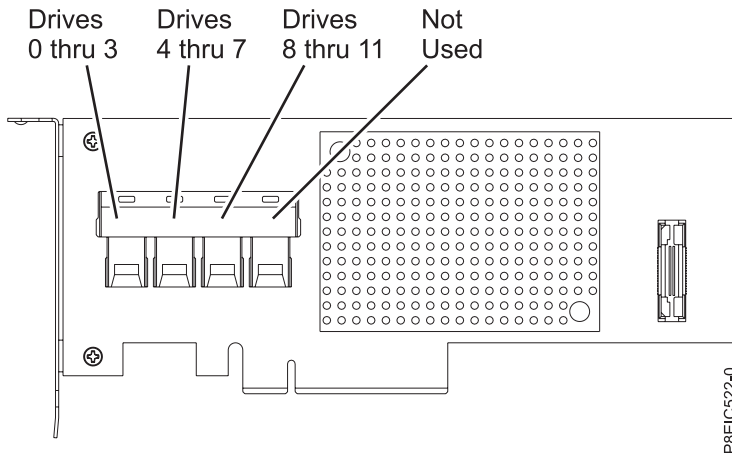
Figure 36. Feature EC3Y drive cable connector details

Be sure to route the drive cables such that the cards do not bend and that other components are forced out of the way.

11. Replace the fans. For instructions, see "Replacing the fan in the 8348-21C" on page 31.

What to do next

Prepare the system for operation. For instructions, see "Preparing the system for operation after removing and replacing internal parts for the 8348-21C" on page 108.

Removing and replacing a fan in the 8348-21C

Learn how to remove and replace a fan in the IBM Power System S812LC (8348-21C) system.

Removing the fan in the 8348-21C

Learn how to remove the fan in the IBM Power System S812LC (8348-21C) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the system to remove and replace internal parts in the 8348-21C" on page 105.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. To disconnect the fan cable, grasp the connector **(A)** and carefully pull the connector up from the disk drive backplane, as shown in Figure 37 on page 31. Do not pull on the wires.
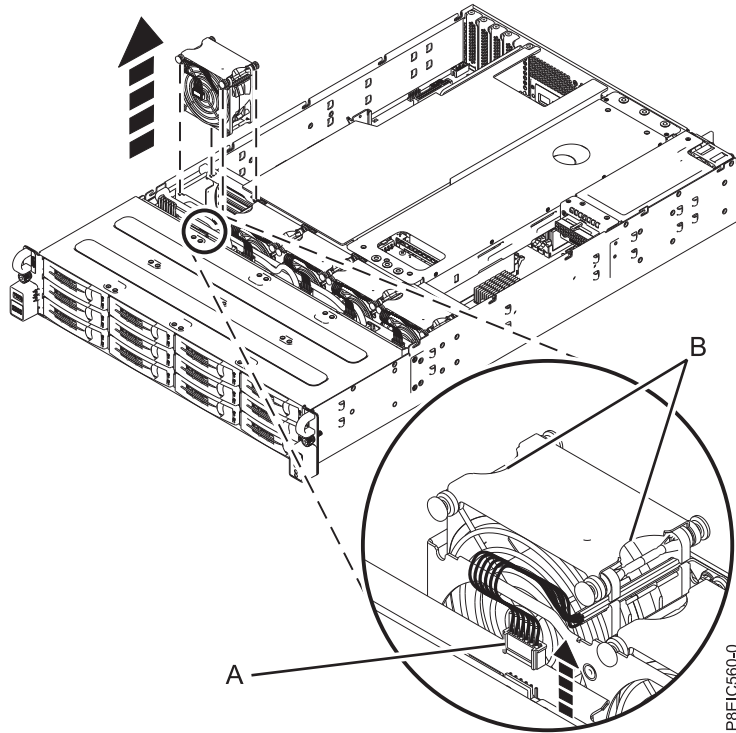
Figure 37. Disconnecting the fan cable and removing the fan

3. Grasp the fan at **(B)** and lift it from the system, as shown in Figure 37.

Replacing the fan in the 8348-21C

Learn how to replace the fan in the IBM Power System S812LC (8348-21C) system.

Procedure

1. While holding the fan at **(A)**, lower the fan into the system while you are aligning the standoffs with the slots in the system chassis, as shown in Figure 38 on page 32. Ensure that the arrow on the fan is pointing toward the rear of the system.
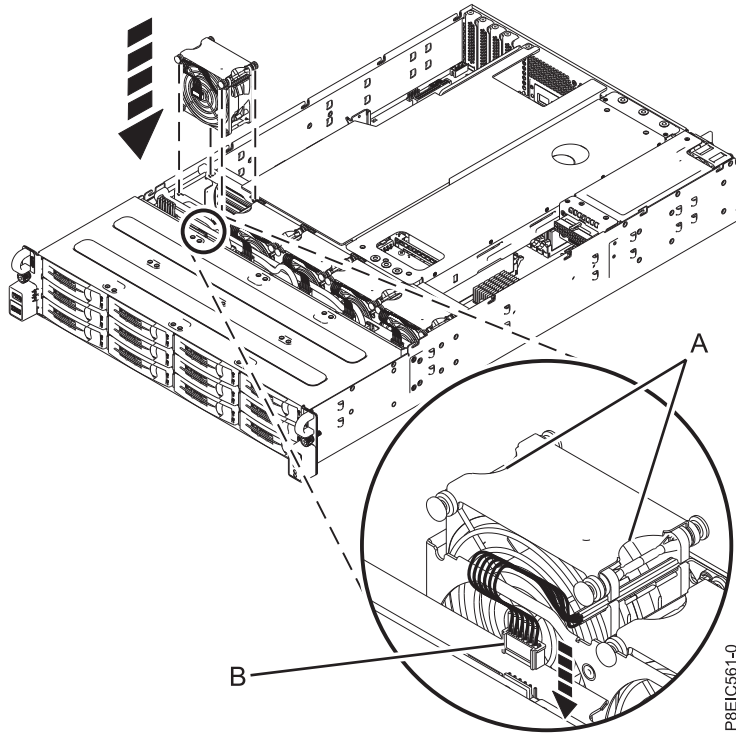
Figure 38. Replacing the fan and reconnecting the cable

2. Connect the fan cable **(B)** to the disk drive backplane, as shown in Figure 38.

What to do next

Prepare the system for operation. For instructions, see "Preparing the system for operation after removing and replacing internal parts for the 8348-21C" on page 108.

Removing and replacing the storage mezzanine card and cable in the 8348-21C

Learn how to remove and replace the storage mezzanine card and cable in the IBM Power System S812LC (8348-21C) system.

Removing the storage mezzanine card and cable the 8348-21C

Learn how to remove the storage mezzanine card and cable in the IBM Power System S812LC (8348-21C) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the system to remove and replace internal parts in the 8348-21C" on page 105.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. Remove the processor baffle. For instructions, see "Removing the processor baffle from an 8348-21C system" on page 118.

3. Disconnect and remove the drive signal cable **(A)** from the rear drive tray assembly, as shown in Figure 39.
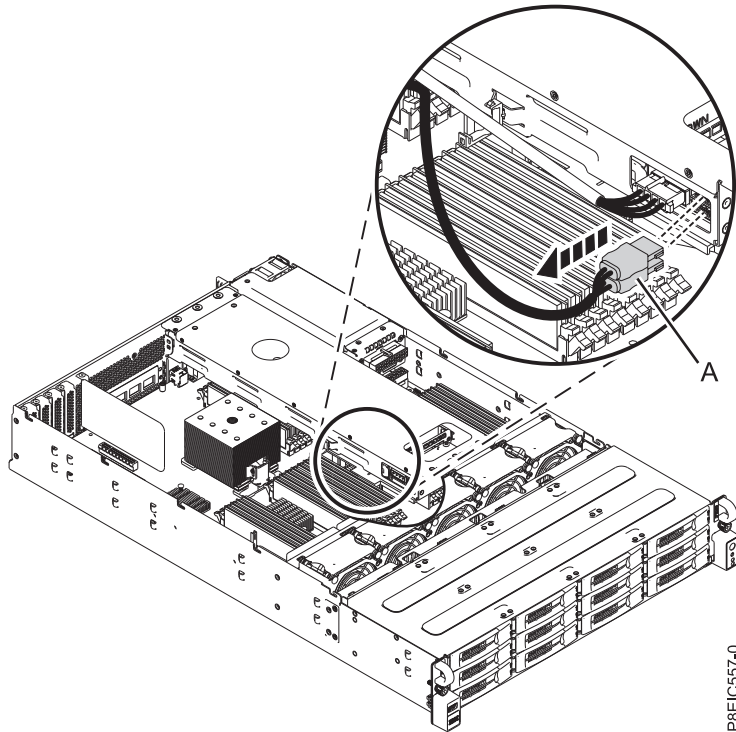
Figure 39. Disconnecting the drive signal cable from the rear drive tray assembly

4. Loosen and remove the four screws that attach the storage mezzanine card **(B)** to the system backplane, then remove the storage mezzanine card, as shown in Figure 40 on page 34.
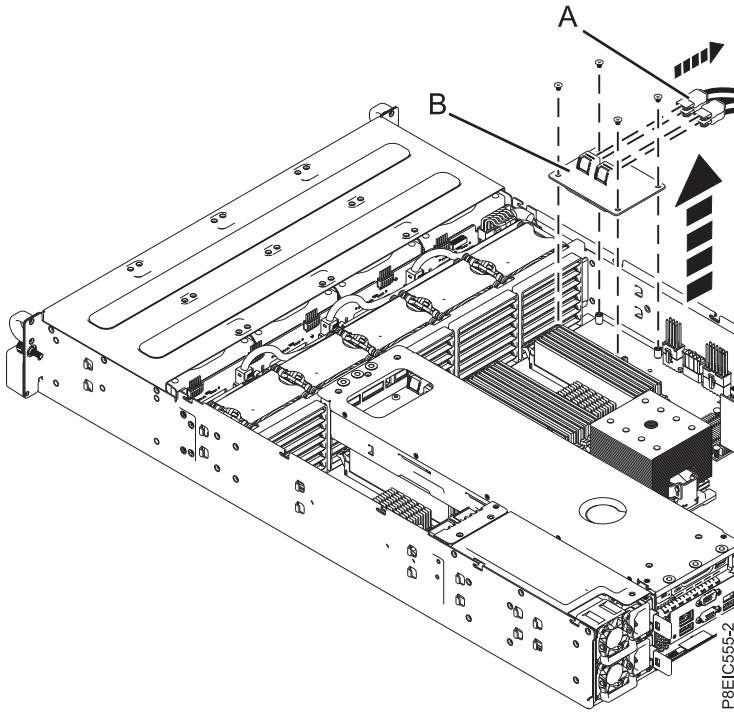
Figure 40. Removing the storage mezzanine card

Replacing the storage mezzanine card and cable in the 8348-21C

Learn how to replace the storage mezzanine card and cable in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Install the storage mezzanine card in the system.
2. Install and tighten the four screws that secure the storage mezzanine card to the system backplane, as shown in Figure 41 on page 35.
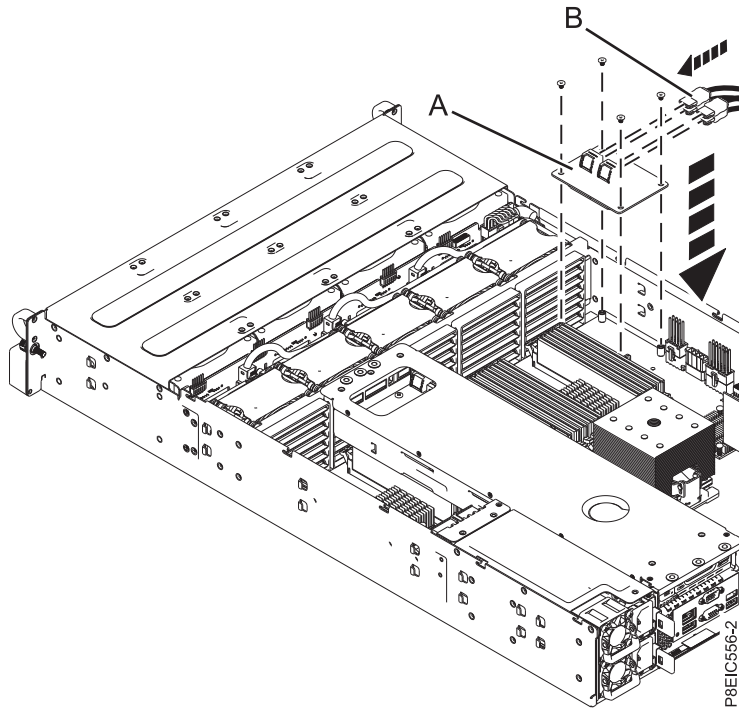
Figure 41. Replacing the storage mezzanine card

3. Connect the drive signal cable **(A)** to the rear drive tray assembly, as shown in Figure 42 on page 36.

   Note: The signal cable marked as **2** connects to the upper port of the rear drive tray assembly and the signal cable marked as **1** connects to the lower port of the rear drive tray assembly.
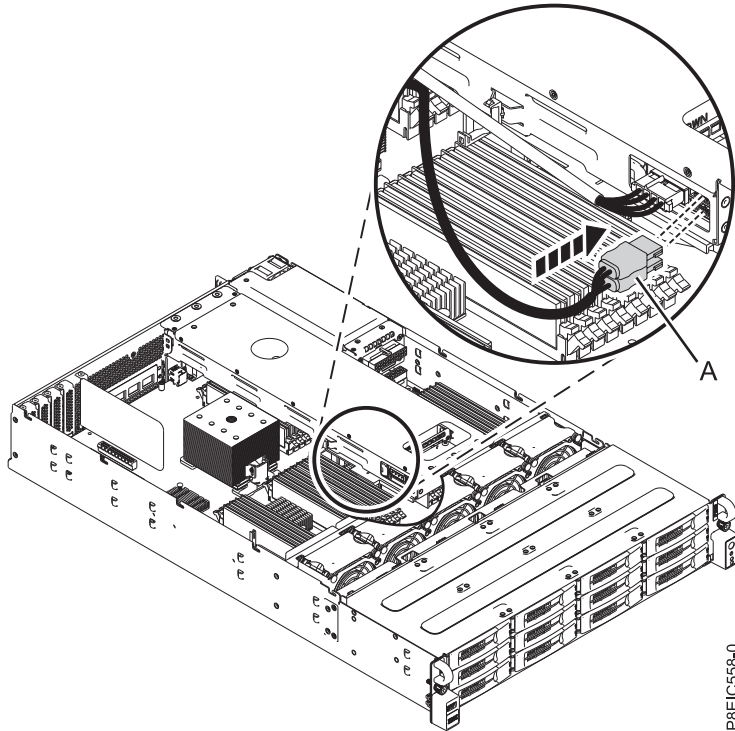
Figure 42. Connecting the drive signal cable to the rear drive tray assembly

4. Replace the processor baffle. For instructions, see "Replacing the processor baffle in an 8348-21C system" on page 119.

What to do next

See "Preparing the system for operation after removing and replacing internal parts for the 8348-21C" on page 108.

Removing and replacing memory in the 8348-21C

Learn how to remove and replace memory in the IBM Power System S812LC (8348-21C) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the system to remove and replace internal parts in the 8348-21C" on page 105.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   • Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   • When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. Remove the processor baffle. For instructions, see "Removing the processor baffle from an 8348-21C system" on page 118.

3. Remove the rear drive tray assembly. For instructions, see "Removing the rear drive tray assembly in the 8348-21C" on page 17.

4. Remove the memory DIMM.

   a. Locate the memory DIMM that you want to remove.

   b. Unlock the memory DIMM by simultaneously pushing the locking tabs away from the memory DIMM, in the direction that is shown in Figure 43. Be sure to unlock both tabs at the same time. The lever action of opening the tabs pushes the memory DIMM out of the slot.

   c. Hold the memory DIMM by the edges and pull it out of the slot.
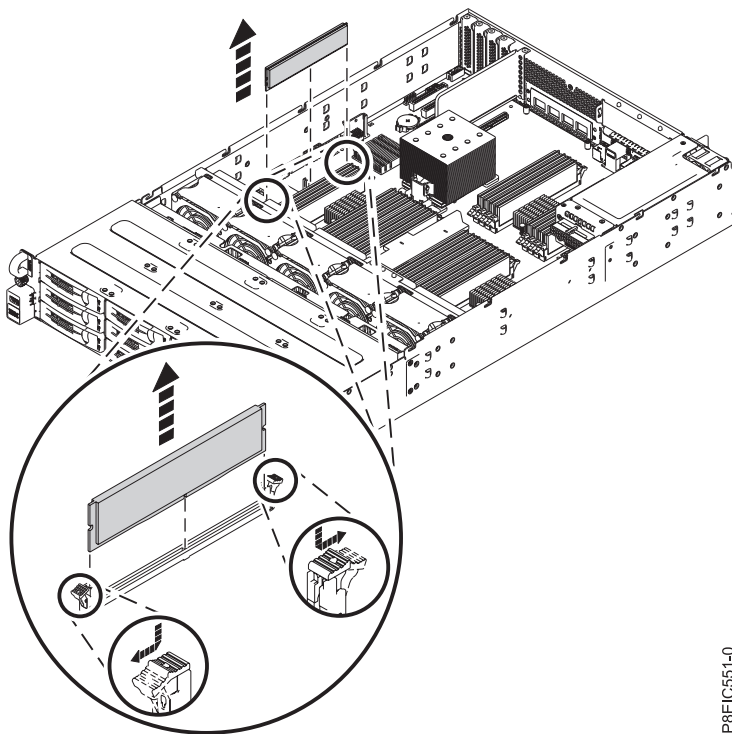
Figure 43. Removing the 8348-21C memory

5. Replace the memory DIMM.

   a. Grasp the memory DIMM along its edges and align it with the slot on the system backplane.

Attention: Memory is keyed to prevent it from being installed incorrectly. Note the location of the key tab within the memory connector before you attempt to install it.

b. Press firmly on each side of the memory DIMM until the locking tab locks in place with an audible click.
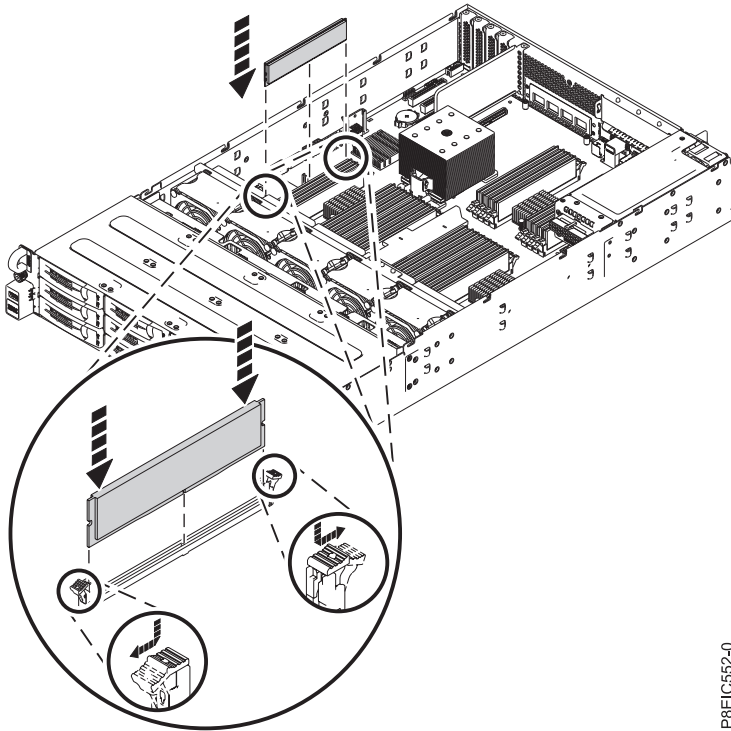
Figure 44. Replacing the 8348-21C memory

6. Replace the rear drive tray assembly. For instructions, see "Replacing the rear drive tray assembly in the 8348-21C" on page 19.

7. Replace the processor baffle. For instructions, see "Replacing the processor baffle in an 8348-21C system" on page 119.

What to do next

Prepare the system for operation. For instructions, see "Preparing the system for operation after removing and replacing internal parts for the 8348-21C" on page 108.

Removing and replacing a PCIe adapter in the 8348-21C

Learn how to remove and replace a PCIe adapter in the IBM Power System S812LC (8348-21C) system.

Removing a PCIe adapter from the 8348-21C

Learn how to remove a PCIe adapter from the IBM Power System S812LC (8348-21C) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the system to remove and replace internal parts in the 8348-21C" on page 105.

Attention: For safety and airflow purposes, if you remove parts from the system, you must ensure that PCIe tailstock fillers are present.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:
   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. If you are removing a (FC EC3S) PCIe Gen3 SAS/SATA RAID adapter, complete this step. Otherwise skip this step and go to step 3.

   Note: The supercapacitor module card is shipped together with the (FC EC3S) PCIe Gen3 SAS/SATA RAID adapter as a single FRU and therefore must also be removed when the SAS RAID adapter is removed.

   a.

   Note: The supercapacitor module must be in a discharged state to avoid damage to the adapter. To ensure that an installed unit is discharged, switch your system off, then wait five minutes. After an abnormal shutdown, wait three minutes after backup is complete, then remove the unit. Label and remove the cables from the PCIe adapter.

   b. Loosen and remove the screw **(A)** that secures the supercapacitor module card to the system chassis in PCIe adapter slot number one by using a Phillips screwdriver. Remove the supercapacitor module card **(B)**, as shown in Figure 45 on page 40.

   c. Go to step 5 on page 40.

3. If needed, label and remove the cables from the PCIe adapter. Also, if needed, label and remove any plugs that extend out of the PCIe adapter.

4. Loosen and remove the screw **(A)** that secures the PCIe adapter to the system chassis by using a Phillips screwdriver. Remove the PCIe adapter **(B)**, as shown in Figure 45 on page 40.
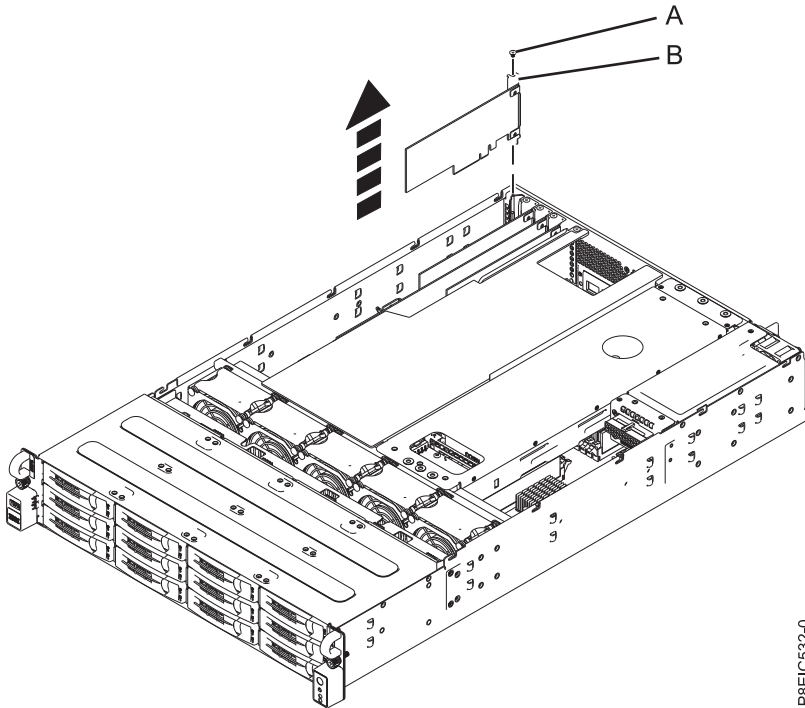
Figure 45. Removing the PCIe adapter

5. The procedure is complete.

Replacing a PCIe adapter in the 8348-21C

Learn how to replace a PCIe adapter in the IBM Power System S812LC (8348-21C) system.

Before you begin

Attention: For safety and airflow purposes, if you remove parts from the system, you must ensure that PCIe tailstock fillers are present.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. If you are replacing a PCIe3 low profile 6 Gb SAS/SATA RAID adapter (FC EC3Y - PMC 71605E – see http://www.ibm.com/support/knowledgecenter/HW4P4/p8eic/fcec3y.htm), complete this step. Otherwise, skip this step and go to step 3 on page 42.

   a. Connect the signal cables for the disk drive to the RAID adapter before installing the adapter. See Figure 46 on page 41.
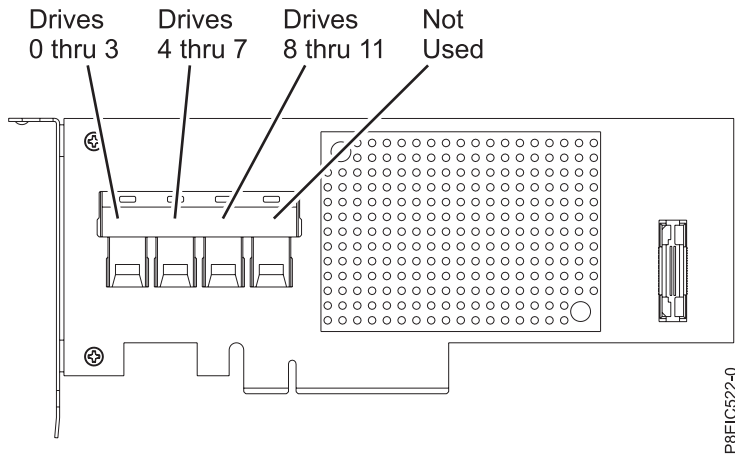
Figure 46. Cabling the PCIe3 low profile 6 Gb SAS/SATA RAID adapter (FC EC3Y - PMC 71605E)

   b. Insert the RAID adapter **(A)** into the adapter slot of the system backplane PCIe, aligning the adapter properly and inserting it fully into the slot.

   c. Insert the retaining screw **(B)** and tighten it to secure the RAID adapter in the system, as shown in Figure 47.

Figure 47. Installing the PCIe3 low profile 6 Gb SAS/SATA RAID adapter (FC EC3Y - PMC 71605E) (A) and screw (B) in the system

   d. Remove any existing cable ties as they can prevent proper cable layout and interfere with the top cover.

   e. Do not damage the adapters or cables.

      Notes:

      • Do not tie the cables together.

