

Power Systems

*System backplane for the 9009-41A,
9009-41G, 9009-42A, 9009-42G,
9223-42H, or 9223-42S*



Note

Before using this information and the product it supports, read the information in [“Safety notices” on page v](#), [“Notices” on page 143](#), the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125-5823.

This edition applies to IBM® Power Systems servers that contain the POWER9™ processor and to all associated models.

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Contents

- Safety notices.....V**

- System backplane..... 1**
 - Removing and replacing the system backplane..... 1
 - Preparing the system.....1
 - Removing the system backplane..... 16
 - Replacing the system backplane..... 76
 - Preparing the system for operation..... 130

- Notices.....143**
 - Accessibility features for IBM Power Systems servers..... 144
 - Privacy policy considerations 145
 - Trademarks..... 145
 - Electronic emission notices.....145
 - Class A Notices.....145
 - Class B Notices.....149
 - Terms and conditions..... 151

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 if provided, unless the earthquake option is to be installed..
- 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).



- Stability hazard:
 - The rack may tip over causing serious personal injury.
 - Before extending the rack to the installation position, read the installation instructions.
 - Do not put any load on the slide-rail mounted equipment mounted in the installation position.
 - Do not leave the slide-rail mounted equipment in the installation position.
- 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 1 of 2)

(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 or if the rack is not bolted to the floor. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.



- (For fixed drawers.) This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack. (R001 part 2 of 2)



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 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 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 2083 mm (30 x 82 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 or in an earthquake environment bolt the rack to the floor.
 - 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)

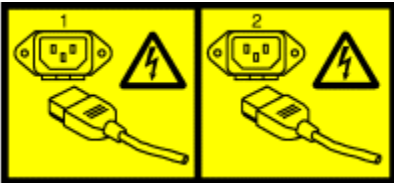


DANGER: Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices. In addition, do not lean on rack-mounted devices and do not use them to stabilize your body position (for example, when working from a ladder). Stability hazard:

- The rack may tip over causing serious personal injury.
- Before extending the rack to the installation position, read the installation instructions.
- Do not put any load on the slide-rail mounted equipment mounted in the installation position.
- Do not leave the slide-rail mounted equipment in the installation position.

(L002)

(L003)



or



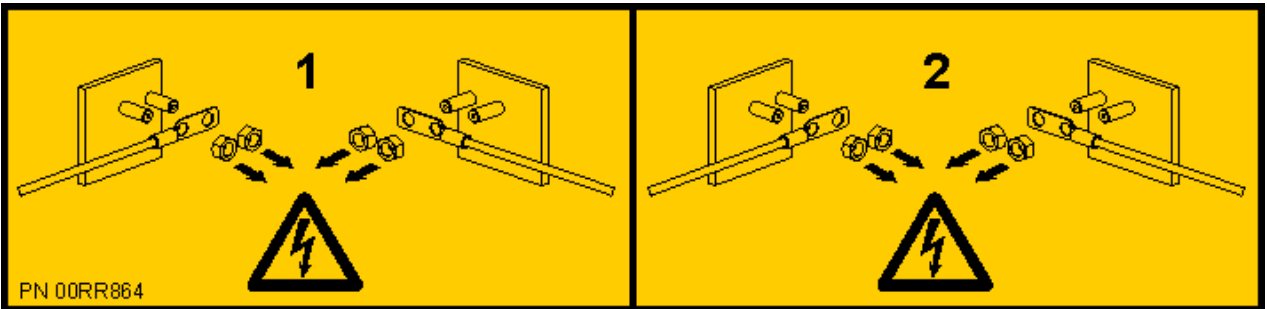
or



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 may 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)


(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 degrees C (212 degrees F)
- Repair or disassemble

Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (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 raise, lower or slide platform load shelf unless stabilizer (brake pedal jack) is fully engaged. Keep stabilizer brake engaged when not in use or motion.
- 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 platforms, tilt riser, angled unit install wedge or other such accessory options. Secure such platforms -- riser tilt, wedge, etc options to main lift shelf or forks in all four (4x or all other provisioned mounting) 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 [adjustable angling platform] option flat at all times except for final minor angle 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 (unless the specific allowance is provided for one following qualified procedures for working at elevations with this 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.

- This TOOL must be maintained correctly for IBM Service personnel to use it. IBM shall inspect condition and verify maintenance history before operation. Personnel reserve the right not to use TOOL if inadequate. (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 the system backplane in the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S

Find information about removing and replacing the system backplane in the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S.

Removing and replacing the system backplane in the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S

Find information about removing and replacing the system backplane in the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S.

If your system is managed by the Hardware Management Console (HMC), use the HMC to repair a part in the system. For instructions, see [Repairing a part by using the HMC](http://www.ibm.com/support/knowledgecenter/POWER9/p9haj/p9haj_hmc_repair.htm) (www.ibm.com/support/knowledgecenter/POWER9/p9haj/p9haj_hmc_repair.htm).

If you do not have an HMC, use the following procedures to remove and replace the system backplane.

Note: Only an authorized service representative must remove or replace this part.

Preparing the system to remove and replace the system backplane

To prepare the system to remove and replace the system backplane, complete the steps in this procedure.

About this task

Before you begin this procedure, ensure that you have authority to log in as an authorized service provider. The authority levels are described in ASMI authority levels.

Procedure

1. Identify the part and the system that you are working on. For instructions, see [Identifying a part](http://www.ibm.com/support/knowledgecenter/POWER9/p9haj/sal.htm) (www.ibm.com/support/knowledgecenter/POWER9/p9haj/sal.htm).
Use the blue identify LED on the enclosure to locate the system. Ensure that the serial number of the system matches the serial number to be serviced.
2. Stop the system. For instructions, see [Stopping a system](http://www.ibm.com/support/knowledgecenter/POWER9/p9haj/crustopsys.htm) (www.ibm.com/support/knowledgecenter/POWER9/p9haj/crustopsys.htm).
3. Access the Advanced System Management Interface (ASMI).
For instructions, see [Accessing the ASMI without an HMC](http://www.ibm.com/support/knowledgecenter/POWER9/p9hby/connect_asmi.htm) (www.ibm.com/support/knowledgecenter/POWER9/p9hby/connect_asmi.htm).
4. On the ASMI welcome panel, locate **Service Processor: Primary (Location: UXXXX.YYY.ZZZZZZZ)** where XXXX.YYY represents the **Feature Code/Sequence Number** and ZZZZZZZ represents the **Enclosure serial number**. Record the values for **XXXX.YYY** and **ZZZZZZZ**.
5. Check and record the System Enclosure Type and Feature Code. The enclosure serial number is a seven-digit number that is printed on a bar-coded label on the system unit.
6. Attach the electrostatic discharge (ESD) wrist strap.
The ESD wrist strap must be connected to an unpainted metal surface until the service procedure is completed, and if applicable, until the service access cover is replaced.



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. If at any point in this service process you move away from the system, it is important to again discharge yourself by touching an unpainted metal surface for at least 5 seconds before you continue with the service process.

7. For rack-mounted systems, continue to the next step.

For stand-alone systems, the recommended service position for working with the system backplane is to lay the system on its side. You do not need to lift the system. For instructions to place a stand-alone system in the service position, continue to step [“17” on page 11](#).



CAUTION: This system requires two people to tip the system onto its side.

8. Open the cable management arm by completing the following steps:

- a) Release the mounting bracket from the cable management arm assembly by pressing the indentation **(A)** on the inner cable management arm tab.

The cable management arm releases from the outer mounting bracket in the direction shown.

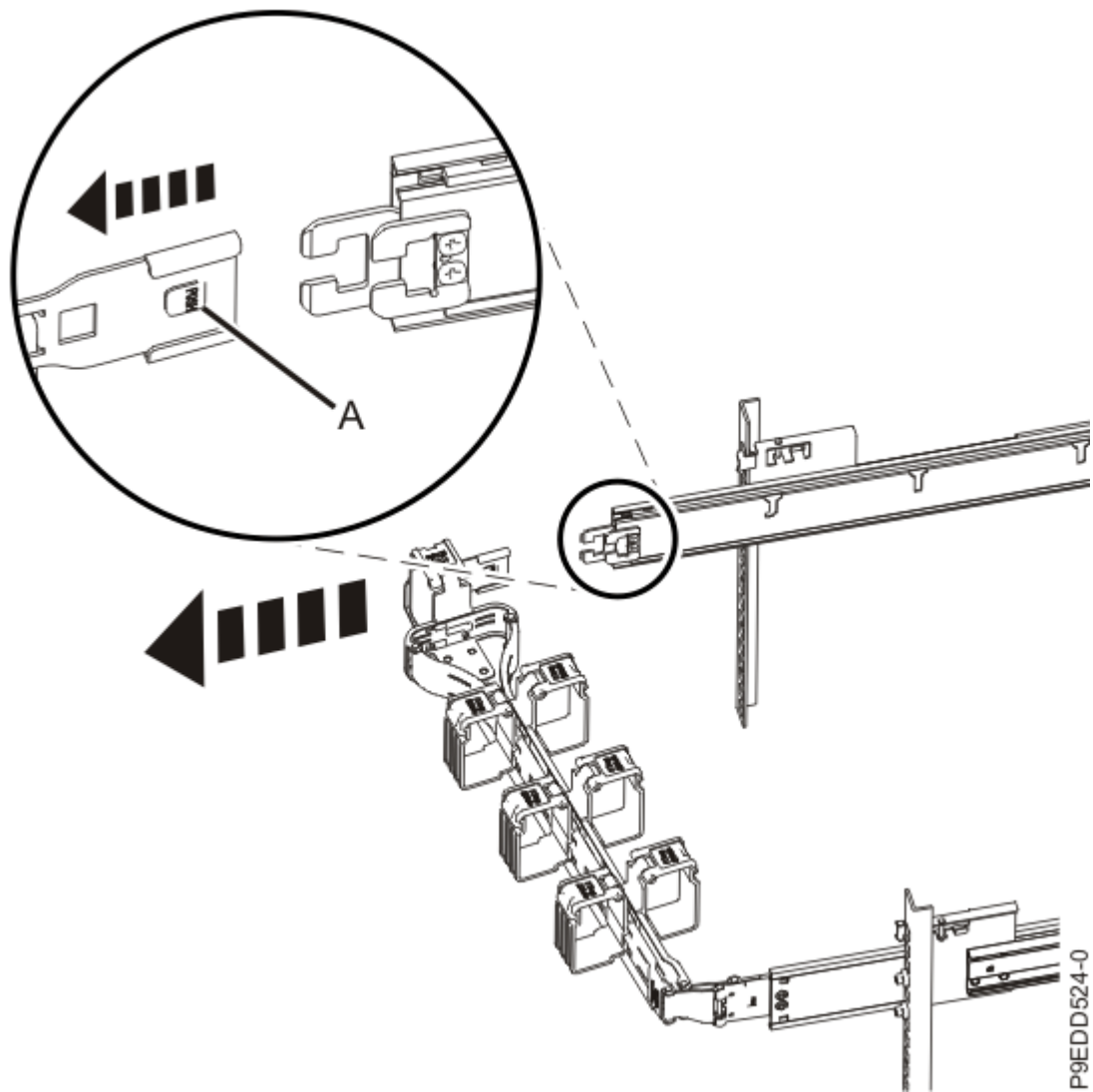


Figure 1. Releasing the cable management arm

b) Swing the cable management arm away from the system.

In the image, the inner cable management arm tab is shown on the left side as you are facing the system from the rear. However, the cable management arm can also be installed so that the inner cable management arm tab is on the right side of the system.



CAUTION: To avoid causing damage to the arm, open the cable management arm just long enough to complete these repairs.

9. Label and disconnect the power cords from the system unit.

See [Figure 2](#) on page 4.

Notes:

- This system might be equipped with two or more 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 are disconnected.
- The power cord (**B**) is fastened to the system with hook-and-loop fastener (**A**). If you are placing the system in a service position after you disconnect the power cords, ensure that you unstrap the fastener.

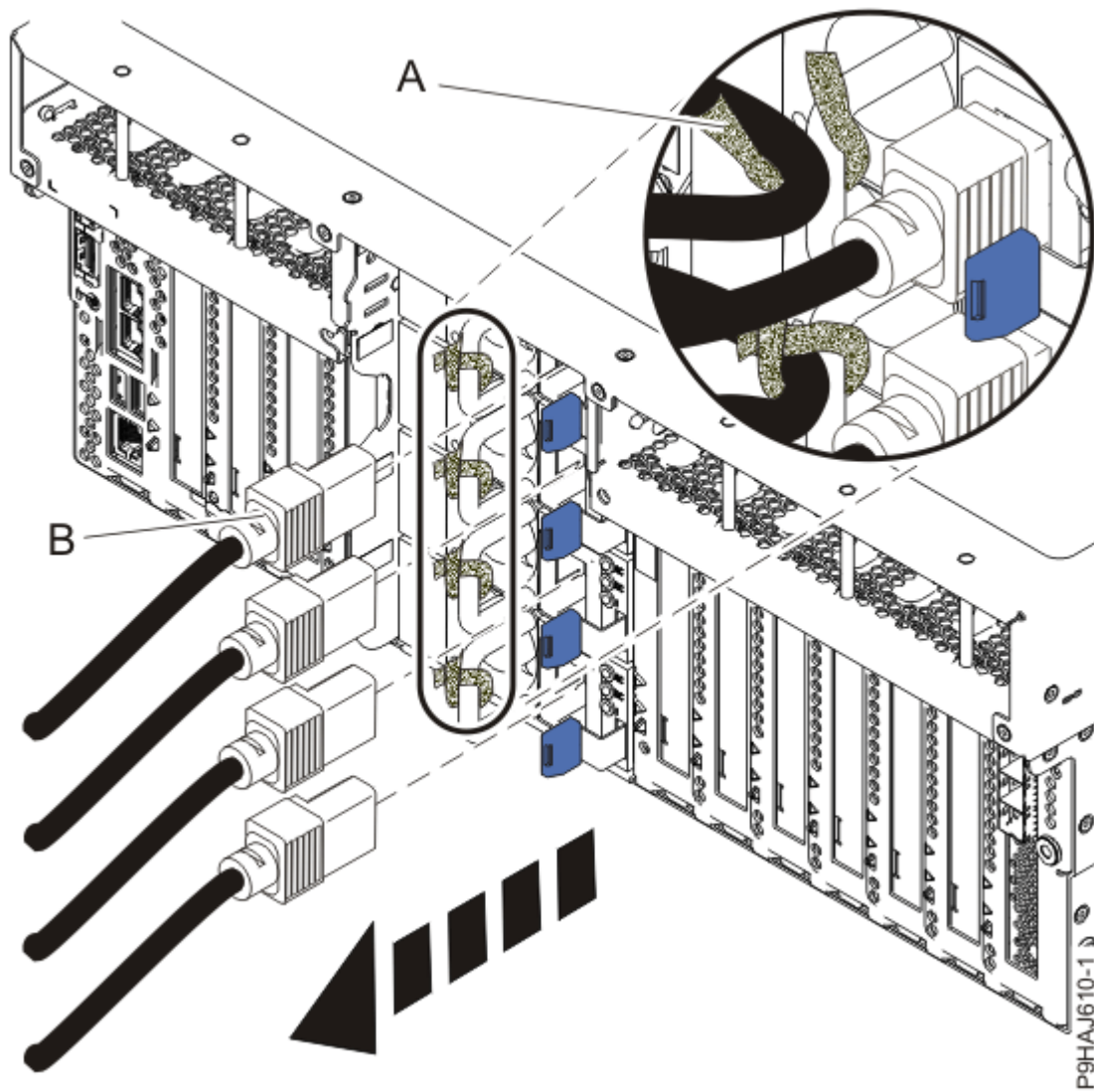
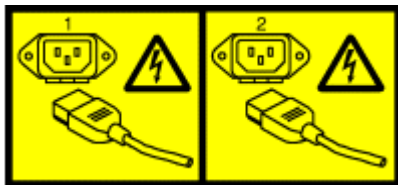


Figure 2. Removing the power cords

(L003)



or



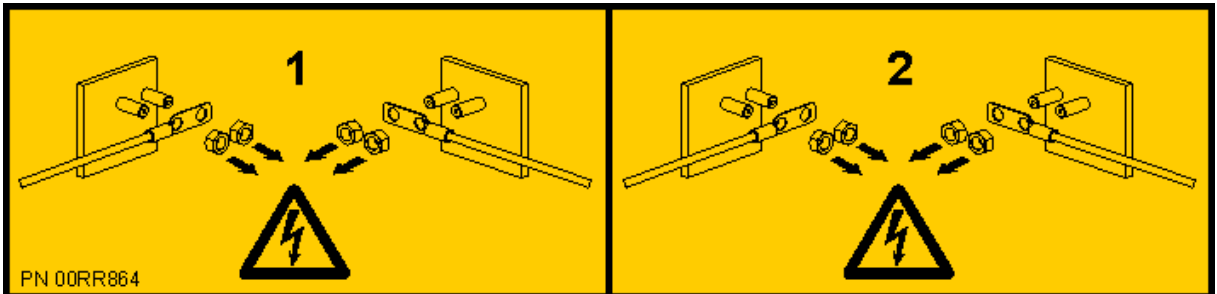
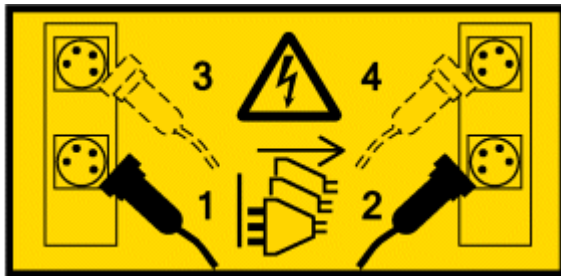
or



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)

10. Unseat each of the power supplies by pushing on the locking-tab and pulling the power supply out enough so that the connector is disengaged.

11. Label, disconnect, and set aside all remaining rear cables that connect to the system.
12. Close the cable management arm by completing the following steps:
 - a) Swing the cable management arm towards the server.
 - b) Insert the inner cable management arm tab **(A)** into the outer mounting bracket **(B)** until it clicks into place as shown. The inner mounting bracket **(C)** is not used on the left side.

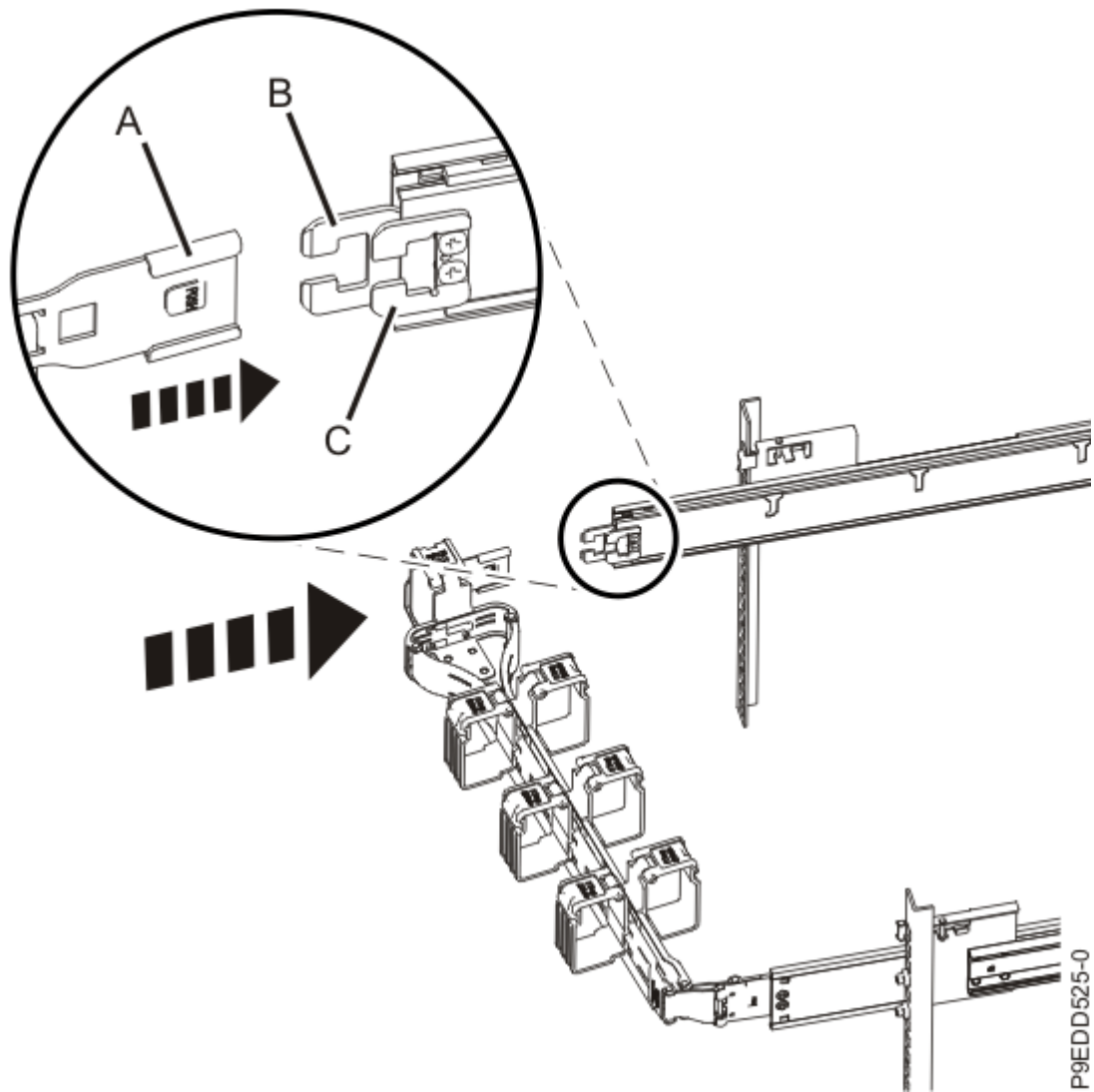
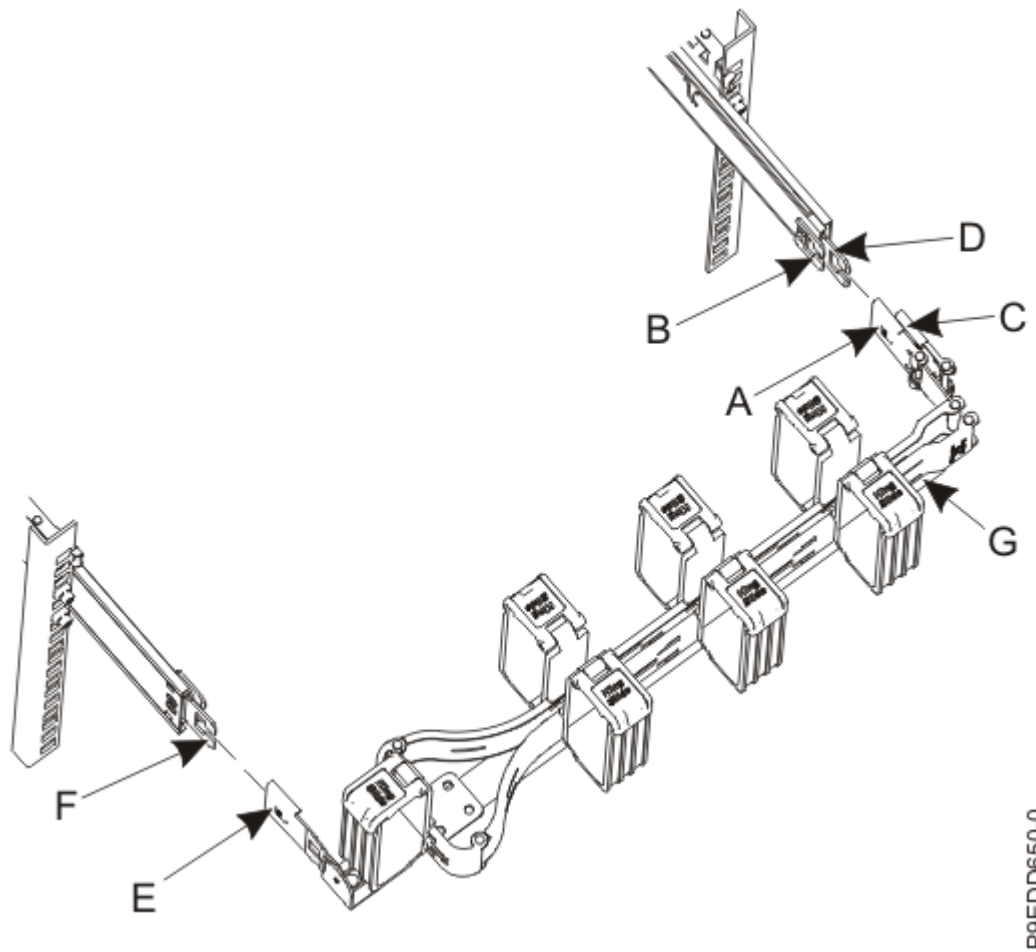


Figure 3. Closing the cable management arm

13. Disconnect the cable management arm from the system by pressing the inner cable management arm tab **(A)** while lightly squeezing the inner and outer cable management arms together. Then, secure the inner cable management arm to the outer cable management arm with a hook and loop fastener. You should secure the inner and outer arms at the narrowest spot **(G)** between the basket and the side of the arm that you just disconnected. See [Figure 4 on page 7](#).



P9EDD650-0

Figure 4. Cable management arm parts

14. Hold the indentations **(A)** on the front cover and pull it away from the system. See [Figure 5](#) on page [8](#).

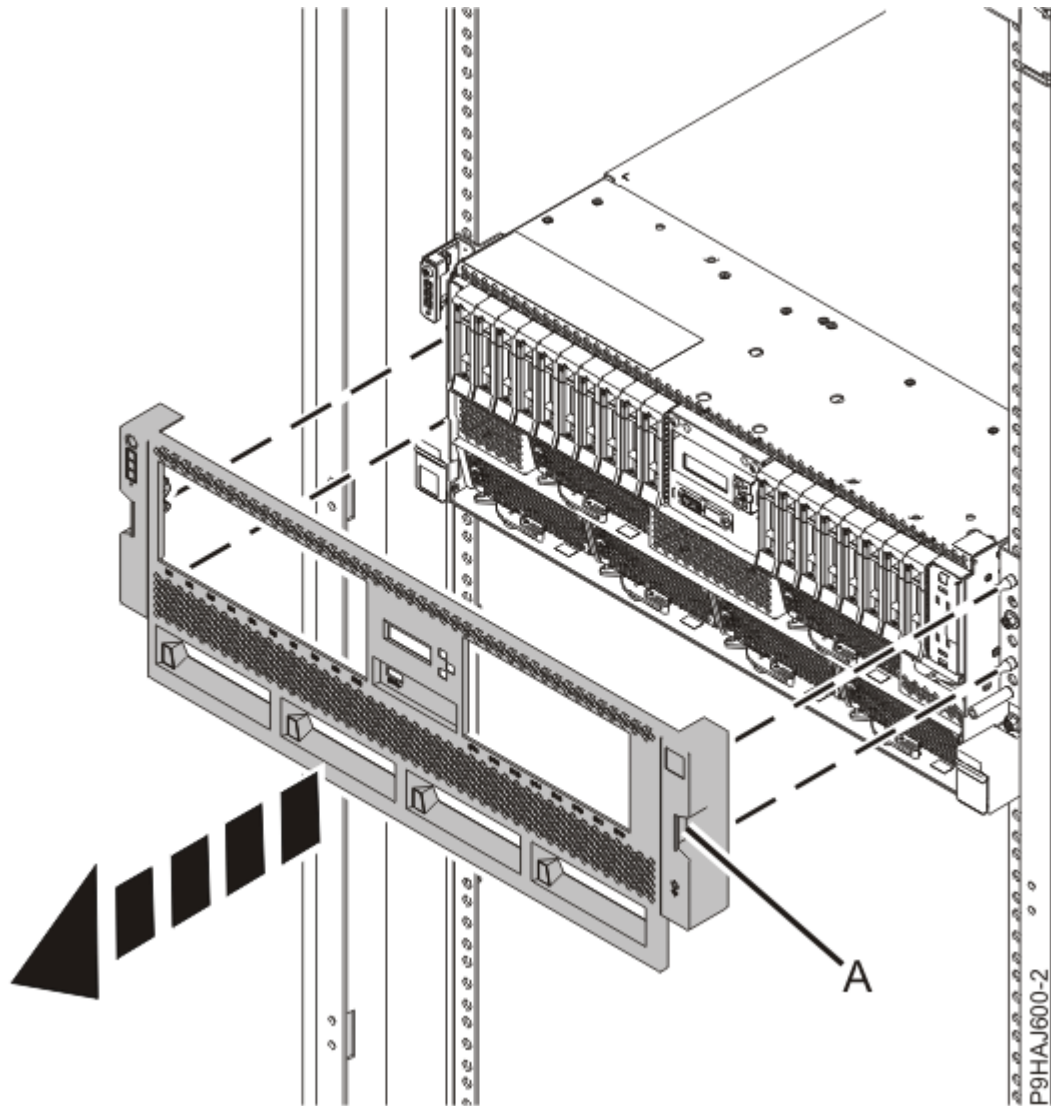


Figure 5. Removing the front cover

15. Open the side latches **(A)** and pull the latches to slide the system unit fully into the service position, until the slides click and hold the system unit securely. Ensure that the screws inside the latches are not secured to the rack.

See [Figure 6](#) on [page 9](#).

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.



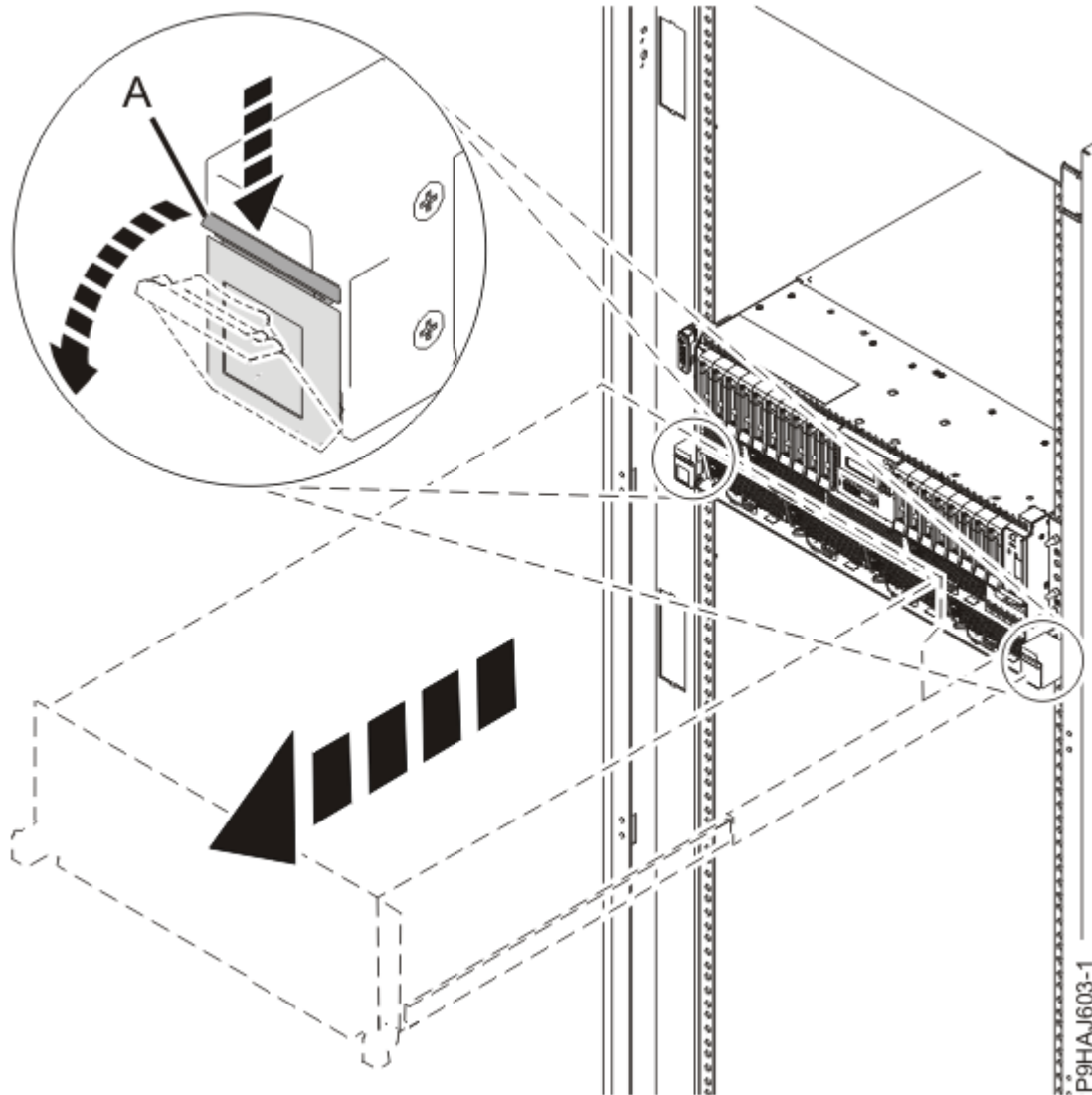


Figure 6. Releasing the side latches

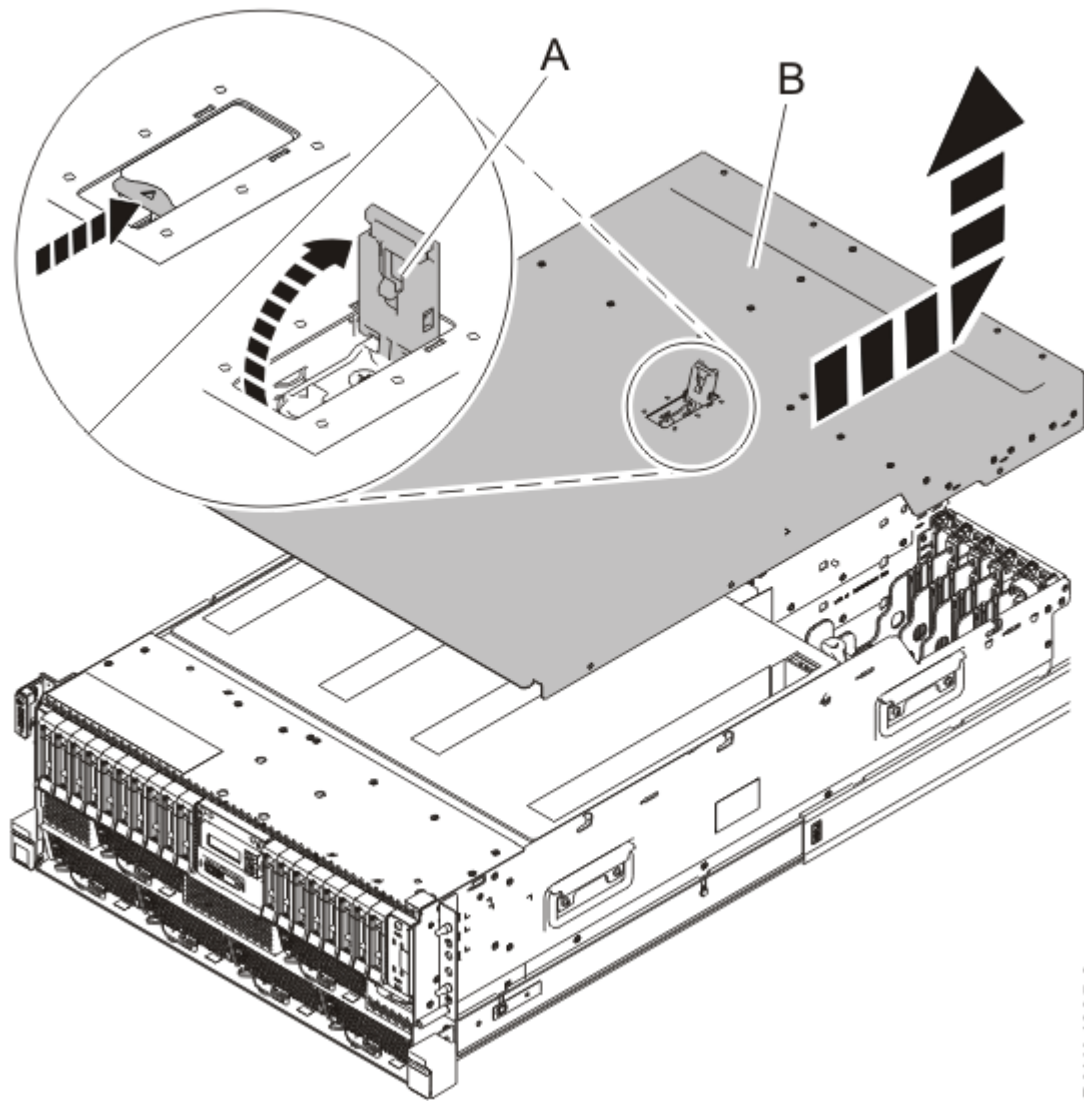
16. Remove the service access cover.

For a rack-mounted system, complete the following steps. Refer to [Figure 7](#) on page 10.



Attention: Operating the system without the service access cover on for more than 10 minutes when the system power is turned on might damage the system components.

- a. Release the service cover latch by pushing the release latch **(A)** in the direction shown.
- b. Slide the cover **(B)** off 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.



P9HAJ605-2

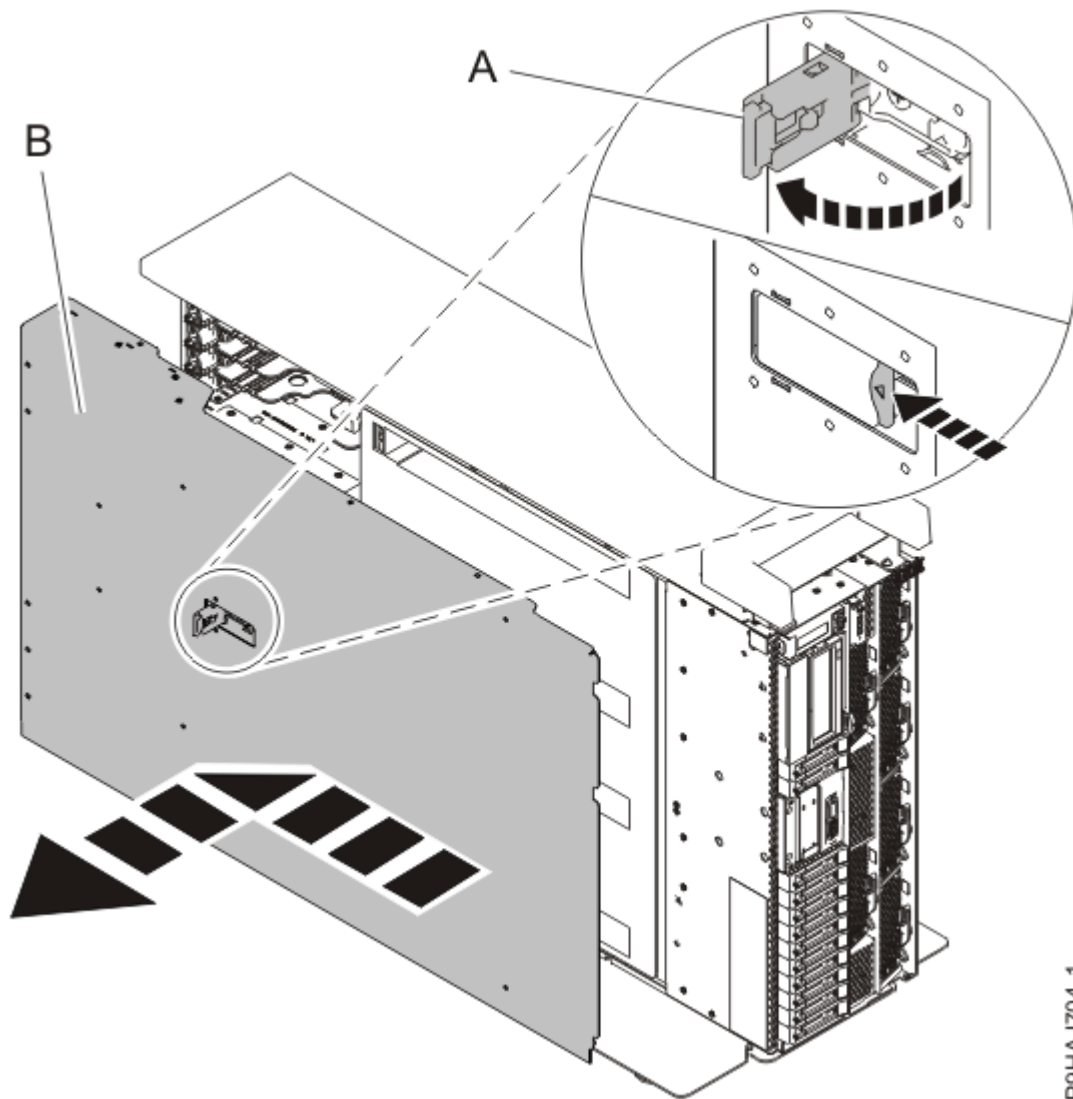
Figure 7. Removing the service access cover from a rack-mounted system

For a stand-alone system, complete the following steps. Refer to [Figure 8 on page 11](#).



Attention: Operating the system without the service access cover on for more than 10 minutes when the system power is turned on might damage the system components.

- a. Release the latch by pushing the release latch **(A)** in the direction shown.
- b. Slide the cover **(B)** off the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.



P9HAJ704-1

Figure 8. Removing the service access cover

17. Complete the following steps to place a stand-alone system into the service position:

- a) Label and remove all cables that connect to the system.
- b) Remove the power supplies from the system to lighten the system.

Refer to [Figure 9](#) on page 12.

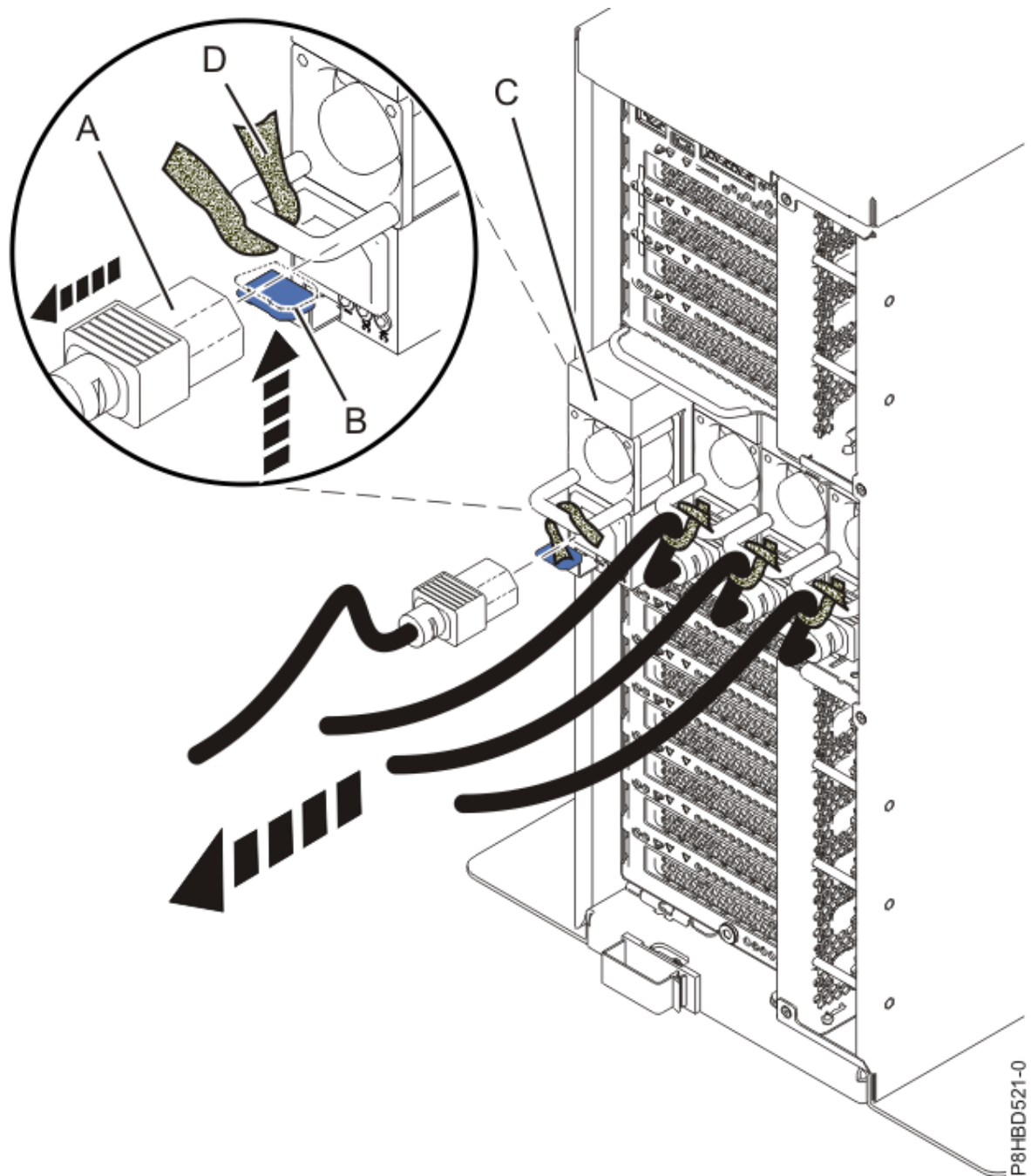
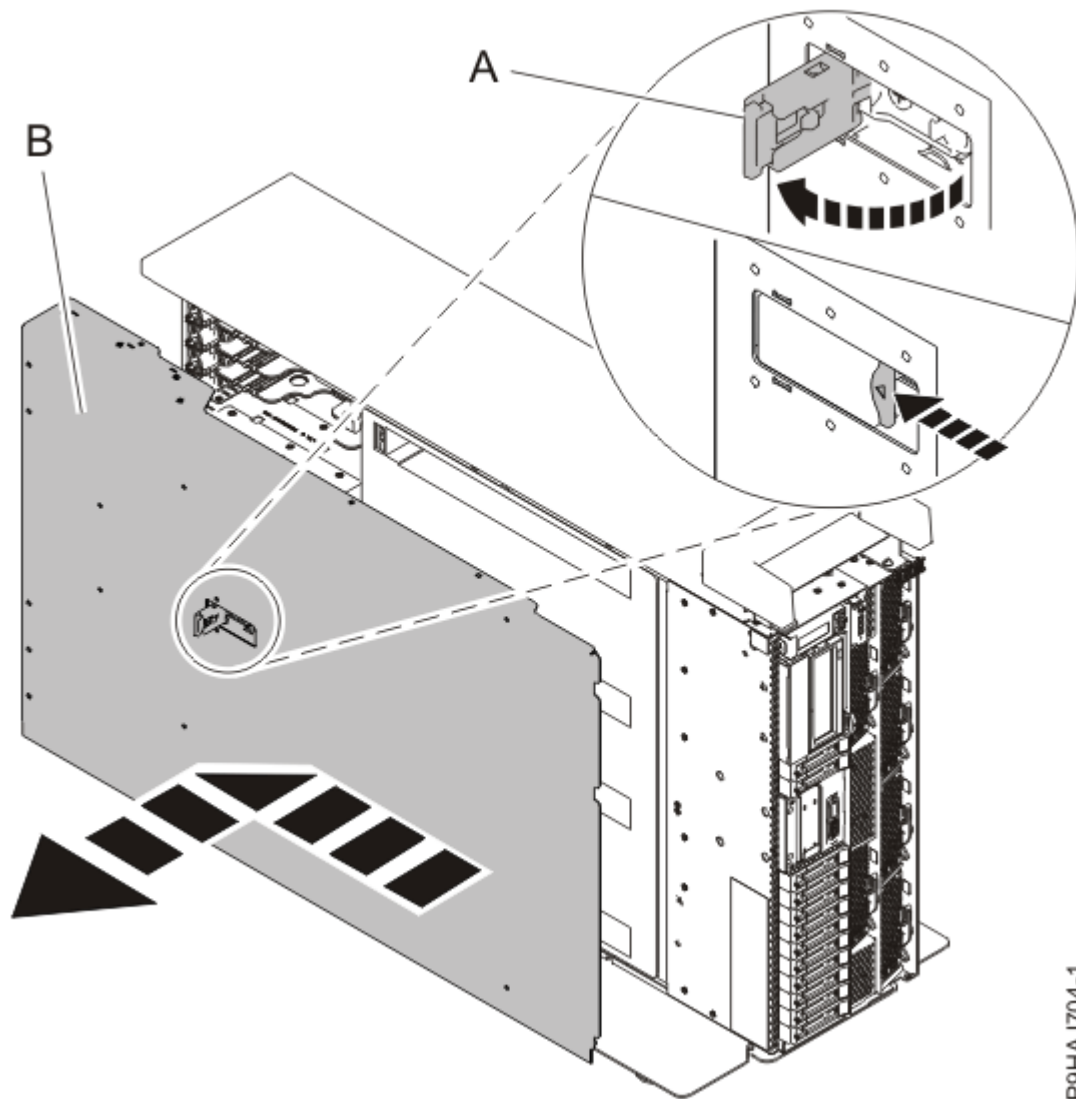


Figure 9. Removing the power supplies

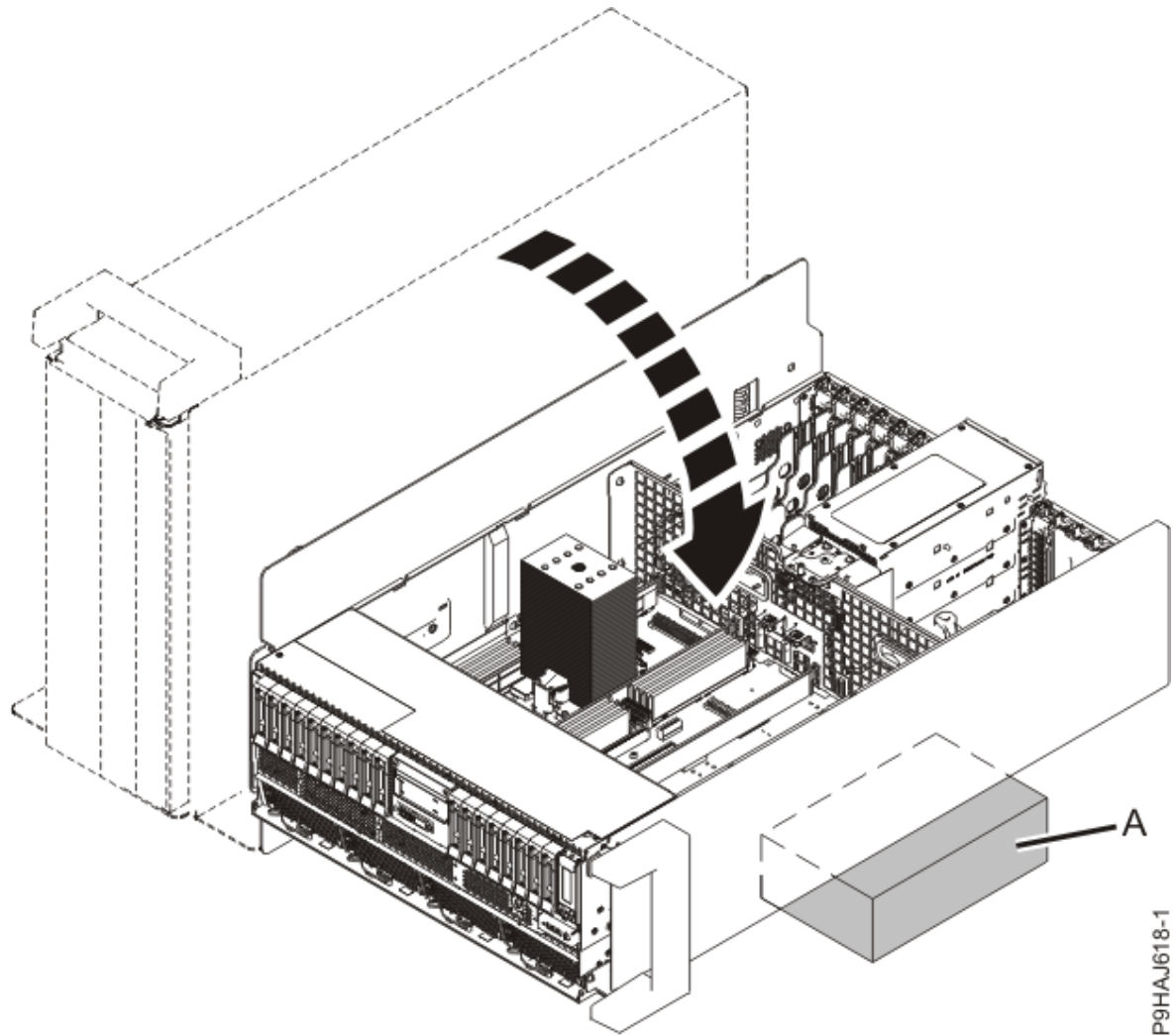
- 1) Label the power cord, and then unstrap the hook-and-loop fastener **(D)** to release the power cord **(A)** from the power supply handle. Retain the hook-and-loop fastener for future use.
 - 2) Pull the power cord **(A)** out of the power supply **(C)** in the direction shown. Pull the power cord connector; do not pull the cord itself.
 - 3) To unseat the power supply from its position in the system, push the locking-tab **(B)** in the direction shown.
 - 4) Using the handle **(E)**, pull the power supply **(C)** away from the system.
 - 5) Repeat steps “17.b.i” on page 12 - “17.b.iv” on page 12 for each power supply.
- c) Remove the side cover.
Refer to [Figure 10](#) on page 13.



P9HAJ704-1

Figure 10. Removing the service access cover

- 1) Release the latch by pushing the release latch **(A)** in the direction shown.
 - 2) Slide the cover **(B)** off the system unit. When the front of the service access cover has cleared the upper frame ledge, lift the cover up and off the system unit.
- d) Carefully tilt the stand-alone system from its vertical position to lay it in a horizontal position. Position the system with the open service area up, and with a 3 cm (1.5") support **(A)** along its top edge, as shown in [Figure 11 on page 14](#).
The support **(A)** is used to prevent the plastic handle from being damaged.

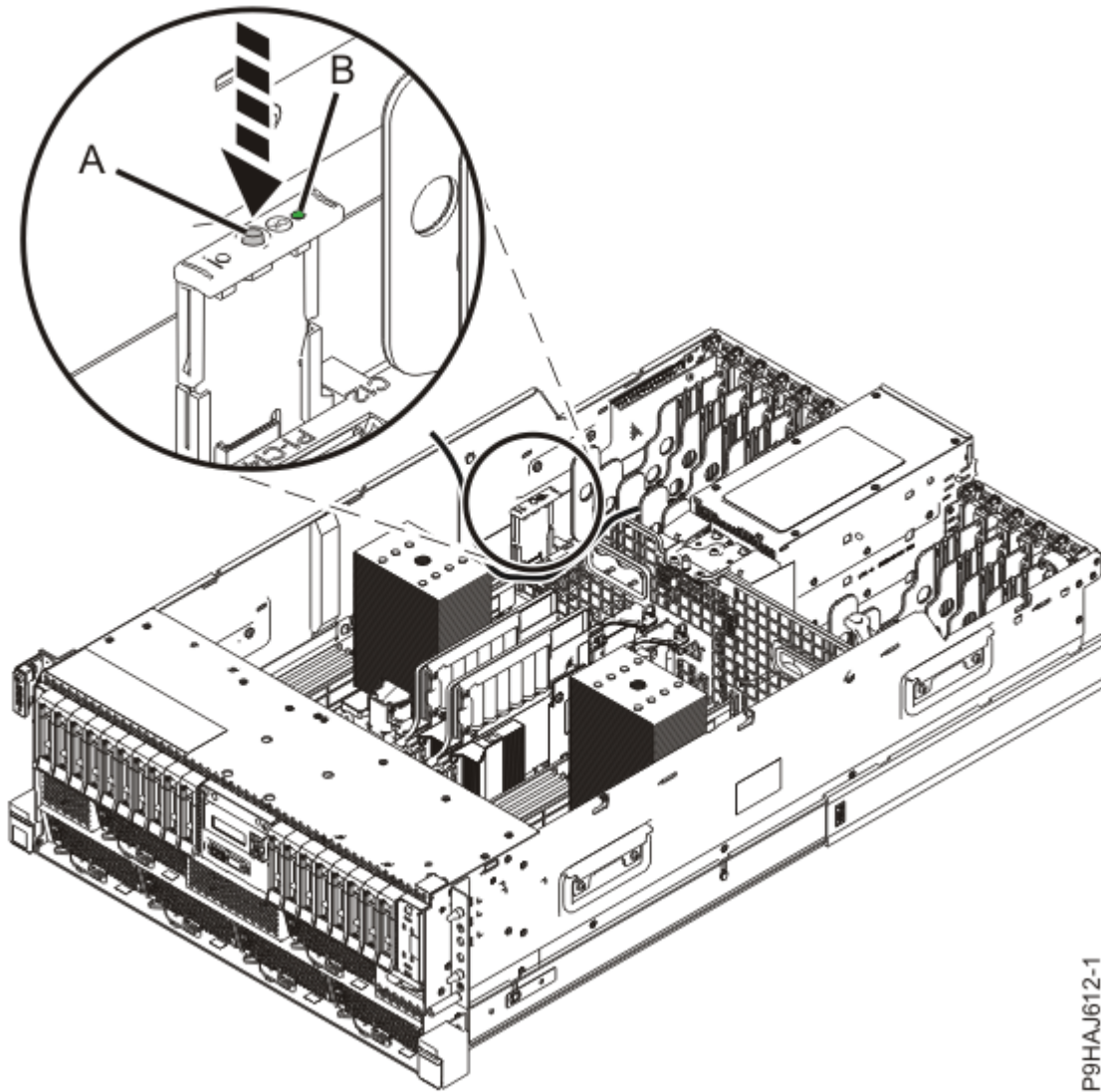


P9HAJ618-1

Figure 11. Tilting the stand-alone system to a horizontal position

18. Press and hold the push-button **(A)** on the trusted platform module card to activate the identify LED for the faulty part as shown in the following figure.

Verify that the LED **(B)** is lit, which indicates that sufficient power exists for the identify LED. If the LED **(B)** is not lit, use the location code to find the physical location by using the service label.



P9HAJ612-1

Figure 12. Activating the identify LED

19. Look for the amber LED of the system backplane. See [Figure 13](#) on page 16.

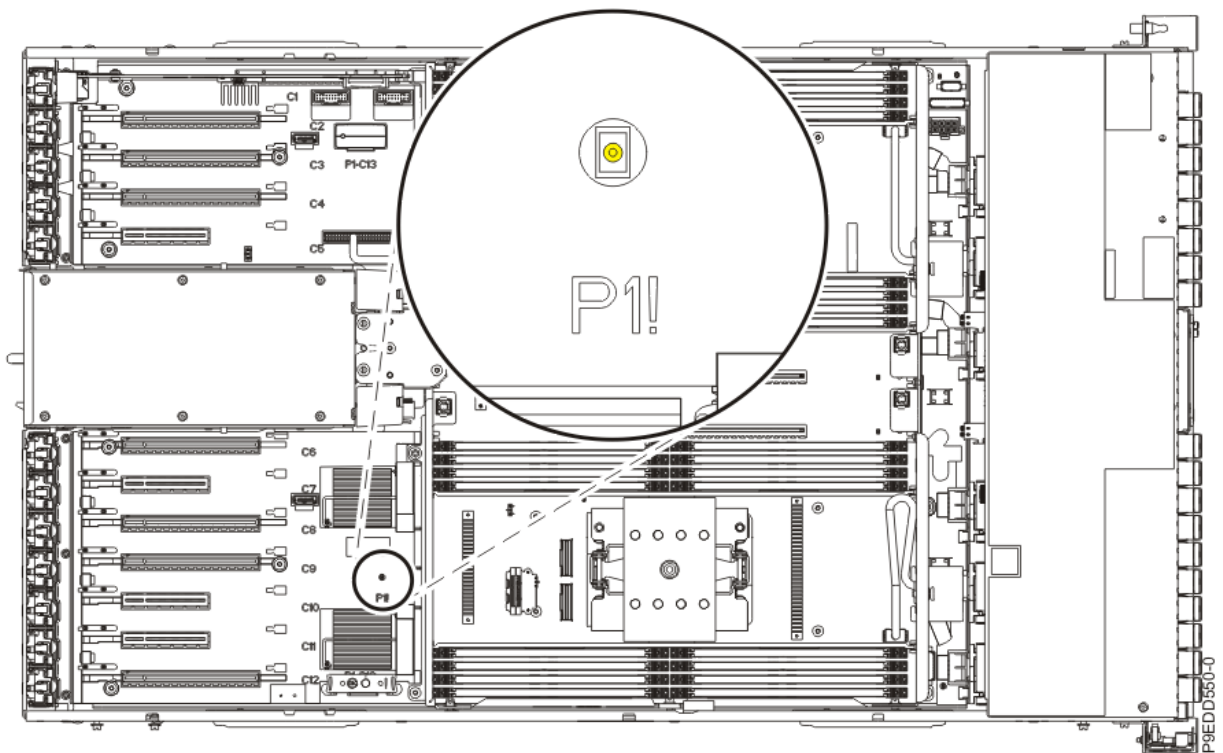


Figure 13. Service indicator LEDs

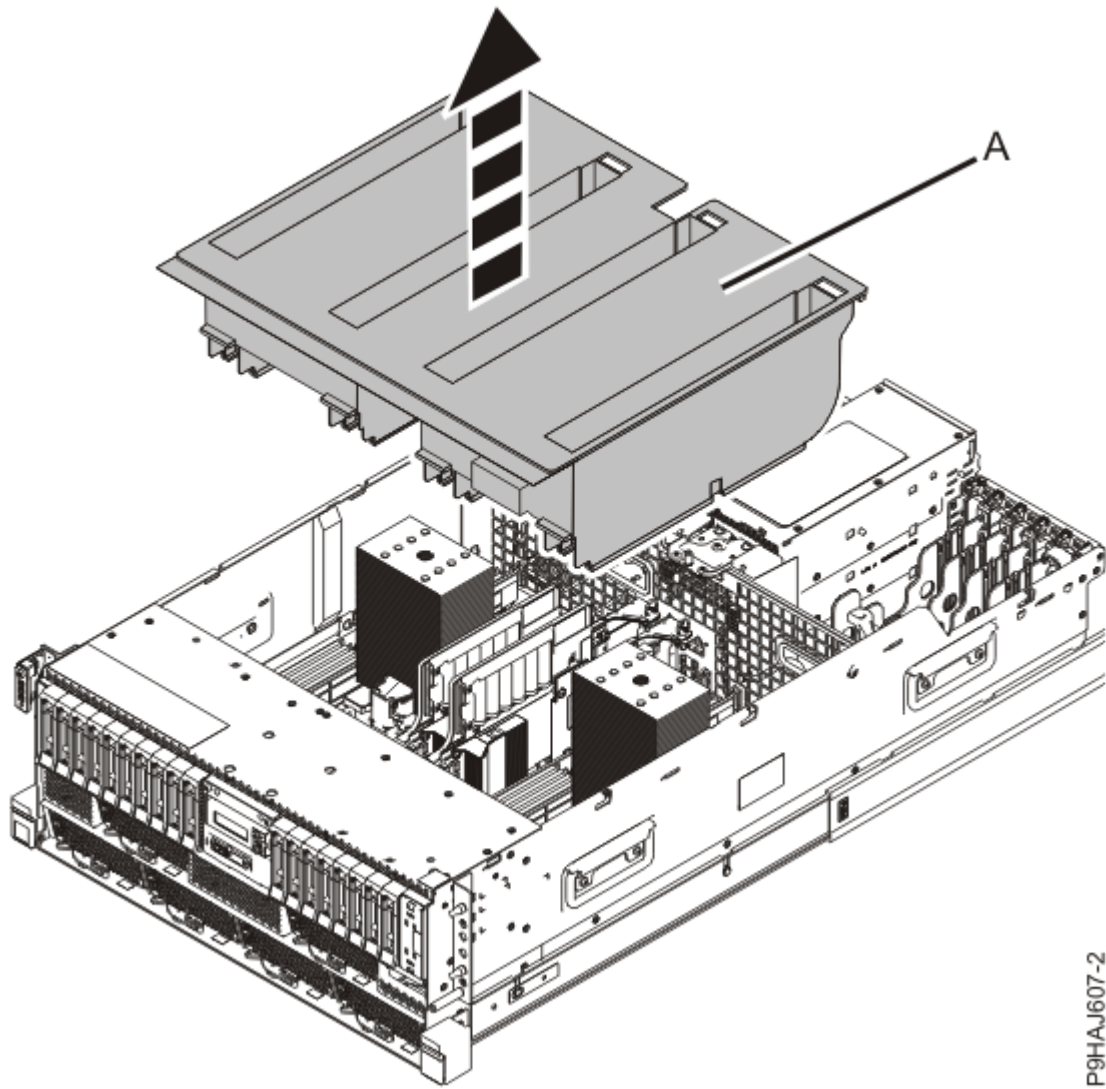
Removing the system backplane from the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S

Follow these steps to remove the system backplane from a server to replace a failing part or as part of another service procedure.

Procedure

1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. For a rack-mounted system, lift the air baffle **(A)** straight up as shown in [Figure 14 on page 17](#).
For a stand-alone system, remove the air baffle **(A)** straight out as shown in [Figure 15 on page 18](#).

Place the air baffle upside down on a clean area.



P9HAJ607-2

Figure 14. Removing the air baffle from a rack-mounted system

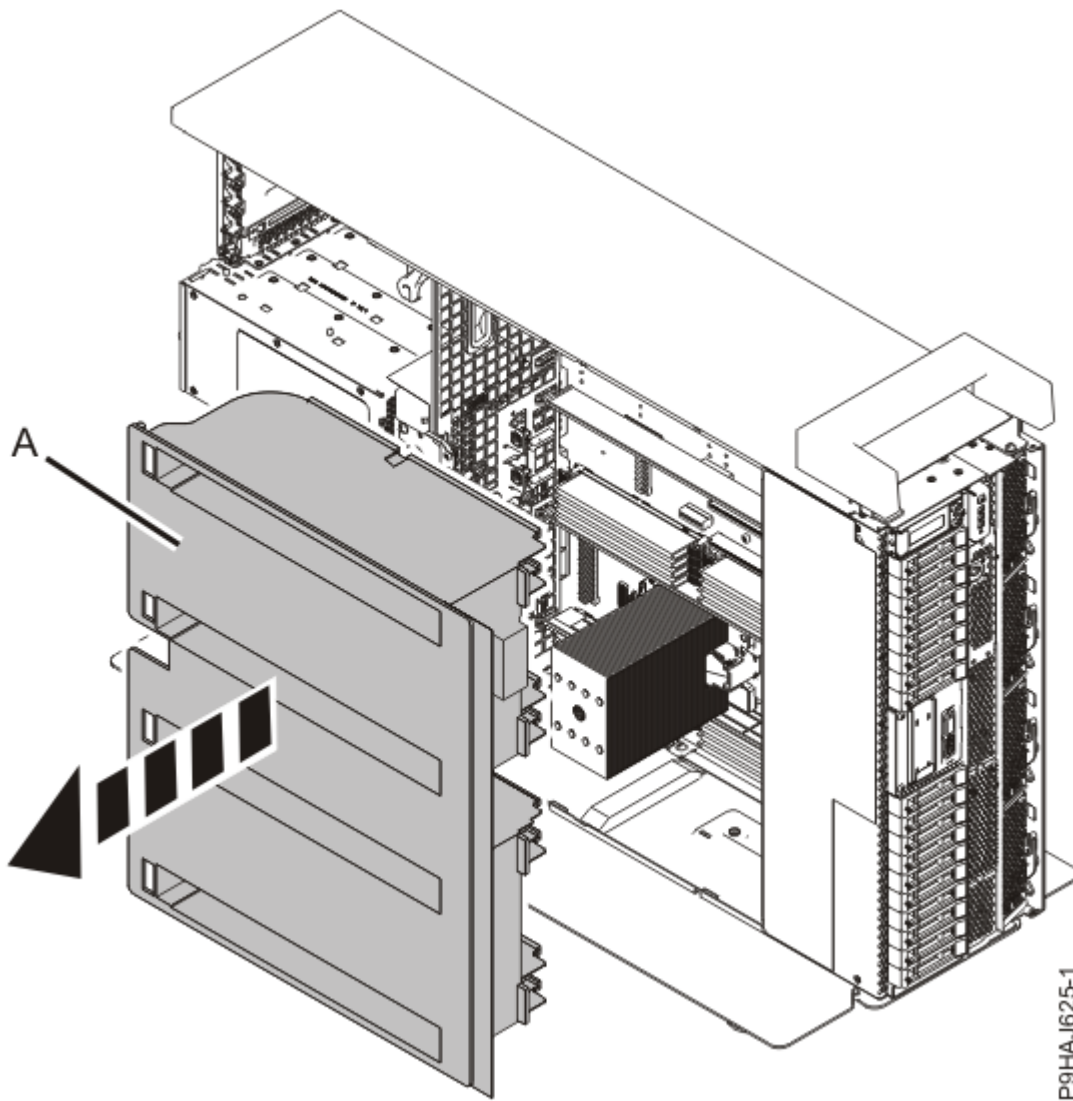


Figure 15. Removing the air baffle from a stand-alone system

3. Remove the PCIe adapters:
 - a) Label and disconnect all external cables that are attached to the adapters.
 - b) Record the slot number and location of each adapter being removed. See the following figure.

