

Bull ESCALA

Expandable Storage Plus 2104 Models DS4 and TS4
Operator's Guide

Bull



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Expandable Storage Plus 2104 Models DS4 and TS4 Operator's Guide

Hardware

November 2003

**BULL CEDOC
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Safety and environmental notices

This section contains the following information:

- Safety notices and their translations
- Safety inspection procedures for this product
- Environmental notices and statements

Safety notices and their translations

Safety notices are printed in English throughout this document.

A *Danger* notice warns you of conditions or procedures that can result in death or severe personal injury.

A *Caution* warns you of conditions or procedures that can cause personal injury that is neither lethal nor extremely hazardous.

An *Attention* notice warns you of conditions or procedures that can cause damage to machines, equipment, programs, or data.

For translations of the danger and caution notices, see *Expandable Storage Plus 2104 Model DS4 and Model TS4 Translated Safety Notices*, SC26-7558. The notices are listed in numeric order based on their IDs, which are displayed in parentheses, at the end of each notice. See the following examples of danger and caution notices for the location of the ID number.

DANGER

An electrical outlet that is not correctly wired could place a hazardous voltage on the metal parts of the system or the products that attach to the system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. (1)

CAUTION:

Do not insert hands or tools into the opening of the empty space that contained the fan assembly. (1)

Electrostatic discharge (ESD)

Attention: When you handle field-replaceable units (FRUs) and other computer parts, take these precautions to avoid static damage:

- Limit your movement. Movement can cause static electricity to build up around you.
- Always touch the computer parts carefully. Hold the cards by their edges or metal cover. Never touch any exposed circuits.
- Prevent people who are not correctly grounded from touching computer parts.
- Before you install a new part, touch the static-protective package that contains the part against an unpainted metal part of the 2104 Model DS4, 2104 Model TS4, or host system for at least 2 seconds. This reduces the static electricity in the package and in your body.
- Remove the part from its package and, if possible, install it directly into the 2104 Model DS4 or Model TS4 without putting the part down. If you must put the part down, follow these steps:
 1. Place the static-protective package that contained the part onto a smooth, level surface.
 2. Place the part onto the static-protective package. Do not place the part directly onto any metal surface.

Safety inspection procedures

The safety inspection procedures describe how to inspect the 2104 Model DS4 or Model TS4.

CAUTION:

The 2104 Model DS4 and Model TS4 are designed to be installed by the customer and are certified as customer setup. Make sure that the system or rack into which the 2104 Model DS4 and Model TS4 will be installed is also designed and certified for customer setup. If the 2104 Model DS4 and Model TS4 are not, then they must be installed by a CE. (22)

Inspecting the rack

Refer to your rack installation manual for information about performing a safety inspection on the rack.

Inspecting the 2104 Model DS4 or Model TS4

Perform the following safety checks to identify unsafe conditions.

External machine checks

Perform the following external machine checks:

1. Check the chassis for damage (loose, broken, or sharp edges).
2. Check the power cables and ensure that the insulation is not worn or damaged.
3. Check for any obvious nonstandard changes. Use good judgment about the safety of any such changes.
4. Verify that all external covers are present and are not damaged.
5. Ensure that all latches and hinges are in correct operating condition.
6. Check the power cable for damage.
7. Check for worn, damaged, or pinched cables.
8. Inspect the fan-and-power-supply assemblies. Check that the fasteners in the cover of the power-supply unit (screws or rivets) have not been removed or disturbed.
9. Check the external signal cable for damage.
10. Check the cover for sharp edges, damage, or alterations that expose the internal parts of the device.
11. Correct any problems that you find.

Internal machine checks

Perform the following internal machine checks:

1. Check for any non-IBM changes that might have been made to the machine. If any are present, obtain the “Non-IBM Alteration Attachment Survey” form, number R009, from the IBM branch office. Complete the form, and return it to the branch office.
2. Check the condition of the inside of the machine for:
 - Metal or other contaminants
 - Indications of water or other fluid
 - Fire
 - Smoke damage
3. Check for any obvious mechanical problems, such as loose components.
4. Check any exposed cables and connectors for wear, cracks, or pinching.

Safety label checks

Perform the following safety label checks:

1. Verify that the label is installed on the 2104 Model DS4 or Model TS4. See Figure 1.

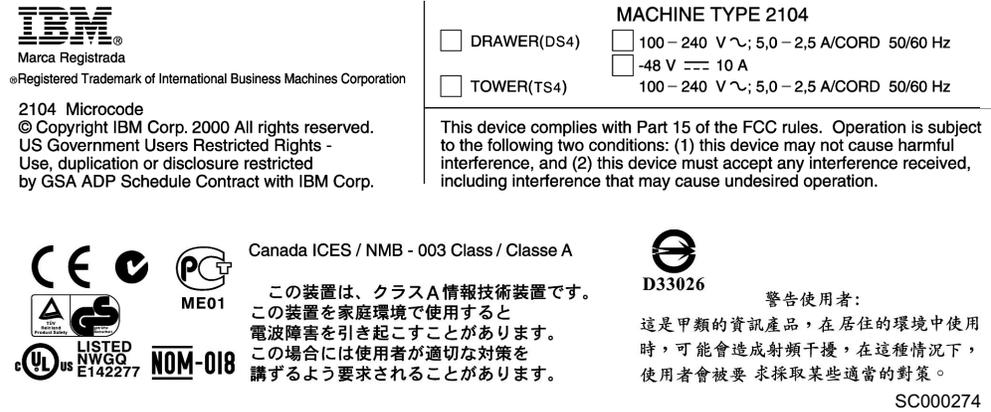


Figure 1. 2104 Model DS4 or Model TS4 label

2. Verify that the linecord caution label is installed on the 2104 Model DS4 or Model TS4 power supply. See Figure 2.

CAUTION:

This unit might have two linecords. To remove all power, disconnect both linecords. (1)

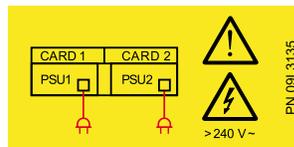


Figure 2. Linecord caution label

3. Verify that the power supply cover caution label is installed on the 2104 Model DS4 or Model TS4 power supply. See Figure 3.

CAUTION:

Do not remove cover, do not service, no serviceable parts. (2)



Figure 3. Power supply cover caution label

4. Verify that the fusing caution label is installed on the 2104 Model DS4 or Model TS4 power supply. See Figure 4.

CAUTION:

Double Pole/Neutral Fusing. (3)

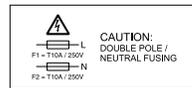


Figure 4. Fusing caution label

5. Verify that the weight label is installed on the 2104 Model DS4. See Figure 5.

CAUTION:

This unit weighs over 32 Kg (70.5 lbs). Refer to manuals. (4)



SC000220

Figure 5. 2104 Model DS4 weight label

CAUTION:

If a 2104 Model DS4 is fully loaded with 14 drives and two power supplies, its total weight exceeds 32 Kg (70.5 lbs). You must remove at least six drives from the 2104 Model DS4 before you lift it or install it into a rack or 2104 Model TS4. This reduces the total weight to less than 32 Kg (70.5 lbs) and the 2104 Model DS4 can then be safely handled by two people. Failure to do so can result in injury.

Attention:

If you have data stored on the drives, label the drives before you remove them. When you replace the drives, install each one in the same drive bay from which you removed it. Failure to do so could result in a loss of data.



≥ 18 Kg (37 lbs)



≥ 32 Kg (70.5 lbs)

SC000334

6. Verify that the weight label is installed on the 2104 Model TS4. See Figure 6.

CAUTION:

This unit weighs between 32 Kg - 55 Kg (70.5 lbs - 121.2 lbs) . (5)



Figure 6. 2104 Model TS4 weight label

CAUTION:

The provided cardboard lifting tool is required for moving, installing, and relocating the product when fully populated. Three people are required to safely move the product. Failure to do so might result in injury.

In case the lifting tool is not readily available, you must reduce the weight to 32 Kg or less by removing all of the heavy components (disk drives and power supplies) from the product. Then only two people are required to move, install, and relocate the product. (6)

Attention:

If you have data stored on the drives, label the drives before you remove them. When you replace the drives, install each one in the same drive bay from which you removed it. Failure to do so could result in a loss of data.



≥ 18 Kg (37 lbs)



≥ 32 Kg (70.5 lbs)

SC000325

7. Verify that the standby condition label is installed on the 2104 Model DS4 or Model TS4. See Figure 7.

CAUTION:

A standby condition is indicated by the symbol to the right of the DC directly above the switch, SW1. When SW1 is toggled to the right position directly under the standby symbol, the unit's ac-power is not shut off. (7)

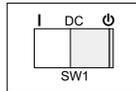


Figure 7. Standby condition label

Checking the grounding of the 2104 Model TS4

Perform the following steps to check the grounding of the 2104 Model TS4:

1. Ensure that a power cable is plugged into each power socket **1**. See Figure 8.

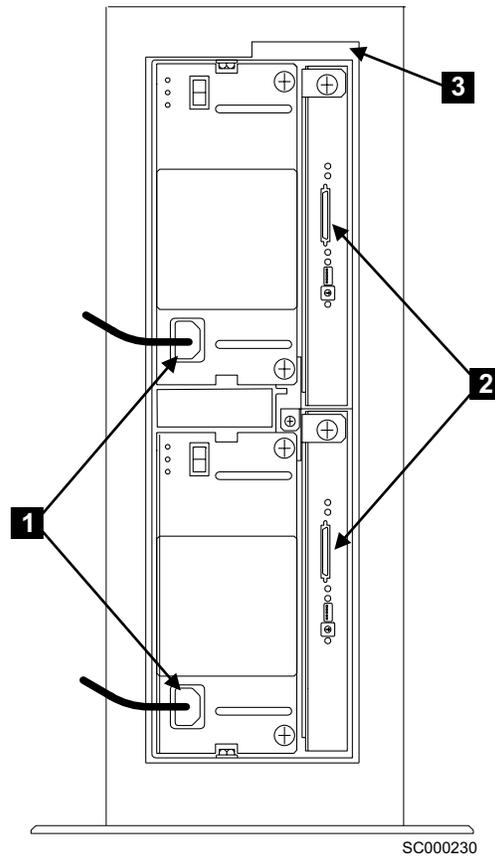


Figure 8. Power cables and SCSI connectors (2104 Model TS4)

2. Ensure that the other ends of the power cables are *not* plugged into electrical power outlets. Unplug the cables if necessary.

3. **Attention:** Some electrical circuits could be damaged if the external SCSI cables are connected to the 2104 Model TS4 while the grounding check is being done.
Ensure that no external SCSI cables are connected at the SCSI connectors **2**. See Figure 8 on page xv.
4. Check for continuity between the chassis of the 2104 Model TS4 **3** and the ground pin of each power cable.
 - a. Check the power cables and ensure that the third-wire ground connector is in good condition.
 - b. Use a meter to check that the third-wire ground continuity is 0.1 ohm or less between the external ground pin and the chassis ground.
5. If the continuity is good, the grounding check is complete.
6. If the grounding is not correct, unplug the power cables from the mainline power connectors.
 - a. Check each power cable for continuity.
 - b. If either power cable is failing, exchange it for a new one.
 - c. Check for continuity between the chassis of the 2104 Model TS4 and the ground pin **1** of the power connector on each fan-and-power-supply assembly. See Figure 9.

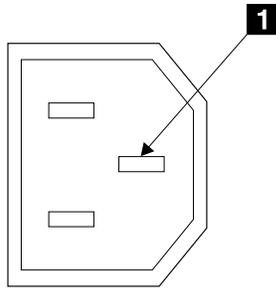


Figure 9. Ground pin (2104 Model TS4)

- d. If either fan-and-power-supply assembly does not have continuity, exchange that assembly for a new one. (See the section about fan and power supply assemblies in *Expandable Storage Plus 2104 Model DS4 and Model TS4 Service Guide*.)

Perform step 1 on page xv through step 6d to complete the grounding check again.

Removing power from the 2104 Model DS4 or Model TS4

Removing power from a 2104 Model DS4

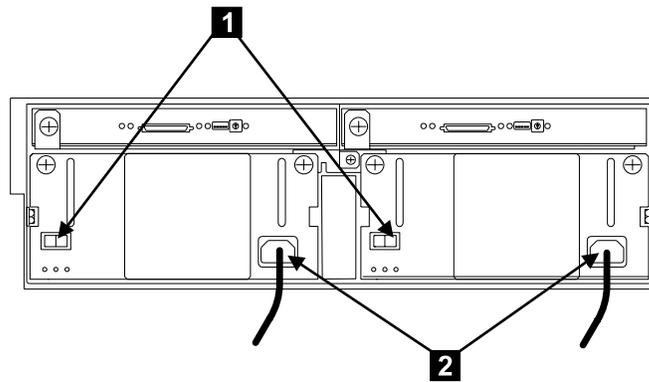
Note: Unless you have a particular reason to do so, do not remove power from the host system or from the 2104 Model DS4 unless the instructions that you are following tell you to.

Perform the following steps to remove the power from a 2104 Model DS4:

1. Verify with the customer that all operations between the 2104 Model DS4 and the host system have stopped.
2. Set the dc on/standby switch **1** of each fan-and-power-supply assembly to standby. See Figure 10.

Notes:

- a. Some 2104 Model DS4s have a fan-and-power-supply assembly and a fan assembly. The fan assembly has no dc on/standby switch.
- b. A fan-and-power-supply assembly might have its CHK light on although its dc on/standby switch is set to standby.



SC000206

Figure 10. Removing the power from a 2104 Model DS4

3. DANGER

In the following step you are going to remove the power cables. These cables are live if the rack power distribution unit or uninterruptible power supply (UPS) unit is still switched on. (1)

Remove the power cables **2** from the back of the 2104 Model DS4. See Figure 10 on page xvii.

4. Perform the following steps to return power to the 2104 Model DS4:
 - a. Reinstall the power cables **2**.
 - b. Set the dc on/standby switch **1** of each fan-and-power-supply assembly to on.

Note: You can configure the motor-start sequencing of the 2104 Model DS4. For more information, see the sections about the drive autostart switch and the delay motor start mode switch in the *Expandable Storage Plus 2104 Model DS4 and Model TS4 Service Guide*.

Removing power from a 2104 Model TS4

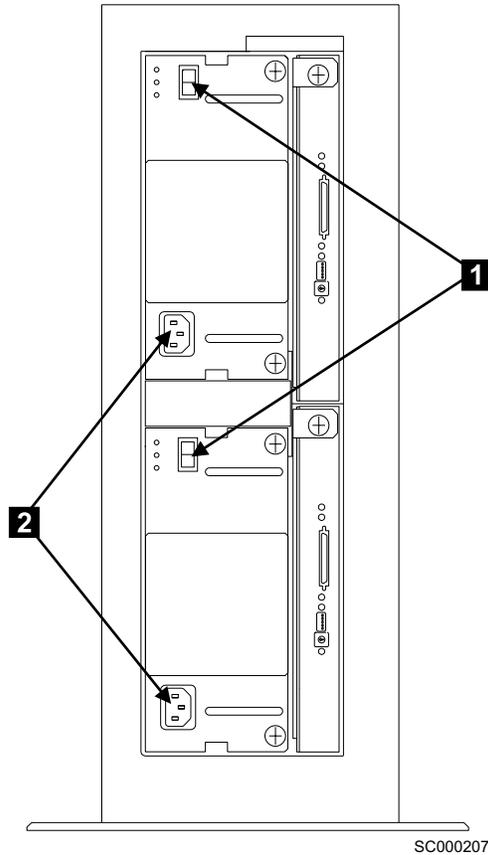
Note: Unless you have a particular reason to do so, do not remove power from the host system or from the 2104 Model TS4 unless the instructions that you are following tell you to.

Perform the following steps to remove the power from a 2104 Model TS4:

1. Verify with the customer that all operations between the 2104 Model TS4 and the host system have stopped.
2. At the back of the 2104 Model TS4, set the dc on/standby switch **1** of each fan-and-power-supply assembly to standby. See Figure 11 on page xix.

Notes:

- a. Some 2104 Model TS4s have a fan-and-power-supply assembly and a fan assembly. The fan assembly has no dc on/standby switch.
- b. A fan-and-power-supply assembly might have its CHK light on although its dc on/standby switch is set to standby.



SC000207

Figure 11. Removing power from a 2104 Model TS4

3. Remove the power cables **2** from the electrical power outlet and from the back of the 2104 Model TS4. See Figure 11.
4. Perform the following steps to return power to the 2104 Model TS4:
 - a. Reinstall the power cables **2**.
 - b. Set the dc on/standby switch **1** of each fan-and-power-supply assembly to on.

Note: You can configure the motor-start sequencing of the 2104 Model TS4. For more information, see the sections about the drive autostart switch and the delay motor start mode switch in *Expandable Storage Plus 2104 Model DS4 and Model TS4 Service Guide*.

Danger notices

DANGER

In the following step you are going to remove the power cables. These cables are live if the rack power distribution unit or uninterruptible power supply (UPS) unit is still switched on. (1)

DANGER

Do not try to open the covers of the fan-and-power-supply assembly. (2)

DANGER

Do not plug a power cable into the fan-and-power-supply assembly until the assembly is fully home and its thumbscrews are fully tightened. (3)

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to that system. It is the customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock. During an electrical storm, do not disconnect cables for display stations, printers, telephones, or station protectors for communication lines. (4)

DANGER

During an electrical storm, do not disconnect cables for display stations, printers, telephones, or station protectors for communication lines. (5)

Caution notices

CAUTION:
This unit might have two linecords. To remove all power, disconnect both linecords. (1)

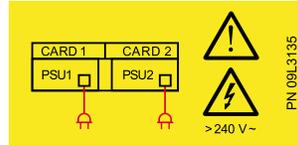


Figure 12. Linecord caution label

CAUTION:
Do not remove cover, do not service, no serviceable parts. (2)

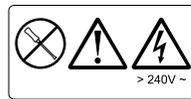


Figure 13. Power supply cover caution label

CAUTION:
Double Pole/Neutral Fusing. (3)

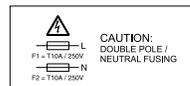


Figure 14. Fusing caution label

CAUTION:
This unit weighs over 32 Kg (70.5 lbs). Refer to manuals. (4)



SC000220

Figure 15. 2104 Model DS4 weight label

CAUTION:
If a 2104 Model DS4 is fully loaded with 14 drives and two power supplies, its total weight exceeds 32 Kg (70.5 lbs). You must remove at least six drives from the 2104 Model DS4 before you lift it or install it into a rack or 2104 Model TS4. This reduces the total weight to less than 32 Kg (70.5 lbs) and the 2104 Model DS4 can then be safely handled by two people. Failure to do so can result in injury.

Attention:
If you have data stored on the drives, label the drives before you remove them. When you replace the drives, install each one in the same drive bay from which you removed it. Failure to do so could result in a loss of data.



≥ 18 Kg (37 lbs)



≥ 32 Kg (70.5 lbs)

SC000334

CAUTION:

This unit weighs between 32 Kg - 55 Kg (70.5 lbs - 121.2 lbs). (5)



Figure 16. 2104 Model TS4 weight label

CAUTION:

The provided cardboard lifting tool is required for moving, installing, and relocating the product when fully populated. Three people are required to safely move the product. Failure to do so might result in injury.

In case the lifting tool is not readily available, you must reduce the weight to 32 Kg or less by removing all of the heavy components (disk drives and power supplies) from the product. Then only two people are required to move, install, and relocate the product. (6)

Attention:

If you have data stored on the drives, label the drives before you remove them. When you replace the drives, install each one in the same drive bay from which you removed it. Failure to do so could result in a loss of data.