- Route the disk drive signal cables along the top of the PCIe adapters to keep the cables from damaging the adapters.
- Do not route the cables between the adapters.
- Spread the cables to ensure that the service access cover can be closed without pinching the cables. See Figure 48.
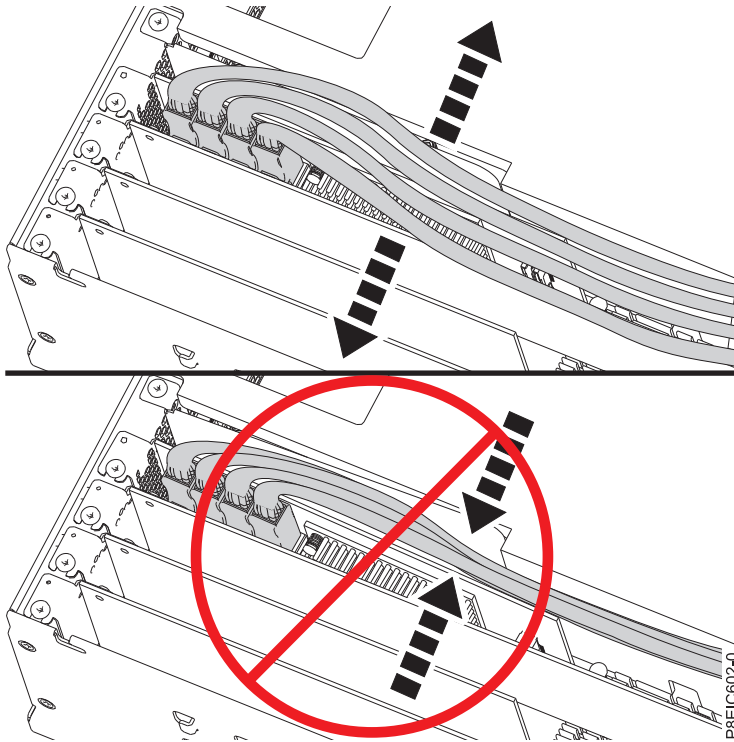
Figure 48. Routing the disk drive signal cables

    f. Go to step 7 on page 46.

3. If you are replacing a PCIe3 low profile 12 Gb SAS/SATA RAID adapter with 1 GB protected write cache (FC EC3S - PMC 81605Z – see http://www.ibm.com/support/knowledgecenter/HW4P4/p8eic/fcec3s.htm), complete this step. Otherwise, skip this step and go to step 4 on page 45.

Note: The supercapacitor module card is shipped together with the PCIe Gen3 SAS/SATA RAID adapter (FC EC3S) as a single FRU and therefore the module card must also be replaced when the SAS RAID adapter is replaced.

    a. Insert the replacement supercapacitor module card **(A)** into the PCIe adapter slot of the system backplane, aligning the module properly and inserting it fully into the slot.

    b. Insert the retaining screw **(B)** and tighten it to secure the supercapacitor module card in the system, as shown in Figure 49 on page 43.
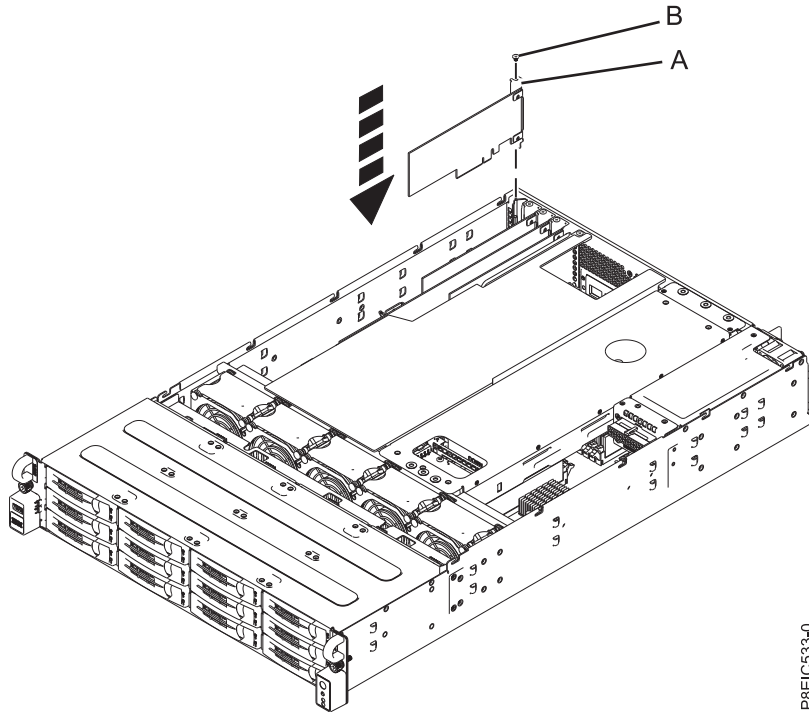
Figure 49. Replacing the supercapacitor module card (A) and screw (B)

    c. Connect the disk drive signal cables to the PCIe Gen3 SAS/SATA RAID adapter (FC EC3S) before installing the adapter. See Figure 50.
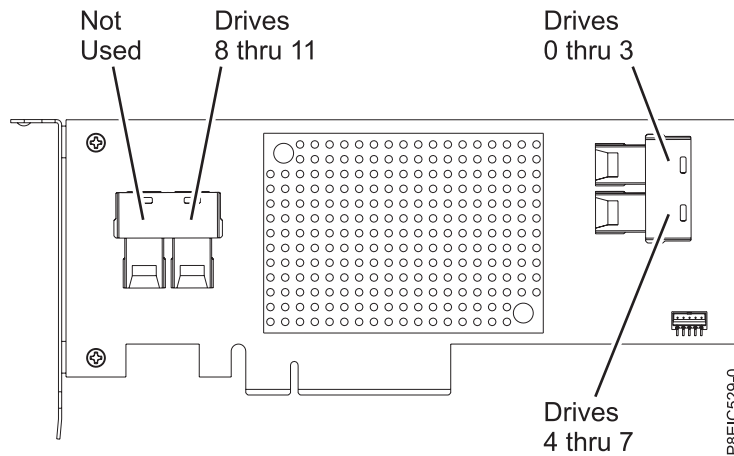
Figure 50. Cabling the PCIe Gen3 SAS/SATA RAID adapter (FC EC3S)

    d. Insert the replacement RAID adapter **(A)** into the PCIe adapter slot of the system backplane, aligning the adapter properly and inserting it fully into the slot.

    e. Insert the retaining screw **(B)** and tighten it to secure the PCIe adapter in the system, as shown in Figure 51 on page 44.
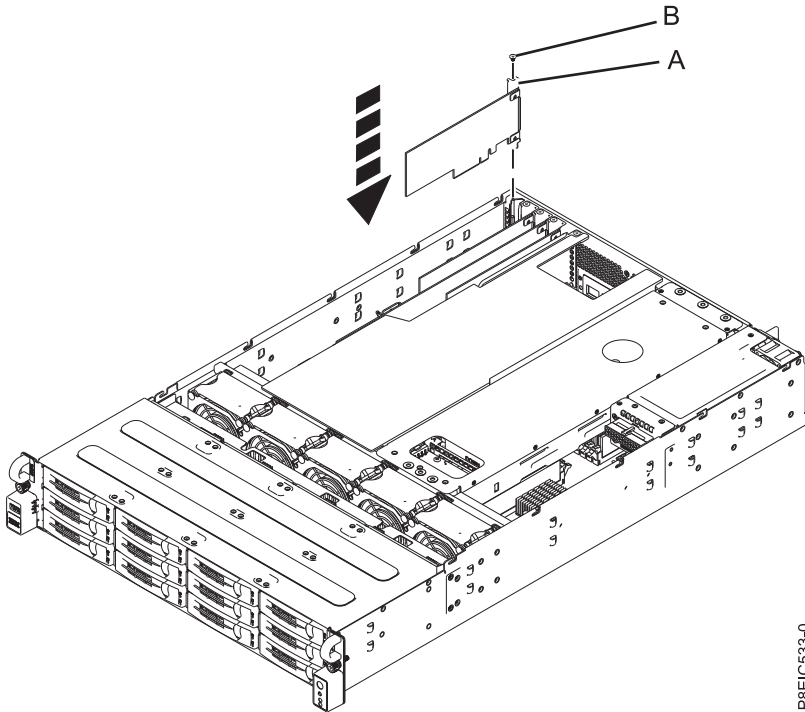
Figure 51. Installing the PCIe Gen3 SAS/SATA RAID adapter (FC EC3S) (A) and screw (B)

    f. Route the disk drive signal cables along the top of the PCIe adapters to keep the cables from damaging the adapters. Do not route the cables between the adapters. Spread the cables to ensure that the service access cover can be closed without pinching the cables. See Figure 52 on page 45 for an example of how to route the cables along the top of the PCIe adapters. Your cable connections may differ from Figure 52 on page 45, but how the cable is routed along the top of the PCIe adapters will not differ.
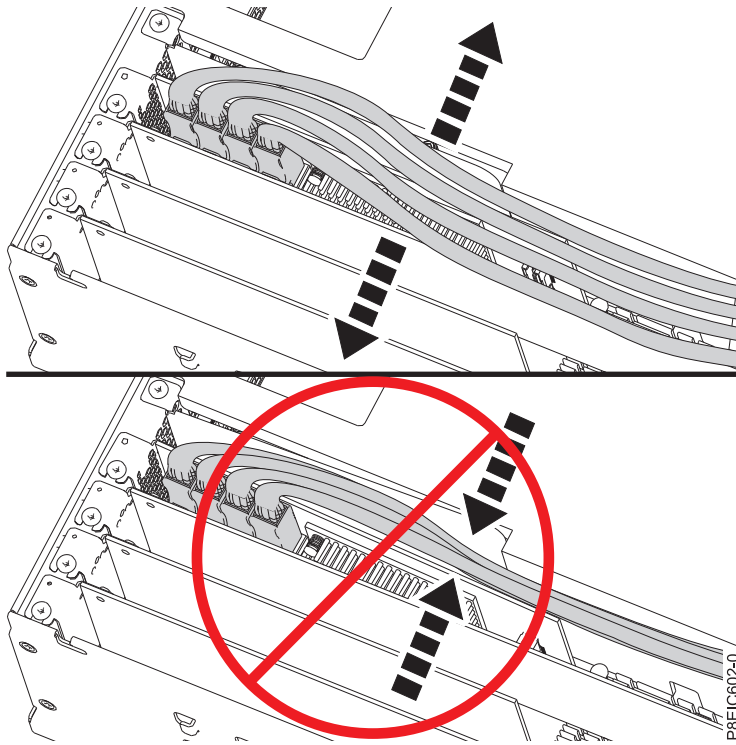
Figure 52. Routing the disk drive signal cable

    g. Go to step 7 on page 46.

4. Insert the replacement PCIe adapter **(A)** into the system backplane, aligning it properly and inserting it fully into the slot.

5. Insert the retaining screw **(B)** and tighten it to secure the PCIe adapter in the system, as shown in Figure 53 on page 46.
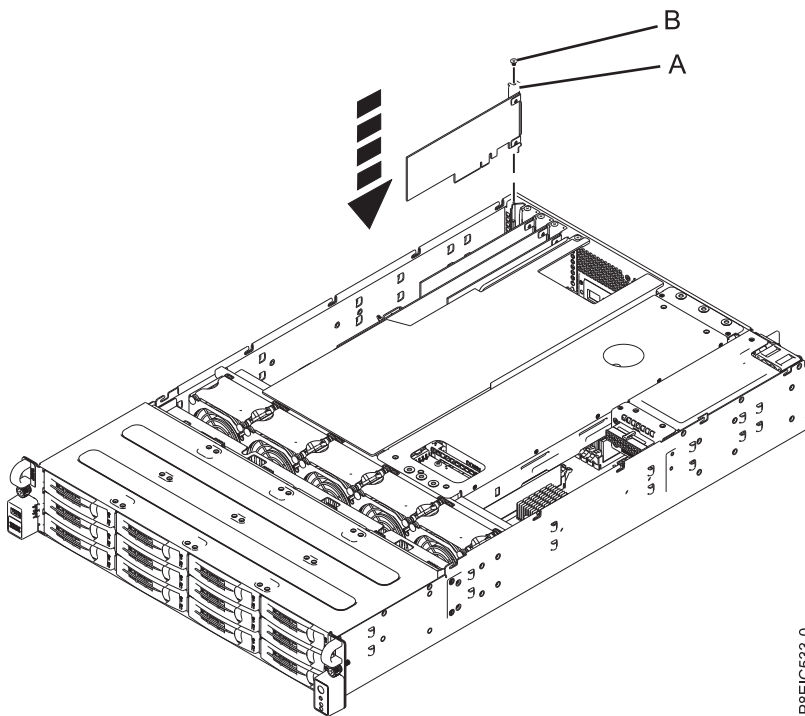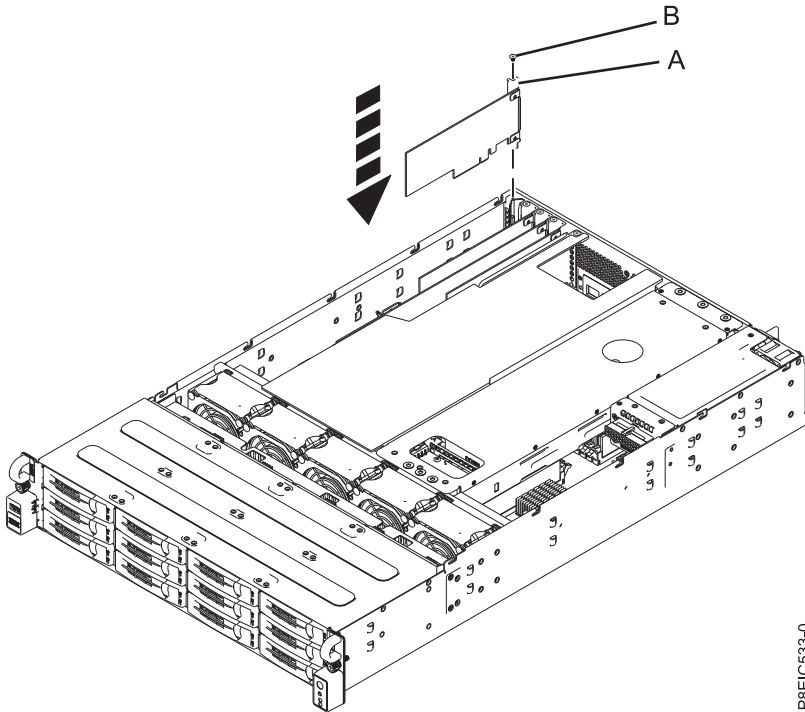
Figure 53. Installing the PCIe adapter (A) and screw (B)

6. Using your labels, replace any plugs that you removed from the PCIe adapter. Using your labels, insert the cables into the PCIe adapter plugs.
7. The procedure is complete.

What to do next

See "Preparing the system for operation after removing and replacing internal parts for the 8348-21C" on page 108.

Removing and replacing the power distribution board and cables in the 8348-21C

Learn how to remove and replace the power distribution board and cables in the IBM Power System S812LC (8348-21C) system.

Removing the power distribution board and cables in the 8348-21C

Learn how to remove the power distribution board and cables in the IBM Power System S812LC (8348-21C) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the system to remove and replace internal parts in the 8348-21C" on page 105.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. If needed, remove the processor baffle. For instructions, see "Removing the processor baffle from an 8348-21C system" on page 118.

3. If needed, move the rear drive tray assembly out of the way. You do not need to disconnect the cables. For instructions, see "Removing the rear drive tray assembly in the 8348-21C" on page 17.

4. Disconnect and remove the power cable **(A)** and the signal cable **(B)** from the power distribution board connectors and the system backplane connectors. Press the release latch to remove the power cable. Use the connector to remove the signal cable; do not pull the wires.
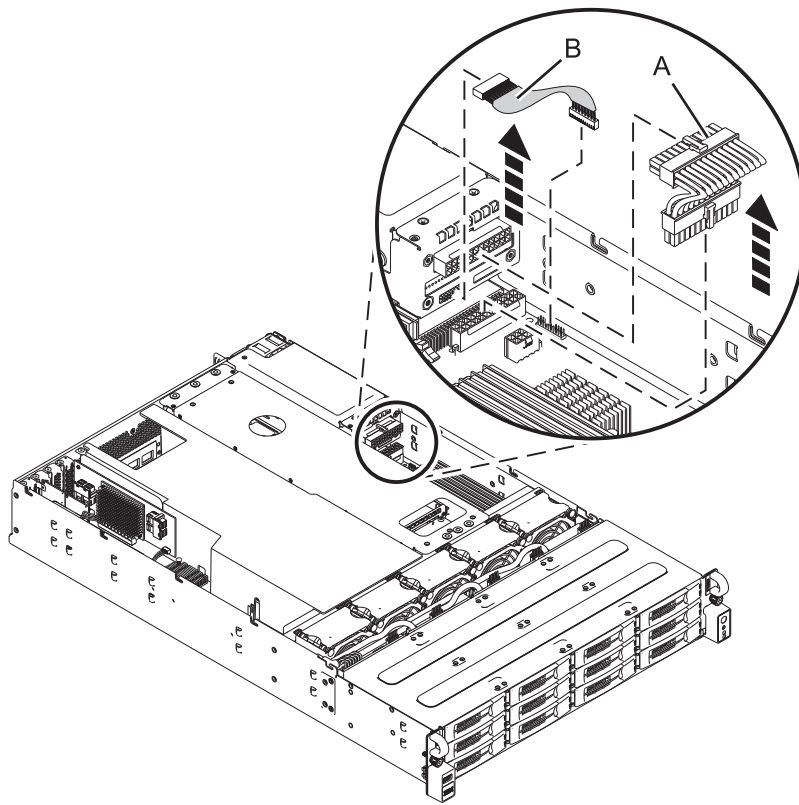
Figure 54. Removing the power distribution board cables

5. Remove the two screws **(A)** that secure the power distribution board by using a Phillips screwdriver. Pull the power distribution board away from pin **(B)**. Then, slide the power distribution board **(C)** towards the center of the system to remove it, as shown in Figure 55 on page 48.
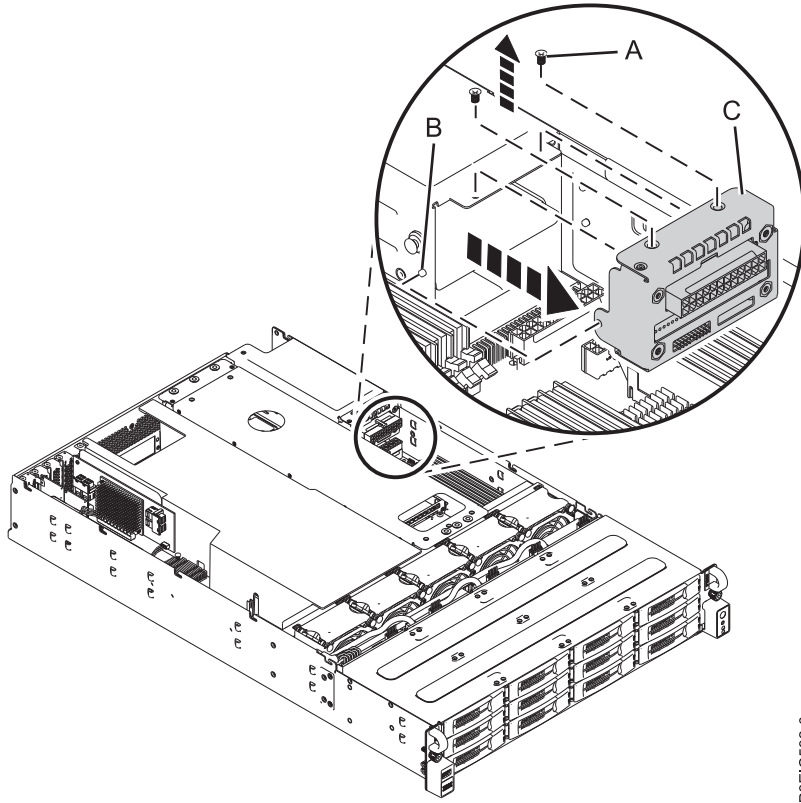
Figure 55. Removing the power distribution board

Replacing the power distribution board and cables in the 8348-21C

Learn how to replace the power distribution board and cables in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Connect the signal cable connector **(A)** and the power cable connector **(B)** to the system backplane, as shown in Figure 56 on page 49.
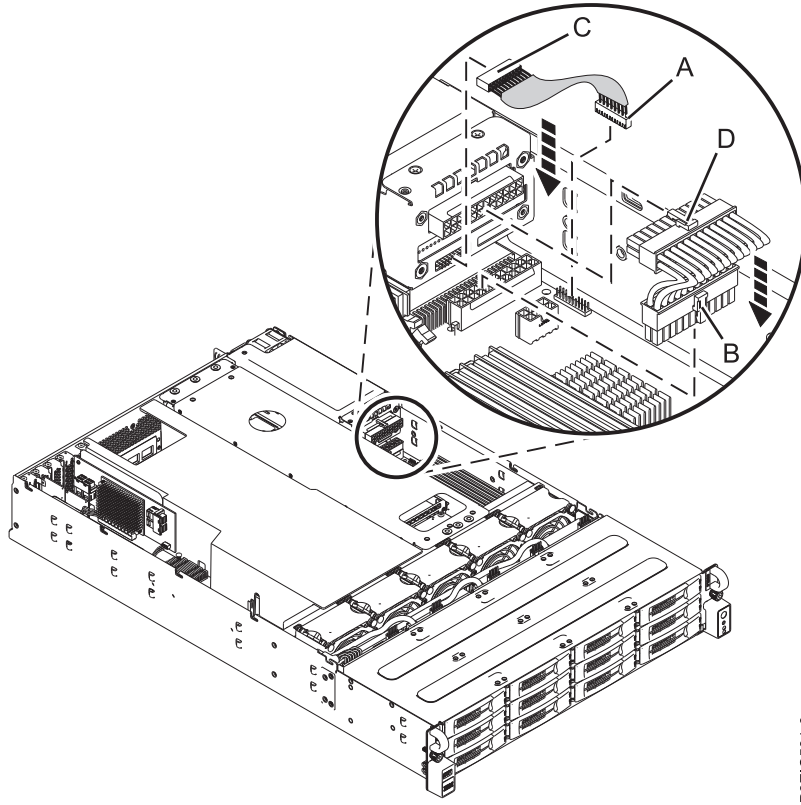
Figure 56. Connecting the power distribution board signal cables to the system backplane

2. Install the power distribution board **(A)**. Ensure that the pin on the chassis **(B)** fits in the hole on the power distribution board housing, as shown in Figure 57 on page 50.

3. Install and tighten the two screws **(C)** that secure the power distribution board, as shown in Figure 57 on page 50.

Figure 57. Installing the power distribution board

4. Connect the signal cable connector **(C)** and the power cable connector **(D)** to the power distribution board, as shown in Figure 56 on page 49

5. If you moved the rear drive tray assembly, replace it. For instructions, see "Replacing the rear drive tray assembly in the 8348-21C" on page 19.

6. If you removed the processor baffle, replace it. For instructions, see "Replacing the processor baffle in an 8348-21C system" on page 119.

What to do next

See "Preparing the system for operation after removing and replacing internal parts for the 8348-21C" on page 108.

Removing and replacing power supplies in the 8348-21C

Learn how to remove and replace power supplies in the IBM Power System S812LC (8348-21C) system.

Removing a power supply from the 8348-21C

Learn how to remove a power supply in the IBM Power System S812LC (8348-21C) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the system to remove and replace internal parts in the 8348-21C" on page 105.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. Label and disconnect the power cord from the failed power supply. For instructions, see "Disconnecting the power cords from an 8348-21C system" on page 113.

3. Remove the power supply from the system.

   a. To unseat the power supply from its position in the system, push the locking-tab **(B)** in the direction shown. See Figure 58.

   b. Grasp the power supply handle with one hand, and pull the power supply **(C)** out of the system about 5 cm (2 in).

   c. Place your other hand underneath the power supply, pull the power supply completely out of the system, and place it on an ESD mat.
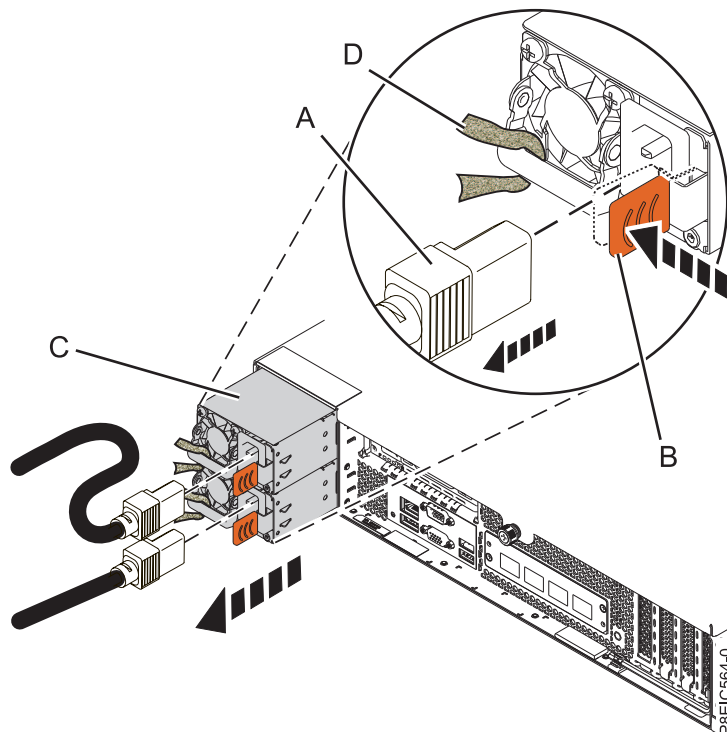
Figure 58. Removing a power supply from the system

Replacing a power supply in the 8348-21C

Learn how to replace the power supply in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Align the power supply **(C)** with the bay and slide the power supply into the system until the latch **(B)** locks in place. See Figure 59.
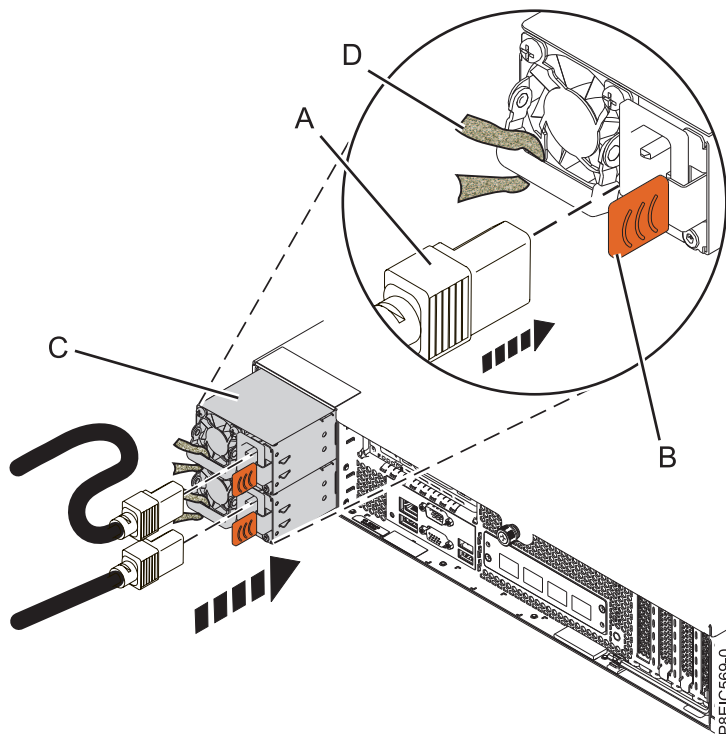
Figure 59. Replacing a power supply in the system

2. Connect and fasten the power cord to the power supply.

   a. Connect the power cord to the power supply, as shown in Figure 59.

   b. Use the hook-and-loop fastener and tie the power cord to the power supply handle.

