

DRWG137-0000 removal  
and replacement procedures

ESCALA Power7



REFERENCE  
86 A1 68FH 04



# ESCALA Models Reference

The ESCALA Power7 publications concern the following models:

Bull Escala E1-700 / E3-700	(31E/2B ,8231-E2B)
Bull Escala E1-705	(31E/1C, 8231-E1C)
Bull Escala E1-715	(31E/1D, 8231-E1D)
Bull Escala E3-705	(31E/2C, 8231-E2C)
Bull Escala E3-715	(31E/2D, 8231-E2D)
Bull Escala E2-700 / E2-700T	(02E/4B, 8202-E4B)
Bull Escala E2-705 / E2-705T	(02E/4C, 8202-E4C)
Bull Escala E2-715 / E2-715T	(02E/4D, 8202-E4D)
Bull Escala E4-700 / E4-700T	(05F/6B, 8205-E6B)
Bull Escala E4-705	(05E/6C, 8205-E6C)
Bull Escala E4-715	(05E/6D, 8205-E6D)
Bull Escala E5-700	(33E/8B, 8233-E8B)
Bull Escala E5-715	(08E/8D, 8408-E8D)
Bull Escala M5-715	(09R/MD, 9109-RMD)
Bull Escala M6-700	(17M/MB, 9117-MMB)
Bull Escala M6-705	(17M/MC, 9117-MMC)
Bull Escala M6-715	(17M/MD, 9117-MMD)
Bull Escala M7-700	(79M/HB, 9179-MHB)
Bull Escala M7-705	(79M/HC, 9179-MHC)
Bull Escala M7-715	(79M/HD, 9179-MHD)
Bull Escala H9-700	(19F/HB, 9119-FHB)

References to 8236-E8C models are irrelevant.

## Hardware

February 2013

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

### German safety information

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

### Laser safety information

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

### Laser compliance

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:

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

To Disconnect:

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

To Connect:

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

(D005)

## DANGER

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

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



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

#### CAUTION

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

(R001)

**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 no empty U-levels between devices installed in the rack cabinet below the 32U level.
- If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- Inspect the route that you plan to take to eliminate potential hazards.
- Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.
- Verify that all door openings are at least 760 x 230 mm (30 x 80 in.).
- Ensure that all devices, shelves, drawers, doors, and cables are secure.
- Ensure that the four leveling pads are raised to their highest position.
- Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.
- Do not use a ramp inclined at more than 10 degrees.
- When the rack cabinet is in the new location, complete the following steps:
  - Lower the four leveling pads.
  - Install stabilizer brackets on the rack cabinet.
  - If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.
- If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also lower the leveling pads to raise the casters off of the pallet and bolt the rack cabinet to the pallet.

(R002)

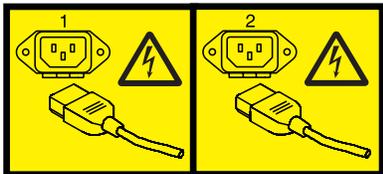
(L001)



(L002)



(L003)



or



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

**CAUTION:**

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

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

(C026)

**CAUTION:**

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

**CAUTION:**

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

**CAUTION:**

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

**CAUTION:**

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

*Do Not:*

- \_\_\_ Throw or immerse into water
- \_\_\_ Heat to more than 100°C (212°F)
- \_\_\_ Repair or disassemble

Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (C003)

## **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.

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## 5888 PCIe storage enclosure removal and replacement procedures

Use the removal and replacement procedures when you repair, maintain, or exchange parts for the 5888 PCIe storage enclosure (EXP30 Ultra SSD I/O Drawer).

Before you begin a replacement, perform the following tasks:

1. If you are performing a replacement procedure that might put your data at risk, ensure, if possible, that you have a current backup of your system or logical partition (including operating systems, licensed programs, and data).
2. Review the installation or replacement procedure for the feature or part.
3. Note the significance of color on your system.

*Blue* or *terra-cotta* on a part of the hardware indicates a touch point where you can grip the hardware to remove it from or install it in the system, to open or close a latch, and other actions. Blue indicates that the part must be removed and replaced with the system powered off. Terra-cotta indicates that the part can be removed and replaced with the system or logical partition power on. The task might require some action before and after part replacement.

4. If parts are incorrect, missing, or visibly damaged, contact your service provider or next level of support.

## DANGER

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

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

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

To Disconnect:

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

To Connect:

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

(D005)

**Attention:** Failure to follow the steps sequentially for field replaceable unit (FRU) removal or installation might result in FRU or system damage.

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

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

---

## Removing and installing a solid-state drive for a 5888 PCIe storage enclosure

Use this procedure to service a solid-state drive concurrently for the 5888 PCIe storage enclosure (EXP30 Ultra SSD I/O Drawer).

To perform a service action on a solid-state drive, see the following procedures for the machine type and model to which the PCIe storage enclosure is attached:

- Installing a disk drive or solid-state drive in the 8202-E4B, 8202-E4C, 8205-E6B, or 8205-E6C.
- Removing a disk drive or solid-state drive from the 8202-E4B, 8202-E4C, 8205-E6B, or 8205-E6C.
- Replacing a disk drive or solid-state drive in the 8202-E4B, 8202-E4C, 8205-E6B, or 8205-E6C.
- Installing a disk drive or solid-state drive in the 8231-E2B, 8231-E1C, or 8231-E2C.
- Removing a disk drive or solid-state drive from the 8231-E2B, 8231-E1C, or 8231-E2C.
- Replacing a disk drive or solid-state drive in the 8231-E2B, 8231-E1C, or 8231-E2C.

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## Removing and installing an enclosure RAID module assembly for a 5888 PCIe storage enclosure

Use this procedure to service an enclosure RAID module (ERM) assembly for the 5888 PCIe storage enclosure (EXP30 Ultra SSD I/O Drawer).

**Attention:** Failure to follow the steps sequentially for this field replaceable unit (FRU) removal or installation might result in damage to the FRU or system.

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

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) from damaging your hardware.
- If you do not have a wrist strap, before 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.
- Keep all electronic components in the shipping container or envelope until you are ready to install them.
- If you remove and reinstall an electronic component, temporarily place the component on an ESD pad or blanket, if available.
- Do not combine the replacement of any ERM assembly with the replacement of the midplane unless there has been a power cycle of the PCIe storage enclosure with one new FRU at a time. If multiple FRUs are replaced at the same time, the serial number is not preserved.

To remove and install an ERM assembly, complete the following steps:

1. Use the location code to find the physical location of the ERM. Does the location code begin with U5888.001.ssssss, where ssssss is the serial number of the PCIe storage enclosure?
  - Yes:** Using the serial number, find the PCIe storage enclosure that has the same serial number printed on the label on the front of the enclosure. The fault indicator of the failing ERM should be on. Label the failing ERM and continue with the next step. For more information about location codes, see the service card located in the front of the enclosure or 5888 locations.
  - No:** Find the port in the system unit identified by the location code. Trace the cable to the PCIe storage enclosure to find the failing ERM. Label the failing ERM and continue with the next step. For more information about system location codes, see Part locations and location codes.
2. Power off the system that is connected to the ERM assembly to be removed. See Powering on and powering off the system.
3. Remove the ERM assembly:
  - a. Disconnect the PCIe cables from the ERM assembly and mark each cable label with its location.
    - Attention:** Incorrect cable placement might result in data loss.
  - b. Open the release lever (**A**) as shown in the following figure.
  - c. Support both sides of the ERM assembly (**B**) while you slide it out of the enclosure.