≥ 18 Kg (37 lbs)



≥ 32 Kg (70.5 lbs)

SC000325

CAUTION:

A standby condition is indicated by the symbol to the right of DC directly above the switch, SW1. When you toggle SW1 to the right position directly under the standby symbol, the ac-power to the unit is not shut off. (7)

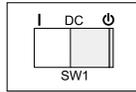


Figure 17. Location of standby condition

CAUTION:

The stabilizer must be correctly attached to the bottom front of the rack to prevent the rack from tipping forward while the 2104 Model DS4 is being removed from the rack. Do not pull out or install any unit if a stabilizer is not attached to the rack. (8)

CAUTION:

The stabilizer must be correctly attached to the bottom front of the rack to prevent the rack from tipping forward while the 2104 Model DS4 is being installed into the rack. Do not remove or install any unit if a stabilizer is not attached to the rack. (9)

CAUTION:

Do not insert hands or tools into the empty space that contained the fan assembly. (10)

CAUTION:

Do not insert hands or tools into the empty space that contained the fan-and-power-supply assembly. (11)

CAUTION:

Do not insert hands or tools into the empty space that contained the SCSI interface card assembly. (12)

CAUTION:

This product is equipped with a 3-wire power cable and plug for the user's safety. Use this power cable in conjunction with a correctly grounded electrical outlet to avoid an electrical shock. (13)

CAUTION:

Do not touch the power outlet or the power outlet face plate with anything other than test probes before you complete this safety check. (14)

CAUTION:

If the reading is not infinity, do not proceed. Make the necessary corrections to the wiring before you continue. Do not switch on the branch circuit CB until you satisfactorily complete the previous steps. (15)

CAUTION:

Do not use the handles of the fan or fan-and-power-supply assemblies to carry the 2104 Model DS4. These handles are not intended to support the weight of the unit. (16)

CAUTION:

As you push the assembly fully home, the lever automatically moves toward its closed position. Ensure that your fingers do not become pinched between the lever and the assembly. (17)

CAUTION:

Ensure that the mainline power cable has been removed from the failing fan-and-power supply before you continue. (18)

CAUTION:

Do not insert hands or tools into the empty space above the fan-and-power supply assembly. (19)

CAUTION:

Do not insert hands or tools into the empty space between the power supply assemblies. (20)

CAUTION:

If the 2104 Model DS4 is installed in a Model T00 or T42 rack, you must also observe the safety notices for those racks before you start to remove the frame assembly. You can find the safety notices in the section about system installation in the *7014 Model T00 and T42 Rack Installation and Service Guide*, SA38-0577, or at the following Web site: www-1.ibm.com/servers/eserver/pseries/library/hardware_docs/7014_t00.html (21)

CAUTION:

The 2104 Model DS4 and Model TS4 are designed to be installed by the customer and are certified as customer setup. Make sure that the system or rack into which the 2104 Model DS4 or Model TS4 will be installed is also designed and certified for customer setup. If they are not, then the 2104 Model DS4 or Model TS4 must be installed by a CE. (22)

CAUTION:

Do not insert hands or tools into the space that contained the card assembly. (23)

CAUTION:

It takes three people to lift the 2104 Model TS4. Do not attempt to lift the 2104 Model TS4 by yourself. Do not attempt to lift it without help from two other people. (24)

CAUTION:

Do not use the handles of the fan or fan-and-power-supply assemblies to carry the 2104 Model TS4. These handles are not intended to support the weight of the unit. (25)

CAUTION:

The 2104 Model DS4 is designed to be installed by the customer and is certified as customer setup. Make sure that the system or rack into which the 2104 Model DS4 will be installed is also designed and certified for customer setup. If they are not, then the 2104 Model DS4 must be installed by a CE. (26)

CAUTION:

The 2104 Model TS4 is designed to be installed by the customer and is certified as customer setup. Make sure that the system into which the 2104 Model TS4 will be installed is also designed and certified for customer setup. If it is not, then the 2104 Model TS4 must be installed by a CE. (27)

Environmental notices and statements

This section describes the environmental notices and statements.

Fire suppression systems

A fire suppression system is the responsibility of the customer. The customer's own insurance underwriter, local fire marshal, or a local building inspector, or both, should be consulted in selecting a fire suppression system that provides the correct level of coverage and protection. IBM designs and manufactures equipment to internal and external standards that require certain environments for reliable operation. Because IBM does not test any equipment for compatibility with fire suppression systems, IBM does not make compatibility claims of any kind nor does IBM provide recommendations on fire suppression systems.

Product recycling

This unit contains recyclable materials. Recycle these materials where processing sites are available and according to local regulations. In some areas, IBM provides a product take-back program that ensures proper handling of the product. Contact your IBM representative for more information.

About this document

This document introduces the Expandable Storage Plus 2104 Model DS4 and Model TS4 (hereafter referred to as the 2104 Model DS4 and Model TS4).

Important: The installation of this product is the responsibility of the customer.

Who should read this document

This document is intended for people who operate a host system that has one or more 2104 Model DS4s or 2104 Model TS4s connected to it.

Throughout this document, the term *service representative* applies to the person that is authorized by your organization to maintain your 2104 Model DS4 or Model TS4.

Additional information

This section contains the following information:

- A list of the documents in the 2104 Model DS4 and Model TS4 library
- A list of the related documents

2104 Model DS4 and Model TS4 library

The following documents contain information related to this product:

- *Expandable Storage Plus 2104 Model DS4 and Model TS4 Hardware Technical Information*, 86 A1 19EM
- *Expandable Storage Plus 2104 Model DS4 and Model TS4 Operator's Guide*, 86 A1 17EM
- *Expandable Storage Plus 2104 Model DS4 Installation Guide*, 86 A1 14EM
- *Expandable Storage Plus 2104 Model TS4 Installation Guide*, 86 A1 15EM
- *Expandable Storage Plus 2104 Model DS4 and Model TS4 Service Guide*, 86 A1 18EM
- *Expandable Storage Plus 2104 Model DS4 and Model TS4 Translated Safety Notices*, 86 X1 16EM

Related documents

The following documents contain information related to this product:

- The operator's guide for your system
- The user's guide for your using system SCSI attachment (for example, your SCSI adapter)
- The site and hardware planning information for your system
- The problem solving guide and reference for your system
- The *7014 Model T00 and T42 Rack Installation and Service Guide*, 86 A1 94HX

The following documents contain information related to the Expandable Storage Plus disk enclosures that attach to the RISC systems:

- *Diagnostic Information for Multiple Bus Systems*, 86 A1 26HX

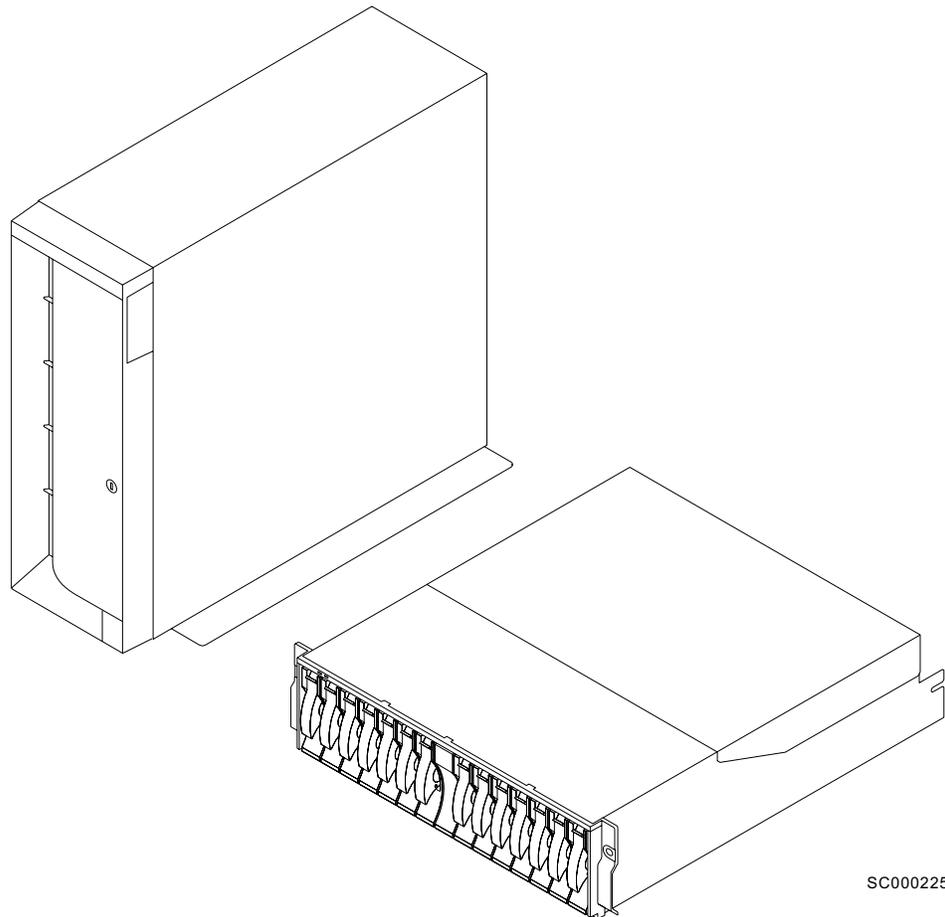
- *Site Preparation for Rack Systems*, 86 A1 30PX
- *Adapters for Multiple Bus Systems*, 86 A1 27HX

Chapter 1. Using the 2104 Model DS4 or Model TS4

Attention: Before you continue with any of the actions described in this book, see “Safety and environmental notices” on page vii.

This section describes the Expandable Storage Plus 2104 Model DS4 and Model TS4, their controls, and how to use them. You can attach a 2104 Model DS4 or Model TS4 to any supported RS/6000™ or IBM® eServer pSeries computer that provides support for any of the Small Computer System Interface (SCSI) adapters listed in “SCSI adapters and cables” on page 69.

Figure 18 shows the 2104 Model DS4 and Model TS4.



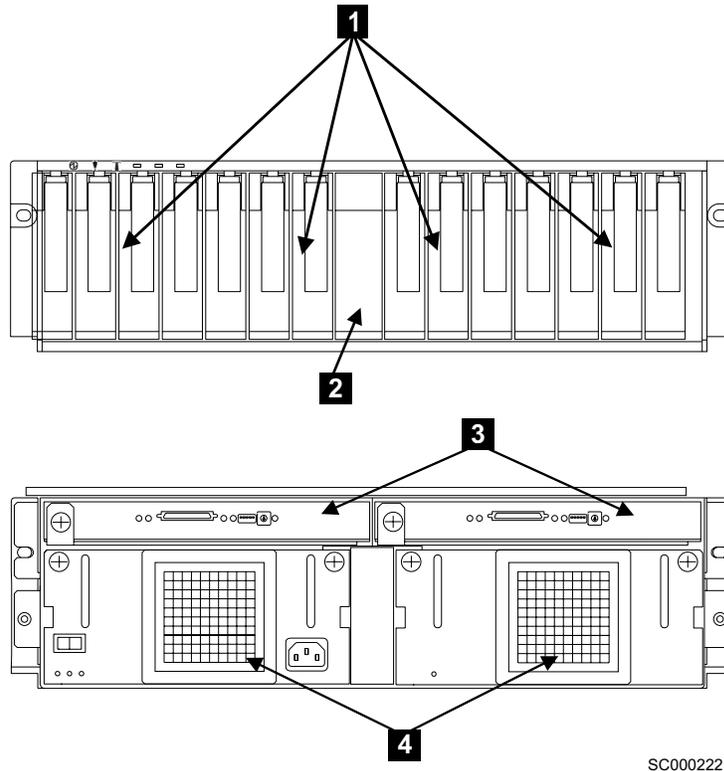
SC000225

Figure 18. 2104 Model TS4 (left) and 2104 Model DS4 (right)

2104 Model DS4

The 2104 Model DS4 is a cabinet-mounted SCSI disk enclosure that you can install into a standard Electrical Industries Association (EIA) 19-in. rack.

Figure 19 shows a fully configured 2104 Model DS4.



SC000222

Figure 19. 2104 Model DS4 shown from the front (top) and back (bottom)

At the front of a 2104 Model DS4, there are 14 device slots **1**. Each slot must contain either a SCSI disk drive module or a dummy disk module. Each disk drive module connects to a backplane, which is mounted vertically about halfway between the front and back of the 2104 Model DS4.

Note: To run input/output (I/O), a minimum of one SCSI disk drive module must be present in each 2104 Model DS4.

The 14 device slots are divided into two groups of 7 slots. Between the two groups of 7 slots, there is a SCSI bridge card **2**. The SCSI bridge card assigns the disk drive modules to a SCSI bus, in accordance with the setting of the SCSI bus split switch.

On the back of the backplane are connectors for two fan-and-power-supply assemblies **4** and two SCSI Interface cards **3**.

The 2104 Model DS4 has either two fan-and-power-supply assemblies, or one fan-and-power-supply assembly and one fan assembly. Either option provides all the necessary power and cooling for the 2104 Model DS4.

Having two fan-and-power-supply assemblies is better than one fan-and-power-supply assembly and one fan assembly because the amount of power required from each power supply is reduced. If one power supply fails, power for the 2104 disk enclosure continues to be supplied by the other power supply.

The SCSI Interface cards **3** connect the host machines to the 2104 Model DS4. These cards contain logic that provides information about what is happening in the 2104 Model DS4 and the status of components within it.

The SCSI Interface cards **3** contain switches that control:

The SCSI Interface cards also contain a rotary switch that sets the ID of the 2104 Model DS4.

- Which SCSI bus mode is selected
- How the 2104 Model DS4 is supplied with power
- What enclosure services are enabled

For more options about how to configure a 2104 Model DS4, see the *Expandable Storage Plus: 2104 Model DS4 Installation Guide*.

2104 Model TS4

The 2104 Model TS4 is a deskside SCSI disk enclosure.

Figure 20 shows a fully configured 2104 Model TS4.

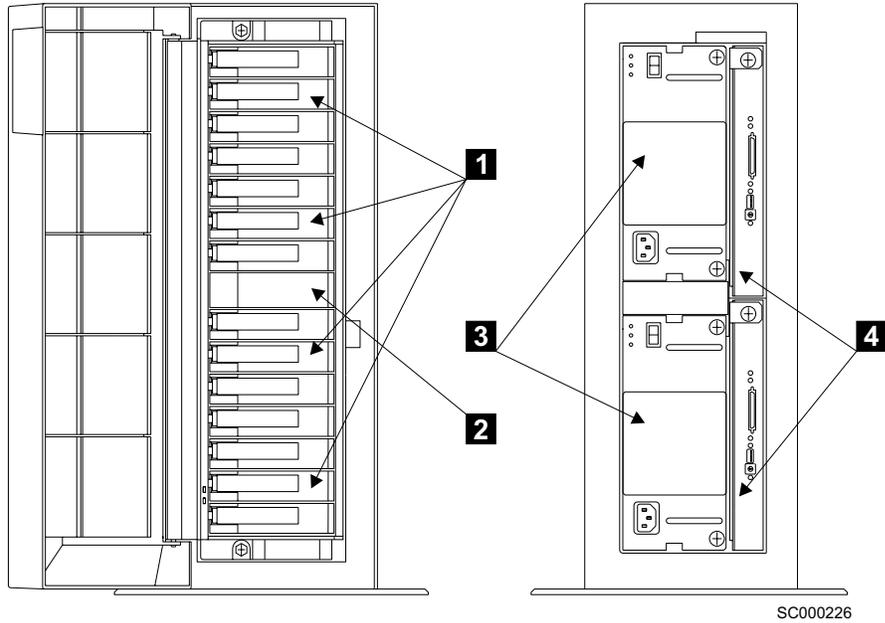


Figure 20. 2104 Model TS4 shown from the front (left) and back (right)

At the front of a 2104 Model TS4, there are 14 device slots **1**. Each slot must contain either a SCSI disk drive module or a dummy disk drive module. Each disk drive module connects to a backplane that is mounted vertically about halfway between the front and back of the 2104 Model TS4.

Note: To run I/O, at least one SCSI disk drive module must be present in each 2104 Model TS4.

The 14 device slots are split into two groups of seven slots. Between the two groups of slots, there is a SCSI bus bridge card **2**. The SCSI bus bridge card assigns the disk drive modules to a SCSI bus, in accordance with the setting of the SCSI bus split switch.

On the back of the backplane are connectors for two fan-and-power-supply assemblies **3** and two SCSI Interface cards **4**.

The 2104 Model TS4 has either two fan-and-power-supply assemblies, or one fan-and-power-supply assembly and one fan assembly. Either option provides all the necessary power and cooling for the 2104 Model TS4.

Having two fan-and-power-supply assemblies is better than one fan-and-power-supply assembly and one fan assembly, because then the amount of power required from each power supply is reduced. If one power supply fails, power for the 2104 Model TS4 disk enclosure continues to be supplied by the other power supply.

The SCSI Interface cards **4** connect the host machines to the 2104 Model TS4. These cards contain logic that provides information about what is happening in the 2104 Model TS4, and controls the operation of the subsystem.

The SCSI Interface cards **4** contain switches that control:

- Which SCSI bus mode is selected
- How the 2104 Model TS4 is supplied with power
- What enclosure services are enabled

The SCSI Interface cards also contain a rotary switch that you use to set the ID of the 2104 Model TS4.

For options about how to configure a 2104 Model TS4, see the *Expandable Storage Plus: 2104 Model TS4 Installation Guide*.

Controls and lights

This section describes the switches and lights on a 2104 Model DS4 and Model TS4.

The 2104 Model DS4 or Model TS4 has no main power switch. However, each fan-and-power-supply assembly has an on/standby switch.

Figure 21 shows the lights on the front of the 2104 Model DS4 and Model TS4.

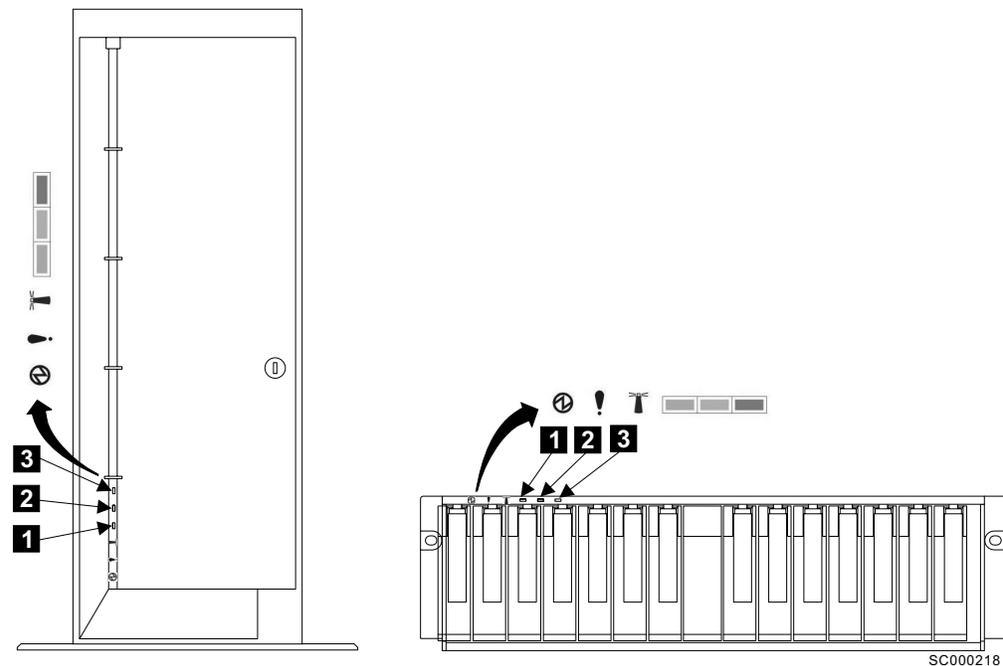


Figure 21. Disk enclosure lights on a 2104 Model TS4 (left) and a 2104 Model DS4 (right)

Power light **1**

The power light, which is green, comes on. It stays on continuously when power is supplied to the 2104 Model DS4 and Model TS4 by one or both of the fan-and-power-supply assemblies within the 2104 Model DS4 and Model TS4.

Check light **2**

The check light, which is amber, comes on if a failure occurs in the 2104 Model DS4 and Model TS4.

Note: The 2104 Model DS4 and Model TS4 might be able to continue operating correctly even when the failure of a single part is detected.

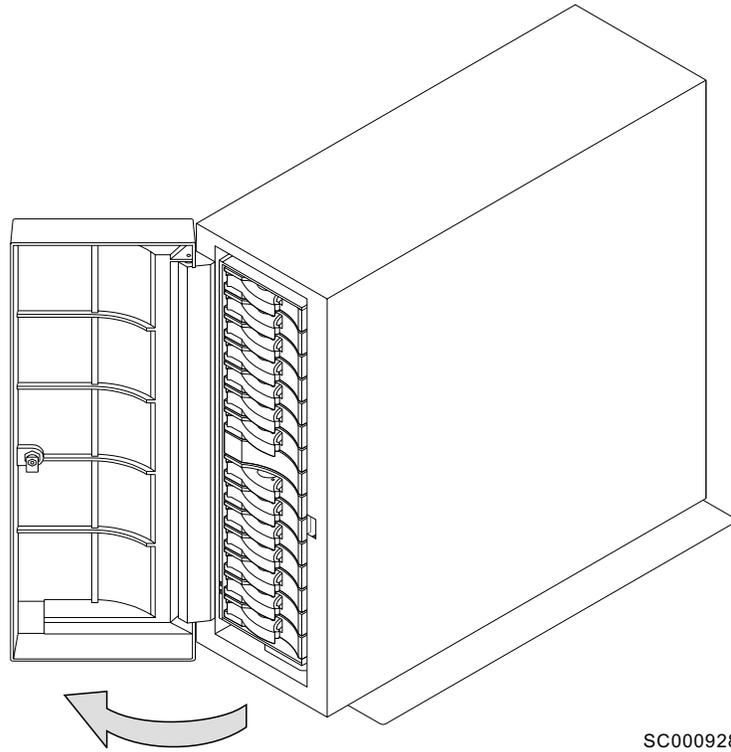
Unit identify light **3**

The unit identify light, which is blue, comes on as a “Unit Identify”. This feature is not used at this time.

Disk drive module lights

Open the front cover of the 2104 Model TS4 to see the lights that are on the disk drive modules. See Figure 22.

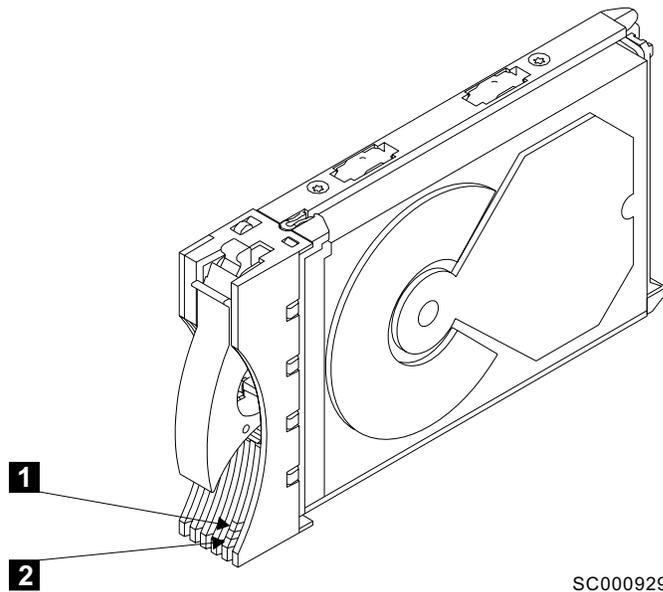
1. Unlock the cover by using the key that was provided.
2. Grip the right-hand side of the front cover, and pivot the cover to the left.



