Power Systems

Memory modules 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 75, 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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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.

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- 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.
- When performing a machine inspection: 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 attempt to switch power to the machine until all possible unsafe conditions are corrected. 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.
- 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)

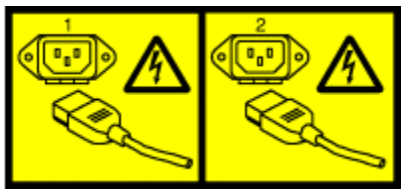
DANGER: Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices. In addition, do not lean on rack-mounted devices and do not use them to stabilize your body position (for example, when working from a ladder). Stability hazard:

- 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)



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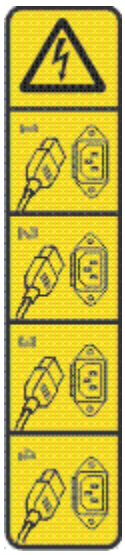

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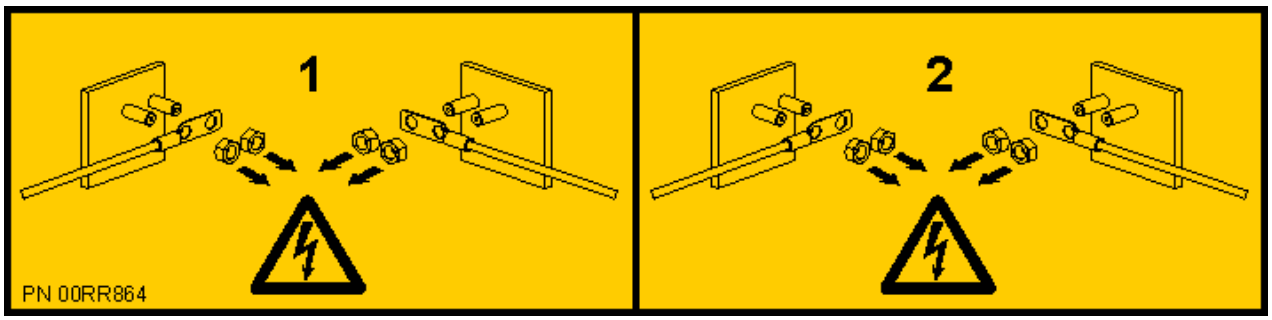

DANGER: Multiple power cords. The product might be equipped with multiple AC power cords or multiple DC power cables. To remove all hazardous voltages, disconnect all power cords and power cables. (L003)

(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.

Memory modules for the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S

Find information about installing, removing, and replacing memory modules in the IBM Power® System S914 (9009-41A and 9009-41G), IBM Power System S924 (9009-42A and 9009-42G), IBM Power System H924 (9223-42H), or IBM Power System H924S (9223-42S) server.

Installing memory modules in the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S system

Find information about installing memory modules in the IBM Power System S914 (9009-41A and 9009-41G), IBM Power System S924 (9009-42A and 9009-42G), IBM Power System H924 (9223-42H), or IBM Power System H924S (9223-42S) server.

About this task

Before you install a feature, ensure that the software that is required to support the feature is installed on your system. For more information about software prerequisites, see the Power Systems Prerequisites website (https://www14.software.ibm.com/support/customercare/iprt/home). If the required software is not installed, see the following websites to download it, and then install it before you continue:

- To download firmware updates, software updates, and fixes, see the Fix Central website (http://www.ibm.com/support/fixcentral/).
- To download Hardware Management Console (HMC) updates and fixes, see the Hardware Management Console Support and downloads website (https://www14.software.ibm.com/webapp/set2/sas/f/hmcl/home.html).

If your system is managed by the Hardware Management Console (HMC), use the HMC to complete the steps for installing a memory module in the system. For instructions, see Installing a part by using the HMC (www.ibm.com/support/knowledgecenter/POWER9/p9haj/hmcinstall.htm).

If your system is not managed by an HMC, complete the steps in the following procedures to install a memory module in the system.

Note: Installing this feature is a customer task. You can complete this task yourself, or contact a service provider to complete the task for you. You might be charged a fee by the service provider for this service.

Preparing the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S system to install memory modules

To prepare the system to install memory modules, complete the steps in this procedure.

Before you begin

Record the plugging order of the memory module slots for the installation.

This information helps you to plan memory module installation in the system.

- The system supports memory modules of 8GB, 16 GB, 32 GB, 64 GB, and 128 GB.
- A system with one system processor supports a minimum of two (a pair of) memory modules and provides a minimum of 16 GB memory.
- A system with two system processors supports a minimum of four (two pairs of) memory modules and provides a minimum of 32 GB memory.
- A pair of memory modules must be the same size, rank, and memory density.

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- Memory locations are assigned to groups; memory modules in each of the groups must be the same size, rank, and memory density.
- Groups of memory modules can be of different sizes, ranks and memory densities than other groups.
- Each system processor supports 2, 4, 6, 8, 12, or 16 memory modules.
- 128 GB memory modules that are located in the same channel must be made by the same manufacturer (Samsung Electronics Co., Ltd. or SK hynix Inc.). Channels are defined in pairs as follows: P1-C33 and P1-C34, P1-C17 and P1-C18, P1-C31 and P1-C32, P1-C15 and P1-C16, P1-C35 and P1-C36, P1-C21 and P1-C22, P1-C37 and P1-C38, P1-C19 and P1-C20, P1-C41 and P1-C42, P1-C25 and P1-C26, P1-C39 and P1-C40, P1-C23 and P1-C24, P1-C43 and P1-C44, P1-C29 and P1-C30, P1-C45 and P1-C46, and P1-C27 and P1-C28.
- If you are installing 128 GB memory modules that are manufactured by Samsung Electronics Co., Ltd. in a new or existing configuration so that the resulting configuration will have more than half of the allowable memory module locations populated, the system firmware level must be FW950.50, or later.

Table 1 on page 2 lists the feature codes of the supported memory modules.

Table 1. Memory feature codes

Size	Feature code	Rank	Memory Density
8 GB	EM60, EM6G	1R	4 Gb
16 GB	EM62, EM6J	1R	8 Gb
32 GB	EM63, EM6K	2R	8 Gb
64 GB	EM64, EM6L	2R	8 Gb
64 GB	EM7B	2R	16 Gb*
128 GB	EM65, EM6M	2R	8 Gb
128 GB	EM7C	2R	16 Gb*

Note:

* The system firmware level must be FW950.00, or later.

The plugging rules for memory modules depend on the number of system processors:

- Plugging rules for systems with one system processor
- Plugging rules for systems with two system processors

Plugging rules for systems with one system processor

One system processor supports 2, 4, 6, 8, 12, or 16 memory modules. Figure 1 on page 3 and Figure 2 on page 4 show the locations of the memory modules for systems with one system processor. After the first four pairs of memory modules are installed, the remaining memory slots must be filled four at a time versus two at a time.

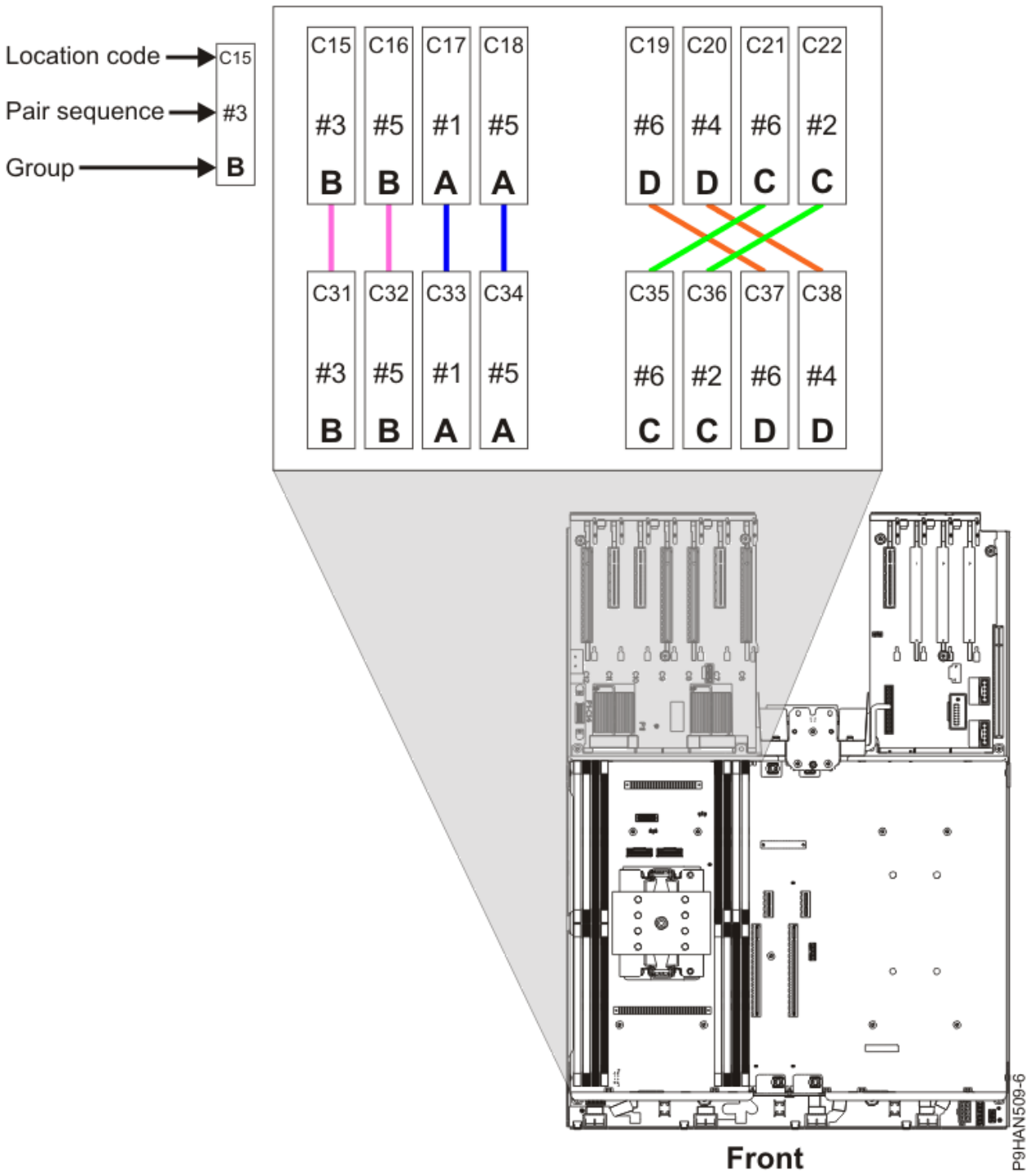


Figure 1. Plugging sequence, one system processor, rack-mounted system

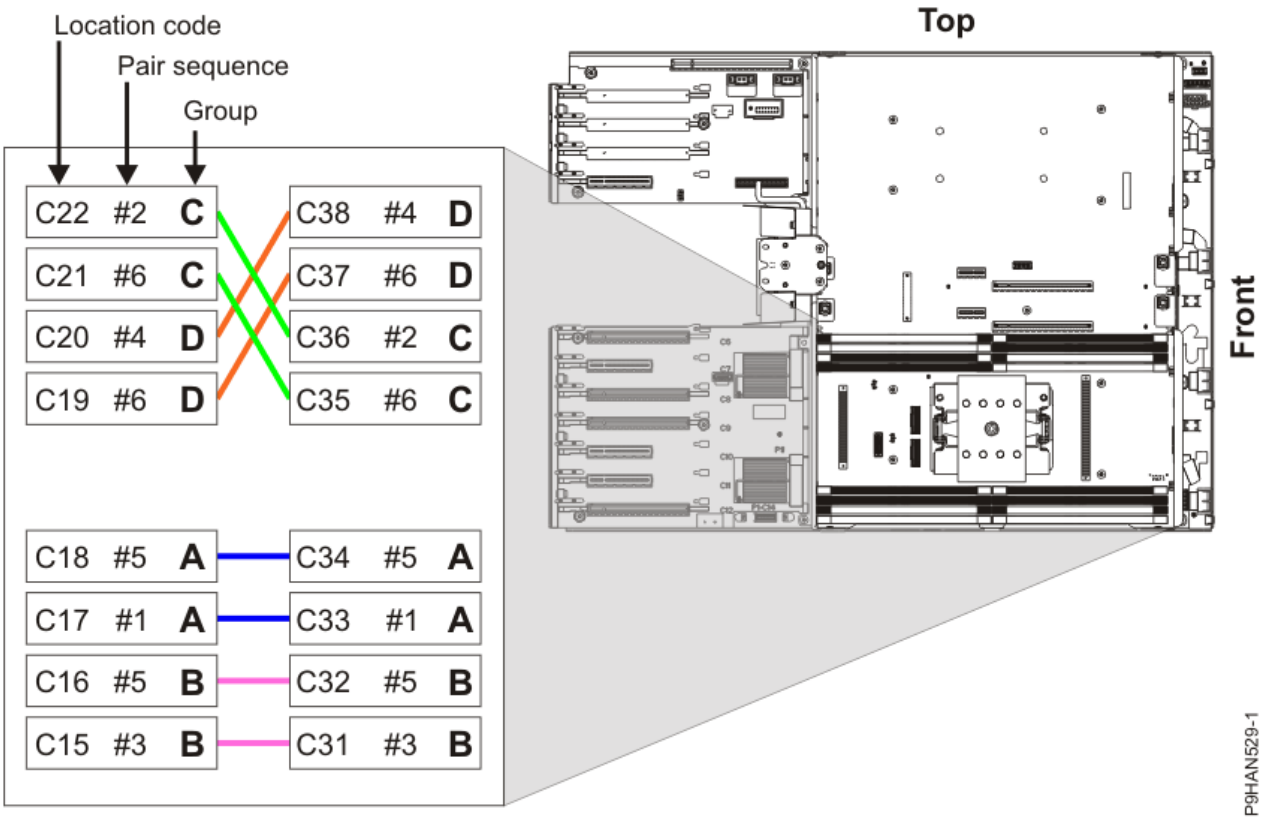


Figure 2. Plugging sequence, one system processor, stand-alone system

The system has groups for the memory modules. All of the memory modules in a group must be the same size and type. The memory in one group can be different than another group.

When the system contains eight or fewer memory modules, extra rules against mixing memory of different ranks (1R or 2R) apply. These positions must have the same rank; either 1R or 2R, but they cannot contain both 1R and 2R:

- Sequences 1 and 3: P1-C17, P1-C33, P1-C15, and P1-C31
- Sequences 2 and 4: P1-C22, P1-C36, P1-C20, and P1-C38

Table 2. Memory groupings for a single-processor system

Memory group	Positions
A	P1-C17, P1-C18, P1-C33, and P1-C34
B	P1-C15, P1-C16, P1-C31, and P1-C32
C	P1-C21, P1-C22, P1-C35, and P1-C36
D	P1-C19, P1-C20, P1-C37, and P1-C38

Table 3 on page 4 shows that the memory modules must be plugged into the system in a certain sequence and position.

Table 3. Plugging sequence for memory modules for a system with one system processor

Total memory modules	Sequence	Memory modules to install	Memory locations
2	1	2	P1-C17 and P1-C33. Minimum supported memory.

Table 3. Plugging sequence for memory modules for a system with one system processor (continued)			
Total memory modules	**Sequence**	**Memory modules to install**	**Memory locations**
4	2	2	P1-C22 and P1-C36
6	3	2	P1-C15 and P1-C31
8	4	2	P1-C20 and P1-C38
12	5	4	P1-C18 and P1-C34 (group A; must match the size and type of P1-C17 and P1-C33) and P1-C16 and P1-C32 (group B; must match the size and type of P1-C15 and P1-C31)
16	6	4	P1-C21 and P1-C35 (group C; must match the size and type of P1-C22 and P1-C36). and P1-C19 and P1-C37 (group D; must match the size and type of P1-C20 and P1-C38)

Plugging rules for systems with two system processors

Two system processors support 4, 6, 8, 10, 12, 14, 16, 20, 24, 28, or 32 memory modules. Figure 3 on page 6 shows the locations of the memory modules for systems with two system processors. After the first eight pairs of memory modules are installed, the remaining memory slots must be filled four at a time (versus two at a time).

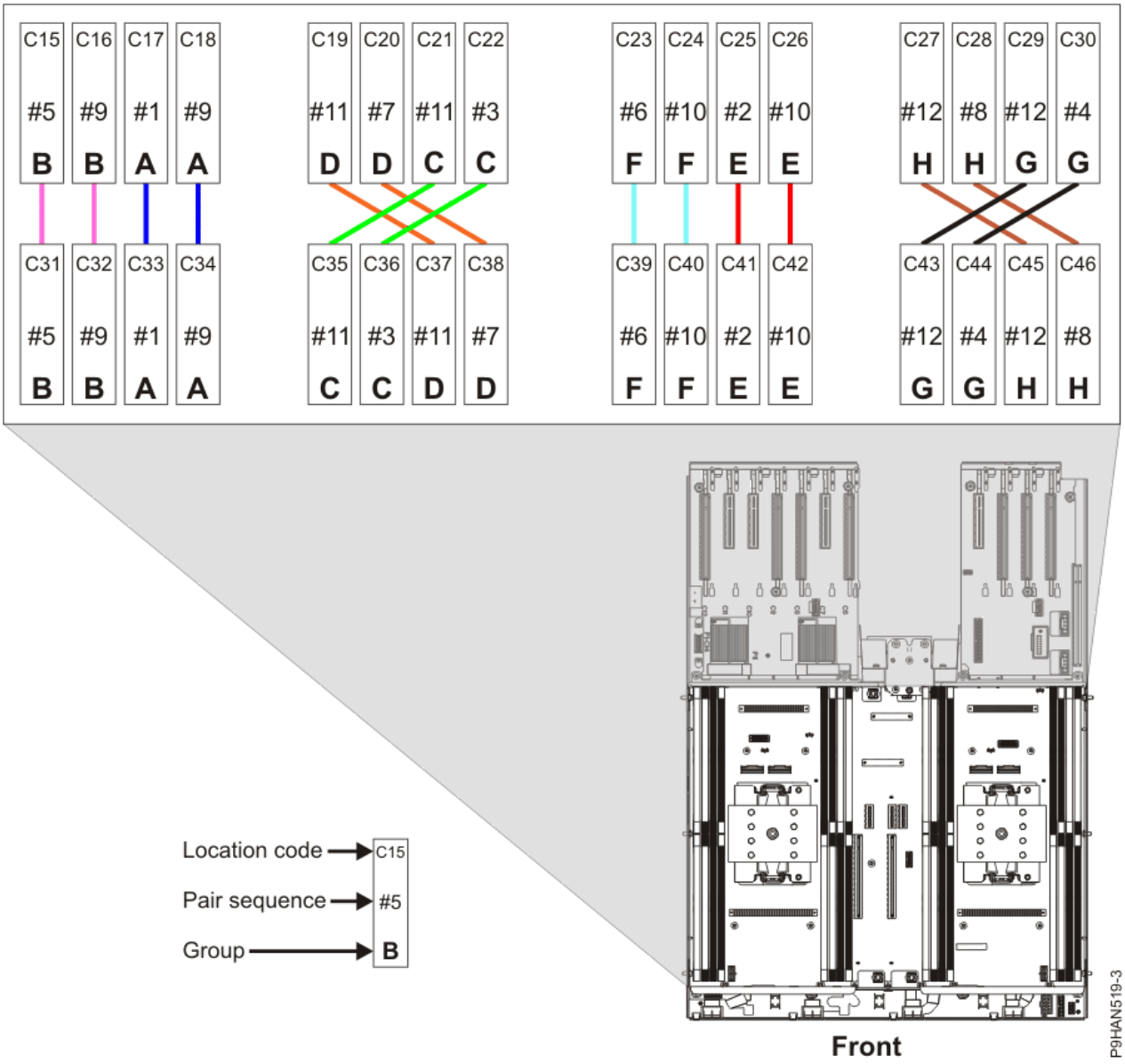


Figure 3. Plugging sequence, two system processors

The system has groups for the memory modules. All of the memory modules in a group must be the same size and type. The memory in one group can be different than another group.

Table 4. Memory groupings for a two-processor system

Memory groupings	**Positions**
A	P1-C17, P1-C18, P1-C33, and P1-C34
B	P1-C15, P1-C16, P1-C31, and P1-C32
C	P1-C21, P1-C22, P1-C35, and P1-C36
D	P1-C19, P1-C20, P1-C37, and P1-C38
E	P1-C25, P1-C26, P1-C41, and P1-C42
F	P1-C23, P1-C24, P1-C39, and P1-C40
G	P1-C29, P1-C30, P1-C43, and P1-C44

Table 4. Memory groupings for a two-processor system (continued)	
Memory groupings	**Positions**
H	P1-C27, P1-C28, P1-C45, and P1-C46

When the system contains 16 or fewer memory modules, extra rules against mixing memory of different ranks (1R or 2R) apply. These positions must have the same rank; either 1R or 2R, but they cannot contain both 1R and 2R:

- Sequences 1 and 5: P1-C17, P1-C33, P1-C15, and P1-C31
- Sequences 2 and 6: P1-C25, P1-C41, P1-C23, and P1-C39
- Sequences 3 and 7: P1-C22, P1-C36, P1-C20, and P1-C38
- Sequences 4 and 8: P1-C30, P1-C44, P1-C28, and P1-C46

Table 5 on page 7 shows that the memory modules must be plugged into the system in a certain sequence and position.

Table 5. Plugging sequence for memory modules for a system with two system processors			
Total memory modules	**Sequence**	**Memory modules to install**	**Memory locations**
2	1	2	P1-C17 and P1-C33. Must have another pair that is installed.
4	2	2	P1-C25 and P1-C41. Minimum supported memory.
6	3	2	P1-C22 and P1-C36
8	4	2	P1-C30 and P1-C44
10	5	2	P1-C15 and P1-C31
12	6	2	P1-C23 and P1-C39
14	7	2	P1-C20 and P1-C38
16	8	2	P1-C28 and P1-C46
20	9	4	P1-C18 and P1-C34 (group A; must match the size and type of P1-C17 and P1-C33) and P1-C16 and P1-C32 (group B; must match the size and type of P1-C15 and P1-C31)
24	10	4	P1-C26 and P1-C42 (group E; must match the size and type of P1-C25 and P1-C41) and P1-C24 and P1-C40 (group F; must match the size and type of P1-C23 and P1-C39)
28	11	4	P1-C21 and P1-C35 (group C; must match the size and type of P1-C22 and P1-C36). and P1-C19 and P1-C37 (group D; must match the size and type of P1-C20 and P1-C38)
32	12	4	P1-C29 and P1-C43 (group G; must match the size and type of P1-C30 and P1-C44) and P1-C27 and P1-C45 (group H; must match the size and type of P1-C28 and P1-C46)

Procedure

1. Ensure that the required software is installed to support the new feature. See the Power Systems Prerequisites website.
2. Stop the system. For instructions, see Stopping a system (www.ibm.com/support/knowledgecenter/POWER9/p9haj/crustopsys.htm).
3. Label and disconnect the power cords from the system unit.

   See Figure 4 on page 8 or Figure 5 on page 9.

   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.

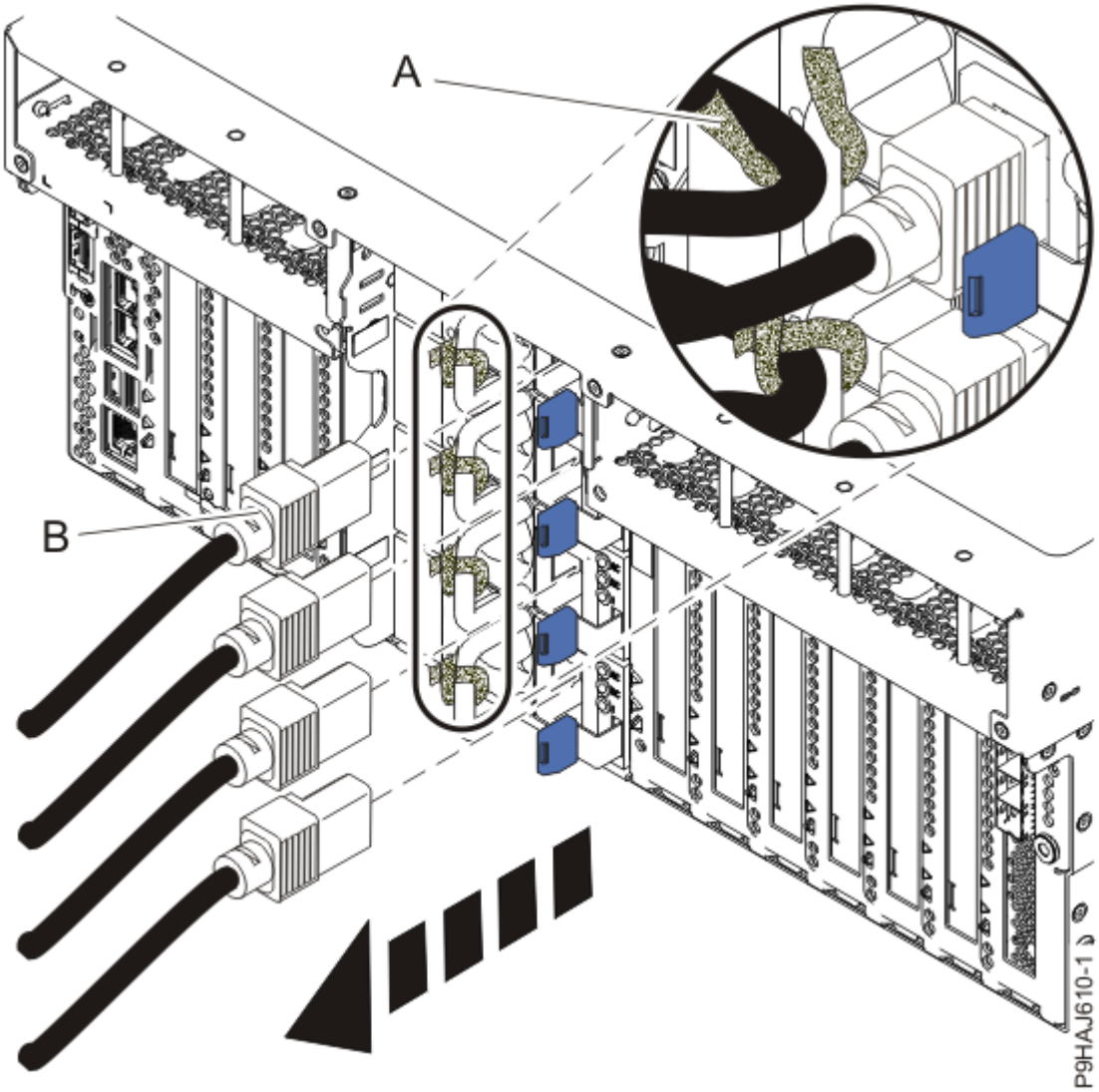


Figure 4. Removing the power cords from a rack-mounted server

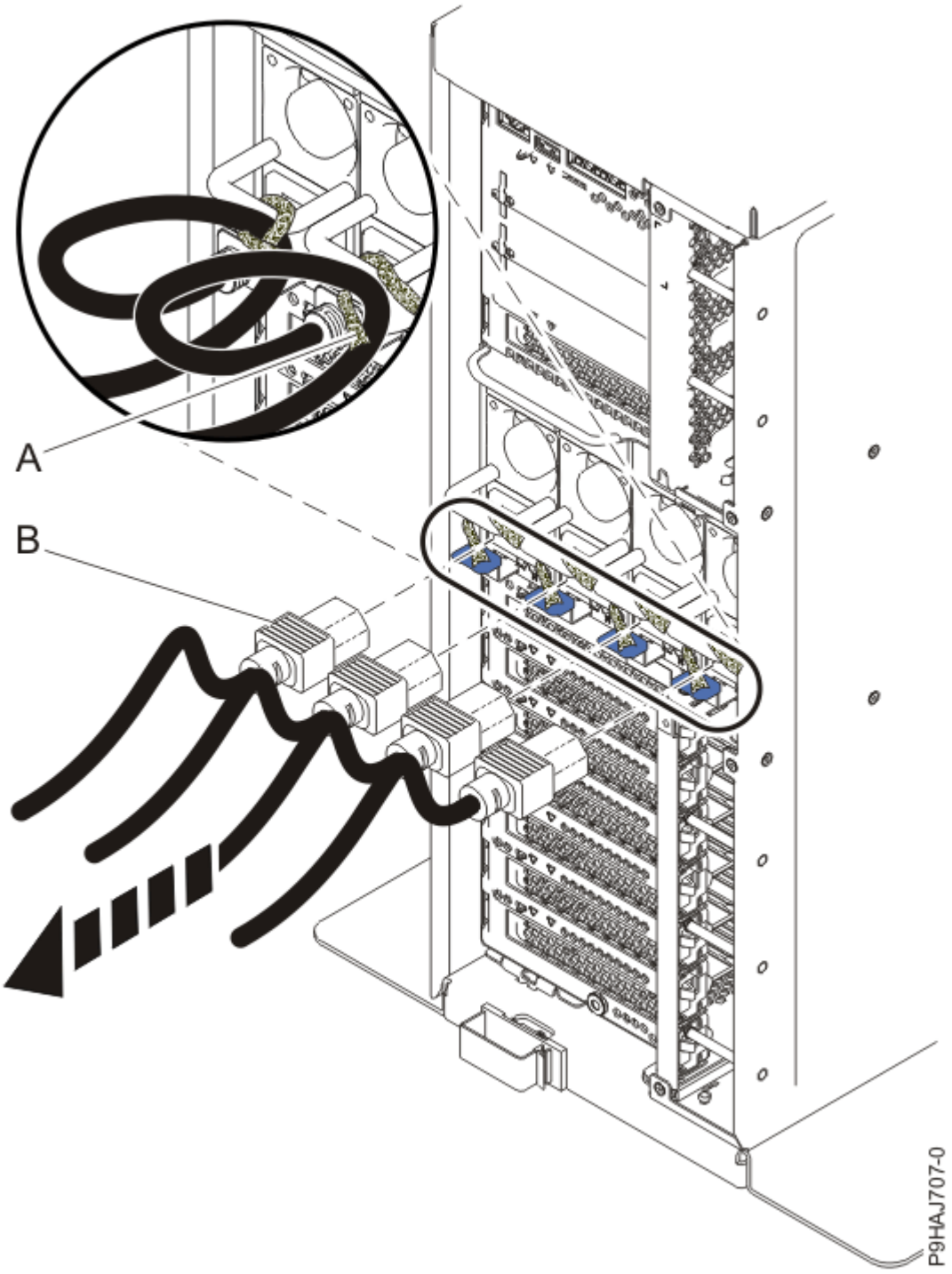
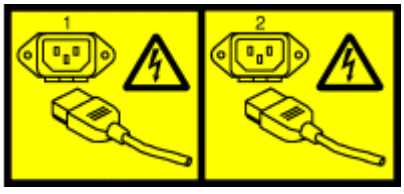


Figure 5. Removing the power cords from a stand-alone server

(L003)



or

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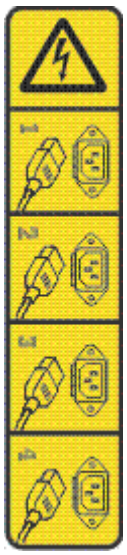
or



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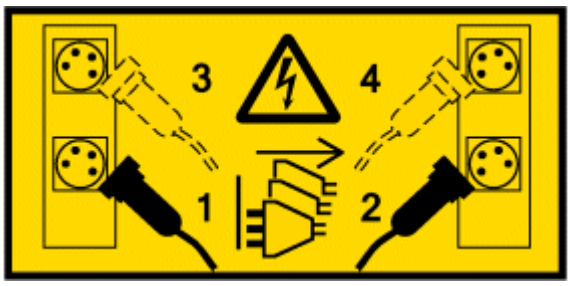
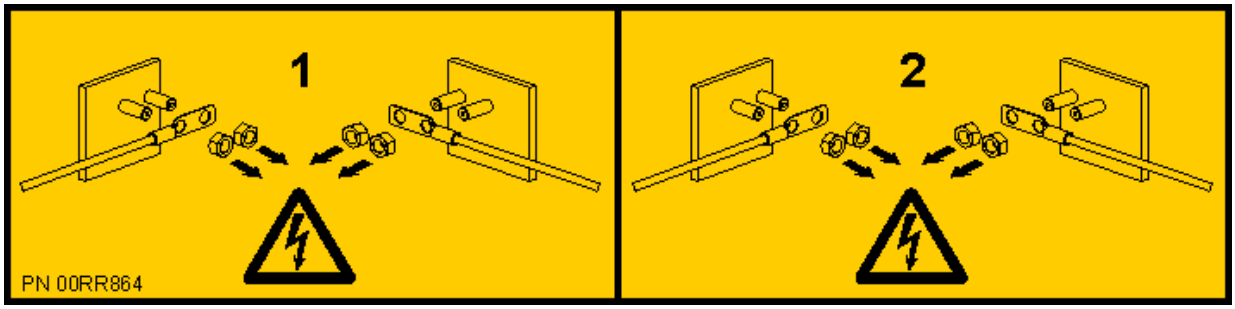




DANGER: Multiple power cords. The product might be equipped with multiple AC power cords or multiple DC power cables. To remove all hazardous voltages, disconnect all power cords and power cables. (L003)

4. For a rack-mounted system, 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 the following figure.

   Remove the hook-and-loop fasteners that secure the cable management arms. Ensure that the cable management arms can move freely. Ensure that the cables at the rear of the system do not catch or bind as you pull the system unit into the service position.