      Attention: This system is equipped with two power supplies. Before you continue with this procedure, connect all power cords to the power supplies and strap them.

   c. Loop the power cables. For instructions, see "Connecting the power cords to an 8348-21C system" on page 113.

What to do next

See "Preparing the system for operation after removing and replacing internal parts for the 8348-21C" on page 108.

Removing and replacing the power switch and cable in the 8348-21C

Learn how to remove and replace the power switch and cable in the IBM Power System S812LC (8348-21C) system.
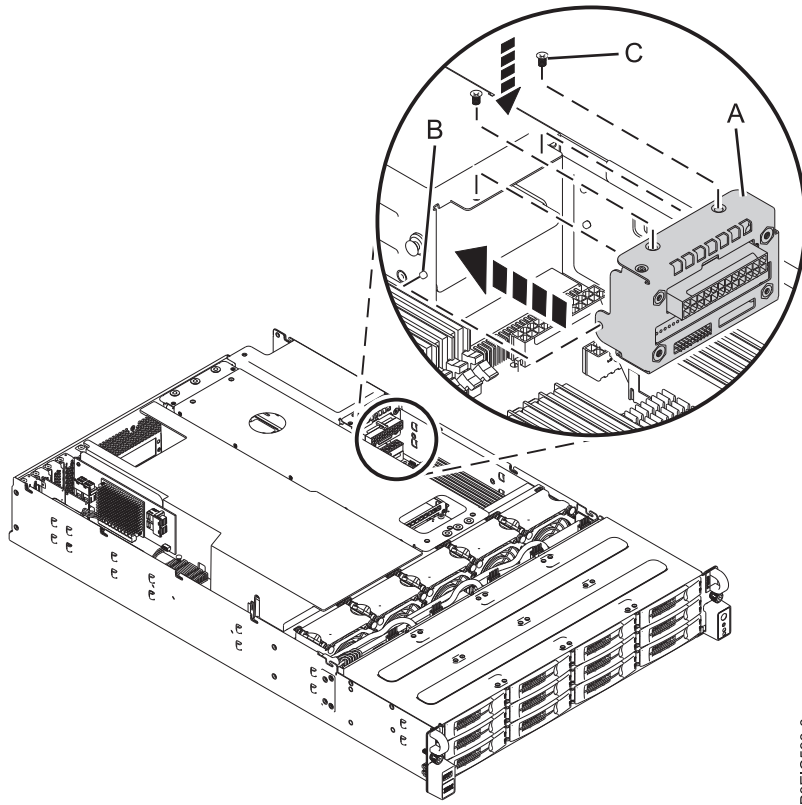
Removing the power switch and cable in the 8348-21C

Learn how to remove the power switch and cable in the IBM Power System S812LC (8348-21C) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the system to remove and replace internal parts in the 8348-21C" on page 105.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

    Attention:

    - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
    - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. Remove the front panel control cable from the system backplane, as shown in Figure 60.

Figure 60. Disconnecting the front panel control cable

3. Remove the disk drive backplane. For instructions, see "Removing the disk drive backplane from the 8348-21C" on page 21.
4. Label and fully remove the three leftmost front drive trays that are located next to the front power switch. For instructions, see "Removing a front drive in the 8348-21C" on page 3.
5. Remove the four screws that secure the power switch bezel and handle to the power switch assembly, as shown in Figure 61 on page 54.
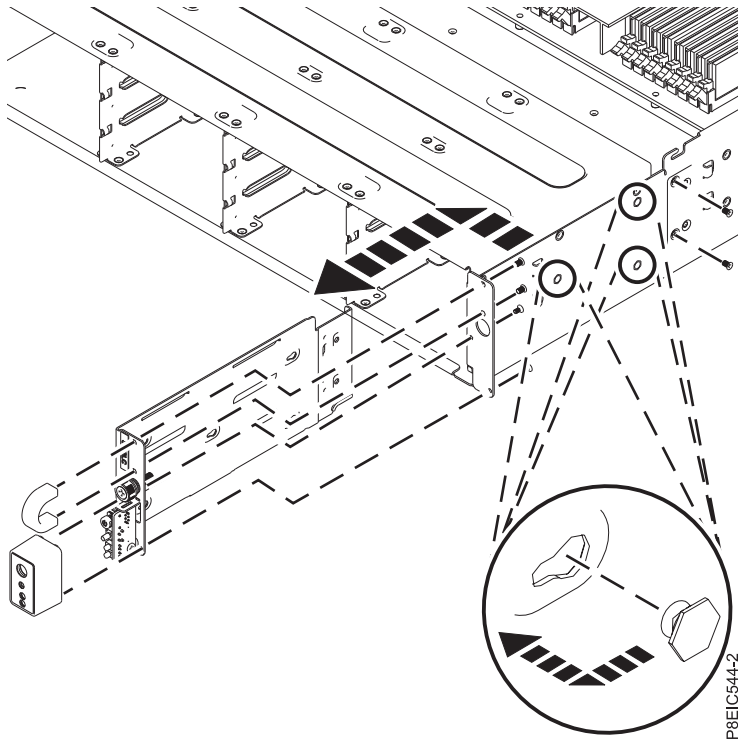
Figure 61. Removing the power switch and cable

6. Remove the two screws that secure the power switch assembly from the side of the chassis, as shown in Figure 61.
7. Pull the power switch assembly forwards, then detach the power switch assembly away from the side of the chassis, as shown in Figure 61.
8. Remove the power switch and cable from the chassis.
9. Remove the screw **(A)** from the power switch card **(B)**; then lower the power switch card and cable away from the holder, as shown in Figure 62 on page 55.
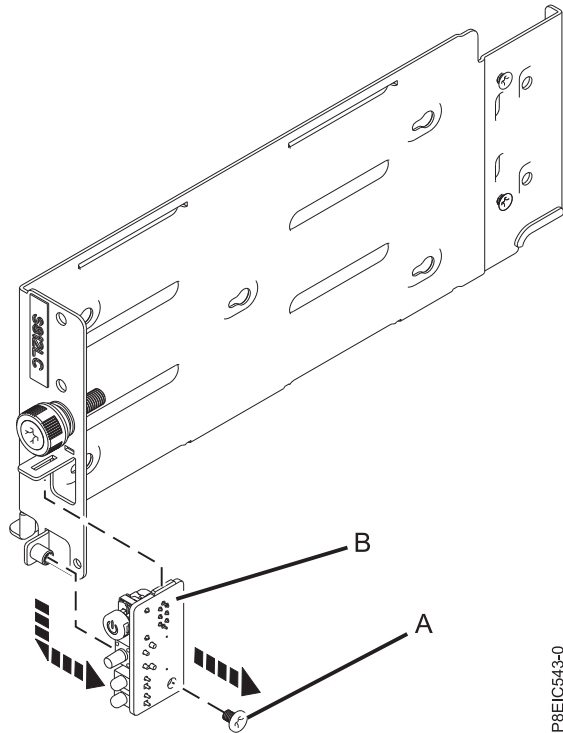
Figure 62. Removing the power switch card

Replacing the power switch and cable in the 8348-21C

Learn how to remove the power switch and cable in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Using the alignment tab, insert the power switch card **(A)** and cable up and into the holder; replace the screw **(B)** to secure the power switch card, as shown in Figure 63 on page 56.
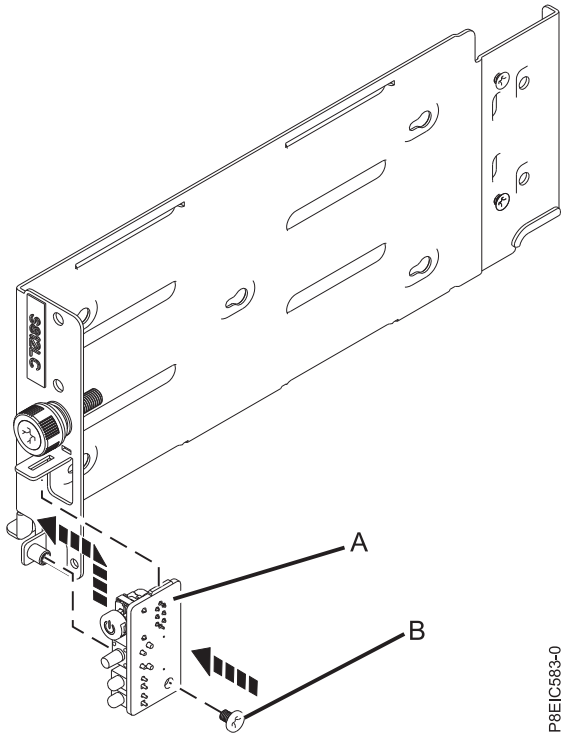
Figure 63. Replacing the power switch card

3. Insert the power switch and cable into the chassis, as shown in Figure 64.
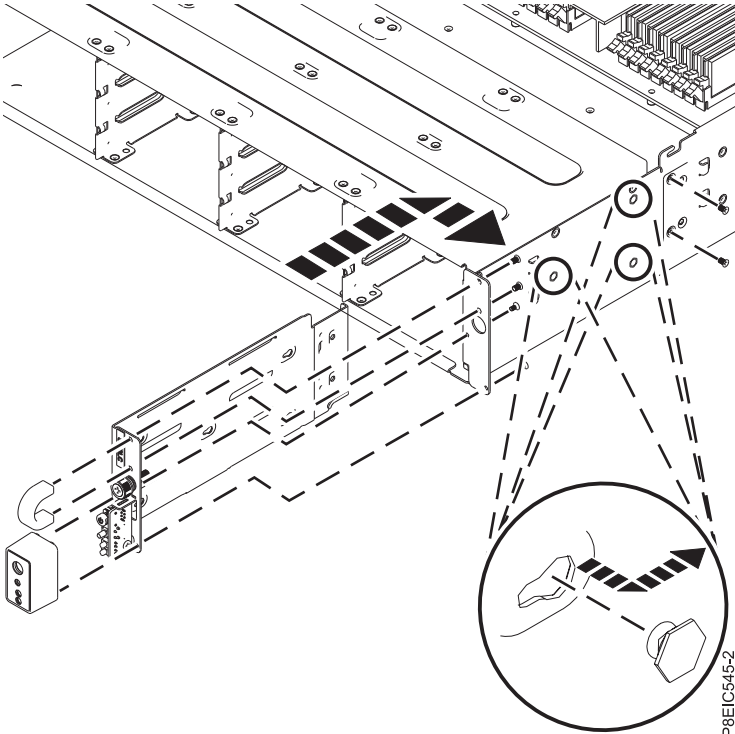
Figure 64. Replacing the power switch and cable

4. Align the power switch assembly with the pins on the inside of the chassis, then slide the power switch assembly to the rear to secure it to the pins, as shown in Figure 64 on page 56.

5. Replace the two screws that secure the power switch assembly to the side of the chassis.

6. Replace the four screws that secure the power switch bezel and the handle, as shown in Figure 64 on page 56.

7. Route the power switch cable through the chassis and secure the cable with the chassis clips.

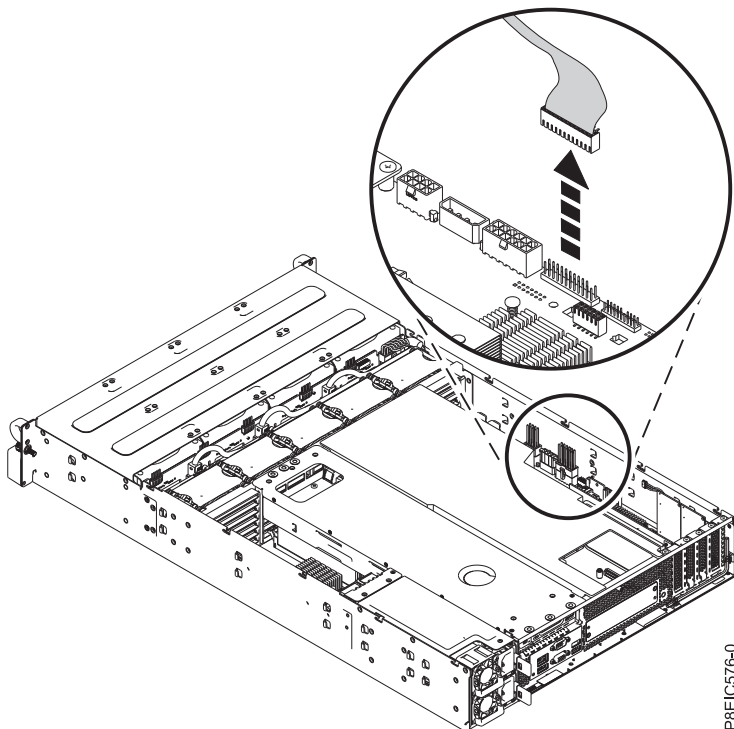8. Replace the front panel control cable in the system backplane, as shown in Figure 65.
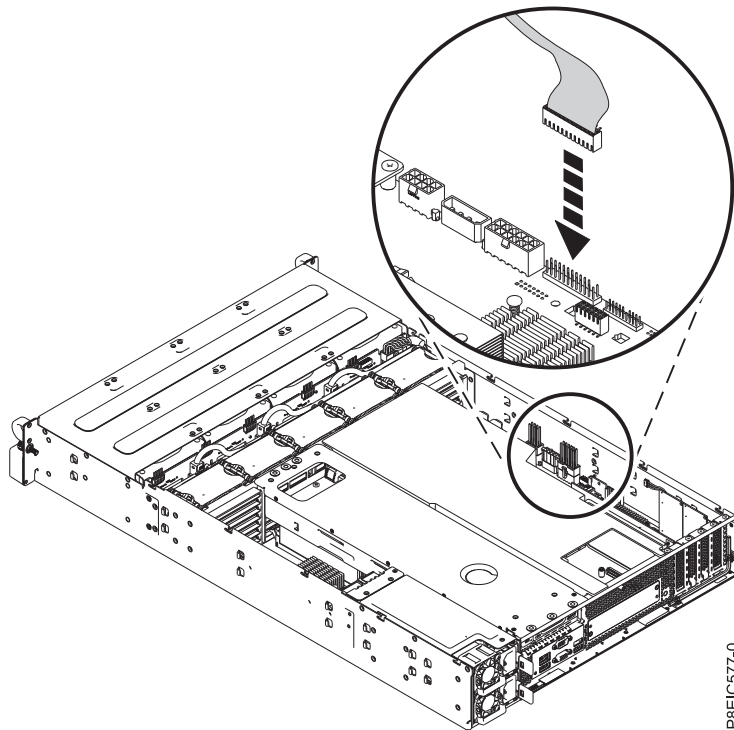
Figure 65. Connecting the front panel control cable

9. Replace the disk drive backplane. For instructions, see "Replacing the disk drive backplane in the 8348-21C" on page 25.

What to do next

Prepare the system for operation. For instructions, see "Preparing the system for operation after removing and replacing internal parts for the 8348-21C" on page 108.

Removing and replacing the system backplane in the 8348-21C

Learn how to remove and replace the system backplane in the IBM Power System S812LC (8348-21C) system.

About this task

You can use a commercially available magnetic tip screwdriver to remove and replace the screws.

Removing the system backplane in the 8348-21C

Learn how to remove the system backplane in the IBM Power System S812LC (8348-21C) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the system to remove and replace internal parts in the 8348-21C" on page 105.

About this task

As part of the system backplane replacement, the system processor module is moved from the old system backplane to the new system backplane.

As part of the system processor module replacement, the heat sink is removed. When the heat sink is removed from the system processor module, the thermal interface material (TIM) is typically adhered to the heat sink. Unless damaged, the TIM that is adhered to the heat sink can be reused. If the TIM is damaged, do not reuse the removed heat sink. Before you begin the system backplane removal and replacement procedure, ensure that you have a spare TIM and heat sink, part number 01AF286, on hand.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:
   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.
   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. Remove the processor baffle. For instructions, see "Removing the processor baffle from an 8348-21C system" on page 118.

3. Remove the rear drive tray assembly. For instructions, see "Removing the rear drive tray assembly in the 8348-21C" on page 17.

4. Remove the storage mezzanine card and cable. For instructions, see "Removing the storage mezzanine card and cable the 8348-21C" on page 32.

5. Remove the front drives power cable from the system backplane, as shown in Figure 66 on page 59. Using your thumb, press the release latch on the connector to remove the cable.
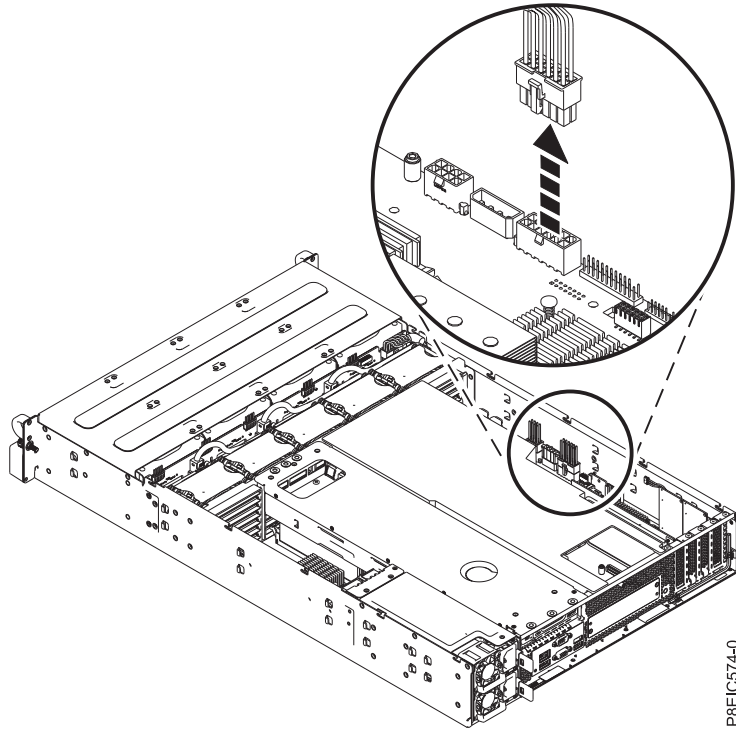
Figure 66. Disconnecting the front drives power cable

6. Remove the inner drives power cable from the system backplane, as shown in Figure 67.
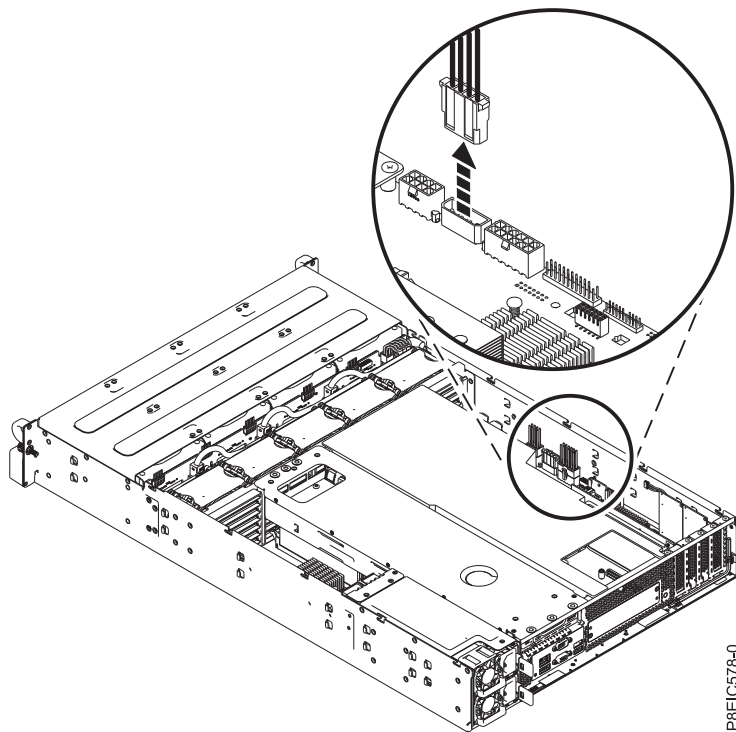
Figure 67. Disconnecting the inner drives power cable

7. Remove the front panel control cable from the system backplane, as shown in Figure 68.
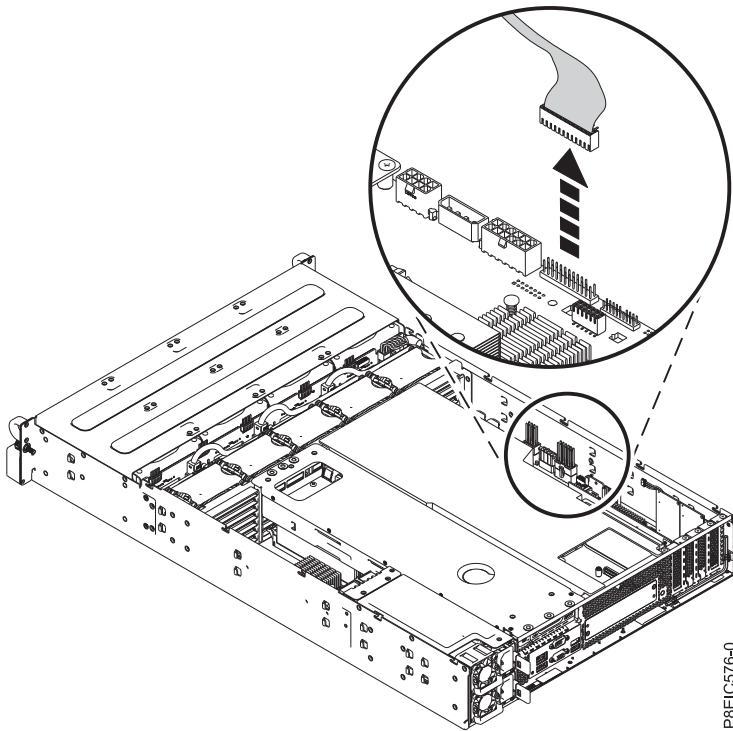
Figure 68. Disconnecting the front panel control cable

8. Remove the front USB signal cable from the system backplane, as shown in Figure 69 on page 61.
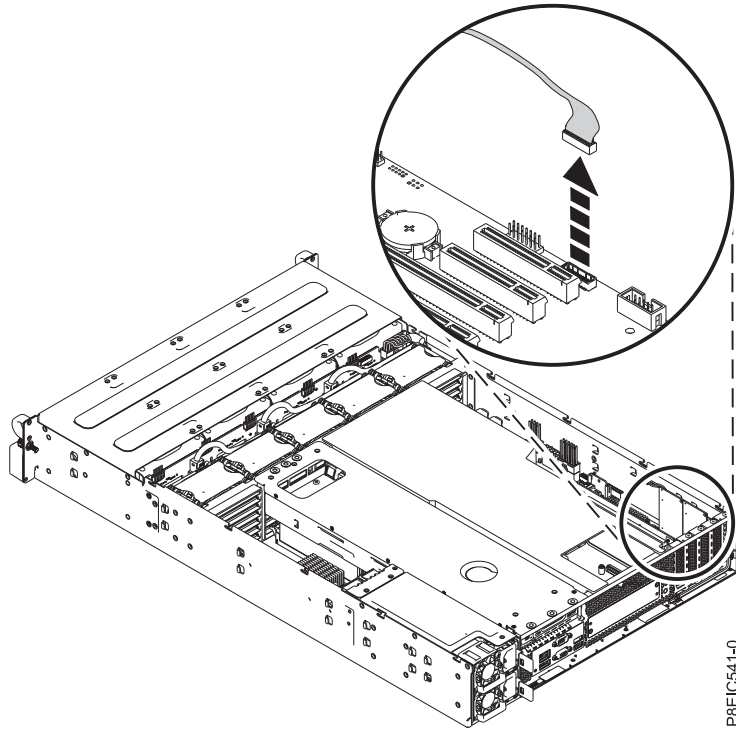
Figure 69. Disconnecting the front USB cable

9. Label and remove the PCIe adapters after recording their slot locations. For instructions, see "Removing a PCIe adapter from the 8348-21C" on page 38.

10. Label and remove the memory DIMMs, recording their slot locations. For instructions, see "Removing and replacing memory in the 8348-21C" on page 36 for the removal steps.

11. Remove the power distribution board and cables. For instructions, see "Removing the power distribution board and cables in the 8348-21C" on page 46.