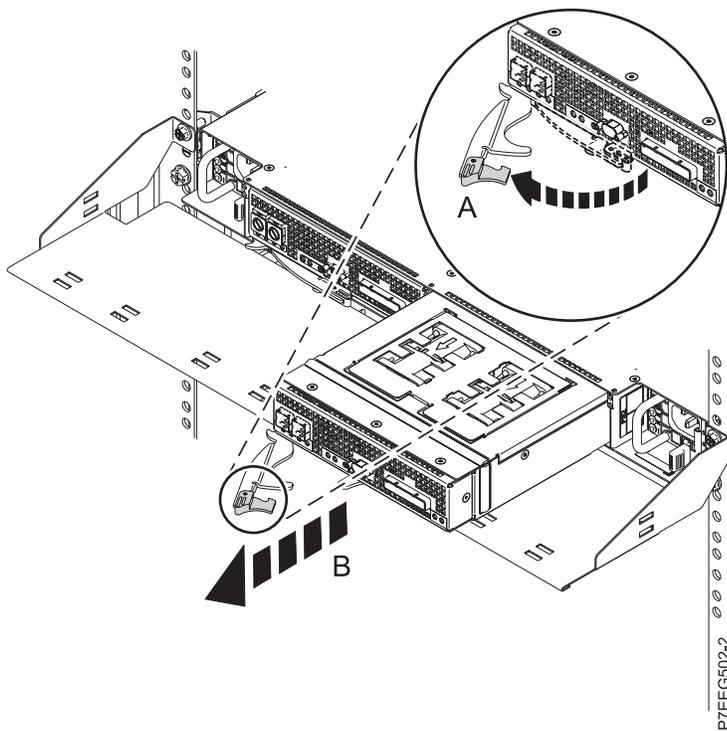


Figure 1. Removing an ERM assembly from the enclosure

4. Install the ERM assembly:
  - a. Ensure that the release lever on the new ERM assembly is in the open position.
  - b. Gently slide the ERM assembly into the enclosure until it stops.
  - c. Push the release lever to the closed position.
  - d. Reconnect the PCIe cables to the ERM assembly by using the location information marked on each cable in step 2a.

**Attention:** Incorrect cable placement might result in data loss.
5. Power on the system that is connected to the ERM assembly. See Powering on and powering off the system.

**Note:** To prevent loss of enclosure information, do not replace both ERM assemblies at the same time. To replace the second ERM, power on the system and the partition that is connected to the ERM assembly that you replaced first. Then power off the system that is connected to the second ERM assembly.

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## Removing and installing a fan assembly for a 5888 PCIe storage enclosure

Use this procedure to service a fan assembly for the 5888 PCIe storage enclosure (EXP30 Ultra SSD I/O Drawer).

**Attention:** Failure to follow the steps sequentially for this field replaceable unit (FRU) removal or installation might result in damage to the FRU or system.

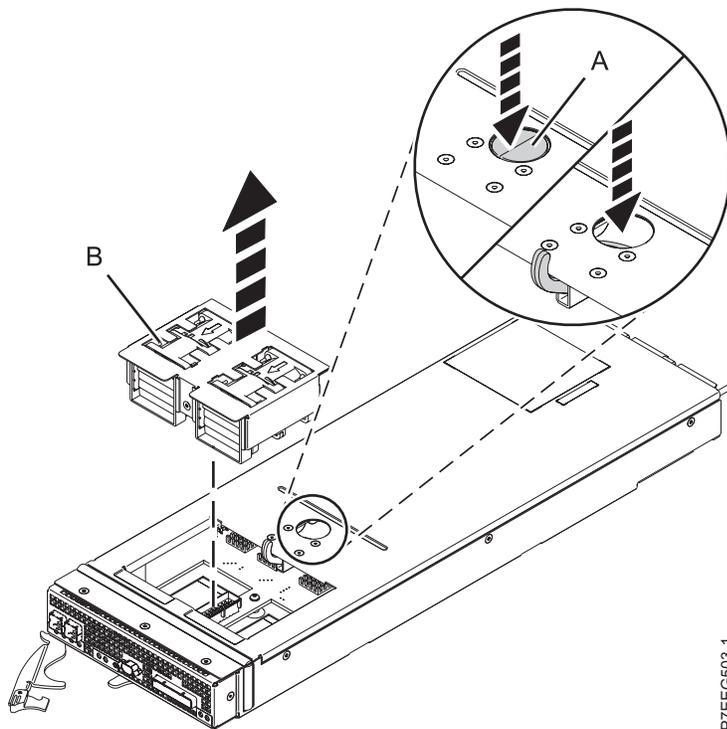
Use the following precautions whenever you handle electronic components or cables:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) from damaging your hardware.

- If you do not have a wrist strap, before 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.
- Keep all electronic components in the shipping container or envelope until you are ready to install them.
- If you remove and reinstall an electronic component, temporarily place the component on an ESD pad or blanket, if available.

To remove and install a fan assembly, complete the following steps:

1. Use the location code to find the physical location of the fan. The location code begins with U5888.001.ssssss, where ssssss is the serial number of the PCIe storage enclosure. Using the serial number, find the PCIe storage enclosure that has the same serial number printed on the label on the front of the enclosure. The fault indicator of the failing fan should be on. Label the ERM with the failing fan and continue with the next step. For more information about location codes, see the service card located in the front of the enclosure or 5888 locations.
2. Power off the system that is connected to the ERM assembly to be removed. See Powering on and powering off the system.
3. Remove the enclosure RAID module (ERM) assembly from the PCIe storage enclosure. See “Removing and installing an enclosure RAID module assembly for a 5888 PCIe storage enclosure” on page 3.
4. Remove the fan assembly from the ERM assembly:
  - a. Place the ERM assembly on a flat surface.
  - b. Press the release button (A), as shown in the following figure, to raise the fan assembly out of the ERM assembly.
  - c. Grasp the fan assembly (B) and remove it from the ERM assembly.



P7EEG503-1

Figure 2. Removing the fan assembly from the ERM assembly

5. Install the fan assembly:
  - a. Insert the fan assembly into the ERM assembly until it stops.

- b. Install the ERM assembly into the PCIe storage enclosure. See “Removing and installing an enclosure RAID module assembly for a 5888 PCIe storage enclosure” on page 3.
6. Power on the system that is connected to the ERM assembly. See Powering on and powering off the system

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## Removing and installing a midplane for a 5888 PCIe storage enclosure

Use this procedure to service a midplane nonconcurrently for the 5888 PCIe storage enclosure (EXP30 Ultra SSD I/O Drawer).

### Notes:

1. Servicing of the midplane must be performed by only trained service personnel.
2. To complete this procedure, you need special bits or drivers (T10 Torx and 5.5 mm hex).

### Attention:

1. Failure to follow the steps sequentially for this field replaceable unit (FRU) removal or installation might result in damage to the FRU or system.
2. The failed midplane must only be replaced with a new midplane that has not yet been installed in another 5888 PCIe storage enclosure. If the midplane was previously installed in a different 5888 PCIe storage enclosure, the enclosure serial number will not be properly updated during power on.
3. Once a midplane has been installed and the 5888 PCIe storage enclosure powered on, the midplane cannot be used in a different 5888 PCIe storage enclosure.
4. Do not replace an enclosure RAID module (ERM) assembly and the midplane at the same time. Both of the original ERM assemblies must be installed during the midplane removal and installation procedure to preserve the enclosure serial number. If an ERM assembly must be replaced, do so only after the midplane has been replaced and the 5888 PCI storage enclosure powered on.

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

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) from damaging your hardware.
- If you do not have a wrist strap, before 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.
- Keep all electronic components in the shipping container or envelope until you are ready to install them.
- If you remove and reinstall an electronic component, temporarily place the component on an ESD pad or blanket, if available.

To remove a midplane, complete the following steps:

1. Use the location code to find the physical location of the midplane. The location code begins with U5888.001.ssssss, where ssssss is the serial number of the PCIe storage enclosure. Using the serial number, find the PCIe storage enclosure that has the same serial number printed on the label on the front of the enclosure.
2. Power off the system or systems that are using the PCIe storage enclosure. See Powering on and powering off the system.
3. Label and remove all PCIe cables to the ERM assemblies.  
**Attention:** After the midplane is replaced, the PCIe cables must be installed back into the same connectors from which they were removed. Incorrect cable placement might result in data loss.
4. Remove the six bezels that cover the solid-state drive slots as shown in the following figure.