   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.

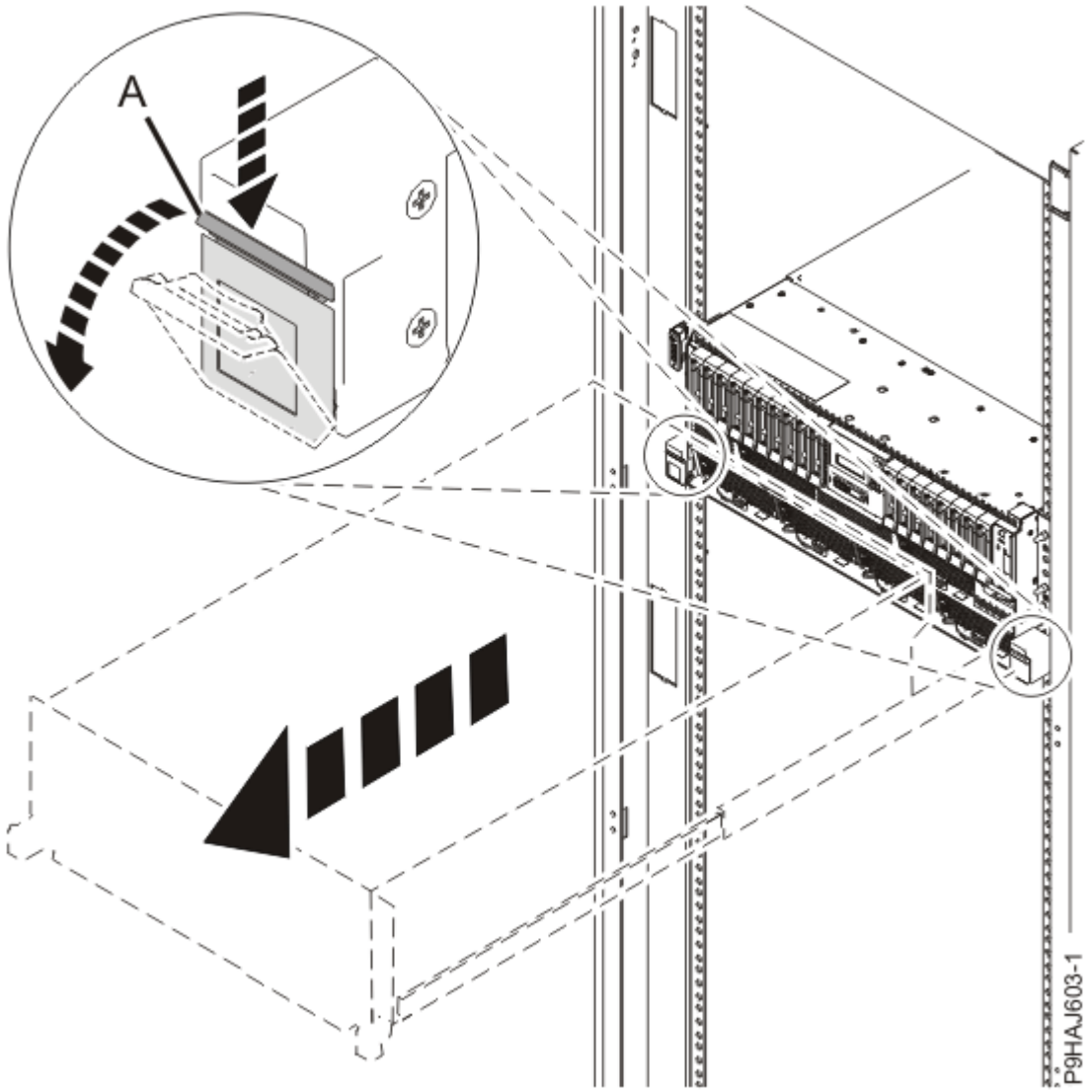


Figure 6. Releasing the side latches

5. Attach the electrostatic discharge (ESD) wrist strap. Your system has ESD jacks on the front and on the rear of the system as shown in the following figure. Plug the ESD wrist strap into the ESD jack.

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.

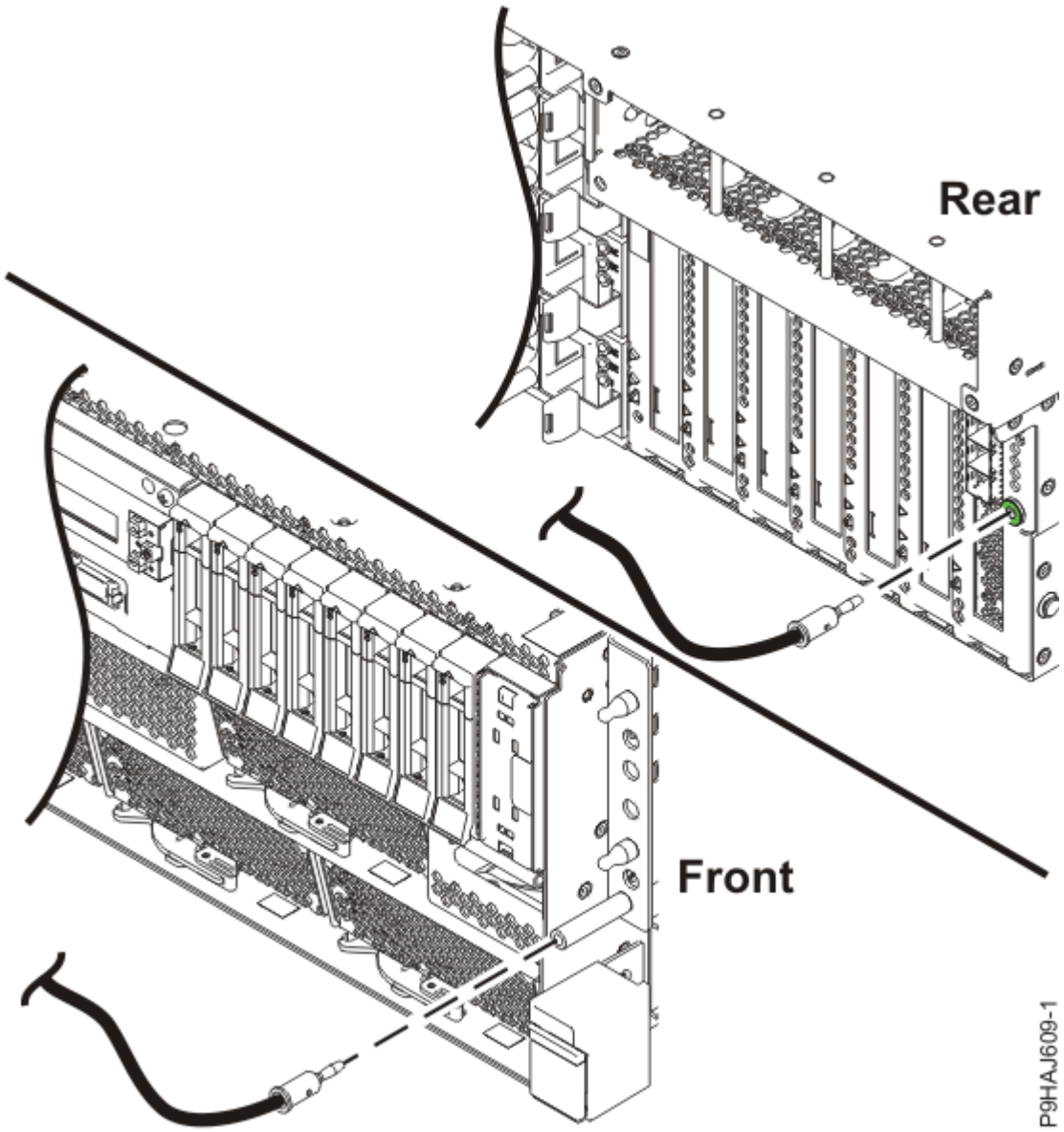


Figure 7. Location of ESD plugs

6. Remove the service access cover.

   For a rack-mounted system, complete the following steps. Refer to Figure 8 on page 14.

   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.

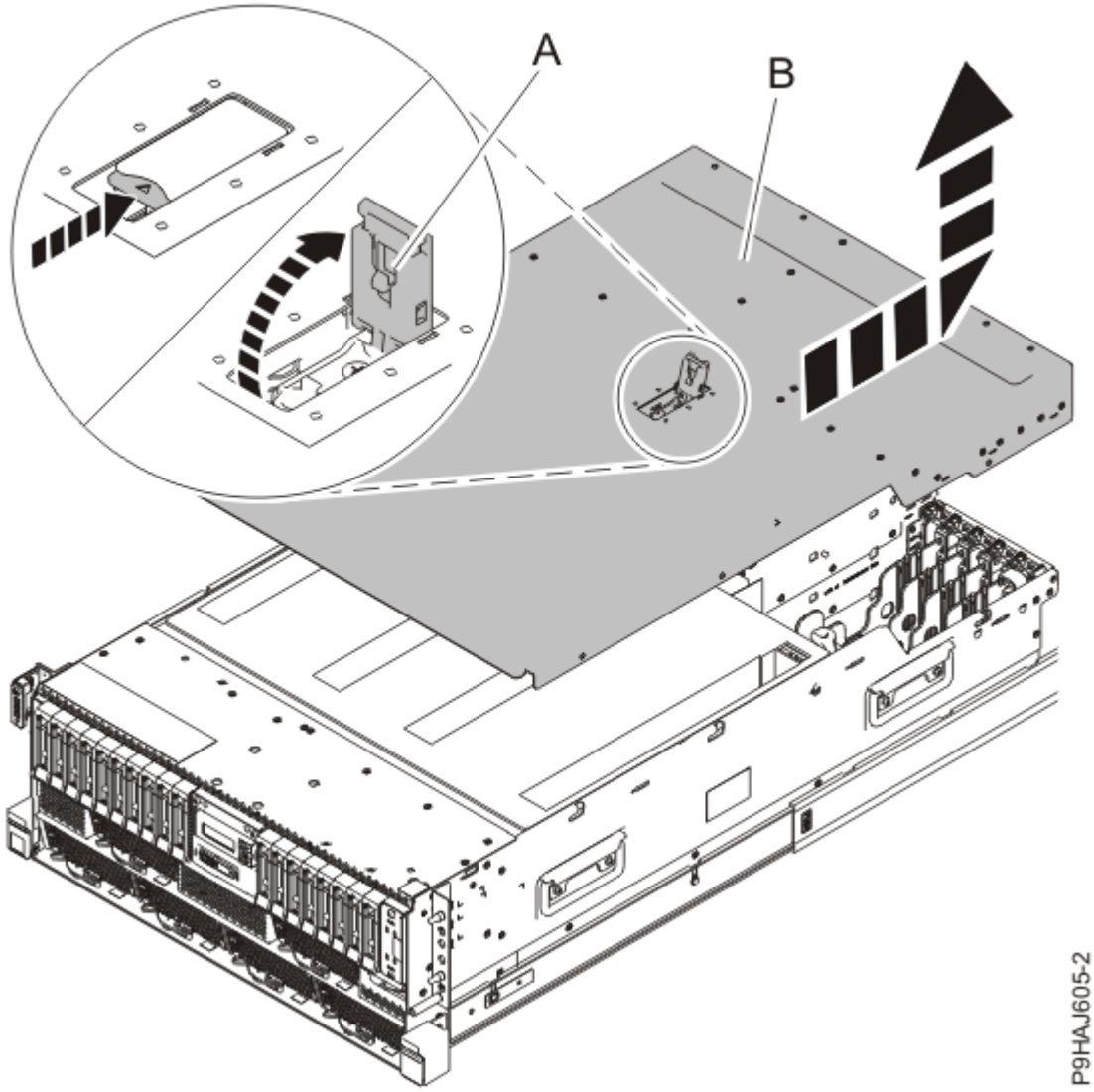


Figure 8. Removing the service access cover from a rack-mounted system

For a stand-alone system, complete the following steps. Refer to Figure 9 on page 15.

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.

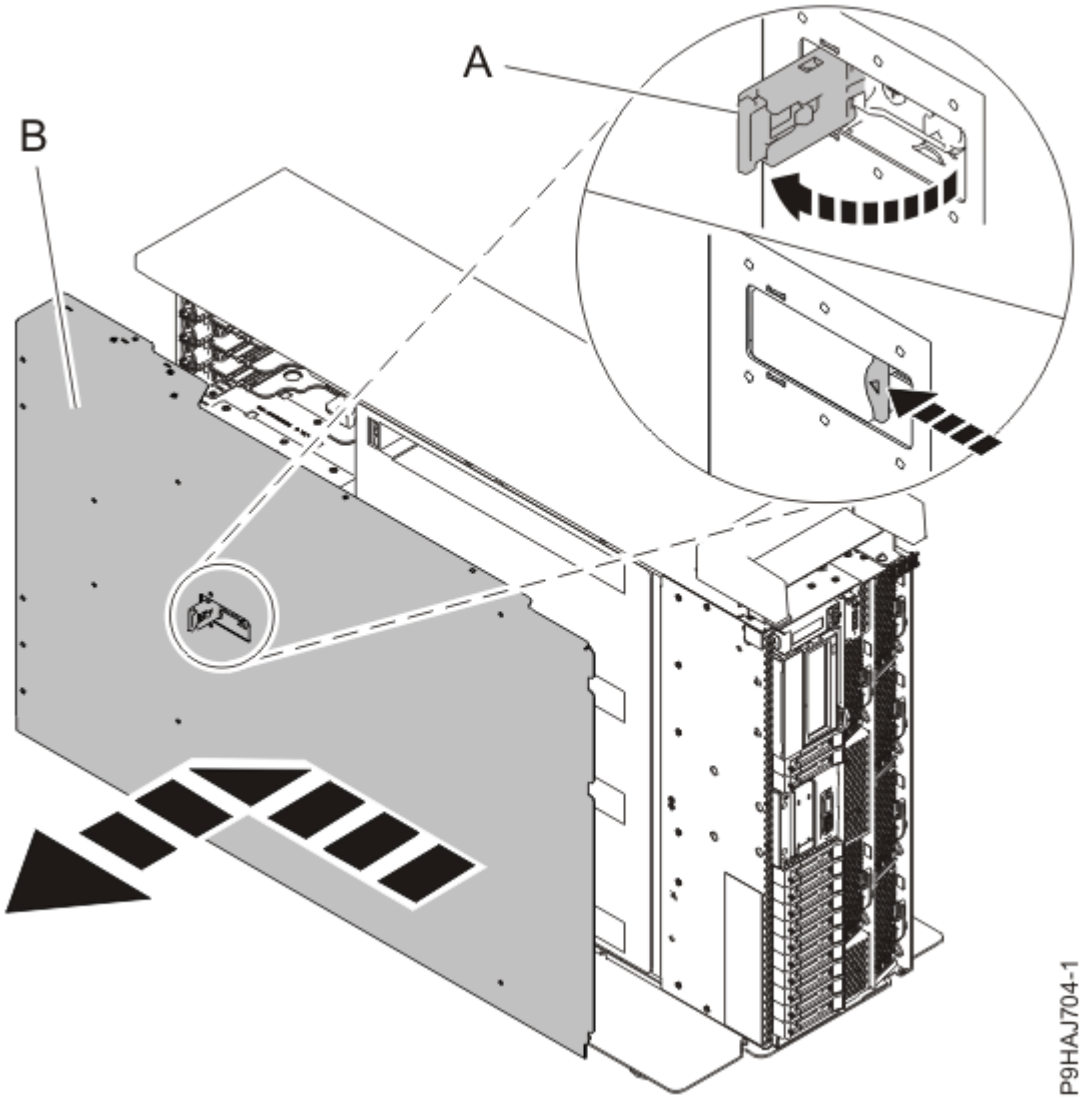


Figure 9. Removing the service access cover

Installing memory modules in the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S system

To install memory modules in a system, complete the steps in this 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 10 on page 16.
   For a stand-alone system, remove the air baffle **(A)** straight out as shown in Figure 11 on page 17.
   Place the air baffle upside down on a clean area.

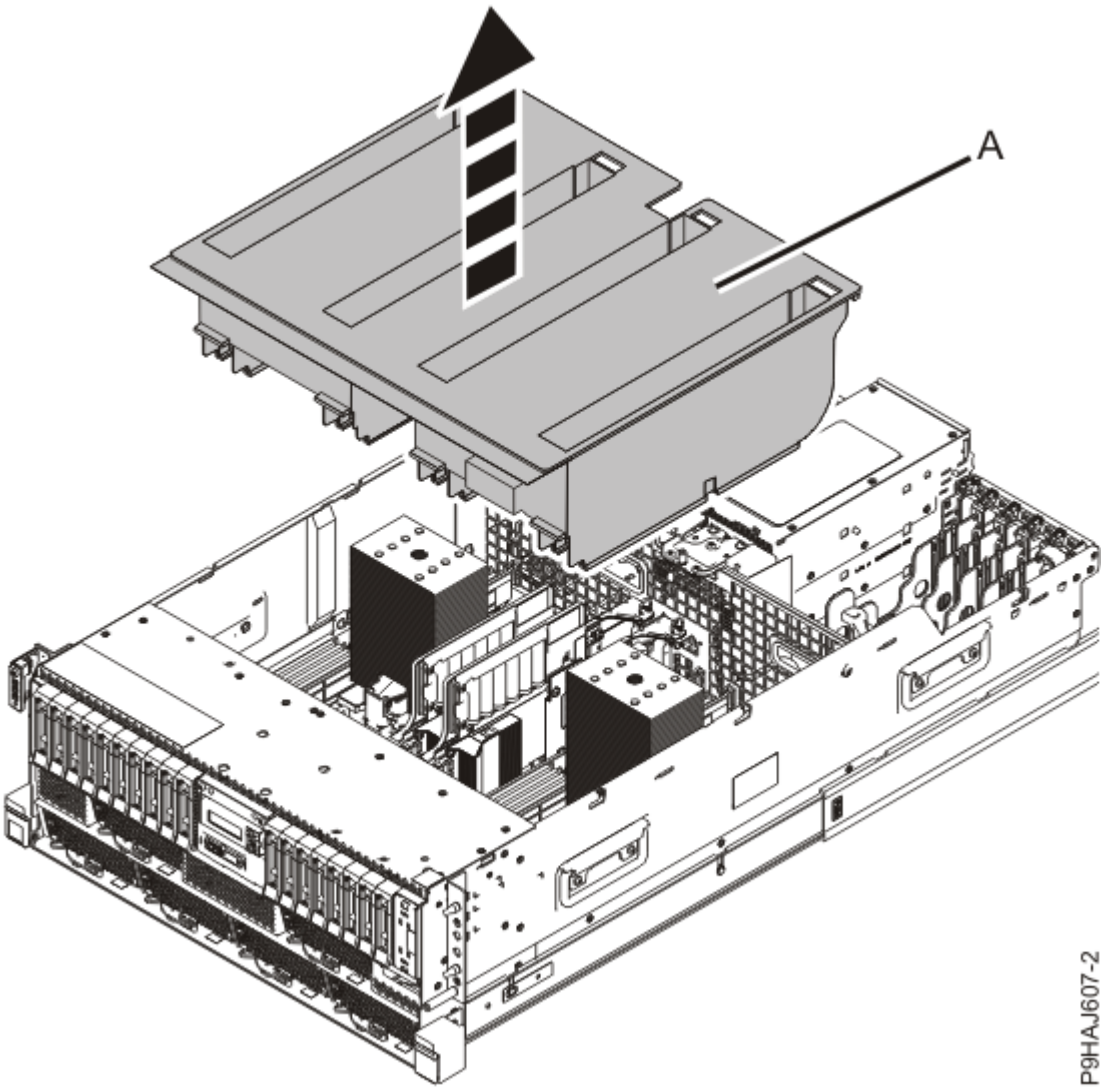


Figure 10. Removing the air baffle from a rack-mounted system

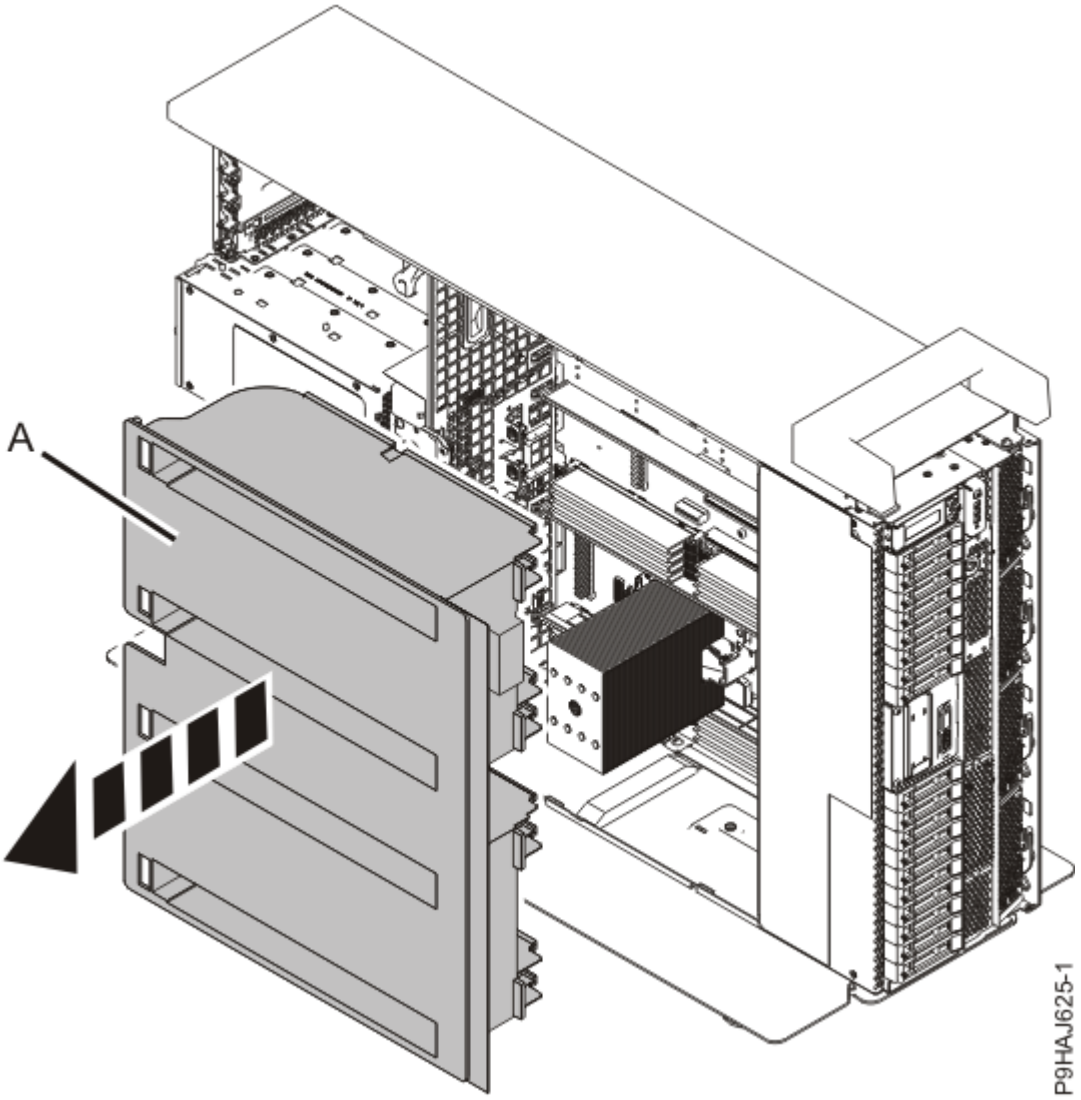


Figure 11. Removing the air baffle from a stand-alone system

3. Use the slot information that you recorded to determine the slot location to place the memory module.
4. If the slot you want to use contains a filler, remove the filler from the slot. Push the locking tabs **(A)** away from the filler.

   Note: The memory module slots must contain either a memory module or a filler to ensure proper cooling.

   To remove the memory module filler, complete the following steps:

   a) To unlock the memory module filler from its connector in the slot, push the locking tabs away from the memory module filler. If you find it hard to open the tabs with your fingers, you may use the tips of ball point pens, or the eraser ends of pencils.

      The lever action of the tabs pushes the memory module filler out of the connector.

   b) Hold the memory module filler by the edges and pull it out of the system.

   c) Retain the removed memory module filler so that you can use it to fill up an empty slot, if required.
5. Grasp the new memory module along its edges and align it with the slot.

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

6. Ensure that the locking tabs of the memory module connector are open. Slowly press the memory module straight down, firmly into the slot, until the locking tabs lock into place. See Figure 12 on page 18.

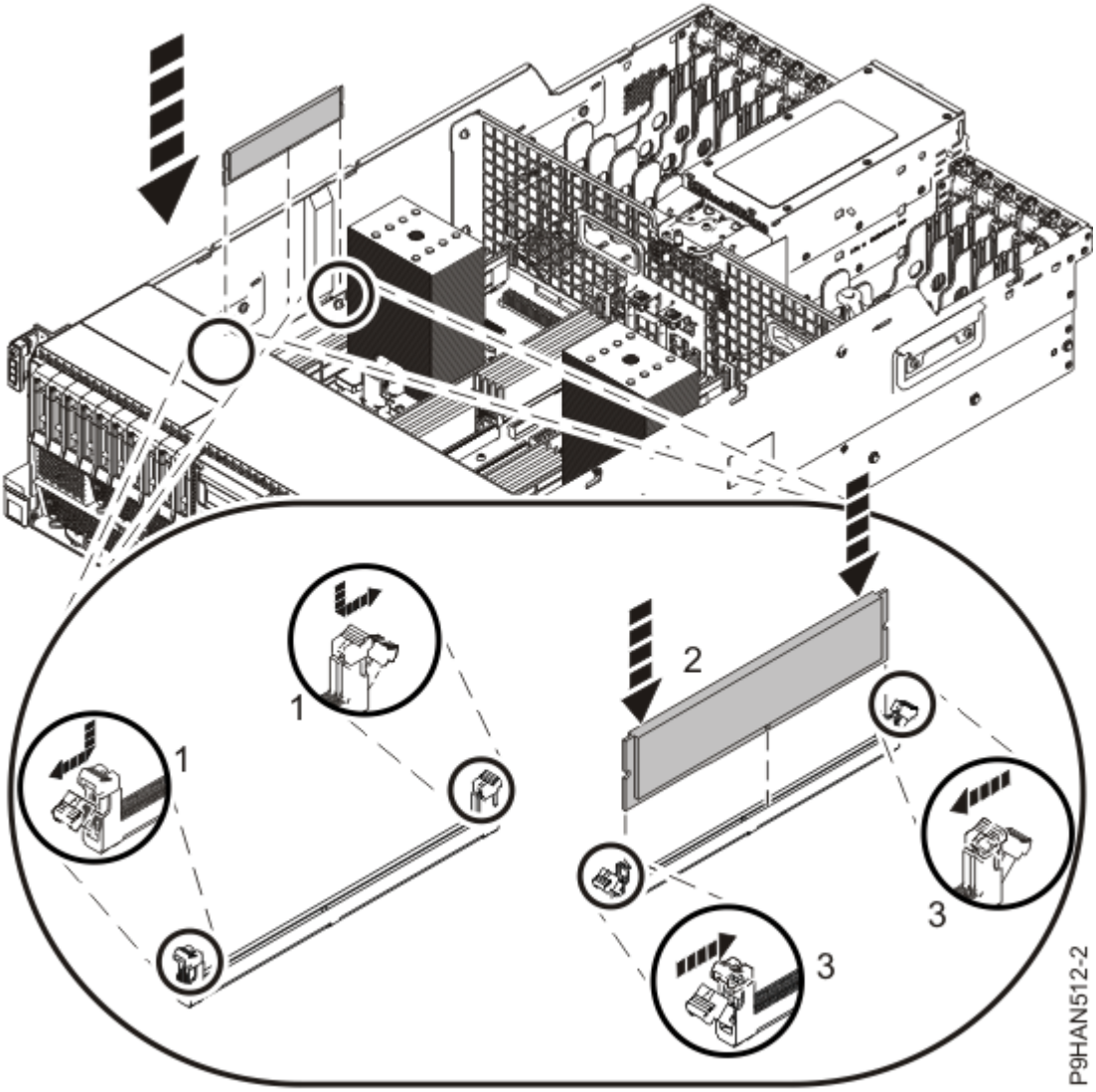


Figure 12. Installing a memory module

7. Repeat steps "3" on page 17 through "6" on page 18 for each memory module.
8. For a rack-mounted system, replace the air baffle **(A)** straight down into the chassis as shown in Figure 13 on page 19.

   For a stand-alone system, replace the air baffle **(A)** straight into the side of the chassis as shown in Figure 14 on page 20.

   Ensure that the front flap tucks under the front chassis.

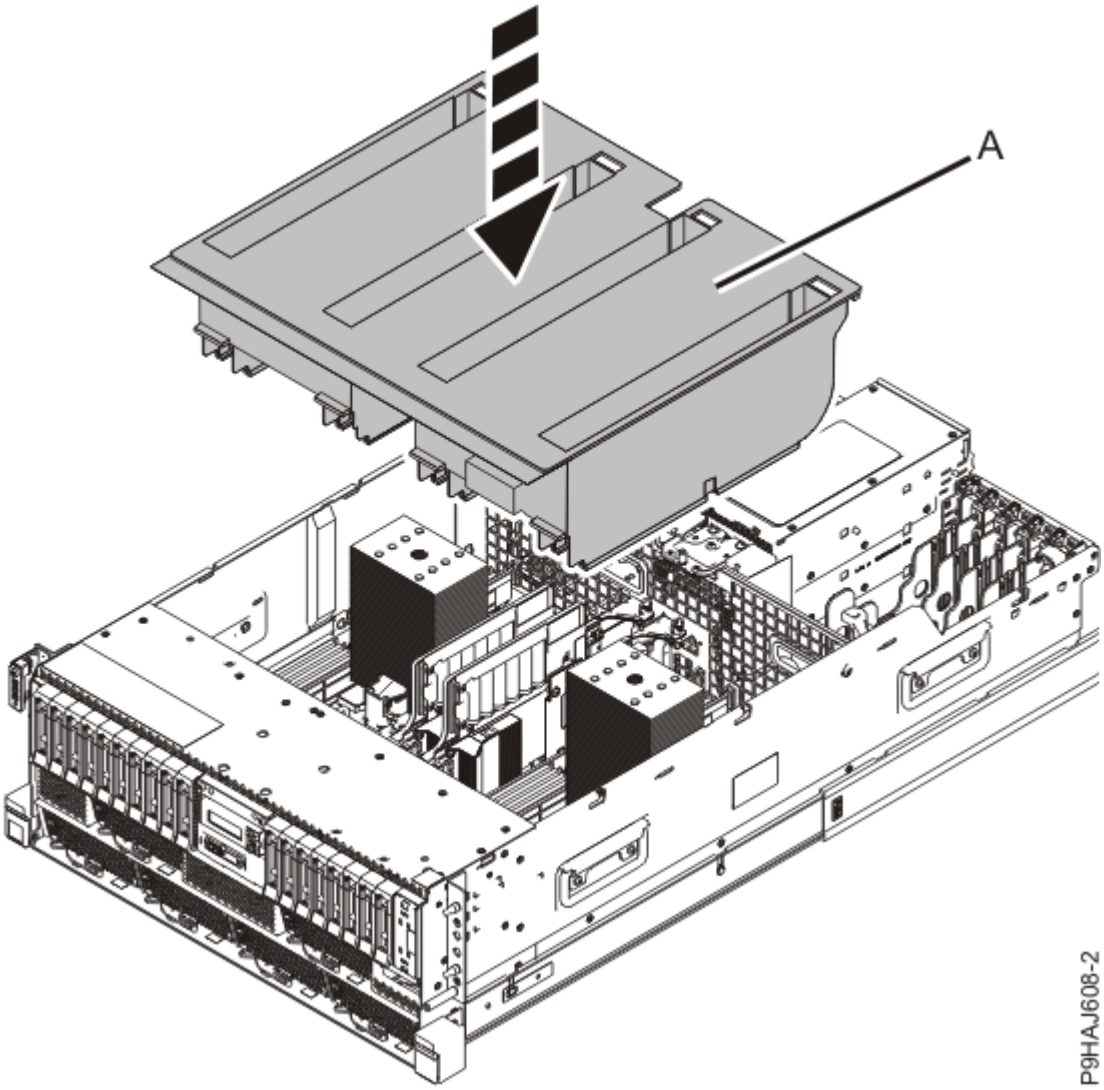


Figure 13. Replacing the air baffle in a rack-mounted system

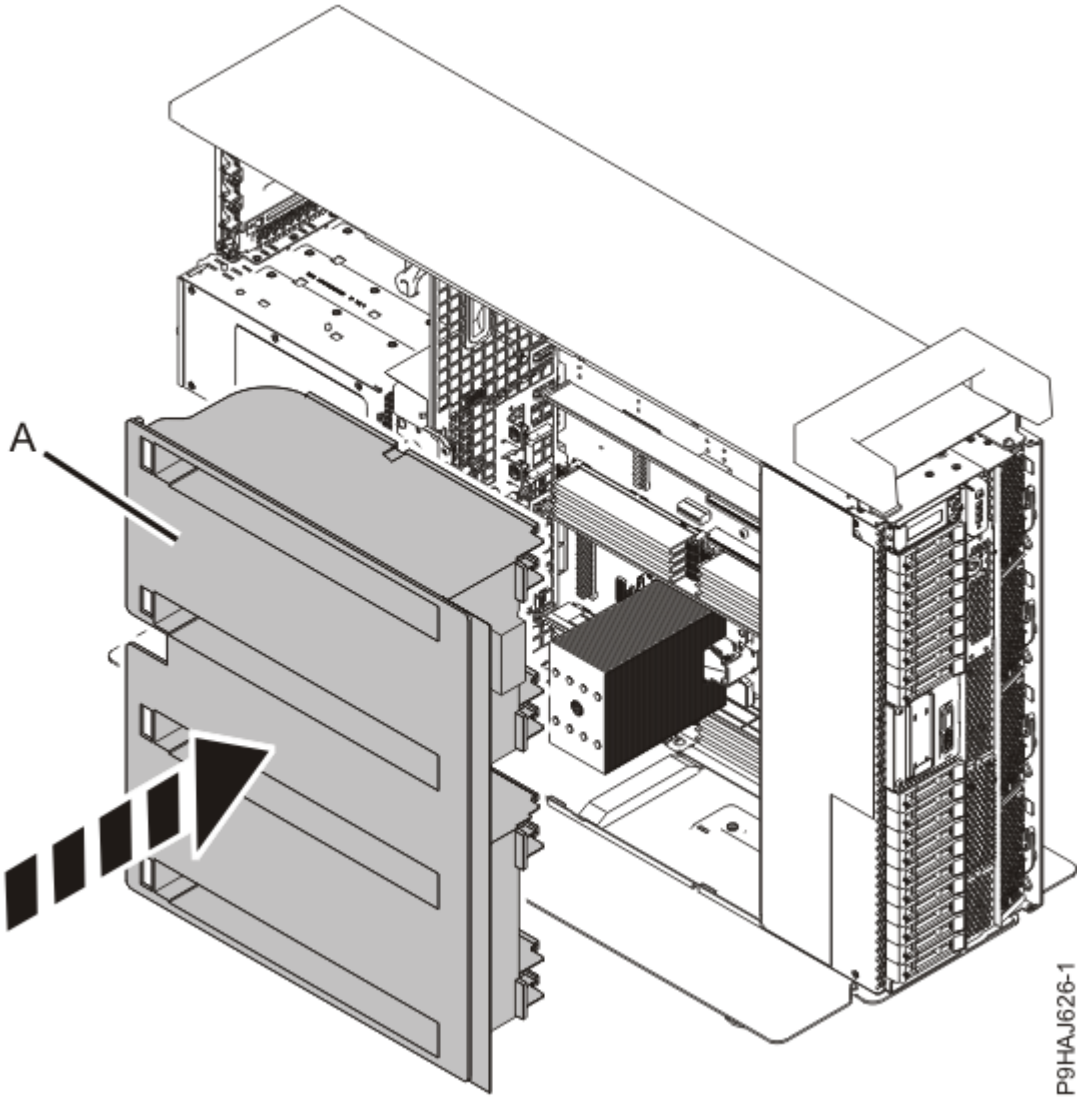


Figure 14. Replacing the air baffle in a stand-alone system

Preparing the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S system for operation after installing memory modules

To prepare the system for operation after you install memory modules, complete the steps in this 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. Replace the service access cover.

