

5887 removal and replacement
procedures

ESCALA Power7



REFERENCE
86 A1 66FG 02

ESCALA Power7

5887 removal and replacement procedures

The ESCALA Power7 publications concern the following models:

- Bull Escala E5-700 (Power 750 / 8233-E8B)
- Bull Escala M6-700 (Power 770 / 9117-MMB)
- Bull Escala M6-705 (Power 770 / 9117-MMC)
- Bull Escala M7-700 (Power 780 / 9179-MHB)
- Bull Escala M7-705 (Power 780 / 9179-MHC)
- Bull Escala E1-700 (Power 710 / 8231-E2B)
- Bull Escala E1-705 (Power 710 / 8231-E1C)
- Bull Escala E2-700 / E2-700T (Power 720 / 8202-E4B)
- Bull Escala E2-705 / E2-705T (Power 720 / 8202-E4C)
- Bull Escala E3-700 (Power 730 / 8231-E2B)
- Bull Escala E3-705 (Power 730 / 8231-E2C)
- Bull Escala E4-700 / E4-700T (Power 740 / 8205-E6B)
- Bull Escala E4-705 (Power 740 / 8205-E6C)

References to Power 755 / 8236-E8C models are irrelevant.

Hardware

October 2011

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Contents

Safety notices	v
Removal and replacement procedures	1
Removing and installing a disk drive	3
Removing and installing an enclosure services manager	4
Removing and installing a midplane	6
Removing and installing a power supply	8
Notices	11
Trademarks	12
Electronic emission notices	12
Class A Notices	12
Class B Notices	16
Terms and conditions	19

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)

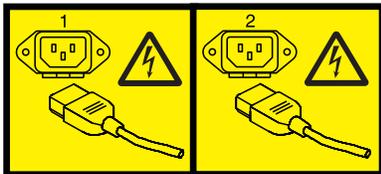
(L001)



(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.

Removal and replacement procedures

Use the removal and replacement procedures when you repair, maintain, or exchange your system parts.

Before you begin a replacement, perform these tasks:

1. If you are performing a replacement procedure that might put your data at risk, ensure, if possible, that you have a current backup of your system or logical partition (including operating systems, licensed programs, and data).
2. Review the installation or replacement procedure for the feature or part.
3. Note the significance of color on your system.
Blue or *terra-cotta* on a part of the hardware indicates a touch point where you can grip the hardware to remove it from or install it in the system, open or close a latch, and so on. *Terra-cotta* might also indicate that the part can be removed and replaced with the system or logical partition power on.
4. Ensure that you have access to a Phillips screwdriver.
5. If parts are incorrect, missing, or visibly damaged, contact your service provider or next level of support.

DANGER

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

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

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

To Disconnect:

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

To Connect:

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

(D005)

Attention: Failure to follow the 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 disk drive

You can service a disk drive concurrently.

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 a disk drive from the disk drive enclosure, complete the following steps:

1. Slide the orange release latch up gently to unlock the drive handle.
2. Grasp the handle and pull the drive partially out of the slot.
3. Grasp the front of the disk drive and pull it out from the slot, making sure that you support the bottom of the disk drive.

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

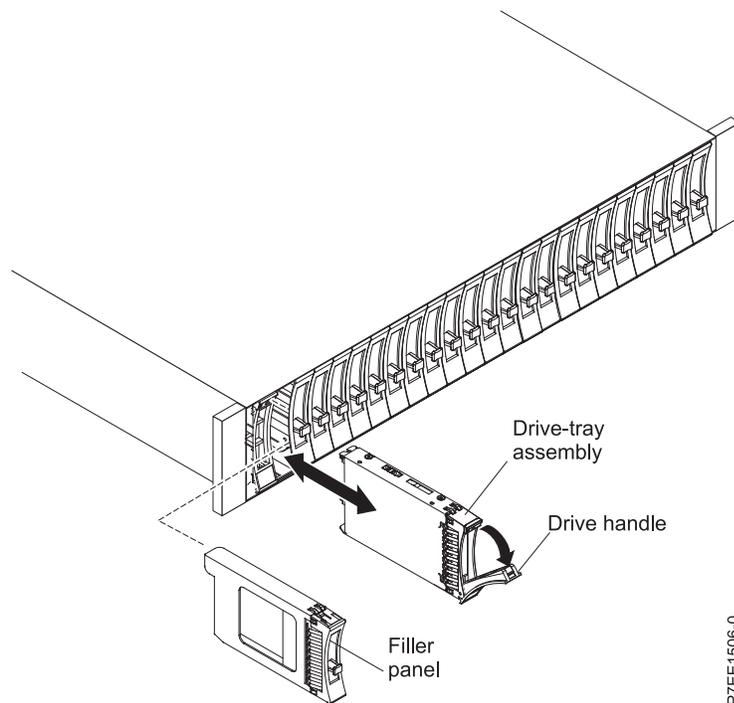


Figure 1. Removing a disk drive from the disk drive enclosure

To install a disk drive in the disk drive enclosure, complete the following steps:

1. With the handle in the unlocked position, support the bottom of the disk drive as you align it with the guide rails in the disk drive enclosure.

- Note:** Do not hold the disk drive only by the handle.
- Slide the disk drive into the disk drive enclosure until the drive stops.
 - Rotate the handle to the locked position.

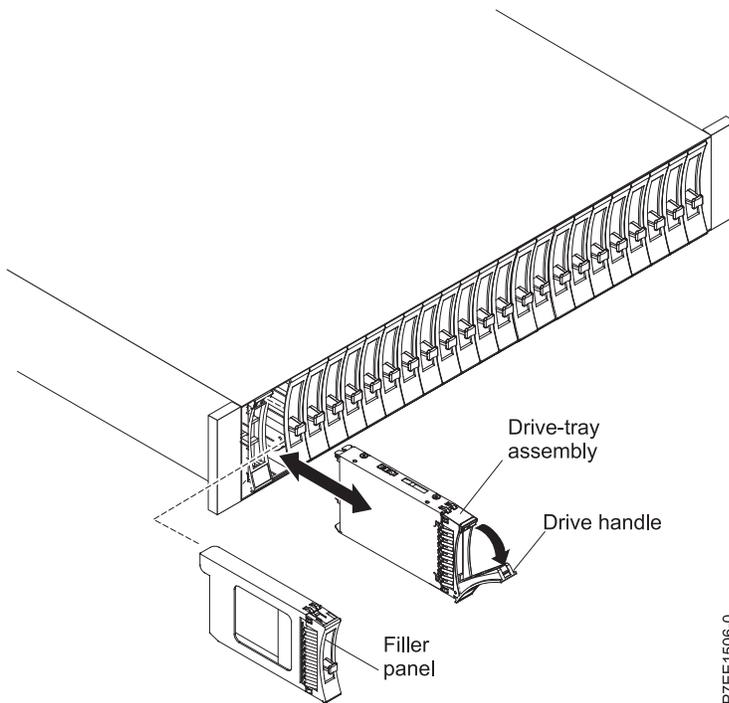


Figure 2. Installing a disk drive in the disk drive enclosure

Removing and installing an enclosure services manager

You can remove and install an enclosure services manager (ESM) concurrently only when its amber fault light is on solid.

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.
- During nonconcurrent replacement, do not combine the replacement of any ESM with the replacement of the midplane unless there has been a power cycle of the disk drive 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 ESM, complete the following steps:

1. Determine whether the repair can continue concurrently. To continue the repair concurrently, the following conditions must be true:
 - A second ESM must already be installed.

- The amber fault light of the failing ESM must be solid on.
2. If any of these conditions are not true, continue the repair only after powering off the unit containing the FRU that is being repaired, and begin with **The ESM will be serviced nonconcurrently**. Otherwise, continue with **The ESM will be serviced concurrently**.
 - **The ESM will be serviced concurrently.**
Go to step 3.
 - **The ESM will be serviced nonconcurrently.**
Power off the system or partition that is using the disk drive enclosure. Remove power from both power supplies of the disk drive enclosure. Go to step 3.
 3. Remove the ESM:
 - a. Disconnect the serial-attached SCSI (SAS) cable or cables from the ESM and mark each cable label with its location.
Attention: Incorrect cable placement might result in data loss.
 - b. Open the two release levers.
 - c. Support both sides of the ESM while you slide it out of the enclosure.