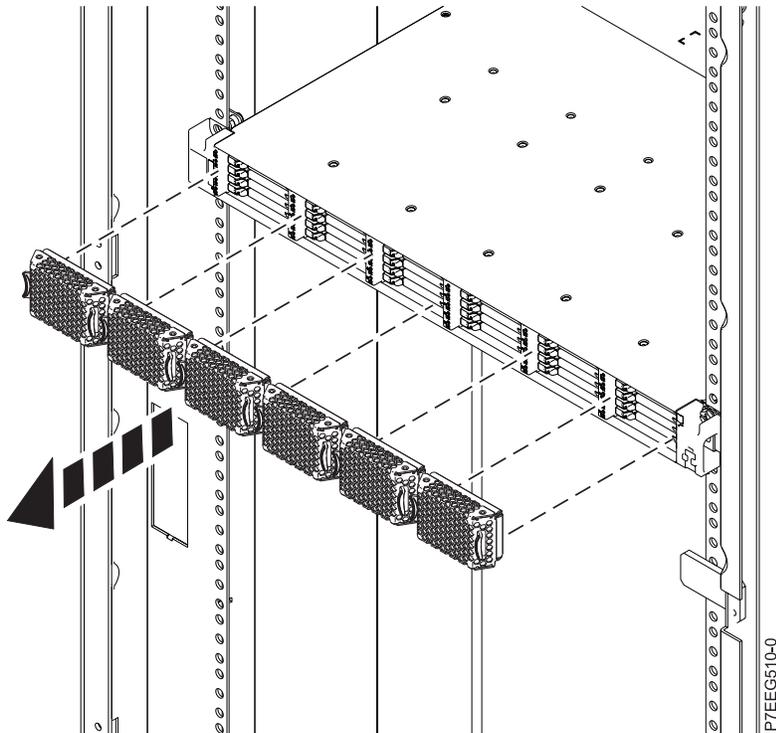
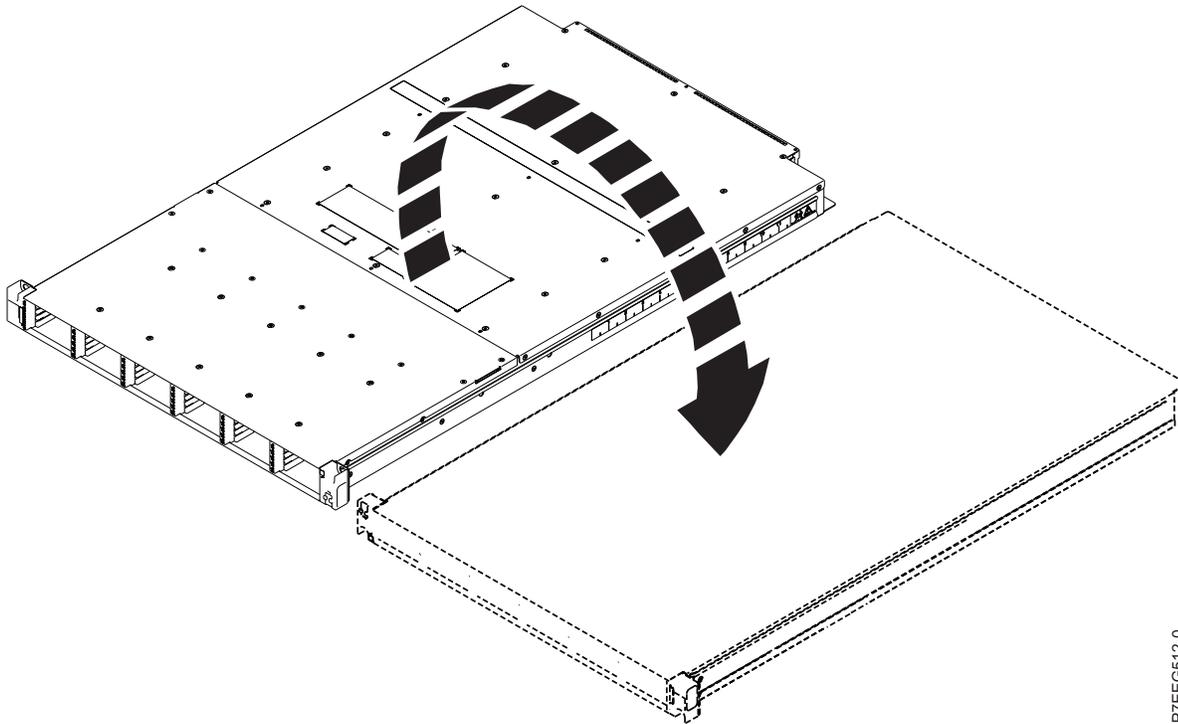


Figure 3. Removing the bezels

5. Carefully remove each solid-state drive and label it with the slot from which it was removed. See “Removing and installing a solid-state drive for a 5888 PCIe storage enclosure” on page 2.

**Note:** After the midplane is replaced, the solid-state drives must be inserted back into the same slots from which they were removed.

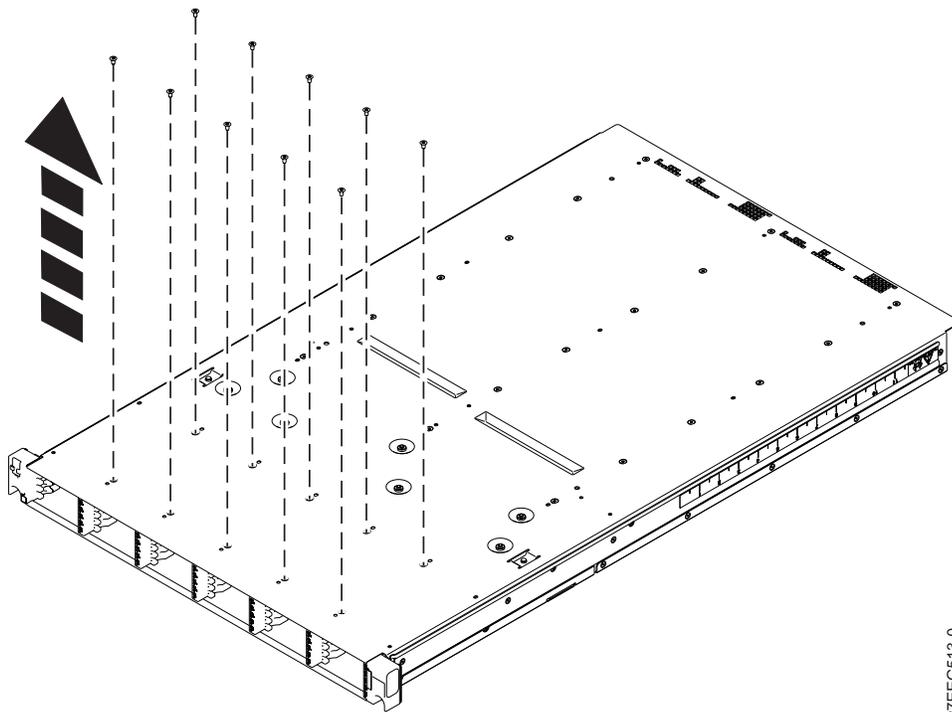
6. Remove the enclosure from the rack. See Removing an enclosure from the rack. Then turn it upside down and place the enclosure on a flat surface.