   For a rack-mounted system, complete the following steps. Refer to Figure 15 on page 21.

   a. Slide the cover **(A)** onto the system unit.

   b. Close the release latch **(B)** by pushing it in the direction shown.

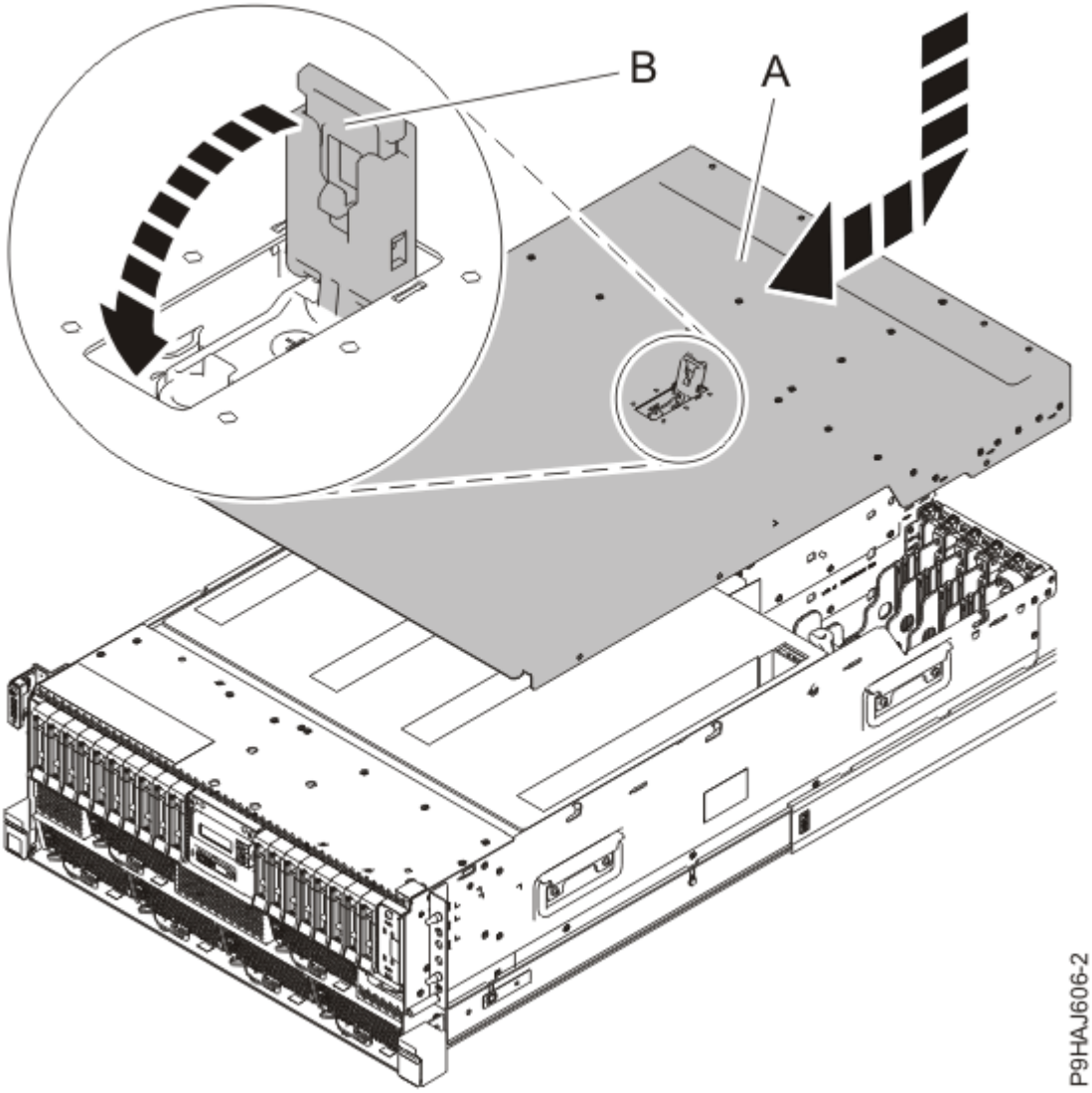


Figure 15. Installing the service access cover

For a stand-alone system, complete the following steps. Refer to Figure 16 on page 22.

a. Slide the cover **(B)** on to the system unit as shown.
b. Close the latch release **(A)** by pushing it in the direction shown.

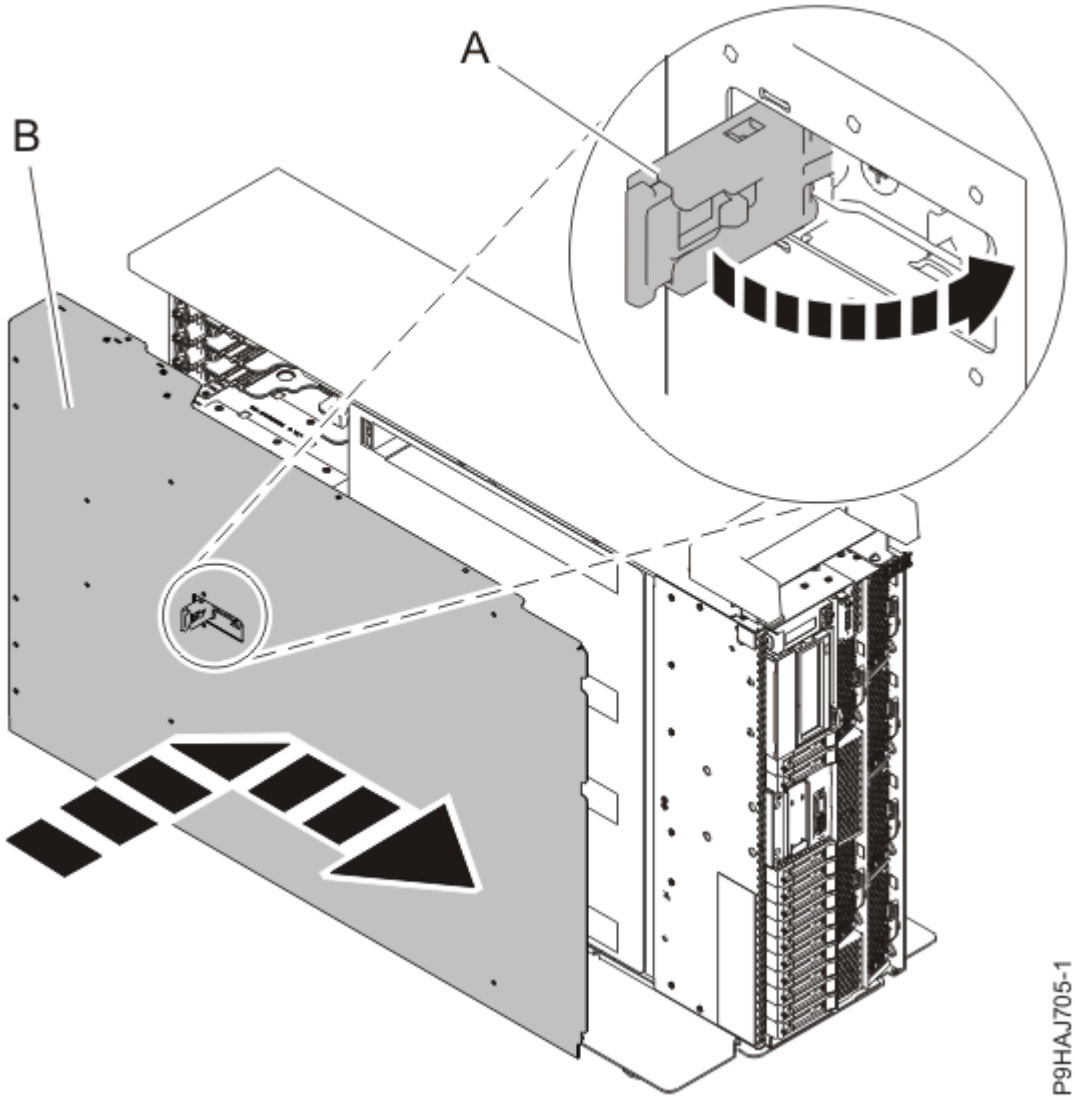


Figure 16. Installing the service access cover

3. For a rack-mounted system, unlock the blue rail safety latches **(A)** as shown in Figure 17 on page 23 by pushing them inward.

   Ensure that the cable management arms can move freely. Ensure that the cables at the rear of the unit do not catch or bind as you push the unit into the operating position.

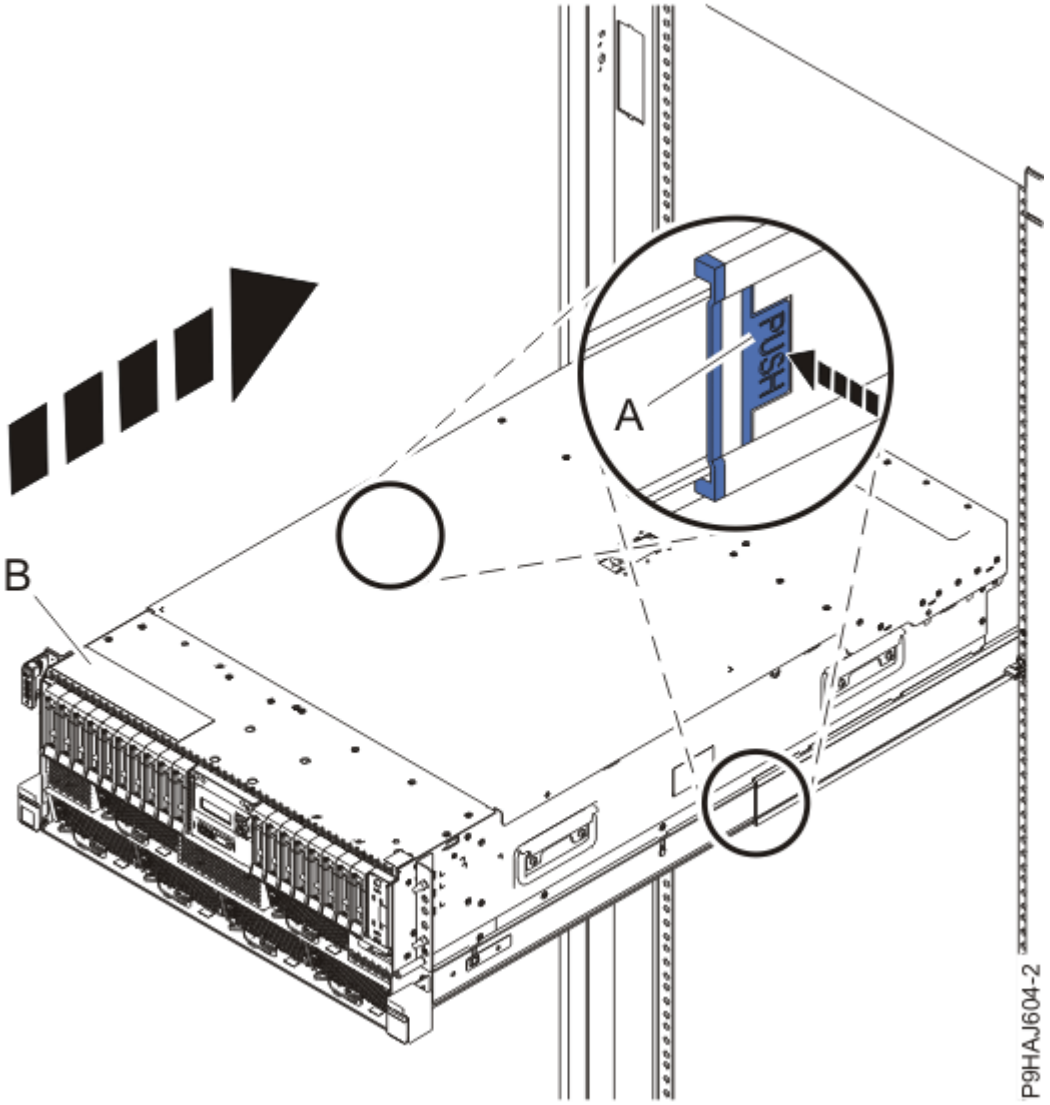


Figure 17. Placing the system into the operating position

4. For a rack-mounted system, push the system unit **(B)** as shown in the previous figure back into the rack until both release latches lock the system into position.

   Secure the cable management arm with hook-and-loop fasteners around the back side of the cable management arm, but not around the cables.

5. 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 18 on page 24 or Figure 19 on page 25.

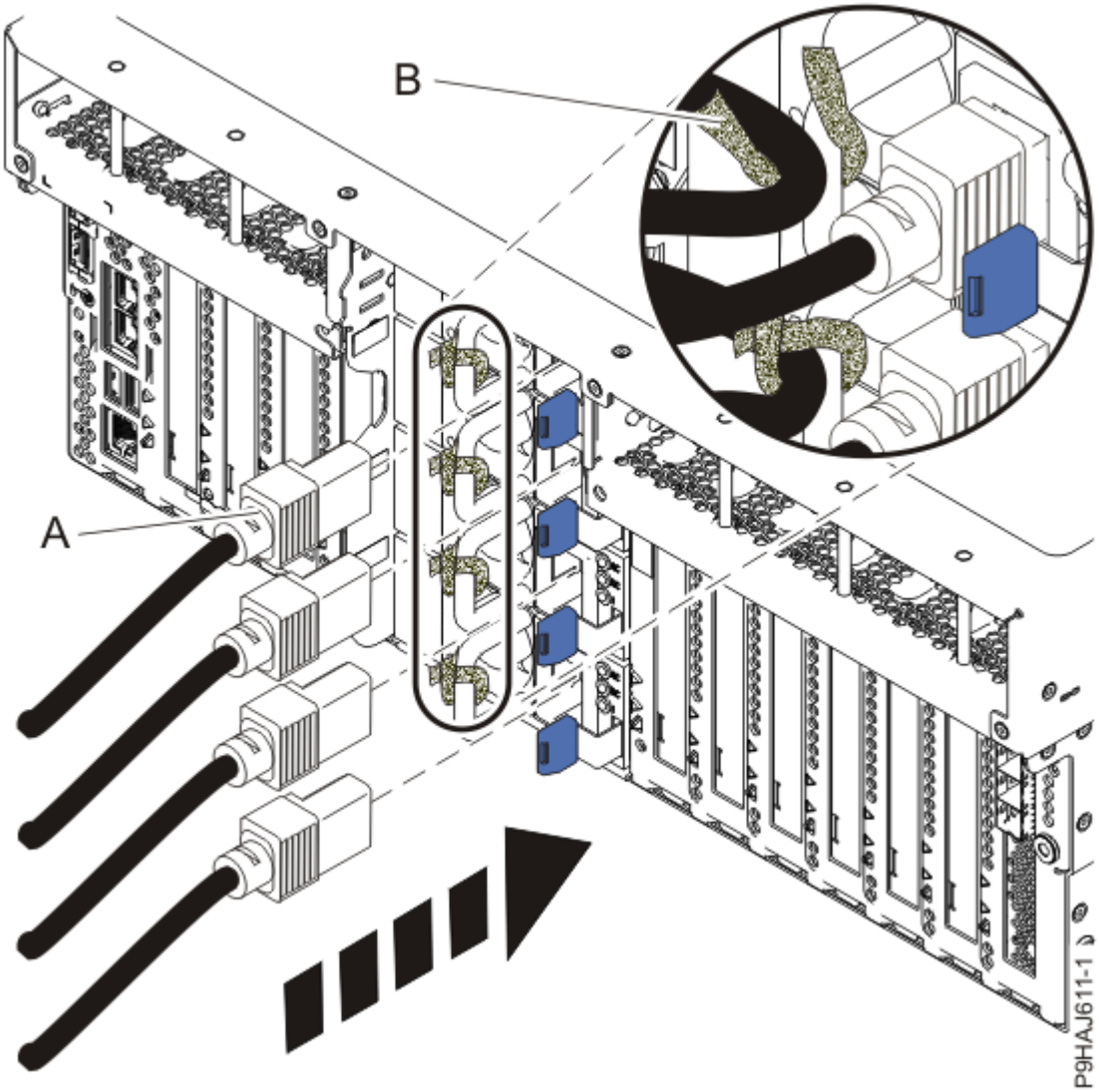


Figure 18. Connecting the power cords to a rack-mounted system

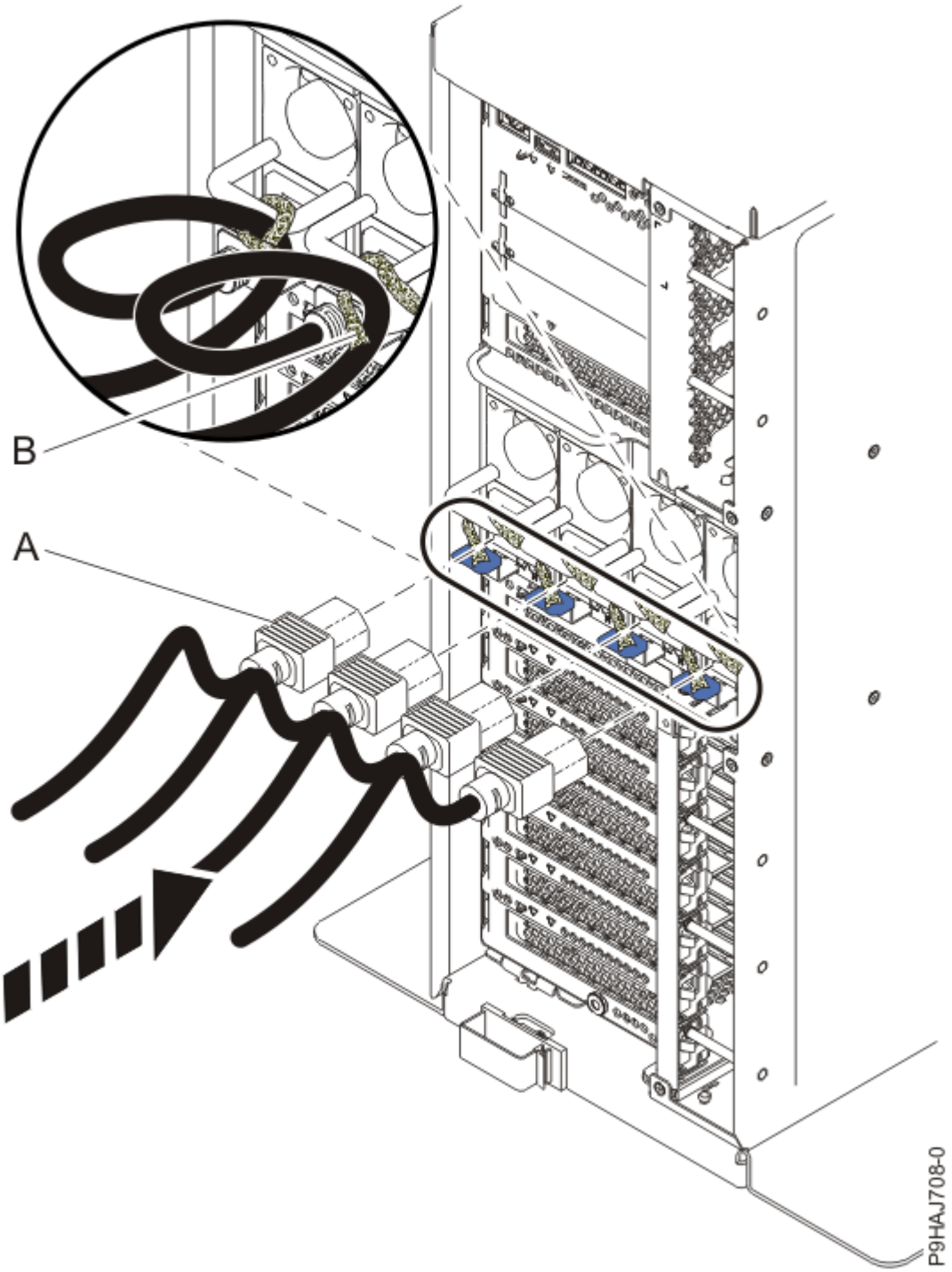


Figure 19. Connecting the power cords to a stand-alone system

6. Start the system. For instructions, see Starting a system (www.ibm.com/support/knowledgecenter/POWER9/p9haj/crustartsys.htm).
7. Turn off the identify LED. For instructions, see Deactivating an identify LED (www.ibm.com/support/knowledgecenter/POWER9/p9haj/p9haj_turn_off_identify_led.htm).
8. Verify the installed part.
   - If you replaced the part because of a service action, verify the installed part. For instructions, see Verifying a repair (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 (www.ibm.com/support/knowledgecenter/POWER9/p9haj/pxhaj_hsmverify.htm).

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

Find information about removing and replacing memory modules in the IBM Power System S914 (9009-41A and 9009-41G), IBM Power System S924 (9009-42A and 9009-42G), IBM Power System H924 (9223-42H), or IBM Power System H924S (9223-42S) server.

About this task

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 (www.ibm.com/support/knowledgecenter/POWER9/p9haj/p9haj_hmc_repair.htm).

If your system is not managed by an HMC, complete the steps in the following procedures to remove and replace a memory module in the system.

Note: Removing or replacing this feature is a customer task. You can complete this task yourself, or contact a service provider to complete the task for you. You might be charged a fee by the service provider for this service.

Preparing the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S system to remove and replace a memory module

To prepare a system to remove and replace a memory module, complete the steps in this procedure.

Procedure

1. Identify the part and the system that you are working on. For instructions, see Identifying a part (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 (www.ibm.com/support/knowledgecenter/POWER9/p9haj/crustopsys.htm).
3. Label and disconnect the power cords from the system unit.

   See Figure 20 on page 27 or Figure 21 on page 28.

   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.

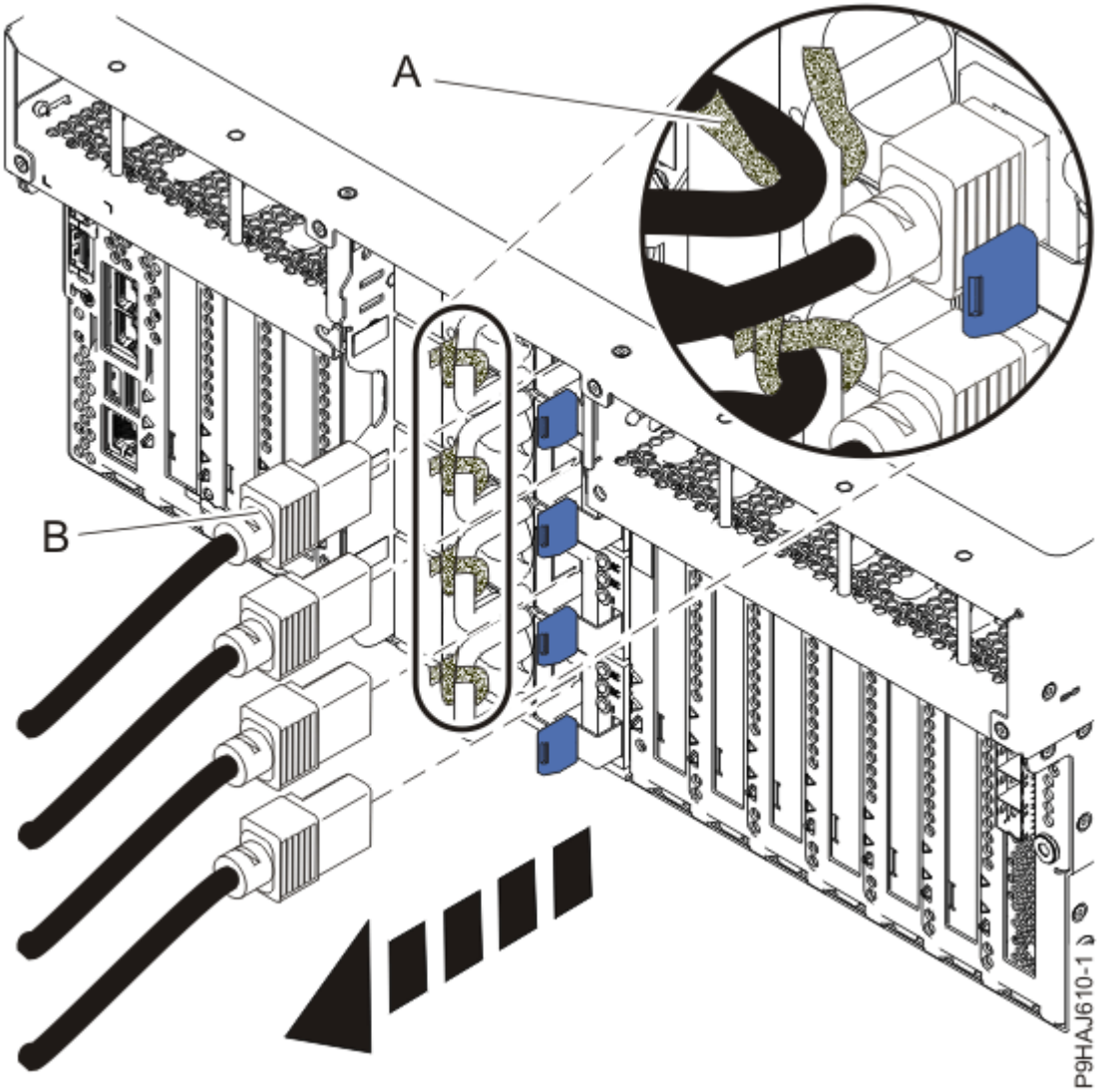


Figure 20. Removing the power cords from a rack-mounted server

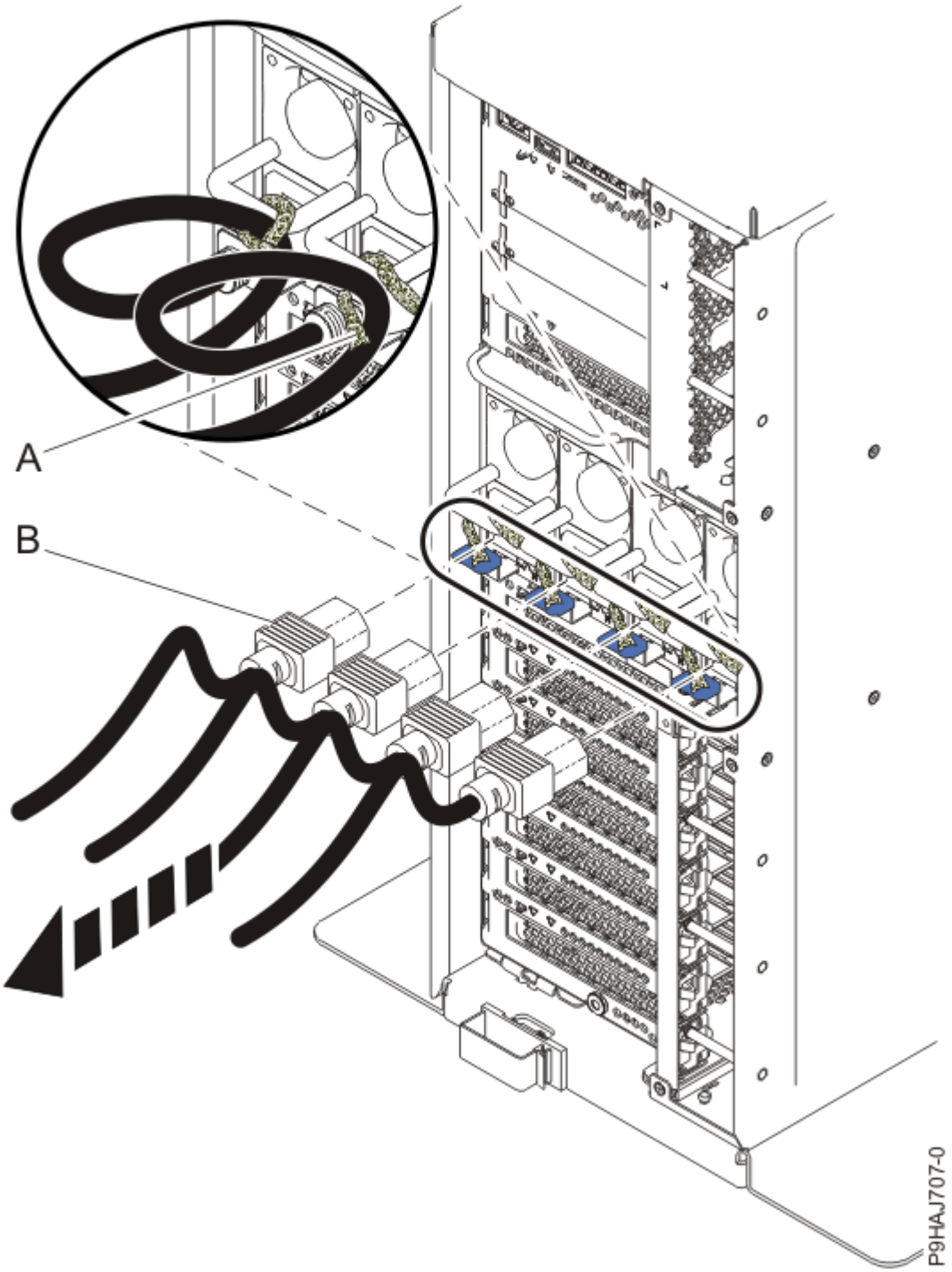
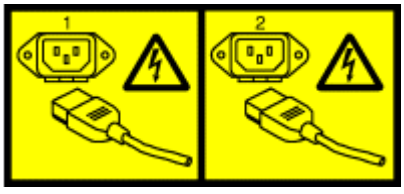


Figure 21. Removing the power cords from a stand-alone server

(L003)



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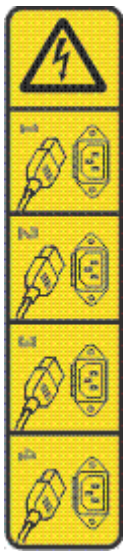

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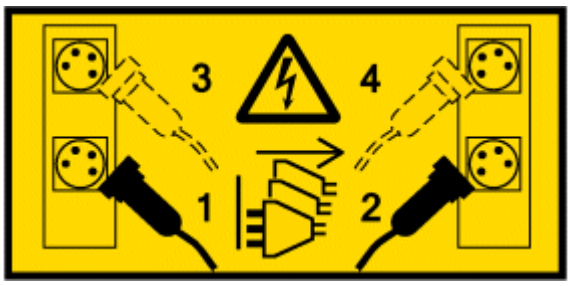
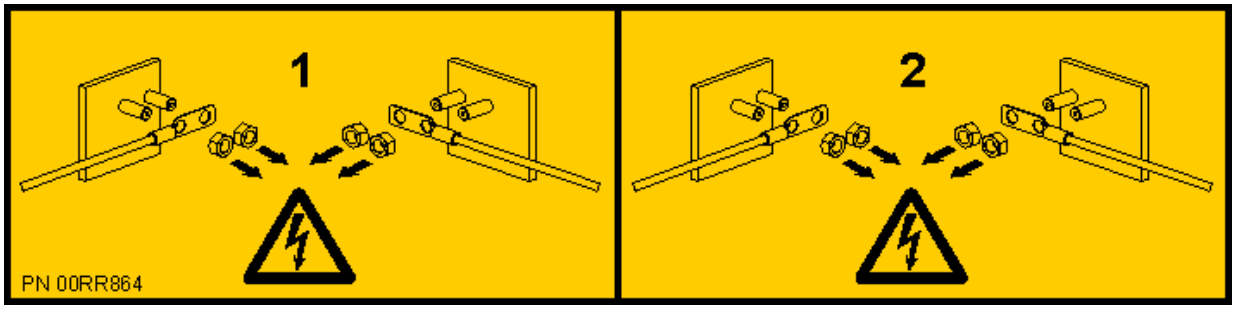




DANGER: Multiple power cords. The product might be equipped with multiple AC power cords or multiple DC power cables. To remove all hazardous voltages, disconnect all power cords and power cables. (L003)

4. For a rack-mounted system, 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 the following figure.

   Remove the hook-and-loop fasteners that secure the cable management arms. Ensure that the cable management arms can move freely. Ensure that the cables at the rear of the system do not catch or bind as you pull the system unit into the service position.