SC000928

Figure 22. 2104 Model TS4 with the cover open

Figure 23 shows the two lights on each disk drive module.



SC000929

Figure 23. Disk drive module lights

1 Activity light

The activity light, which is green, shows the following conditions:

Off The SCSI link to the disk drive is not active.

Flashing

This disk drive module is active, and a command is in progress.

2 Check light

The check light, which is amber, shows the following conditions:

Off Normal operating condition

Permanently On

One of the following conditions:

- The service aid set **Remove** for this disk drive module. For more information, see “Operating with RISC systems,” on page 69.
- The disk drive reported a Predictive Failure Analysis (PFA) error. This error indicates that the disk drive has had an excessive number of internally recovered errors.
- The disk drive is faulty. This is a Conner/Intel SCSI-Accessed Fault-Tolerant Enclosures (SAF-TE) function.

Flashing (2 seconds on, 2 seconds off)

The check light is set by a SCSI service aid to identify the position of this disk drive module.

Flashing (0.25 seconds on, 0.25 seconds off)

The disk drive is part of an array that is being rebuilt (this is a SAF-TE function).

Note: SAF-TE services are not used with RS/6000 or IBM @server pSeries computers.

Fan-and-power-supply assembly and fan assembly lights and switch

Either one or two fan-and-power-supply assemblies **1** are installed in the back of a 2104 Model DS4 or Model TS4.

Figure 24 shows the power switch and the lights at the back of the 2104 Model DS4 or Model TS4.

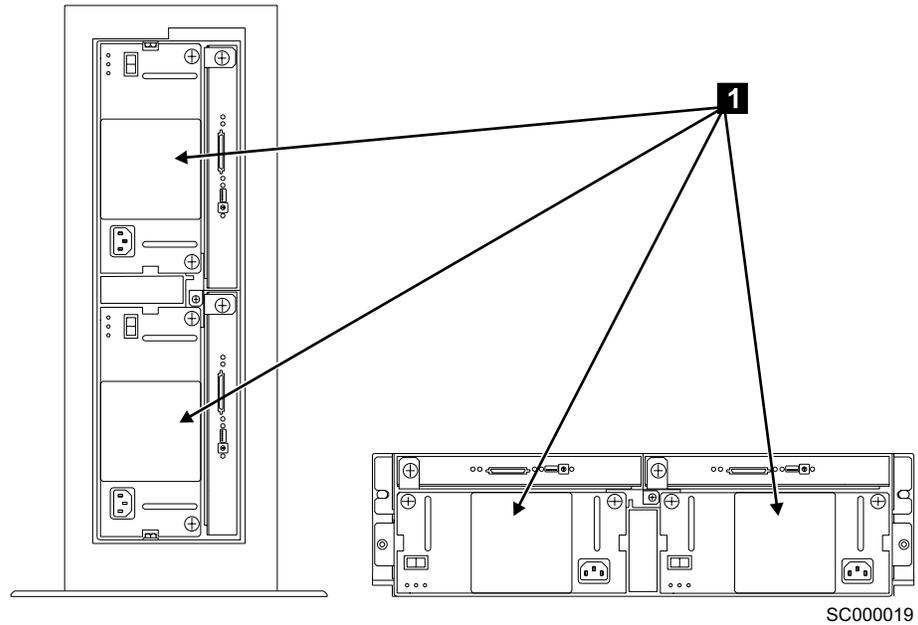
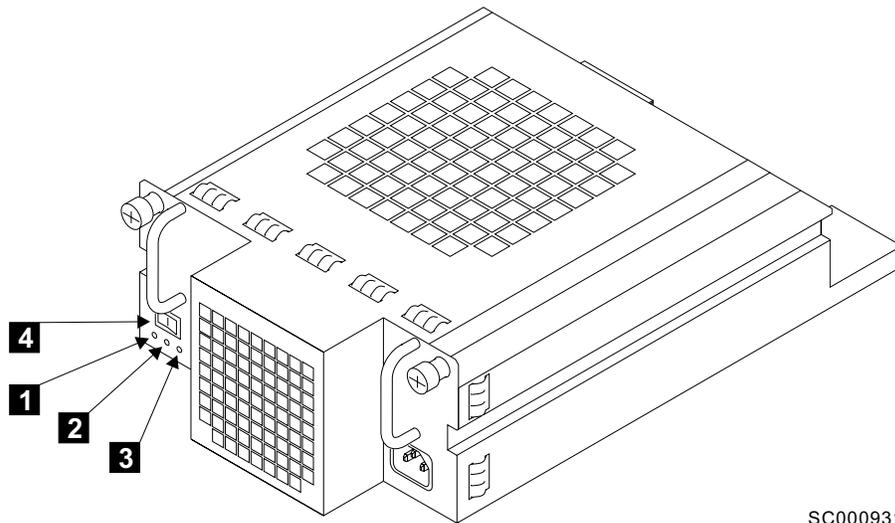


Figure 24. Fan-and-power-supply assemblies in a 2104 Model TS4 (left) and 2104 Model DS4 (right)

Figure 25 shows the switch and the lights on the fan-and-power-supply assembly.



SC000931

Figure 25. Fan-and-power-supply assembly lights and switch

AC PWR light 1

The AC PWR light, which is green, comes on when the mainline power supply is connected to the fan-and-power-supply assembly.

DC PWR light 2

The DC PWR light, which is green, comes on when this fan-and-power-supply assembly is supplying power to the 2104 Model DS4 or Model TS4.

CHK light 3

The CHK light, which is amber, indicates either that there is a failure in the fan-and-power-supply assembly or that the dc on/standby switch is set to standby.

Note: This light flashes when the failure in the fan-and-power-supply assembly is a fan failure.

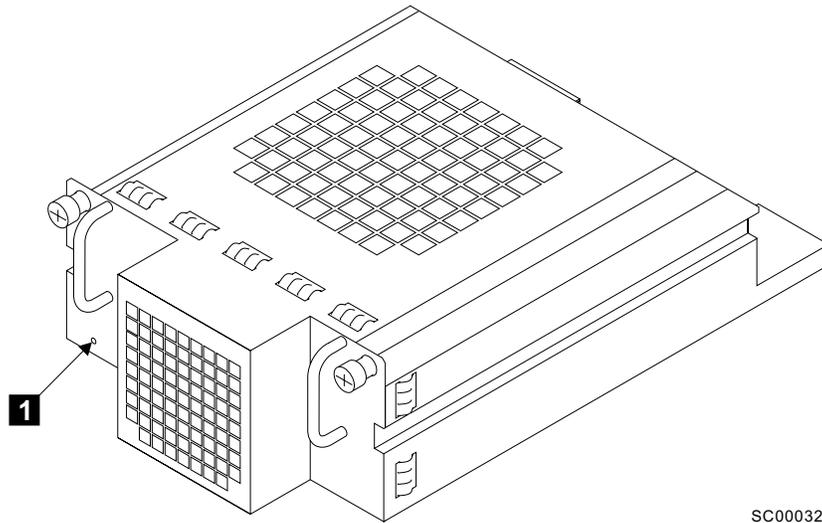
DC on/standby switch 4

The dc on/standby switch connects dc electrical power from the fan-and-power-supply assembly to the disk drives and other components in the 2104 Model DS4 or Model TS4. This switch must be set to on for the fan-and-power-supply unit to start.

If the dc on/standby switch on either of the two fan-and-power-supply assemblies is set to on, power in a 2104 Model DS4 or Model TS4 unit is switched on automatically if all of the following conditions exist:

- Input power to the 2104 Model DS4 or Model TS4 is present.
- The fan-and-power-supply assembly is fully home in its slot.
- Either the power control switch is set to on, or terminator power is active in an external SCSI connection.

Figure 26 shows the light on the fan assembly.



SC000321

Figure 26. Fan assembly

CHK light 1

The CHK light, which is amber, flashes when the fan fails.

SCSI Interface card lights

Figure 27 shows the SCSI Interface cards in a 2104 Model DS4 or Model TS4. You can install up to two SCSI Interface **1** cards in the back of a 2104 Model DS4 or Model TS4.

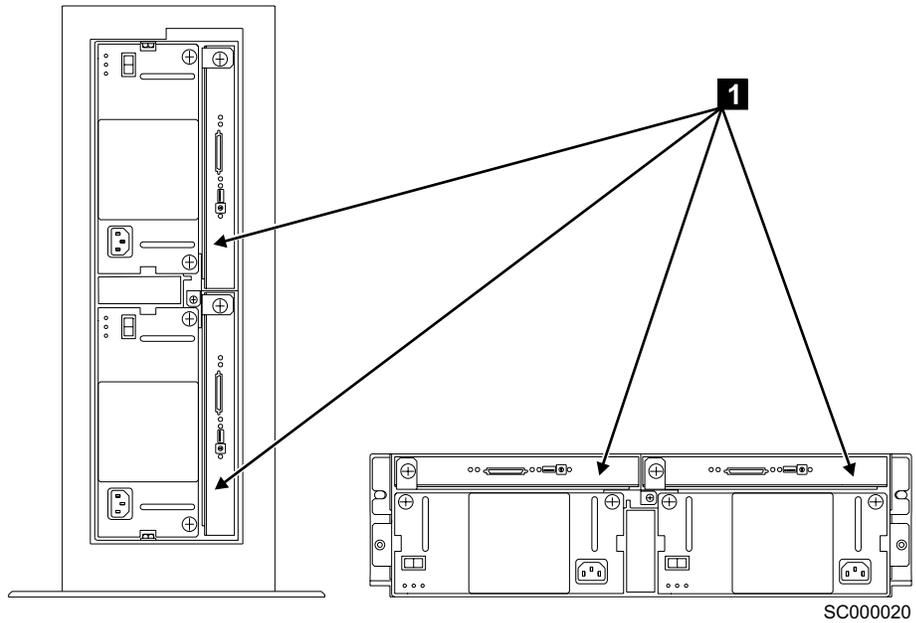
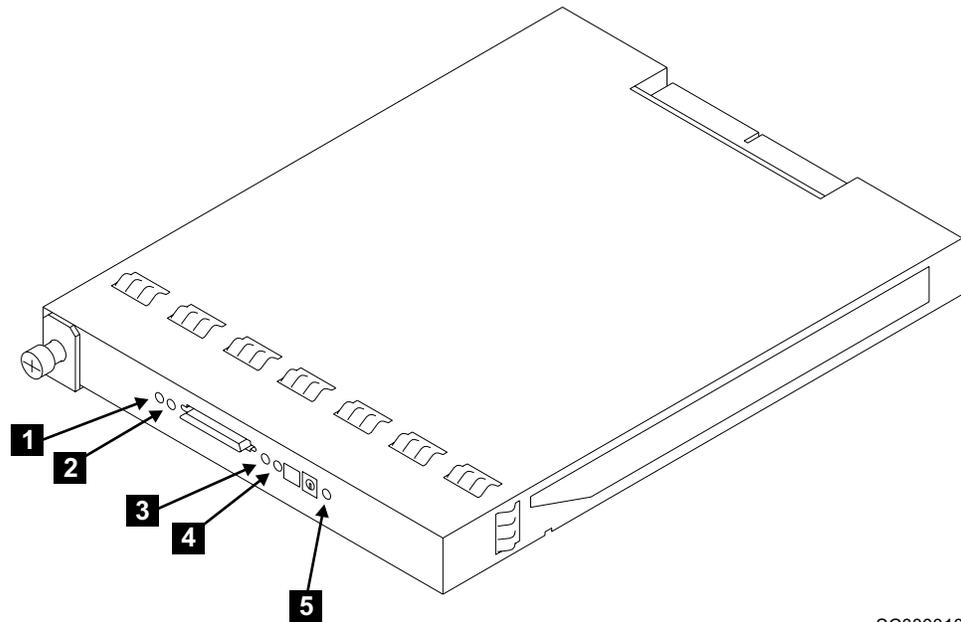


Figure 27. SCSI Interface cards in a 2104 Model TS4 (left) and 2104 Model DS4 (right)

Figure 28 shows the lights on the SCSI Interface card.



SC000010

Figure 28. SCSI Interface card assembly lights

TERMINATOR POWER light 1

The TERMINATOR POWER light, which is green, comes on when an active SCSI connection is present.

LVD light 2

The LVD light, which is green, indicates the type of host SCSI cable. When this light is on, this indicates an active Low Voltage Differential (LVD) SCSI connection. If this light is off and the term power light is on, there is an active single-ended (SE) SCSI connection.

ACTIVE light 3

The ACTIVE light, which is green, comes on when the host system is communicating with the SCSI Enclosure Services (SES) processor or the disk drives.

RESET light 4

The RESET light, which is green, comes on when a Power On Reset (POR) or a SCSI bus reset occurs. This light is switched off by the SES processor.

FAULT light 5

The FAULT light, which is amber, comes on if the SCSI Interface card fails.

SCSI Interface card switches

Figure 29 shows the switches on the SCSI Interface card.

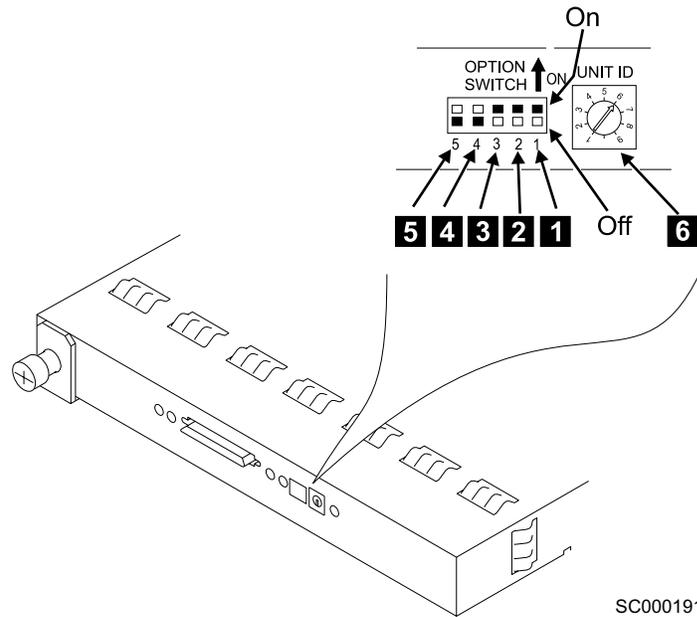


Figure 29. SCSI Interface card switches

The SCSI Interface card contains the following switches that are accessible to the operator.

Note: Switch configuration is only valid on the SCSI Interface card-1 and the configuration on the SCSI Interface card-2 is ignored. Therefore, the SCSI Interface card must be placed in the left side viewing it from the rear in single SCSI Interface card configuration.

Drive autostart switch-1 **1**

The disk drive motors are controlled by the combination of this switch and the drive autostart switch-2 **2**.

When this switch is set to off, and the drive autostart switch-2 **2** is set to on, the disk drive motors do not start until you issue a **START MOTOR** command. The timing sequence of the disk motor startup is under the control of the host system software.

When this switch is set to on, and the drive autostart switch-2 **2** is set to off, the disk drives are set to delay motor start mode. The disk motor startup delay time is different for each disk drive and is usually computed by multiplying 12 seconds by its SCSI ID. For example, the disk drive motor of a disk drive whose SCSI ID is 2 starts 24 (2x12) seconds after power is applied to the 2104 Model DS4 or Model TS4.

When this switch is set to off, and the drive autostart switch-2 **2** is set to off, the disk drives are set to normal start mode. The disk drive motors start when power is applied to the 2104 Model DS4 or Model TS4.

The effect of both this switch and the drive autostart switch-2 **2** being set to on is undefined.

Drive autostart switch-2 **2**

Refer to the explanation of the drive autostart switch-1 **1**.

Enable enclosure services switch 3

When this switch is set to on, the enclosure services can operate.

When the switch is set to off, no response occurs to any request to use the enclosure services.

Note: Enclosure services are not supported by SuSE Linux Enterprise Server for pSeries, however, it is recommended that this switch be left on to support the possible use of AIX stand-alone diagnostics.

Select enclosure services switch 4

This switch selects which enclosure services can be used — SAF-TE or SES.

When set to off, it selects SAF-TE.

When set to on, it selects SES.

Note: Enclosure services are not supported by SuSE Linux Enterprise Server for pSeries, however, it is recommended that this switch be left on to support the possible use of AIX stand-alone diagnostics.

Note: SAF-TE services are not used with RS/6000 or IBM @server pSeries computers.

Power control switch 5

When this switch is set to off, the 2104 Model DS4 and Model TS4 automatically switch off or on when the host system is switched off or on.

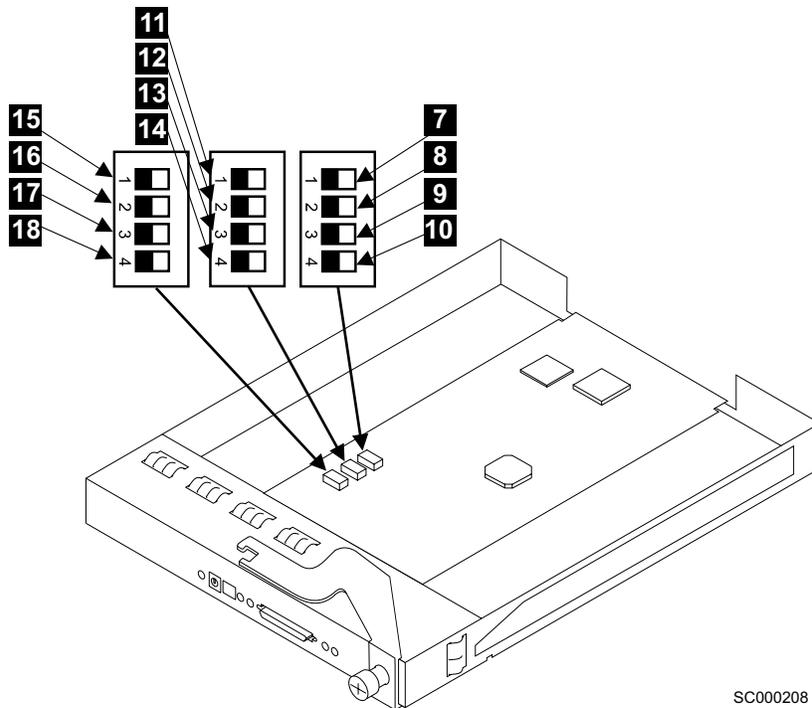
When this switch is set to on, the 2104 Model DS4 and Model TS4 is powered up or down by the DC on/standby switch on a fan-and-power-supply assembly.

Box ID switch 6

This 10-position rotary switch indicates the ID of the 2104 Model DS4 and Model TS4. The operator selects the required setting that the **SES Inquiry** command and the **SAF-TE buffer 1** command can use.

Note: SAF-TE services are not used with RS/6000 or IBM @server pSeries computers.

The SCSI Interface card has other switches that are accessible only when the SCSI Interface card is removed from the 2104 Model DS4 and Model TS4. See Figure 30 on page 16 for other switches on the SCSI Interface card.



SC000208

Figure 30. Other switches on the SCSI Interface card

SCSI bus split control switch **7**

This switch controls the SCSI bus mode. When the switch is off, the enclosure is configured as a single SCSI bus. When this switch is on, the enclosure is configured as a dual or split SCSI bus.

The default logical setting for this switch is off.

Switches **8** and **9** (reserved)

This switch should be off.

Disable ID6 handling switch **10**

The SCSI ID6 is automatically disabled and removed from the system when all of the following conditions are met:

- This switch is turned off.
- Two SCSI Interface cards are installed with single bus configuration.
- Two hosts are connected to the 2104 Model DS4 and Model TS4 and both are powered on.

When two SCSI Interface cards are installed and the 2104 Model DS4 and Model TS4 are configured for single-bus mode, an ID conflict exists if a drive is installed in the slot of SCSI ID 6. The conflict exists because one of the host bus adapter (HBA) SCSI IDs should be set to 6 when using both host ports. Unless the disable ID 6 handling switch is off or the drive is removed from the slot of SCSI ID 6, there will be an ID conflict between the HBA using ID 6 and the drive in the slot of SCSI ID 6.

Removing the drive from slot 6 and replacing it with a dummy carrier eliminates the conflict.

An alternative is to turn off the disable SCSI ID6 handling switch, which continuously applies a SCSI RESET signal to the drive in the slot of ID 6

when TERMPWR is present on both JBOD interface cards. While the drive is held in RESET, it releases all bus signals, effectively removing it from the system. The drive in the slot of SCSI ID 6 continuously remains in RESET under these conditions until power is removed and the disable SCSI ID6 handling switch is turned on.

Configuration switch **11** - **13**

This switch must always be set to off in a 2104 Model DS4 and Model TS4.

Switch cover plate

Note: Switch configuration is only valid on the SCSI Interface card-1, which is on the left side (left side from the rear view). The configuration on the SCSI Interface card-2, which is on the right side, is ignored. The switch cover plate is on card-2 so that it can be masked. See Figure 31.