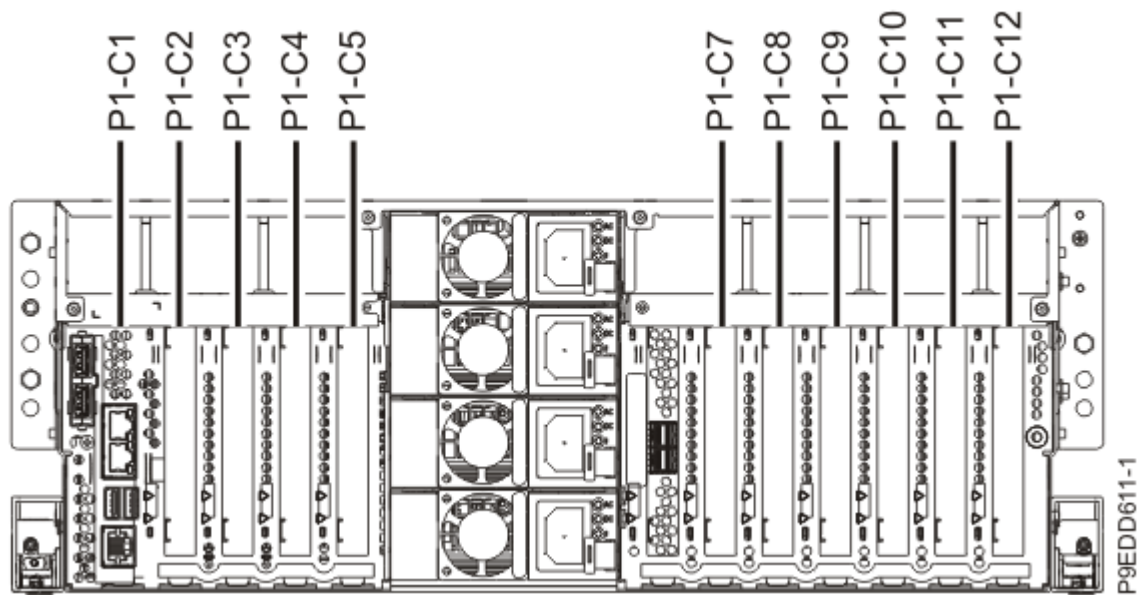


Figure 16. PCIe adapter slot locations in the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S system

- c) Set the adapter latch **(A)** in the target slot to the open position by rotating the latch **(A)** in the direction that is shown in the following figure.

(L007)

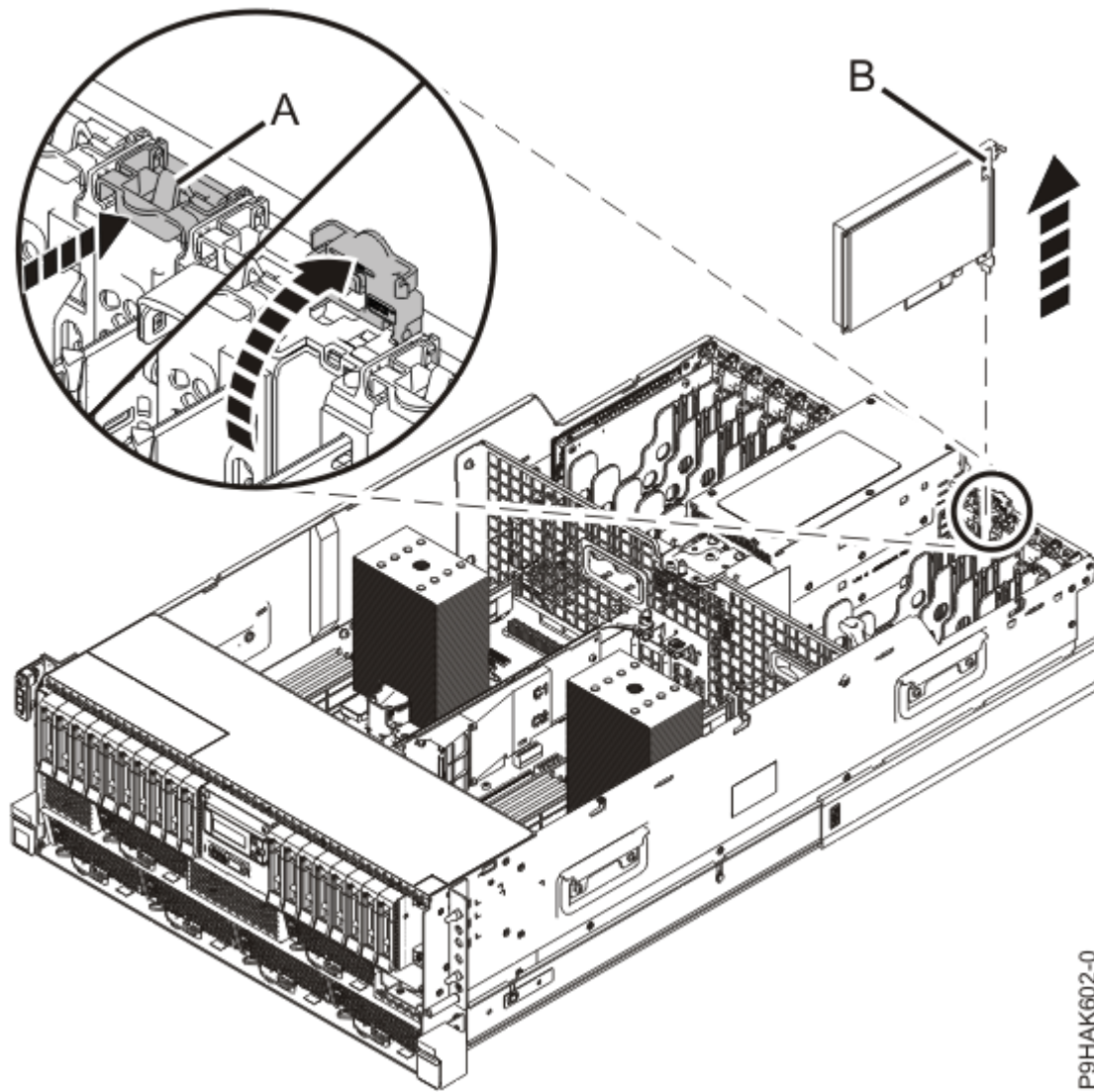


CAUTION: A hot surface nearby. (L007)

- d) Carefully grasp the adapter **(B)** by its top edge or tailstock, and remove the adapter from the slot as shown in the following figure.

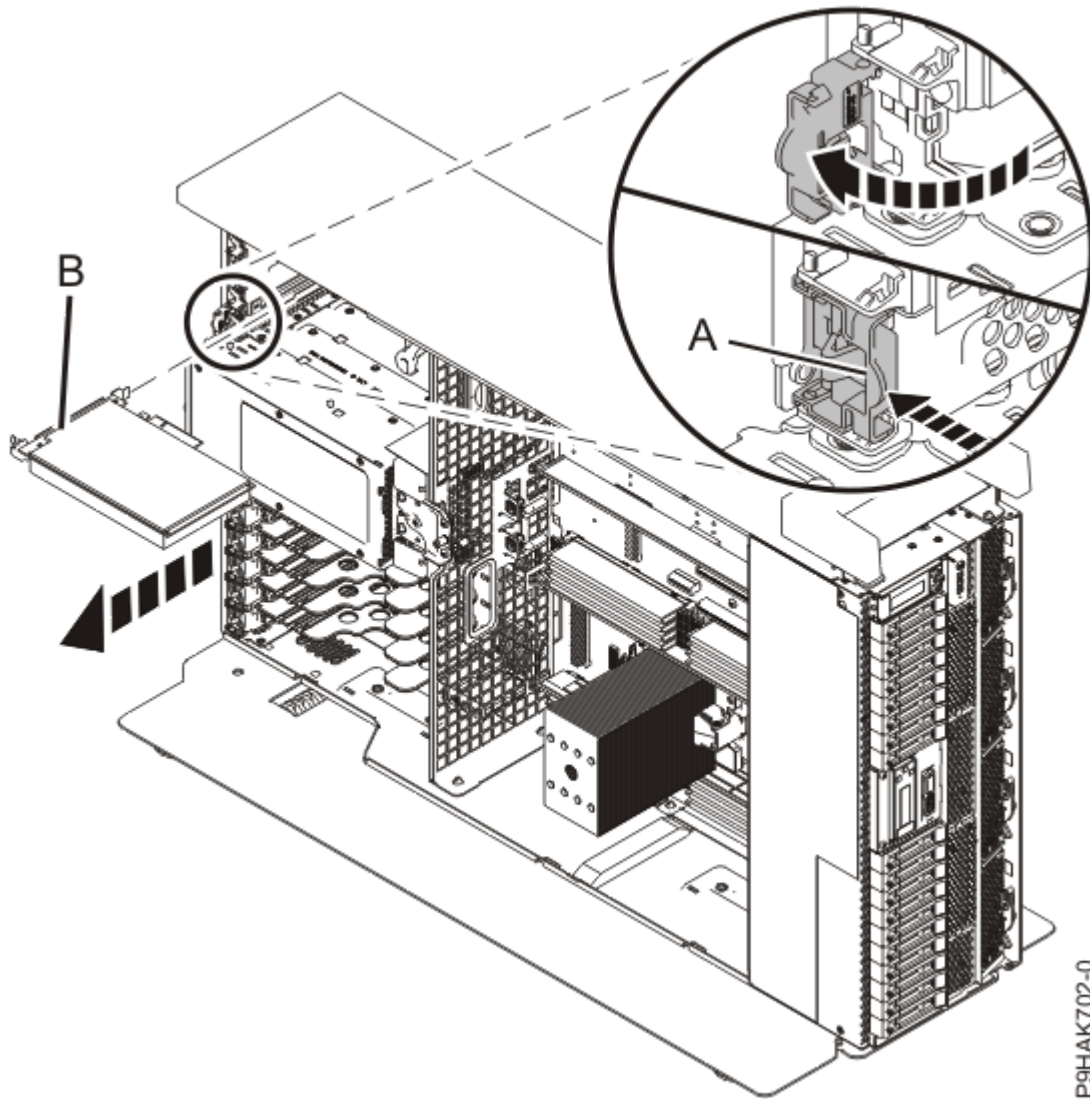


Attention: A pin on the tailstock of the adapter resembles a removable screw. Do not remove this pin. It is required for correct alignment and seating.



P9HAK602-0

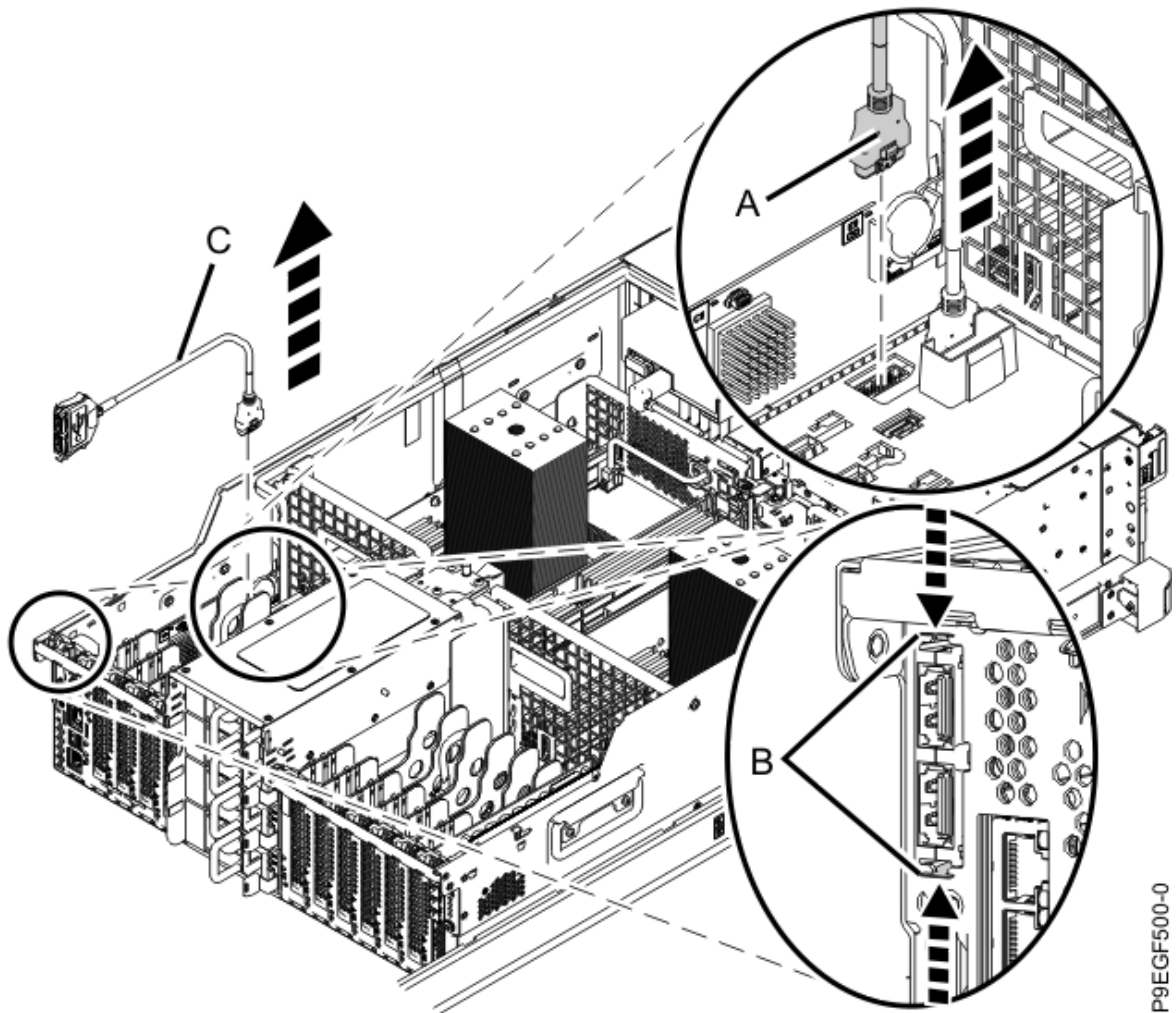
Figure 17. Removing an adapter from a 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S rack-mounted system



P9HAK702-0

Figure 18. Removing an adapter from the 9009-41A stand-alone system

- e) Place the adapter on an appropriate ESD surface.
 - f) Repeat steps “3.a” on page 18 through “3.e” on page 21 for the remaining adapters.
4. Remove the rear USB cable:
- a) While pressing the latch release on the connector, unplug the rear USB cable (**A**) from the system backplane as shown in the following figure. The connector on the system backplane that has the USB port symbol with an arrow that points to the rear of the system.



P9EGF500-0

Figure 19. Removing the rear USB cable

- b) At the rear of the system, press on the tabs **(B)** in the direction that is shown in the previous figure to release the rear USB cable **(C)**.
 - c) Lift the rear USB cable out of the system.
 - d) Place the rear USB cable on an appropriate ESD surface.
5. Disconnect the front USB cable from the system backplane.
- a) Pressing the latch release on the connector, disconnect the front USB cable **(A)** from the system backplane as shown in the following figure. The connector on the system backplane that has the USB port symbol with an arrow that points to the front of the system.
 - b) Unfasten the cable from the hook and loop fasteners that secure the cable to the right side of the chassis.
 - c) Route the cable over the side of the system and out of the way to provide clearance for removing the backplane.

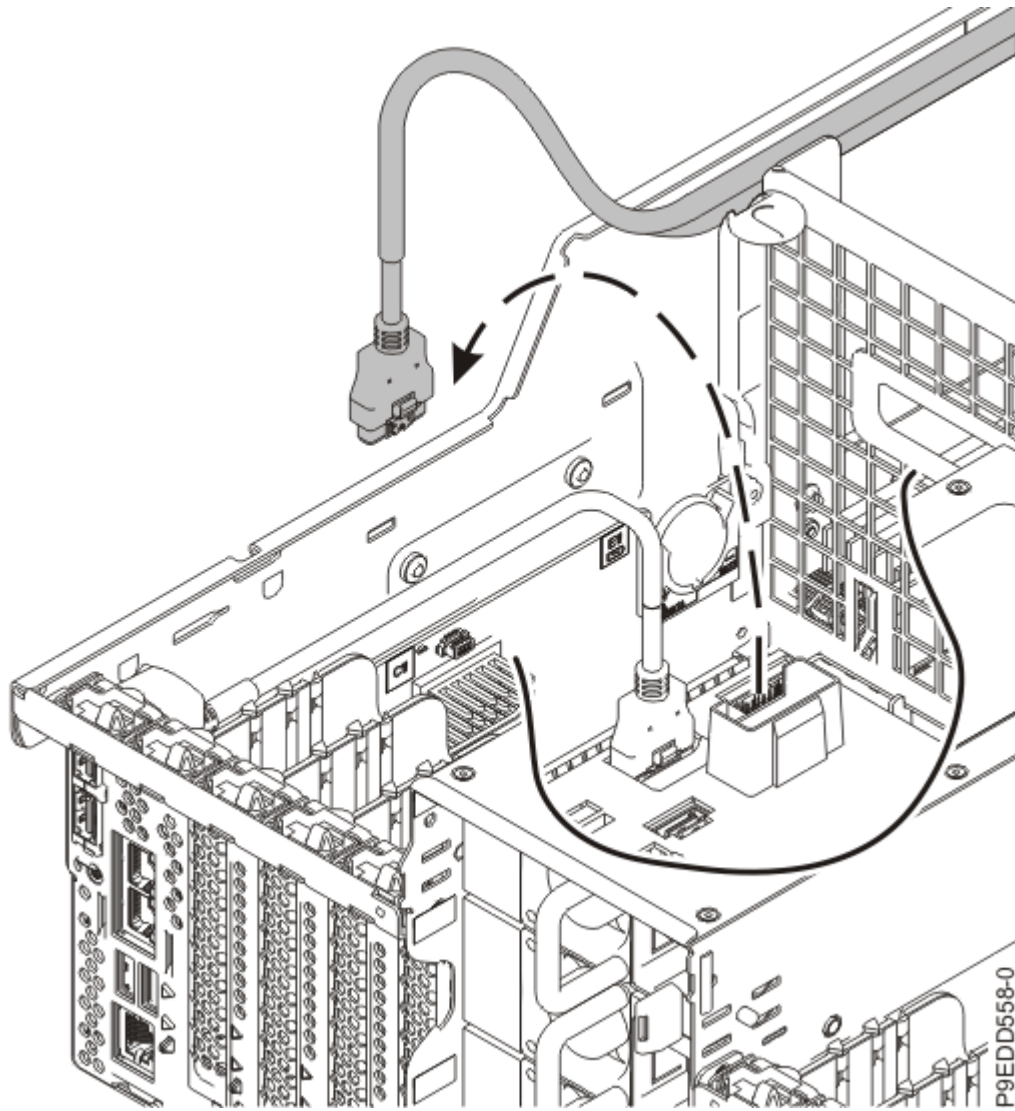
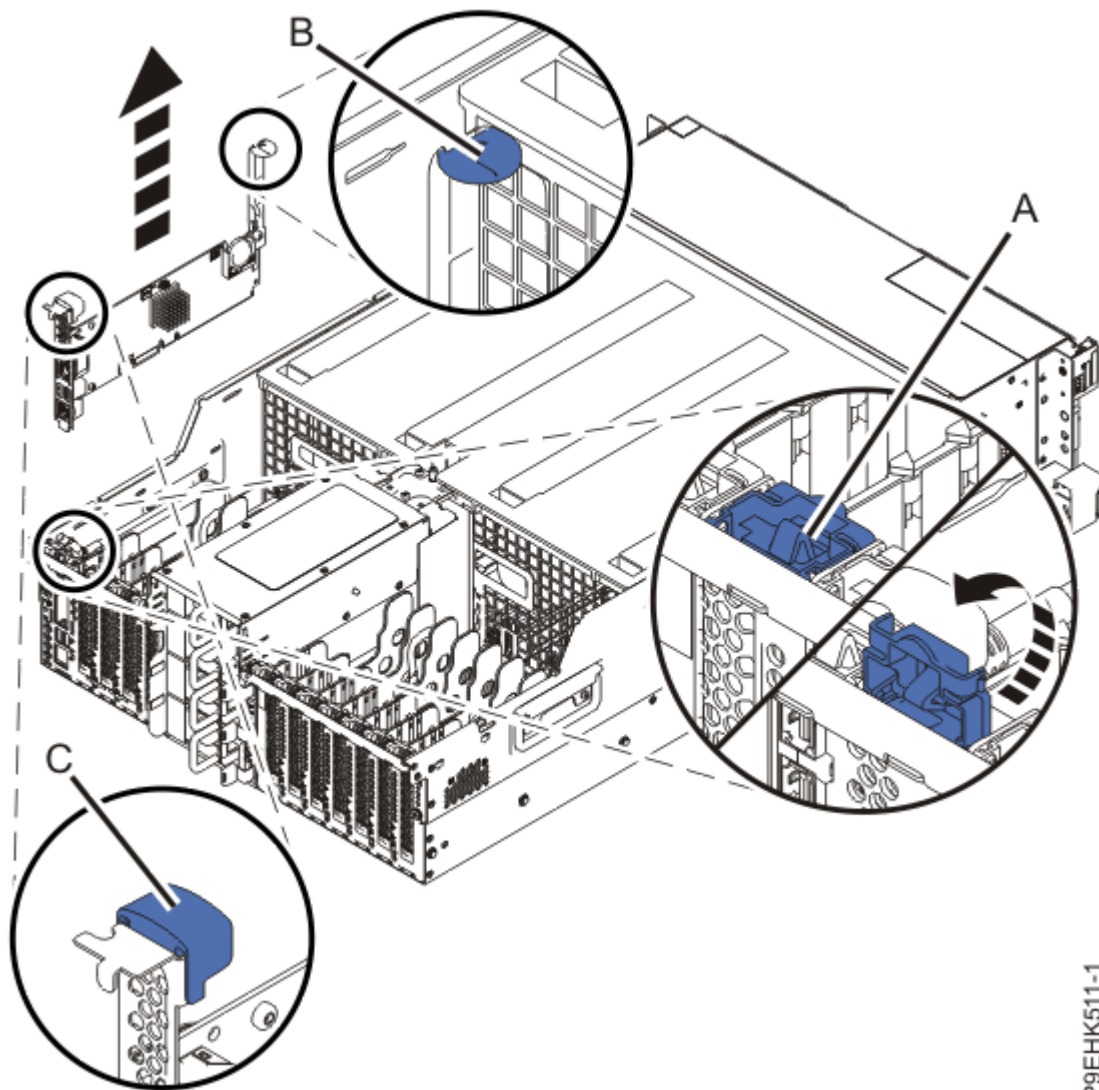


Figure 20. Disconnecting the front USB cable and routing it over the side of the system

6. Remove the service processor card:

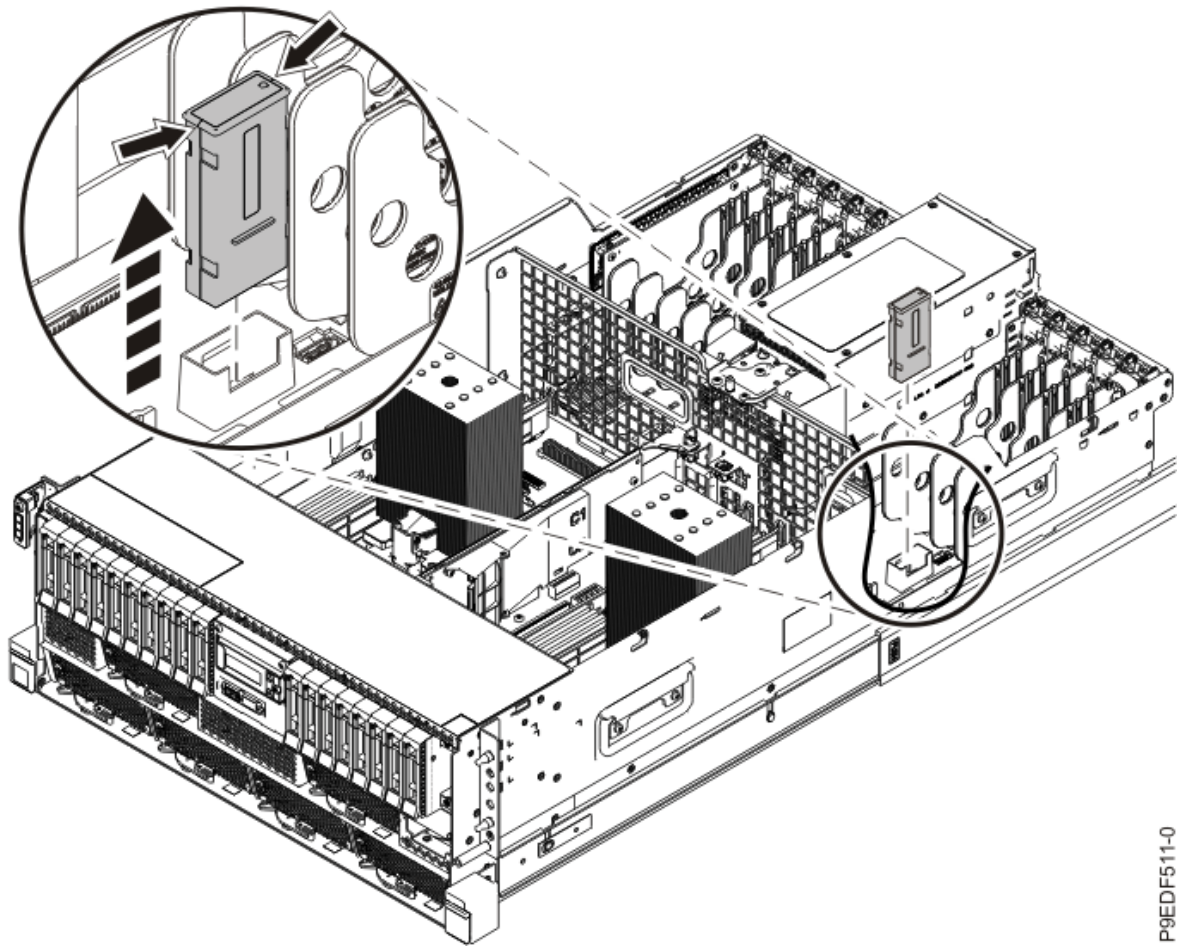
- a) At the rear of the system, unlatch the PCI adapter retainer **(A)** for the service processor card as shown in [Figure 21](#) on page 24.
- b) Pull the service processor card straight up from the slot by holding the two card holder brackets **(B)** at the front and rear of the card as shown in the following figure.



P9EHK511-1

Figure 21. Removing the service processor card from slot P1-C1

- c) Place the service processor card on an appropriate ESD surface.
7. Remove the vital product data (VPD) card:
- a) Grasp the VPD card by the plastic housing as shown in the following figure.
 - b) Pull the VPD card out of its slot in location P1-C13 on the system backplane. See the following figure.

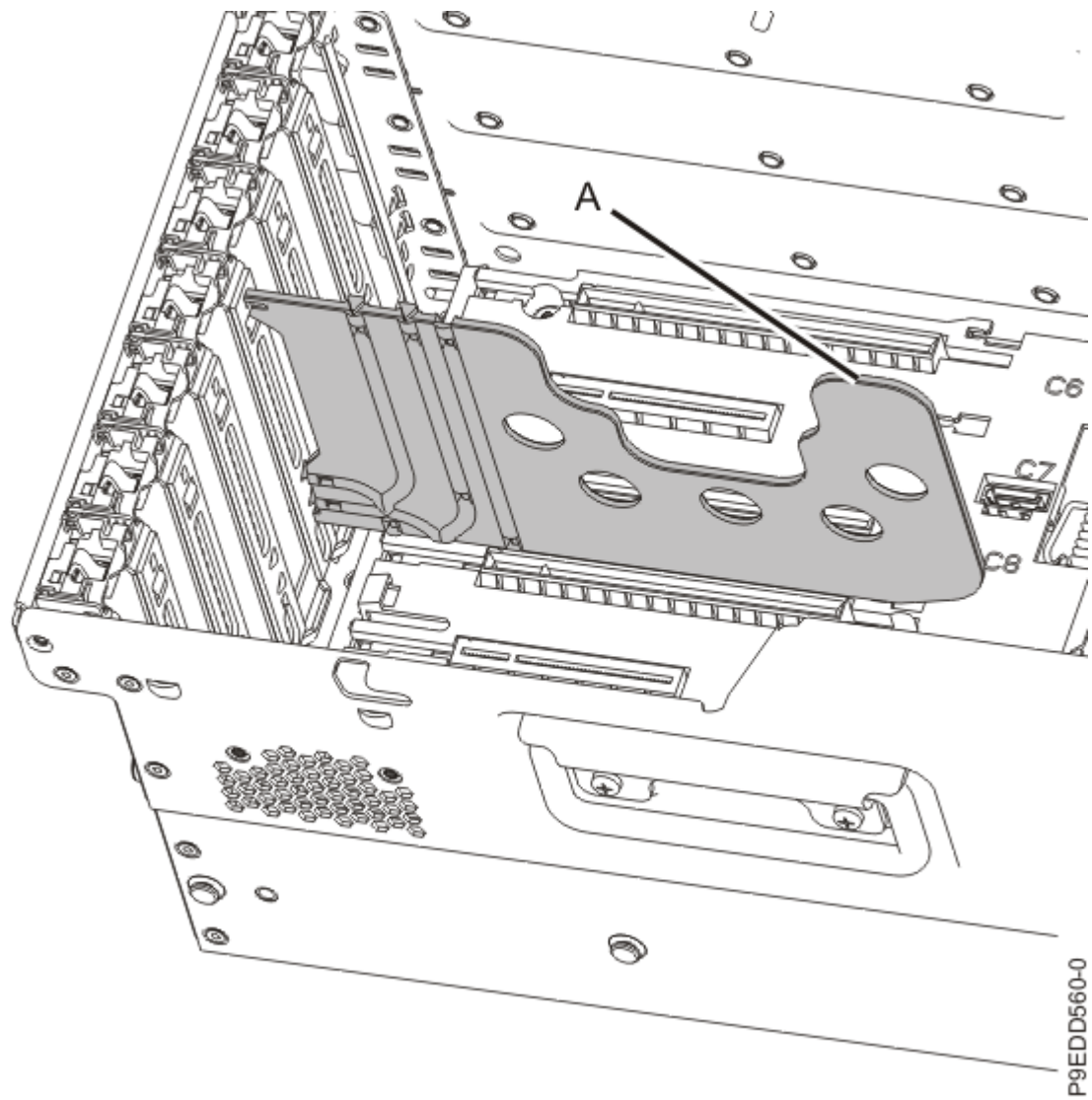


P9EDF511-0

Figure 22. Removing the VPD card

- c) Place the VPD card on an appropriate ESD surface.
8. Remove the PCIe adapter dividers:
- a) Place your finger on the top edge of the PCIe adapter divider **(A)** to hold the divider steady as shown in the following figure.

Figure 23. Preparing to remove the PCIe adapter divider



b) Press down on the retaining latch at the back edge of the divider (**B**) as shown in the following figure.

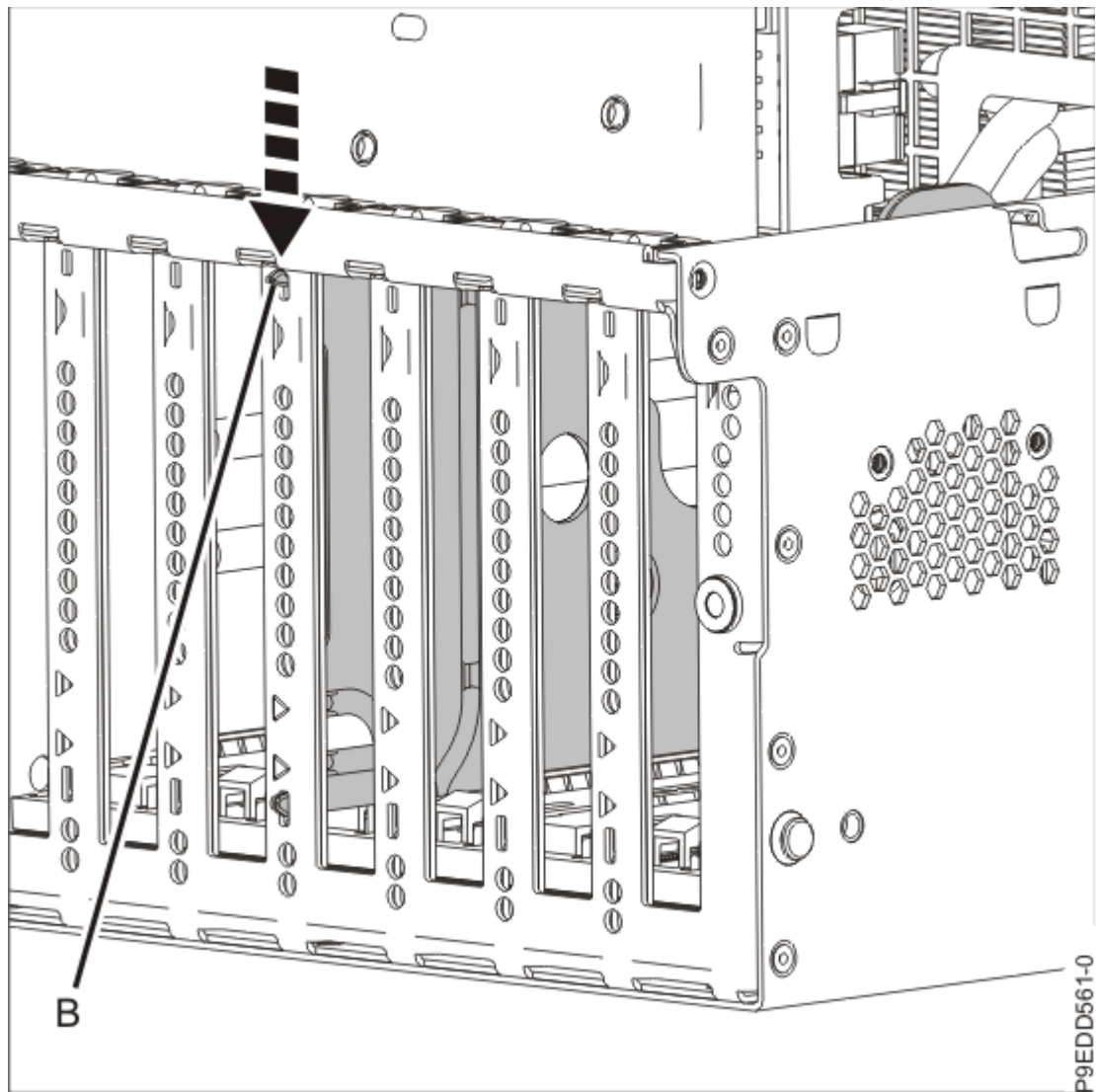


Figure 24. Pressing the retaining latch on the PCIe divider

- c) Slide the divider away from the system chassis and towards the inside of the system. When the tab on the divider (**C**) clears the groove in the system backplane, lift the divider to remove it from the system. See the following figure.

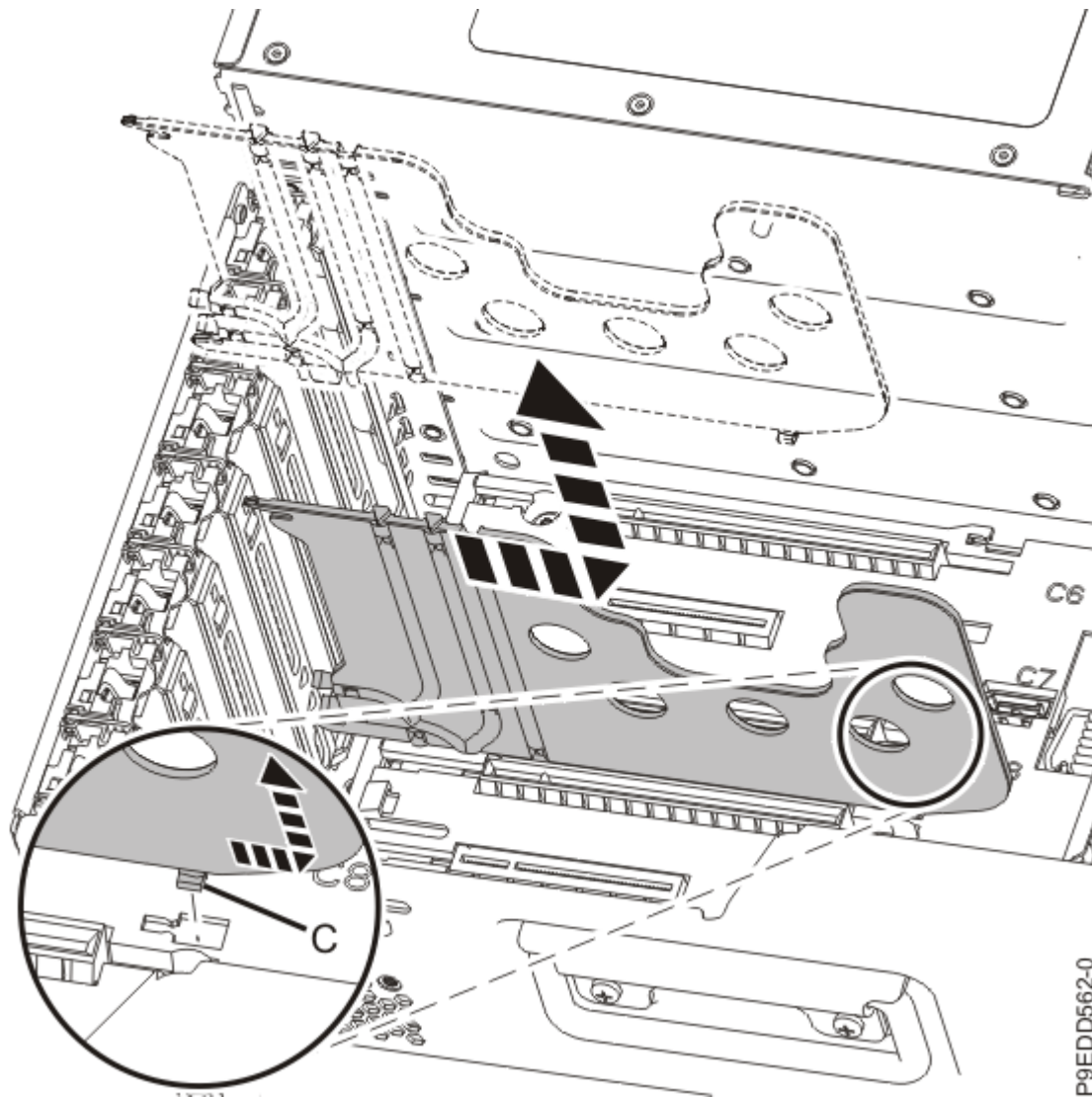


Figure 25. Sliding the PCIe divider out of the system

- d) Place the adapter divider in a clean area.
 - e) Repeat steps “8.a” on page 25 through “8.d” on page 28 for the remaining adapter dividers.
9. Disconnect the front SAS cable or cables from the drive backplane, if present. Otherwise, continue with the next step.

- a) Identify and label the front SAS cable or cables.

Note: Pay attention to the locations of the connectors where the cable or cables attach to the disk drive backplane and the SAS RAID internal adapter, if present. Depending on your configuration, one or two front SAS cables might be connected to the SAS RAID adapter. A rear SAS cable might also be connected to the SAS RAID adapter.

- b) Press the cable connector latch and disconnect the front SAS cables from the drive backplane as shown in the following figures. Leave the front SAS cable or cables connected to the SAS RAID adapter, if present.

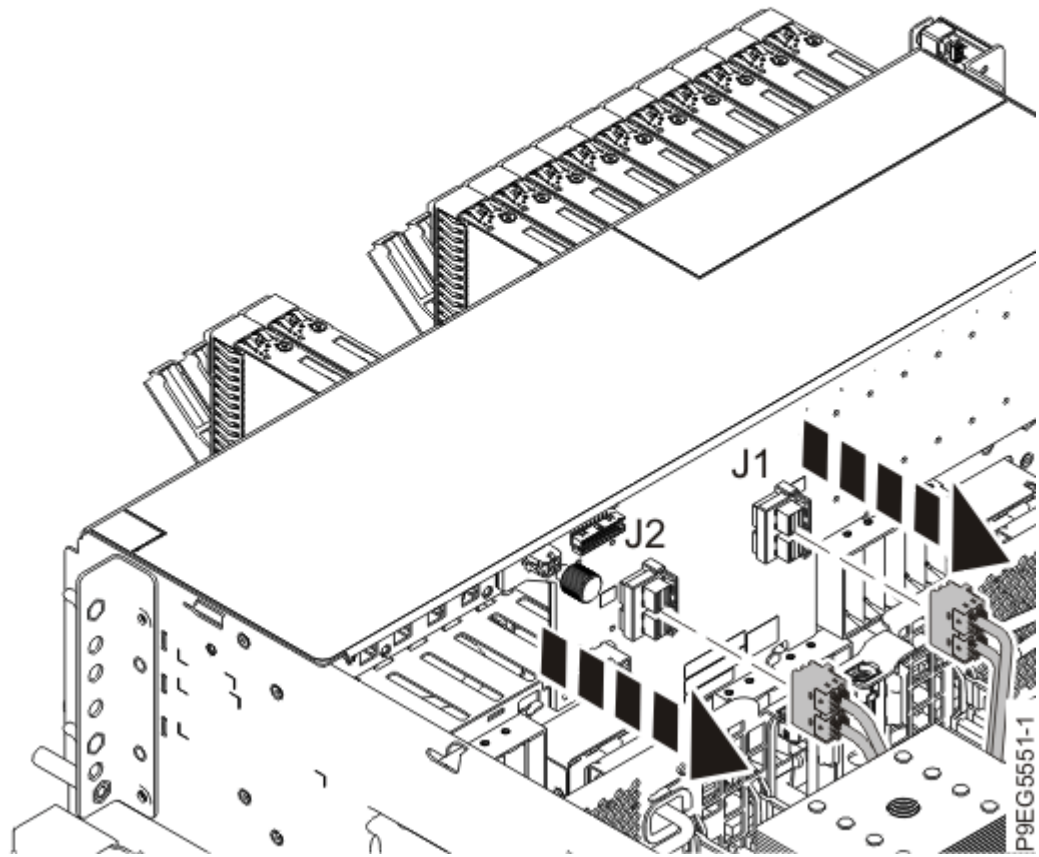


Figure 26. Disconnecting the front SAS cables from the base function disk drive backplane

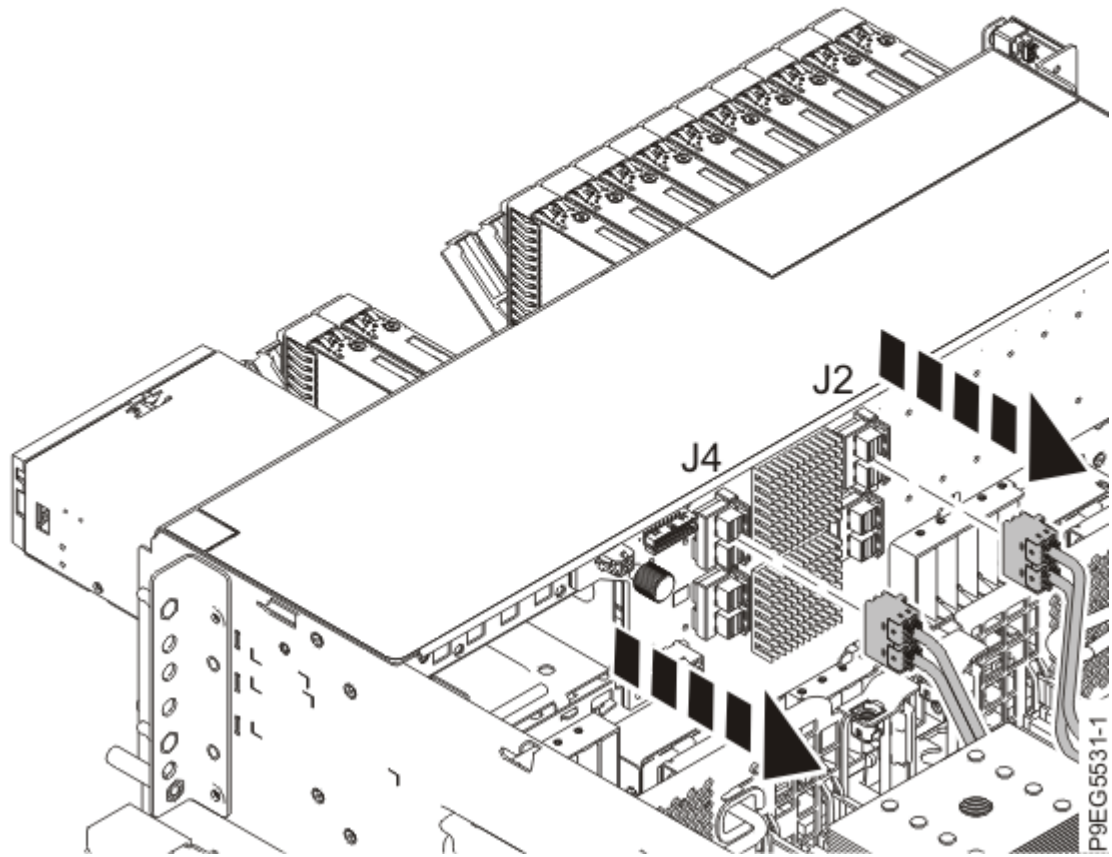


Figure 27. Disconnecting the front SAS cables from the 12-drive expanded function disk drive backplane

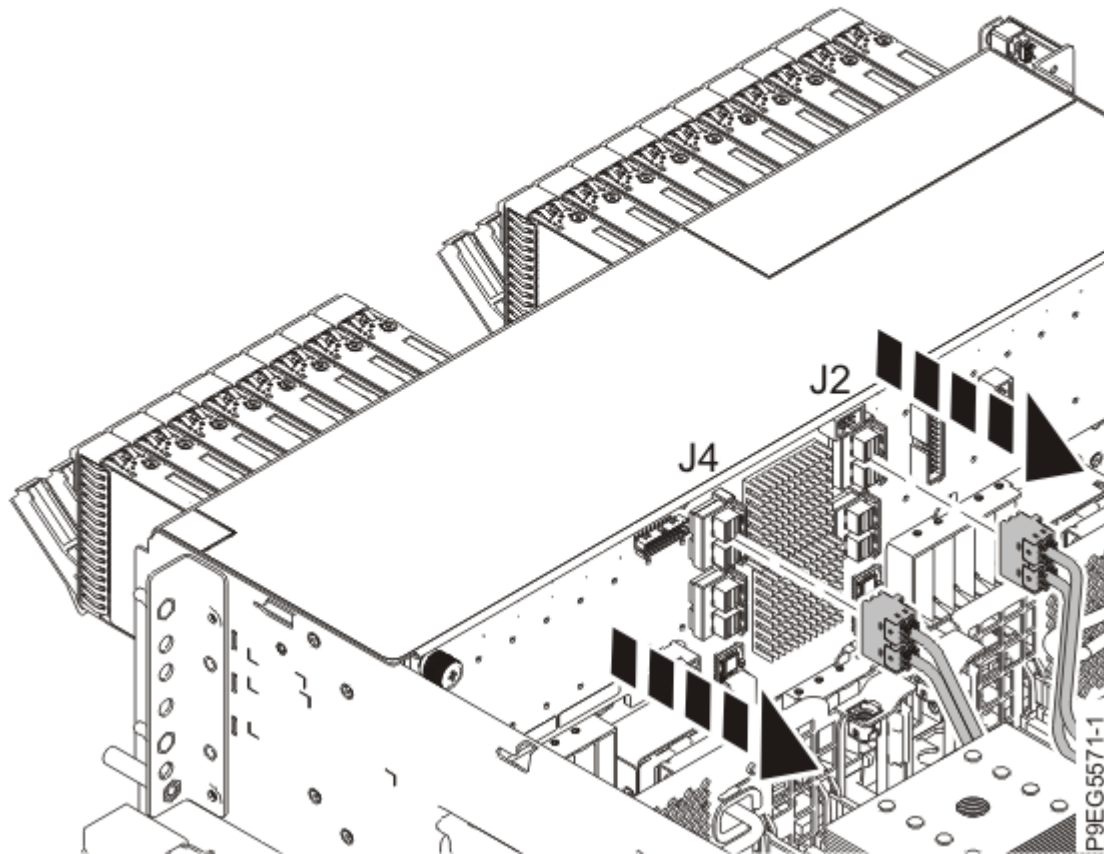


Figure 28. Disconnecting the front SAS cables from the 18-drive expanded function disk drive backplane

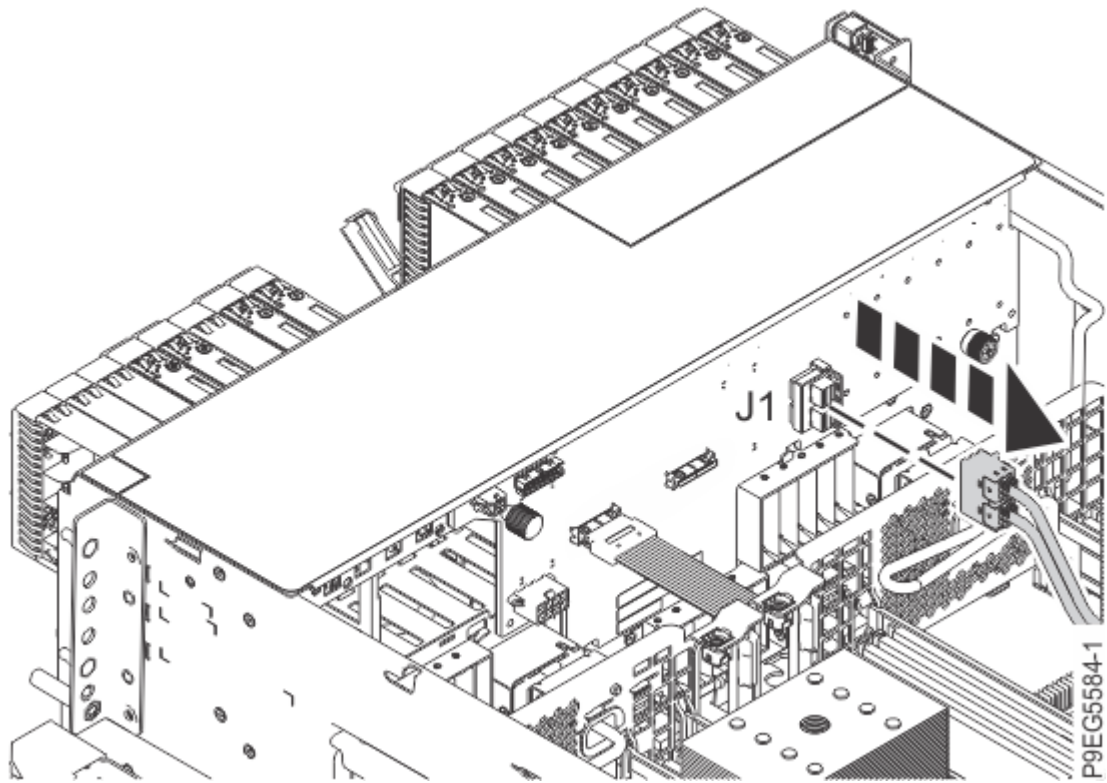
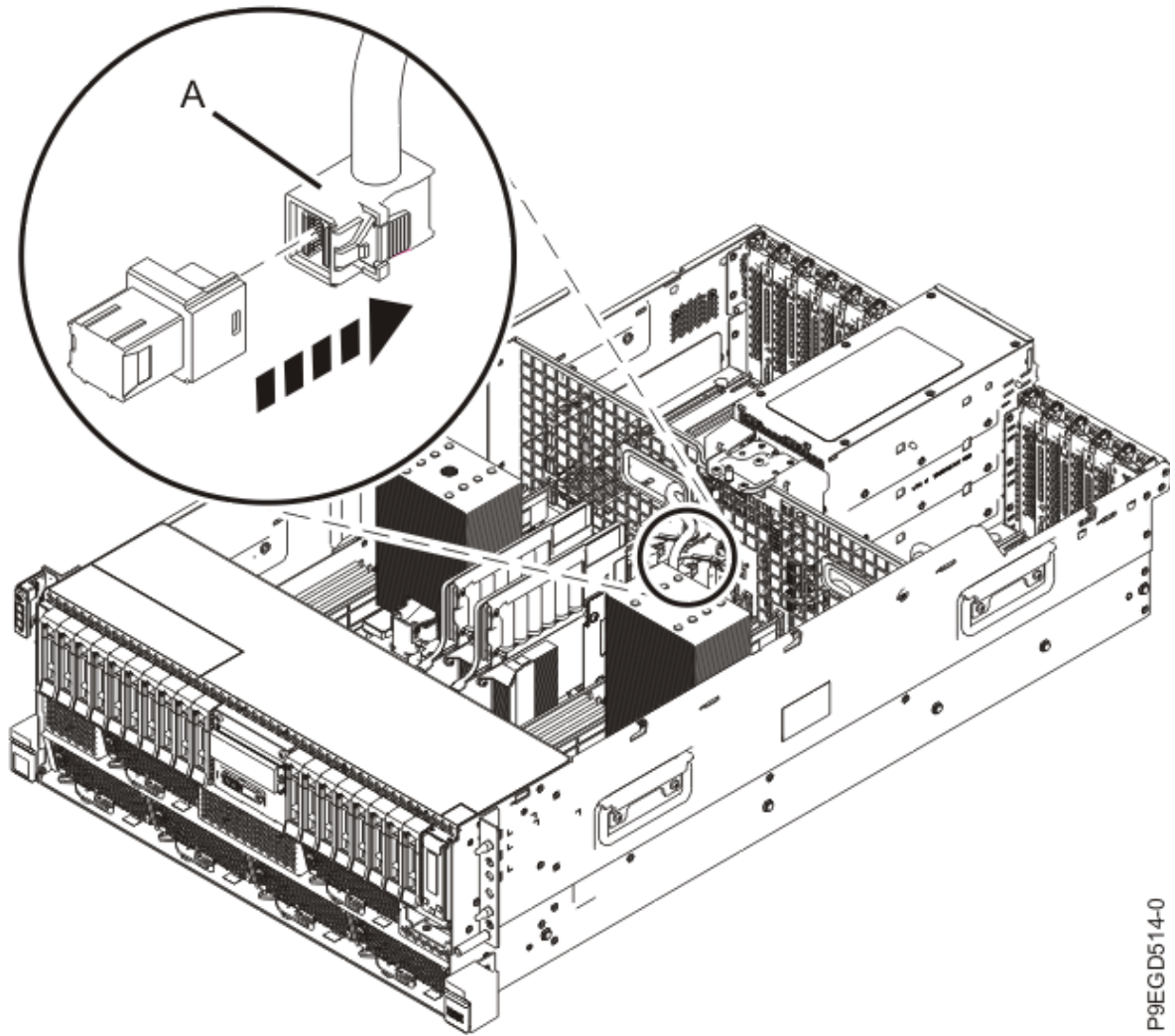


Figure 29. Disconnecting the front SAS cable from the NVMe drive backplane

10. Remove the SAS RAID adapter or adapters, if present. Otherwise, continue with the next step.

- a) Locate the SAS RAID adapter you want to remove.
- b) If a rear SAS cable is attached to the SAS RAID adapter, label and disconnect the rear SAS cables from the SAS RAID internal adapters in positions P1-C49 and P1-C50 by pressing the connector latch and unplugging the cable. See the following figure.



P9EGD514-0

Figure 30. Disconnecting the rear SAS cables from the SAS RAID internal adapter

- c) If a rear SAS cable is attached to the SAS RAID adapter, unlatch the PCI retainer **(A)** for the PCI adapter slot P1-C6 at the rear of the system. Then, lift and remove the rear SAS cable adapter **(B)**. See the following figure.

Ensure that the rear SAS cable does not catch on any components while you are lifting the rear SAS adapter out of the slot.

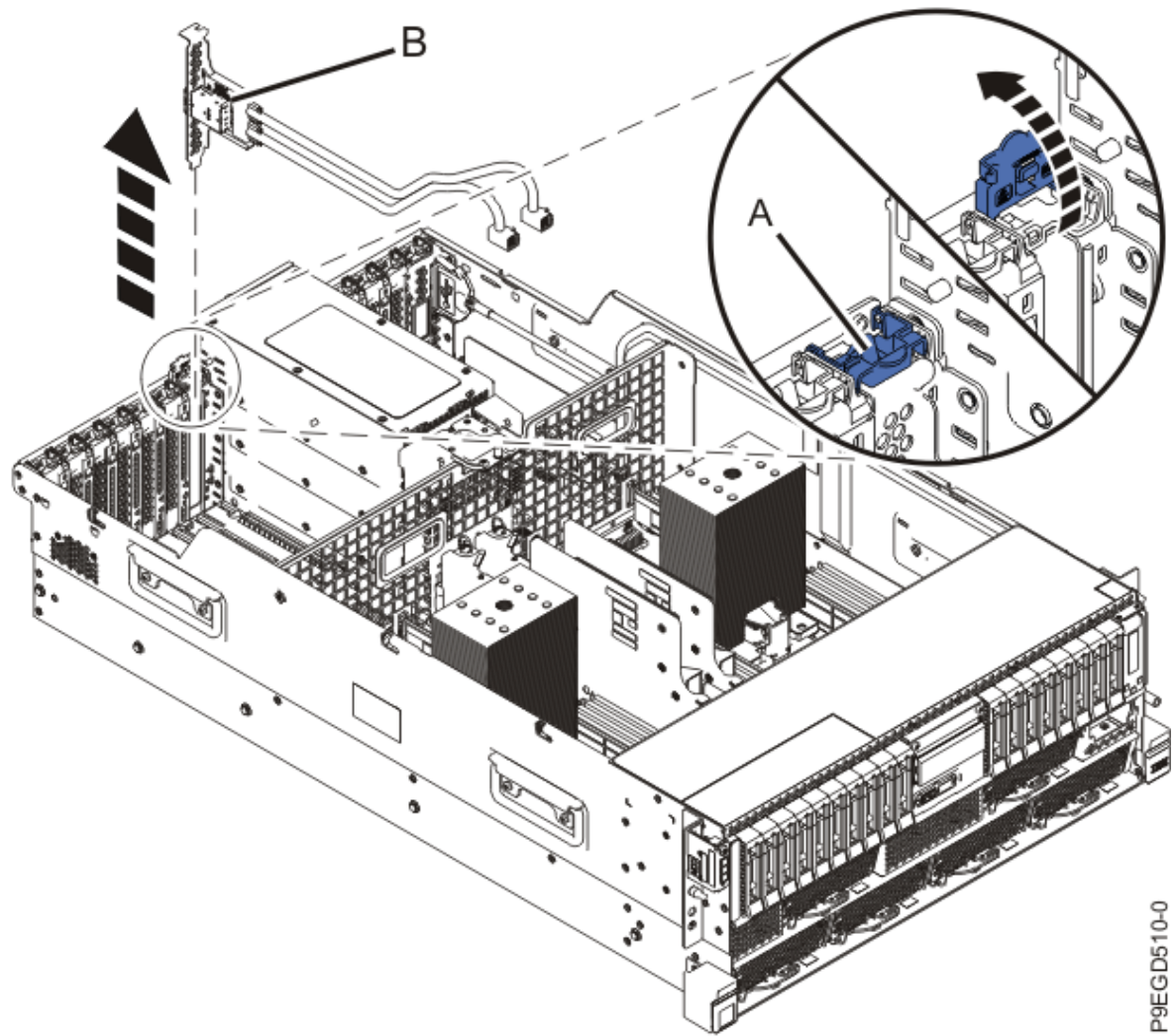


Figure 31. Removing the rear SAS cable adapter

- d) Place the rear SAS cable and connector on an appropriate ESD surface.
- e) Twist the screws **(A)** counterclockwise to release the SAS RAID adapter. Lift both the SAS RAID adapter and the front SAS cable out of the slot. Ensure that the front SAS cable does not catch on any components while you are lifting the SAS RAID adapter out of the slot. See the following figure.

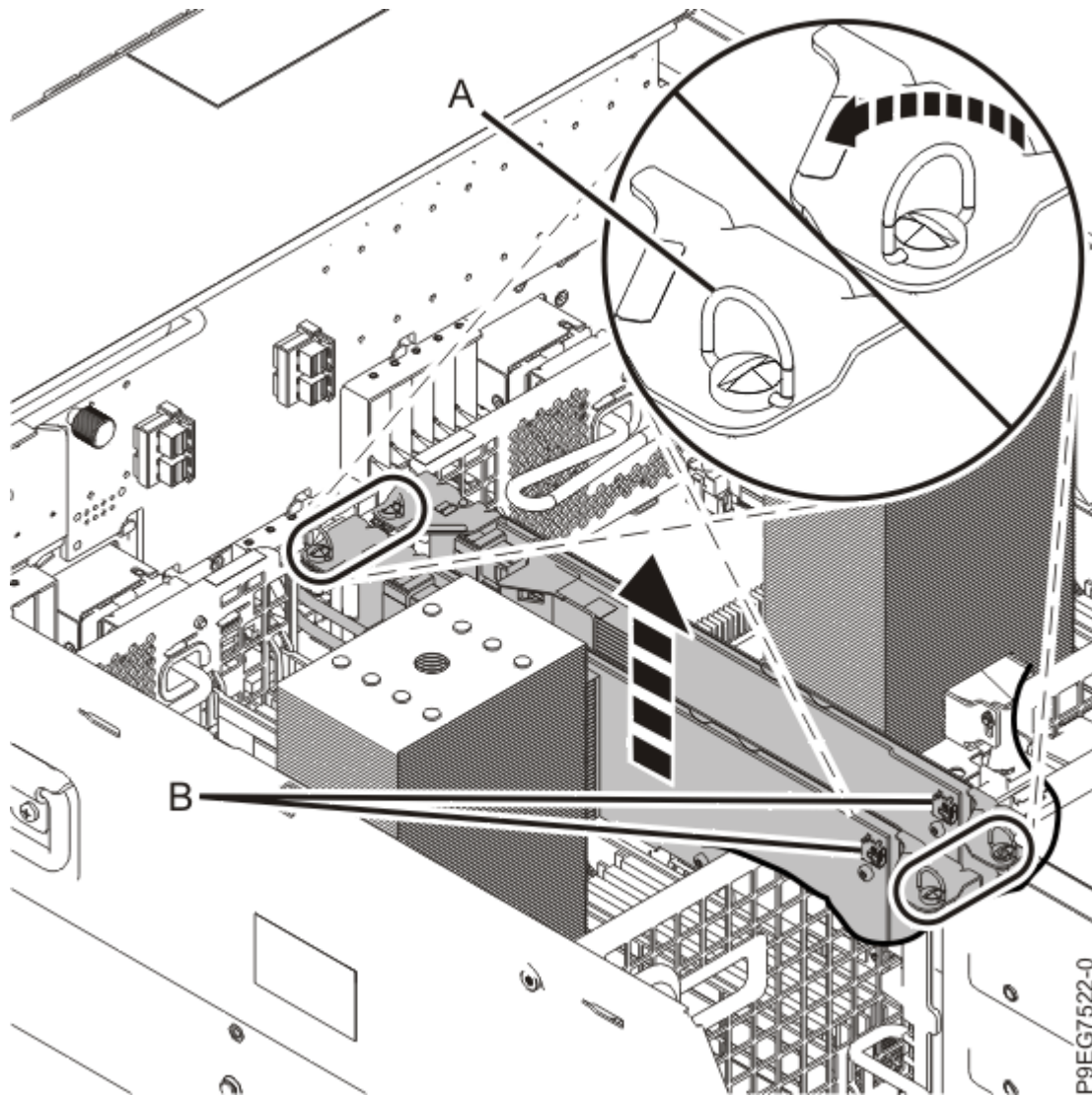


Figure 32. Removing the SAS RAID adapter

- f) Place the SAS RAID internal adapter on an appropriate ESD surface.
- g) Repeat steps “10.a” on page 32 through “10.f” on page 35 for any additional SAS RAID adapters.
- 11. Remove the NVMe M.2 carrier card, if present. Otherwise, continue with the next step.
 - a) Twist the screws **(A)** counterclockwise to release the NVMe M.2 carrier card.
 - b) Lift the NVMe M.2 carrier card out of the slot as shown in the following figure.

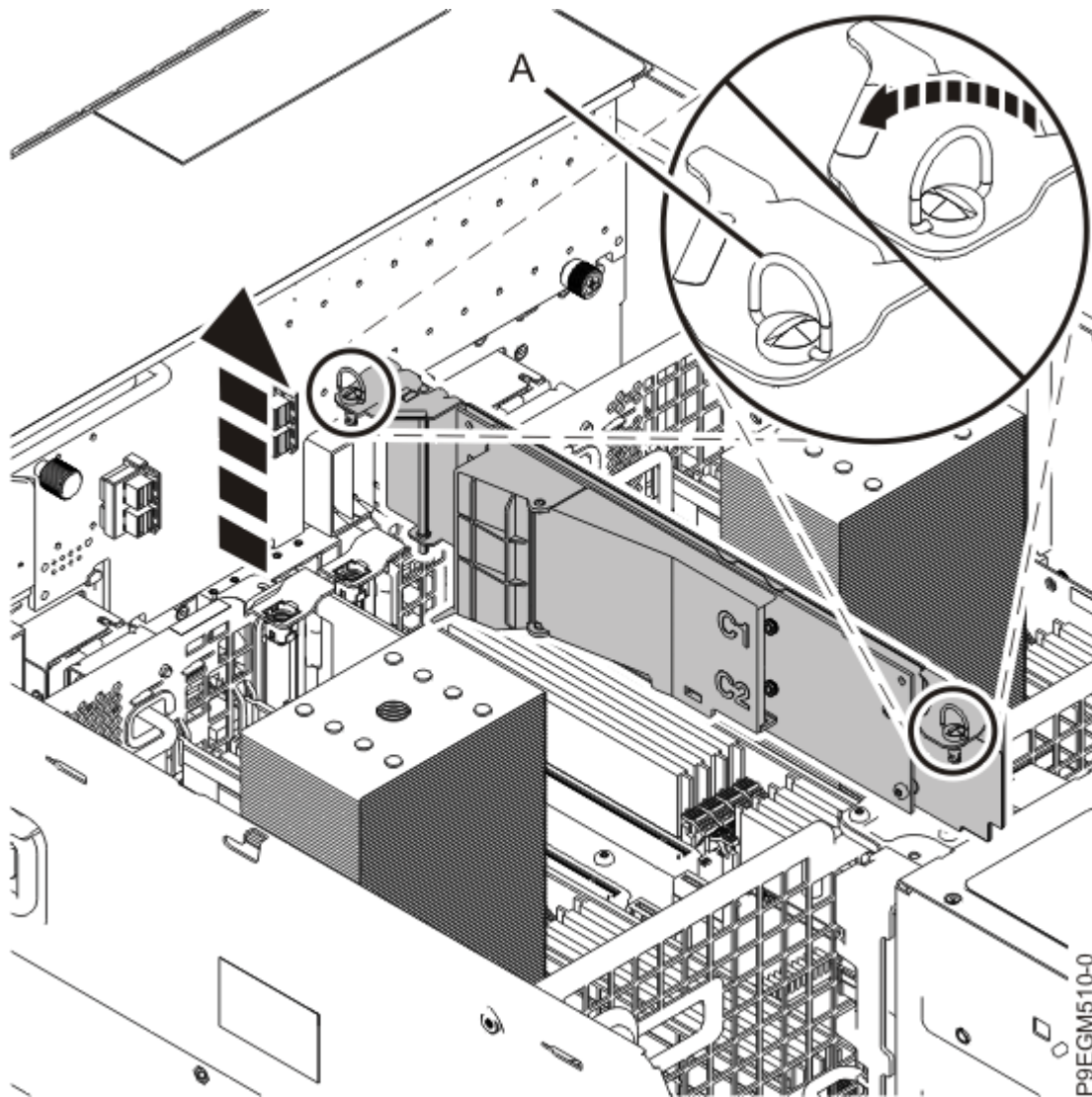


Figure 33. Removing the NVMe M.2 carrier card

- c) Place the NVMe M.2 carrier card on an appropriate ESD surface.
12. Remove the internal RDX docking station, if present. Otherwise, continue with the next step.
- a) Disconnect the RDX power cable (**A**) from the back of the RDX docking station and route the cable over the side of the system as shown in the following figure.
 - b) Disconnect the front USB cable (**B**) from the back of the RDX docking station and route the cable over the side of the system as shown in the following figure.