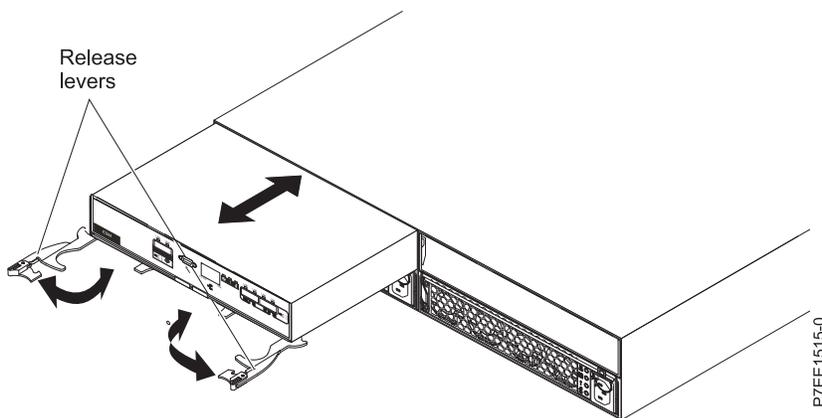


Figure 3. Removing an ESM from the disk drive enclosure

4. Install the ESM:
 - a. Ensure that the release levers on the new ESM are in the open position.
 - b. Gently slide the ESM into the enclosure until the ESM stops.
 - c. Push the release levers to the closed position.
 - d. Reconnect the SAS cable or cables to the ESM using the location information marked on each cable in step 3a.
Attention: Incorrect cable placement might result in data loss.
 - e. If this service action was a nonconcurrent repair, restore power to the power supplies of the disk drive enclosure and power on the system or partition.

Note: To prevent loss of enclosure information, do not replace both ESMs at the same time with the power off. To replace the second ESM nonconcurrently, restore power first. Then remove power and replace the ESM.

Removing and installing a midplane

You can service the midplane nonconcurrently.

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.
- Replace only the midplane FRU in this procedure until power has been applied to the disk drive enclosure with the new midplane installed. The original enclosure services managers (ESMs) must be used in this procedure to preserve the serial number.

To remove and install a midplane, complete the following steps:

1. Remove power to the disk drive enclosure to service the midplane. Removing power to the disk drive enclosure might require powering off the system or partition that is using the disk drive enclosure. Remove power from both power supplies of the disk drive enclosure.
2. Carefully remove each disk drive and label it with the slot from which it was removed. See “Removing and installing a disk drive” on page 3. After the midplane is replaced, the disk drives must be inserted back into the same slots from which they were removed.
3. Remove the two power supplies. For instructions, see “Removing and installing a power supply” on page 8.
4. Label and remove all SAS cables to the ESMs.
5. Remove both ESMs. For instructions, see “Removing and installing an enclosure services manager” on page 4.
6. Remove the bezels and unscrew the drawer from the rack.
7. Remove the midplane assembly screws.
 - a. Remove the enclosure from the rack, turn it upside down, and place the enclosure on a flat surface.
 - b. Using the correct size screwdriver, remove the two screws from the bottom of the enclosure. Label these screws as to the location from which they are removed and place them aside.
 - c. Turn the enclosure top side up and place it on a flat surface. Remove the four beveled screws on the right and left sides that secure the midplane assembly to the front of the enclosure. Label the four screws with the location from which they are removed and place them aside.
 - d. Remove the four screws on the right and left sides of the enclosure that secure the midplane assembly to the chassis. Label the four screws with the location from which they are removed and place them aside.