P7EEG512-0

Figure 4. Turning the enclosure upside down

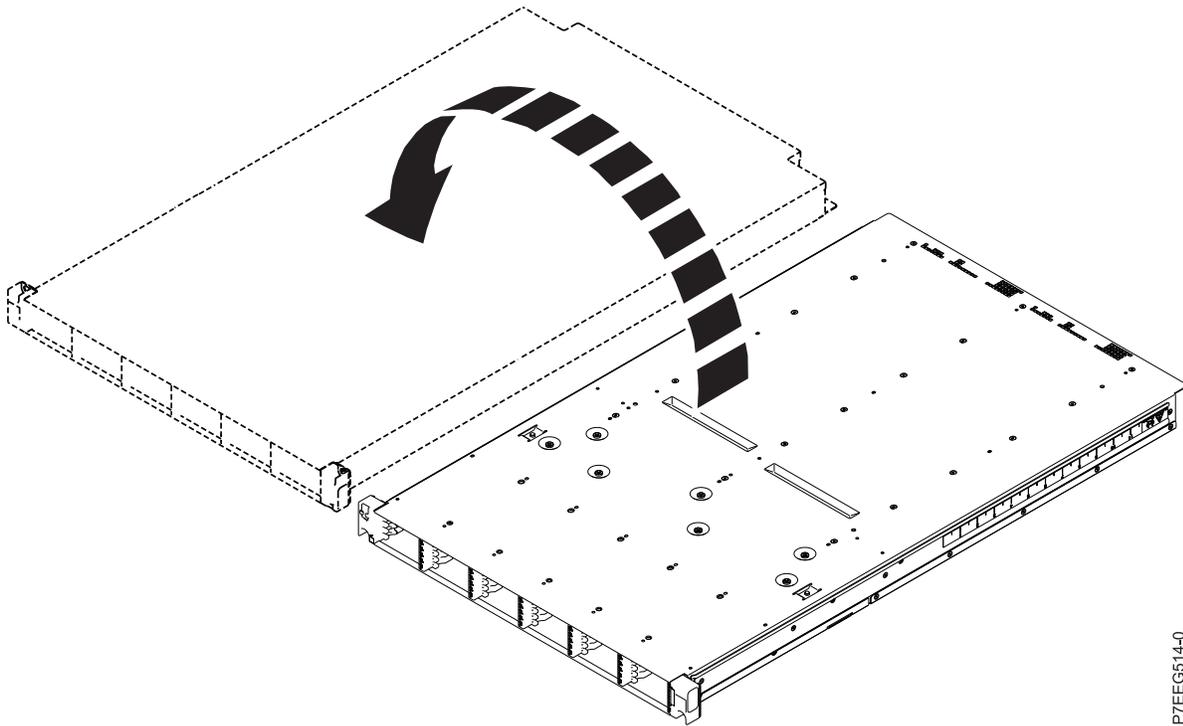
7. Using the correct size Torx bit or driver, remove the 10 screws from the bottom of the enclosure that are closest to the front of the enclosure.



P7EEG513-0

Figure 5. Removing the screws from the bottom of the enclosure

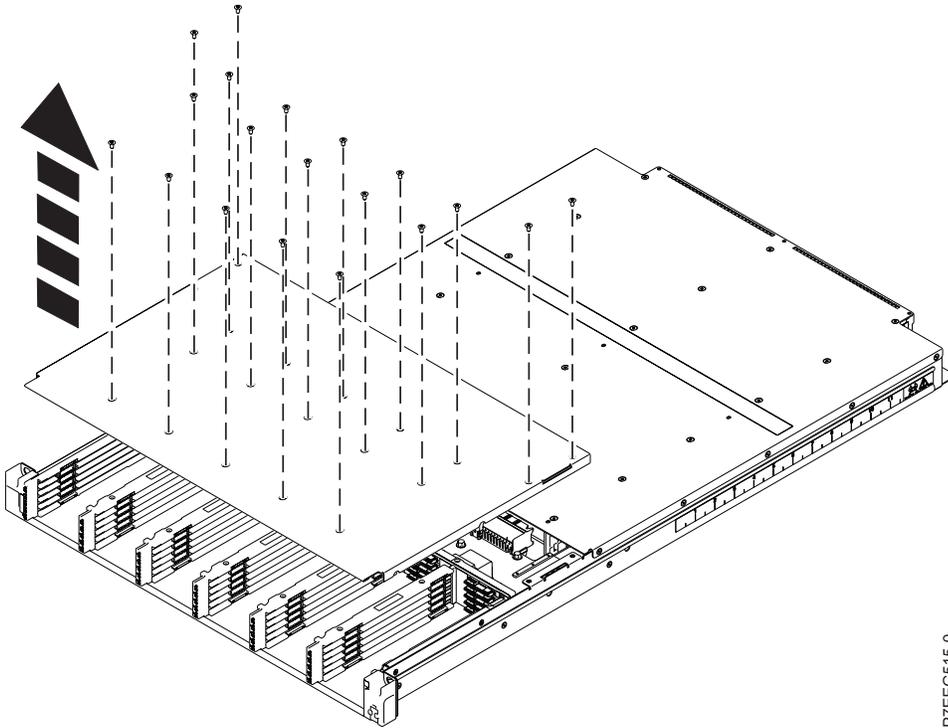
8. Turn the enclosure top side up.



P7EEG514-0

*Figure 6. Turning the enclosure top side up*

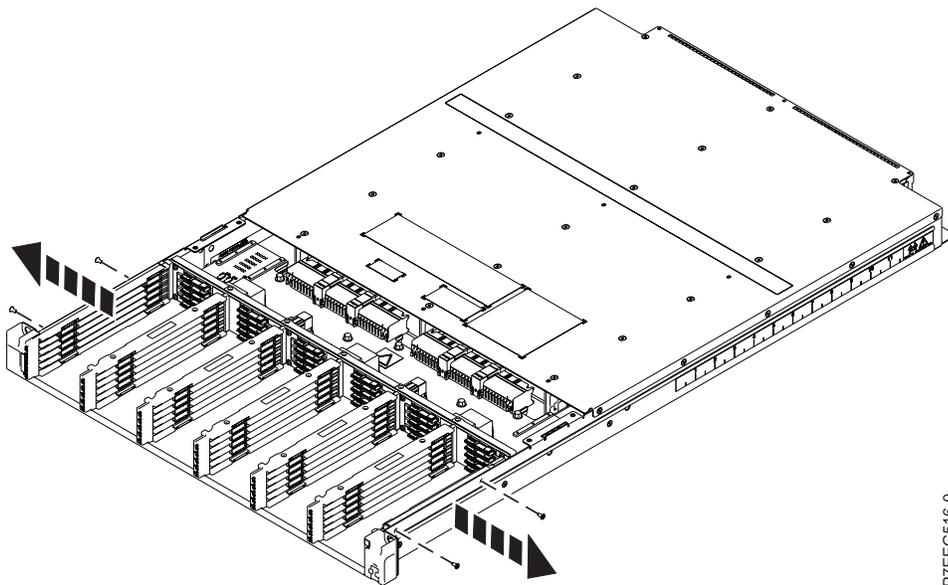
9. Unseat both power supplies.  
To unseat a power supply, press the orange release tab to the left while sliding the power supply partially out of the enclosure. For more information, see “Removing and installing a power supply for a 5888 PCIe storage enclosure” on page 18.
10. Unseat both ERM assemblies.  
To unseat an ERM assembly, open the release lever and slide the ERM assembly partially out of the enclosure. For more information, see “Removing and installing an enclosure RAID module assembly for a 5888 PCIe storage enclosure” on page 3.
11. Remove the 19 screws that secure the top front cover to the enclosure.



P7EEG515-0

Figure 7. Removing the screws from the top front cover of the enclosure

12. Remove the top front cover.
13. Remove the two screws on the right side of the enclosure and the two screws on the left side of the enclosure that secure the solid-state drive rails to the enclosure.