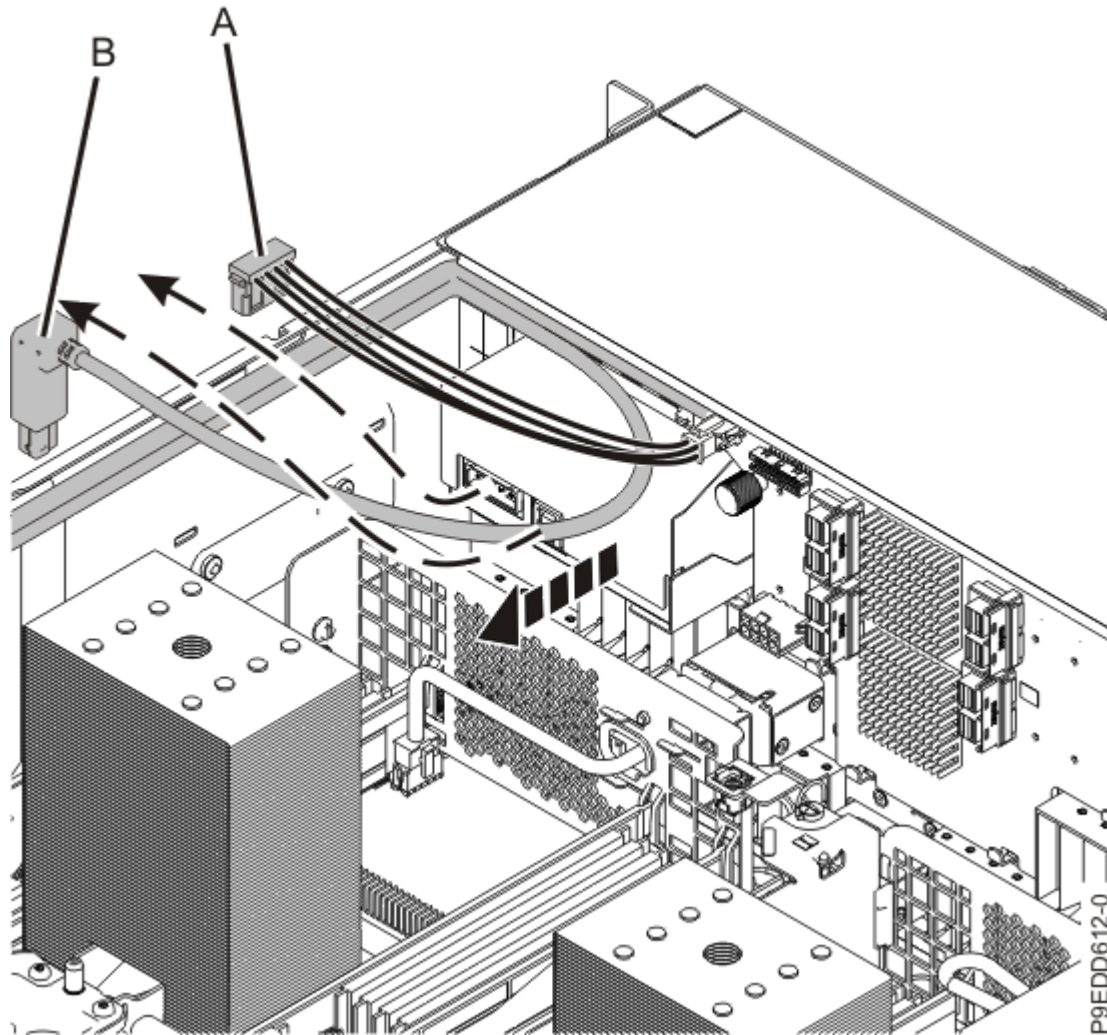
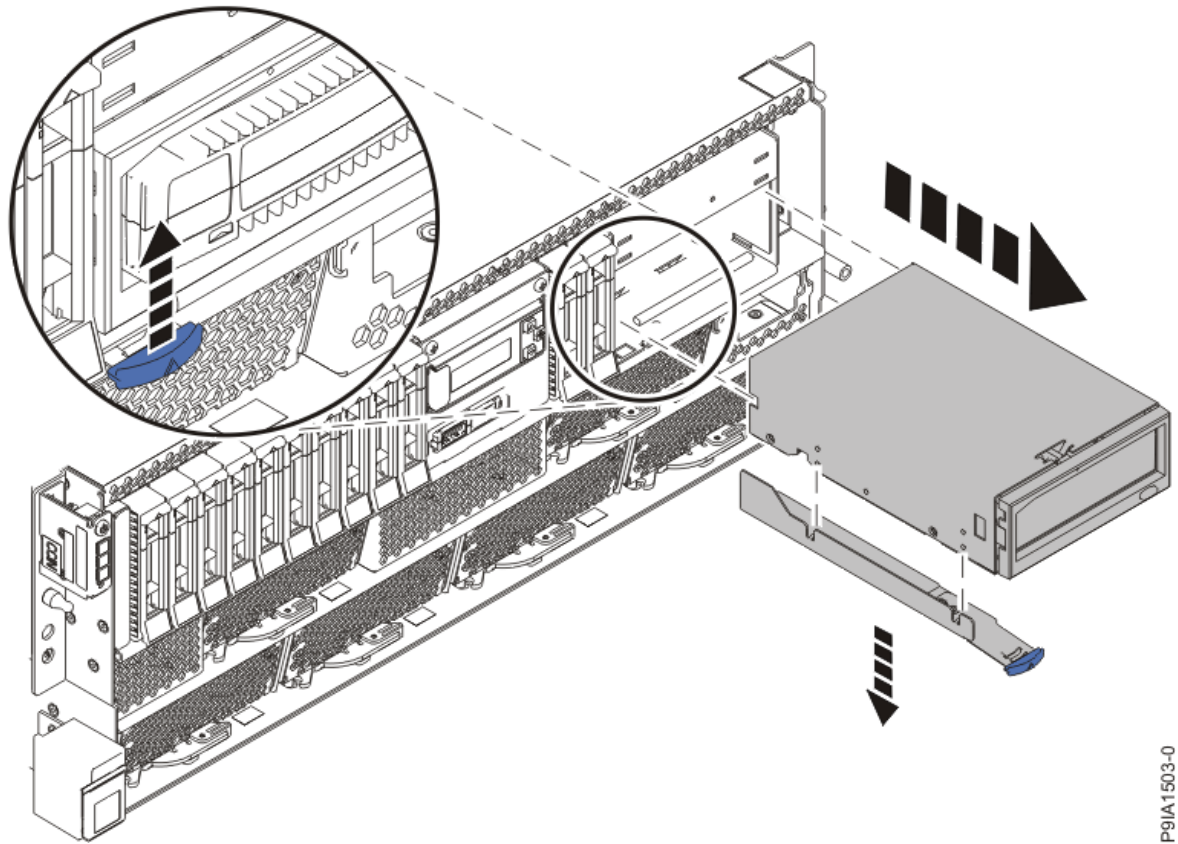


Figure 34. Routing the RDX power and USB cables over the side of the system

- c) Push the blue tab on the internal RDX docking station latch upwards to release the internal RDX docking station as shown in the following figure.
- d) Gently slide the internal RDX docking station and its latch out from the system. Remove the internal RDX docking station latch from the docking station in the direction of the arrow shown.



P91A1503-0

Figure 35. Removing the internal RDX docking station

- e) Place the RDX docking station on an appropriate ESD surface.
- 13. Remove the filler for the RDX docking station, if present. Otherwise, continue with the next step.
 - a) Push down on the clips (**A**) to unlock the filler from the chassis as shown in the following figure.

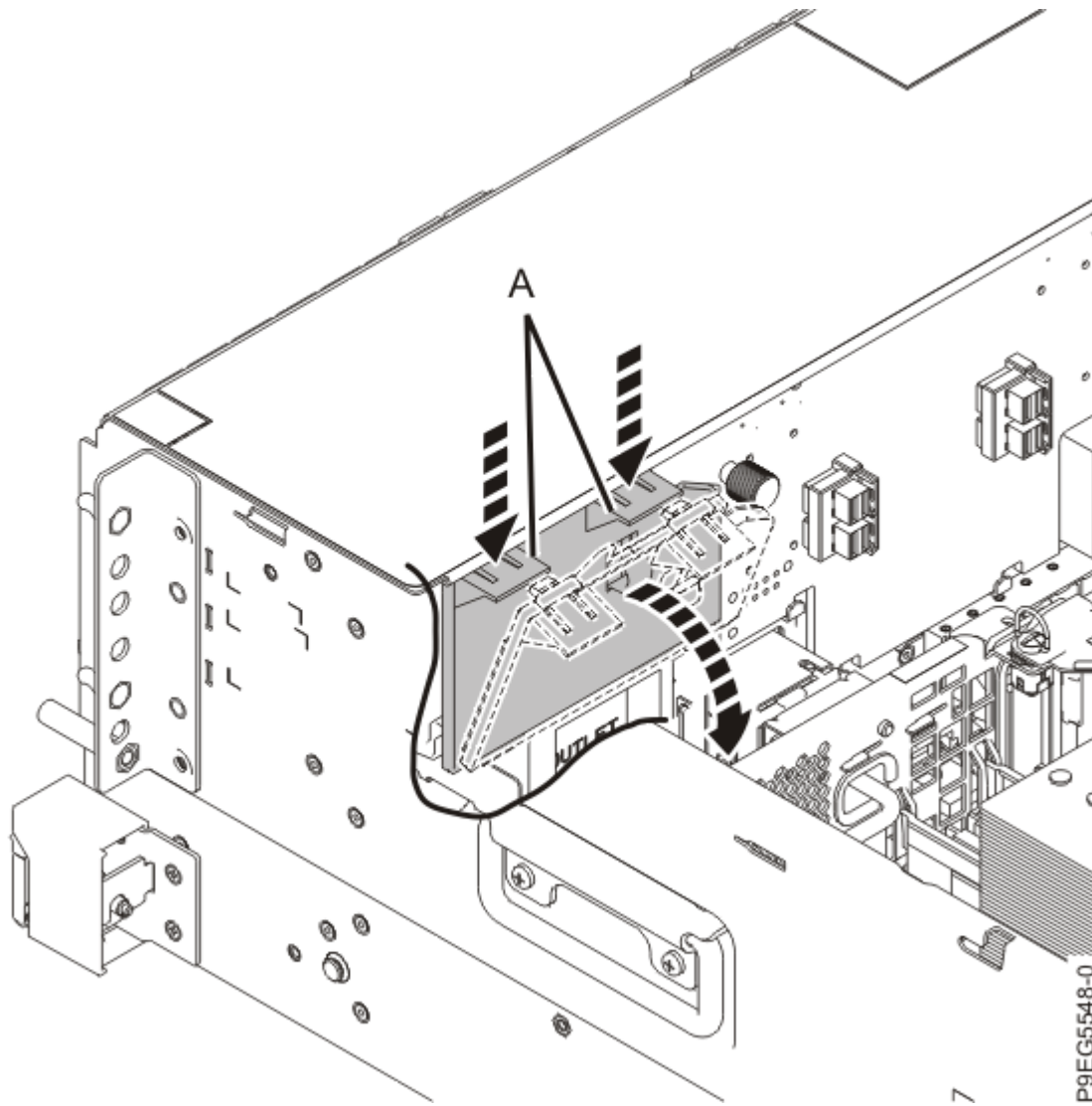


Figure 36. Removing the RDX drive filler

- b) Holding the clips, pivot the filler away from the disk drive backplane.
 - c) Lift the filler out of the system, and place it on an appropriate ESD surface.
14. Remove the NVMe U.2 pass-thru cards, if present. Otherwise, continue with the next step.
- a) Label the NVMe cables that are connected to the NVMe drive backplane connectors (J2) and (J3), depending on your configuration. Disconnect the NVMe cables from the NVMe drive backplane as shown in the following figure.

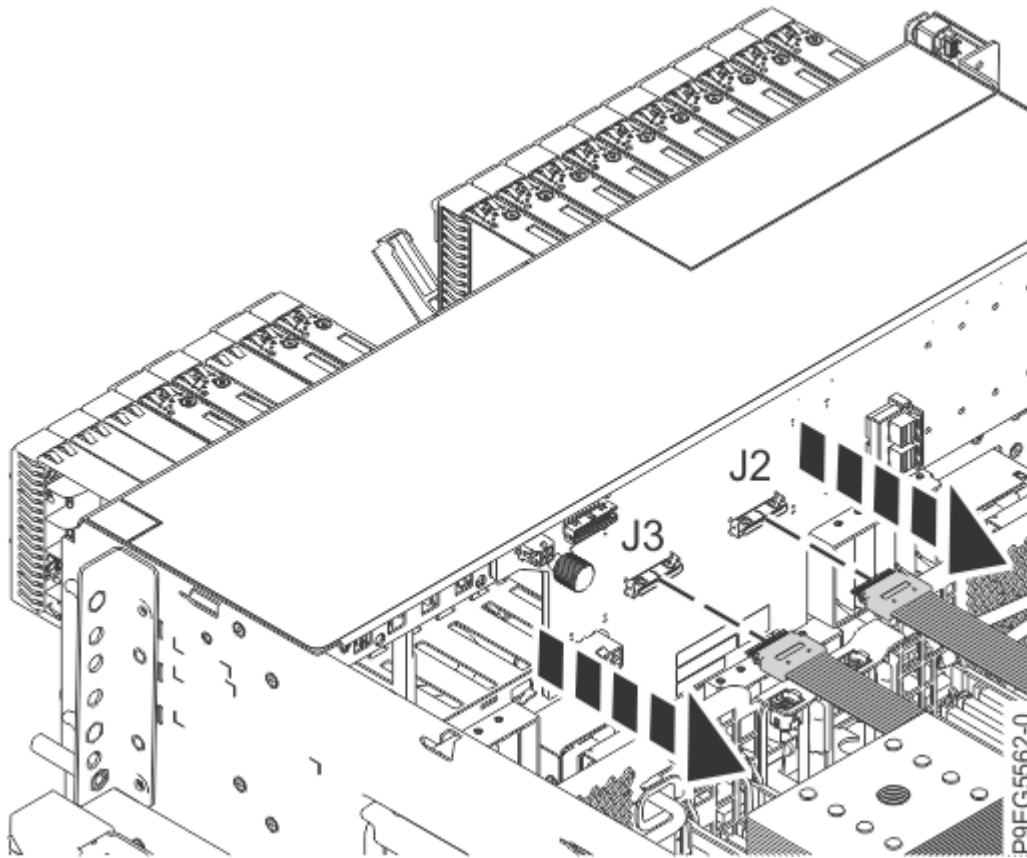


Figure 37. Disconnecting the NVMe cables from the NVMe drive backplane

- b) Twist the screws **(A)** counterclockwise to release the NVMe U.2 pass-thru card. Lift both the NVMe U.2 pass-thru card and the NVMe cable out of the slot as shown in the following figure.

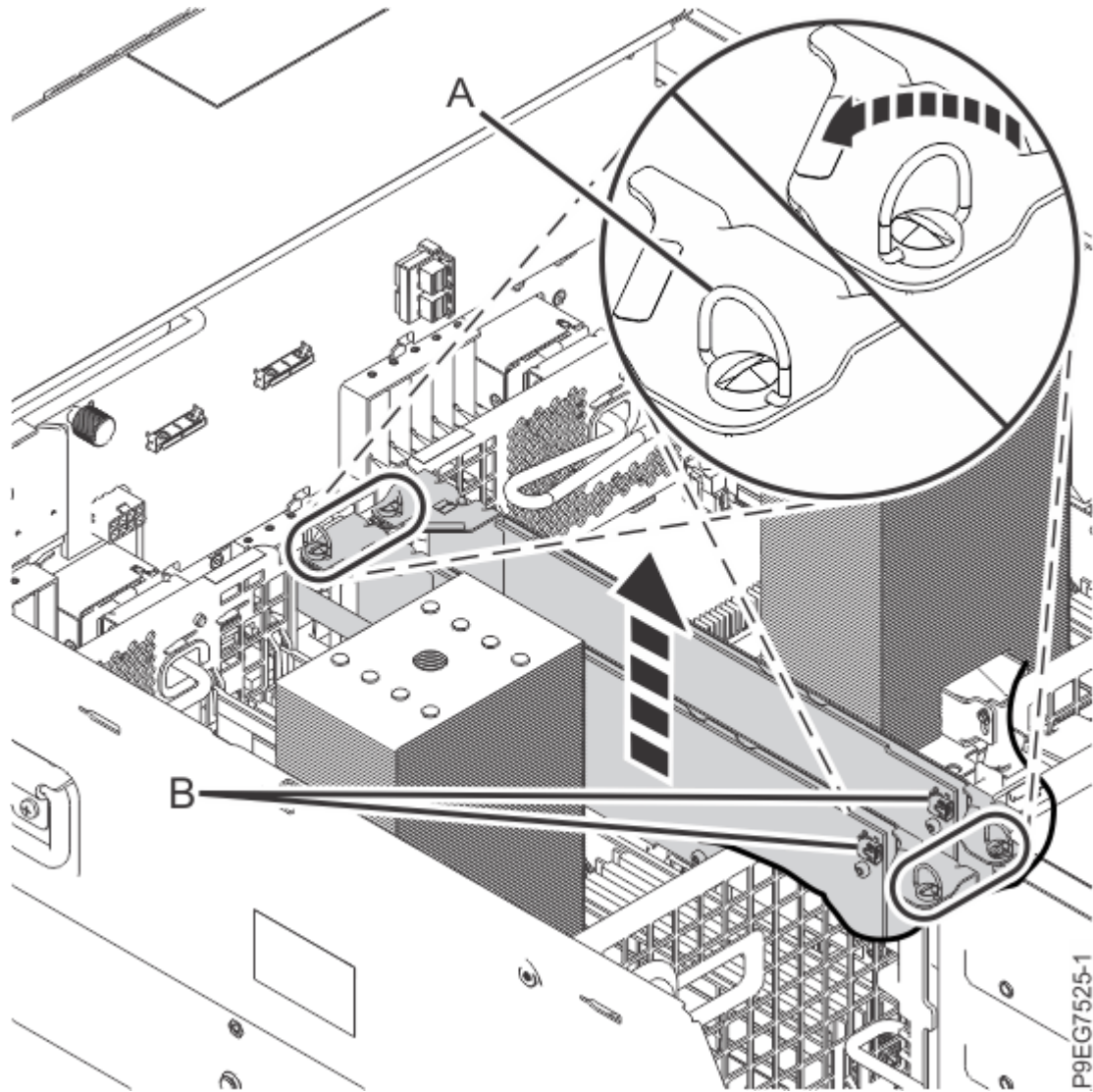


Figure 38. Removing the NVMe U.2 pass-thru card

- c) Place the NVMe U.2 pass-thru card on an appropriate ESD surface.
 - d) If a second NVMe U.2 pass thru card is present, repeat steps [“14.a”](#) on page 39 through [“14.c”](#) on page 41.
15. Remove the front drives enough to prevent them from interfering with the removal of the system backplane:
- a) Unlatch a front drive by pushing the drive tab **(A)** to release the drive lever **(B)** as shown in the following figures.

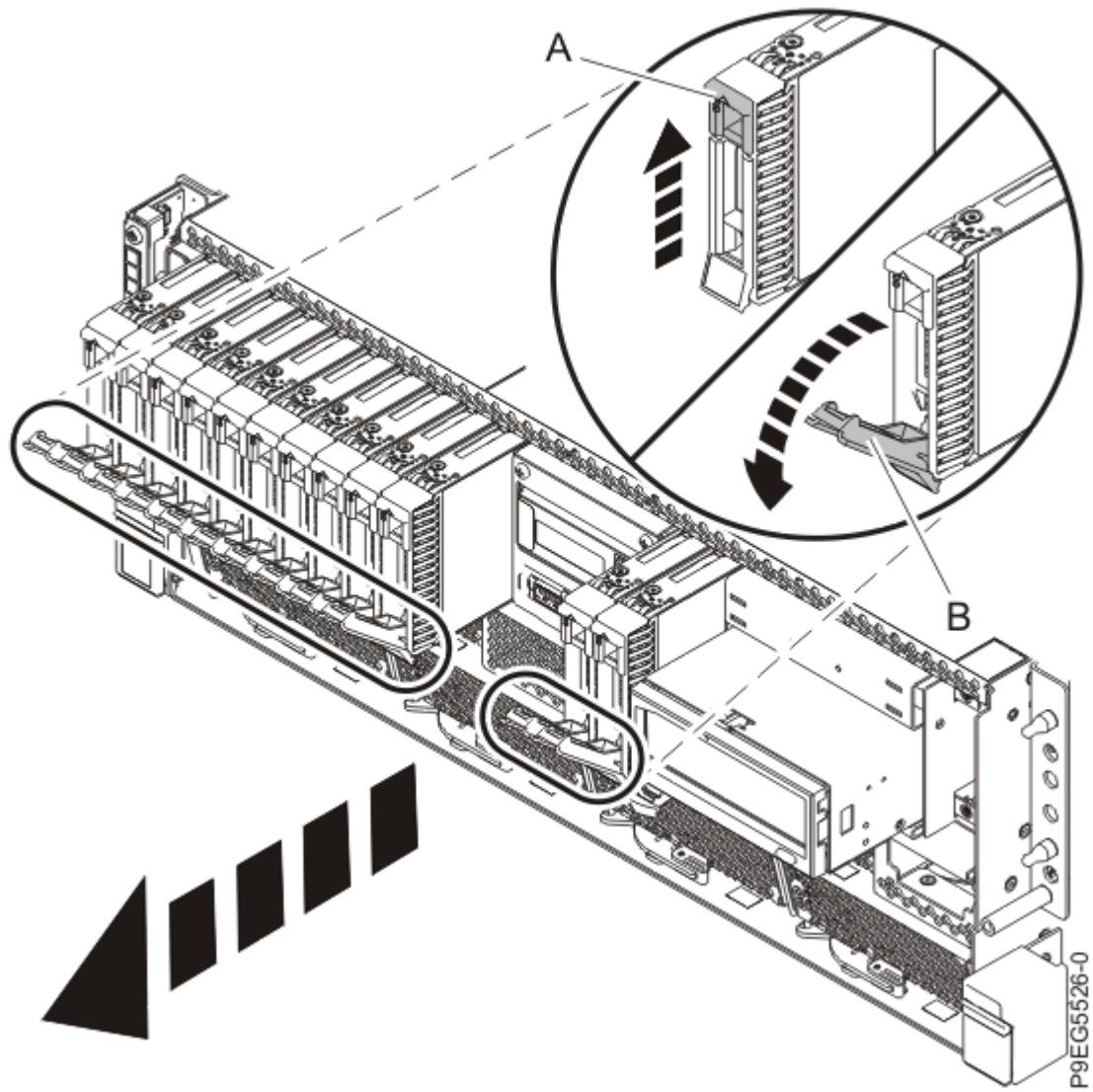


Figure 39. Partially removing the front drives from a base function or 12-drive expanded function disk drive backplane

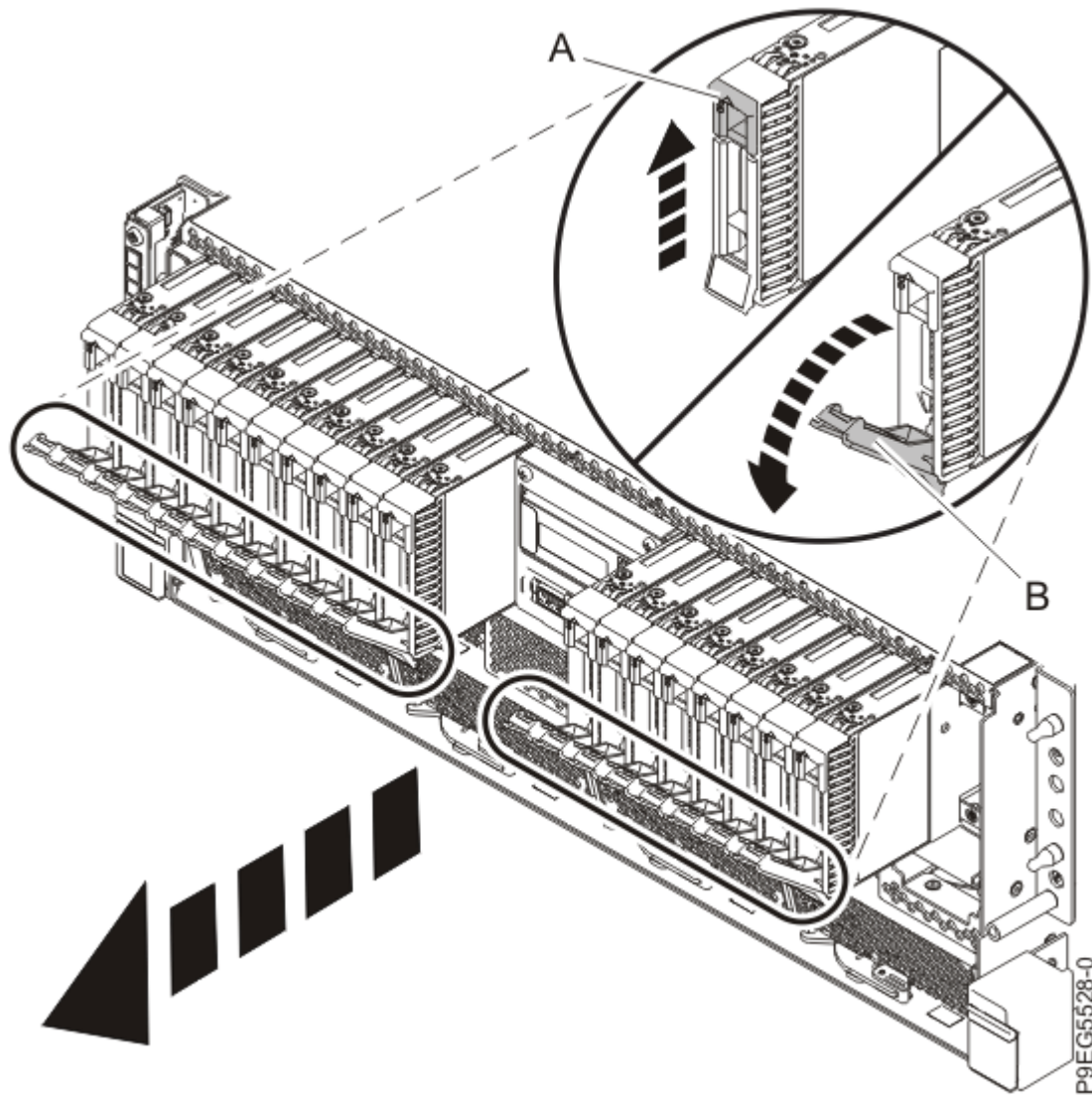


Figure 40. Partially removing the front drives from an 18-drive expanded function disk drive backplane

- b) After the drive unlatches, unplug but do not remove the front drive from its slot. Using the drive lever, pull the drive about 2.5 cm (1 in) from the system or far enough to prevent it from interfering with the removal of the disk drive backplane.
 - c) Repeat “15.a” on page 41 through “15.b” on page 43 for the other front drives.
16. Remove the disk drive backplane:
- If you have a base function disk drive backplane, continue with step “17” on page 43.
 - If you have a 12-drive expanded function disk drive backplane, continue with step “22” on page 46.
 - If you have an 18-drive expanded function disk drive backplane, continue with step “27” on page 49.
 - If you have an NVMe drive backplane, continue with step “32” on page 52.
17. Label and disconnect the signal cable **(A)** and the power cable **(B)** from the disk drive backplane as shown in the following figure.
- Unlatch the clips that secure the connectors to the disk drive backplane.

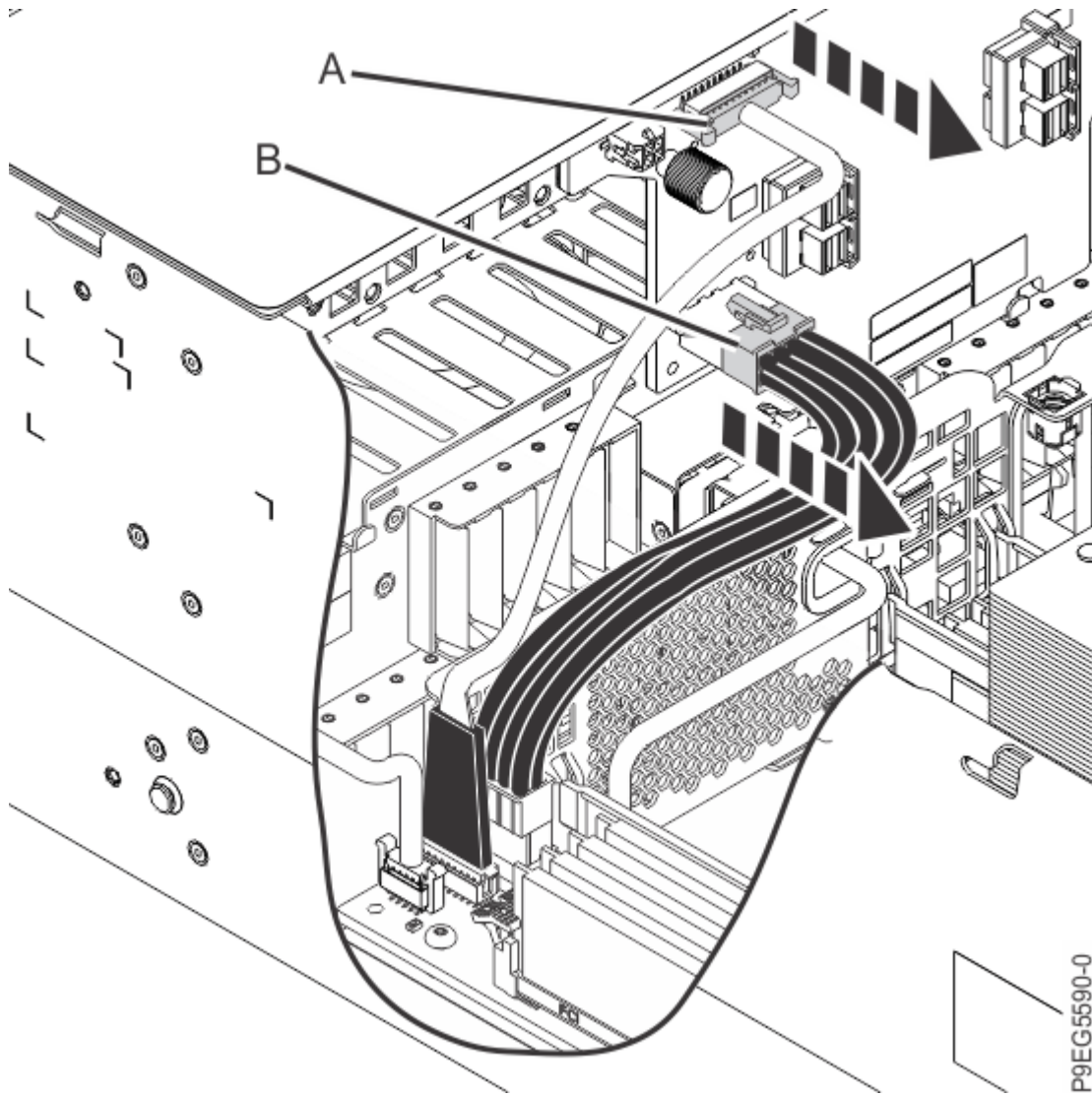


Figure 41. Disconnecting the signal cable and the power cable

18. Ensure that all cables are carefully positioned out of the way, such that the disk drive backplane can be easily lifted and removed.
19. Carefully unscrew the captive thumbscrew **(A)** of the disk drive backplane until fully loose as shown in the following figure.
If needed, use a Phillips screwdriver to loosen the screws.

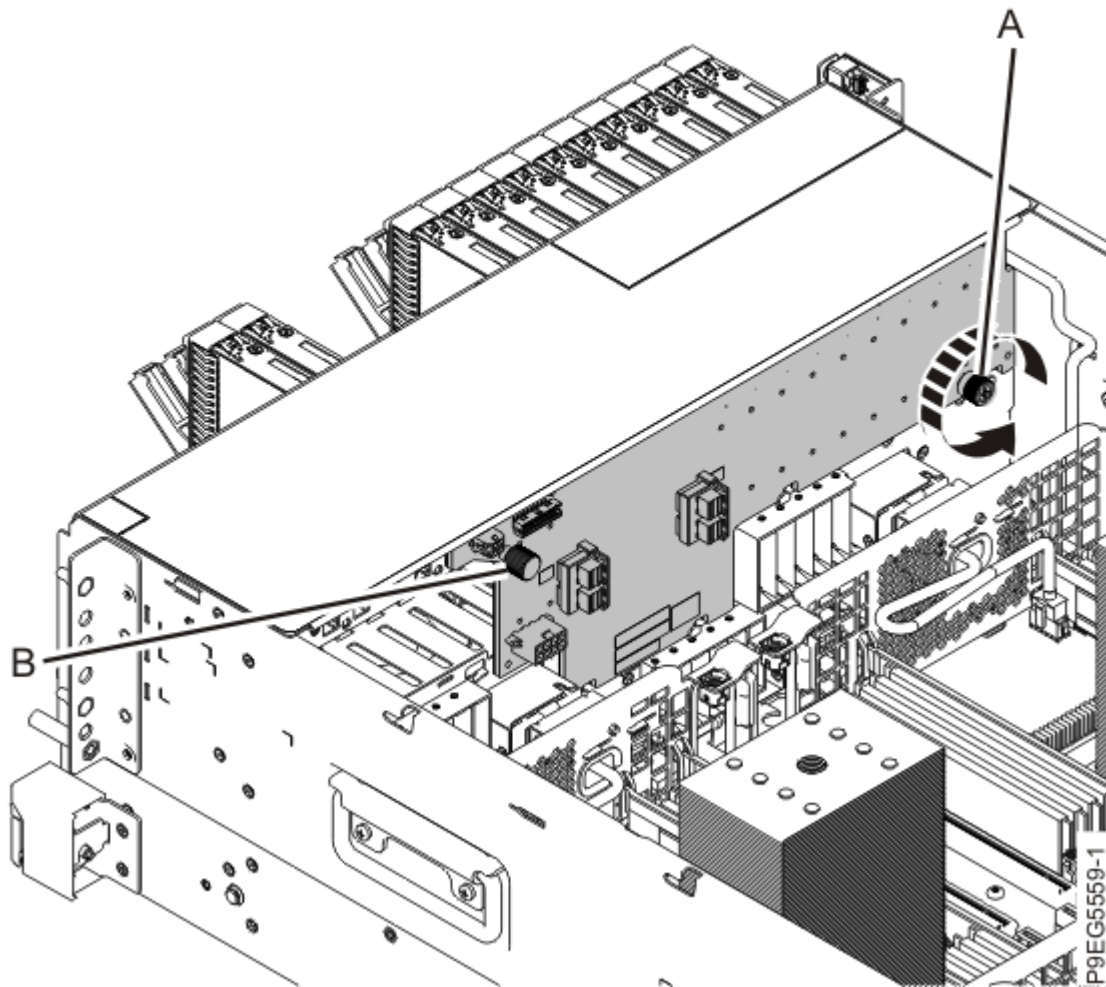


Figure 42. Loosening the disk drive backplane screw

20. Using the thumbscrew **(A)** and the disk drive backplane holder **(B)**, slide the disk drive backplane to the side in the direction that is shown in the following figure, so that the disk drive backplane clears the tabs in the chassis.

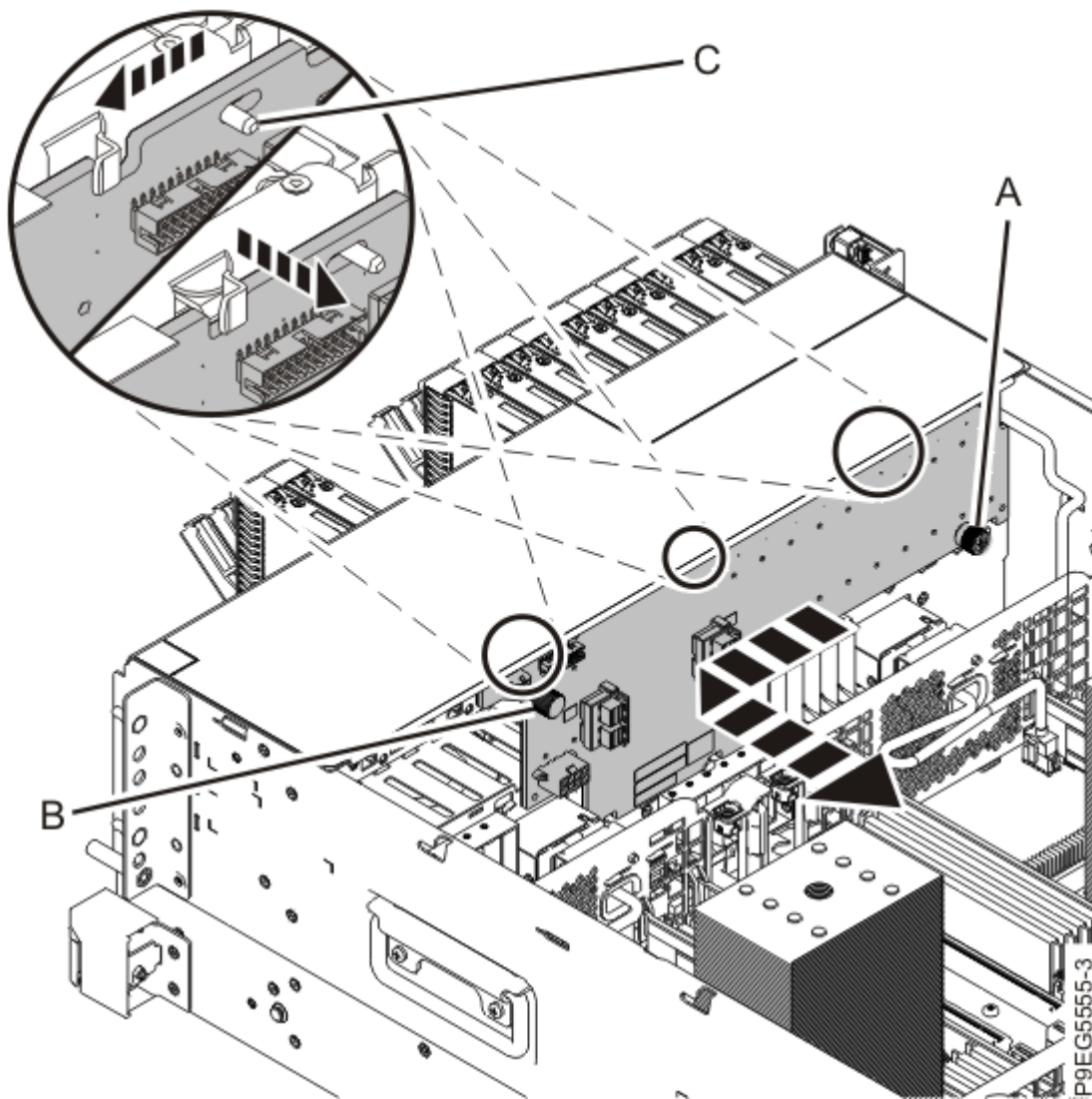


Figure 43. Removing the disk drive backplane

21. Lift the base function disk drive backplane out of the chassis and place the base function disk drive backplane on an appropriate ESD surface. Continue with step “36” on page 55.
22. Label and disconnect the signal cable **(A)** and the power cable **(B)** from the disk drive backplane as shown in the following figure.

Unlatch the clips that secure the connectors to the disk drive backplane.

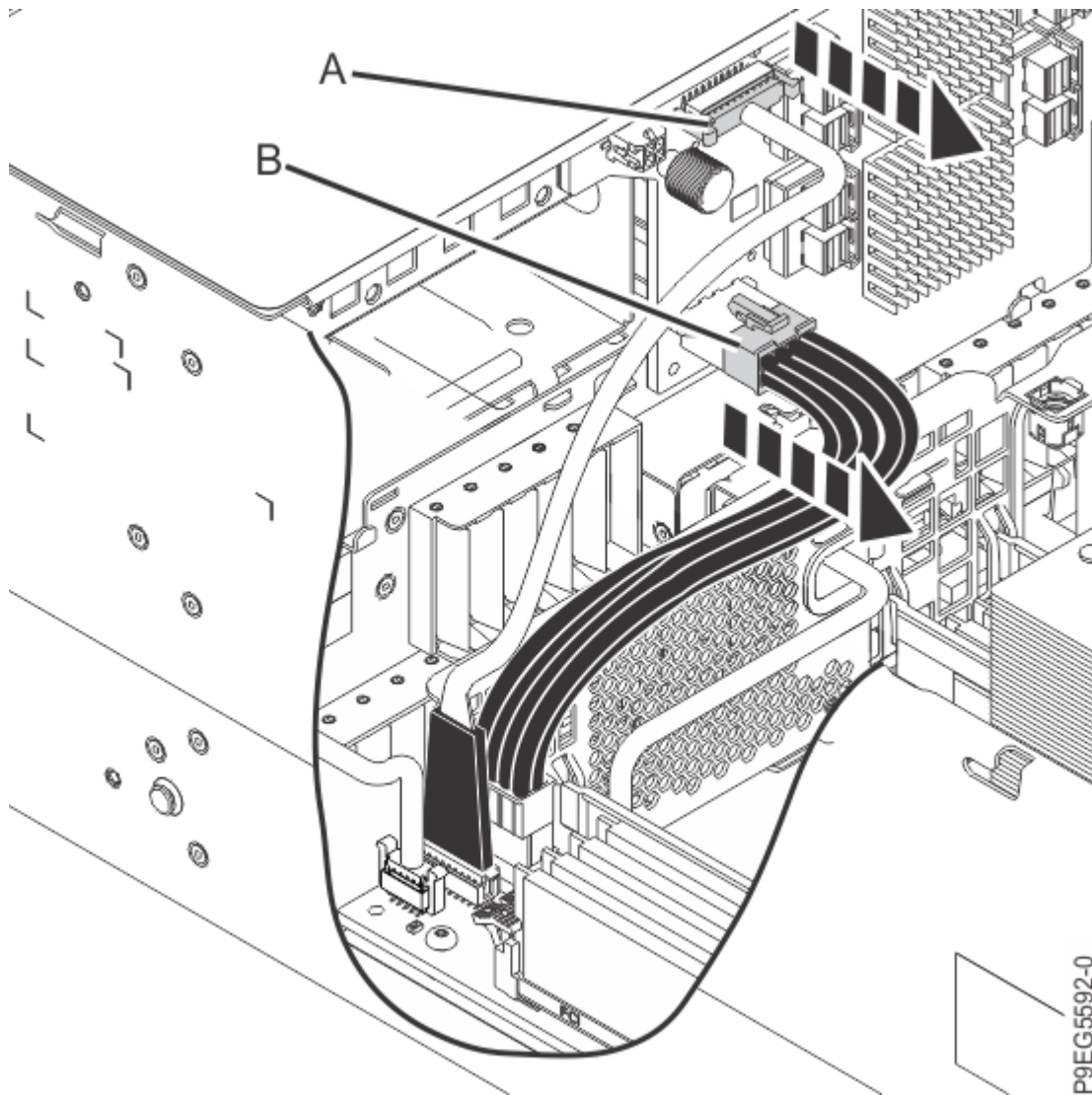


Figure 44. Disconnecting the signal cable and power cable

23. Ensure that all cables are carefully positioned out of the way, such that the disk drive backplane can be easily lifted and removed.
24. Carefully unscrew the captive thumbscrew **(A)** of the disk drive backplane until fully loose as shown in [Figure 45 on page 48](#).
If needed, use a Phillips screwdriver to loosen the screws.

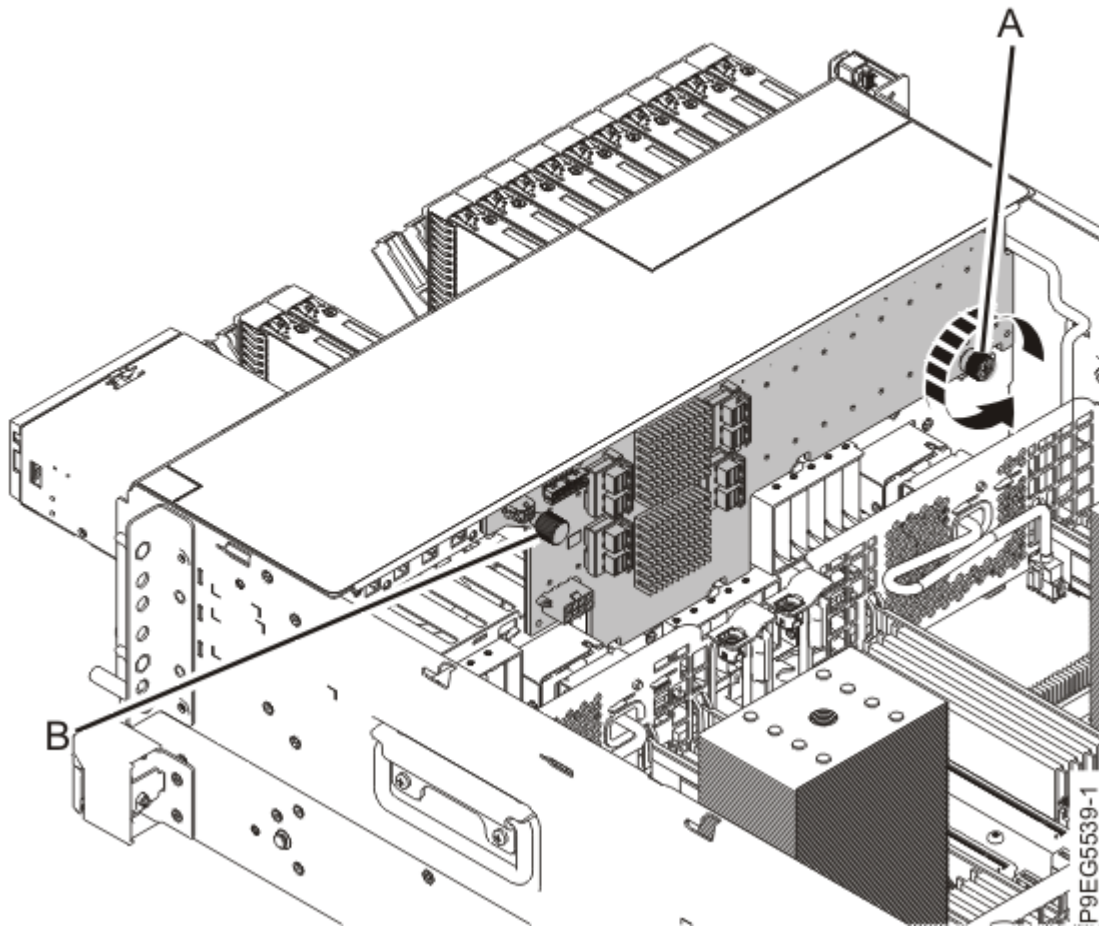


Figure 45. Loosening the disk drive backplane screw

25. Using the thumbscrew **(A)** and the disk drive backplane holder **(B)**, slide the disk drive backplane to the side in the direction that is shown in the following figure, so that the disk drive backplane cutouts clear the tabs in the chassis.

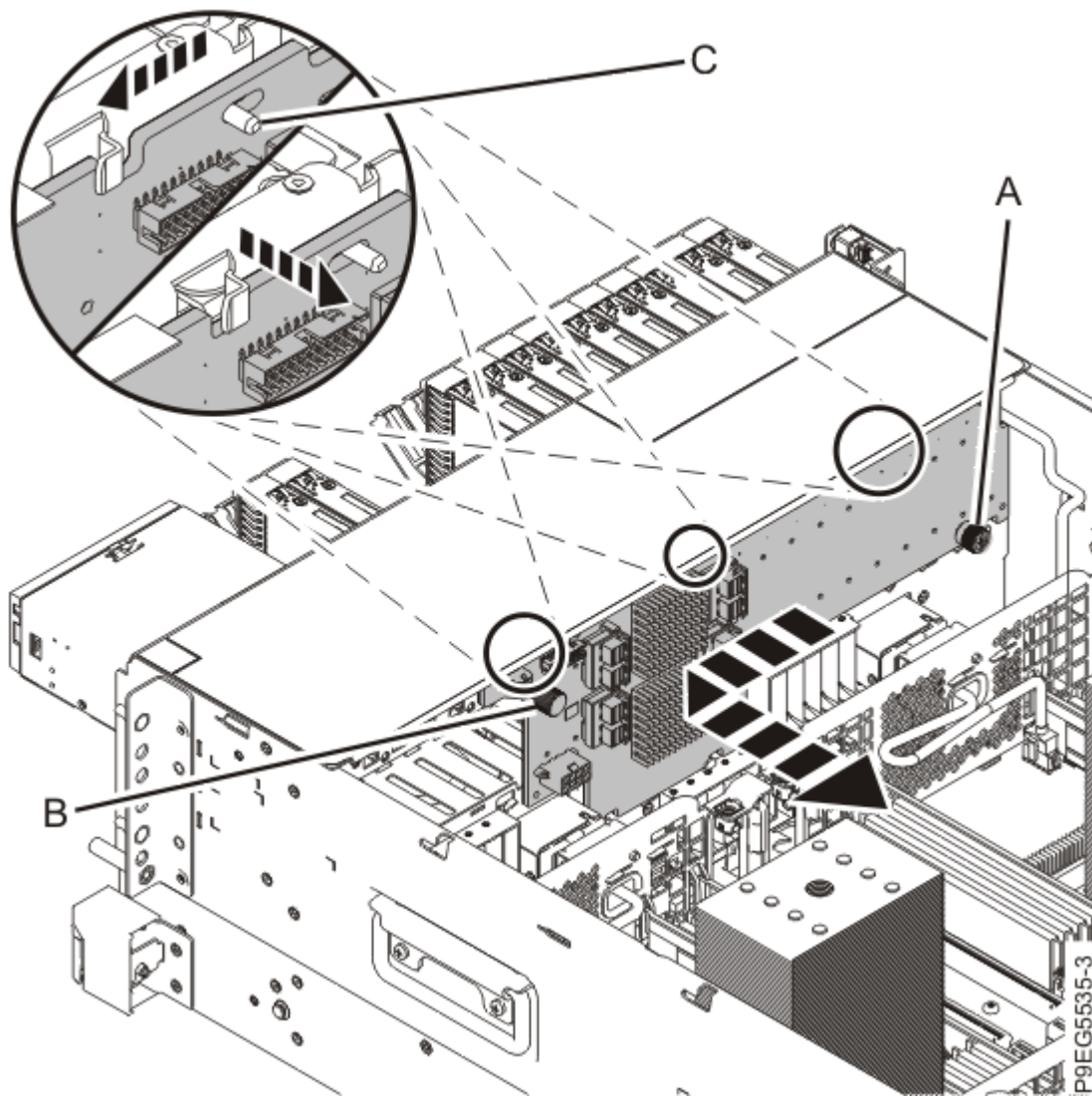
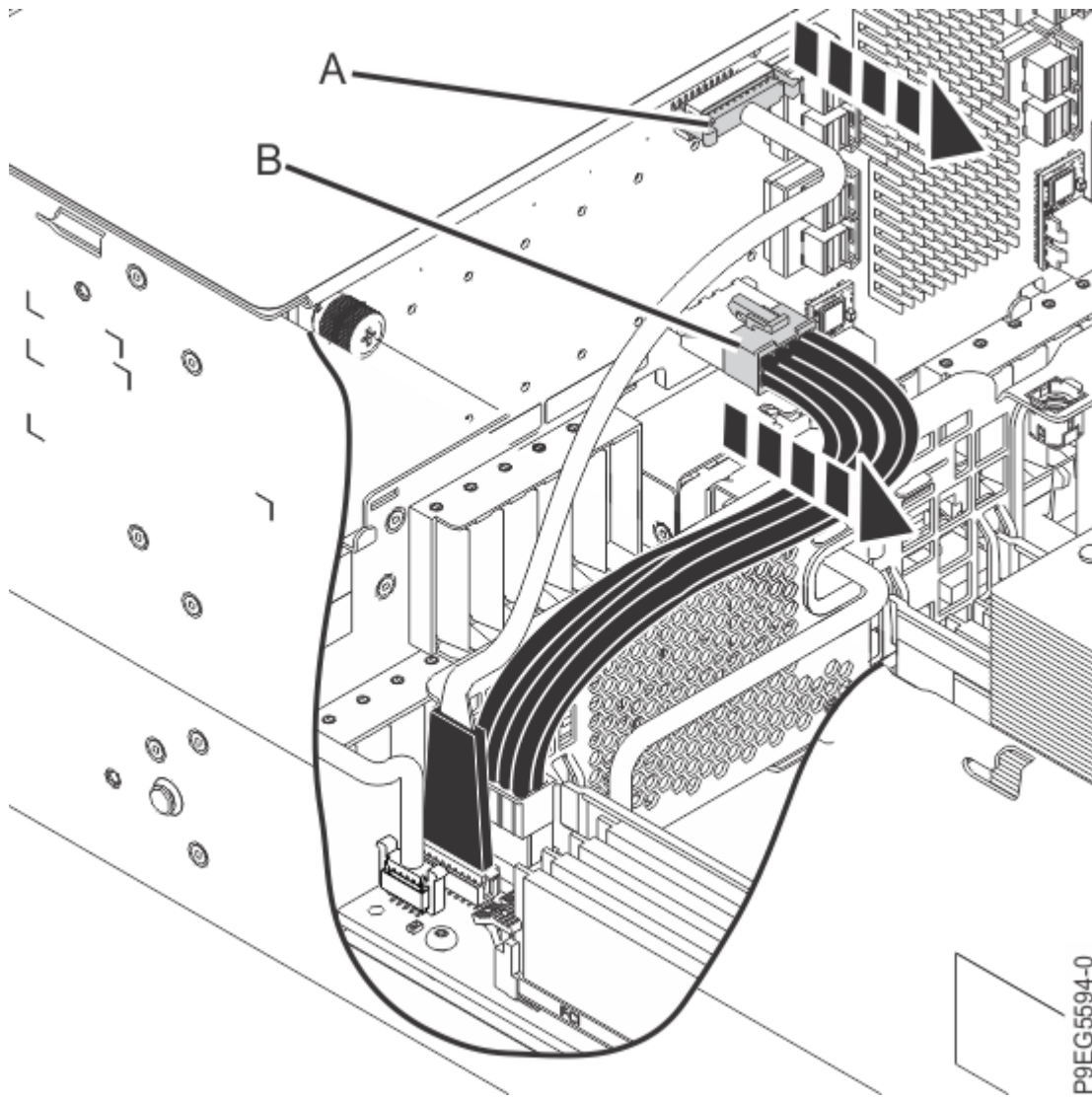


Figure 46. Removing the disk drive backplane

26. Lift the 12-drive expanded function disk drive backplane out of the chassis and place the 12-drive expanded function disk drive backplane on an appropriate ESD surface. Continue with step [“36”](#) on [page 55](#).
27. Label and disconnect the signal cable **(A)** and the power cable **(B)** from the disk drive backplane as shown in the following figure.
Unlatch the clips that secure the connectors to the disk drive backplane.



P9EG5594-0

Figure 47. Disconnecting the signal cable and power cable

28. Ensure that all cables are carefully positioned out of the way, such that the disk drive backplane can be easily lifted and removed.
29. Carefully unscrew the captive thumbscrews **(A)** and **(B)** of the disk drive backplane until fully loose as shown in the following figure.
If needed, use a Phillips screwdriver to loosen the screws.

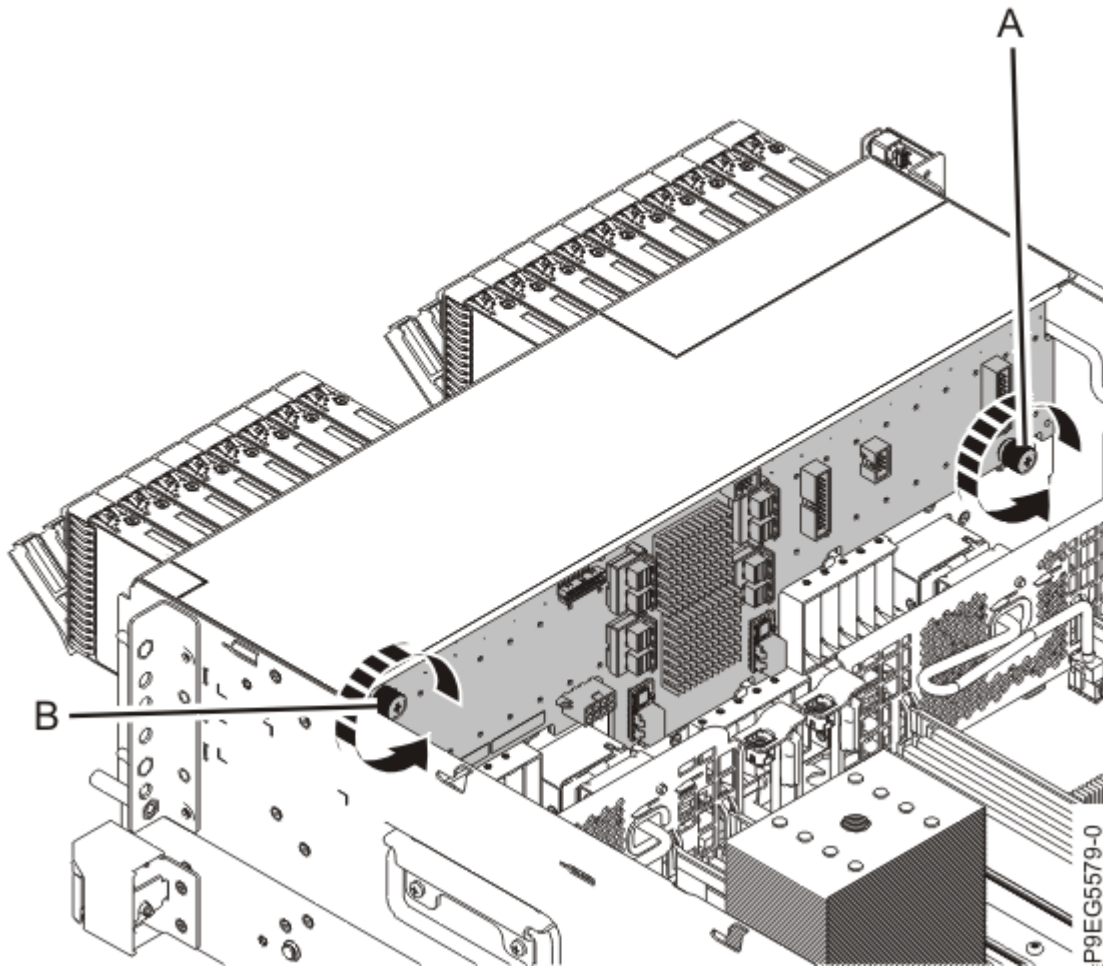


Figure 48. Loosening the disk drive backplane screws

30. Using the thumbscrews **(A)** and **(B)**, slide the disk drive backplane to the side in the direction that is shown in the following figure, so that the disk drive backplane clears the tabs in the chassis.

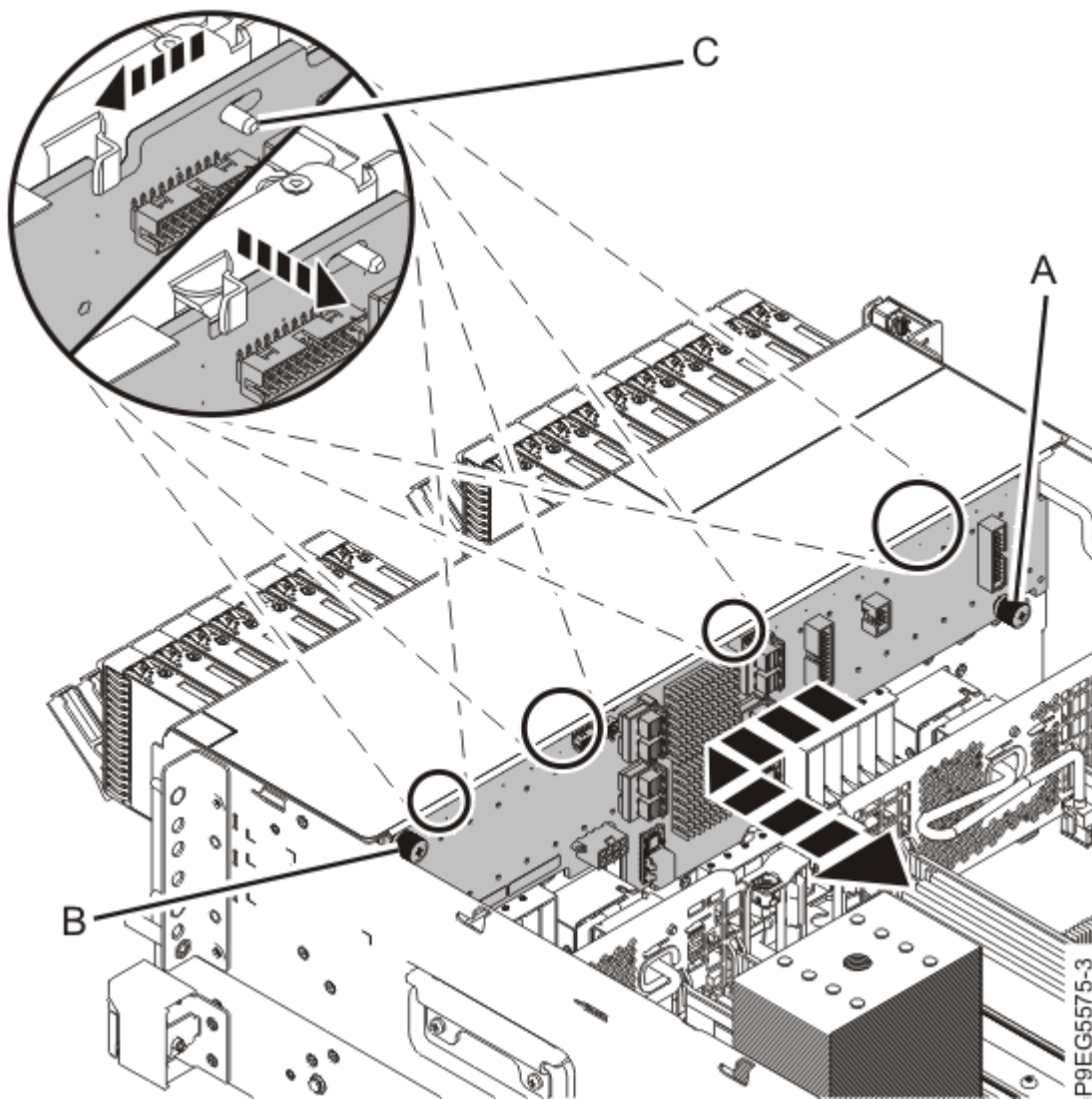


Figure 49. Removing the disk drive backplane

31. Lift the 18-drive expanded function disk drive backplane out of the chassis and place the 18-drive expanded function disk drive backplane on an appropriate ESD surface. Continue with step [“36”](#) on [page 55](#).
32. Label and disconnect the signal cable **(A)** and the power cable **(B)** from the NVMe drive backplane as shown in the following figure.
Unlatch the clips that secure the connectors to the NVMe drive backplane.

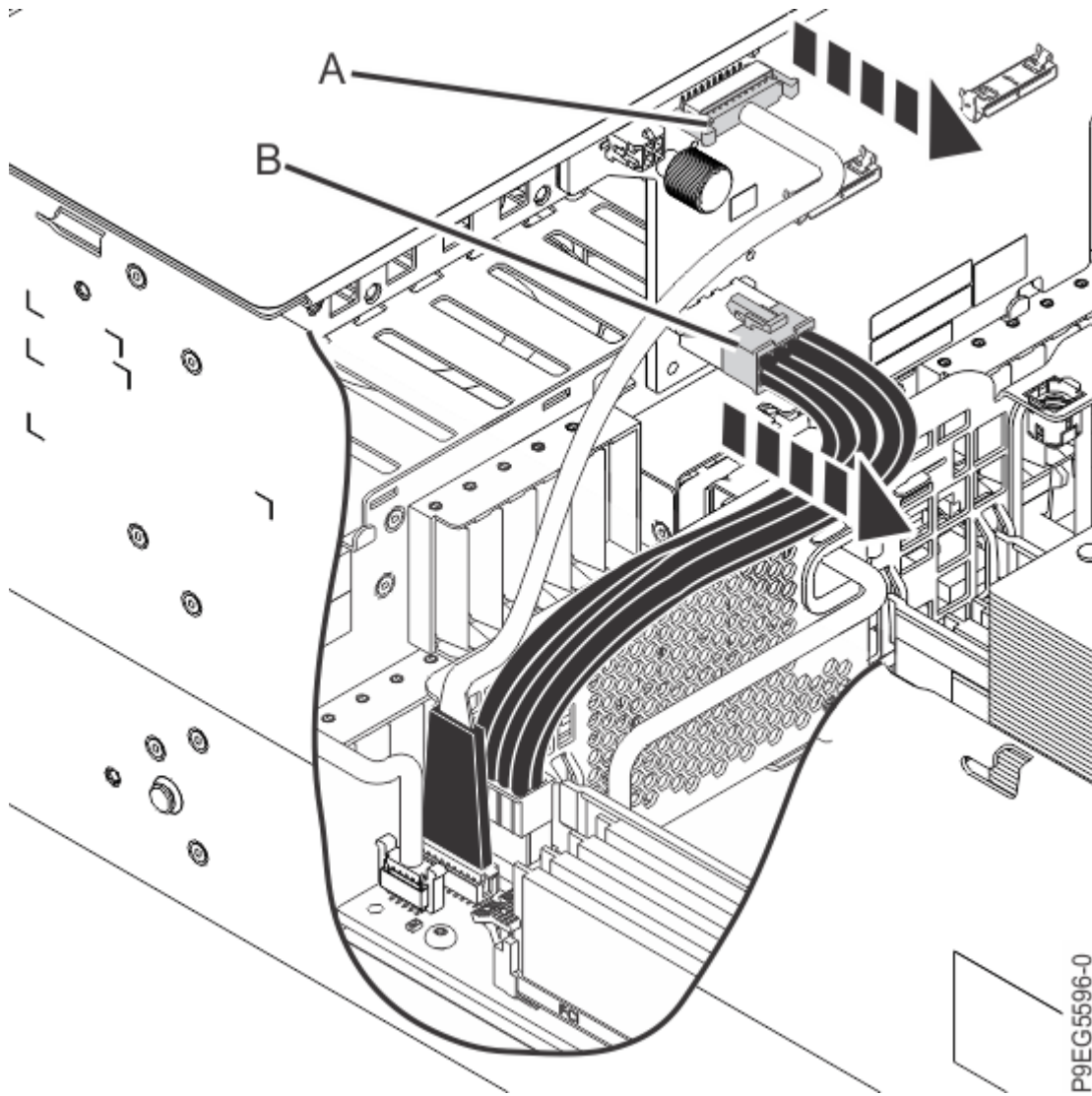


Figure 50. Disconnecting the signal cable and power cable

33. Carefully unscrew the captive thumbscrew **(A)** of the NVMe drive backplane until fully loose as shown in [Figure 51](#) on page 54.

If needed, use a Phillips screwdriver to loosen the screws.

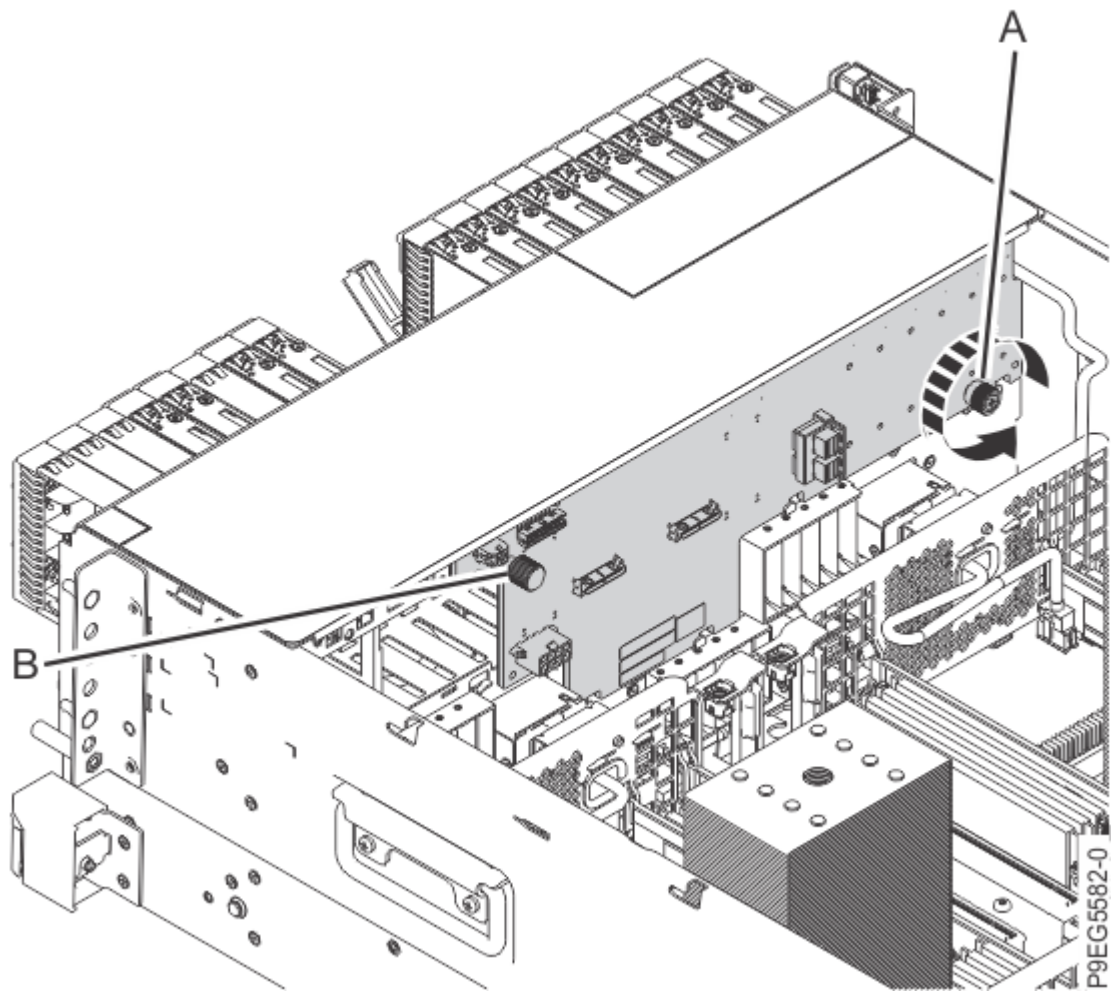


Figure 51. Loosening the NVMe drive backplane screw

34. Using the thumbscrew **(A)** and the NVMe drive backplane holder **(B)**, slide the NVMe drive backplane to the side in the direction that is shown in the following figure. Ensure that the NVMe drive backplane cutouts clear the tabs in the chassis.