   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.

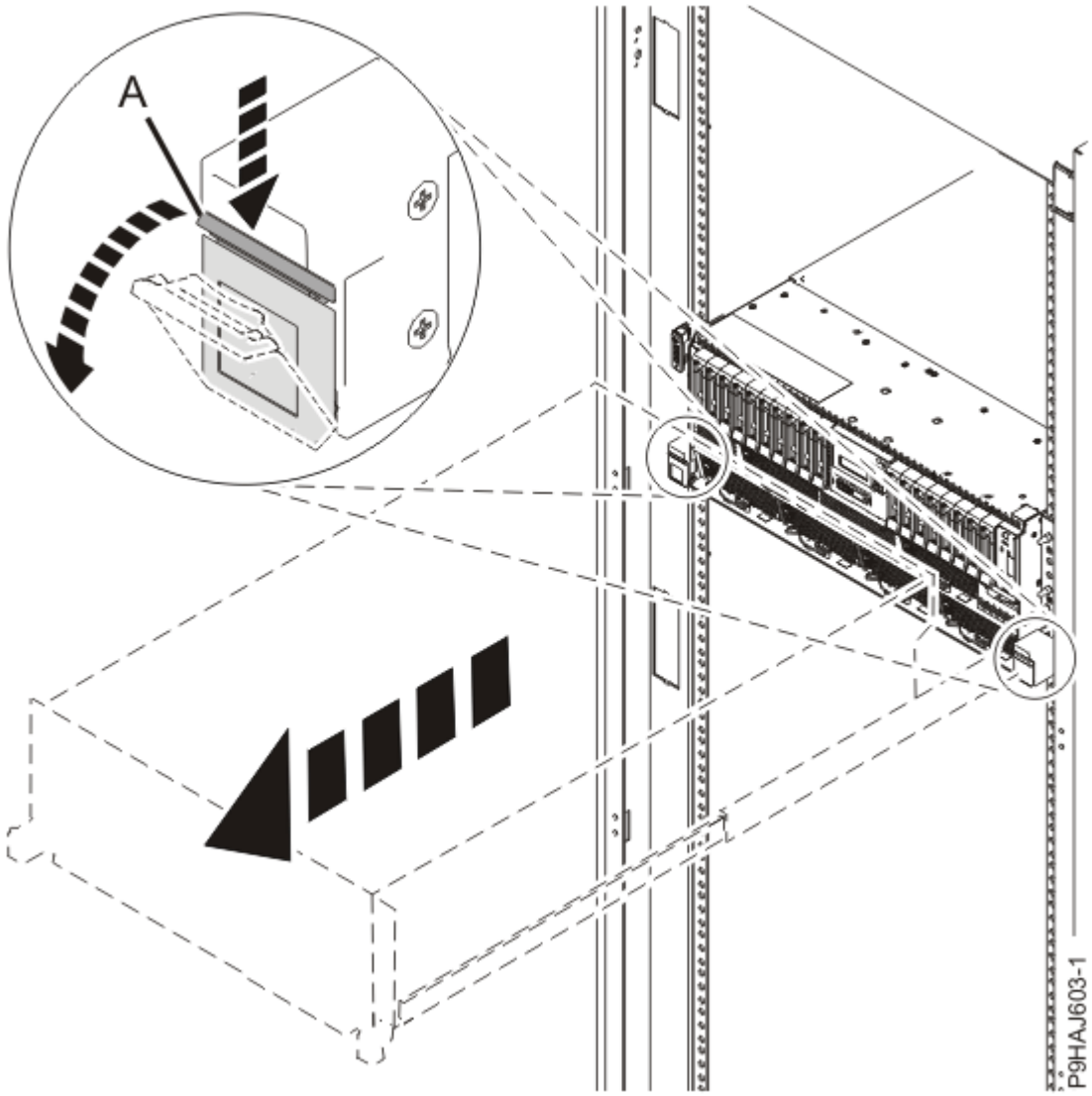


Figure 22. Releasing the side latches

5. Attach the electrostatic discharge (ESD) wrist strap. Your system has ESD jacks on the front and on the rear of the system as shown in the following figure. Plug the ESD wrist strap into the ESD jack.

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.

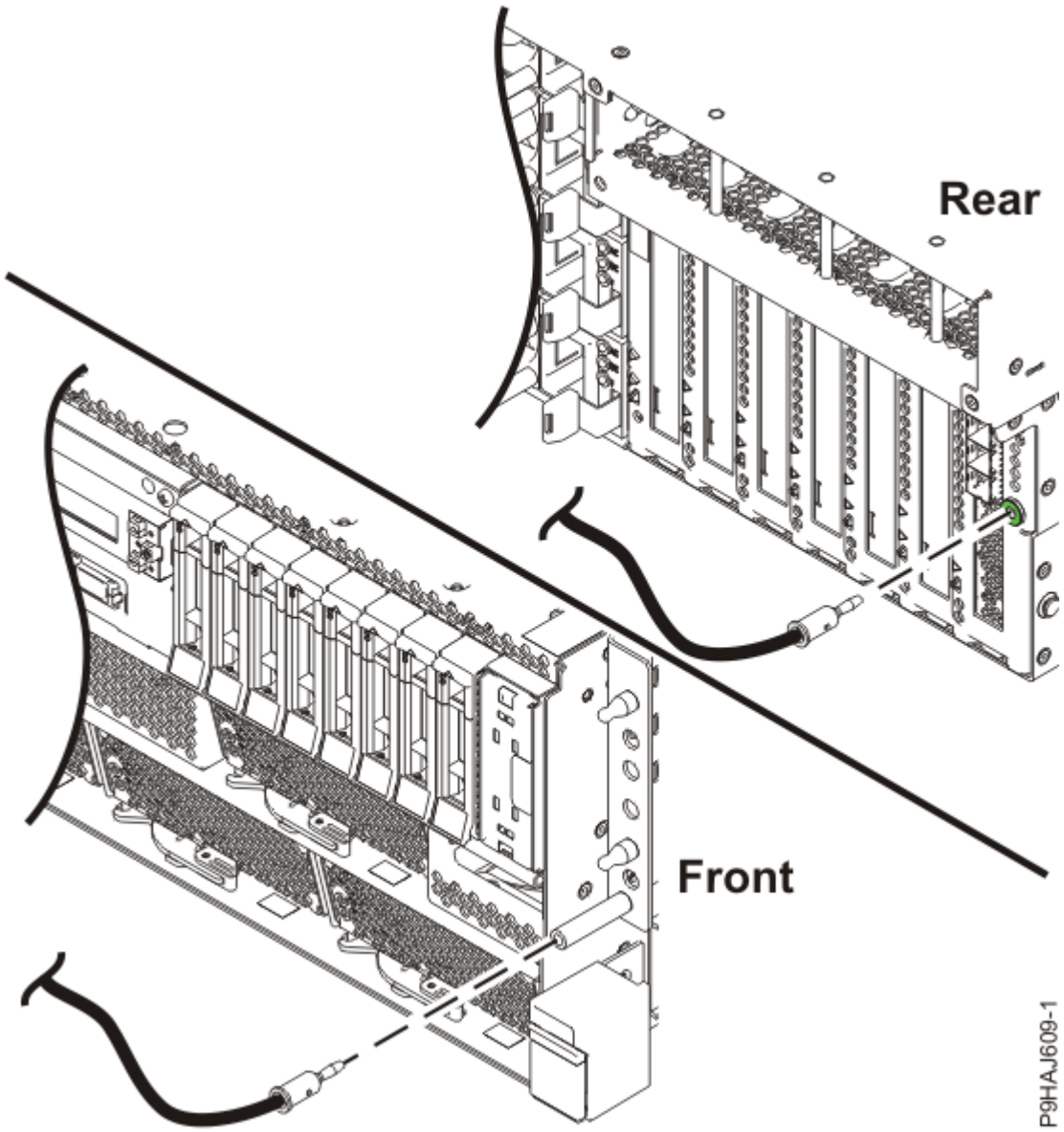


Figure 23. Location of ESD plugs

6. Remove the service access cover.

   For a rack-mounted system, complete the following steps. Refer to Figure 24 on page 33.

   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.

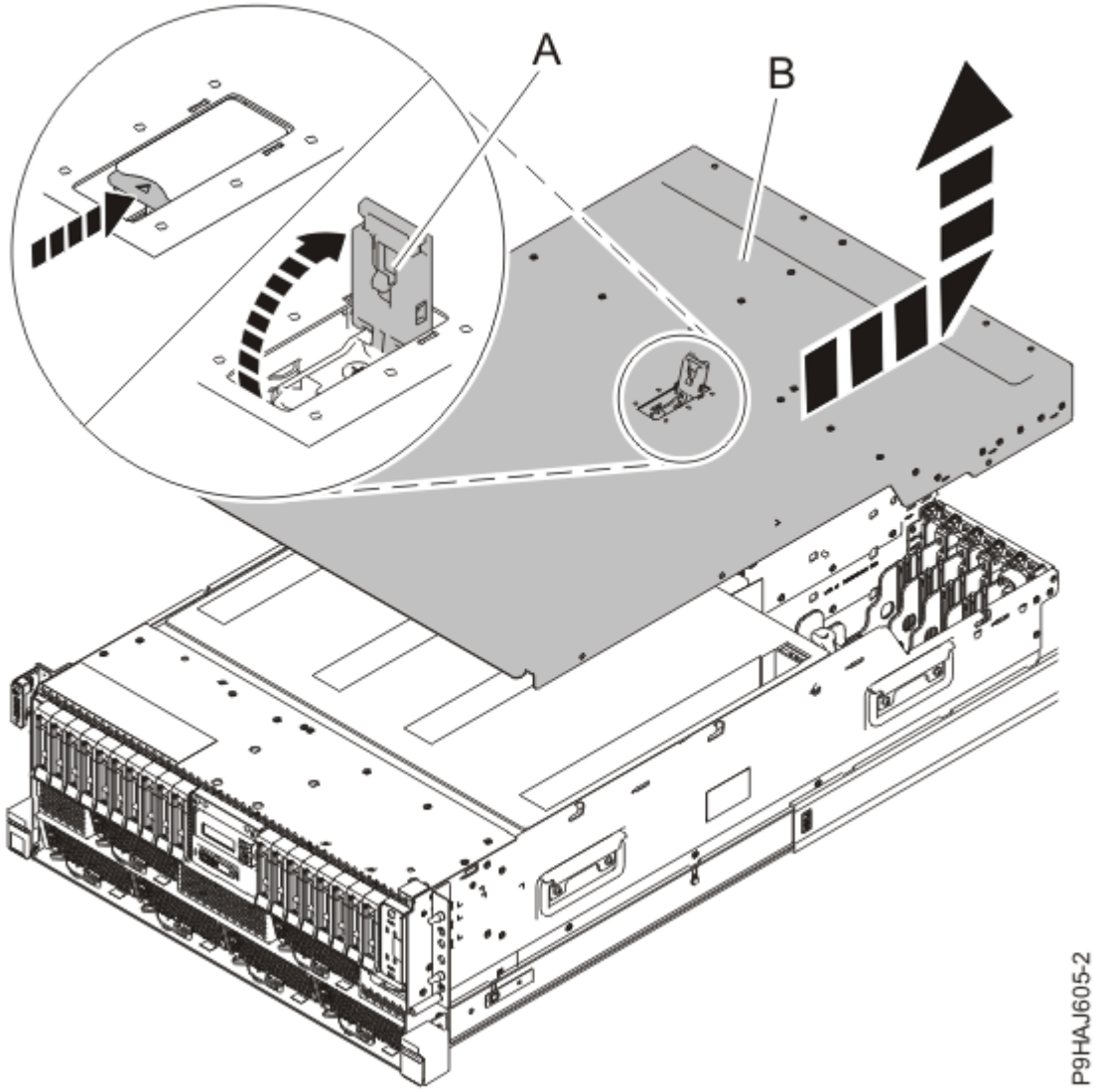


Figure 24. Removing the service access cover from a rack-mounted system

For a stand-alone system, complete the following steps. Refer to Figure 25 on page 34.

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.

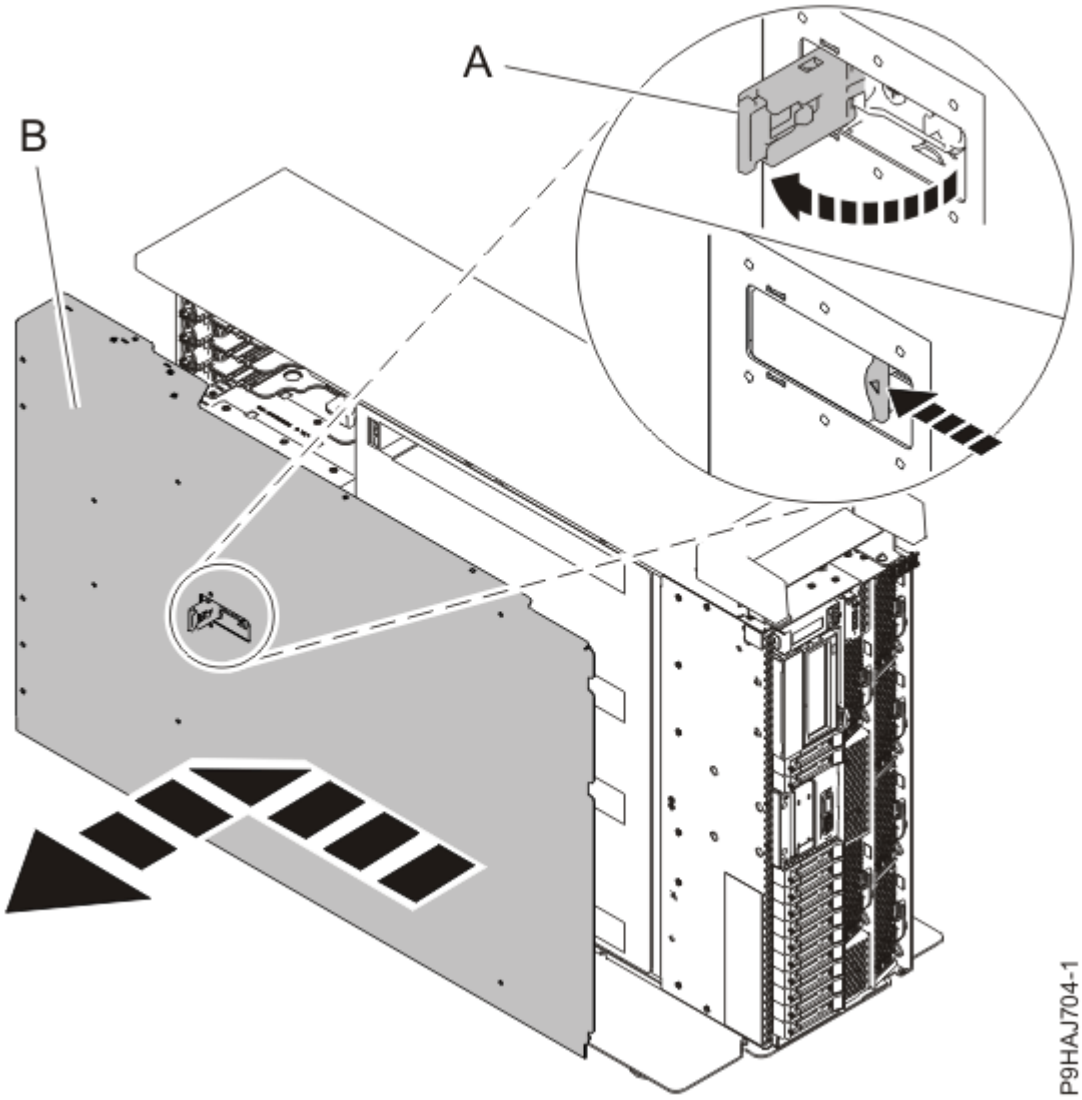


Figure 25. Removing the service access cover

7. 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.

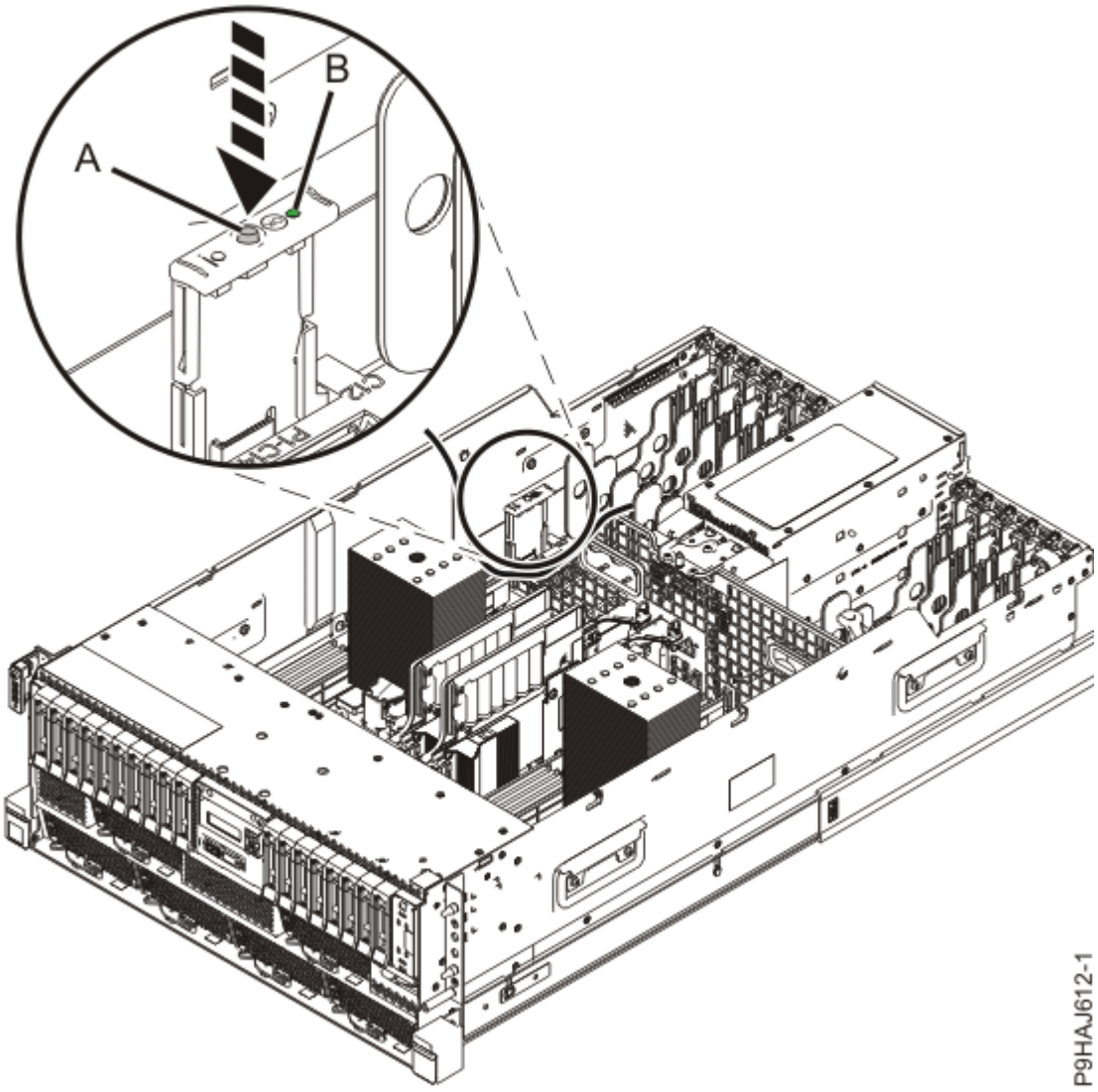


Figure 26. Activating the identify LED

8. Locate the amber LED for the failed memory module. Make a note of which location is lit; that indicates the memory module to replace.

   Figure 27 on page 36 shows the locations and states of the memory module LEDs.

   - When the LED is off **(B)**, the memory module is good.
   - An amber LED is on **(C)** for a failed memory module.
   - A flashing amber LED **(D**) identifies a memory module.

   Record the location of the flashing LED.

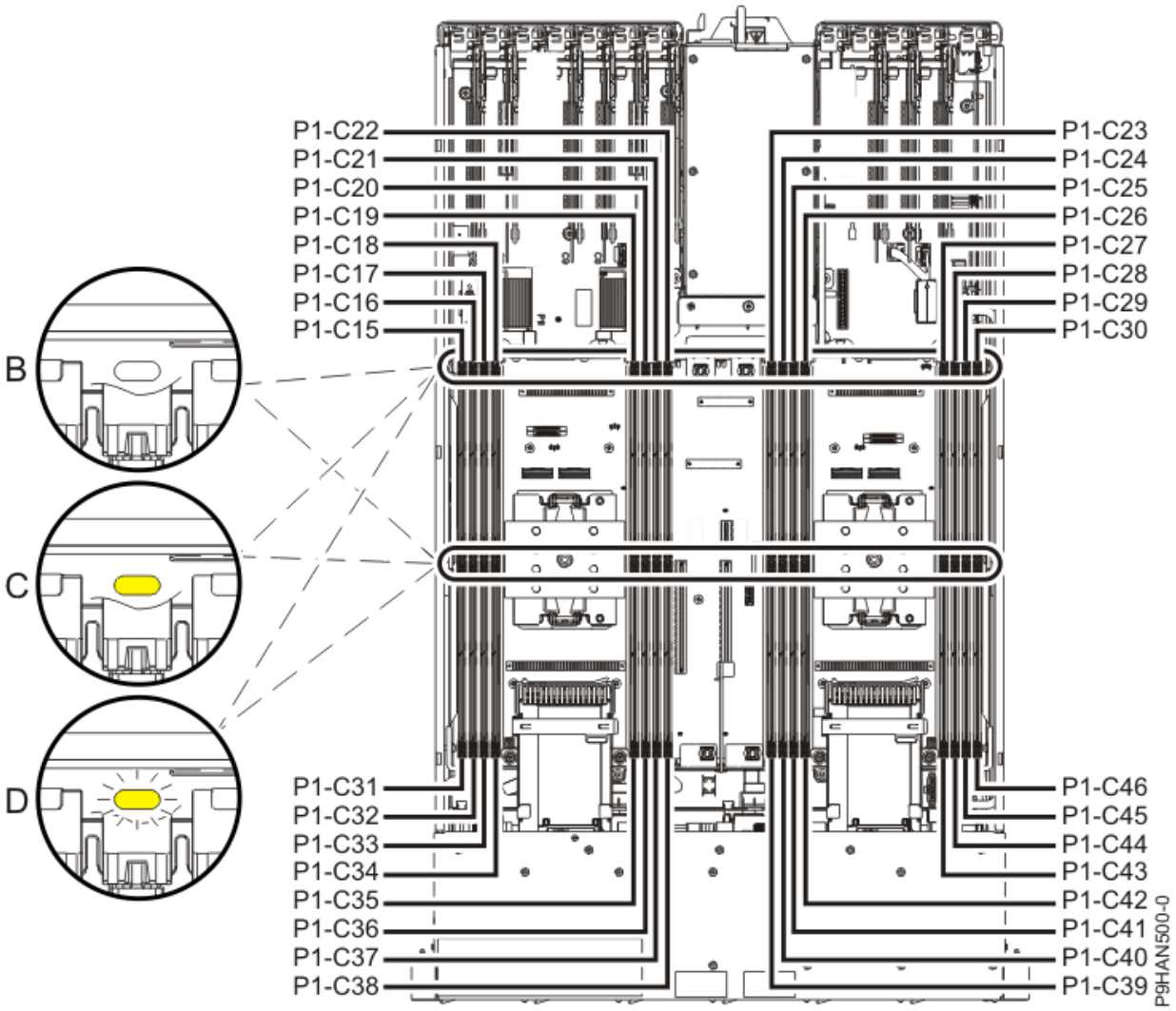


Figure 27. LEDs for a working and failed memory module

Removing a memory module from the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S system

To remove a memory module from the system, complete the steps in this 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 28 on page 37.

   For a stand-alone system, remove the air baffle **(A)** straight out as shown in Figure 29 on page 38.

   Place the air baffle upside down on a clean area.

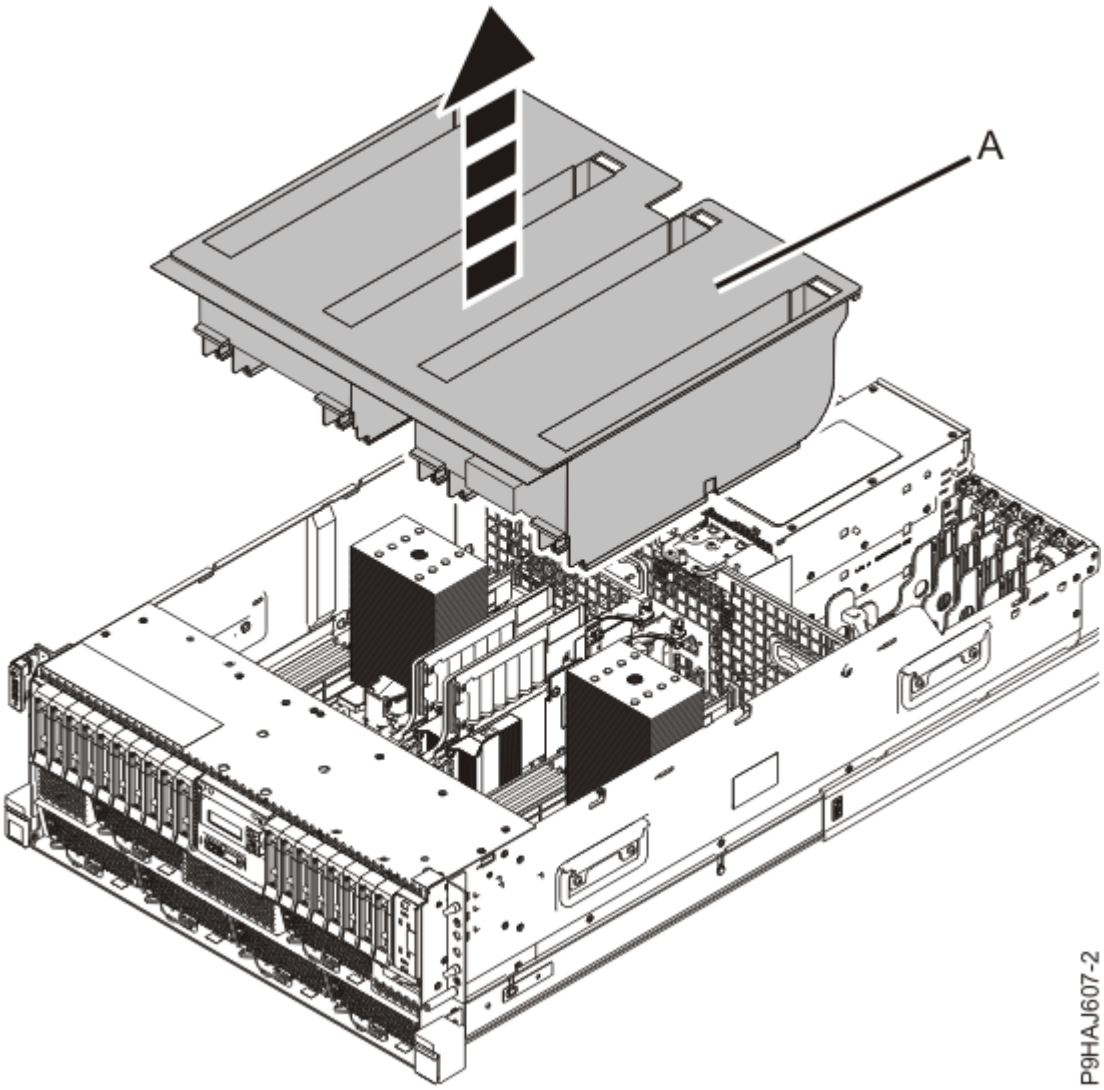


Figure 28. Removing the air baffle from a rack-mounted system

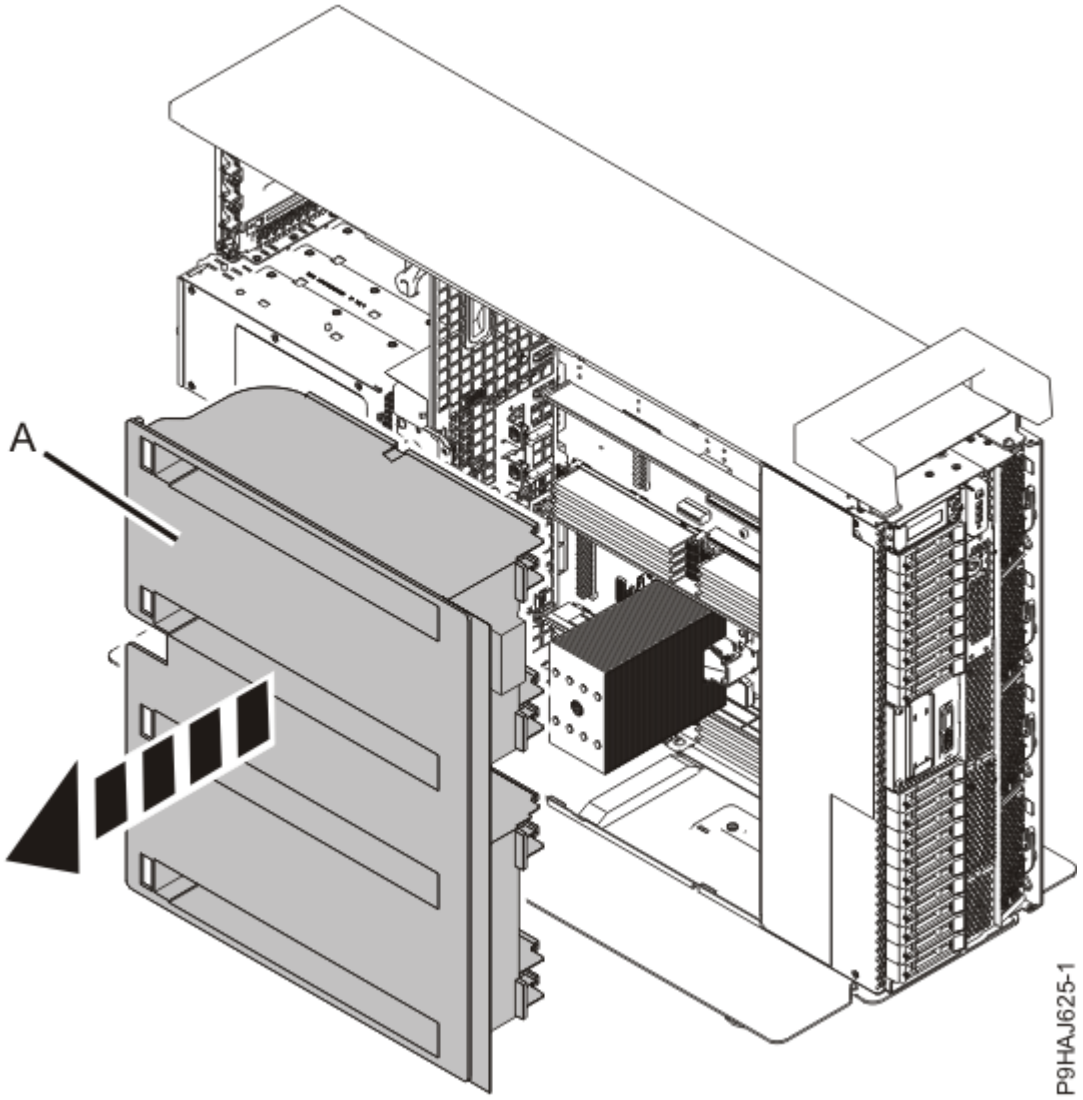


Figure 29. Removing the air baffle from a stand-alone system

3. To unlock the memory module from its connector, simultaneously push the locking tabs **(A)** away from the memory module in the direction that is shown in Figure 30 on page 39.