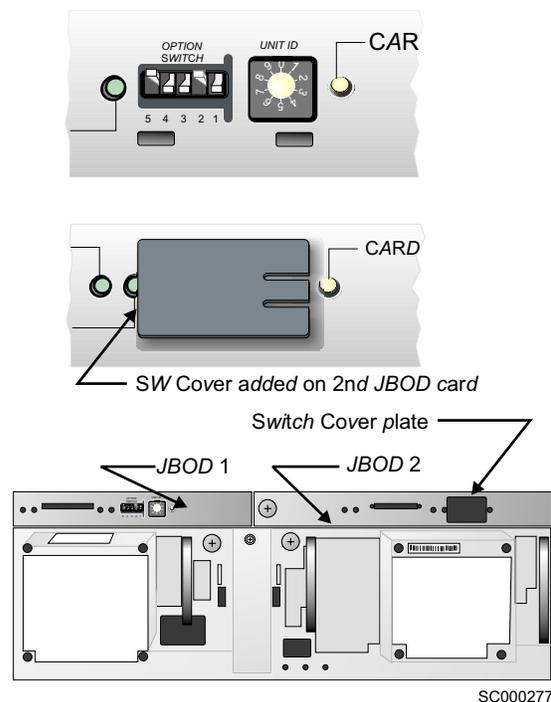


Figure 31. Switch cover plate on the panel of the SCSI Interface card-2 (second JBOD interface card) box

Identifying 2104 Model DS4 or Model TS4 disk enclosures

The Box ID switch on the SCSI Interface card is a 10-position rotary switch that indicates the ID of the 2104 Model DS4 or Model TS4. The **SES Inquiry** command or the **SAF-TE buffer 1** command uses its setting.

Labels are supplied with the 2104 Model DS4 or Model TS4 to enable the operator to identify each 2104 Model DS4 or Model TS4. Attach the label that represents the ID set by the Box ID switch to the front of the 2104 Model DS4 or Model TS4.

Identifying disk drive modules

You can identify a disk drive module by the serial number that appears on the label **1** on the front of the disk drive module. See Figure 32.

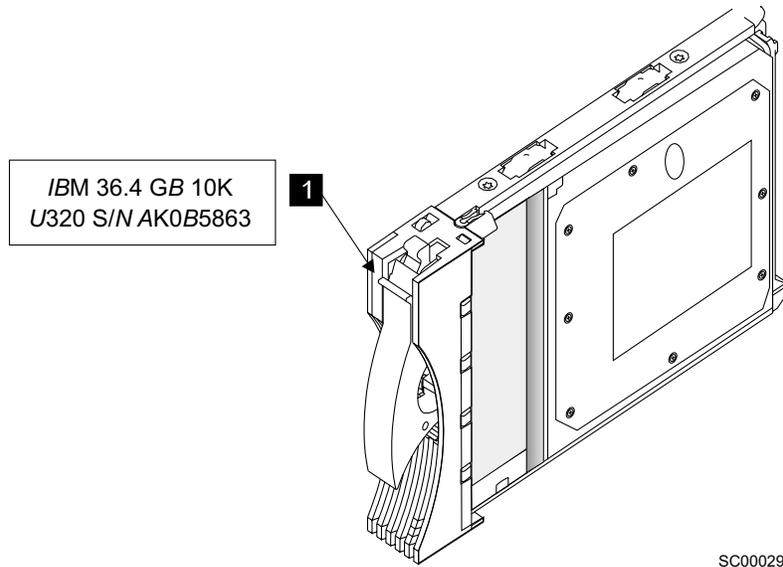


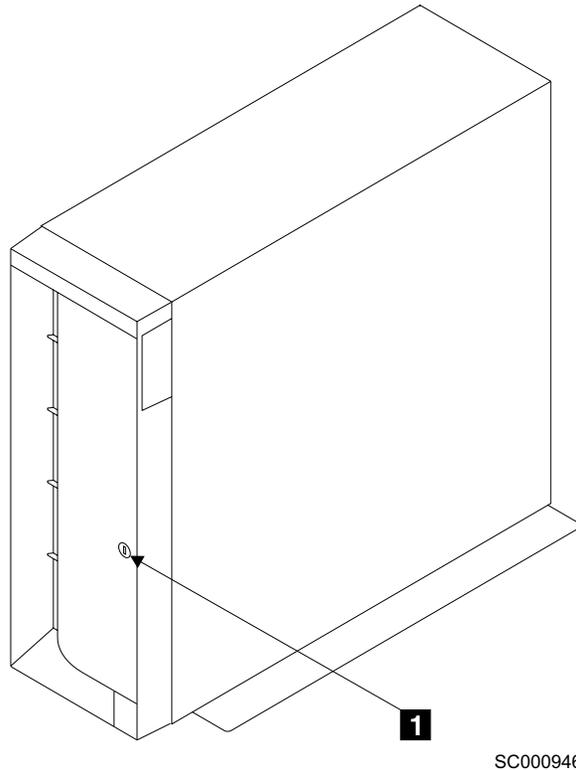
Figure 32. Disk drive module label (2104 Model DS4 or Model TS4)

This label shows the size, motor speed (RPM), and SCSI Interface speed of the disk drive.

Each disk drive module also has a SCSI address that is related to its position in the 2104 Model DS4 or Model TS4. The addresses used are 0, 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, and 14. These addresses are usually assigned, in sequence, from left to right in the 2104 Model DS4 and from bottom to top in the 2104 Model TS4.

Security

Figure 33 shows a lock **1** on the front cover of the 2104 Model TS4. The lock provides physical security for the disk drives. You do not need to remove this cover during normal operations. If you lock the cover, it cannot be opened for servicing without the key. You do not need to lock the cover for it to stay closed. The 2104 Model DS4 does not have a cover or lock.



SC000946

Figure 33. 2104 Model TS4 lock

For protection against unauthorized key duplication, the cover lock is a high-security lock. Keys for these locks are a factory-restricted series. Duplicate keys are *not* available through normal commercial channels. The serial number of the lock is stamped on each key. Make a note of this number. Store the additional key, which was supplied, and your note of its number in separate secure areas.

If you lose the key, or it becomes faulty, you can purchase a replacement key from:

Illinois Lock Company
301 W. Hintz Road
Wheeling, Illinois 60090

Telephone: (800) 299-5880 (inside USA)
001-847-537-1800 (outside USA)

FAX: 001-847-537-1881

e-mail: illock@aol.com

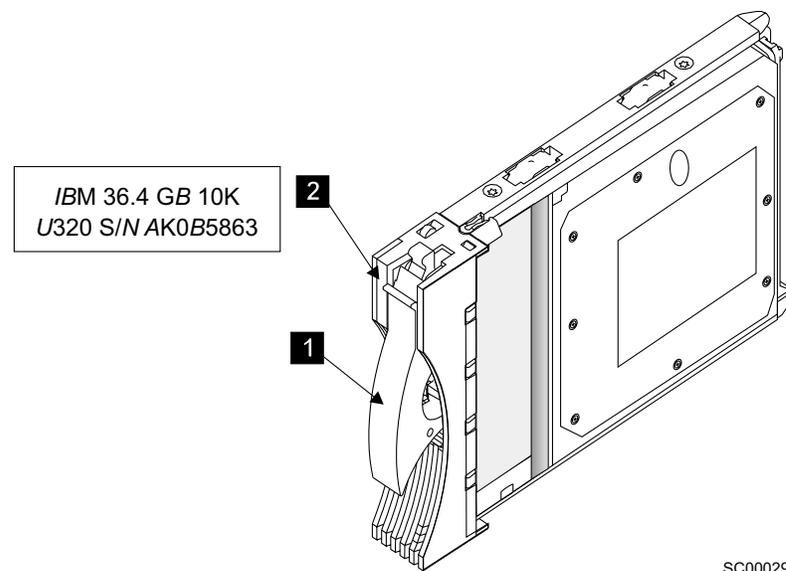
Web site: www.illinoislock.com

Chapter 2. Adding disk drive modules

This chapter describes how to add disk drive modules to a 2104 Model DS4 or Model TS4 that is already installed as part of your system.

You can add disk drive modules only if:

1. You are authorized by your organization.
2. You have the correct disk drive module. Figure 34 shows the disk drive module for the 2104 Model DS4 or Model TS4. The front of the disk drive module has a handle **1** that you can pull up to open. Verify the size of the disk drive module to ensure that you have the correct size and speed. The size and speed of the disk drive module is shown on the label **2** at the front of the disk drive module.



SC000291

Figure 34. Disk drive module handle and label (2104 Model DS4 or Model TS4)

Attention:

- Disk drive modules are fragile. Handle them with care. Keep them well away from strong magnetic fields.
- Any slot that does not have a disk drive module installed must contain a dummy disk drive module. The dummy disk drive module ensures that the correct airflow is maintained around the disk drive modules in the other slots. If a slot remains empty, overheating might occur.

You do not need to remove power from the 2104 Model DS4 or Model TS4 when you add a disk drive module.

After you add a disk drive module to a 2104 Model DS4 or Model TS4, you must add it into your system software configuration by using the system programs. See “Operating with RISC systems,” on page 69.

Before adding a disk drive module

Perform the following tasks before you add a disk drive module:

1. Identify the slot for the new disk drive module by using the configuration planning information for your system. The slot should contain a dummy disk drive module. See Figure 35.

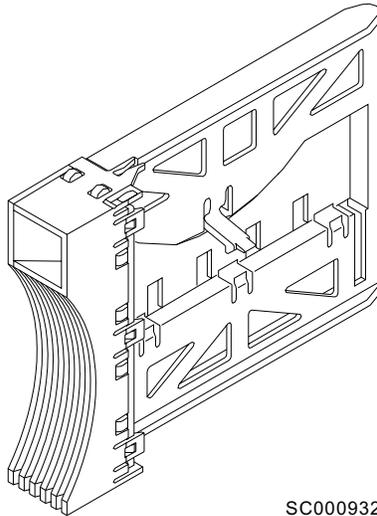
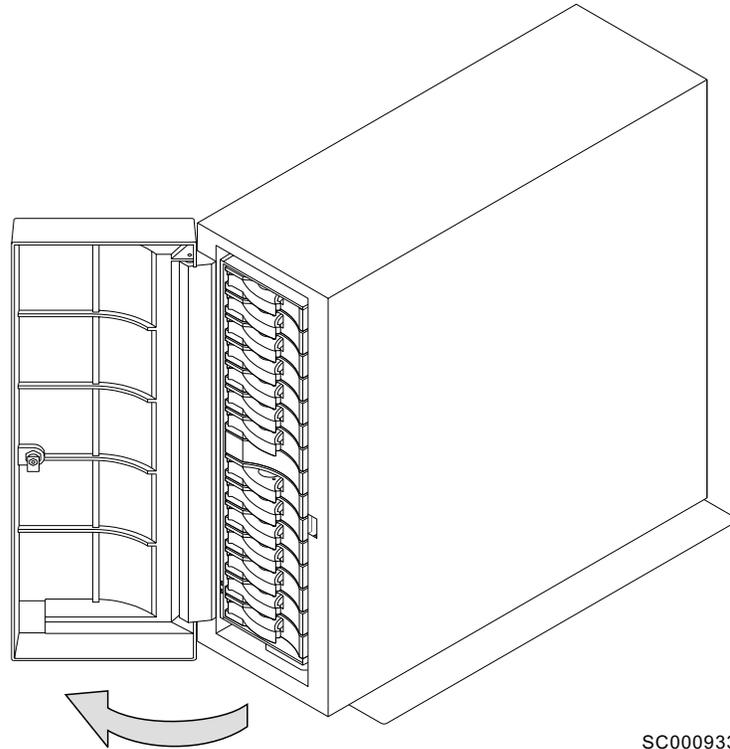


Figure 35. Dummy disk drive module

Use the SCSI Device Identification and Removal service aid to set the disk drive slot to **Insert**. If you remove the dummy disk drive module from the identified slot, an amber light on the backplane should be visible. This verifies that you selected the correct slot into which to add the new disk drive module. This light goes off when you add a disk drive module. If it does not, it is visible as the amber check light on the disk drive module that you added.

2. If you are adding a disk drive module into a 2104 Model TS4, open the front cover of the unit. See Figure 36.
 - a. If necessary, unlock the cover using the key provided.
 - b. Grip the right-hand side of the cover and pivot the cover to the left.



SC000933

Figure 36. Disk drive modules in a 2104 Model TS4

Adding a disk drive module

Figure 37 and Figure 38 on page 25 show a 2104 Model DS4. The steps for adding a disk drive module into a 2104 Model TS4 are the same, but the parts are turned 90 degrees.

1. Pull the dummy disk drive module from the 2104 Model DS4. See Figure 37.

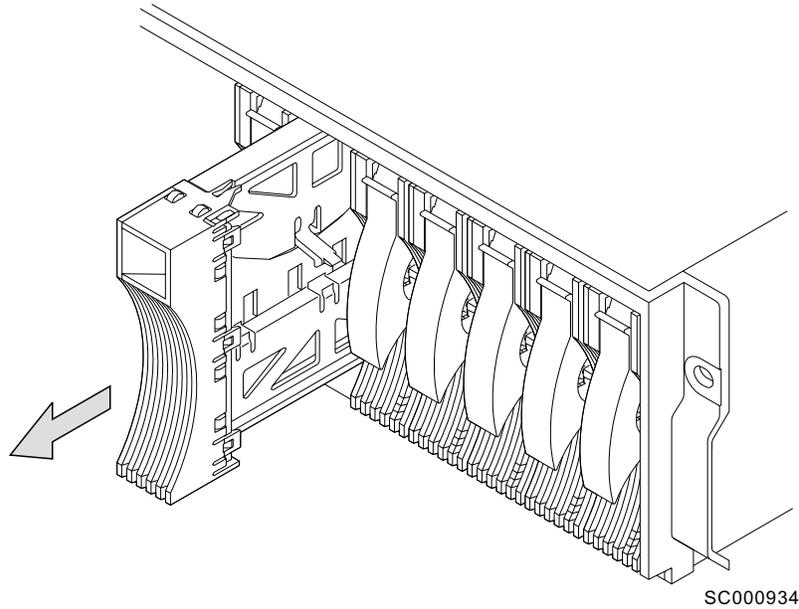


Figure 37. Removing a dummy disk drive module

Attention: Do not leave the slot empty for more than 30 minutes. If you do, the 2104 Model DS4 and its disk drive modules might overheat and be damaged.

2. Use one hand to support the base of the disk drive module. Use the other hand to hold the handle **1**. See Figure 38. Insert the module, and push it into the slot.

When the handle touches the front surface of the enclosure, the module stops. However, the module is not yet fully home.

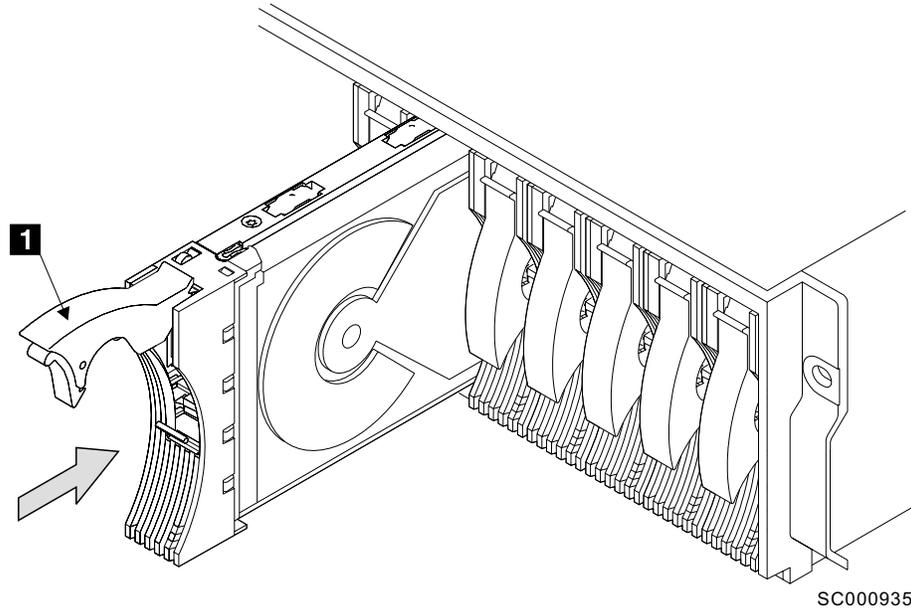
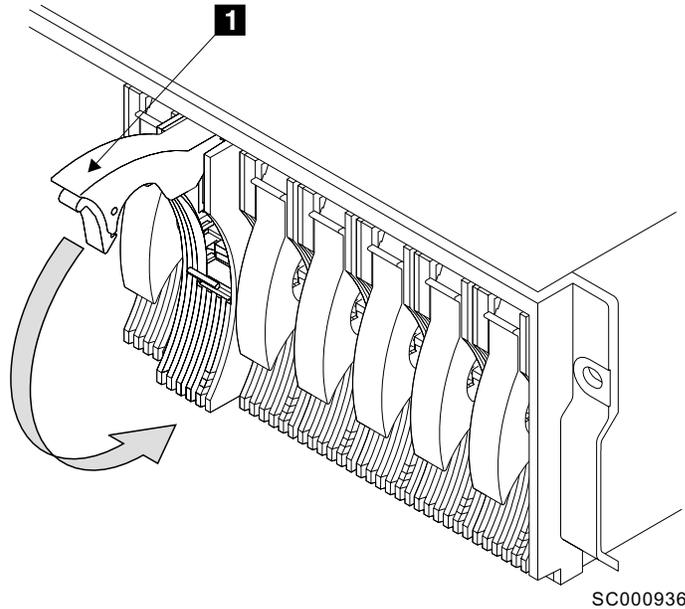


Figure 38. Adding a disk drive module

SC000935

3. While continuing to push the disk drive module into the slot, slowly close the handle **1** until it stops with a click. See Figure 39. This action pushes the module fully home.

Attention: The fans might decrease in speed.



SC000936

Figure 39. Closing the handle of a disk drive module

4. Verify that the disk drive module that you just installed is aligned with the sides of the 2104 Model DS4, and that there is no gap between this module and the modules that are next to it.

Verify also that the front edge of this disk drive module aligns with the front edges of the modules next to it.

If the disk drive module is not correctly aligned, perform step 2 on page 33 to remove it, and step 2 on page 25 through step 3 to reinstall it.

5. If the amber check light **2** comes on, first verify that the new disk drive module is correctly installed. See Figure 40. Run diagnostics in problem determination mode to check the error log. See “Operating with RISC systems,” on page 69.

Note: The green activity light **1** does not come on until disk activity begins.

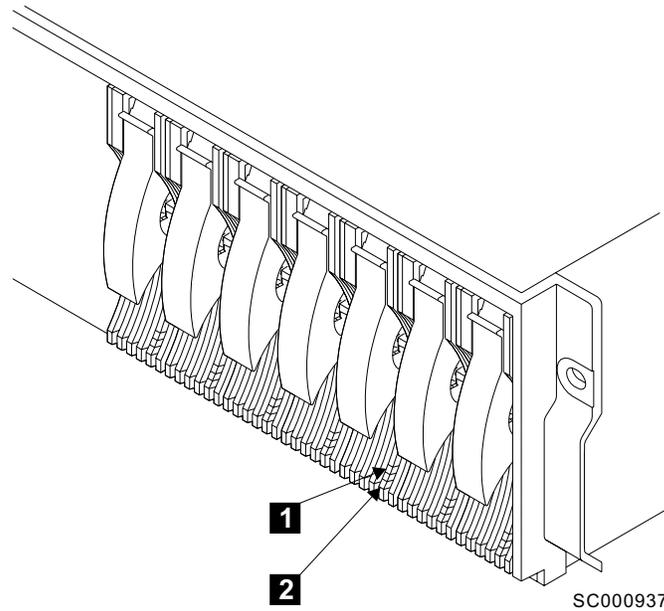
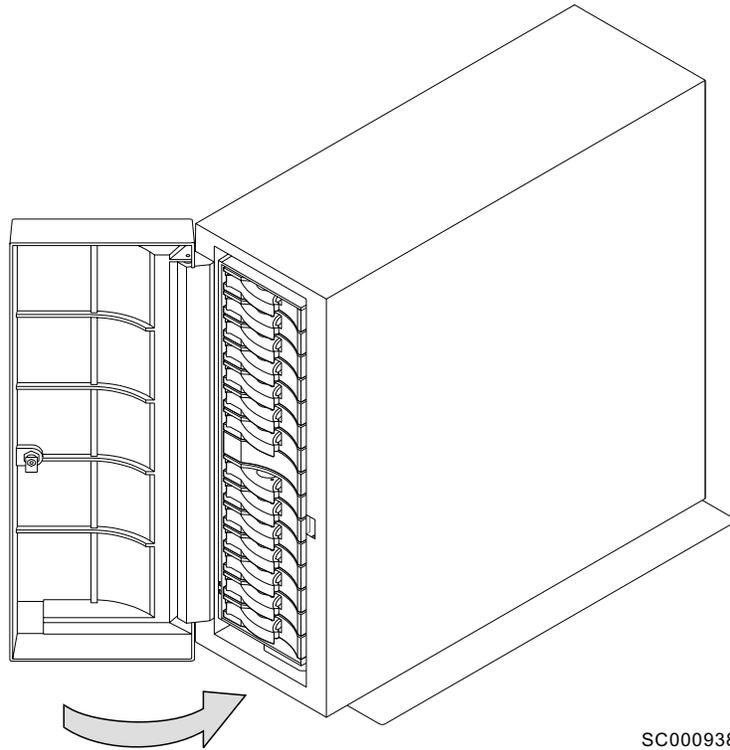


Figure 40. Disk drive module lights

6. If you just added a disk drive module to a 2104 Model TS4, close the cover. If required, lock it with the key provided. See Figure 41.