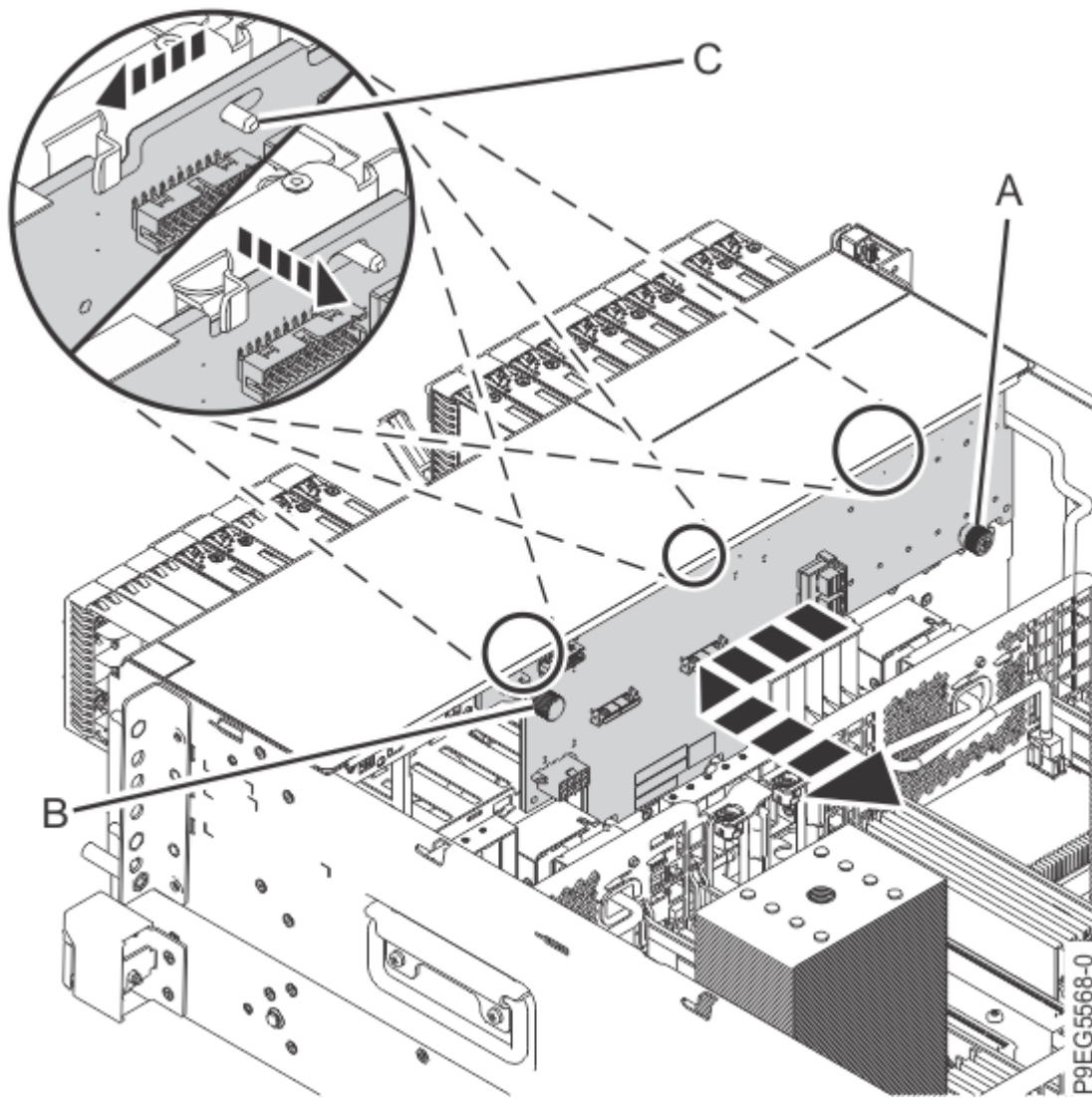


Figure 52. Removing the NVMe drive backplane

35. Lift the NVMe drive backplane out of the chassis and place the NVMe drive backplane on an appropriate ESD surface. Continue with step [“36”](#) on page 55.
36. Remove the fans enough to prevent them from interfering with the removal of the system backplane:
 - a) Put your thumb against the front of the latch, **(A)** as shown in the following figure, and put your index finger against the rear of the latch.
 - b) Push against the latch with your thumb and pull out with your index finger. This action releases the latch.
 - c) Rotate the handle in the direction shown in the following figure to unlock the fan from its slot.
 - d) After the fan unlatches, unplug but do not remove fan from its slot. Pull the fan out far enough to prevent it from interfering with the removal of the system backplane. See the following figure.
 - e) Repeat [“36.a”](#) on page 55 through [“36.d”](#) on page 55 for the other fans.

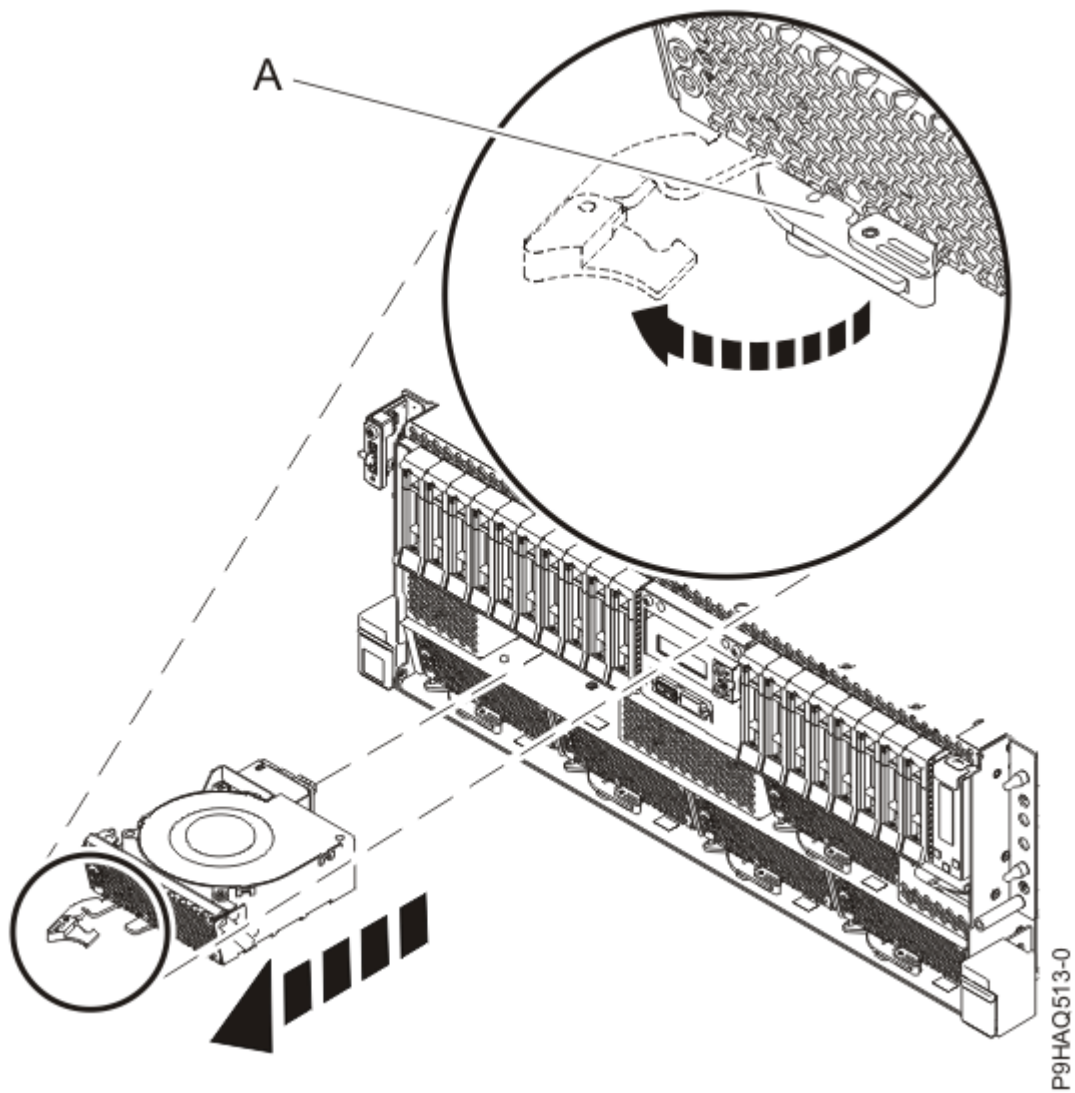


Figure 53. Removing a fan from the system

37. Disconnect the control panel cable from the system backplane:

- a) Unplug the control panel cable from the system backplane as shown in the following figure. As you face the chassis, the connector is in the left front corner. You can pull the cable from the system backplane by using the cable cover near the plug.

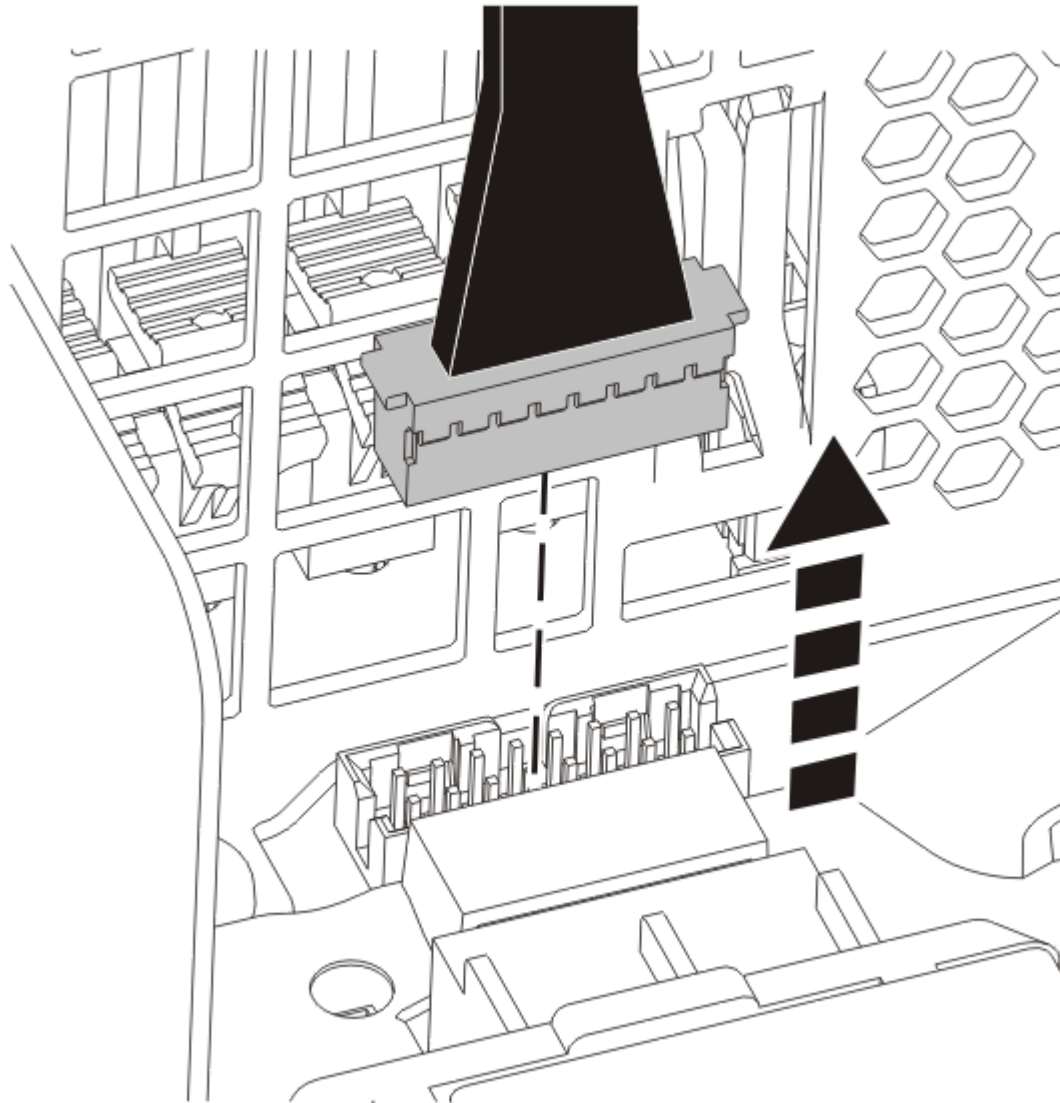


Figure 54. Disconnecting the control panel cable from the system backplane for a rack-mounted system

- b) Route the cable over the side of the system and out of the way to provide clearance for removing the backplane.
38. Disconnect the control panel display cable from the system backplane:
- a) Unplug the control panel display cable from the system backplane as shown in the following figure.

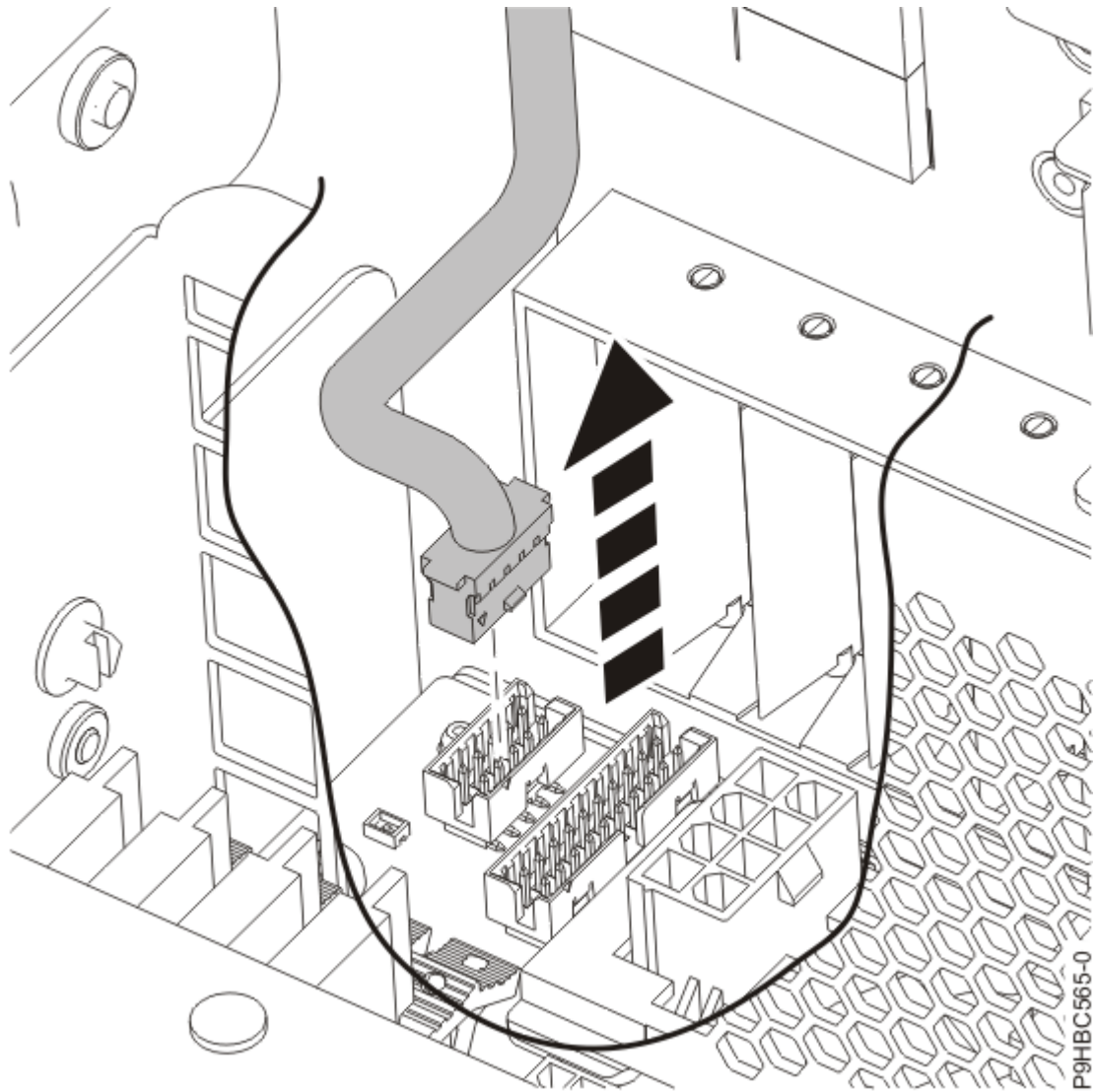
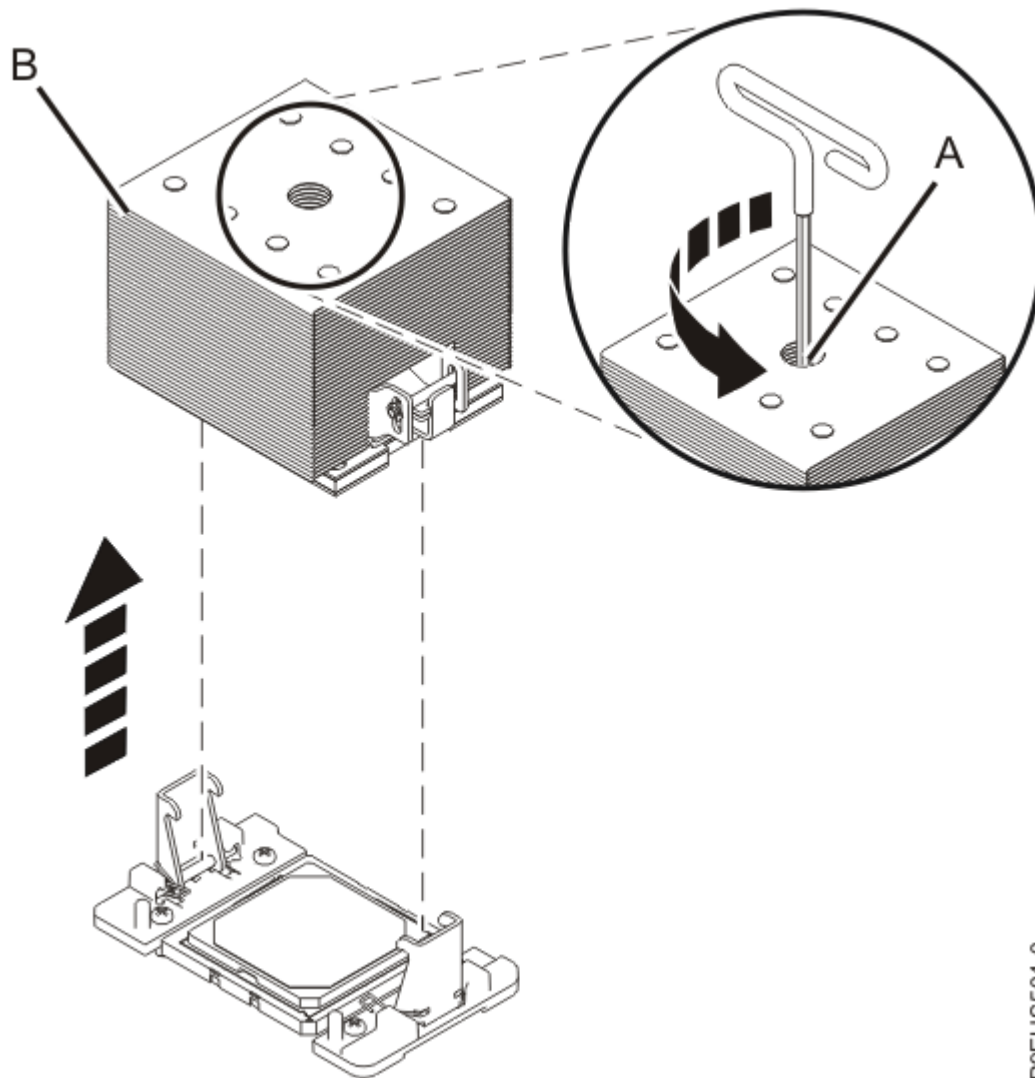


Figure 55. Disconnecting the control panel display cable from the system backplane for a rack-mounted system

- b) Route the cable over the side of the system and out of the way to provide clearance for removing the backplane.
39. Remove the heat sink from the system processor module:
- a) Loosen the heat sink actuation screw by turning the supplied hex key counterclockwise **(A)**. Loosen the screw until it moves freely. See the following figure.



P9EHS504-0

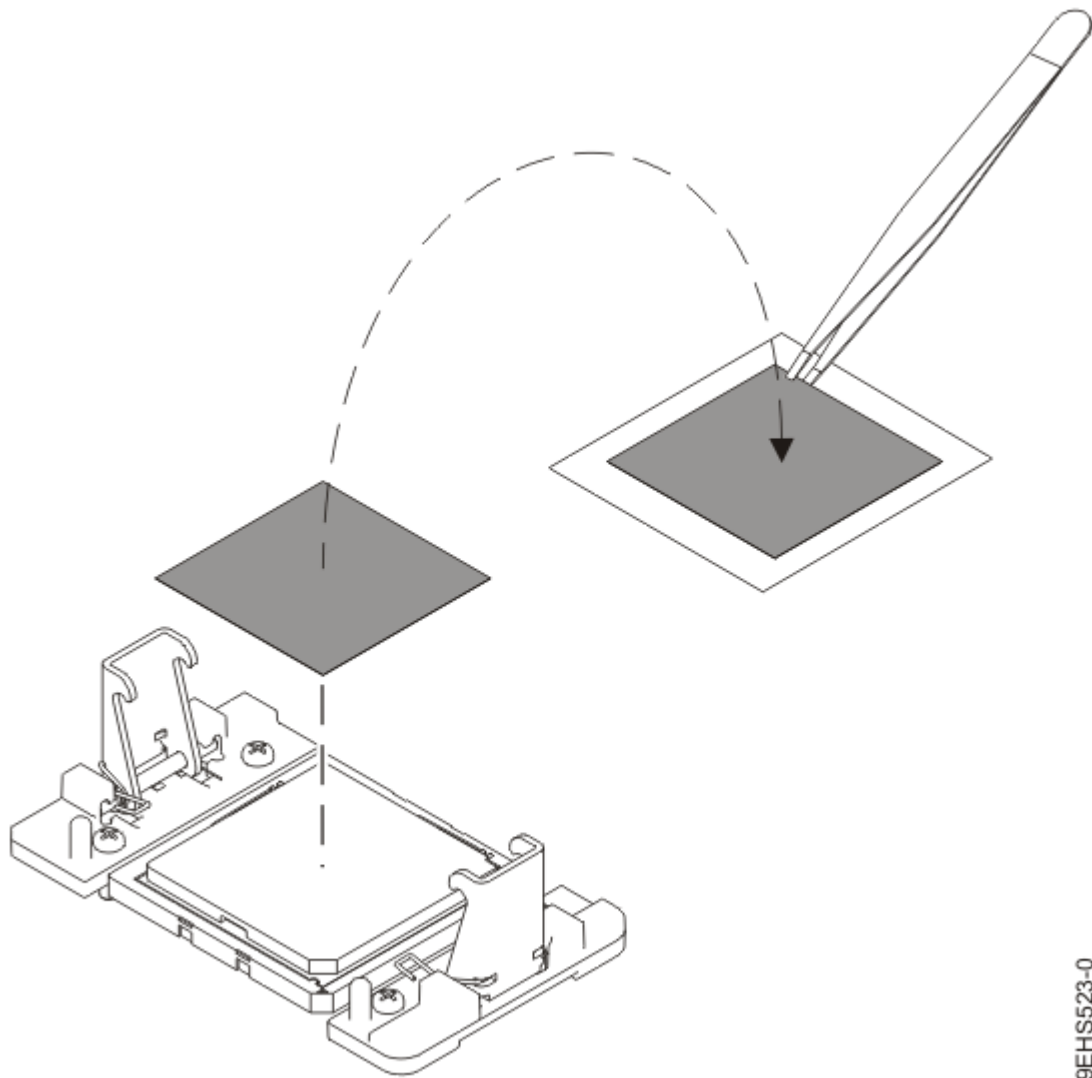
Figure 56. Removing the heat sink

- 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 upward.

Note: If you plan to remove dust or debris from the heat sink, this operation must be performed in another room that is greater than 7.6 m (24.9 ft) away from the work area.
 - c) Place the heat sink on an appropriate ESD surface.
 - d) If your system has a second system processor, repeat steps [“39.a” on page 58](#) through [“39.c” on page 59](#) to remove the other heat sink.
40. Remove the thermal interface material (TIM) from the system processor module or modules:
- a) If the system uses the gray-colored TIM: Using the tweezers, remove the gray-colored TIM from the top of the processor and place it in a clean, dry area as shown in the following figure.

The system can use two types of TIMs. One TIM is silver-colored with trimmed corners and typically adheres to the heat sink. The other TIM is dark gray with square corners and will lightly adhere. The gray-colored TIM needs to be removed before the processor is removed.

Note: The gray-colored TIM can be removed using tweezers and reused, but it is best left on the heat sink during servicing. Be careful not to damage the gray-colored TIM as it is very light and porous.



P9EHS523-0

Figure 57. Removing the TIM from the system processor module

- b) If your system has a second system processor, repeat step [“40.a” on page 59](#) to remove the other system processor module.
41. Remove the system processor module or modules:
- a) Open the packaging of the system processor module tray. Remove the tray cover and set it aside. Place the system processor module tray on a solid surface.
 - b) Ensure that the removal tool **(A)** is in the open position as shown in [Figure 58 on page 61](#). The middle pin **(B)** must be pushed down and blue tabs **(C)** must be turned inward.

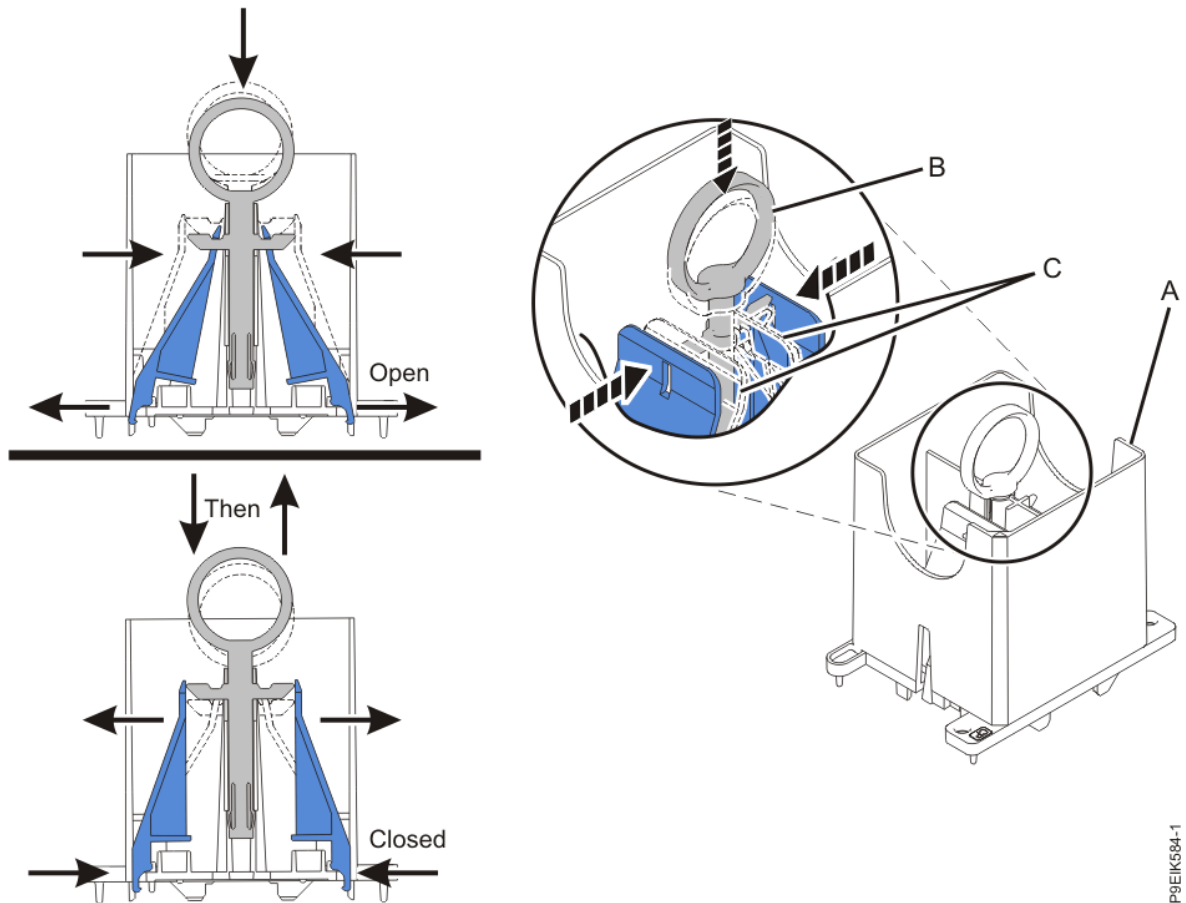


Figure 58. Ensuring the removal tool is in the open position

- c) Using the supplied removal tool, align the tool over the system processor module on the system backplane as shown in the following figure. Lower the tool over the system processor module by ensuring the two guide pins **(A)** are inserted into the alignment holes **(B)** on each side of the tool. Ensure that the chamfered edge on the tool aligns with the chamfered edge of the processor **(C)**.

P9EIK584-1

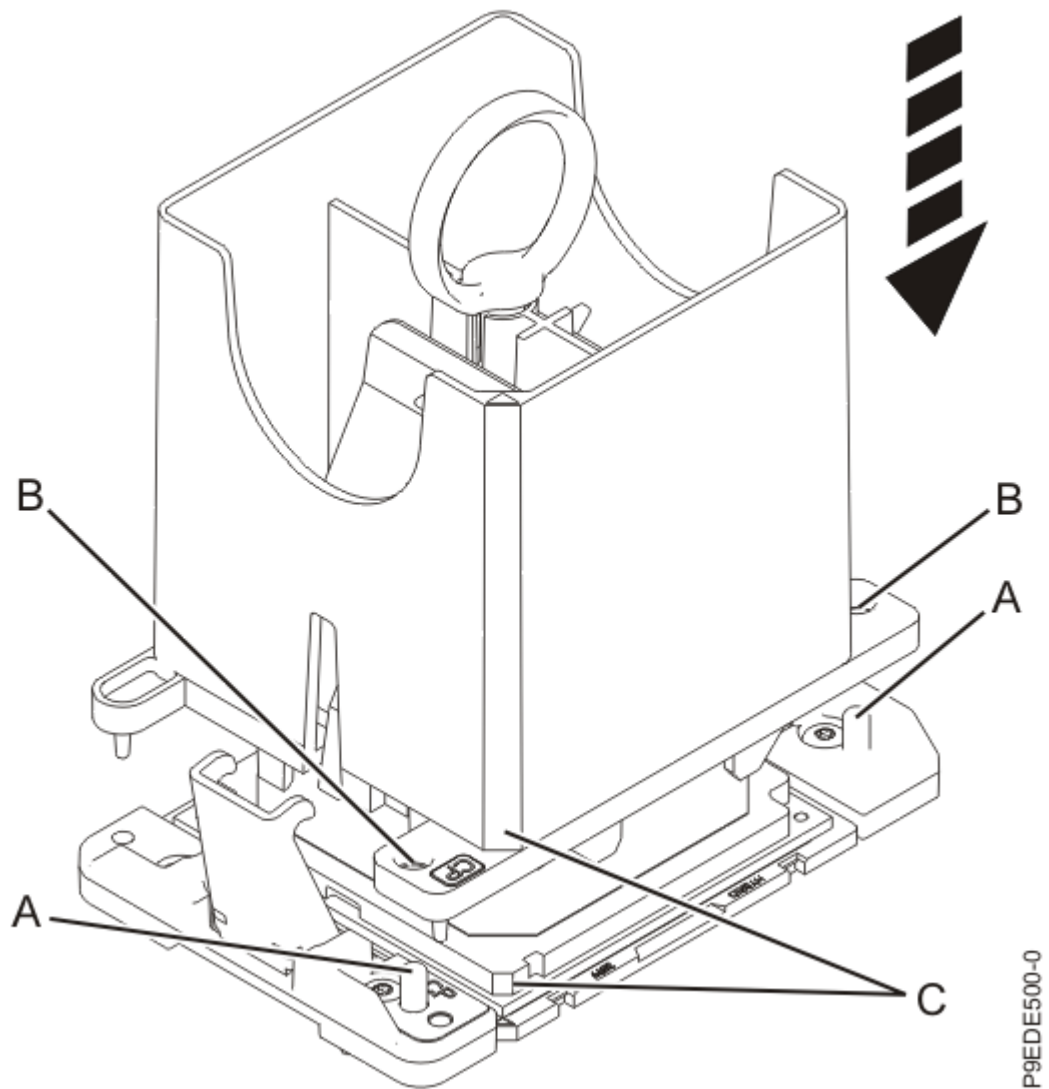
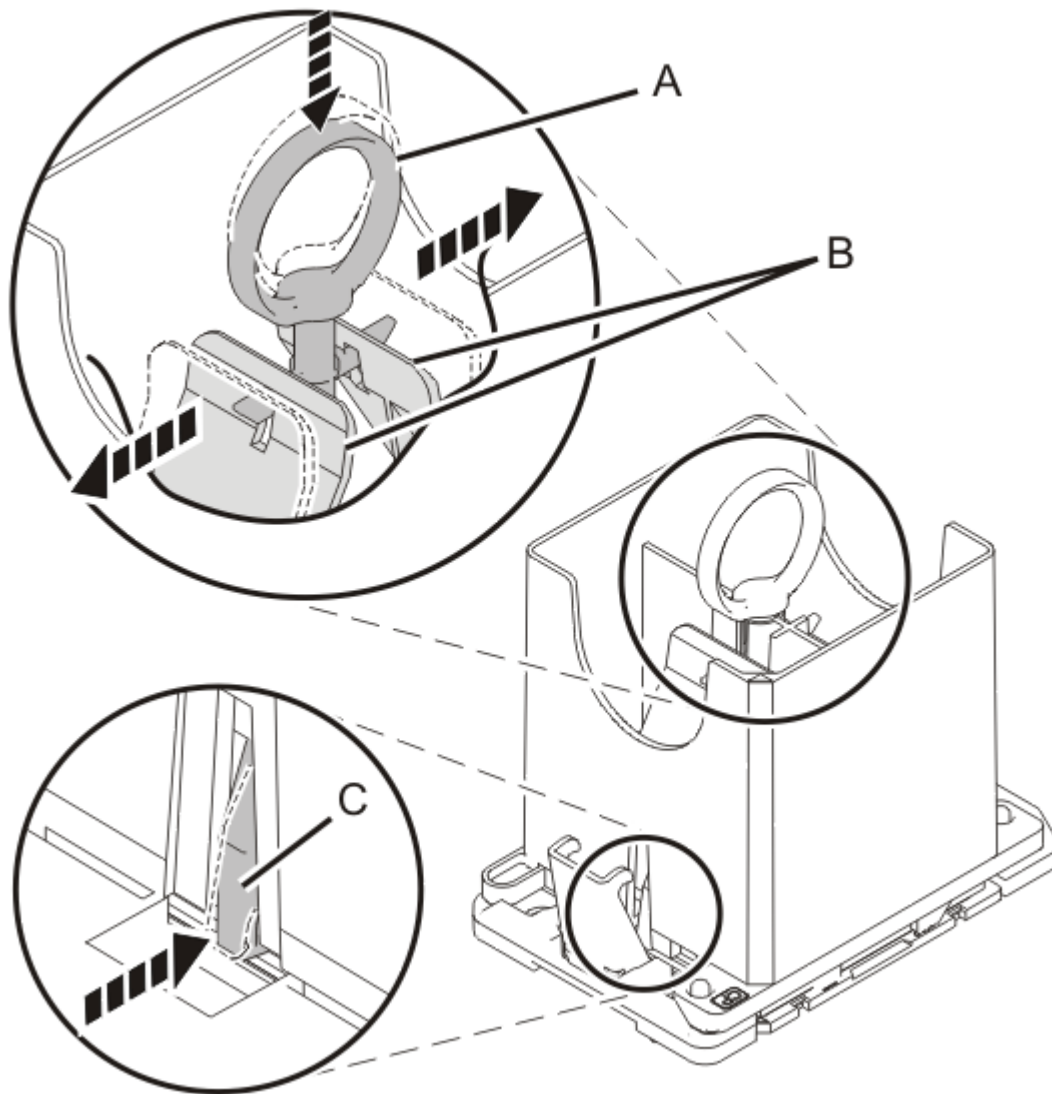


Figure 59. Lowering the removal tool onto the system processor module

- d) With the removal tool sitting on top of the system processor module, push down on the pin **(A)** slightly so that the blue tabs **(B)** snap outward and the jaws engage with the system processor module as shown in the following figure. Make sure that both of the tool jaws are locked onto the system processor module by pushing down on the tool.

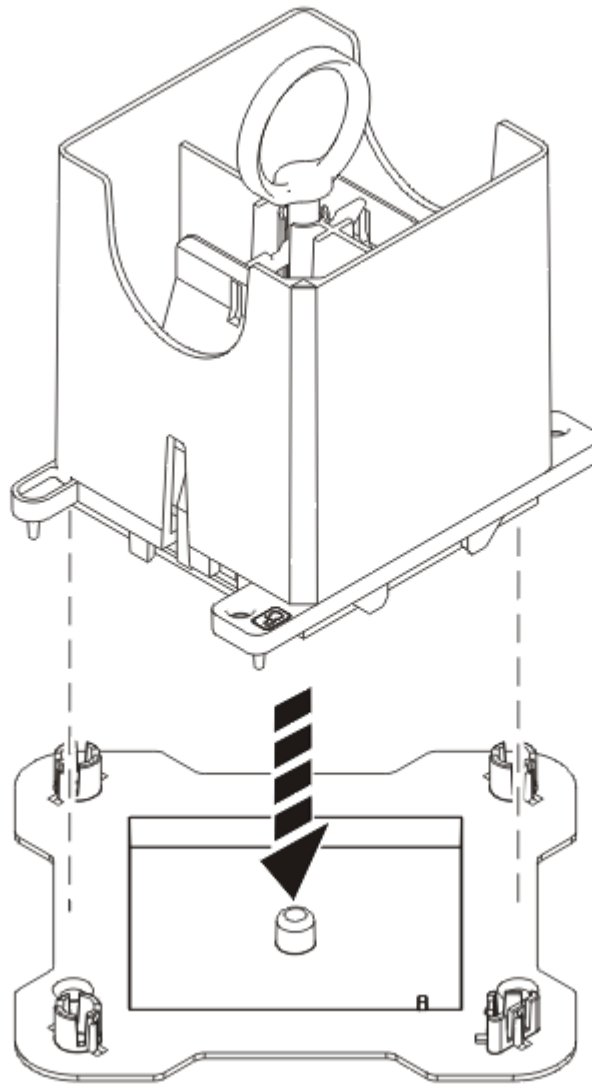
Important: Do not press the blue release tabs until directed to do so later.



P9EIK581-0

Figure 60. Locking the system processor module into the tool

- e) Hold the outside of the tool and use it to lift the system processor module from the socket. Lift the tool upward slowly to ensure that the jaws are fully engaged with the system processor module. Ensure that the system processor module does not disengage and fall back into the socket of the system processor module. If the system processor module falls back into the socket of system processor module, the pins may be damaged. Place the system processor module on the system processor module tray as shown in the following figure.



P9EIK588-0

Figure 61. Placing the tool on the system processor module tray

- f) To release the system processor module, push the pin downward. Hold the pin down while pushing the blue tabs inward. Ensure that the pin catches on the openings in the blue tabs, and that the blue tabs are locked in a fixed position. See the following figure.

Note: To prevent the system processor module from falling, pull up on the round lever before you place the tool on the system processor module tray.

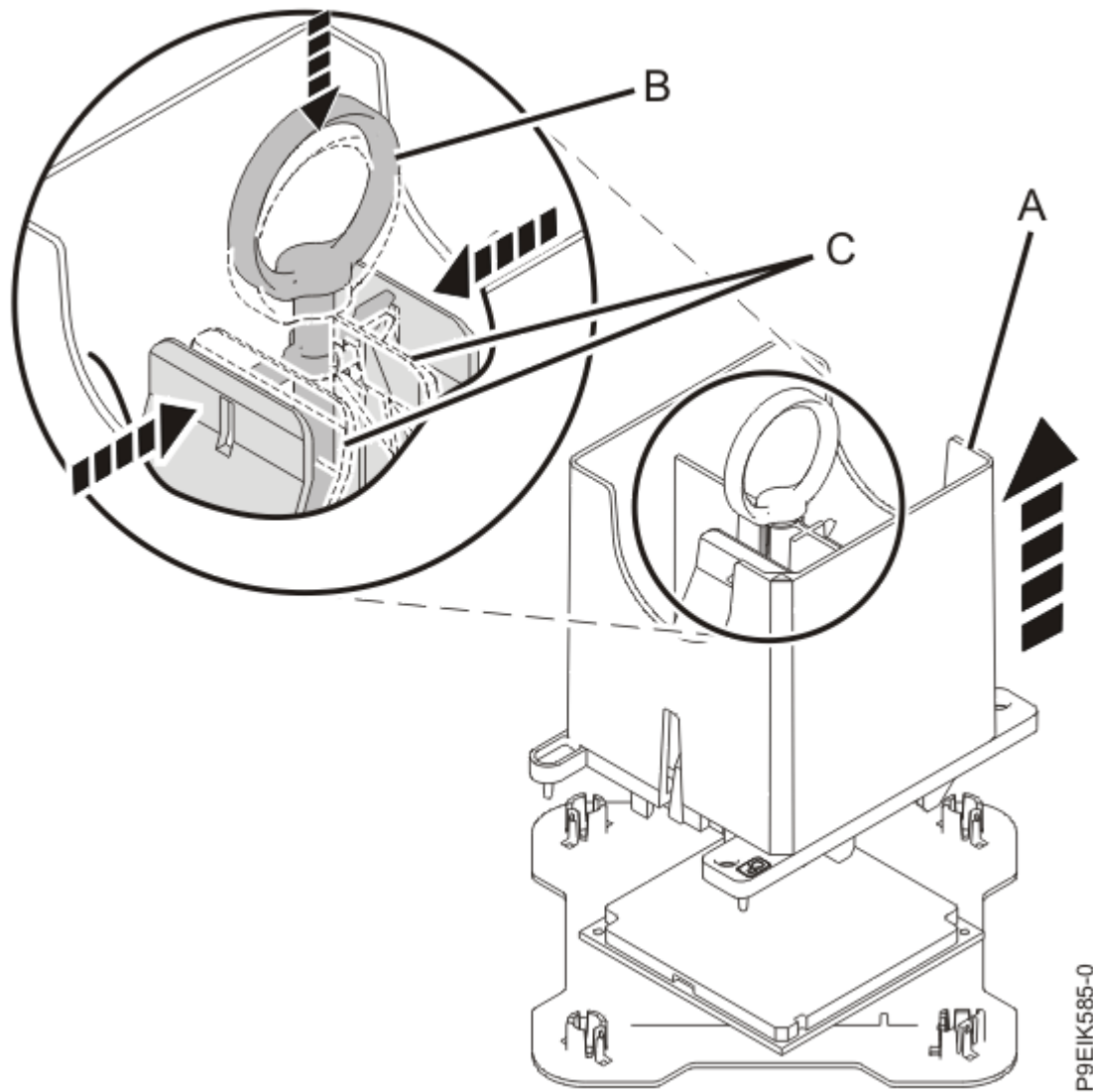


Figure 62. Releasing the system processor module from the tool

- g) Place the cover on the system processor module tray.
 - h) If your system has a second system processor module, repeat steps “41.a” on page 60 through “41.g” on page 65 to remove the other system processor module.
42. Place the socket dust covers in the system processor module sockets on the system backplane:
- a) Lower the socket dust cover over the sockets on the system backplane and ensure that the holes **(B)** on the socket dust cover align with the two guide pins **(A)** on the system backplane. Push straight down until the latches **(D)** on the socket dust cover engage with the latches **(C)** on the backplane. See the following figure.

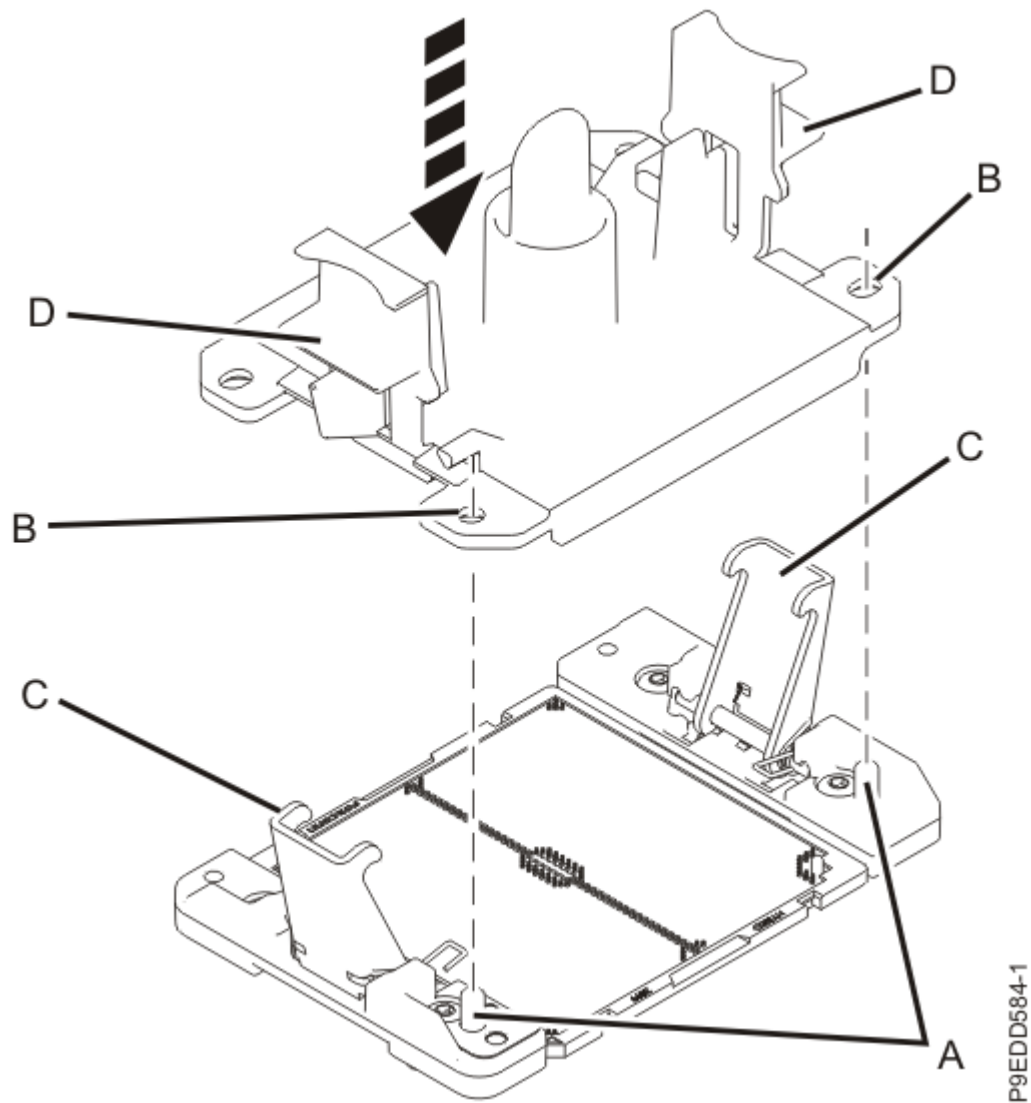


Figure 63. Placing the dust covers on the system processor module sockets on the system backplane

- b) If your system has a second system processor, repeat step “42.a” on page 65 to install the other socket dust cover.
43. Remove the fan socket from the right side of the bulkhead on the system backplane:
- a) Pull out the release pin (**A**) towards the front of the system. See the following figure.

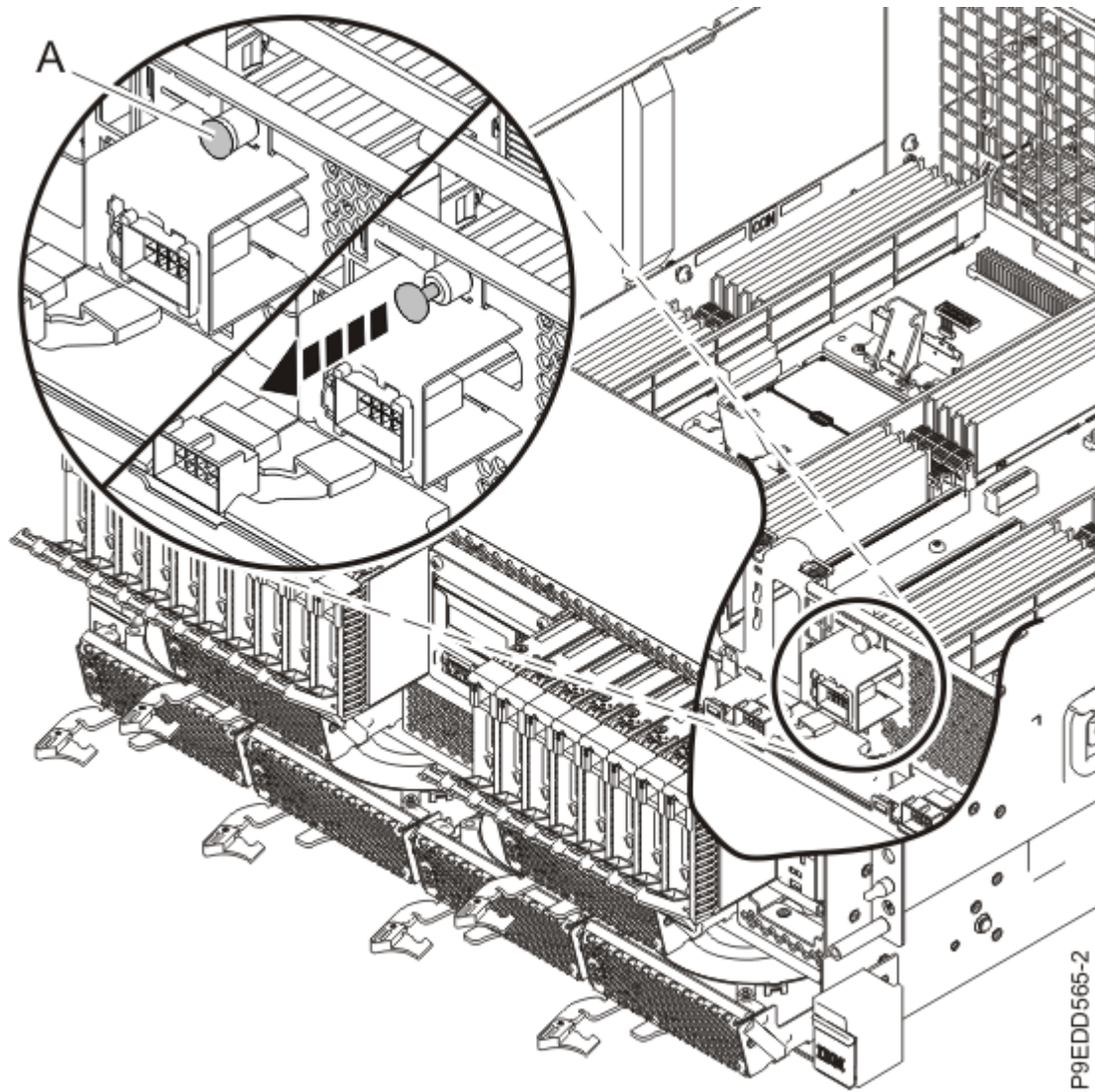


Figure 64. Releasing the fan socket from the bulkhead

b) Slide the fan socket to the side to release it from the bulkhead. See the following figure.

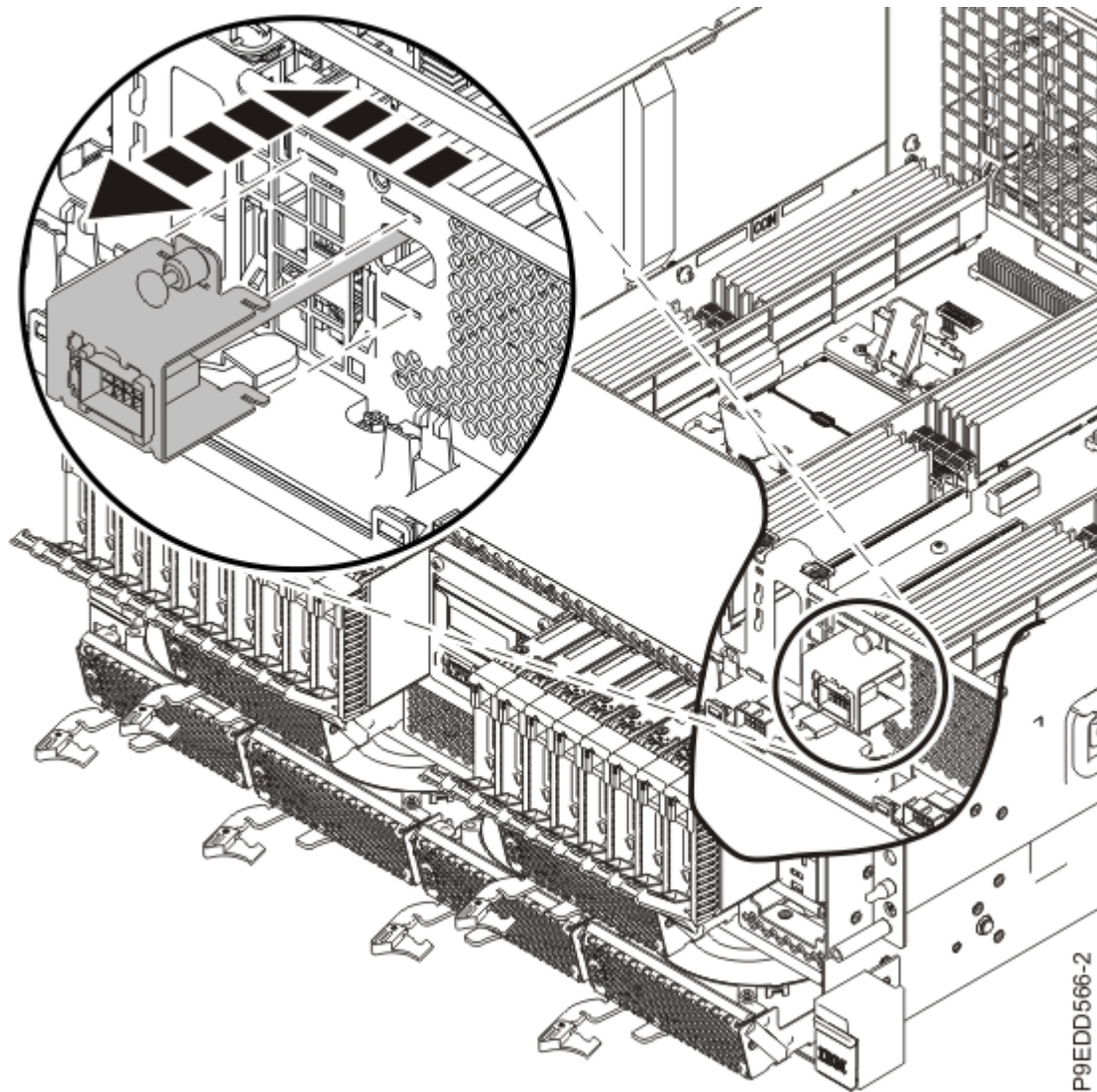


Figure 65. Removing the fan socket from the bulkhead

44. Remove the system backplane:

Notes:

- You might find it helpful to use a magnetic screwdriver.
- Do not remove the silver Torx screws.
- a) Using a Phillips screwdriver, unscrew and remove the screw that is underneath the fan socket.
- b) Using a Phillips screwdriver, unscrew and remove the remaining three black screws **(A)** that mount the backplane to the chassis. See the following figure.

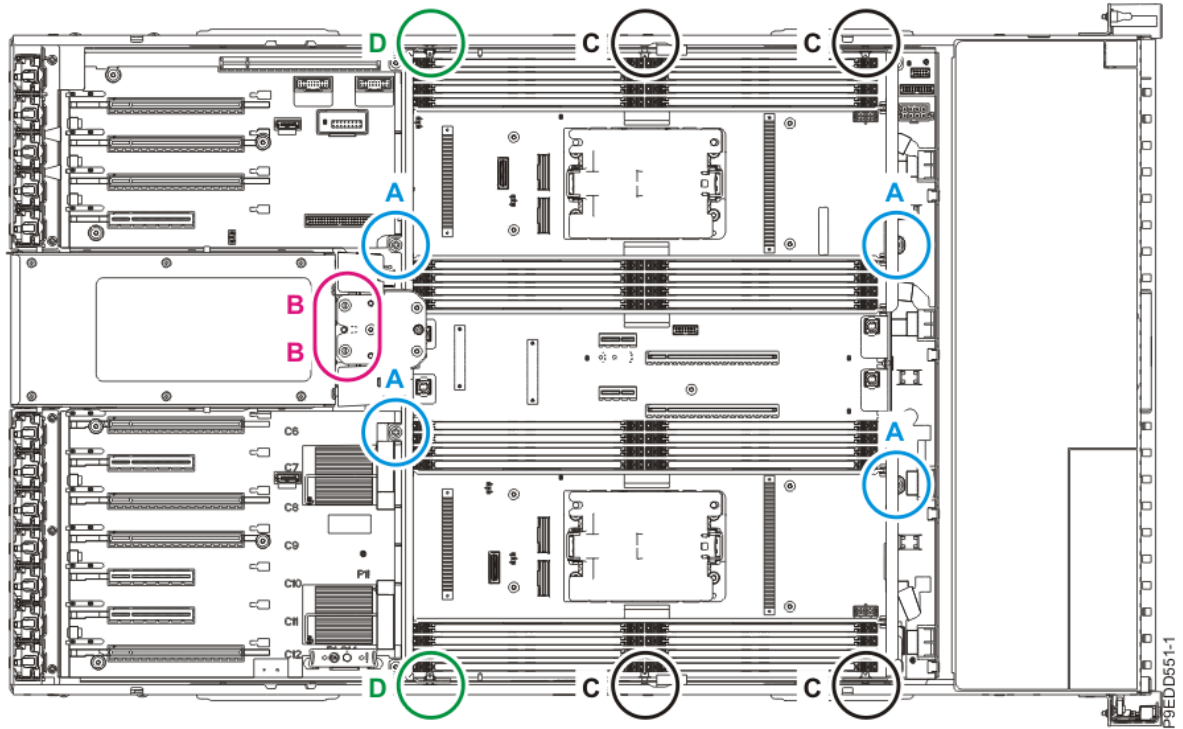
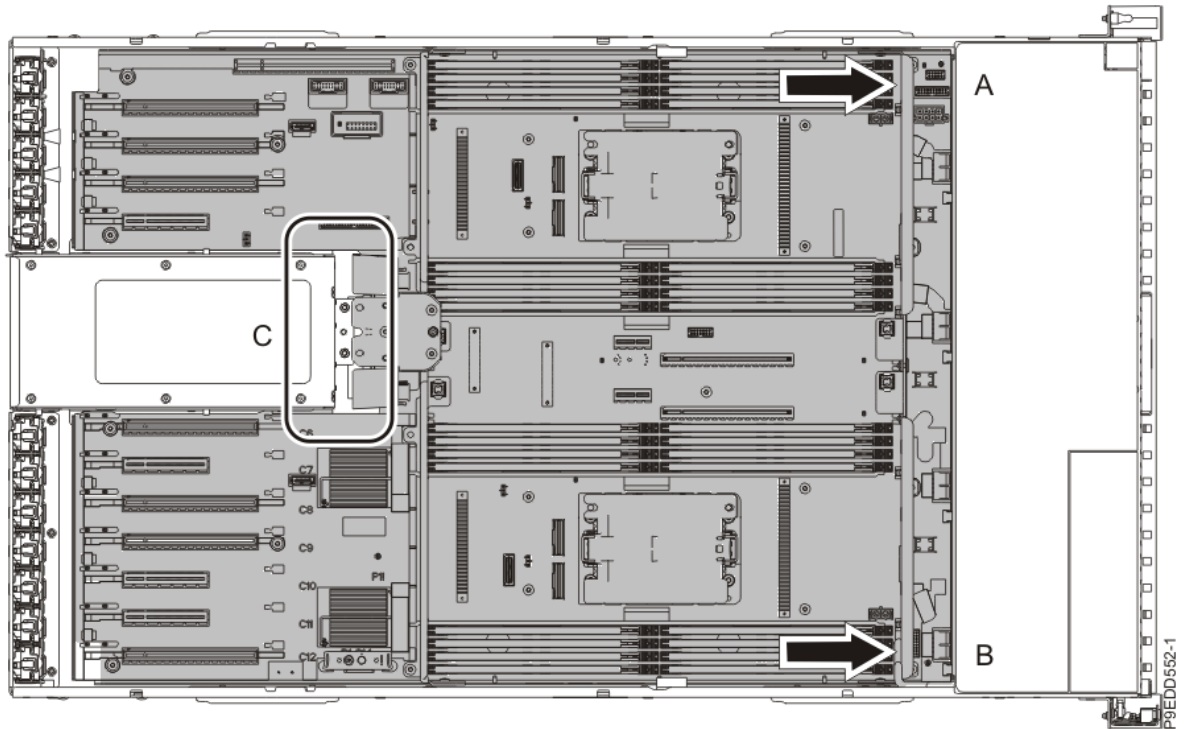


Figure 66. System backplane screw locations

- c) Using a Phillips screwdriver, unscrew and remove the two screws **(B)** that attach the backplane to the power supply cage. See the following figure.
- d) Using a Phillips screwdriver, unscrew and remove the four screws **(C)** that attach the backplane to the sides of the system chassis. See the following figure.
- e) Using a Phillips screwdriver, unscrew and remove the remaining four screws **(D)**, which are aligned vertically, that attach the backplane to the sides of the system chassis. See the following figure.
- f) After you remove the screws, place your fingers in positions **(A)** and **(B)** and slide the system backplane slightly toward the front of the system as shown in the following figure.

Note: Slide the system backplane carefully. There is just enough space for the power connectors to clear the flange on the power supply cage **(C)**.

Figure 67. Preparing the system backplane for removal



g) Grasp the system backplane by positions **(A)** and **(B)** on the front and middle metal bulkheads and lift up until the pins disengage from the bottom of the chassis. See the following figure.