   The lever action of the tabs pushes the memory module out of the connector. If you find it hard to open the tabs with your fingers, you may use the tips of ball point pens, or the eraser ends of pencils. The levers must be opened simultaneously, so that the memory module lifts straight up.

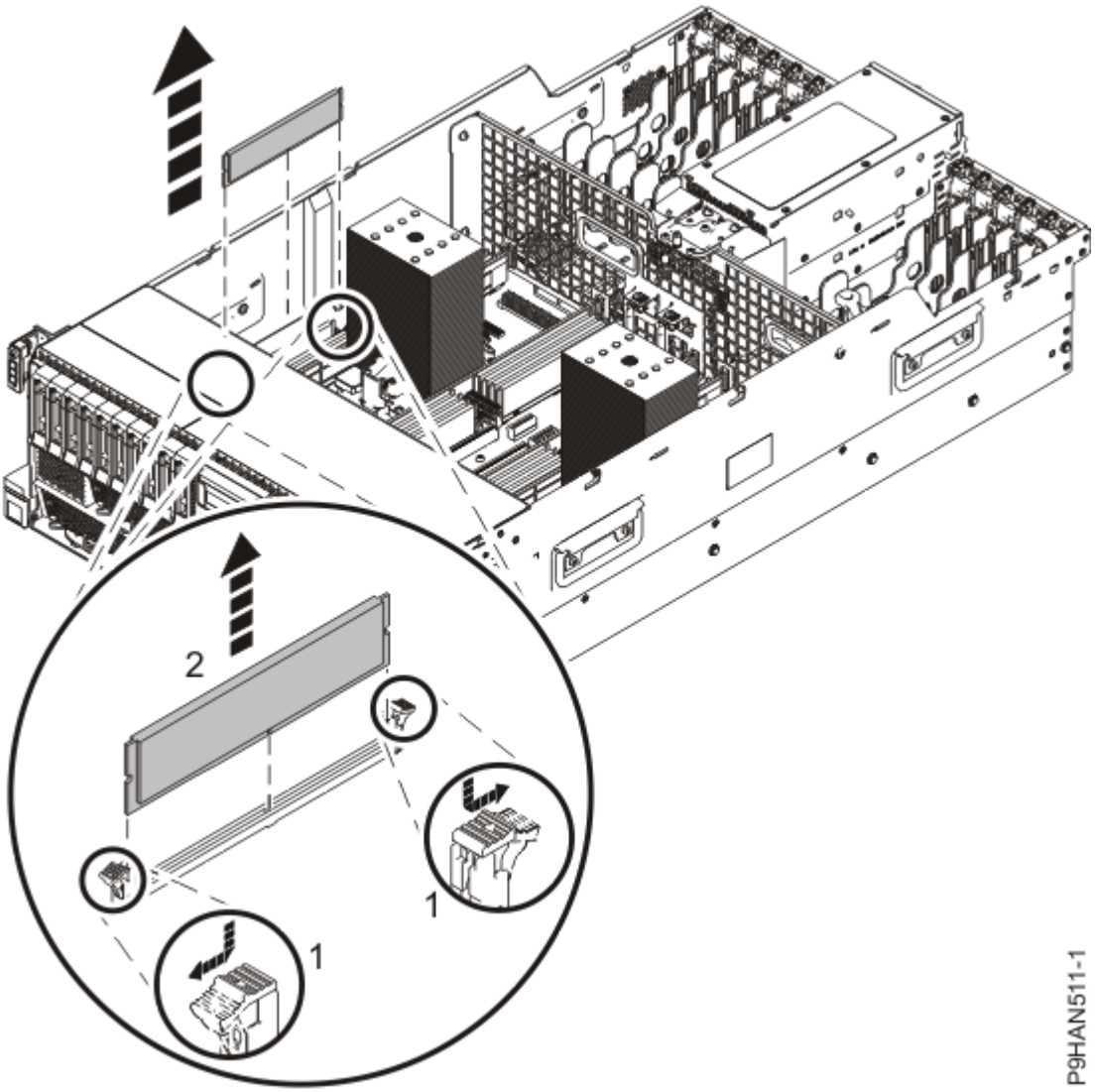


Figure 30. Removing a memory module

4. Hold the memory module by the edges and pull it out of the system.
5. If the removed part is used again, place the part on an electrostatic discharge (ESD) mat.

Replacing a memory module in the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S system

To replace a memory module in the system, complete the steps in this 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. Use the slot information that you recorded to determine the slot location to place the memory module.
3. Grasp the new memory module along its edges and align it with the slot.

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

4. Ensure that the locking tabs of the memory module connector are open. Slowly press the memory module straight down, firmly into the slot, until the locking tabs lock into place. See Figure 31 on page 40.

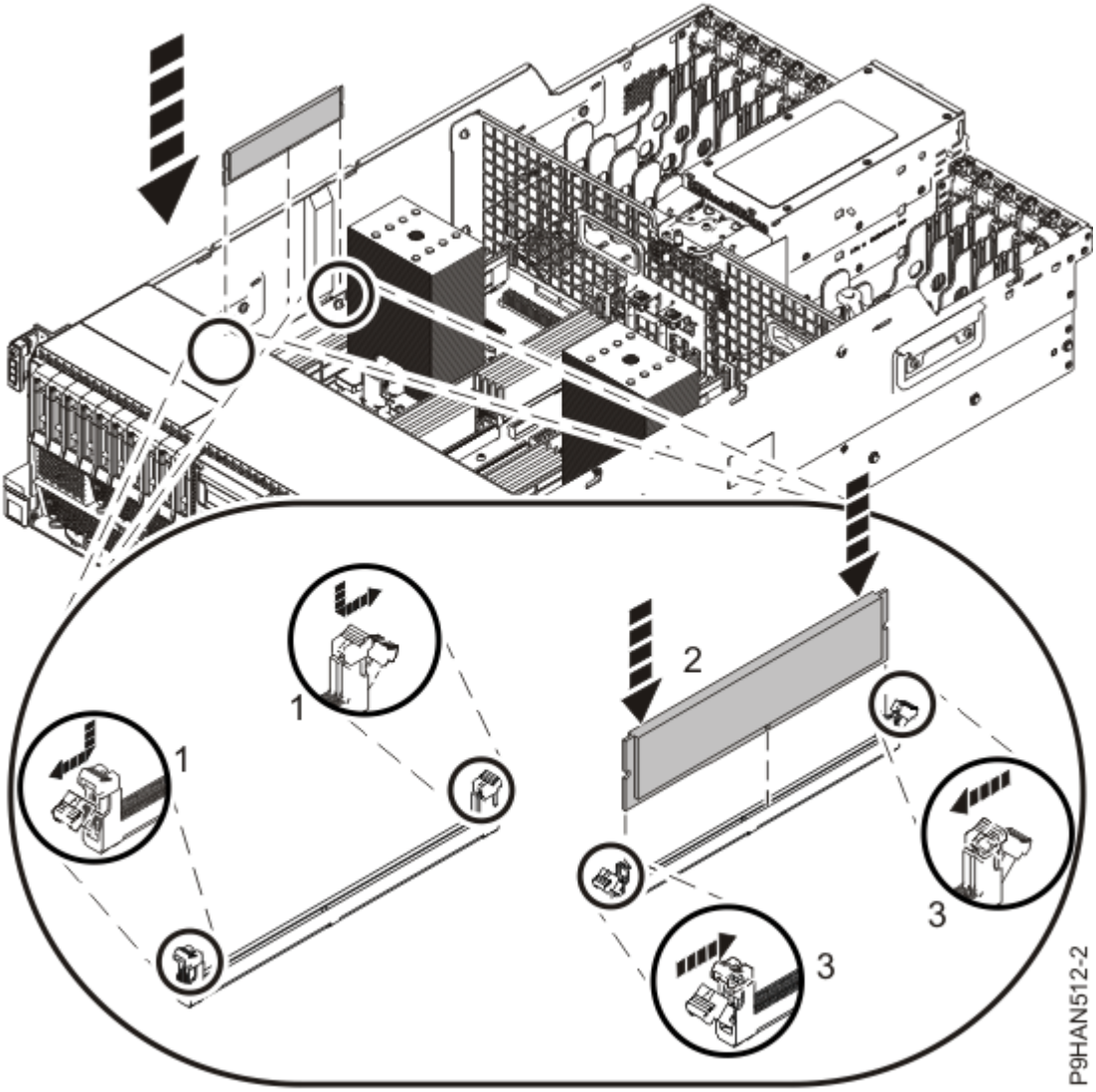


Figure 31. Replacing a memory module

5. For a rack-mounted system, replace the air baffle **(A)** straight down into the chassis as shown in Figure 32 on page 41.

   For a stand-alone system, replace the air baffle **(A)** straight into the side of the chassis as shown in Figure 33 on page 42.

   Ensure that the front flap tucks under the front chassis.

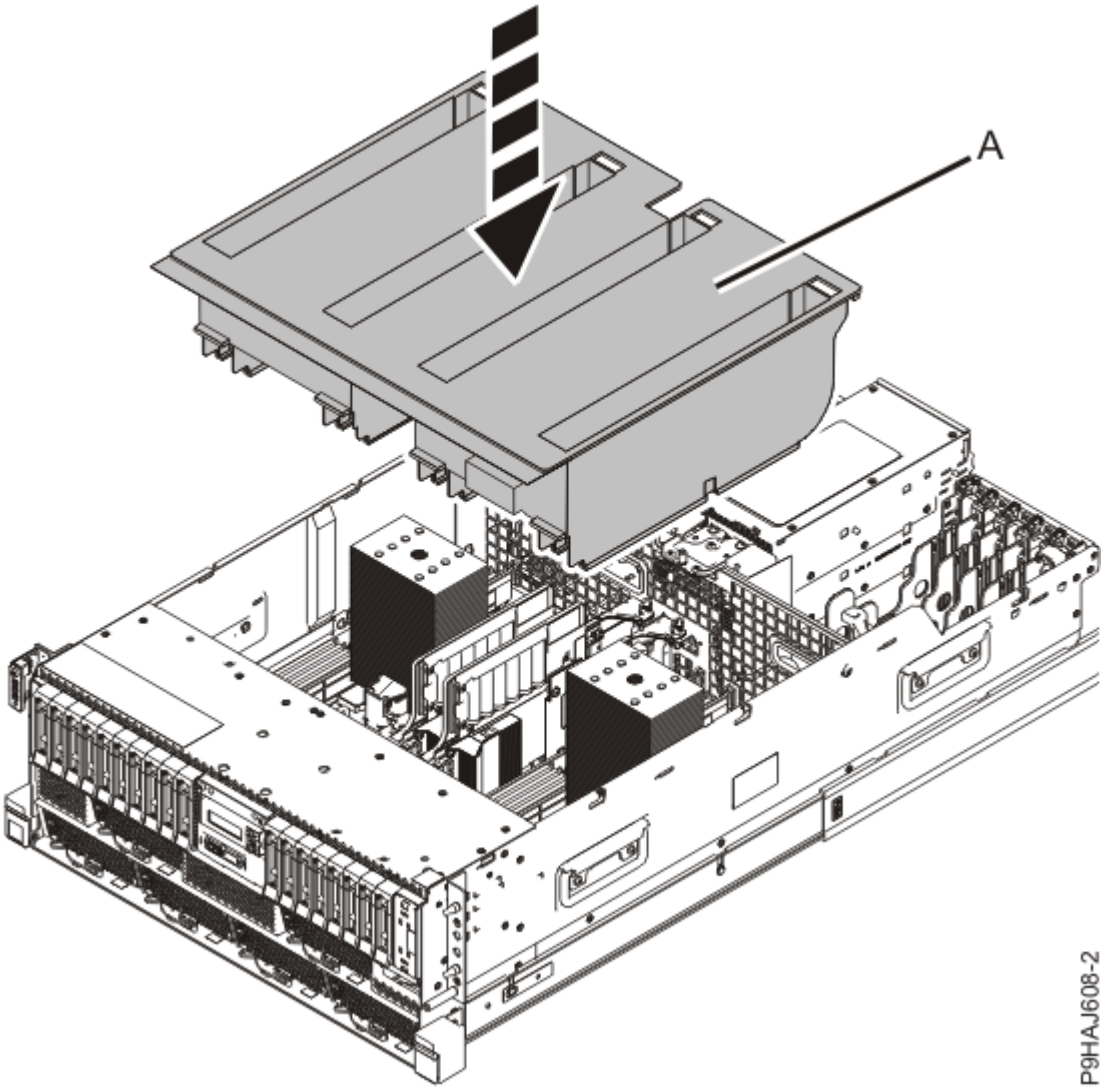


Figure 32. Replacing the air baffle in a rack-mounted system

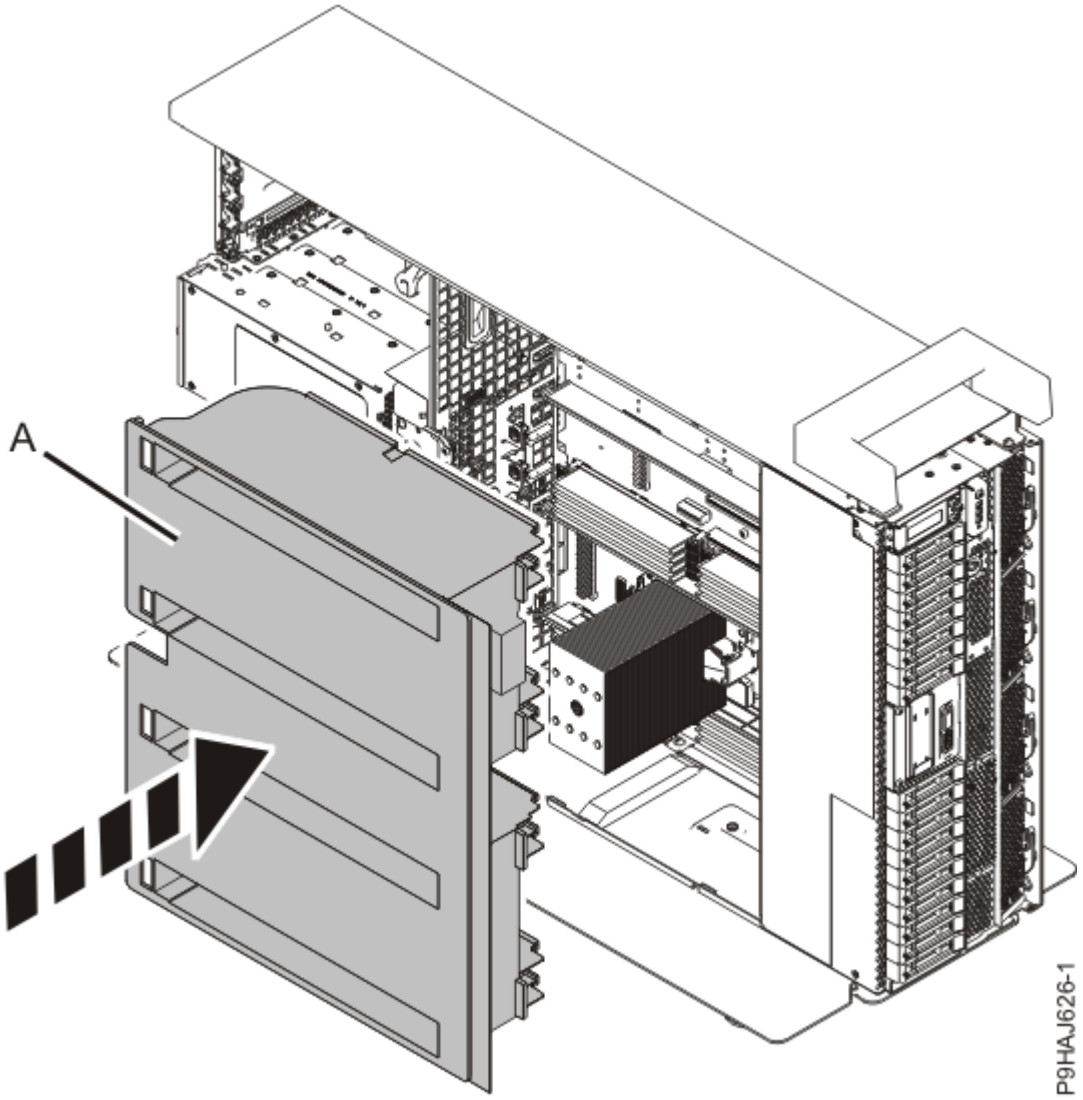


Figure 33. Replacing the air baffle in a stand-alone system

Preparing the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S system for operation after removing and replacing a memory module

To prepare the system for operation after you remove and replace a memory module, complete the steps in this 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. Replace the service access cover.

   For a rack-mounted system, complete the following steps. Refer to Figure 34 on page 43.

   a. Slide the cover **(A)** onto the system unit.

   b. Close the release latch **(B)** by pushing it in the direction shown.

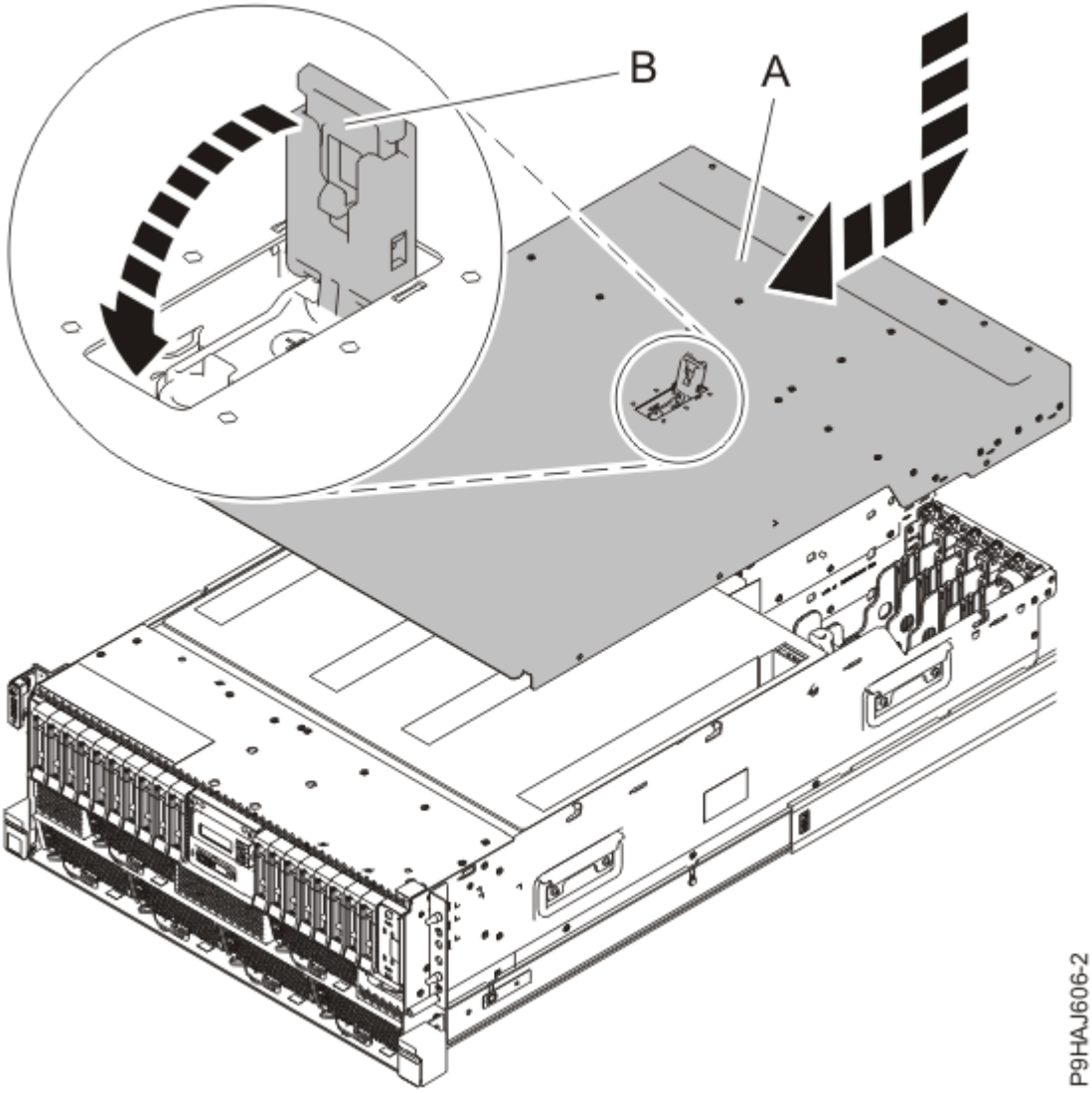


Figure 34. Installing the service access cover

For a stand-alone system, complete the following steps. Refer to Figure 35 on page 44.

a. Slide the cover **(B)** on to the system unit as shown.
b. Close the latch release **(A)** by pushing it in the direction shown.

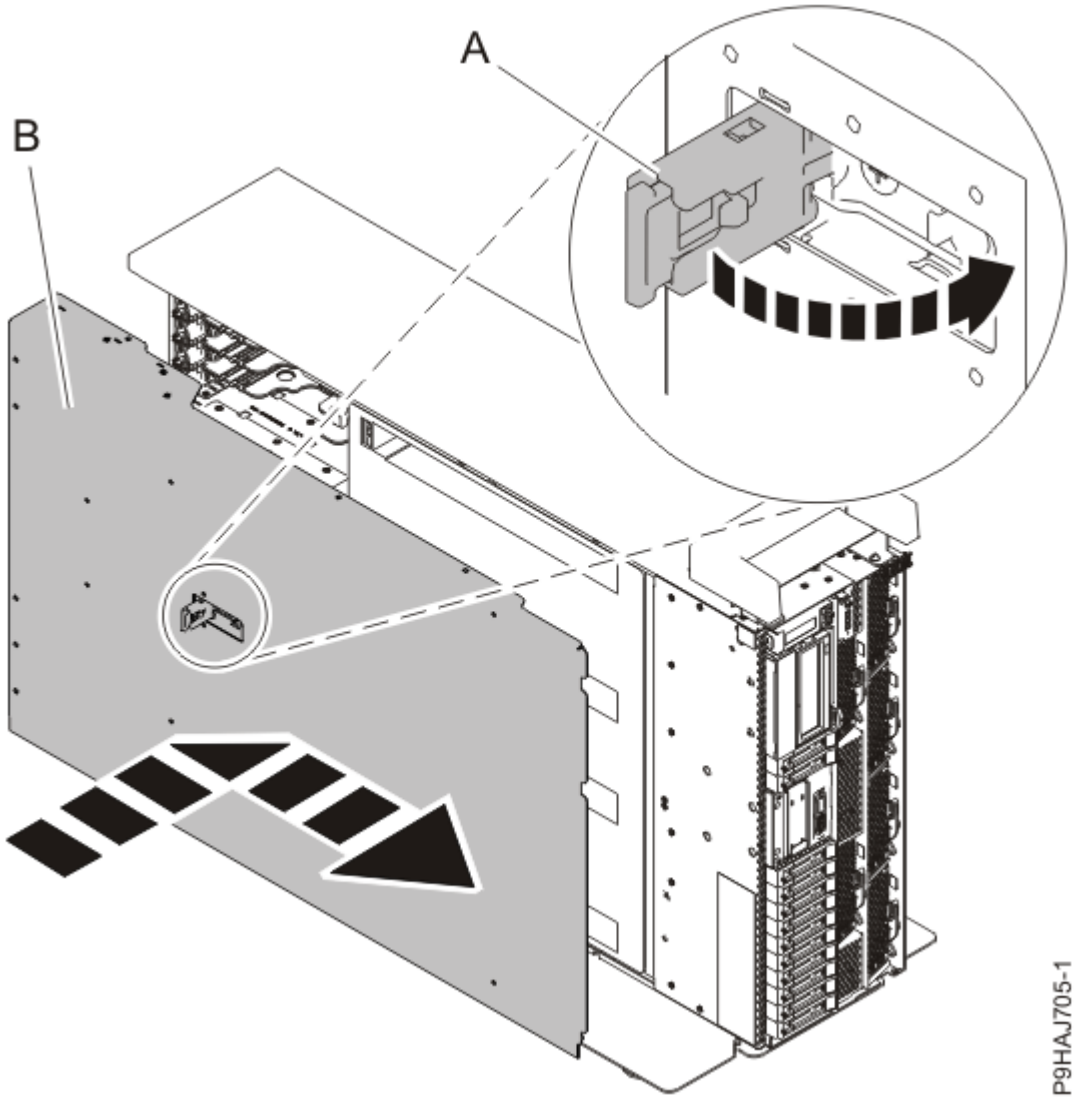


Figure 35. Installing the service access cover

3. For a rack-mounted system, unlock the blue rail safety latches **(A)** as shown in Figure 36 on page 45 by pushing them inward.

   Ensure that the cable management arms can move freely. Ensure that the cables at the rear of the unit do not catch or bind as you push the unit into the operating position.

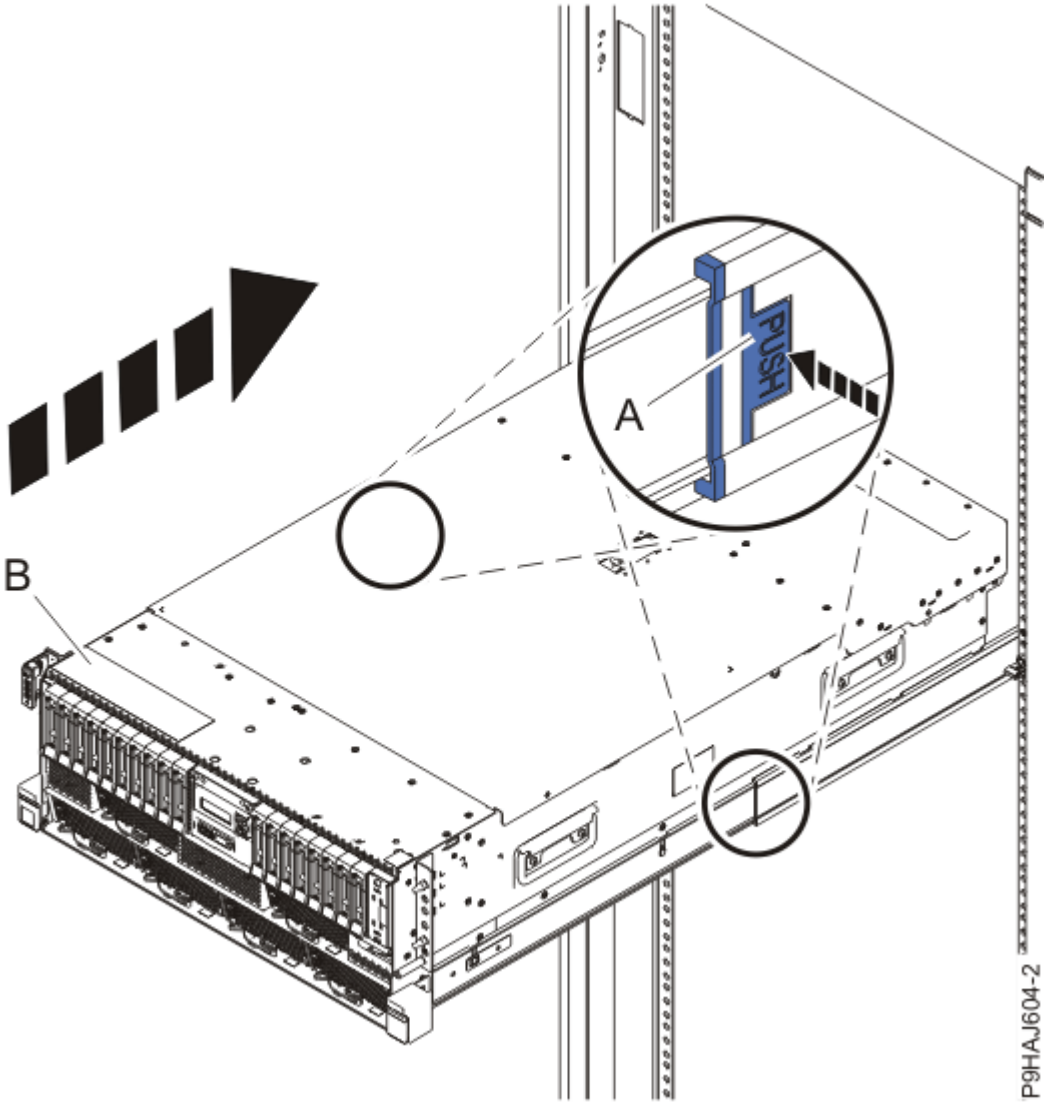


Figure 36. Placing the system into the operating position

4. For a rack-mounted system, push the system unit **(B)** as shown in the previous figure back into the rack until both release latches lock the system into position.

   Secure the cable management arm with hook-and-loop fasteners around the back side of the cable management arm, but not around the cables.

5. 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 37 on page 46 or Figure 38 on page 47.