SC000938

Figure 41. Closing the cover of a 2104 Model TS4

7. Add the new disk drive module into your system software configuration using the system programs. See “Operating with RISC systems,” on page 69.

Chapter 3. Exchanging FRUs

This chapter describes how to exchange the following field replaceable units (FRUs) on your 2104 Model DS4 or Model TS4:

- Disk drive module
- Fan-and-power-supply assembly
- Fan assembly
- SCSI Interface card assembly

If you need to exchange the SCSI bus bridge card, see the *Expandable Storage Plus: 2104 Model DS4 and Model TS4 Service Guide*.

Disk drive module

Sometimes you can exchange a faulty disk drive module without the assistance of a service representative. You can do this only if:

- You are authorized by your organization.
- You have the correct disk drive module. Figure 42 shows the disk drive module for the 2104 Model DS4 or Model TS4. The front of the disk drive module has a handle **1** that you can pull up to open. Verify the size of the disk drive module. The size of a disk drive module is on the label **2** at the front of the disk drive module.

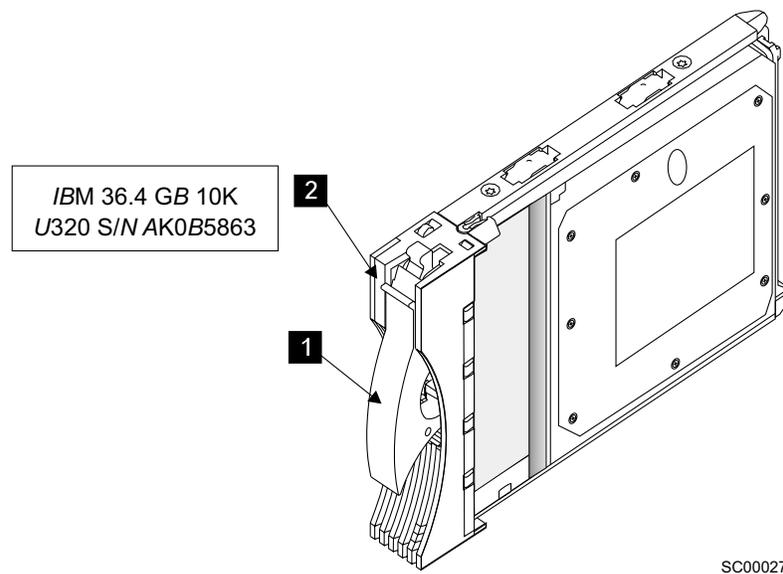


Figure 42. Disk drive module handle and capacity (2104 Model DS4 or Model TS4)

Attention:

- Disk drive modules are fragile. Handle them with care. Keep them well away from strong magnetic fields.
- Any slot that has no disk drive module installed must contain a dummy disk drive module. The dummy module ensures that the correct airflow is maintained around the disk drive modules in the other slots. If a slot remains empty, overheating might occur.

You do not need to remove power from the 2104 Model DS4 or Model TS4 when you exchange a disk drive module.

Before exchanging a disk drive module

Perform the following steps before you exchange a disk drive module:

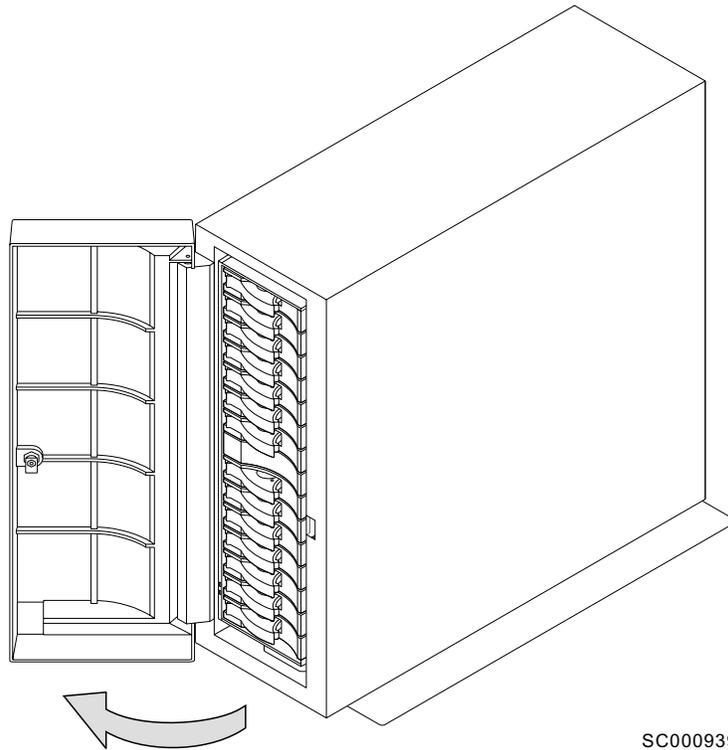
1. Use the system error log to identify the faulty disk drive module. “Operating with RISC systems,” on page 69 describes how to do this if you have a RISC-based system.
2. Find the failing disk drive module by using the location code supplied in the error log.
3. Use the SCSI Device Identification and Removal service aid to set **Remove** on the failing disk drive module. “Operating with RISC systems,” on page 69 describes how to do this if you have a RISC-based system.
4. Check the lights on this disk drive module. “Disk drive module lights” on page 7 describes where these are and how to see them.

If the check light is on, go to “Exchanging a disk drive module” on page 32.

Exchanging a disk drive module

Perform the following steps to exchange a disk drive module:

1. If the failing disk drive module is in a 2104 Model TS4, open the front cover.
See Figure 43.
 - a. If necessary, unlock the cover, using the key provided.
 - b. Grip the cover at the right, and pivot it to the left.



SC000939

Figure 43. Disk drive modules in a 2104 Model TS4

Figure 44 and Figure 45 on page 34 show a 2104 Model DS4. The steps for exchanging a disk drive module in a 2104 Model TS4 are the same, but the parts are turned 90 degrees.

2. Pull the trigger up **1** and pull the handle out **2** of the failing disk drive module. See Figure 44. This action moves the module partly out of the slot. Wait for about 20 seconds to allow the disk drive motor time to spin down.

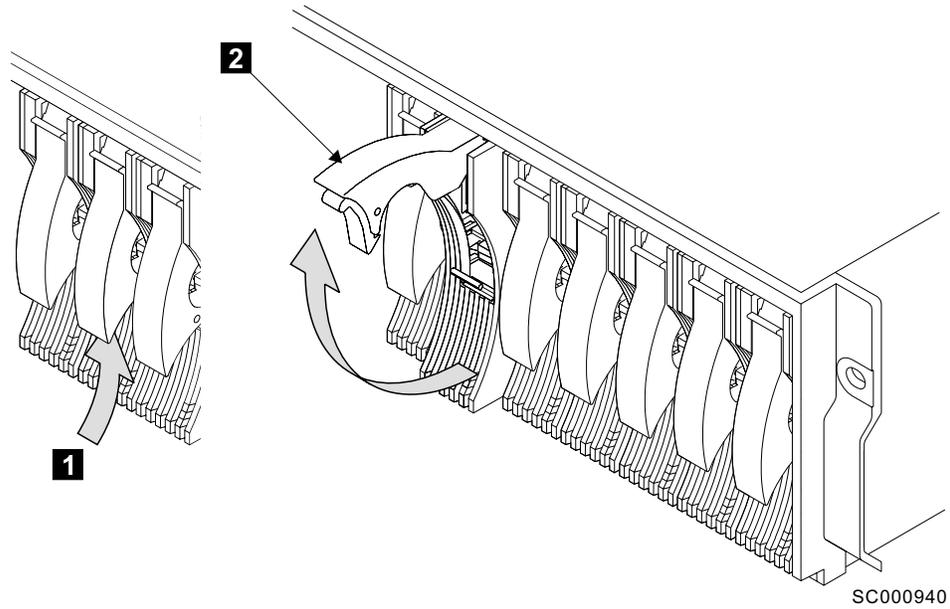
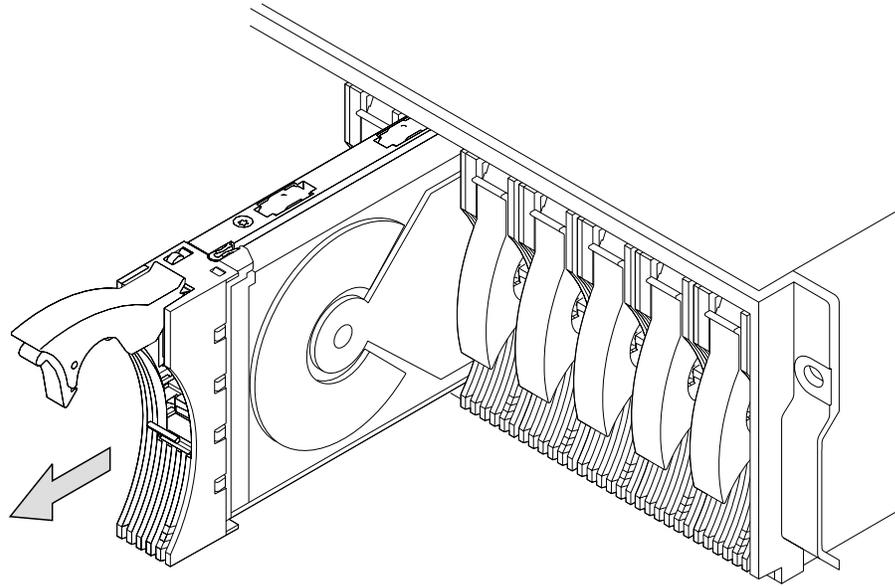


Figure 44. Opening the disk drive module handle

- Carefully pull the module from the 2104 Model DS4. See Figure 45. Support the module with your other hand as you remove it from the 2104 Model DS4.

Attention: The fan speed might increase. Do not leave the slot empty for more than 30 minutes. If you do, the 2104 Model DS4, and its disk drive modules, might overheat and be damaged.



SC000941

Figure 45. Removing a disk drive module

4. Use one hand to support the base of the replacement module. Use the other hand to hold the handle **1**. See Figure 46. Insert the module, and push it into the slot.

When the handle touches the front surface of the enclosure, the module stops. The disk drive module is not yet fully home.

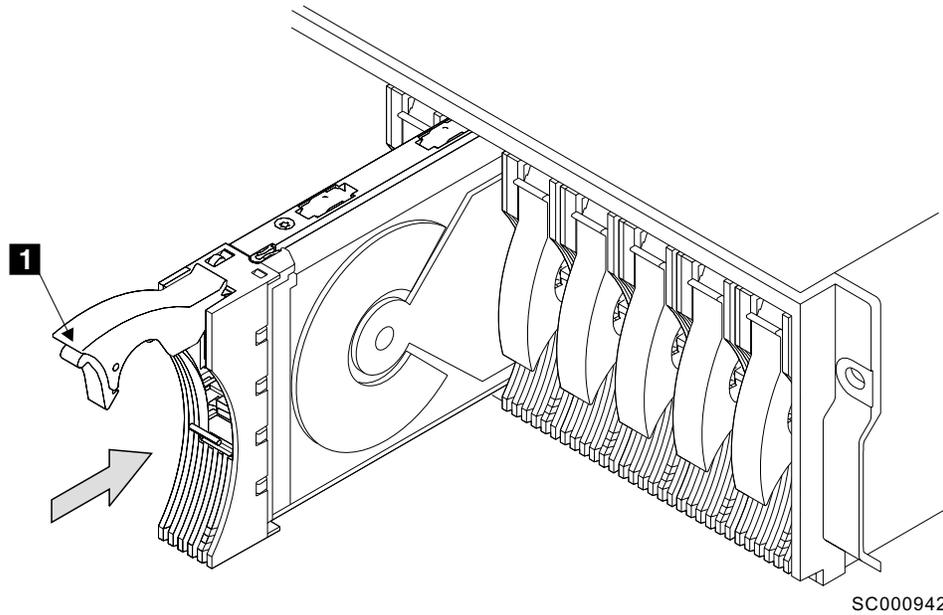


Figure 46. Inserting a disk drive module

SC000942

5. While continuing to push the disk drive module into the slot, slowly close the handle **1** until it stops with a click. See Figure 47. This action pushes the module fully home.

Attention: The fans might decrease their speed.

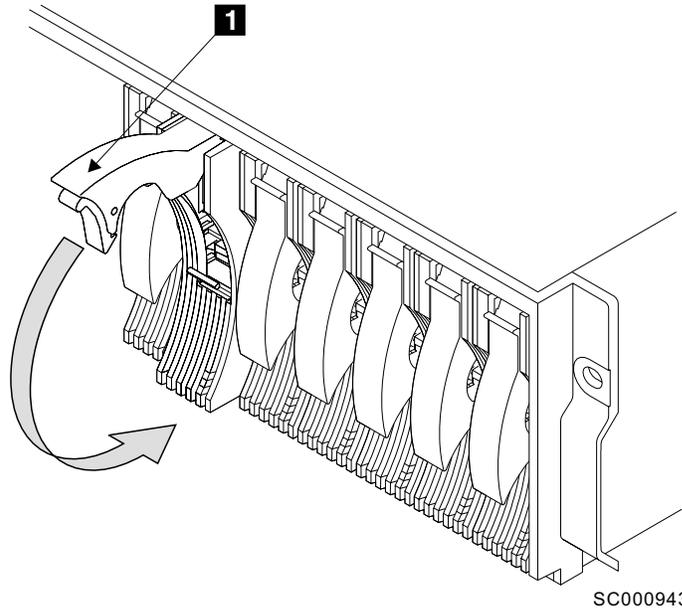


Figure 47. Closing the handle

6. Verify that the disk drive module that you just installed is aligned with the sides of the 2104 Model DS4. Verify that there is no gap between this module and the modules that are next to it.

Verify that the front edge of this disk drive module aligns with the front edges of the modules next to it.

If the disk drive module is not correctly aligned, go to step 2 on page 33 to remove it. Perform step 4 on page 35 through step 6 to reinstall it.

7. If the amber check light **2** comes on, first verify that the new disk drive module is correctly installed. See Figure 48. Run diagnostics in problem determination mode to check the error log. See “Operating with RISC systems,” on page 69.

Note: The green activity light **1** comes on for about 1 second after the disk drive module is installed. The light then goes out and comes on again only when disk I/O activity begins.

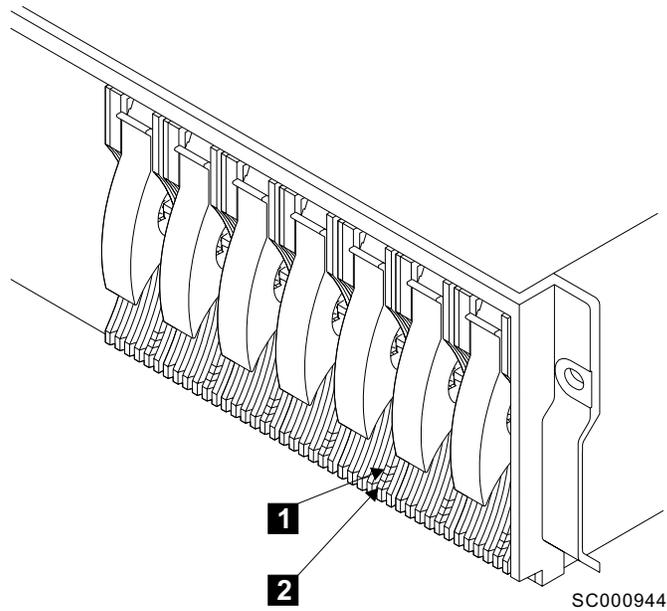
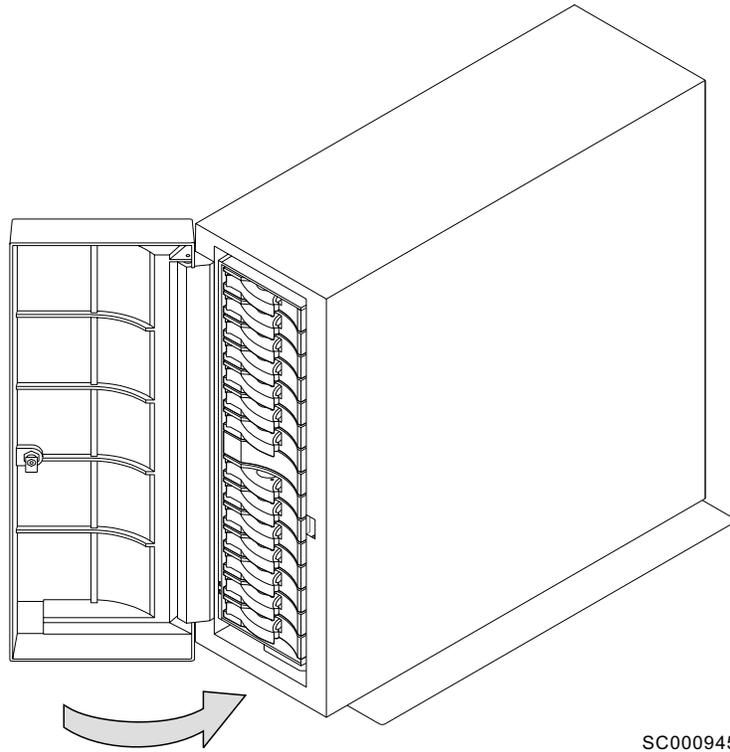


Figure 48. Disk drive module lights

8. If you exchanged a disk drive module in a 2104 Model TS4, close the cover. See Figure 49. If required, lock it with the key provided.



SC000945

Figure 49. Closing the cover of a 2104 Model TS4

9. Restore the disk drive module into your system by using the system programs. See "Operating with RISC systems," on page 69.

Fan-and-power-supply assembly

Figure 50 shows the fan-and-power-supply assembly. You can exchange a faulty fan-and-power-supply assembly if:

- You have a correct spare fan-and-power-supply assembly or fan assembly.
- Another fan-and-power-supply assembly is still present in the 2104 Model DS4 or Model TS4.

Note: If your 2104 Model DS4 or Model TS4 contains just one fan-and-power-supply assembly (and one fan assembly), see the *Expandable Storage Plus: 2104 Model DS4 and Model TS4 Service Guide* for more information about how to replace the fan-and-power-supply assembly.

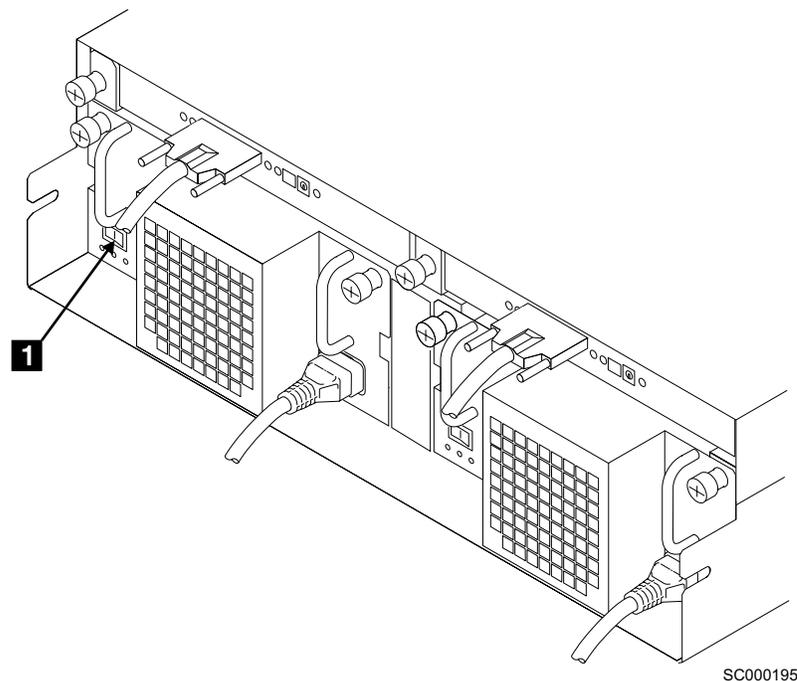


Figure 50. A fan-and-power-supply assembly

You do not need to remove power from the 2104 Model DS4 or Model TS4 when you exchange a fan-and-power-supply assembly.

Before exchanging a fan-and-power-supply assembly

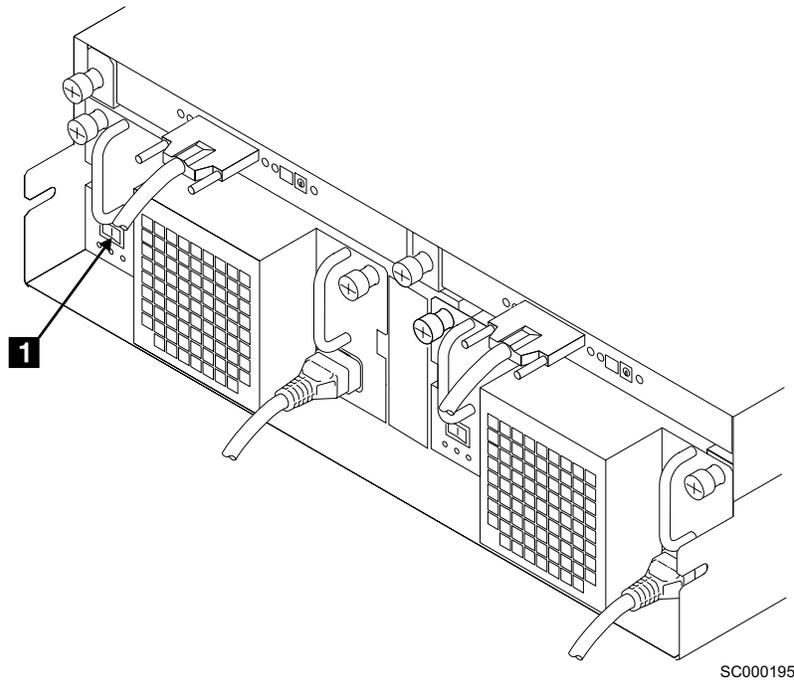
Before you exchange a fan-and-power-supply assembly, check the lights on it. “Fan-and-power-supply assembly and fan assembly lights and switch” on page 9 describes these lights and how to see them. Ensure that the dc on/standby switch is set to on. If the CHK light is on, exchange the fan-and-power-supply assembly. Go to “Exchanging a fan-and-power-supply assembly” on page 40.