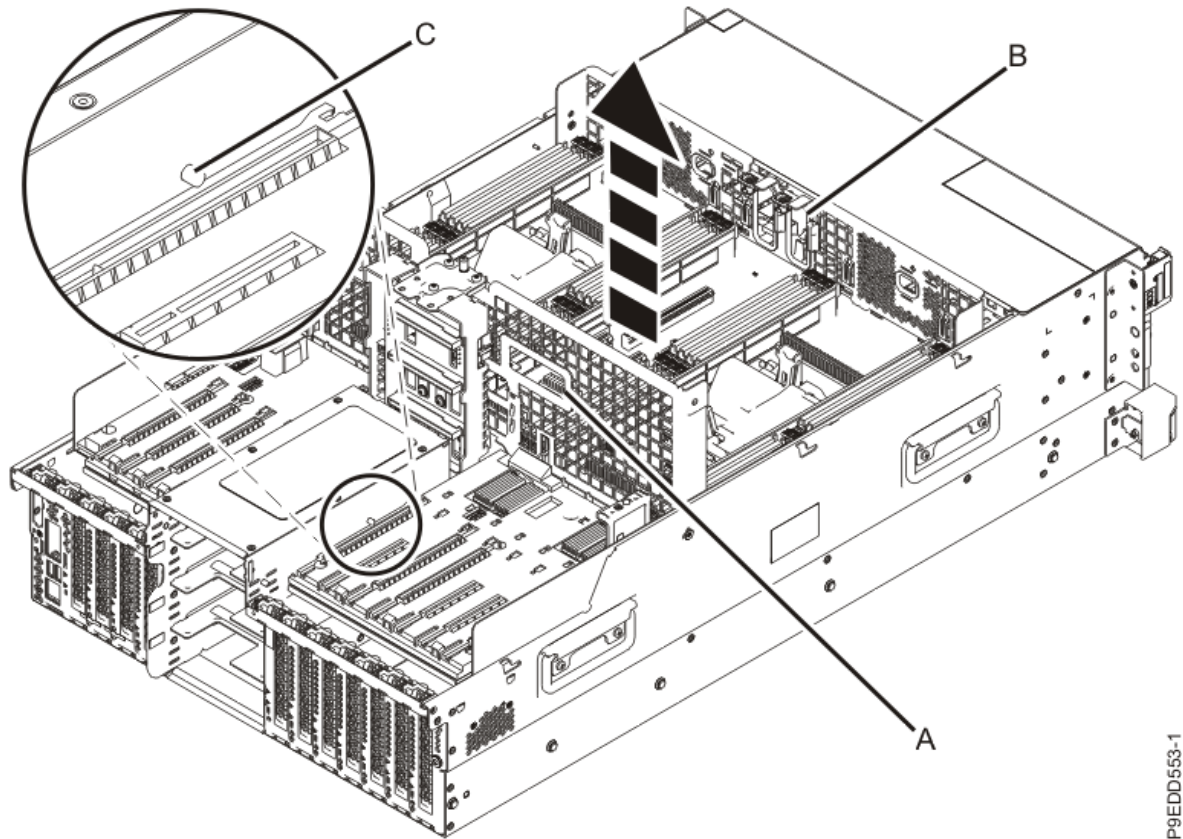
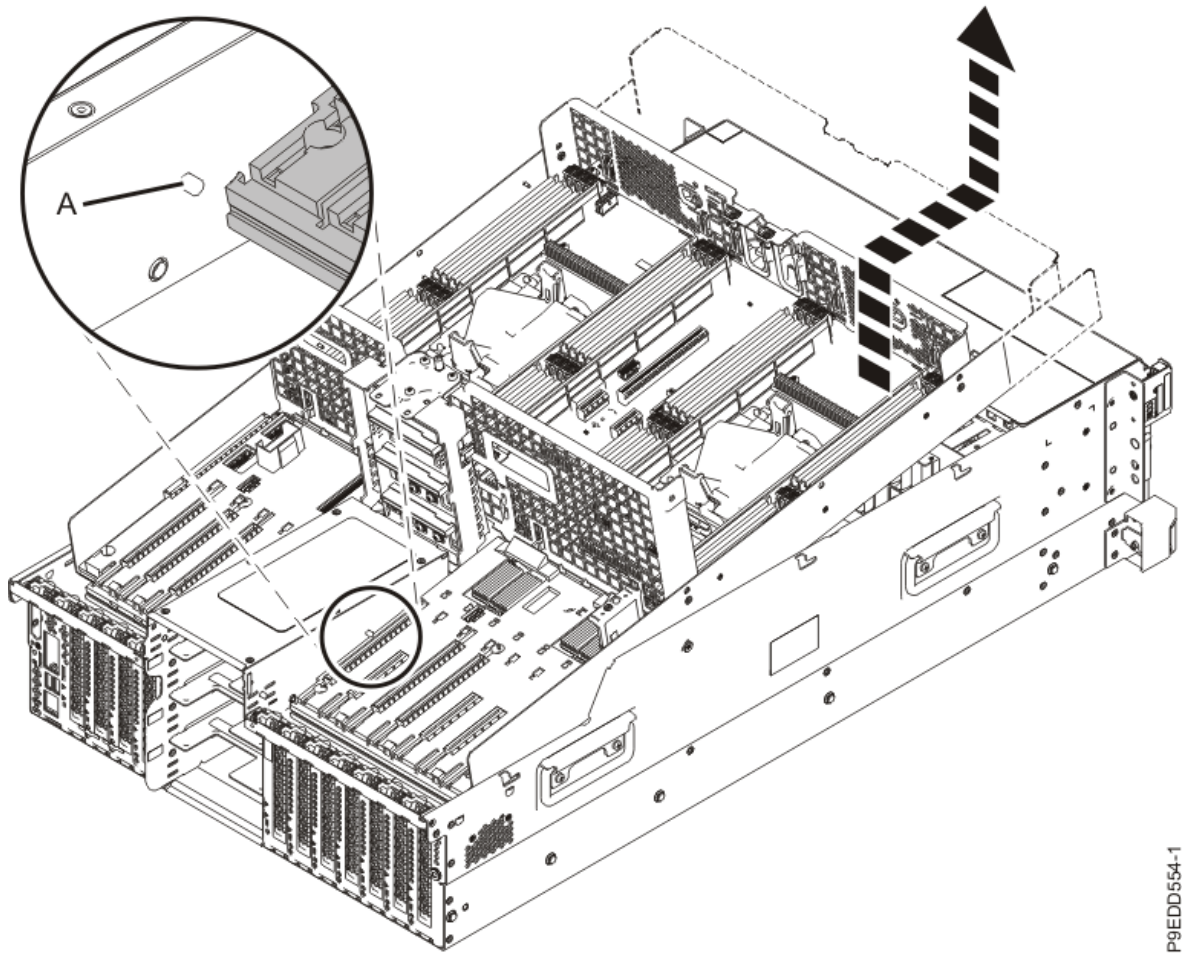


Figure 68. Grasping the system backplane and disengaging the pins

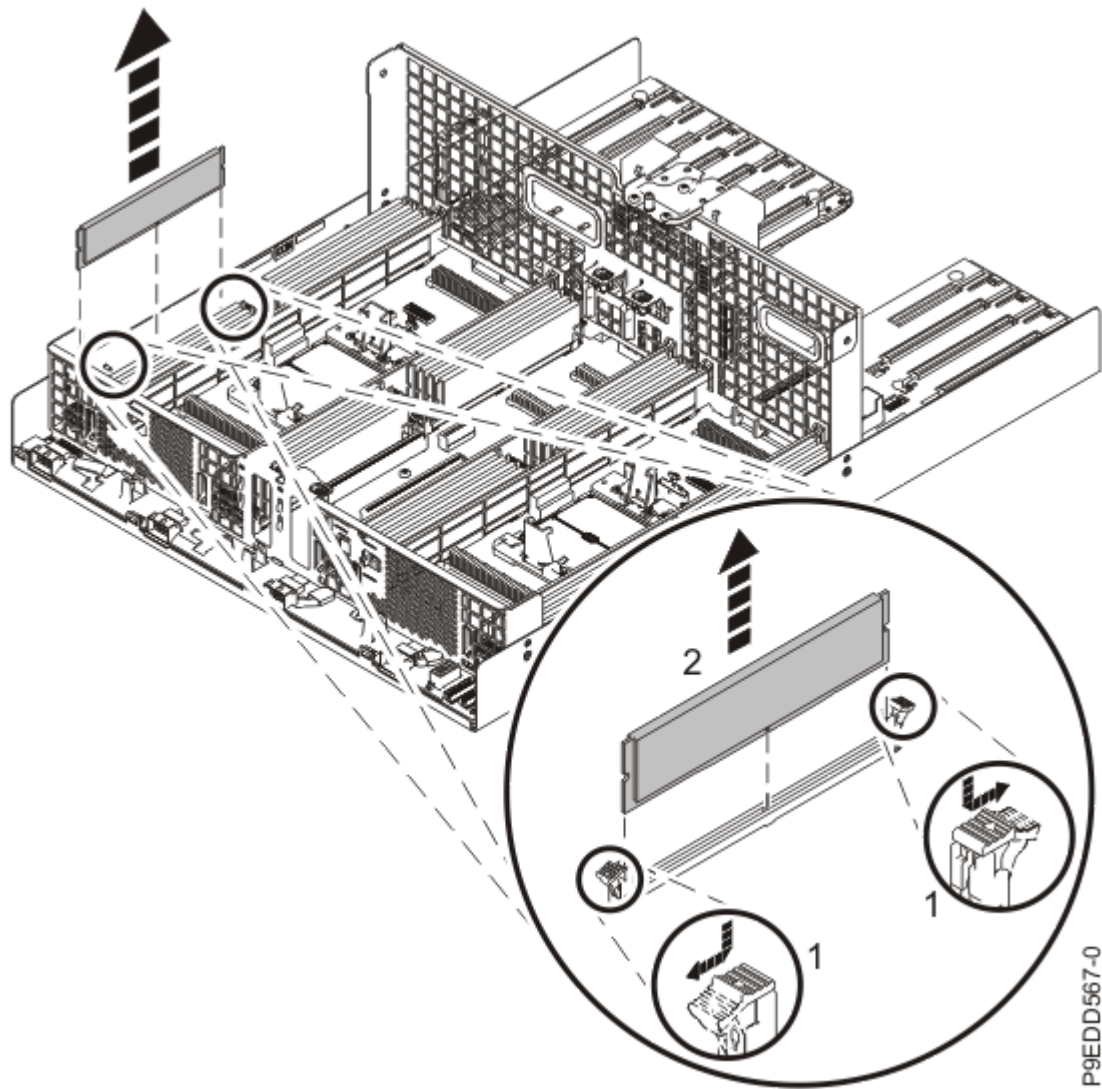
h) Tilt the system backplane so that the front end is high and the back end is low as you continue to lift the system backplane out of the chassis. When the system backplane catches on the pins **(A)** on the power supply cage, slide the system backplane forward until it clear the pins. Then, lift the system backplane completely out of the system. See the following figure.



P9EDD554-1

Figure 69. Lifting the system backplane out of the system

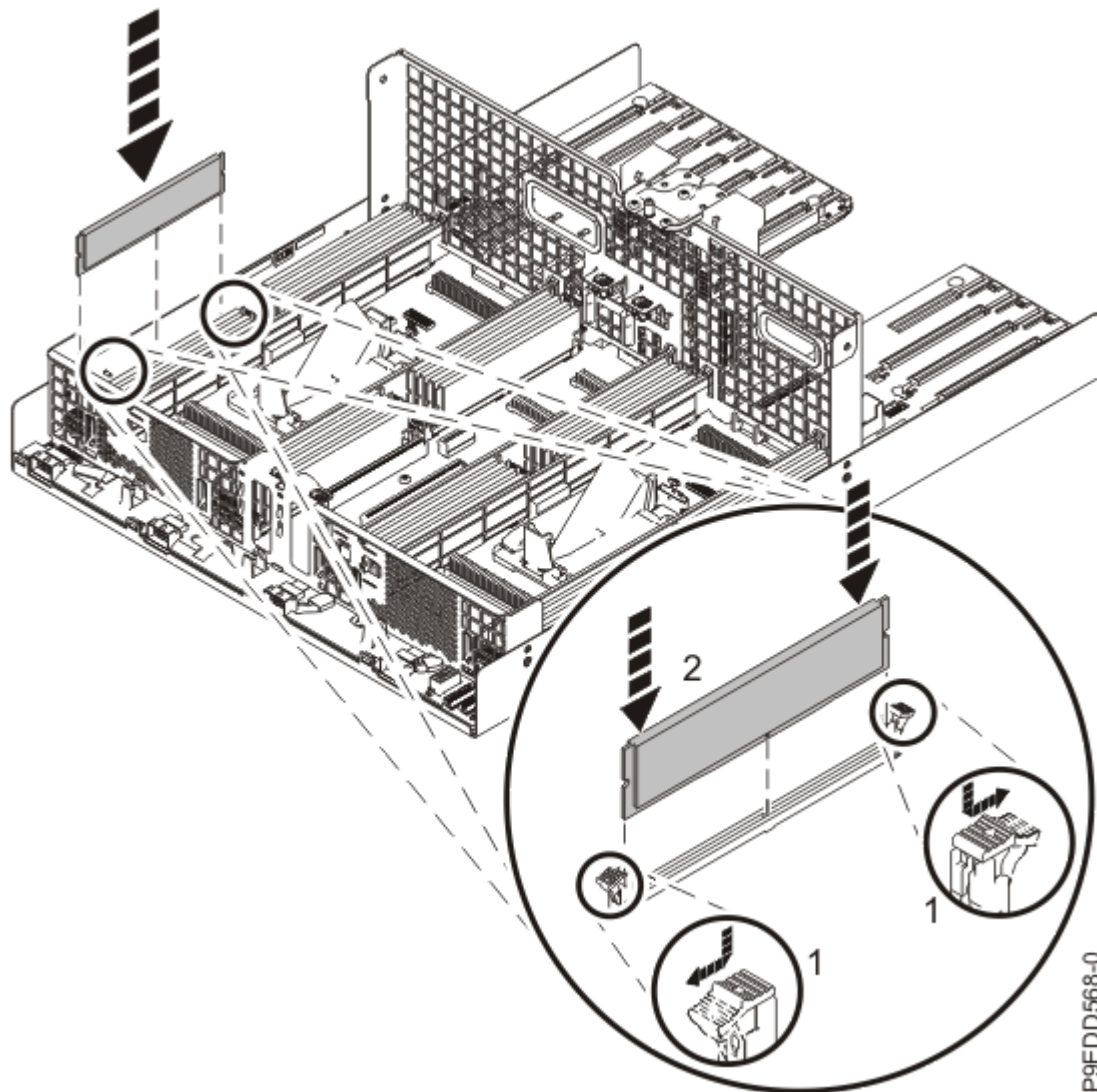
- i) Place the system backplane on an appropriate ESD surface.
45. Replace the fan socket on the right side of the bulkhead on the system backplane you just removed:
- a) Insert the socket tabs into the bulkhead.
 - b) Slide the socket to the side to fasten it to the bulkhead.
 - c) Ensure that the pin clicks into place to secure the socket to the bulkhead.
46. Set the new system backplane on the ESD surface next to the system backplane you just removed.
47. Remove the fan socket from the right side of the bulkhead on the new system backplane:
- a) Pull out the release pin towards the front of the system.
 - b) Slide the fan socket to the side to release it from the bulkhead.
48. Transfer the memory modules and fillers to the new system backplane:
- a) Unlock a memory module or filler from its connector by pushing the locking tabs away from the module in the direction that is shown in the following figure.
- The lever action of the tabs pushes the memory module or filler out of the connector. If you find it difficult to open the tabs with your fingers, you may use the tips of ball point pens or the eraser ends of pencils to open the tabs. The levers must be opened simultaneously, so that the memory module lifts straight up.



P9EDD567-0

Figure 70. Removing a memory module or filler

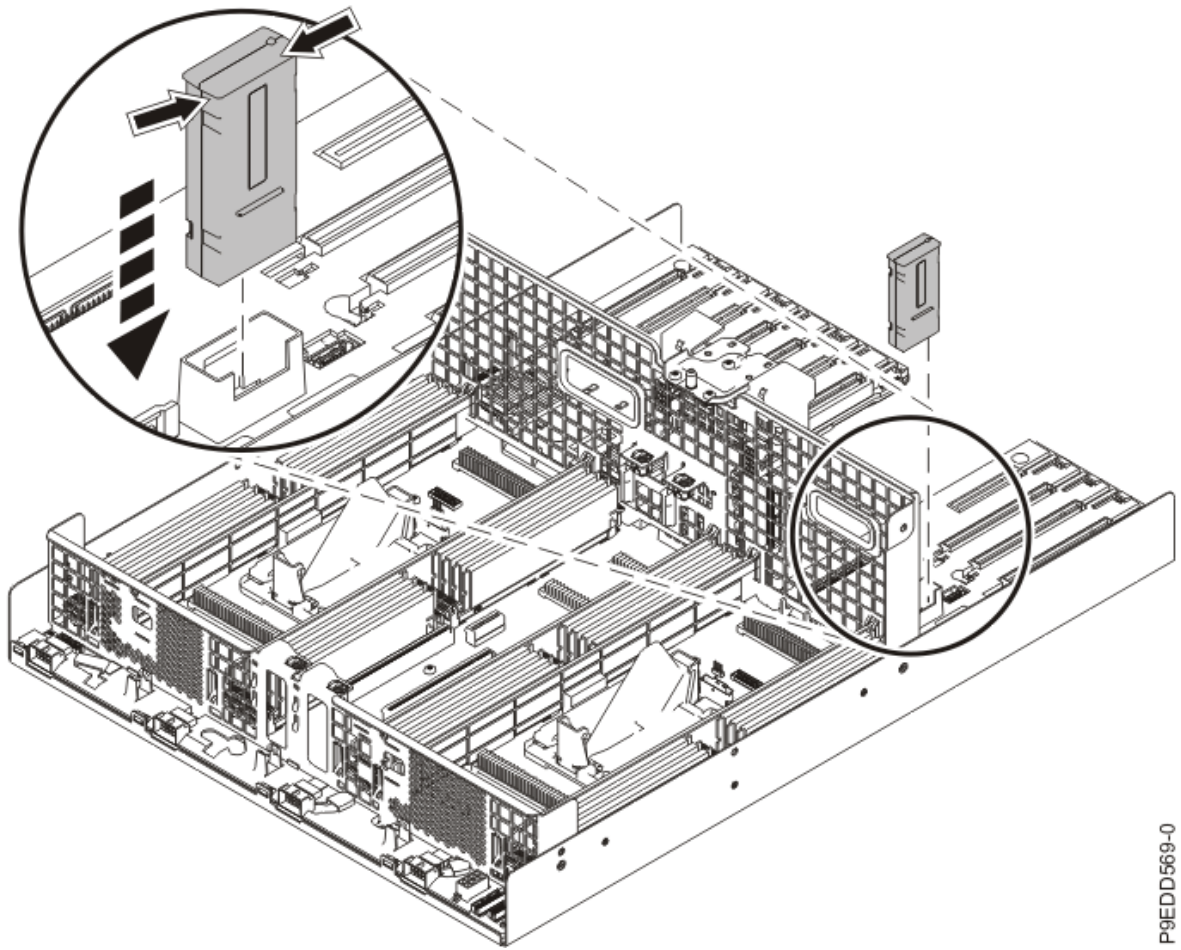
- b) Hold the memory module or filler by the edges and pull it out of the system. Note the location from which you are removing the memory module.
- c) Identify the corresponding location on the new system backplane and ensure that the locking tabs are open. See the following figure.



P9EDD568-0

Figure 71. Replacing a memory module or filler

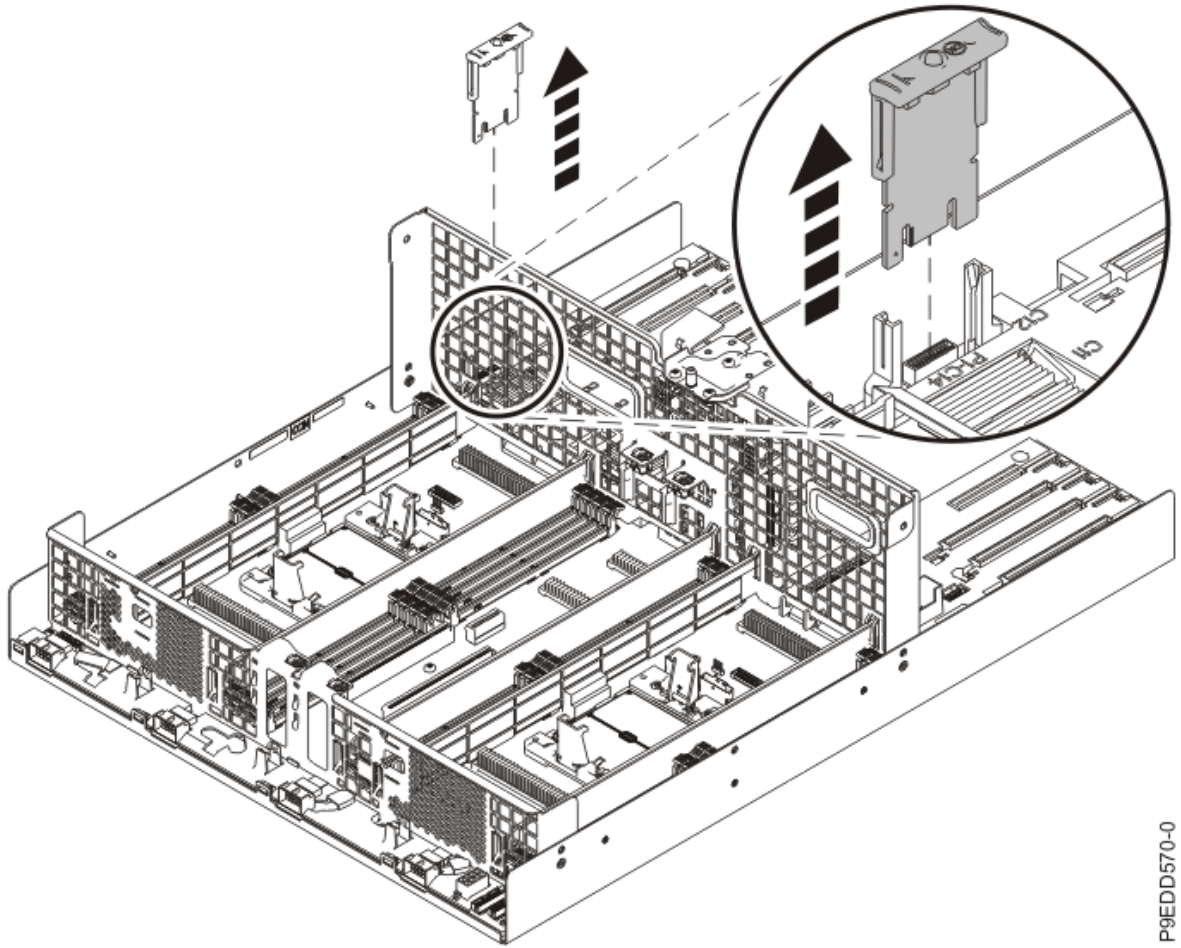
- d) Press the memory module or filler straight down, firmly into the slot, until the locking tabs lock into place.
 - e) Repeat [“48.a” on page 71](#) through [“48.d” on page 73](#) for the remaining memory modules and fillers.
49. Install the vital product data card in the new system backplane:
- a) Align the VPD card in its slot in location P1-C13 on the new system backplane as shown in the following figure.



P9EDD569-0

Figure 72. Replacing the VPD card

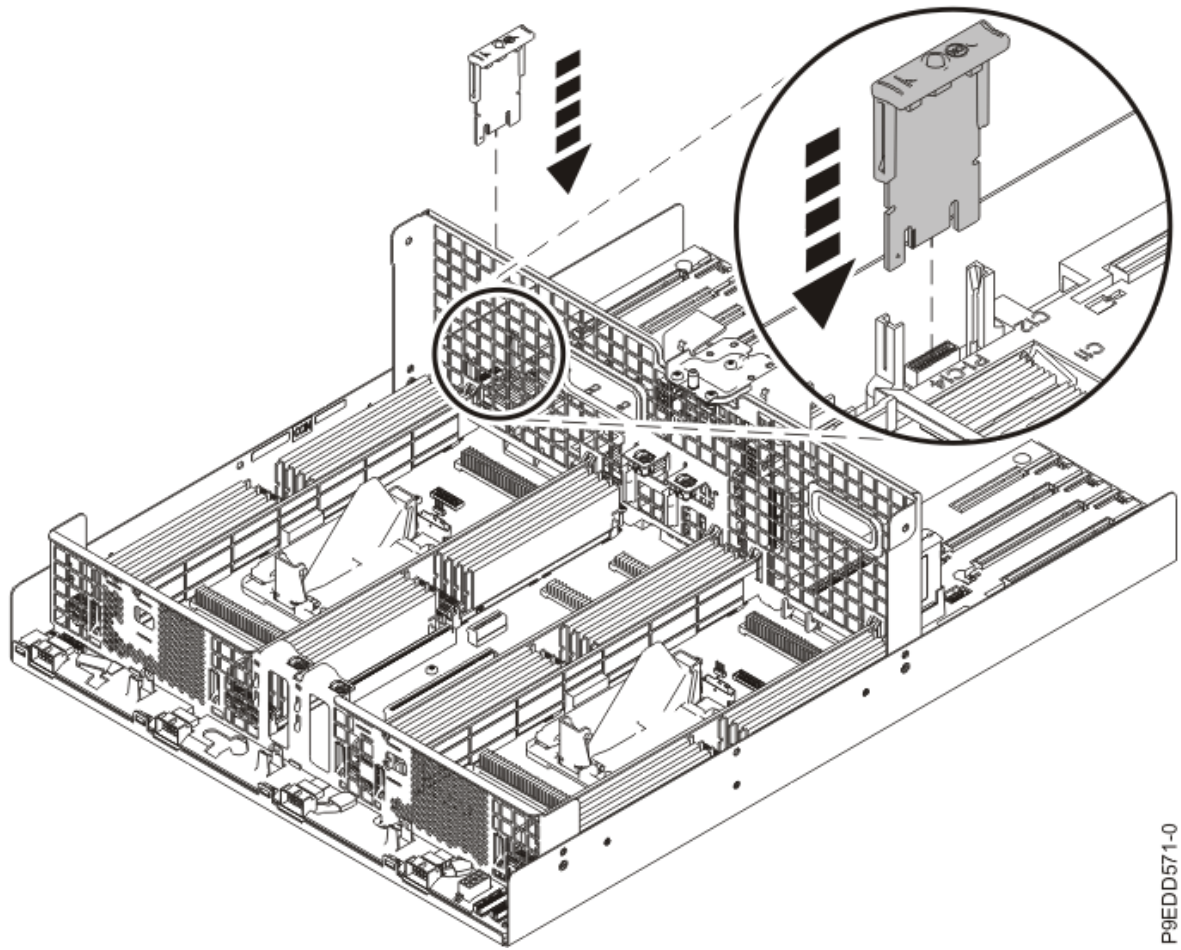
- b) Push the VPD card into place until it is fully seated in the new system backplane.
50. Install the trusted platform module card in the new system backplane:
- a) Grasp the TPM card by the plastic housing as shown in the following figure.
 - b) Pull the TPM card out of its slot in location P1-C14 on the system backplane.



P9EDD570-0

Figure 73. Removing the TPM card

- c) Insert the TPM card into its slot in location P1-C14 on the new system backplane as shown in the following figure.



P9EDD571-0

Figure 74. Replacing the TPM card

d) Push the TPM card into place until it is fully seated in the new system backplane.

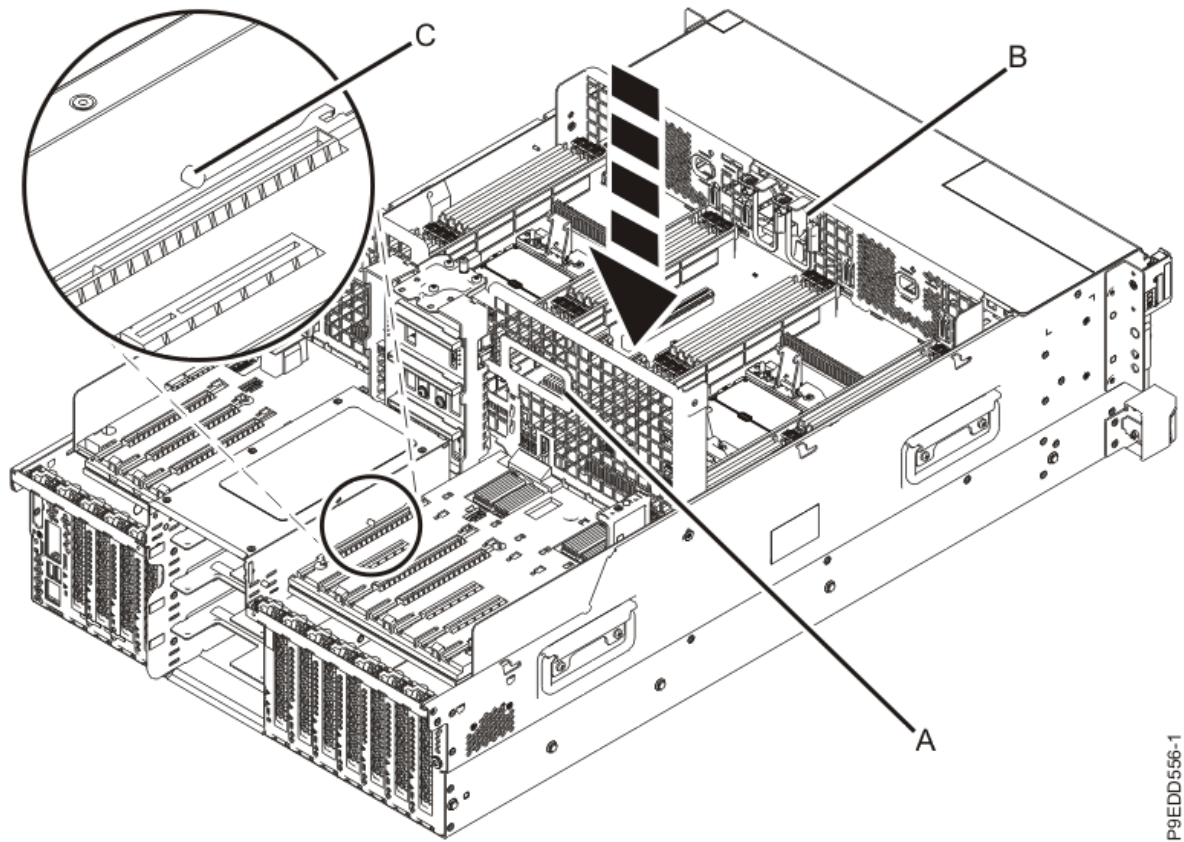
Replacing the system backplane in the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S

Follow these steps to replace the system backplane.

About this task

Procedure

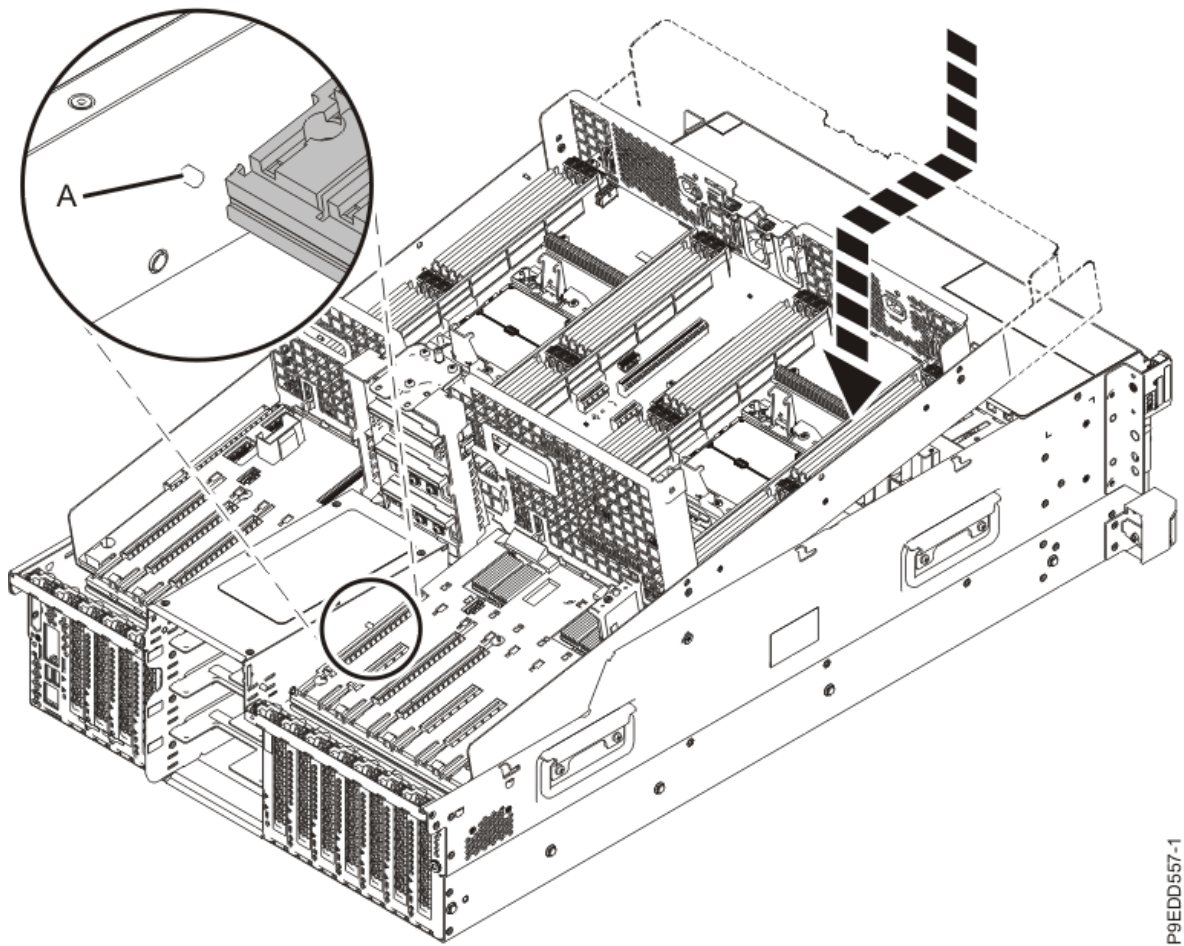
1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. Install the replacement system backplane.
 - a) Grasp the replacement system backplane by positions **(A)** and **(B)** on the front and middle metal bulkheads and begin lowering the backplane into the chassis. As you lower the backplane, be careful not to hit the pins **(C)** on the power supply cage. See the following image.



P9EDD556-1

Figure 75. Grasping the system backplane and lowering it into the chassis

- b) Tilt the backplane so that the front end is high and the back end is low as you continue to lower the backplane into the chassis. When the system backplane catches on the pins **(A)** on the power supply cage, lower the front end enough so that it clears the pins. See the following image.



P9EDD557-1

Figure 76. Tilting and lowering the system backplane into the chassis

- c) Continue lowering the backplane into the chassis until the pins engage.
- d) Place your fingers in positions **(A)** and **(B)** and slide the system backplane slightly toward the rear of the system as shown in the following image.

Note: Slide the system backplane carefully. There is just enough space for the power connectors to clear the flange on the power supply cage **(C)**.

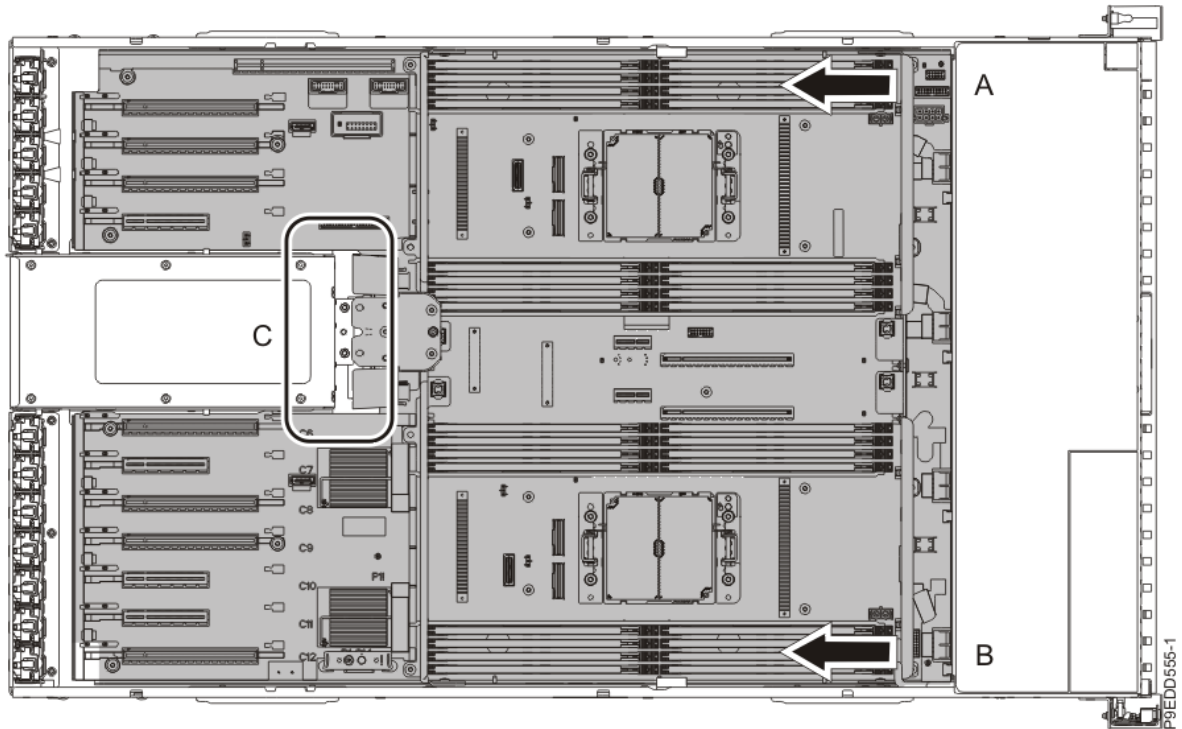


Figure 77. Sliding the backplane towards the rear of the system

- e) Using a Phillips screwdriver, replace and screw in the four screws **(D)** that are vertically aligned and that attach the backplane to the sides of the system chassis. See the following image.

Notes:

- You might find it helpful to use a magnetic screwdriver.
- Do not remove the silver Torx screws.

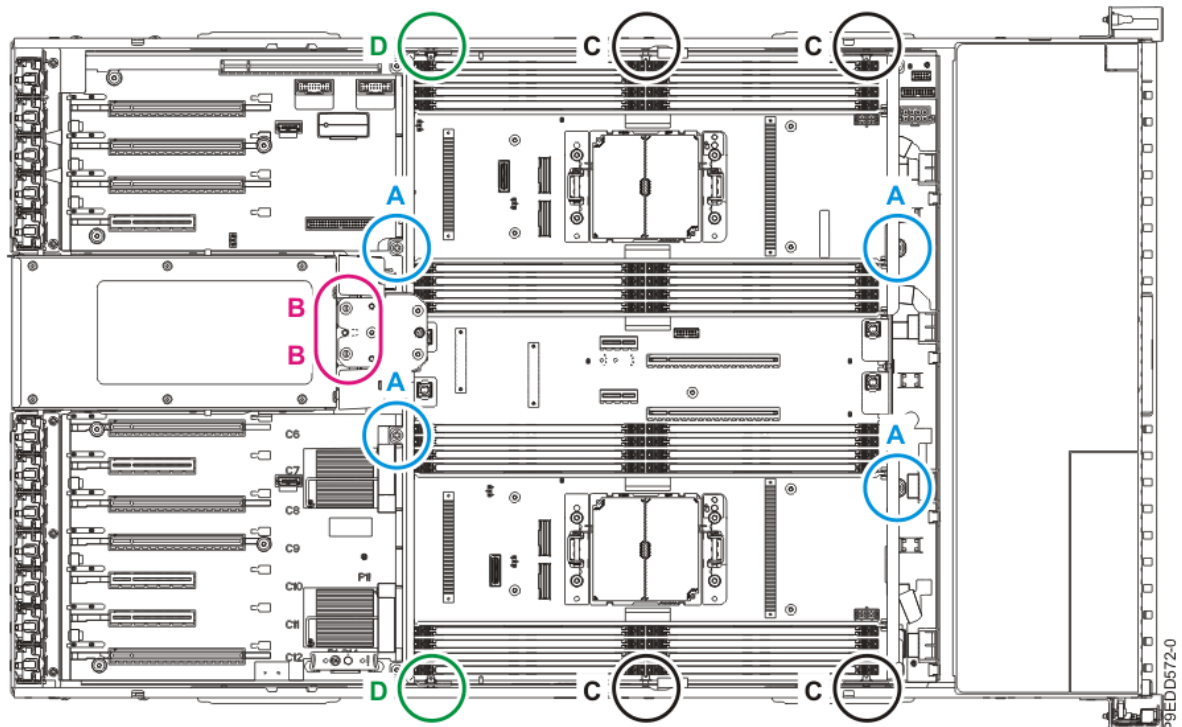
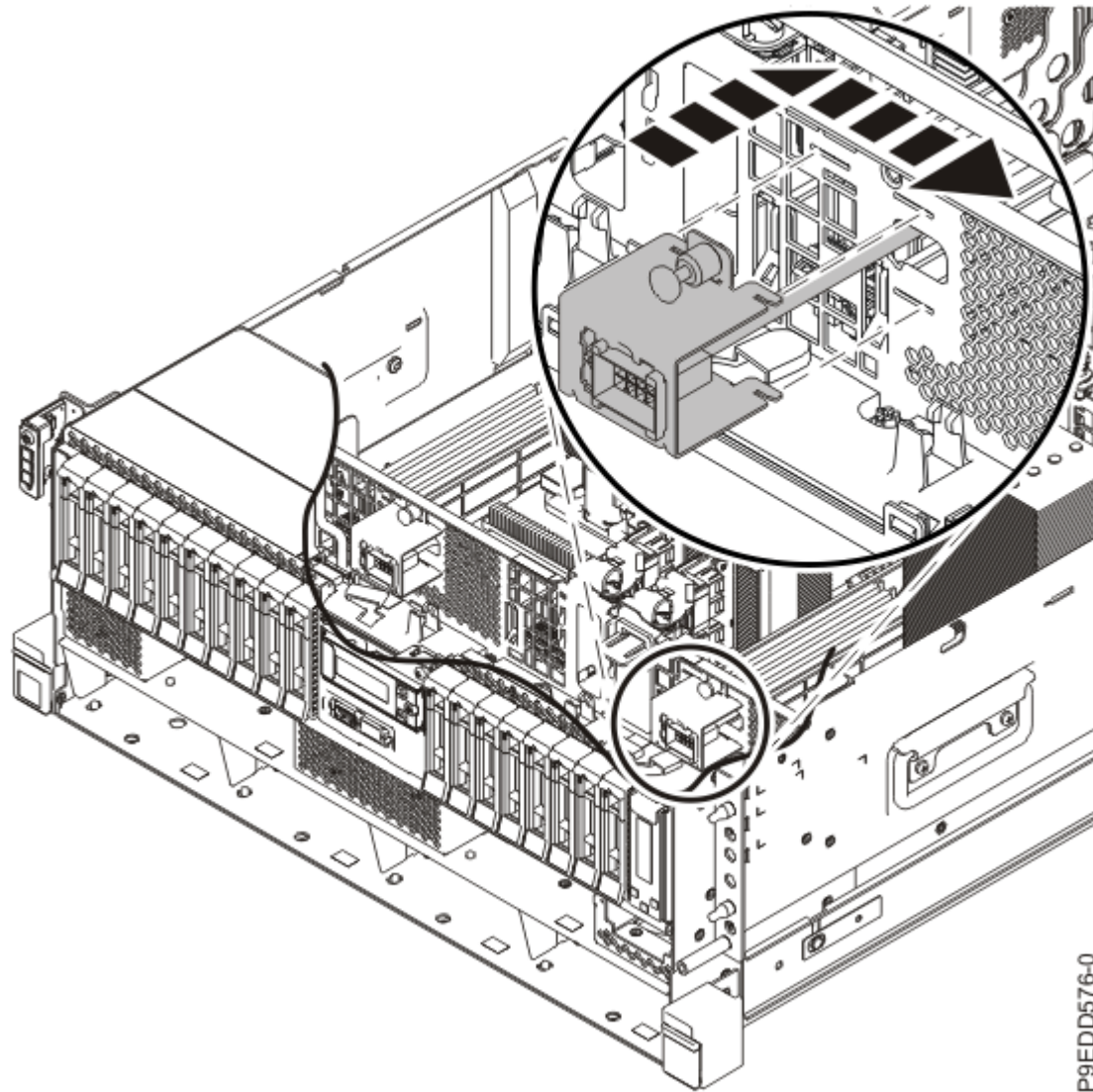


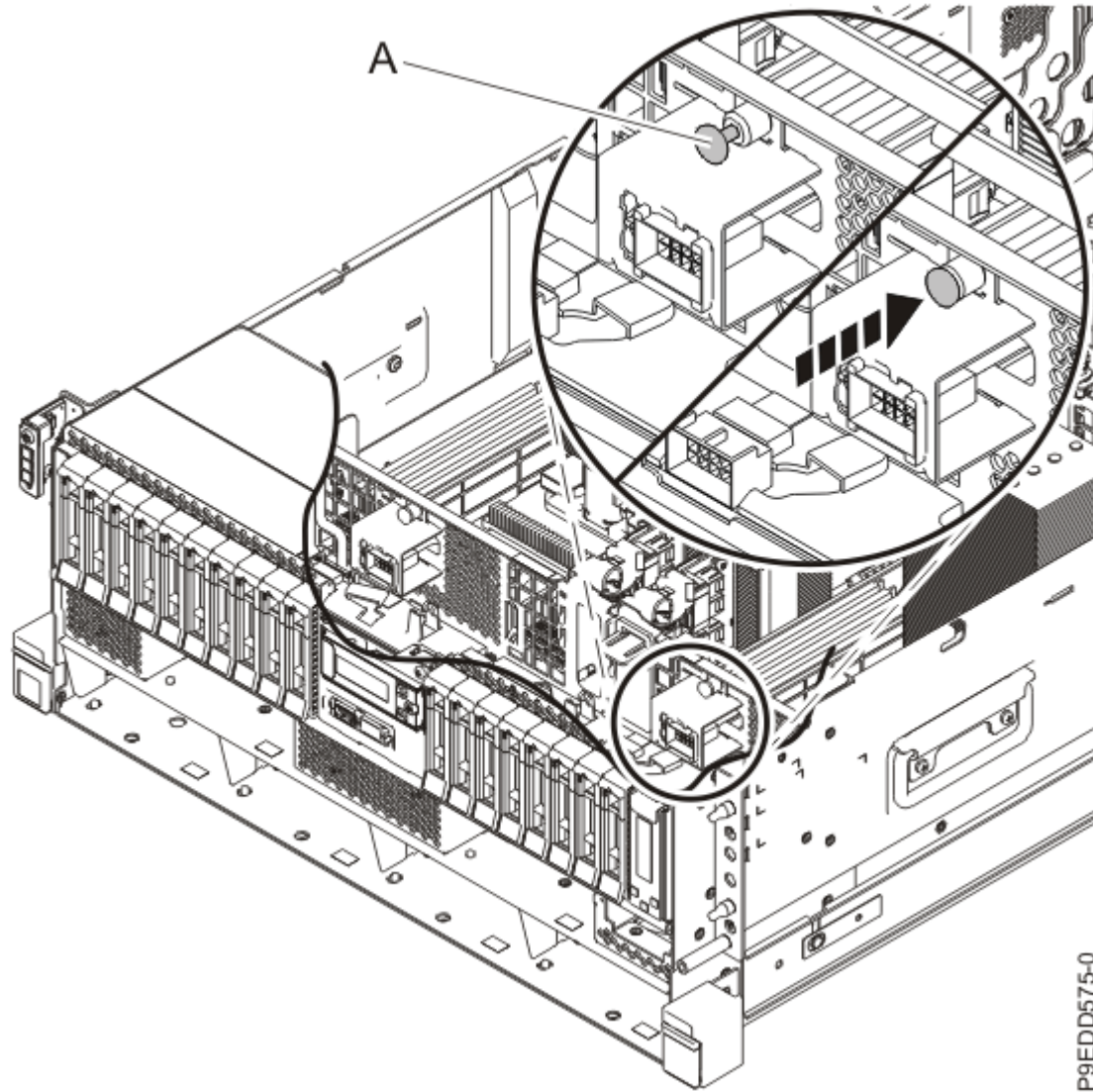
Figure 78. System backplane screw locations

- f) Using a Phillips screwdriver, replace and screw in the four screws **(C)** that attach the backplane to the sides of the system chassis. See the previous image.
 - g) Using a Phillips screwdriver, replace and screw in the two screws **(B)** that attach the backplane to the power supply cage. See the previous image.
 - h) Using a Phillips screwdriver, replace and screw in the three black screws **(A)** that mount the backplane to the chassis. See the previous image.
 - i) Using a Phillips screwdriver, replace and screw in the screw that is underneath the fan socket.
3. Replace the fan socket on the right side of the bulkhead on the new system backplane as shown in the following images:
- a) Insert the socket tabs into the bulkhead.
 - b) Slide the socket to the side to fasten it to the bulkhead.
 - c) Ensure that the pin **(A)** clicks into place to secure the socket to the bulkhead.



P9EDD576-0

Figure 79. Replacing the socket in the bulkhead



P9EDD575-0

Figure 80. Fastening the fan socket to the bulkhead

4. Remove the socket dust covers from the system processor module sockets on the new system backplane:
 - a) Grasp the latches on both sides of the socket dust cover and squeeze them inwards until the latches release from the pins on the system backplane. See the following image.
 - b) Lift the socket dust cover straight up as shown in the following image. Set the dust cover aside.

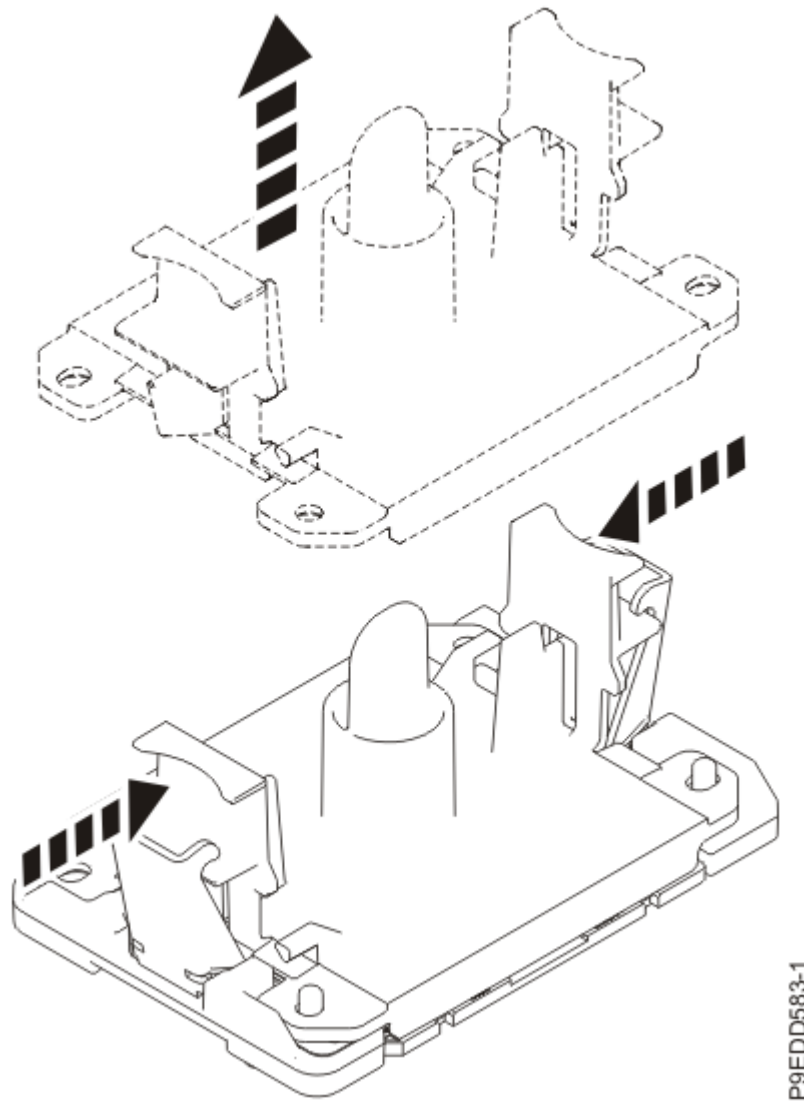
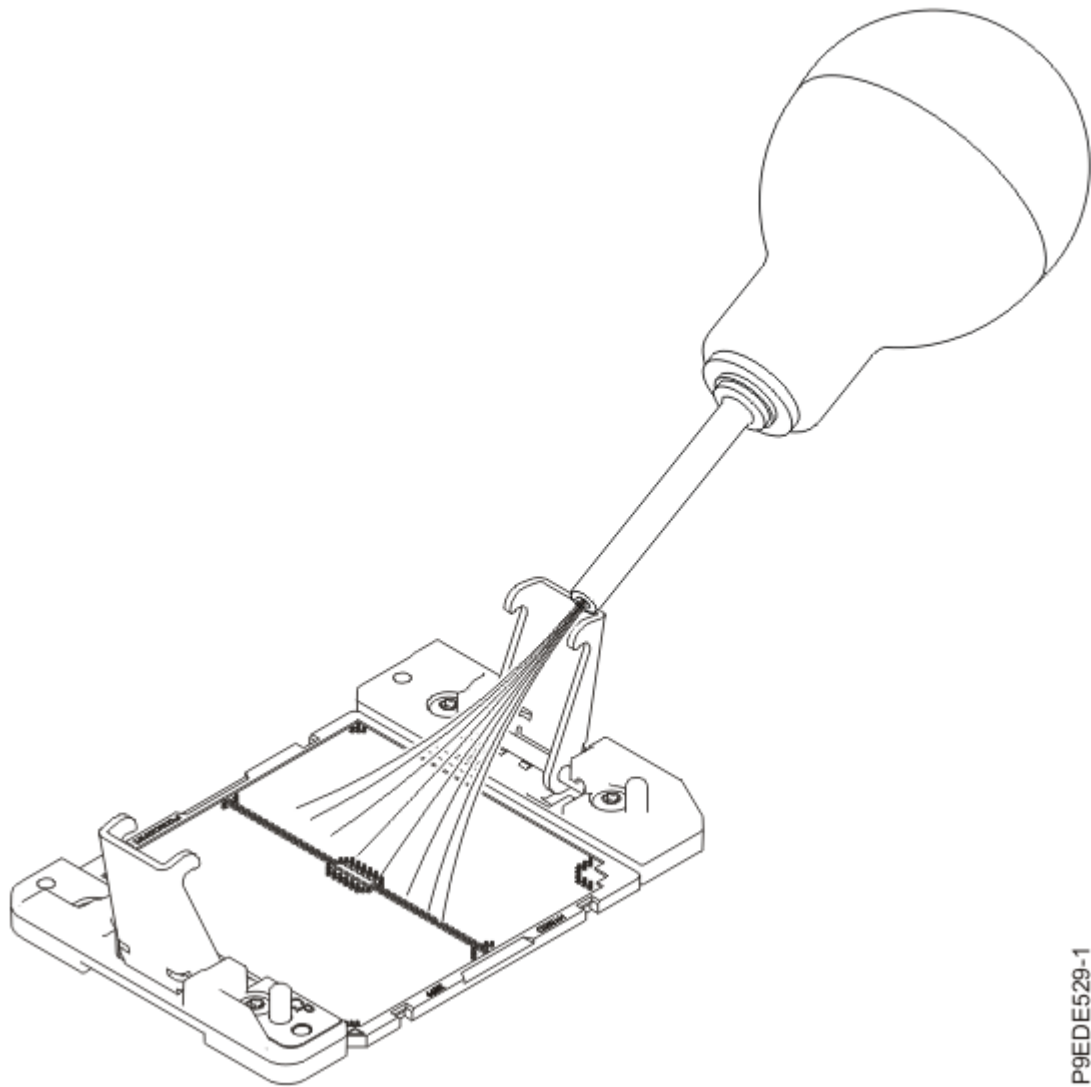


Figure 81. Removing the socket dust covers

- c) If your system has a second system processor, repeat steps [“4.a” on page 81](#) through [“4.b” on page 81](#) to remove the other socket dust cover.
5. Place the original system backplane on the packaging for the replacement system backplane FRU and place it near the system with the replacement system backplane.
6. Install the system processor modules from the original system backplane in the new system backplane:
 - a) If dust or debris is present on the system processor socket on the new system backplane, use the supplied air pump to clean the socket before you install the new system processor. Blow small bursts of air from the center toward the sides of the socket, as shown the following image.

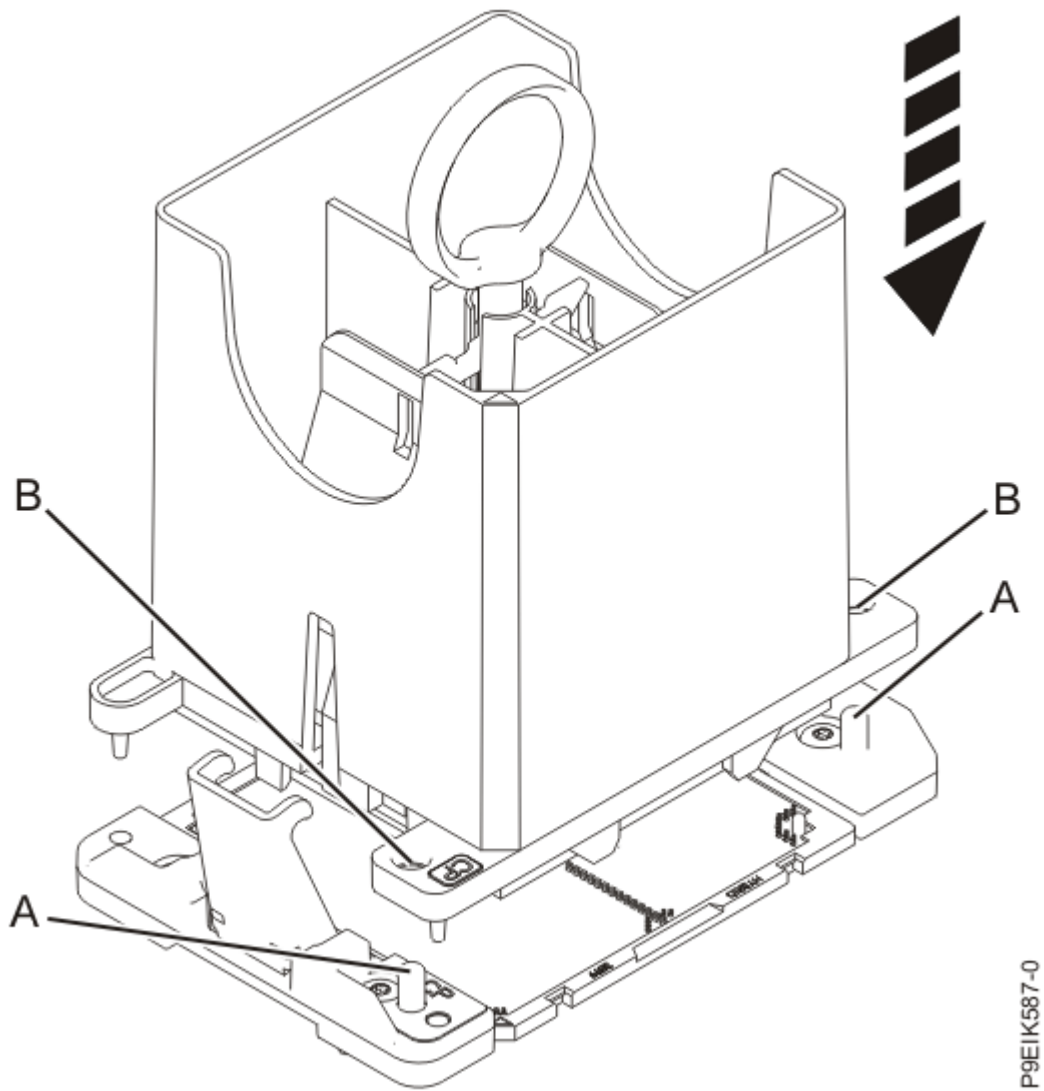


P9EDE529-1

Figure 82. Removing dust and debris from the system processor socket

- b) If necessary, take the cover off of the system processor module tray.
- c) Hold the sides of the tool with system processor module and carefully lift the tool out of the system processor module tray.
- d) Lower the tool and system processor module onto the socket. Align the beveled corner of the tool with the beveled corner on the socket. Align the guide pins **(A)** with the alignment holes **(B)** on each side of the tool. Use care to lower the tool evenly without tilting the tool.

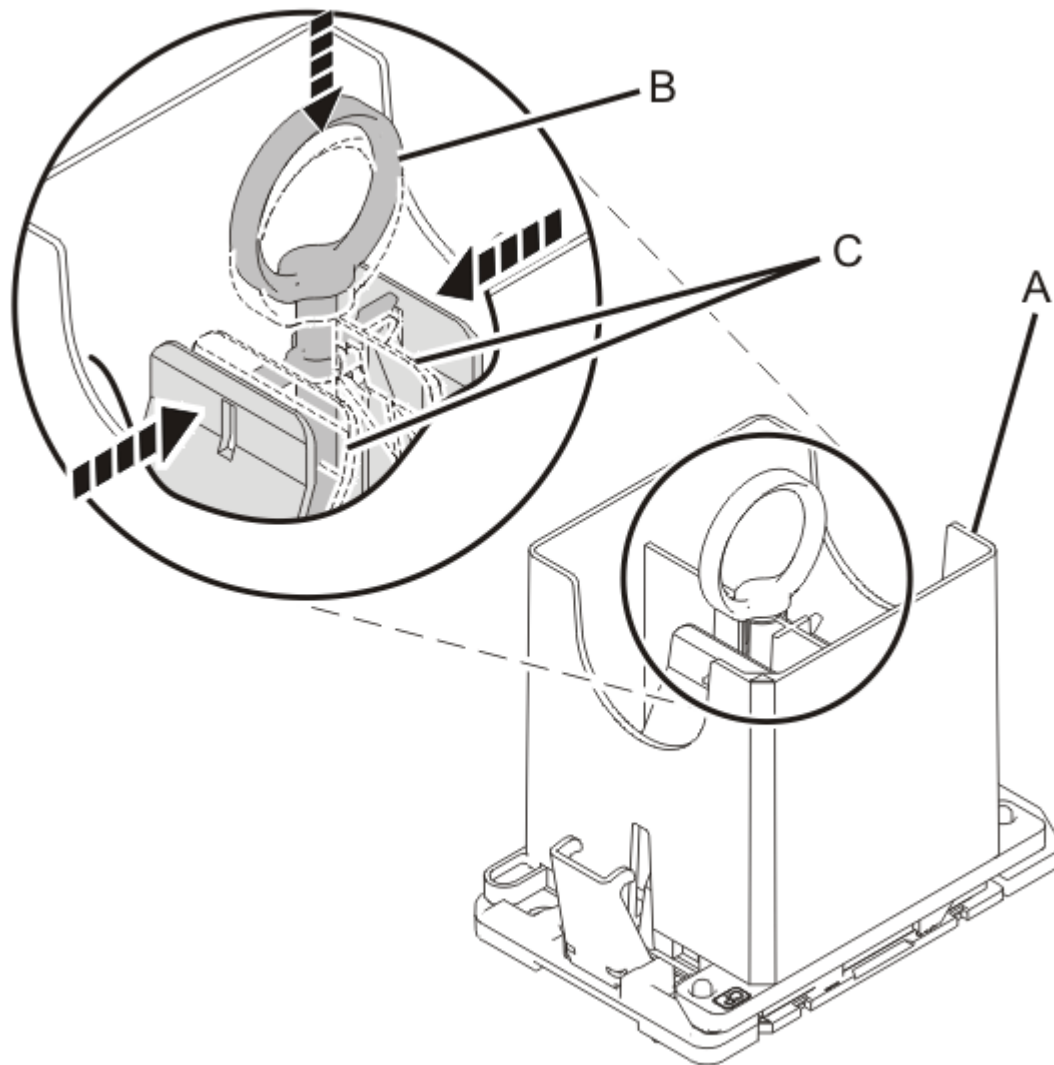
Note: Do not attempt to slide the tool and the system processor module in any direction while the system processor module is touching the socket. If the tool and the system processor module are not aligned with the guide pins, lift the tool and the system processor module and reposition them.



P9EIK587-0

Figure 83. Installing the system processor module

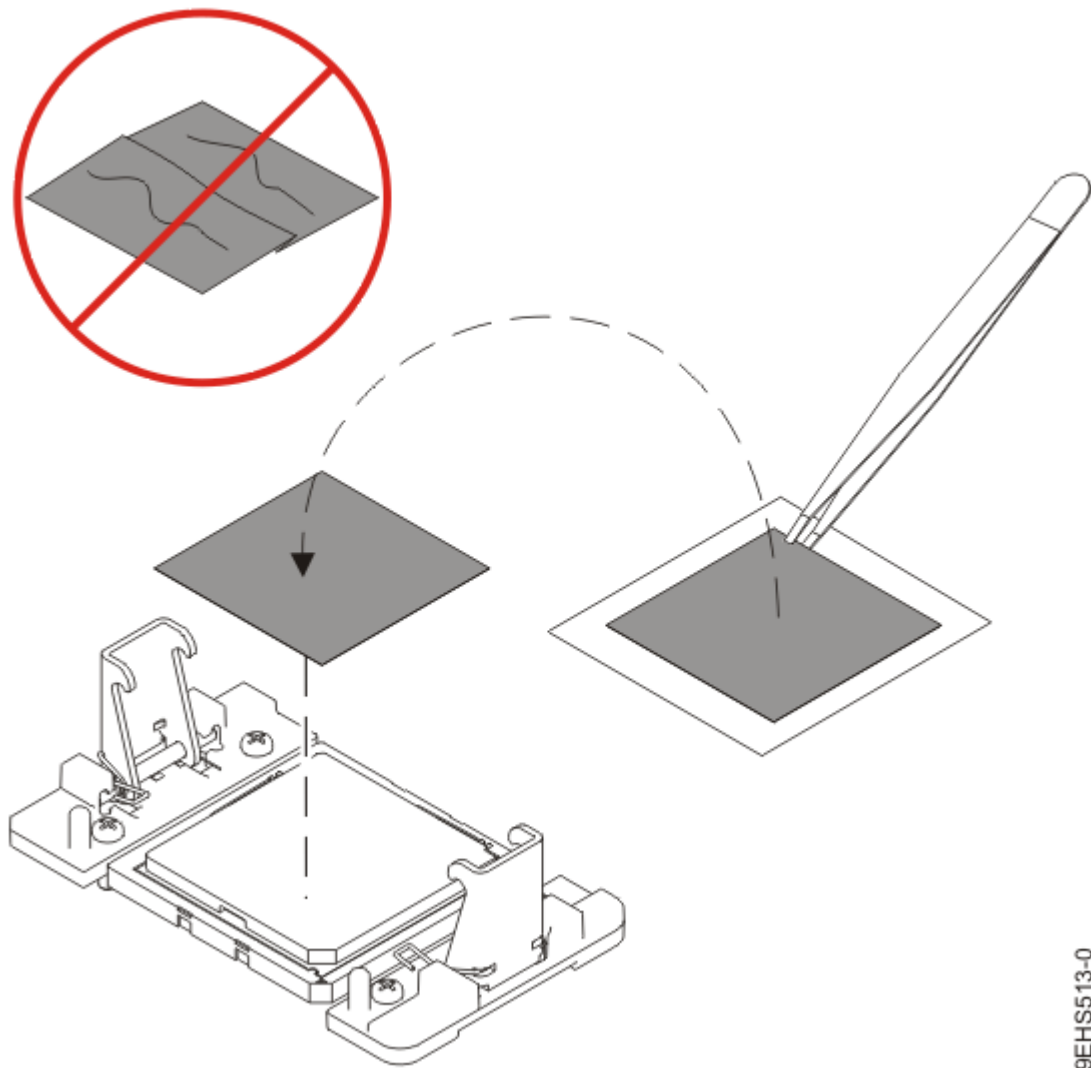
- e) Open the latches that hold the system processor module in the supplied removal tool **(A)** as shown in the following figure. Push down on the ring **(B)** while pressing in on the tabs **(C)**.



P9EIK582-0

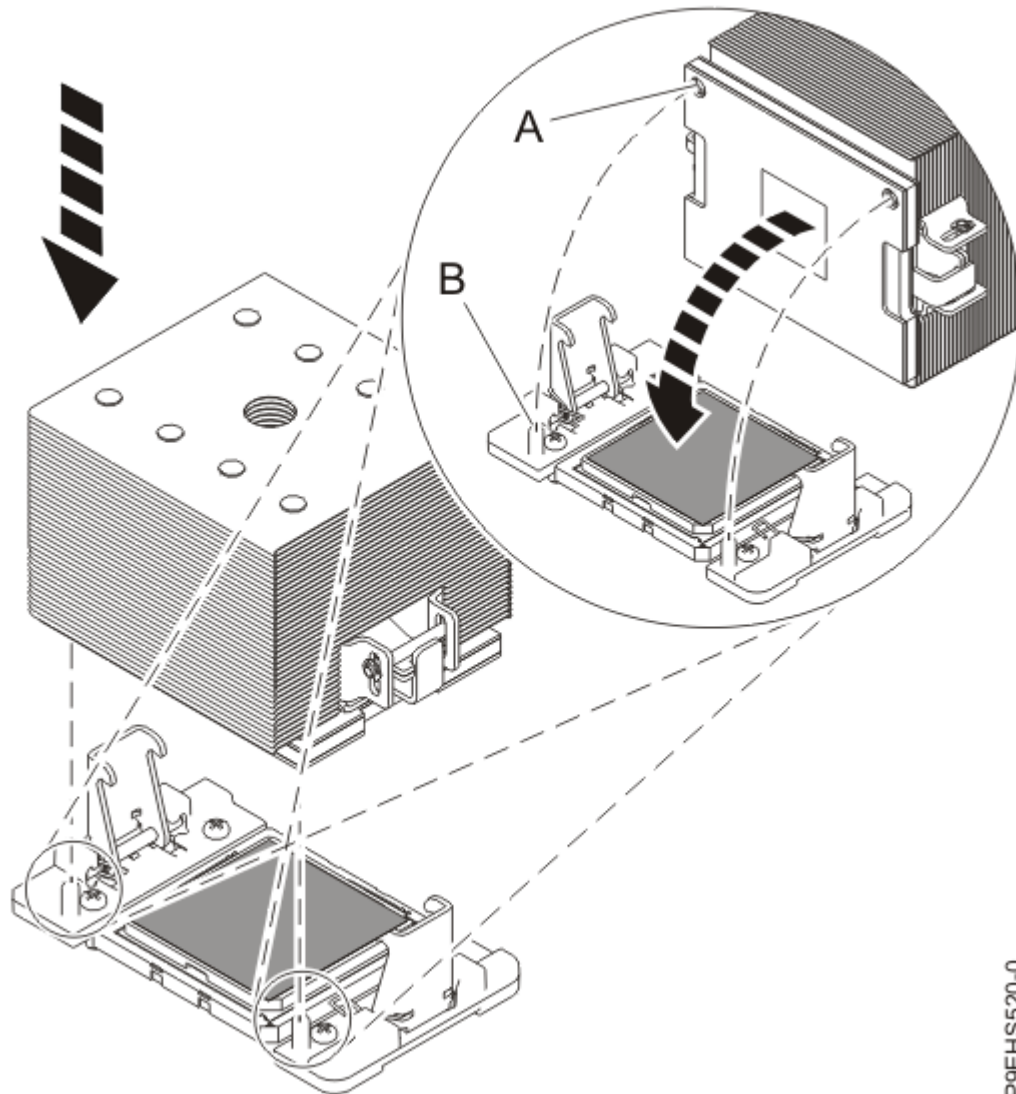
Figure 84. Removing the system processor module tool

- f) Lift the tool off the system processor module.
 - g) Repeat “6.a” on page 82 through “6.f” on page 85 for the other system processor module.
7. Replace the thermal interface material (TIM) and heat sinks.
- a) Using the tweezers, move the old processor's TIM from the clean, dry surface and center it onto the new system processor module.
The TIM has no preferred up side. The TIM can be placed on the processor and centered as shown in the following figure.



P9EHS513-0

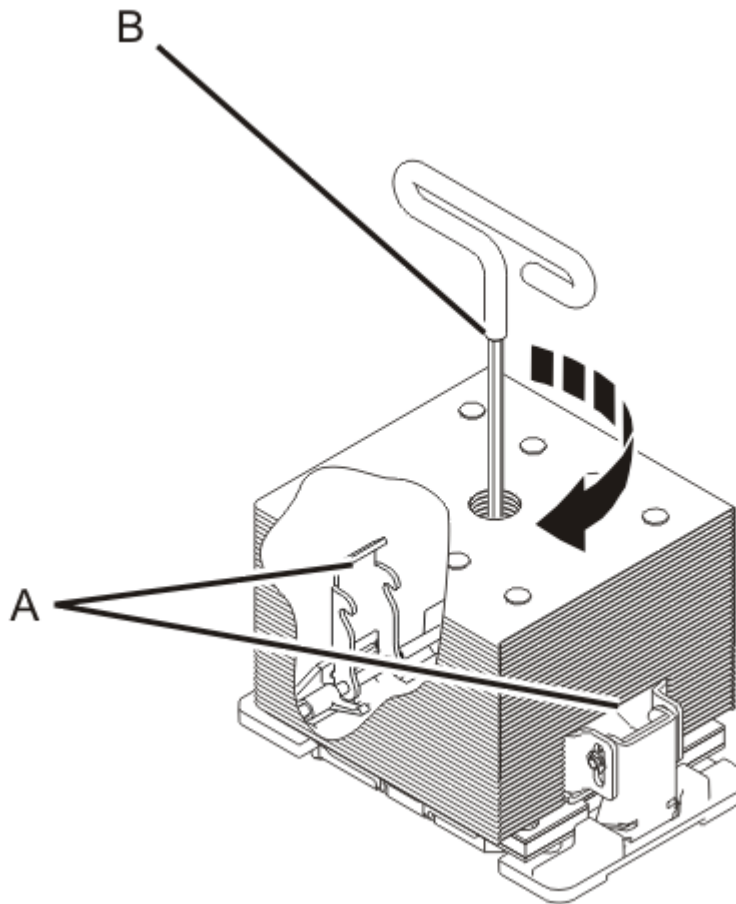
Figure 85. Moving the TIM onto the system processor module
b) Place the heat sink on the TIM as shown in the following figure.