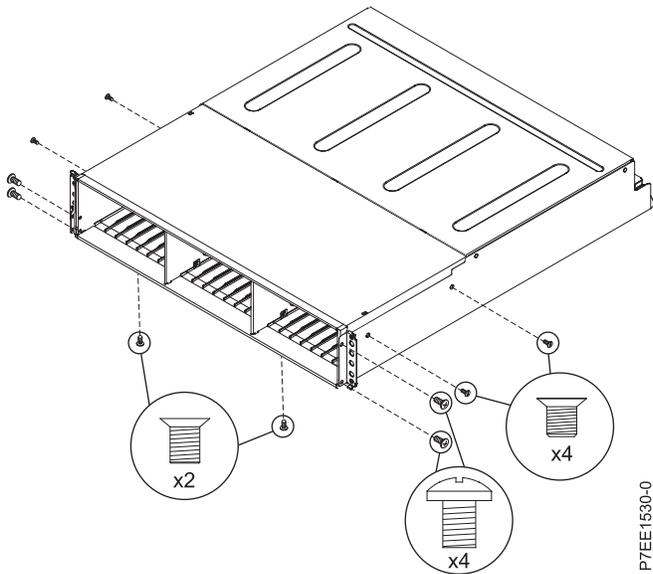
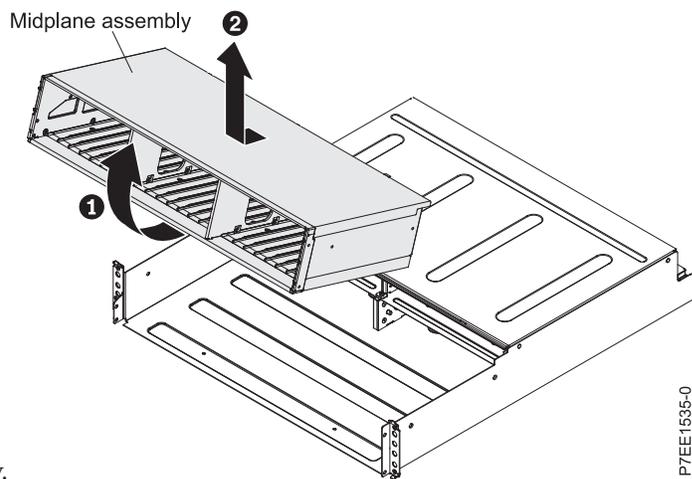
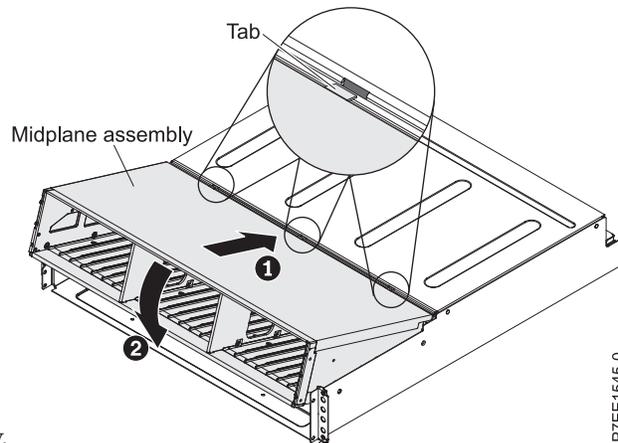


Figure 4. Removing the midplane assembly screws



8. Remove the midplane assembly.
 - a. Rotate the midplane assembly up about 45 degrees.
 - b. Lift the midplane assembly out of the enclosure.



9. Install the midplane assembly.
 - a. Grasp the midplane assembly with two hands and hold it at a 45 degree angle.

- b. Insert the three tabs on the midplane assembly into the tab holes in the enclosure and rotate the front of the assembly down.
10. Install the midplane assembly screws.
 - a. Secure the midplane assembly to the chassis on both the right and left sides of the enclosure by using the four screws that you removed earlier in step 7d.
 - b. Insert the four beveled screws that secure the midplane assembly to the front of the enclosure by using the four screws that you removed earlier in step 7c.
 - c. Turn the enclosure upside down and insert the two screws on the bottom of the enclosure by using the two screws that you removed in step 7b.
 - d. Turn the enclosure top side up and install the enclosure in the rack.
11. Screw the drawer into the rack and install bezels.
12. Install both of the original ESMs. For instructions, see “Removing and installing an enclosure services manager” on page 4.
13. Install SAS cables to the ESMs.
14. Install both original power supplies. For instructions, see “Removing and installing a power supply.”
15. Install the disk drives making sure that each disk drive is inserted back into the same slot from which it was removed. For instructions, see “Removing and installing a disk drive” on page 3.
16. Restore power to the power supplies of the disk drive enclosure and power on the system or partition.
17. Check the LEDs to make sure that the enclosure is fully operational.

Removing and installing a power supply

You can remove and install a power supply concurrently or nonconcurrently.

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. Determine whether the repair can continue concurrently. To continue the repair concurrently, the following conditions must be true:
 - A second power supply must already be installed.
 - The second power supply LEDs must be set as follows:
 - The dc power LED (green) is on solid.
 - The fault LED (amber) is off.
 - The ac power LED (green) is on solid.

Note: If you decide to remove and replace the failing power supply with the power on, the procedure must be performed in less than 15 minutes to prevent overheating.

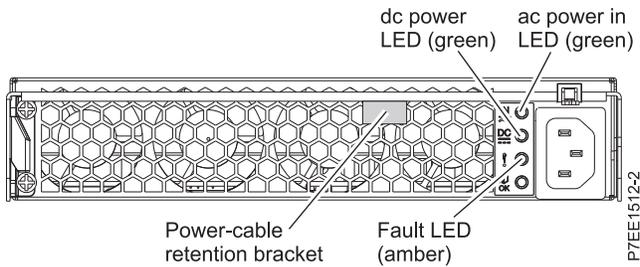


Figure 5. Rear view of power supply

2. If any of these conditions are not true, continue the repair only after powering off the unit containing the FRU that is being repaired, and 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 power-cable retention bracket. Label and remove the power cable from the power supply to be removed. Go to step 3.