Exchanging a fan-and-power-supply assembly

Note: Figure 51 and Figure 52 on page 41 show a 2104 Model DS4. The steps for exchanging a fan-and-power-supply assembly in a 2104 Model TS4 are the same, but the parts are turned 90 degrees.

Perform the following steps to exchange a fan-and-power-supply assembly:

1. Set the dc on/standby switch **1** on the fan-and-power-supply assembly to standby. See Figure 51.



SC000195

Figure 51. Fan-and-power-supply dc on/standby switch

Note: The DC PWR light might stay on for a short time. Wait until the DC PWR light is off before you go to step 2 on page 41.

2. Unplug the mainline power cable from the failing fan-and-power-supply assembly. See Figure 52.

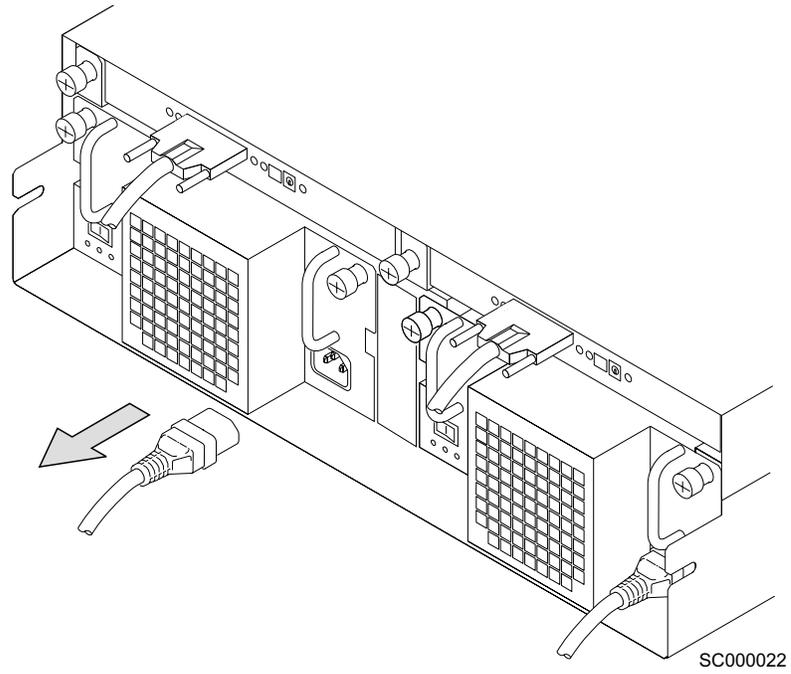


Figure 52. Unplugging the mainline power cable

3. **CAUTION:**
Ensure that the mainline power cable has been removed from the failing fan-and-power supply before you continue. (18)

Unscrew the two thumbscrews on the fan-and-power-supply assembly. See Figure 53.

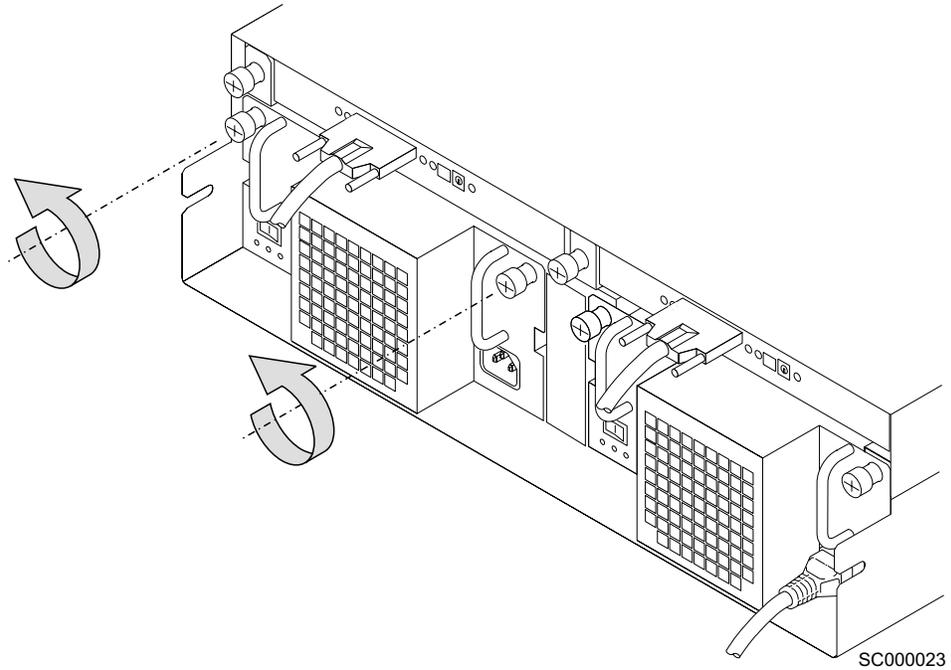


Figure 53. Unscrewing the thumbscrews on the fan-and-power-supply assembly

4. Pull the fan-and-power-supply assembly from the 2104 Model DS4. See Figure 54. The speed of the other fan in the 2104 Model DS4 might increase.

Attention: Do not leave the space empty for more than 30 minutes. If you do, the 2104 Model DS4 and the disk drive modules might overheat and be damaged.

CAUTION:
Do not insert hands or tools into the empty space that contained the fan-and-power-supply assembly. (11)

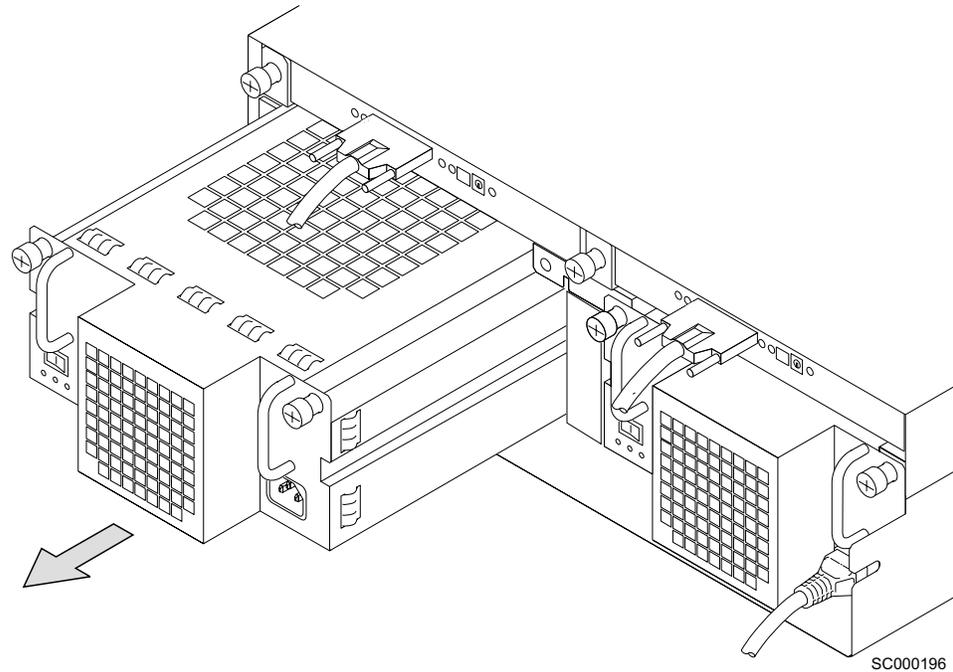


Figure 54. Removing the fan-and-power-supply assembly

5. Push the replacement fan-and-power-supply assembly fully into the 2104 Model DS4. See Figure 55.

DANGER

Do not plug a power cable into the fan-and-power-supply assembly until the assembly is fully home and its thumbscrews are fully tightened. (3)

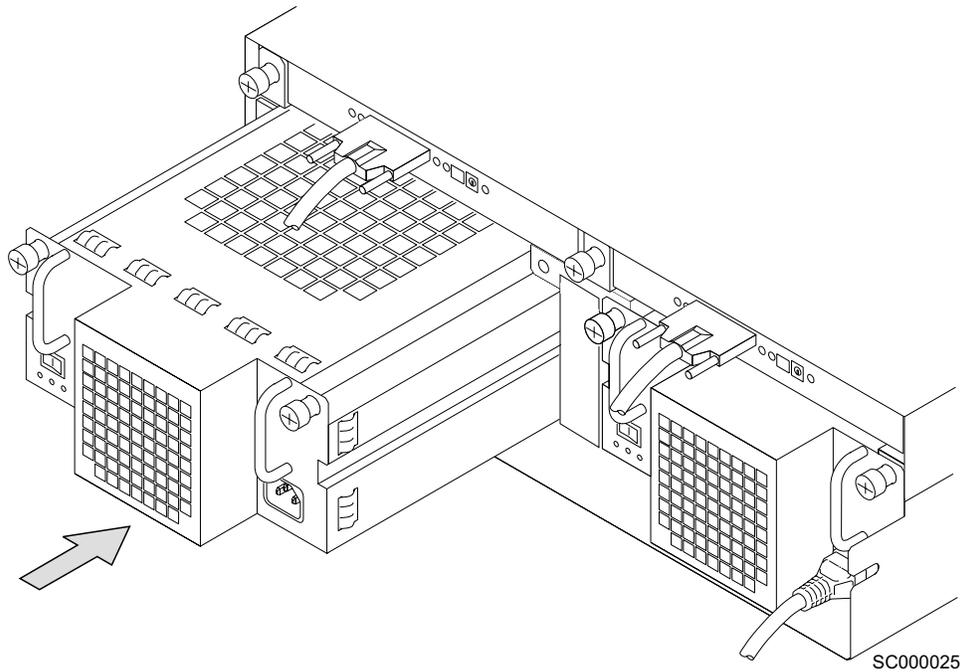


Figure 55. Inserting a replacement fan-and-power-supply assembly

6. Tighten the two thumbscrews by turning them clockwise. See Figure 56.

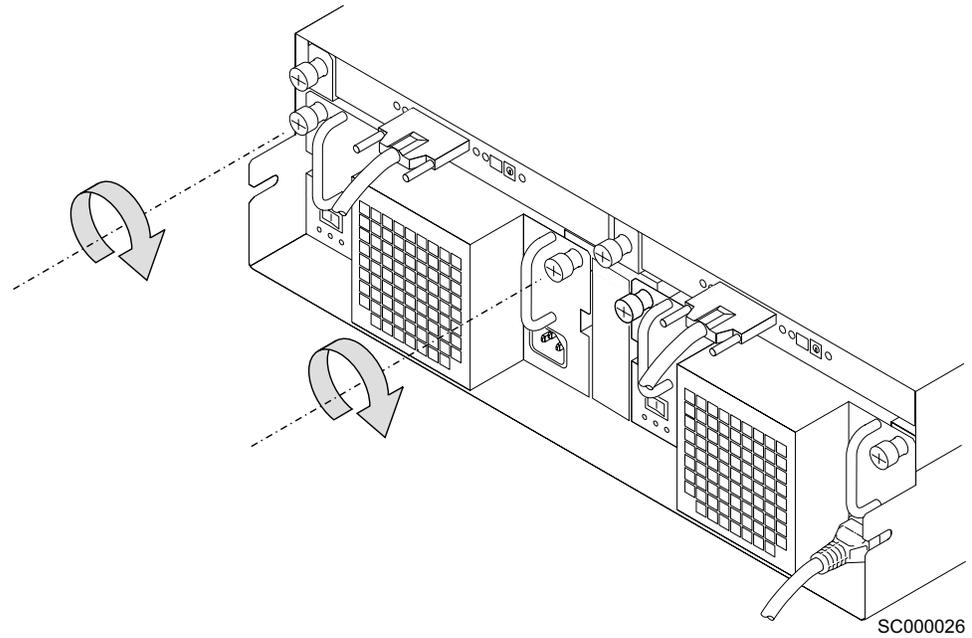


Figure 56. Tightening the screws on a fan-and-power-supply assembly

7. Plug the mainline power cable into the new fan-and-power-supply assembly. See Figure 57. Verify that the green AC PWR light **1** comes on immediately.

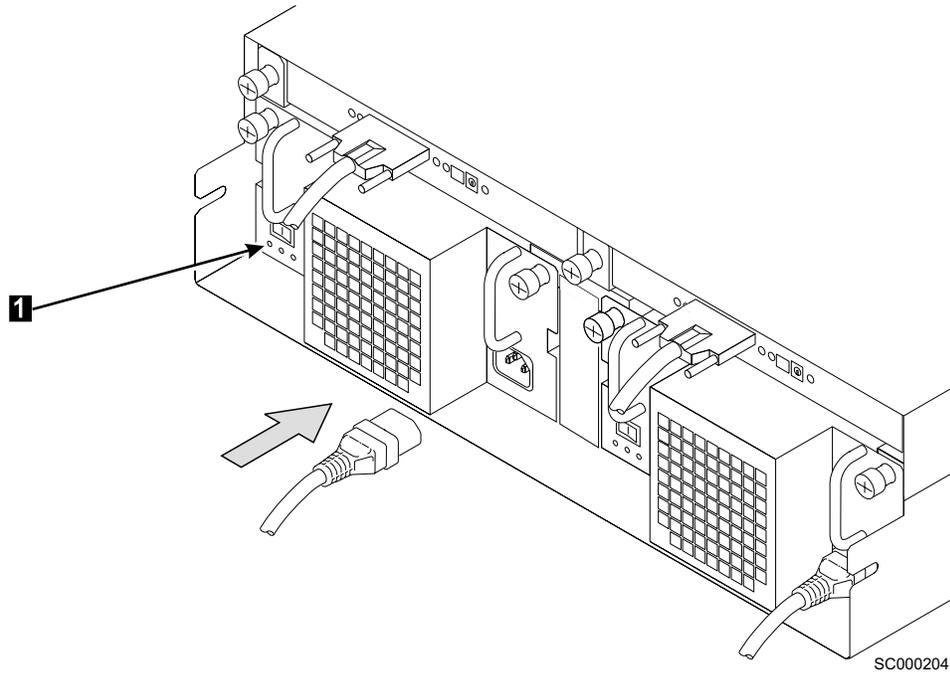


Figure 57. Plugging in the mainline power cable

8. Set the dc on/standby switch **1** on the new fan-and-power-supply assembly to on. See Figure 58.

Note: The fan speeds might decrease.

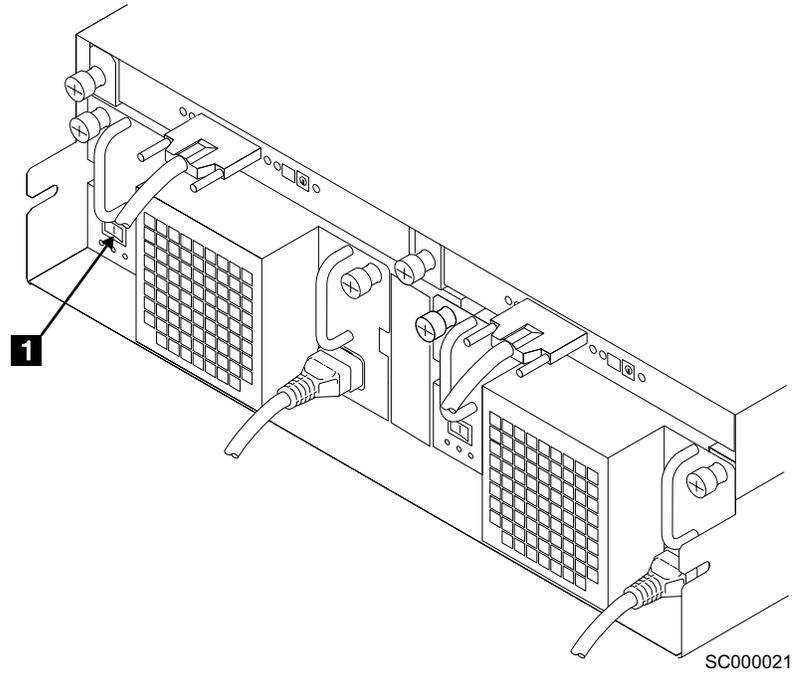


Figure 58. Fan-and-power-supply dc on/standby switch

9. Verify that the green DC PWR light **1** comes on within 5 seconds. See Figure 59.

If it does not, or the amber CHK light **2** comes on, verify that the new fan-and-power-supply assembly is correctly installed. If the new fan-and-power-supply assembly is correctly installed, report the problem to your service representative.

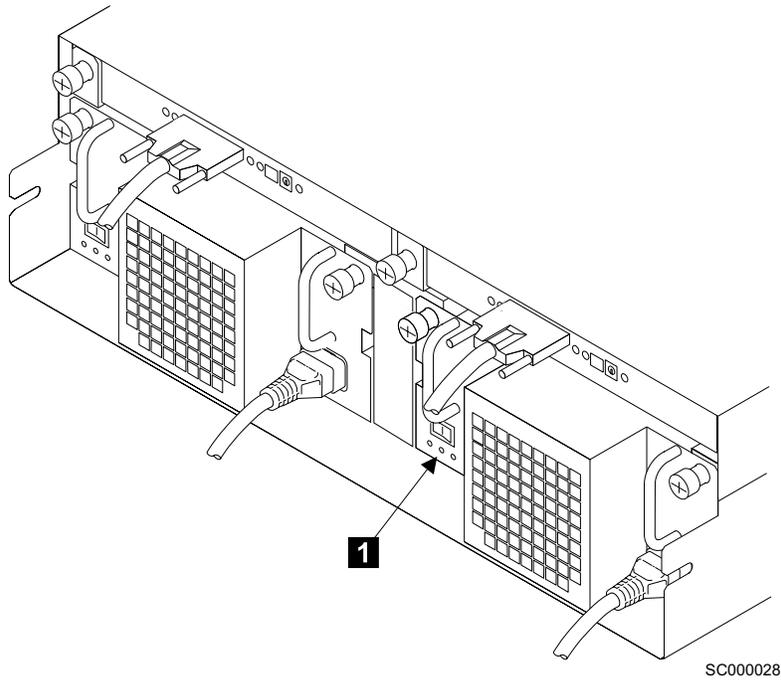
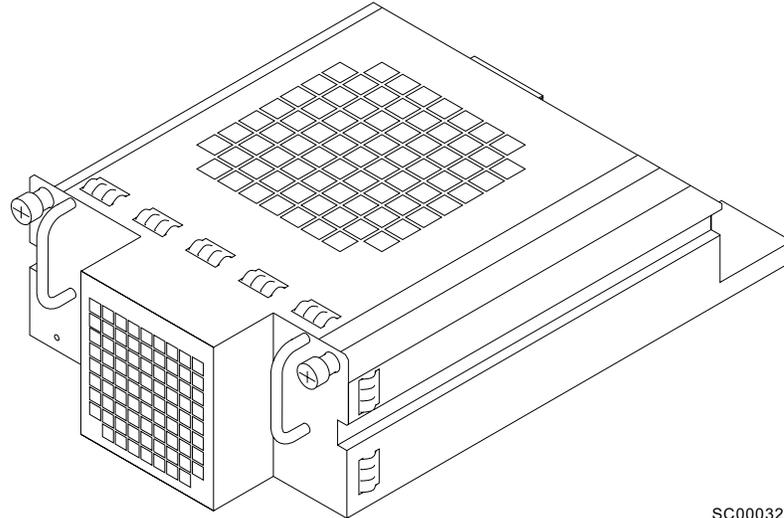


Figure 59. Fan-and-power-supply lights

Fan assembly

You can exchange a faulty fan assembly if:

- You have a correct spare fan assembly. See Figure 60.
- Another fan-and-power-supply assembly is present in the 2104 Model DS4 or Model TS4.



SC000322

Figure 60. Fan assembly

You do not need to remove power from the 2104 Model DS4 or Model TS4 when you exchange a fan assembly.

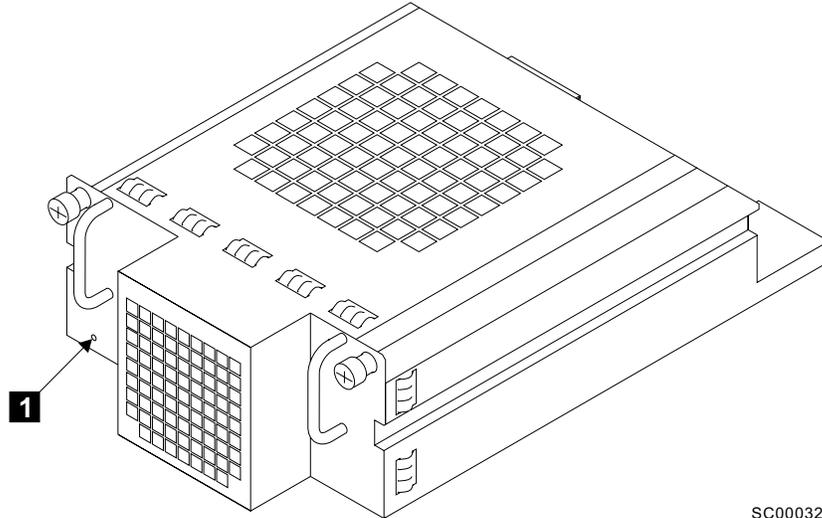
Before exchanging a fan assembly

Look at the check light on this fan assembly. See Figure 25 on page 10. If the check light is flashing, go to “Exchanging a fan assembly” on page 50 and follow the steps to exchange the fan assembly.