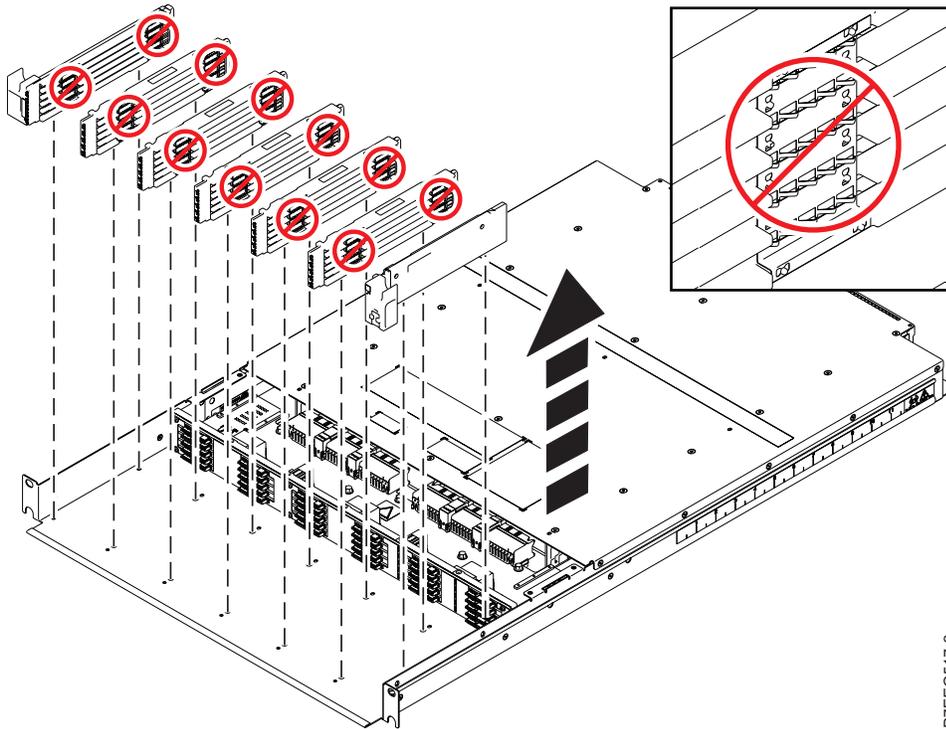


P7EEG516-0

Figure 8. Removing the screws on the right and left sides of the enclosure

14. Remove all seven solid-state drive rails.

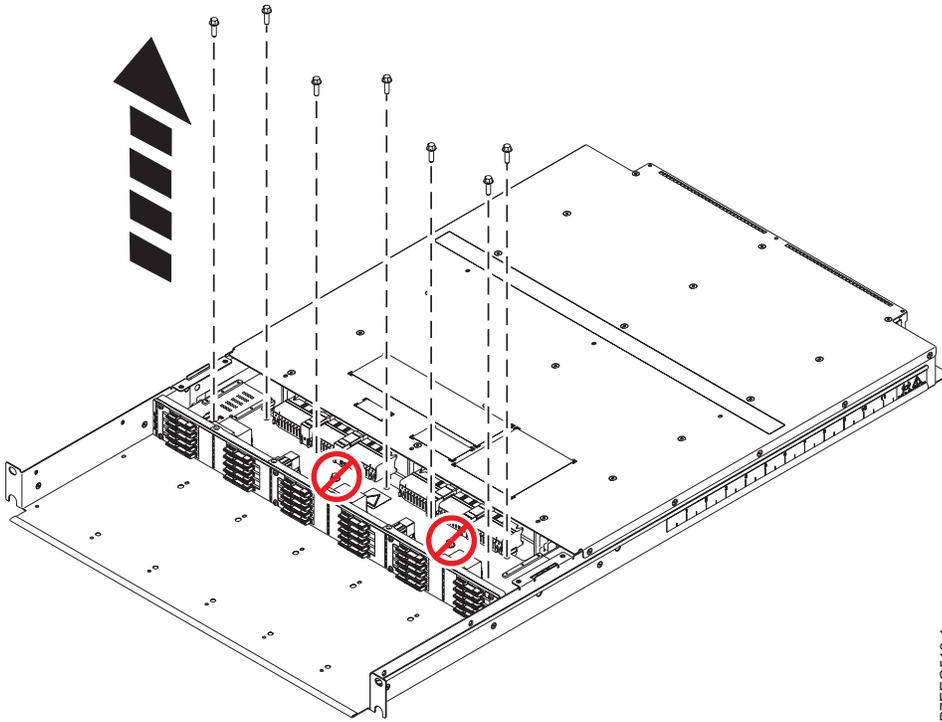
**Note:** The EMC springs on the solid-state drive rails can be easily bent. Avoid touching the EMC springs when handling the solid-state drive rails.



P7EEG517-2

Figure 9. Removing the solid-state drive rails

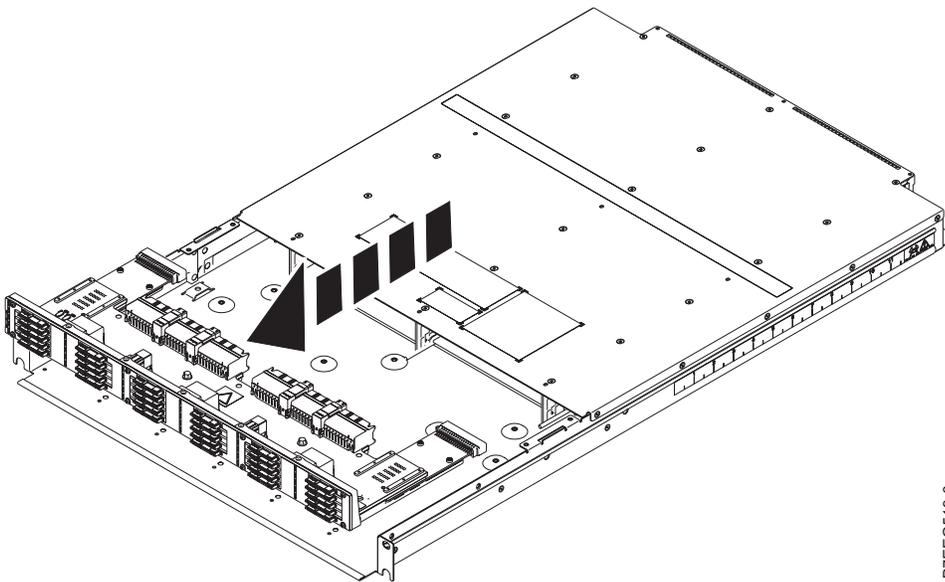
15. Remove the seven screws that secure the midplane to the enclosure. Do not remove the two screws at the center that attach the midplane to its underplate assembly, which are identified in the following figure.



P7EEG518-1

Figure 10. Removing the midplane screws

16. Lift the midplane slightly and pull it forward to remove it from the enclosure.



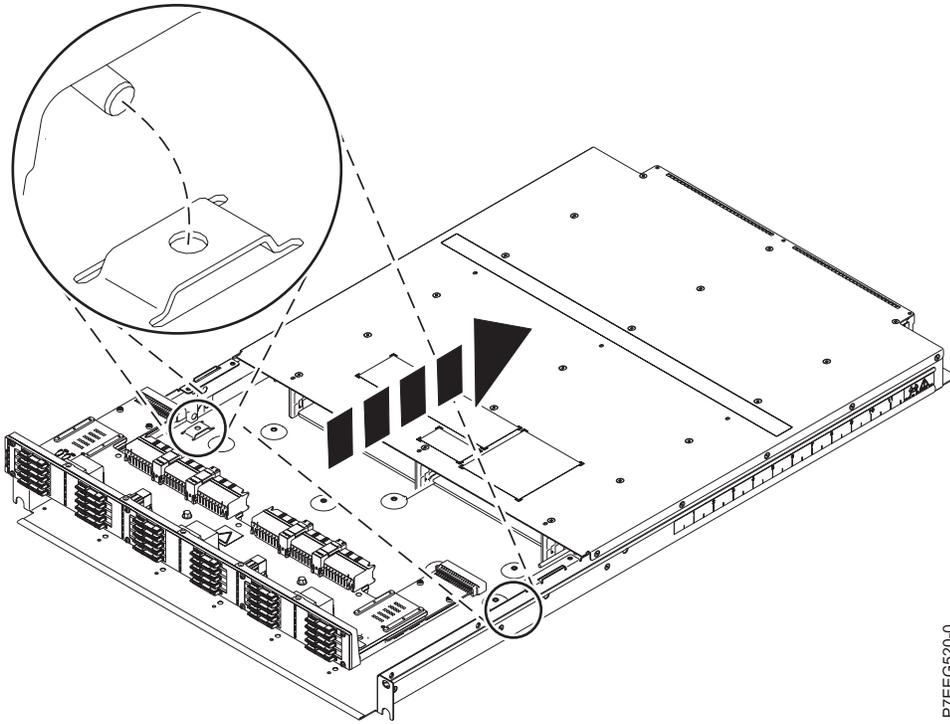
P7EEG519-0

Figure 11. Removing the midplane

To install a midplane, complete the following steps:

1. Install the new midplane, ensuring that the alignment pins are properly seated. When seating the midplane on the alignment pins, do not slide the midplane past the alignment pins in the direction of the rear of the chassis.