12. Unscrew and remove 13 screws from the system backplane. The screw locations are shown in Figure 70 on page 62.
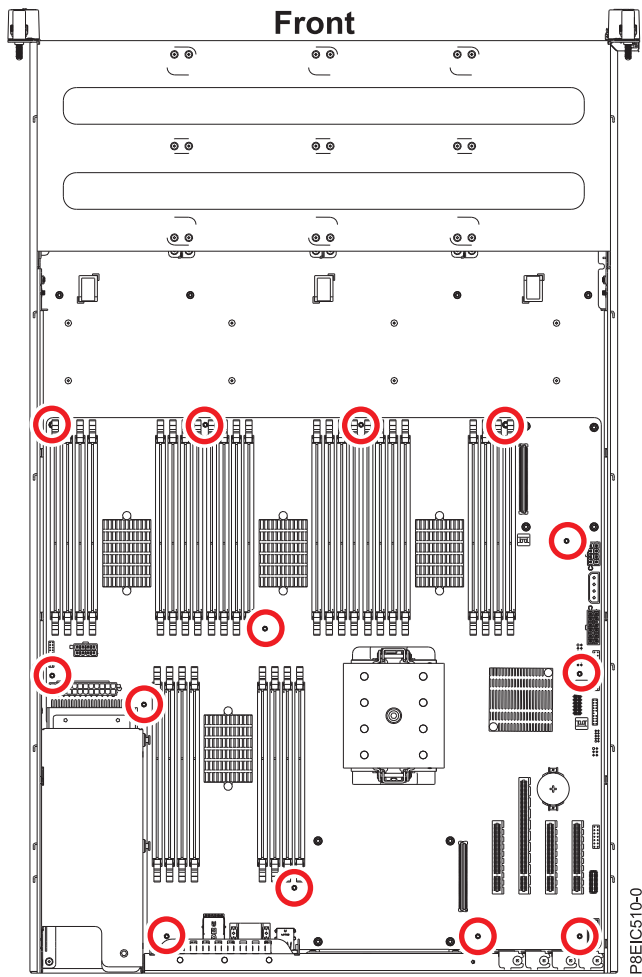
Figure 70. System backplane screw locations

13. Moving the front cables out of the way, and carefully holding the processor heat sink, slide the
    system backplane towards the fans, then lift to remove it. See Figure 71 on page 63.
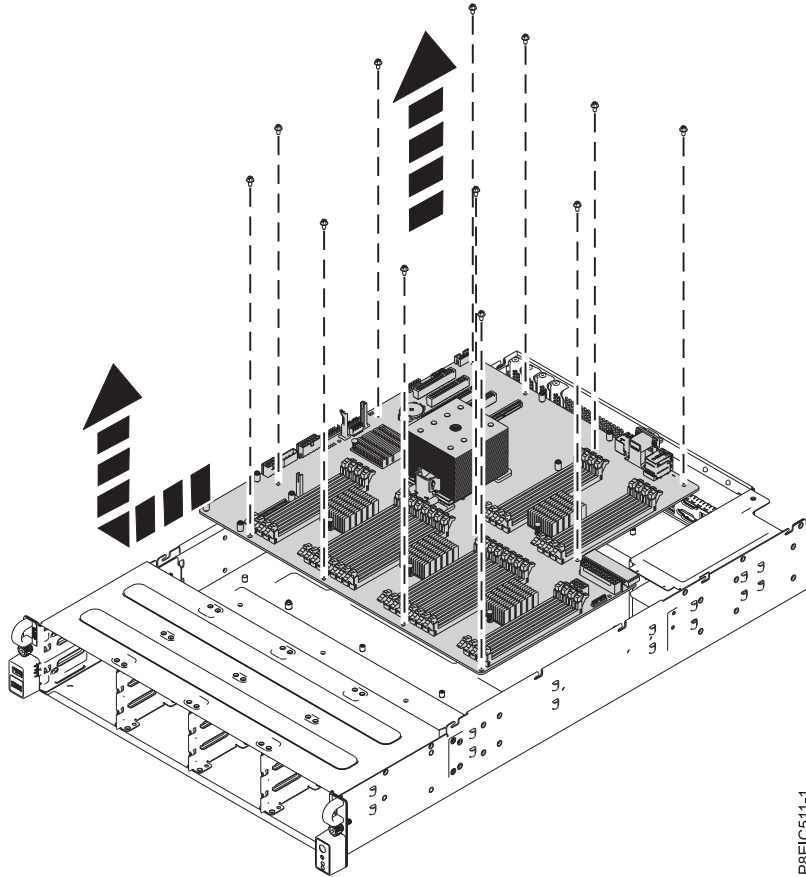
Figure 71. Lifting out the system backplane

14. Place the system backplane on an ESD mat.

Replacing the system backplane in the 8348-21C

Learn how to replace the system backplane in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Remove the replacement system backplane from the static-protective package and place it on an ESD mat.

The following steps move the system processor module from the old system backplane to the new system backplane:

3. Remove the heat sink from the system processor module:
   a. A hex key wrench is attached to the rear of the chassis. Use that hex key wrench to loosen the heat sink actuation screw **(A)** by turning the screw counterclockwise. Loosen the screw until it moves freely. See Figure 72 on page 64.
   b. Grip the heat sink **(B)** on opposing sides and remove the heat sink by lifting it upward. Set the heat sink aside with the module side facing up.

   Note: If you plan to remove dust or debris from the heat sink, you must do this operation in another room that is greater than 7.6 m (24.9 ft) away from the work area.
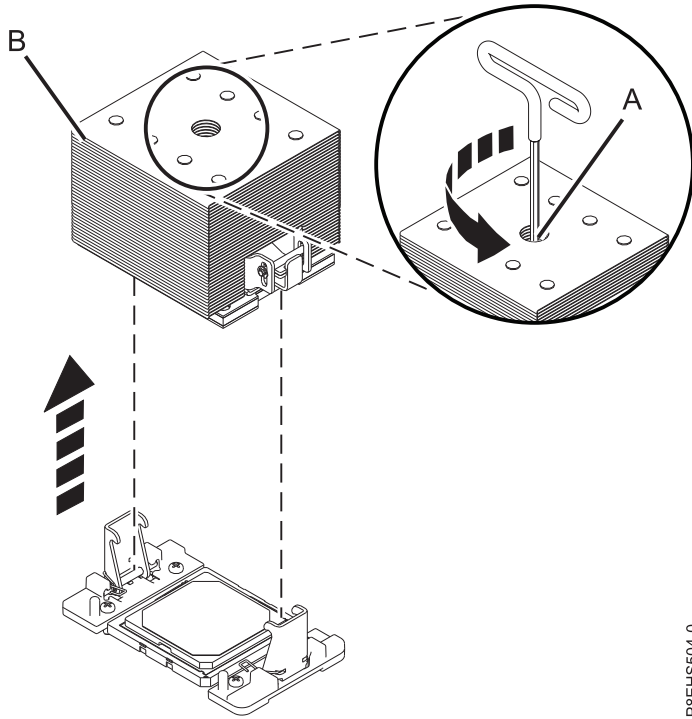
Figure 72. Removing the heat sink

4. Remove dust and debris from the system processor module area.

   a. If dust or debris is present, use the supplied air pump (part number 45D2645) to clean the system processor module area. Blow small bursts of air from the center toward the sides of the system processor module as shown in Figure 73 on page 65. If your air pump is not assembled as shown in Figure 73 on page 65, fasten the tip onto the bulb.
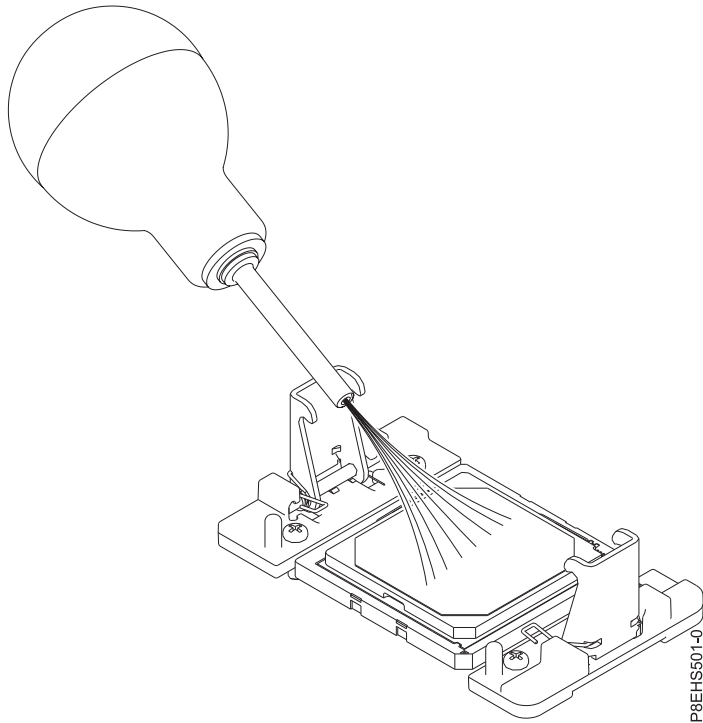
Figure 73. Removing dust and debris from the system processor module area

5. On the new system backplane, remove the socket cover from a system processor socket.
6. Prepare the system processor module for removal.
   a. Using the supplied removal tool (part number 01AF101), align the beveled corner **(A)** of the tool over the beveled corner of the system processor module as shown in Figure 74 on page 66.
   b. Lower the tool over the system processor module by ensuring that the two guide pins **(C)** are inserted into the alignment holes **(B)** on each side of the tool.
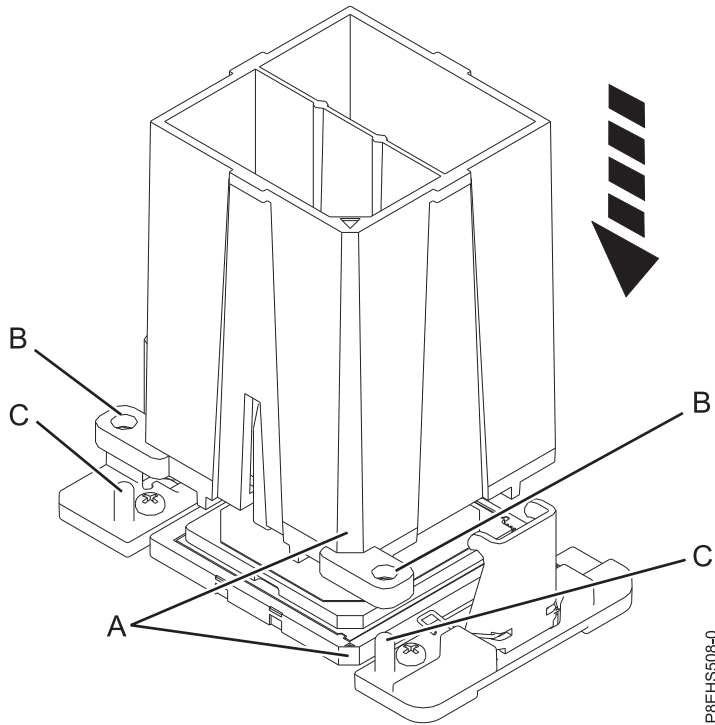
Figure 74. Lowering the removal tool onto the system processor module

   c. With the removal tool **(A)** sitting on top of the system processor module, push down on the tool to lock the system processor module into the tool, as shown in Figure 75 on page 67. Ensure that both of the tool jaws are locked on the system processor module. Do not press the blue release tabs until directed to do so later.

      Note: The tool drops slightly when you push down on the processor module so that the jaws can grab the bottom of the module.
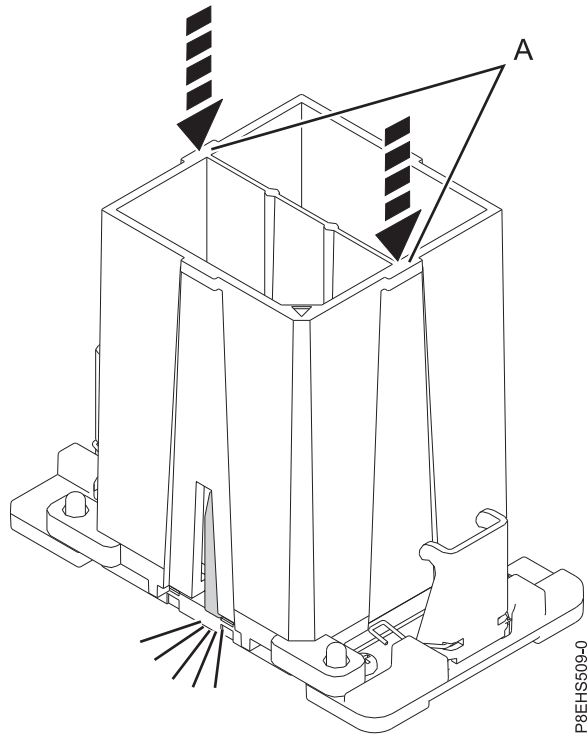
Figure 75. Locking the system processor module into the tool

7. Holding the outside of the tool, lift the tool and system processor module from the old system backplane socket to transfer it to the new system backplane socket.

8. Install the system processor module:

   a. If dust or debris is present on the system processor socket, use the supplied air pump (part number 45D2645) to clean the socket. Blow small bursts of air from the center toward the sides of the socket, as shown Figure 76 on page 68.

P8EDE529-0
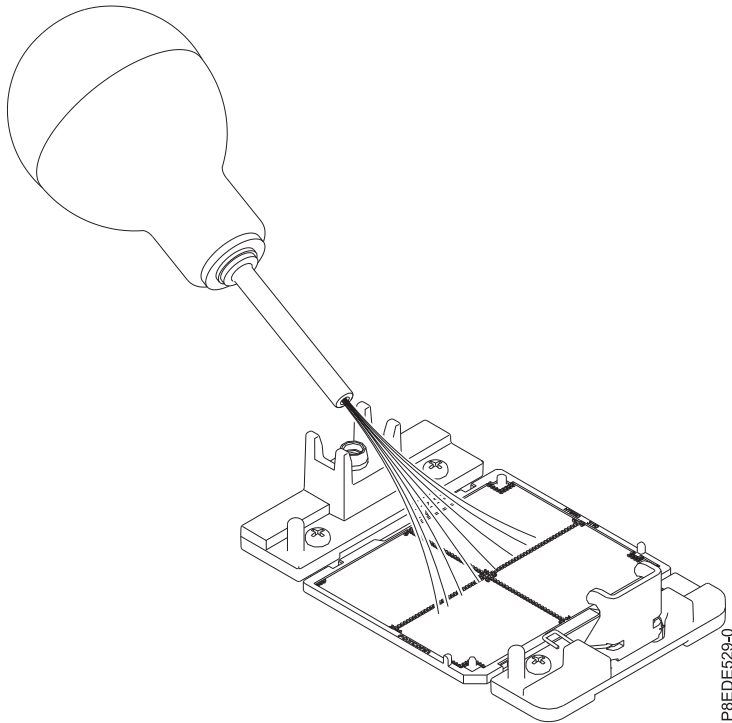
Figure 76. Removing dust and debris from the system processor socket

b. Lower the tool and system processor module onto the socket. Align the beveled corner **(A)** of the tool with the beveled corner on the socket. Ensure that the two guide pins **(C)** are inserted into the alignment holes **(B)** on each side of the tool. Use care to lower the tool evenly without tilting the tool. See Figure 77 on page 69.

Note: Do not attempt to slide the tool and the system processor module in any direction while the system processor module is touching the socket. If the tool and the system processor module are not aligned with the guide pins, lift the tool and the system processor module and reposition them.
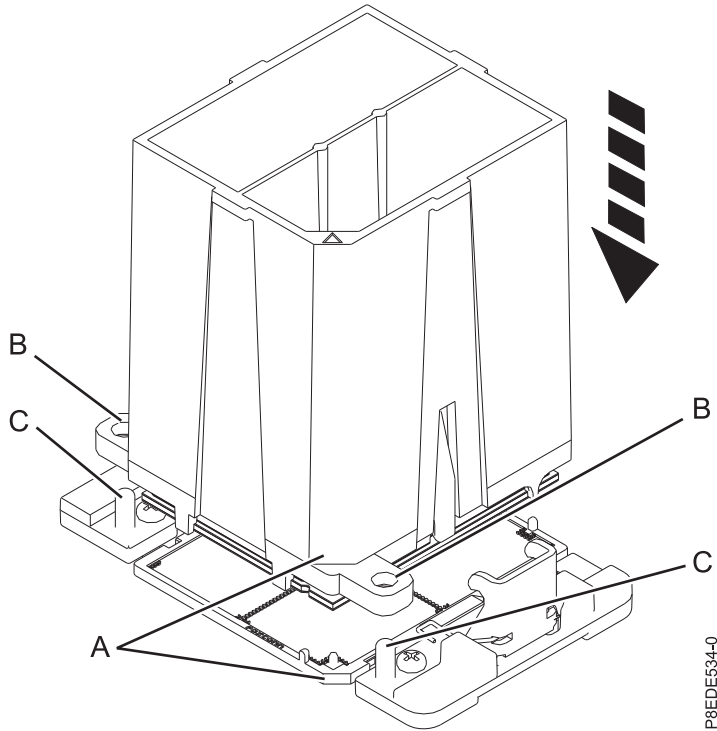
Figure 77. Installing the system processor module

   c. After the tool and system processor module holes and guide pins are properly aligned, squeeze and hold the two blue release tabs **(A)** together until a firm stop is reached, as shown in Figure 78 on page 70. Then, lift the tool off the system processor module.
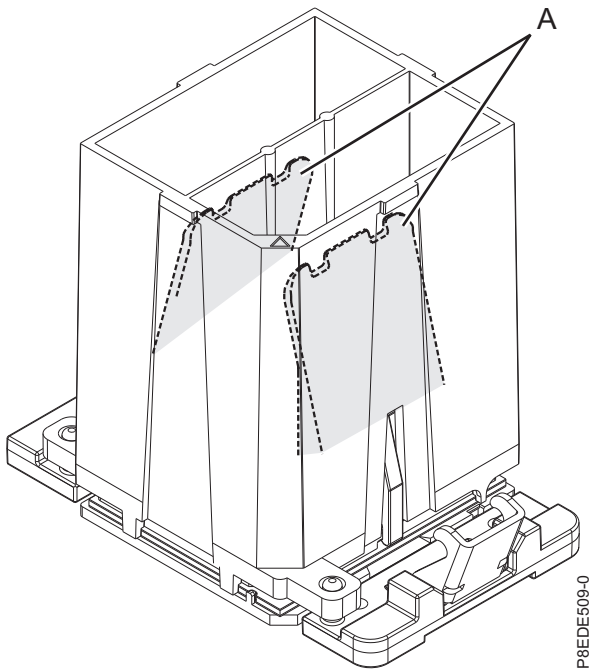
Figure 78. Removing the system processor module tool

9. Inspect the thermal interface material (TIM) for visible signs of damage, as shown in Figure 79 on page 71.

   The thermal interface material (TIM) is typically adhered to the heat sink. Unless damaged, the TIM that is adhered to the heat sink can be reused. If the TIM is damaged, do not reuse the removed heat sink. Ensure that you have a spare TIM and heat sink on hand, part number 01AF286.
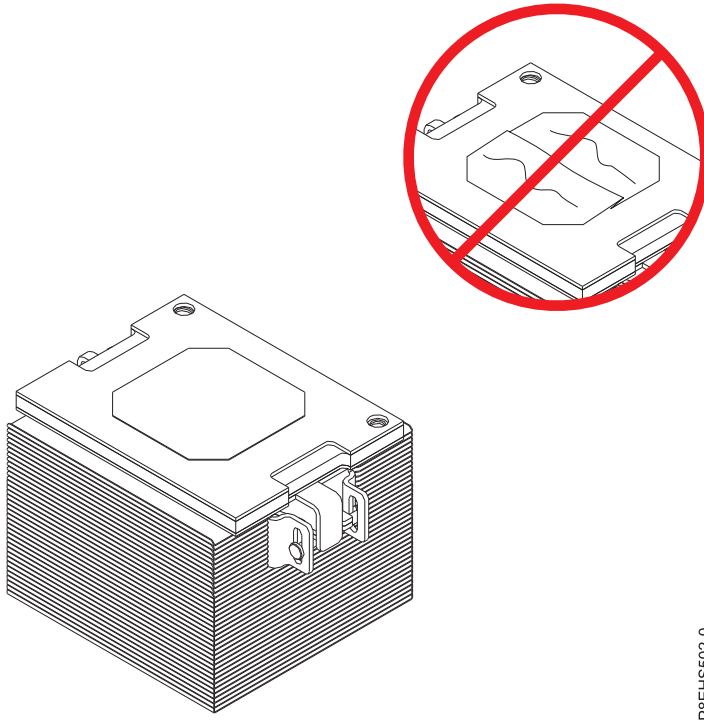
Figure 79. Inspecting the thermal interface material

10. Are you replacing the TIM or heat sink?

   Yes: Continue with step 11.

   No: Go to step 12 on page 72.

11. Install a new TIM pad:

   a. If the TIM or heat sink must be replaced, order part number 01AF286, heat sink and TIM.

   b. Open the TIM packaging and carefully remove the TIM, holding it by the edges of the carrier strip and holding it away from the shipping container.

   c. Remove the protective film from the clear carrier strip by using the supplied tweezers.

   Note: The TIM must remain flat. Small wrinkles are acceptable, but folds are not acceptable.

   d. Using the tweezers, remove the TIM from the carrier strip and center it onto the system processor module. The side with the red stripe must be facing up. Align the beveled edges of the TIM and the system processor module **(A)**, as shown in Figure 80 on page 72.
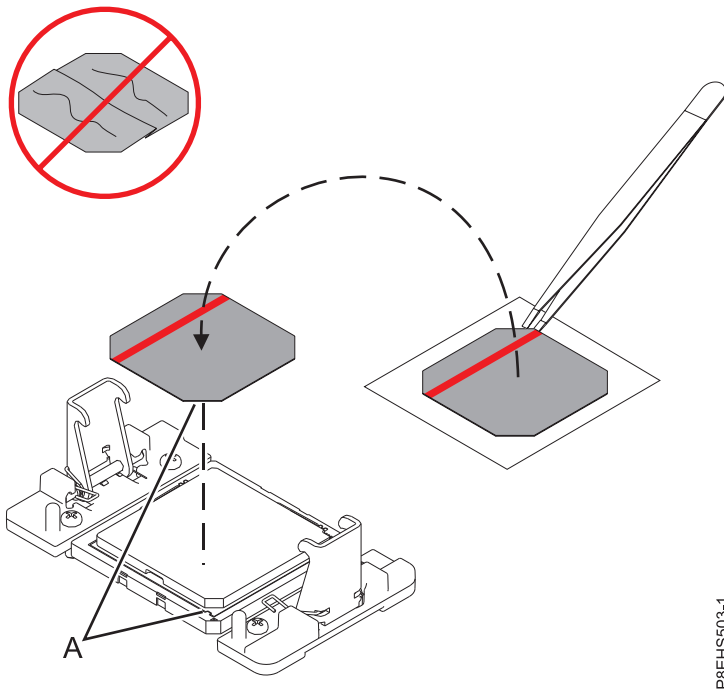
Figure 80. Installing the TIM onto the processor lid

12. Install the heat sink:

    a. Position the heat sink by using the guide holes on the heat sink **(A)** to correctly align it with the guide pins **(B)**. See Figure 81 on page 73.

    b. Ensure that the heat sink load arms are engaged.
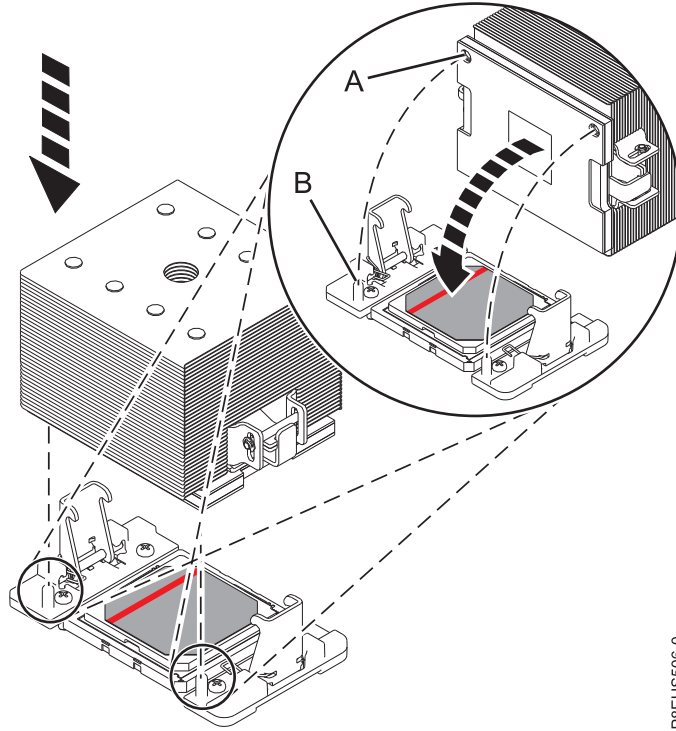
Figure 81. Installing the heat sink

   c. A hex key wrench is attached to the rear of the chassis. Use that hex key to tighten the center load screw **(B)** clockwise until a firm stop is reached. If the heat sink moves noticeably, the load arms **(A)** are not engaged. Unscrew the center load screw and repeat this step again. See Figure 82.
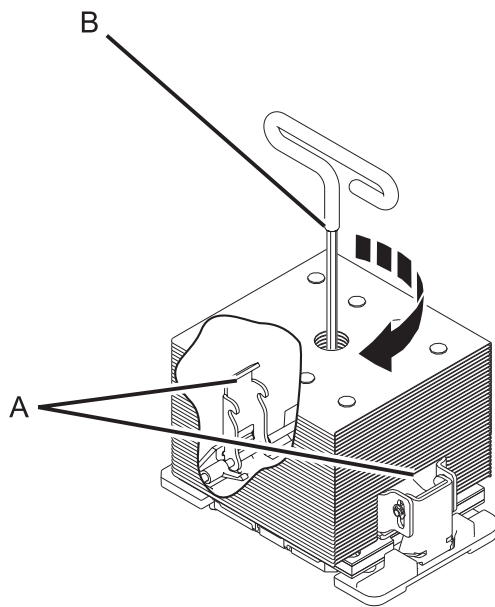
Figure 82. Tightening the center load screw on the heat sink

The following steps continue installing components into the new system backplane:

13. Moving the front cables out of the way, and carefully holding the processor heat sink, lower the system backplane into the chassis, sliding it towards rear of the chassis. See Figure 83.
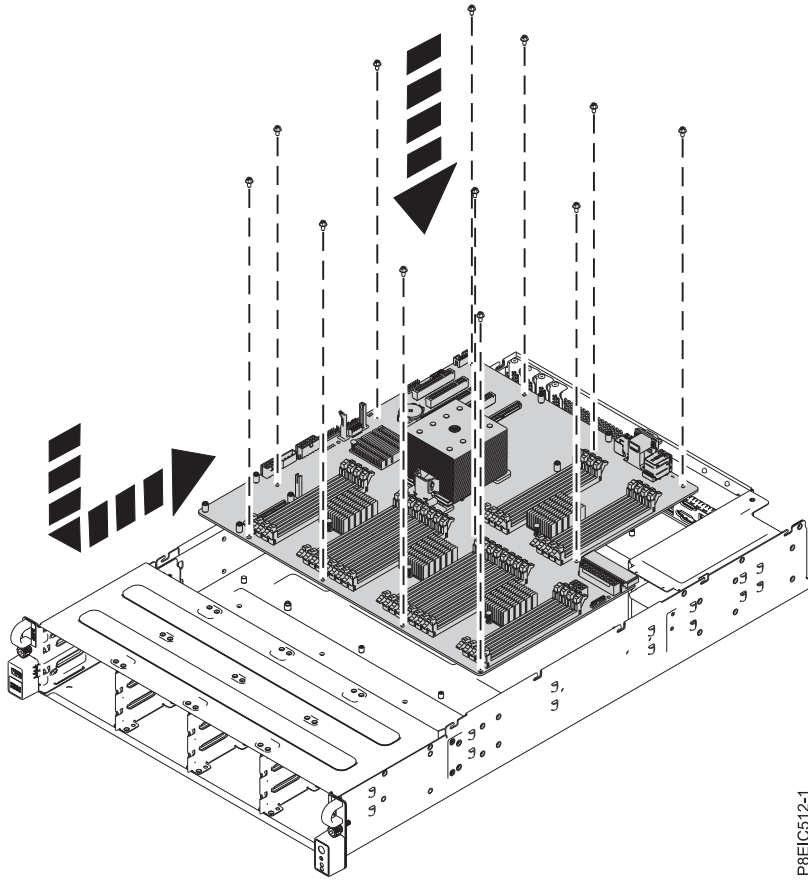
Figure 83. Replacing the system backplane

14. Align and screw the 13 screws into the system backplane. The screw locations are shown in Figure 84 on page 75.
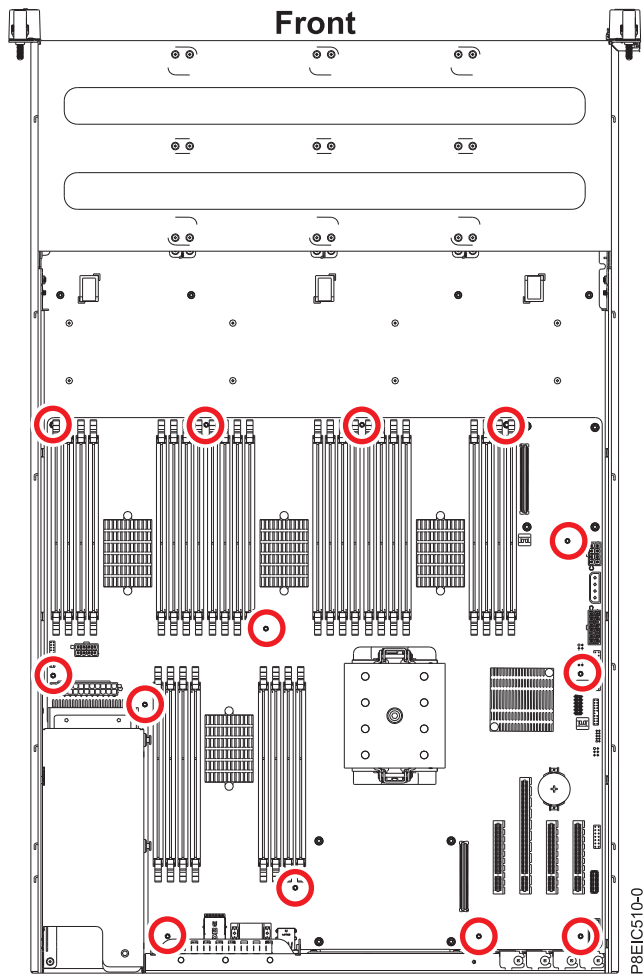
Figure 84. System backplane screw locations

15. Replace the power distribution board and cables. See "Replacing the power distribution board and cables in the 8348-21C" on page 48.

16. Using your labels, replace the memory DIMMs. For instructions, see "Removing and replacing memory in the 8348-21C" on page 36 for the replacement steps.

17. Using your labels, replace the PCIe adapters. For instructions, see "Replacing a PCIe adapter in the 8348-21C" on page 40.

18. Replace the front panel control cable in the system backplane, as shown in Figure 85 on page 76.
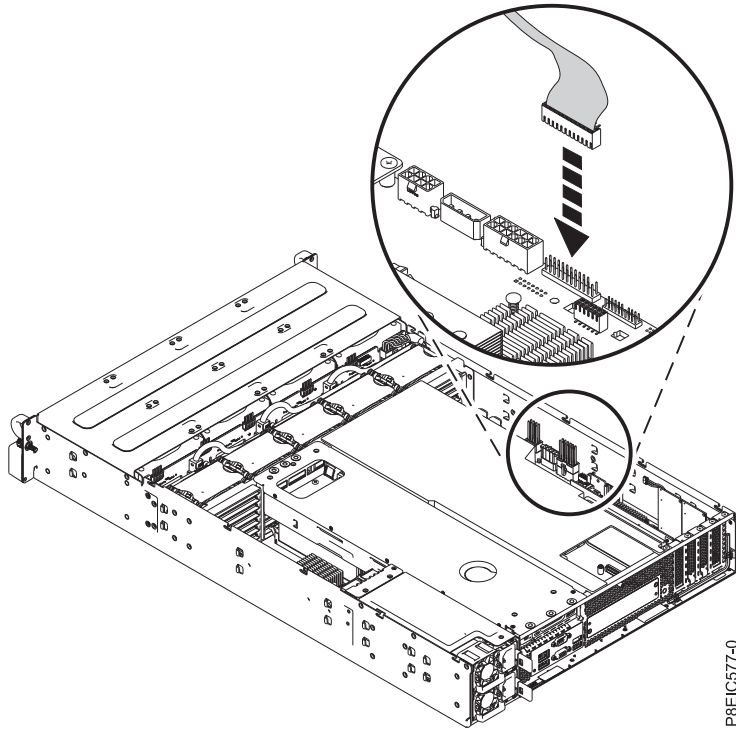
Figure 85. Connecting the front panel control cable

19. Replace the inner drives power cable in the system backplane, as shown in Figure 86.
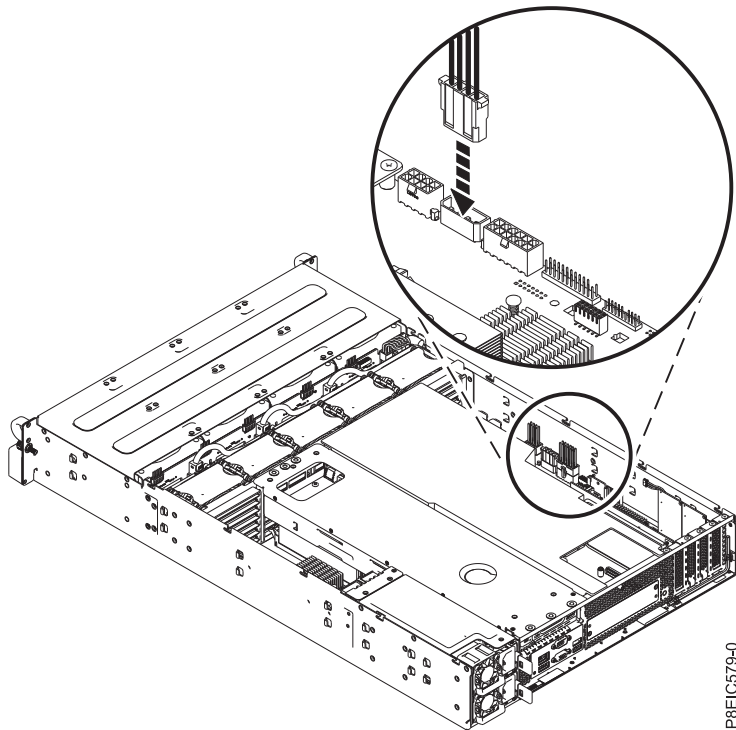
Figure 86. Connecting the inner drives power cable

20. Replace the front drive power cable in the system backplane, as shown in Figure 87. Ensure that the cable latch clip snaps into place on the connector.
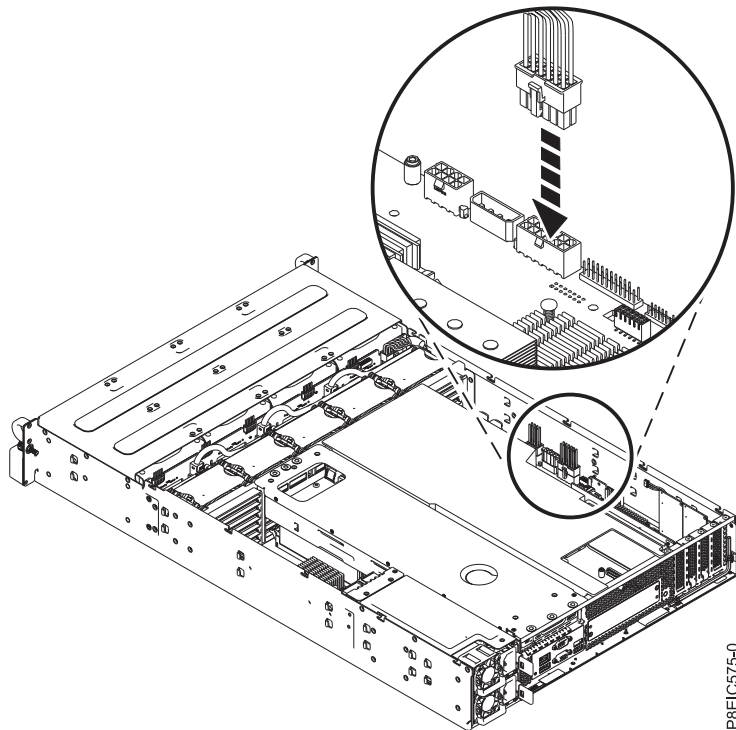
Figure 87. Connecting the front drive power cable

21. Replace the storage mezzanine card and cable. For instructions, see "Replacing the storage mezzanine card and cable in the 8348-21C" on page 34.
22. Replace the rear drive tray assembly. For instructions, see "Replacing the rear drive tray assembly in the 8348-21C" on page 19.
23. Replace the processor baffle. For instructions, see "Replacing the processor baffle in an 8348-21C system" on page 119.

What to do next

Prepare the system for operation. For instructions, see "Preparing the system for operation after removing and replacing internal parts for the 8348-21C" on page 108.

After you replace the system backplane, you must set the system serial number in the system backplane by using the vital product data (VPD) update tool. To download the tool, complete the following steps:

1. Go to the IBM Support Portal (www.ibm.com/support/entry/portal/product/power/scale-out_lc).
2. From the Downloads list, click Scale-out LC system VPD update tool.
3. Follow the directions that are with the tool to update the VPD.

After you replace a system backplane, you must update the BMC firmware. To download the update, go to Fix Central (www.ibm.com/support/fixcentral/). Follow the instructions provided with the update.

Removing and replacing the system processor module in the 8348-21C

Learn how to remove and replace the system processor module in the IBM Power System S812LC (8348-21C) system.

Removing the system processor module in the 8348-21C system

Learn how to remove the system processor module from the IBM Power System S812LC (8348-21C) system.

Before you begin

As part of the system processor module replacement, the heat sink is removed. When the heat sink is removed from the system processor module, the thermal interface material (TIM) is typically adhered to the heat sink. Unless damaged, the TIM that is adhered to the heat sink can be reused. If the TIM is damaged, do not reuse the removed heat sink. Before you begin the system backplane removal and replacement procedure, ensure that you have a spare TIM and heat sink, part number 01AF286, on hand.

Power off the system and place it in the service position. For instructions, see "Preparing the system to remove and replace internal parts in the 8348-21C" on page 105.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. Open the packaging of the new system processor module, and place the cover upside down next to the tray, as shown in Figure 88. The cover is used for the system processor module that you are replacing.
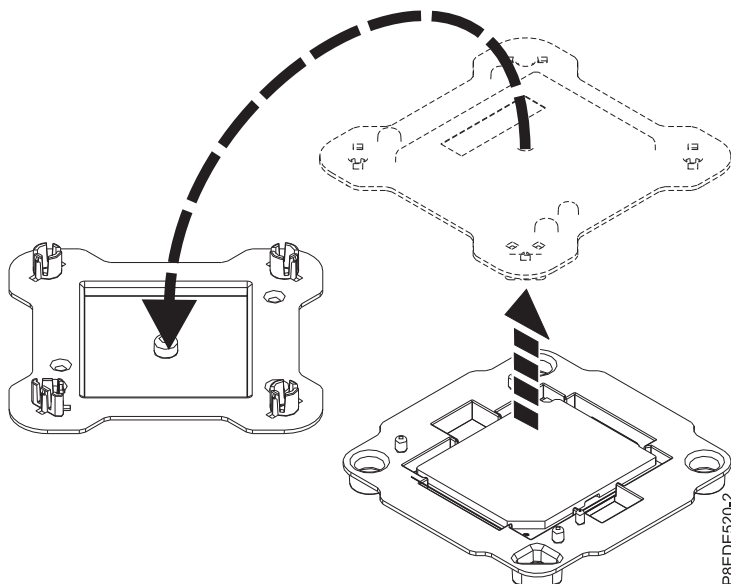
Figure 88. Opening the system processor module packaging

3. Remove the processor baffle. See "Removing the processor baffle from an 8348-21C system" on page 118.

4. Remove the heat sink from the system processor module:

   a. A hex key wrench is attached to the rear of the chassis. Use that hex key wrench to loosen the heat sink actuation screw **(A)** by turning the screw counterclockwise. Loosen the screw until it moves freely. See Figure 89.

   b. Grip the heat sink **(B)** on opposing sides and remove the heat sink by lifting it upward. Set the heat sink aside with the module side facing up.

   Note: If you plan to remove dust or debris from the heat sink, you must do this operation in another room that is greater than 7.6 m (24.9 ft) away from the work area.
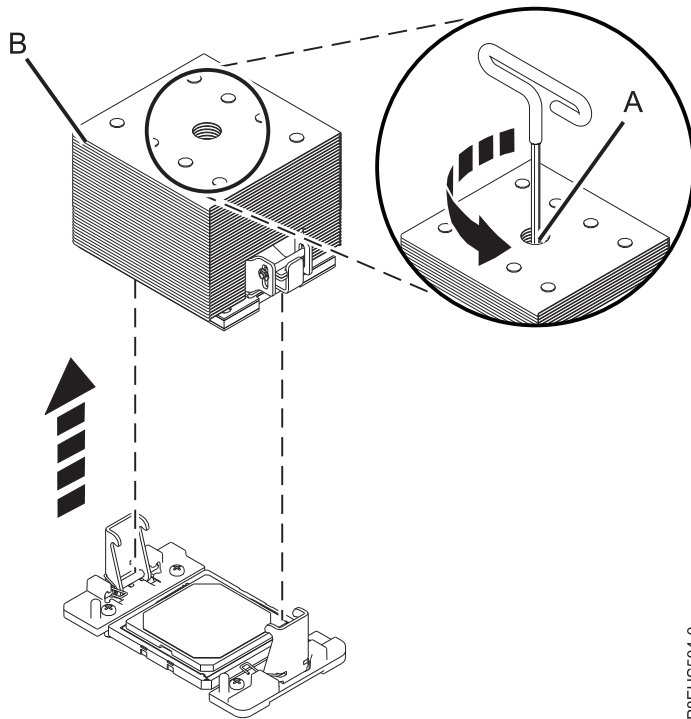
Figure 89. Removing the heat sink

5. Remove dust and debris from the system processor module area.

   a. If dust or debris is present, use the supplied air pump (part number 45D2645) to clean the system processor module area. Blow small bursts of air from the center toward the sides of the system processor module as shown in Figure 90 on page 80. If your air pump is not assembled as shown in Figure 90 on page 80, fasten the tip onto the bulb.
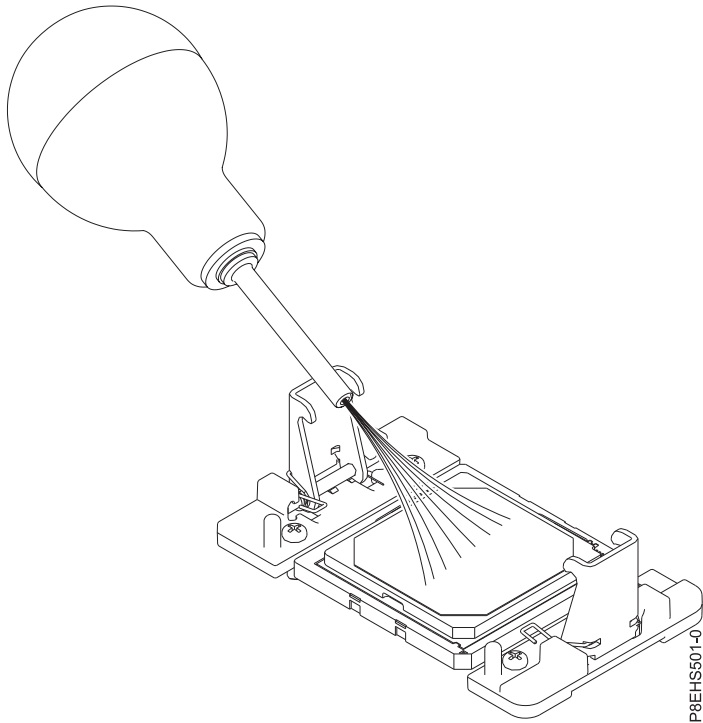
Figure 90. Removing dust and debris from the system processor module area

6. Prepare the system processor module for removal.

   a. Using the supplied removal tool (part number 01AF101), align the beveled corner **(A)** of the tool over the beveled corner of the system processor module as shown in Figure 91 on page 81.

   b. Lower the tool over the system processor module by ensuring that the two guide pins **(C)** are inserted into the alignment holes **(B)** on each side of the tool.
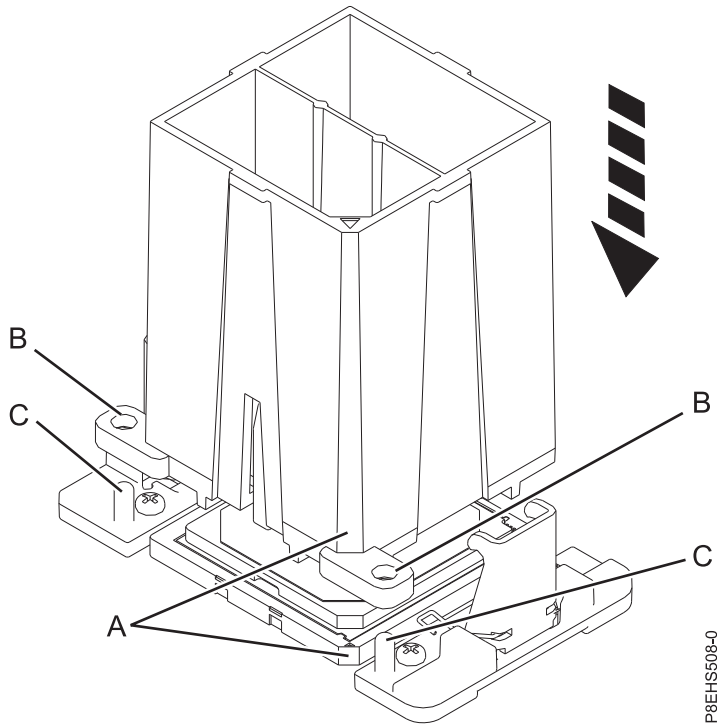
Figure 91. Lowering the removal tool onto the system processor module

c. With the removal tool **(A)** sitting on top of the system processor module, push down on the tool to lock the system processor module into the tool, as shown in Figure 92 on page 82. Ensure that both of the tool jaws are locked on the system processor module. Do not press the blue release tabs until directed to do so later.

Note: The tool drops slightly when you push down on the processor module so that the jaws can grab the bottom of the module.
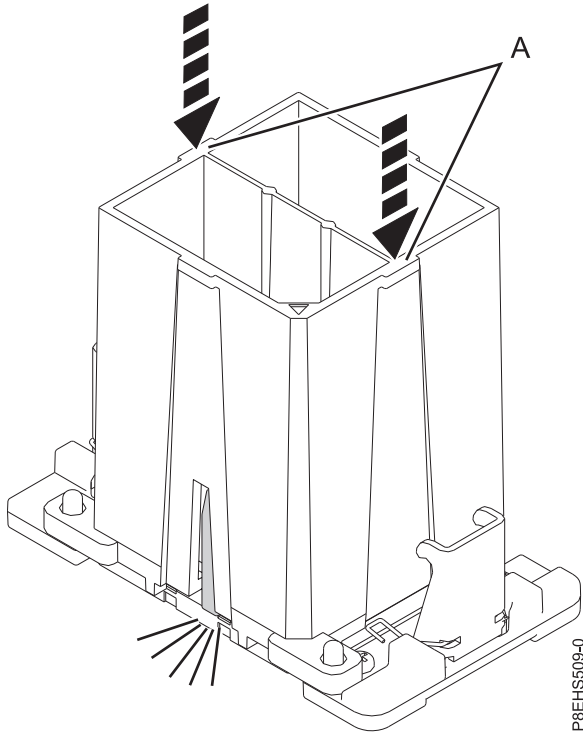
Figure 92. Locking the system processor module into the tool

7. Holding the outside of the tool, lift the tool and system processor module from the socket. Place them at an angle in the top cover of the system processor module packaging, as shown in Figure 93 on page 83.

   Note: Setting the tool and system processor module at an angle on the top cover of the system processor module packaging will make it easier to pick up and place in the packaging after you replace the system processor module.
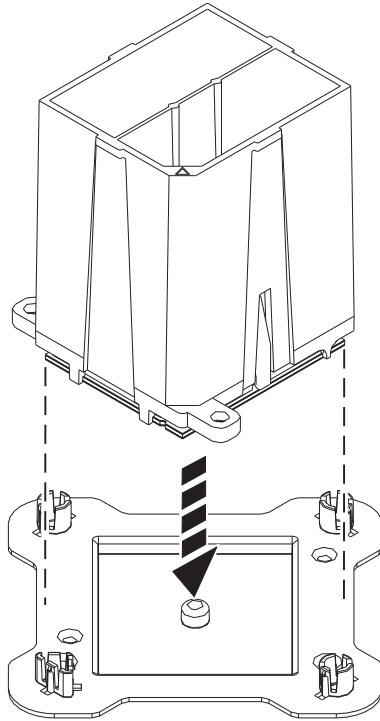
Figure 93. Placing the tool at an angle on the top cover of the packaging

8. Squeeze the two blue tabs to release the system processor module from the tool. See Figure 94 on page 84.

   Note: To prevent the system processor module from falling, do not squeeze the two tabs before you place the tool on the top cover of the system processor module packaging.
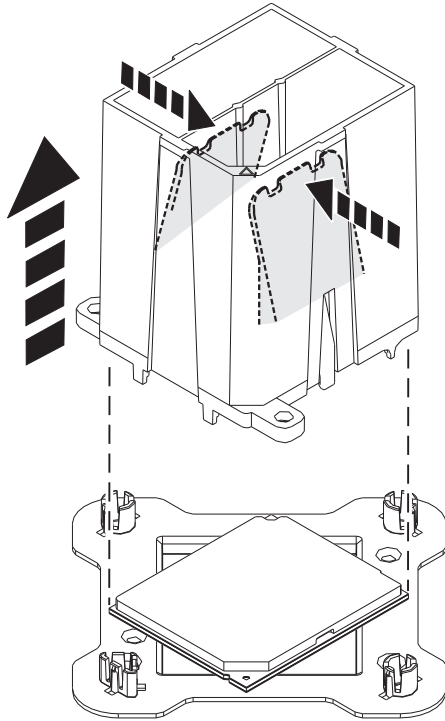
Figure 94. Releasing the system processor module from the tool

Replacing the system processor module in the 8348-21C system

Learn how to replace the system processor module in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Remove dust and debris from the system processor socket area. If dust or debris is present, use the supplied air pump (part number 45D2645) to clean the system processor socket area.
3. Prepare the system processor module for installation:
   a. Remove the replacement processor module from the shipping tray. Using the supplied removal tool (part number 01AF101), align the beveled corner **(A)** of the tool over the beveled corner of the module, as shown in Figure 95 on page 85.
   b. Lower the tool over the system processor module by ensuring that the two guide pins **(C)** are inserted into the alignment holes **(B)** on each side of the tool, as shown in Figure 95 on page 85. Then, push down on the tool to lock the system processor module into the tool, as shown in Figure 96 on page 85. Do not press the blue release tabs until directed to do so later.
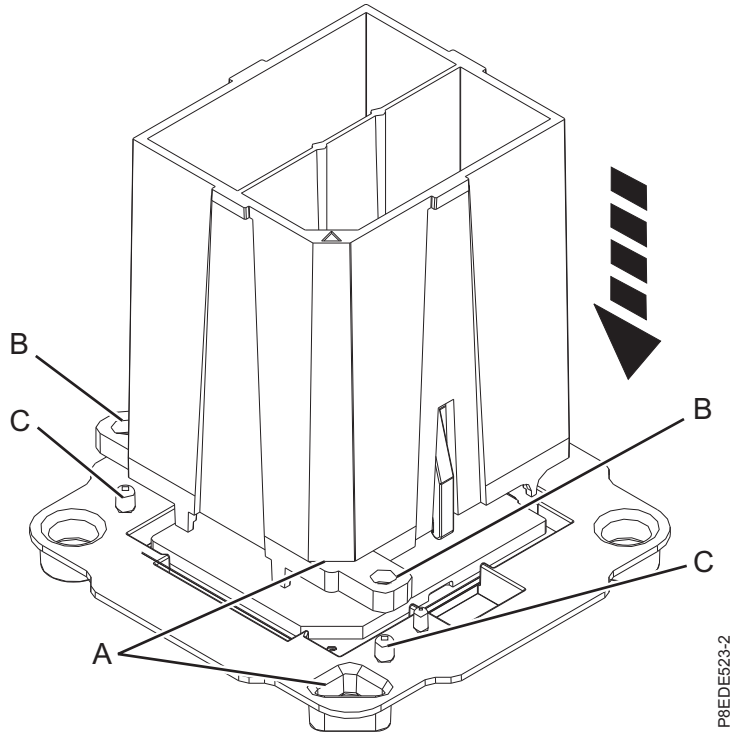
Figure 95. Aligning the removal tool
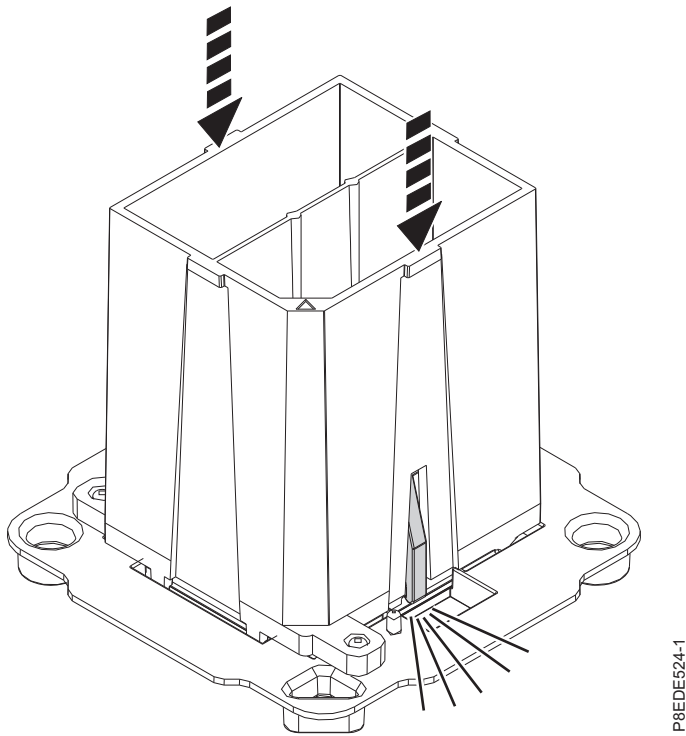
Figure 96. Locking the system processor module into the tool

4. Prepare for system processor module installation:

a. Grasping the sides of the tool and system processor module, carefully lift it slightly out of the system processor module tray. Then, turn it over so that the system processor module side is up.

b. Ensure that both jaws **(A)** are firmly grabbing the system processor module, as shown in Figure 97.