Exchanging a fan assembly

The illustrations in the following steps show a 2104 Model DS4. The steps for exchanging a fan assembly in a 2104 Model TS4 are the same, but the parts are turned 90 degrees. See Figure 61.

1. Verify that the amber CHK light **1** is flashing.



SC000321

Figure 61. Fan assembly CHK light

2. Unscrew the two thumbscrews. See Figure 62.

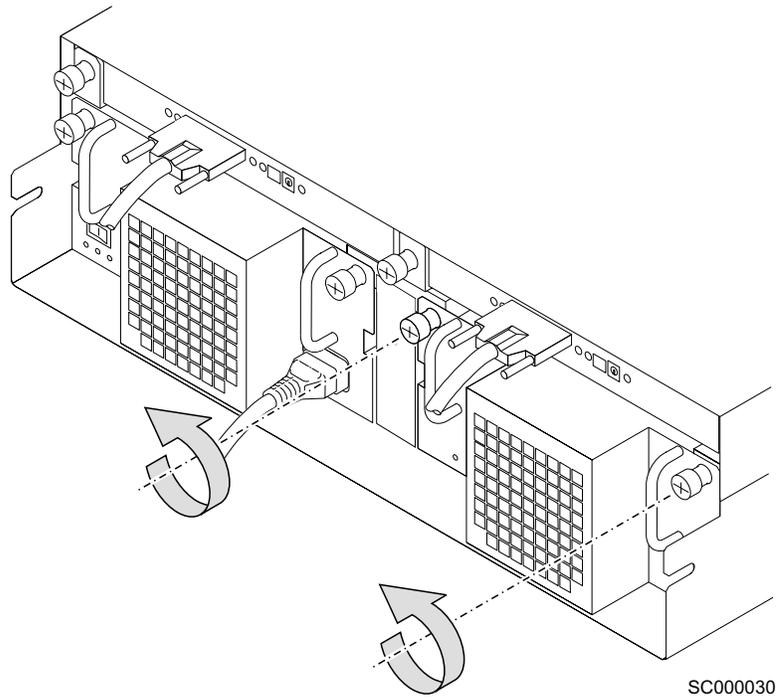


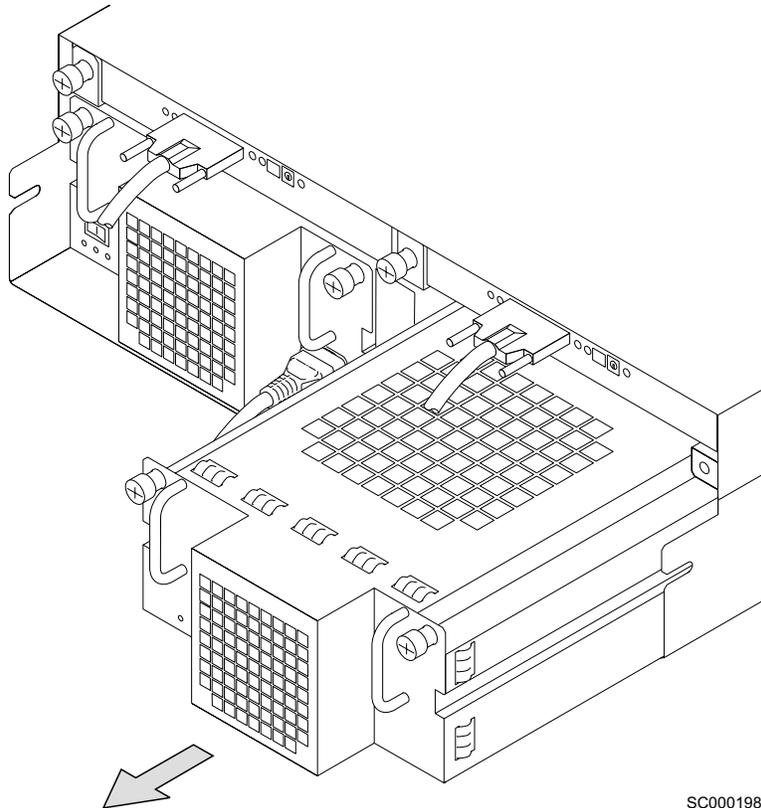
Figure 62. Unscrewing the thumbscrews on a fan assembly

3. Pull the fan assembly from the 2104 Model DS4. See Figure 63.

Attention: Do not leave the space empty for more than 30 minutes. If you do, the 2104 Model DS4 and its disk drive modules might overheat and be damaged.

CAUTION:
Do not insert hands or tools into the empty space that contained the fan assembly. (10)

Note: The speed of the other fan in the 2104 Model DS4 might increase.

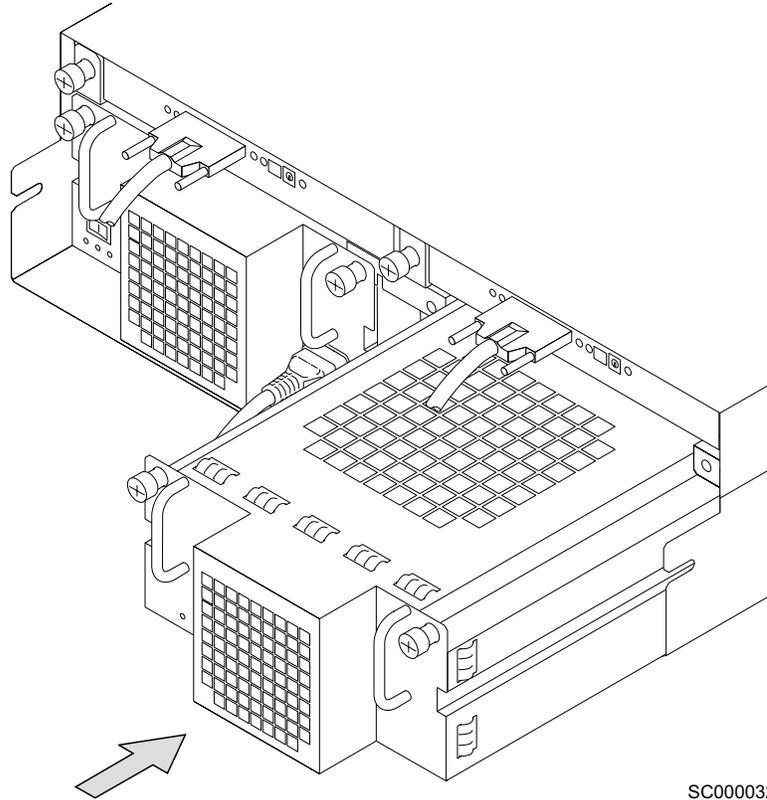


SC000198

Figure 63. Pulling out a fan assembly

4. Push the replacement fan assembly fully into the 2104 Model DS4. See Figure 64.

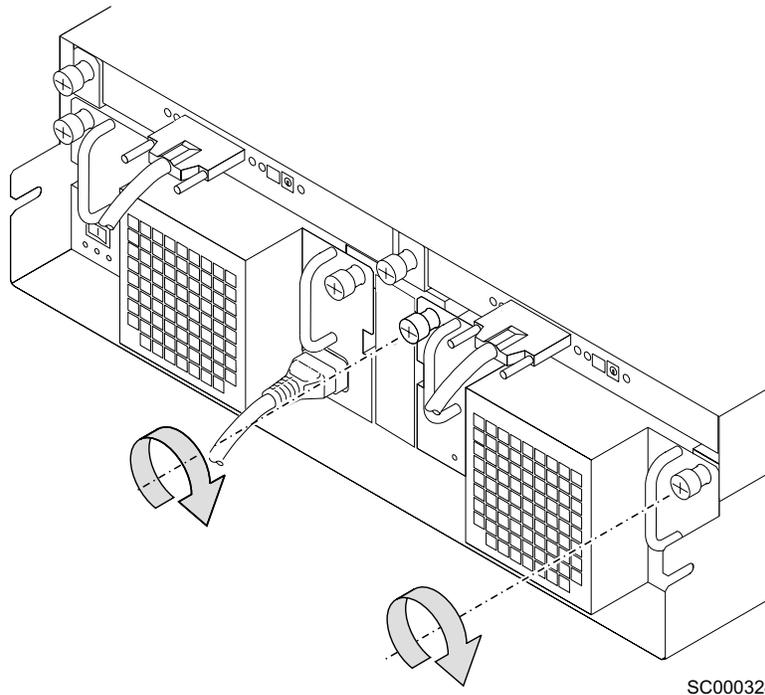
Note: The speed of the other fan in the 2104 Model DS4 might decrease.



SC000032

Figure 64. Inserting a fan assembly

5. Tighten the two thumbscrews. See Figure 65.



SC000324

Figure 65. Tightening the thumbscrews

6. Verify that the amber CHK light **1** is off. See Figure 66.

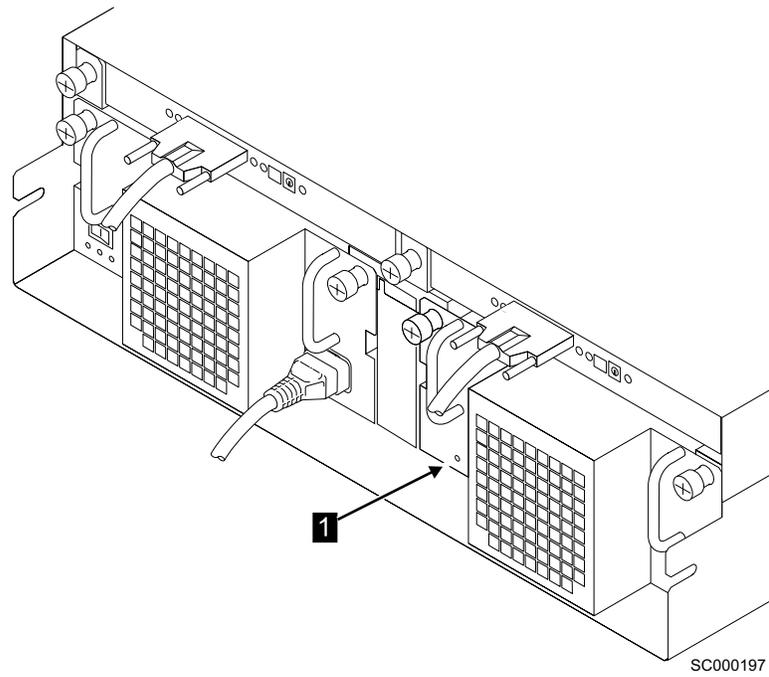


Figure 66. Fan assembly light

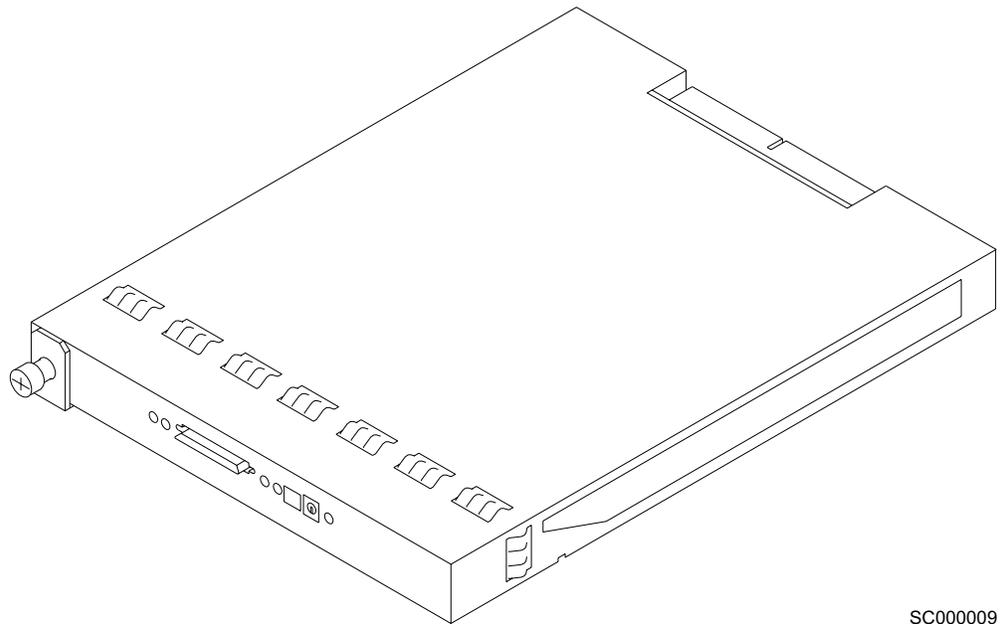
SCSI Interface card assembly

Attention: The SCSI Interface card is sensitive to electrostatic discharge (ESD). See Figure 67. Use the tools and procedures defined by your organization to protect such parts.

You can exchange a faulty SCSI Interface card assembly if:

- You are authorized by your organization.
- You have a correct spare SCSI Interface card assembly.

Note: SCSI Interface cards for 2104 Model DU3 and Model TU3 are not supported.



SC000009

Figure 67. SCSI Interface card assembly

You do not need to remove power from the 2104 Model DS4 or Model TS4 when you exchange a SCSI Interface card assembly.

Before exchanging the SCSI Interface card assembly

Check the lights on the SCSI Interface card. See Figure 68.

If the fault light is on, exchange the SCSI Interface card assembly by using the procedure in the following section.

Switch configuration is only valid on the SCSI Interface card-1 on the left side, viewed from the rear. The configuration on the SCSI Interface card-2 on the right side is inactive. The switch cover plate will be plugged into card-2, so that it can be masked. For more information, see the section about installing the switch cover plate in the *Expandable Storage Plus 2104 Model DS4 Installation Guide* or the *Expandable Storage Plus 2104 Model TS4 Installation Guide*.

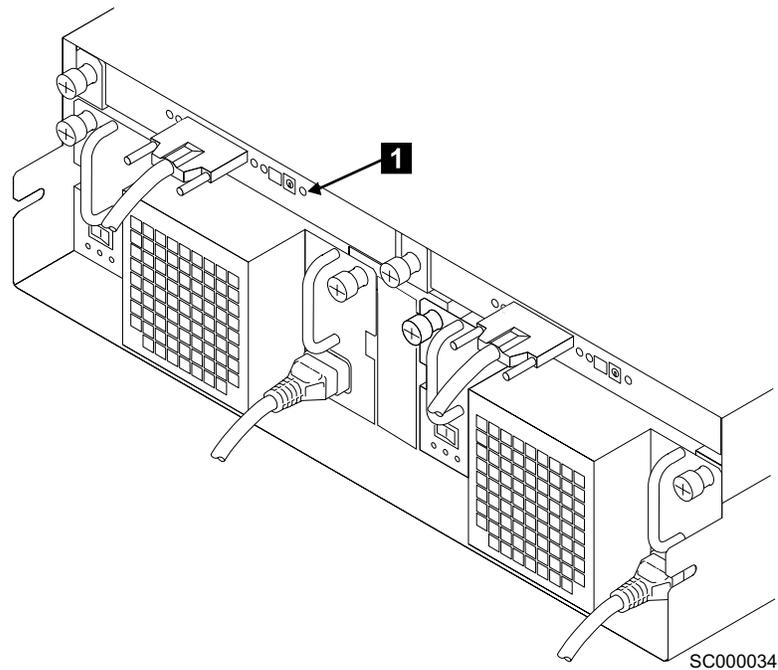


Figure 68. Fault light on an SCSI Interface card assembly

Exchanging a SCSI Interface card assembly

Figure 69 and Figure 70 on page 59 show a 2104 Model DS4. The steps for exchanging a SCSI Interface card assembly in a 2104 Model TS4 are the same, but the parts are turned 90 degrees.

1. Unscrew and unplug the SCSI cable. See Figure 69.

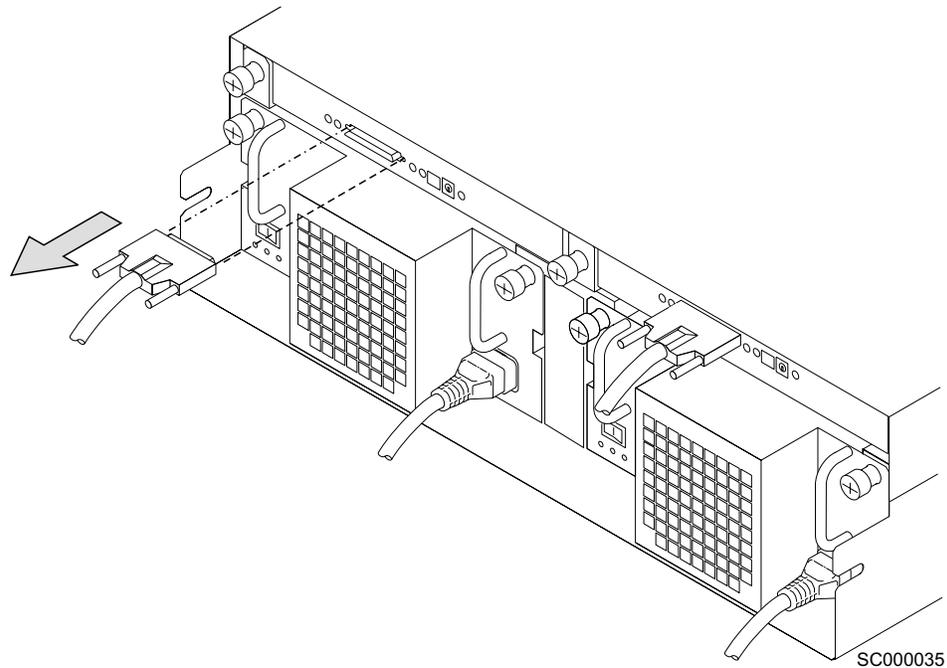


Figure 69. Removing the SCSI cable

2. Unscrew the thumbscrew **1** on the failing SCSI Interface card. See Figure 70.

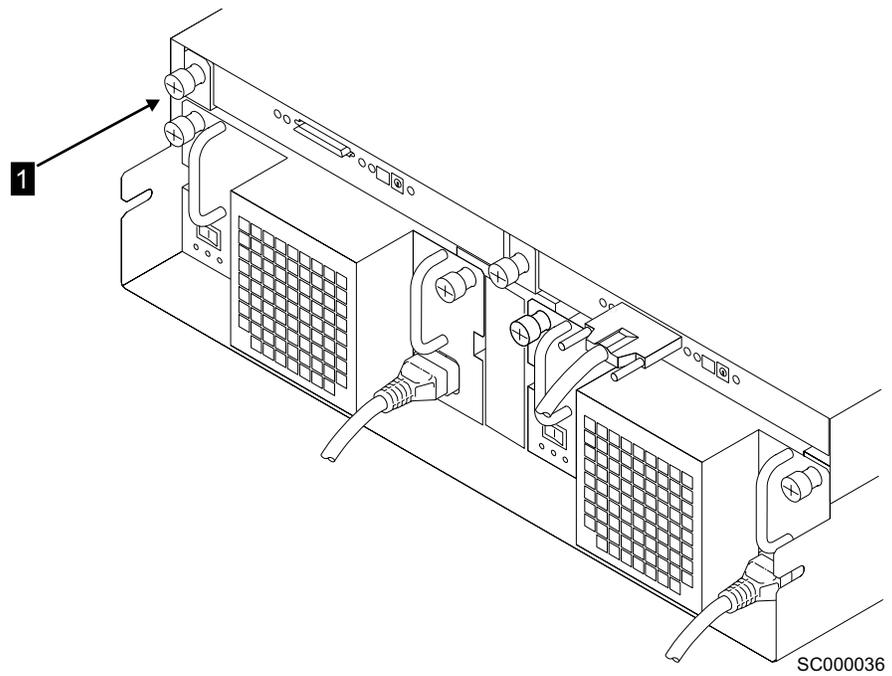


Figure 70. Unscrewing the SCSI Interface card

3. Open the lever fully by moving it to the right. This action unplugs the card assembly from the backplane. See Figure 71

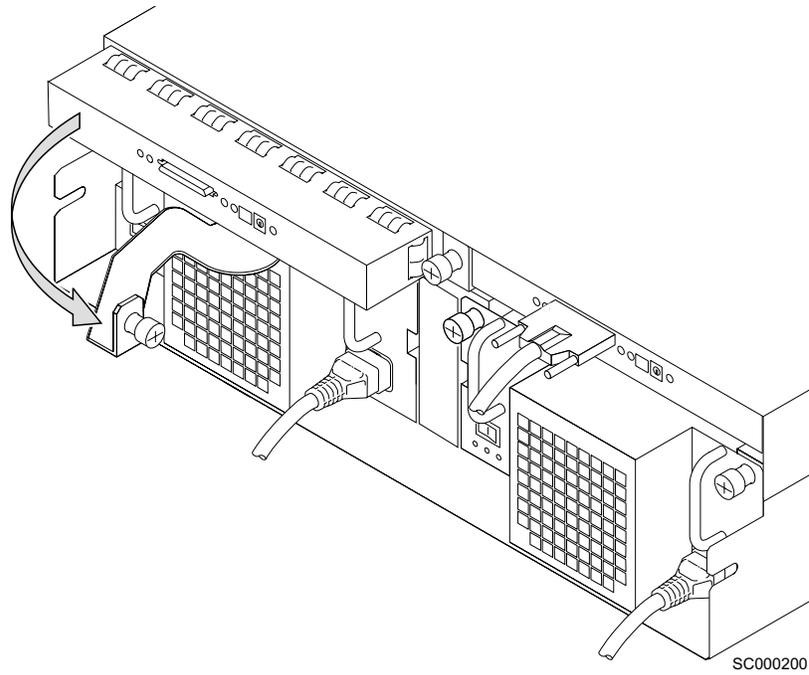


Figure 71. Opening the lever

4. **CAUTION:**
Do not insert hands or tools into the empty space above the fan-and-power supply assembly. (19)
Pull the SCSI Interface card assembly out of the 2104 Model DS4. See Figure 72.