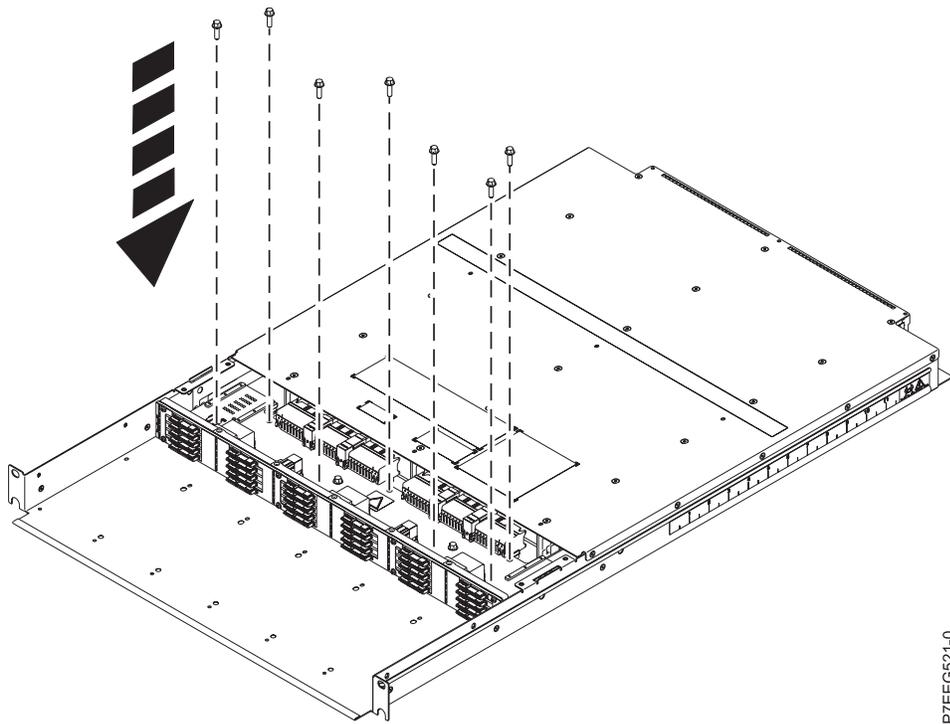
**Attention:** Sliding the midplane past the alignment pins might result in damage to the midplane.



P7EEG520-0

Figure 12. Installing the midplane

- Secure the midplane assembly to the enclosure by using the seven screws that you removed in step 15 on page 11 in the removing a midplane section.



P7EEG521-0

Figure 13. Installing the midplane screws

- Secure the two solid-state drive end rails to the enclosure by using two screws on the right side of the enclosure and two screws on the left side of the enclosure that you removed in step 13 on page 10 in the removing a midplane section.

**Notes:**

- The solid-state drive end rail on the left side of the enclosure has drive identification numbers. The solid-state drive end rail on the right side of the enclosure does not have drive identification numbers.
  - The EMC springs on the solid-state drive rails can be easily bent. Avoid touching the EMC springs when handling the solid-state drive rails.
- Place the remaining five solid-state drive rails into position, ensuring that the alignment pins on the bottom of each solid-state drive rail are properly seated in the enclosure.

**Note:** Ensure that the solid-state drive rails are positioned so that the drive location numbers are in ascending order from left to right.

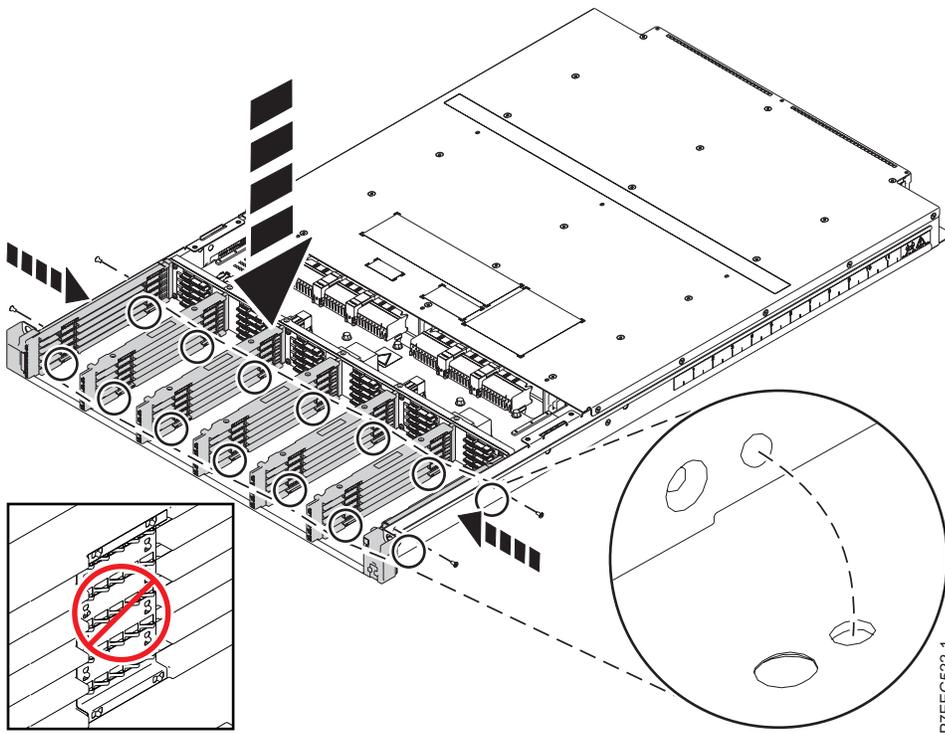
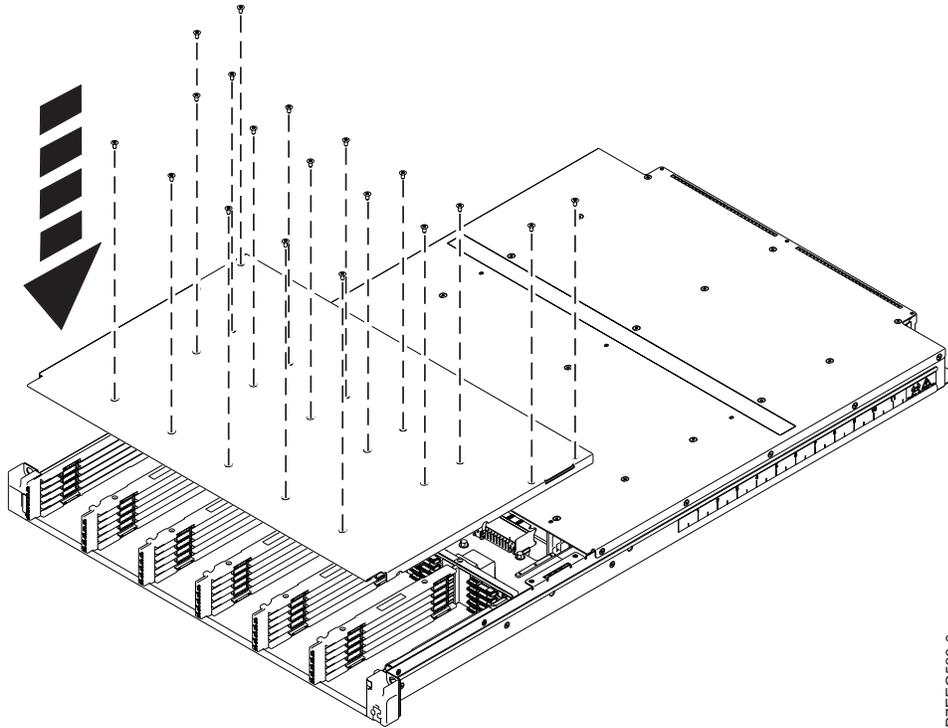


Figure 14. Installing the solid-state drive rails

- Secure the top front cover to the enclosure by using the 19 screws that you removed in step 11 on page 9 in the removing a midplane section.