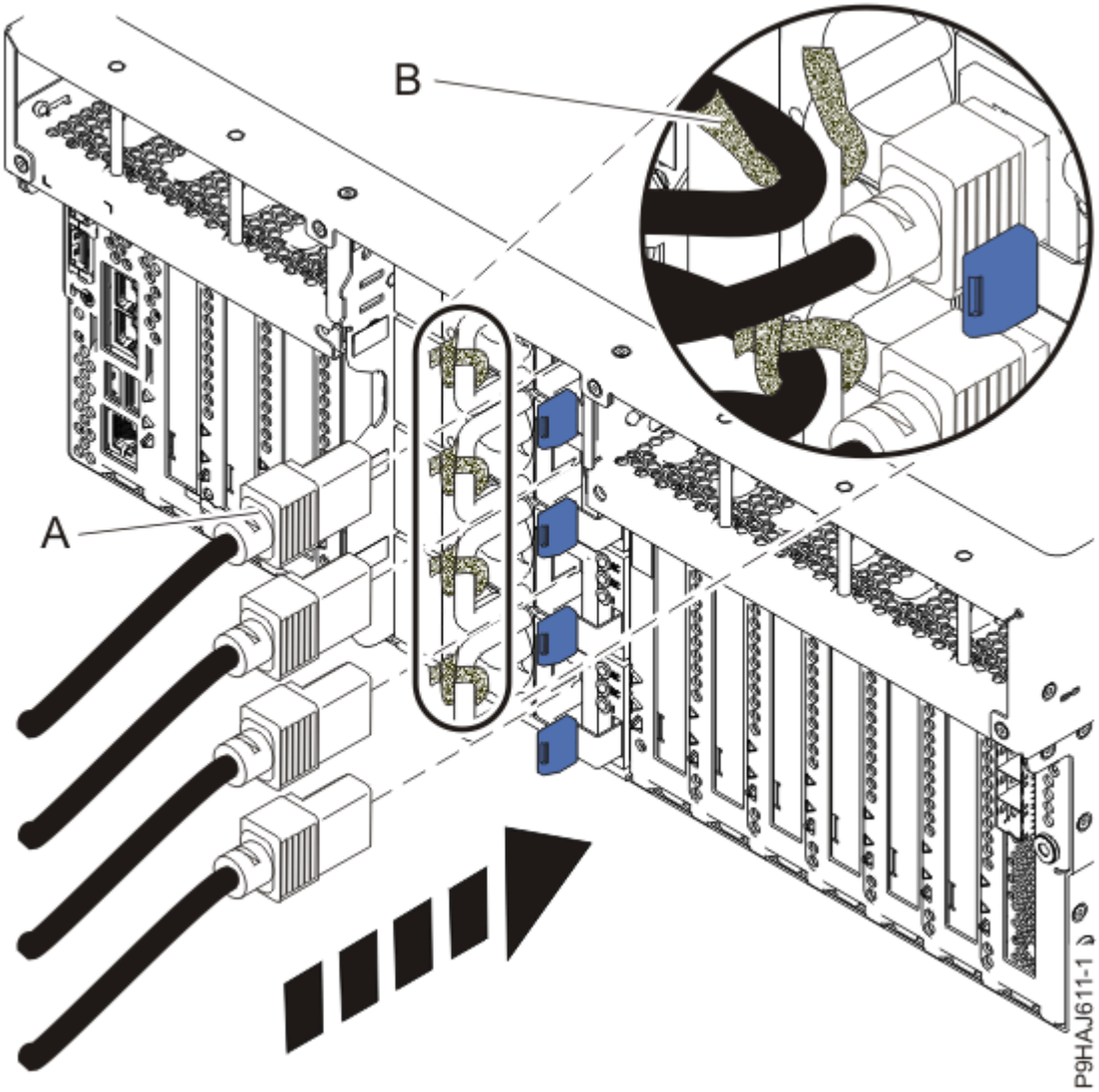


Figure 37. Connecting the power cords to a rack-mounted system

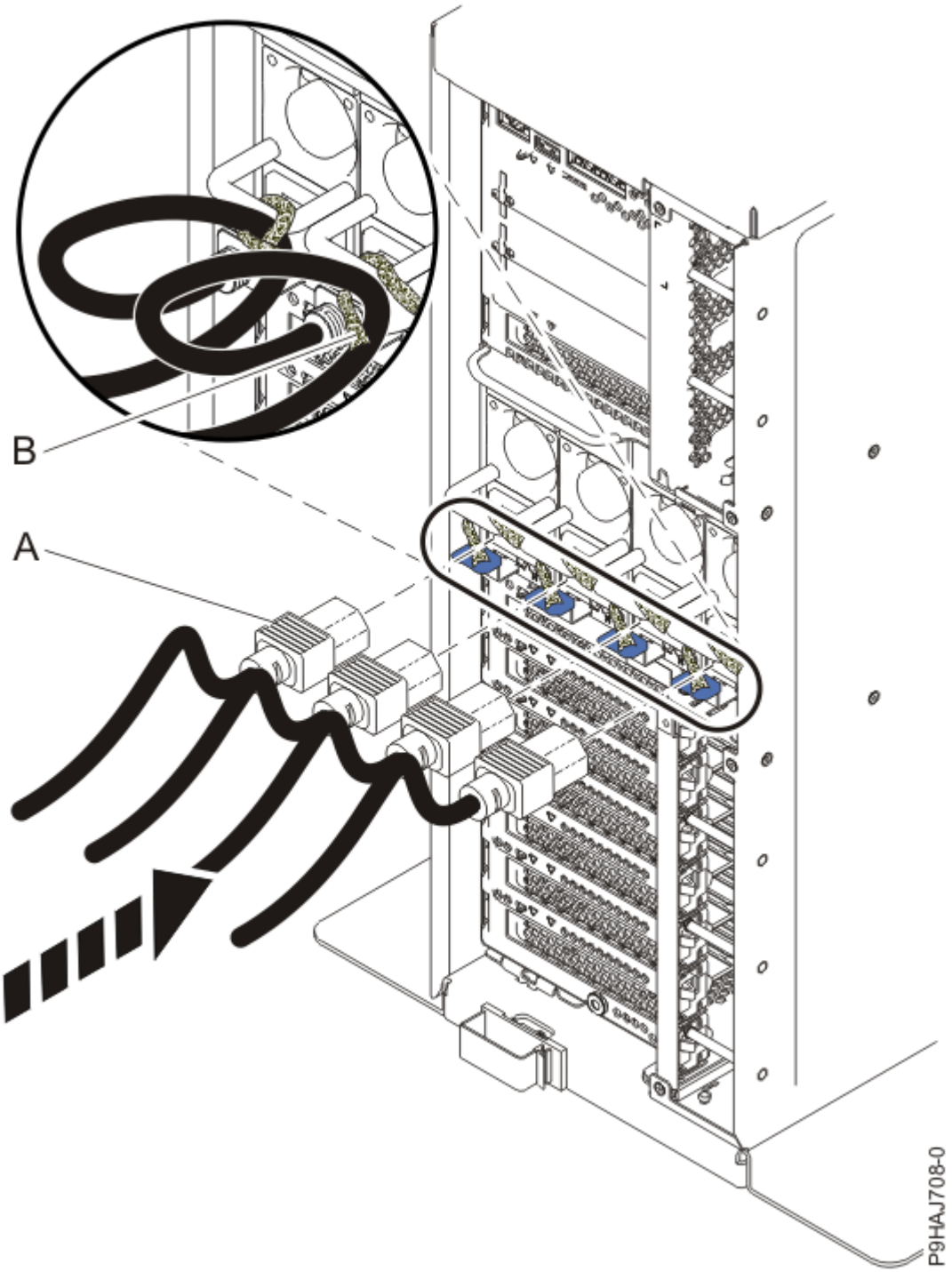


Figure 38. Connecting the power cords to a stand-alone system

6. Start the system. For instructions, see Starting a system (www.ibm.com/support/knowledgecenter/POWER9/p9haj/crustartsys.htm).
7. Turn off the identify LED. For instructions, see Deactivating an identify LED (www.ibm.com/support/knowledgecenter/POWER9/p9haj/p9haj_turn_off_identify_led.htm).
8. Verify the installed part.
   - If you replaced the part because of a service action, verify the installed part. For instructions, see Verifying a repair (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 (www.ibm.com/support/knowledgecenter/POWER9/p9haj/pxhaj_hsmverify.htm).

Plugging rules for memory modules in the 5105-22E, 9008-22L, 9009-22A, 9009-22G, 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-22H, 9223-22S, 9223-42H, or 9223-42S system

Find information about the configurations and rules that apply to memory modules for the 5105-22E, IBM Power System L922 (9008-22L), IBM Power System S922 (9009-22A and 9009-22G), IBM Power System H922 (9223-22H), or IBM Power System H922S (9223-22S), IBM Power System S914 (9009-41A and 9009-41G), IBM Power System S924 (9009-42A and 9009-42G), IBM Power System H924 (9223-42H), or IBM Power System H924S (9223-42S) server.

This information helps you to plan memory module installation in the system.

- The system supports memory modules of 8GB, 16 GB, 32 GB, 64 GB, and 128 GB.
- A system with one system processor supports a minimum of two (a pair of) memory modules and provides a minimum of 16 GB memory.
- A system with two system processors supports a minimum of four (two pairs of) memory modules and provides a minimum of 32 GB memory.
- A pair of memory modules must be the same size, rank, and memory density.
- Memory locations are assigned to groups; memory modules in each of the groups must be the same size, rank, and memory density.
- Groups of memory modules can be of different sizes, ranks and memory densities than other groups.
- Each system processor supports 2, 4, 6, 8, 12, or 16 memory modules.
- 128 GB memory modules that are located in the same channel must be made by the same manufacturer (Samsung Electronics Co., Ltd. or SK hynix Inc.). Channels are defined in pairs as follows: P1-C33 and P1-C34, P1-C17 and P1-C18, P1-C31 and P1-C32, P1-C15 and P1-C16, P1-C35 and P1-C36, P1-C21 and P1-C22, P1-C37 and P1-C38, P1-C19 and P1-C20, P1-C41 and P1-C42, P1-C25 and P1-C26, P1-C39 and P1-C40, P1-C23 and P1-C24, P1-C43 and P1-C44, P1-C29 and P1-C30, P1-C45 and P1-C46, and P1-C27 and P1-C28.
- If you are installing 128 GB memory modules that are manufactured by Samsung Electronics Co., Ltd. in a new or existing configuration so that the resulting configuration will have more than half of the allowable memory module locations populated, the system firmware level must be FW950.50, or later.

Table 6 on page 48 lists the feature codes of the supported memory modules.

Table 6. Memory feature codes

Size	Feature code	Rank	Memory Density
8 GB	EM60, EM6G	1R	4 Gb
16 GB	EM62, EM6J	1R	8 Gb
32 GB	EM63, EM6K	2R	8 Gb
64 GB	EM64, EM6L	2R	8 Gb
64 GB	EM7B	2R	16 Gb*
128 GB	EM65, EM6M	2R	8 Gb
128 GB	EM7C	2R	16 Gb*

Note:

* The system firmware level must be FW950.00, or later.

The plugging rules for memory modules depend on the number of system processors:

- “Plugging rules for systems with one system processor” on page 49

- “Plugging rules for systems with two system processors” on page 51

Plugging rules for systems with one system processor

One system processor supports 2, 4, 6, 8, 12, or 16 memory modules. Figure 39 on page 49 and Figure 40 on page 50 show the locations of the memory modules for systems with one system processor. After the first four pairs of memory modules are installed, the remaining memory slots must be filled four at a time versus two at a time.

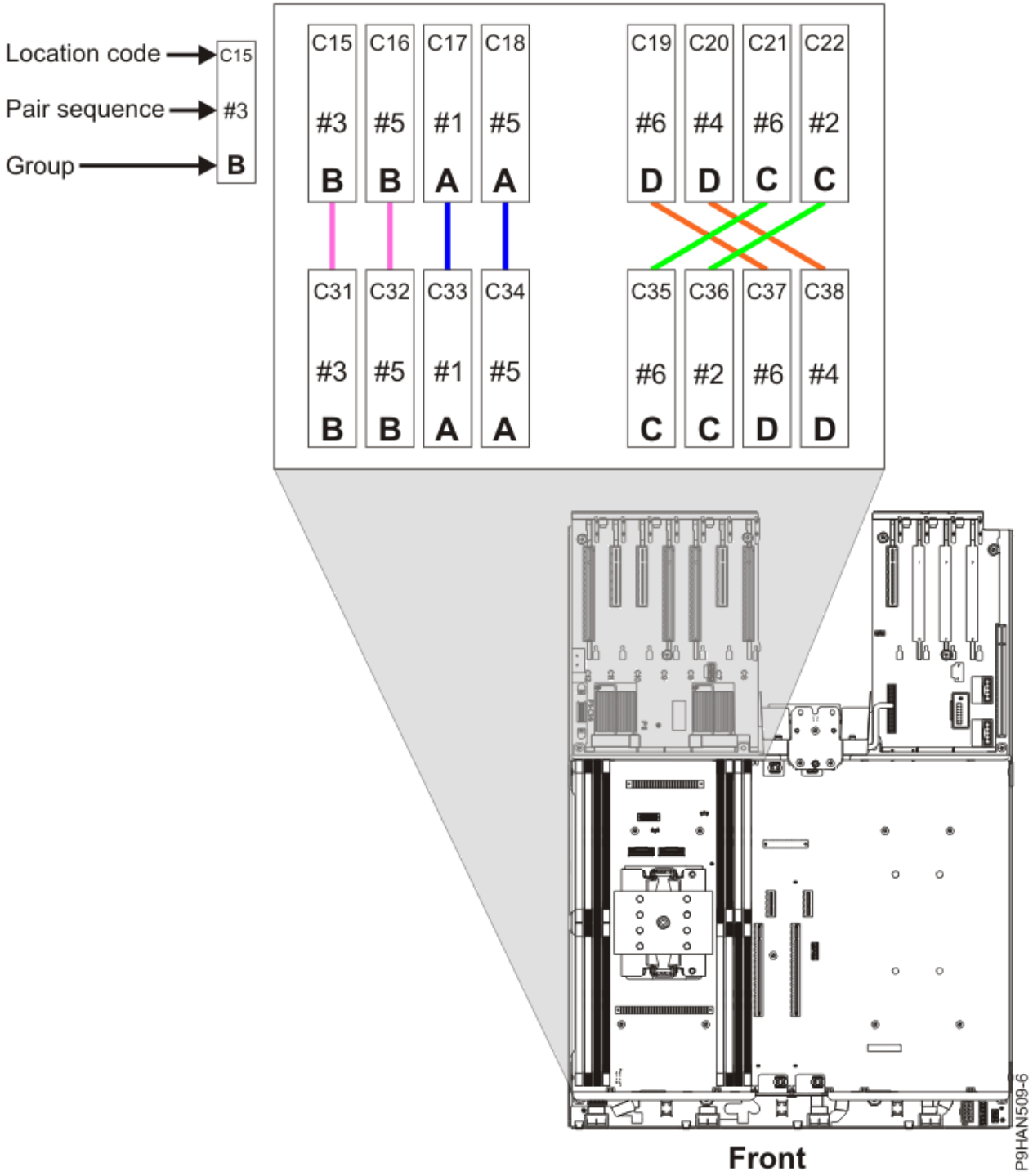


Figure 39. Plugging sequence, one system processor, rack-mounted system

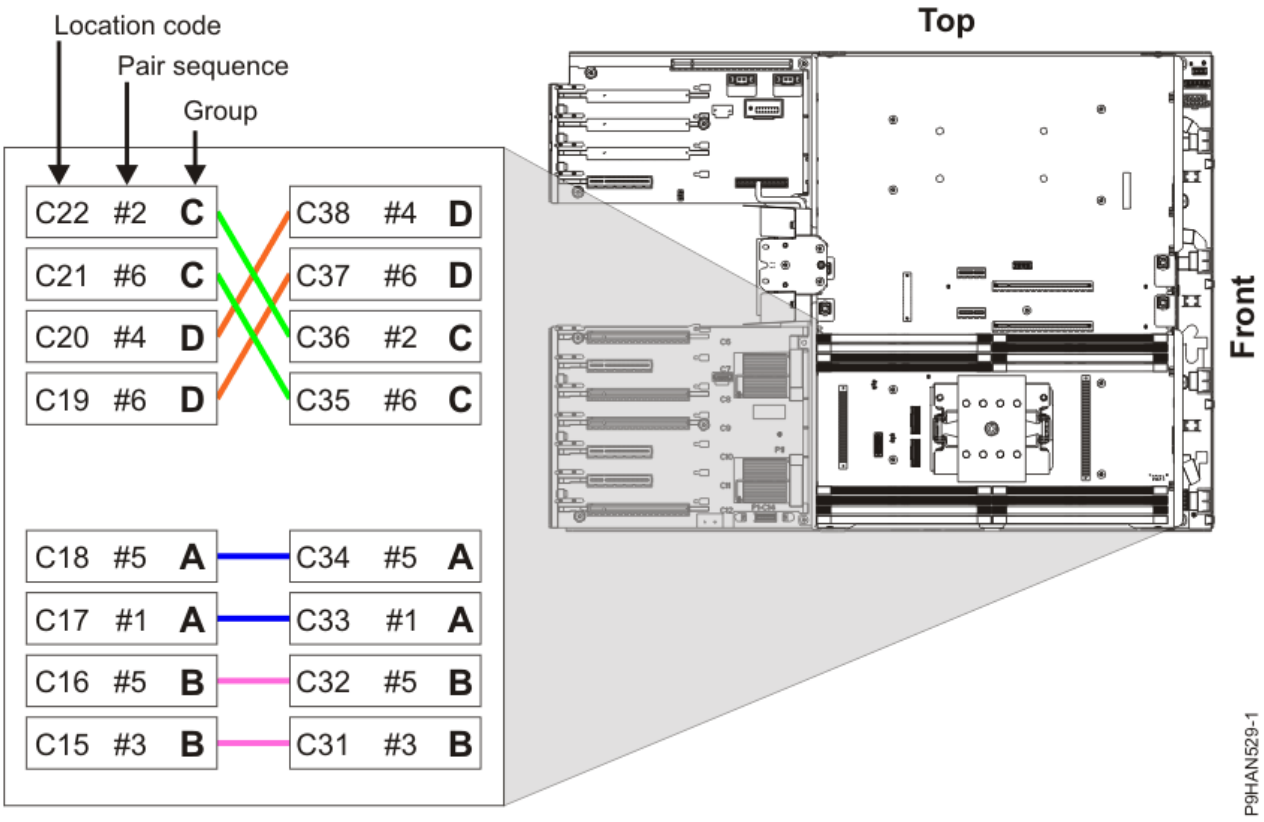


Figure 40. Plugging sequence, one system processor, stand-alone system

The system has groups for the memory modules. All of the memory modules in a group must be the same size and type. The memory in one group can be different than another group.

Table 7. Memory groupings for a single-processor system

Memory group	Positions
A	P1-C17, P1-C18, P1-C33, and P1-C34
B	P1-C15, P1-C16, P1-C31, and P1-C32
C	P1-C21, P1-C22, P1-C35, and P1-C36
D	P1-C19, P1-C20, P1-C37, and P1-C38

When the system contains eight or fewer memory modules, extra rules against mixing memory of different ranks (1R or 2R) apply. These positions must have the same rank; either 1R or 2R, but they cannot contain both 1R and 2R:

- Sequences 1 and 3: P1-C17, P1-C33, P1-C15, and P1-C31
- Sequences 2 and 4: P1-C22, P1-C36, P1-C20, and P1-C38

Table 8 on page 50 shows that the memory modules must be plugged into the system in a certain sequence and position.

Table 8. Plugging sequence for memory modules for a system with one system processor

Total memory modules	Sequence	Memory modules to install	Memory locations
2	1	2	P1-C17 and P1-C33. Minimum supported memory.

Table 8. Plugging sequence for memory modules for a system with one system processor (continued)			
Total memory modules	**Sequence**	**Memory modules to install**	**Memory locations**
4	2	2	P1-C22 and P1-C36
6	3	2	P1-C15 and P1-C31
8	4	2	P1-C20 and P1-C38
12	5	4	P1-C18 and P1-C34 (group A; must match the size and type of P1-C17 and P1-C33) and P1-C16 and P1-C32 (group B; must match the size and type of P1-C15 and P1-C31)
16	6	4	P1-C21 and P1-C35 (group C; must match the size and type of P1-C22 and P1-C36). and P1-C19 and P1-C37 (group D; must match the size and type of P1-C20 and P1-C38)

Plugging rules for systems with two system processors

Two system processors support 4, 6, 8, 10, 12, 14, 16, 20, 24, 28, or 32 memory modules. Figure 41 on page 52 shows the locations of the memory modules for systems with two system processors. After the first eight pairs of memory modules are installed, the remaining memory slots must be filled four at a time (versus two at a time).

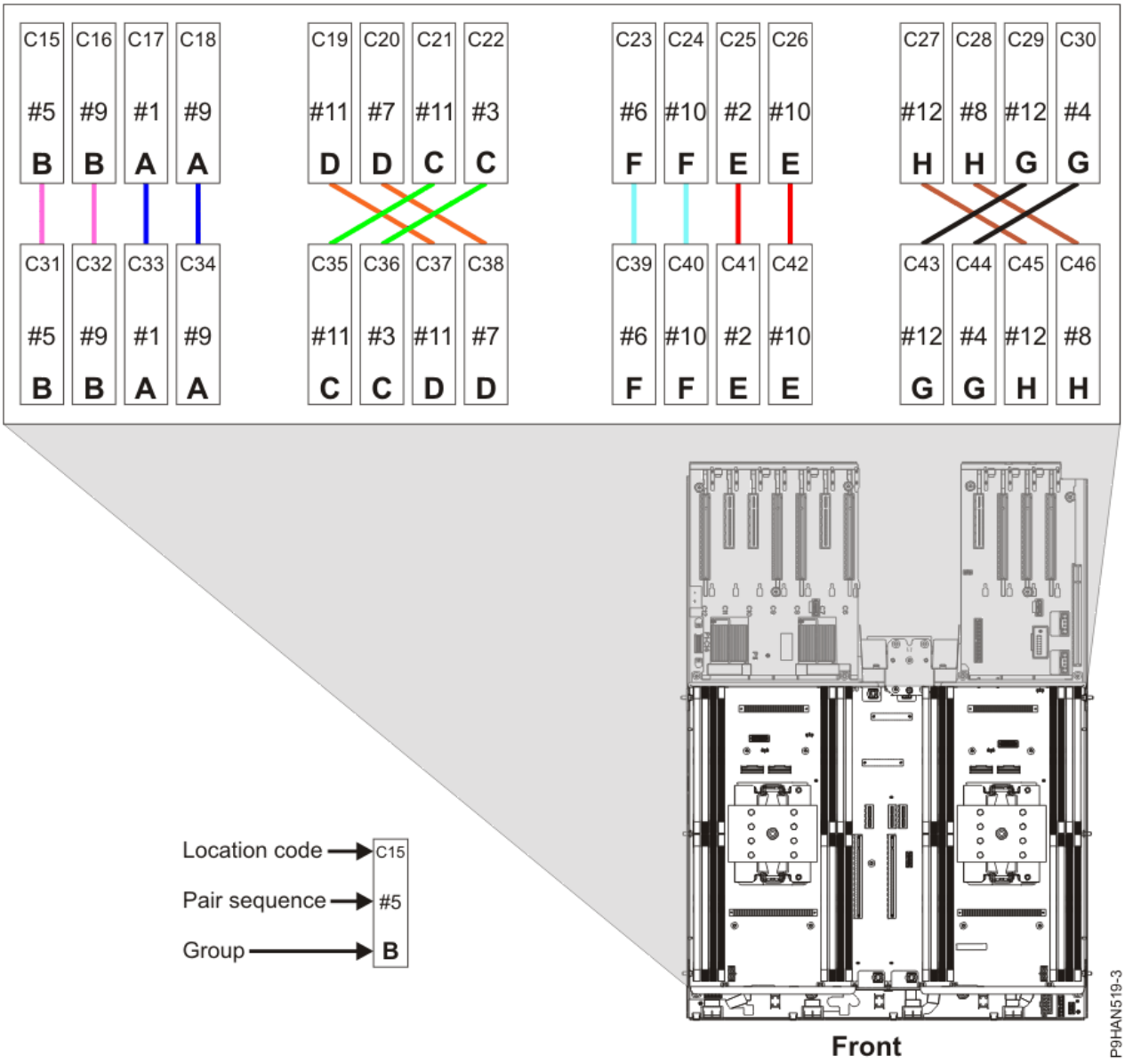


Figure 41. Plugging sequence, two system processors

The system has groups for the memory modules. All of the memory modules in a group must be the same size and type. The memory in one group can be different than another group.

Table 9. Memory groupings for a two-processor system

Memory groupings	**Positions**
A	P1-C17, P1-C18, P1-C33, and P1-C34
B	P1-C15, P1-C16, P1-C31, and P1-C32
C	P1-C21, P1-C22, P1-C35, and P1-C36
D	P1-C19, P1-C20, P1-C37, and P1-C38
E	P1-C25, P1-C26, P1-C41, and P1-C42
F	P1-C23, P1-C24, P1-C39, and P1-C40
G	P1-C29, P1-C30, P1-C43, and P1-C44

Table 9. Memory groupings for a two-processor system (continued)	
Memory groupings	**Positions**
H	P1-C27, P1-C28, P1-C45, and P1-C46

When the system contains 16 or fewer memory modules, extra rules against mixing memory of different ranks (1R or 2R) apply. These positions must have the same rank; either 1R or 2R, but they cannot contain both 1R and 2R:

- Sequences 1 and 5: P1-C17, P1-C33, P1-C15, and P1-C31
- Sequences 2 and 6: P1-C25, P1-C41, P1-C23, and P1-C39
- Sequences 3 and 7: P1-C22, P1-C36, P1-C20, and P1-C38
- Sequences 4 and 8: P1-C30, P1-C44, P1-C28, and P1-C46

Table 10 on page 53 shows that the memory modules must be plugged into the system in a certain sequence and position.

Table 10. Plugging sequence for memory modules for a system with two system processors

Total memory modules	**Sequence**	**Memory modules to install**	**Memory locations**
2	1	2	P1-C17 and P1-C33. Must have another pair that is installed.
4	2	2	P1-C25 and P1-C41. Minimum supported memory.
6	3	2	P1-C22 and P1-C36
8	4	2	P1-C30 and P1-C44
10	5	2	P1-C15 and P1-C31
12	6	2	P1-C23 and P1-C39
14	7	2	P1-C20 and P1-C38
16	8	2	P1-C28 and P1-C46
20	9	4	P1-C18 and P1-C34 (group A; must match the size and type of P1-C17 and P1-C33) and P1-C16 and P1-C32 (group B; must match the size and type of P1-C15 and P1-C31)
24	10	4	P1-C26 and P1-C42 (group E; must match the size and type of P1-C25 and P1-C41) and P1-C24 and P1-C40 (group F; must match the size and type of P1-C23 and P1-C39)
28	11	4	P1-C21 and P1-C35 (group C; must match the size and type of P1-C22 and P1-C36). and P1-C19 and P1-C37 (group D; must match the size and type of P1-C20 and P1-C38)
32	12	4	P1-C29 and P1-C43 (group G; must match the size and type of P1-C30 and P1-C44) and P1-C27 and P1-C45 (group H; must match the size and type of P1-C28 and P1-C46)

Permanently removing memory modules from the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S system

Find information about permanently removing memory modules in the IBM Power System S914 (9009-41A and 9009-41G), IBM Power System S924 (9009-42A and 9009-42G), IBM Power System H924 (9223-42H), or IBM Power System H924S (9223-42S) server.

About this task

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 (www.ibm.com/support/knowledgecenter/POWER9/p9haj/p9haj_hmc_repair.htm).

If your system is not managed by an HMC, complete the steps in the following procedures to permanently remove a memory module from the system.

Note: Removing or replacing this feature is a customer task. You can complete this task yourself, or contact a service provider to complete the task for you. You might be charged a fee by the service provider for this service.

Preparing the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S system to permanently remove memory modules

To prepare a system to permanently remove memory modules, complete the steps in this procedure.

Before you begin

The memory modules must be removed in pairs, and in a sequence. The system has a minimum memory requirement:

- A system with one system processor must not have the memory modules in positions P1-C17 and P1-C33 removed; they must be replaced.
- A system with two system processors must not have the memory modules in positions P1-C17, P1-C33, P1-C25 and P1-C41 removed; they must be replaced.

Table 11 on page 54 and Table 12 on page 55 show that given the current number of memory modules in the system, which modules can be removed, and in what sequence. Make a note of the memory modules to remove.

Table 11. Removal sequence for memory modules for a system with one system processor

Current number of memory modules	Sequence	Memory modules to remove	Memory locations
16	1	4	P1-C19, P1-C21, P1-C35, and P1-C37
12	2	4	P1-C16, P1-C18, P1-C32, and P1-C34
8	3	2	P1-C20 and P1-C38
6	4	2	P1-C15 and P1-C31
4	5	2	P1-C22 and P1-C36
2	-	0	P1-C17 and P1-C33 must have memory modules

When the system contains eight or fewer memory modules, extra rules against mixing memory of different ranks (1R or 2R) apply. These positions must have the same rank; either 1R or 2R, but they cannot contain both 1R and 2R:

- Sequence 3 and 5: P1-C22, P1-C36, P1-C20, and P1-C38
- Sequence 4 and base: P1-C17, P1-C33, P1-C15, and P1-C31

Table 12. Plugging sequence for memory modules for a system with two system processors

Current number of memory modules	Sequence	Memory modules to remove	Memory locations
32	1	4	P1-C27, P1-C29, P1-C43, and P1-C45
28	2	4	P1-C19, P1-C21, P1-C35, and P1-C37
24	3	4	P1-C24, P1-C26, P1-C40, and P1-C42
20	4	4	P1-C16, P1-C18, P1-C32, and P1-C34
16	5	2	P1-C28 and P1-C46
14	6	2	P1-C20 and P1-C38
12	7	2	P1-C23 and P1-C39
10	8	2	P1-C15 and P1-C31
8	9	2	P1-C30 and P1-C44
6	10	2	P1-C22 and P1-C36
4	-	0	P1-C17, P1-C25, P1-C33, and P1-C41 must have memory modules

When the system contains 16 or fewer memory modules, extra rules against mixing memory of different ranks (1R or 2R) apply. These positions must have the same rank; either 1R or 2R, but they cannot contain both 1R and 2R:

- Sequence 5 and 9: P1-C30, P1-C44, P1-C28, and P1-C46
- Sequence 6 and 10: P1-C22, P1-C36, P1-C20, and P1-C38
- Sequence 7 and base: P1-C25, P1-C41, P1-C23, and P1-C39
- Sequence 8 and base: P1-C17, P1-C33, P1-C15, and P1-C31

Procedure

1. Identify the part and the system that you are working on. For instructions, see Identifying a part (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 (www.ibm.com/support/knowledgecenter/POWER9/p9haj/crustopsys.htm).
3. Label and disconnect the power cords from the system unit.

   See Figure 42 on page 56 or Figure 43 on page 57.

   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.