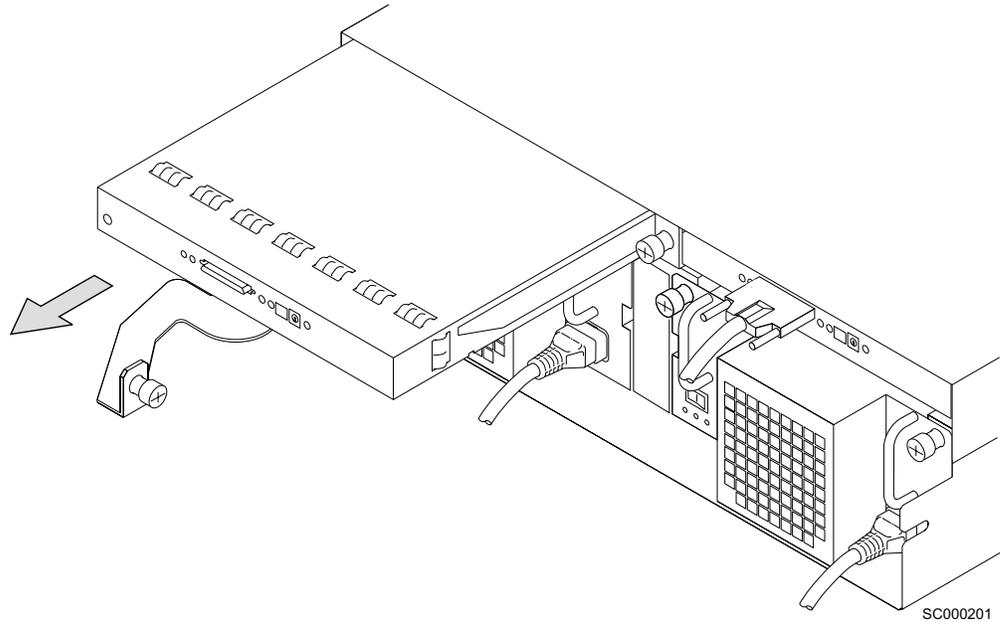
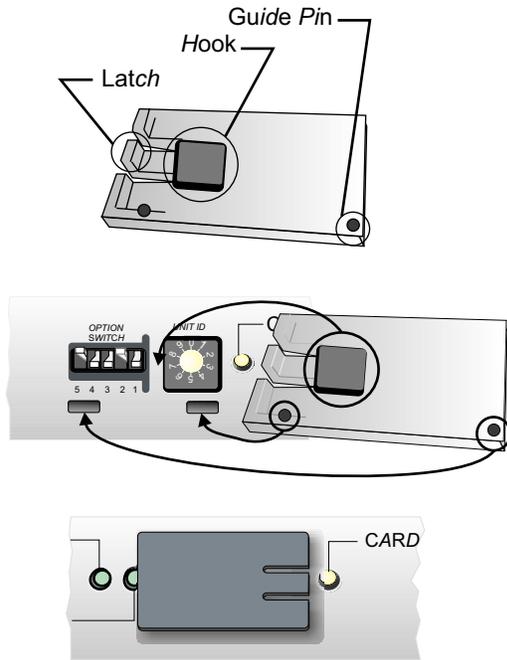


Figure 72. Pulling the SCSI Interface card out

If you are replacing SCSI interface card-1, which is on the left side viewing from the rear, remove the switch cover plate from the new SCSI interface card assembly. Ensure that its switch settings match those of the original SCSI interface card assembly. To remove the switch cover plate, pull the latch and slide to the right. See Figure 73 on page 62.

If you are replacing SCSI interface card-2, which is on the right side viewing from the rear, do not remove the switch cover plate from the new SCSI interface card assembly. The switch settings on SCSI interface card-2 are ignored.



SC000333

Figure 73. Inside of the switch cover plate showing the hook, latch, and two guide pins to mate with the SCSI Interface card assembly

5. Push the replacement SCSI Interface card assembly into the 2104 Model DS4. See Figure 74.

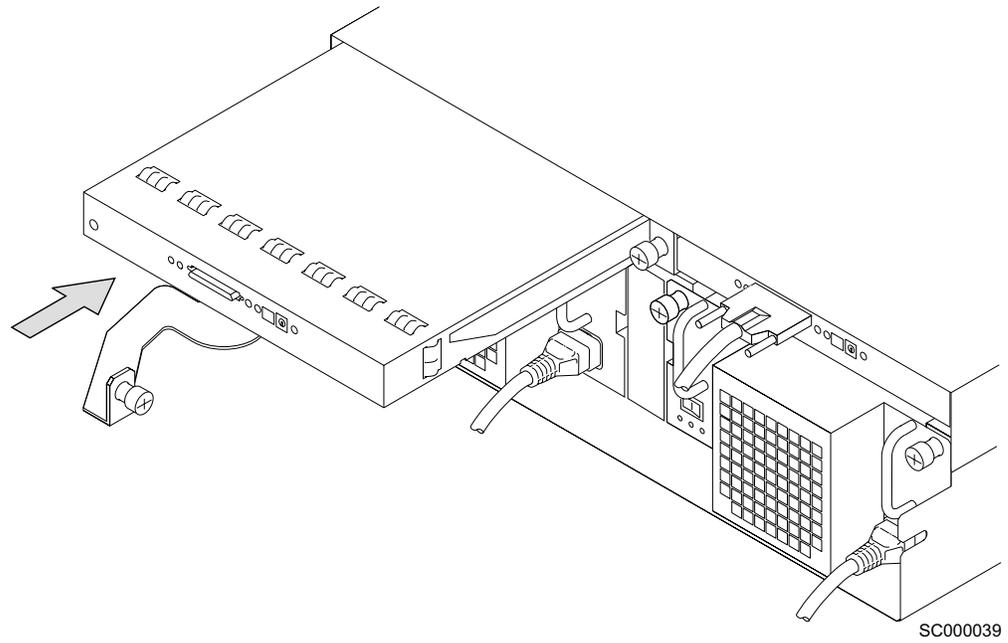


Figure 74. Pushing the replacement SCSI Interface card in

6. **CAUTION:**
As you push the assembly fully home, the lever automatically moves toward its closed position. Ensure that your fingers do not become pinched between the lever and the assembly. (17)
Move the lever to the left. See Figure 75.

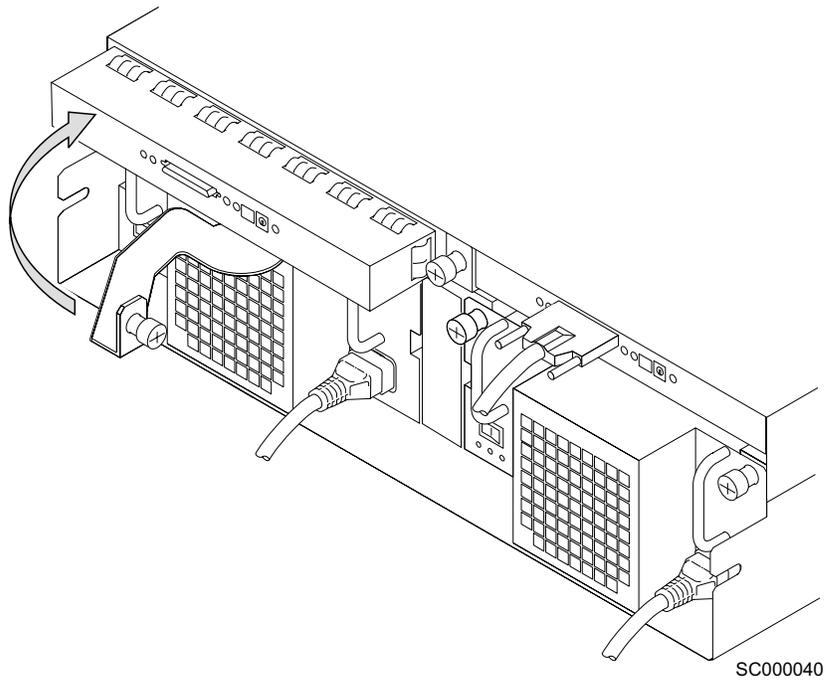


Figure 75. Closing the lever

7. Tighten the thumbscrew. See Figure 76.

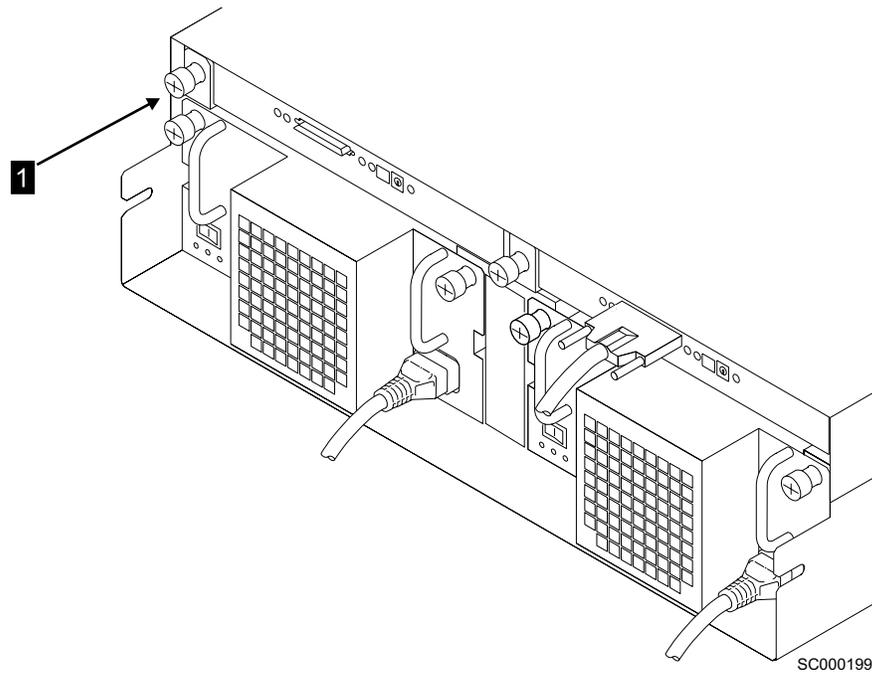


Figure 76. Tightening the thumbscrews

8. Plug the SCSI connector into the SCSI Interface card, and tighten the retaining screws. See Figure 77.

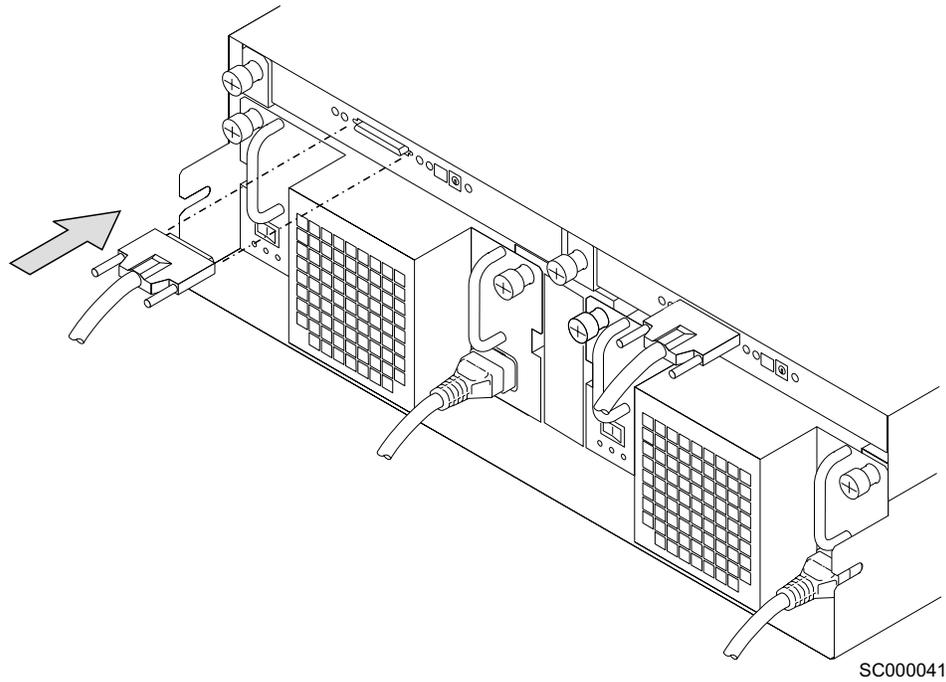


Figure 77. Plugging in the SCSI cable

9. Check that the green TERM POWER light **1** comes on within 5 seconds. See Figure 78. It indicates that the TERM POWER from a host bus adapter is activated. If it does not, check that the new SCSI Interface card is correctly installed.

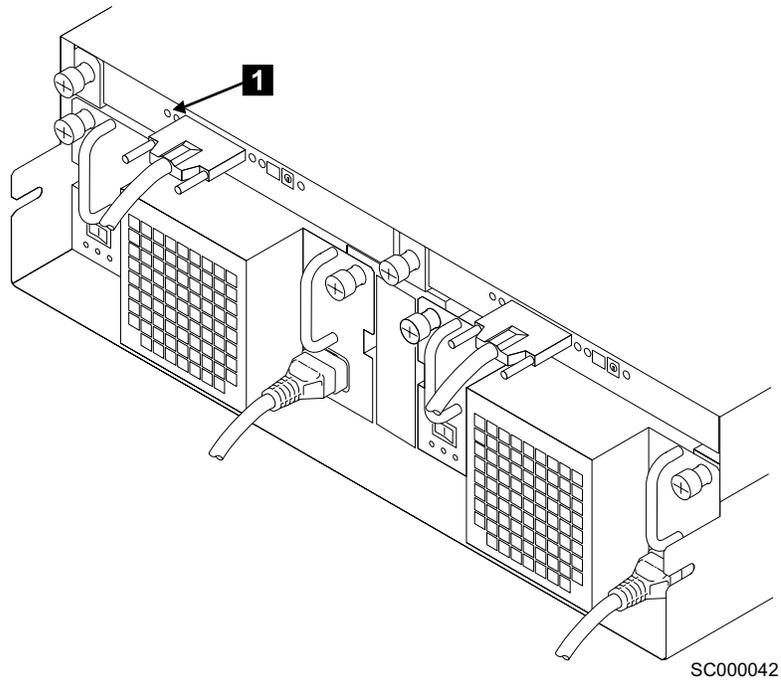


Figure 78. SCSI Interface card assembly TERM POWER light

Appendix. Operating with RISC systems

This appendix contains information that is specific to Expandable Storage Plus disk enclosures that are attached to RISC systems.

SCSI adapters and cables

An RS/6000 or IBM @server pSeries computer running AIX uses one of the following SCSI adapters to connect to the 2104 Model DS4 or Model TS4:

- PCI 4-Channel Ultra3 SCSI RAID Adapter/A (feature code 2498, type number 4-X)
- PCI-X Dual Channel Ultra320 SCSI Adapter (feature code 5712, type number 5702)
- PCI Dual-Channel Ultra3 SCSI Adapter (feature code 6203, type number 4-Y)
- PCI-X Dual Channel Ultra320 SCSI Raid Adapter (feature code 5703, type number 5703)
- PCI Dual-Channel Ultra2 SCSI Adapter (feature code 6205, type number 4-R)

An RS/6000 or IBM @server pSeries computer running Linux on pSeries uses one of the following SCSI adapters to connect to the the 2104 Model DS4 or Model TS4:

- PCI-X Dual Channel Ultra320 SCSI Adapter (feature code 5712, type number 5702)
- PCI-X Dual Channel Ultra320 SCSI RAID Adapter (feature code 5703, type number 5703)
- PCI Dual-Channel Ultra3 SCSI Adapter (feature code 6203, type number 4-Y)

These adapters are supported by the following SCSI cables. See Table 1.

Table 1. SCSI cables

Cable length	Feature code	Part number
20 meters	5320	09L3307
10 meters	5310	09L3305
5 meters	5305	09L3303
3 meters	5303	09L3301
1 meter	5301	09L3299

System service aids

Service aids are available on the host system to help you service the 2104 Model DS4 or Model TS4. The following service aids are described in the *Expandable Storage Plus: 2104 Model DS4 and Model TS4 Service Guide*:

- Format Media
- Certify Media
- SCSI Device Identification and Removal
- Download Microcode

Identifying a 2104 Model DS4 or Model TS4 and its disk drive modules

This section describes how to identify a 2104 Model DS4 or Model TS4 and its disk drive modules.

AIX

When running AIX, you can identify an Expandable Storage Plus 2104 Model DS4 or Model TS4 and the disk drive modules installed in it either by the location code contained in system messages that refer to that unit, or by using the SCSI Device Identification and Removal service aid.

See the location codes command in the operator's guide for your system for general information about location codes.

Linux

When running Linux, you can identify a 2104 Model DS4, 2104 Model TS4, and the disk drive modules installed in it by using the **List Configuration** command. Consult your Linux operating system documentation for information on how to use this command.

Note: Refer to the 2104 Interoperability Matrix link located at the following Web site:

www.storage.ibm.com/disk/expplus/supserver.htm/

to learn which versions of AIX or Linux are supported for the Expandable Storage Plus family of products.

Problem determination

For some problems, your system diagnostics tell you to check the lights on the system to determine which part, if any, has a fault. "Controls and lights" on page 6 of this book shows the position of the lights. The diagnostic programs tell you what to report to your service representative. "Reporting problems" describes other information you should report.

Reporting problems

When you report a problem that has occurred in a 2104 Model DS4 or Model TS4, it is important that you report the following information, in addition to the error information (the SRN) given to you by your operating system:

The machine type number	2104
The machine model number	DS4 or TS4
The machine serial number	xx-xxxxx

You can read the serial number from the label at the bottom right of the front of the 2104 Model DS4 or Model TS4, or from the label on the back of the 2104 Model DS4 or Model TS4.

Checking the SCSI error log

You can check the error log by running diagnostics in problem determination mode. Diagnostics check the error log and present messages about any problems that have been logged. Your system manuals describe how to run the diagnostic programs.

Configuring a 2104 Model DS4 or Model TS4 to an AIX host system

Use the **cfgmgr** command to configure or reconfigure a 2104 Model DS4 or Model TS4 to the host system.

Unconfiguring a 2104 Model DS4 or Model TS4 from an AIX host system

To remove a 2104 Model DS4 or Model TS4 from the host system, use the following command:

```
rmdev -l [enclosurenumber] -d
```

where [enclosurenumber] is the enclosure device that was generated by the **cfgmgr** command (for example, [ses0], [ses1], [ses2])

Remove the ses_healthcheck job from the system cron table.

Configuring a 2104 Model DS4 or Model TS4 in a SuSE Linux Enterprise Server for pSeries Environment

In general, SuSE Linux Enterprise Server for pSeries systems are automatically configured during initial start up or restart. For details, refer to the SuSE Linux Enterprise Server for pSeries documentation.

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This section gives the electronic emission notices or statements for the United States and other countries.

Federal Communications Commission (FCC) statement

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.

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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.

Industry Canada compliance statement

Avis de conformite a la reglementation d'Industrie Canada: Cet appareil numerique de la classe A est conform a la norme NMB-003 du Canada.

Chinese Class A warning statement

Attention: 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.

中华人民共和国“A类”警告声明

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。

European Community compliance statement

This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC 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 is in conformity with the EU council directive 73/23/EEC on the approximation of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits. This conformity is based on compliance with the following harmonized standard: EN60950.

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Germany compliance statement

Zulassungsbescheinigung laut Gesetz ueber die elektromagnetische

Vertraeglichkeit von Geraeten (EMVG) vom 30. August 1995.

Dieses Geraet ist berechtigt, in Uebereinstimmung mit dem deutschen EMVG das EG-Konformitaetszeichen - CE - zu fuehren.

Der Aussteller der Konformitaetserklaeung ist die IBM Deutschland.

Informationen in Hinsicht EMVG Paragraph 3 Abs. (2) 2:

Das Geraet erfuellt die Schutzanforderungen nach EN 50082-1 und EN 55022 Klasse A.

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Nach dem EMVG: ¹

“Gerate duerfen an Orten, fuer die sie nicht ausreichend entstoert sind, nur mit besonderer Genehmigung des Bundesministeriums fuer Post und Telekommunikation oder des Bundesamtes fuer Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Stoerungen zu erwarten sind.” (Auszug aus dem EMVG, Paragraph 3, Abs.4)

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Kostenverordnung (Amtsblatt 14/93) kostenpflichtig.

Nach der EN 55022:

“Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstoerungen verursachen. in diesem Fall kann vom Betreiber verlangt werden, angemessene Massnahmen durchzufuehren und dafuer aufzukommen.”

Anmerkung:

Um die Einhaltung des EMVG sicherzustellen, sind die Gerate wie in den Handbuechern angegeben zu installieren und zu betreiben.

Japanese Voluntary Control Council for Interference (VCCI) class 1 statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラス 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。

Korean Government Ministry of Communication (MOC) statement

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Taiwan class A compliance statement

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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。

VS07171L

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