P9EHS520-0

Figure 86. Installing the heat sink on the TIM

- c) Ensure that the heat sink load arms are engaged as shown by **(A)** in the following figure.
- d) Tighten the center load screw clockwise by using the supplied hex key as shown by **(B)** in the following figure until a firm stop is reached. If the heat sink moves noticeably, the load arms are not engaged. Unscrew the center load screw and repeat this step again.



P9EHS507-0

Figure 87. Tightening the center load screw on the heat sink

- e) If your system has a second system processor module, repeat steps [“7.a” on page 85](#) through [“7.d” on page 87](#) to replace the other TIM and heat sink.
8. Reconnect the control panel display cable to the system backplane as shown in the following figure.

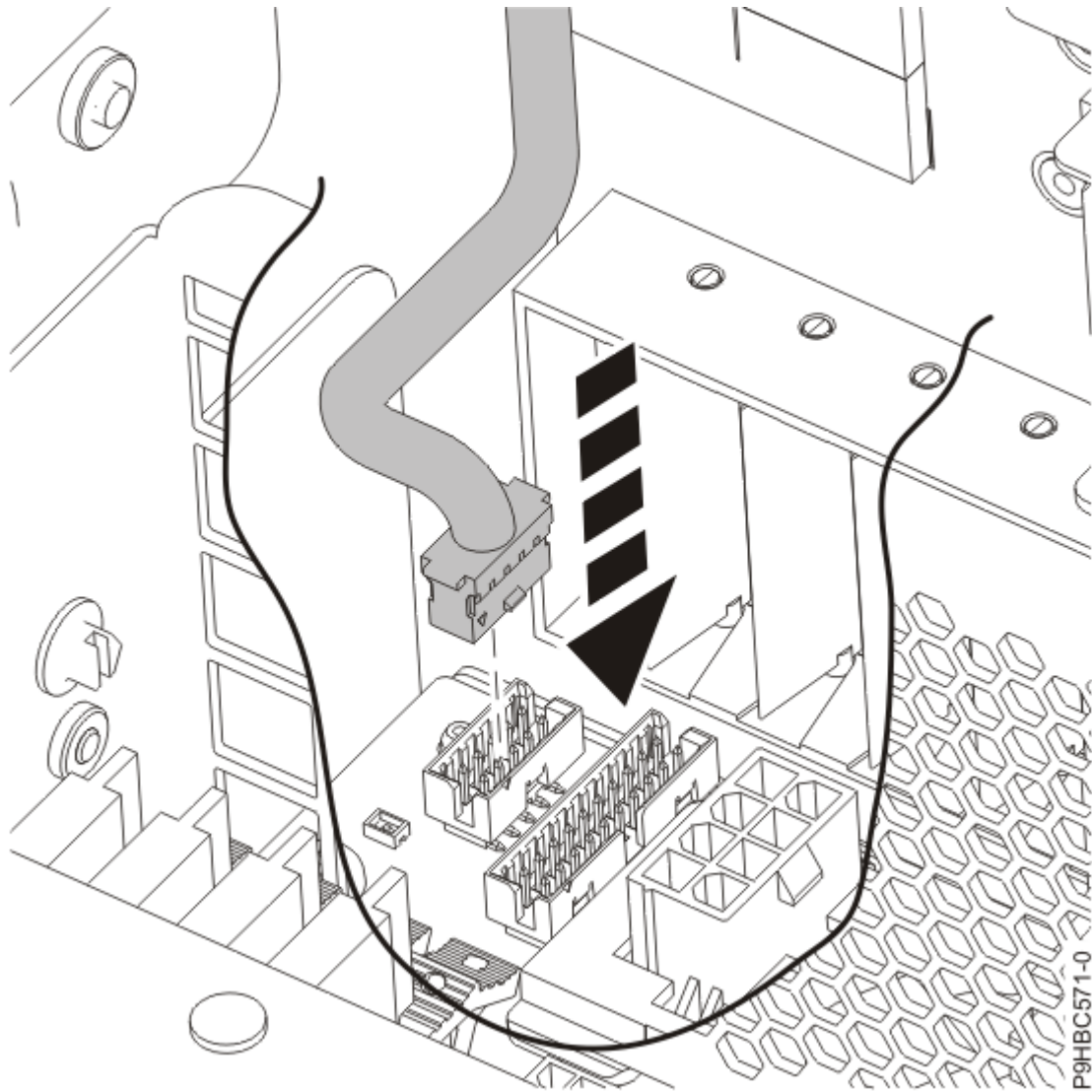


Figure 88. Connecting the control panel display cable to the system backplane for a rack-mounted system

9. Reconnect the control panel cable to the system backplane as shown in the following figure.

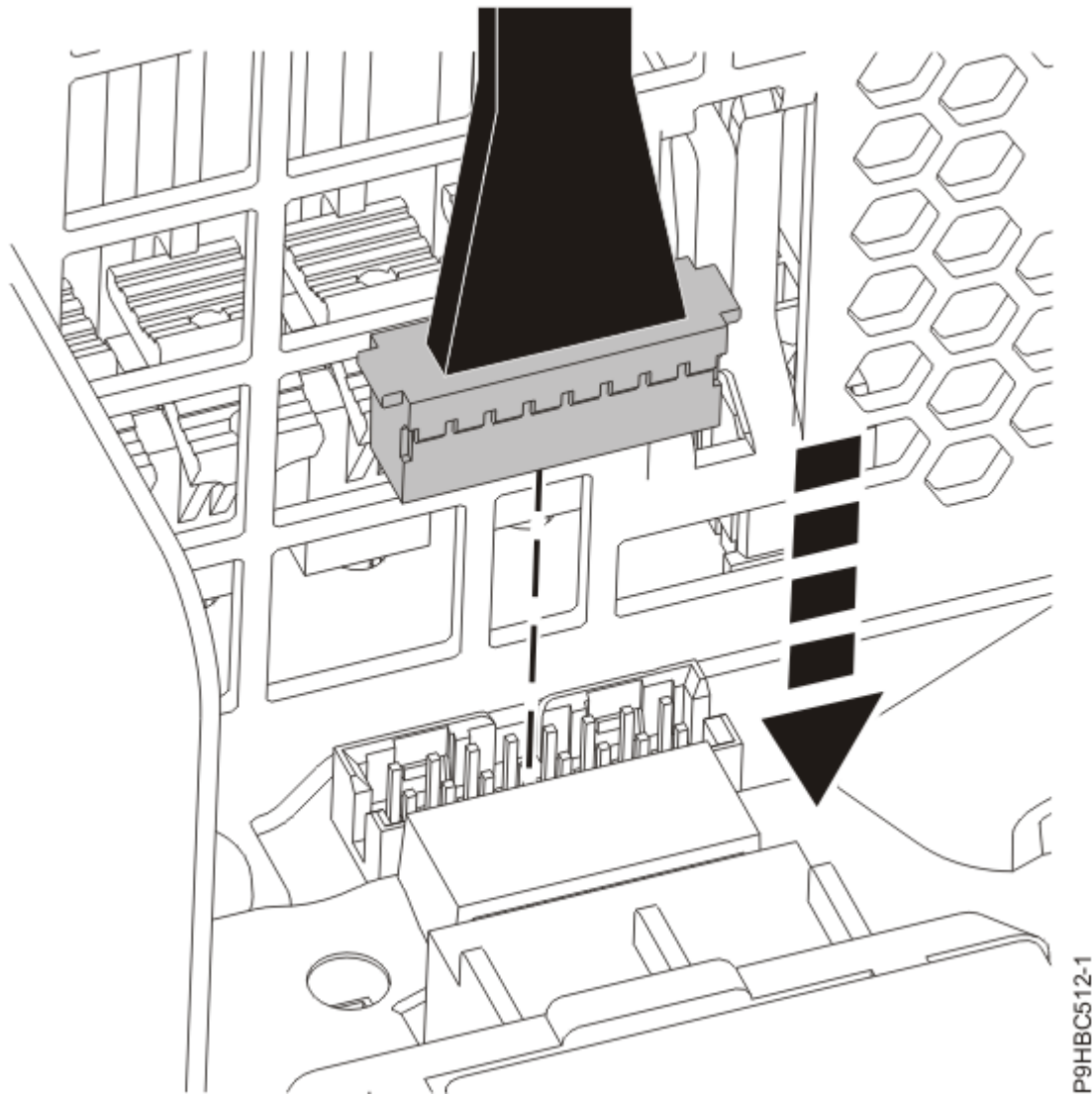


Figure 89. Connecting the control panel cable to the system backplane for a rack-mounted system

10. Replace the fans into their slots.

- a) Using your hand to support the bottom of the fan, slide the fan into the system. See the following figure.
- b) Rotate the fan handle (**A**) in the direction shown, and then press the handle until the latch locks in place. See the following figure.
- c) Repeat [“10.a”](#) on page 90 through [“10.b”](#) on page 90 for the other fans.

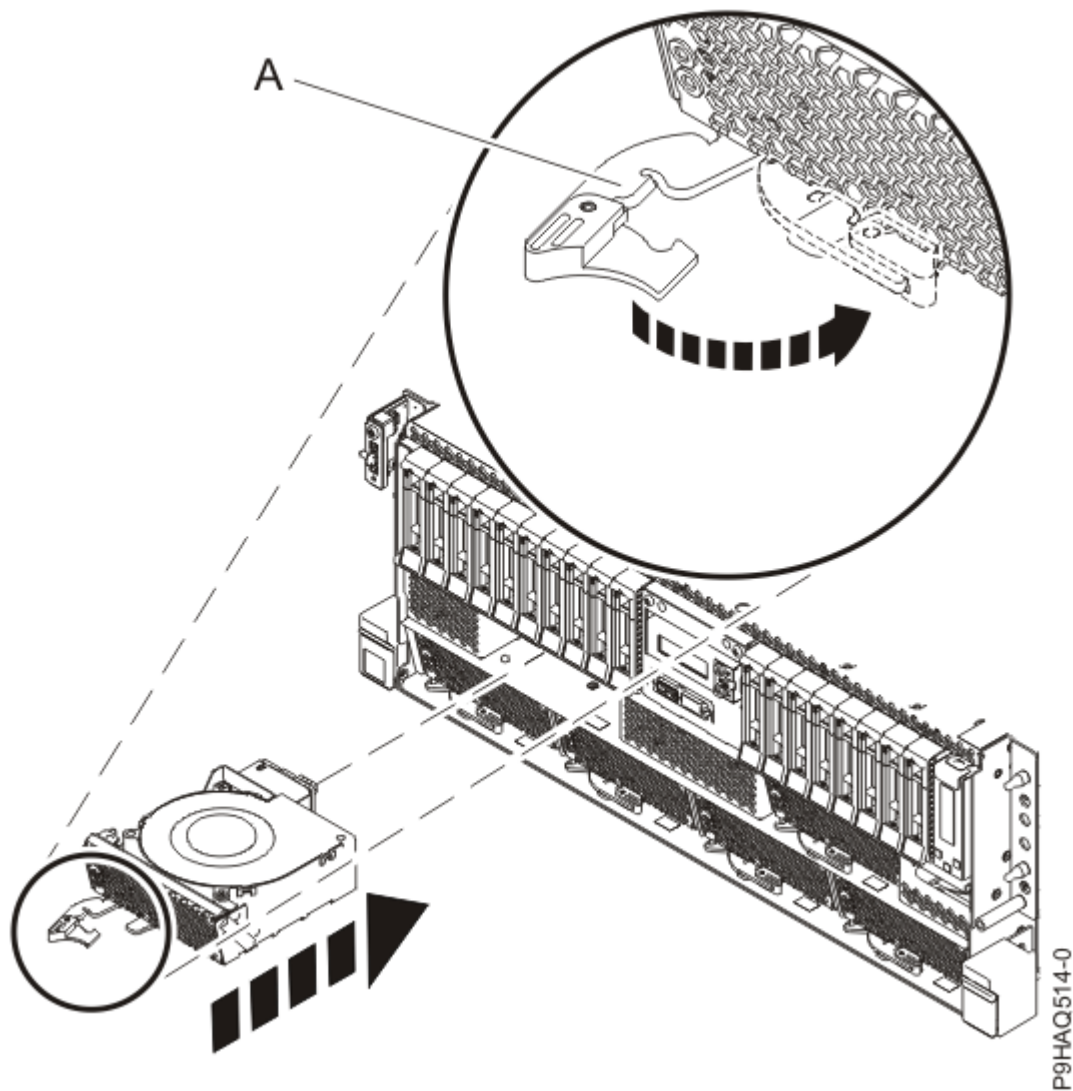


Figure 90. Replacing a fan in the system

11. Replace the disk drive backplane.

- If you have a base function disk drive backplane, complete steps [“12” on page 91](#) through [“14” on page 93](#). Then, continue with step [“24” on page 103](#).
- If you have a 12-drive expanded function disk drive backplane, complete steps [“15” on page 94](#) through [“17” on page 96](#). Then, continue with step [“24” on page 103](#).
- If you have an 18-drive expanded function disk drive backplane, complete steps [“18” on page 97](#) through [“20” on page 99](#). Then, continue with step [“24” on page 103](#).
- If you have an NVMe drive backplane, skip to step [“21” on page 100](#).

12. The chassis has two alignment pins and several brackets **(A)** to secure the disk drive backplane. Using the disk drive backplane touchpoint **(B)**, thumbscrew **(C)**, and alignment pins **(A)**, insert the disk drive backplane into the chassis as shown in the following figure.

Slide the disk drive backplane to the side in the direction that is shown so that the disk drive backplane slides under tabs in the chassis.

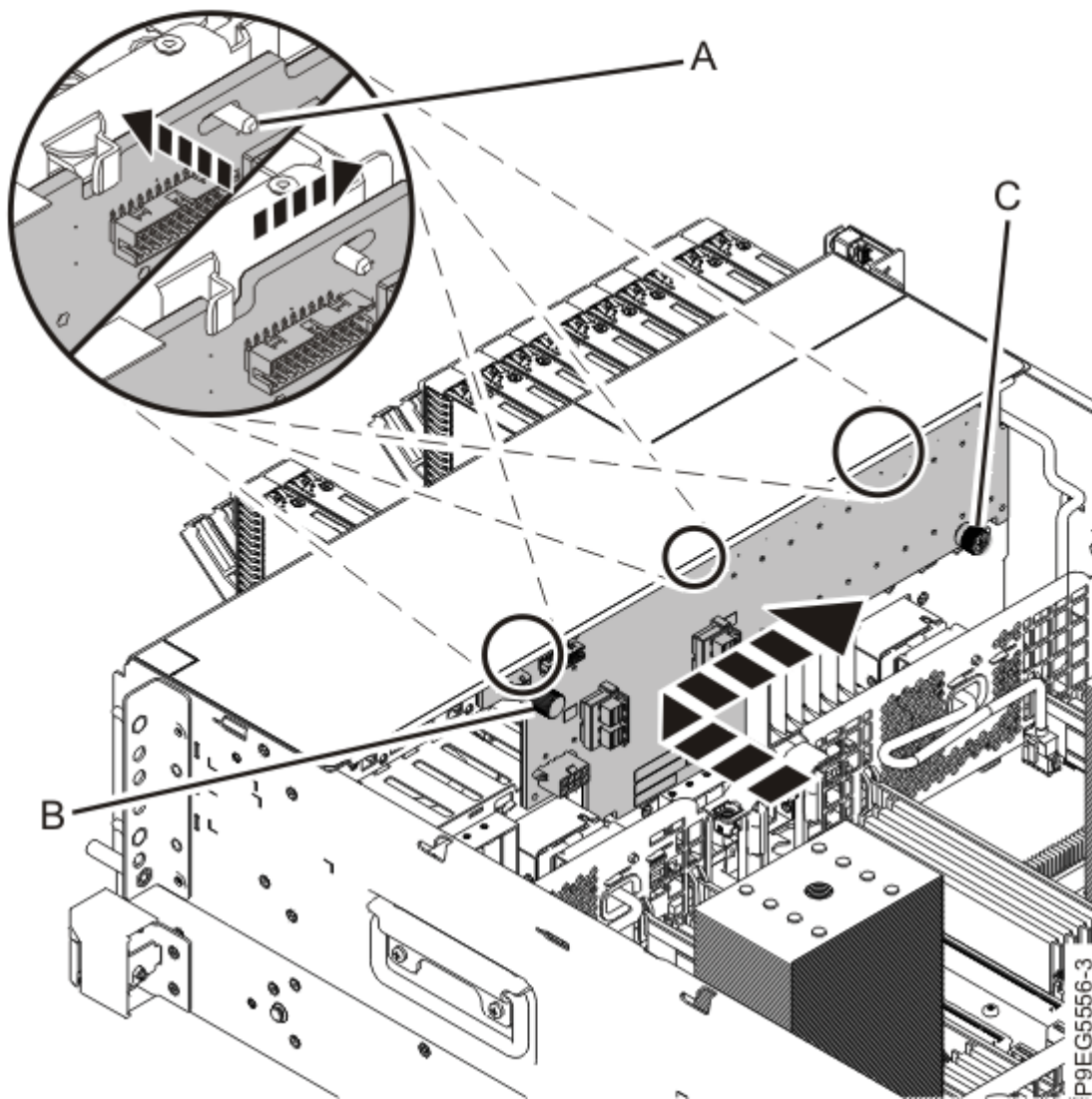


Figure 91. Replacing the disk drive backplane by using alignment pins

13. Carefully tighten the captive thumbscrew **(C)** to secure the disk drive backplane to the system chassis as shown in the following figure.

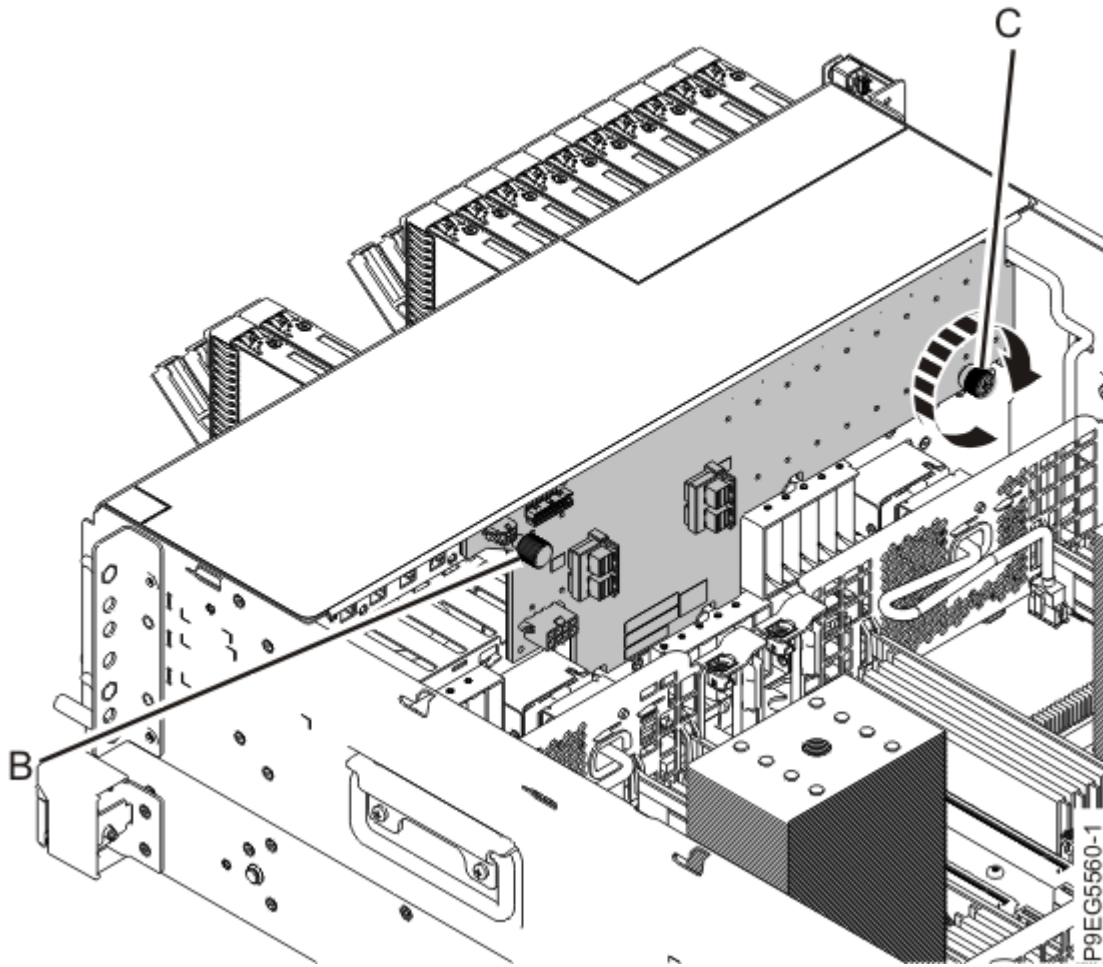


Figure 92. Replacing the disk drive backplane

14. Reconnect the signal cable **(A)**, and the power cable **(B)**, to the disk drive backplane as shown in the following figure.

Push the connectors in until the latches click.

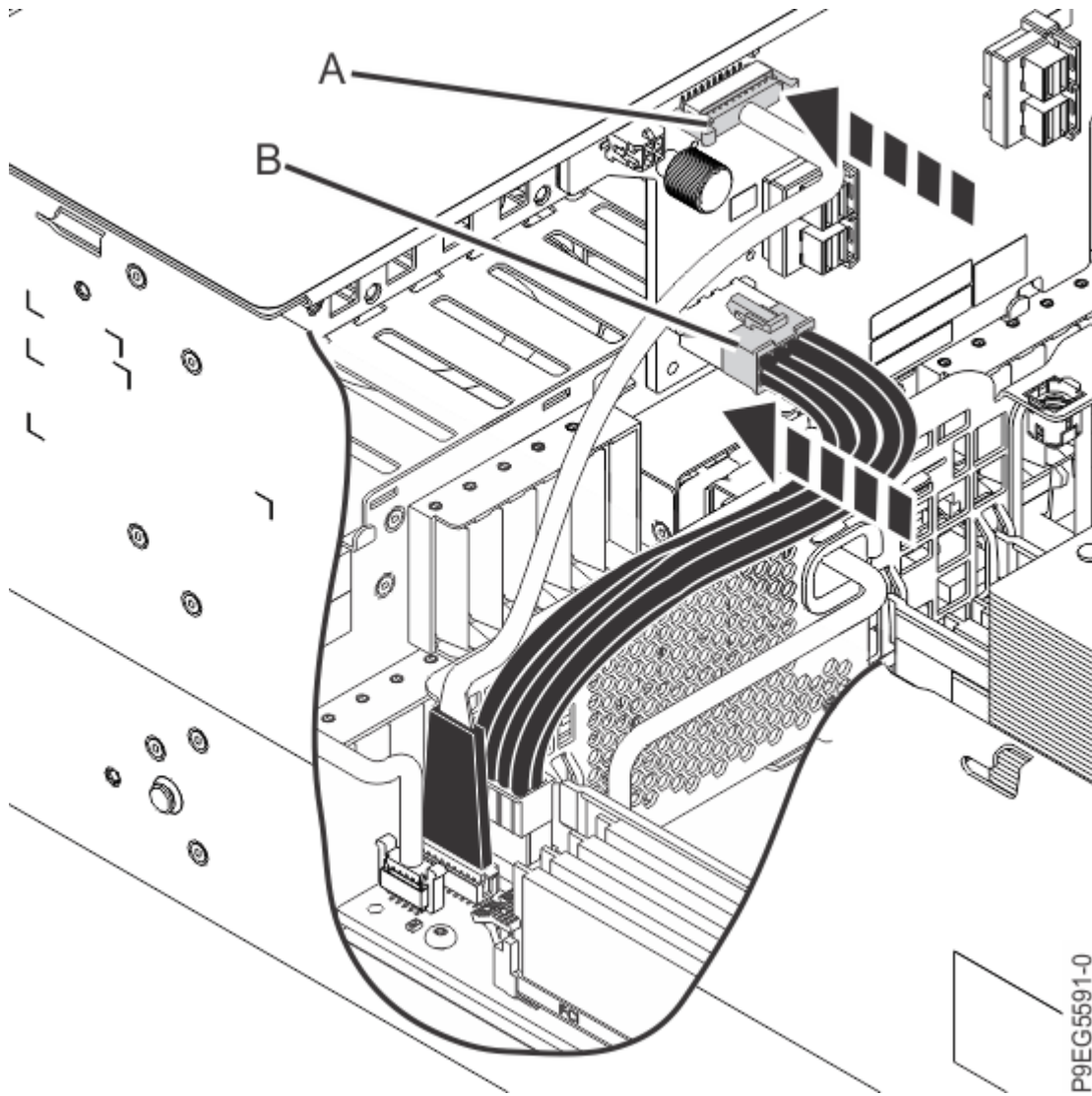


Figure 93. Reconnecting the power cable and the signal cable to the disk drive backplane

15. The chassis has two alignment pins and several brackets **(A)** to secure the disk drive backplane. Using the disk drive backplane touchpoint **(B)**, thumbscrew **(C)** and alignment pins **(A)**, insert the disk drive backplane as shown in the following figure, while you ensure that the alignment pins fit through the holes in the disk drive backplane.

Slide the disk drive backplane to the side in the direction that is shown so that the disk drive backplane slides under tabs in the chassis.

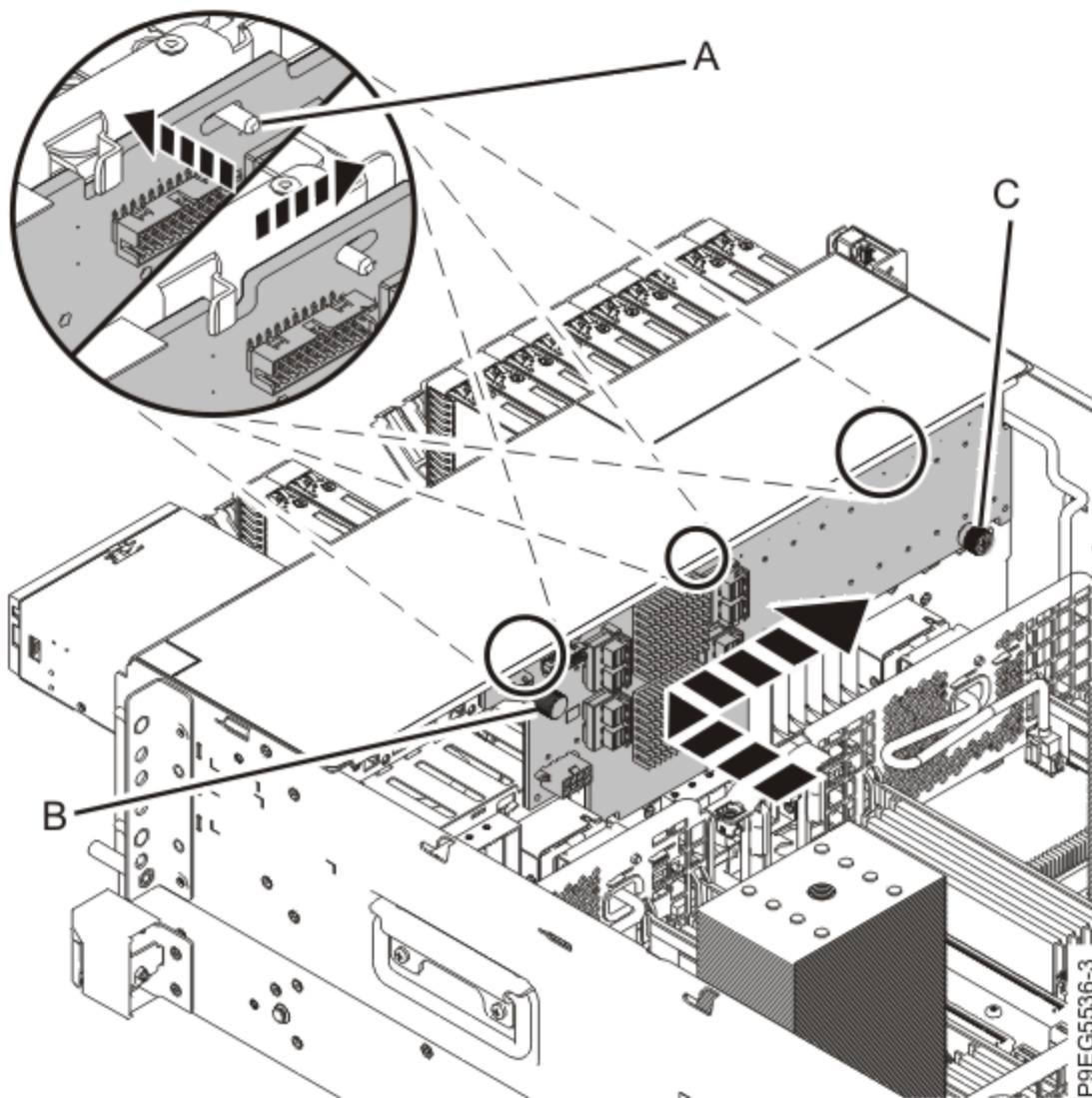


Figure 94. Replacing the disk drive backplane by using alignment pins

16. Carefully tighten the captive thumbscrew **(C)** to secure the disk drive backplane to the system chassis as shown in the following figure.

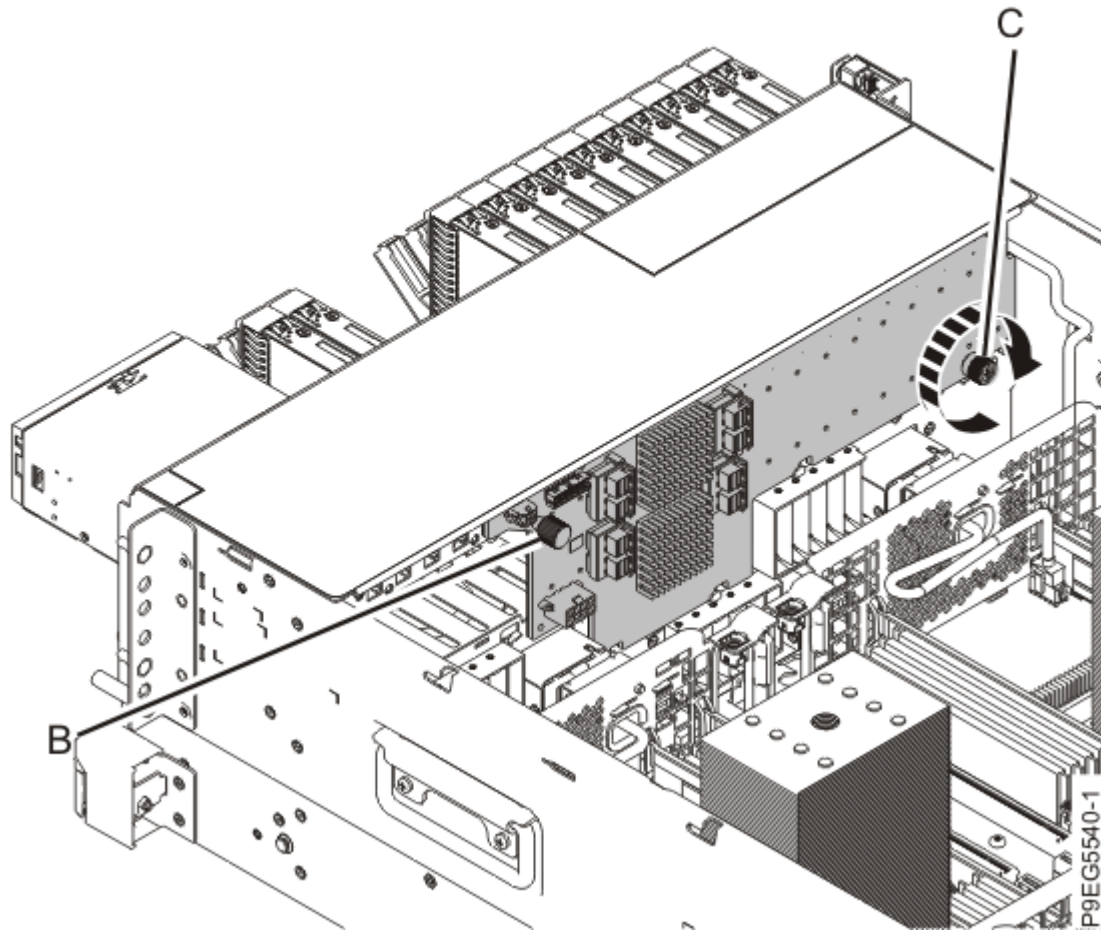


Figure 95. Replacing the disk drive backplane

17. Reconnect the signal cable **(A)** and the power cable **(B)** to the disk drive backplane as shown in the following figure.

Push the connectors in until the latches click.

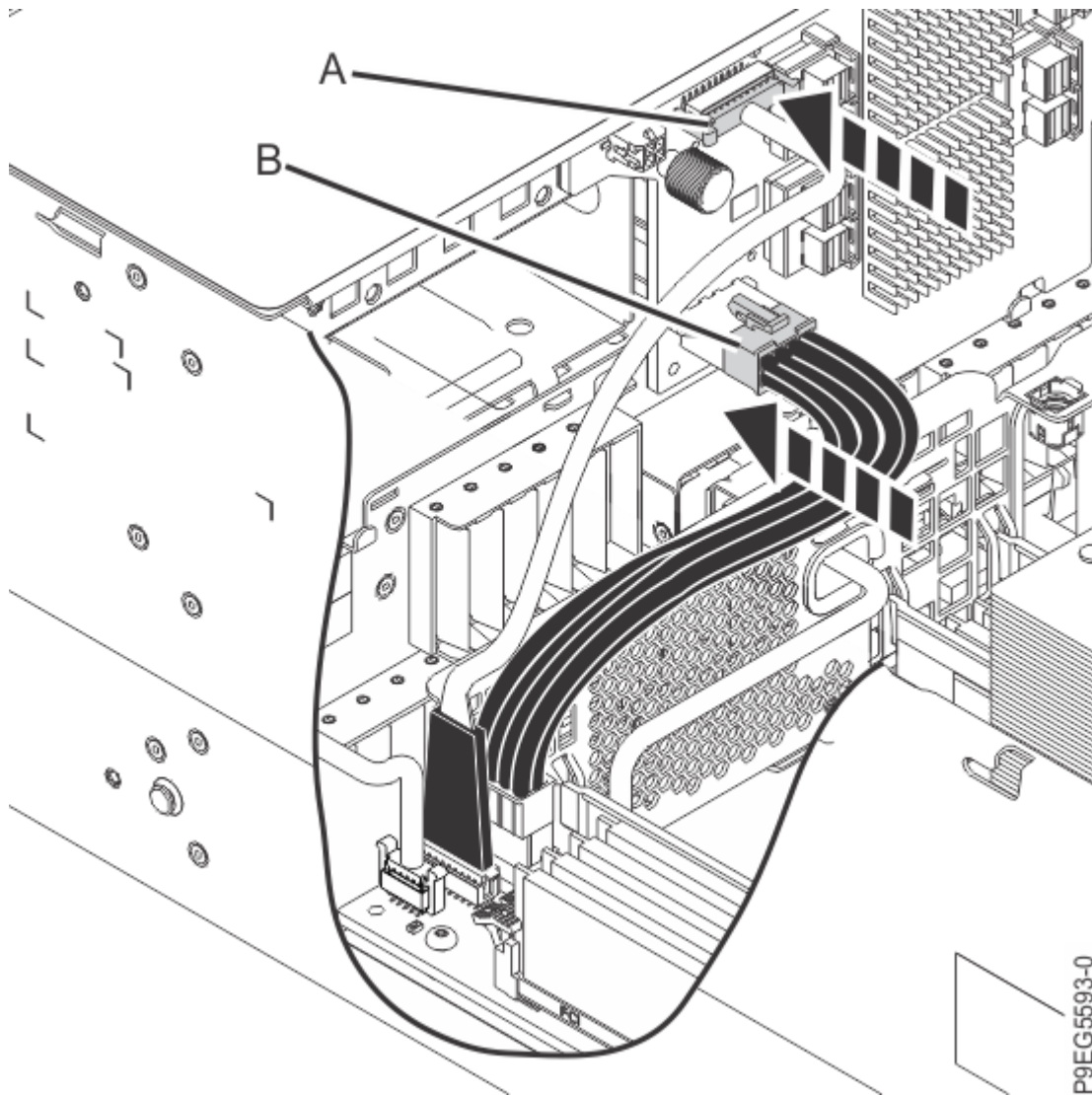


Figure 96. Reconnecting the power cable and signal cable to the disk drive backplane

18. The chassis has two alignment pins and several brackets **(A)** to secure the disk drive backplane. Using the thumbscrews **(B)**, **(C)**, and the alignment pins **(A)**, insert the disk drive backplane as shown in the following figure, while you ensure that the alignment pins fit through the holes in the disk drive backplane.

Slide the disk drive backplane to the side in the direction shown so that the disk drive backplane slides under the tabs in the chassis.

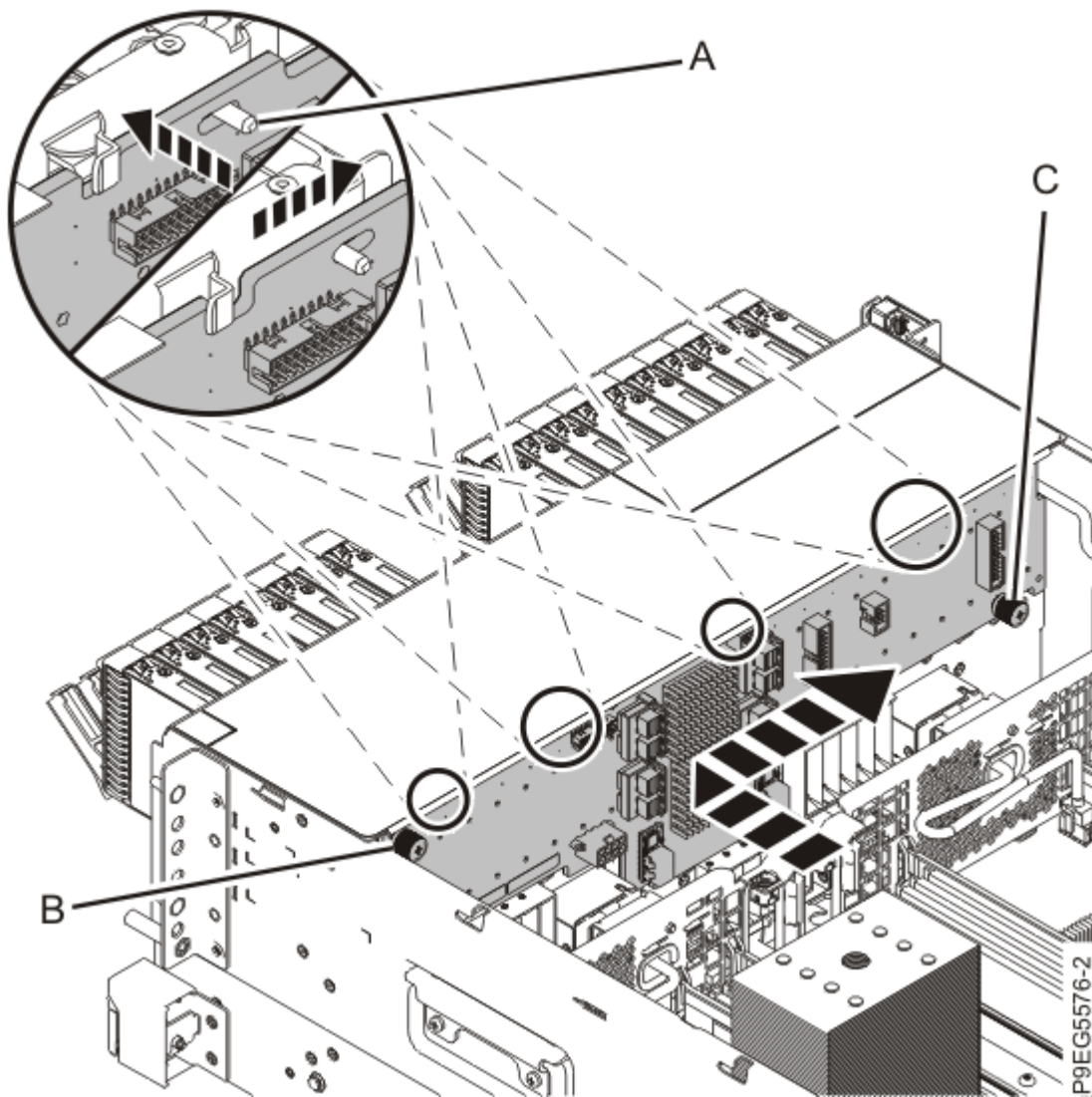


Figure 97. Replacing the disk drive backplane by using alignment pins

19. Carefully tighten the captive thumbscrews **(B)** and **(C)** to secure the disk drive backplane to the system chassis as shown in the following figure.

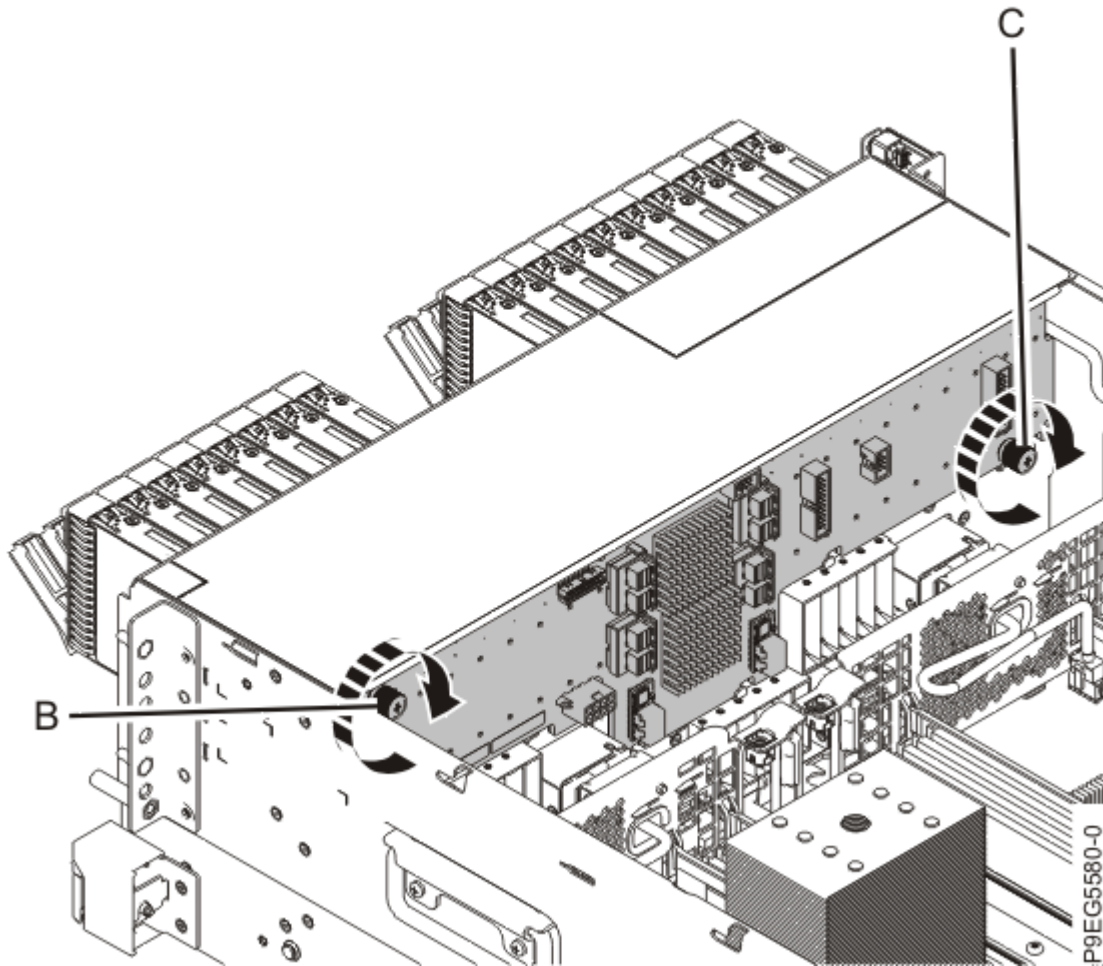


Figure 98. Replacing the disk drive backplane

20. Reconnect the signal cable **(A)** and the power cable **(B)** to the disk drive backplane as shown in the following figure.

Push the connectors in until the latches click.

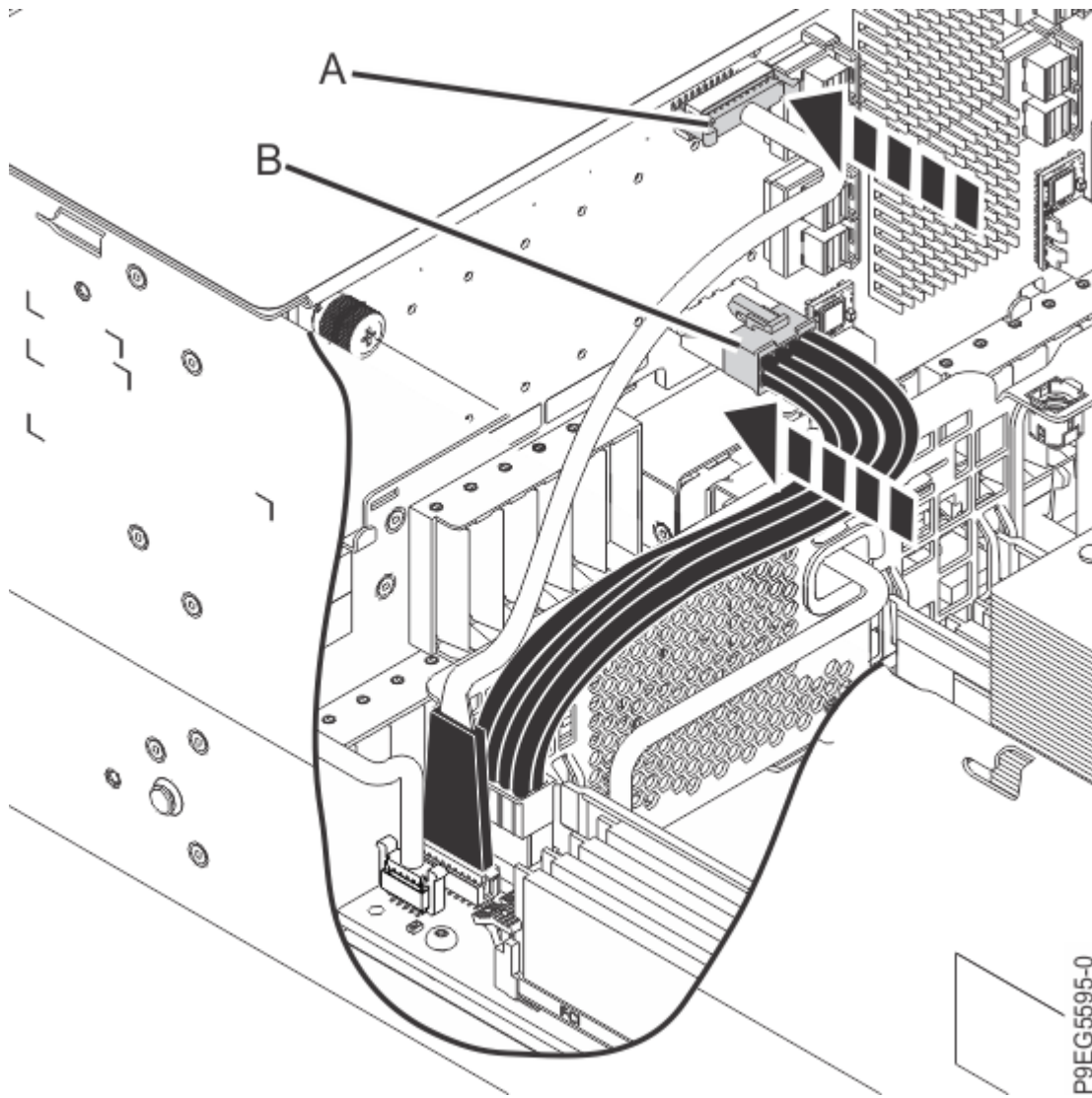


Figure 99. Reconnecting the power cable and signal cable to the disk drive backplane

21. The chassis has two alignment pins and several brackets **(A)** to secure the NVMe drive backplane. Using the NVMe drive backplane touchpoint **(B)**, thumbscrew **(C)** and alignment pins **(A)**, insert the NVMe drive backplane as shown in the following figure. Ensure that the alignment pins fit through the holes in the NVMe drive backplane.

Slide the NVMe drive backplane to the side in the direction that is shown so that the NVMe drive backplane slides under tabs in the chassis.

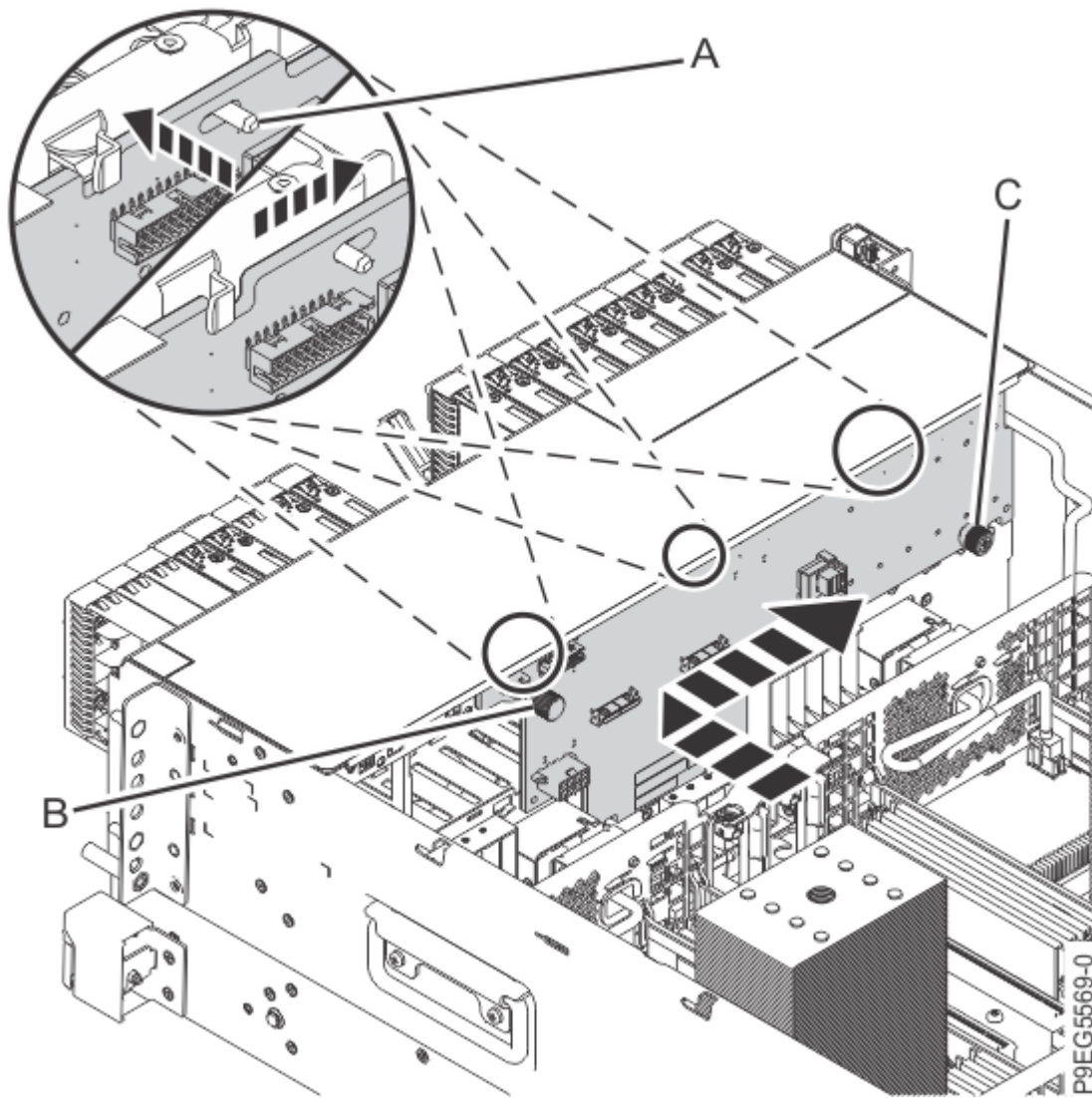


Figure 100. Replacing the NVMe drive backplane by using alignment pins

22. Carefully tighten the captive thumbscrew **(C)** to secure the NVMe drive backplane to the system chassis as shown in the following figure.

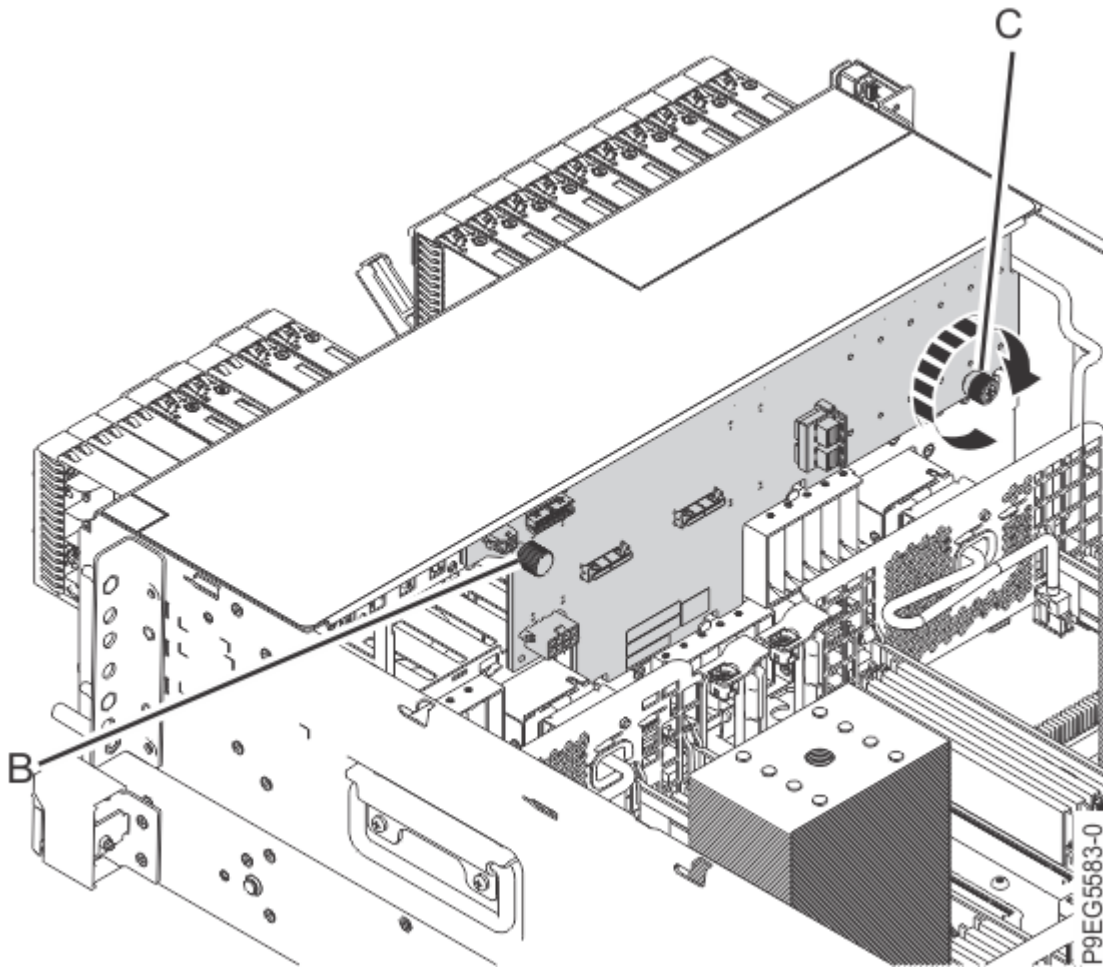


Figure 101. Replacing the NVMe drive backplane

23. Reconnect the signal cable **(A)** and the power cable **(B)** to the NVMe drive backplane as shown in the following figure.

Push the connectors in until the latches click.

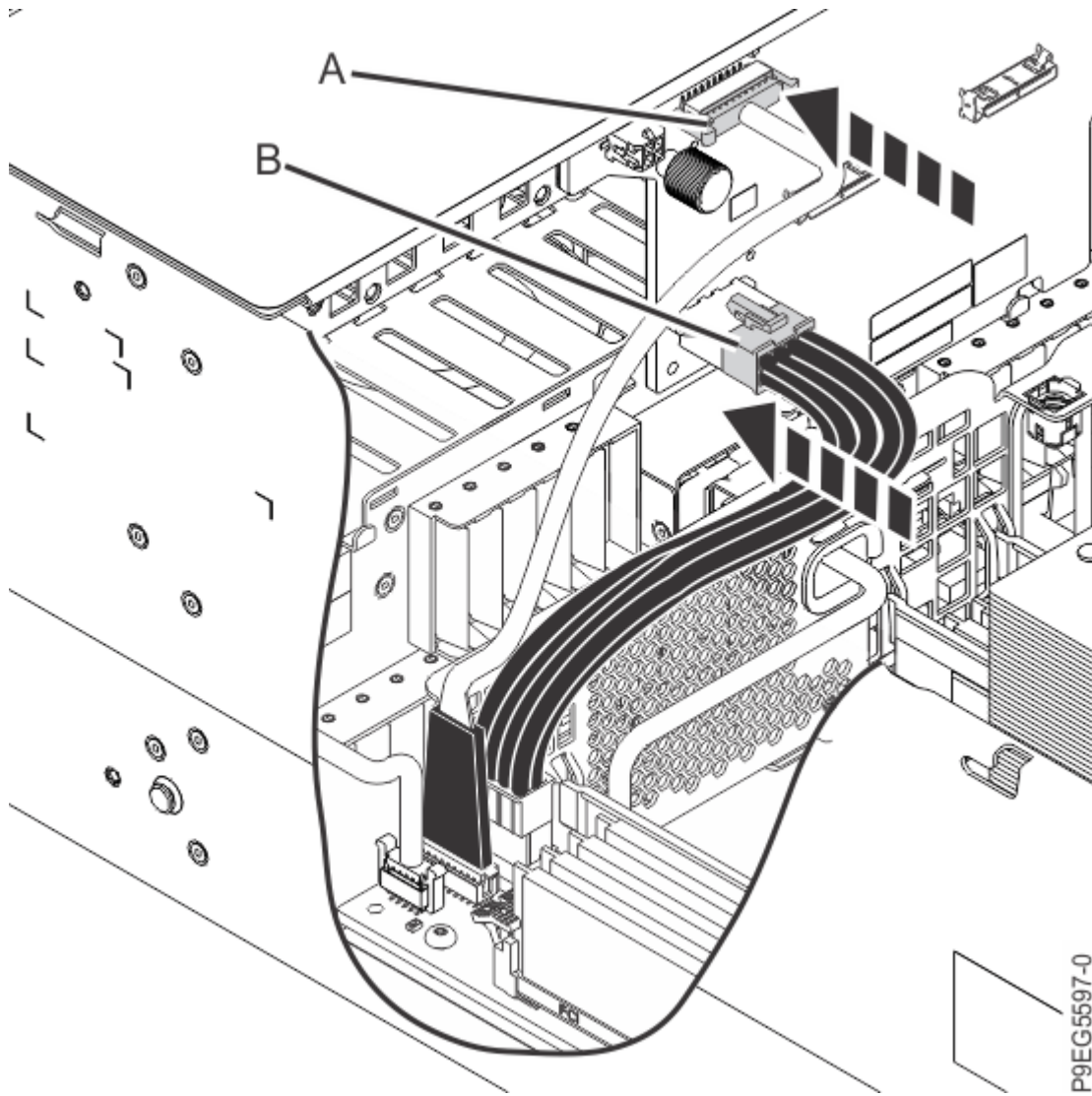


Figure 102. Reconnecting the power cable and signal cable to the NVMe drive backplane
24. Fully seat all the front drives into their slots as shown in the following figures.
Push drive lever **(B)** until the drive is seated and the lever snaps closed **(A)**.

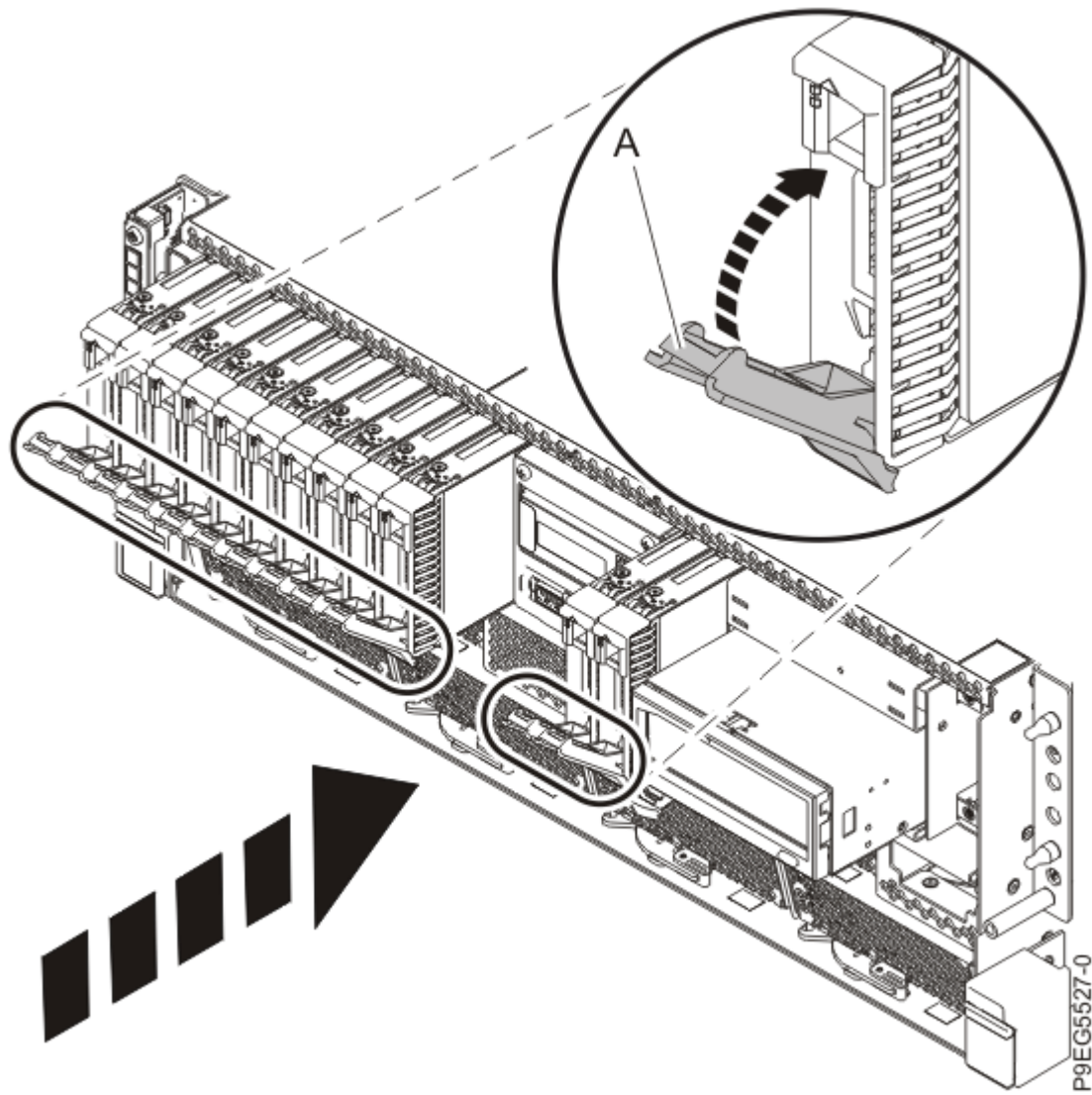


Figure 103. Replacing the front drives and fillers

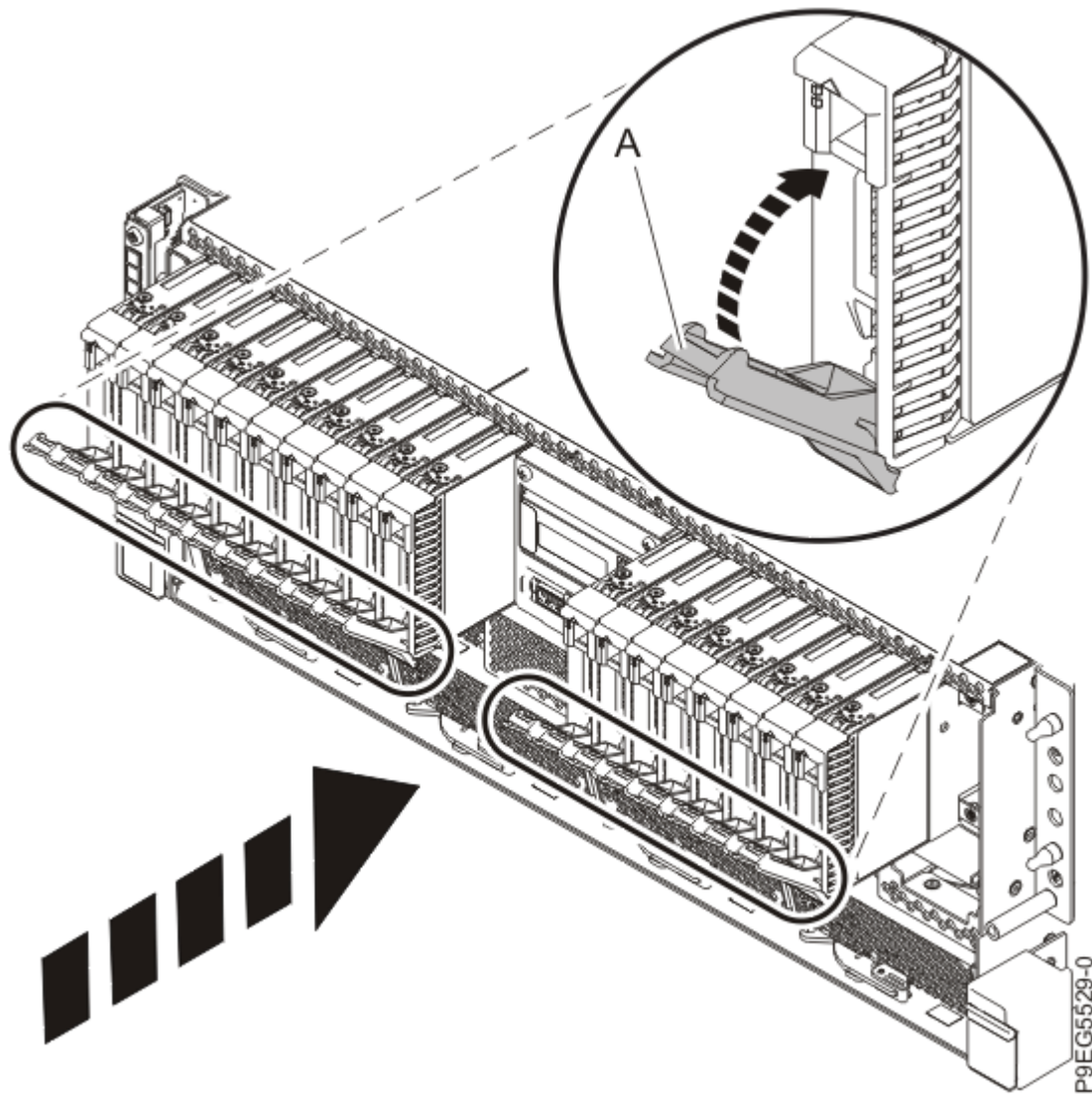
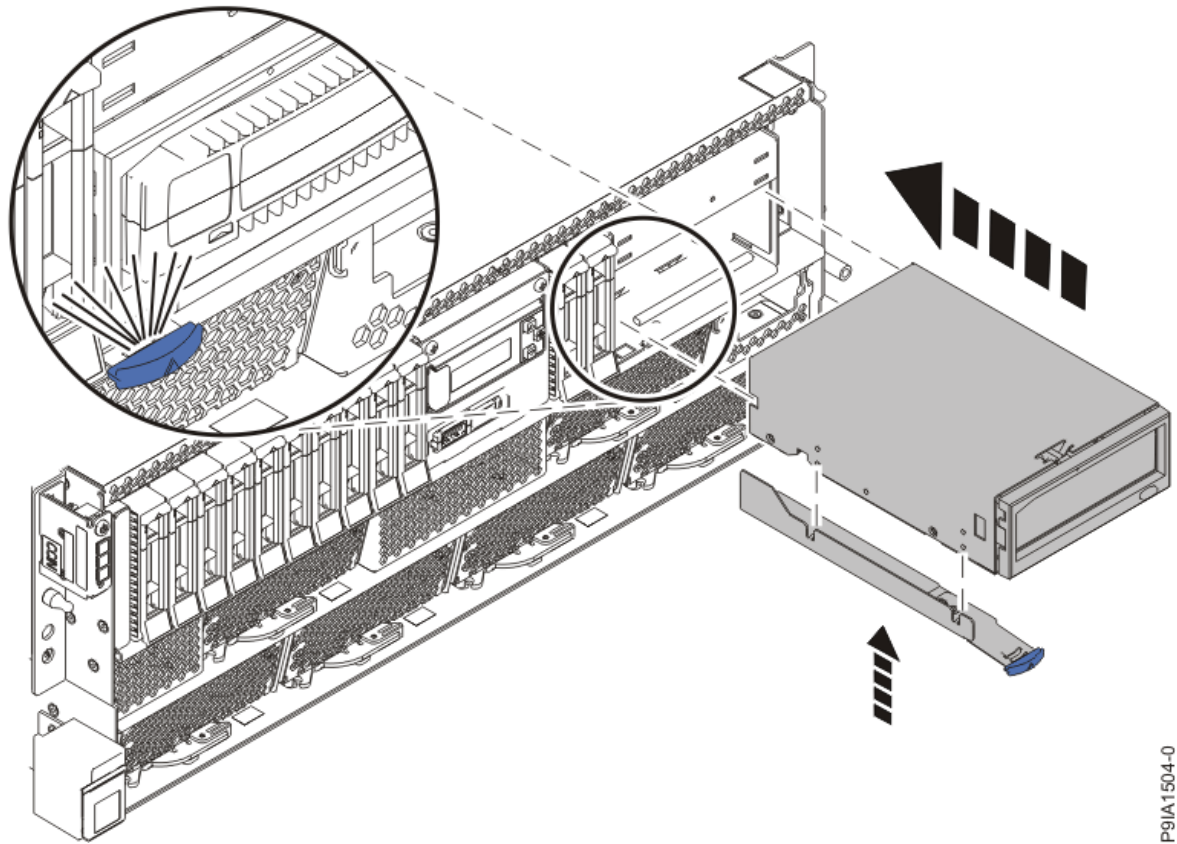


Figure 104. Replacing the front drives and fillers

25. Replace the RDX docking station, if present. Otherwise, continue with the next step.
 - a) Align the internal RDX latch with the holes on the bottom of the internal RDX docking station.
 - b) Hold the internal RDX latch in place while sliding the internal RDX docking station into the system.
 - c) Slide the internal RDX docking station into the system until it locks into place as shown in the following figure.