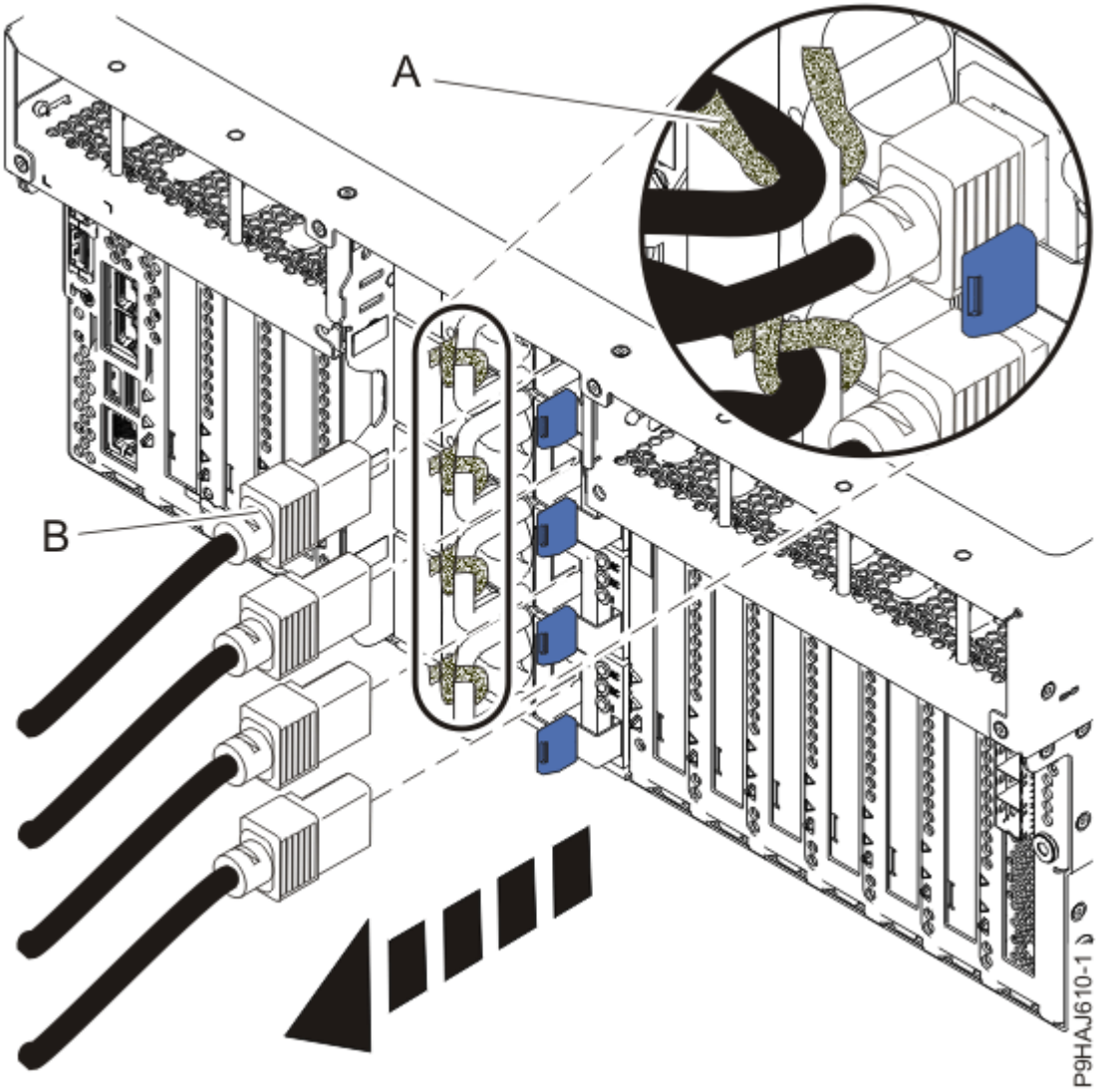


Figure 42. Removing the power cords from a rack-mounted server

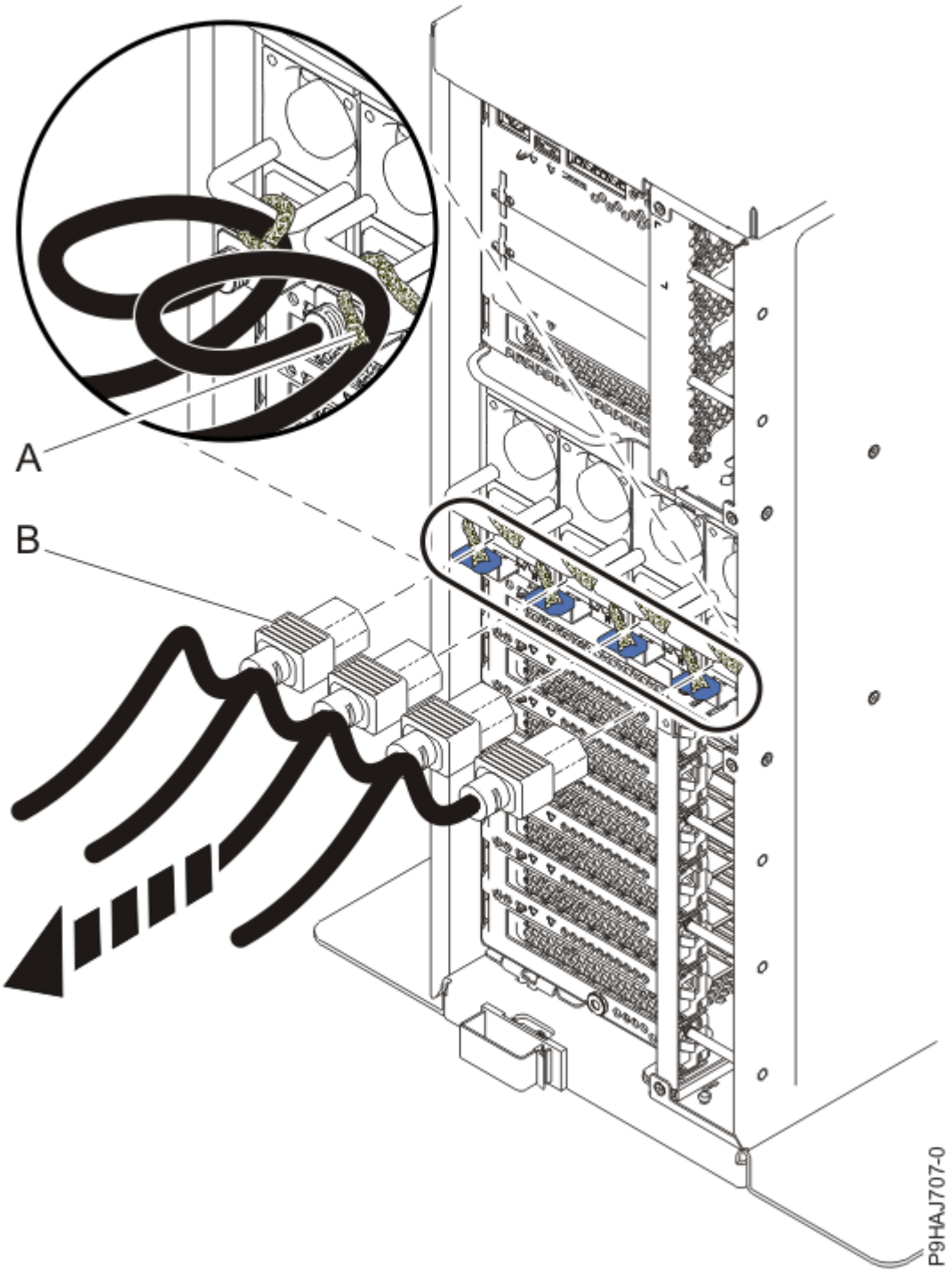
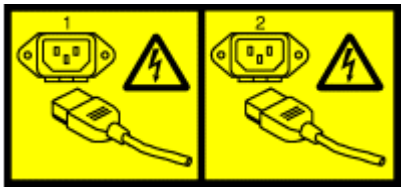


Figure 43. Removing the power cords from a stand-alone server

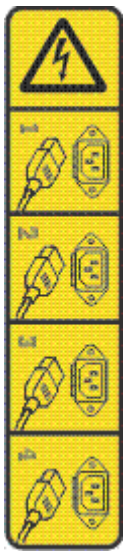
(L003)



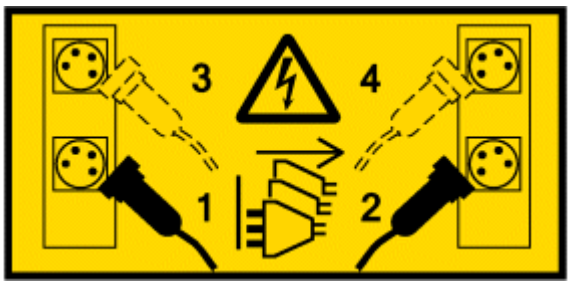
or

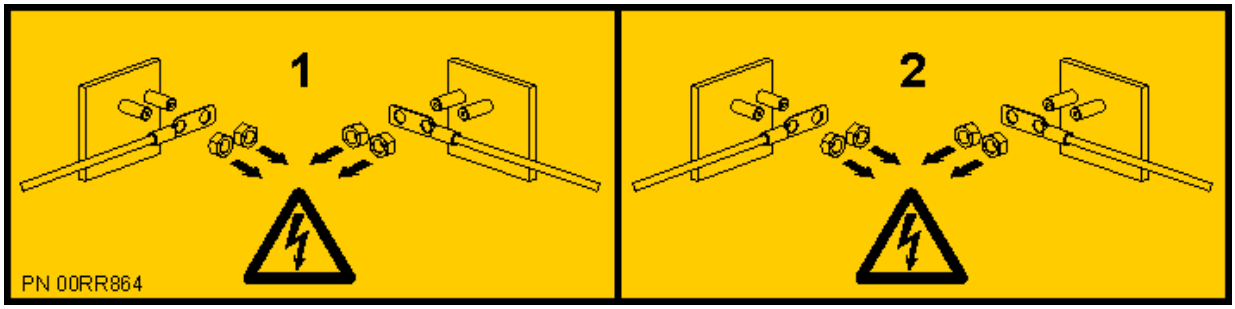
or

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)

4. For a rack-mounted system, 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 the following figure.

   Remove the hook-and-loop fasteners that secure the cable management arms. Ensure that the cable management arms can move freely. Ensure that the cables at the rear of the system do not catch or bind as you pull the system unit into the service position.

   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.

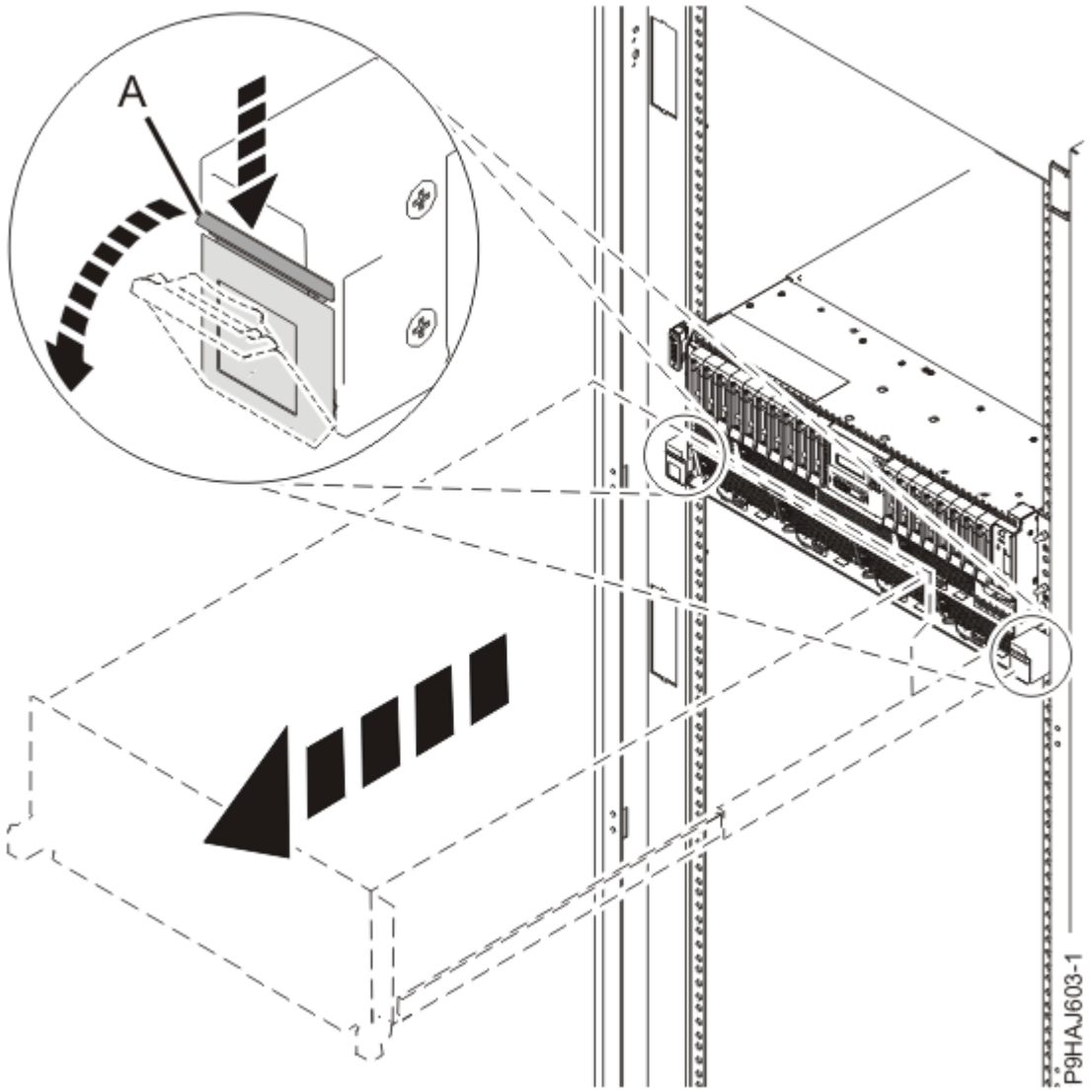


Figure 44. Releasing the side latches

5. Attach the electrostatic discharge (ESD) wrist strap. Your system has ESD jacks on the front and on the rear of the system as shown in the following figure. Plug the ESD wrist strap into the ESD jack.

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.

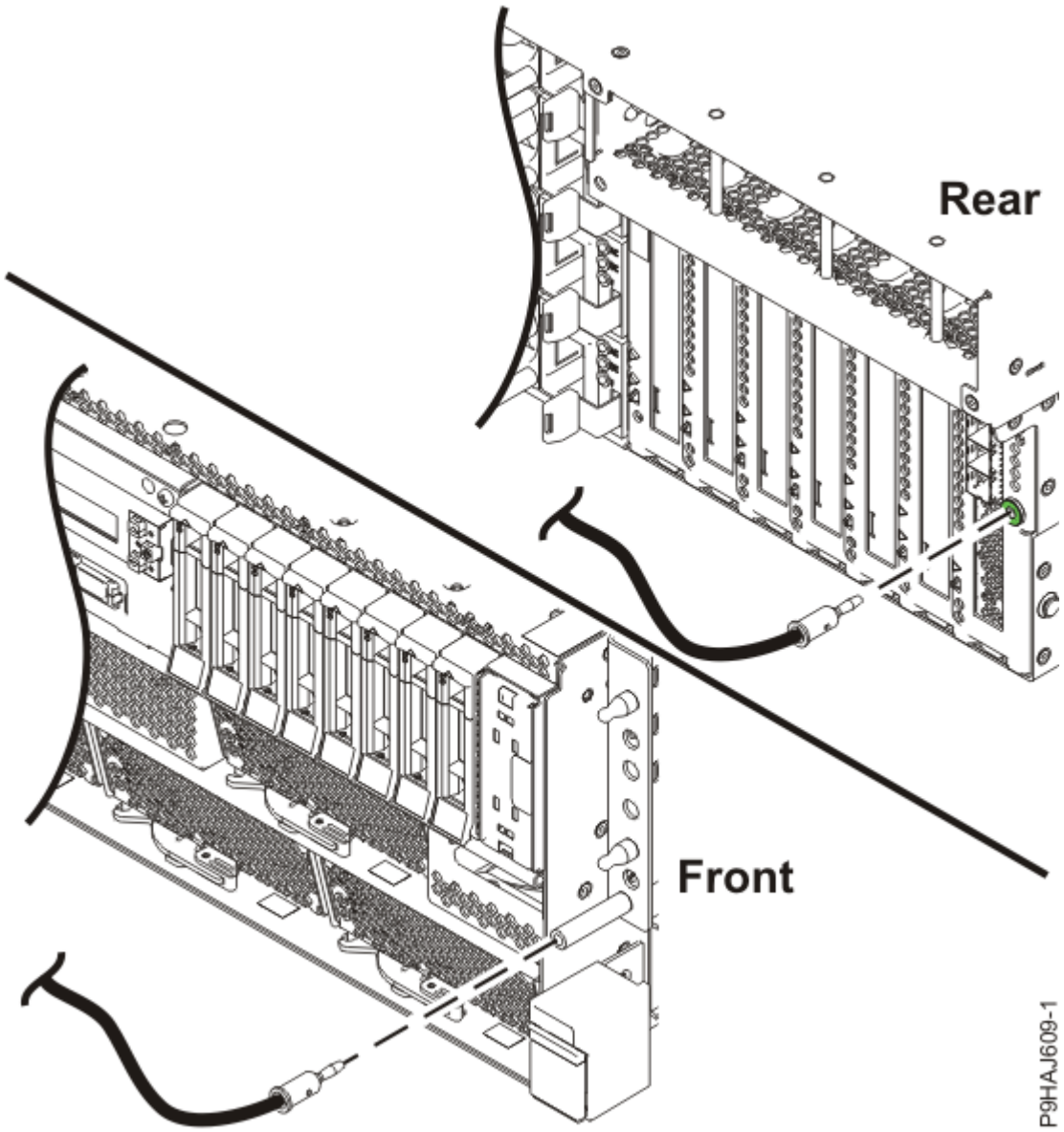


Figure 45. Location of ESD plugs

6. Remove the service access cover.

   For a rack-mounted system, complete the following steps. Refer to Figure 46 on page 62.

   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.

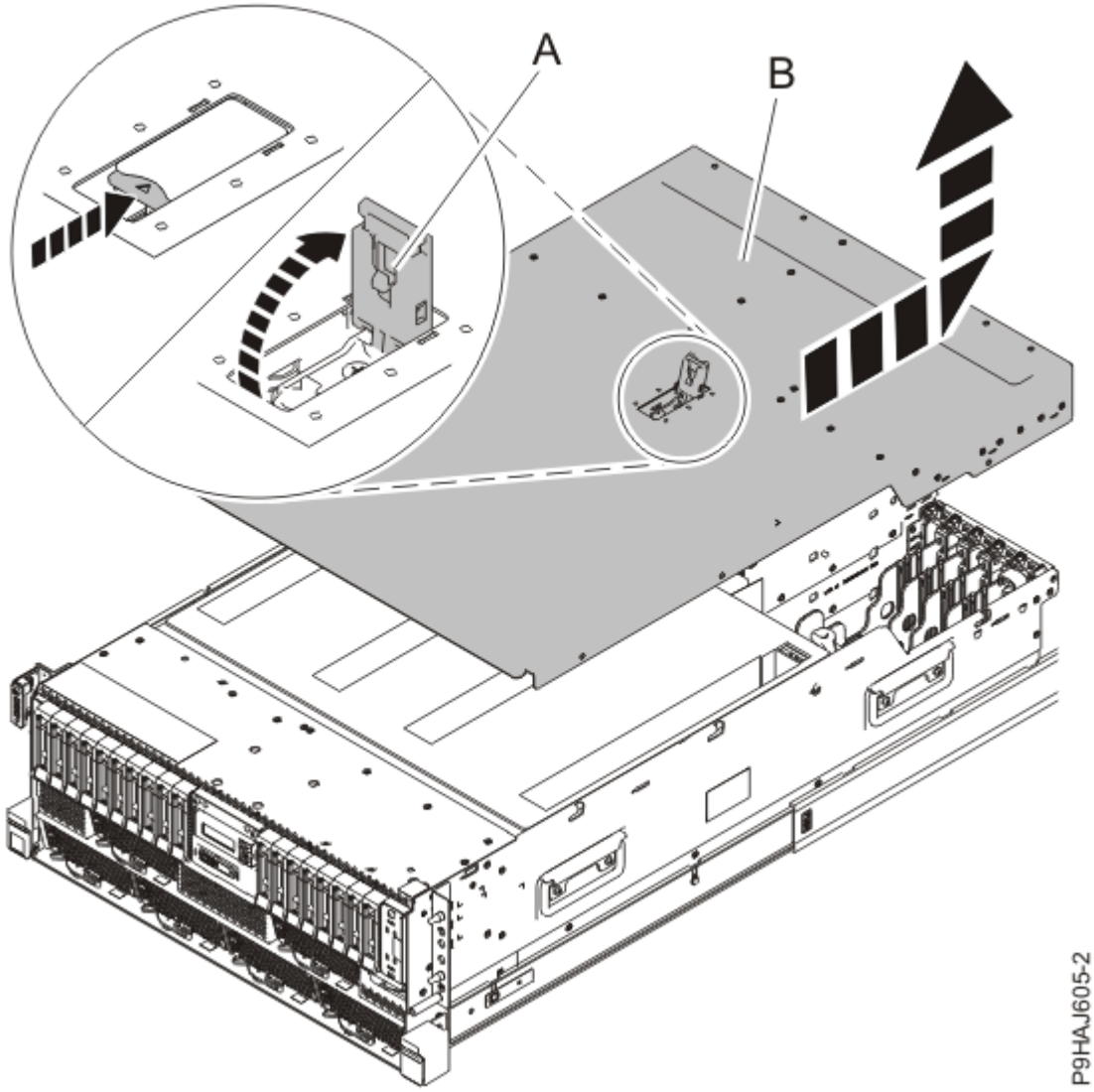


Figure 46. Removing the service access cover from a rack-mounted system

For a stand-alone system, complete the following steps. Refer to Figure 47 on page 63.

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.

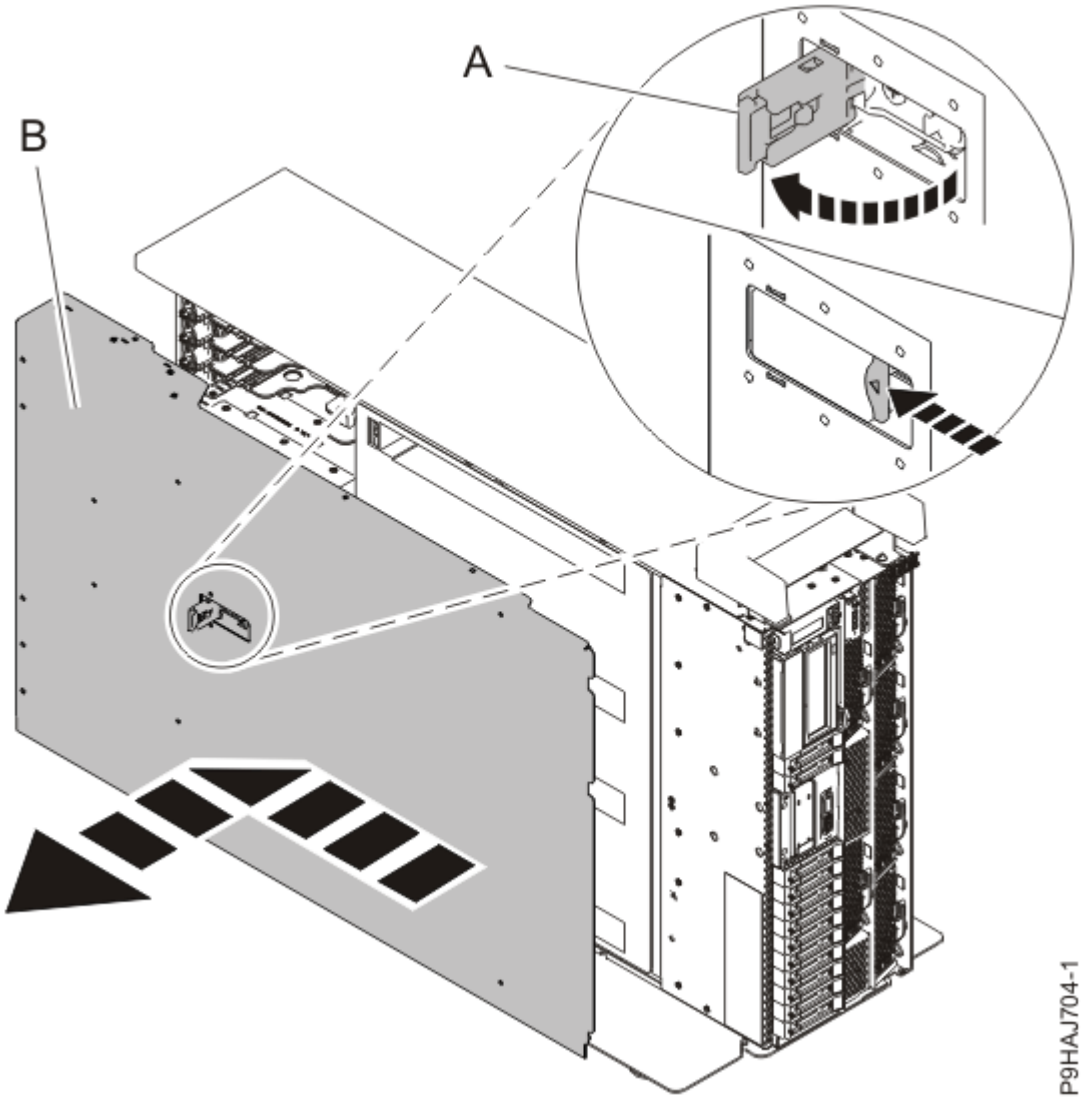


Figure 47. Removing the service access cover

Permanently removing a memory module from the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S system

To permanently remove memory modules from the system, complete the steps in this 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 48 on page 64.
   For a stand-alone system, remove the air baffle **(A)** straight out as shown in Figure 49 on page 65.
   Place the air baffle upside down on a clean area.

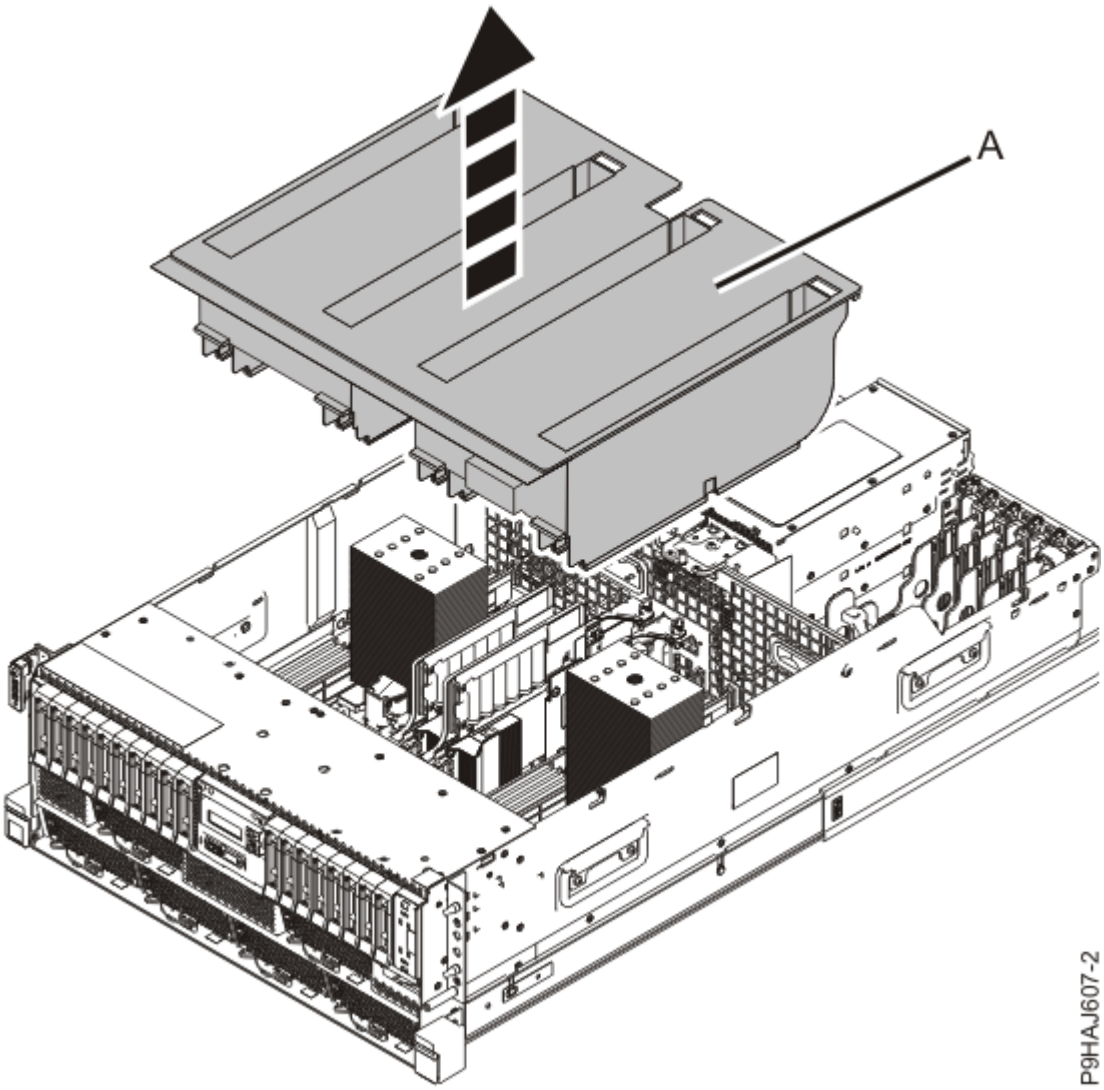


Figure 48. Removing the air baffle from a rack-mounted system

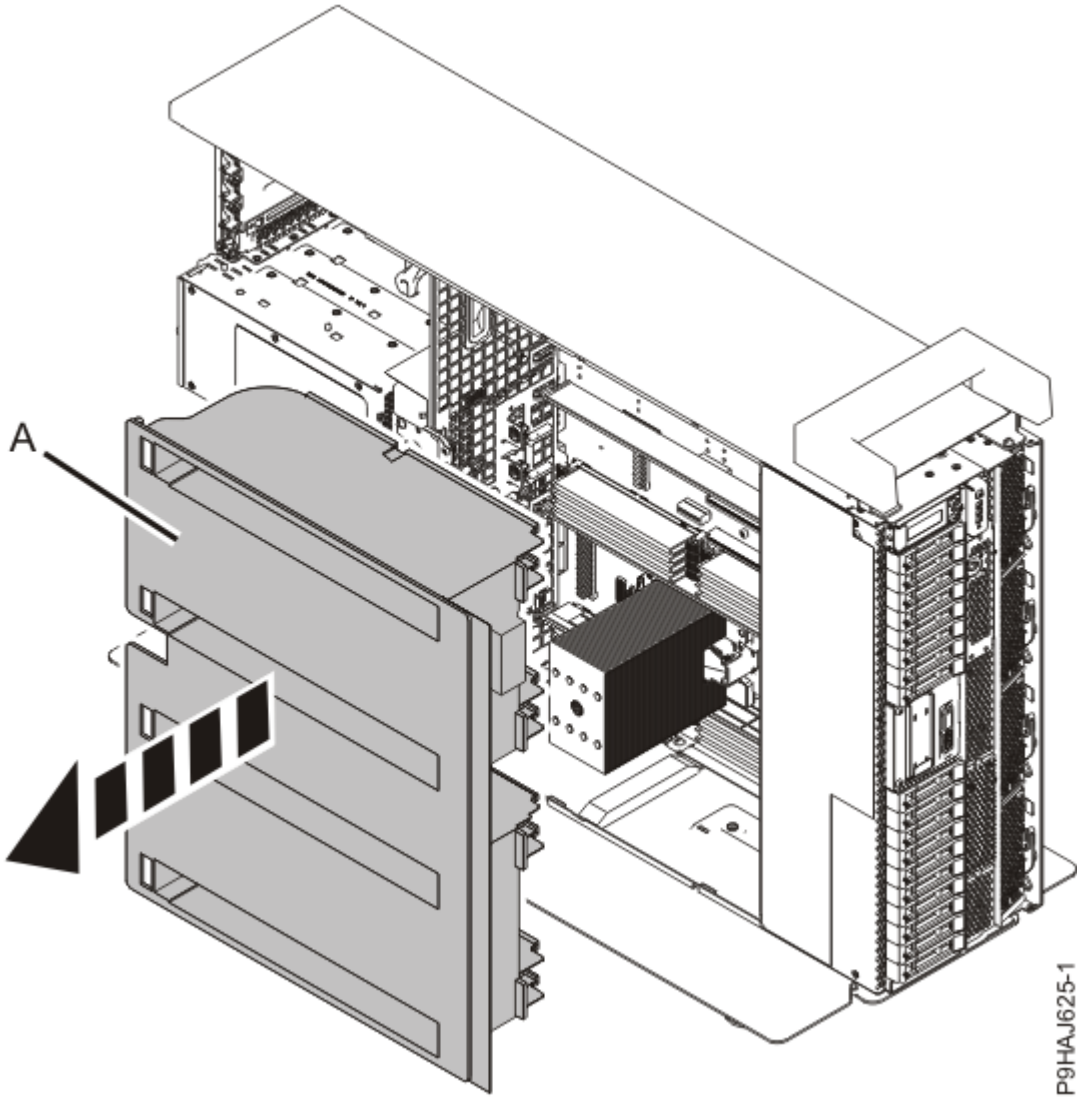


Figure 49. Removing the air baffle from a stand-alone system

3. To unlock the memory module from its connector, simultaneously push the locking tabs **(A)** away from the memory module in the direction that is shown in Figure 50 on page 66.

   The lever action of the tabs pushes the memory module out of the connector. If you find it hard to open the tabs with your fingers, you may use the tips of ball point pens, or the eraser ends of pencils. The levers must be opened simultaneously, so that the memory module lifts straight up.

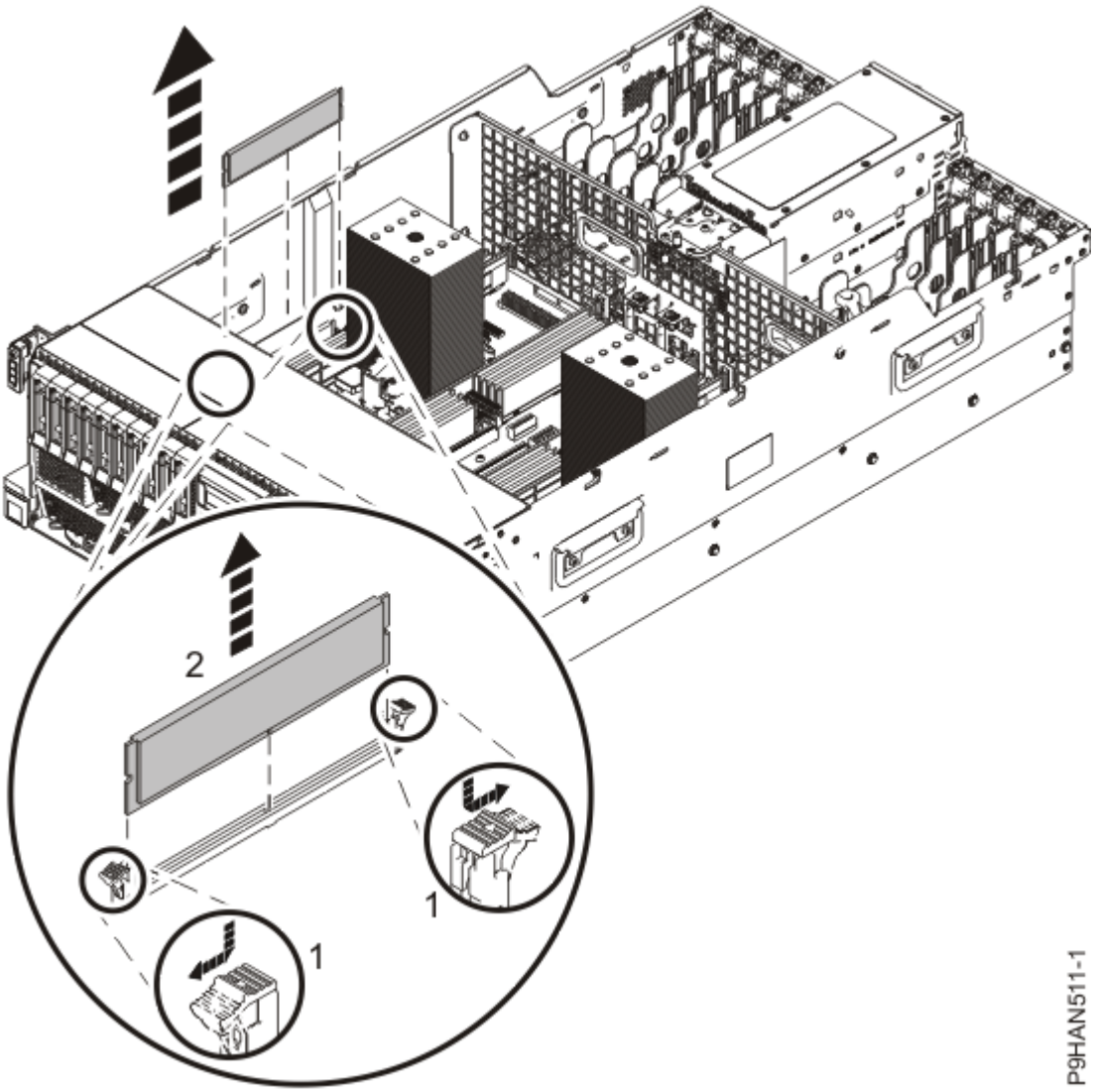


Figure 50. Removing a memory module

4. Hold the memory module by the edges and pull it out of the system.
5. If the removed part is used again, place the part on an electrostatic discharge (ESD) mat.
6. Insert a memory module filler.