Note: If both jaws are not firmly grabbing the system processor module, press down on the corner of the system processor module closest to the jaw until it locks into place. Do not touch any part of the system processor module other than the corners.
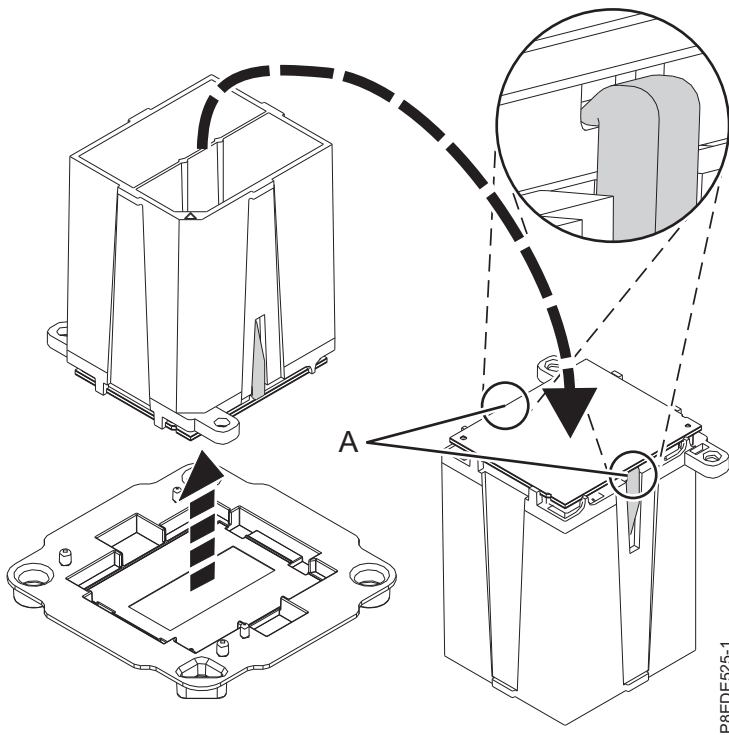
Figure 97. Preparing for system processor module installation

5. Install the system processor module:

a. If dust or debris is present on the system processor socket, use the supplied air pump (part number 45D2645) to clean the socket. Blow small bursts of air from the center toward the sides of the socket, as shown Figure 98 on page 87.
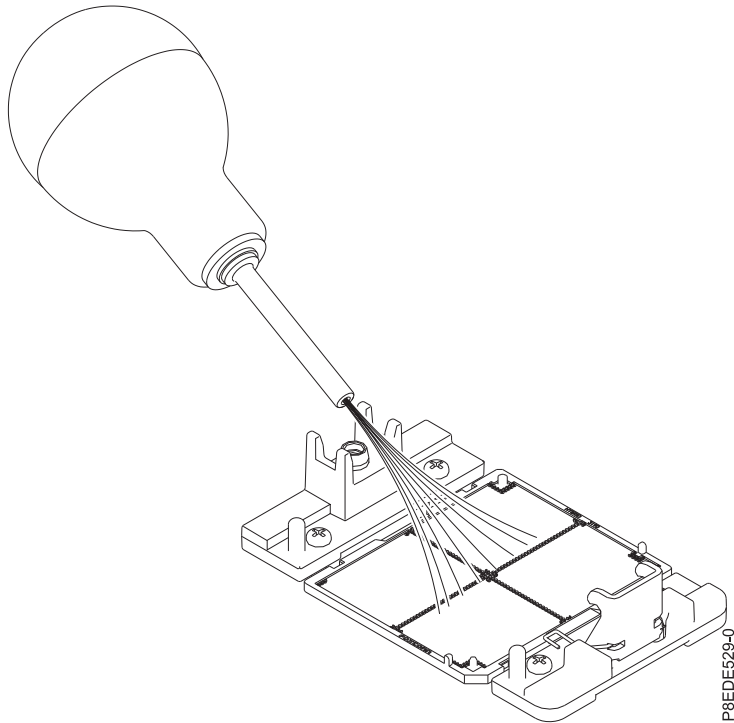
Figure 98. Removing dust and debris from the system processor socket

    b. Lower the tool and system processor module onto the socket. Align the beveled corner **(A)** of the tool with the beveled corner on the socket. Ensure that the two guide pins **(C)** are inserted into the alignment holes **(B)** on each side of the tool. Use care to lower the tool evenly without tilting the tool. See Figure 99 on page 88.

    Note: Do not attempt to slide the tool and the system processor module in any direction while the system processor module is touching the socket. If the tool and the system processor module are not aligned with the guide pins, lift the tool and the system processor module and reposition them.
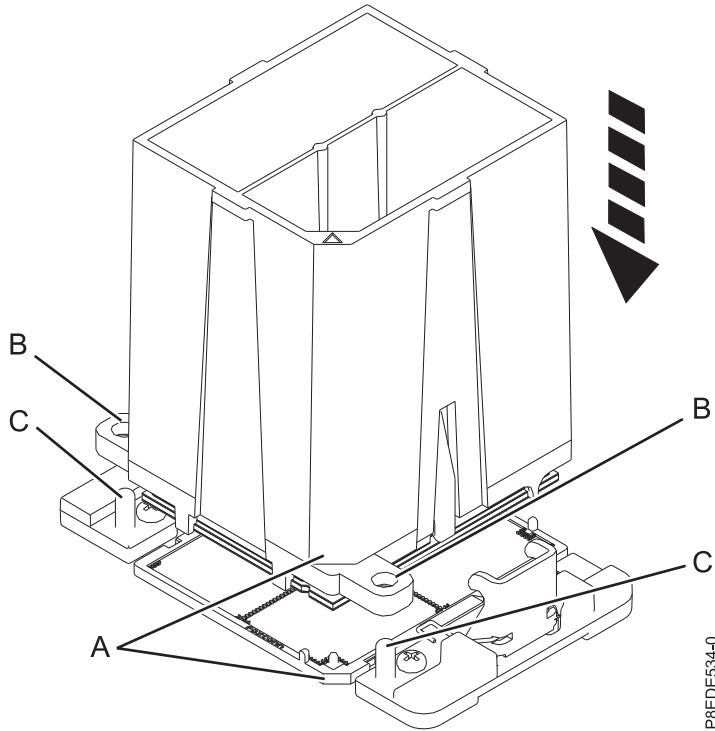
Figure 99. Installing the system processor module

   c. After the tool and system processor module holes and guide pins are properly aligned, squeeze
and hold the two blue release tabs **(A)** together until a firm stop is reached, as shown in
Figure 100 on page 89. Then, lift the tool off the system processor module.
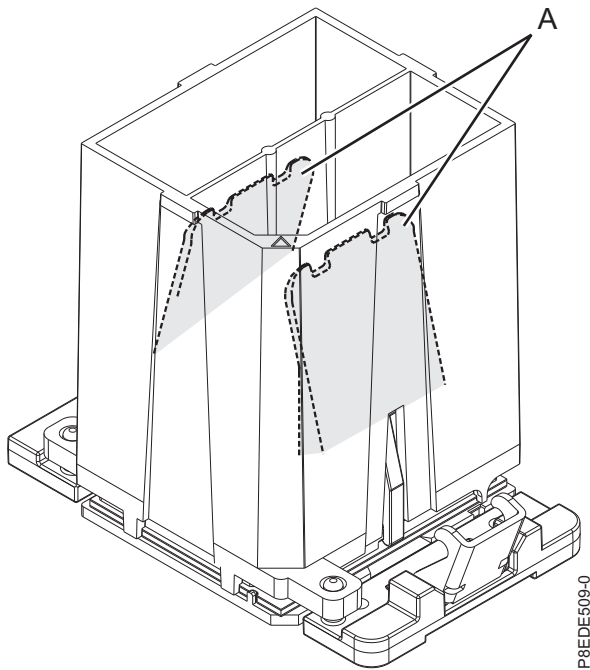
Figure 100. Removing the system processor module tool

6. Inspect the thermal interface material (TIM) for visible signs of damage, as shown in Figure 101 on page 90.

   The thermal interface material (TIM) is typically adhered to the heat sink. Unless damaged, the TIM that is adhered to the heat sink can be reused. If the TIM is damaged, do not reuse the removed heat sink. Ensure that you have a spare TIM and heat sink on hand, part number 01AF286.
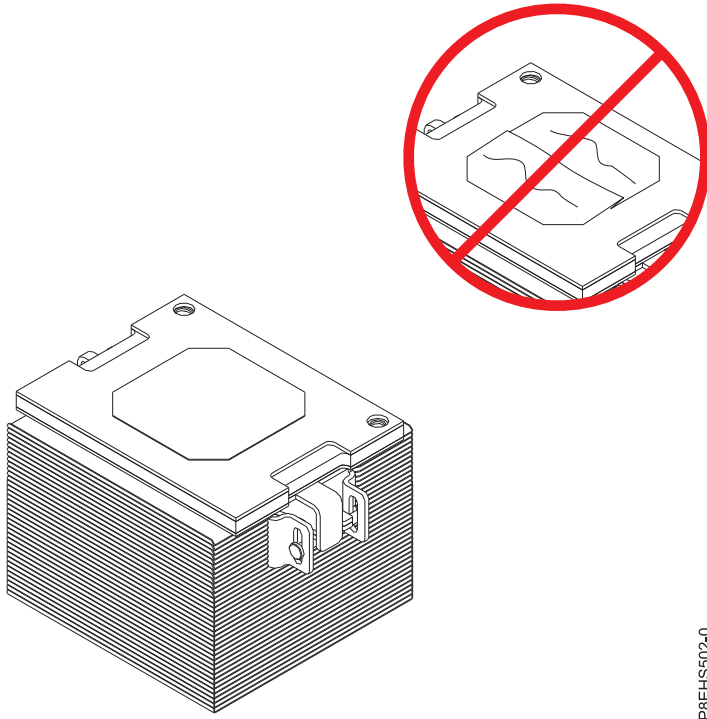
Figure 101. Inspecting the thermal interface material

7. Are you replacing the TIM or heat sink?

   Yes: Continue with step 8.

   No: Go to step 9 on page 91.

8. Install a new TIM pad:
   a. If the TIM or heat sink must be replaced, order part number 01AF286, heat sink and TIM.
   b. Open the TIM packaging and carefully remove the TIM, holding it by the edges of the carrier strip and holding it away from the shipping container.
   c. Remove the protective film from the clear carrier strip by using the supplied tweezers.

      Note: The TIM must remain flat. Small wrinkles are acceptable, but folds are not acceptable.
   d. Using the tweezers, remove the TIM from the carrier strip and center it onto the system processor module. The side with the red stripe must be facing up. Align the beveled edges of the TIM and the system processor module **(A)**, as shown in Figure 102 on page 91.
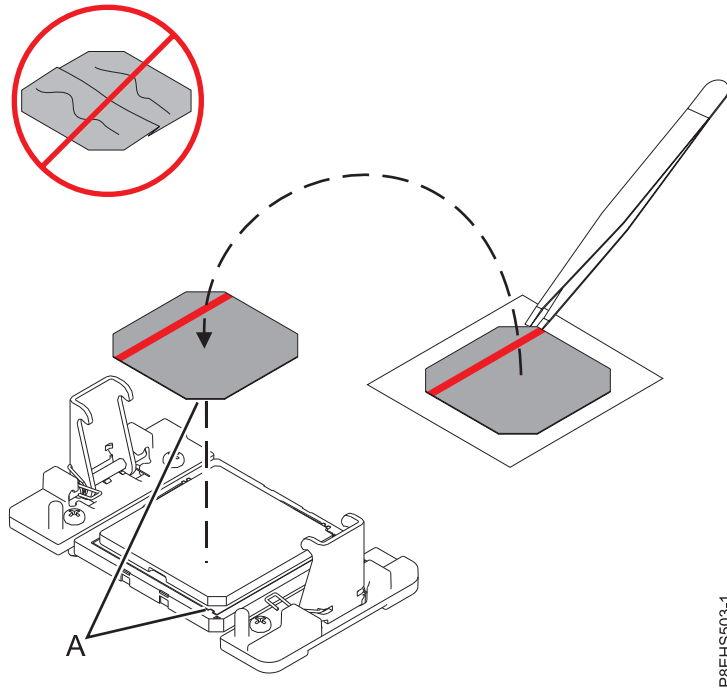
Figure 102. Installing the TIM onto the processor lid

9. Install the heat sink:

   a. Position the heat sink by using the guide holes on the heat sink **(A)** to correctly align it with the guide pins **(B)**. See Figure 103 on page 92.

   b. Ensure that the heat sink load arms are engaged.
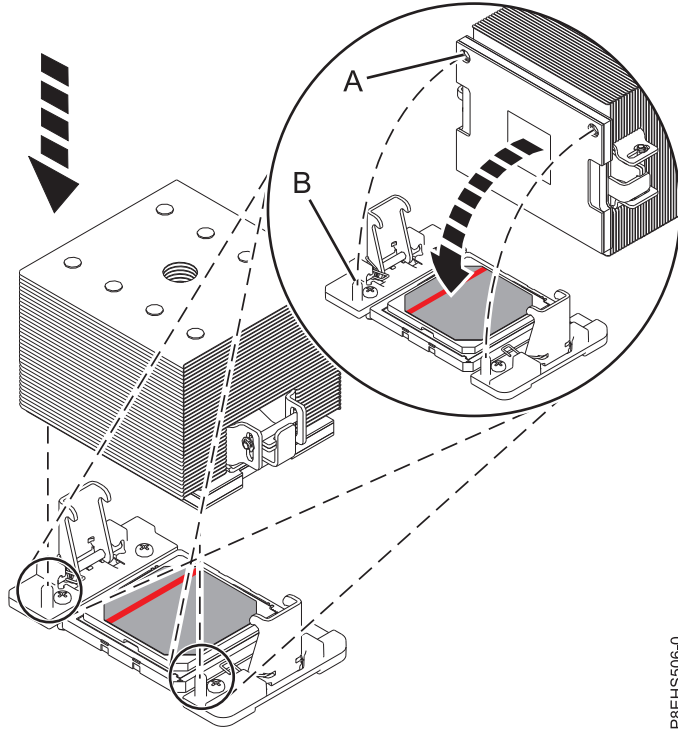
Figure 103. Installing the heat sink

    c. A hex key wrench is attached to the rear of the chassis. Use that hex key to tighten the center load screw **(B)** clockwise until a firm stop is reached. If the heat sink moves noticeably, the load arms **(A)** are not engaged. Unscrew the center load screw and repeat this step again. See Figure 104.
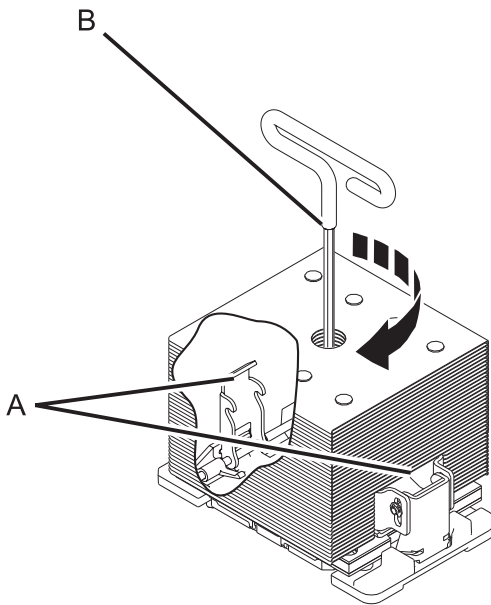
Figure 104. Tightening the center load screw on the heat sink

10. Replace the processor air baffle. For instructions, see "Replacing the processor baffle in an 8348-21C system" on page 119.

11. Lightly grip the system processor module that you replaced by the edges and lift it off of the packaging cover. Align the beveled corner of the module **(A)** to the corner of the packaging with triangle **(B)** and place it in the packaging, as shown in Figure 105. Close the packaging cover.
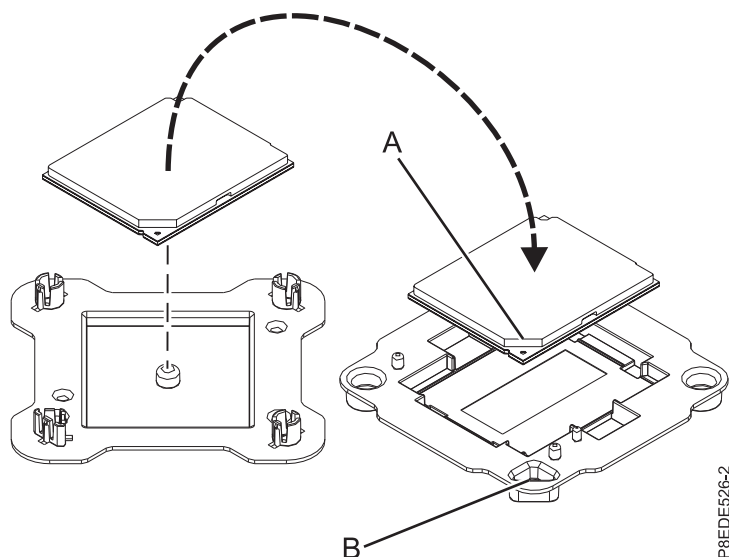
Figure 105. Placing the system processor module into the packaging

What to do next

Prepare the system for operation. For instructions, see "Preparing the system for operation after removing and replacing internal parts for the 8348-21C" on page 108.

Removing and replacing the time-of-day battery in the 8348-21C

Learn how to remove and replace the time-of-day battery in the IBM Power System S812LC (8348-21C) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the system to remove and replace internal parts in the 8348-21C" on page 105.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   • Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   • When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. If PCIe adapters are in slots 2 and 3, blocking the time-of-day battery **(A)**, as shown in Figure 106 on page 94, label and remove the adapters. For instructions, see "Removing a PCIe adapter from the

8348-21C" on page 38.
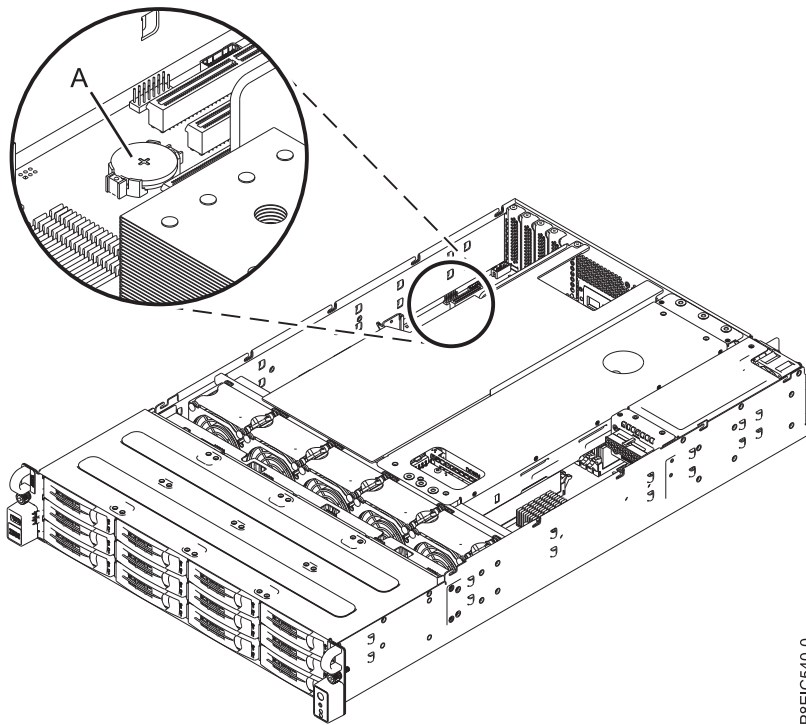
Figure 106. Time-of-day battery location

3. Remove and replace the time-of-day battery **(A)**, as shown in Figure 106. When you remove the battery, do not use a metallic tool to disengage it from its slot. The orientation of the + of the battery is up.
4. Using your labels, replace the PCIe adapters that you removed. See "Replacing a PCIe adapter in the 8348-21C" on page 40.

What to do next

Prepare the system for operation. For instructions, see "Preparing the system for operation after removing and replacing internal parts for the 8348-21C" on page 108.

Removing and replacing the front USB and cable in the 8348-21C

Learn how to remove and replace the front USB and cable in the IBM Power System S812LC (8348-21C) system.

Removing the front USB and cable in the 8348-21C

Learn how to remove the front USB and cable in the IBM Power System S812LC (8348-21C) system.

Before you begin

Power off the system and place it in the service position. For instructions, see "Preparing the system to remove and replace internal parts in the 8348-21C" on page 105.

Procedure

1. Attach the electrostatic discharge (ESD) wrist strap.

   Attention:

   - Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

   - When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD 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.

2. Remove the front USB signal cable from the system backplane, as shown in Figure 107.

Figure 107. Disconnecting the front USB cable

3. Remove the disk drive backplane. For instructions, see "Removing the disk drive backplane from the 8348-21C" on page 21.

4. Label and fully remove the three leftmost front drive trays that are located next to the front USB port. For instructions, see "Removing a front drive in the 8348-21C" on page 3.