P9IA1504-0

Figure 105. Replacing the internal RDX docking station

- d) Connect the internal RDX docking station USB cable **(B)** to the rear of the new internal RDX docking station as shown in the following figure.
- e) Connect the internal RDX docking station power cable **(A)** to the rear of the new internal RDX docking station as shown in the following figure..

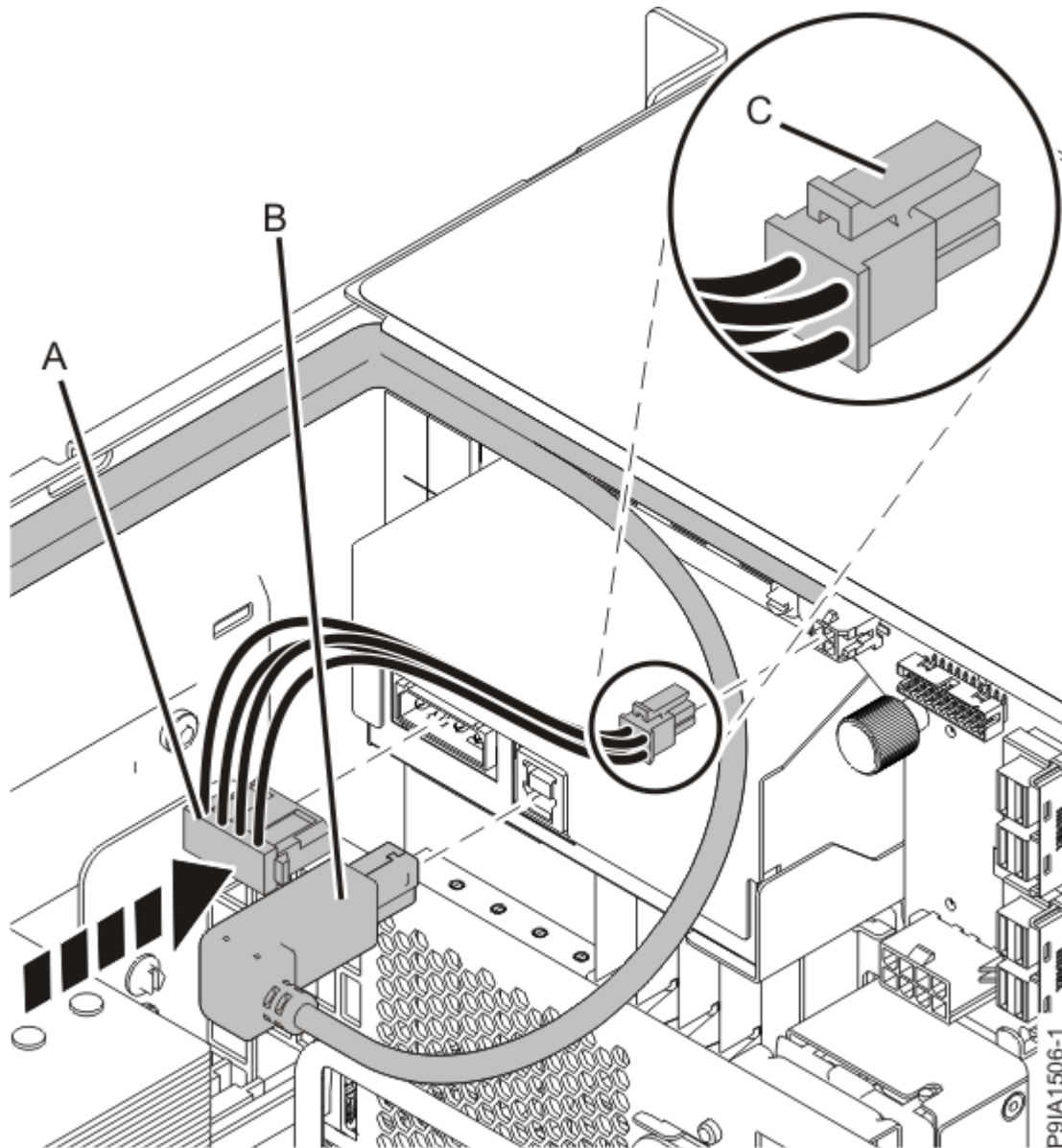


Figure 106. Connecting the internal RDX docking station power and USB cables

26. Replace the filler for the RDX drive, if present. Otherwise, continue with the next step.

- a) Place the filler into the system as shown in the following figure, ensure that the filler is in the tab at **(A)**.

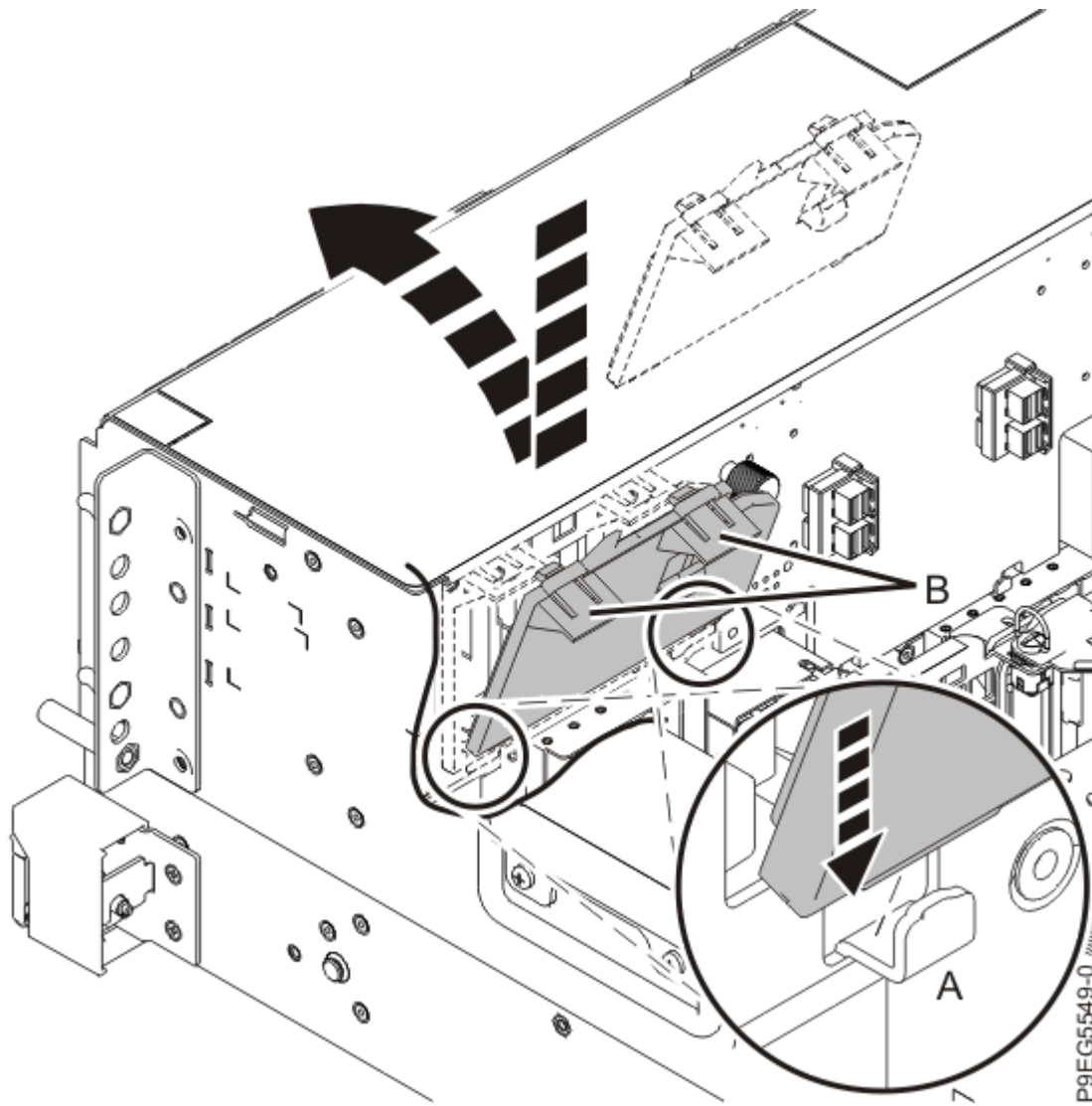


Figure 107. Replacing the RDX drive filler

- b) Push in the clips (**B**) to snap the filler into the chassis.
27. Replace the NVMe U.2 pass-thru cards, if present. Otherwise, continue with the next step.
- a) Route the NVMe cable into position while you lower the NVMe U.2 pass-thru card into its slot. Push the NVMe U.2 pass-thru card down to seat the card. Push in and twist the screws (**A**) clockwise to fully seat the NVMe U.2 pass-thru card.

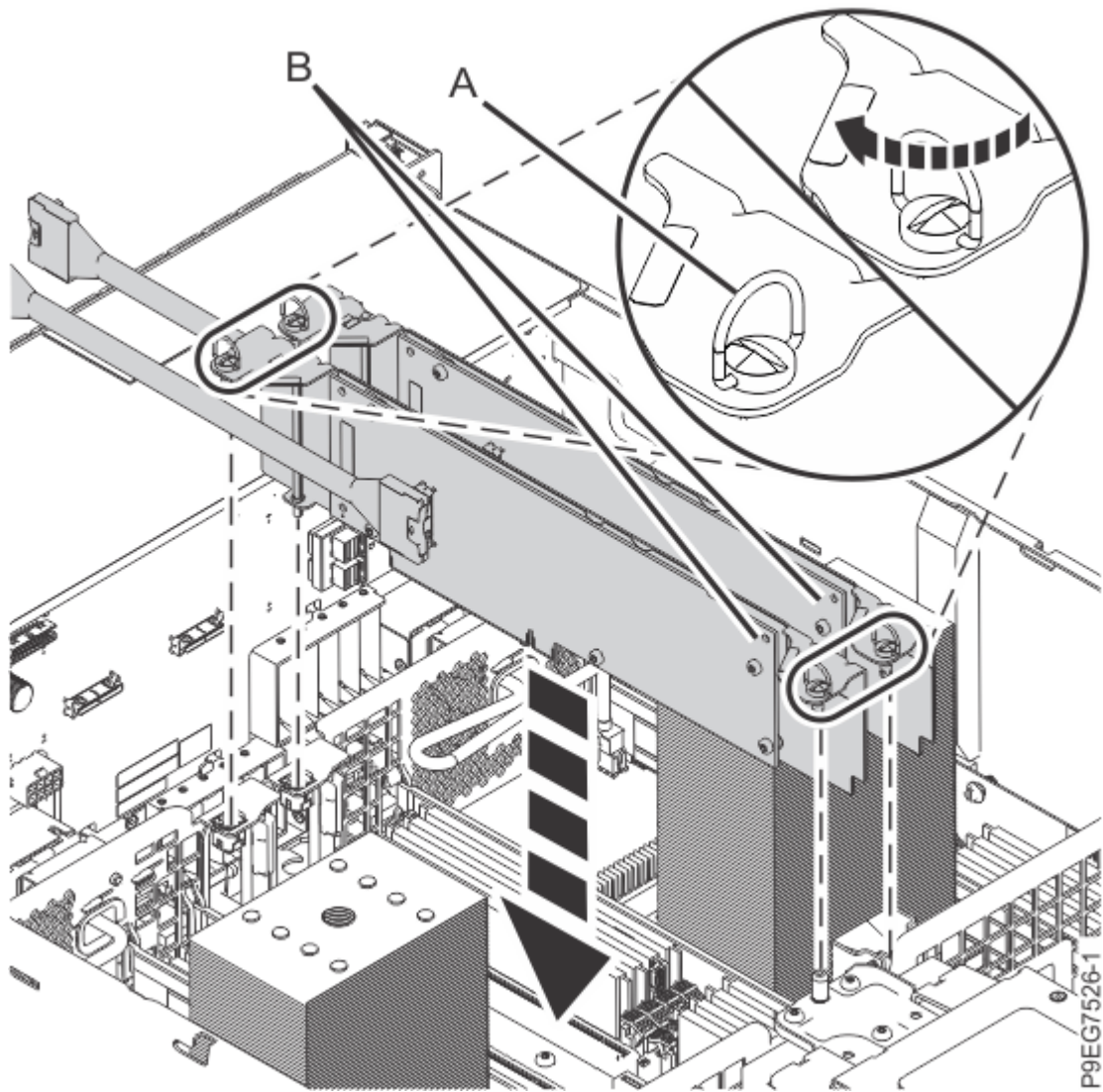


Figure 108. Seating the NVMe U.2 pass-thru card

- b) Using your labels, reconnect the NVMe cables to the NVMe drive backplane connectors (**J2**) and (**J3**) as is shown in the following figure.

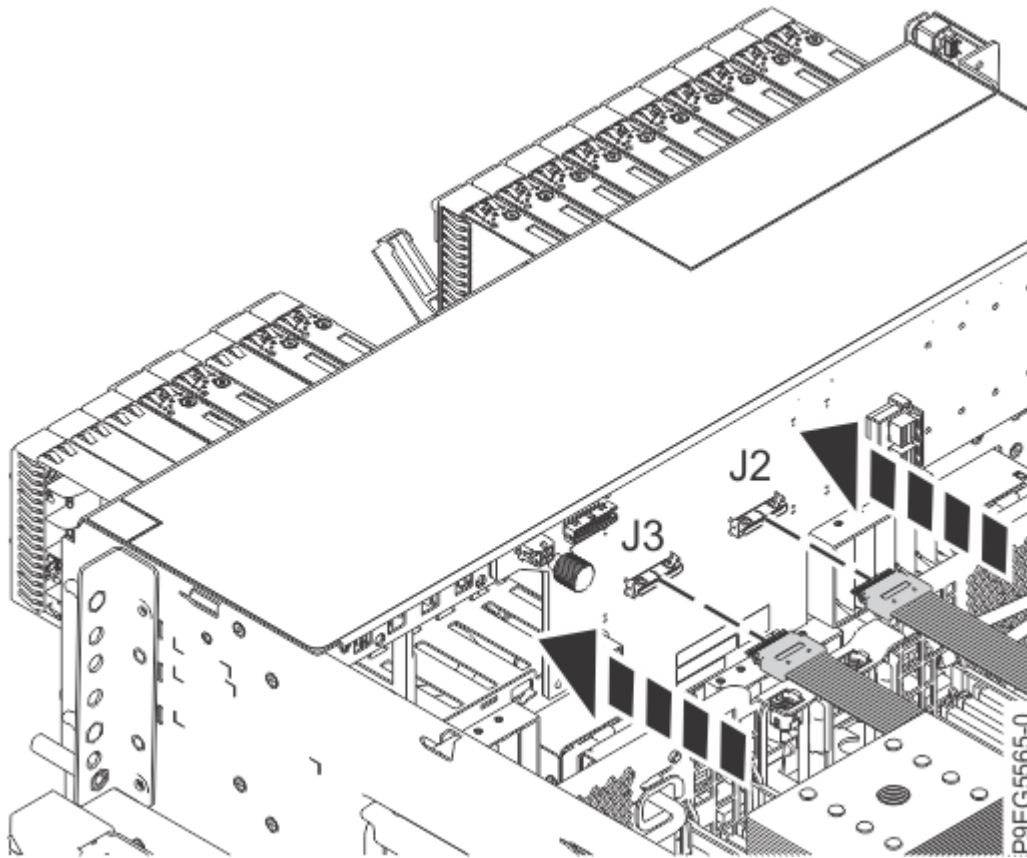


Figure 109. Reconnecting the NVMe drive cables to the NVMe drive backplane

- c) If a second NVMe U.2 pass thru card is present, repeat steps [“27.a”](#) on page 108 through [“27.b”](#) on page 109.
28. Replace the NVMe carrier card, if present. Otherwise, continue with the next step.
 - a) Lower the NVMe M.2 carrier card down into the slot.
 - b) Push in and twist the screws **(A)** clockwise to fully seat the NVMe M.2 carrier card as shown in the following figure.

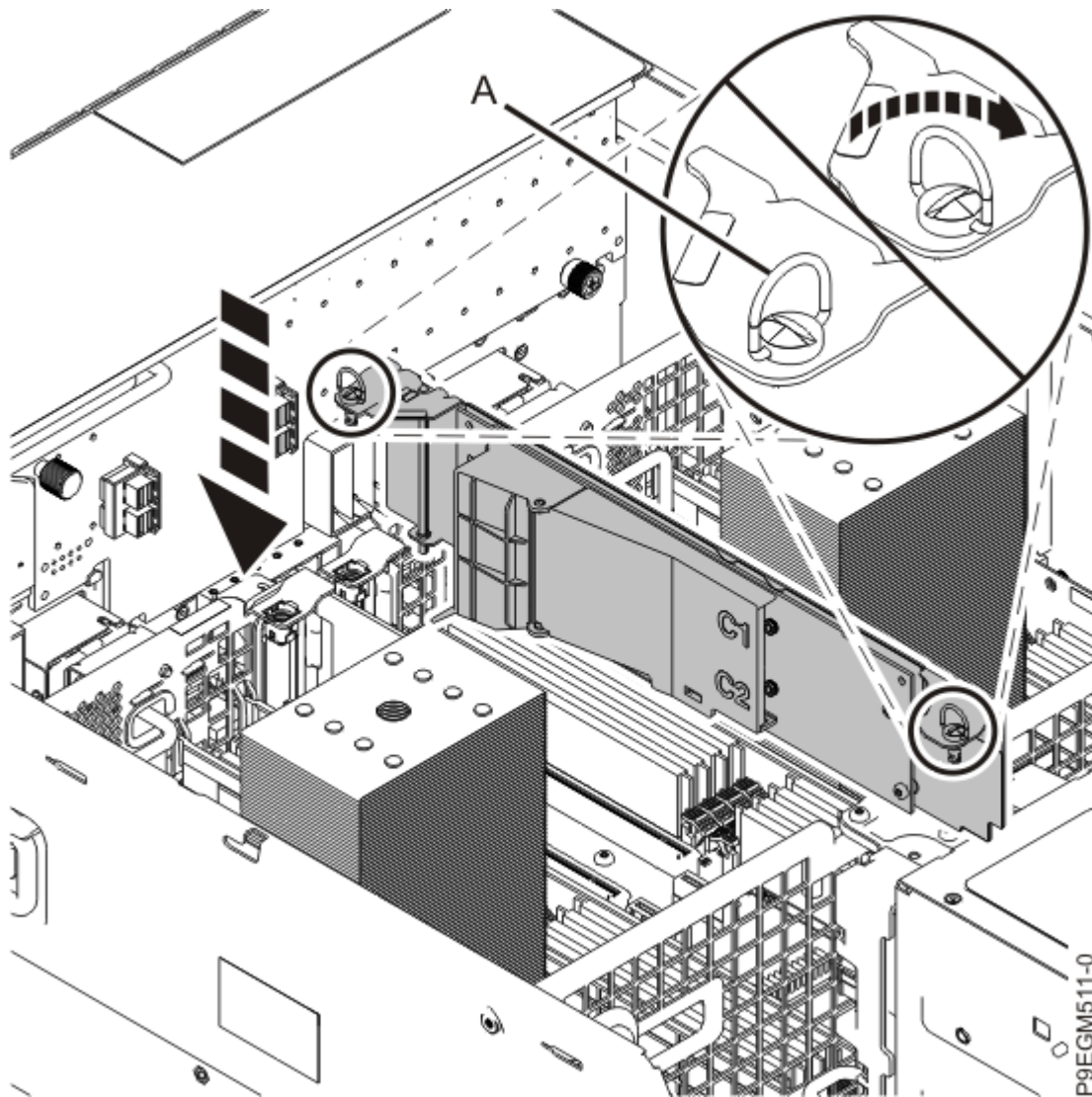


Figure 110. Seating the NVMe. M.2 carrier card

29. Replace the RAID adapter, if present. Otherwise, continue with the next step.

- a) Route the front SAS cables into position while you lower the SAS RAID adapter into its slot. Push the SAS RAID adapter down to seat the adapter. Push in and twist the screws **(A)** clockwise to fully seat the adapter. See the following figure.

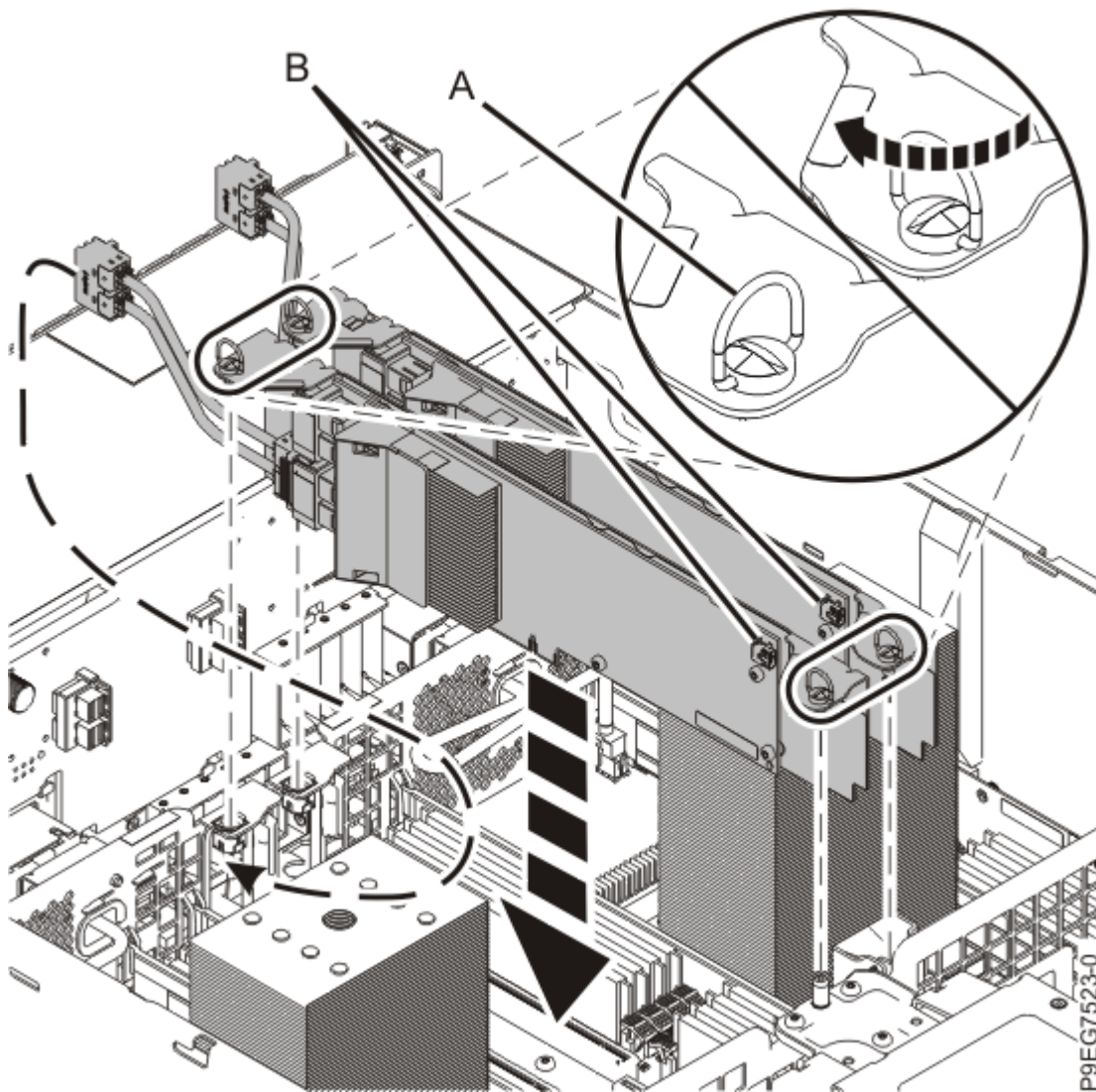
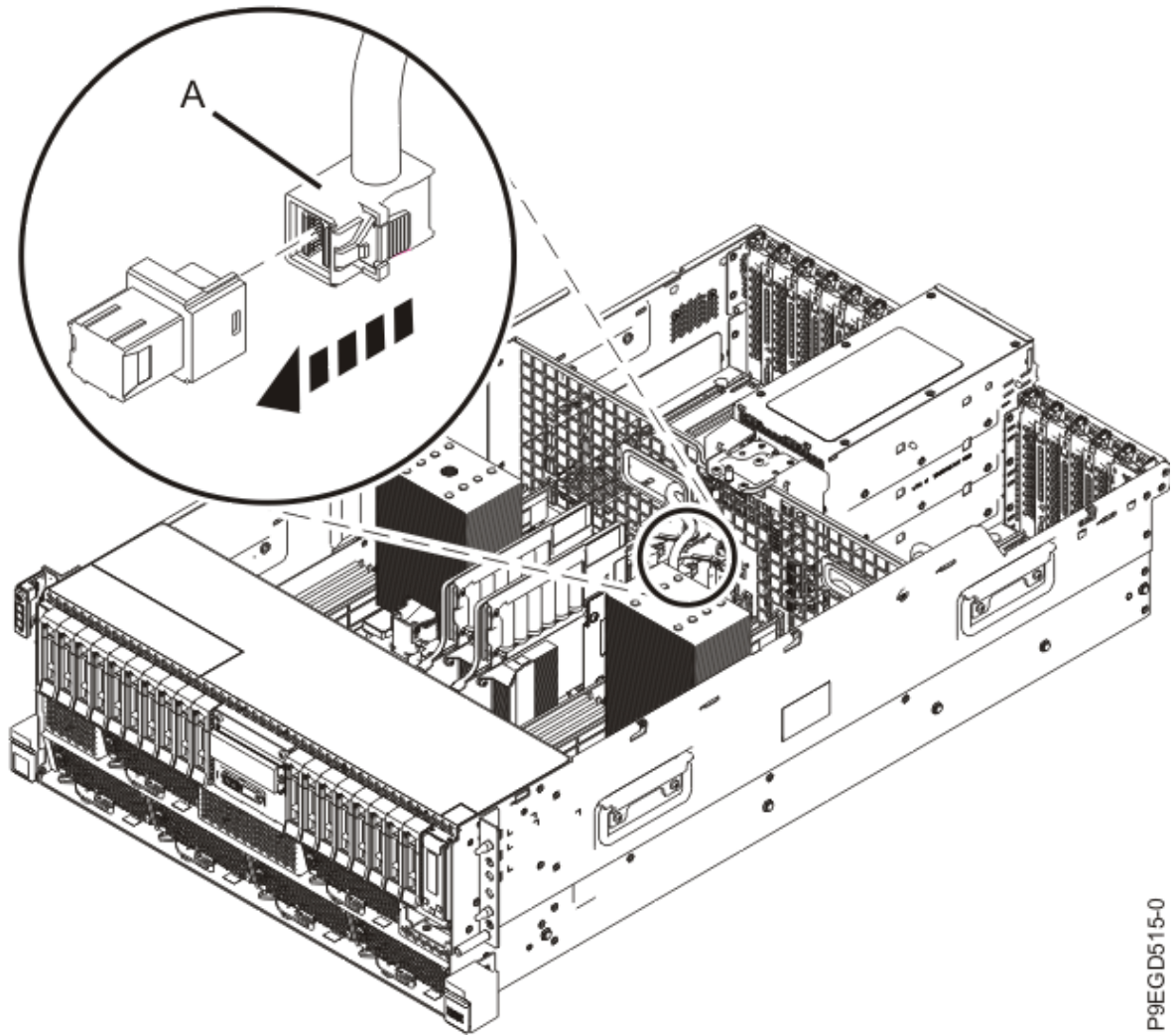


Figure 111. Replacing the SAS RAID adapter

- b) If a rear SAS cable was attached to the SAS RAID adapter, reconnect the rear SAS cable (**B**) to the SAS RAID adapter rear connector as shown in the following figure.



P9EGD515-0

Figure 112. Reconnecting the rear SAS cable

30. Reconnect the front SAS cables, if present. Otherwise, continue with the next step.

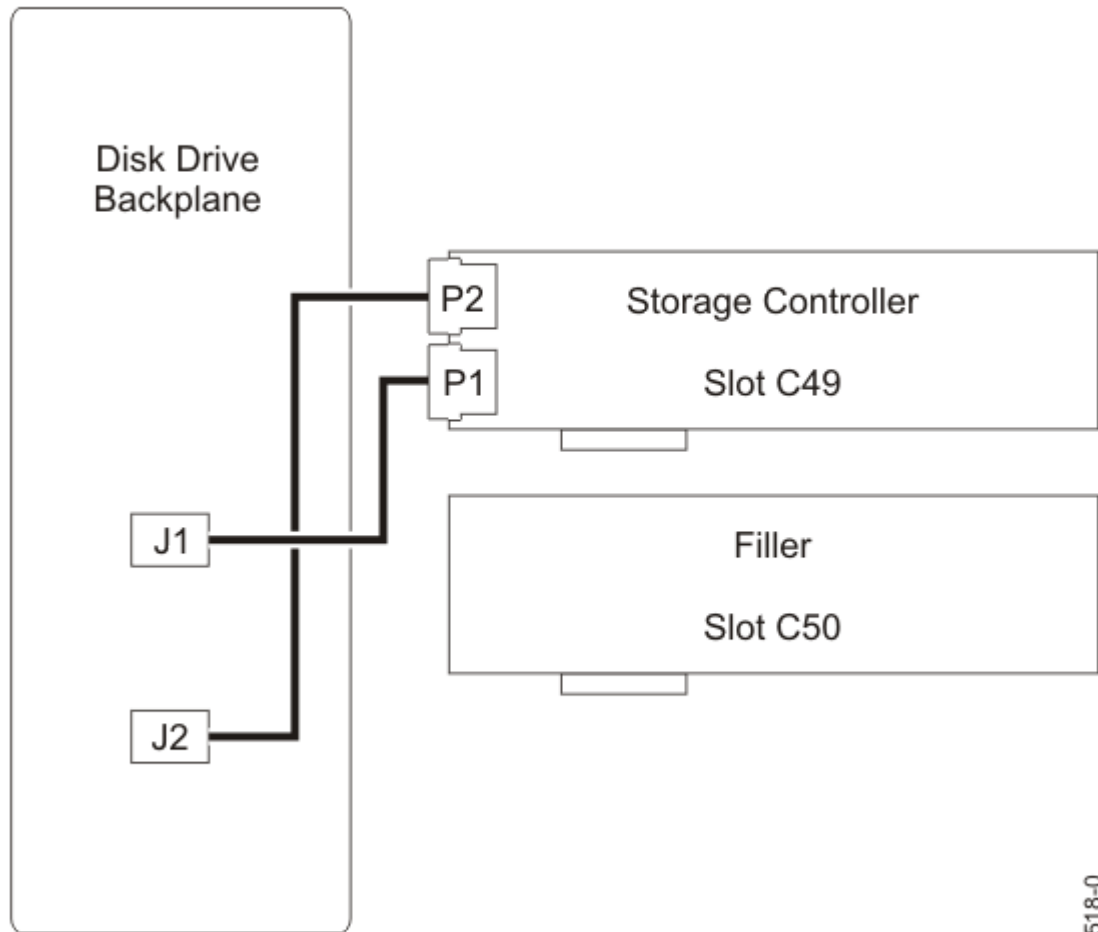
- a) Using your labels, reconnect the front SAS cables to the connector port on the disk drive backplane.

Use the following information to determine in which connector to plug the front SAS cables into the base function disk drive backplane:

Notes:

If you have one storage controller in slot P1-C49 (base-storage feature) and a filler in slot P1-C50

One SAS cable connects the disk drive backplane connector J1 to the P1 connector on the storage controller. Another SAS cable connects the disk drive backplane connector J2 to the P2 connector on the same storage controller. See the following figure.

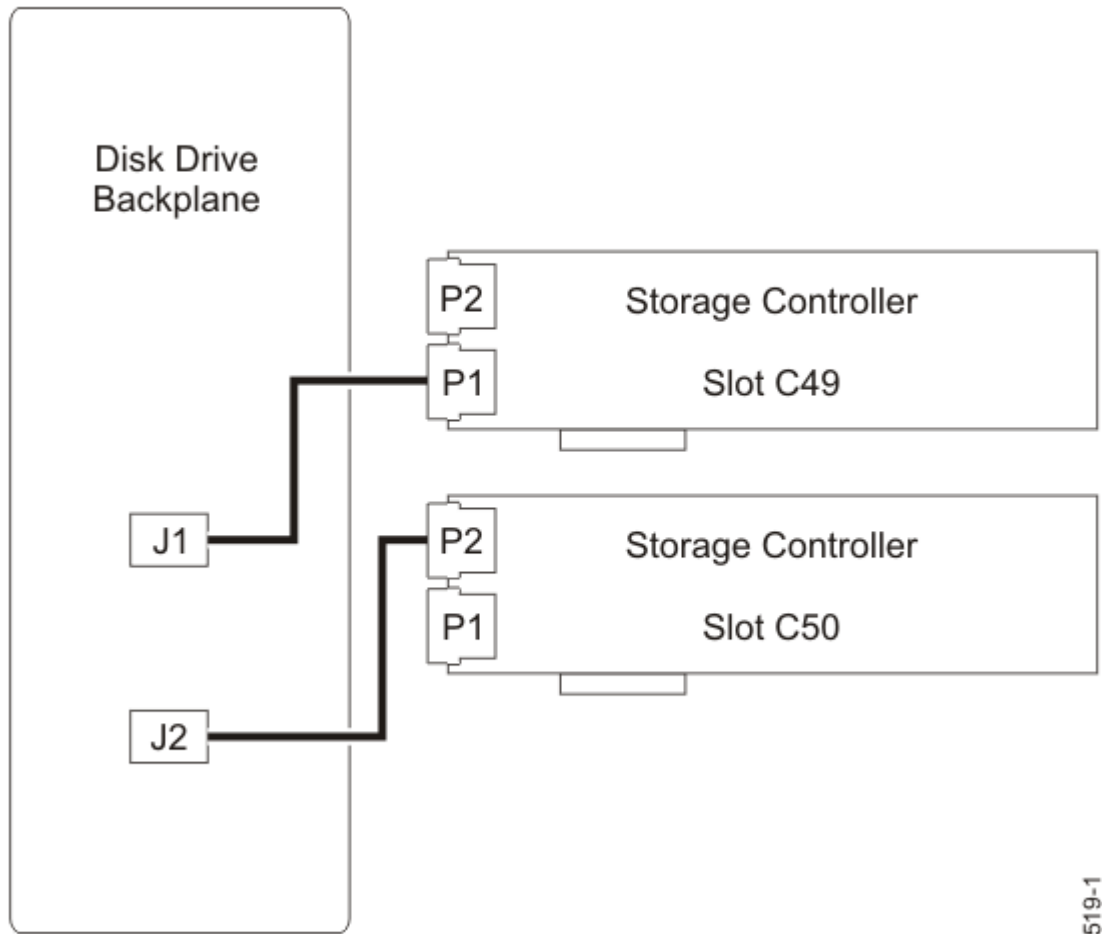


P9EG5518-0

Figure 113. Reconnecting the SAS cable in a base-storage configuration

If you have two storage controllers (split-disk feature), in slots P1-C49 and P1-C50

One SAS cable connects the disk drive backplane connector J1 to the P1 connector on the storage controller in slot P1-C49. The other SAS cable connects the disk drive backplane connector J2 to the P2 connector on the storage controller in slot P1-C50. See the following figure.



P9EG5519-1

Figure 114. Reconnecting the SAS cable in a split-disk configuration

Use the following information to determine in which connector to plug front SAS cables into the 12-drive expanded function disk drive backplane:

Note: One SAS cable connects the disk drive backplane connector J2 to the P1 connector on the storage controller in slot P1-C49. The other SAS cable connects the disk drive backplane connector J4 to the P1 connector on the storage controller in slot P1-C50. See the following figure.

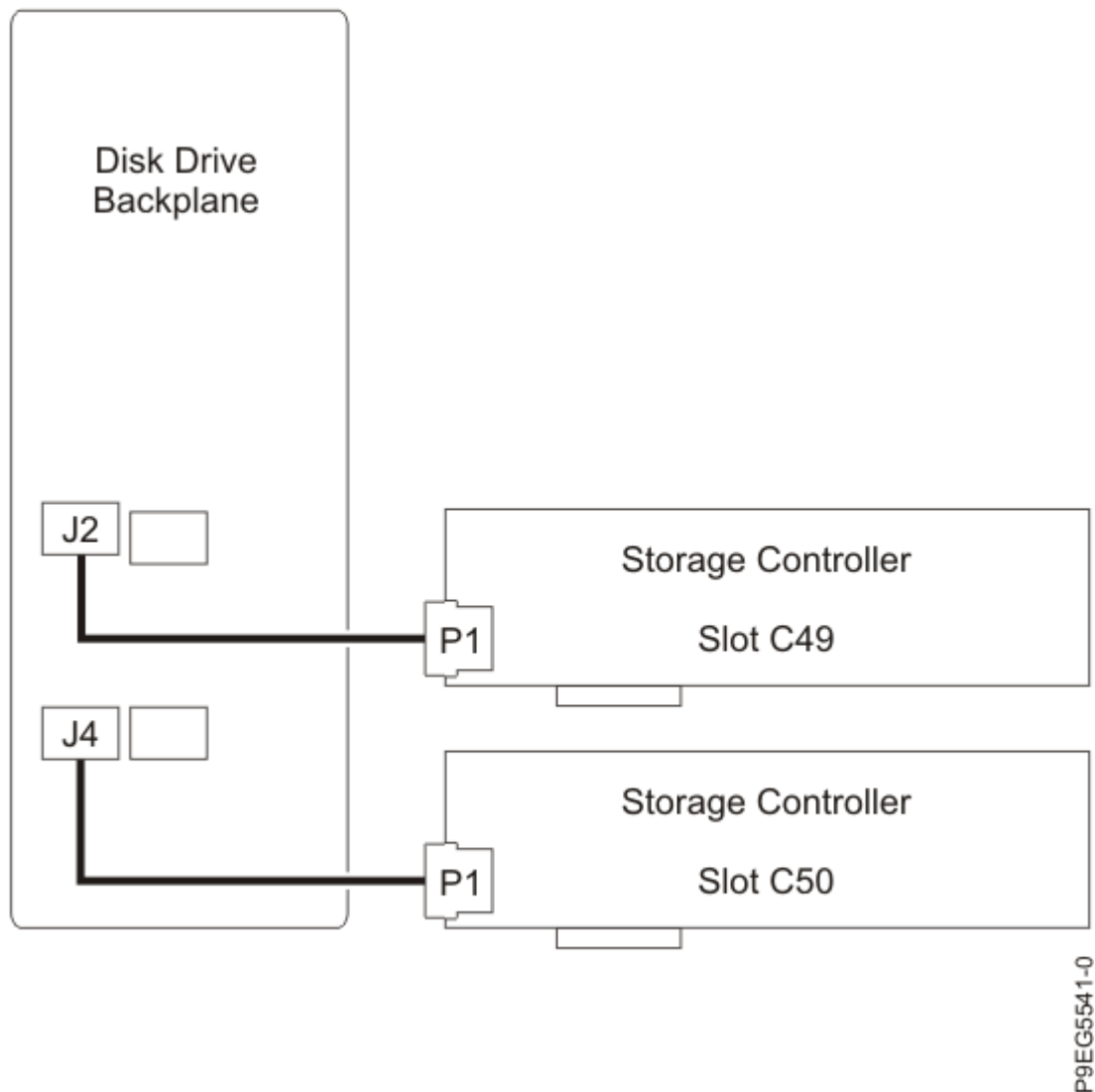


Figure 115. Reconnecting the SAS cable in the 12-drive expanded function configuration

Use the following information to determine in which connector to plug front SAS cables into the 18-drive expanded function disk drive backplane:

Note: One SAS cable connects the disk drive backplane connector J2 to the P1 connector on the storage controller in slot P1-C49. The other SAS cable connects the disk drive backplane connector J4 to the P1 connector on the storage controller in slot P1-C50. See the following figure.

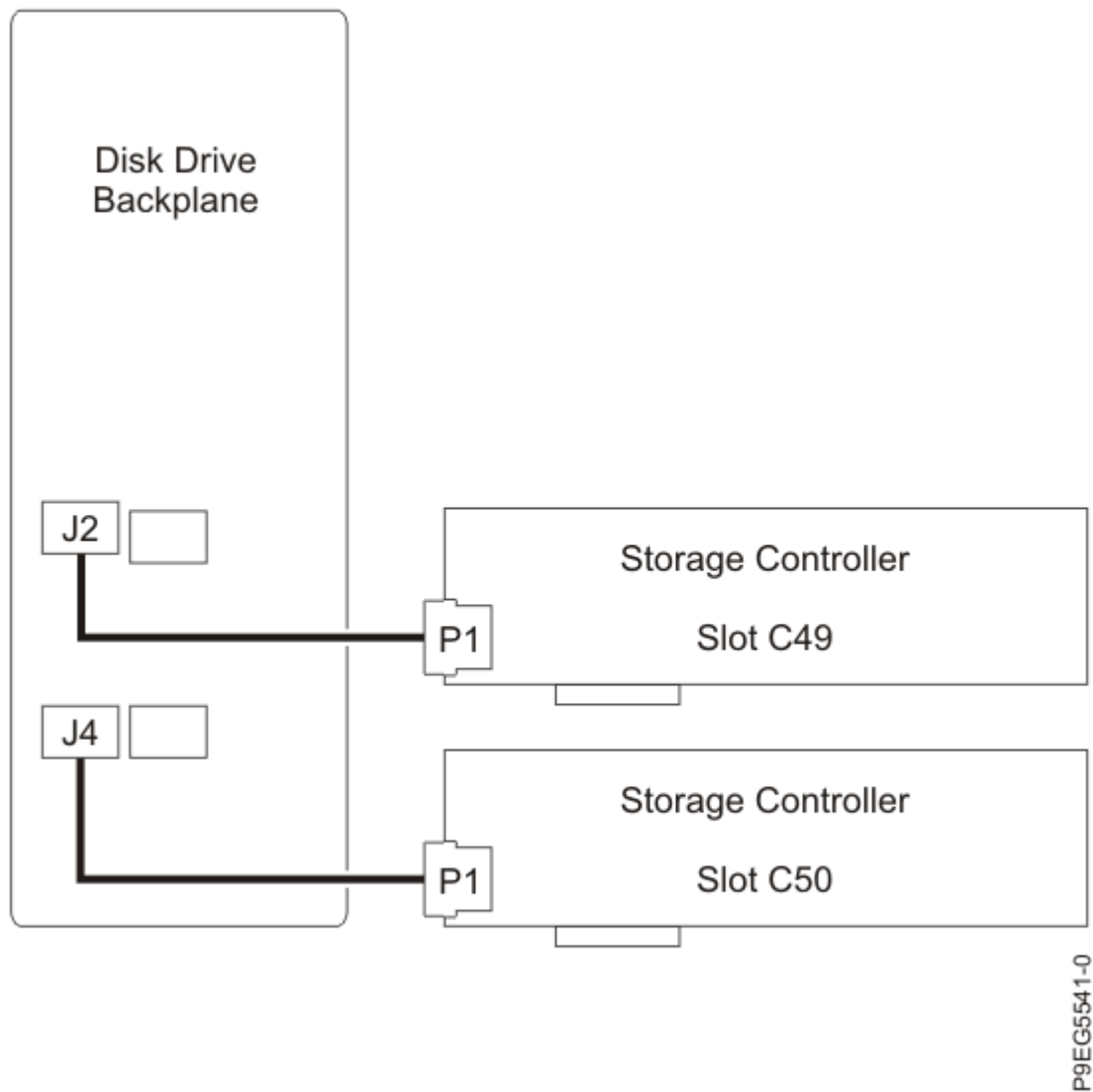
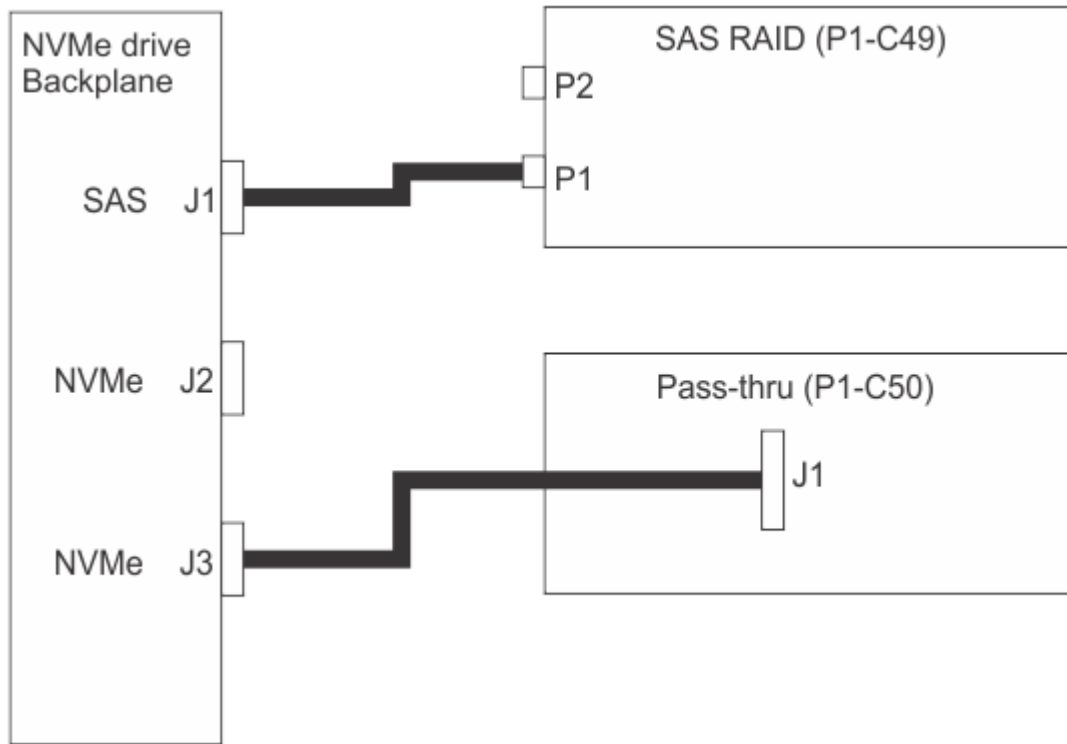


Figure 116. Reconnecting the SAS cable in the 18-drive expanded function configuration

Use the following information to determine in which connector to plug a front SAS cable into the NVMe drive backplane:

Note: The SAS cable connects from SAS port (J1) on the NVMe drive backplane to port (P1) on the SAS RAID internal adapter. See the following figure.



P9EG7529-3

Figure 117. Reconnecting the SAS cable in the NVMe drive backplane configuration
 b) Push the connector in until the connector latch clicks. See the following figures.

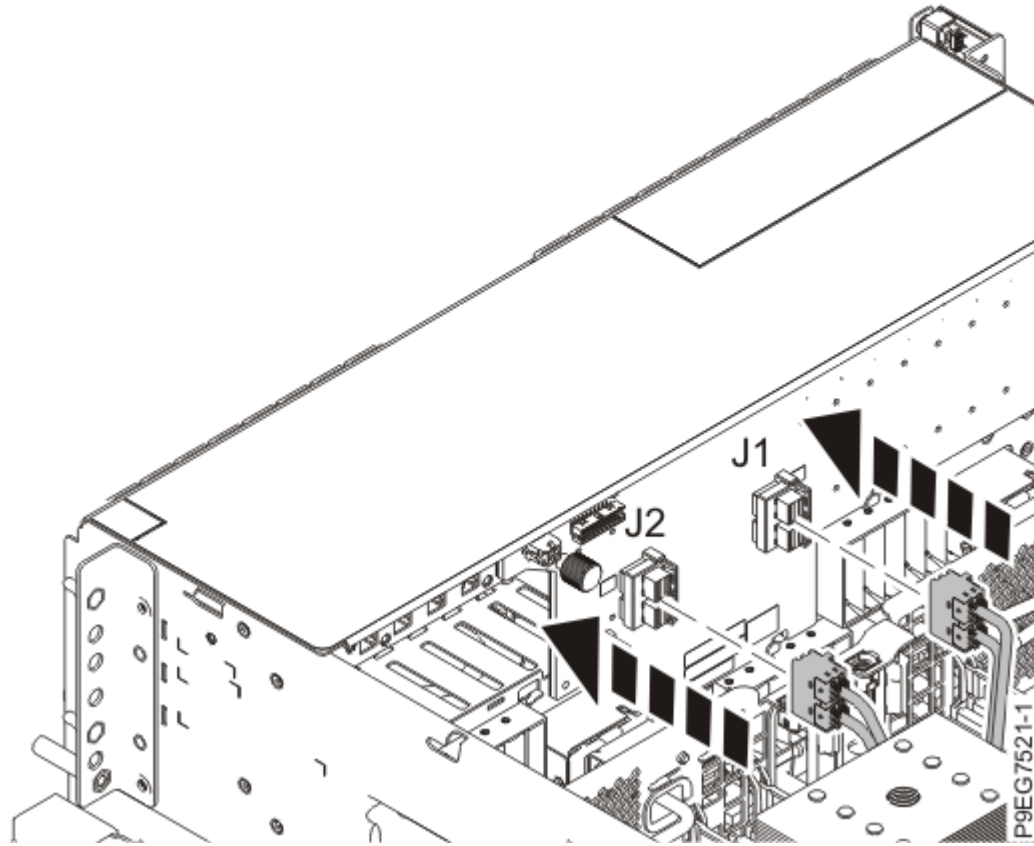


Figure 118. Reconnecting the front SAS cables for the base function disk drive backplane

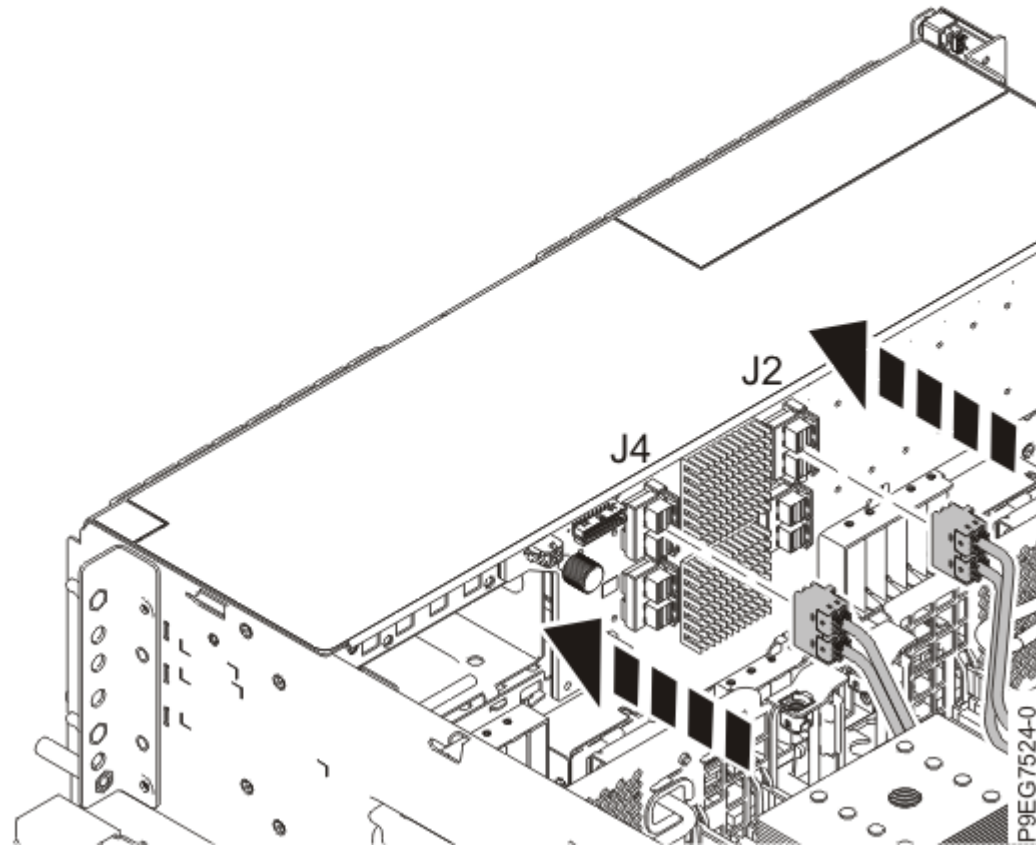


Figure 119. Reconnecting the front SAS cables for the 12-drive expanded function or 18-drive expanded function disk drive backplane

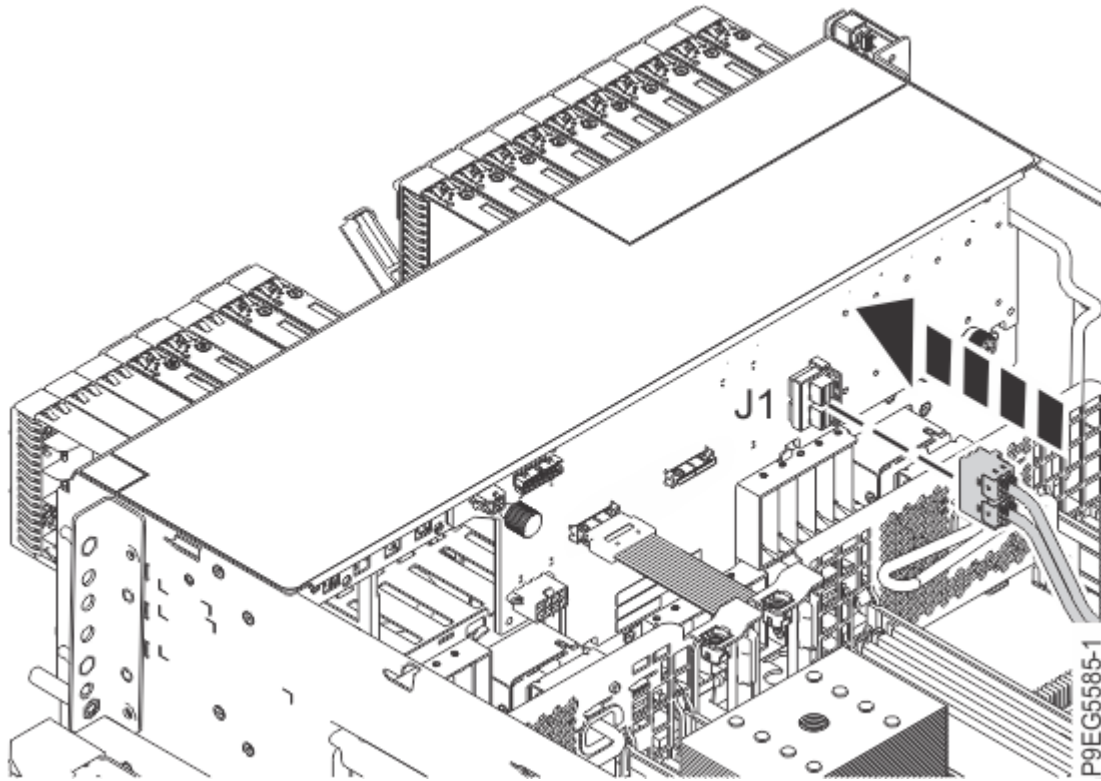
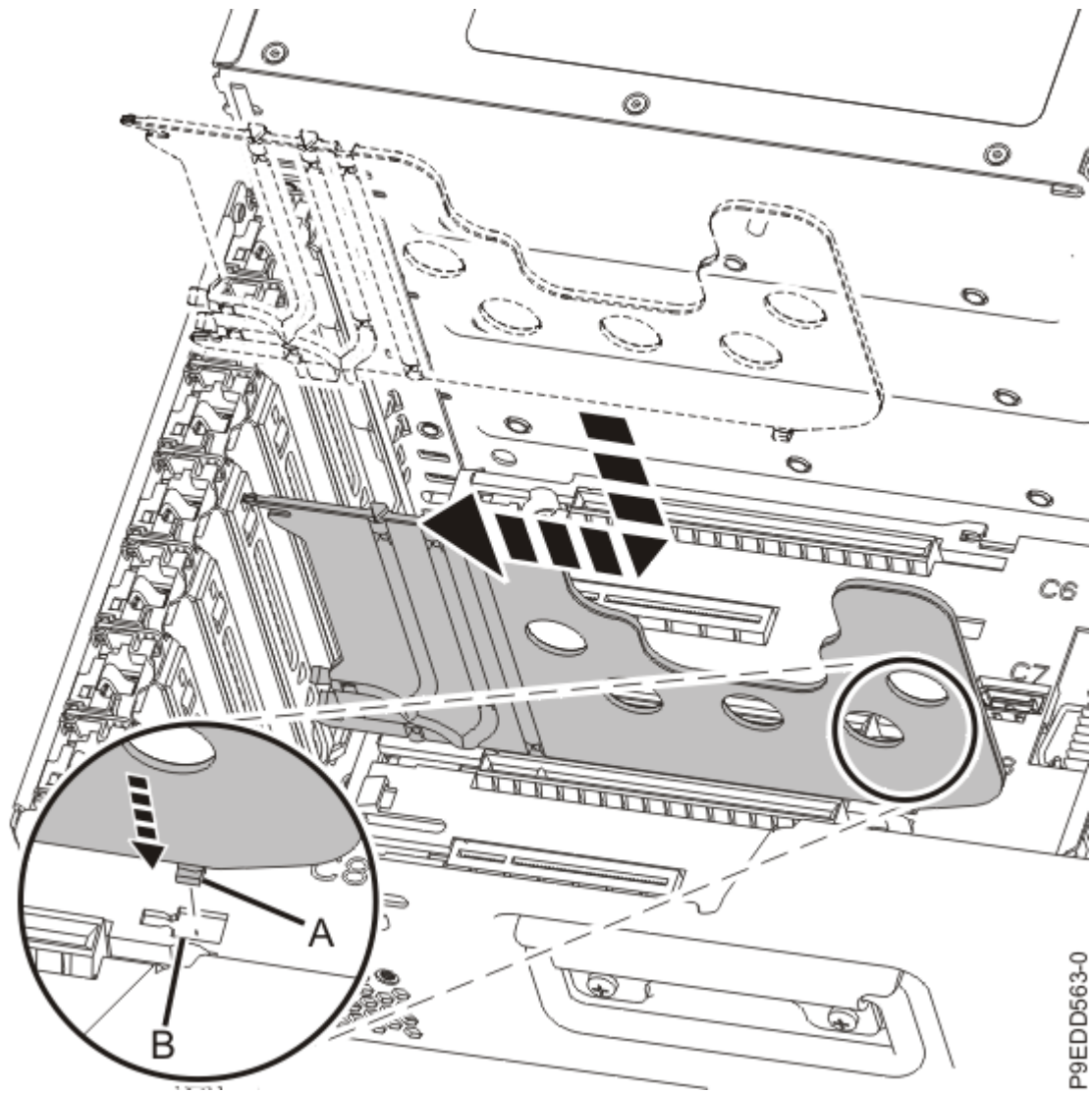


Figure 120. Reconnecting a front SAS cable for the NVMe drive backplane

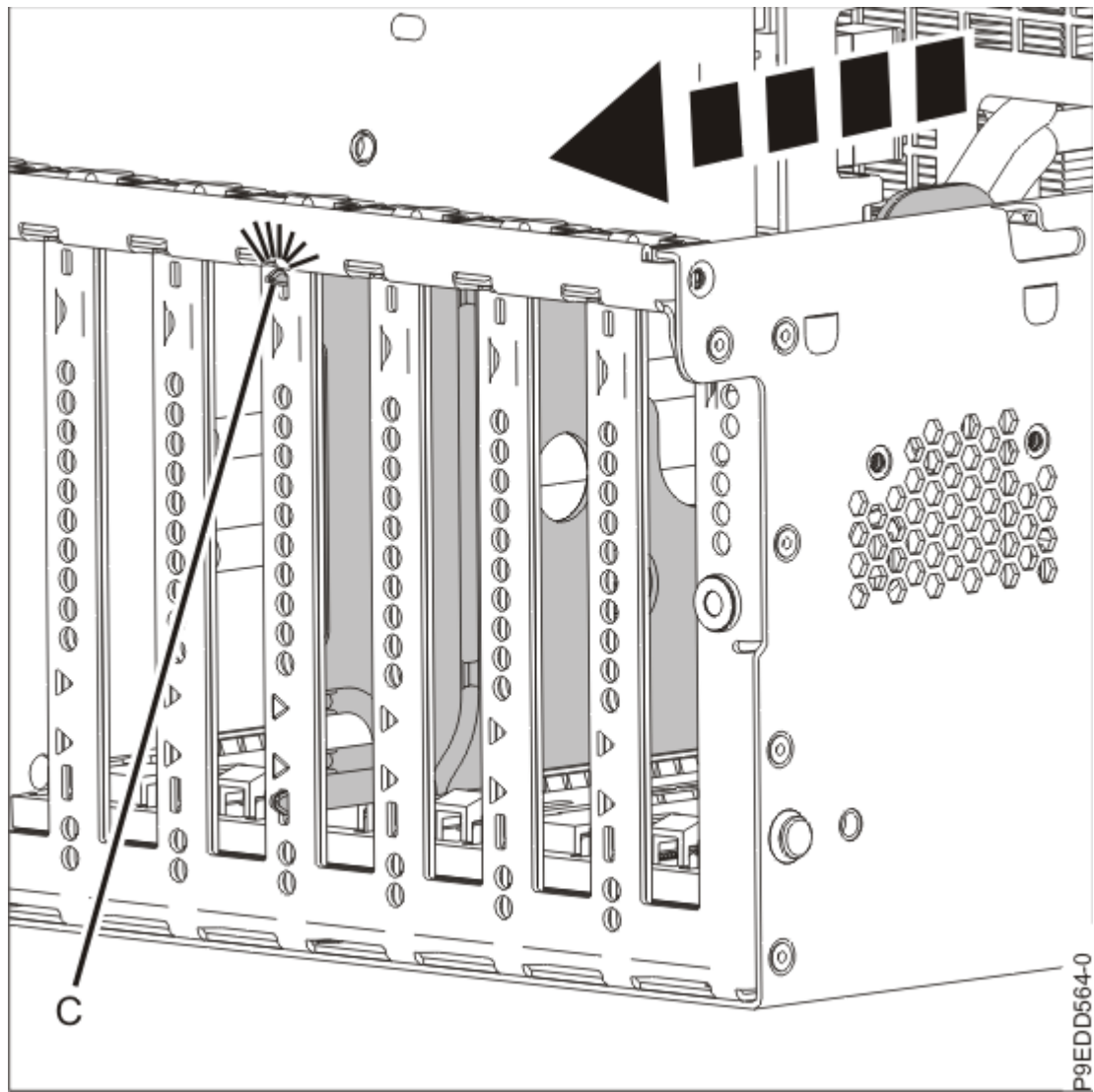
31. Replace the SAS air block, if present.
32. Replace the PCIe adapter divider, if present. Otherwise, continue with step “37” on page 128.
 - a) Carefully grasp the adapter divider by its edge or tailstock and slide the divider towards the system chassis and into its slot. Make sure the tab **(A)** on the divider is fully seated and slides into the groove **(B)** on the system backplane. See the following figure.

Figure 121. Sliding the PCIe divider into the system



b) To lock the divider in its slot, lift up on the retaining latch at the back edge of the divider (**C**) as shown in the following figure.

Figure 122. Locking the retaining latch on the PCIe divider



P9EDD564-0

33. Replace the rear USB cable.

- a) Insert the rear USB cable **(A)** into the opening on the rear of the system, pressing in on the tabs **(B)** as shown in the following figure.