   Note: The memory module slots must contain either a memory module or a filler to ensure proper cooling.

   To insert the memory module filler, complete the following steps:

   a) Ensure that the locking tabs are open.

   b) Hold the memory module filler by the edges and press it firmly into the slot until the locking tabs lock into place.
7. Repeat steps “3” on page 65 and “6” on page 66 for the matching memory module.
8. For a rack-mounted system, replace the air baffle **(A)** straight down into the chassis as shown in Figure 51 on page 67.

   For a stand-alone system, replace the air baffle **(A)** straight into the side of the chassis as shown in Figure 52 on page 68.

   Ensure that the front flap tucks under the front chassis.

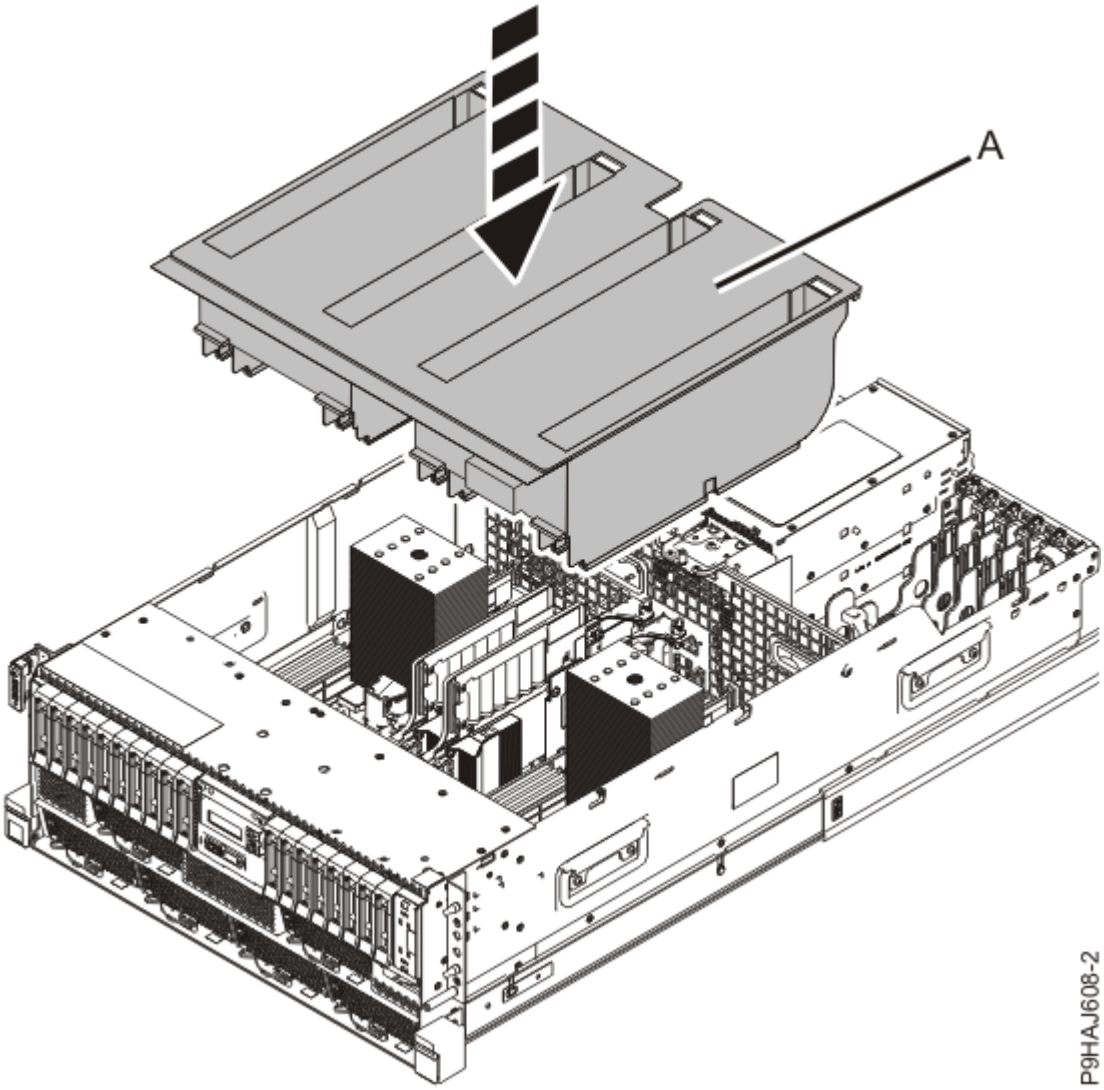


Figure 51. Replacing the air baffle in a rack-mounted system

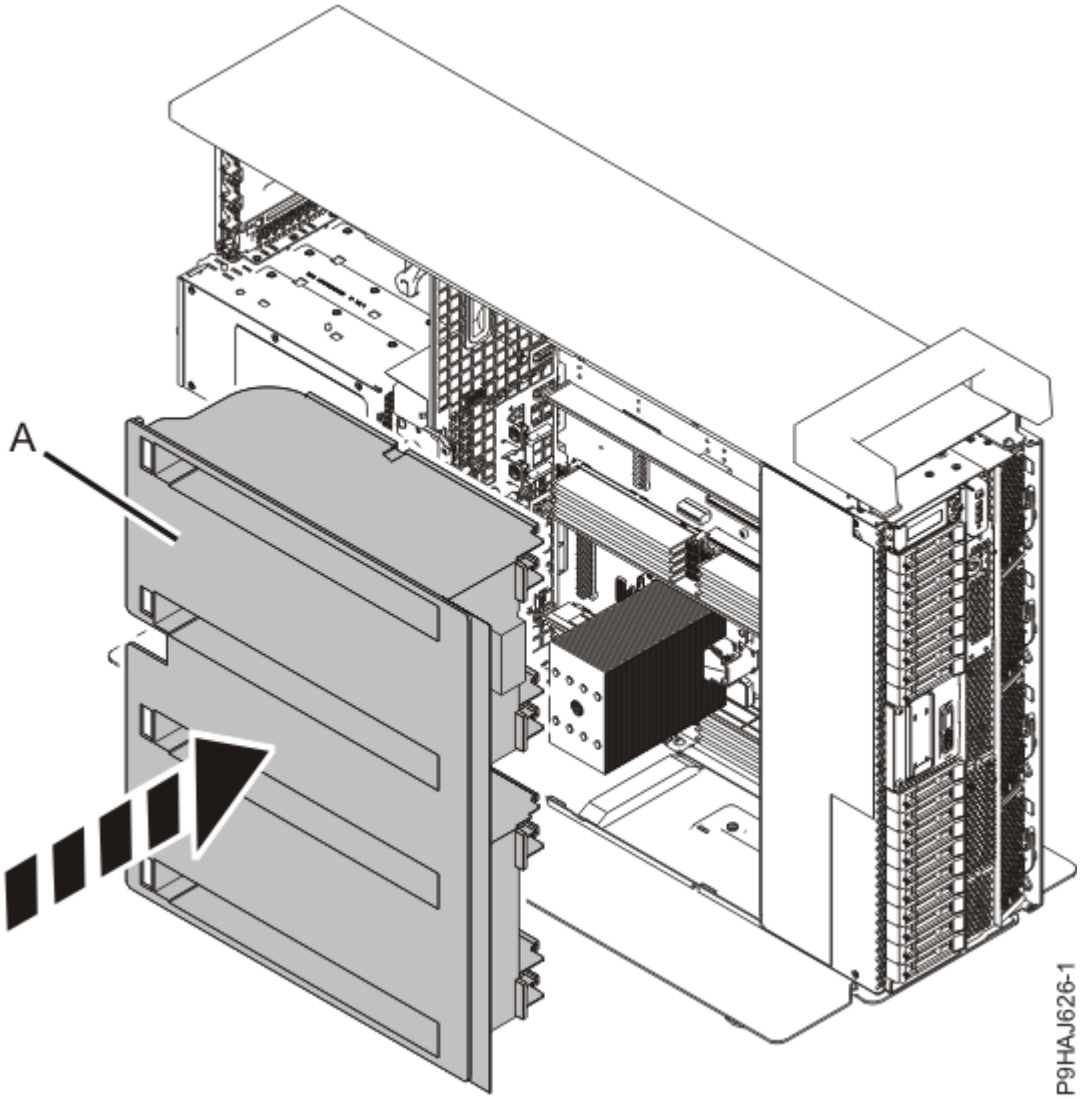


Figure 52. Replacing the air baffle in a stand-alone system

Preparing the 9009-41A, 9009-41G, 9009-42A, 9009-42G, 9223-42H, or 9223-42S system for operation after permanently removing a memory module

To prepare the system for operation after you permanently remove memory modules, complete the steps in this 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. Replace the service access cover.

   For a rack-mounted system, complete the following steps. Refer to Figure 53 on page 69.

   a. Slide the cover **(A)** onto the system unit.

   b. Close the release latch **(B)** by pushing it in the direction shown.

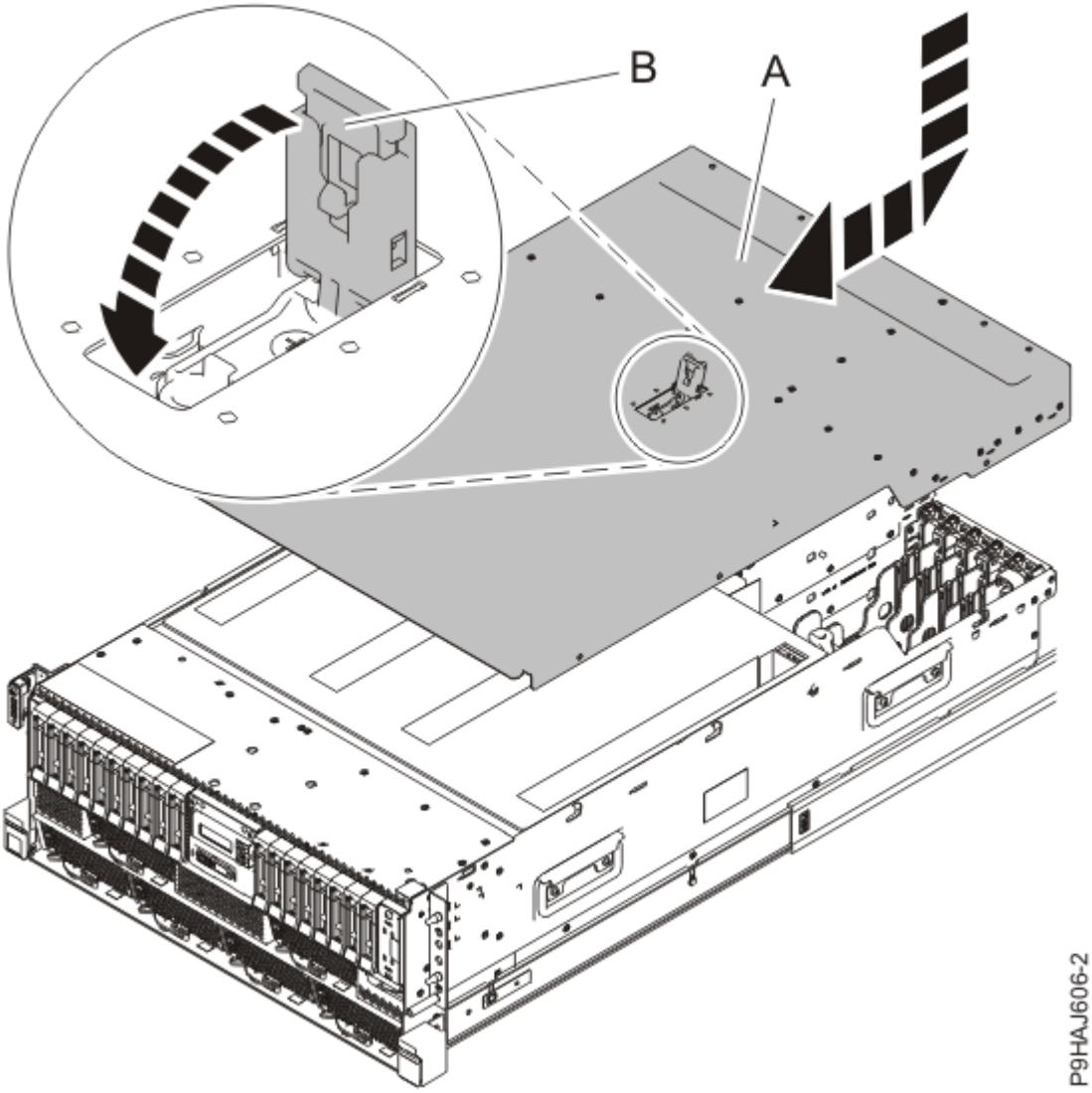


Figure 53. Installing the service access cover

For a stand-alone system, complete the following steps. Refer to Figure 54 on page 70.

a. Slide the cover **(B)** on to the system unit as shown.
b. Close the latch release **(A)** by pushing it in the direction shown.

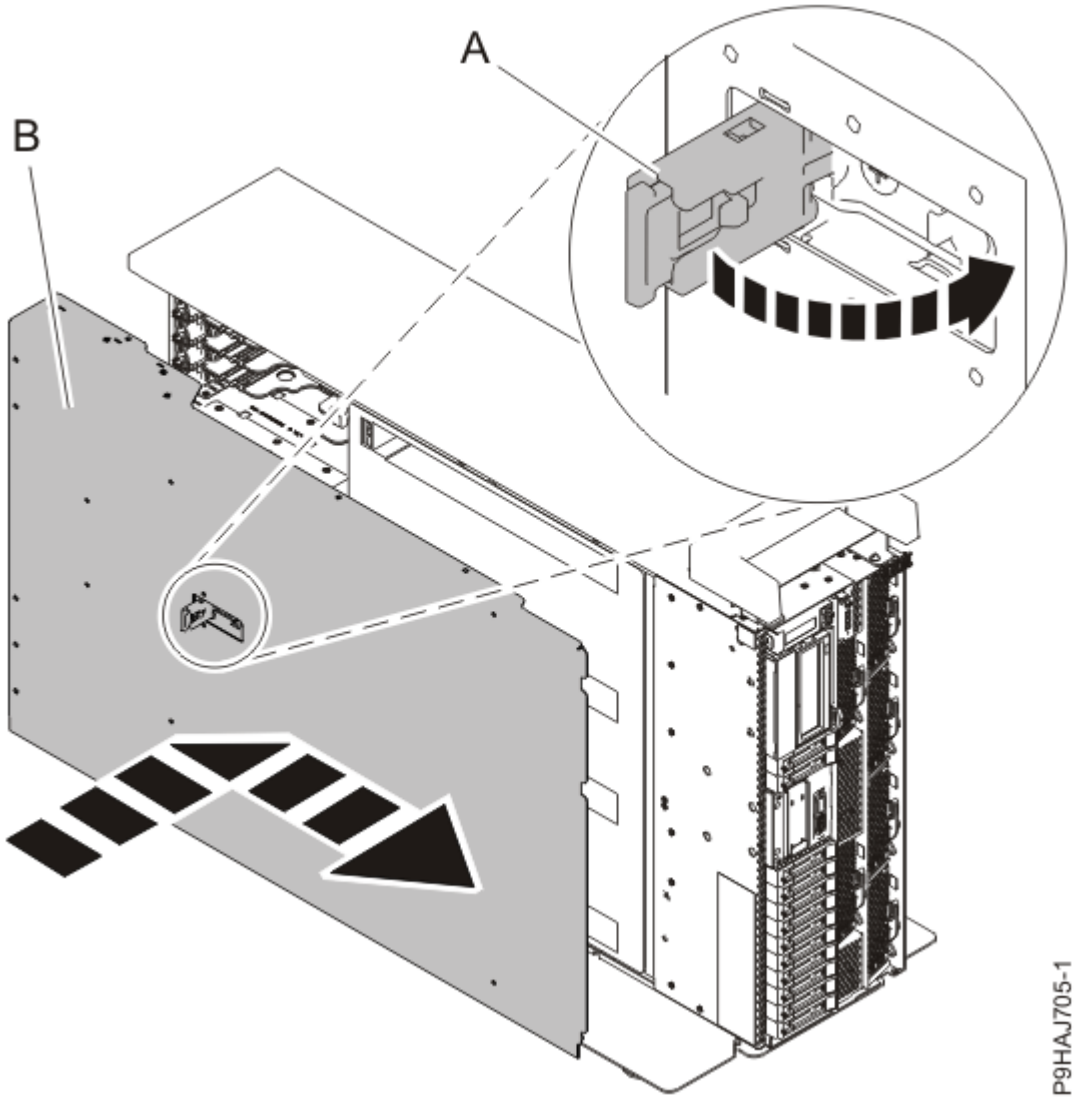


Figure 54. Installing the service access cover

3. For a rack-mounted system, unlock the blue rail safety latches **(A)** as shown in Figure 55 on page 71 by pushing them inward.

   Ensure that the cable management arms can move freely. Ensure that the cables at the rear of the unit do not catch or bind as you push the unit into the operating position.

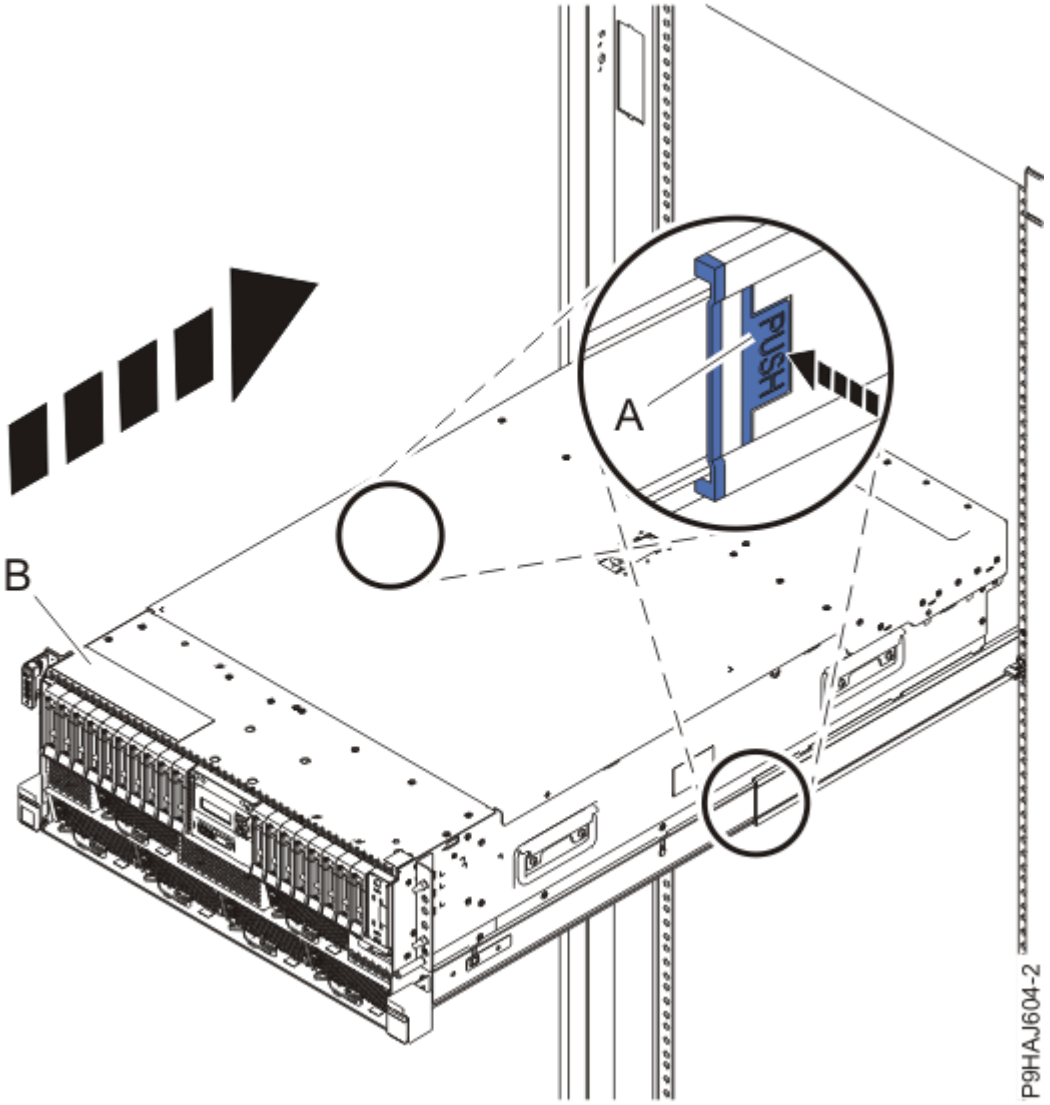


Figure 55. Placing the system into the operating position

4. For a rack-mounted system, push the system unit **(B)** as shown in the previous figure back into the rack until both release latches lock the system into position.

   Secure the cable management arm with hook-and-loop fasteners around the back side of the cable management arm, but not around the cables.

5. 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 56 on page 72 or Figure 57 on page 73.

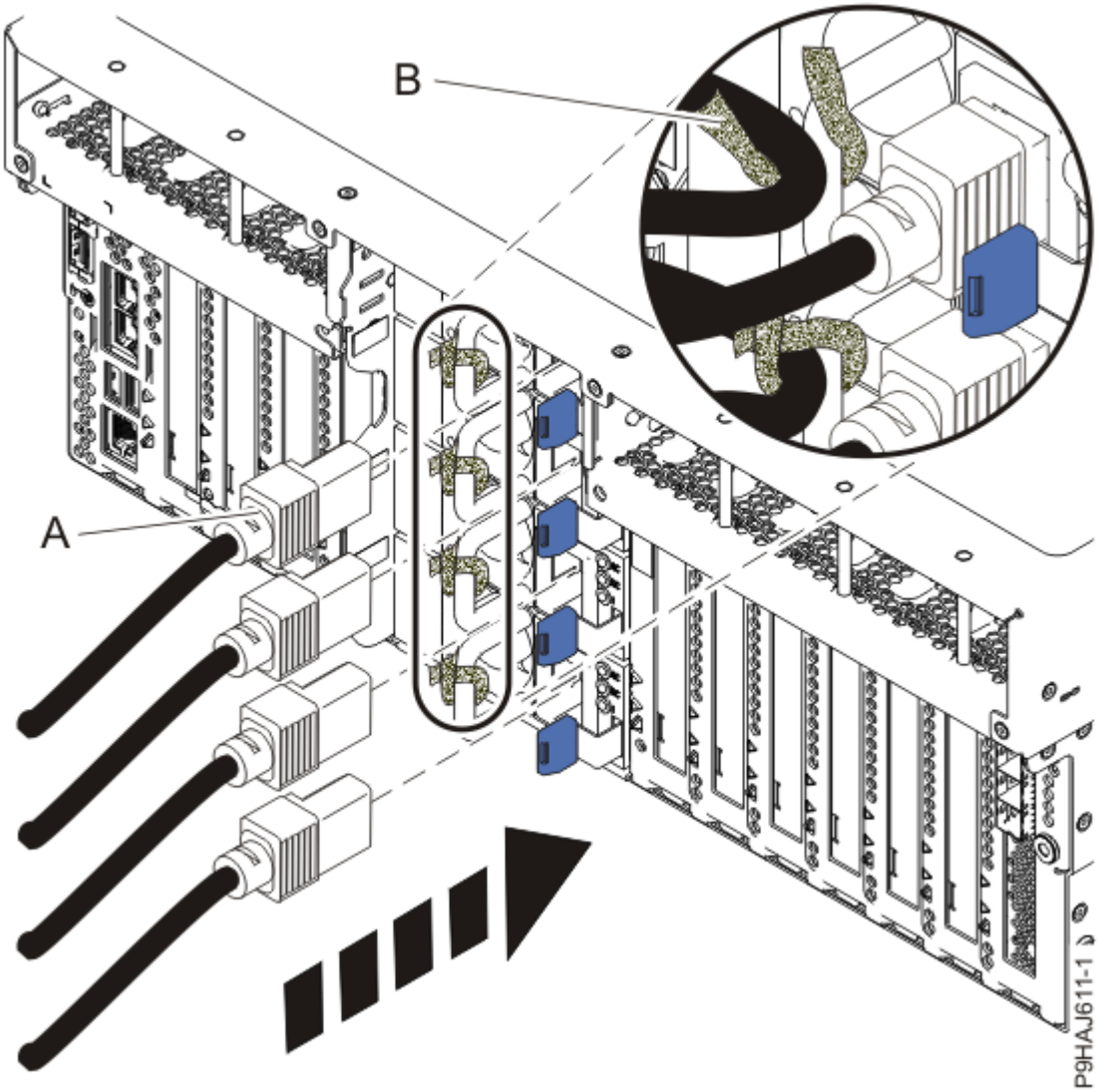


Figure 56. Connecting the power cords to a rack-mounted system

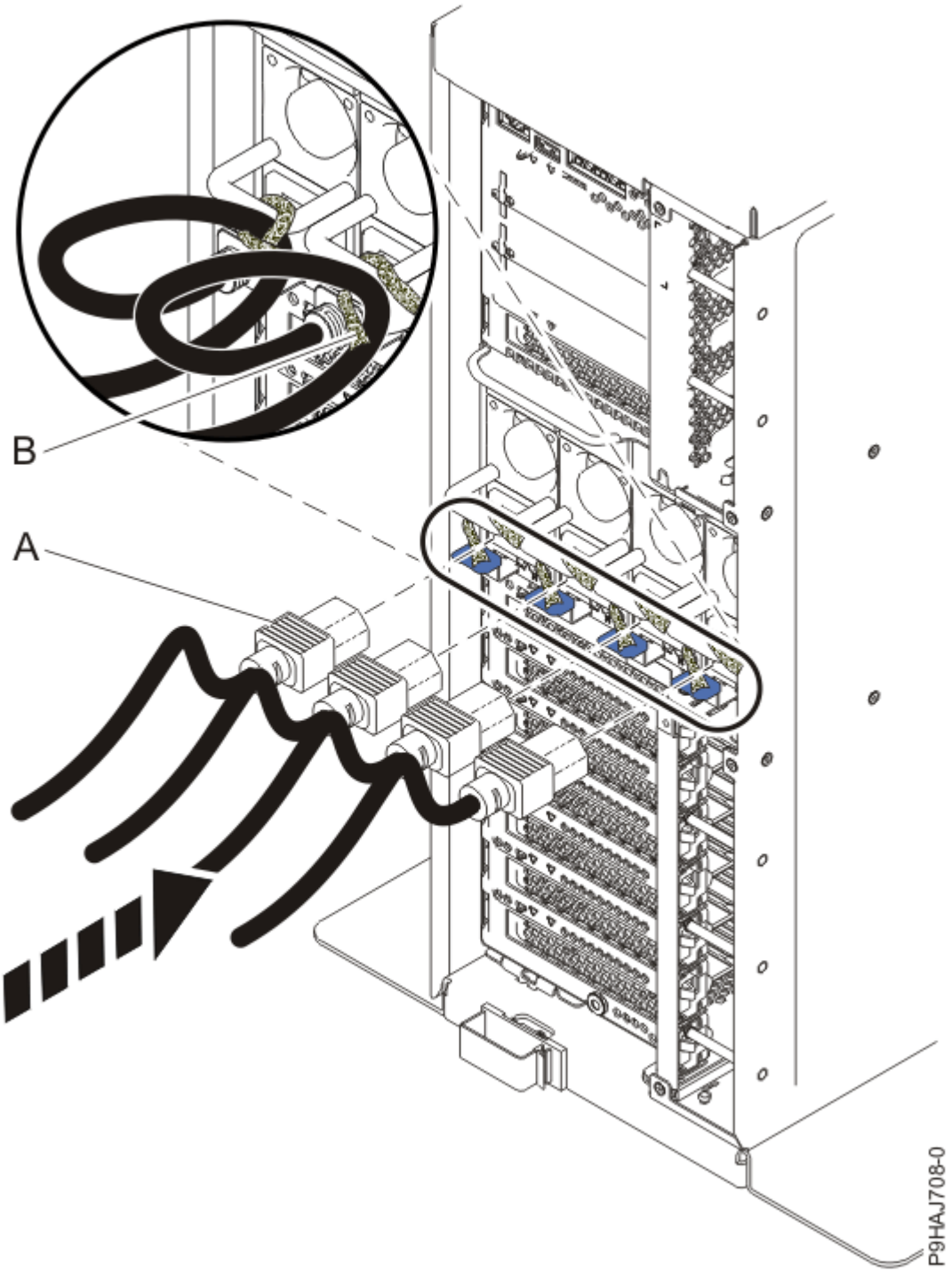


Figure 57. Connecting the power cords to a stand-alone system

6. Start the system. For instructions, see Starting a system (www.ibm.com/support/knowledgecenter/POWER9/p9haj/crustartsys.htm).
7. Turn off the identify LED. For instructions, see Deactivating an identify LED (www.ibm.com/support/knowledgecenter/POWER9/p9haj/p9haj_turn_off_identify_led.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

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- Keyboard-only operation
- Operations that use a screen reader

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

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Keyboard navigation

This product uses standard navigation keys.

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

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

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TTY service
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Class A Notices

The following Class A statements apply to the IBM servers that contain the POWER9 processor and its features unless designated as electromagnetic compatibility (EMC) Class B in the feature information.

When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices supplied with the monitor.

Canada Notice

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

European Community and Morocco Notice

This product is in conformity with the protection requirements of Directive 2014/30/EU of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product may cause interference if used in residential areas. Such use must be avoided unless the user takes special measures to reduce electromagnetic emissions to prevent interference to the reception of radio and television broadcasts.

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

Germany Notice

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

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaatenund hält die Grenzwerte der EN 55022 / EN 55032 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung von IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung von IBM gesteckt/eingebaut werden.

EN 55032 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:

"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem “Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)“. Dies ist die Umsetzung der EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

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

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

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

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

Generelle Informationen:

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

Japan Electronics and Information Technology Industries Association (JEITA) Notice

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

This statement applies to products less than or equal to 20 A per phase.

高調波電流規格　JIS C 61000-3-2 適合品

This statement applies to products greater than 20 A, single phase.

高調波電流規格　JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。
• 回路分類　：6（単相、ＰＦＣ回路付）
• 換算係数　：0

This statement applies to products greater than 20 A per phase, three-phase.

高調波電流規格　JIS C 61000-3-2 準用品

本装置は、「高圧又は特別高圧で受電する需要家の高調波抑制対策ガイドライン」対象機器（高調波発生機器）です。
• 回路分類　：5（3相、ＰＦＣ回路付）
• 換算係数　：0

Japan Voluntary Control Council for Interference (VCCI) Notice

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Korea Notice

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

People's Republic of China Notice

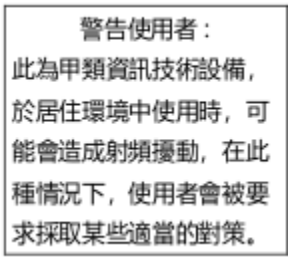
声　明

此为A级产品，在生活环境中，
该产品可能会造成无线电干扰。
在这种情况下，可能需要用户对其
干扰采取切实可行的措施。

Russia Notice

ВНИМАНИЕ! Настоящее изделие относится к классу А.
В жилых помещениях оно может создавать
радиопомехи, для снижения которых необходимы
дополнительные меры

Taiwan Notice



IBM Taiwan Contact Information:

台灣IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

United States Federal Communications Commission (FCC) Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

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

Responsible Party:
International Business Machines Corporation
New Orchard Road
Armonk, NY 10504
Contact for FCC compliance information only: fccinfo@us.ibm.com

Class B Notices

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

When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices supplied with the monitor.

Canada Notice

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

European Community and Morocco Notice

This product is in conformity with the protection requirements of Directive 2014/30/EU of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

German Notice

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

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2014/30/EU zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaatenund hält die Grenzwerte der EN 55022/ EN 55032 Klasse B ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung von IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung von IBM gesteckt/eingebaut werden.

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem “Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)“. Dies ist die Umsetzung der EU-Richtlinie 2014/30/EU in der Bundesrepublik Deutschland.

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

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

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

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

Generelle Informationen:

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

Japan Electronics and Information Technology Industries Association (JEITA) Notice

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

This statement applies to products less than or equal to 20 A per phase.

高調波電流規格　JIS C 61000-3-2 適合品

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高調波電流規格　JIS C 61000-3-2 準用品

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This statement applies to products greater than 20 A per phase, three-phase.

高調波電流規格　JIS C 61000-3-2 準用品

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• 換算係数　：0

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Taiwan Notice

台灣IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路7號3樓
電話：0800-016-888

United States Federal Communications Commission (FCC) Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

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

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

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

Responsible Party:

International Business Machines Corporation
New Orchard Road
Armonk, New York 10504
Contact for FCC compliance information only: fccinfo@us.ibm.com

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