5. Remove the four screws that secure the USB bezel and handle to the USB front assembly, as shown in Figure 108 on page 96.
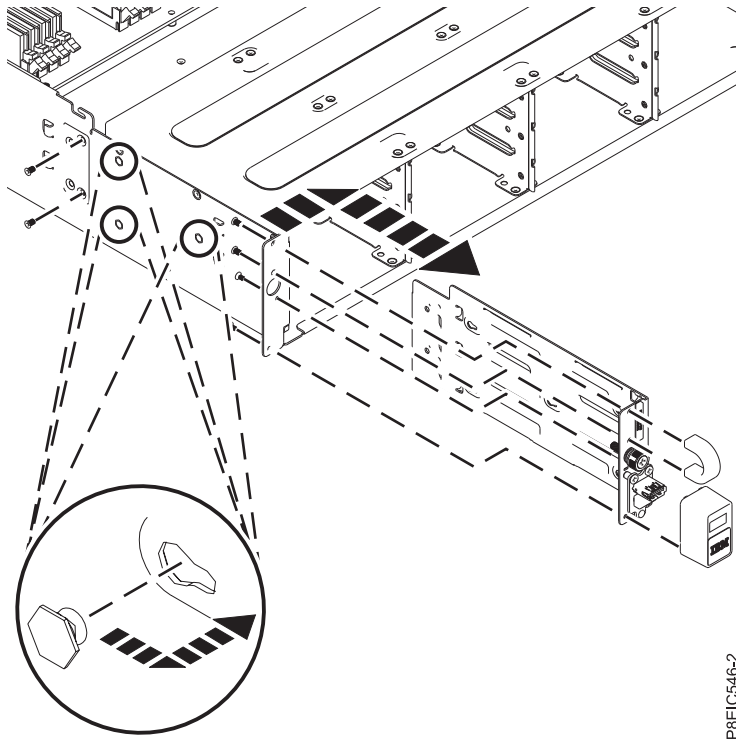
Figure 108. Removing the front USB and cable

6. Remove the two screws that secure the USB assembly to the side of the chassis, as shown in Figure 108.
7. Pull the USB assembly forward, then detach the USB assembly away from the pins in the side of the chassis, as shown in Figure 108.
8. Remove the front USB and cable from the chassis.
9. Remove the two screws **(A)** from the USB card **(B)**; then lift the USB card and cable away from the holder, as shown in Figure 109 on page 97.
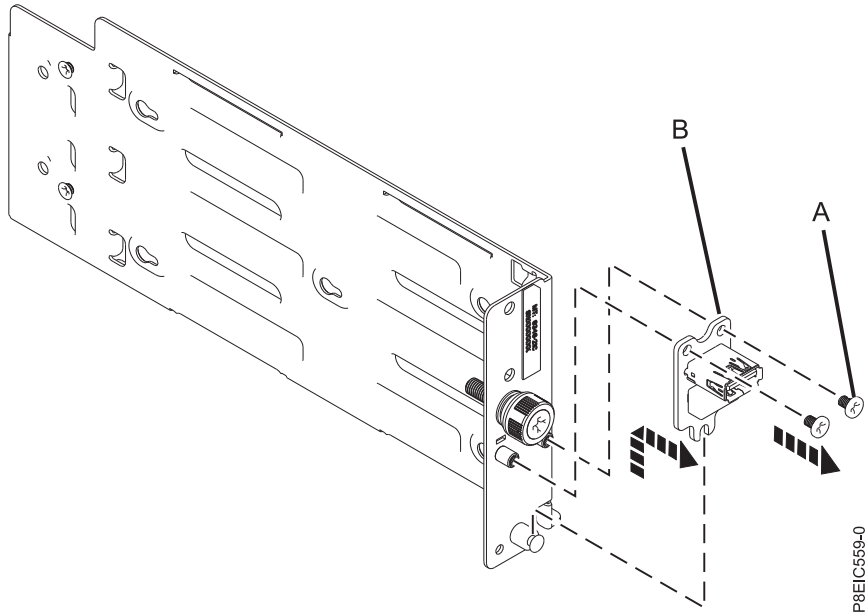
Figure 109. Removing the USB card

Replacing the front USB and cable in the 8348-21C

Learn how to replace the front USB and cable in the IBM Power System S812LC (8348-21C) system.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.
2. Using the alignment pin, lower the USB card **(A)** and cable into the holder; replace the two screws **(B)** to secure the USB card, as shown in Figure 110.
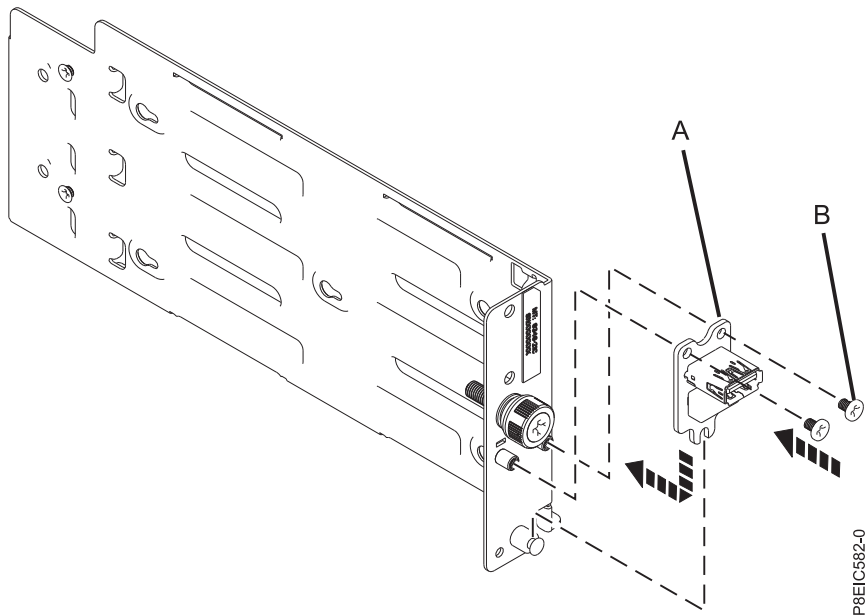
Figure 110. Replacing the USB card

3. Insert the front USB and cable into the chassis, as shown in Figure 111.
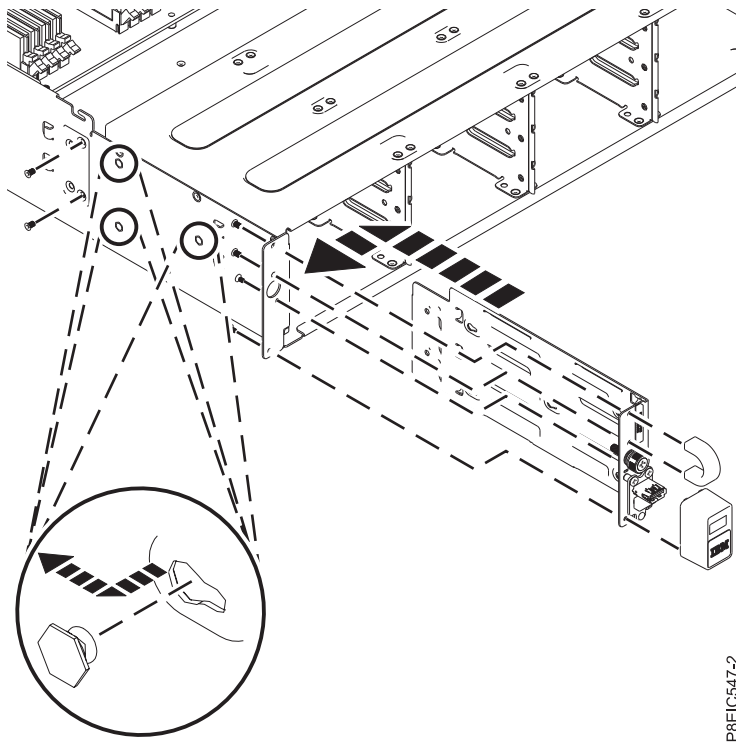
Figure 111. Replacing the front USB and cable

4. Align the USB assembly with the pins on the inside of the chassis, then slide the USB assembly to the rear of the enclosure to secure it to the pins, as shown in Figure 111.
5. Replace the two screws that secure the USB assembly to the side of the chassis, as shown in Figure 111.
6. Replace the four screws that secure the USB bezel and the handle, as shown in Figure 111.
7. Route the USB cable through the chassis.
8. Replace the front USB signal cable in the system backplane, as shown in Figure 112 on page 99.
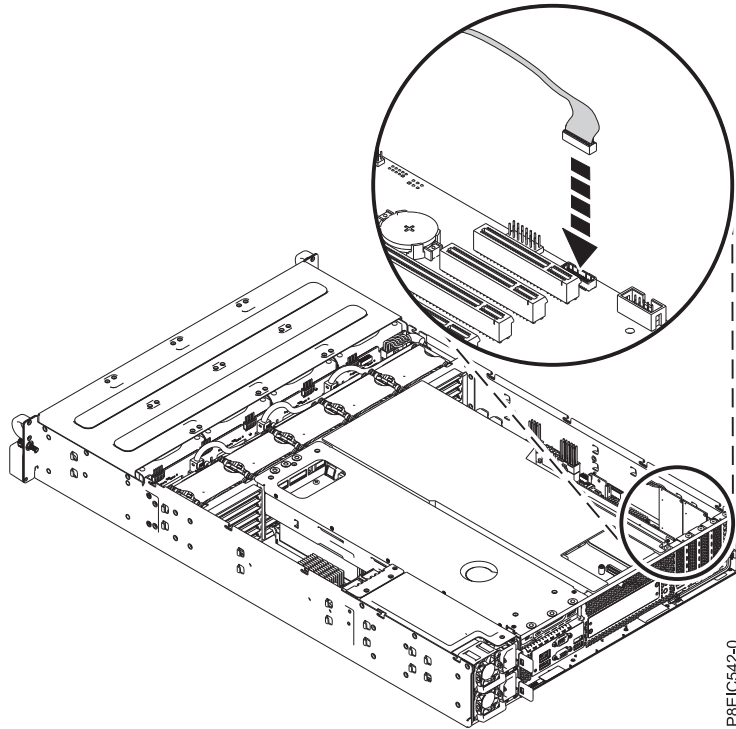
Figure 112. Connecting the front USB cable

9. Replace the disk drive backplane. For instructions, see "Replacing the disk drive backplane in the 8348-21C" on page 25.

What to do next

Prepare the system for operation. For instructions, see "Preparing the system for operation after removing and replacing internal parts for the 8348-21C" on page 108.

Common procedures for servicing or installing features in the 8348-21C

This section contains all the common procedures related to installing, removing, and replacing features in the IBM Power System S812LC (8348-21C) system.

Before you begin

Observe these precautions when you are installing, removing, or replacing features and parts.

About this task

These precautions are intended to create a safe environment to service your system and do not provide steps for servicing your system. The installation, removal, and replacement procedures provide the step-by-step processes required to service your system.

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

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:
- If IBM supplied the power cord(s), 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.
  - For AC power, disconnect all power cords from their AC power source.
  - For racks with a DC power distribution panel (PDP), disconnect the customer's DC power source to the PDP.
- When connecting power to the product ensure all power cables are properly connected.
  - For racks with AC power, 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.
  - For racks with a DC power distribution panel (PDP), connect the customer's DC power source to the PDP. Ensure that the proper polarity is used when attaching the DC power and DC power return wiring.
- 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.
- Do not attempt to switch on power to the machine until all possible unsafe conditions are corrected.
- Assume that an electrical safety hazard is present. Perform all continuity, grounding, and power checks specified during the subsystem installation procedures to ensure that the machine meets safety requirements.
- Do not continue with the inspection if any unsafe conditions are present.
- Before you open the device covers, unless instructed otherwise in the installation and configuration procedures: Disconnect the attached AC power cords, turn off the applicable circuit breakers located in the rack power distribution panel (PDP), and disconnect any telecommunications systems, networks, and modems.

DANGER:

- 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. For AC power, remove the power cords from the outlets.
  3. For racks with a DC power distribution panel (PDP), turn off the circuit breakers located in the PDP and remove the power from the Customer's DC power source.
  4. Remove the signal cables from the connectors.
  5. 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. For AC power, attach the power cords to the outlets.
  5. For racks with a DC power distribution panel (PDP), restore the power from the Customer's DC power source and turn on the circuit breakers located in the PDP.
  6. Turn on the devices.

  Sharp edges, corners and joints may be present in and around the system. Use care when handling equipment to avoid cuts, scrapes and pinching. (D005)

(R001 part 1 of 2):

DANGER: Observe the following precautions when working on or around your IT rack system:
- Heavy equipment–personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices. In addition, do not lean on rack mounted devices and do not use them to stabilize your body position (for example, when working from a ladder).

- Each rack cabinet might have more than one power cord.
  – For AC powered racks, be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
  – For racks with a DC power distribution panel (PDP), turn off the circuit breaker that controls the power to the system unit(s), or disconnect the customer's DC power source, when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

(R001 part 2 of 2):

CAUTION:

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

- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

Procedure

1. If you are installing a new feature, ensure that you have the software required to support the new feature. See IBM Prerequisite.
2. If you are performing an installation or replacement procedure that might put your data at risk, ensure, wherever possible, that you have a current backup of your system or logical partition (including operating systems, licensed programs, and data).
3. Review the installation or replacement procedure for the feature or part.
4. Note the significance of color on your system.

   Blue or terra-cotta on a part of the hardware indicates a touch point where you can grip the hardware to remove it from or install it in the system, open or close a latch, and so on. Terra-cotta might also indicate that the part can be removed and replaced with the system or logical partition power on.
5. Ensure that you have access to a medium flat-blade screwdriver, a Phillips screwdriver, and a pair of scissors.
6. If parts are incorrect, missing, or visibly damaged, do the following:
   - If you are replacing a part, contact the provider of your parts or next level of support.
   - If you are installing a feature, contact one of the following service organizations:
     - The provider of your parts or next level of support.
     - In the United States, the IBM Rochester Manufacturing Automated Information Line (R-MAIL) at 1-800-300-8751.

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

   http://www.ibm.com/planetwide
7. If you encounter difficulties during the installation, contact your service provider, your IBM reseller, or your next level of support.

8. Ensure that the top cover is on when running for thermal performance.
9. If you are installing new hardware in a logical partition, you need to understand and plan for the implications of partitioning your system. For information, see Logical Partitioning.

LEDs on the 8348-21C system

Use this information as a guide to the LEDs on the IBM Power System S812LC (8348-21C) system.

The LEDs indicate various system status. If the part does not have a problem indicator LED, you can use a troubleshooting program such as **impitool** to identify the issue.

These LEDs are located at the front (as shown in Figure 113).
- The green LED and power button **(A)** indicates the power status.
  - A constant light indicates full system power to the unit.
  - A flashing light indicates standby power to the unit.
- The blue LED **(B)** is used to identify the system that requires service.
- The amber LED **(C)** indicates a problem in the system. After a part is repaired, the amber LED takes a minute to turn off.
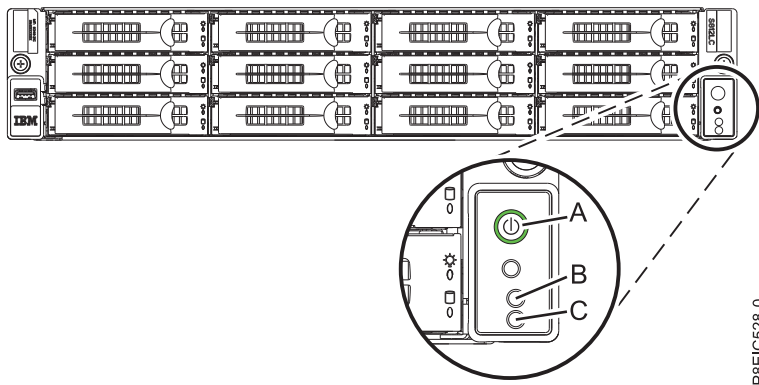
Figure 113. LEDs on the front of the 8348-21C system

LEDs are also located on the rear of the system; see Figure 114. The identify LED is at **(A)**.
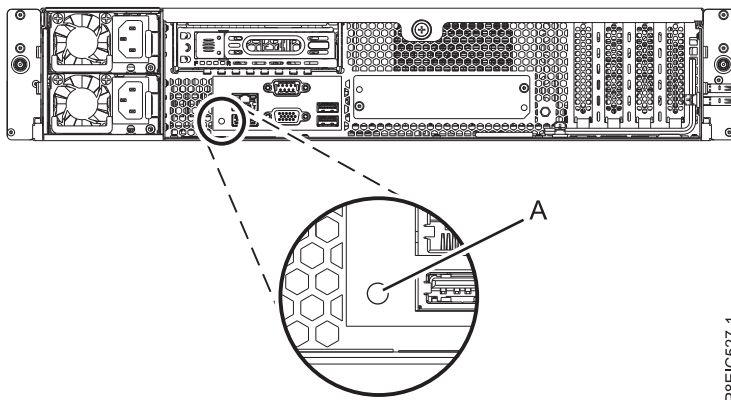
Figure 114. LEDs on the rear of the 8348-21C system

LEDs are located on the following parts:
- At the front of the system:

- Disk drives:
  - Steady green LED indicates that the drive is present but has no activity
  - Blinking green LED indicates activity
  - Steady amber LED indicates a problem
  - 1 Hz blinking amber LED indicates identifier
  - 4 Hz blinking amber LED indicates that drive is rebuilding
- At the rear of the system:
  - LAN connectors
  - Power supplies: green LED indicates that power is on and functioning properly; amber LED indicates a problem with the power supply
  - PCIe adapters

Identifying the 8348-21C system that needs servicing

Use the blue identify LEDs on the front and rear panels to help you find the system that needs servicing.

Procedure

- You can press the identify LED button on the front panel to turn the blue identify LEDs on the front and rear panels on or off.
- You can use the **ipmitool** command to activate the blue identify LEDs.

  For in-band networks, run the following chassis identify command:

  `ipmitool -I <interface> chassis identify <interval>`

  Where:

  interface
  The interface you are using to connect to the system. For example: usb.m

  interval
  The time to turn on the identify LED, in seconds. The default value is 15. This means that the LED is on for 15 seconds and then it turns off. A value of zero (0) turns off the LED. A value of force turns on the LED and leaves it on until turned off.

  To run the command remotely over the LAN, run the following chassis identify command:

  `ipmitool -I lanplus -H <hostname> -U <username> -P <password> chassis identify <interval>`

Preparing the system to remove and replace internal parts in the 8348-21C

Learn how to prepare the IBM Power System S812LC (8348-21C) system to remove and replace internal parts.

About this task

The front disks can be removed and replaced when the system is running and the system power is on.

Procedure

1. Complete the prerequisite tasks. For instructions, see "Before you begin" on page 101.
2. Identify the system that you need to work on. For instructions, see "Identifying the 8348-21C system that needs servicing."
3. If applicable, open the rack front door.
4. Attach the electrostatic discharge (ESD) wrist strap.

Attention:

- Attach an electrostatic discharge (ESD) wrist strap to the front ESD jack, to the rear ESD jack, or to an unpainted metal surface of your hardware to prevent the electrostatic discharge from damaging your hardware.

- When you use an ESD wrist strap, follow all electrical safety procedures. An ESD wrist strap is used 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 an ESD wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.

5. Stop the system. For instructions, see "Stopping the 8348-21C system" on page 110.

6. If applicable, open the rack door at the rear of the system.

7. Disconnect the power source from the system by unplugging the system. For instructions, see "Disconnecting the power cords from an 8348-21C system" on page 113.

Note: The system might be equipped with redundant power supply. Before you continue with this procedure, ensure that all power to your system is disconnected.

(L003)
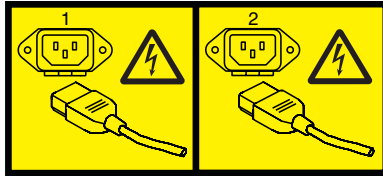
or

or

or
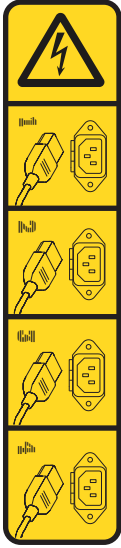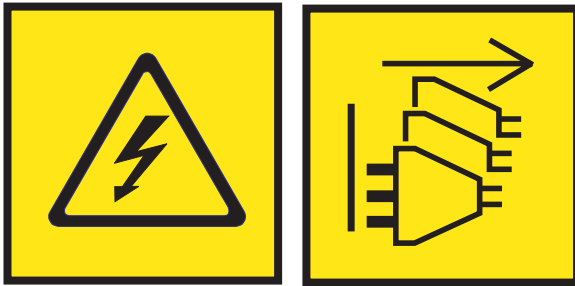
DANGER: Multiple power cords. The product might be equipped with multiple AC power cords or multiple DC power cables. To remove all hazardous voltages, disconnect all power cords and power cables. (L003)

8. Place the system into the service position. For instructions, see "Placing an 8348-21C system into the service position" on page 114.

CAUTION:
Do not place any object on top of a rack-mounted device unless that rack-mounted device is intended for use as a shelf. (R008)

(L012)

or

CAUTION: Pinch hazard. (L012)

9. Remove the service access cover. For instructions, see "Removing the service access cover from an 8348-21C system" on page 116.

Preparing the system for operation after removing and replacing internal parts for the 8348-21C

Learn how to prepare the IBM Power System S812LC (8348-21C) system for operation after removing and replacing internal parts.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap attached. If not, attach it now.

2. Replace the service access cover. For instructions, see "Installing the service access cover on an 8348-21C system" on page 117.

3. Place the system into the operating position. For instructions, see "Placing an 8348-21C system into the operating position" on page 115.

   (L012)

    or

   CAUTION: Pinch hazard. (L012)

4. Reconnect the power cords to the system. For instructions, see "Connecting the power cords to an 8348-21C system" on page 113.

5. If applicable, close the rack door at the rear of the system.

6. Start the system. For instructions, see "Starting the 8348-21C system" on page 109.

7. If applicable, close the rack front door.

8. Did you install or replace one of the following PCIe3 adapters?
   - PCIe3 low profile 6 Gb SAS/SATA RAID adapter (FC EC3Y)
   - PCIe3 low profile 12 Gb SAS/SATA RAID adapter with 1 GB protected write cache (FC EC3S)

Option	Description
Yes	Continue with the next step.
No	Go to step 14 on page 109.

9. Is your operating system stored on a front drive?

Option	Description
Yes	Continue with the next step.
No	Go to step 12 on page 109.

10. From another system that is running, go to the PMC Adaptec downloads website (http://i.adaptec.com/power) and copy the following two files to a portable USB device:
    - **Arcconf-1.0n-21nnn.pb-plugin**
    - Latest firmware
      - If you have a Series 7 adapter copy (EC3Y - PMC 71605E) **as716E01.ufi**.
      - If you have a Series 8 adapter copy (EC3S - PMC 81605Z) **AS816Z01.ufi**.

11. From the system where the adapter was replaced, plug the portable USB device into the front USB port and complete the following steps:

   a. From the Petitboot menu select **Exit to shell**.

   b. Locate the USB device in the subdirectory /var/petitboot/mnt/dev/sd*nn*.

   c. Type the following command to load the arcconf tool:

   - `pb-plugin install /var/petitboot/mnt/dev/sd`*nn*`/Arcconf-1.0`*n*`-21`*nnn*`.pb-plugin` where sd*nn* is the portable USB device, and `Arcconf-1.0`*n*`-21`*nnn*`.pb-plugin` is the arcconf file that you copied in step 10 on page 108.

   d. Copy the firmware file for your adapter that was copied in step 10 on page 108 to the **/var** directory by entering the following command:

   - `cp /var/petitboot/mnt/dev/<sd`*nn*`>/<`*latest firmware*`>.ufi /var`

   e. Download the latest firmware to your adapter by entering the following command:

   - `arcconf romupdate 1 /var/<`*latest firmware*`>.ufi`

   f. Reboot the system.

   g. Go to step 13.

12. Update the adapter firmware. See Getting firmware fixes for vendor I/O adapters by using the vendor website.

13. Set the **BACKPLANEMODE BIOS** parameter by entering the following command:

   - `arcconf setbiosparams 1 backplanemode 1`

14. Verify the installed part. For instructions, see Verifying a repair (www.ibm.com/support/knowledgecenter/POWER8//p8ei3/p8ei3_verifyrepair.htm).

Starting the 8348-21C system

You can use the power button to start the IBM Power System S812LC (8348-21C) system.

About this task

Attention: For safety, airflow purposes and thermal performance, the service access cover must be installed and fully seated before you power on the system.

Procedure

1. Open the front rack door, if necessary.

2. Before you press the power button, ensure that the power supplies are connected to the system unit and verify the following items:

   - All system power cables are connected to a power source.
   - The power-on LED, as shown in Figure 115 on page 110, is flashing. A flashing light indicates standby power to the unit.

3. Press the power button **(A)** shown in Figure 115 on page 110. The power-on light stops flashing and remains on, indicating that the system power is turned on. The system cooling fans operate at a high speed, and after approximately 30 seconds, return to operating speed.
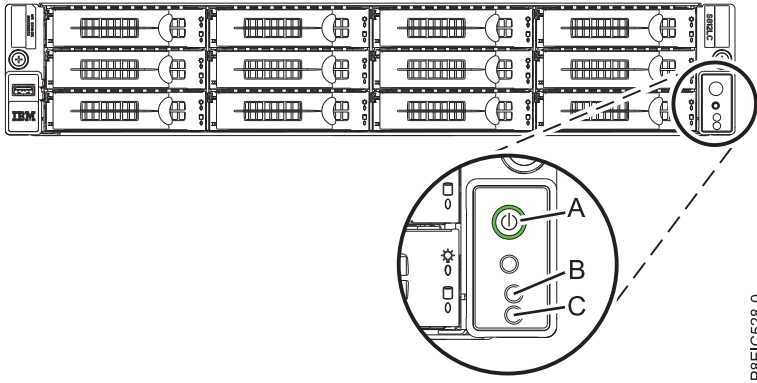
Figure 115. Power button

What to do next

If pressing the power button does not start the system, then contact your next level of support or your service provider.

Stopping the 8348-21C system

Learn how to stop the IBM Power System S812LC (8348-21C) system to complete another task.

Procedure

You can use the Linux **shutdown** command to stop and power down the system.
From a Linux command prompt, run the following command to shut down the system in 10 minutes and send the message "System shutdown in 10 minutes; repairs coming." to the users.

```
shutdown -P +10 "System shutdown in 10 minutes; repairs coming."
```

The **-P** setting instructs the system to shut down and then power off.

Event sensor status GUI display

The event sensor status GUI display is a way to quickly determine the general health status of the server without having to look at the detailed system event log (SEL) information.

To view the event sensor status GUI display, log in to the BMC web interface. The sensors and values appear on the first page (the dashboard).

Some occurrences of errors in the system might not appear in the event sensor GUI. After you view the event sensor status GUI display, use the SEL logs to view any active SEL events that indicate a service action event.

Event sensor status display operation

Most sensors are initially gray, then change status and color during the boot process when the FRU is initialized and either determined to be good (green) or faulty (red). No sensor display is available until you can get to the sensor display selection on the BMC, which means that the system attains a certain power level or that the BMC finishes initializing. The indicator color of the sensor is determined based on the sensor status at time of invocation of the display. The sensor display maintains the sensor status indicator color until the display is refreshed, which updates the sensor value with the latest status. Changes to SEL events changes color of sensor indicator when you refresh or restart the display. Sensor

status display also starts over with a reboot or a power cycle with a few exceptions, indicated in Table 1.

Event sensor status indicator descriptions

Gray indicator:
* FRU not plugged
* Sensor not initialized
* Sensor function is not initialized

Red (faulty) indicator:
* Critical threshold exceeded (an event requires a service action)
* Service action required for hard fail
* Partial function failure that reached a "service action required" state
* A deconfigured resource requires service action

Green (good) indicator:
* FRU or sensor is plugged in and fully operational
* Recoverable event is below the critical "service action required" threshold
* FRU or sensor returned to "normal" operating range (for threshold sensors)

Sensor state values during boot process

The key stages of operation.

Initial power on to BMC ready state
    In this stage, some indicator values might not reflect the status of the physical sensor. In some
    instances, the state is not available because the sensor is not initialized; in this case, the sensor
    color is gray. In other cases (typically associated with Host Boot sensors), the value of the sensor
    shows the state when the system was operational. These sensors update to indicate the current
    status if the display is refreshed when the system reaches the Petitboot stage of operation. Table 1
    shows the affected indicators.

BMC ready to PetitBoot or Host operation state
    When the system reaches the Petitboot menu stage, and you refresh the display, all of the
    indicators reflect their operational state.