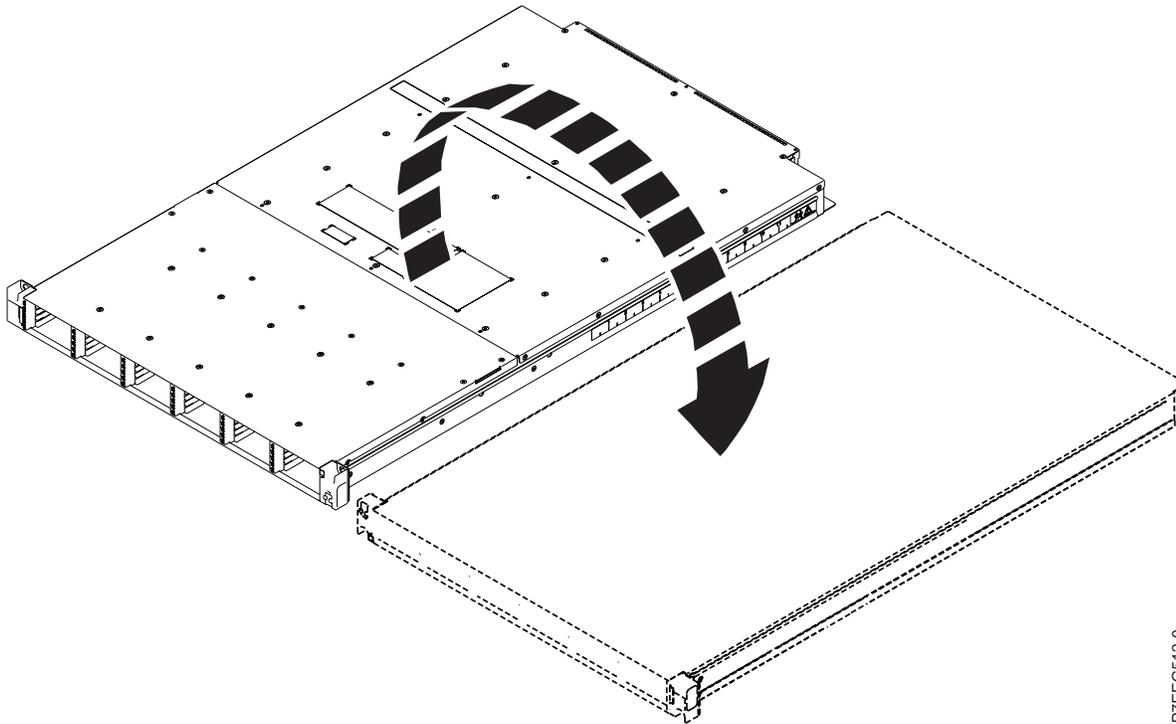
**Tip:** Leave these screws slightly loose for easier alignment when secure the bottom screws.



P7EEG523-0

Figure 15. Installing the screws in the top front cover of the enclosure

6. Reseat both ERM assemblies. To reseat an ERM assembly, ensure that the release lever is in the open position. Then gently slide the ERM assembly into the enclosure until it stops. Push the release lever to the closed position. For more information, see “Removing and installing an enclosure RAID module assembly for a 5888 PCIe storage enclosure” on page 3.
7. Reseat both power supplies. To reseat a power supply, gently slide the power supply into the enclosure until the orange release tab latches. For more information, see “Removing and installing a power supply for a 5888 PCIe storage enclosure” on page 18.
8. Turn the enclosure upside down.



P7EEG512-0

*Figure 16. Turning the enclosure upside down*

9. Secure the solid-state drive rails to the enclosure by using the 10 screws that you removed in step 7 on page 8 in the removing a midplane section. Ensure that the alignment pins on the bottom of each solid-state drive rail are properly seated in the enclosure.

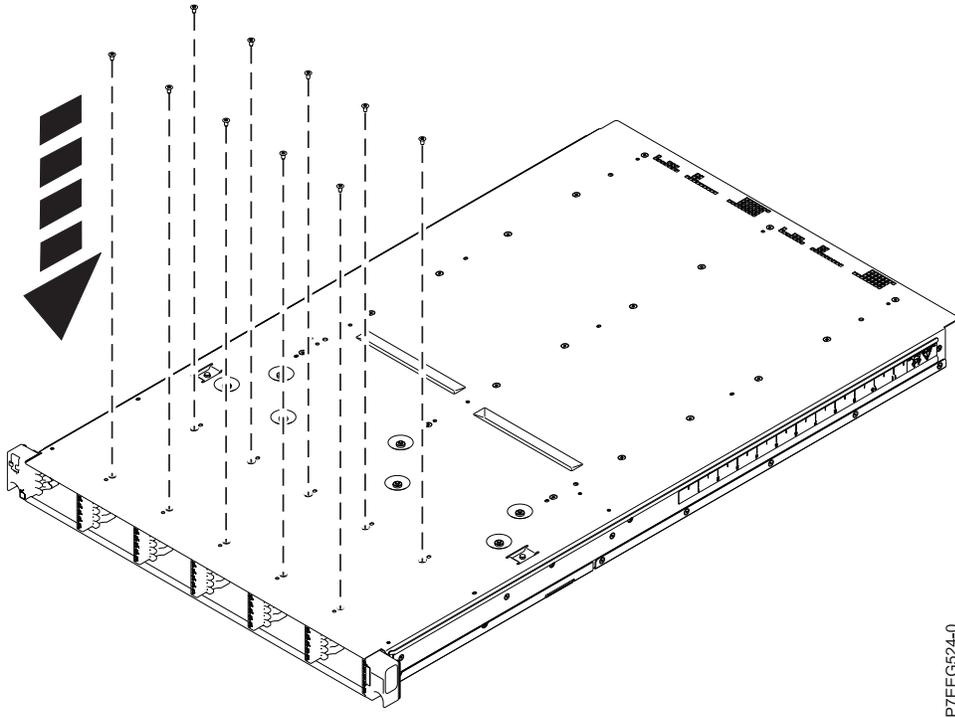


Figure 17. Installing the screws to the bottom of the enclosure

10. Turn the enclosure top side up, tighten the top cover screws and install the enclosure in the rack. See Installing the 5888 PCIe storage enclosure.