- **The power supply will be serviced nonconcurrently.**

Power off the system or partition that is using the disk drive enclosure. Remove the power-cable retention brackets. Label and remove the power cables from the power supplies of the disk drive enclosure. Go to step 3.

3. Remove the power supply:

Note: If you are removing the power supply with the power on, this operation must be performed within 15 minutes to prevent overheating.

- a. On the left side of the power supply, press the orange release tab to the right, just enough to release the handle as you rotate the handle downward.
- b. Using the handle, gently slide the power supply out of the enclosure, supporting the bottom.

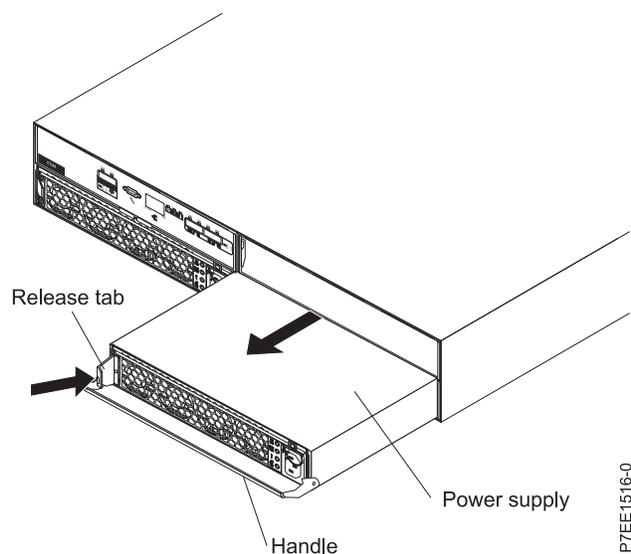


Figure 6. Removing the power supply

4. Install the power supply:

- a. Hold the replacement power supply so that the handle is fully extended downward.
- b. Gently slide the power supply into the enclosure until it stops.

- c. Rotate the handle upward into the closed position until it clicks.
- d. Reconnect the power cable to the power supply. Install the power-cable retention bracket.

Note: After the power cord is reconnected, ensure that the ac and dc power (green) LEDs are lit and that the fault (amber) LED is off.

- e. If this service action was a nonconcurrent repair, reconnect the power cable to the other power supply, install the power-cable retention bracket, and power on the system or partition.

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Ethernet connection usage restriction

This product is not intended to be connected directly or indirectly by any means whatsoever to interfaces of public telecommunications networks.

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Electronic emission notices

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

Class A Notices

The following Class A statements apply to the IBM servers that contain the POWER7[®] 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.

European Community Compliance Statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

European Community contact:
IBM Deutschland GmbH
Technical Regulations, Department M456
IBM-Allee 1, 71139 Ehningen, Germany
Tele: +49 7032 15-2937
email: tjahn@de.ibm.com

Warning: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

VCCI Statement - Japan

この装置は、クラスA 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI-A

The following is a summary of the VCCI Japanese statement in the box above:

This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

**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

Electromagnetic Interference (EMI) Statement - People's Republic of China

声 明

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

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

Electromagnetic Interference (EMI) Statement - Taiwan

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user will be required to take adequate measures.

IBM Taiwan Contact Information:

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

Electromagnetic Interference (EMI) Statement - Korea

이 기기는 업무용(A급)으로 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Germany Compliance Statement

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

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

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

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:

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

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A

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

Verantwortlich für die 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 M456
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 7032 15-2937
email: tjahn@de.ibm.com

Generelle Informationen:

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

Electromagnetic Interference (EMI) Statement - Russia

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

Class B Notices

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

Federal Communications Commission (FCC) statement

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

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

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

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

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM-authorized dealers. IBM is not responsible for

any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate this equipment.

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

Industry Canada Compliance Statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

European Community Compliance Statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication equipment.

European Community contact:
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台北市松仁路7號3樓
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Germany Compliance Statement

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

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse B ein.

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Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

**Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von
Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse 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 Regulations, Abteilung M456

IBM-Allee 1, 71139 Ehningen, Germany

Tel: +49 7032 15-2937

email: tjahn@de.ibm.com

Generelle Informationen:

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

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