Table 1. Sensors and values during the stages of system operation

Sensor Name	Value at BMC Ready	Value at Petitboot or Later
Mem Buf Temp x (x = 0 - 7)	Not Available	Current
CPUx Temp (x = 0 - 1)	Not Available	Current
CPU Core Temp x (x = 0 - 23)	Not Available	Current
DIMMx Temp (x = 0 – 31)	Not Available	Current
GPU Temp x (x = 1 – 4)	Not Available	Current
CPU Diode x (x = 1 – 2)	Current	Current
Ambient Temp	Current	Current
CPU VDD Volt	Not Available	Current
CPU VDD Current	Not Available	Current
Fan x (x = 0 – 5)	Not Available	Current
Mem Buf Func x (X = 0 – 7)	From Previous IPL	Current
DIMM Func x (x = 0 – 31)	From Previous IPL	Current

Table 1. Sensors and values during the stages of system operation (continued)

Sensor Name	Value at BMC Ready	Value at Petitboot or Later
GPU Func x (x = 1 – 4)	Not Available	Current
CPU Core Func x (x = 0 – 23)	From Previous IPL	Current
CPU Func x (X = 0 – 1)	From Previous IPL	Current
Checkstop	Current	Current
Quick Power Drop	Current	Current
OCC x Active (x = 1 – 2)	Current	Current
PSU Fault x (x = 1 – 2)	Current	Current
All Pgood	Current	Current
FW Boot Progress	From Previous IPL	Current
Host Status	Current	Current
Watchdog	From Previous IPL	Current
System Event	From Previous IPL	Current
OS Boot	From Previous IPL	Current
PCI	From Previous IPL	Current
Mem ProcX Pwr (x = 0 – 3)	From Previous IPL	Current
Procx Power (x = 0 – 1)	From Previous IPL	Current
PCIE Procx Pwr (x = 0 – 1)	From Previous IPL	Current
Fan Power A (Fan Power)	From Previous IPL	Current
Mem Cache Power	From Previous IPL	Current
12V Sense	From Previous IPL	Current
GPU Sense (GPU Power)	From Previous IPL	Current
IO (A-B) Power	From Previous IPL	Current
Storage Power (A-B)	From Previous IPL	Current
Motherboard Flt	From Previous IPL	Current
Ref Clock Fault	From Previous IPL	Current
PCI Clock Fault	From Previous IPL	Current
TOD Clock Fault	From Previous IPL	Current
APSS Fault	From Previous IPL	Current
BMC Golden Side	Current	Current
BIOS Golden Side	Current	Current
Boot Count	Current	Current
Activate Pwr Lt	From Previous IPL	Current
PS Derating Fac	Current	Current
NxtPwr Redundant	Current	Current
CurPwr Redundant	Current	Current
System Power	Not Applicable	Current if applicable
Freq Limit OT x (x = 1 - 2)	Not Applicable	Current if applicable
Freq Limit Pwr x (x = 1 - 2)	Not Applicable	Current if applicable
CPU x VDD Temp (x = 1 - 2)	Not Applicable	Current if applicable

Disconnecting the power cords from an 8348-21C system

Learn how to disconnect the power cords from an IBM Power System S812LC (8348-21C) system.

Procedure

1. Open the rear rack door on the system unit that you are servicing.
2. Identify the system unit that you are servicing in the rack.
3. Disconnect the power cords from the power supply handle.
4. Label and disconnect the power cords from the system unit. See figure Figure 116.

   Note: This system is equipped with two power supplies. If the removing and replacing procedures require the system power to be turned off, ensure that all the power sources to the system have been completely disconnected.
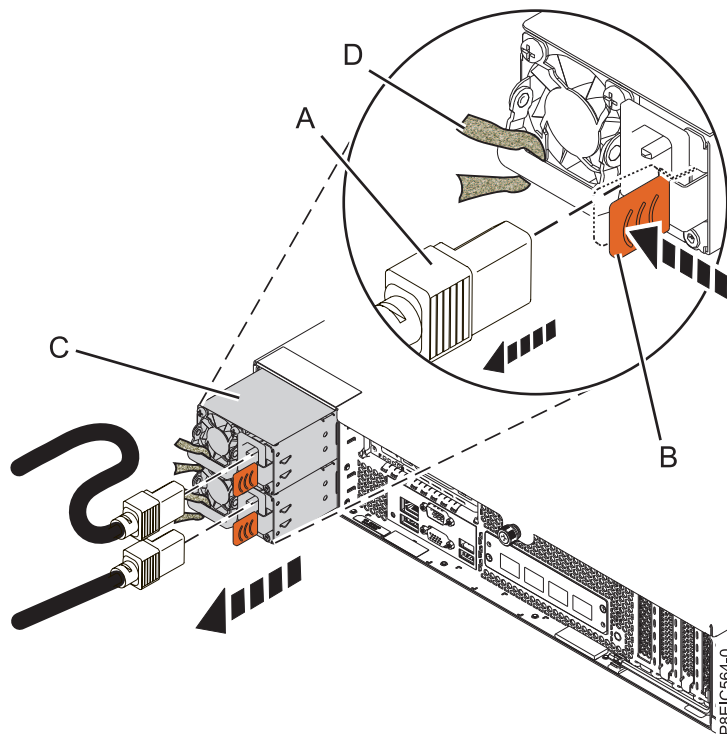
Figure 116. Removing the power cords from the system

Connecting the power cords to an 8348-21C system

Learn how to connect the power cords to an IBM Power System S812LC (8348-21C) system.

Procedure

1. Open the rear rack door on the system unit that you are servicing.
2. Using your labels, reconnect the power cords to the system unit. See figure
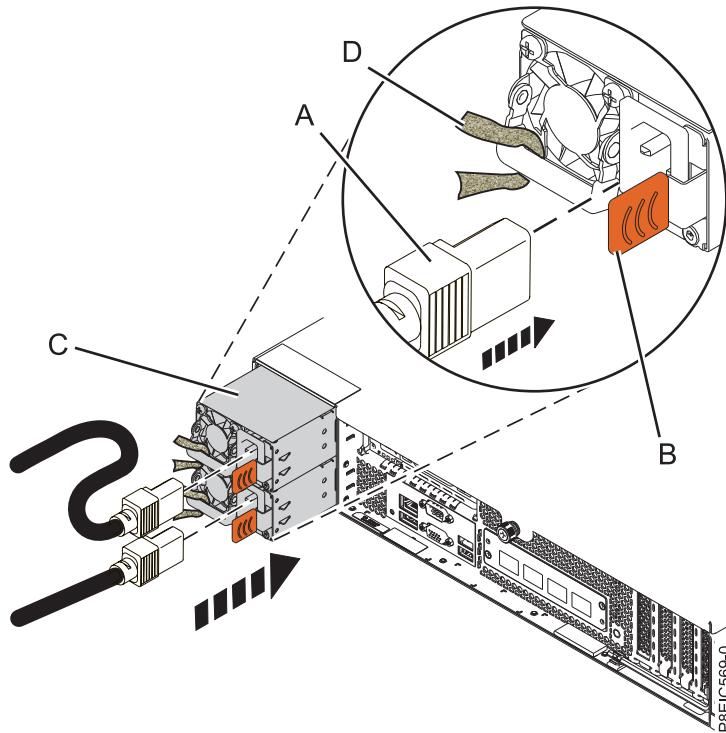
Figure 117. Connecting the power cords to the system

3. Loop and attach the power cords to the power supply handle.
4. Close the rack door at the rear of the system.

Placing an 8348-21C system into the service position

Learn how to place an IBM Power System S812LC (8348-21C) system into the service position.

Before you begin

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

Procedure

1. Remove the front screws that secure the system to the rack from both sides of the system.
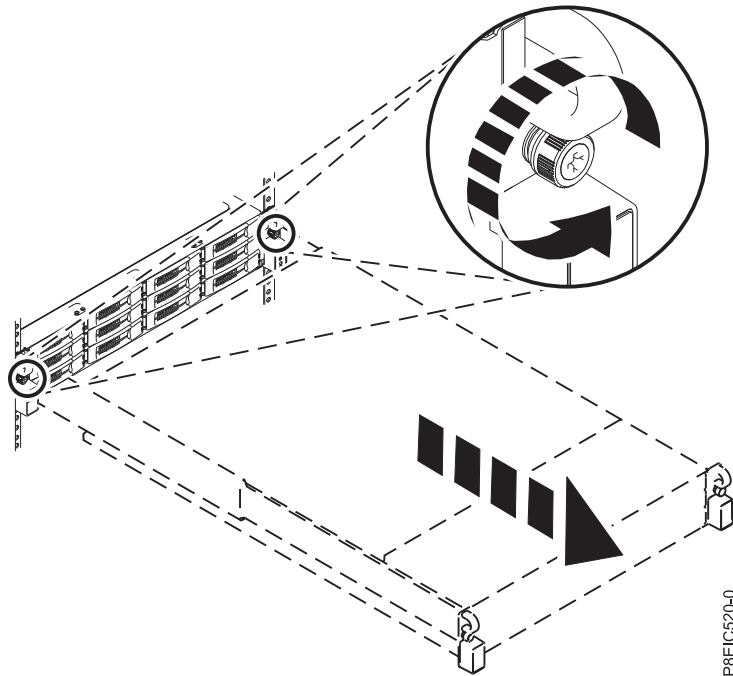
Figure 118. Removing the front screws and removing the system from the rack

2. Pull the system unit out of the rack.
3. If you are working on the front USB and cable, you must remove the system from the rails. You must also remove the left rail holder to access the mounting screws on the side of the system.
4. If you are working on the power switch and cable, you must remove the system from the rails. You must also remove the right rail holder to access the mounting screws on the side of the system.
5. If you are working on the disk drive backplane, and did not remove the lower side screws during installation, you must remove the system from the rails. You must also remove both rail holders to access the lower mounting screws on the side of the system.

   If you did remove the lower side screws during installation, you can service the system while it remains in the rails.
6. If you are working on the system backplane, the recommendation is to remove the system from the rails.
7. If you need to remove the system from the rails, use a lift tool or seek the help of a second person. If a second person is not available, you can also make the system lighter by doing the following steps:

   a. Remove the power supplies. For instructions, see "Removing a power supply from the 8348-21C" on page 50.
   b. Label and remove the front drives, keeping track of their locations. For instructions, see "Removing a front drive in the 8348-21C" on page 3.

Placing an 8348-21C system into the operating position

Learn how to place an IBM Power System S812LC (8348-21C) system into the operating position.

Before you begin

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

Procedure

1. If you removed the rail holders from the side of the system, reattach the rail holders. Replace the screws that secure the rail holders to the system.

2. If you removed the system from the rails, reattach the system to the rails. Depending on the weight of the system, you need two people to lift the system, carry it, and replace it in the rack.

3. If you removed the power supplies, replace them. For instructions, see "Replacing a power supply in the 8348-21C" on page 51.

4. If you removed the front drives, replace them in their proper locations. For instructions, see "Replacing a front drive in the 8348-21C" on page 5.

5. Release the rail safety latches **(A)** by lifting them upward, as shown in Figure 119, then push the system fully into the rack.
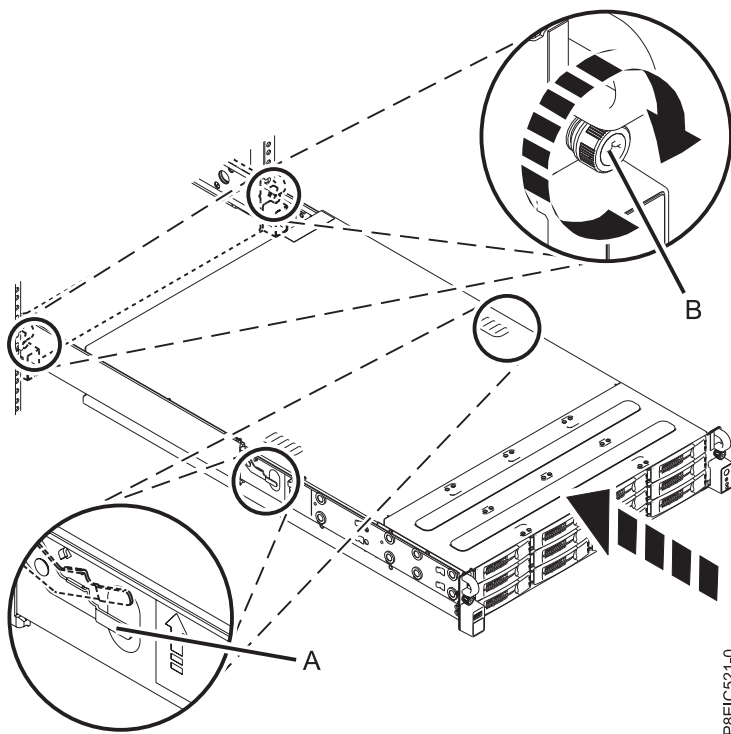
Figure 119. Placing the system into the operating position

6. Fasten the two front screws **(B)** to secure the system to the rack.

Removing the service access cover from an 8348-21C system

Learn how to remove the service access cover from an IBM Power System S812LC (8348-21C) system.

Before you begin

Ensure that the power plugs are removed from the power supplies.

Procedure

1. At the rear of the system, loosen the cover screw **(A)** that fastens the cover to the chassis. See Figure 120 on page 117.
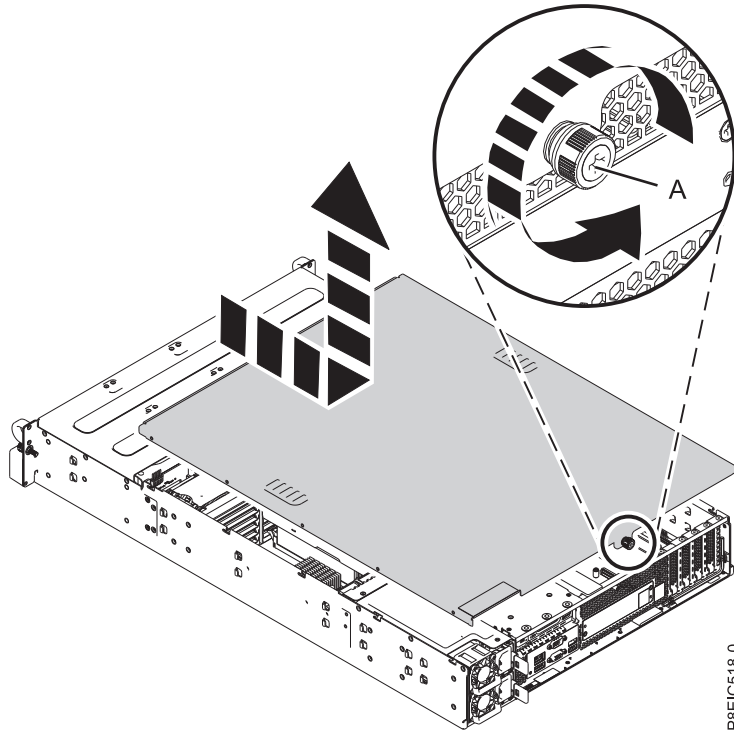
Figure 120. Removing the service cover

2. Slide the cover toward the rear of the system unit. When the front of the service access cover clears the upper frame ledge, lift the cover up and off the system unit.

   Attention: For proper cooling and airflow, replace the cover before powering on the system.

Installing the service access cover on an 8348-21C system

Learn how to install the service access cover on a rack-mounted IBM Power System S812LC (8348-21C) system.

About this task

Attention: For safety, airflow purposes and thermal performance, the service access cover must be installed and fully seated before you power on the system.

Procedure

1. Place the cover on the system unit such that the alignment pins on the cover are aligned to the slots on the chassis. Slide the cover forward. See Figure 121 on page 118.
2. Fasten the cover with the cover screw **(A)**. See Figure 121 on page 118.
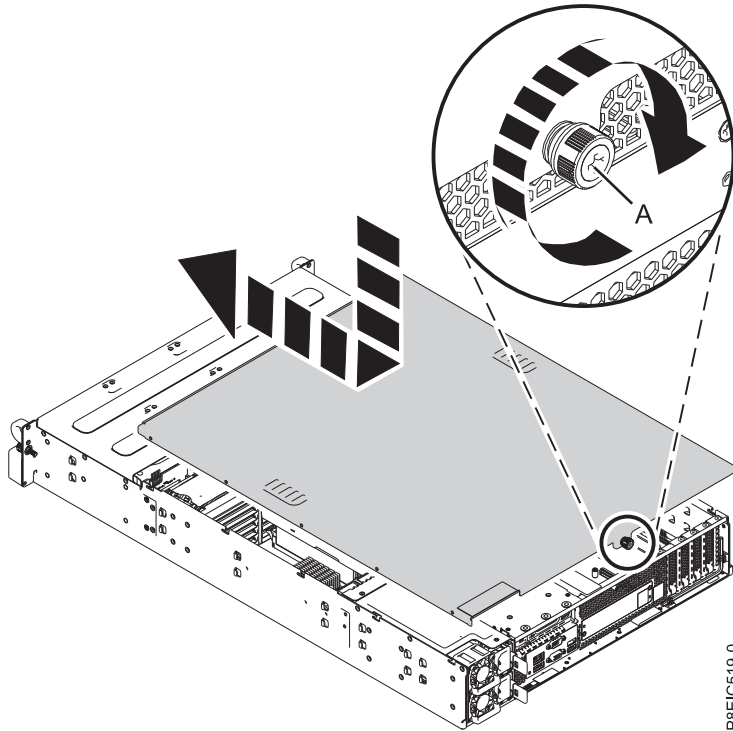
Figure 121. Replacing the service cover

Removing the processor baffle from an 8348-21C system

Learn how to remove the processor baffle from an IBM Power System S812LC (8348-21C) system.

Procedure

Remove the processor baffle as shown in .
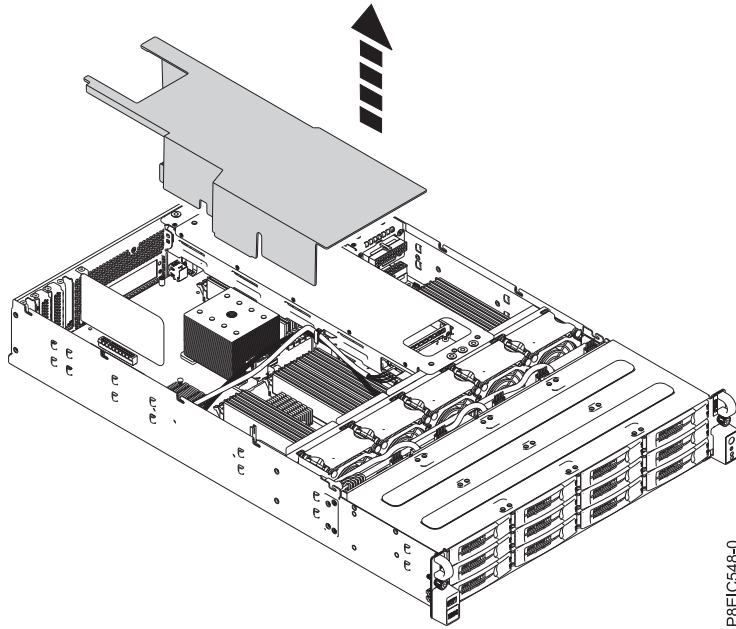
Figure 122. Removing processor baffle

Replacing the processor baffle in an 8348-21C system

Learn how to replace the processor baffle in an IBM Power System S812LC (8348-21C) system.

Procedure

1. Route the drive signal cable and drive power cable through the cable slot **(A)** in the baffle, as shown in Figure 123 on page 120.
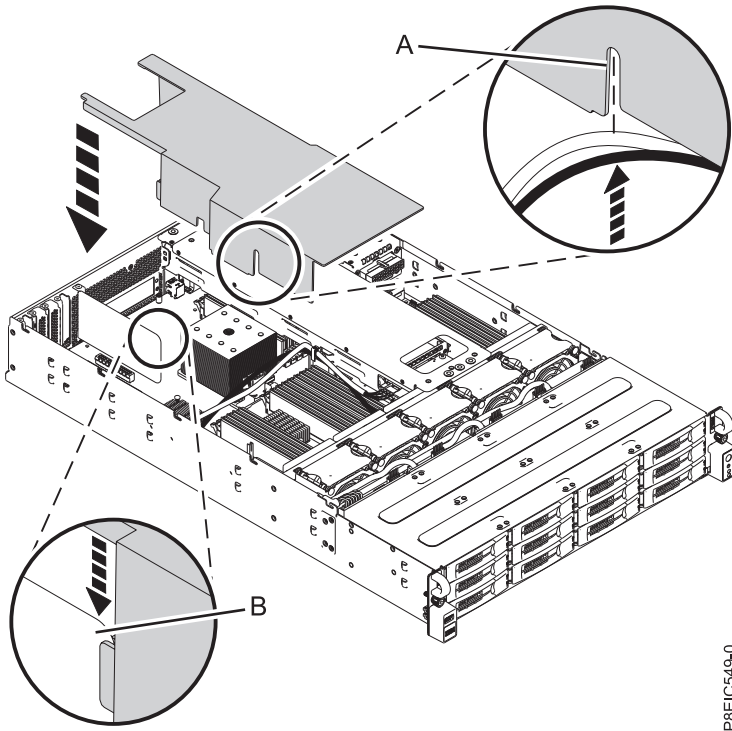
Figure 123. Replacing the processor baffle. Route the drive signal cable and drive power cable through **(A)**; align the air divider at **(B)**.

2. Align the air divider **(B)** into the air divider slot in the baffle, as shown in Figure 123.
3. Carefully press the baffle fully into the system.

Additional procedures

Getting firmware fixes for vendor I/O adapters by using the vendor website

Learn how to get vendor I/O adapter firmware fixes by using the vendor website.

About this task

To get fixes for the vendor I/O adapter firmware, complete the following steps:

Procedure

1. Go to the vendor website listed for your I/O adapter in Table 2.
2. Follow the on-screen instructions to download and install the I/O adapter firmware fixes to your system.

Table 2. Vendor websites

Name	Website
Broadcom	Broadcom website (http://www.broadcom.com/support/)
Emulex	Emulex website (http://www.emulex.com/products/ethernet-networking-storage-connectivity/ethernet-networking-adapters/ibm-branded/selection-guide/)
Marvell	Marvell website (http://www.marvell.com/storage/system-solutions/sata-controllers/)
Mellanox	Mellanox website (http://www.mellanox.com/page/oem_firmware_download)
NVIDIA	NVIDIA website (http://www.nvidia.com)
PMC-Sierra	PMC-Sierra website (http://i.adaptec.com/power)
QLogic	QLogic website (http://driverdownloads.qlogic.com/QLogicDriverDownloads_UI/IBM_Search.aspx)

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Accessibility features for IBM Power Systems servers

Accessibility features assist users who have a disability, such as restricted mobility or limited vision, to use information technology content successfully.

Overview

The IBM Power Systems servers include the following major accessibility features:
- Keyboard-only operation
- Operations that use a screen reader

The IBM Power Systems servers use the latest W3C Standard, WAI-ARIA 1.0 (www.w3.org/TR/wai-aria/), to ensure compliance with US Section 508 (www.access-board.gov/guidelines-and-standards/ communications-and-it/about-the-section-508-standards/section-508-standards) and Web Content Accessibility Guidelines (WCAG) 2.0 (www.w3.org/TR/WCAG20/). To take advantage of accessibility features, use the latest release of your screen reader and the latest web browser that is supported by the IBM Power Systems servers.

The IBM Power Systems servers online product documentation in IBM Knowledge Center is enabled for accessibility. The accessibility features of IBM Knowledge Center are described in the Accessibility section of the IBM Knowledge Center help (www.ibm.com/support/knowledgecenter/doc/ kc_help.html#accessibility).

Keyboard navigation

This product uses standard navigation keys.

Interface information

The IBM Power Systems servers user interfaces do not have content that flashes 2 - 55 times per second.

The IBM Power Systems servers web user interface relies on cascading style sheets to render content properly and to provide a usable experience. The application provides an equivalent way for low-vision users to use system display settings, including high-contrast mode. You can control font size by using the device or web browser settings.

The IBM Power Systems servers web user interface includes WAI-ARIA navigational landmarks that you can use to quickly navigate to functional areas in the application.

Vendor software

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Related accessibility information

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TTY service
800-IBM-3383 (800-426-3383)
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For more information about the commitment that IBM has to accessibility, see IBM Accessibility (www.ibm.com/able).

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Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Compliance Statement

CAN ICES-3 (A)/NMB-3(A)

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European Community contact:
IBM Deutschland GmbH
Technical Regulations, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 800 225 5426
email: halloibm@de.ibm.com

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・回路分類　：6（単相、ＰＦＣ回路付）
・換算係数　：0

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Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 / EN 55032 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

Class B Notices

The following Class B statements apply to features designated as electromagnetic compatibility (EMC) Class B in the feature installation information.

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM-authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM-authorized dealers. IBM is not responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Compliance Statement

CAN ICES-3 (B)/NMB-3(B)

European Community Compliance Statement

This product is in conformity with the protection requirements of EU Council Directive 2014/30/EU 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.

European Community contact:
IBM Deutschland GmbH
Technical Regulations, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 800 225 5426
email: halloibm@de.ibm.com

VCCI Statement - Japan

　この装置は，クラスＢ情報技術装置です。この装置は，家庭環境で使用
することを目的としていますが，この装置がラジオやテレビジョン受信機に
近接して使用されると，受信障害を引き起こすことがあります。
　取扱説明書に従って正しい取り扱いをして下さい。　　　　ＶＣＣＩ－Ｂ

Japan Electronics and Information Technology Industries Association Statement

This statement explains the Japan JIS C 61000-3-2 product wattage compliance.

（一社）電子情報技術産業協会　高調波電流抑制対策実施
要領に基づく定格入力電力値：　Knowledge Centerの各製品の
仕様ページ参照

This statement explains the Japan Electronics and Information Technology Industries Association (JEITA) statement for products less than or equal to 20 A per phase.

高調波電流規格　JIS C 61000-3-2 適合品

This statement explains the JEITA statement for products greater than 20 A, single phase.

This statement explains the JEITA statement for products greater than 20 A per phase, three-phase.

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

Germany Compliance Statement

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse B EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaatenund hält die Grenzwerte der EN 55022/ EN 55032 Klasse B 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 von IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung von IBM gesteckt/eingebaut werden.

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 2014/30/EU in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC Richtlinie 2014/30/EU) für Geräte der Klasse B

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
IBM Deutschland GmbH
Technical Relations Europe, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 (0) 800 225 5426
email: HalloIBM@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022/ EN 55032 Klasse B.

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