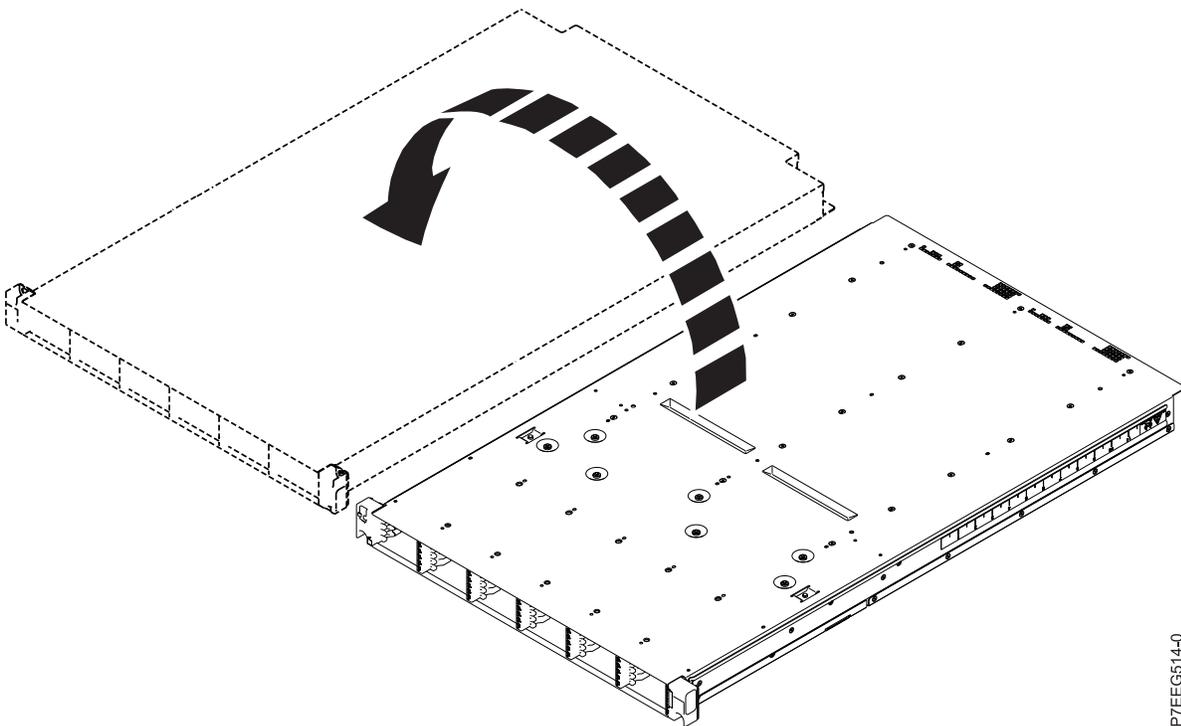


Figure 18. Turning the enclosure top side up

11. Install the solid-state drives by using the location information marked on each drive in step 5 on page 7 in the removing a midplane section. See “Removing and installing a solid-state drive for a 5888 PCIe storage enclosure” on page 2.
12. Install the six bezels that cover the solid-state drive slots.
13. Reconnect the PCIe cables to the ERM assembly by using the location information marked on each cable in step 6 on page 7 in the removing a midplane section.  
**Attention:** Incorrect cable placement might result in data loss.
14. Power on the system or systems that are using the PCIe storage enclosure. See Powering on and powering off the system.
15. Check the LEDs to make sure that the enclosure is fully operational.

---

## Removing and installing a power supply for a 5888 PCIe storage enclosure

Use this procedure to service a power supply concurrently or nonconcurrently for the 5888 PCIe storage enclosure (EXP30 Ultra SSD I/O Drawer).

**Attention:** Failure to follow the steps sequentially for this field replaceable unit (FRU) removal or installation might result in damage to the FRU or system.

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

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge (ESD) from damaging your hardware.
- If you do not have a wrist strap, before 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.
- Keep all electronic components in the shipping container or envelope until you are ready to install them.
- If you remove and reinstall an electronic component, temporarily place the component on an ESD pad or blanket, if available.

To remove and install a power supply, complete the following steps:

1. Use the location code to find the physical location of the power supply. The location code begins with U5888.001.ssssss, where ssssss is the serial number of the PCIe storage enclosure. Using the serial number, find the PCIe storage enclosure that has the same serial number printed on the label on the front of the enclosure. The fault indicator of the failing power supply should be on. Label the failing power supply and continue with the next step. For more information about location codes, see the service card located in the front of the enclosure or 5888 locations.
2. Determine whether the repair can continue concurrently. To continue the repair concurrently, the second power supply LEDs must be set as follows:
  - The ac power LED (green) is on solid.
  - The dc power LED (green) is on solid.
  - The fault LED (amber) is off.

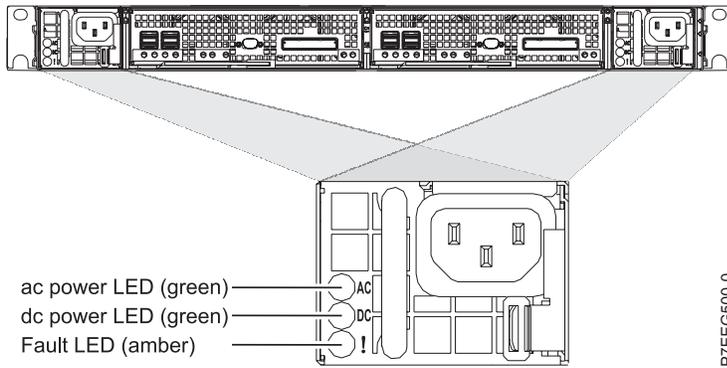


Figure 19. Rear view of power supply

3. If any of these conditions are not true, begin with **The power supply will be serviced nonconcurrently**. Otherwise, continue with **The power supply will be serviced concurrently**.
  - **The power supply will be serviced concurrently.**  
Do not remove power from the working power supply during this procedure. Remove the cable tie that secures the power cable to the cable management bracket. Remove the power cable from the power supply to be removed. Go to step 4.
  - **The power supply will be serviced nonconcurrently.**  
Power off the system or systems that are using the PCIe storage enclosure. Remove the cable tie that secures the power cable to the cable management bracket. Remove the power cables from both the power supplies. Go to step 4.
4. Remove the power supply:
  - a. While pressing the orange release tab to the left, grasp the handle and gently slide the power supply partially out of the slot.
  - b. Pull the power supply out from the slot, making sure that you support the bottom of the power supply.

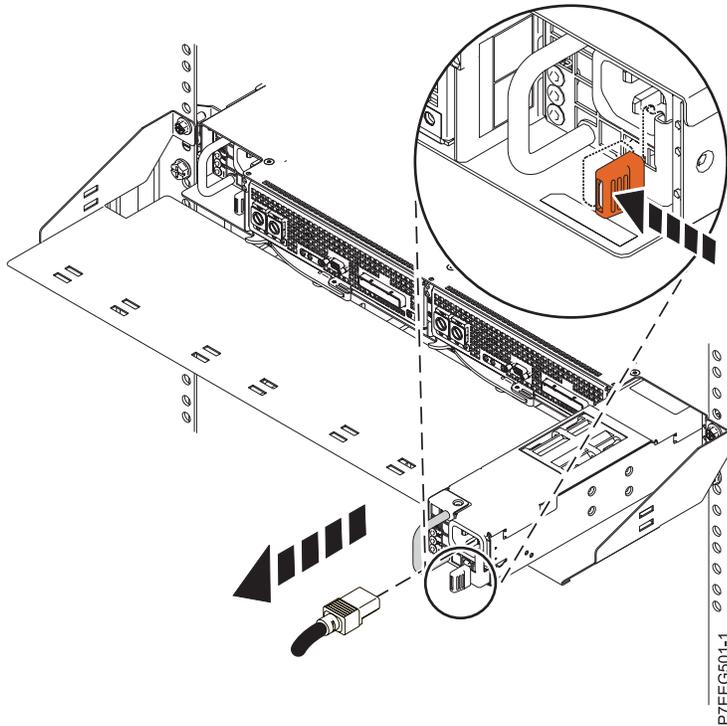


Figure 20. Removing the power supply

5. Install the power supply:
  - a. Gently slide the power supply into the enclosure until the orange release tab latches.
  - b. Reconnect the power cable to the power supply. Secure the power cable to the cable management bracket by using a cable tie. If this service action was a nonconcurrent repair, reconnect the power cable to the other power supply, secure the power cable to the cable management bracket by using a cable tie, and power on the system or systems.

**Note:** Ensure that the ac and dc power (green) LEDs are lit and that the fault (amber) LED is off.

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## **Electronic emission notices**

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## **Class A Notices**

The following Class A statements apply to the IBM servers that contain the POWER7<sup>®</sup> processor and its features unless designated as electromagnetic compatibility (EMC) Class B in the feature information.

## **Federal Communications Commission (FCC) statement**

**Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this

equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

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

### **Industry Canada Compliance Statement**

This Class A digital apparatus complies with Canadian ICES-003.

### **Avis de conformité à la réglementation d'Industrie Canada**

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

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European Community contact:  
IBM Deutschland GmbH  
Technical Regulations, Department M372  
IBM-Allee 1, 71139 Ehningen, Germany  
Tele: +49 7032 15 2941  
email: lugi@de.ibm.com

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VCCI-A

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**Japanese Electronics and Information Technology Industries Association (JEITA)  
Confirmed Harmonics Guideline (products less than or equal to 20 A per phase)**

高調波ガイドライン適合品

**Japanese Electronics and Information Technology Industries Association (JEITA)  
Confirmed Harmonics Guideline with Modifications (products greater than 20 A per phase)**

高調波ガイドライン準用品

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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。

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種情況下，使用者會被要  
求採取某些適當的對策。

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**IBM Taiwan Contact Information:**

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台北市松仁路7號3樓  
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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 Regulations, Abteilung M372  
IBM-Allee 1, 71139 Ehningen, Germany  
Tel: +49 7032 15 2941  
email: lugi@de.ibm.com

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- 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.

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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.

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Armonk, New York 10504  
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