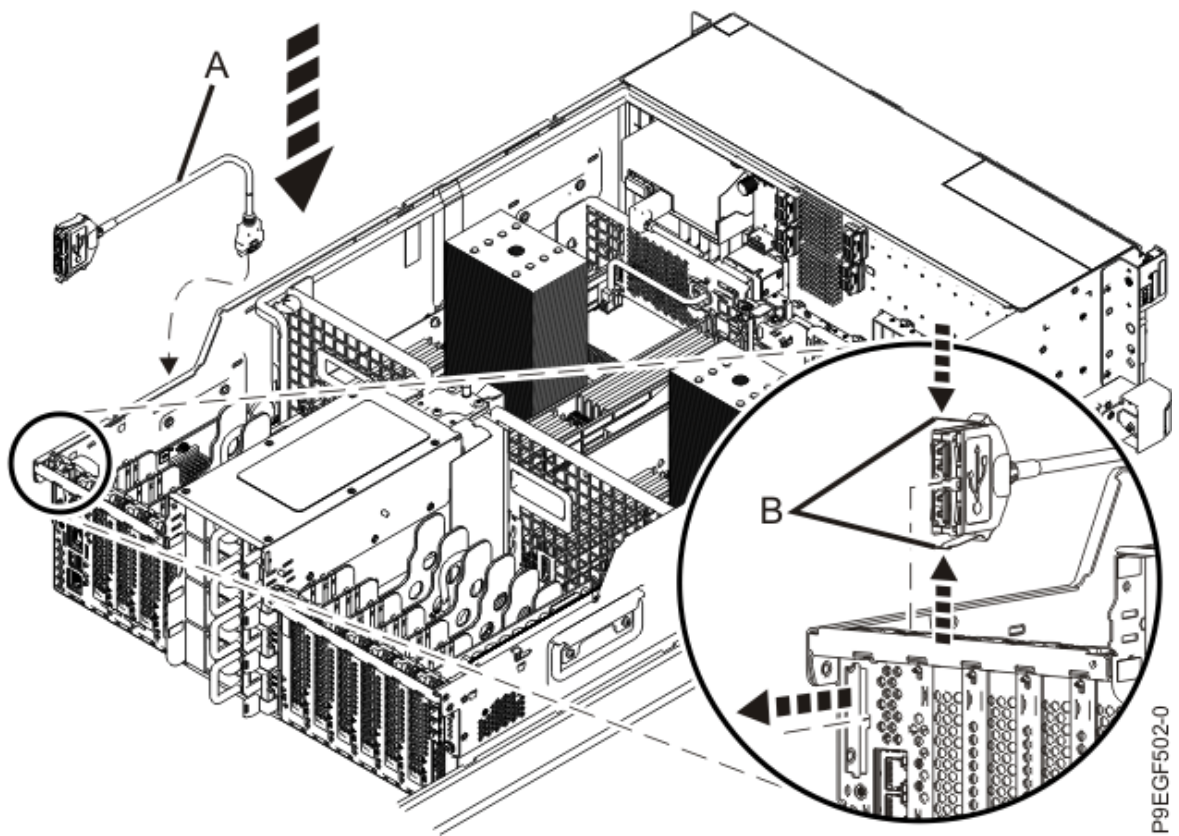
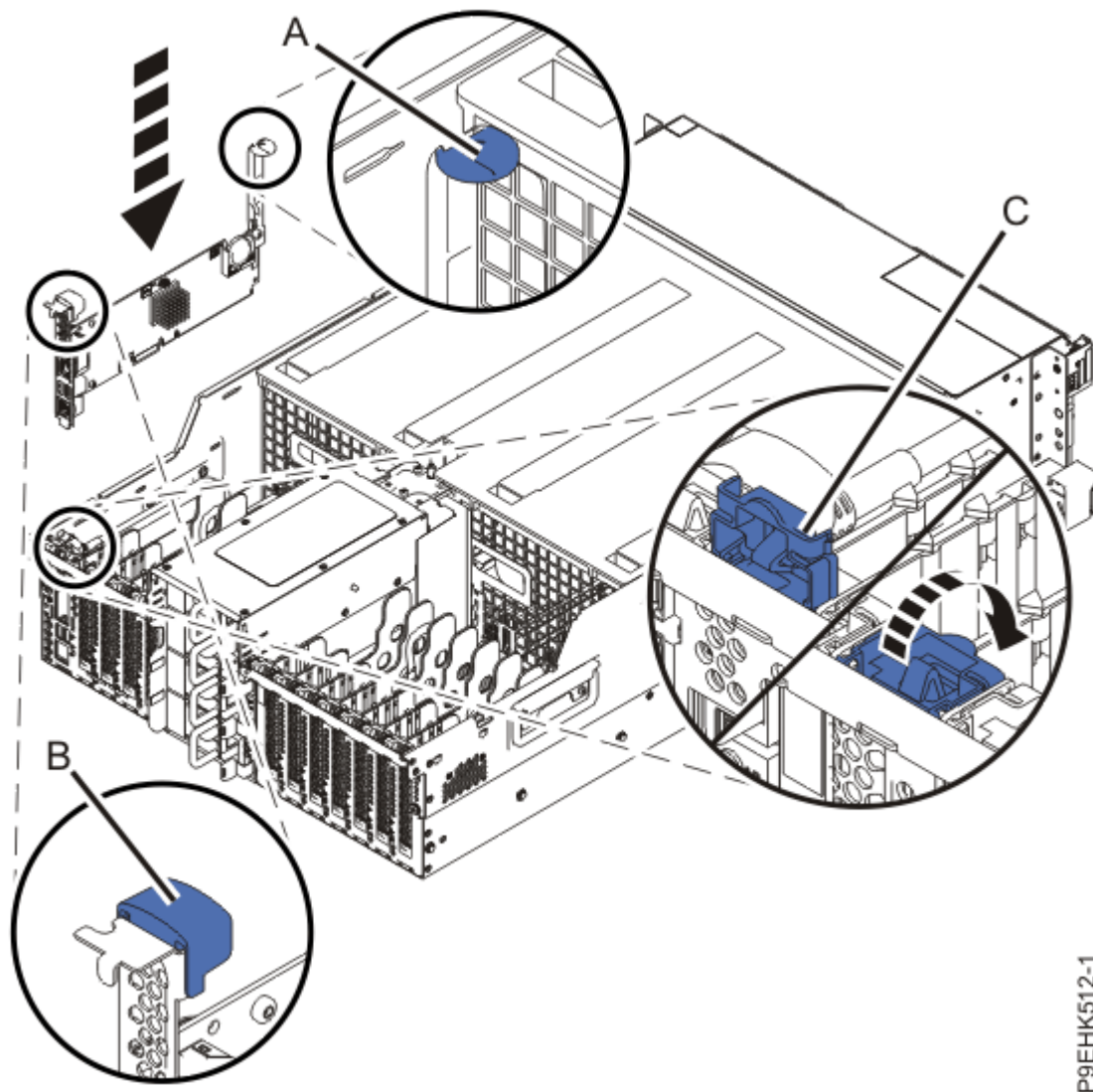


Figure 123. Replacing the rear USB cable into the system

- b) Route the cable along the right side of the chassis. Do not plug the other end of the rear USB cable into the connector on the system backplane until directed in a later step.
34. Replace the service processor card.
- a) Align the service processor card into PCIe location and push the card straight down into the slot using two brackets **(A)** and **(B)**, as shown in the following figure.



P9EHK512-1

Figure 124. Installing the service processor card into slot P1-C1

- b) Close the PCI adapter retainer latch **(C)** to secure the card.
35. Connect the front and rear USB cables.
- a) Plug the front USB cable **(A)** into the connector on the system backplane, as shown in the following figure. The connector on the system backplane that has the USB port symbol with an arrow that points to the front of the system.

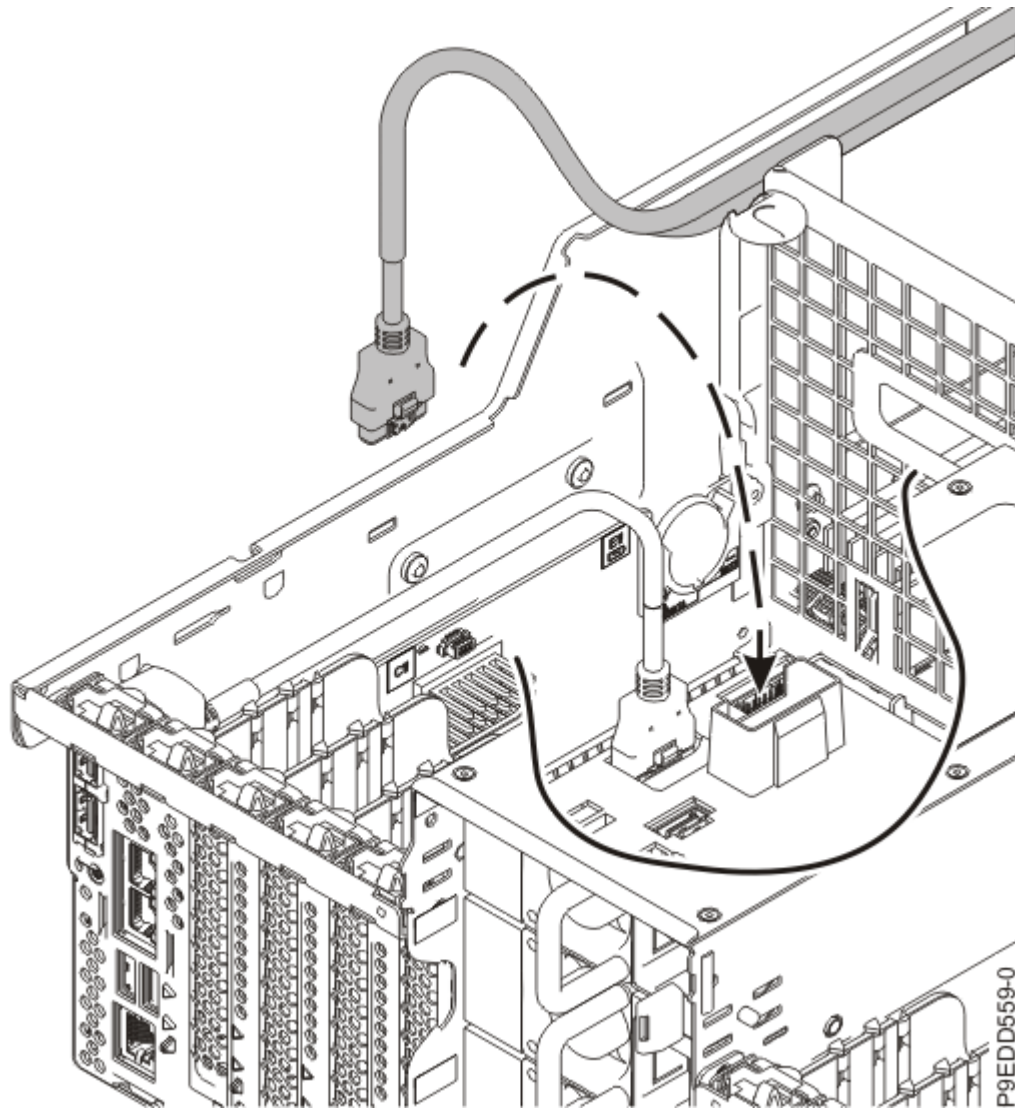
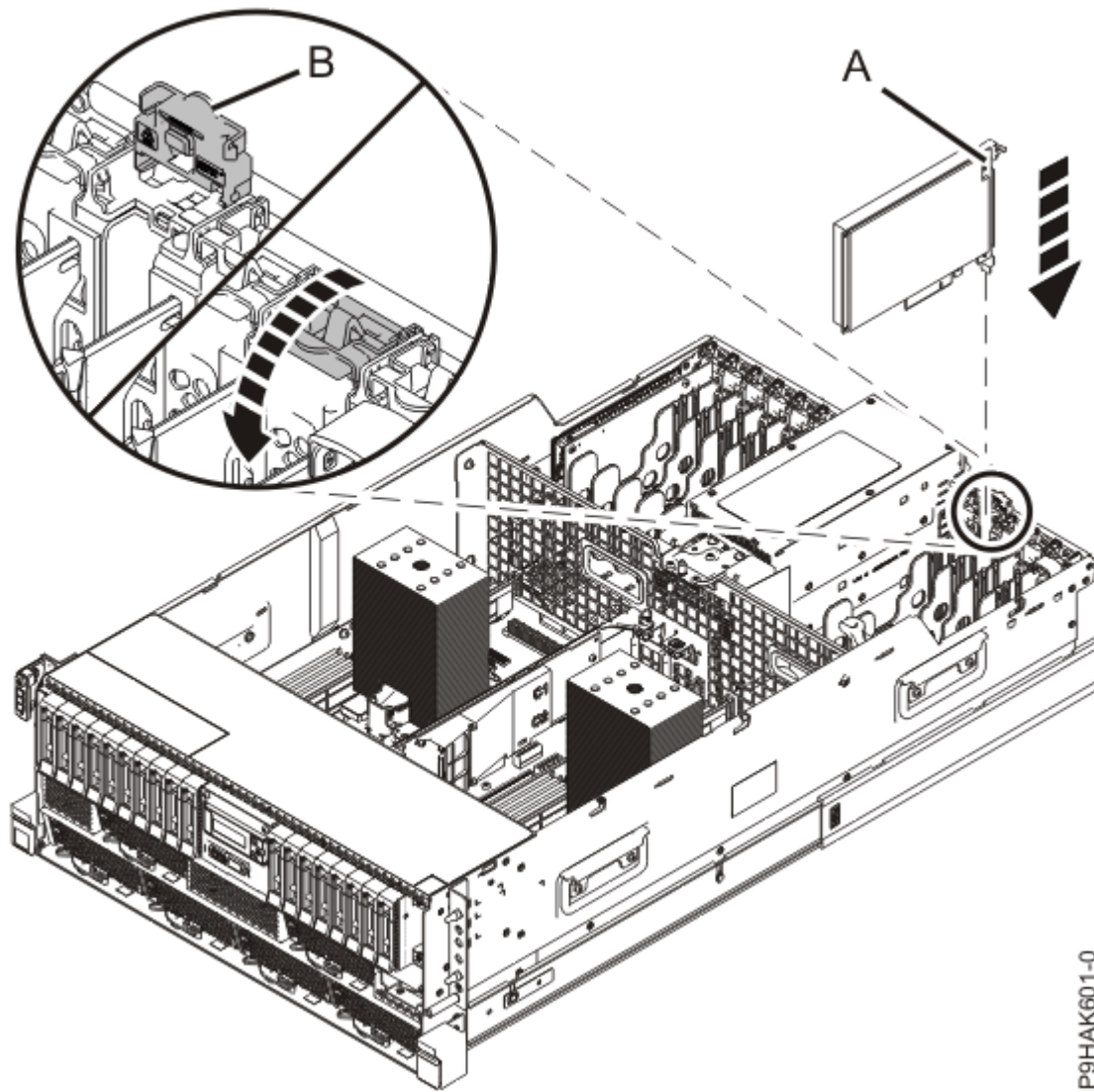


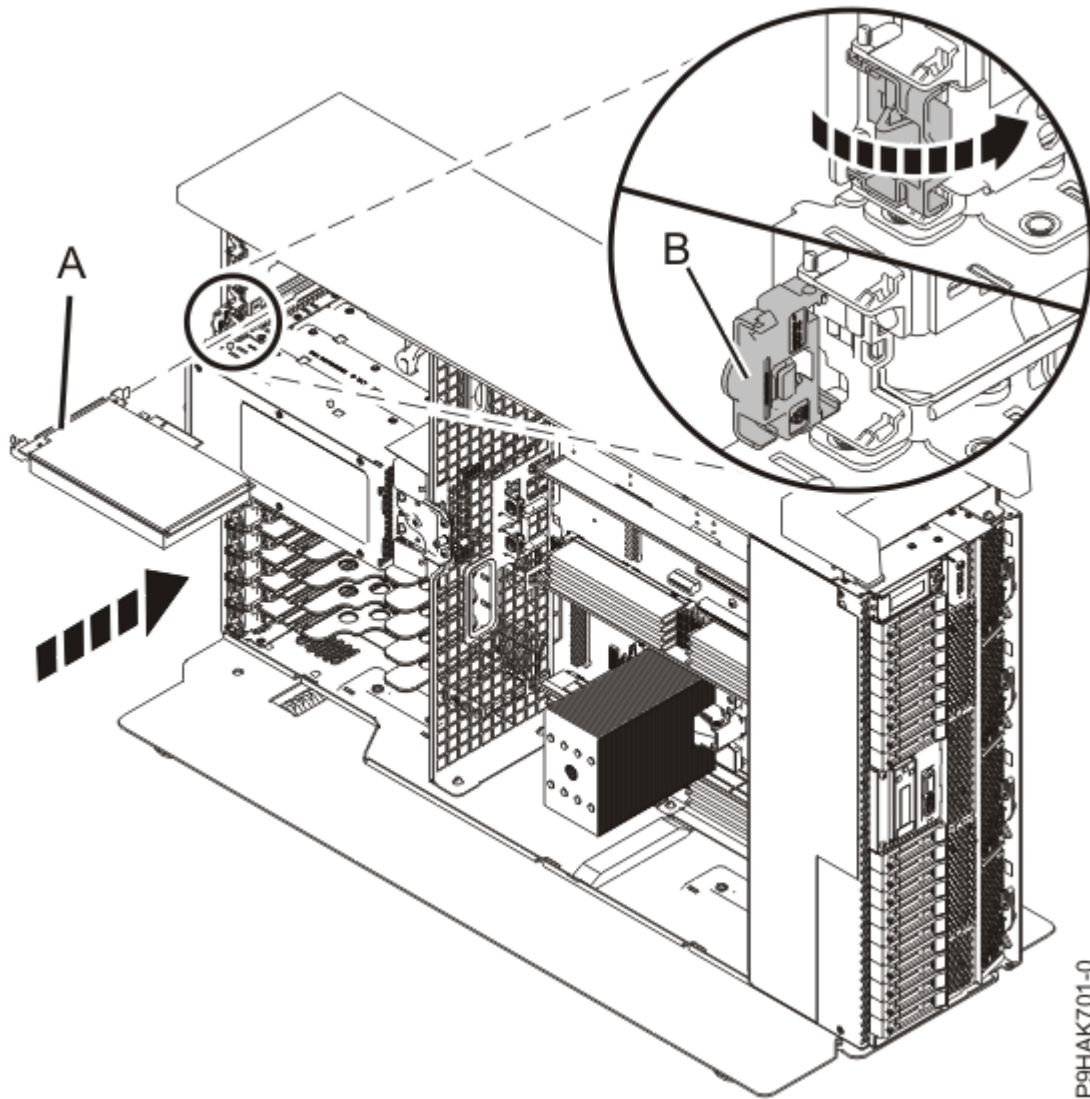
Figure 125. Plugging the front USB cable into the system backplane

- b) Reroute the front USB cable along the top right side of the system and secure it to the hook and loop fasteners on the side of the system.
 - c) Plug the other end of the rear USB cable (**C**) into the connector on the system backplane as shown in the following figure. The connector on the system backplane that has the USB port symbol with an arrow that points to the rear of the system.
36. Replace the PCIe adapters.
- a) Refer to your notes to identify the location where you want to install the PCIe adapter.
 - b) If the adapter latch (**B**) at the target slot on the system is not already in the open position, pull the latch into the open position by rotating the latch outwards from its clip on the back of the system.
 - c) Press the adapter firmly into its connector ensuring that it is seated.
 - d) To lock the adapter in its slot, rotate the adapter latch (**B**) in the direction that is shown.



P9HAK601-0

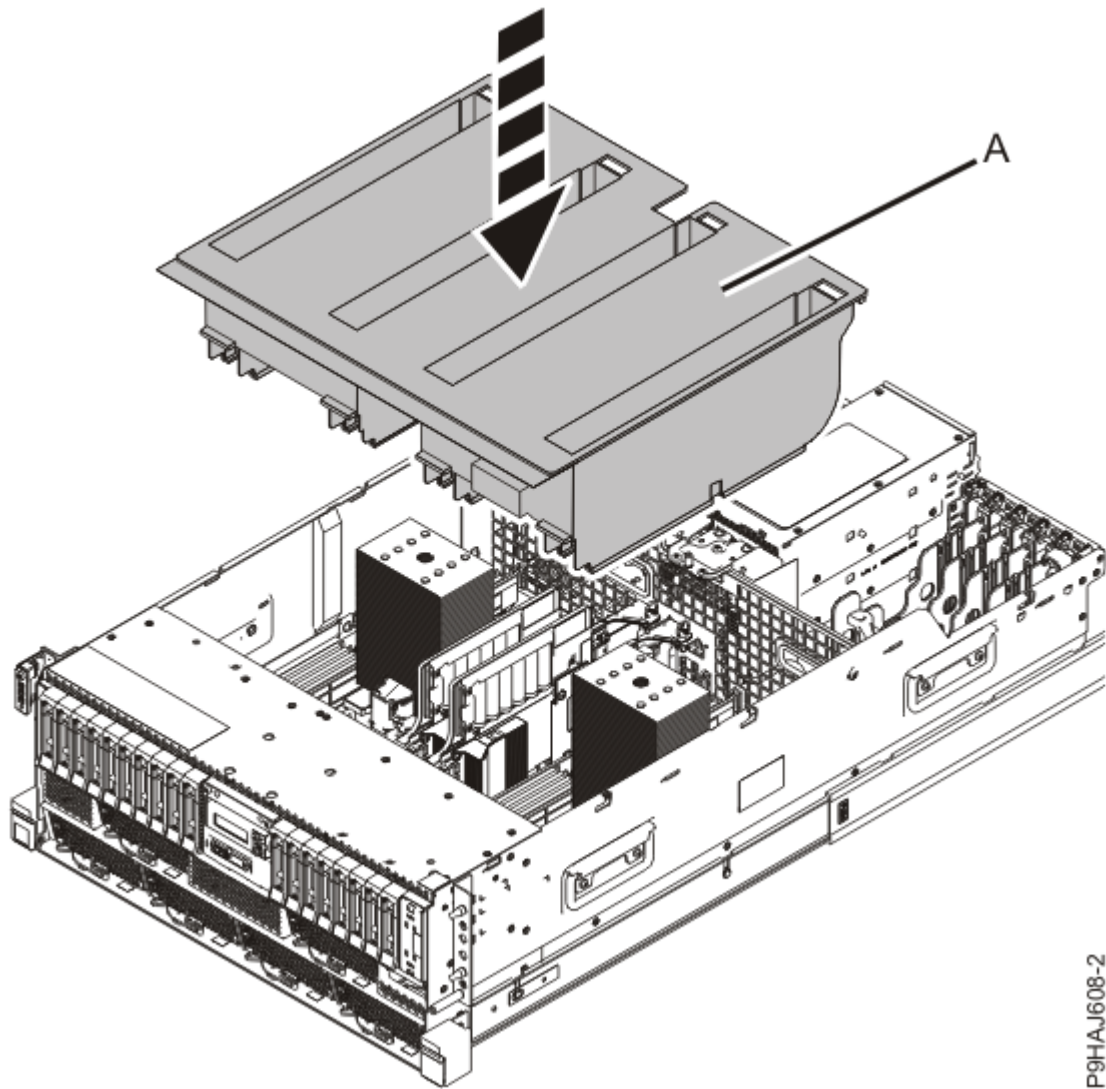
Figure 126. Installing or replacing an adapter in a 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S rack-mounted system



P9HAK701-0

Figure 127. Installing or replacing an adapter in the 9009-41A stand-alone system.

- e) Using your labels, reconnect all cables and transceivers that are attached to the adapter.
 - f) Repeat steps “36.a” on page 126 through “36.e” on page 128 for the remaining adapters.
37. For a rack-mounted system, replace the air baffle **(A)** straight down into the chassis as shown in Figure 128 on page 129.
- For a stand-alone system, replace the air baffle **(A)** straight into the side of the chassis as shown in Figure 129 on page 130.
- Ensure that the front flap tucks under the front chassis.



P9HAJ608-2

Figure 128. Replacing the air baffle in a rack-mounted system

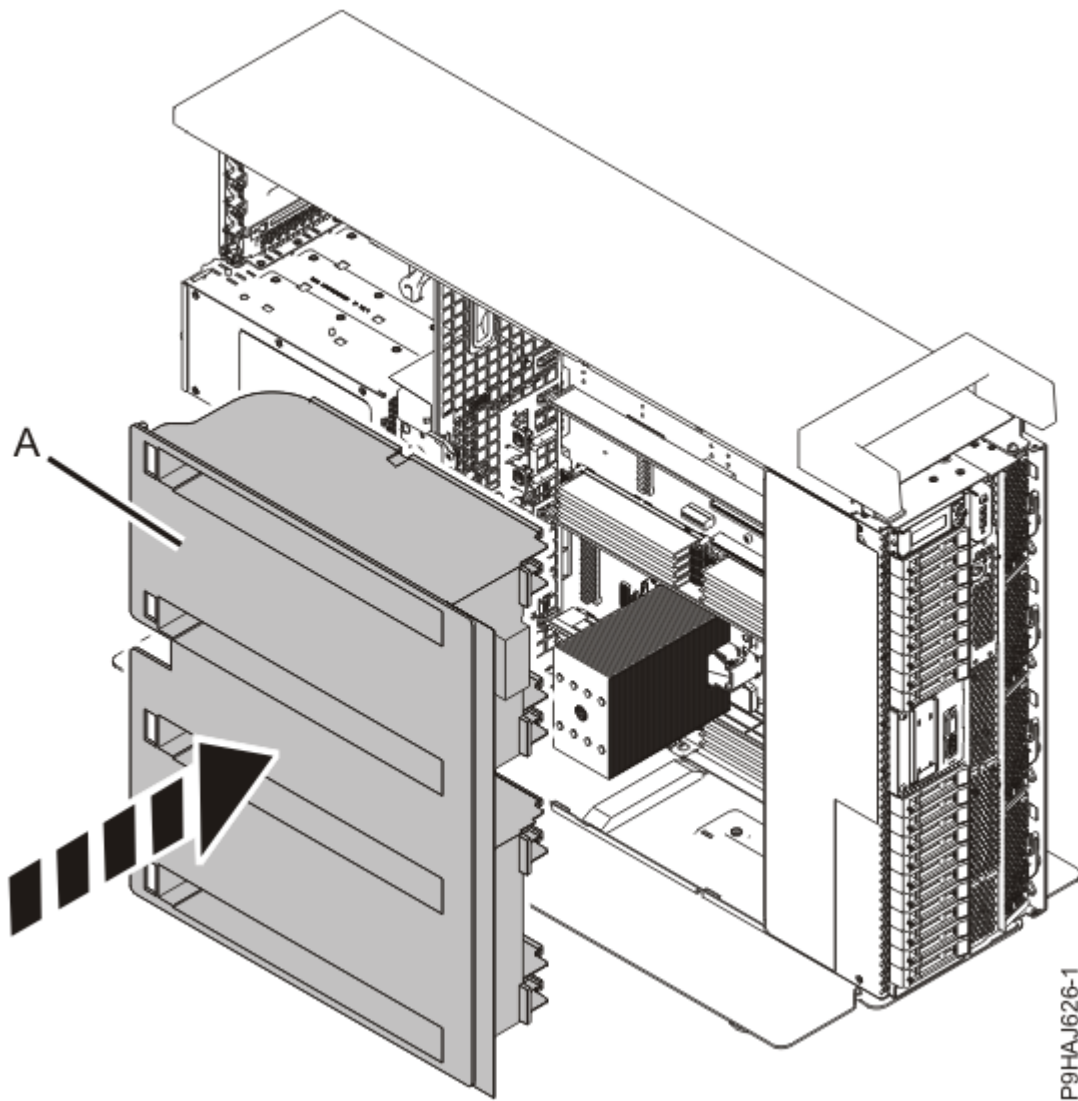


Figure 129. Replacing the air baffle in a stand-alone system

Preparing the system for operation after removing and replacing the system backplane

Follow these steps to prepare the system for operation after removing and replacing the system backplane.

Procedure

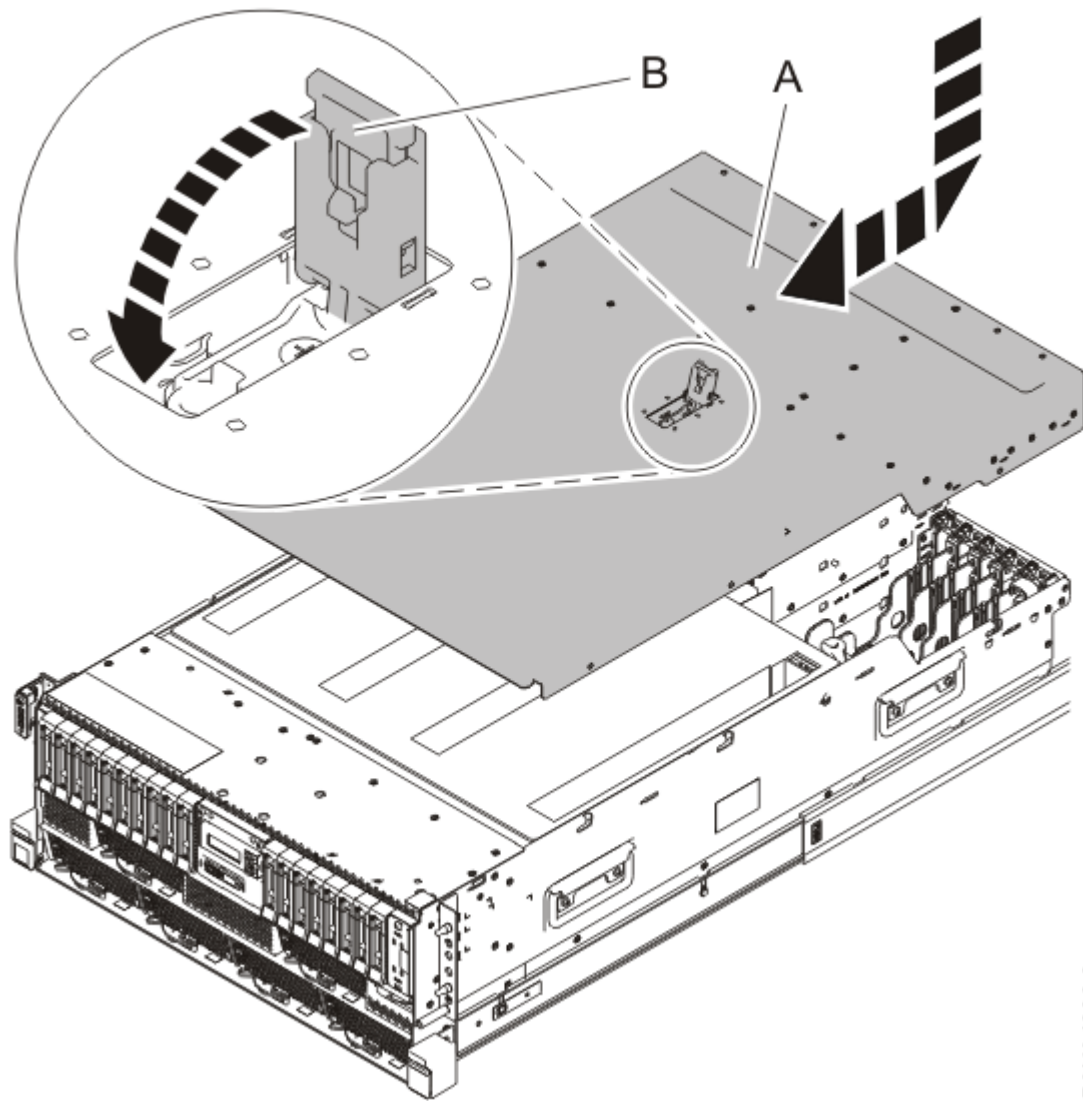
1. Ensure that you have the electrostatic discharge (ESD) wrist strap on and that the ESD clip is plugged into a ground jack or connected to an unpainted metal surface. If not, do so now.
2. For rack-mounted systems, continue to the next step.

For stand-alone systems, the recommended operating position is to place the stand-alone system into a vertical position. You do not need to lift the system. For instructions to place a stand-alone system in the operating position, continue to step “14” on page 137.



CAUTION: This system requires two people to tilt the system back into its vertical position.

3. Replace the service access cover. See [Figure 130](#) on page 131.
 - a. Slide the cover **(A)** onto the system unit.
 - b. Close the release latch **(B)** by pushing it in the direction shown.



P9HAJ606-2

Figure 130. Installing the service access cover

4. Unlock the blue rail safety latches **(A)** as shown in [Figure 131](#) on [page 132](#) by pushing them inward. Carefully push the system unit until it is 2.5-5 cm (1-2 in.) away from the rack.

Note: To allow enough room to attach the cable management arm, do not push the system unit all the way into the rack.

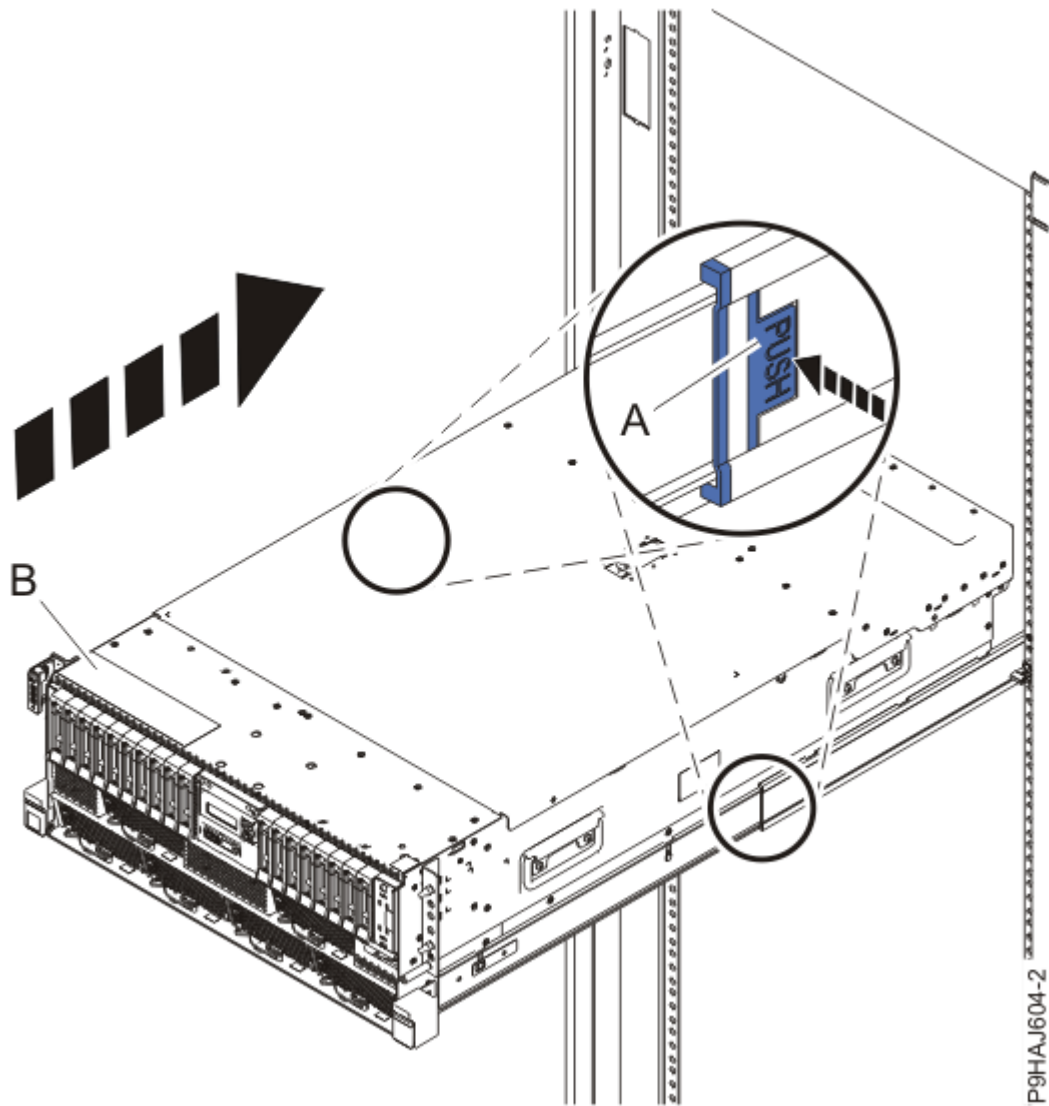


Figure 131. Pushing the system into the rack

5. Unlatch the hook and loop fastener that you used to secure the inner cable management arm to the outer cable management arm. The fastener is attached at the narrowest spot (**G**) between the basket and the side of the arm. See [“Preparing the system for operation after removing and replacing the system backplane”](#) on page 130.

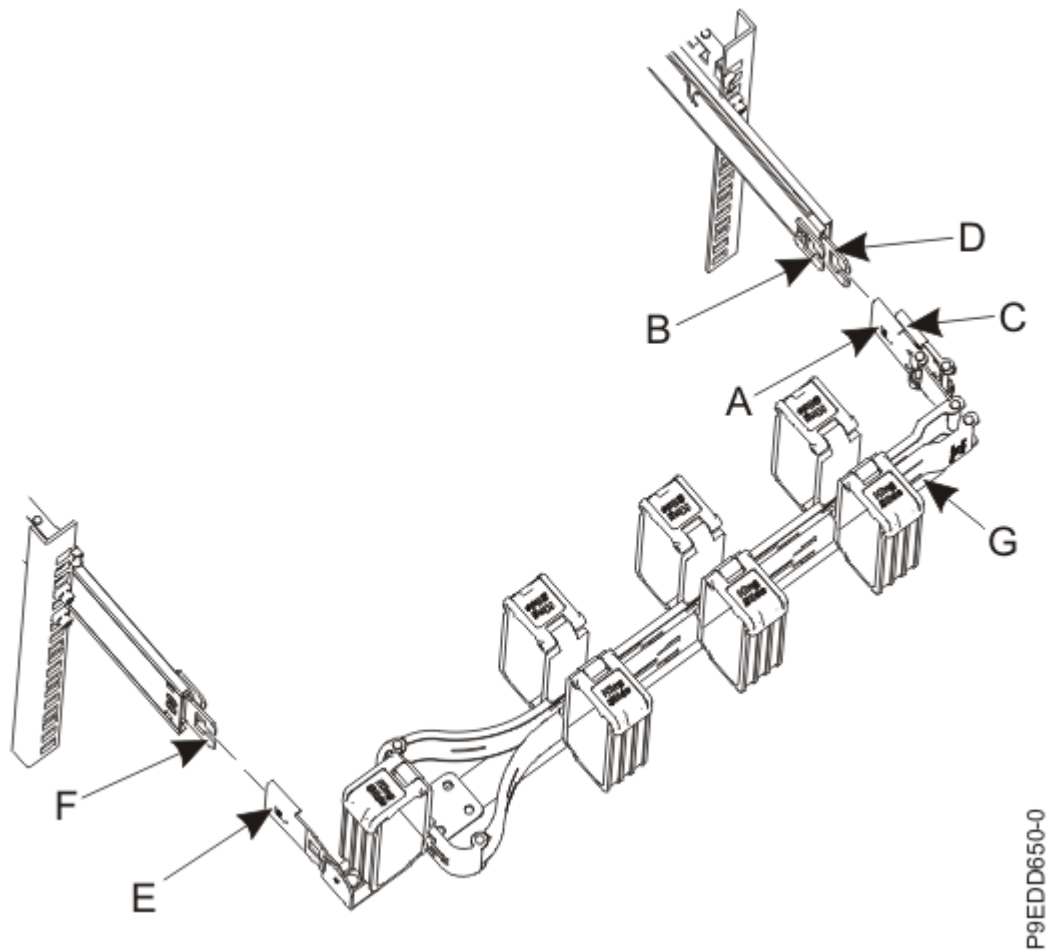


Figure 132. Cable management arm parts

6. Reconnect the cable management arm by inserting the inner cable management arm tab **(A)** into the inner mounting bracket **(B)** until it clicks into place. As you insert the tab, ensure the pin on the support arm is positioned between the inner and outer arm.
7. Continue to push the system unit all the way into the rack until both release latches lock the system into the operation position.
8. For a rack-mounted system, gently push the front cover **(A)** in until the cover snaps into place. The cover has indentations where you can hold it more easily. Use the alignment pins **(B)** to secure the cover to the system as shown in [Figure 133](#) on page 134.

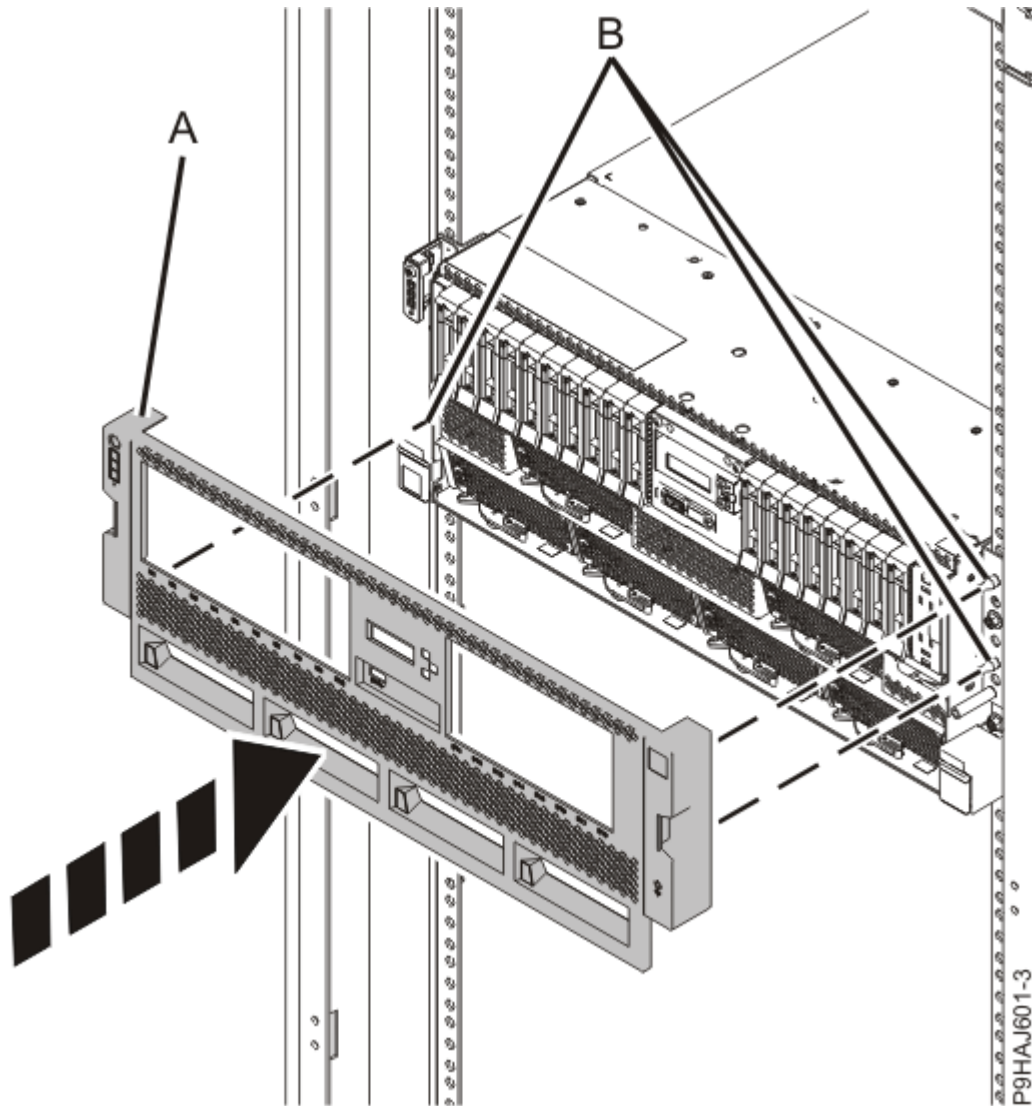


Figure 133. Installing the front cover

9. Open the cable management arm by completing the following steps:

In the image, the inner cable management arm tab is shown on the left side as you are facing the system from the rear. However, the cable management arm can also be installed so that the inner cable management arm tab is on the right side of the system.



CAUTION: To avoid causing damage to the arm, open the cable management arm just long enough to complete these repairs.

- a) Release the mounting bracket from the cable management arm assembly by pressing the indentation **(A)** on the inner cable management arm tab.

The cable management arm releases from the outer mounting bracket in the direction shown.

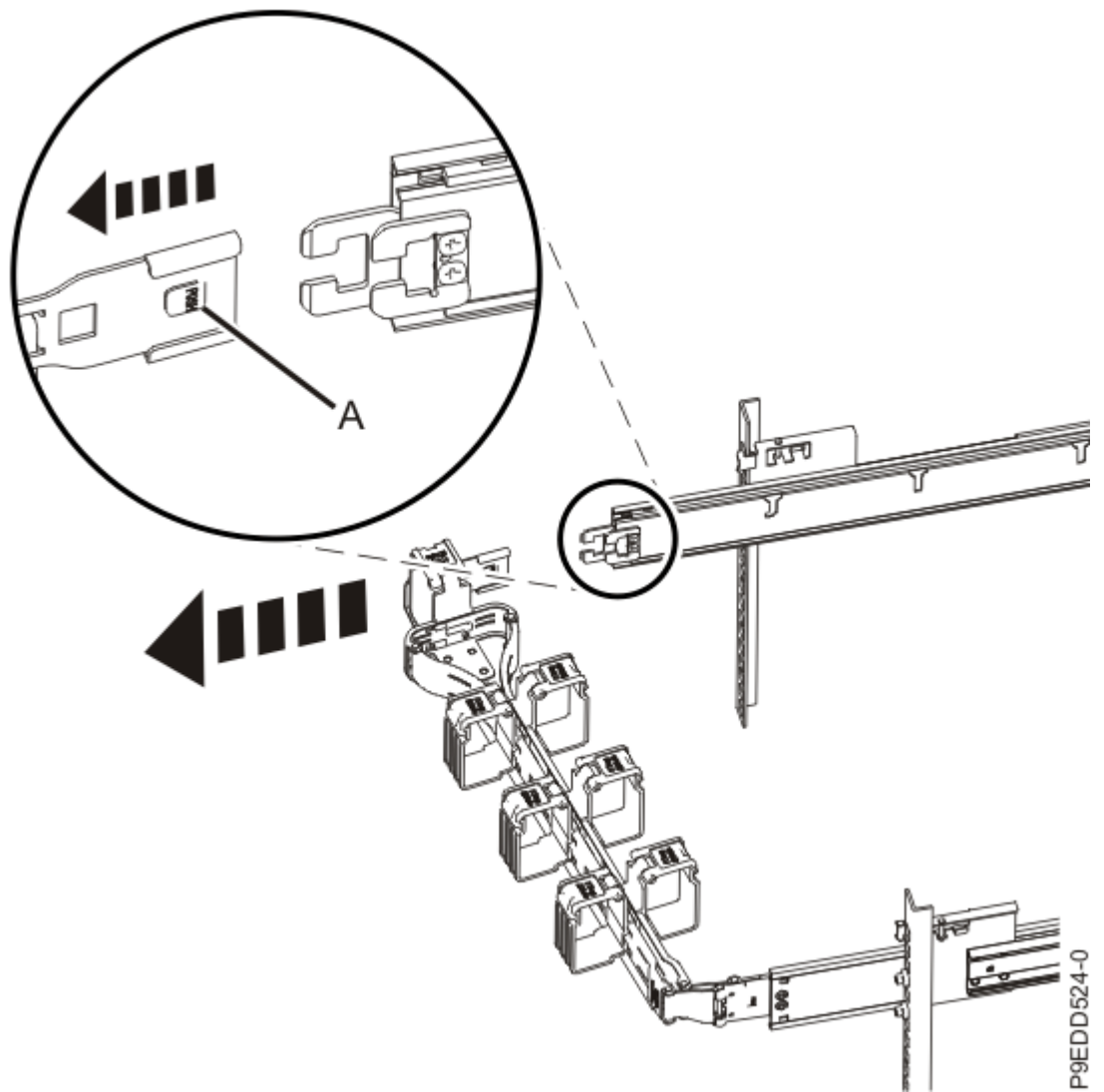


Figure 134. Releasing the cable management arm

- b) Swing the cable management arm away from the system.
- 10. Slide each of the power supplies into the system until the latch locks each one in place.
- 11. Using your labels, reconnect the power cords **(A)** to the system unit.
Fasten the power cords **(A)** to the system using the hook-and-loop fasteners **(B)** as shown in [Figure 135](#) on page 136.

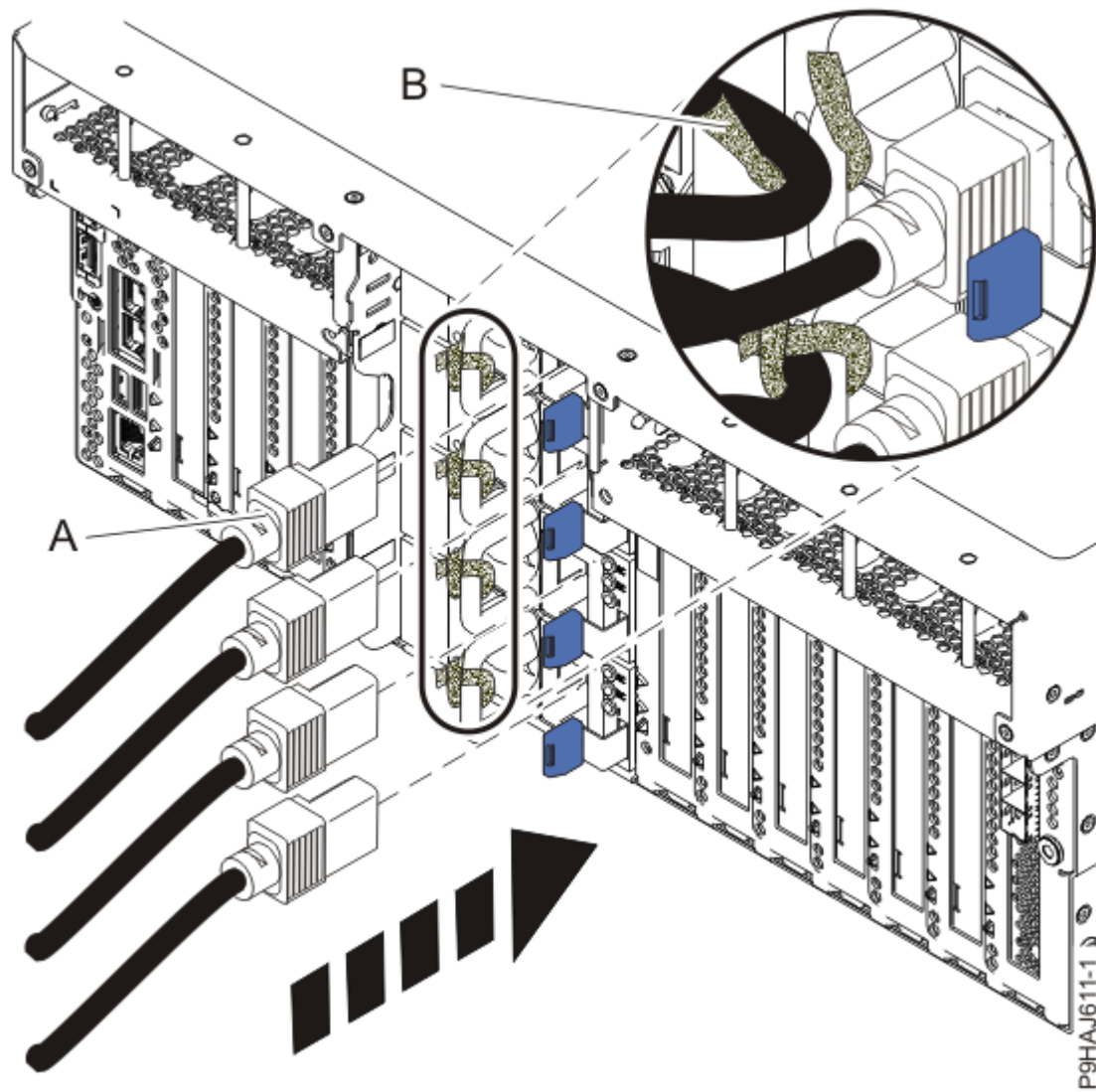


Figure 135. Connecting the power cords

12. Use your labels to reconnect the remaining rear external cables to the system.
13. Close the cable management arm by completing the following steps:
 - a) Swing the cable management arm towards the server.
 - b) Insert the inner cable management arm tab **(A)** into the outer mounting bracket **(B)** until it clicks into place as shown. The inner mounting bracket **(C)** is not used on the left side.

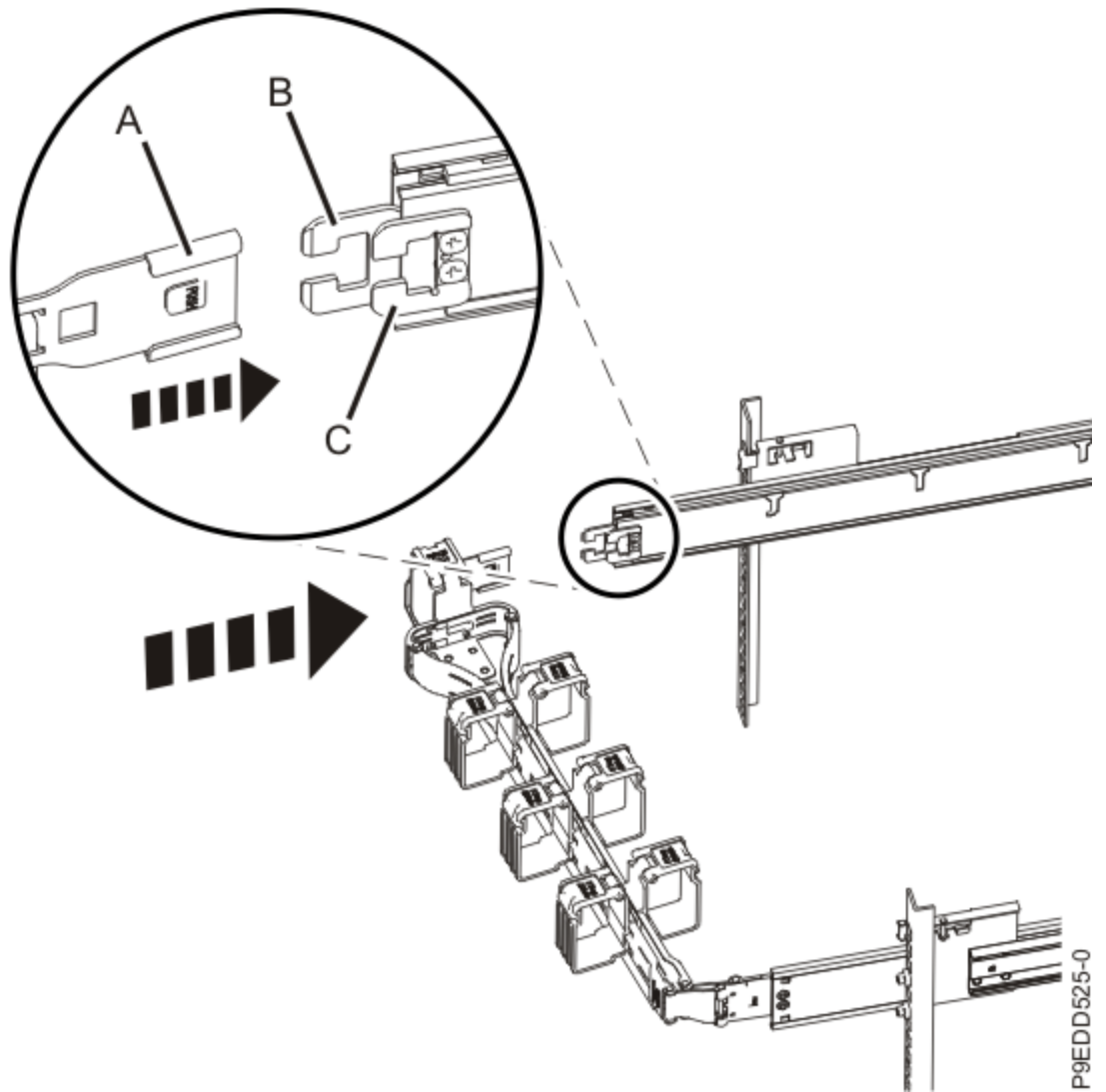
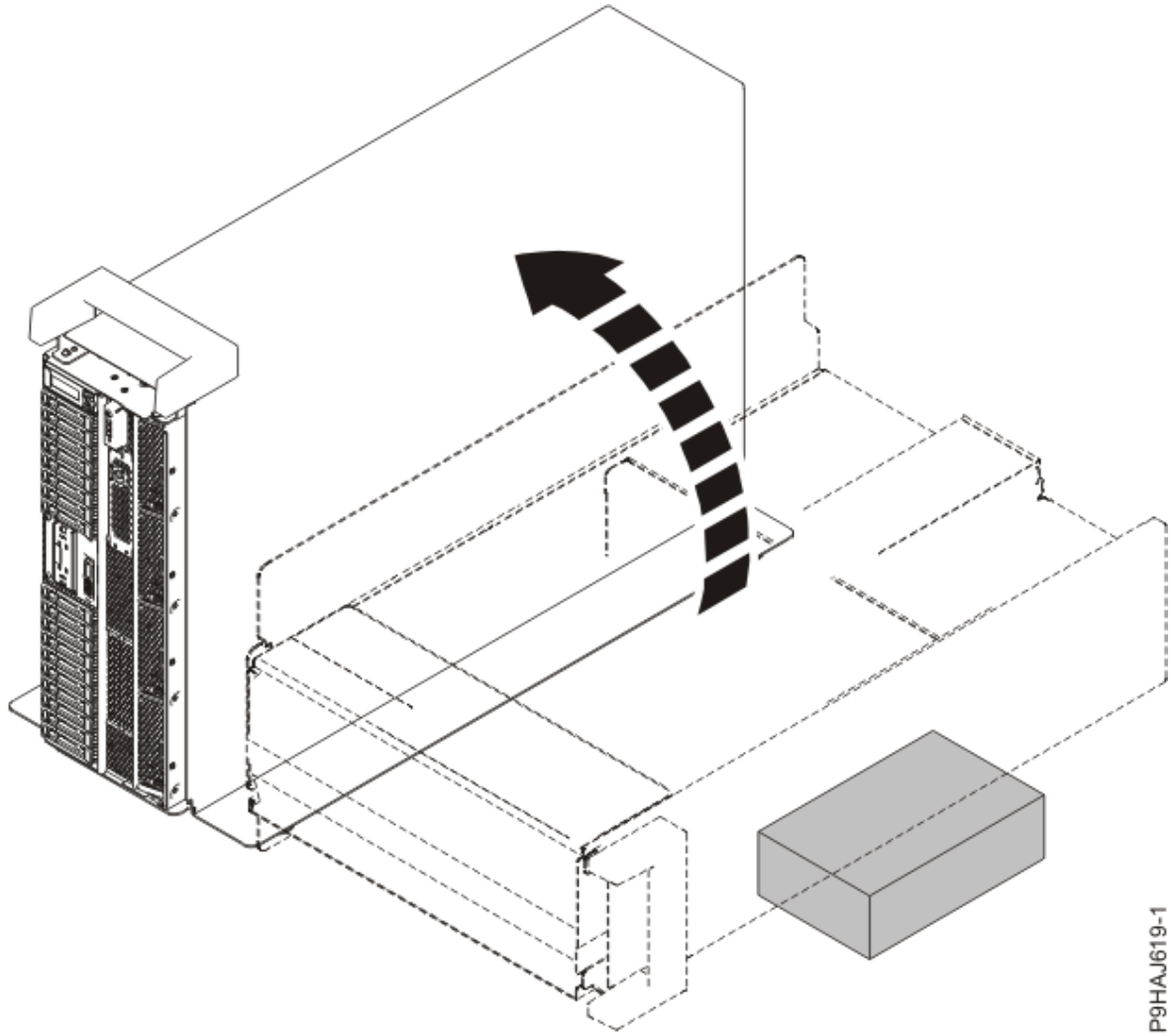


Figure 136. Closing the cable management arm

14. Complete the following steps to place a stand-alone system into the operating position:

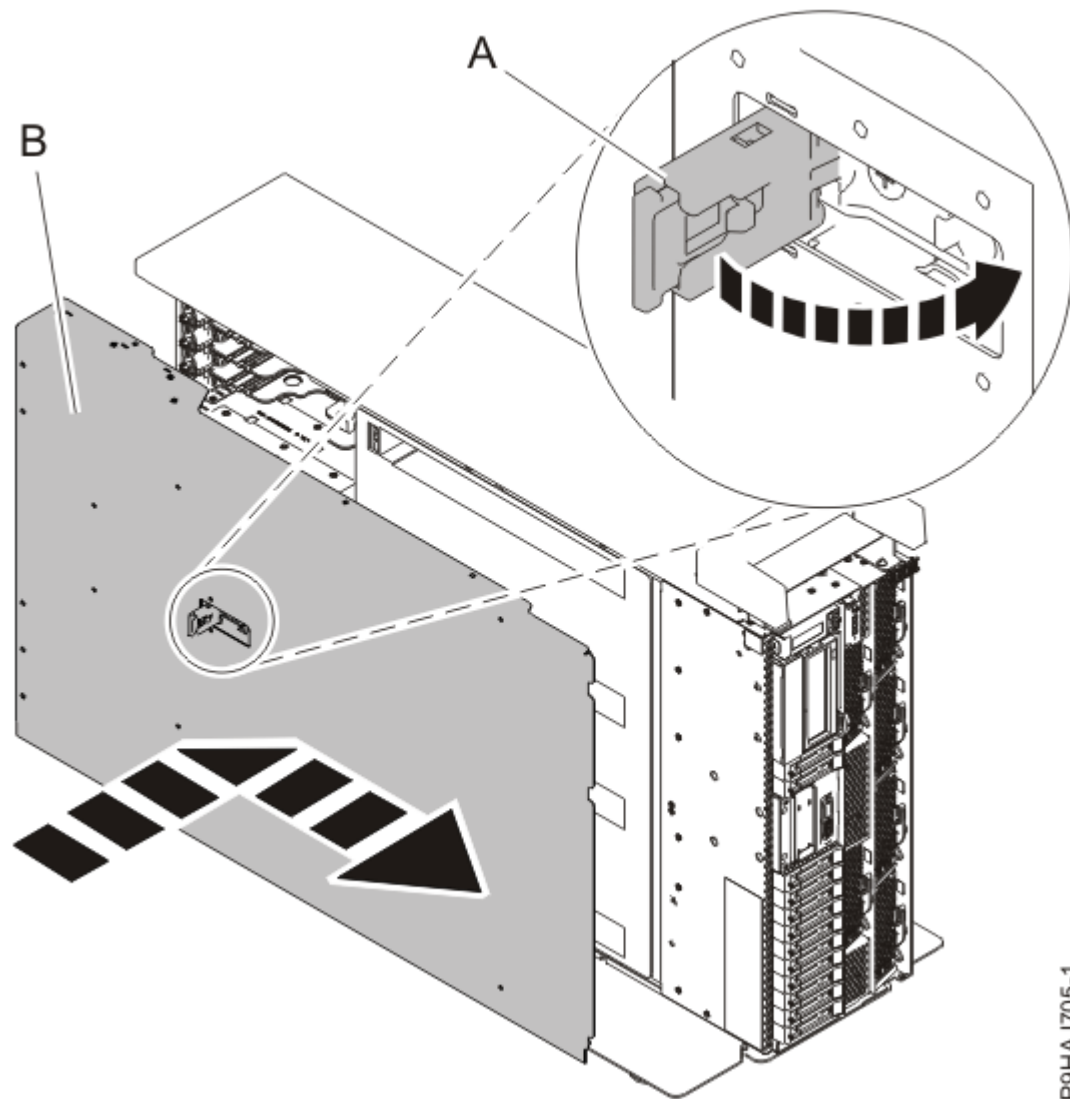
- a) Carefully tilt the stand-alone system from its horizontal position back to its vertical position. See [Figure 137 on page 138](#).



P9HAJ619-1

Figure 137. Moving the stand-alone system to the vertical position

- b) Replace the side cover.
Refer to [Figure 138](#) on page 139.



P9HAJ705-1

Figure 138. Installing the service access cover

- 1) Slide the cover **(B)** on to the system unit as shown.
- 2) Close the latch release **(A)** by pushing it in the direction shown.
- c) Replace the power supplies into the system.
Refer to [Figure 139](#) on page 140.

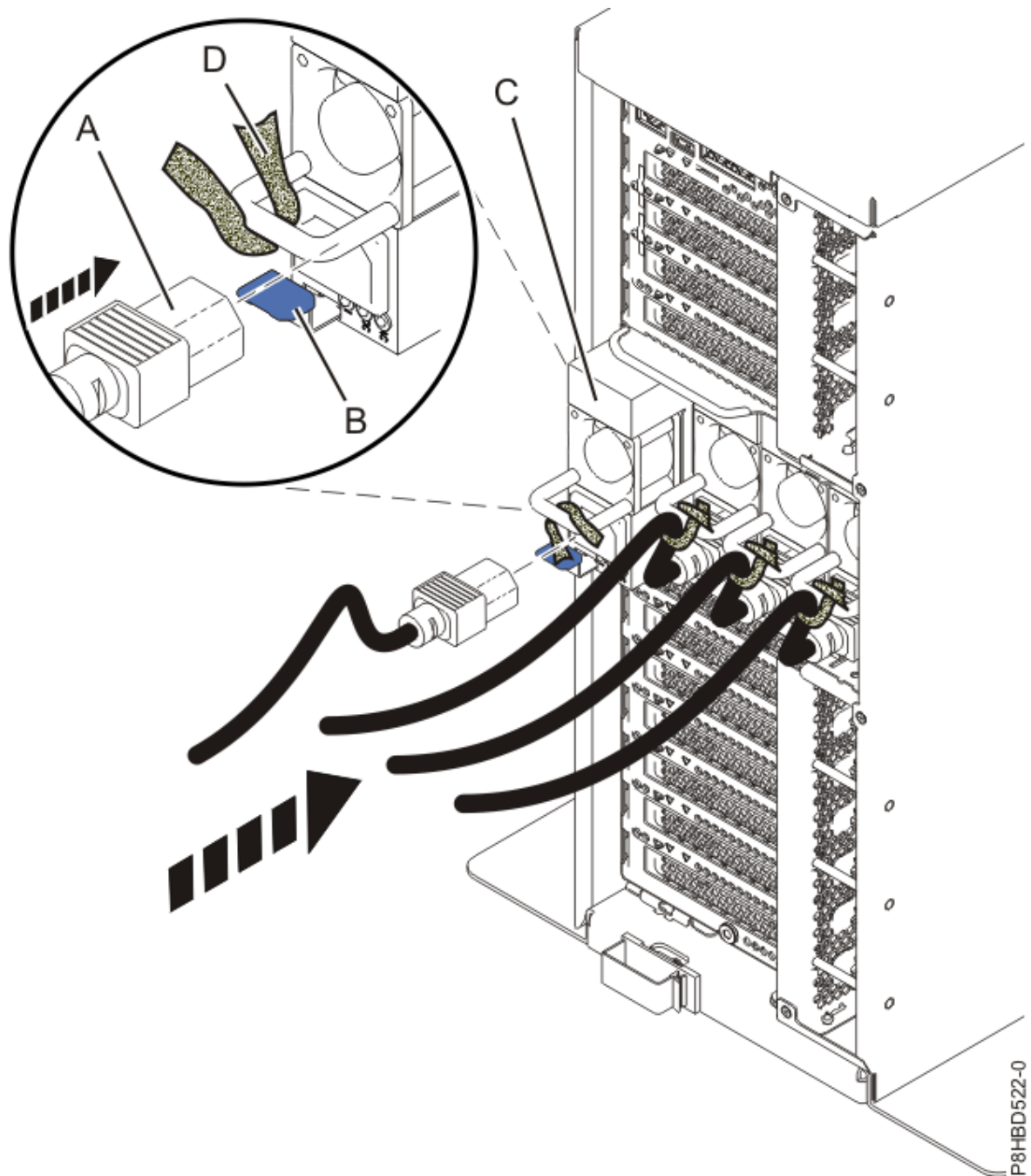


Figure 139. Replacing a power supply

- 1) Align the power supply **(C)** with the bay and slide the power supply into the system until the latch **(B)** locks in place.
- 2) Connect the power cord **(A)** to the power supply **(C)**.
- 3) Use the hook-and-loop fastener **(D)** and tie the power cord to the power supply handle.
- d) Using your labels, replace the cables that connected to the system.
15. When the service processor comes up to the standby state (the power-on LED on the control panel is flashing slowly), continue to the next step.
16. Turn off the identify LED. For instructions, see [Deactivating an identify LED](http://www.ibm.com/support/knowledgecenter/POWER9/p9haj/p9haj_turn_off_identify_led.htm) (www.ibm.com/support/knowledgecenter/POWER9/p9haj/p9haj_turn_off_identify_led.htm).
17. Start the system. For instructions, see [Starting a system](http://www.ibm.com/support/knowledgecenter/POWER9/p9haj/crustartsys.htm) (www.ibm.com/support/knowledgecenter/POWER9/p9haj/crustartsys.htm).

18. Access the Advanced System Management Interface (ASMI).

For instructions, see [Accessing the ASMI without an HMC](http://www.ibm.com/support/knowledgecenter/POWER9/p9hby/connect_asmi.htm) (www.ibm.com/support/knowledgecenter/POWER9/p9hby/connect_asmi.htm).

19. Verify that the **Enclosure serial number** and **Feature Code/Sequence Number** match the values you recorded.

Note: To complete these steps, your authority level must be Authorized Service Provider (ID: celogin).

- a. On the ASMI Welcome pane, specify your user ID and password, and click **Log in**.
- b. In the navigation area, expand **System Configuration > Program Vital Product Data**.
- c. Select **System Enclosures**. In the right pane, the current system enclosures are displayed.
- d. Compare the values listed for the **Feature Code/Sequence Number** and **Enclosure serial number** with your notes.

On the right pane, the **Feature Code/Sequence Number** value includes a dash (-) instead of a decimal as shown on the ASMI welcome panel. For example, the ASMI welcome panel lists the **Feature Code/Sequence Number** value as 78D3.001 while the right pane lists the **Feature Code/Sequence Number** value as 78D3-001.

- e. If the **Enclosure serial number** and **Feature Code/Sequence Number** do not match your notes, update the values.

Note: If you update the value for the **Feature Code/Sequence Number**, be sure to include a dash (-) instead of a decimal. For example, if your notes indicate the value for XXXX.YYY is 78D3.001, you should specify 78D3-001 in the **Feature Code/Sequence Number** field.

- f. Click **Save settings** to update and save the **Enclosure serial number** and **Feature Code/Sequence Number**.

20. Verify the installed part.

- If you replaced the part because of a service action, verify the installed part. For instructions, see [Verifying a repair](http://www.ibm.com/support/knowledgecenter/POWER9/p9ect/pxect_verifyrepair.htm) (www.ibm.com/support/knowledgecenter/POWER9/p9ect/pxect_verifyrepair.htm).
- If you installed the part for any other reason, verify the installed part. For instructions, see [Verifying the installed part](http://www.ibm.com/support/knowledgecenter/POWER9/p9haj/pxhaj_hsmverify.htm) (www.ibm.com/support/knowledgecenter/POWER9/p9haj/pxhaj_hsmverify.htm).

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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 \(www.w3.org/TR/wai-aria/\)](http://www.w3.org/TR/wai-aria/), to ensure compliance with [US Section 508 \(www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/section-508-standards\)](http://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 \(www.w3.org/TR/WCAG20/\)](http://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](http://www.ibm.com/support/knowledgecenter/doc/kc_help.html#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.

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TTY service
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Warning: This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.

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Armonk, New York 10504

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New Orchard Road
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(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Responsible Party:

International Business Machines Corporation
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Contact for FCC compliance information only: fccinfo@us.ibm.com

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